

Submitted by:



in conjunction with



**ORIGINAL**  
Copy 1 of 10

# TECHNICAL PROPOSAL – VOLUME I

## DESIGN-BUILD

### ROUTE 7 – WESTBOUND TRUCK CLIMBING LANE

FROM: ROUTE 9  
TO: WEST MARKET STREET  
LOUDOUN COUNTY, VIRGINIA

STATE PROJECT No.: 6007-053-133, R201, C501  
FEDERAL PROJECT No.: STP-5401(518)  
CONTRACT ID NUMBER: C00058599DB54



**JUNE 20, 2013**





12001 Guilford Road  
Annapolis Junction, MD 20701

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June 20, 2013

Kevin C. Reichert, PE  
Virginia Department of Transportation  
1401 East Broad Street  
Richmond, VA 23219

**RE: Letter of Submittal: Design-Build Route 7–Westbound Truck Climbing Lane, Loudon County, VA / From: Route 9 / To: West Market Street**  
**State Project No.: 6007-053-133, R201, C501 / Federal Project No.: STP-5401(518)**  
**Contract ID No: C00058599DB54**

Dear Mr. Reichert:

Corman Construction, Inc. (Corman) is pleased to submit 10 copies of our Technical Proposal, Volumes I and II, and one CD-ROM to provide design-build services for the **Route 7–Westbound Truck Climbing Lane** project. The Corman Team confirms we examined the Request for Proposal, Addendums 1 and 2, Questions and Answers, visited the project site, and attended the mandatory and proprietary meetings.

**4.1.1** Corman Construction, Inc., 12001 Guilford Road, Annapolis Junction, MD 20701, is the legal entity who will execute the contract with VDOT.

**4.1.2** Corman hereby declares our intent, if selected, to enter into a contract with VDOT for the project in accordance with the terms of this RFP.

**4.1.3** Pursuant to Part 1, Section 8.2, Corman hereby declares that the offer represented by the Technical and Price Proposals will remain in full force and effect for 120 days after the Technical Proposal submission date.

**4.1.4 POINT OF CONTACT:** Jo Ellen Sines, DBIA, Vice President Project Development  
Corman Construction, Inc. 301-953-0900 –Telephone / 301-343-5484 -Cell  
12001 Guilford Road 301-953-0384 - Fax  
Annapolis Junction, MD 20701 jsines@cormanconstruction.com

**4.1.5 PRINCIPAL OFFICER:** Arthur C. Cox, III, Vice President  
Corman Construction, Inc. 301-953-0900 –Telephone  
12001 Guilford Road  
Annapolis Junction, MD 20701

**4.1.6**

| Interim Milestone Date | Substantial Completion Date | Final Completion Date |
|------------------------|-----------------------------|-----------------------|
| 8/22/15                | 10/22/15                    | 10/22/15              |

**4.1.7 Proposal Payment Agreement (Attachment 9.3.1):** Signed and in the Appendix.

**4.1.8 Certification Regarding Debarment Forms:** Signed and in the Appendix.

**4.1.9** Corman’s Technical Proposal is fully compliant with the Design Criteria Table and all other requirements in the RFP. We also certify that Corman’s proposed limits of construction to include all stormwater management facilities are located within the right-of-way limits shown in the RFP plans with the exception of permanent and temporary easements and that Corman’s design concept does not require Design Exception and/or Design Waivers unless they are identified or included in the RFP or Addendum.

Sincerely,

**CORMAN CONSTRUCTION, INC.**

  
\_\_\_\_\_  
Arthur C. Cox, III, Vice President



4.2 QUALIFICATIONS

4.2.1 The information and statements made in our SOQ remain true and accurate. The organization chart and narrative as provided in our SOQ is wholly incorporated into this technical proposal by reference. Two non-key personnel (shown below in red) have left the firms and are replaced as shown. VDOT has previously approved these changes.

4.2.2 ORGANIZATION CHART



**LEGEND**  
 \* = Key Personnel  
 CCI = Corman Construction  
 AMT = A. Morton Thomas  
 DPS = Diversified Property Services (DBE)  
 SWA = Sabra, Wang & Associates (MBE/DBE)  
 SE = Specialized Engineering  
 QCS = Quinn Consulting Services (WBE)  
 MT = McCormick Taylor (if needed)



4.3 DESIGN CONCEPT

4.3.1 ROADWAY DESIGN CONCEPT: The Corman DB Team’s design concept follows the roadway design criteria in the RFP’s Design Criteria Table (updated on 6/17/13). Conceptual roadway and structural plan graphics are in our Technical Proposal, Volume II and is summarized in this section.

The project includes median widening, shoulder reconstruction, and additional turn lanes on westbound (WB) and eastbound (EB) Route 7. Except for two median crossings onto White Gate Road, from Fort Johnston Road and onto Roxbury Hall Road, all other median crossings will be removed. A 3,400 ft. section of Fort Johnston Road and a 780 ft section of Beechnut Road will be constructed. The West Market Street interchange will be improved and the Route 9 interchange will be reconstructed as a roundabout diamond. The W&OD Trail at the Route 9 interchange will also be realigned to pass under the Route 9 Bridge and Ramp D and will loop around to access the trail bridge over Route 7 on the west side of Route 9. The trail will have just one street crossing at the Route 9 Ramp B. The RFP plans depict a 650’ long section of WB Route 7 beneath the Route 9 Bridge and West Market Street Bridge requiring full depth pavement reconstruction to lower the surface elevation and meet the minimum 16’ 6” bridge clearance. Our design eliminates the majority of this reconstruction through refinements to both the horizontal and vertical alignment, while still meeting VDOT and AASHTO design criteria.

No design exceptions or waivers are required except as listed in the RFP/Addendum and may include an access management waiver, as shown in Addendum 1, Part 2, Page 20. Listed below are the significant enhancements of our team to VDOT’s RFP Concept Plans:

SIGNIFICANT ENHANCEMENTS WITHIN CORMAN DB TEAM’S CONCEPT DESIGN:

- |    |   |
|----|---|
| 1. | Shifting the baseline and crown of the road to the center of the existing lanes as the road was originally designed and constructed. This eliminates a large quantity of additional pavement shown in the RFP Concept Plans and shortens impacts to the motoring public.                          |
| 2. | Adjusting the RFP Concept profile on Route 7 to minimize earthwork and paving quantities and impacts.   |
| 3. | Constructing a short retaining wall from Station 240+00 to 252+00 along EB Route 7 to minimize the fill slopes and avoid impacts to the parallel perennial stream. Keep the wall close to the road and away from the actual stream to minimize clearing and other negative environmental impacts. |
| 4. | Adjust Route 7 profile to avoid full depth construction under the West Market Street Bridge.  |
| 5. | Shorten the amount of pavement reconstruction of WB Route 7 required under the existing Route 9 Bridge by adjusting the mainline profile.   |

**Roadway Geometry:** The Route 7 roadway geometry will be designed to meet VDOT standard GS-1 for 60 mph. The horizontal and vertical alignments will generally match existing. We are modifying the proposed profile in the RFP plans to match existing more closely and avoid excessive overlay and wedge and level of pavement. All proposed cross slopes on existing pavement will be achieved by wedge / level and pavement overlay. The proposed and existing maximum grade on Route 7 is 7% WB and 6% EB. The road is being designed for an 8% maximum super elevation rate with transition rates and length to match VDOT’s standards. All final lane widths will be a minimum 12’ wide. Super elevation utilizes the new standard TC 5.11.

*TEAMWORK: AMT recently prepared preliminary design of a roundabout interchange for the planned Southgate Drive Interchange at US 460 in Blacksburg, VA. Sabra Wang prepared VISSIM modeling of the roundabouts for operational analysis.*

West Market Street will be widened meeting VDOT’s criteria for a 30 mph design speed while keeping its current horizontal and vertical



geometrics. Route 9 will be redesigned, adding roundabouts at each intersection with the Route 7 ramps, following criteria for GS-2 with a 45 mph design speed and a maximum 6% grade.

The roundabouts will be designed as shown in the RFP Concept plans as two lanes, although current use will be for one lane, with the added lane striped off. Geometrics will follow the *NCHRP Roundabouts: An Information Guide* standards. To accommodate traffic volumes, Ramp C from WB Route 7 will have a separate bypass lane to access Northbound Route 9 designed to a 30 mph design speed. The roundabout geometrics will be checked to assure the approaches and circulating roadway have acceptable stopping sight distance and the intersecting points have the acceptable intersection sight distance (240 ft for 25 mph). Median landscaping will be low maintenance and aesthetically pleasing without interfering with sight distance.

Affected interchange ramps will follow VDOT’s standards for GS-R and have a design speed of 30 mph. The Route 9 to EB Route 7 ramp (Ramp D) will require mill and overlay for its full length.

Local road construction for Fort Johnston and Beechnut Roads will follow VDOT standards for GS-4 with a design speed of 30 mph and a maximum 8% super elevation. The maximum grade for Ft. Johnston Road will be 10%, as modified by the updated Minimum Roadway Design Criteria Table.

**Roadside Design:** Roads will be designed as open section with paved and open graded shoulders, except Route 9, the roundabouts, and portions of West Market Street, which will be curbed sections. Open section roads will meet VDOT standards for safety grading or mitigated with traffic barrier (w-beam or concrete). A few sections of Route 7 will have widening in the median that eliminates the open grading and requires concrete barrier between opposing directions of traffic. At these locations, a closed storm drain system will be installed. Since portions of the roadway are bifurcated, a concrete barrier will be installed in the median where identified in the Volume II Concept plans. Along EB Route 7’s outside shoulder, an F-shaped barrier is required to minimize slope impacts and, therefore, a closed drainage system may be required. Aside from the retaining walls related to the Trail construction, there are **four** other locations that require retaining walls to minimize environmental impacts, right-of-way, and/or avoid a conflict with other elements (median grading) as indicated in the table below.

| RETAINING WALL LOCATIONS |                                     |                  |
|--------------------------|-------------------------------------|------------------|
| Route 7 Median           | 225+50 to 233+00                    | RCC Gravity Wall |
| Route 7 Median           | 236+00 to 238+50                    | RCC Gravity Wall |
| Route 7 EB               | 240+00 to 251+00 (outside shoulder) | MSE Wall         |
| West Market Street       | 79+00 to 83+00                      | MSE Wall         |

**W&OD Trail Design:** Key to the project is the proper design and construction of the W&OD trail adjacent to the new roundabouts at Route 9. The Northern Virginia Regional Parks Authority (NVRPA), owner of the trail, has specific design criteria that need to be met. However, we anticipate their main concern will be our maintenance and protection of traffic plans and how we provide for the trail to remain open during construction while providing safe passage for the walkers, joggers and bicyclists that use the trail daily. Friends of the W&OD Trail will also be an involved stakeholder

**SIMILAR TRAIL RELOCATION:**  
*Huckleberry Trail within Virginia Tech Campus is being designed by AMT. Key elements incorporated into the design are: safety improvements to the horizontal alignment (removing a sharp curve); aesthetic treatments; grade separated crossings of roadways at three locations; and maintaining trail traffic throughout construction.*



offering advice and opinions during our design and construction process. Because of our past work on the W&OD to install two tunnels under the trail near Ashburn, we already understand the Park Authority’s key concerns and will:

- Provide an all weather surface at all times
- Design the final product to the NVRPA’s design criteria for width, clear zone, curvature, and pavement section.
- Clearly mark any detours or dangers
- Separate the trail and its users from our construction activities
- Clearly communicate our plans to the Park Authority prior to impacting the Trail
- Maintain the historic nature of the Trail within the project limits

**Pavement Design:** Pavement sections are assumed to be as specified in the RFP. During the scope validation process, subsurface and non-destructive testing will verify the VDOT pre-bid assumptions and revised designs provided, if required.

**Stormwater Management Design Concept:** The Corman DB Team’s stormwater management approach uses BMP’s to achieve water quality treatment to the maximum extent. Our facilities will be chosen based on acceptable VDOT and DCR standard criteria. Our design also includes the two detention facilities matching the locations in the RFP. Our conceptual analysis identified potential BMP facility locations as shown in the following table. ***As an innovative approach to BMP water quality treatment, we are proposing using linear sand filter swales with the grassed medians in lieu of traditional extended detention BMP’s. This allows us to treat more than 6 lbs. of phosphorus per year more than required, a 150% increase!***

**INNOVATION:** *Our approach to SWM treats 6 lbs. of phosphorous per year more than required by current regulations; A 150% INCREASE!*

| CONCEPTUAL SWM BMP SUMMARY                    |                  |                 |                                       |
|---|------------------|-----------------|---------------------------------------|
| Location                                      | Watershed        | Facility Number | Corman DB Team Proposed Facility Type |
| Route 7 Station 137+00 L                      | Catoctin         | BMP-1A          | Extended Detention - Enhanced         |
| Route 7 Station 139+00 L                      | Catoctin         | BMP-1B          | Extended Detention - Enhanced         |
| Route 9 Station 12+75 L                       | Catoctin         | BMP-1C          | Sand Filter/Bio-filter                |
| Route 9 Station 12+50R                        | Catoctin         | BMP-1D          | Extended Detention - Enhanced         |
| Route 7 Station 142+50 L                      | Catoctin         | BMP-1-E         | Extended Detention - Enhanced         |
| Route 7 Station 144+00 R                      | Catoctin         | BMP-1F          | Sand Filter/Bio-filter                |
| Route 7 Station 157+20 to 164+70 R            | Catoctin         | BMP-1G          | Sand Filter/Bio-filter                |
| Route 7 Station 175+40 to 176+70 R            | Limestone Branch | BMP-2A          | Sand Filter/Bio-filter                |
| Route 7 Station 184+10 to 185+70 R            | Limestone Branch | BMP-2B          | Sand Filter/Bio-filter                |
| Route 7 Station 237+L                         | Goose Creek      | BMP-3A          | Extended Detention - Enhanced         |
| Route 7 Station 255+00 R and Station 259+00 R | Goose Creek      | BMP-4A          | Extended Detention - Enhanced         |
| Route 7 (Business) Station 77+75 R            | Goose Creek      | BMP-4B          | Sand Filter/Bio-filter                |
| Route 7 Station 259+50 R to 265+00 R          | Goose Creek      | BMP-4C          | Sand Filter/Bio-filter                |



**Closed Drainage Systems:** The Corman DB Team plans for four closed drainage systems along Route 7 widened median consisting of standard drop inlets (DI-1) and concrete median barrier drop inlets (DI-10J). All proposed closed drainage systems will outfall to a new BMP facility. The inlet locations will be established to minimize the pond spread on the adjacent driving lane.

**Major Drainage Structures**

**Existing Roadway Culvert Crossings:** The Corman DB Team’s drainage design concept for culverts and pipe systems achieves these goals:

|   |                                     |
|---|-------------------------------------|
| 1. Hydraulic capacity sized to meet the ultimate zoned land use based on the existing drainage area boundaries to the culverts                | 3. Minimizes traffic impacts        |
| 2. Structural integrity achieved through replacement or restoration of existing crossings and/or provisions of new crossings where necessary; | 4. Economical design/construction   |
|   | 5. Environmentally friendly         |
|   | 6. Meets current design standards   |
|   | 7. Meet MS-19 standards at outfalls |

Our preliminary design for major culvert design solutions are shown and annotated in the Concept Roadway Plans. The RFP states, for bidding purposes, to assume culverts within the project limits are unserviceable, and should be plugged and replaced with adequate structures. Our approach to the greatest extent possible uses the existing drainage culverts after inspection with VDOT approval, where deemed structurally sound, and replaces or supplements deficient-sized pipes with larger ones for additional capacity. We anticipate jacking and boring, tunneling or open cut to maintain traffic and expedite construction to install new cross culverts as dictated by field conditions, such as top of rock elevations. As specified in the RFP documents, our concept design provides for new 60” culverts where new pipe is installed to meet required drainage capacity in fills over 20 ft. A preliminary sizing and design approach is shown in the following table:

| Culvert Crossing | Station Crossing  | Approx. Drainage Area (Ac.) | Existing RFP Diameter (VDOT) | Corman Culvert Diameter** | Proposed Action * |
|------------------|-------------------|-----------------------------|------------------------------|---------------------------|-------------------|
| 1                | Simpson Circle    | 73.30                       | 54”                          | 54”                       | Remain in Service |
| 1-A              | Route 9 EB Ramp D | 4.05                        | 18”                          | 30”/60”**                 | Replace           |
| 1-B              | Route 7 142+50    | 6.55                        | 27”                          | 30”                       | Replace           |
| 1-C              | Route 9 WB Ramp C | 9.89                        | 24”                          | 36”                       | Replace           |
| 1-D              | Route 9 20+00     | 41.53                       | 48”                          | 48”                       | Remain in Service |
| 1-E              | Route 7 139+25    | 19.82                       | 36”                          | 36”                       | Remain in Service |
| 1-F              | Route 9 WB Ramp B | 24.28                       | 36”                          | 36”                       | Remain in Service |
| 2                | Route 7 154+50    | 6.11                        | 24”                          | 42”                       | Replace           |
| 3                | Route 7 160+75    | 3.24                        | 24”                          | 24”                       | Remain in Service |
| 4                | Route 7 164+75    | 5.12                        | 18”                          | 18”                       | Remain in Service |
| 5                | Route 7 175+25    | 23.26                       | 33”                          | 42”/60”**                 | Replace           |
| 6                | Route 7 183+50    | 5.14                        | 15”                          | 30”/60”**                 | Replace           |
| 7                | Route 7 198+00    | 11.24                       | 18”                          | 42”/60”**                 | Replace           |
| 8                | Route 7 223+00    | 16.27                       | 27”                          | 42”/60”**                 | Replace           |
| 8-A              | Ft Johnston       | 0.47                        | 15”                          | 15”                       | Remain in Service |
| 8-B              | Ft Johnston       | 1.34                        | 18”                          | 18”                       | Remain in Service |
| 8-C              | Ft Johnston       | 3.70                        | 21”                          | 21”                       | Remain in Service |



|      |                     |        |     |            |                   |
|------|---------------------|--------|-----|------------|-------------------|
| 8-D  | Route 7 221+75      | 9.05   | 18" | 30"        | Replace           |
| 9    | Route 7 226+00      | 6.67   | 27" | 27"        | Remain in Service |
| 9-A  | Roxbury Hall Road   | 5.27   | 24" | 24"        | Remain in Service |
| 10   | Route 7 259+00      | 149.73 | 54" | 54"        | Remain in Service |
| 10-A | Route 7 238+60      | 6.43   | 30" | 30"        | Remain in Service |
| 10-B | Route 7 239+00 (s)  | 10.85  | 36" | 36"        | Remain in Service |
| 10-C | Route 7 242+25      | 16.54  | 24" | 36"/60"*** | Replace           |
| 10-D | Route 7 248+25      | 5.40   | 24" | 24"        | Remain in Service |
| 10-E | Route 7 254+75      | 8.80   | 21" | 21"        | Remain in Service |
| 10-F | Route 7 258+00      | 2.96   | 18" | 18"        | Remain in Service |
| 10-G | Market Street 79+60 | 5.94   | 24" | 24"        | Remain in Service |
| 11   | Route 7 265+00      | 13.14  | 33" | 33"        | Remain in Service |
| 12   | Catoctin Circle     | 7.43   | 42" | 42"        | Remain in Service |

\*Pending inspection of existing culvert, final design, and VDOT approval.

\*\*Pipes in 20 ft of fill or more to be upgraded to 60" pipe when replaced.

**Lighting and Signing Design Concept**

**Signing and Marking:** The signing design will adhere to VDOT’s 2011 Traffic Engineering Design Manual, Virginia Road Design Manual (similar to AASHTO), 2007 Road & Bridge Specifications & Revisions, Manual of Uniform Traffic Control Devices (MUTCD) 2009, VDOT’s 2011 MUTCD Supplement, Virginia Work Area Protection Manual, AASHTO LTS-4-M Standard Specifications for Structural Supports for Highway Signs, and 2008 Road and Bridge Standards specifically:

**Integrated Directional Signing Program (IDSP) Signs:** Permanent locations and sign structures of proposed, relocated, or modified IDSP signs, such as Supplemental Guide Signs (SGS), Travel Services (Logo) Signs, and all other approved signs, will be coordinated with the IDSP Manager. IDSP signs will be installed on 2½” square tube posts and concrete foundations per Standards STP-1, SSP-VA structures and foundations or SSP-VIA structures and foundations per RFP.

**W&OD Trail Signs:** W&OD Trail signs will be provided per W&OD Trail Standards.

**Roundabout Signs:** Signs for the two roundabouts will be prepared per the RFP and NCHRP Report 672 – Roundabouts–An Informational Guide. The Route 7 and Route 9 interchange will have advanced roundabout guide signs, intersection lane control signs for roundabouts, advanced warning signs, regulatory signs, object markers, pedestrian crossing signs (if any), and advanced street name signs.

**Sign Panel and Marking Design:** Sign panel layouts will be designed using GuidSIGN. The signing plans will be at one inch = 50 feet scale and show sign designations and sizes. Sign supports will be designed in accordance with 2008 Road and Bridge Standards for Sign Supports and the manufacturer’s criteria for steel beams. A schedule of pavement markings, any delineation devices and signs (existing to be removed/relocated and proposed), sign elevations with the sign supports and summary of quantities will be in the final plans. Signing plans will include any advanced guide, supplemental, roundabout, and W&OD signs.

**Roadway Lighting:** The lighting design along Route 7 will be per RFP and VDOT’s 2011 Traffic Engineering Design Manual, Virginia Road Design Manual (similar to AASHTO), 2007 Road & Bridge Specifications & Revisions, AASHTO Roadway Lighting Design Guide, Luminaires and Traffic Signals, IESNA RP-8-00 Roadway Lighting Illuminance and Luminance Criteria and IESNA TM-11-00 Light Trespass Recommendations, and 2008 Road and Bridge Standards.

The lighting design includes these locations per the RFP:



- WB Route 7 from Sta. 135+00 to Sta. 144+50
- WB Route 7 from Sta. 219+00 to Sta. 234+00 (to remedy limited sight distance)
- Along Route 9 through the roundabouts from E. Colonial Highway to Simpson Circle
- On the W&OD Trail, the more stringent standard, VDOT or the Northern Virginia Regional Park Authority, will be followed at these locations:
  - Proposed tunnel under Ramp D
  - Underpass of W&OD Trail under Route 9

**Roundabout Lighting:** For a roundabout to operate safely and efficiently, a driver can enter the roundabout, move through the circulating traffic, and separate from the circulating stream. To accomplish this, a driver must be able to perceive the general layout and operation of the intersection in time to maneuver. Roundabout lighting provides visibility from a distance for drivers approaching the roundabout, the key conflict area, and layout. The *Design Guide for Roundabout Lighting*, published by the Illuminating Engineering Society (IES) will be used in accomplishing a safe and efficient roundabout lighting design illuminating the entry and exit approaches and all conflict areas.

**Landscaping Design Concept:** The proposed design will provide approximately 80,000 SF of landscape in three areas: the north roundabout at Route 9, the south roundabout at Route 9 and all the stormwater management extended detention facilities. Landscape plans will be designed and reviewed by a licensed Landscape Architect. The design team will utilize native and adaptive plant species that are durable, long-lived and aesthetically pleasing, and require minimal maintenance. They will be located to mitigate impacts to adjacent properties, will not impede sight distance at intersections, and will be designed to meet VDOT guidelines. The design team will use plant materials that tolerate a wide variety of conditions for stormwater management features. The planting designs will be aesthetically pleasing and provide wildlife habitat and forage. Stormwater management features will be screened from residences with perimeter plantings. The roundabouts will also be designed to include hardscape in the form of a stamped concrete apron and/ or channelizing islands. A colored rendering of our proposed north roundabout on Route 9 is included in our Concept Plans in Volume II.

**4.3.2 STRUCTURAL DESIGN CONCEPT:** The W&OD Trail will be realigned from its current path to pass under existing Ramp D (Route 9 access to EB Route 7) and beneath the Route 9 overpass at the south abutment. To accommodate this, we propose the following:

- Install a pre-cast concrete arch with appropriate architectural treatments to carry the W&OD Trail beneath Ramp D per the RFP Conceptual Plans.
- Remove part of the existing Route 9 overpass south abutment slope protection to accommodate the W&OD trail beneath the bridge and construct a retaining wall to accommodate the trail.

**Concrete Arch:** A pre-cast concrete arch will be constructed beneath Ramp D of the Route 7 / Route 9 interchange for the proposed W&OD Trail realignment. Constructing the arch in phases will allow us to maintain traffic on Ramp D at all times. The structure is precast off-site and shipped onsite in 8' sections. They are seated on a strip footing and a butyl rubber seal is installed between the units to waterproof the structure.



The advantage of precast construction is that once the cast-in-place concrete strip footing is in place, it is constructed quickly – about 80 linear feet per day – with backfilling proceeding immediately. The headwalls and wingwalls will be precast or cast-in-place concrete sections that incorporate form liner finishes as prescribed in the RFP.



Construction on Ramp D will consist of a two-phase operation where traffic is shifted for arch construction. There will be temporary support of excavation and concrete traffic barriers for the phased construction.

**Route 9 Overpass South Abutment Wall:** To accommodate the realigned W&OD Trail beneath the Route 9 overpass at the south abutment, the existing slope protection – a combination of stone and concrete slab – will be removed and replaced with a retaining wall similar to that shown in the photo on the right. Of particular importance in constructing this retaining wall is the stability of the existing steel battered piles in the abutment during each phase. Working with the geotechnical engineer, the structural engineer will ascertain the minimum soil cover over the existing piles that must be maintained during construction.



Form liner for the retaining walls

Although several types of retaining walls are applicable at this site, a wall using top-down construction eliminates the need for temporary support of excavation and minimizes impacts to the existing piles. Our initial soil assessment (from the as-built bridge plans) and site conditions indicate that a *soil nail wall* is the most cost effective. The soil nail wall is typically constructed in four steps: 1) a portion of the existing slope protection is removed from the top down and the cut is excavated to a pre-determined height; 2) the soil nails (steel reinforcing rods) are drilled and grouted into the soil mass at a depth and spacing designed for the soil to act as a stabilized mass; 3) the face of the excavated cut is reinforced with shotcrete and repeated until the desired wall height is reached; and 4) an aesthetic precast or cast-in-place concrete finish wall is then attached to the shotcrete wall.



Example wall construction for trail at Route 9 Bridge

Soil nail wall design requires careful design placement and spacing to meet the requirements and avoid interference with the existing battered abutment piles. A critical step is to develop comprehensive special provisions incorporating current construction techniques and quality assurance provisions. Significant components are:

1. Experience of the soil nail wall contractor and personnel, such as Corman Construction;
2. Coordination with the design structural and geotechnical engineers and preparing/reviewing contractor design and working drawings;
3. Quality Control/Quality Assurance of the soil nail wall components and materials.



## 4.4 PROJECT APPROACH

### 4.4.1 ENVIRONMENTAL MANAGEMENT

Our Environmental Team is adept at navigating the environmental process with VDOT and the various regulatory and permitting agencies, including U.S. Army Corps of Engineers (USACE), Virginia Department of Environmental Quality (VDEQ), U.S. Fish and Wildlife Service (FWS) and Virginia Department of Game and Inland Fisheries (VDGIF). ***The Team's approach to environmental risk management is 100% compliance following a detailed avoidance, minimization, and mitigation process.*** This process is built upon a foundation of accurate resource identification and thorough understanding of the rules and regulations protecting each resource. Early resource identification and Rare Threatened and Endangered Species (RTE) coordination will ensure we are aware of all the environmental design issues, and inclusion of realistic permitting timeframes and Time-of Year (TOY) restrictions in the design and construction schedule will substantially reduce the possibility of delays. ***Early informal meetings with the approval and regulatory agencies will ensure complete understanding of the nuances of permitting issues specific to our project, and regular consultation as the project progresses will eliminate surprises and risk.*** Early design consideration of access, staging, and construction methodologies will ensure we have the minimum possible comprehensive Limit of Disturbance (LOD) for permitting purposes, while minimizing the risks associated with modifications during construction. Vigilance and awareness of environmental resources and the permitted limits of construction are hallmarks of our Team which will eliminate encroachment. Permit modifications carry risk and will be avoided to the extent possible by consulting early and often with the construction team. Early, open and regular communication with the regulatory agencies will keep risks to a minimum.

***Environmental Issue Mitigation:*** This project has been reviewed and meets the criteria for a Categorical Exclusion pursuant to 40 CFR 1508.4 and 23 CFR 771.117, and will not result in significant impacts to the human or natural environment.

Our Environmental Team has walked the site and reviewed all the provided documentation. We understand the environmental issues this project faces and potential mitigation as identified in the table on the following page.

***Environmental Permitting:*** Corman and AMT have successfully secured environmental permits on numerous other VDOT transportation projects and have a complete understanding of the required documentation, evaluation, analysis, and coordination necessary to secure critical environmental permits as quickly as possible. Following a design approach of avoidance first and minimization second, the team has already sought to reduce impacts. Our current design will qualify for Nationwide Permit No. 23 for all impacts to wetlands/waters of the U.S., due to our plan for a retaining wall to avoid impacts to the Town Branch perennial stream. Should subsequent design refinements result in additional impacts to this stream, we anticipate that the VWP SPGP #3 (linear transportation projects) will be required. Mitigation bank credits from primary banks in the same watershed will be sought to compensate for any unavoidable impacts to wetlands and streams.



| ENVIRONMENTAL ISSUES SUMMARY   |   |
|--|---|
| <b>1. NEPA RE-EVALUATIONS</b>  |   |
| <b>Understanding</b>   | <b>Mitigation</b>   |
| Provide VDOT information to complete NEPA re-evaluations, including changes in project footprint or environmental conditions. VDOT will prepare re-evaluations prior to ROW acquisition and construction.  | <ul style="list-style-type: none"> <li>✓ Avoid project scope and footprint changes to eliminate or substantially reduce the need for additional studies (including studies for historic properties).</li> <li>✓ Provide accurate and timely identification of any changes to ensure VDOT completes final NEPA documentation easily, thereby avoiding delays.</li> </ul>   |
| <b>2. COMMITMENT COMPLIANCE</b>  |   |
| <b>Understanding</b>   | <b>Mitigation</b>   |
| Provide information to VDOT for completing the Environmental Certification / Commitments Checklist. VDOT will complete it prior to releasing the project for construction.   | <ul style="list-style-type: none"> <li>✓ Carry out necessary environmental commitments and provide documentation of completion to VDOT.</li> <li>✓ Monitor environmental compliance, permitting and mitigation requirements for environmental issues using a tracking database.</li> </ul>  |
| <b>3. RARE, THREATENED AND ENDANGERED SPECIES (RTE)</b>  |   |
| <b>Understanding</b>   | <b>Mitigation</b>   |
| CEDAR GIS shows coldwater streams within the 2 mi search radius. However, due to topography, the project drains away from these streams. The Team is responsible for requesting the latest RTE information and conducting studies and analysis required for any additional species. All RTE coordination will be provided to VDOT <u>prior to the project being released for construction.</u> | <ul style="list-style-type: none"> <li>✓ Avoid project scope and footprint changes to ensure VDOT’s RTE surveys remain valid for already identified species.</li> <li>✓ Initiate RTE coordination immediately upon NTP to avoid delays in identifying any potential new species.</li> </ul>   |
| <b>4. WETLANDS AND WATER QUALITY</b>   |   |
| <b>Understanding</b>   | <b>Mitigation</b>   |
| The Team is independently responsible for securing environmental permits. The Team will delineate wetlands and other waters of the US, conduct stream assessments, document avoidance and minimization, develop permit impact plates, request permits, secure required mitigation, and provide documentation and notifications to VDOT as required in the RFP.                                 | <ul style="list-style-type: none"> <li>✓ Complete early and accurate resource documentation.</li> <li>✓ Avoidance and minimization of resource impacts through design enhancement is a primary goal.</li> <li>✓ Construct retaining wall and integral concrete barrier at the slope hinge point to eliminate 1,100 ft. of stream impacts / minimize stream or wetland impacts.</li> <li>✓ Mitigation will be secured from banks with approved credits following US Army Corps of Engineers procedures.</li> </ul> |

FEMA Maps No. C0227 and C0115 in Loudoun County identified two areas as “Zone X” at the western and eastern project termini. Zone X is defined as either within or outside of the 500 year floodplain, or as an area within the 100 year floodplain that is less than 1 ft. deep or less than 1 square mile in watershed. Both FEMA mapped areas are anticipated to be beyond project limits.

A surface water intake on the Potomac River is within 5 miles downstream of the project. Strict Erosion and Sediment controls will be utilized to mitigate any intake impacts. The Loudoun County Health Department issued a 2008 permit for the abandonment of well and septic systems on the west side of Route 9 across from Beacon Hill Drive. Our Design-Build Team will confirm whether these systems were properly abandoned before construction.



A listing of the anticipated required environmental evaluations and permits follow along with the approving agency and their approximate review period.

**ANTICIPATED ENVIRONMENTAL PERMITS**

| Evaluation/<br>Permit/Approval                          | Regulated Resource/<br>Approval Agency                | Approx.<br>Review<br>Period | Comments  |
|---|---|-----------------------------|---|
| Confirmed Jurisdictional Determination                  | Wetlands, other Waters of the US, State Waters/ USACE | 2 months                    | Required prior to VWP General Permit or Individual Permits.   |
| Rare, Threatened, and Endangered Species                | Federally Listed Species / DCR, USFWS                 | 1 month                     | N/A. No species impacts expected. Team will verify absence of RTEs within area or potential project impacts.  |
| VWP General Permit WP3 “Linear Transportation Projects” | Wetlands, other Waters of the US, State Waters/DEQ    | 4 months                    | Applicable if longitudinal stream impacts are reduced to less than 300 ft. at each crossing.  |
| Nationwide Permit 23                                    | US Army COE   | 2 months                    | Applies to impacts from all culvert crossing construction except for Town Branch  |
| Virginia Stormwater Management Program Permit (VSMP)    | Streams/DCR   | 1 month                     | Submitted with SWM, ESC, SWPPP plan prior to land disturbance activities. Coordination is only to VDOT unless a SWM BMP is proposed that is not a standard VDOT practice. |

Per the RFP, the Team will be the permittee for all required environmental permits and will take the lead in all permit related agency coordination. The Team will work collaboratively with the regulatory agencies to determine permitting approach, achieve consensus on appropriate avoidance and minimization, and ultimately secure required permits using limits of construction that are both feasible and cost effective. Internally the Team’s Permit Group will consist of our permitting specialist, designers, and construction specialists to ensure final limits of disturbance reflect maximum avoidance and minimization, while accommodating critical design features and allowing reasonable room for construction, including erosion and sediment control. Avoidance and minimization discussions between our permit specialists and designers and construction specialists are already underway and will continue in earnest following NTP. Collaboration with the regulatory agencies will begin during the JD confirmation field walk with USACE and VDEQ representatives. During the field walk, when reviewing each feature, avoidance and minimization possibilities and constraints will be discussed. Typically, additional field visits with the resource agencies are not necessary and additional collaboration can be done over the phone or by email as design evolution requires.

An example of avoidance and minimization being discussed for this project is the avoidance of impacts to Town Branch, a perennial stream located on the south side of Route 7 between Station 240+00 and Station 251+00. The RFP documents require widening to the outside edge of eastbound side of Route 7, and with the existing steep side slopes, the proposed widening chases the slope down at a permitted 2:1 slope until the fill slope is beyond the existing stream. Our proposed design will instead construct an MSE wall at the slope hinge point. We will be able to eliminate the guardrail that is currently shown in the plans and have an integral concrete barrier at the top of the MSE wall. ***This completely eliminates any fill or grading on the stream, while reducing the limit of disturbance to the current wooded habitat and amount of clearing and grading required at this site.***



#### 4.4.2 UTILITY COORDINATION APPROACH

Our Utility Team has longstanding relationships and frequently works with the utility companies anticipated on this project, including Verizon, Comcast, AT&T, and Dominion Virginia Power. Team members have performed field reconnaissance and identified the potential relocation impacts.

Our utility coordination approach is a well defined and effective four-stage process based upon previous experiences with VDOT and affected utilities on this project.

Substantial progress was made during the pre-award phase in identifying potential utility conflicts and determining if they can be avoided, mitigated through design changes, or must be relocated. Contacts were made with utilities / providers that currently have facilities within the work area. Meetings generated discussions about their utilities, specific features, utility maps, as-built drawings, and relocation criteria, where applicable.

#### Utility Coordination, Relocation, and Mitigation Strategies

##### *Stage 1 – Initial Coordination During Proposal Phase*

- Developed a Utility Matrix listing the known and potential utilities and utility providers within the project limits of disturbance (*noting that there may be more than one provider for a particular utility in some cases*);
- Obtained drawings of the utility’s facilities in the area of interest;
- Identified each utility point of contact(s);
- Held Informational Meeting with critical utilities having facilities within the project limits;
- Obtained additional information; such as, as-built drawings with profiles, elevation data, materials, procedures for managing relocations from design through construction and acceptance.

The Corman DB Team devised alternatives to resolve conflicts as shown in the Utility Impacts and Mitigation Strategies Table on Page 15. If the conflict is unavoidable, the relocation scope is documented and costs are incorporated into the proposal pricing.

##### *Stage 2 – After Contract Notice to Proceed: Concept Development / Design Phase*

- Convert the Utility Matrix into a Utility Project Management Plan to prioritize, define, schedule, and manage the design and construction of each task;
- Immediately initiate Miss Utility services, utility designation services, and test pits (vacuum / excavate) supported by the Corman DB Team’s survey location documentation capability, to pinpoint the exact location, and material for each utility. Precise utility location data is maintained in a Master Utility Database and then transferred to the roadway and structural design plans;
- As roadway and structural design plans are developed, coordinate with the Utility Design Team. It is expected that in some locations, several utility relocations may be in proximity to each other. The Corman DB Team will manage scheduling, materials, traffic control, outages, and all other relocation elements to minimize public disruption in the work area;
- These designs are refined with the hard data from the utility database, defines conflicts and identifies potential conflicts;
- Within 45 days of Notice to Proceed, our Utility Team meets with VDOT’s Regional Utilities Office to review what is required with each utility relocation submittal. Preparation includes thoroughly reviewing relative concerns to be addressed;
- Within 120 days of Notice to Proceed, a Preliminary Utility Status Report is submitted identifying utilities within the project limits, conflicts and proposed resolutions, time impacts, cost responsibilities, and supporting documentation;
- Conduct a UFI to discuss the project with all utility owners. There will be a UT-9 form for each utility owner to resolve any questions about relocations, including cost;



- Submit relocation plans, certified by the Corman DB Team, to VDOT for approval prior to starting any relocation.

**Stage 3 – Accomplish Relocations / Conflict Resolutions**

The Corman DB Team and/or utility companies will complete relocations per the approved design. ***Should the affected utility companies not be available to quickly relocate their utilities, the Corman DB Team will, with their approval, use our own forces to relocate and keep the project moving.***

**Stage 4 – Final Completion:** The Corman DB Team certifies to VDOT that conflicts were resolved, relocations accomplished, and as-builts completed and submitted per VDOT and utility owner requirements.

**Mitigation Strategies:** The best plan of attack on unexpected utility delays is precision planning and scheduling with reserves to mitigate potential impacts on the construction schedule. This means assigning one Corman DB Team lead person responsible for the entire utility process, as well as jump starting after Notice to Proceed to physically identify and precisely locate every surface and subsurface utility along the project limits.

As illustrated on our Organization chart, Keith Sinclair, PE will lead the utility efforts coordinating with Susan Stancik for field location service survey and our Construction Utility Manager Tim Bulford. Keith and Tim will band together to mitigate utility impacts during design and construction and the team will utilize our Four-Stage Process to get the job done.

***During this pre-award phase, the Corman DB Team has proactively met the utilities identified and made personal contact with ALL known utilities in the corridor, integrating data into our Conceptual Plans and schedule.***

The next step is coordinating with the utility companies to resolve issues, eliminate uncertainty of possible conflicts, and develop relocation plans and schedules for confirmed conflicts. Relocation schedules are integrated into the Project Master Planning Program and CPM Schedule. Additional mitigation tactics include overtime and overlapping relocation work of several utility companies.

Discovering an unknown utility within the project limits can cause a major impact on construction schedule and cost. Our Utility Team will be on the hunt for unknown utilities through initial field walks searching for telltale signs, such as unmarked valves or pull boxes, cleared tree lines or long narrow strips of replaced asphalt. If anything surfaces, additional research and exploration will be conducted prior to the plan submittal.

Our Construction Sequencing in Section 4.5.1 identifies possibilities for concurrent work and provides the advantage that unexpected utility conflicts discovered in one area will not affect progress in other priority areas.

The Corman DB Team will apply due diligence during the initial stages of construction when it is most probable that facilities will be impacted. This is especially true throughout roundabout construction on Route 9 and along Ft. Johnston Road. If or when additional impacts are noted, we will cease operations until an impact assessment is completed and take immediate action to integrate any additional relocation into the Master Scheduling Plan, using slack time and/or other accelerations to mitigate adverse schedule impacts.

Extensive utility relocations are not expected. Work up to this point indicates a conflict exists for four poles along Ft. Johnston Road and Beechnut Road. Construction can advance while these utilities are being relocated and they are not on the critical path.

We have already reviewed our proposed design and known facilities with each utility owner. Individual utility impacts within the project site and their expected impacts and mitigation strategies are outlined in the table on the following page.



**UTILITY IMPACTS AND MITIGATION STRATEGIES**

| STATION                           | UTILITY  | UTILITY OWNER           | CONFLICT  |               | CONFLICT DESCRIPTION                                     | MITIGATION  |
|-----------------------------------|--|-------------------------|-----------|---------------|--|---|
|                                   |  |                         | VDOT Plan | Corman Design |  |   |
| WB 146+35 to 147+00               | Telephone Duct Crossing  | Verizon/ Comcast        | No        | No            |  |   |
| WB 146+40 to 146+75               | Future Use Telephone Duct Casing Crossing                              | AT&T                    | No        | No            |  |   |
| 17+38 Ramp D                      | Future Use Telephone Duct Casing Crossing                              | AT&T                    | No        | No            |  |   |
| 17+62 Ramp D                      | Telephone Duct Crossing  | Verizon /Comcast        | No        | No            |  |   |
| Beechnut Road 52+28               | Power Pole #832 on left  | Dominion Virginia Power | Yes       | No            | Edge of pavement against pole                            | Shift alignment   |
| Beechnut Road 53+42               | Telephone Duct Crossing  | Verizon/ Comcast        | Potential | No            | Reduction of cover over duct                             | Raise road profile  |
| Beechnut Road 54+10               | Power Pole #P125 on right  | Dominion Virginia Power | No        | No            |  |   |
| WB 184+98                         | Fiber Optic Telephone Duct Crossing                                    | Verizon/ Comcast        | No        | No            |  |   |
| WB 192+42 to 193+18               | Telephone Duct on Left Side  | Verizon/ Comcast        | Potential | No            | 2 ducts at top of cut slope (1 AATFI) reduction of cover | Add low wall  |
| WB 203+68 to 204+56               | Two Telephone Duct Crossings & One Fiber Optic Telephone Duct Crossing | Verizon/ Comcast        | No        | No            |  |   |
| Fort Johnston Road 2+18           | Power Pole # SF 94 on Right Side                                       | Dominion Virginia Power | Potential | No            | Pole within cut slope                                    | Add low wall  |
| Fort Johnston Road 3+00           | Power Pole #804 on Right Side  | Dominion Virginia Power | Potential | No            | Pole within cut slope                                    | Add low wall  |
| Fort Johnston Road 2+00 to 4+75   | Two Telephone Ducts on Right Side                                      | Verizon/ Comcast        | Potential | No            | Ducts at top of cut slope                                | Add low wall  |
| Fort Johnston Road 7+12 to 9+66   | Two Telephone Ducts on Right Side                                      | Verizon/ Comcast        | No        | No            |  |   |
| Fort Johnston Road 19+80 to 26+62 | Two Telephone Ducts varying from Center to Right Side (AATFI)          | Verizon/ Comcast        | Potential | Potential     | Reduction/Elimination of cover over duct                 | Relocate duct beyond edge of pavement                       |
| Fort Johnston Road 22+10          | Power Pole #VC46 on Right Side   | Dominion Virginia Power | Yes       | Yes           | Edge of pavement against pole                            | Relocate pole or realign road to provide adequate clearance |
| Fort Johnston Road 24+28          | Power Pole #91 on Right Side   | Dominion Virginia Power | Yes       | Yes           | Proximity to edge of pavement and within cut slope       | Relocate pole or realign road to provide adequate clearance |
| Fort Johnston Road 24+90          | Power Pole #VC80 on Left Side  | Dominion Virginia Power | Yes       | Yes           | Pole within proposed pavement                            | Relocate pole or realign road to provide adequate clearance |
| Fort Johnston Road 28+00 to 33+86 | Fiber Optic Telephone Duct Varying from Center to Right Side           | Verizon/ Comcast        | Potential | Potential     | Cover over duct is both reduced and increased            | Relocate duct beyond edge of pavement                       |
| Fort Johnston Road 28+70          | Power Pole #WB13 on Right Side   | Dominion Virginia Power | Potential | Potential     | Pole within proposed fill slope                          | Relocation may be required for constructability             |
| Fort Johnston Road 30+00          | Power Pole #WB30 on Right Side   | Dominion Virginia Power | No        | No            |  |   |
| WB & EB 235+25                    | Crossing of Multiple Ducts (Including Fiber Optic & AATFI)             | Verizon                 | Potential | Potential     | Reduction of cover over duct                             | Encase utility  |
| West Market Street 82+96 to 84+30 | Fiber Optic Telephone Duct Crossing                                    | Verizon/ Comcast        | Potential | No            | Retaining wall   | Encase utility  |
| West Market Street 84+30          | Telephone Manhole/Vault  | Verizon/ Comcast        | Potential | No            | Guard rail on top of manhole/vault                       | Avoid utility with wide space guardrail                     |



#### 4.4.3 GEOTECHNICAL

**Local Geology:** The Corman DB Team is comprised of geotechnical professionals with many years of experience in designing and constructing projects within the geologic setting of the Route 7 Truck Climbing Lane. From review of Geologic Maps and the results of the VDOT *Geotechnical Engineering Data Report*, we understand that geologic conditions along the proposed project alignment are generally as described below:

The eastern end of the project is near the transition between the Blue Ridge Physiographic Province to the west and the Piedmont Physiographic Province to the east, where a major normal fault is shown by geologic maps to trend in a northeasterly to southwesterly direction and pass through the general area of the Route 7/West Market Street interchange. Extending eastward from the western edge of the fault is the Culpeper Basin, a rift valley that formed at the time of faulting and subsequently was in-filled with sedimentary soils and sedimentary rocks that overlie original pre-fault rocks typically found in the Piedmont Physiographic Province and the Blue Ridge Physiographic Province. While areas in the extreme eastern portion of the project possibly could exhibit geology characteristic of the Culpeper Basin, the VDOT *Geotechnical Engineering Data Report* for the project indicates that rock types encountered in borings within the project limits consist of deformed and metamorphosed igneous and sedimentary rocks associated with the creation of the Blue Ridge Mountains.

Current data indicate that the primary geologic unit within the project limits is the Catoclin Formation, which is characterized by dark-green to bluish-gray metabasalt that can vary from amygdaloidal greenstone to well-foliated greenschist. The minor geologic unit within the project limits is the Weverton Formation, a light-gray, massive to thick-bedded vitreous quartzite with minor phyllitic interbeds, located in the eastern portions of the project and apparently separating the rocks of the Catoclin Formation from the rocks of the Culpeper Basin.

Borings drilled for the VDOT *Geotechnical Engineering Data Report* indicated conditions typical of areas having natural residual soils formed through mechanical and chemical weathering of the underlying parent bedrock, with the degrees of weathering decreasing with increasing depths below grade, until fresh parent rock occurs. Because much of the project alignment lies within areas of previous grading and other construction, fill materials associated with the previous grading and construction sometimes overlie natural subsurface strata.

Previous borings drilled for the project disclosed existing FILL consisting of mixtures of fine-grained and coarse-grained soils with varying amounts of gravel, rock fragments, and organics. Below FILL soils, or below topsoil materials in areas of non-fill, subsurface materials, comprise a residual profile and consist, in descending order, of upper zone residuum, residuum, decomposed rock, highly weathered rock, and bedrock, with the various material types differentiated by general appearance, texture, relative density or consistency, and, in the case of parent rock, by refusal of the drilling and sampling tools. Natural residual soils tend to vary from predominantly fine-grained and plastic clay and silt mixtures initially, becoming generally coarser-grained (more sandy) and less plastic with increasing depths, until decomposed rock, highly weathered rock, and parent rock are encountered. Coring of selected borings below refusal levels indicated the parent bedrock to comprise Schist and Metabasalt.

The previously drilled borings indicate highly variable groundwater conditions across the project limits, ranging from near surface water levels in some borings, to very deep water levels in other borings, and even no water levels at all in numerous borings, indicating that groundwater levels within the project limits depend on numerous factors, including topography, geology, surface drainage patterns, and prevailing weather conditions.

**Geotechnical Risks and Mitigation Measures:** The Corman DB Team is aware of, and is prepared to address, the geotechnical issues highlighted and briefly discussed in the VDOT *Geotechnical Engineering Data Report*, as well as other yet unknown geotechnical issues that may arise during design and construction of the Route 7 Truck Climbing Lane project. Specific geotechnical issues currently known to exist are as follows:

- Earthwork and grading, including rock excavation
- Identification and treatment of unsuitable materials
- Design and construction of cut and fill slopes



- Design and construction of the concrete arch structure for the W&OD Trail re-alignment
- Design and construction of retaining walls, especially those associated with the south abutment of the Route 9 Bridge over Route 7
- Design and construction of drainage pipes
- Design and construction of stormwater management facilities
- Design and construction of a wide variety of pavements.

Several of these geotechnical design and construction issues are further discussed below to illustrate the capabilities of the Corman DB Team in identifying and mitigating geotechnical design and construction risks.

***Retaining Wall Construction at Route 9 Bridge over Route 7:*** There is a slight risk of excessive lateral movement and/or settlement of the south abutment of existing Route 9 Bridge over Route 7 during realignment of W&OD Trail in the immediate area of the interchange. Our geotechnical and structural engineers will be onsite during this operation to monitor any movement and recommend mitigation as necessary. Planned realignment of the W&OD Trail will necessitate excavation of the existing slope at the north side of the south abutment of the bridge. A permanent retaining wall system must be installed for support of a vertical cut at the north side of the abutment to provide sufficient room for the approximately 20 ft wide W&OD Trail between the south abutment and East Bound Route 7.

It is anticipated that a soil nail or similar wall type will likely be provided for permanent lateral support of the south abutment of the Route 9 Bridge over Route 7, as such a retaining wall system can be constructed in stages to maintain support for the south abutment during the cut being made for the W&OD Trail realignment. Mitigation for the south abutment also may need to consider supplemental vertical support and global stability needs. Supplemental resistance for global stability may need to be evaluated.

***Concrete Arch for Ramp D Over W&OD Trail:*** There is risk of inadequate bearing support and excessive settlements if conventional footing foundations are used to support the Concrete Arch that is to carry Ramp D over the realigned W&OD Trail. Inadequate bearing support and excessive settlements might stem from the highly variable subsurface conditions at planned Concrete Arch sub-grade levels which are proposed to be near EL 595 ft at the southeast end of the arch and near EL 600 ft at the northwest end of the arch. Current subsurface information indicates that subsurface materials below these planned sub-grade levels for the arch are high-moisture content natural SILT at the southeast end of the arch and previously constructed FILL at the northwest end of the arch. Decomposed rock materials in the area occur at levels ranging from about EL 586 ft to EL 589 ft.

Various mitigation measures will be considered to provide relatively uniform support conditions for the Concrete Arch and avoid potential excessive total and differential settlements. Suitable foundation possibilities might include conventional footings supported over fill soils and natural soils that would be modified and improved in place through some type of ground improvement method or excavation of existing fill and high-moisture-content soils down to the decomposed rock and then re-establish design grades for the concrete arch using high quality backfill that would permit support of the concrete arch on a conventional footing foundation system.

***Cut Slope and Fill Slope Design and Construction:*** There will be locations along the alignments of the roadway improvements where roadway width adjustments require construction of cut or fill slopes. Current planning indicates consideration of cut and fill slopes with tentative gradients not exceeding 2H:1V, and steeper slope gradients are not permitted unless stabilities for such slopes are well documented and approved by VDOT. Also, there are specific criteria relating to safety used to evaluate slopes, depending on slope heights and criticality and the investigation performed to evaluate soil strength and other parameters.

The currently proposed slope gradients of 2H:1V typically should be acceptable for long-term stability of cuts made within decomposed rock, highly weathered rock, and rock, and in most cases can be steepened for greater



economy of construction. Also, 2H:1V fill slopes constructed of predominantly coarse grained soils may be acceptable for many situations, depending on the materials being used. However, cut and fill slope gradients of 2H:1V are non-trivial with regard to long-term stability considerations for slopes that occur in areas of existing fill or where the natural residuum consist of finer grained silt and clay mixtures. As a result, additional investigation may be conducted of the subsurface soil and groundwater conditions in areas of cut and fill slopes greater than 10 ft high and/or where previous borings indicate potential problematic soils conditions, will be conducted for any slopes meeting criteria for critical slopes. Thoughtful and careful analyses will be performed to demonstrate the anticipated safety factor of the various slopes along the project alignment.

One major fill slope along the project alignment is proposed for the north side of Ramp C and is likely to be considered a “critical slope” based on a maximum height in excess of 30 ft and possible impacts associated with a major slope failure. Current boring information for the slope area appears to be limited to relatively shallow borings (approximately 6 ft deep) drilled from the top of the existing ramp. These borings indicate the presence of highly variable cohesive fill soils within the depth of Ramp C soils investigated.

Additional subsurface exploration will evaluate the new fill slope at the north side of Ramp C, with possibly two conventional borings at the top of the current slope and possibly two conventional borings at the base level of the proposed fill slope. Once the general subsurface conditions are established, supplementary borings may be needed to obtain special samples (Shelby tube) for laboratory testing to establish representative strength and other pertinent soil properties to use in slope stability analyses. Additional laboratory testing also will be needed to establish strength and other soil properties for the materials proposed for new fill slope construction. Specifics of the laboratory testing to be performed will be determined once the subsurface profiles and soil types present, or to be used, are known. Conventional slope stability analyses will be conducted using appropriate geotechnical software to verify that the final slope design will provide a safety factor of 1.5.

Similar procedures will be used to evaluate other cut and fill slopes along the project alignment, although the scope of investigation and analyses will be scaled to match the nature of the slopes to be evaluated.

**GEOTECHNICAL RISK AND MITIGATION STRATEGIES**

| <b>Risk</b>   | <b>Mitigation</b>   |
|---|---|
| Excessive lateral movement and/or settlement of the south abutment of the existing Route. 9 Bridge over Route 7 during realignment of W&OD Trail.                           | <ul style="list-style-type: none"> <li>▪ Review available design drawing and geotechnical information for the south abutment of the Bridge to ascertain details of current foundation support.</li> <li>▪ Perform additional subsurface exploration and laboratory testing to further evaluate subsurface conditions for the south abutment.</li> <li>▪ Conduct analyses to determine appropriate vertical and lateral support measures and global stability of the abutment.</li> <li>▪ Select mitigation measures based on safety, performance, and cost.</li> <li>▪ Have the Geotechnical and Structural Engineers visit the construction site as appropriate</li> </ul> |
| Inadequate bearing support and excessive settlements for the concrete arch that is to provide access for, and is to carry Ramp D over the re-aligned W&OD Trail.            | <ul style="list-style-type: none"> <li>▪ Review current subsurface information and foundation loading information associated with the concrete arch.</li> <li>▪ Perform additional subsurface exploration and laboratory testing to further evaluate subsurface conditions at the arch location.</li> <li>▪ Perform analyses to evaluate foundation methods for bearing support and settlements.</li> <li>▪ Select mitigation measures based on safety, performance, and cost.</li> </ul>   |
| Inadequate performance for 2H:1V cut and fill slopes along the project alignment depending on specifics of the slopes and the subsurface conditions at the slope locations. | <ul style="list-style-type: none"> <li>▪ Review each slope area for general configuration and currently available subsurface information.</li> <li>▪ Perform additional subsurface exploration, special field and laboratory testings to further evaluate subsurface conditions at each site.</li> <li>▪ Perform stability analyses per accepted VDOT procedures to evaluate stability conditions for the slopes.</li> <li>▪ Select mitigation measures based on site limitations, safety, performance, and costs.</li> </ul>   |



**4.4.4 QUALITY ASSURANCE/QUALITY CONTROL:** The Corman DB Team’s QA/QC approach creates a partnership between the project’s designers, contractor’s field staff, QC inspectors/testers, and QA staff. Forming this partnering environment with a proactive QC testing and inspection program and an adequate level of QA is key to a robust QA/QC Plan. It is in every stakeholder’s interest that the QC is proactive and effective to: 1) reduce contractor or designer rework; 2) limit required QA efforts to perform the QC for the team; 3) limit VDOT need to assign valuable resources; and, 4) assure VDOT of a well-maintained, safe construction site with design criteria and construction and materials meeting the overriding specifications. *Our DBPM will instruct the QC staff early on that their job supersedes keeping records and testing materials, includes the traditional duties of a VDOT inspector, and being assertive if anything is non-compliant.* Knowing if any work items are not performed properly early sparks immediate correction while the cost and schedule impacts are minimized.

**DEDICATION:** *Our DBPM will instruct the QC staff early on that their job supersedes keeping records and testing materials, includes the traditional duties of a VDOT inspector, and being assertive if anything is non-compliant.*

Our QA/QC program will be in accordance with VDOT’s *Minimum Requirements for Quality Assurance and Quality Control on Design Build and Public-Private Transportation Act Projects, January 2012.*

During our Partnering meeting, representatives from VDOT, Utilities, Local Jurisdictions, and other stakeholders will be invited to discuss and resolve “rocks in the road” to achieve quality goals. Including Quality in the Partnering meeting’s agenda has proven successful on our past projects.

**Design QA/QC:** To kick-off QA/QC, prior to design, the Design Manager, lead discipline engineers and Design Quality Manager will establish the design criteria and checklists for each design element to provide to assigned staff engineers. They will then audit the work to ensure correct standards are followed, checklists are used, and the work is documented. Regular “All Hands” meetings, which stress the importance of quality in the design, keep the required quality culture in check. It is also a forum for Lead Construction and Design firm principals to offer lessons learned on past DB projects and perspectives on the role quality plays in project success.

**Key to project success is an integrated QA/QC process that includes the QC staff, designers, contractors, and the design team’s quality control checkers.** During the design process, plans will be reviewed not only by the design QC staff, but by the construction and QC staff for constructability and ease and efficiency of resulting means and methods. This especially holds true for the impact the design will have on MOT. Items, such as material delivery / storage, workforce accessibility, and crane and other equipment placement will be reviewed to minimize their impact on traffic. Review checklists will be prepared during the constructability reviews and comment sheets will be rechecked for the action taken prior to the plans being issued for construction. ***Special attention will be given to adequacy of temporary drainage and sight distance impacts of temporary Traffic Controls during construction.***

**PARTNERSHIP:** *Our goal is to encourage “over the shoulder reviews” by VDOT during the design process and “doing it right the first time,” thereby minimizing comments and reviews from VDOT and other reviewing agencies.*

The mission of the QA/QC procedure for the design elements is to provide quality designs and plans in the fast-paced delivery of a design-build project. The key that drives success is effective communication among everyone involved with the design.

QA/QC design procedures goals are:

- Designing features that are safe and meet VDOT regulations and Design Manuals;
- Conforming to the standards and reference documents in RFP, Part 2, Section 2.1.1;



- Design elements that meet requirements, are constructible, durable, economical, inspectable, and minimize maintenance;
- Meeting design schedule, budget, and construction staging requirements;
- Minimizing design costs;
- Ensuring that an organized and indexed set of design calculations, including design criteria and assumptions; are provided;
- Minimizing VDOT review effort.

A flow chart for the design QA/QC process described below is shown in the Design QA/ QC Workflow Diagram.

**Checking Design Deliverables:** It is essential that the design deliverables show complete and clear fabrication and construction requirements / details. The Design QA & QC lead will develop a QA/QC Plan and implement it. The processes / procedures defined in the Plan will be strictly enforced and thoroughly documented to minimize VDOT reviews.

**Design Preparation:** Design deliverables will be prepared under the Lead Discipline (Structural, Roadway, Drainage Geotechnical, etc) Engineers. Weekly meetings will be held throughout the design process, led by the Design Manager, and include the Lead Discipline Engineer, QC staff, the Construction Manager or their representative and representatives from key construction team members, such as the fabricator and erector. VDOT can also participate at their discretion. These meetings reduce design and VDOT review time by facilitating coordination of design and construction requirements.

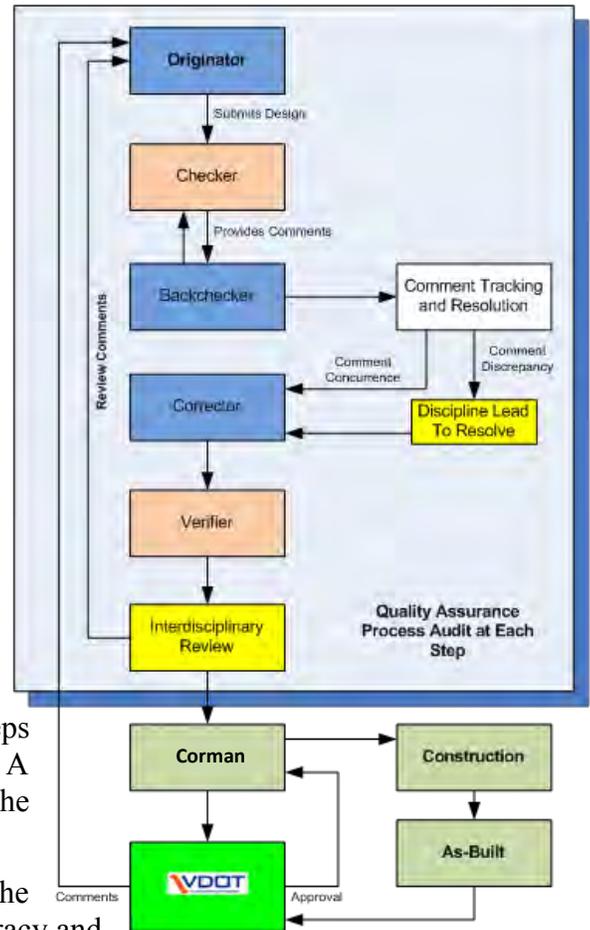
Checking Design deliverables come in the form of drawings and calculations. Review starts within the discipline before the deliverable is reviewed by the Design QA & QC Lead, Design Manager and others. Reviewing each deliverable follows the steps below. At the end of each step, the checkprint stamp is signed. A stamp on each sheet is required for the drawings and on the calculation cover sheet.

**Originator**—Responsible for the initial preparation of the deliverable to be checked. The originator is accountable for accuracy and adequacy of the deliverable and prepared per requirements in the applicable design codes. It is not intended that the originator rely on the checking process to complete the deliverable.

**Checker**—Independent of the originator and checks the deliverable. The checker reviews every aspect, including input required for design programs that are a part of the calculation set. The checker marks up the stamped deliverable set with comments and returns it to the originator. The checker is a senior staff member with the experience to check the design.

**Back-checker**—Reviews the checked deliverable and confirms the items marked for revision are justifiable, and that the corrections noted are correct. The back-checker is also the originator. If the back-checker disagrees with a correction from the checker, they must coordinate to resolve prior to the next step. If both continue to disagree, the Lead Engineer resolves the difference.

Design QA/QC Workflow Diagram





**Corrector**—Ensures that the changes marked on the checkprint are addressed and revised on the original deliverable. The corrector is either the originator or a CAD drafter. A CAD drafter can be the corrector for drawings.

**Verifier**— Reviews a copy of the corrected deliverable against the checkprint and verifies corrections marked have been properly addressed. The verifier is also the checker.

**Interdisciplinary Review**—Once the design deliverable is checked, the Design Manager organizes the discipline leads (structures, roadway, drainage, utilities, etc.) to review the submittal. Concurrently, the Construction Manager and QC group reviews the submittal for constructability. If there are comments from the Interdisciplinary Review, the checking procedure starts from the beginning for the affected portions of the deliverable.

**Quality Assurance**—The Design QA & QC Lead is responsible for auditing that the quality control checking process is being followed by the design team. In addition, when required, a design peer review will be performed by a senior technical member of the team.

**Contractor Review**—As a final review, prior to submitting to VDOT, Corman will again review for constructability and conformance to anticipated means and methods.

**Submit to VDOT** – The Lead Discipline Engineer signs a form that all QA/QC efforts are in accordance with the required procedures and transmits it to the Design Manager. The Design Manager and Contractor then sign off on it. At this time, the deliverables are ready to be signed and sealed by the Lead Engineer as a Virginia Professional Engineer and our Project Manager submits the completed and reviewed documents to VDOT for information and approval. VDOT reviews the design and submits any comments to the Corman DB Team. If there are comments, the Team addresses them into the final design, as appropriate, and resubmits for VDOT approval. The approved plans are then used to construct the Route 7 Westbound Truck Climbing Lanes.

Design changes during construction will be reviewed using the same process as the original design. Changes, such as field design changes and nonconformance evaluations, will be maintained in a database to track revisions and update the as-built documents.

**Records:** The Lead Engineer verifies that all quality control procedures were performed for the individual discipline. The Design QA & QC Lead and the Design Manager are responsible for Quality Assurance. Copies of the documents for each submittal, including revisions, will be kept for the duration of the project. Final design records of the required forms and checkprints are maintained by the Design Manager in the project files.

**One Unique Design QA/QC Element:** One design element that has the most significant challenge is the **concrete slope removal and structural/geotechnical design of the retaining wall beneath the Route 9 Bridge to accommodate the relocated trail**. Some concerns include: existing abutment condition, existing pile location and geometry, proximity of the wall to the abutment, and existing soil conditions. Our proposed retaining wall consists of removing the concrete slope protection slab and excavation from the top to the bottom in set pre-determined and monitored stages to construct the trail beneath the bridge to the horizontal and vertical grade as per the contract documents. The proximity of the trail to the existing bridge abutment leaves little room to spare. One concern in our design is the risk of lateral movement and/or settlement of the south abutment of existing Route 9 Bridge over Route 7. Also, soil nailing placement will require careful consideration of the location of the piles so there are no conflicts in the field.

To meet the schedule and minimize cost overruns, the Corman DB Team will design the wall and adjacent trail so there will be no surprises in the field during construction. We will obtain accurate information in regards to the abutment location and shape, and the location of the support piles. We currently have the as-built bridge plans and inspection reports, but our structural engineers will field inspect the existing bridge to document the existing condition of the bridge abutment and superstructure to provide a baseline for monitoring the bridge



during each phase of the retaining wall construction. Our surveyors will provide additional survey of the bridge and road beneath for accurate dimensions and offsets of EB Route 7. We will work with Specialized Engineering, our Geotechnical consultant, to probe the foundation beneath the bridge abutment to accurately pinpoint the pile locations. Additional borings may be required to verify soil conditions for accurate design of the soil nail wall. Our construction plans will require that the retaining wall system be constructed in stages to maintain adequate support for the south abutment during the excavation. Depending on final analysis, we may call for additional vertical support for the abutment if required provided through micro-piles. Also, supplemental resistance for global stability may need to be provided using drilled, cast-in-place reinforced concrete piers or some type of ground improvement.

Every step of the retaining wall design will be in accordance with our firm's QA/QC Manual which outlines a specific color-coded checking process for all design calculations and plans that is universally followed throughout the firm. Form LD-436 will be passed along with the plan sets for our internal quality control reviewers to assure that the plans meet VDOT standards and are complete for the contractor's use. Information, calculations, and assumptions related to the retaining wall design will be kept in a hard copy design book and in our network folders in electronic form (archived nightly) to be passed along to the reviewers. The QC reviewer will check calculations, plan stations and offsets for accuracy, check the concept of the plan for conformity to VDOT standards and the intent of the design, and verify assumptions made during the design process. Modifications/corrections are then passed back to the designers for revisions. A follow up QC of the plans and calculations will verify that all changes were made and are correct. Only when this process is complete will the plans be submitted to VDOT for review.

**Construction QA/QC:** No matter how accurate the design is, its implementation during construction will determine the project's ultimate success. Effective and aggressive Quality Control, positively supported by management, will drive the project toward success from the contractor's profit perspective, as well as VDOT's and the community's perspectives. Achieving this goal takes pre-planning and effective communication of that plan. Prior starting construction, while design is still in progress, the DBPM, CM, QC Manager and QAM will hold a lessons learned planning forum. ***Based upon their collective judgment, they will identify the 20% of work tasks that will cause 80% of the quality challenges.*** Specific inspection and testing plans (ITPs) will be developed for those critical items and distributed to the Foremen, QC Inspectors and QA staff to use as a guide in performing and inspecting the work. Based upon past history and shared experiences, additional witness and hold points above those required by VDOT will be identified, and then enforced in the field by the DBPM, CM and QC Manager and their staff. Documents releasing work at each witness / hold point are identified on the ITPs and documented for review by the QAM or VDOT, as appropriate. Our goal is to perform work "*right the first time*" and if issues are identified, determine the root cause and then correct the overall underlying cause.

To summarize, one of the goals of the project-specific QA/QC Plan is to minimize the effort VDOT must expend performing QA or QC. For an item, such as maintenance of traffic, this goal can be accomplished through implementing structured QA/QC procedures that include comprehensive preparatory meetings, routine inspections, using prepared checklists, thorough QA/QC documentation, and following a communications plan that provides procedures for project stakeholder notifications, incident management, and emergency response.

Our current Staffing Plan assigns an onsite QC Manager supplemented by experienced QC inspector(s) to meet operation needs. For example, during paving, VDOT specifications require a minimum of two qualified inspectors per paving operation. For this project, we envision approximately three QC full time inspectors onsite for the majority of the project. All will be VDOT-certified for the work they are inspecting. If paving, MOT set ups or beam erections are at night and concurrent daytime work is also required, the number of inspectors would be adjusted to meet actual field needs. Arrangements with a testing laboratory and back-up lab will be made, should issues arise in performing the required field and laboratory testing. Each will hold certifications to perform material testing on VDOT projects. Other QC issues encountered on past design-build



projects with Contractor-led QC follow. *We will specifically address these past Lessons Learned on this project to limit the need for additional VDOT involvement.*

**WE WILL NOT PERMIT:**

- ✘ Inadequate/unqualified inspection staff and poor QC staff management;
- ✘ A lack of upper management support for QC or QA staff actions;
- ✘ The QC staff to concentrate on material testing vs. inspection of the actual work;
- ✘ Ineffective MOT (vehicle, pedestrian, bicycle) with allowable lane closure restrictions and involvement of the designers slip;
- ✘ A *less-than-stellar* Contractor Safety Program;
- ✘ Improper coordination between the field and office staff (including designers);
- ✘ Inadequate coordination with the QA staff in scheduling proper oversight;
- ✘ Poor maintenance / protection of completed work (e.g. underdrains);
- ✘ Lack of follow-up inspections and punch lists, and;
- ✘ Incomplete or late QC/QA *documentation*.

**Project Document Control and Maintenance:** The QA and QC teams will follow VDOT’s Design Build QA/QC Guide, VDOT’s Construction Manual and Materials Manual, among others for document control. The QAM monitors the QC team in preparing and submitting records daily, including daily work, inspection and material test reports. A master set of QA documents (hard and electronic) with submittal, RFI, and photo logs, is maintained by the QAM at the field office to include preparatory meeting minutes, completed QC and QA inspection checklists / test reports, Materials Notebook entries and corresponding materials tests reports, invoices, and TL weigh sheets. A customized tracking log will monitor information.

**One Unique Construction QC/QA Element:** The Corman DB Team evaluated the critical construction risks identifying the 20% of the tasks that represent 80% of the risk. The analysis identified construction of the arch tunnel, wall under Route 9 Bridge, drainage culverts, and MOT as the most likely to cause the majority of the risk. After several internal discussions, we predict MOT to be the major risk factor on this 20% list having the most impact to VDOT if not performed properly. Not providing effective MOT can cause tie-ups and congestion to the motoring public resulting in unfavorable traffic reports and delays. *Corman learned firsthand on the recently completed Design Build Hampstead Road and MD 216 projects how to handle traffic control when incorporating new roundabouts into existing conditions on heavily-traveled commuter highways and on side roads through local neighborhoods.* On this project, we will apply these and other lessons learned to effectively manage high volumes of suburban commuter traffic through tight, congested construction zones.

The cross road intersections are already experiencing a significant number of traffic accidents (217 in a recent four-year period) and queuing in the peak periods. During normal rush hours, traffic backups are severe and will potentially get worse if the proper precautions are not included in our design and construction planning. It is vital to construct this project in a way that acknowledges the importance of the route for commuters from the western portion of Loudoun County to Leesburg and easterly via Route 7, as well as the Greenway to the Dulles, Reston and Tyson’s Corner business areas. It also provides access from the DC Metro area to the popular Charlestown, West Virginia Casino/Racetrack. While most construction will be adjacent to and outside the existing roadway, the project falls within an area of rolling terrain and limited sight distances for speeds of many drivers. Construction vehicles will be slowing down in the left lanes to access the median construction zones or accelerating up steep gradients to leave the median work areas. MOT controls during the switch over to the roundabouts at the Route 9 interchange present issues as drivers traditionally have concerns with changes in traffic. *Our Team solved similar commuter issues on previous DB projects when we installed new roundabouts on our Design-Build Hampstead Bypass project and constrained access/egress on our Design-Build I-70 DB project in Frederick, MD.* Failure to clearly address and provide a well-defined traffic control plan will result in driver indecision, reduced speeds and capacity on the mainline, congestion, delays, and potential for an increase in accidents.



Our QA/QC team must verify that contractor and subcontractor personnel closely follow the approved Traffic Management Plan. Traffic controls are checked that they are set up per the applicable contractual versions of the *Manual of Uniform Traffic Devices (MUTCD)* and the *Virginia Work Area Protection Manual (VWAPM)*. Confusing and poorly executed traffic control will lead to congestion and delays through the project area, which impacts driver safety and construction. It is extremely important that access through the construction limits, as well as access to and from Route 9 and Business 7, are not adversely impacted. As part of the approved project-specific QA/QC Plan, a Preparatory Inspection Meeting will be held for Maintenance of Traffic. This meeting is classified as a hold point in the schedule and representatives of the design-build contractor, subcontractor(s), quality control and quality assurance managers and inspectors are required to attend. In addition, Department representatives and other stakeholders, such as EMS, police, and the other affected public services, will be invited and encouraged to participate, as these meetings are intended to facilitate a dialogue between all project stakeholders.

Our QA/QC approach to the unique construction element of MOT on Route 7, Route 9 and associated ramps would start during the development of the project-wide TMP in the early stages of design. Our Construction MOT Team will review the initial MOT Plan based upon their expertise on past projects, such as, I-70 Design Build in Frederick, Maryland where we modified our TMP several times during design to account for changing traffic situations throughout the construction phasing. Through meetings with Maryland State Highway Administration and County representatives, we developed acceptable TMP plans for the different construction stages for MOT flows through the active construction site.

During construction, the QA/QC Inspection Team will be certified as Intermediate Work Zone Safety Supervisors to carefully monitor adherence to the Traffic Management Plan (TMP) by assigning a lead QC Inspector to work with the Team's designated Certified Work Zone Traffic Coordinator. The assigned Quality Assurance Inspector, working in concert with the QAM, will monitor the Contractor and QC inspection staff for adherence to the TMP. TMP elements that will be monitored/inspected include:

1. Project Phasing;
2. Temporary Traffic Control Plans;
3. Motorist, Pedestrian and Bicyclist Considerations;
4. Daily Lane and Shoulder Closure Standards/Set Ups;
5. Coordination with adjacent construction projects or special events;
6. Coordination with other stakeholders, including EMS responders, police, local schools, and transit agencies;
7. Equipment and Materials Storage;
8. Temporary Signing, Marking, and Signals, including TCB and temporary pavement striping;
9. Public Communications; and
10. Incident Management.

QC Inspectors will regularly drive the work zone to confirm that the Temporary Traffic Control (TTC) devices are per plan and operating properly. These inspections will take place after any temporary MOT devices are set up for daily activities and at the end of each work day to confirm the work zone is safe and no unnecessary signage remains in place. Inspectors will also check that devices are clean and have the proper retro-reflectivity. There will be additional inspections when traffic patterns change or in the case of severe weather that can potentially impact devices and/or markings.



## 4.5 CONSTRUCTION OF THE PROJECT

### 4.5.1 SEQUENCE OF CONSTRUCTION

**Construction Sequencing:** During the bid preparatory phase, our team of designers, project managers, superintendents, and estimators independently reviewed the RFP plans and specifications, then presented ideas on how to best approach construction. Our plan limits construction phases, lane closures, and traffic disruptions, while accounting for emergency access, continuous trail access, and provides safe travel lanes and work zone. The sequence was established to begin work in areas that avoided final right of way agreements and due diligence was placed on optimizing earthwork and paving during the limited construction schedule, avoiding delays due to winter weather.

It was apparent that there is a time advantage to completing the design in two major packages for sequencing of the work. Design work will begin upon Notice of Intent to Award the project. A Project Wide Package will be for preliminary plans for the entire project. This will enable us to move forward with the ROW and utility designation process. The design will then be broken into two separate packages. Package 1 will include the tunnel, Route 9 Bridge modifications, roundabouts, W. Market Street, EB Rte. 7 outside shoulder/retaining wall, Beechnut Road connection and Ft. Johnston Road. Package 2 will include the remaining Route 7 improvements. Our Team chose this sequence to enhance the work flow of traveling public through the workzone. This will establish better access through the Route 7/Route 9 Interchange before closing the existing crossovers on Route 7. Design work will progress concurrently on the Packages.

Construction will be in four phases:

**Phase 1** – Tunnel, Route 9 bridge modifications, Route 9 roundabout and trail reconstruction.

**Phase 2** – West Market Street improvements, Beechnut Road connection, Fort Johnston Road, widening EB shoulders, retaining wall along stream, and upgrade median shoulders on Route 7 for MOT (Depending on the ROW acquisition process, the Fort Johnston Road work may shift forward into Phase 3).

**Phase 3** – Median construction of WB and EB Route 7.

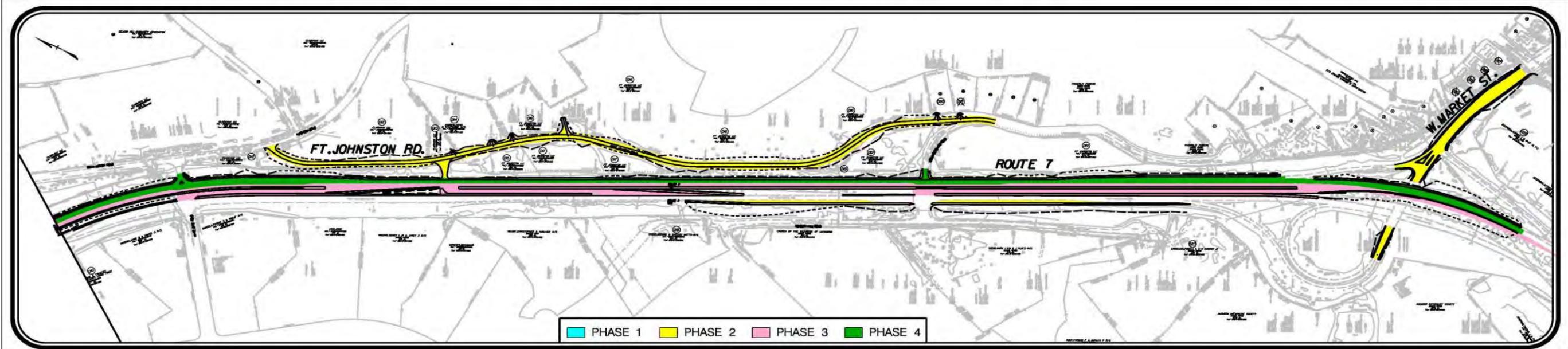
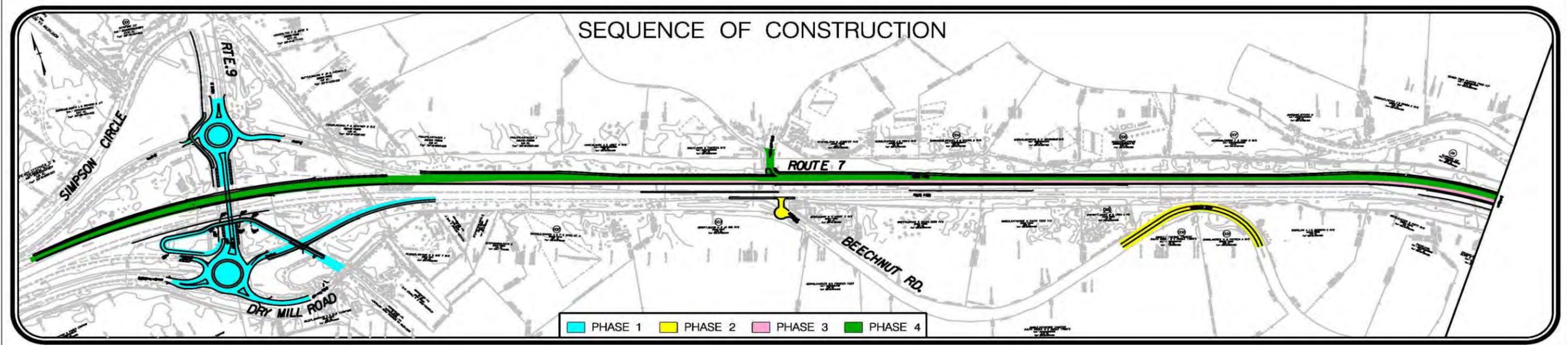
**Phase 4** – Route 7 WB outside shoulder widening and final surface paving of Route 7.

For the ease of the reviewer, we have elected to show the sequence of construction, including the phased descriptions graphically as shown on the next page.

**Scheduling and Coordination:** As with any Design-Build project, it is vital to understand and communicate the schedule clearly and effectively to the entire team, including stakeholders. The Corman DB Team is proficient in updating and reviewing schedules to develop strategies, stay ahead of the curve, and even beat the CPM schedule. Led by our Construction Manager, Daily Coordination Meetings, Weekly Schedule Meetings, 30, 60, and 90-day look ahead Schedule Meetings, and Schedule Review Meetings will be conducted with field supervision and QC / QA staff present. The weekly 3-week look ahead schedules will include detailed QC inspection and testing needs. Subcontractors will be involved in the weekly scheduling meetings. These regimented forums plan the following work day, week, and month and ensures critical schedule items are followed. It also gives us ample time, if needed, to fine tune or add resources to keep the job progressing.

Construction is scheduled to take place with multiple crews.

With this sequencing of construction, the Corman DB Team proposes to meet the Interim Milestone date of August 22, 2015 and Substantial / Final Completion date of October 22, 2015.



**PHASE 1**

- CONSTRUCT TRAIL REALIGNMENT, ROUTE 9 BRIDGE MODIFICATIONS, RAMP D, ARCH TUNNEL AND ROUNDABOUTS.
- \* CLOSE EB RTE 7 SHOULDER USING CONCRETE BARRIER; REMOVE BRIDGE CONCRETE SLOPE AND CONSTRUCT RETAINING WALL UNDER RTE 9 BRIDGE. NO RTE 7 LANES TO BE CLOSED.
- \* CONSTRUCT THE ARCH TUNNEL AND RETAINING WALLS FOR THE TRAIL SECTION THAT GOES UNDER RTE 9 RAMP D TO EB RTE 7. TUNNEL AND RAMP CONSTRUCTION IS IN 2 PHASES. EXISTING LEFT SHOULDER OF RAMP D WILL NEED TO BE PAVED FULL DEPTH FOR THE SHIFT OF TRAFFIC TO USE THE SHOULDER DURING THE FIRST PHASE OF ARCH AND RAMP CONSTRUCTION. SHIFT TRAFFIC TO THE RIGHT SIDE OF THE RAMP, ON NEW PAVEMENT, TO BUILD THE SECOND HALF OF ARCH AND RAMP. CONSTRUCTION WILL NOT CLOSE ANY LANES ON THE RAMP AND WILL BE SHIELDED BY TEMPORARY CONSTRUCTION BARRIER.
- \* GRADE AND PAVE THE REMAINING TRAIL FROM THE TIE-IN AT THE EXISTING TRAIL NEAR DRY MILL RD TO THE TIE-IN POINT ON THE WEST SIDE OF RTE 9. THE TRAIL WILL BE ACCESSIBLE AT ALL TIMES TO ACCESS RTE 9 AT ITS CURRENT LOCATION UNTIL THE NEW TRAIL IS COMPLETE. MAY REQUIRE SMALL AMOUNT OF TEMPORARY PAVEMENT AT THE CONNECTION NEAR DRY MILL ROAD
- \* CONSTRUCT RTE 9 ROUNDABOUTS IN SEVERAL STAGES; MAINTAIN ACCESS TO RTE 7 RAMPS AT ALL TIMES

**PHASE 2**

- CONSTRUCT MARKET STREET IMPROVEMENTS, BEECHNUT ROAD, FOREST JOHNSTON ROAD, AND EB ROUTE 7 OUTSIDE SHOULDER /WIDENING WORK
- \* SEQUENCE CONSTRUCTION TO BUILD THE DRAINAGE FACILITIES AT OUTFALL POINTS
- \* CONSTRUCT MARKET ST. IMPROVEMENTS. STAGE 1: MAINTAIN 1 LANE OF TRAFFIC IN EACH DIRECTION AND CONSTRUCT WEST SIDE OF ROAD. STAGE 2: MAINTAIN 1 LANE OF TRAFFIC IN EACH DIRECTION AND CONSTRUCT EAST SIDE OF ROAD. MAINTAIN ACCESS TO RTE 7 RAMPS AT ALL TIMES. CONSTRUCT MARKET ST. ON SOUTH SIDE OF RTE 7 WITH 1-WAY TRAFFIC AND FLAGGER IN OFF PEAK HRS.
- \* CONSTRUCT BEECHNUT RD. CLOSE THE ROAD TO COMPLETE CONSTRUCTION
- \* CONSTRUCT FT JOHNSTON RD. MAINTAIN ACCESS TO ADJACENT PROPERTIES AT ALL TIMES. MAINTAIN ACCESS TO RTE 7 UNTIL FT JOHNSTON RD IS COMPLETE AND OPEN TO TRAFFIC.
- \* CONSTRUCT WIDENING ON THE OUTSIDE SHOULDER FOR EB RT 7. PRIOR TO WORK, INSIDE MEDIAN SHOULDER MUST BE BROUGHT TO STANDARD FOR TEMPORARY PAVEMENT. CONSTRUCT RETAINING WALL, GRADING AND FULL DEPTH PAVEMENT.

**PHASE 3**

- CONSTRUCT WBD ROUTE 7 MEDIAN WIDENING AND EBD ROUTE 7 MEDIAN WIDENING

- \* CONSTRUCT ALL SWM AND DRAINAGE OUTFALLS PRIOR TO STARTING CONSTRUCTION.

- \* PRIOR TO WORK, OUTSIDE SHOULDER MUST BE BROUGHT TO STANDARD FOR TEMPORARY PAVEMENT. PLACE 1.5" OF OVERLAY ON EXISTING WB LANES TO RAISE PAVEMENT ELEVATION.

- \* CLOSE MEDIAN CROSSINGS THAT ARE REMOVED IN THE PROPOSED DESIGN AFTER FT JOHNSTONS RD. IS OPEN TO TRAFFIC.

- \* PLACE CONCRET BARRIER ALONG EXISTING MEDIDAN EDGE. MAINTAIN 2 LANES OF TRAFFIC IN EACH DIRECTION. CONSTRUCT GRADING, STORM DRAIN, PAVING AND ALL WORK IN MEDIAN. WIDENED PAVEMENT SURFACE TO MEET SURFACE OF THROUGH LANES. NOTE: WIDENING OF WB RTE 7 UNDER RTE 9 OCCURS ON THE OUTSIDE EDGE OF PAVEMENT \* CONSTRUCT IN THIS PHASE.

**PHASE 4**

- CONSTRUCT WBD ROUTE 7 OUTSIDE SHOULDER WIDENING
- \* SHIFT TRAFFIC TOWARD THE WIDENED MEDIAN; PLACE TEMPORARY BARRIER ALONG OUTSIDE EDGE OF ROADWAY. GRADE, CONSTRUCT GUARDRAIL AND BARRIER AND PAVE OUTSIDE SHOULDER
- \* CONSTRUCT FINAL PAVEMENT SURFACE USING SINGLE LANE CLOSURES; ADD FINAL WEDGE LEVEL AND SURFACE COURSE TO RTE 7. COMPLETE FINAL ROADWAY STRIPING.



### 4.5.2 TRANSPORTATION MANAGEMENT PLAN

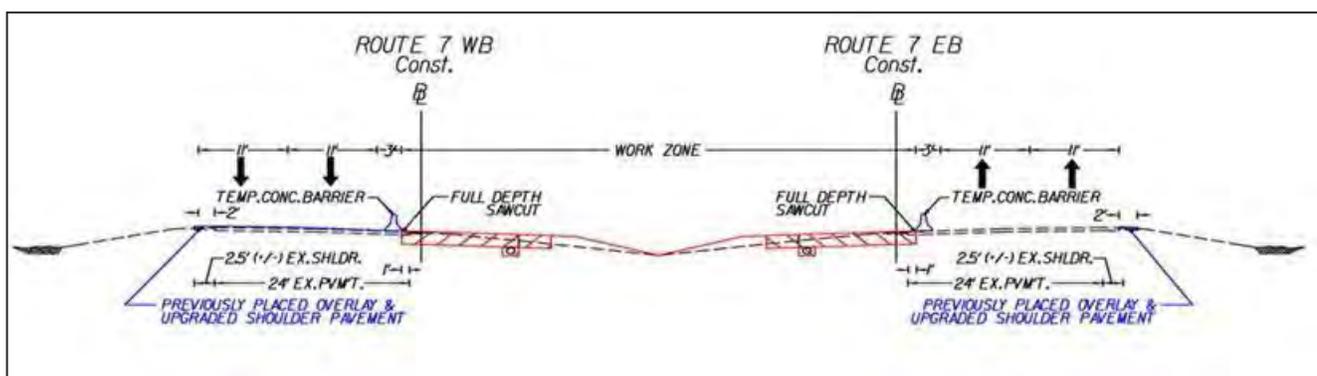
The project requires a Transportation Management Plan (TMP) Type B and will follow Project Management Process (PMP) Category III. Our team will work with VDOT to develop the TMP, including the development of the TMP’s three major components: Temporary Traffic Control (TTC) Plans, Public Communications (PC) Plan, and Transportation Operations (TO) Plan. An important part of the TMP will be the inclusion of an extensive public information program to inform the public of changes in traffic patterns and major impact activities (i.e. bridge steel removal, delivery and placement). This will involve close coordination with VDOT and other key stakeholders as summarized at the end of this section. During the design development, the Corman DB Team will establish an MOT Task Force that meets weekly to address traffic conditions and our construction sequence. An added value to our team, Lou Robbins, PE, DBIA, will hold the dual roles of DB Integrator and PR Manager. This assures a 360 degree perspective for the TMP, was brings together design and construction, for proper communication to the traveling public and residents regarding constructability and design requirements.

**Maintenance of Traffic:** Per the RFP, the MOT and TCP will minimize adverse impacts to drivers. Two 11 ft. lanes will be maintained on Route 7 during peak periods of traffic throughout construction. Traffic drums will be used for some construction phases to close lanes during non-peak hours of traffic. Temporary barriers, when utilized, will be offset a minimum of two feet from active travel lanes. Temporary pavement markings will meet VDOT standards. Lane restrictions in the RFP will be strictly followed. Traffic will not be shifted onto shoulder pavement unless it has been reconstructed as full depth or meets temporary pavement design standards. The trail will remain open at all times during realignment. No median crossings on Route 7 will be closed until the interchange modifications at Route 9 and West Market Street are complete to avoid traffic delays with the increase in traffic using these routes.

The TMP will also consider provisions for transit users, pedestrians, and cyclists who will be accommodated throughout the project.

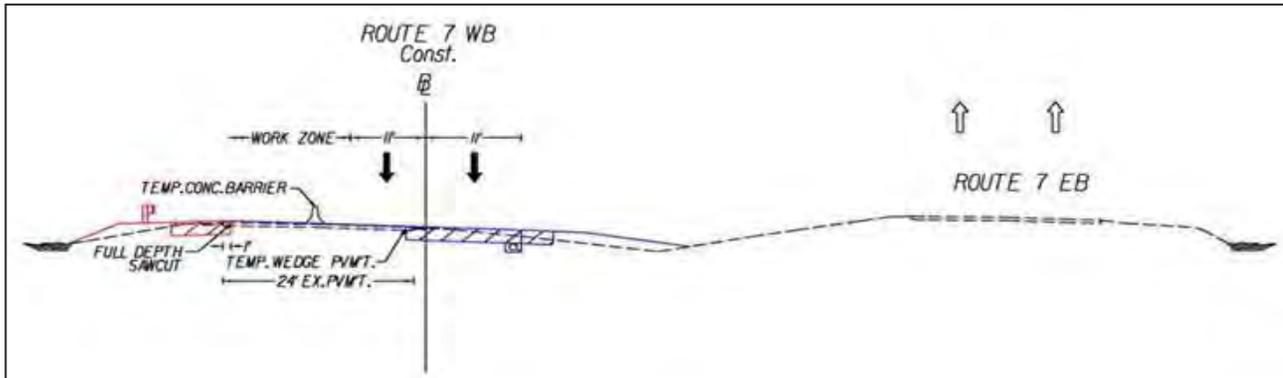
With this in mind, we developed a sequence of construction shown in Section 4.5.1. The Route 7 construction, taking place in Phases 3 and 4, unlike Phases 1 and 2, will require shifting traffic for the median reconstruction and outside widening. The MOT typical section for each of these phases is as follows:

### PHASE 3 TYPICAL SECTION





## PHASE 4 TYPICAL SECTION



**Traffic Management Plan:** As part of the TMP a traffic model will be developed to optimize traffic operations during construction and minimize disruption and delay to motorists. Traffic analysis for MOT conditions will be performed in advance of the work and modified as conditions warrant. As necessary, we will perform traffic analysis for the different MOT conditions, including:

- Function of roundabouts at Route 9 interchange during Route 7 construction
- Off peak lane closures for final paving surface

As described above, we have provided a Maintenance of Traffic Plan that reduces the need to close traffic lanes during any peak hour period and improves interchange access at Route 9 and West Market Street to facilitate traffic flow and turning movements during work on Route 7. All MOT plan and work zone details and sequence will be in accordance with the *Virginia Work Area Protection Manual* and MUTCD.

**Work Zone Speed:** The Corman DB Team's plan includes a 55 mph work zone speed on Route 7 and maintains existing speed limits for all other roadways.

**Flagging Operations:** Flagging operations are anticipated for a short section of West Market Street on the southwest side of Route 7 and during implementation of the roundabouts.

**Detours:** None are anticipated at this time.

**Time of Day Restrictions:** Work hours will follow the restrictions as noted in the RFP, Section 2.11.1.1.

**Transportation Management Plan Deliverables:** Our phased construction plans, including Transportation Management Plans (TMPs) and Maintenance of Traffic (MOT) drawings, will be prepared in an integrated, multi-disciplinary manner, with significant construction team involvement. The TMP/MOT design team will receive critical input from construction professionals on access needs, haul routes, staging areas, and construction durations. Our TMPs and MOT Plans also address pedestrian access and safety. Our construction phasing plan has also taken consideration earthwork balance, pre-consolidation of embankments, and intra-site access.

Our MOT Plans will provide for and address construction components, including drainage facilities (temporary and permanent), utilities, sound walls, bridges, stormwater management, and erosion and sediment control.

**Transportation Management Plan Stakeholders:** The Corman DB Team fully understands the importance of keeping the impacted stakeholders informed on the progress and potential impacts. There are three key components to our outreach program:

1. Inclusion of the appropriate stakeholders during the preparation of the TMP and traffic control plans, to obtain input on important stakeholder issues such as access to properties, bus routes, detours and emergency response considerations.



**DESIGN-BUILD ROUTE 7 – WESTBOUND TRUCK CLIMBING LANE**  
**Contract ID #C00058599DB54**

2. Formation of an MOT Task Force, which will include select stakeholders as well as VDOT, to facilitate sharing of detailed maintenance of traffic issues such as upcoming traffic switches, upcoming bridge girder installation, and other items that have an impact on traffic flow and access.
3. A close working relationship between VDOT and the Corman DB Team ensuring a continuous and cooperative dissemination of appropriate information to project stakeholders.

The Major Stakeholders, along with their role in the project and the key anticipated risks or impacts to them, are shown on the table below:

| STAKEHOLDER  | ROLE   | IMPACTS DURING CONSTRUCTION   |
|--|--|---|
| VDOT   | Owner  | Work Zone Safety; Coordination with Adjacent Projects; Traffic Backups or Inadequate Public Outreach  |
| FHWA   | Funding and Project Oversight                          | Work Zone Safety; Coordination with Adjacent Projects; Traffic Backups or Inadequate Public Outreach  |
| Loudon County  | Local Jurisdiction                                     | Coordination with Adjacent Projects; Traffic Backups or Inadequate Public Outreach  |
| Leesburg / Purcellville                                  | Local Jurisdiction                                     | Coordination with Adjacent Projects; Traffic Backups or Inadequate Public Outreach; Dust and Noise  |
| INOVA Hospital / Town and/or County local EMS Responders | Emergency Responders                                   | Emergency Response Routes Impacted by Detours or Temporary Lane Closures  |
| County School District, Private Schools                  | Student Transport                                      | Bus Routes Impacted by Detours or Temporary Lane Closures   |
| Traveling Public (Commuter & Local)                      | User of the Facility - Route Impacted                  | Bus Routes Impacted by Detours or Temporary Lane Closures; Travel Time Through Work Zone Impacted by Reduced Speeds and/or Back-ups             |
| Local HOA Associations                                   | Represent Local Communities                            | Routes Impacted by Detours or Temporary Lane Closures; Travel Time Through Work Zone Impacted by Reduced Speeds and/or Back-ups; Dust and Noise |
| Other Contractors Working in the Area                    | Adjacent Contractors                                   | Scheduling of Construction Operations may be Impacted in Order to not Impact the Route 7 Truck Climbing Lane Project Activities                 |
| Utility Companies  | Maintain / Operate Utilities Within or Across Corridor | Accessibility to Facilities through Work Zones; Impacts on Response Time to Outages   |
| Northern Virginia Regional Park Authority                | W&OD Trail   | Meet their Requirements for Accessibility and Trail Conditions  |



#### 4.6 DISADVANTAGED BUSINESS ENTERPRISES

*The Corman DB Team is committed to achieving a 15% DBE participation goal for the entire value of the contract.* The following summary of our DBE Subcontractor Participation Plan narrates how we will achieve this goal during design and construction:

***Strategies to Meet/Exceed the Goal:*** Our DB Team encompasses highly-regarded DBE/WBE members, including Quinn Consulting, Sabra Wang & Associates, and Diversified Property Services. Although they were selected based on their premium work and abilities, they will also assist the Corman DB Team in achieving the 15% DBE participation goal through their designated project roles.

Corman DB Team members always maintain a substantial database of DBE firms qualified to work on our projects. Outreach is continuous as a way to connect with additional qualified DBE firms. Corman DB Team members routinely meet and exceed the DBE requirements on projects. ***So much so, that the Maryland Washington Minority Contractors Associations awarded Corman Construction as “Prime Contractor of the Year for Minority Business” in 2011.***

The Corman DB Team will modify Corman’s standard Local DBE Subcontracting Plan to meet the requirements and challenges of the 15% participation goal for this project. The following checklist specifies ways we solicit DBE firms during pre-construction:

1. Publish Proposal Notifications/Bid Notices in local and minority newspapers 30 and 10 days prior to bid;
2. Post Bid Notices 30 days and every subsequent Tuesday prior to bid on the Maryland / Washington Minority Contractors Association (MWMCA) website. This circulation reaches 10,000 companies, many based in Virginia;
3. Post plans and specifications on our FTP site for subcontractors to view;
4. Based on available scopes of work, identify potential DBE firms from our company DBE Firm Database;
5. The Corman DB Team’s Estimating Assistants will reach out to identify DBE firms, respond to project inquiries, and furnish requested information;
6. Maintain a spreadsheet with DBE subcontractor/supplier contact information and correspondence;
7. Validate qualifications of certified DBE subcontractors/suppliers applicable to specific requirements.

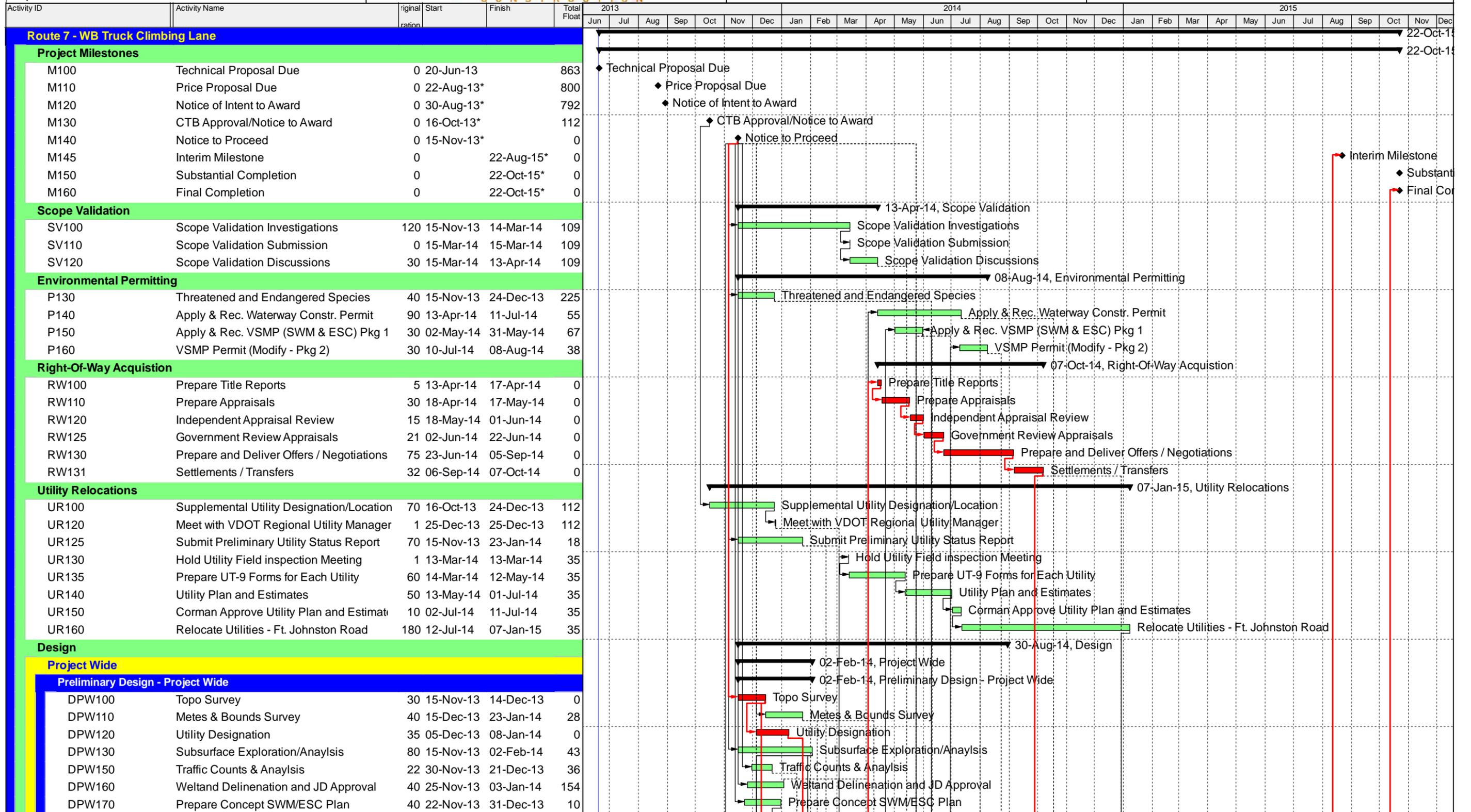
During Price Proposal development, we prepare comprehensive lists for DBE participation. In addition to our standardized DBE solicitations, our estimating staff personally reaches out to DBE subcontractors / suppliers and educates them on jobsite opportunities. Face-to-face meetings are often held with DBE firms where we explain the project, accommodate their concerns and needs, and provide opportunities within their scope of work.

***COMMITMENT:*** *The Corman DB Team commits to achieving a 15% DBE participation goal for the entire value of the contract.*

We also track the status of our DBE participation. This creates an awareness to maintain and/or increase our efforts to successfully meet the goals. As the bid date approaches, design and construction DBE participation goals are evaluated and finalized to ensure they are met.

During design and construction, the project team monitors DBE participation for compliance with the required goal.

Proposal Critical Path Schedule



█ Actual Work   
 █ Critical Remaining Work   
 ▾ Summary   
 █ Remaining Work   
 ◆ Milestone





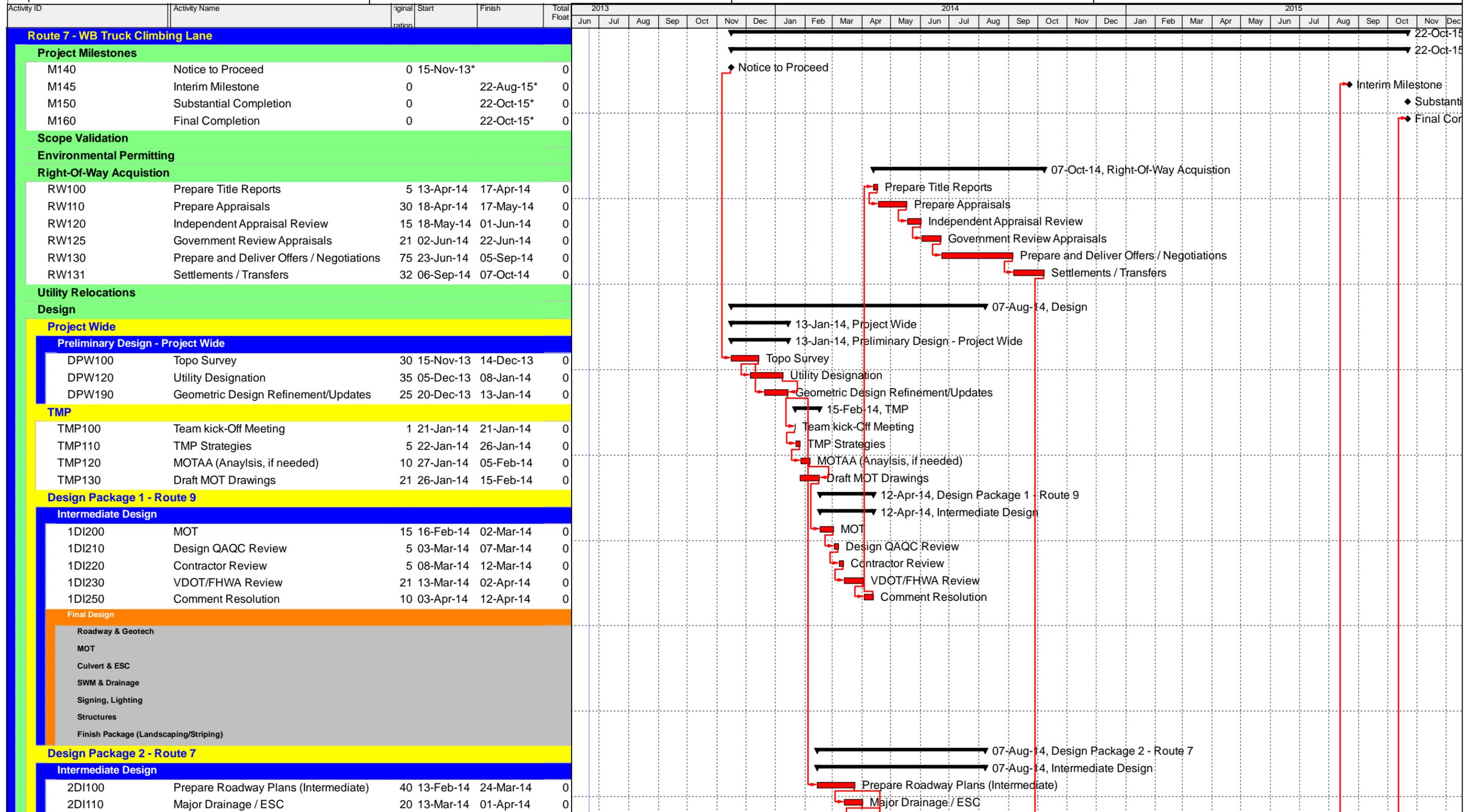








Proposal Critical Path Schedule



█ Actual Work     █ Critical Remaining Work     ▶ Summary  
█ Remaining Work     ◆ Milestone







## 4.7 PROPOSAL SCHEDULE

### 4.7.1 PROPOSAL SCHEDULE DEVELOPMENT

The Corman DB Team has thoroughly evaluated the Project RFP documents, performed site visits of Route 7, including the Route 9 and W. Market Street Interchanges, attended pre-proposal meetings, participated in proprietary meeting discussions, and had working sessions among our construction and design teams. Through this progression, we developed a simplified solution to the project to deliver the project through our sequencing plan. This narrative explains how we plan to deliver a positive experience to VDOT and the stakeholders of the area. The project completion date is as shown in the RFP of October 22, 2015.

The proposal schedule can be found in the Appendix.

#### Project Milestones

|                                   |                   |
|-----------------------------------|-------------------|
| Notice of Intent to Award Date    | August 30, 2013   |
| CTB Approval/Notice to Award      | October 16, 2013  |
| Notice to Proceed                 | November 15, 2013 |
| Substantial Completion of Design  | August 30, 2014   |
| Mobilization                      | April 28, 2014    |
| Interim Milestone:                | August 22, 2015   |
| Substantial Completion of Project | October 22, 2015  |
| Final Completion of Project:      | October 22, 2015  |

#### Work Breakdown Structure

The baseline schedule integrates design and construction into a Work Breakdown Structure (WBS) as shown below:

**Level 1:** Schedule Milestones – Overall schedule review of progress.

**Level 2:** Scope Validation Period – Includes verification of utilities, geotechnical investigations and conceptual pavement designs, and spot checking the survey and base maps.

**Level 3:** Design – Includes preliminary (project wide), detailed and final design cycles with time allocated for engineering services, plan development, QA/QC reviews, VDOT, FHWA and other regulatory agency reviews and approvals of plans.

**Level 4:** Environmental Permitting – Includes preparation and approvals of Erosion and Sediment Control plans, JPA, SWPPP, VSMP, etc.

**Level 5:** Right of Way Acquisition – Includes title research, appraisals, offers, and negotiations.

**Level 6:** Utility Relocations – Includes activities for the UFI meetings, finalizing UT-9 Forms, preparation of the preliminary engineering estimates, utility relocation design by the our team and utility owners, approval of P&E estimates, utility design approvals, and utility relocations.

**Level 7:** Construction – Includes all components of roadway construction, as well as maintenance of traffic, temporary pavement for MOT, erosion & sediment controls, stormwater management, wall construction, tunnel construction, trail relocation, Route 9 bridge modifications, ditches/drainage, lighting, landscaping, and roadside improvements. QA/QC witness and hold points are incorporated in this section. Public Relations are included in the general section of this phase.



**WORK BREAKDOWN STRUCTURE**

| Level 1        | Levels 2 and 3   |
|----------------|--|
| <b>Phase 1</b> | <b>Schedule Milestones</b>   |
| <b>Phase 2</b> | <b>Scope Validation Period</b>   |
| <b>Phase 3</b> | <b>Environmental Permitting</b>  |
| <b>Phase 4</b> | <b>Right-of-Way Acquisition</b>  |
| <b>Phase 5</b> | <b>Utility Relocations</b>   |
| <b>Phase 6</b> | <b>Design</b><br><br>1.6.1 Project Wide<br><br>1.6.2 TMP<br><br>1.6.3 Design Package 1 – Route 9<br><br>1.6.4 Design Package 2 – Route 7 |
| <b>Phase 7</b> | <b>Construction</b><br><br>1.7.1 Project Wide<br><br>1.7.2 Phase 1<br><br>1.7.3 Phase 2<br><br>1.7.4 Phase 3<br><br>1.7.5 Phase 4        |

**Calendars**

Three project calendars were used in the schedule and include:

1. “I-64 - Calendar Day” –Based on seven days per week and is used for design and review periods.
2. “I-64 - Winter Calendar” –Based on a non-work period from December 22 through February 28 for weather dependent activities, such as asphalt paving.
3. “I-64 - Construction Calendar” –Based on five working days per week and is used for construction activities and includes holiday restrictions and anticipated weather days.

**Design Phase**

The design phase includes preparation, QA/QC reviews, and submissions of Preliminary (Project Wide), Intermediate, Final and Ready for Construction design stages of the structure and roadway design process. Included are 21-day review activities for VDOT review periods. Included to support the plan preparation is survey coordination and mapping, geo-technical investigations, and utility designations. Activities are included for geotechnical investigations, reports and a 45-day period for VDOT's review of the geotechnical report prior to submitting the final roadway package. The design phase will begin immediately upon Notice of Intent to Award to begin work advancing the concept plans to the Preliminary and Intermediate stage. It is expected to have "Ready for Construction" plans in May 2014.

**Environmental Permitting**

Activities have been incorporated for the full project wide concept SWM/ES Plan, Complete Wetland Delineation, Confirm Jurisdictional Determinations, Threatened and Endangered Species, Virginia Water Protection (VWP) Permit, Individual Wetland Permit and the VSMP Permit.

This portion of the schedule should not impact the project's critical path.

**Right-of-way Acquisition**

ROW will be required for permanent takes for roadway construction and permanent easements for drainage facilities and SWM ponds.

**Utility Relocations**

There are three anticipated utility conflicts along Ft. Johnston Road. The utility relocations are sequenced to match the required work operations.

**Construction**

Construction will be phased as described below:

**PHASE 1 - CONSTRUCT TRAIL REALIGNMENT, ROUTE 9 BRIDGE MODIFICATIONS, ROUTE 9 ROUNDABOUTS/RAMPS AND ARCH TUNNEL.**

- Close EB Route 7 shoulder using concrete barrier; remove existing slope protection and construct retaining wall and trail under Route 9 Bridge.
- Construct the arch tunnel and retaining walls for the trail section that goes under Route 9 Ramp D to EB Route 7. The tunnel and ramp construction is in two phases. Existing left shoulder of the ramps will need to be paved full depth for the shift of traffic to use the shoulder during the first phase of arch and ramp construction. Shift traffic to the right of ramp to build the second half of arch and ramp. Construction will not close any lanes on the ramp and will be shielded by temporary construction barrier.
- Grade and pave the remaining trail from the tie in at the existing trail near Dry Mill Road to the tie in point on the west side of Route 9. The existing trail remains open at all times.
- Construct the Route 9 roundabouts in several stages, maintaining access to existing Route 7 bridges at all times. Sequence construction to build the drainage facilities at outfall points first. The trail will remain open at all times.

**PHASE 2 - CONSTRUCT WEST MARKET STREET IMPROVEMENTS, FORT JOHNSTON ROAD, BEECHNUT ROAD AND EB ROUTE 7 OUTSIDE SHOULDER / WIDENING WORK**



- Construct the West Market Street improvements. In the first stage, maintain one lane of traffic in each direction and construct widening and retaining wall on west side of road. In second stage, maintain one lane of traffic in each direction and construct the east side of the road. Maintain access to ramps to Route 7 at all times. Portion of West Market Street on south side of Route 7 may require one way traffic / flagger during off-peak hours.
- Construct connection of Beechnut Road.
- Construct Fort Johnston Road. Maintain access to adjacent properties at all times. Maintain access to Route 7 until Fort Johnston Road is complete and open to traffic. This required a majority of the ROW for the project. The work has float and may be shifted forward depending on design approvals, ROW acquisition and utility relocations.
- Upgrade median shoulders on EB Route 7 for temporary MOT.
- Construct widening on the outside shoulders for EB Route 7 and proposed retaining wall along stream.

#### PHASE 3 - CONSTRUCT WB ROUTE 7 MEDIAN WIDENING AND EB ROUTE 7 MEDIAN WIDENING

- Upgrade outside shoulders on WB / EB on Route 7 for temporary MOT.
- Close all existing median crossings.
- Reconstruct WB / EB median, including drainage, retaining/barrier walls, SWM, signing and roadside improvements.

#### PHASE 4 – CONSTRUCT WB ROUTE 7 OUTSIDE SHOULDER WIDENING, CONSTRUCT FINAL PAVEMENT SURFACE

- Reconstruct WB outside shoulders.
- Construct final surface course to Route 7.

#### 4.7.2 PROPOSAL SCHEDULE NARRATIVE

**Plan to Execute the Work:** In general, we plan to complete the design in two major packages. This will allow construction to commence on the tunnel, Route 9 bridge modification and roadwork on Route 9 while design work for Route 7 is progressed. Construction will be performed in four (4) phases and complete the project on or before the Final Completion Date of 10/22/15.

For this project we have made the following assumptions:

- **Bridge:** A soil nail and CIP wall be installed along the existing abutment for permanent trail construction. No modifications of existing EB Route 7 at this location are required.
- **ROW Requirements:** Twenty-one parcels are affected, 16 permanent easement acquisitions for drainage and 5 fee simple acquisitions for roadway construction.
- **Utility Relocations:** There are four utility conflicts involving pole relocations for roadway construction along Fort Johnston Road and Beechnut Road.
- **Signal Work:** None required.
- **Signing Work:** Updated signing.
- **Stormwater Management:** State-of-the-art application of stormwater management techniques.
- **Storm Drainage:** Culvert extensions and replacements are anticipated under Route 7 per the schedule included in the design concept section. Drainage systems are included along the new roadway sections.
- **Design Reviews:** The project design will be completed as two packages with preliminary (project wide), intermediate, final and RFC submissions.



- **Work Times/Traffic Control:** Traffic will be maintained per RFP requirements. The outside shoulders will be improved for interim MOT purposes on Route 7. The schedule is based on the work hours allowed in the RFP.
- **Substantial and Final Job Completion:** Work will be completed by October 22, 2015.

### Schedule Overview

|                            |                          |
|----------------------------|--------------------------|
| Notice of Intent to Award: | August 30, 2013          |
| Design Activities:         | August 2013 –August 2014 |
| Construction:              | May 2014 – October 2015  |
| Interim Milestone          | August 22, 2015          |
| Final Completion:          | October 22, 2015         |

**Construction:** We divided the project into logical segments of work for efficiency use of MOT devices. We then combined and sequenced the work to maximize resources, reduce overall schedule duration and diligently progress the work while maintaining constant flow of traffic through the work zones.

A sequence of construction graphic is shown on Page 26.

Construction will be in four phases as follows:

**Phase 1** – Tunnel, Route 9 bridge modifications, roundabouts/ramps, and trail reconstruction.

**Phase 2** –West Market Street improvements, Beechnut Road connection, Fort Johnston Road, widening EB shoulders, retaining wall along stream, and upgrade median shoulders on Route 7 for MOT.

**Phase 3** – Median construction of WB and EB Route 7.

**Phase 4** –Route 7 WB outside shoulder widening and final surface paving of Route 7.

Construction is scheduled to take place with multiple crews. Weekly scheduling and supervisory meetings with the Construction Manager, Project Engineer, Construction QC Manager, QAM, superintendents, foreman, and engineers will be held to establish the three-week look-ahead schedules. These schedules include detailed QC inspection and testing needs. Subcontractors will be involved in weekly scheduling meetings.

**Design:** As our team studied the overall project schedule, it was apparent that there is a time advantage to completing the design in two major packages for sequencing of the work. Design work will begin upon Notice of Intent to Award the project. During the Scope Validation Period, we will verify utilities and conceptual pavement designs, begin the geotechnical investigations, and spot check the survey and base maps. We allotted 21-day review cycles and a RFC revision period for major plan submissions in the CPM schedule. The maintenance of traffic, as well as the required SWM Report, and E&S permitting plans will advance concurrently with the roadway design. Over-the-shoulder reviews will be conducted throughout design to keep VDOT informed of decisions made as the design is being developed.

**Critical Path:** The Critical Path is shown in the Appendix which flows through the ROW acquisition, preliminary design/project wide, TMP, reviews of intermediate design of design package 1, intermediate and final design of design package 2, tunnel construction, Route 9 improvements, cross culvert and median improvements on Route 7, Route 7 outside widening, and the final surface paving on route 7.



***Managing the Schedule and the Project:*** Open and honest communication leads to effective coordination. The construction schedule is the primary means for the Corman DB Team to communicate the construction plan to the team and other stakeholders. It includes planned means and methods, sequencing, resourcing and timing. The schedule provides the framework for planning and scheduling the day-to-day work. The durations established for activities become the basis for setting production goals. The schedule also serves as the yardstick to monitor and measure progress and is a tool for identifying the impact of unexpected events or conditions and for revising the construction plan to mitigate the impact of delays.

The schedule will be constantly reviewed and maintained to avoid slippage, as well as impacts discussed as part of the monthly partnering process, to finalize mitigation and recovery solutions, should they be needed. Systems to manage the design and construction sequencing will be clear and concise and include:

- Weekly design/construction scheduling and coordination meetings during the design phase
- Weekly construction scheduling meeting during the construction phase
- Utility relocation tracking sheets during the design and construction phases
- ROW progress tracking spreadsheets (if needed) during the design and construction phases
- Review and approval tracking spreadsheets of design element submittals
- Shop drawings status tracking sheets
- Material submittals and delivery schedules
- Non-conformance logs by QC and QA for design and construction
- RFI logs
- Monthly internal project review meetings by the Corman DB Team’s Executive Review Committee
- Monthly progress/partnering meetings with the major stakeholders, including VDOT, the Corman DB Team’s designers, major subcontractors/vendors and local businesses. Affected utilities will also be invited for the current stage of the work

At the internal weekly meetings, issues/concerns will be identified utilizing the above tracking aids and action items identified and assigned to the responsible party who can resolve it. Three-week, 30 day and 60 day “look-ahead schedules” will be prepared and discussed to analyze schedule and quality impacts. Similar information will be discussed and action items assigned at the Monthly Progress/Partnering meetings with key stakeholders. Other stakeholders may be invited to the monthly meeting as required for anticipated issues during upcoming schedule activities.

The Executive Review Committee will meet monthly, usually one week prior to the Monthly Progress/Partnering meeting, to review actual progress and identify resources (manpower, equipment and materials) for upcoming scheduled items. Should issues be identified at these meetings, resolutions and recovery strategies can be agreed upon prior to the monthly meeting, so the Corman DB Team can inform stakeholders of potential issues and solutions.

The tracking sheets, submittal logs, and meeting action item lists, along with all other tracking and correspondence, will be contained in Viewpoint (a project management database system) which allows integration with the schedule.

***Managing the Design and Construction Schedule:*** Meeting design milestones is the key to successful design build projects. The Corman DB Team will use performance evaluation tools, mainly the earned value method, to track the progress of our design consultants and other team members. This provides the design status to the management team as the job progresses. Constructability reviews are crucial and will be performed by all parties to avoid schedule delays of field design changes. At the regularly scheduled project control meeting, the



individual discipline manager (whether it be design or field) will report on his group's progress and how it fits into the overall CPM schedule.

Keeping the CPM as the “big picture” and using the three-week look ahead for the details has proven successful. The Construction Manager (CM), along with the Design Manager, will review, maintain, and update the schedules as the work progresses. Three-week schedules (TWS) will be updated weekly at a scheduling/planning meeting. The overall CPM schedule will be updated weekly and used as the long-range planning tool. The “approved schedule” will be updated by the CM and project engineer, provided to VDOT monthly prior to the monthly progress/partnering meetings, and include a comprehensive and detailed narrative, performance evaluation charts, photos, etc.

The Corman DB Team has proven management systems (shown below) that keep the project on track:

- **Weekly** scheduling and supervisory meetings with the Construction Manager, Design Manager, Construction QC Manager, QAM, superintendents, foreman, and engineers to establish the two-week schedules. These schedules include detailed QC testing needs.
- **Weekly** site meetings during construction include the design team, public relations, and utility coordination until design work is complete and as needed for the remainder of construction.
- **Bi-weekly** onsite progress meetings include all relevant parties to review schedule progress, design issues, QA/QC matters, unresolved construction problems, safety performance, administration issues, and general project management matters.
- **Monthly Progress/Partnering Meetings** are held by the DBPM, as well as all other project meetings. The DBPM will develop and review the schedule and work closely with the Public Relations Manager to implement the public outreach plan. When construction starts, the DBPM coordinates construction activities through the CM and holds monthly progress meetings to review progress, conflicts, safety, and quality. The Corman DB Team will keep minutes of all meetings and distribute them to all stakeholders within 48 hours.
- **During Construction** design engineers will remain available to discuss and meet about field changes that may occur during construction.

This project will be administered using our Viewpoint Project Management System, which manages the project lifecycle, including design plans, contract management, RFI control, change orders, submittal/ transmittal control, meetings, QA/QC documents, issue logs and lists, and more. It will help ensure that the project is administered timely to prevent schedule delays. Viewpoint offers secure remote access by all appropriate stakeholders via the web. It is designed to give Corman, designers, VDOT, subcontractors, utilities and vendors access to the project data they need, when they need it, 24/7.

**Schedule Recovery:** The experience the Corman DB Team gained in working on similar projects will be critical to the timeliness of resolving design and construction hurdles as they occur. The Corman DB Team has successfully managed design on other jobs that enables critical activities, such as utility relocations and environmental permitting, to be prioritized and monitored with the overall design and construction progress accordingly. This team prides itself in solving construction and design issues rapidly without sacrificing quality. This team will aggressively manage the entire project, allowing VDOT to minimize its management and inspection resources required. Should any item on the CPM Schedule show unacceptable progress – for any reason – a schedule recovery strategy will be developed and implemented immediately with VDOT's concurrence.



**Subcontractor Scheduling:** Subcontractors will be selected based on quality performance per schedule requirements. They will be involved in schedule meetings to understand well in advance of project expectations.

**Resource Availability:** In the event additional resources are required to mitigate delays, Corman has a large pool of resources to draw from including crews, equipment, subcontractors, suppliers, and professional expertise. The Construction Manager will have a direct relationship with Corman’s Operations Manager and Executive Team, who will intervene immediately on the project’s behalf to supply supplemental manpower and equipment to maintain schedules. Rick Kumrow, Corman Operations Manager, will be actively involved in oversight operations of the project. He has served in this capacity for over 20 years and has earned the respect of local agencies, including VDOT, for successfully finishing jobs on or ahead of schedule. Mr. Kumrow’s specialty is mitigating delays with alternate methods and adding shifts or providing additional resources as demands change.

*Our team is committed to providing VDOT a completed project by October 22, 2015.*

**ATTACHMENT 4.0.1.1**  
**ROUTE 7 – WESTBOUND TRUCK CLIMBING LANE**  
**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 |
|--|--|----------------------------|-----------------------------|-----------------------------------|
| <b>Technical Proposal Checklist and Contents</b>         | Attachment 4.0.1.1                           | Section 4.0.1.1            | no                          | Vol. I Appendix A-1 – A-3         |
| <b>Acknowledgement of RFP, Revisions, and/or Addenda</b> | Attachment 3.6 (Form C-78-RFP)               | Sections 3.6, 4.0.1.1      | no                          | Vol. I Appendix A-4               |
|  |  |                            |                             |                                   |
| <b>Letter of Submittal</b>                               | NA   | Sections 4.1               |                             |                                   |
| Letter of Submittal on Offeror’s letterhead              | NA   | Section 4.1.1              | yes                         | Vol. I -1                         |
| Offeror’s official representative information            | NA   | Section 4.1.1              | yes                         | Vol. I -1                         |
| Authorized representative’s original signature           | NA   | Section 4.1.1              | yes                         | Vol. I -1                         |
| Declaration of intent                                    | NA   | Section 4.1.2              | yes                         | Vol. I -1                         |
| 120 day declaration                                      | NA   | Section 4.1.3              | yes                         | Vol. I -1                         |
| Principal Officer information                            | NA   | Section 4.1.4              | yes                         | Vol. I -1                         |
| Substantial and Final Completion Date(s)                 | NA   | Section 4.1.5              | yes                         | Vol. I -1                         |
| Proposal Payment Agreement or Waiver of Proposal Payment | Attachment 9.3.1 or 9.3.2                    | Section 4.1.6              | no                          | Vol. I Appendix A-5 – A-8         |
| Certification Regarding Debarment Forms                  | Attachment 11.8.6(a)<br>Attachment 11.8.6(b) | Section 4.1.7              | no                          | Vol. I Appendix A-9 – A-17        |
|  |  |                            |                             |                                   |

**ATTACHMENT 4.0.1.1**  
**ROUTE 7 – WESTBOUND TRUCK CLIMBING LANE**  
**TECHNICAL PROPOSAL CHECKLIST AND CONTENTS**

| Technical Proposal Component   | Form (if any) | RFP Part 1<br>Cross Reference | Included<br>within page<br>limit? | Technical<br>Proposal<br>Page<br>Reference                |
|--|---------------|-------------------------------|-----------------------------------|---|
| <b>Offeror's Qualifications</b>  | 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                               | Vol. I -2   |
| Organizational chart with any updates since the SOQ submittal clearly identified   | NA            | Section 4.2.2                 | yes                               | Vol. I -2   |
| Revised narrative when organizational chart includes updates since the SOQ submittal   | NA            | Section 4.2.2                 | yes                               | Vol. I -2   |
|  |               |                               |                                   |   |
| <b>Design Concept</b>  | NA            | Section 4.3                   |                                   |   |
| Conceptual Roadway Plans and description   | NA            | Section 4.3.1.1               | yes                               | Vol. II-Plans<br>CP-1-CP-26<br>Vol. I- 3-8<br>Description |
| Conceptual Structural Plans and description  | NA            | Section 4.3.1.2               | yes                               | Vol. II-Plans<br>CP-1-CP-26<br>Vol. I -8-9                |
|  |               |                               |                                   |   |
| <b>Project Approach</b>  | NA            | Section 4.4                   |                                   |   |
| Environmental Management   | NA            | Section 4.4.1                 | yes                               | Vol. I -10-12   |
| Utilities  | NA            | Section 4.4.2                 | yes                               | Vol. I -13-15   |
| Geotechnical   | NA            | Section 4.4.3                 | yes                               | Vol. I -16-18   |

**ATTACHMENT 4.0.1.1**  
**ROUTE 7 – WESTBOUND TRUCK CLIMBING LANE**  
**TECHNICAL PROPOSAL CHECKLIST AND CONTENTS**

| Technical Proposal Component                    | Form (if any) | RFP Part 1<br>Cross Reference | Included<br>within page<br>limit? | Technical<br>Proposal<br>Page<br>Reference |
|---|---------------|-------------------------------|-----------------------------------|--|
| Quality Assurance/ Quality Control (QA/QC)      | NA            | Section 4.4.4                 | yes                               | Vol. I -19-24                              |
| <b>Construction of Project</b>                  | NA            | Section 4.5                   |                                   |  |
| Sequence of Construction                        | NA            | Section 4.5.1                 | yes                               | Vol. I -25-26                              |
| Transportation Management Plan                  | NA            | Section 4.5.2                 | yes                               | Vol. I -27-29                              |
| <b>Disadvantaged Business Enterprises (DBE)</b> | NA            | Section 4.6                   |                                   |  |
| Written statement of percent DBE participation  | NA            | Section 4.6                   | yes                               | Vol. I -30                                 |
| DBE subcontracting narrative                    | NA            | Section 4.6                   | yes                               | Vol. I -30                                 |
| <b>Proposal Schedule</b>                        | NA            | Section 4.7                   |                                   |  |
| Proposal Schedule                               | NA            | Section 4.7                   | no                                | PS-1 –<br>PS-14                            |
| Proposal Schedule Narrative                     | NA            | Section 4.7                   | no                                | PS-14-18                                   |
| Proposal Schedule in electronic format (CD-ROM) | NA            | Section 4.7                   | no                                | CD-ROM                                     |
|   |               |                               |                                   |  |

**ATTACHMENT 3.6****COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF TRANSPORTATION**

RFP NO. C00058599DB54  
 PROJECT NO.: 6007-053-133, R201, C501

**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 March 27, 2013 – RFP  
(Date)
2. Cover letter of May 14, 2013 – Addendum #1  
(Date)
3. Cover letter of June 4, 2013 – Addendum #2  
(Date)

Allop  
SIGNATURE

6/5/13  
DATE

**ATTACHMENT 9.3.1**  
**PROPOSAL PAYMENT AGREEMENT**

**THIS PROPOSAL PAYMENT AGREEMENT** (this “Agreement”) is made and entered into as of this 20<sup>th</sup> day of June, 2013 by and between the Virginia Department of Transportation (“VDOT”), and Corman Construction, Inc. (“Offeror”).

**WITNESSETH:**

**WHEREAS**, Offeror is one of the entities who submitted Statements of Qualifications (“SOQs”) pursuant to VDOT’s [*Month Day, Year*] Request for Qualifications (“RFQ”) and was invited to submit proposals in response to a Request for Proposals (“RFP”) for the [*Project Name*], Project No. [*0000-000-000*] (“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 and in writing during proprietary meetings or interviews; and (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 (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 [*written number*] and 00/100 Dollars (\$[*numerical*].00) ("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: \_\_\_\_\_

*[Insert Offeror's Name]* Corman Construction, Inc.

By: \_\_\_\_\_ *ACox*

Name: Arthur C. Cox, III

Title: Vice President

**ATTACHMENT 11.8.6(a)**  
**CERTIFICATION REGARDING DEBARMENT**  
**PRIMARY COVERED TRANSACTIONS**

**Project No.: 6007-053-133, R201, C501**

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.

|   |         |                |
|---|---------|----------------|
|  | 6/20/13 | Vice President |
| Signature   | Date    | Title          |

Corman Construction, Inc.

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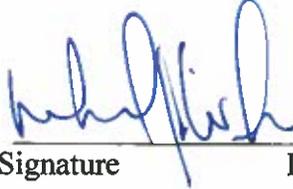
Name of Firm

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

**Project No.: 6007-053-133, R201, C501**

- 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.

|   |              |           |
|---|--------------|-----------|
|  | June 3, 2013 | Principal |
| Signature   | Date         | Title     |

A. Morton Thomas and Associates, Inc.

Name of Firm

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

**Project No.: 6007-053-133, R201, C501**

- 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.

|   |           |           |
|---|-----------|-----------|
|  | 5/30/2013 | President |
| Signature   | Date      | Title     |

Sabra, Wang & Associates, Inc.  
\_\_\_\_\_  
Name of Firm



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

**Project No.: 6007-053-133, R201, C501**

- 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.

  
\_\_\_\_\_  
Signature                      Date

Vice President of Finance  
\_\_\_\_\_  
Title

McCormick Taylor, Inc.  
\_\_\_\_\_  
Name of Firm

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

**Project No.: 6007-053-133, R201, C501**

- 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.

 5/29/13  
Signature                      Date

President  
Title

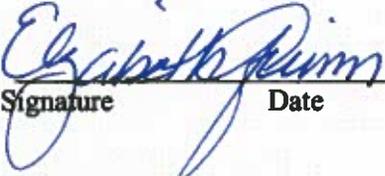
Diversified Property Services, Inc.  
Name of Firm

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

**Project No.: 6007-053-133, R201, C501**

- 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.

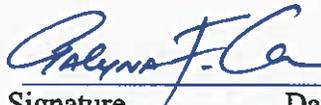
|  |              |           |
|--|--------------|-----------|
|  | May 28, 2013 | President |
| Signature  | Date         | Title     |
| <hr/>  |              |           |
| Quinn Consulting Services, Inc.  |              |           |
| Name of Firm   |              |           |

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

**Project No.: 6007-053-133, R201, C501**

- 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.

|   |            |                            |
|---|------------|----------------------------|
|  | 05/30/2013 |                            |
| Signature   | Date       | Contracts Manager<br>Title |

CTI Consultants, Inc.  
\_\_\_\_\_  
Name of Firm

RECEIVED

JUN 03 2013

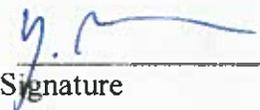
CORMAN CONSTRUCTION

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

**Project No.: 6007-053-133, R201, C501**

- 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.

|   |              |                   |
|---|--------------|-------------------|
|  | May 30, 2013 | President and CEO |
| Signature   | Date         | Title             |

DMY Engineering Consultants, LLC  
Name of Firm

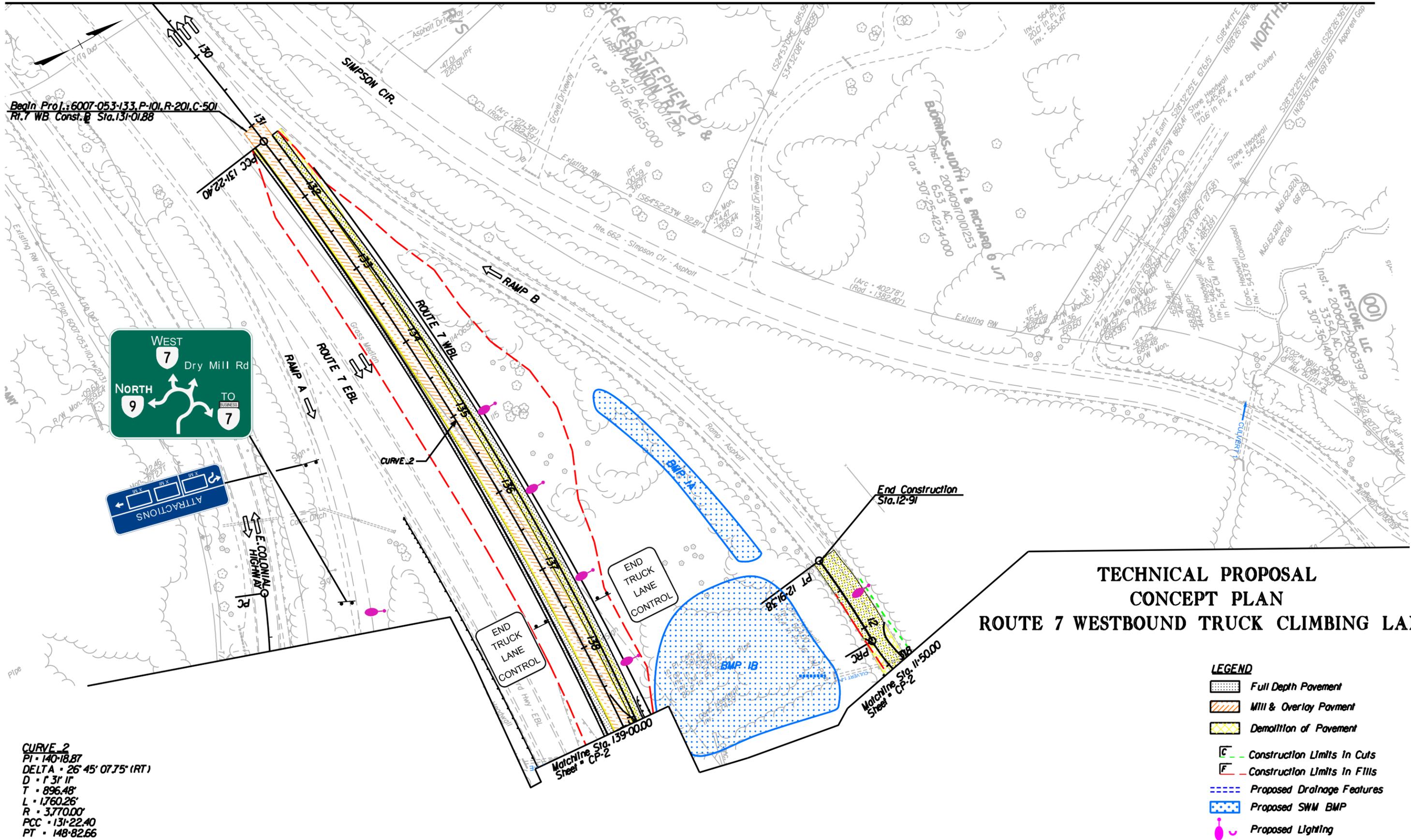
# TECHNICAL PROPOSAL - VOLUME II

## DESIGN-BUILD ROUTE 7 - WESTBOUND TRUCK CLIMBING LANE

FROM: ROUTE 9  
TO: WEST MARKET STREET  
LOUDOUN COUNTY, VIRGINIA

STATE PROJECT No.: 6007-053-133, R201, C501  
FEDERAL PROJECT No.: STP-5401(518)  
CONTRACT ID NUMBER: C00058599DB54





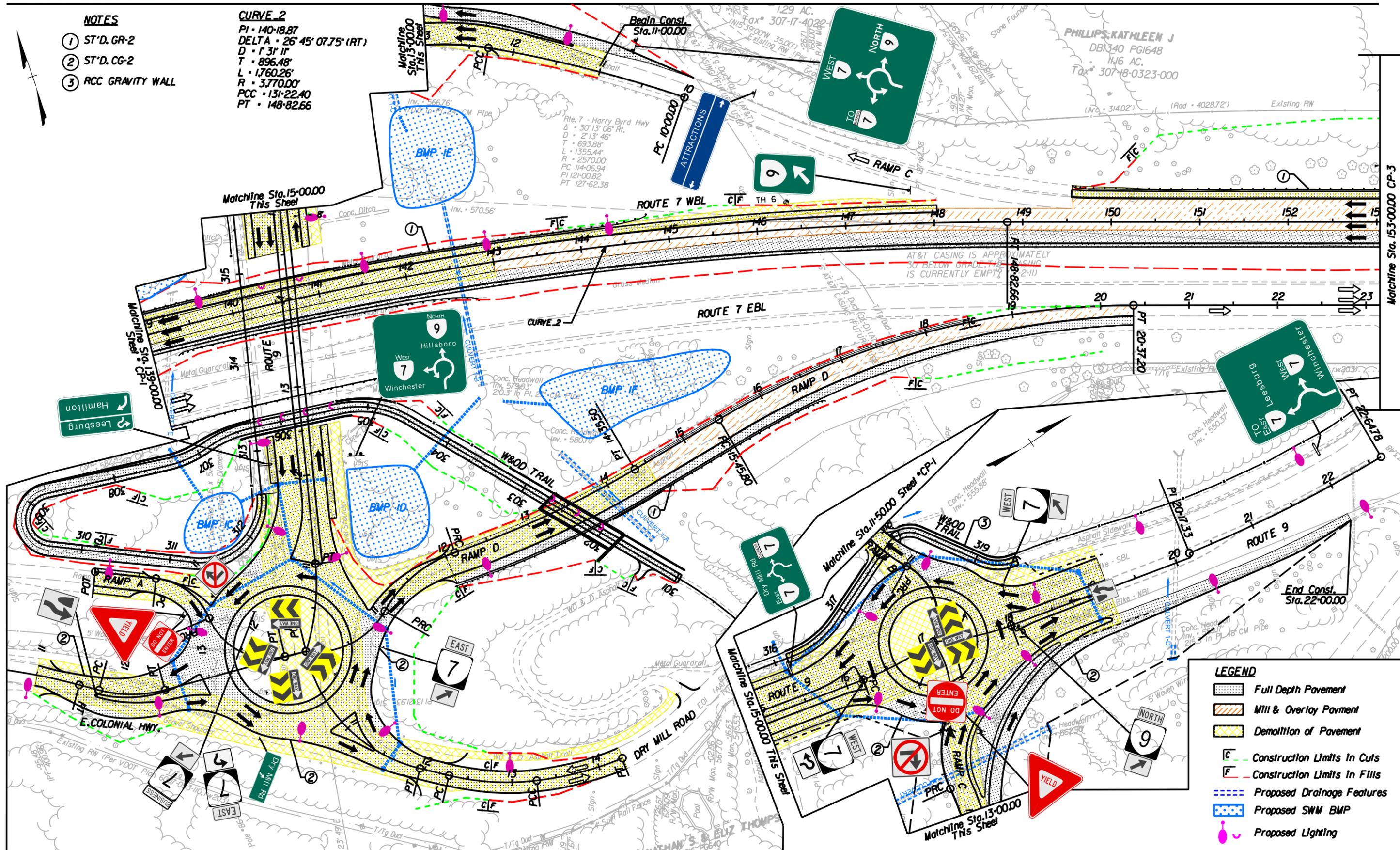
**TECHNICAL PROPOSAL  
 CONCEPT PLAN  
 ROUTE 7 WESTBOUND TRUCK CLIMBING LANE**

**NOTES**

- ① ST'D. GR-2
- ② ST'D. CG-2
- ③ RCC GRAVITY WALL

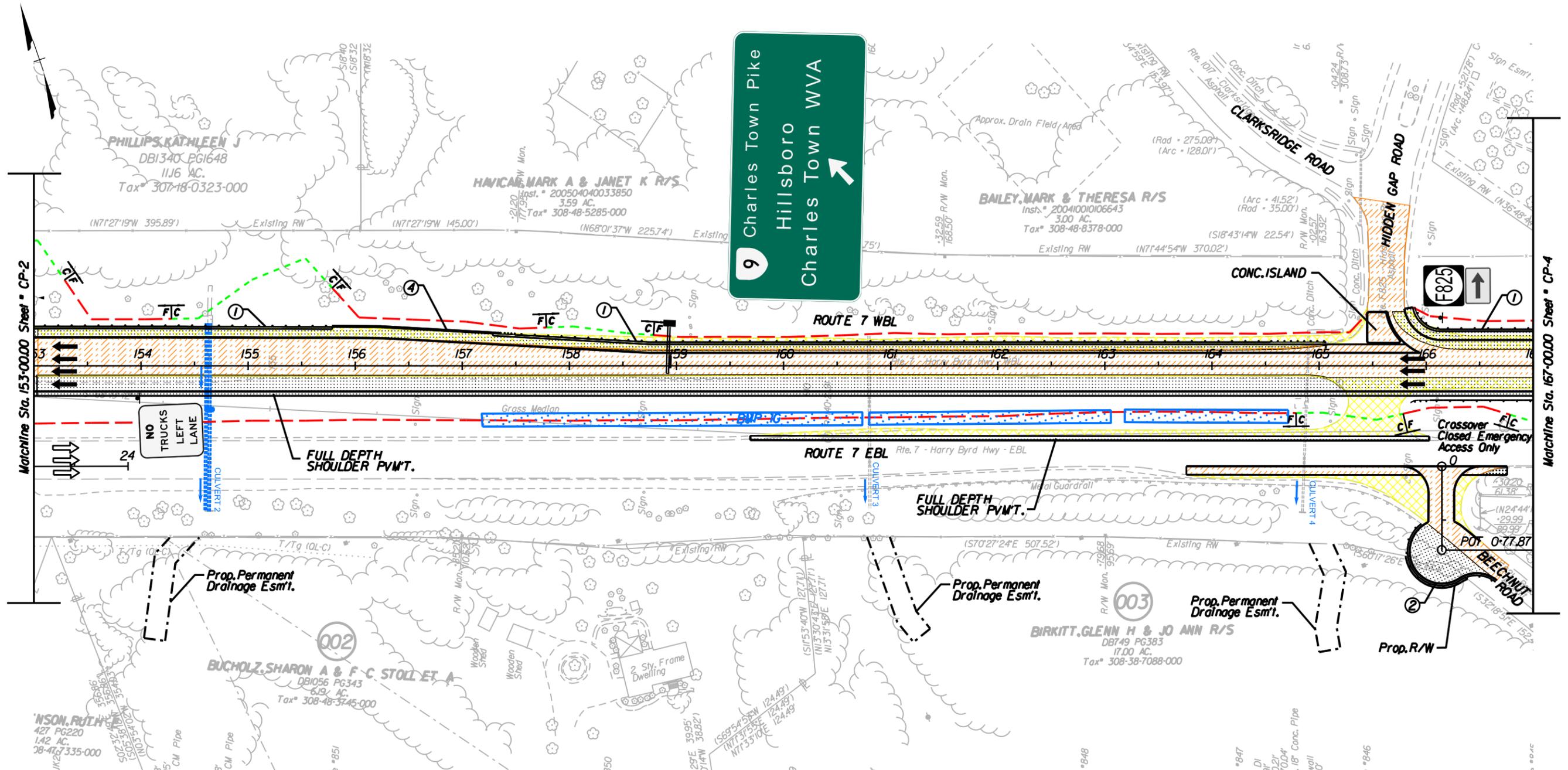
**CURVE 2**

PI • 140-18.87  
 DELTA • 26° 45' 07.75" (RT)  
 D • 1' 31" 11"  
 T • 896.48'  
 L • 1760.26'  
 R • 3770.00'  
 PCC • 131-22.40  
 PT • 148-82.66



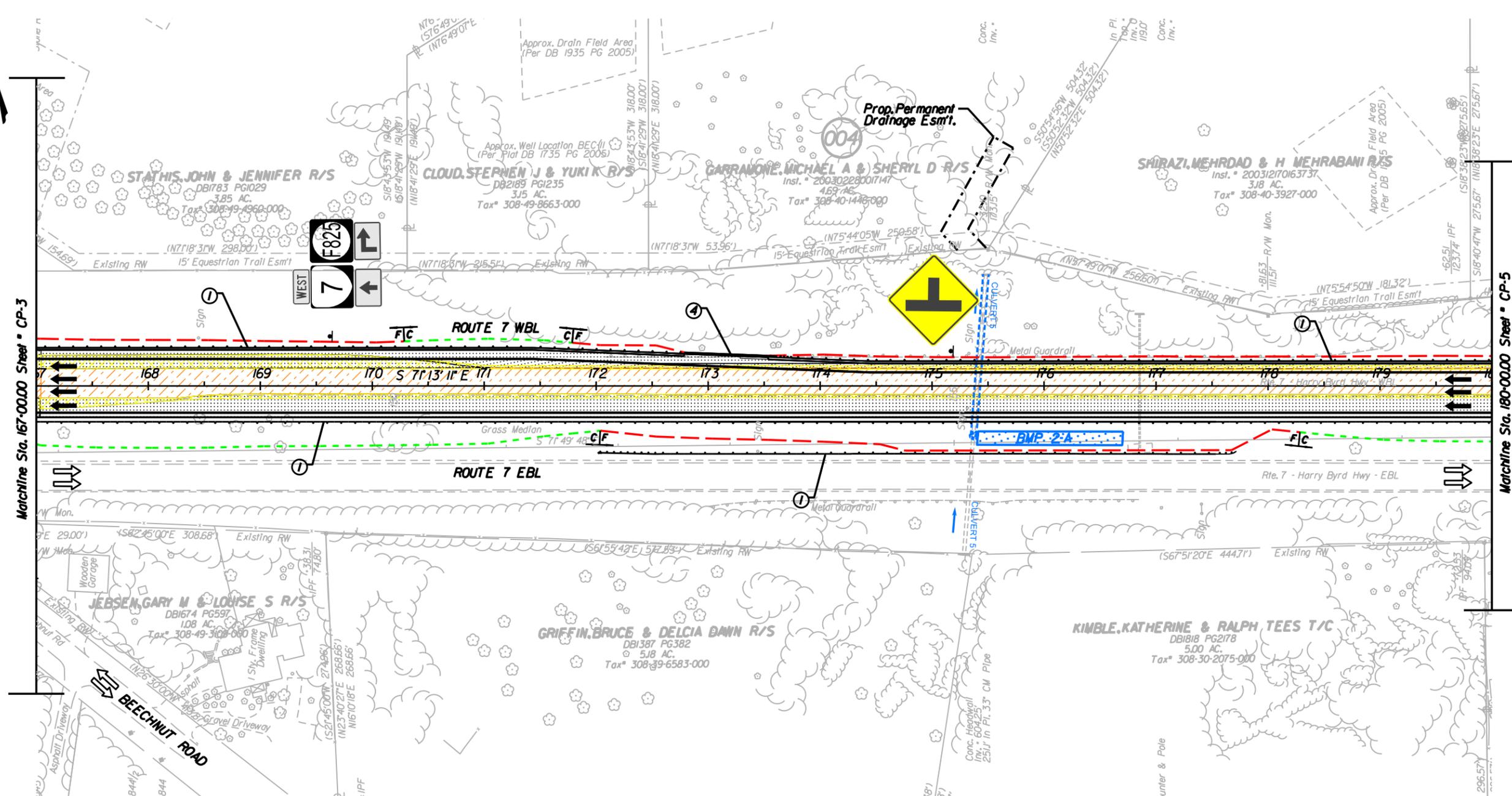
**LEGEND**

- Full Depth Pavement
- Mill & Overlay Pavement
- Demolition of Pavement
- Construction Limits In Cuts
- Construction Limits In Fills
- Proposed Drainage Features
- Proposed SWM BMP
- Proposed Lighting



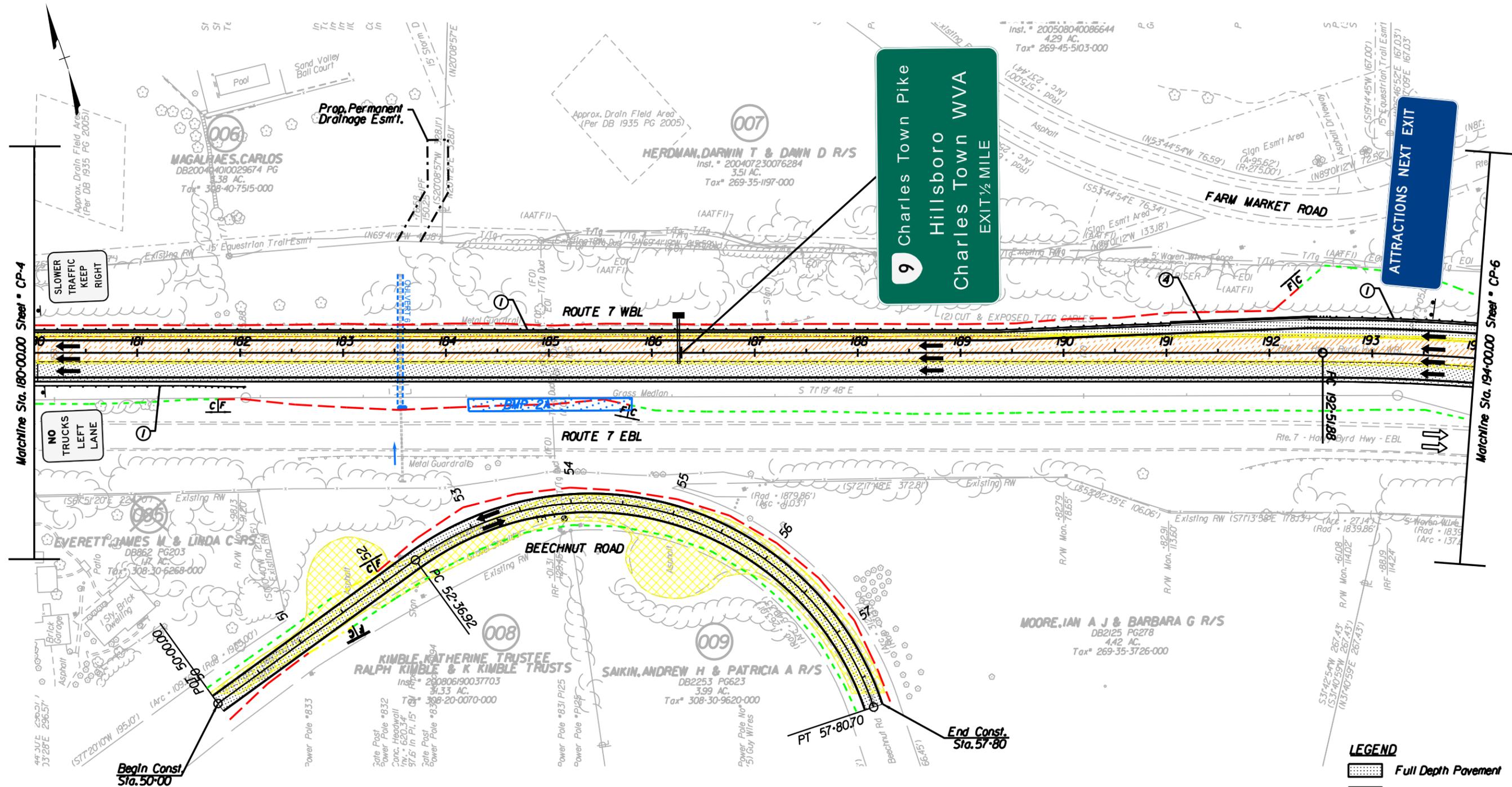
- NOTES**
- ① ST'D. GR-2
  - ② ST'D. CG-2
  - ③ RCC GRAVITY WALL
  - ④ ST'D. MB-12B

- LEGEND**
- Full Depth Pavement
  - Mill & Overlay Pavement
  - Demolition of Pavement
  - Construction Limits In Cuts
  - Construction Limits In Fills
  - Proposed Drainage Features
  - Proposed SWM BMP
  - Proposed Lighting



- NOTES**
- ① ST'D. GR-2
  - ② ST'D. CG-2
  - ③ RCC GRAVITY WALL
  - ④ ST'D. MB-12B

- LEGEND**
- Full Depth Pavement
  - Mill & Overlay Pavement
  - Demolition of Pavement
  - Construction Limits In Cuts
  - Construction Limits In Fills
  - Proposed Drainage Features
  - Proposed SWM BMP
  - Proposed Lighting



Matchline Sta. 180+00.00 Street - CP-4

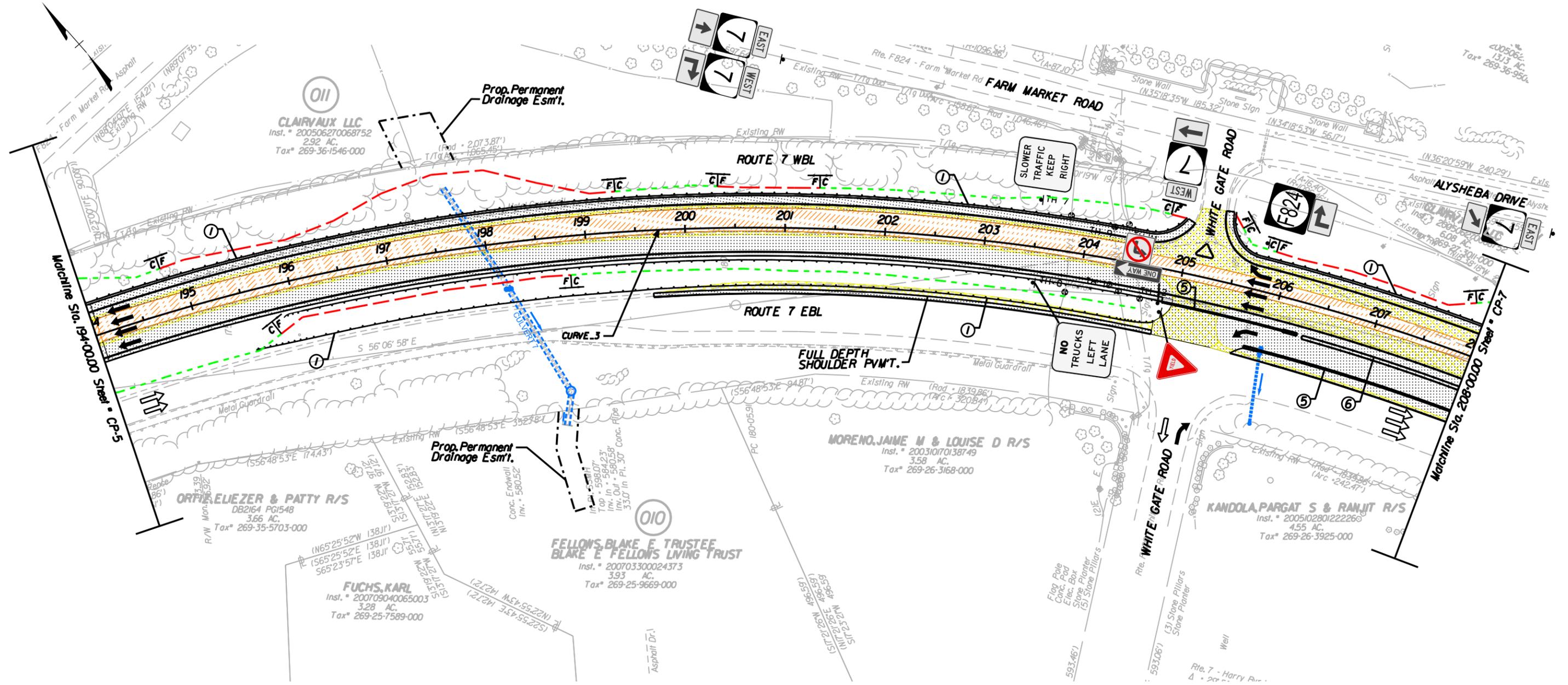
Matchline Sta. 194+00.00 Street - CP-6

**NOTES**

- ① ST'D. GR-2
- ② ST'D. CG-2
- ③ RCC GRAVITY WALL
- ④ ST'D. MB-12B

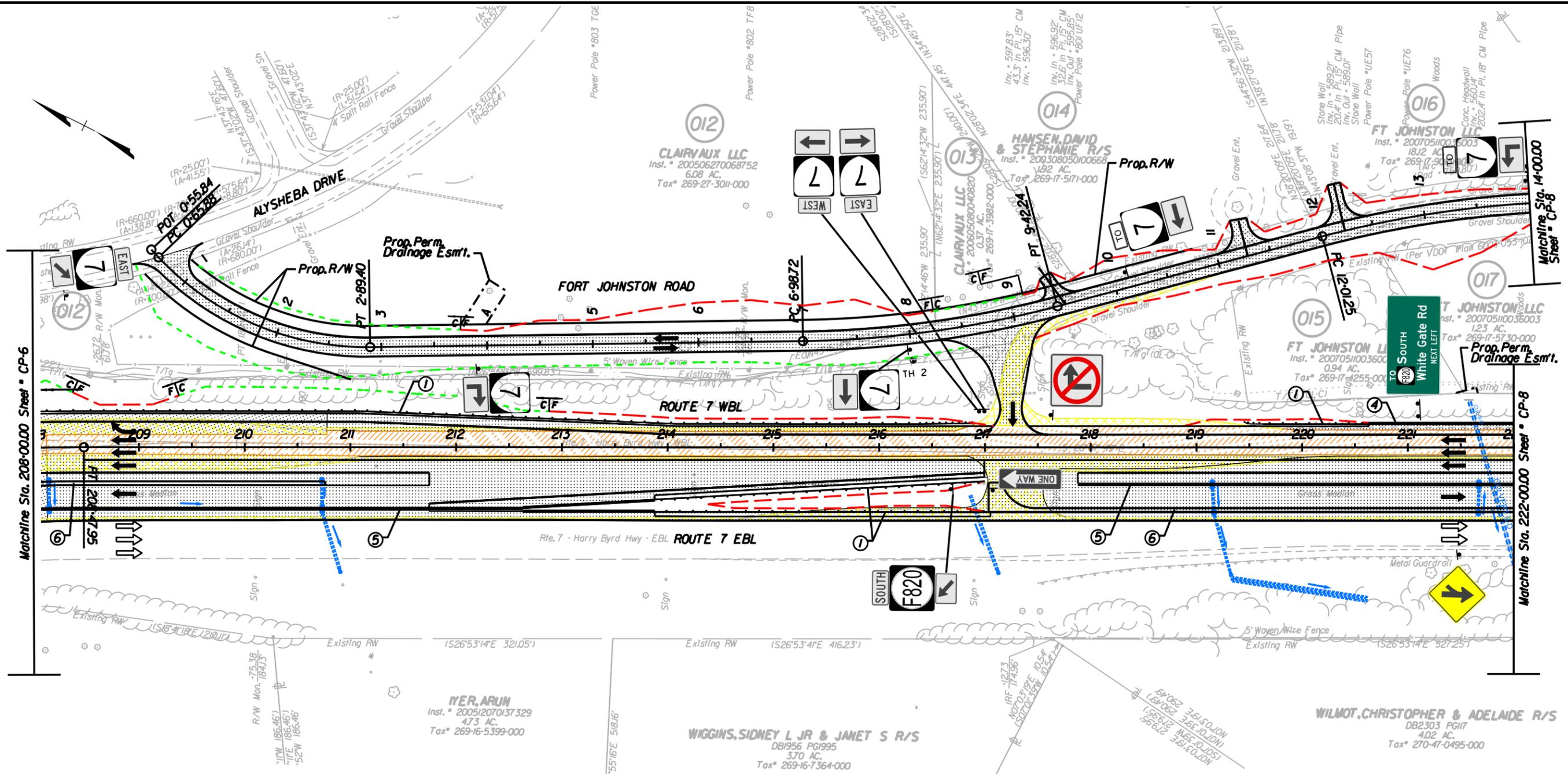
**LEGEND**

- Full Depth Pavement
- Mill & Overlay Pavement
- Demolition of Pavement
- Construction Limits In Cuts
- Construction Limits In Fills
- Proposed Drainage Features
- Proposed SWM BMP
- Proposed Lighting



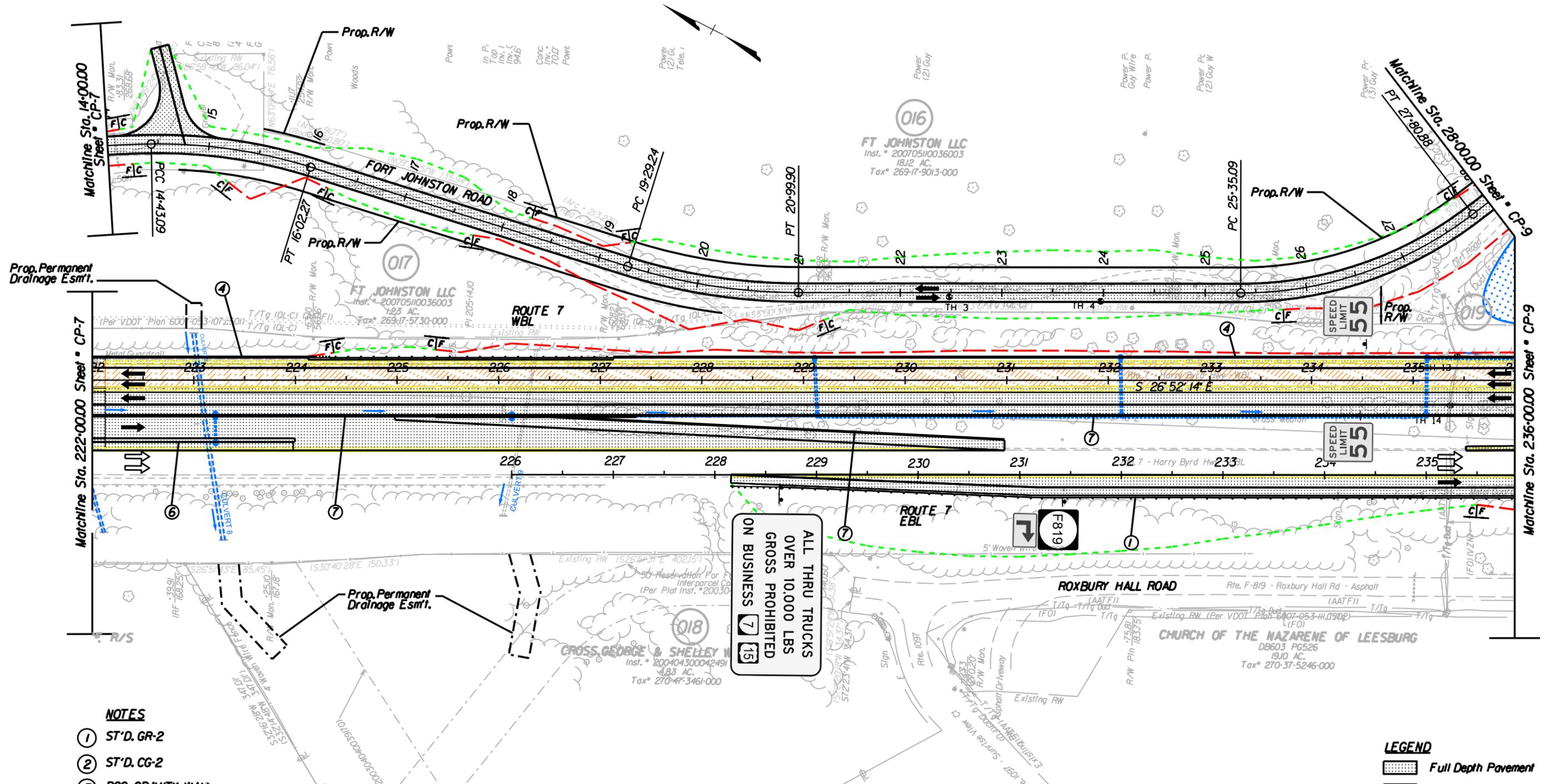
- NOTES**
- ① ST'D. GR-2
  - ② ST'D. CG-2
  - ③ RCC GRAVITY WALL
  - ④ ST'D. MB-12B
  - ⑤ ST'D. MB-13
  - ⑥ ST'D. MS-1
- CURVE 3**
- PI • 200+92.30
  - DELTA • 44° 20' 56.9" (RT)
  - D • 2' 46' 43"
  - T • 840.42'
  - L • 1596.07'
  - R • 2.062.00'
  - PC • 192+51.88
  - PT • 208+47.95

- LEGEND**
- Full Depth Pavement
  - Mill & Overlay Pavement
  - Demolition of Pavement
  - Construction Limits In Cuts
  - Construction Limits In Fills
  - Proposed Drainage Features
  - Proposed SWM BMP
  - Proposed Lighting

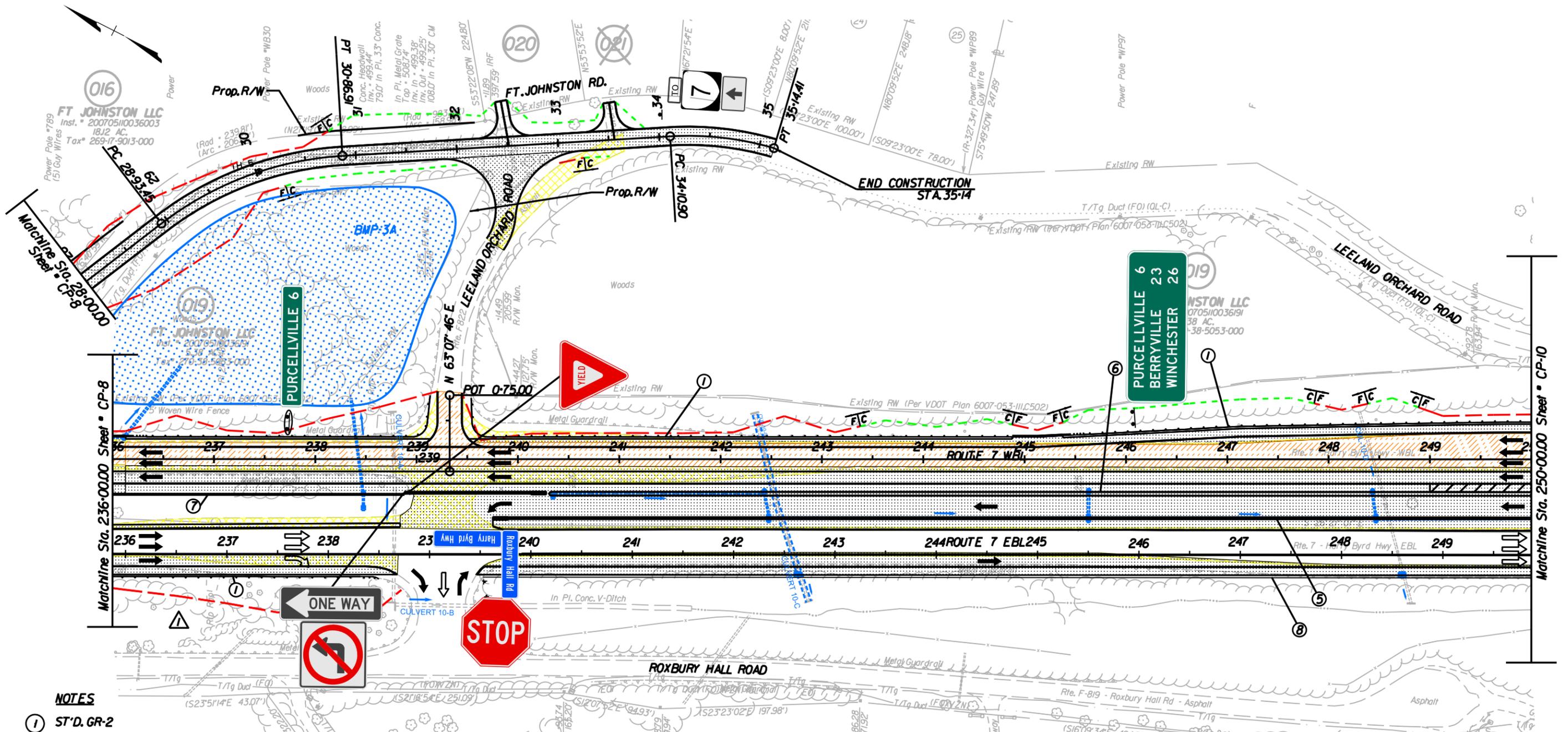


- NOTES**
- ① ST'D. GR-2
  - ② ST'D. CG-2
  - ③ RCC GRAVITY WALL
  - ④ ST'D. MB-12B
  - ⑤ ST'D. MB-13
  - ⑥ ST'D. MS-1

- LEGEND**
- Full Depth Pavement
  - Mill & Overlay Pavement
  - Demolition of Pavement
  - Construction Limits In Cuts
  - Construction Limits In Fills
  - Proposed Drainage Features
  - Proposed SWM BMP
  - Proposed Lighting



- LEGEND**
- Full Depth Pavement
  - Mill & Overlay Pavement
  - Demolition of Pavement
  - Construction Limits In Cuts
  - Construction Limits In Fills
  - Proposed Drainage Features
  - Proposed SWM BMP
  - Proposed Lighting

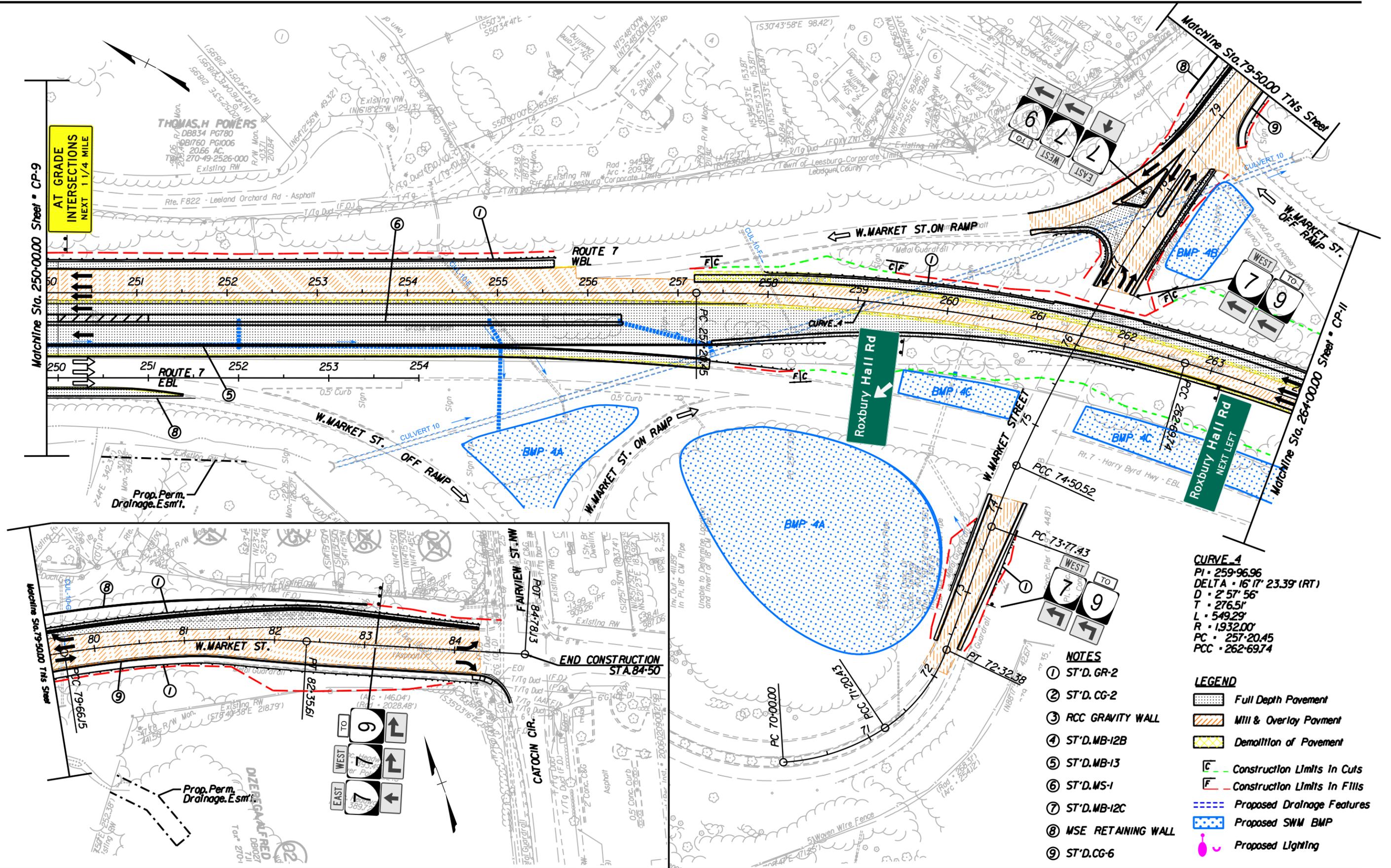


**NOTES**

- ① ST'D. GR-2
- ② ST'D. CG-2
- ③ RCC GRAVITY WALL
- ④ ST'D. MB-12B
- ⑤ ST'D. MB-13
- ⑥ ST'D. MS-1
- ⑦ ST'D. MB-12C
- ⑧ MSE RETAINING WALL

**LEGEND**

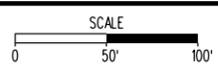
- Full Depth Pavement
- Mill & Overlay Pavement
- Demolition of Pavement
- Construction Limits In Cuts
- Construction Limits In Fills
- Proposed Drainage Features
- Proposed SWM BMP
- Proposed Lighting

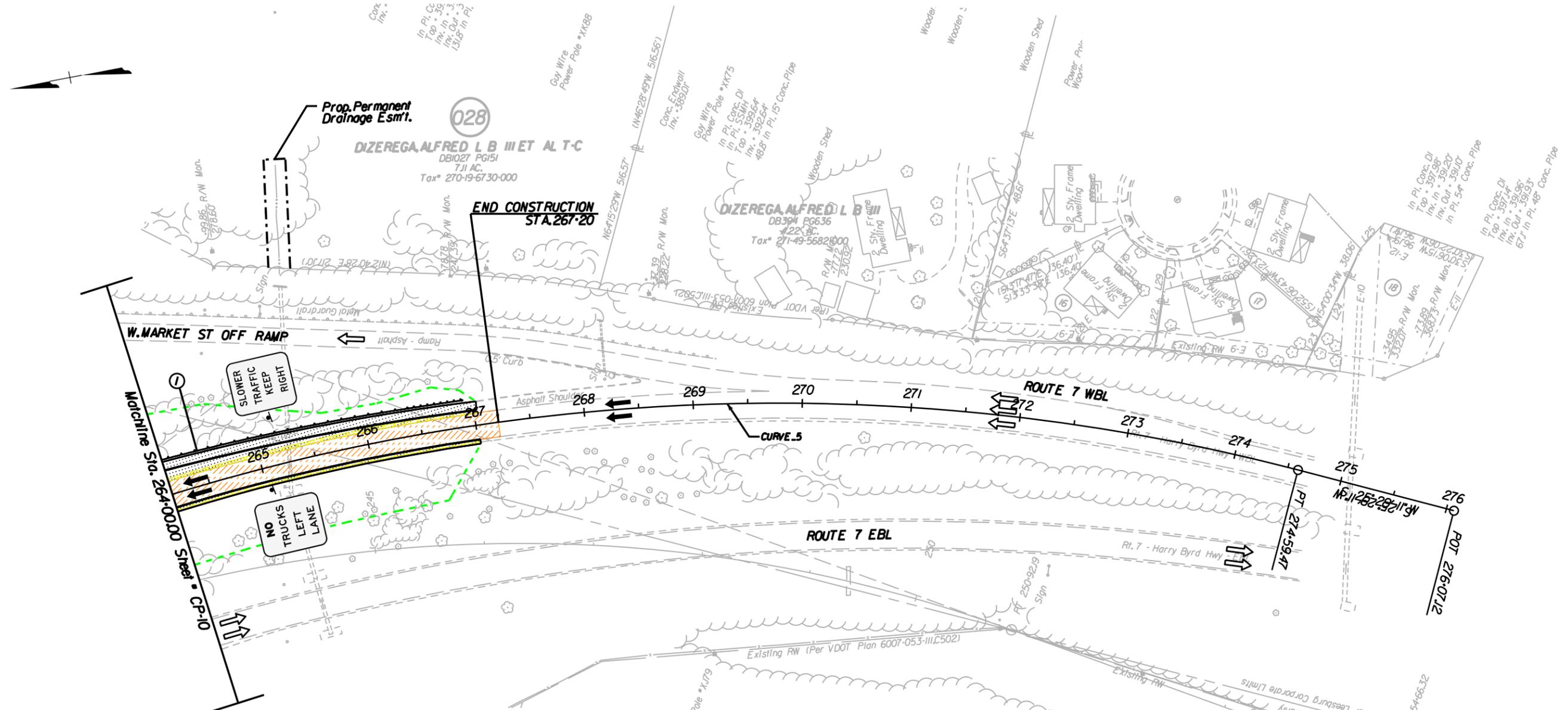


**CURVE 4**  
 PI - 259+96.96  
 DELTA - 16' 23.39" (RT)  
 D - 2' 57" 56"  
 T - 276.51'  
 L - 549.29'  
 R - 1,932.00'  
 PC - 257+20.45  
 PCC - 262+69.74

- NOTES**
- ① ST'D. GR-2
  - ② ST'D. CG-2
  - ③ RCC GRAVITY WALL
  - ④ ST'D. MB-12B
  - ⑤ ST'D. MB-13
  - ⑥ ST'D. MS-1
  - ⑦ ST'D. MB-12C
  - ⑧ MSE RETAINING WALL
  - ⑨ ST'D. CG-6

- LEGEND**
- Full Depth Pavement
  - Mill & Overlay Pavement
  - Demolition of Pavement
  - Construction Limits In Cuts
  - Construction Limits In Fills
  - Proposed Drainage Features
  - Proposed SWM BMP
  - Proposed Lighting





**NOTES**

- ① ST'D. GR-2
- ② ST'D. CG-2
- ③ RCC GRAVITY WALL
- ④ ST'D. MB-12B
- ⑤ ST'D. MB-13
- ⑥ ST'D. MS-1
- ⑦ ST'D. MB-12C
- ⑧ MSE RETAINING WALL

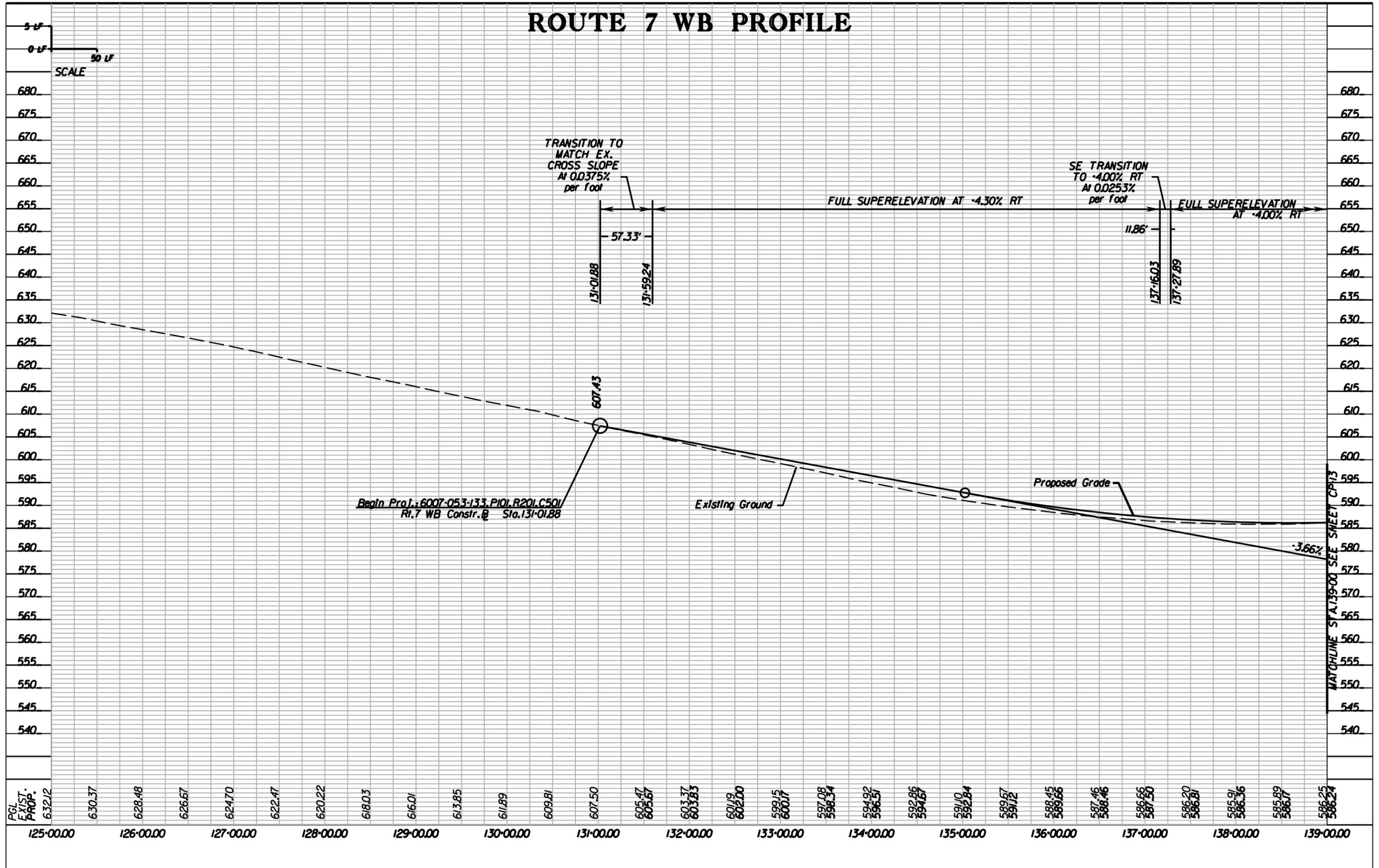
**CURVE 5**

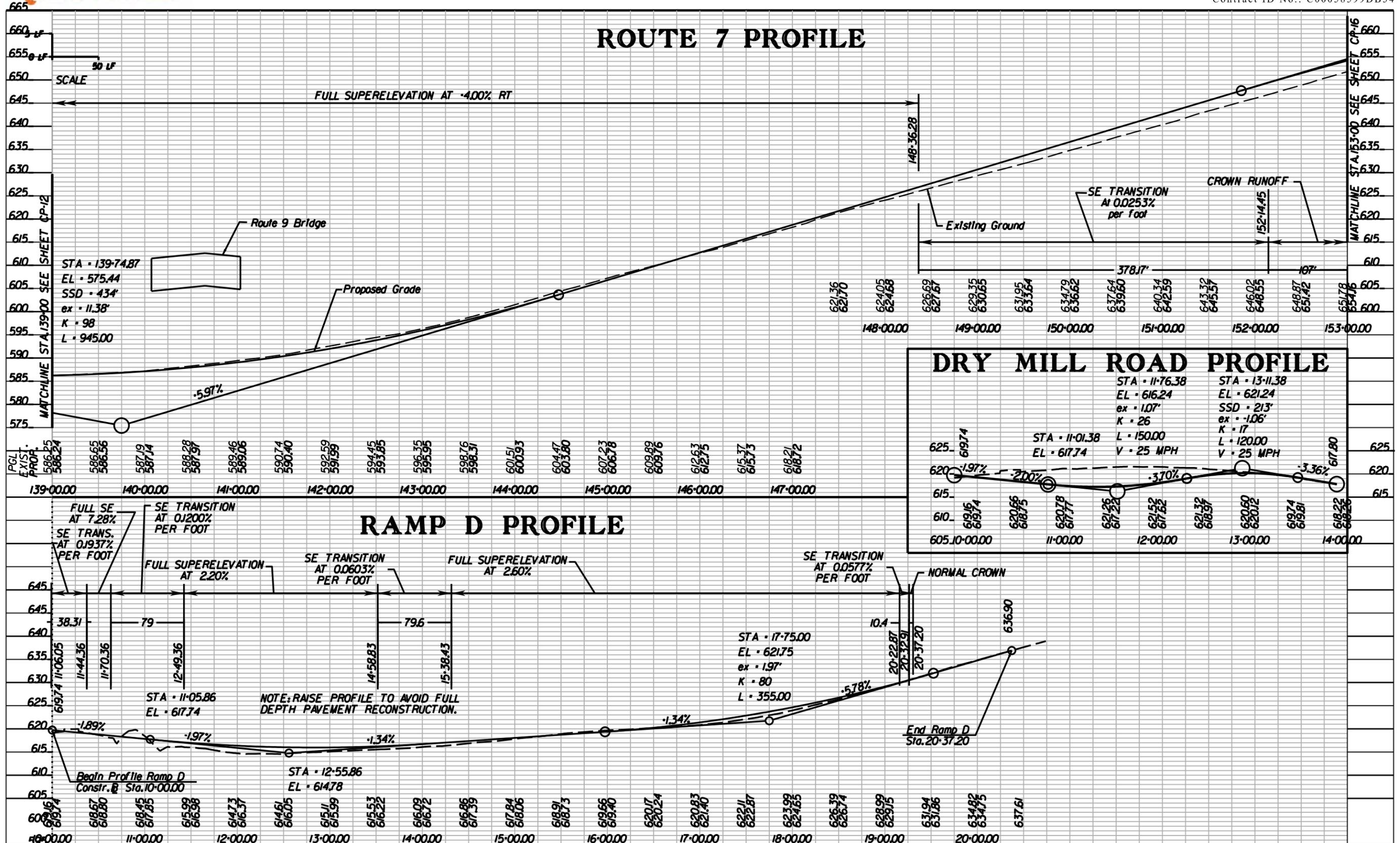
PI • 268-85.06  
 DELTA • 36° 04' 01.64" (RT)  
 D • 3' 01' 5.3"  
 T • 615.32'  
 L • 1189.74'  
 R • 1890.00'  
 PCC • 262-69.74  
 PT • 274-59.47

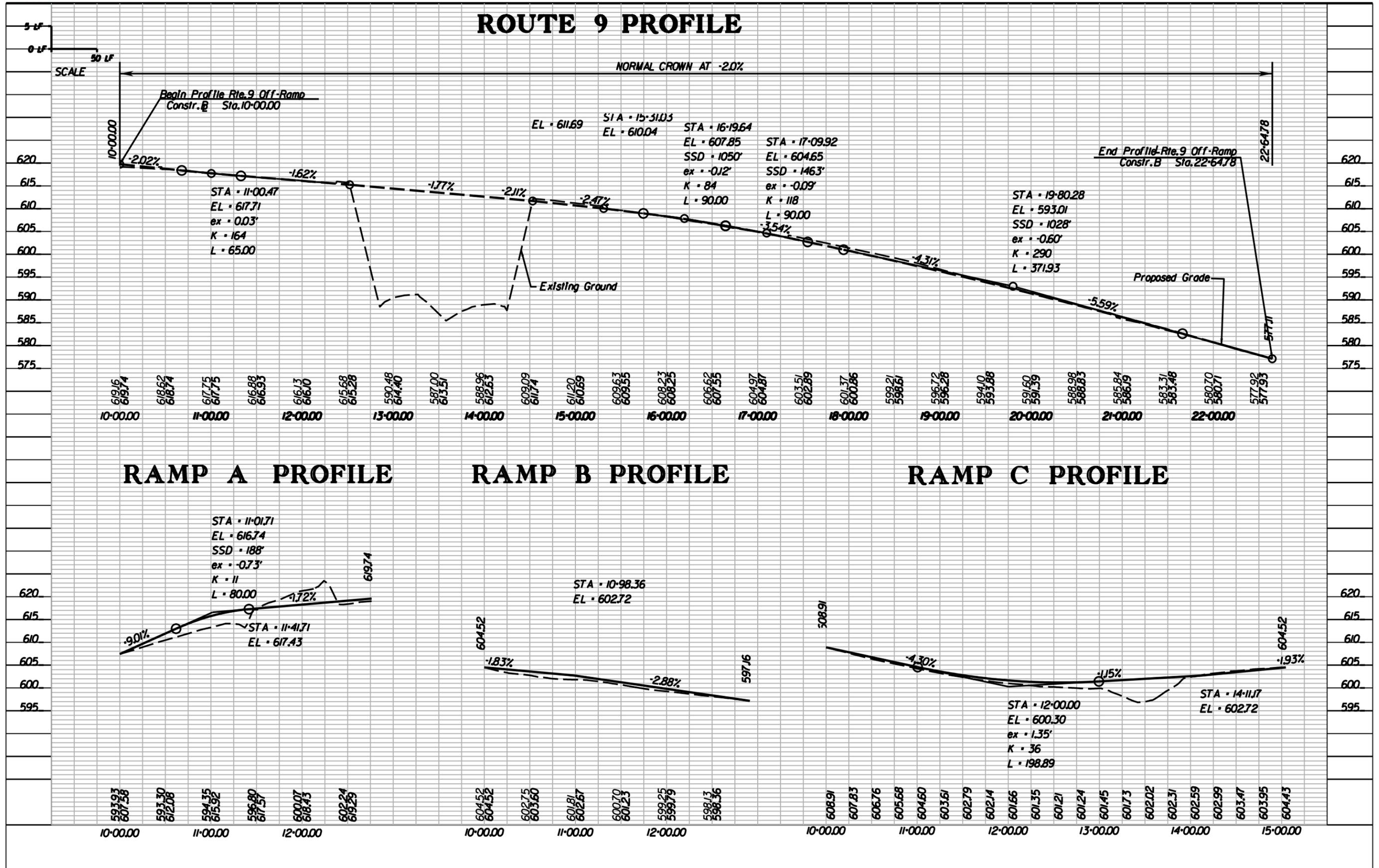
**LEGEND**

- Full Depth Pavement
- Mill & Overlay Pavement
- Demolition of Pavement
- Construction Limits In Cuts
- Construction Limits In Fills
- Proposed Drainage Features
- Proposed SWM BMP
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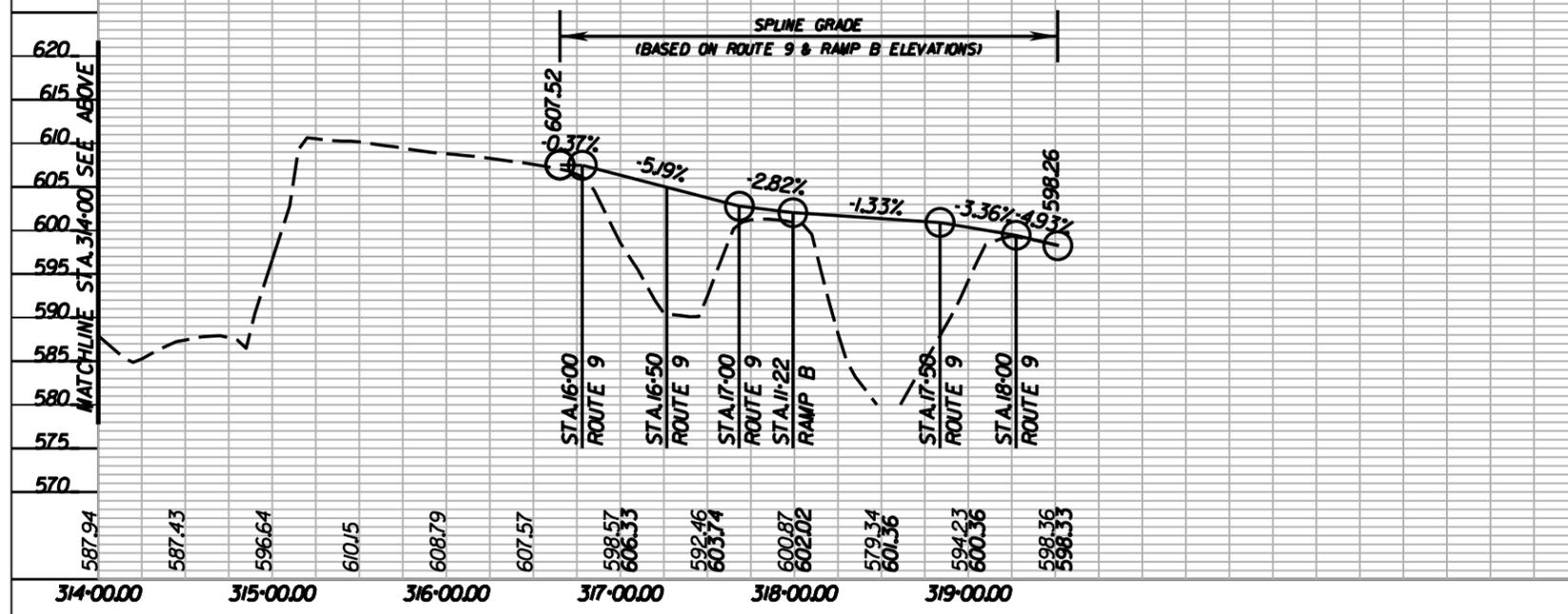
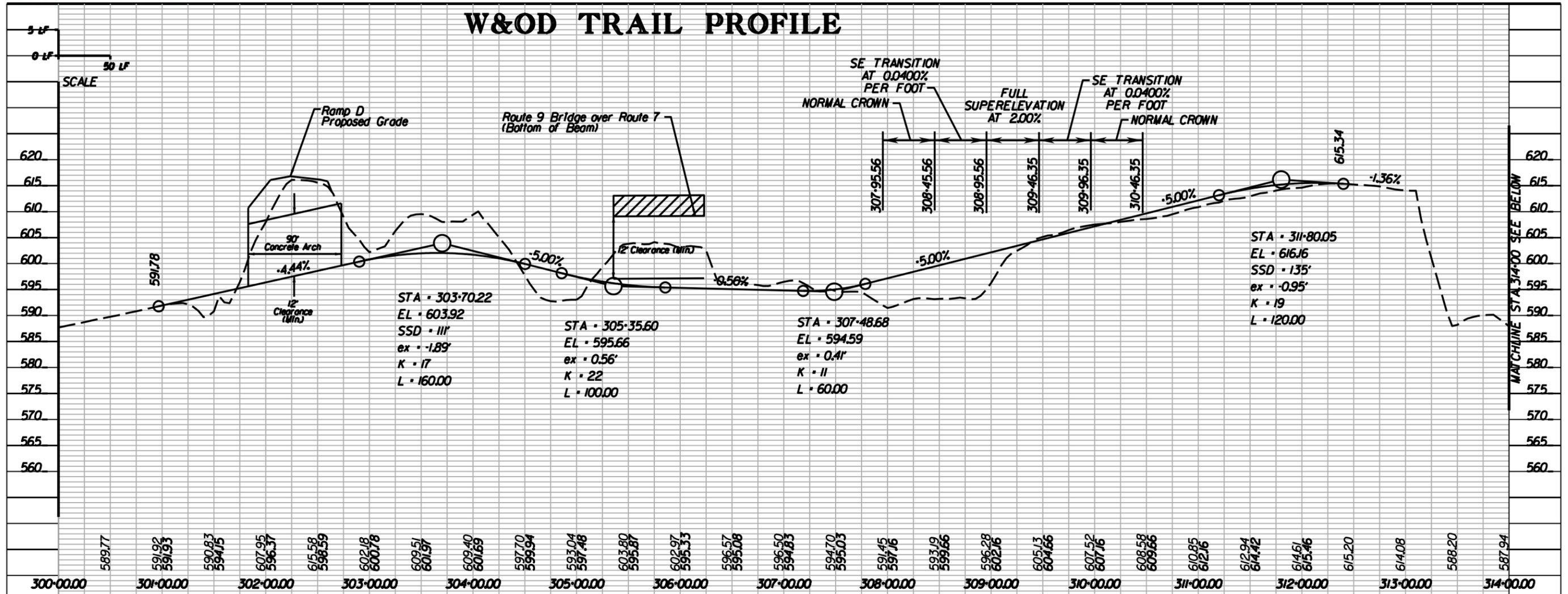
# ROUTE 7 WB PROFILE



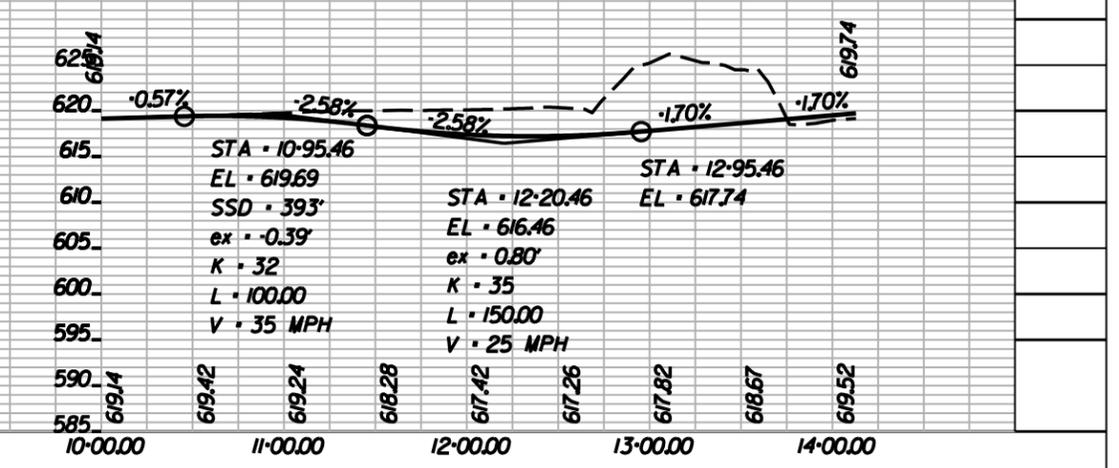




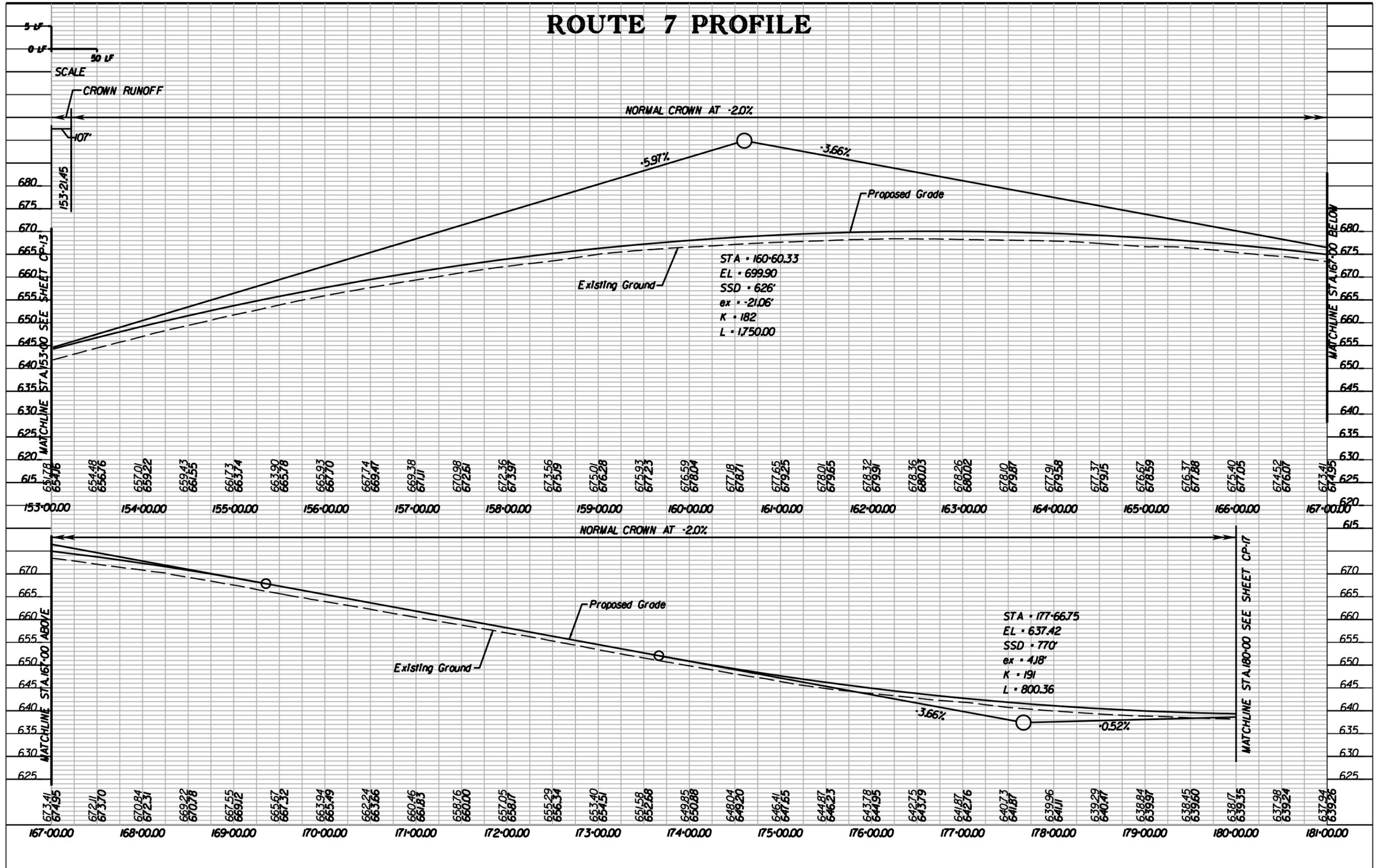
# W&OD TRAIL PROFILE

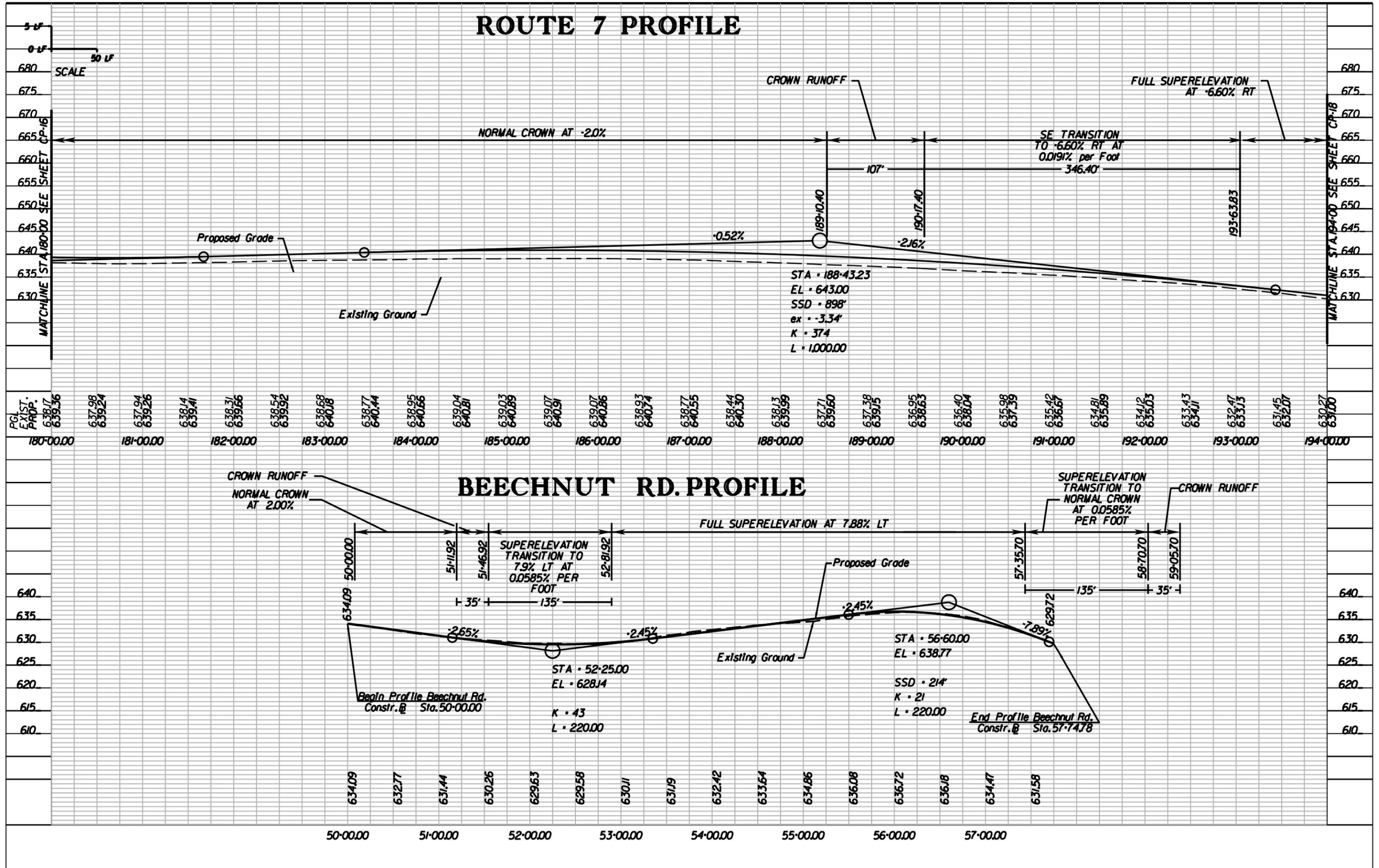


# E. COLONIAL HIGHWAY PROFILE

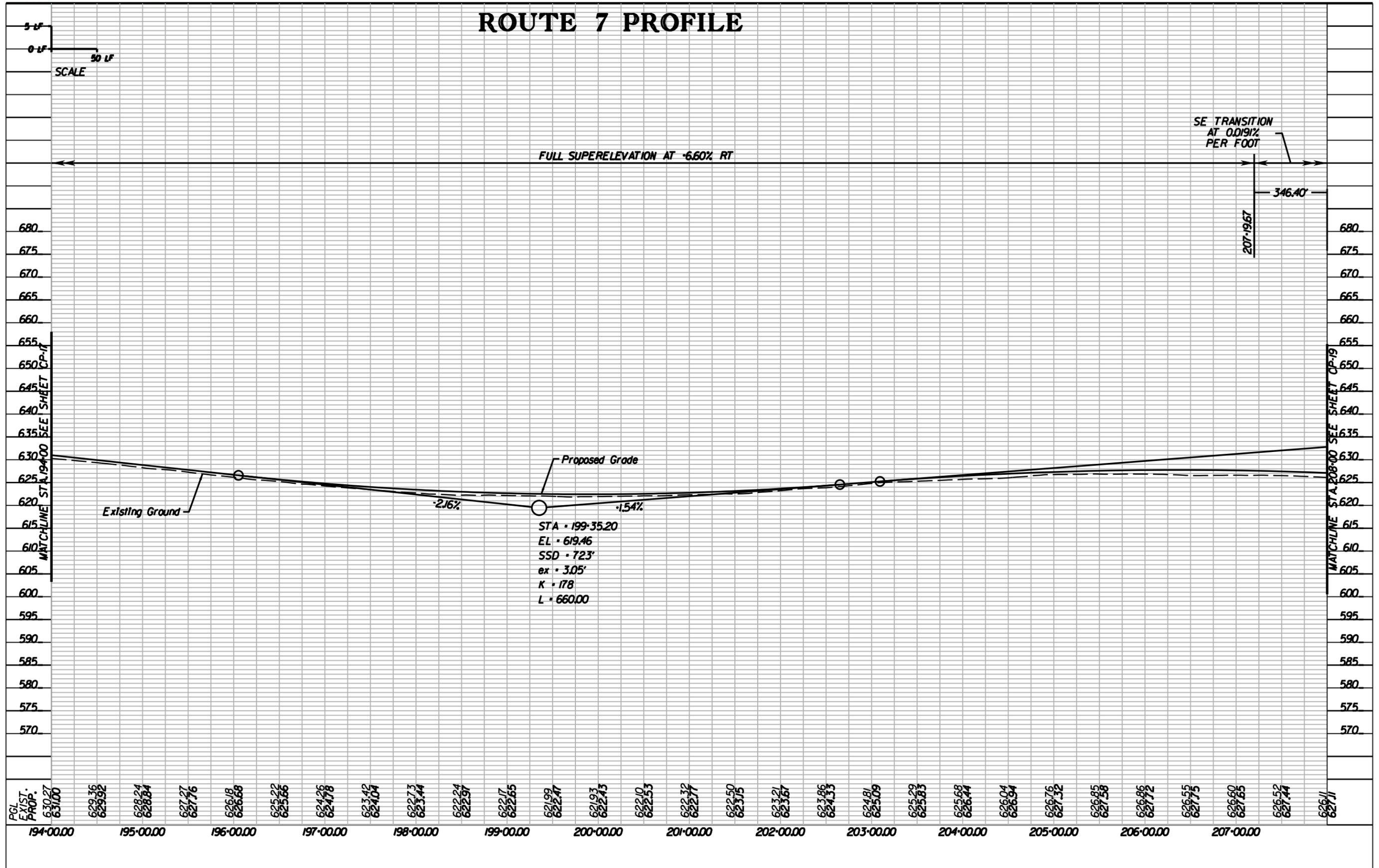


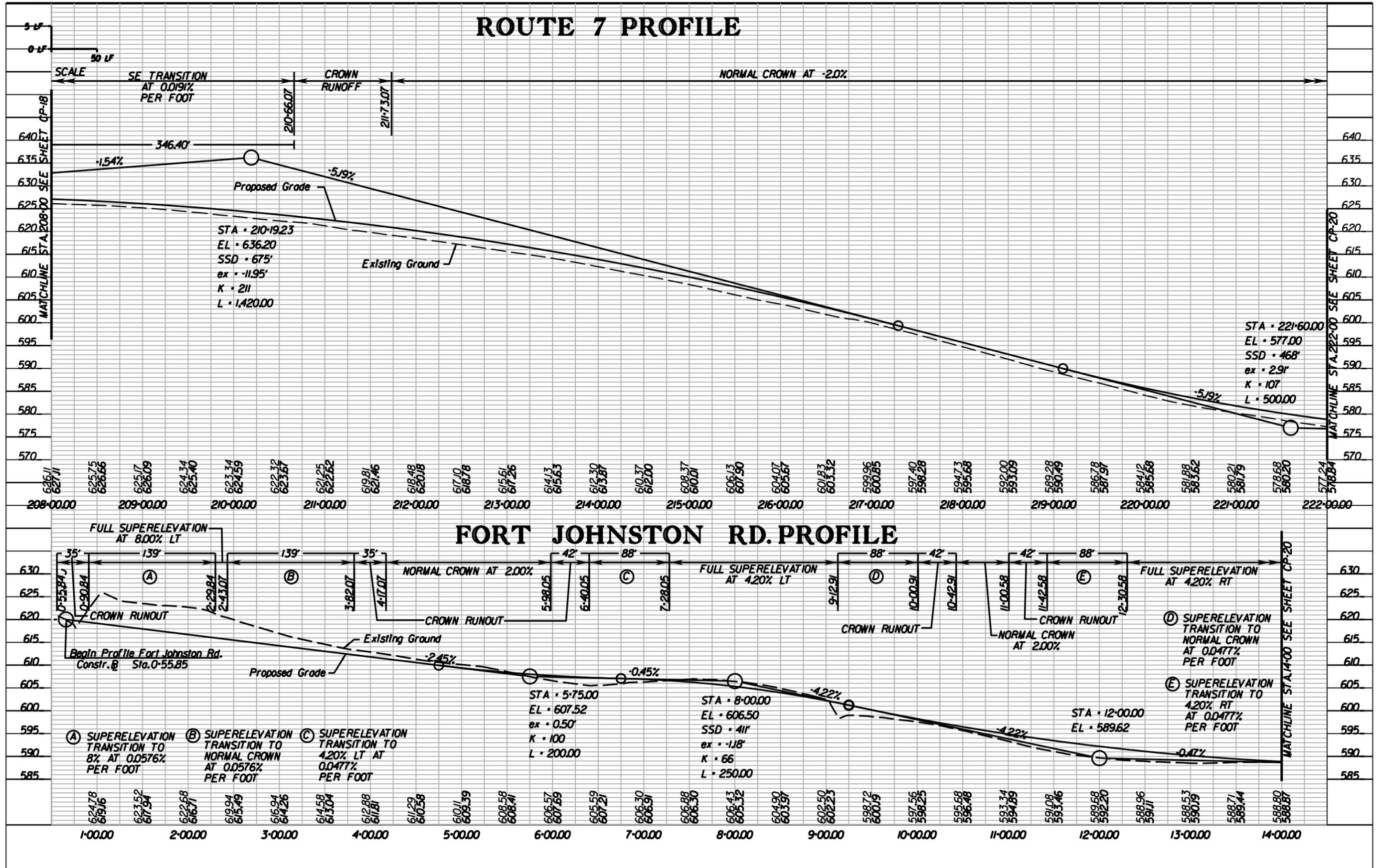
# ROUTE 7 PROFILE

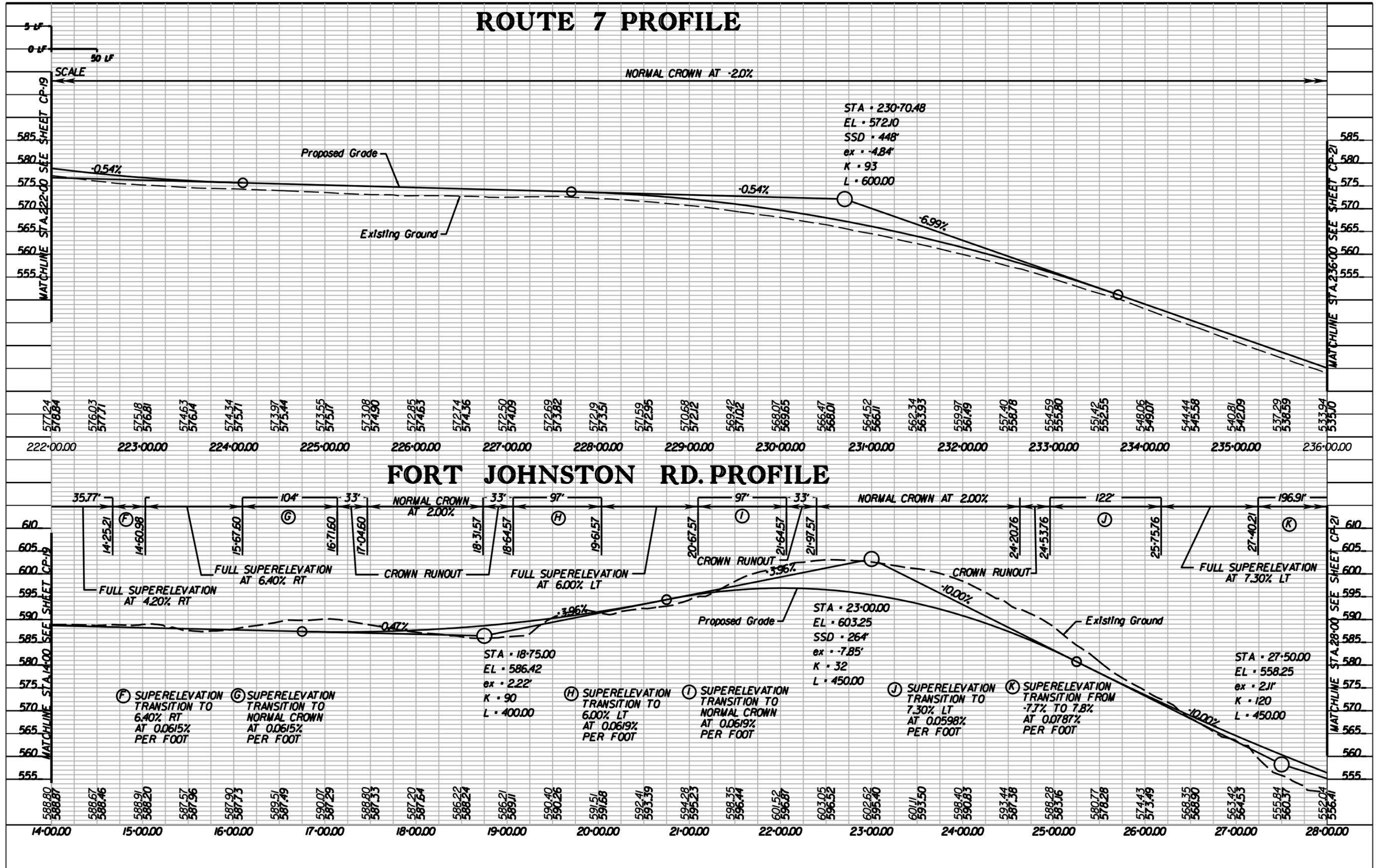


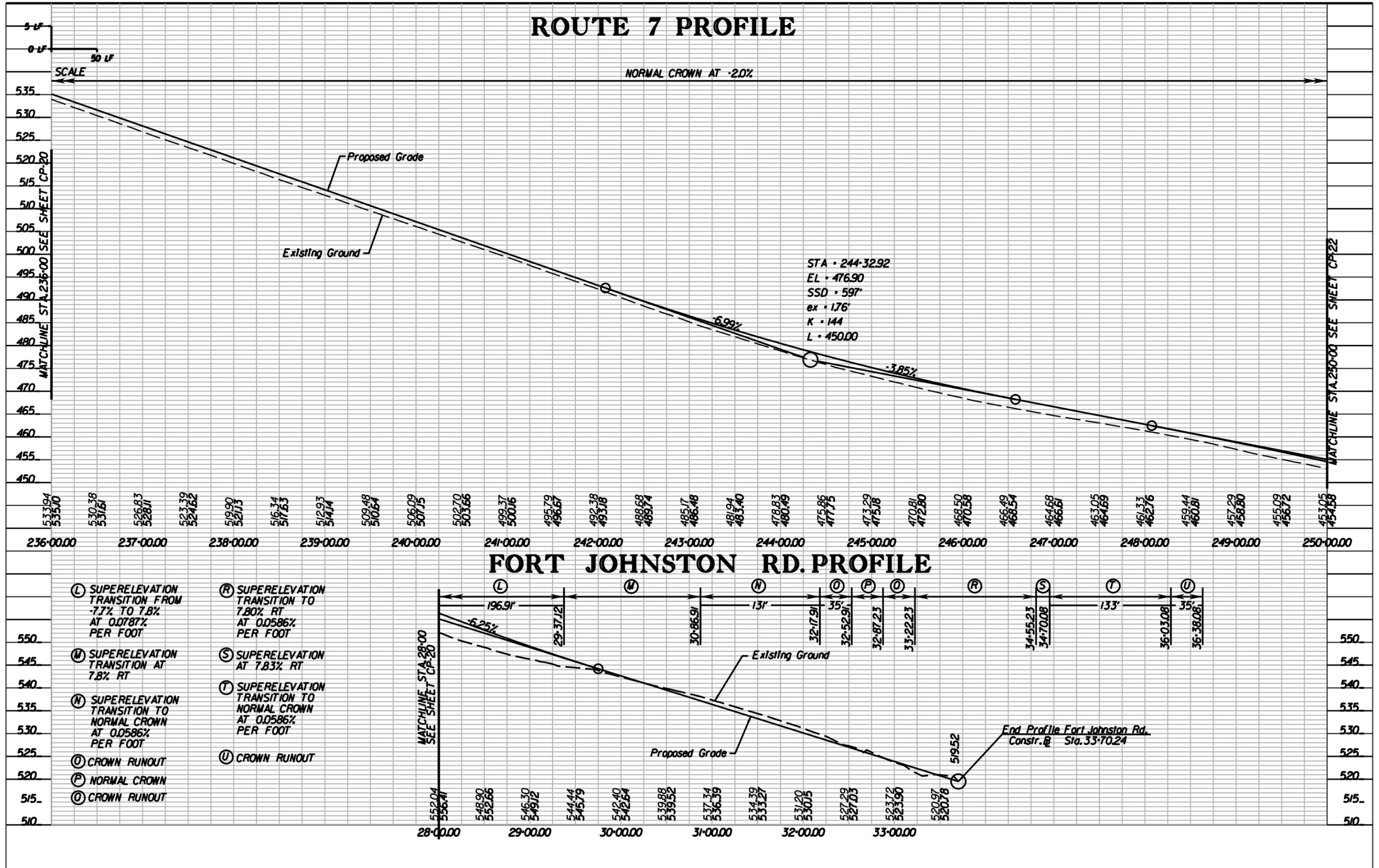


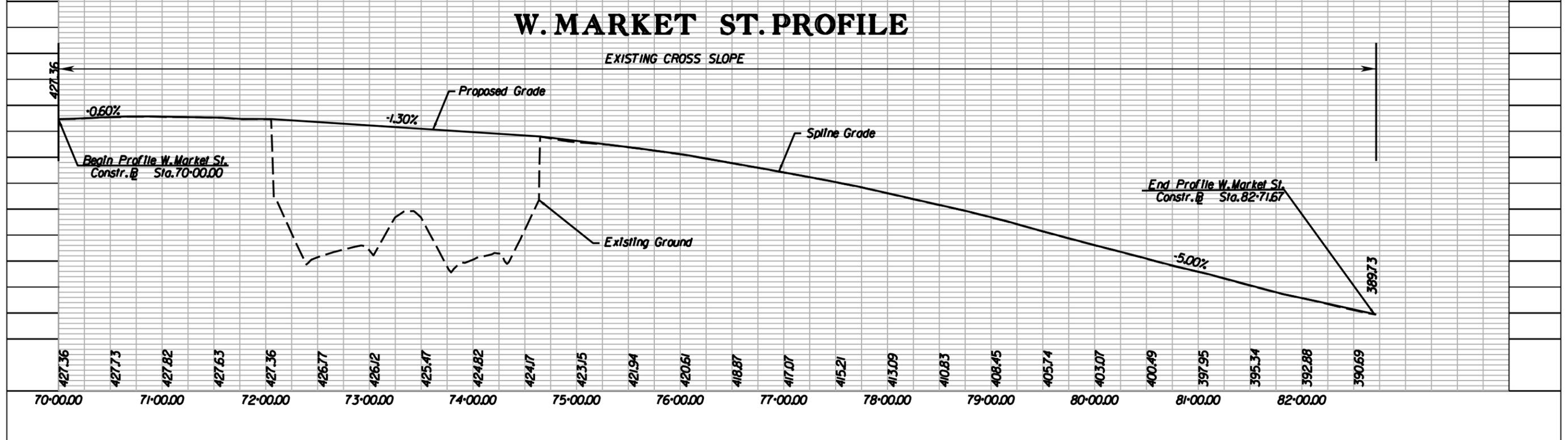
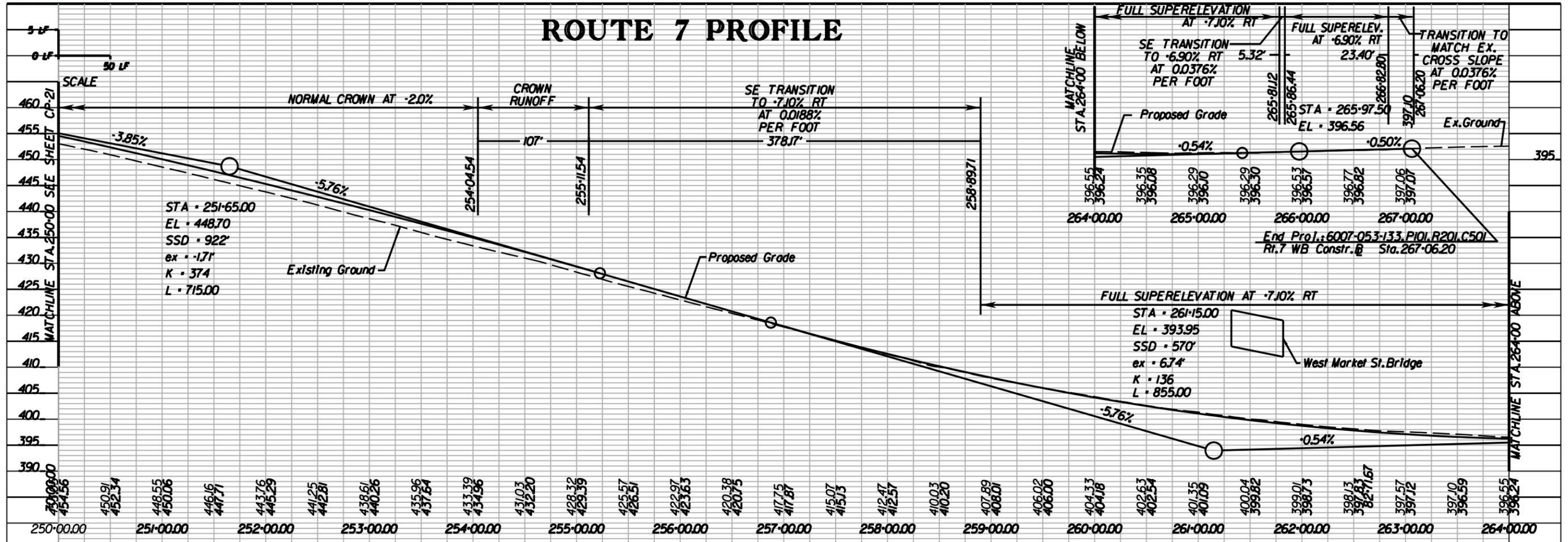
# ROUTE 7 PROFILE







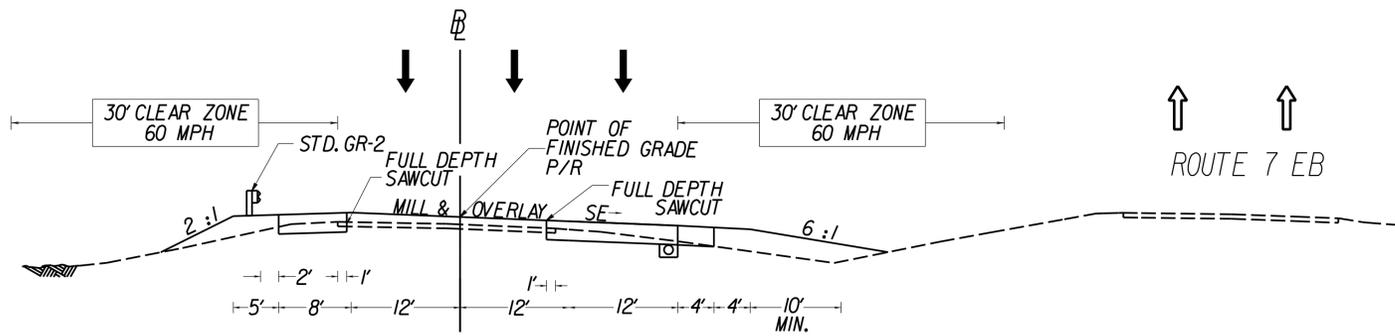




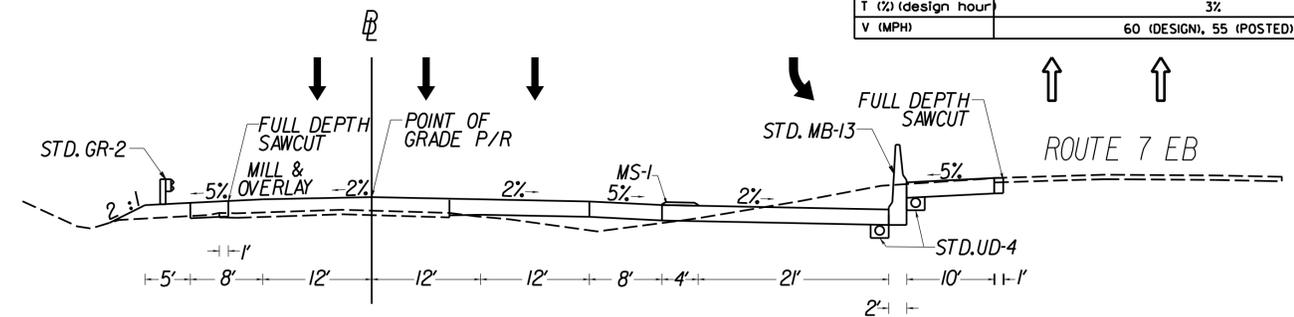
# TYPICAL SECTIONS

| RTE. 7 FUNCTIONAL CLASSIFICATION AND TRAFFIC DATA                 |                          |
|---|--------------------------|
| RURAL PRINCIPAL DIVIDED ARTERIAL<br>ROLLING - 60 MPH DESIGN SPEED |                          |
| Fr: WEST MARKET STREET INTERCHANGE<br>To: ROUTE 9 INTERCHANGE     |                          |
| ADT (2011)  | 60,500                   |
| ADT (2036)  | 84,750                   |
| DHV   | 6,800                    |
| D (%) (design hour)   | 76/23                    |
| T (%) (design hour)   | 3%                       |
| V (MPH)   | 60 (DESIGN), 55 (POSTED) |

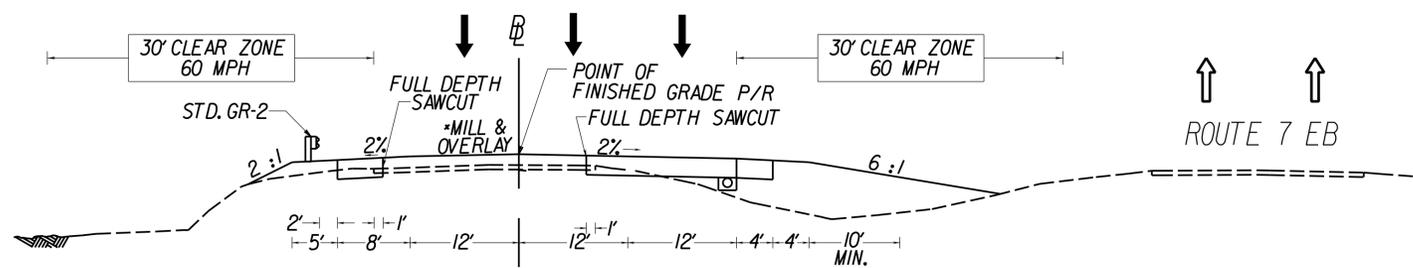
SUPERELEVATION SECTION  
ROUTE 7 WB



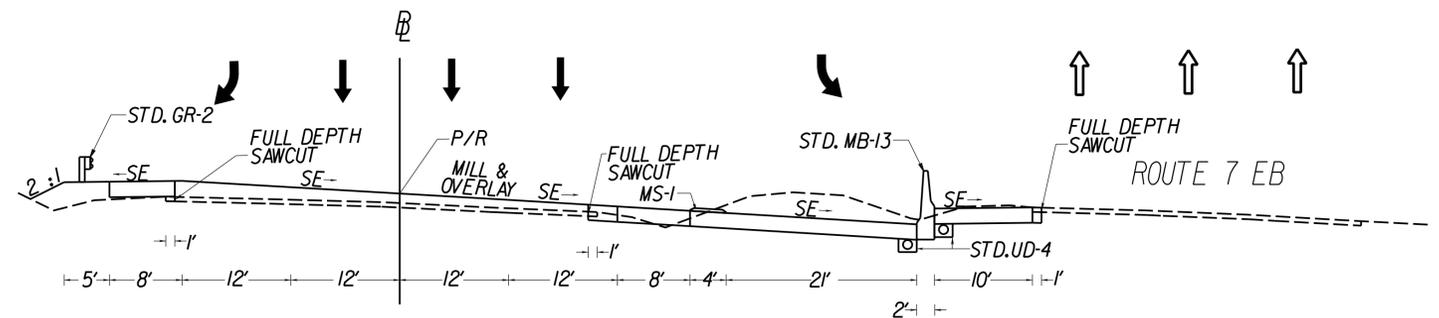
LEFT TURN LANE ONTO ROXBURY HALL ROAD  
ROUTE 7 WB



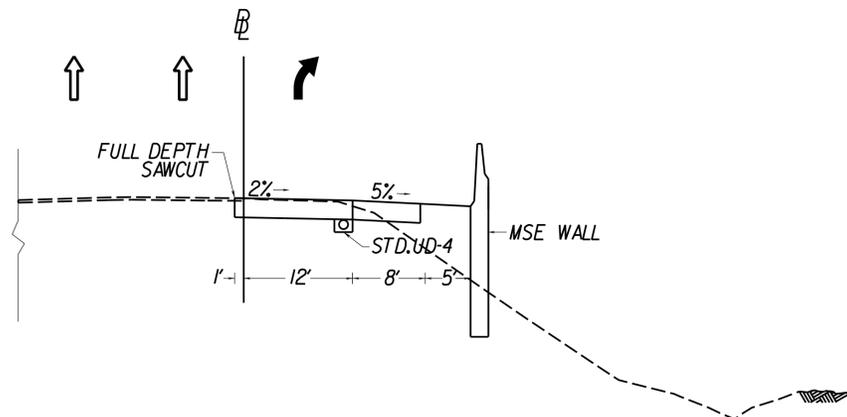
NORMAL CROWN SECTION  
ROUTE 7 WB



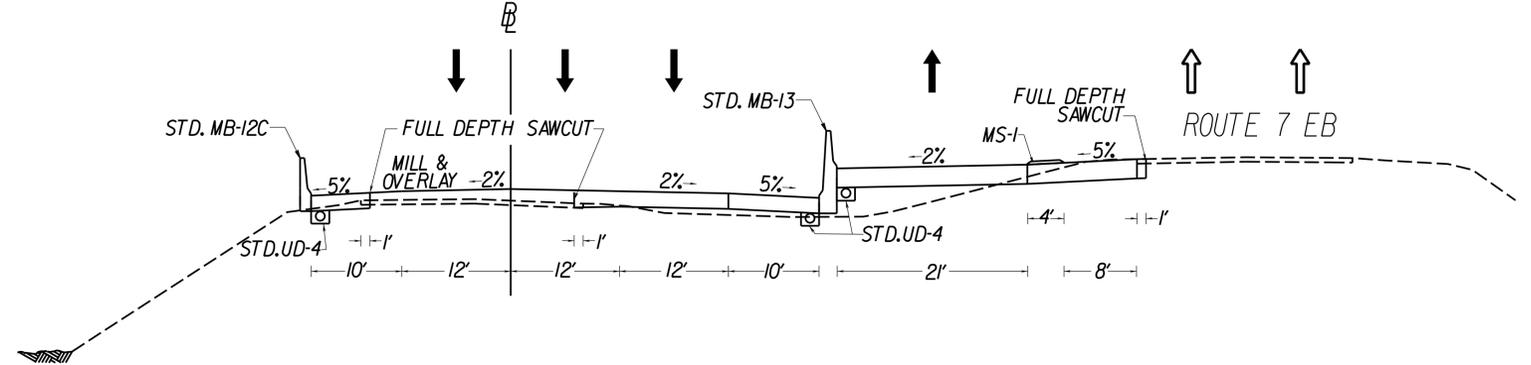
LEFT TURN LANE AT WHITE GATE ROAD  
ROUTE 7 WB



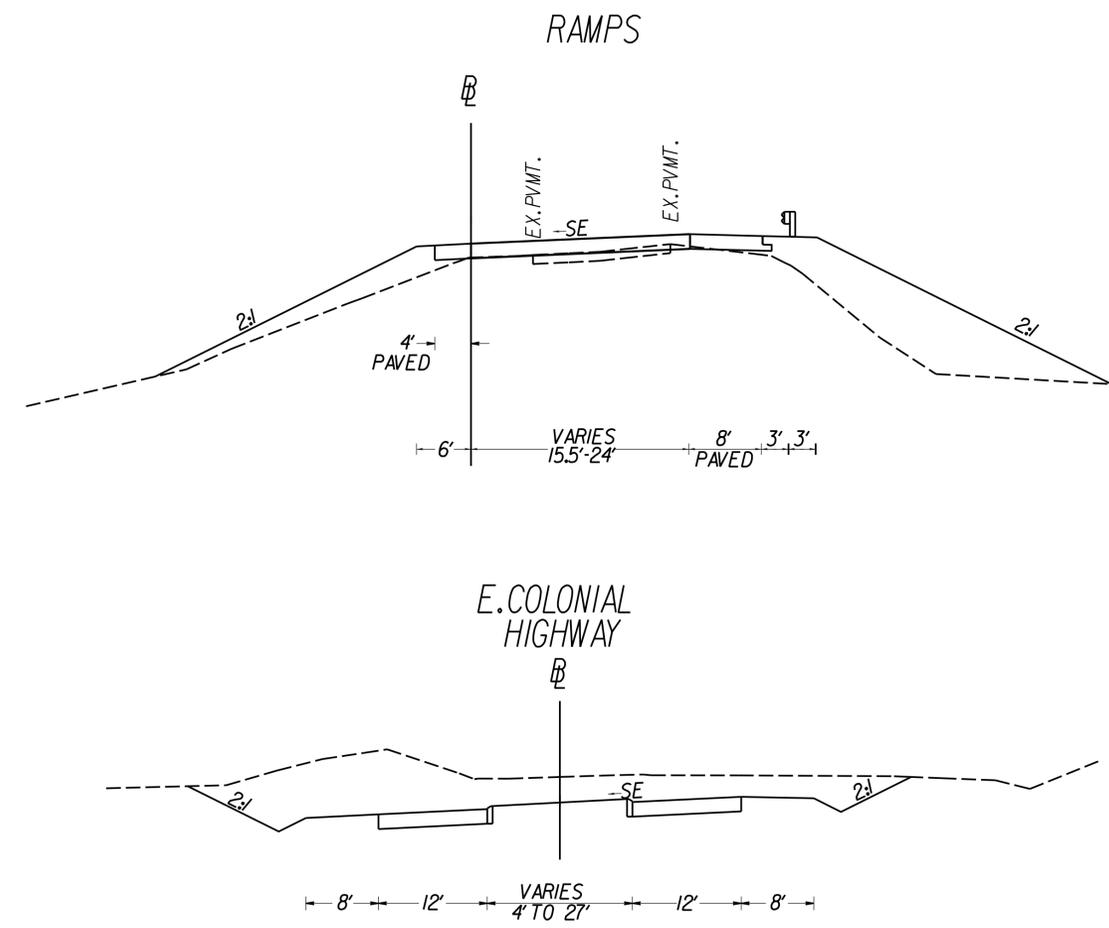
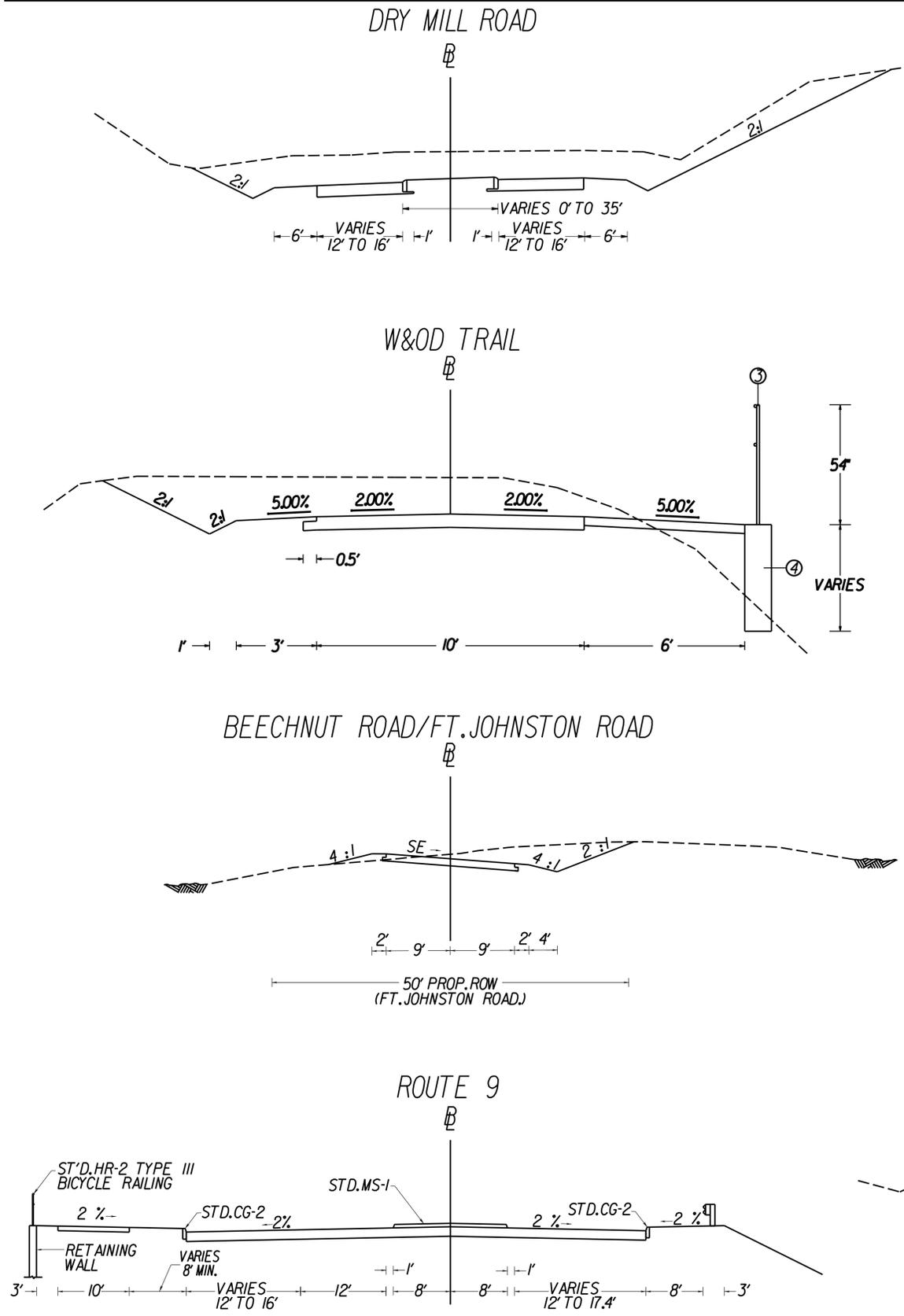
DECELERATION LANE TO ROXBURY HALL ROAD  
ROUTE 7 EB



ACCELERATION LANE OUT OF FORT JOHNSTON ROAD  
ROUTE 7 WB



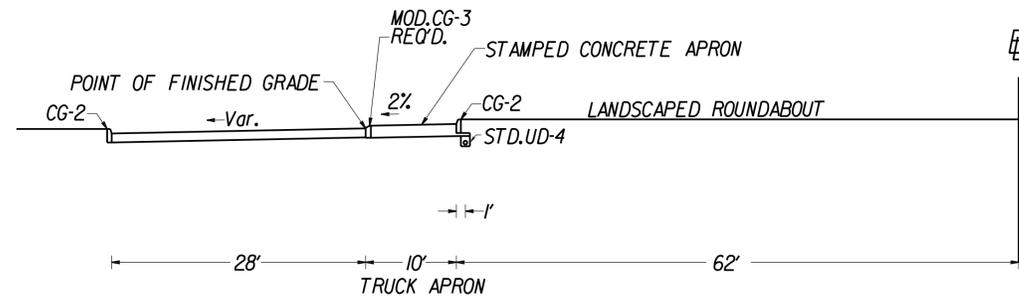
# TYPICAL SECTIONS



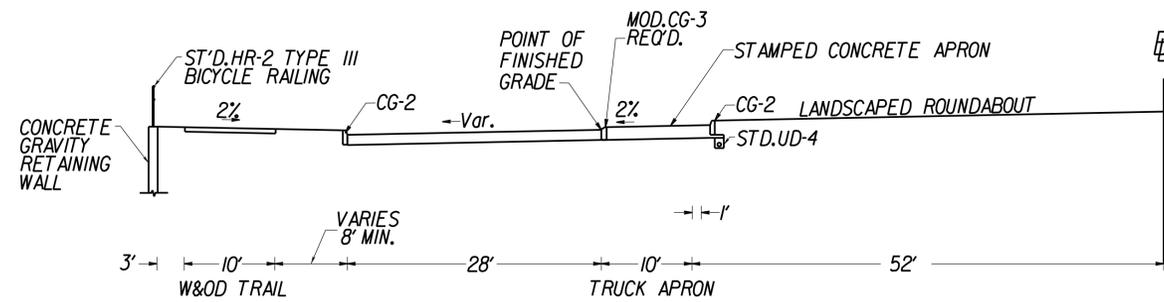
| E. COLONIAL HIGHWAY<br>RURAL MAJOR COLLECTOR        |                                |
|---|--------------------------------|
| DESIGN SPEED (MPH)                                  | 40                             |
| POSTED SPEED (MPH)                                  | 35                             |
| GEOMETRIC DESIGN STANDARD                           | GS-3 (VDOT ROAD DESIGN MANUAL) |
| DRY MILL ROAD<br>RURAL LOCAL ROAD                   |                                |
| DESIGN SPEED (MPH)                                  | 40                             |
| POSTED SPEED (MPH)                                  | 35                             |
| GEOMETRIC DESIGN STANDARD                           | GS-4 (VDOT ROAD DESIGN MANUAL) |
| FUNCTIONAL CLASSIFICATION DATA                      |                                |
| RAMP<br>INTERCHANGE RAMP                            |                                |
| DESIGN SPEED (MPH)                                  | 35                             |
| GEOMETRIC DESIGN STANDARD                           | GS-R (VDOT ROAD DESIGN MANUAL) |
| CHARLES TOWN PIKE (ROUTE 9)<br>RURAL MINOR ARTERIAL |                                |
| DESIGN SPEED (MPH)                                  | 45                             |
| POSTED SPEED (MPH)                                  | 40                             |
| GEOMETRIC DESIGN STANDARD                           | GS-2 (VDOT ROAD DESIGN MANUAL) |
| ADT (2011)  | 20,000                         |
| ADT (2036)  | 26,000                         |
| T% SINGLE UNIT (2036)                               | 1                              |
| T% TRACTOR TRAILER (2036)                           | 3                              |
| WEST MARKET STREET<br>URBAN MINOR ARTERIAL          |                                |
| DESIGN SPEED (MPH)                                  | 30                             |
| POSTED SPEED (MPH)                                  | 25                             |
| GEOMETRIC DESIGN STANDARD                           | GS-6 (VDOT ROAD DESIGN MANUAL) |
| ADT (2011)  | 54,000                         |
| ADT (2036)  | 69,400                         |
| T% SINGLE UNIT (2036)                               | 1                              |
| T% TRACTOR TRAILER (2036)                           | 1                              |
| FUNCTIONAL CLASSIFICATION DATA                      |                                |
| FORT JOHNSTON ROAD<br>RURAL LOCAL ROAD              |                                |
| DESIGN SPEED (MPH)                                  | 30                             |
| POSTED SPEED (MPH)                                  | 25                             |
| GEOMETRIC DESIGN STANDARD                           | GS-4 (VDOT ROAD DESIGN MANUAL) |
| ADT (2011)  | 65                             |
| ADT (2036)  | 75                             |
| T% SINGLE UNIT (2036)                               | 5                              |
| T% TRACTOR TRAILER (2036)                           | 0                              |
| FUNCTIONAL CLASSIFICATION DATA                      |                                |
| BEECHNUT ROAD<br>RURAL LOCAL ROAD                   |                                |
| DESIGN SPEED (MPH)                                  | 30                             |
| POSTED SPEED (MPH)                                  | 25                             |
| GEOMETRIC DESIGN STANDARD                           | GS-4 (VDOT ROAD DESIGN MANUAL) |
| ADT (2011)  | 50                             |
| ADT (2036)  | 60                             |
| T% SINGLE UNIT (2036)                               | 5                              |
| T% TRACTOR TRAILER (2036)                           | 0                              |

## TYPICAL SECTIONS

SOUTH ROUNDABOUT



NORTH ROUNDABOUT

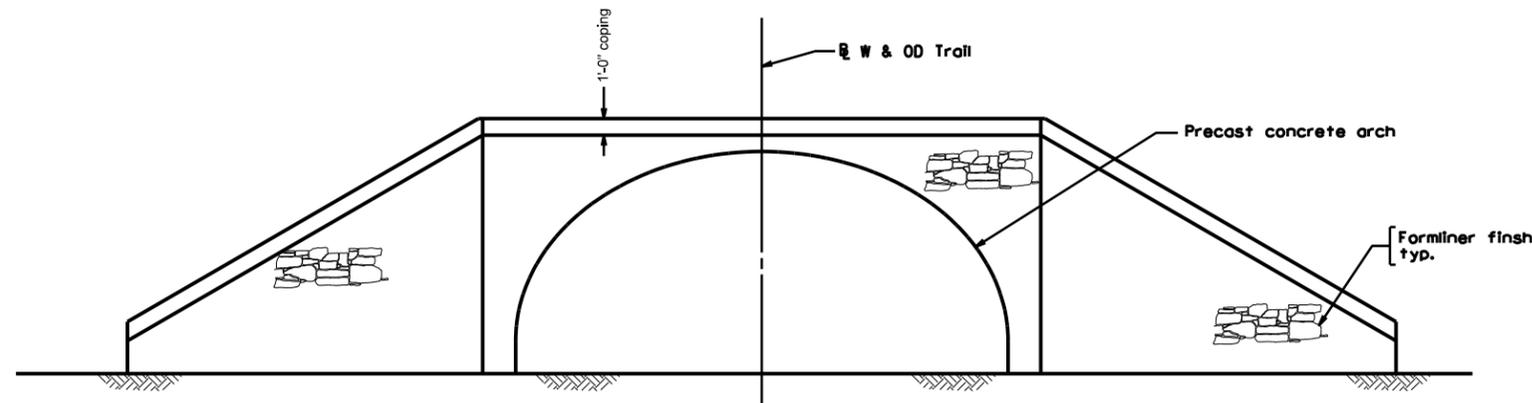


## TYPICAL ROUNDABOUT LANDSCAPE

PLANT & HARDSCAPE SCHEDULE

| TREES/SHRUBS | BOTANICAL NAME    | CONT. | CAL.     | GROUNDCOVERS/BEDS | BOTANICAL NAME          | CONT.         | SPACING |
|--------------|-------------------|-------|----------|-------------------|-------------------------|---------------|---------|
| ○            | SHRUB 1           | 3 GAL |          | □                 | LOW MOW TURF GRASS      | SEED          |         |
| ○            | SHRUB 2           | 3 GAL |          | □                 | ORNAMENTAL GRASS MEADOW | 2.25"x5" PLUG | 18"     |
| ○            | SHRUB 3           | 3 GAL |          | □                 | PERENNIAL BED 1         | 2.25"x5" PLUG | 18"     |
| ○            | SHRUB 4           | 3 GAL |          | □                 | PERENNIAL BED 2         | 2.25"x5" PLUG | 18"     |
| ○            | LARGE SHADE TREE  | B & B | 4" CAL   | □                 | PERENNIAL BED 3         | 2.25"x5" PLUG | 18"     |
| ○            | ORNAMENTAL TREE 1 | B & B | 1.5" CAL | □                 | PERENNIAL BED 4         | 2.25"x5" PLUG | 18"     |
| ○            | SHADE TREE 1      | B & B | 2" CAL   | □                 | PERENNIAL BED 5         | 2.25"x5" PLUG | 18"     |
| ○            | SHADE TREE 2      | B & B | 2" CAL   | □                 | MATERIAL                |               |         |
|              |                   |       |          | □                 | STAMPED CONCRETE        |               |         |

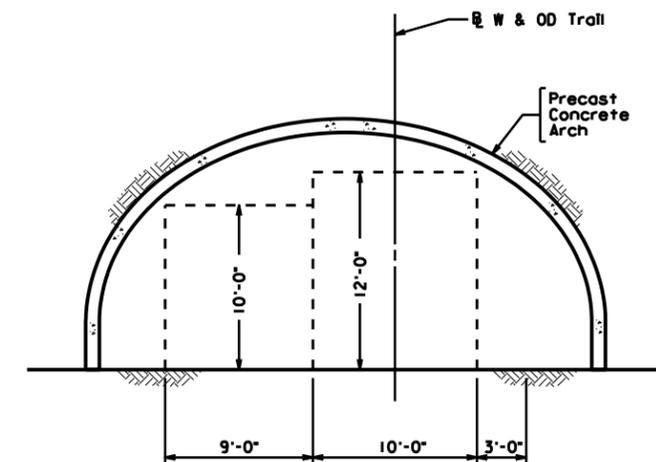




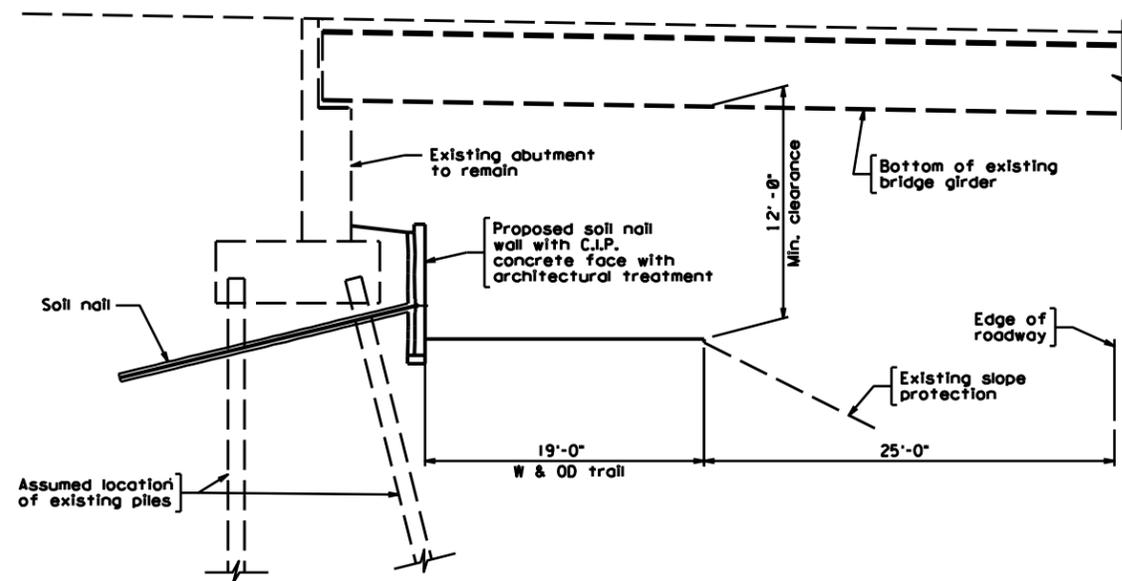
**TRAIL UNDERPASS ELEVATION**  
 Scale:  $\frac{3}{8}'' = 1'-0''$



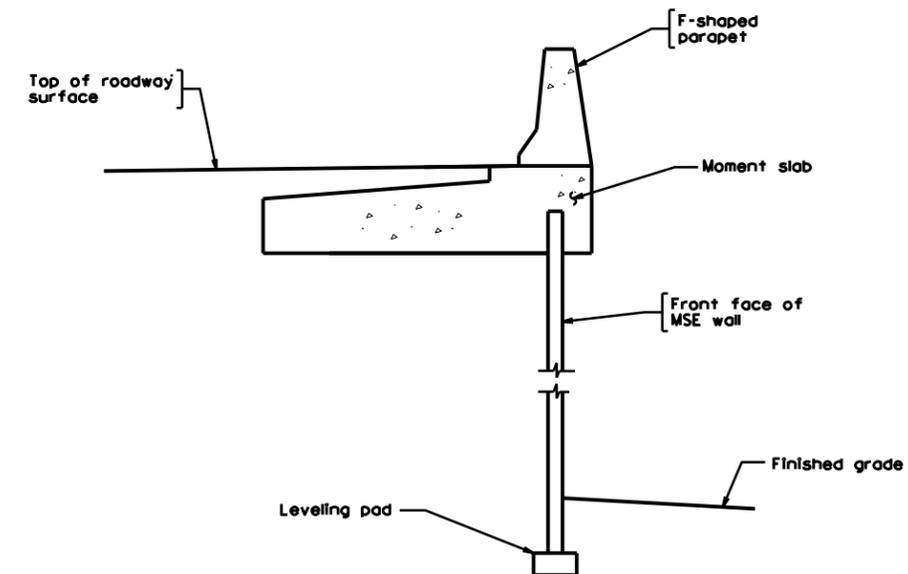
**ARCHITECTURAL TREATMENT**



**TYPICAL SECTION W & OD TRAIL UNDERPASS**  
 Scale: N.T.S.  
 Revised 7/23/2013



**TYPICAL SECTION AT SOIL NAIL WALL**  
 Scale:  $\frac{3}{8}'' = 1'-0''$   
 Revised 7/23/2013



**TYPICAL MSE WALL SECTION**  
 Scale:  $\frac{1}{4}'' = 1'-0''$

