



**STATEMENT OF FINDINGS**  
**FOR**  
**EXECUTIVE ORDER 11988 (“FLOODPLAIN MANAGEMENT”)**  
Natchez Trace Parkway Multi-Use Trail Construction  
Highland Colony Parkway to within 2,000 feet of Livingston Road  
PROJECT NATR 3P16, PMIS 055898  
Natchez Trace Parkway  
Madison County, Mississippi

Recommended: \_\_\_\_\_  
Superintendent, Natchez Trace Parkway Date

Concurred: \_\_\_\_\_  
Chief, Water Resources Division Date

Approved: \_\_\_\_\_  
Director, Southeast Region Date

Executive Order 11988 (“Floodplain Management”) requires the National Park Service (NPS) and other agencies to evaluate the likely impacts of actions in floodplains. It is NPS policy to preserve floodplain values and minimize potentially hazardous conditions associated with flooding. If a proposed action is in an applicable regulatory floodplain, then flood conditions and associated hazards must be quantified, and a formal Statement of Findings (SOF) must be prepared. The NPS *Procedural Manual #77-2, Floodplain Management* provides direction for the preparation of a floodplain SOF. This SOF has been prepared to comply with EO 11988 and with Procedural Manual #77-2.

## **PROPOSED ACTION**

The National Park Service, in cooperation with the Federal Highway Administration (FHWA) is proposing to construct approximately 2.97 miles of multi-use trail from Highland Colony Parkway to within 2,000 feet of Livingston Road.

The NPS proposes to construct the 2.97 mile-long trail section along the north side of the Natchez Trace Parkway (NATR) motor road. The multi-use trail will follow the alignment identified in the September 1995 *Multi-Use Trail Study Environmental Assessment, Jackson, Mississippi, Natchez Trace Parkway*, subject to changes identified during design, and approved by the NPS. In a 1996 Finding of No Significant Impact (FONSI) the NPS approved the preferred alternative for building an approximately 21 mile-long multi-use trail.

The Federal Emergency Management Agency (FEMA) released preliminary digital flood insurance rate maps (DFIRMs) on September 30, 2008. This section of multi-use trail will cross the FEMA 100-year floodplains of Hanging Moss Creek Tributary #4, White Oak Creek, White Oak Creek Tributary #1, White Oak Creek Tributary #2, and White Oak Creek Tributary #3. The part of the trail route that crosses those floodplains is shown on Plan and Profile sheets D1 through D4, included as attachments at the end of this report.

The multi-use trail profile will closely match the existing ground elevations. The typical section of the multi-use trail will have a 10-foot wide paved travel surface with 2-foot wide unpaved shoulders. The trail will be constructed on compacted fill, including an aggregate base to existing ground or 24 inch depth minimum, and a cement-treated sub-base approximately 6 inches deep, topped with a layer of Super Pave asphalt concrete pavement approximately 3 inches deep. Drawings of a typical section of the multi-use trail are included as the last two of the six attachments in this document.

A 12-foot span, 5-foot rise concrete box culvert will be installed to cross Hanging Moss Creek Tributary #4. White Oak Creek and White Oak Creek Tributary #1 will be crossed on bridges next to North Agency Lane. Bridge construction there will require placement of approximately 2,000 square feet of fill within the floodplain. The maximum height of the fill will be approximately 6 feet.

A 6-foot span, 5-foot rise concrete box culvert will be installed to cross White Oak Creek Tributary #2. A 12-foot span, 5-foot rise concrete box culvert will be installed to cross White Oak Creek Tributary #3.

## **Floodplains**

FEMA, as part of the Flood Map Modernization Initiative for Mississippi, is currently reviewing and updating the floodplain maps within the project area. Eastern Federal Lands Highway Division has consulted with FEMA to identify and define the characteristics of the floodplains impacted by this segment of multi-use trail, and has provided that information for discussion in this SOF.

All of the 100-year floodplains of the creeks and tributaries crossed by the trail extend north to south across the width of NATR property. The Hanging Moss Creek Tributary #4 stream channel is typically 16 feet wide. The 100-year flood width along Tributary #4 is approximately 365 feet wide. The elevation of the Tributary #4 100-year floodplain just upstream of the trail is approximately 376 feet. All elevations in this document are ground elevations surveyed in the North American Vertical Datum 1988 (NAVD88).

The 100-year floodplains of White Oak Creek Tributary #1 and White Oak Creek are mapped as a single floodplain by FEMA. The 100-year flood width along this single floodplain is approximately 700 feet.

The 100-year flood width along White Oak Creek Tributary #2 is approximately 340 feet. The 100-year floodplain elevation just upstream of the proposed trail is approximately 354 feet.

The 100-year flood width along White Oak Creek Tributary #3 is approximately 187 feet. The elevation of the floodplain of White Oak Creek Tributary #3 is approximately 352 feet.

Vegetation in the floodplains is a combination of trees, shrubs, and an herbaceous layer. Trees are predominantly sweet gum, black cherry, loblolly pine, water oak, and sassafras. Shrubs include Chinese privet and blackberry. The herbaceous layer is dominated by field garlic, strawberry, goldenrod, poison ivy, and Japanese honeysuckle. On the NATR roadway fill where the roadway crosses the floodplains the vegetation is perennial grasses, flowers, and other species associated with landscaping.

## **Justification for Use of the Floodplains**

The 1987 *Comprehensive Trail Plan, Natchez Trace National Scenic Trail / Alabama-Mississippi-Tennessee* identified Jackson, Mississippi as one of three high use areas in which the NPS will build multi-use trails on NATR lands, but off of the NATR motor road. By the 1990s it had become apparent that the NATR motor road through the Jackson, Mississippi metropolitan area would be heavily traveled and would present serious safety concerns for bicyclists traveling on the NATR motor road.

To address that concern, a 1995 environmental assessment (EA) identified a multi-use trail route through those communities on NATR lands paralleling the motor road. The route included a segment of the trail north of the motor road between Livingston Road and Highland Colony Parkway.

In 1999 a Congressional Directive to the NPS directed NATR to construct a multi-use trail in conjunction with the construction of the NATR motor road. A Congressionally mandated feasibility study prepared in 2002 by EFLHD/FHWA in conjunction with the NPS, identified the Jackson, Mississippi metropolitan area as one of three NATR areas where the multi-use trail should be built, based on average daily traffic.

Any trail route along NATR between Livingston Road and Highland Colony Parkway must cross the floodplains of a tributary of Hanging Moss Creek, the White Oak Creek floodplain and nearby drainages, and the floodplains of two tributaries of White Oak Creek, because they span the entire width of the NATR property boundary.

### **Investigation of Alternative Sites**

Investigation of the project area has led to the determination that there are no alternative sites for a multi-use trail along NATR that could avoid crossing the floodplains of Hanging Moss Creek Tributary #4 and White Oak Creek and its tributaries. The trail cannot be constructed entirely upon the existing NATR roadway shoulder to cross the streams and the tributaries, because the roadway shoulders are only six feet wide. That would not provide enough room for trail users or enough separation between trail users and vehicles for safety. Building the trail that close to the NATR motor road would require a 54-inch high barrier between the trail and the roadway, and would not provide a pleasant or aesthetically pleasing experience for motorists or trail users.

In the 1995 EA an alternative of providing four-foot-wide paved lanes on the road shoulders on each side of the NATR motor road was considered but rejected. The alternative for paved shoulders was rejected for a number of reasons, primarily for safety.

Locating the trail on NATR property on either the north or the south side of the roadway would require crossing the floodplains, because they flow across the entire width of the NATR property boundary.

Alternative floodplain crossing locations were investigated by the multi-use trail designers, and it was determined that to meet design requirements, the most suitable trail route is that depicted on Plan and Profile Sheets D1 through D4 (included as attachments with this SOF). To meet the requirements of the Natchez Trace Comprehensive Trail Plan (1987), to make scenic qualities and nearness to cultural, natural, or recreation features a design consideration for the trail route, the trail is distanced from the NATR motor road as much as is feasible. The topography along the trail route is relatively level, to provide a grade of 5% or less, as required by the Americans With Disabilities Act. As much as is feasible, the trail as designed crosses the floodplains at their narrowest points.

### **Hydrologic Risk**

The 100-year floodplains will be impacted during and after construction by placement of fill associated with grading and drainage work, and through a minimal increase in surface run-off from the bridges and paved trail. Compacted fill material will be placed at depths of 2 feet to 6 feet on approximately 59,500 square feet (1.4 acre) of floodplain in this

segment of multi-use trail. A 10-foot-wide paved trail with 2-foot-wide unpaved shoulders will traverse approximately 1,080 linear feet of floodplains. The unvegetated surfaces of the bridges and the paved trail will not retain precipitation as well as the vegetated or unpaved areas they will cover. Bridges, combined with the paved trail, will add approximately 3.5 acres of impervious surface within approximately 140 acres of NATR property between Livingston Road and Highland Colony Parkway. Drainage patterns will be maintained and conveyed through the trail embankment.

Conditions associated with flooding in the proposed project location are not considered hazardous. Review of the U.S. Geological Survey 7.5 minute topographic map, *Ridgeland Quadrangle, Mississippi*, indicated that the elevation levels decrease by approximately 10 feet over a distance of one half a mile along the tributaries and along White Oak Creek in the vicinity of the project. The nature of flooding in this area is low velocity sheet flooding, which allows for adequate evacuation time and easy access to evacuation routes and areas outside of the 100-year floodplain.

EFLHD/FHWA provided information about flows and flood characteristics of the stream and tributaries. Hanging Moss Creek Tributary # 4 is shown on the FEMA Flood Insurance Rate Map (FIRM) as Zone A in the current 1994 and in the 2008 preliminary maps. A Zone A floodplain does not have a hydraulic model prepared by FEMA. The proposed crossing was analyzed using FHWA Culvert Hydraulic Analysis Program-8 (HY-8) software, version 7.1 (v 7.1). The modeling reference point on the stream was at the double 11.5-foot x 6-foot box culverts under the NATR motor road, approximately 160 feet downstream of the proposed multi-use trail crossing. Those culverts will be the controlling factor for flows in the vicinity of the proposed multi-use trail. The 100-year floodplain has a flow depth of approximately 1 foot and the stream channel has a flow depth of approximately 4 to 5 feet. The stream channel width is approximately 16 feet. Because a FEMA hydraulic model was not available for Tributary #4, the stream flow velocity and the 100-year floodplain flow velocity were not computed.

White Oak Creek Tributary # 2 is depicted on the 2008 preliminary FEMA FIRM as Zone AE. However, after further consultation with FEMA, FEMA determined that White Oak Tributary #2 should be designated as Zone A. It should be depicted as Zone A in the final FEMA FIRM. A Zone A floodplain does not have a hydraulic model prepared by FEMA, so the proposed crossing was analyzed using FHWA HY-8 (v 7.1) culvert analysis software. The modeling reference point on the stream was at a double 65-inch x 40-inch double pipe arch under the NATR motor road, approximately 105 feet downstream from the proposed multi-use trail crossing. The floodplain flow depth is approximately 3.75 feet at the deepest point. The stream flow depth is approximately 7.3 feet. The stream channel width is approximately 7 feet. Because a FEMA hydraulic model was not available for Tributary #2, the stream flow velocity and the 100-year floodplain flow velocity were not computed.

White Oak Creek Tributary # 3 is shown on the 2008 preliminary FEMA FIRM as Zone AE. A hydraulic model was obtained from FEMA and the proposed crossing was analyzed using U.S. Corps of Engineers Hydrologic Engineering Center River Analysis System (HECRAS) software, version 3.1. The modeling reference point on the stream was at a double 9-foot x 5-foot double box culvert under the NATR motor road, approximately 110 feet downstream from the proposed multi-use trail crossing. Just

upstream of the proposed trail the floodplain width is approximately 187 feet. The floodplain flow depth is approximately 0.2 foot, and the channel flow depth is 3.6 feet. The stream channel width is approximately 37 feet, with a stream flow velocity of approximately 3.6 feet per second and a 100-year floodplain flow velocity of 0.5 foot per second.

The hydrologic models indicated that there will be some negligible localized changes in the ability of the floodplains to convey and store floodwaters, but the trail and the box culverts spanning the streams and tributaries will not contribute to flooding.

The bridges across White Oak Creek and its Tributary #1 will be alongside and parallel to the North Agency Lane. They will be built and installed as much as is feasible on the existing fill that was placed during roadway construction. Measures will be taken to minimize harm to life, property, and natural values.

Staff from EFLHD/FHWA advise that temporary disturbance from construction activities will impact an area approximately 10 percent greater than the area of permanent impact. In the Hanging Moss Creek Tributary #4 100-year floodplain the area of temporary impact will be approximately 6,500 square feet. The area of temporary disturbance in the 100-year floodplain of White Oak Creek Tributary #1, White Oak Creek, and the two nearby drainages will be approximately 3,800 square feet. In the White Oak Creek Tributary #2 100-year floodplain the area of temporary impact will be approximately 3,000 square feet. In the White Oak Creek Tributary #3 100-year floodplain the area of temporary impact will be approximately 3,500 square feet. Best management practices will be followed during and after construction, and areas of temporary disturbance will be returned to original condition as much as is practicable after construction.

The impact of the project on 100-year floodplains will be minimal. There will be very little change in the ability of a floodplain to convey floodwaters, or its values and functions. The NATR motor road is near the multi-use trail route and is situated at least 1 foot above 100-year floodplain elevations. At Hanging Moss Creek Tributary #4 the NATR motor road is approximately 9 feet above the 100-year floodplain. At White Oak Creek Tributary #2 the NATR motor road is approximately 1 foot above the 100-year floodplain. Because it is at least 1 foot above the 100-year floodplain, the NATR motor road would provide an evacuation route during a flood event.

## **MITIGATIVE ACTIONS**

Mitigation will be provided by incorporating methods for protecting life and minimizing damage through appropriate procedures. Mitigation during and after construction will include sustainable design principles, appropriate elevations for the finished trail and box culverts, and Best Management Practices such as those presented in FHWA publications such as the *Work Zone Best Practices Guidebook*, and *Best Management Practices for Erosion and Sediment Control*.

The multi-use trail will be designed to minimize the adverse environmental impacts on natural floodplain values and to minimize potential risk to lives and property. The

floodplain environment will be maintained as close to its natural state as is possible using all practicable means.

The box culverts and the trail will be designed to minimize scouring, deposition, or other damage to floodplains. Placement of fill on floodplains will be minimized. Free natural drainage and natural contours will be preserved to the extent practicable during design and construction.

Topsoil will be protected during construction and reused, except where it is heavily contaminated with exotic/invasive species. Topsoil contaminated with such species will be disposed of outside NATR boundaries, to preclude spreading further in disturbed areas of the project. The project area will be revegetated when construction is complete. Grading activities will be minimized and compaction in revegetated areas will be kept to a minimum. Construction activities will be curtailed beyond the project limits to ensure that soil is not unduly compacted in floodplain areas.

These mitigation measures will be in accordance with the NPS floodplain guidelines and with Executive Order 11988 (“Floodplain Management”). The facilities in the proposed project will be designed to be consistent with the intent of the standards and criteria of the National Flood Insurance Program (44 CFR Part 60), to protect life and property from the effects of flooding.

## **COMPLIANCE**

Box culverts for the NATR multi-use trail will be constructed and installed on or adjacent to the 100-year floodplains of Hanging Moss Creek Tributary #4, White Oak Creek, and two of its tributaries. The 100-year floodplains, the creeks, and the tributaries will be impacted through fill operations associated with grading and drainage work required for construction. There will be some minimal, negligible localized changes in the ability of the floodplain to convey and store floodwaters, but the trail, the bridge, and the box culverts spanning the creeks and tributaries will not contribute to flooding.

Section 401 of the Clean Water Act is a certification by the state that the project impacts to water quality will not exceed the state’s water quality standards. Section 404 of the Clean Water Act requires a permit for any activity that may result in the discharge of dredged or fill material into navigable waters. Therefore, Section 401 and Section 404, and National Pollution Discharge Elimination System (NPDES) permits will be required for this project.

Section 401, Section 404, and NPDES permits will complete the requirements for federal and state permitting for this section of the multi-use trail. The 1995 environmental assessment and its finding of no significant impact (FONSI), and this SOF for Executive Order 11988 and *Procedural Manual #77-2*, combined with a wetland SOF for Executive Order 11990 (“Protection of Wetlands”) and *Procedural Manual #77-1, Wetland Protection*, will complete the requirements for the National Environmental Policy Act.

## **CONCLUSION**

The protection of people and property is a high priority to NATR. The proposed multi-use trail will be constructed on NATR lands, and Hanging Moss Tributary #4, White Oak Creek, and two of its tributaries flow across the entire width of the NATR property boundary. The National Park Service concludes that there is no other practicable alternative for the development proposed. With the trail and its box culverts designed to prevent or reduce flood damage, the risk to life and property will be minimized.

There will be no significant effect on natural or beneficial floodplain values. Mitigation will include good design through sustainable design principles, appropriate siting, and Best Management Practices during and after construction. The National Park Service finds the proposal to be consistent with Executive Order 11988.



## REFERENCES CITED

- 1987 “Comprehensive Trail Plan, Natchez Trace National Scenic Trail, Alabama, Mississippi, Tennessee.” Report developed in conjunction with the NATR GMP. On file at NATR Headquarters.
- 1995 “Multi-use Trail Study, Environmental Assessment, Natchez Trace Parkway, Jackson MS; with 1996 FONSI.” On file at NATR Headquarters.
- 1999 National Park Service – Construction. Natchez Trace Parkway Construction.
- 2002 “Procedural Manual #77-2, National Park Service, Floodplain Management.”
- 2002 “Trail Feasibility Study.” By Eastern Federal Highway Division, Federal Highway Administration, in conjunction with the National Park Service. On file at NATR Headquarters.
- 2007 Memo to Files “Adequacy of National Environmental Policy Act Documentation, Multi-Use Trail, Hinds and Madison Counties, Mississippi.” On file at NATR Headquarters.

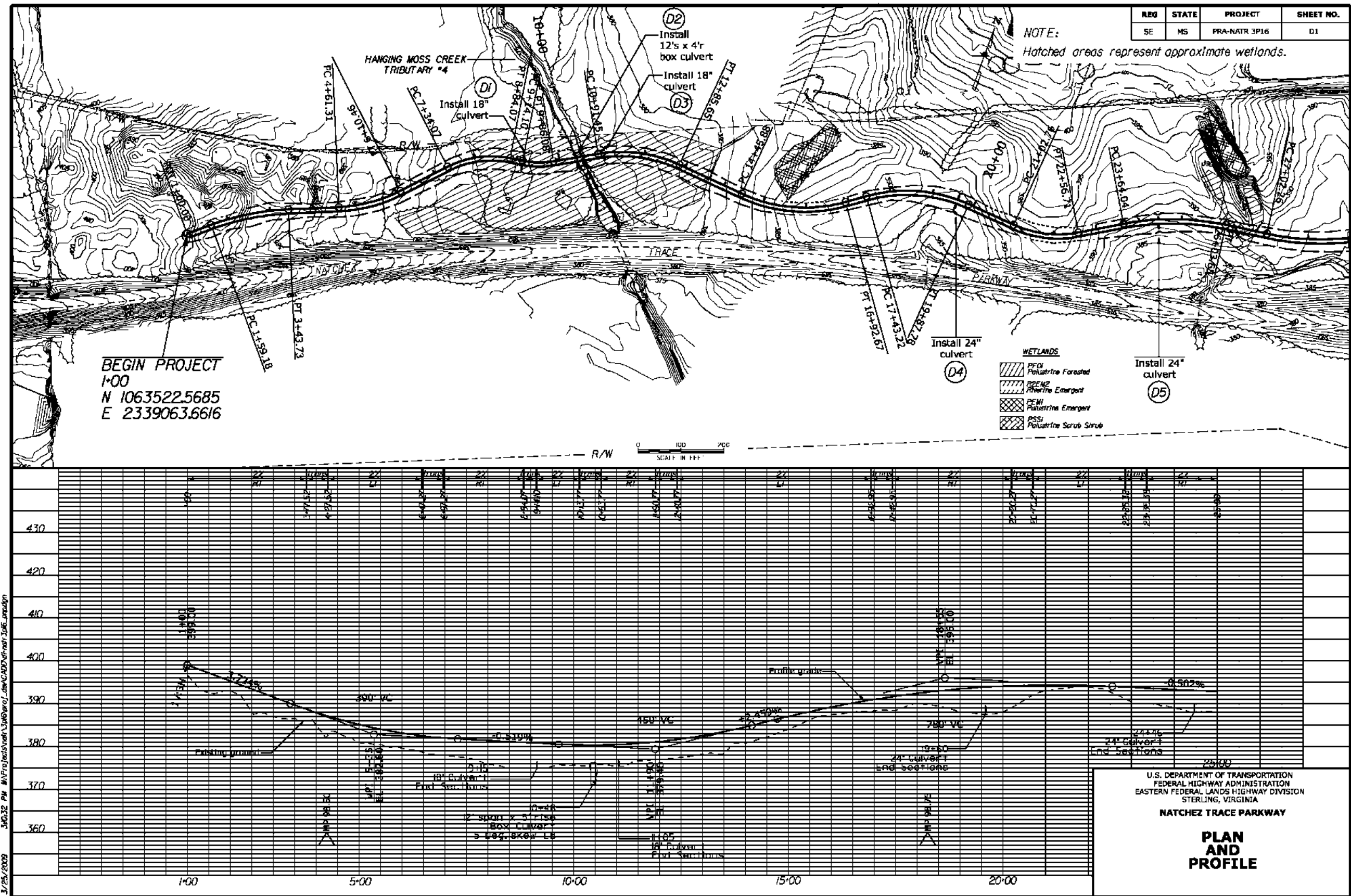
## **ATTACHMENTS**

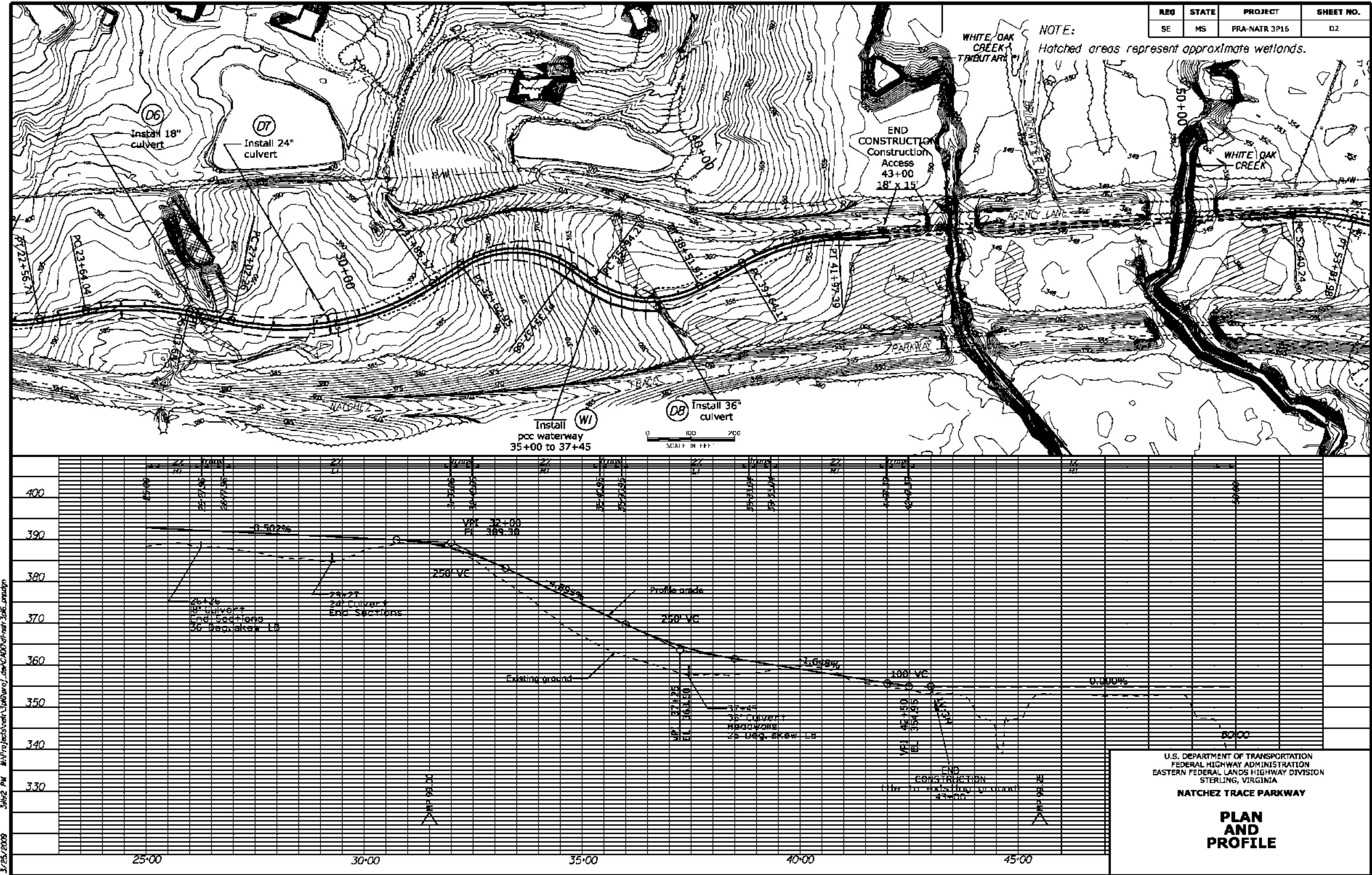
**Plan and Profile Sheets D1 through D4  
Depicting the Trail Route**

**and**

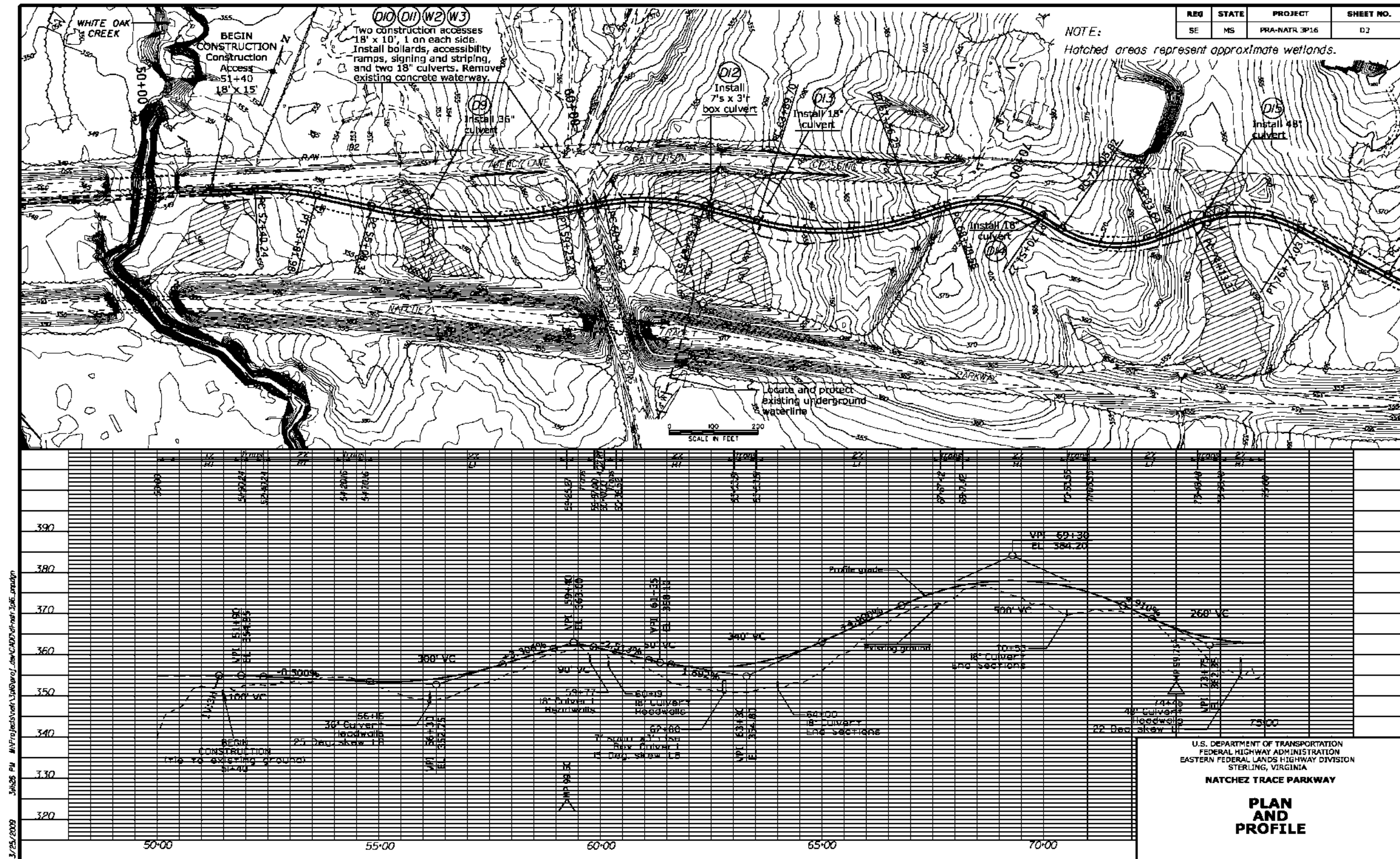
**Typical Section Showing Trail Construction Design**

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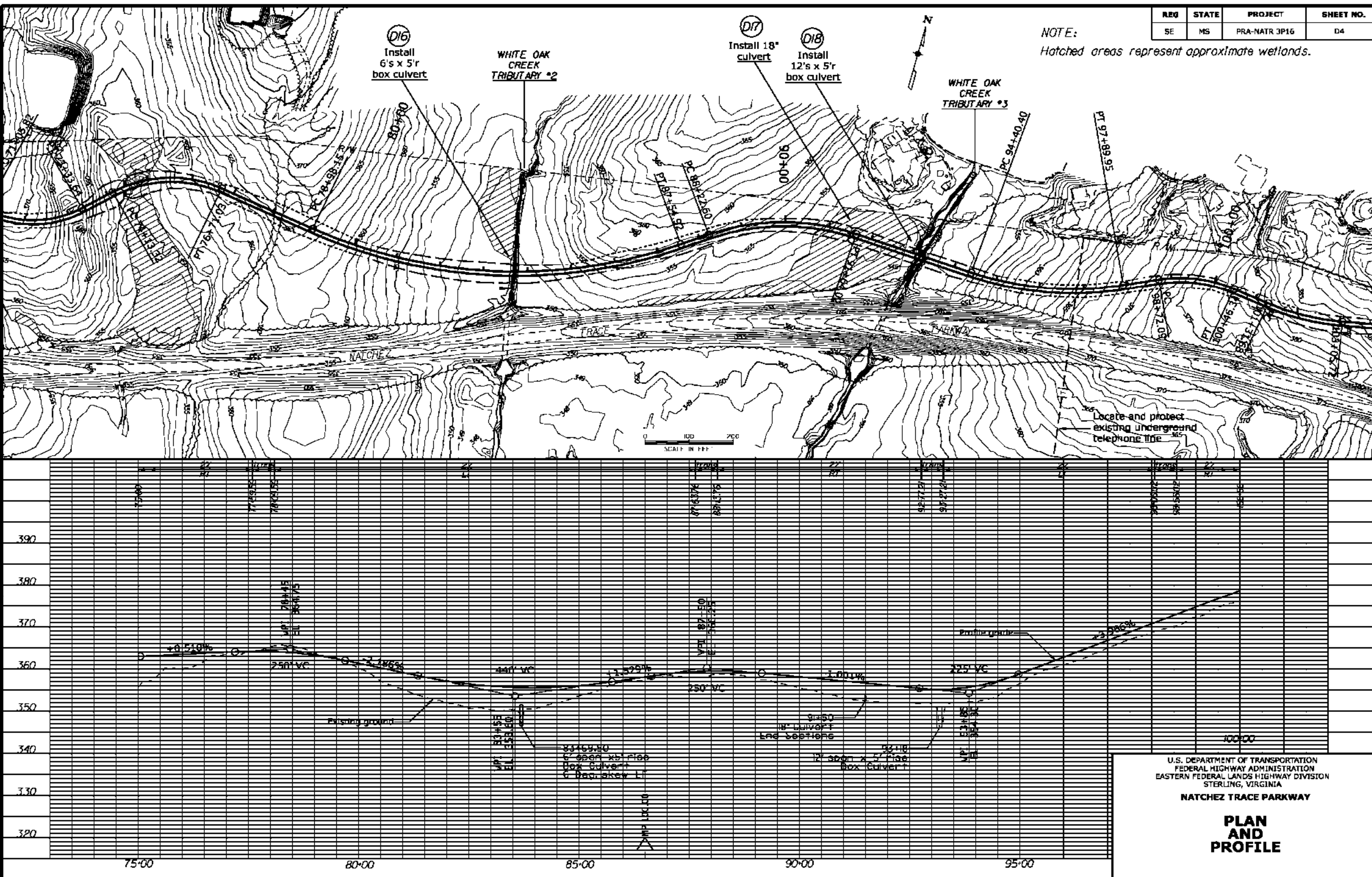




REG	STATE	PROJECT	SHEET NO.
SE	MS	PRA-NATR 3P16	D3



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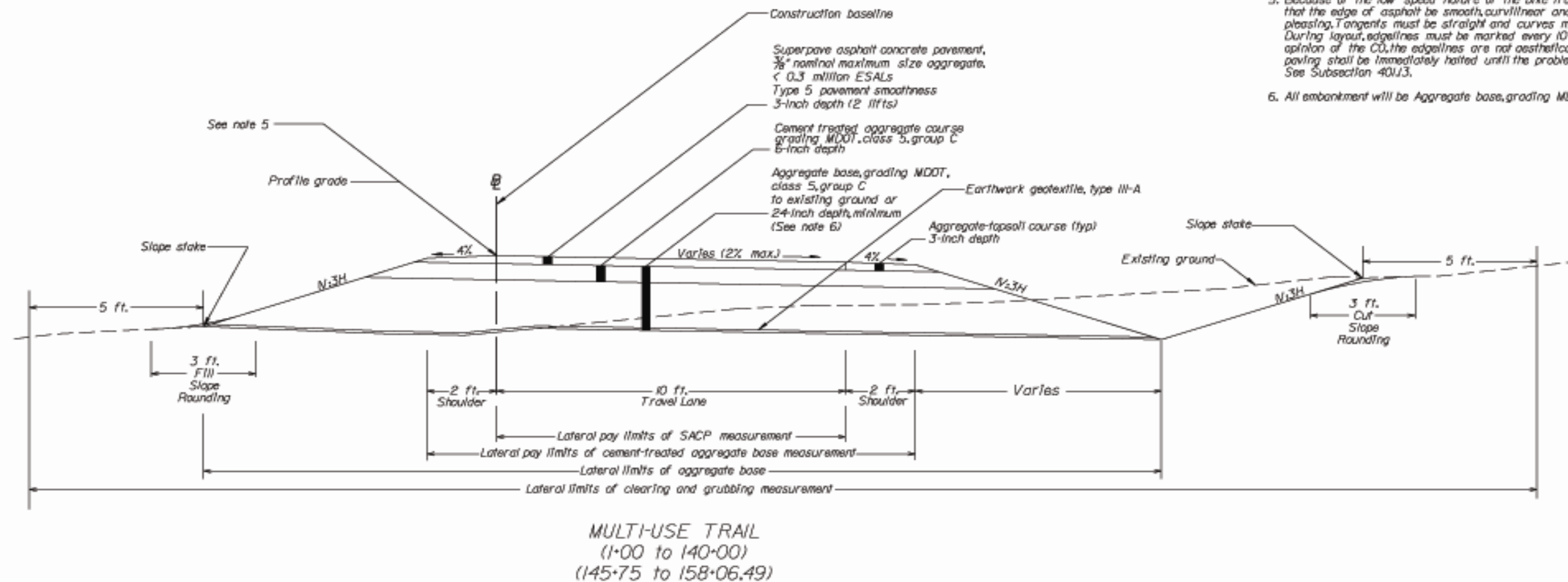




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SE	MS	PRA-NATR 3P16	B1

Notes:

1. Cement-treated base shall consist of 6% by weight of ordinary portland cement.
2. Minimum ditch grades are 0.5%. Adjust ditches to provide for proper drainage as directed by the CO.
3. Provide turf establishment on the shoulders. Provide topsoil 4-inch depth, and turf establishment on all other disturbed areas except the paved multi-use trail.
4. No payment will be made for SACP and cement-treated base outside the lateral limits of measurement for each item.
5. Because of the low speed nature of the bike trail, it is critical that the edge of asphalt be smooth, curvilinear and aesthetically pleasing. Tangents must be straight and curves must be uniform. During layout, edgelines must be marked every 10 feet. If, in the opinion of the CO, the edgelines are not aesthetically pleasing, paving shall be immediately halted until the problem is corrected. See Subsection 40U.3.
6. All embankment will be Aggregate base, grading MDOT, class 5, group C.



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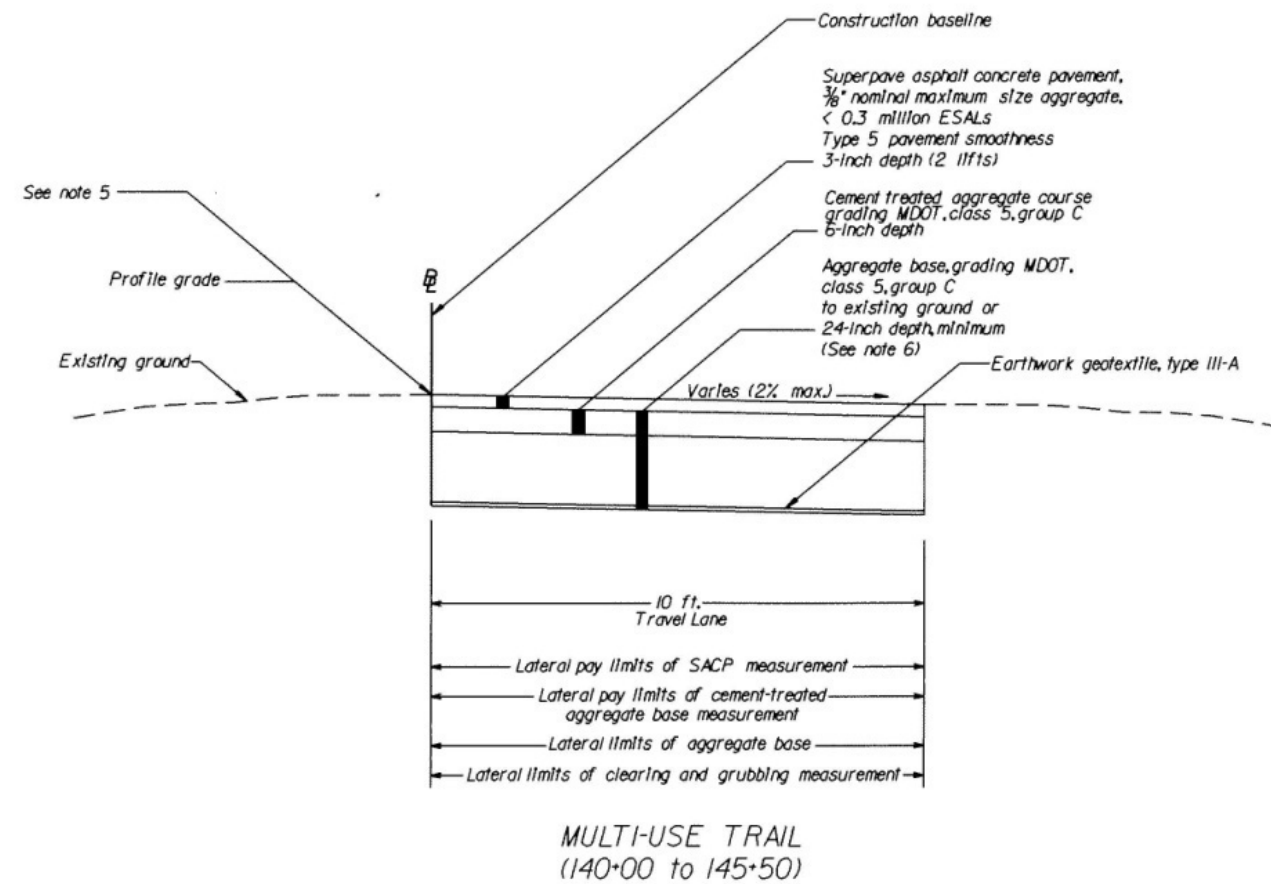
NATCHEZ TRACE PARKWAY

**TYPICAL SECTION**

REG	STATE	PROJECT	SHEET NO.
SE	MS	PRA-NATR 3P16	B2

Notes:

1. Cement-treated base shall consist of 6% by weight of ordinary portland cement.
2. Minimum ditch grades are 0.5%. Adjust ditches to provide for proper drainage as directed by the CO.
3. Provide turf establishment on the shoulders. Provide topsoil 4-inch depth, and turf establishment on all other disturbed areas except the paved multi-use trail.
4. No payment will be made for SACP and cement-treated base outside the lateral limits of measurement for each item.
5. Because of the low speed nature of the bike trail, it is critical that the edge of asphalt be smooth, curvilinear and aesthetically pleasing. Tangents must be straight and curves must be uniform. During layout, edgelines must be marked every 10 feet. If, in the opinion of the CO, the edgelines are not aesthetically pleasing, paving shall be immediately halted until the problem is corrected. See Subsection 401J3.
6. All embankment will be Aggregate base, grading MDOT, class 5, group C.



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NATCHEZ TRACE PARKWAY

**TYPICAL SECTION**

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