

DESIGN STUDY REPORT
Final Submission

May 6, 2015



Colonel Ruby Bradley Bridge
State Project U344-33-12.76 00
Federal Project STP-0033(243) D
Spencer, Roane County, West Virginia

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1.0 PROJECT DESCRIPTION & PURPOSE

This project involves the study, preparation, and submission of a Design Study Report for the Colonel Ruby Bradley Bridge which carries US Route 33 over Spring Creek in Roane County and is located approximately 0.02 mile east of US Route 119.

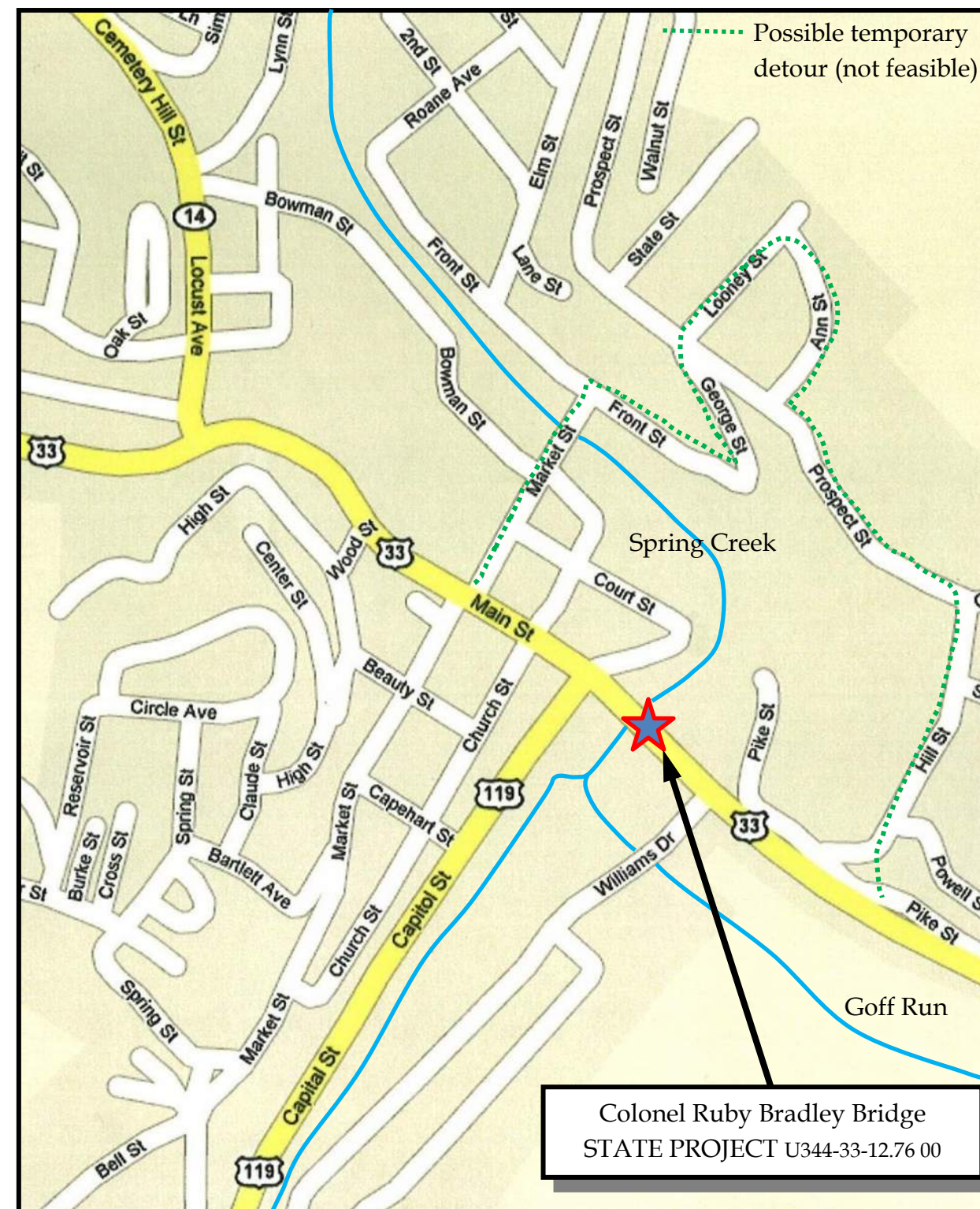
This structure, which is eligible for registration for the National Register of Historic Places, was built in 1932 and was rehabilitated in 1996. Since that time, the bridge has experienced substantial deterioration. A "Condition Assessment Report" is submitted under a separate cover which rates the deck of the structure in poor condition and in need of replacement. Both the original plans and rehabilitation drawings are included in the appendices of that report.

The existing bridge has a 30-foot roadway and was originally designed for two-lanes of traffic, but was converted to three-lanes in the 2000's (see cover photo). Traffic congestion has increased with recent development of large retailers, strip malls, medical facilities, and restaurants. Traffic volumes are estimated to increase to an ADT of 13,800 on US Route 33 by 2033 (Photos 1 & 2, Appendix A), as compared to current ADT of 10,300. Intersections with US Route 119 and Williams Drive introduce the need for turning lanes on the bridge (Photos 3 & 4). The results of a traffic study performed by WVDOT in July 2013 indicate the bridge should accommodate four lanes of traffic and that expansion of the adjacent intersection with US Route 119 is needed (See sketch in Appendix D).

The purpose of this Design Study Report is to compare various alternatives for replacement or widening of the existing bridge. Temporary traffic control during construction is a primary concern, as no reasonable detours appear to be available for vehicular or pedestrian traffic. The goal of the design study is to select an alternative that meets the following criteria:

- Minimizes impact to traffic during construction;
- Economically feasible to construct;
- Accommodates 2033 traffic volumes;
- Maintains hydraulic performance of the stream;
- Minimizes in-stream work;
- Addresses the historical significance;
- Creates a long-term, durable solution; and
- Provides acceptable level of aesthetics and lighting.

LOCATION MAP



2.0 PROJECT REQUIREMENTS

2.1 Existing Conditions

The existing bridge consists of five spans of cast-in-place concrete T-beams supported on three-column piers and wall-type abutments (Photo 5). The bridge carries three lanes of traffic and two sidewalks with an overall deck width of 42 feet and overall length of 227 feet. The profile grade is a constant -4 percent over the bridge transitioning to vertical curves on the approaches. The US Route 33 typical section on the west approach is downtown Main Street of Spencer (Photo 6). Main Street is composed of three lanes with an overall roadway width of 39 feet with sidewalks on each side. The east approach roadway to the bridge expands to four lanes at the intersection with Williams Drive (Photo 7). Traffic signals are present at each intersection.

2.2 Design Criteria

The geometric design follows the guidelines established in the American Association of State Highway and Transportation Officials' (AASHTO) A Policy on Geometric Design of Highways and Streets, 6th Edition, 2011, or when applicable, AASHTO's Geometric Design of Very Low-Volume Local Roads (ADT \leq 400), AASHTO, Washington, D.C., 2001. The design will be in accordance to the Public Rights-of-Way Accessibility Guidelines (PROWAG) 2014. The study of the bridge structure will be based on Load and Resistance Factor Design (LRFD) in accordance with the AASHTO "LRFD Bridge Design Specifications, 2012" and latest interim revisions, and the WVDOT Bridge Design Manual, dated March 1, 2004, with any revisions.

The US Route 33 mainline roadway typical section over the bridge will include two 12' through lanes, two 11' inside lanes, 2' shoulders and two 5'-6" sidewalks. The extension of Williams Drive will assume two 12' lanes, 3' shoulders, and one 5'-6" sidewalk. Detailed typical sections can be found in Appendix E.

Table 1
Design Criteria

Roadway	Classification	Design Speed	Maximum Grade
US Route 33	Urban Collector	35 mph	No Change
Williams Drive	Urban Local Street	25 mph	12%

Design criteria tables are included in Appendix B. No design exceptions are required.

2.3 Geotechnical Overview

A professional engineer visited the bridge site and performed limited research of the readily available information, including evaluating the geologic setting and previous mining for potential problems within the project area.

Core borings have not been obtained, but borings from the existing plans encountered three-layers of underlying bedrock: broken shale, solid red rock, and solid sandstone. Each layer is respectively deeper. Approximately 15 feet of sandy loam overburden was also encountered and is visible along the stream banks (Photo 8). No bedrock outcrops were observed in the vicinity of the existing bridge. Rock outcropping was observed near the Williams Drive Extension but no hands-on observation of the rock was made. No major slope instabilities were observed. The existing bridge is founded on spread footings at elevations ranging from 699 feet to 706 feet, corresponding to broken shale layer. No apparent signs of settlement, rotation, or undermining have been observed in recent inspections. Local scouring around the piers has been noted. Stream channel profiles show up to 5 feet of change in the stream bank elevations from 1977 to 2011. The stream invert has remained the same. The DS-34 scour evaluation summary prepared in 2003, classifies the structure as low risk.

Four core borings were obtained by WVDOT for the replacement of the North Market Street Bridge in November of 2007 (Photo 9). North Market Street Bridge is located approximately 1,000 feet north of Ruby Bradley Bridge. The borings encountered a medium hard, grey-red shale or medium hard, grey sandstone at elevations ranging from 696 feet to 699 feet. The overburden consisted of 17 to 20 feet of redbrown, brown, and grey sandy clay. The geotechnical competence of the rock allowed the full structural capacity of the steel H-piles to be used during the design.

Based on the West Virginal Geologic Economic Survey web page, this project is located in the Appalachian Low Plateau Physiographic Province. The province is characterized by relatively level strata that were deeply eroded after the last stage of mountain building during the Appalachian Orogeny. Based on information from the USGS Mineral Resources Online Spatial Data, the project is in the Dunkard Group. This group consists of non-marine cyclic sequences of sandstone, siltstone, red and gray shale, limestone, and coal. Contains the Greene, Washington and Waynesburg Formations. Extends from the top of the exposed bed rock section to the top of the Waynesburg coal. Includes the Washington coals and limestones. Palynological evidence favors a Pennsylvanian age, at least for the lower portion. Based on our review of the WVDEP Interactive Mapping web page, and the WVGES Interactive Coal Bed Mapping web pages, no evidence of permitted coal mines was found near the project area. Based on our review of the WVDEP Oil and Gas Well Information Mapping web page, no evidence of permitted oil or gas wells was found near the project area.

Based on our overview, we did not observe unusual or significant geotechnical problems that would negatively impact these bridge alternatives as planned, nor do we anticipate unusual mining, geological, or geotechnical hazards within the project area. Generally, cut side slopes are shown at 1½:1 and fill slopes are shown at 2:1 for this submission. It is anticipated that the abutments will be semi-integral or integral for the alternatives which propose a new structure.

2.4 Environmental Overview

The project requires National Environmental Policy Act (NEPA) documentation. B&N will determine the appropriate level of NEPA review, and prepare associated NEPA documentation during the next phase of the project, in cooperation with the West Virginia Division of Highways (WVDOH). Based on information to date, this will include, but may not necessarily be limited to, review and consultation with the:

- **State Historic Preservation Office.** The existing bridge is eligible for registration for the National Register of Historic Places. In depth coordination with the West Virginia Division of Culture and History is anticipated, including additional field studies. Mitigative measures to avoid, minimize, or compensate for potential adverse impacts to the bridge or other affected historic properties may be required.
- **U.S. Fish & Wildlife Service and West Virginia Division of Natural Resources** regarding potential effects to rare, threatened, or endangered species. Impacts to Spring Creek are expected to be limited to temporary access and cofferdams. A mussel survey in accordance with 2014 *West Virginia Mussel Survey Protocols* is anticipated, based on upstream drainage area at the project site (> 10 mi²). The Williams Drive Extension site (Alternative 3) will include the removal of some trees. Proposed tree clear areas will be screened for potential summer habitat characteristics for Indiana bat (endangered), and northern long-eared bat (proposed endangered).
- **WV Department of Environmental Protection** and other state and local environmental regulatory agencies regarding the potential for legacy impacts from petroleum or hazardous substances in the project area, including properties proposed for right-of way (ROW) acquisition. A Phase I Environmental Site Assessment covering the project area and any proposed ROW acquisitions is anticipated. The total impacted area at each site appears to be less than 3 acres which will qualify for a NPDES notice of intent letter, rather than a general stormwater permit.
- **U.S. Army Corps of Engineers** regarding requirements associated with obtaining permits under Section 404 of the Clean Water Act. B&N will prepare required permit application documents, in cooperation with WVDOH. Jurisdictional impacts to Spring Creek are, at this time, expected to be limited to temporary access structures and cofferdams. It is

anticipated that proposed work will be eligible for authorization under one or more Nationwide Permits.

- **Public Entities** will be asked to provide any comments they believe are pertinent to any potential effects to historic or archaeological resources that may assist with the decision-making.
- **Environmental Justice/Title VI Community Review** Roane county is considered a distressed county by the Appalachian Regional Commission (ARC).

3.0 PROPOSED ALTERNATIVES

3.1 No Build Option

Due to the deteriorated condition of the bridge and forecasted traffic volumes, the No Build Alternative would result in eventual failure due to traffic congestion of the existing intersections and roadways. The structure would also continue to deteriorate until complete replacement was unavoidable. The No Build Alternative is not a viable option. Therefore, no further investigation was performed.

3.2 Description of Build Alternatives Considered

Various alternatives were reviewed during the development of this design study. Each alternative was carried forward to the point at which it was no longer feasible. Appendix A includes site photographs. Appendix C includes preliminary cost estimates. Appendix E includes plans, typical sections, and details of the alternatives.

The proposed alternatives include:

- | | |
|-----------------|--|
| Alternative 1A: | Rehabilitate Bridge using Upstream Temporary Detour; |
| Alternative 1B: | Replace Bridge using Phased Construction; |
| Alternative 2A: | Replace Bridge using Downstream Temporary Detour; |
| Alternative 2B: | Replace Bridge using Upstream Temporary Detour; |
| Alternative 3: | Replace Bridge using Williams Drive Detour; and |
| Alternative 4: | Replace Bridge using ABC -Lateral Slide. |

ALTERNATIVE 1A: REHABILITATE BRIDGE

Build Alternative 1A proposes to replace the reinforced concrete deck and maintain the current configuration of three 10-foot lanes. The existing substructure and remaining portions of the existing superstructure will be rehabilitated and re-used. Visible existing and proposed concrete will be coated for protection. A 175-foot long, single-span temporary bridge to the upstream side

will be installed to maintain traffic. The temporary bridge will include a minimum of two 10' lanes and a 5' sidewalk. Reverse curves will be needed on the approach which meet a 25-mph design speed. The profile of the temporary detour is set to 5 percent max. to accommodate ADA requirements. B&N consulted with representatives from Mabey Bridge to prepare this report and more information is included in Appendix D.

Recent bridge inspection reports rated the existing beams in fair condition but noted that areas that had been repaired with epoxy injection of cracks and grouting of spalls were in good condition. Chloride ion sampling and testing was performed by WVDOT to determine the level of chloride contamination on the substructure units. The testing was summarized in a memorandum dated January 15, 2015 by Clifford J. Skeens. The testing indicated that advanced contamination is present, averaging 3.6 to 17.4 lb/cy. In this case, extraction of the chlorides will not be feasible. The depth of the patching repairs cannot be reasonably set to remove the contaminated concrete. Ongoing corrosion of the reinforcing steel will likely result in additional deterioration adjacent to the new repairs. The durability of the structure would be short-term.

Particular care would have to be taken during the removal of the existing bridge deck, both to prevent debris from falling into Spring Creek and to protect the underlying concrete beams. A strip approximately 3 feet wide centered along each beam would need to be removed with hydro demolition or other controlled methods to preserve the existing reinforcing steel in the beams. The original design plans do not indicate the presence of any reinforcing steel in the top of the diaphragms. The demolition method used away from the beams lines could be used over the diaphragms, provided that the top surface of the diaphragms are sufficiently roughened to facilitated the bonding of the new deck to the existing concrete.

If this alternative is selected, structural analysis of the beams with deck removed is required and likelihood of passing is unknown at this time. The load rating of the existing bridge is 41 tons for the HS inventory rating, as calculated by District 3 in 2011.

Alternative 1A does not provide additional lanes; therefore, this option would not accommodate forecasted traffic volumes. This alternative would also result in significant, ongoing maintenance costs as compared to other alternatives since the original structure, built in 1932, would remain. This alternative does not meet the purpose and need of the project.

Alternative 1A has an estimated construction cost of \$2,020,000. The 175 foot-long, temporary detour bridge was estimated at \$100 per square foot for a total cost of \$522,000. Additional cost may arise during design and construction phases that could not be anticipated in advance.

ALTERNATIVE 1B: REPLACE BRIDGE USING PHASED CONSTRUCTION

Build Alternative 1B will provide two 11-foot and two 12-foot travel lanes, two 2-foot shoulders, and two 5'-6" sidewalks. A portion of the existing structure will be utilized for temporary traffic control before being replaced.

The existing upstream beam and sidewalk will be demolished, making room for the construction of three new beams that support 23 feet of bridge deck, a 5'-6" sidewalk and a 1-foot combo rail. The new beams would be supported by integral abutments and multi-column piers which will also be constructed in phases. The new three-span structure will allow for placement of the piers between the existing pier locations. The proposed abutments will be set behind the existing wall type abutments and feature 2:1 spill through slopes with 3' thick foundation protection material. Two 10'-9½" travel lanes will be available on the existing structure throughout this phase. A temporary barrier will be anchored 1'-0" from the edge of construction to provide safety to motorists during construction. The existing pier caps will need to be notched at the ends to allow for construction of one of the new beams.

Upon completion of the first phase of construction, the two travel lanes will be shifted to the newly constructed bridge deck. In this phase the temporary lanes will be 10-feet wide. The remainder of the existing bridge will be removed, and three new beams will be constructed. This phase includes the addition of 31 feet of bridge, which includes a 5'-6" sidewalk and 1-foot rail. A temporary barrier will be anchored 1'-0" from the edge of construction to provide safety to motorists during construction.

A 2'-6" closure pour will tie the two phases of construction together. The downstream curb line will not change in this alternative, which is less desirable than the other alternatives due to the offset that is already present in the existing curb line. The completed 3-span structure will have a 63' out-to-out width and 250' length.

Alternative 1B has an estimated construction cost of \$5,417,000. A cost premium of \$275,000 was included for the challenges faced during phased construction.

ALTERNATIVE 2A: REPLACE BRIDGE USING DOWNSTREAM TEMPORARY DETOUR

Build Alternative 2A proposes to replace the bridge on the existing alignment (full width construction). The new 3-span structure will have a 63' out-to-out width and 250' length. The completed structure will provide two 11'-0" lanes, two 12'-0" lanes, two 2'-0" shoulders, two 5'-6" sidewalks, and two 1'-0" rails. A 175-foot long, single-span temporary bridge to the downstream side will be installed to maintain traffic. Embankment will be placed in the Save-A-Lot parking lot (Photo 10). The temporary bridge will include a minimum of two 10' lanes and a 5' sidewalk. Reverse curves will be needed on the approach which meet a 25-mph design speed. The profile of the temporary detour is set to 5 percent max. to accommodate ADA requirements. B&N consulted

with representatives from Mabey Bridge to prepare this report and more information is included in Appendix D.

Alternative 2A has an estimated construction cost of \$5,730,000. The 175 foot-long, temporary detour bridge was estimated at \$100 per square foot for a total cost of \$522,000.

ALTERNATIVE 2B: REPLACE BRIDGE USING UPSTREAM TEMPORARY DETOUR

Build Alternative 2B proposes to replace the bridge on the existing alignment (full width construction). The new 3-span structure will have a 63' out-to-out width and 250' length. The completed structure will provide two 11'-0" lanes, two 12'-0" lanes, two 2'-0" shoulders, two 5'-6" sidewalks, and two 1'-0" rails. A 175-foot long, single-span temporary bridge to the upstream side will be installed to maintain traffic. The temporary bridge will include a minimum of two 10' lanes and a 5' sidewalk. Reverse curves will be needed on the approach which meet a 25-mph design speed. The profile of the temporary detour is set to 5 percent max. to accommodate ADA requirements. B&N consulted with representatives from Mabey Bridge to prepare this report and more information is included in Appendix D.

Alternative 2B has an estimated construction cost of \$5,728,000,. The 175 foot-long, temporary detour bridge was estimated at \$100 per square foot for a total cost of \$525,000.

ALTERNATIVE 3: REPLACE BRIDGE USING WILLIAMS DRIVE DETOUR

Build Alternative 3 also proposes to replace the bridge on existing alignment (full width construction). The new 3-span structure will have a 63' out-to-out width and 250' length. The completed structure will provide two 11'-0" lanes, two 12'-0" lanes, two 2'-0" shoulders, two 5'-6" sidewalks, and two 1'-0" rails.

A new 80 foot long bridge is proposed on the south end of Williams Drive at Market Street intersection with US 119 (Photos 11 & 12). The bridge will assume two 12' lanes, 3' shoulders, and one 5'-6" sidewalk. For the temporary condition, it can be striped as three 10' lanes and 5'-6" sidewalk. The profile uses a maximum 12 percent roadway grade. A permanent traffic signal and temporary left turn lane on US Route 119 will be needed at the new intersection. The southbound through lane is shifted onto the southbound shoulder to make room for the temporary turn lane (Photo 13).

Alternative 3 has an estimated construction cost of \$7,613,000, of which approximately \$2,500,000 is related to the cost of the Williams Drive Extension.

ALTERNATIVE 4: REPLACE BRIDGE USING ABC - LATERAL SLIDE

Build Alternative 4 proposes to construct the full-width bridge upstream of existing on temporary bents (Photo 14). The new 3-span superstructure will have a 63' out-to-out width and 250' length. While supported by the temporary bents, the bridge will be used to maintain traffic during demolition of the existing bridge and construction of the new piers and abutments. The contractor will slide the new bridge into place using lateral jacking operations during night time closures. An incentive/disincentive clause will be used for this alternative. The completed structure will provide two 11'-0" lanes, two 12'-0" lanes, two 2'-0" shoulders, two 5'-6" sidewalks, and two 1'-0" rails.

This Accelerated Bridge Construction (ABC) technique has been used on various structures in the United States. FHWA has guidance for lateral slides on their website. WVDOT is proposing to use a similar procedure on the Basnetville Bridge in Marion County. Compared to most bridge replacement projects in West Virginia, the Ruby Bradley Bridge site is particularly well-suited for sliding: a practical detour does not exist, high traffic volumes, the framing is square, the existing alignment is preferred, a staging area is present adjacent to the bridge, and temporary foundations are feasible.

Temporary low speed shift in traffic lanes is anticipated. Emergency vehicles should be allowed to interrupt or cross during the slide. The approach slabs will be partially constructed on top of geotextile reinforced fill during the initial phase. A 2 foot gap will remain to allow for the abutment diaphragm to slide into place. Traffic will be maintained using steel plates until the closure pour can be made (see abutment section in Appendix D). The grade of US Route 119 will be accommodated by adjusting the bearing height down while in the temporary position.

Alternative 4 has an estimated construction cost of \$5,464,000. This includes a cost of \$142,500 for equipment and labor to perform the slide. The temporary bents are estimated at \$316,800 and premium for additional engineering and construction services related issues of \$185,000.

3.3 Utilities

Several utilities are located within the project area all around the existing bridge. The overhead electric, telephone, and cable lines paralleling the upstream edge of deck will conflict with the proposed construction and will need relocated (Photo 15). Underground telephone and signal poles on the southwest corner of the bridge will be in conflict. The sanitary sewer line below Span 2 will conflict with all alternatives except Alternative 1A. Various sanitary sewer lines and manholes below Span 5 will need relocated (Photo 16). A gas line is located at the upstream end of Abutment 2 and will be impacted by the proposed alternatives. An exposed sewer line in the creek parallels the downstream side of the bridge and would be affected by the Alternative 2A detour (Photo 17). However, this pipe is not in service and should be demolished.

The Williams Drive Extension project area for Alternative 3 also includes various utilities. Relocations will be required for water, gas, overhead electric, and overhead and underground fiber-optic telephone (Photos 18-20). The bridge will span over the sanitary sewer line which should not be affected.

Utility relocation costs have been provided by WV DOT and are included in the cost estimate.

3.4 Major Drainage Requirements

No pipes 36" or larger are required for this project.

3.5 Constructability Issues

A three-span bridge has been proposed to limit the girder lengths to 100 feet which should be deliverable to the site. Although the piers are proposed out of the normal flow of Spring Creek, cofferdams and de-watering will be required. Alternative 1A will not accommodate forecasted traffic volumes and will present ongoing maintenance issues due to rehabilitation and re-use of the existing structure. Temporary shoring will be required on both approaches during the phased construction of Alternative 1B. Closure pours are included in Alternative 1B to allow for splicing the rebar and differential deflection of the decks. Prior to the bridge construction, adequate time should be allowed for the relocation of various utilities. The Williams Drive Extension Bridge will have complex framing due to the flared edges of the bridge needed for the turning radius of trucks combined with curved horizontal and vertical alignment. Construction of the temporary detour on the downstream side of the bridge will allow time for the overhead utilities to be relocated. Construction of the temporary detour on the upstream side of the bridge will allow time for the building demolition.

3.6 Temporary Traffic Control

Schematic plans which apply for all alternatives are included in Appendix E.

It has been suggested that there is a 10-mile detour over County Routes that most people would use if this bridge was out of service. However, the official detour for truck traffic would be US 33 to Ripley, I-77 to Charleston, I-79 to US Route 119, which is approximately 97 miles, on a bridge with a 10,300 ADT. Another local detour option would include using the North Market Street Bridge, Front Street, George Street, Prospect Street, Hill Street, and Pike Street (See dashed line on Location Map). This local detour would be considered single-lane two-way traffic in some locations. It has very steep vertical grade and through low income residential areas, but is all paved. Using a series of flaggers might make it viable for short-term, night closures for cars and small emergency vehicles. Likewise, no feasible detour is available for the duration of bridge construction.

The Williams Drive Extension detour route is approximately 5,000 feet long (Photos 21-27) and includes the construction of a new permanent bridge over Spring Creek (Photo 28). Adding another crossing provides redundancy to the transportation system. There is an existing two-lane bridge on Williams Drive crossing Goff Run. This bridge should handle the detour traffic as it is a modern pre-cast slab bridge and is currently accommodating commercial truck traffic to WalMart and other businesses.

All of the alternatives propose a minimum of two-lanes for the temporary condition. B&N has proposed to close the north leg (North Main Street) of the intersection (Photo 29). This will allow re-phasing of the signal and eliminate the turn lane on the bridge during construction. The remaining three legs of the intersection will utilize a two-phase signal. Eastbound and westbound traffic will receive a green signal simultaneously. All westbound left turning traffic will have to yield to eastbound traffic. Traffic leaving Wendy's, the US Post Office, and the Hardman's hardware store and wanting to go Eastbound would be detoured to Court Street then to Market Street to make a left onto US Route 33 East. B&N performed a capacity analysis of the temporary condition which was submitted on March 27, 2015. The results of the analysis indicate that the 2-phase signal operation will provide an overall level of service B, similar to the current condition. The signal timing should be adjusted in the field and be set to maximize the green time for the eastbound/westbound phase. The northbound approach has over 2,000 feet of storage space available and if necessary, operation on this approach should be sacrificed in the peak hour to ensure the westbound queues will not extend to the Williams Drive intersection.

The turning radius from US Route 119 onto the bridge will be tight. B&N evaluated this turning radius and found it to be feasible. The turning radius during the construction of Alternative 1B will be an issue for trucks coming from US 119. The proposed structure would need to be flared to accommodate this, increasing the cost of the alternative.

3.7 Pedestrian Facilities

A 5'-0" wide sidewalk will remain in service throughout construction in Alternatives 1, 2 and 4 with two 5'-6" sidewalks available on the completed structure. During construction of Alternative 3, temporary pedestrian access can be provided on the Williams Drive Extension; however, the steep grade will not comply with ADA requirements and is a long detour for pedestrians. An existing concrete pedestrian bridge is located 1200' upstream (Photo 30). However, the east approach is an unimproved hill side (Photo 31). It may be possible to install a temporary elevator/lift system at this location for approximately \$150,000, as well as a pedestrian walkway between Tractor Supply Co. and Tudors Biscuit World to connect this pedestrian bridge with the sidewalk along Williams Drive. Another option would be to provide a temporary pedestrian bridge that meets ADA grades for estimated cost of \$300,000.

3.8 Bicycle Facilities

Bicycle lanes have not been required for this project. Although dedicated bicycle lanes have not been included, the bicycles are accommodated within the proposed typical section per DD-813 by using wider 12-foot lanes and 2-foot shoulders. This is similar to the other streets in Spencer, although large shoulders do exist on US Route 119 (Photo 13).

3.9 Proposed Right-of-Way

Proposed right-of-way takes will be required for the construction of the bridge. The Richard's Tractor Sales property will be acquired for all alternatives to allow the addition of the North Main Street turn lane (Photo 32). There are also large cracks in the foundation of this building that is in contact with bridge abutment (Photos 33 and 34). Many of the alternatives require acquisition of a portion of the Save-A-Lot parking lot and the temporary detour will require temporary construction easement (TCE) in this area (Photo 35). Alternative 3 will require takes from the Roane County Economic Development Authority and Roane County Family Health Care, Inc. (Photo 36). The construction of the cut slope in the front yard of the Joint Base, West Virginia National Guard, ASL Operation will render the existing loading dock driveway unusable (Photo 37). B&N evaluated the addition of a retaining wall to minimize cut, but this retaining wall still did not provide the turning radii necessary to accommodate large trucks. Likewise, an alternate loading dock layout is provided. Alternative 4 requires TCE from the Sisters Properties, LLC for the temporary construction staging of the bridge before the slide (Photo 38). If development of this property occurs before the project is advertised, the feasibility of the TCE will be impacted. See Appendix E for the ownership index and property map.

3.10 Hydraulic Performance

The reach of Spring Creek throughout the project site is part of a detail FEMA flood insurance study zoned AE. According to the flood insurance rate map (included in Appendix D), the 100-year flood elevation near the Col. Ruby Bradley Bridge is Elev. 725.

The low steel of all alternatives have excess freeboard over this elevation. The existing abutments are wall-type, but it was observed that approach fill wraps around the abutment and reduces the waterway opening just upstream and downstream of the bridge. As a result, many of the alternatives propose spill through slopes, which are estimated to have little impact on the hydraulic openings. The hydraulic data that B&N prepared for the North Market Street Bridge has been displayed on the situation plans for an approximation of the anticipated flood elevations. Flooding occurred in June 2013, which may have peaked near the top of the arch on North Market Street (Photos 39 & 40) near Elevation 717. The Williams Drive Bridge over Golf Run was overtopped (Photo 41). This magnitude of flooding may occur on less than a 10-year frequency. Alternative 1A will have the smallest waterway opening with all four piers remaining.

The 100-year flood elevation near the Market Street intersection with US Route 119 is 726 and encroaches onto the roadway. The deck of the proposed William Drive Extension Bridge will be below this elevation. Although a larger opening at Ruby Bradley may help reduce the impact upstream, private residential property is within 100' of the bridge limits and would likely be impacted. The previous truss bridge located downstream of the existing bridge has been removed. The new development of Sisters Properties, LLC has placed fill below the 100-year flood plain. Both change affect the hydraulic performance of the stream in the area and should be accounted for in the modeling.

3.11 Bridge Aesthetics and Lighting

The location of bridge is highly visible from all sides to restaurants, shopping areas, and commuters. The demolition of the Richard's Tractor Sales building would further increase the visibility of the bridge to the post office area.

The existing bridge has ornamental light posts at each end of the perforated concrete barrier (Photo 42). The bridge fascia contains curved outriggers at the diaphragm locations. The piers have arched caps.

The proposed structures will include black aluminum ornamental street lights similar to those found throughout downtown Spencer (Photo 43). The lights would be mounted to the top of the bridge combo rail at six locations on each side of the bridge. The concrete barrier will be formlined to provide an architectural surface to the concrete. The texture of the formliner will be selected to resemble the local architectural theme of the buildings in the downtown area. The exposed concrete will be sealed with a protective coating with a color selected to accentuate the details.

Other options to enhance the structure could include: black steel or aluminum fence-type railing, staining the formlined areas with multiple colors, extending combination railing or fencing onto the approaches, rather than using standard guardrail, and pier design to replicate the details of the existing bridge. Upon request of the Division, further discussion and exhibits of these options can be provided.

3.12 Other Considerations

The following should be considered during the review of this office review submission.

- A detour route behind Save-A-Lot was considered in the previous location of an old truss bridge, which has since been demolished. This detour option was found to be non-viable due to impacts to Save-A-Lot and the lumber facility. Additionally, a portion of this detour route would only accommodate a single lane.
- Access management improvements to the Wendy's parking lot may be considered to

further enhance the function and safety of the intersection.

- The addition of turn lanes on US Route 119 and North Main Street was suggested in the lane schematic from WVDOT Traffic Section. The addition of these turn lanes was considered beyond the scope of this study. Should the turn lanes be requested, additional evaluation of the intersection turning radius would be required to determine the needed pavement width. If additional pavement width is needed along US Route 119, the fill will impact the 100 year flood plain and hydraulic analysis would be required to determine the impacts. The use of a retaining wall to mitigate this impact may be a possible solution.

Table 2
Comparison of Alternatives

Number	Alternative	Bridge Width (feet)	Bridge Length (feet)	# of Spans & Span Lengths (ft)	Impact to Traffic During Construction	Re-use of Existing Structure	Hydraulic Performance	Redundancy of Transportation System	Utility Impacts	Right-of-Way Impacts	Right-of-Way Costs	Construction Costs
1A	Rehabilitate Bridge using Upstream Detour	42	227	5 Spans @ 40, 40, 50, 40, 40	Moderate	Re-use of beams, piers and abutments	Acceptable, Most Piers in Stream	Lacking	High (less one sewer)	1 Business Displaced, Necessary TCE in Development Pad	\$580,000	\$2,001,000
1B	Replace Bridge using Phased Construction	63	250	3 Spans @ 75, 100, 75	High	All new construction	Best, Less impact from Temporary Structure	Lacking	High	1 Business Displaced	\$550,000	\$5,397,000
2A	Replace Bridge using Downstream Temporary Detour	63	250	3 Spans @ 75, 100, 75	Moderate	All new construction	Better, Temporary Impact needs Evaluation	Lacking	High	1 Business Displaced, TCE will impact parking area of Business	\$600,000	\$5,703,000
2B	Replace Bridge using Upstream Temporary Detour	63	250	3 Spans @ 75, 100, 75	Moderate	All new construction	Better, Temporary Impact needs Evaluation	Lacking	High	1 Business Displaced, Necessary TCE in Development Pad	\$580,000	\$5,704,000
3	Replace Bridge using Williams Drive Detour	63	250	3 Spans @ 75, 100, 75	Longer Detour	All new construction	New Structure in Floodway needs Evaluation	Two Bridges, Alternate Access	Extreme	1 Business Displaced, Loading Dock Drive Affected to WVARNG	\$940,000	\$7,702,000
4	Replace Bridge using ABC - Lateral Slide	63	250	3 Spans @ 75, 100, 75	Low; due to shorter Duration	All new construction	Best, Less impact from Temporary Structure	Lacking	High	1 Business Displaced, Necessary TCE in Development Pad	\$580,000	\$5,452,000

4.0 CONCLUSIONS

A preferred alternative will not be selected at this time. The following conclusions may be inferred from this report:

- The No Build Alternative is not feasible.
- The least cost option, Alternative 1A, would only provide a short-term structural solution and offers no relief for traffic congestion.
- Phased construction in Alternative 1B increases the length of the project and duration of two-lane temporary traffic control. The additional joints provide a less durable structure. It is the 2nd least cost and better hydraulic performance during construction.
- Benefits of Alternative 2A include a faster start-up for the contractor not being delayed with the overhead utility relocations and a slightly improved alignment to the intersection. In a significant flood event, there may be benefits of having the temporary bridge on the downstream side. It is economically feasible.
- The upstream detour used Alternative 2B has less impact on the Save-A-Lot parking area.
- Alternative 3 is the only solution that provides additional redundancy in the transportation system. This is the highest cost alternative. Hydraulic modeling of the Williams Drive Extension Bridge is needed to determine if it is a viable solution. Additional alignments could be investigated to raise the bridge, all of which will likely increase the cost.
- Lateral bridge sliding of Alternative 4 will have the least impact on traffic and will perform better hydraulically during construction. A higher level of risk is associated with the slide.

APPENDIX A
SITE PHOTOGRAPHS

Appendix A



Photo 1: Typical traffic condition on existing bridge.



Photo 3: Aerial view of bridge and intersection of US33, US119 and North Main Street.



*Photo 2: Intersection of US33 and Williams Drive at south end of bridge.
Note recent development of adjacent properties.*



Photo 4: Turning lanes at intersection of US33 and Williams Drive.

Appendix A



Photo 5: Existing bridge consists of CIP concrete T-beams and three-column piers.



Photo 7: East approach to bridge and turning lanes at US33 intersection with Williams Drive.



Photo 6: Downtown Main Street. Spencer, WV.



Photo 8: Sandy loam overburden along the banks of Spring Creek.

Appendix A



Photo 9: North Market Street Bridge.



Photo 11: Proposed location of the Williams Extension, Alternative 3.



Photo 10: Save-A-Lot parking lot, adjacent to Ruby Bradley Bridge.



Photo 12: Looking toward Market Street from the parking lot at the WV National Guard building.

Appendix A



Photo 13: Typical wide shoulder along US Route 119, just north of the proposed intersection with Market Street.



Photo 15: Overhead utility lines which parallel the upstream side of the existing bridge.



Photo 14: Upstream of existing bridge. Proposed location for Alternatives 1A, 2B and 4 temporary condition.



Photo 16: Sanitary manhole below Span 5 of the existing bridge.

Appendix A



Photo 17: Abandoned aerial sewer crossing paralleling the downstream side of the existing bridge.



Photo 19: Gas pipeline within the proposed alignment of the Williams Extension, Alternative 3.



Photo 18: Utilities within the proposed alignment of the Williams Extension, Alternative 3.



Photo 20: Overhead lines within the proposed alignment of the Williams Extension, Alternative 3.

Appendix A



Photo 21: Looking north near match existing point on Williams Drive Extension.



*Photo 23: Looking north at Williams Drive detour route in front of Roane County Family Medical.
Note head-in parking along route will need to be eliminated.*



Photo 22: Looking south near match existing point on Williams Drive Extension.



*Photo 24: Looking south at Williams Drive detour route in front of Roane County Family Medical.
Note head-in parking along route will need to be eliminated.*

Appendix A



Photo 25: Looking south at Williams Drive detour route in front of Walmart.



Photo 27: Bridge and aerial gas line crossing Goff Run along the Williams Drive detour route.



Photo 26: Section of Williams Drive detour route with poor asphalt condition.



Photo 28: Spring Creek at the location of the proposed permanent bridge for the Williams Drive Extension.

Appendix A



Photo 29: Looking along the southbound lane of North Main Street at the intersection of US33 and US119.



Photo 31: East approach to the existing pedestrian bridge. Note steep grade.



Photo 30: Pedestrian bridge adjacent to Walmart, approximately 1200' upstream from Ruby Bradley Bridge.



Photo 32: Looking from North Main Street at Richard's Tractor Sales.

Appendix A



Photo 33: Large cracks in the foundation of the Richard's Tractor Sales building.



Photo 35: Looking northwest through Save-A-Lot parking lot, adjacent to Ruby Bradley Bridge.



Photo 34: Foundation of Richard's Tractor Sales in contact with Abutment 1 of Ruby Bradley Bridge.



Photo 36: Sections of property owned by Roane County EDA and Roane County Family Health Care, Inc.

Appendix A



Photo 37: Loading dock at the Joint Base, West Virginia National Guard, ASL Operation.



Photo 39: Flooding at North Market Street Bridge in June 2013.



Photo 38: Upstream side of bridge. Location of required TCE for Alternatives 1A, 2B and 4, from Sisters Properties, LLC.



Photo 40: Flooding at North Market Street Bridge in June 2013.



Photo 41: Flooding over Williams Drive in June 2013.



Photo 43: Typical light pole along North Main Street in Spencer.

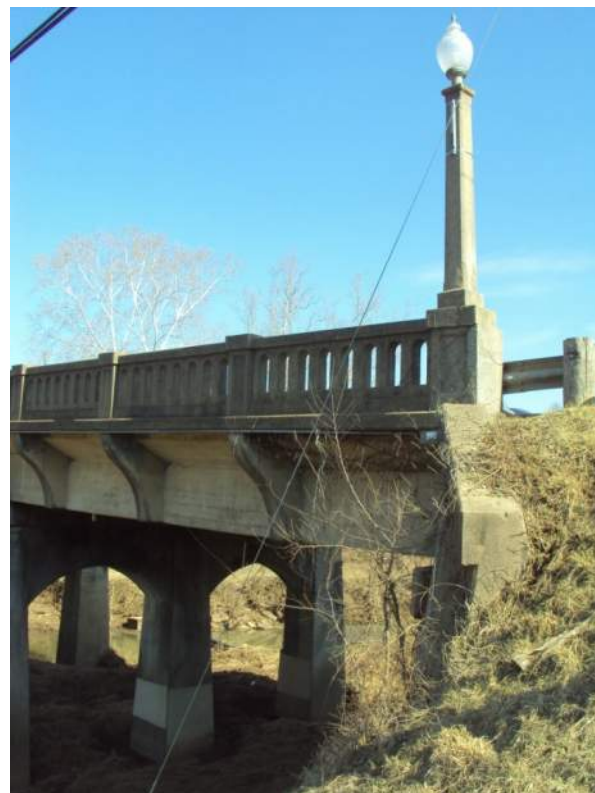


Photo 42: Existing typical lighting on Ruby Bradley Bridge.



Photo 44: Examples of possible aesthetic enhancements. Note street lights at 50 foot spacings

Appendix A



Photo 45: Elevation view of Three Springs Bridge over US 22 in Weirton, WV.



Photo 47: View of concrete stamping on the deck barrier and wingwall of Three Springs Bridge.



Photo 46: View of concrete stamping on the deck barrier of Three Springs Bridge.



Photo 48: Close-up view of concrete stamping on Three Springs Bridge.

APPENDIX B
DESIGN CRITERIA

<p style="text-align: center;">STATE PROJECT U344-33-12.76 COLONEL RUBY BRADLEY BRIDGE REPLACEMENT Design Study - Final Submission</p> <p style="text-align: center;">US ROUTE 33 2013 ADT: 10,200 2033 ADT: 13,800</p> <p style="text-align: center;"><u>DESIGN CRITERIA CHART</u></p>					
DESIGN PARAMETER	WVDOH DESIGN CRITERIA	PROVIDED DESIGN	REQUIRES DESIGN EXCEPTION	REFERENCE	REMARKS
Roadway Classification:	Urban Collector	--		DD-610	
Terrain	Mountainous	--		observed	
Design Speed:	35 MPH	35 MPH		Assumed posted speed	
Lane Width:	10' Lanes	10' min. lane width 12' max. lane width		DD-610	
Outside Shoulder Width:	2' Curb and Gutter	curb and gutter with 2' gutter pan			
Inside Shoulder Width:	N/A	--			
Horizontal Alignment: (Min. Radius "ft")	371' (35 MPH; emax 4%)	N/A		(GDHS 2011, pg 3-32)	CENTERLINE IS HELD TANGENT AND LANES WILL SHIFT TO ACCOMMODATE
Vertical Alignment: (Minimum K)	29 (crest) 35 MPH 49 (Sag) 35 MPH	no crest curves no sag curves		(GDHS 2011, pg 3-155,3-161)	
Grade:	12% max	3.70%		DD-610	
Cross Slopes:	2% (traveled way normal crown)	2% (traveled way normal crown)		(GDHS 2011, pg 10-93)	
Superelevation:	4% (max)	N/A		DD-610	
Vertical Bridge Clearance	14'	n/a		DD-610	

<p style="text-align: center;">STATE PROJECT U344-33-12.76 COLONEL RUBY BRADLEY BRIDGE REPLACEMENT Design Study - Final Submission</p> <p style="text-align: center;">WILLIAMS DRIVE EXTENSION 2013 ADT: 5700 2033 ADT: N/A</p> <p style="text-align: center;"><u>DESIGN CRITERIA CHART</u></p>					
DESIGN PARAMETER	WVDOH DESIGN CRITERIA	PROVIDED DESIGN	REQUIRES DESIGN EXCEPTION	REFERENCE	REMARKS
Roadway Classification:	Urban Local Street	--			
Terrain	Mountainous	--		observed	
Design Speed:	20 MPH to 30 MPH	25 MPH		DD-610	
Lane Width:	10' Lanes	12' max. lane width		DD-610	
Outside Shoulder Width:	2' Curb and Gutter	3' Paved Shoulder		DD-610	
Inside Shoulder Width:	N/A	--		DD-610	
Horizontal Alignment: (Min. Radius "ft")	198' (25 MPH; normal crown)	198'	198'	(GDHS 2011, pg 3-55)	
Vertical Alignment: (Minimum K)	12 (crest) 25 MPH 26 (Sag) 25 MPH	12 (crest) 26 (sag)		DD-610	
Grade:	12% max	11.5%		DD-610	
Cross Slopes:	2% (traveled way normal crown)	2% (traveled way normal crown)		(GDHS 2011, pg 10-93)	
Superelevation:	8% (max)	Normal Crown		DD-610	
Vertical Bridge Clearance	14'	n/a		DD-610	

STATE PROJECT U344-33-12.76 COLONEL RUBY BRADLEY BRIDGE REPLACEMENT Design Study - Final Submission					
Clear Zone Table					
				PROVIDED DESIGN	
Alignment	Design Speed	ADT	Clear Zone Width	Foreslope*	Backslope**
US Route 33	35 mph	10,200 (2013) 13,800 (2033)	16'-18' in fill (4:1 max) 16'-18' in cut (3:1 max)	4:1	3:1
Williams Drive Extension	25 mph	5,700 (2013) N/A (2033)	12'-14' in fill (4:1 max) 12'-14' in cut (3:1 max)	4:1	3:1

*Column lists maximum slope found within the clear zone; slopes steeper than 4:1 will be protected with guardrail or other barrier
 **Column lists maximum slope found within the clear zone; slopes steeper than 3:1 will be protected with guardrail or other barrier

APPENDIX C
PRELIMINARY COST ESTIMATE

**COLONEL RUBY BRADLEY BRIDGE DESIGN STUDY
COST COMPARISON OF ALTERNATIVES**

WVDOT

Prepared By: MWL 7/31/14 Revised By: ASG/MWL 5/5/15

ALT 1A = Rehabilitate Bridge and Replace Deck
ALT 1B = Replace Bridge using Phased Construction
ALT 2A = Replace Bridge using Downstream Temporary Detour
ALT 2B = Replace Bridge using Upstream Temporary Detour
ALT 3 = Replace Bridge using Williams Drive Detour
ALT 4 = Replace Bridge using ABC -Lateral Slide

ITEM	DESCRIPTION	UNITS	SUMMARY OF ESTIMATED QUANTITIES						COST INFORMATION							
			QUANTITY						UNIT COST	ITEM COST						
			ALT 1A	ALT 1B	ALT 2A	ALT 2B	ALT 3	ALT 4		ALT 1A	ALT 1B	ALT 2A	ALT 2B	ALT 3	ALT 4	
ROADWAY																
201001-000	CLEARING AND GRUBBING	LS	1	1	1	1	1	1	VARIES	\$10,000	\$10,000	\$12,000	\$10,000	\$22,000	\$12,000	
201002-001	EXISTING PAVEMENT REMOVAL	SY	0	0	0	0	0	807	\$15.00	\$0	\$0	\$0	\$0	\$0	\$12,200	
204001-000	MOBILIZATION	LS	1	1	1	1	1	1	VARIES	\$45,420	\$72,530	\$76,680	\$76,660	\$91,850	\$72,910	
207001-001	UNCLASSIFIED EXCAVATION	CY	0	0	0	0	19,566	0	\$10.00	\$0	\$0	\$0	\$0	\$195,700	\$0	
211001-001	UNCLASSIFIED BORROW EXCAVATION	CY	1,062	691	2,823	2,583	1,062	2,135	\$20.00	\$21,300	\$13,900	\$56,500	\$51,700	\$21,300	\$42,700	
307001-000	AGGREGATE BASE COURSE, CLASS	CY	0	50	100	100	150	100	\$38.00	\$0	\$1,900	\$3,800	\$3,800	\$5,700	\$3,800	
	ROADWAY PAVING AND SUBGRADE (SF)	SF	8,111	10,008	15,391	16,299	19,768	15,235	\$10.00	\$81,200	\$100,100	\$154,000	\$163,000	\$197,700	\$152,400	
	ROADWAY OVERLAY (SF)	SF	10,686	2,000	2,000	2,000	3,000	2,000	\$4.00	\$42,800	\$8,000	\$8,000	\$8,000	\$12,000	\$8,000	
	ROADWAY OVERLAY (WILLIAMS DRIVE ONLY) (SF)						43,680		\$2.00					\$87,400		
502001-012	12 INCH PORTLAND CEMENT CONCRETE APPROACH SLAB	SY	178	280	280	280	387	280	\$250.00	\$44,500	\$70,000	\$70,000	\$70,000	\$96,800	\$70,000	
	DRAINAGE	LS	1	1	1	1	1	1	VARIES	\$5,000	\$2,000	\$5,000	\$5,000	\$10,000	\$5,000	
606029-001	FREE DRAINING BASE TRENCH	LF	1,000	1,000	1,000	1,000	1,700	1,000	\$10.00	\$10,000	\$10,000	\$10,000	\$10,000	\$17,000	\$10,000	
606030-001	OUTLET PIPE	LF	100	100	100	100	170	100	\$15.00	\$1,500	\$1,500	\$1,500	\$1,500	\$2,600	\$1,500	
607001-001	TYPE 1 GUARDRAIL, CLASS	LF	100	325	425	313	413	363	\$10.00	\$1,000	\$3,300	\$4,300	\$3,200	\$4,200	\$3,700	
607006-001	THRIE BEAM GUARDRAIL BRIDGE TRANSITION	EA	0	4	4	4	8	4	\$800.00	\$0	\$3,200	\$3,200	\$3,200	\$6,400	\$3,200	
607037-001	BUFFER END SECTION	EA	0	4	4	4	4	4	\$75.00	\$0	\$300	\$300	\$300	\$300	\$300	
607065-001	FLARED END TERMINAL	EA	0	3	3	3	3	3	\$1,200.00	\$0	\$3,600	\$3,600	\$3,600	\$3,600	\$3,600	
609001-001	CONCRETE SIDEWALK	SY	100	311	252	252	480	252	\$55	\$5,500	\$17,200	\$13,900	\$13,900	\$26,400	\$13,900	
610003-002	COMBINATION CONCRETE CURB AND GUTTER, TYPE II	LF	190	488	417	417	791	417	\$50	\$9,500	\$24,400	\$20,900	\$20,900	\$39,600	\$20,900	
636 ITEMS	TEMPORARY TRAFFIC CONTROL	LS	1	1	1	1	1	1	VARIES	\$35,000	\$60,000	\$35,000	\$35,000	\$3,000	\$35,000	
636005-001	TEMPORARY STRUCTURE FOR MAINTAINING TRAFFIC	SF	5,250	0	5,250	5,250	0	0	\$100	\$525,000	\$0	\$525,000	\$525,000	\$0	\$0	
636017-001	TEMPORARY CONCRETE BARRIER	LF	100	850	100	100	0	100	\$40	\$4,000	\$34,000	\$4,000	\$4,000	\$0	\$4,000	
636018-001	REMOVE AND RESET TEMPORARY CONCRETE BARRIER	LF	100	850	100	100	0	100	\$10	\$1,000	\$8,500	\$1,000	\$1,000	\$0	\$1,000	
637001-001	WATER FOR DUST PALLIATIVE	MG	1,000	1,000	1,000	1,000	1,000	1,000	\$20.50	\$20,500	\$20,500	\$20,500	\$20,500	\$20,500	\$20,500	
638002-001	RIGHT OF WAY MARKER	EA	15	15	15	15	30	15	\$74.00	\$1,200	\$1,200	\$1,200	\$1,200	\$2,300	\$1,200	
638003-001	SURVEY MARKER	EA	4	4	4	4	8	4	\$205.00	\$900	\$900	\$900	\$900	\$1,700	\$900	
639001-001	CONSTRUCTION LAYOUT STAKE	LS	1	1	1	1	2	1	\$10,000.00	\$10,000	\$10,000	\$10,000	\$10,000	\$20,000	\$10,000	
640006-001	SMALL FIELD OFFICE	MO	9	18	12	12	18	12	\$2,000.00	\$18,000	\$36,000	\$24,000	\$24,000	\$36,000	\$24,000	
640003-001	BUILDING EQUIPMENT	LS	1	1	1	1	1	1	\$9,000.00	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000	
642 ITEMS	TEMPORARY EROSION AND SEDDIMENT CONTROL	LS	1	1	1	1	2	1	\$5,000	\$5,000	\$5,000	\$5,000	\$5,000	\$10,000	\$5,000	
652 ITEMS	PERMANENT SEEDING AND MULCHING	LS	1	1	1	1	2	1	\$20,000	\$20,000	\$20,000	\$20,000	\$20,000	\$40,000	\$20,000	
660 ITEMS	TRAFFIC SIGNALS	EA	0	0	0	0	1	0	\$105,000.00	\$0	\$0	\$0	\$0	\$105,000	\$0	
COMPUTER SYSTEM																
640004-001	COMPUTER SYSTEM FOR FIELD OFFICE	LS	1	1	1	1	1	1	\$10,000.00	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	
TOTAL ROADWAY COST										\$938,000	\$558,000	\$1,110,000	\$1,111,000	\$1,099,000	\$577,000	

**COLONEL RUBY BRADLEY BRIDGE DESIGN STUDY
COST COMPARISON OF ALTERNATIVES**

WVDOT

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Prepared By: MWL 7/31/14 Revised By: ASG/MWL 5/5/15

ITEM	DESCRIPTION	UNITS	SUMMARY OF ESTIMATED QUANTITIES						COST INFORMATION						
			QUANTITY						UNIT COST	ITEM COST					
			ALT 1A	ALT 1B	ALT 2A	ALT 2B	ALT 3	ALT 4		ALT 1A	ALT 1B	ALT 2A	ALT 2B	ALT 3	ALT 4
BRIDGE															
203001-001	DISMANTLING STRUCTURE	LS	1	1	1	1	1	1	VARIES	\$120,000	\$80,000	\$60,000	\$60,000	\$55,000	\$60,000
212001-000	STRUCTURE EXCAVATION	CY	0	0	0	0	0	868	\$55	\$0	\$0	\$0	\$0	\$0	\$47,800
212002-000	WET EXCAVATION	CY	0	0	0	0	0	760	\$150	\$0	\$0	\$0	\$0	\$0	\$114,000
212004-000	COFFERDAM	EA	0	0	0	0	0	2	\$20,000	\$0	\$0	\$0	\$0	\$0	\$40,000
212005-000	SELECT MATERIAL FOR BACKFILLING	CY	0	0	0	0	0	59	\$80	\$0	\$0	\$0	\$0	\$0	\$4,800
218006-000	FOUNDATION PROTECTION	CY	0	0	0	0	0	1,147	\$65	\$0	\$0	\$0	\$0	\$0	\$74,600
601002-001	CLASS B CONCRETE	CY	0	0	0	0	0	536	\$850	\$0	\$0	\$0	\$0	\$0	\$455,600
601009-001	CLASS H CONCRETE	CY	169	0	0	0	0	0	\$1,000	\$169,000	\$0	\$0	\$0	\$0	\$0
601019-001	CONCRETE PROTECTIVE COATING	SF	8,965	0	0	0	0	0	\$8	\$71,800	\$0	\$0	\$0	\$0	\$0
601030-001	PATCHING CONCRETE STRUCTURES	SF	593	0	0	0	0	0	\$150	\$89,000	\$0	\$0	\$0	\$0	\$0
602001-001	REINFORCING STEEL BAR	LB	0	0	0	0	0	55,744	\$1.35	\$0	\$0	\$0	\$0	\$0	\$75,300
602002-001	EPOXY COATED REINFORCING STEEL BAR	LB	47,341	0	0	0	0	0	\$1.40	\$66,300	\$0	\$0	\$0	\$0	\$0
614001-003	HP10X42 STEEL PILE	LF	0	0	0	0	0	865	\$55.00	\$0	\$0	\$0	\$0	\$0	\$47,600
615039-001	JACKING STEEL SUPERSTRUCTURE	LS	0	0	0	0	0	1	\$142,500	\$0	\$0	\$0	\$0	\$0	\$142,500
615075-001	MISCELLANEOUS BRIDGE WORK, BEAM REPAIRS	LS	1	0	0	0	0	0	\$170,000	\$170,000	\$0	\$0	\$0	\$0	\$0
	TEMPORARY BENTS	LS	0	0	0	0	0	1	\$316,780	\$0	\$0	\$0	\$0	\$0	\$316,800
	SLIDING PREMIUM FOR DESIGN AND INSPECTION	LS	0	0	0	0	0	1	\$185,000	\$0	\$0	\$0	\$0	\$0	\$185,000
	NEW STRUCTURE	SF	0	15,750	15,750	15,750	23,250	0	\$225	\$0	\$3,543,800	\$3,543,800	\$3,543,800	\$5,231,300	\$0
	NEW SUPERSTRUCTURE	SF	0	0	0	0	0	15,750	\$150	\$0	\$0	\$0	\$0	\$0	\$2,362,500
	FORMLINER	SF	0	975	975	975	1,376	975	\$22	\$0	\$21,500	\$21,500	\$21,500	\$30,300	\$21,500
	PHASED CONSTRUCTION PREMIUM	LS	0	1	0	0	0	0	VARIES	\$0	\$275,000	\$0	\$0	\$0	\$0
	BRIDGE LIGHTING	LS	1	1	1	1	1	1	\$56,000.00	\$56,000	\$56,000	\$56,000	\$56,000	\$56,000	\$56,000
TOTAL BRIDGE COST										\$743,000	\$3,977,000	\$3,682,000	\$3,682,000	\$5,373,000	\$4,004,000
SUBTOTAL CONSTRUCTION COST										\$1,681,000	\$4,535,000	\$4,792,000	\$4,793,000	\$6,472,000	\$4,581,000
CONSTRUCTION CONTINGENCY (19%)										\$320,000	\$862,000	\$911,000	\$911,000	\$1,230,000	\$871,000
TOTAL CONSTRUCTION COST										\$2,001,000	\$5,397,000	\$5,703,000	\$5,704,000	\$7,702,000	\$5,452,000
PERCENT DIFFERENCE FROM LOWEST										0%	170%	185%	185%	285%	172%

Note: Williams Drive Extension is approximately \$2,500,000 of the total for Alternative 3.

**COLONEL RUBY BRADLEY BRIDGE DESIGN STUDY
COST COMPARISON OF ALTERNATIVES**

WVDOT

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Prepared By: MWL 7/31/14 Revised By: ASG/MWL 5/5/15

ITEM	DESCRIPTION	UNITS	SUMMARY OF ESTIMATED QUANTITIES						COST INFORMATION						
			QUANTITY						UNIT COST	ITEM COST					
			ALT 1A	ALT 1B	ALT 2A	ALT 2B	ALT 3	ALT 4		ALT 1A	ALT 1B	ALT 2A	ALT 2B	ALT 3	ALT 4
	MONPOWER²	LS	0	0	0	0	60,000	0	VARIES	\$0	\$0	\$0	\$0	\$60,000	\$0
	FRONTIER	LS	0	0	5,000	0	35,000	0	VARIES	\$0	\$0	\$5,000	\$0	\$35,000	\$0
	SPENCER WATER COMMISION	LS	0	0	0	0	25,000	0	VARIES	\$0	\$0	\$0	\$0	\$25,000	\$0
	SPENCER SANITARY BOARD	LS	0	50,000	50,000	50,000	60,000	60,000	VARIES	\$0	\$50,000	\$50,000	\$50,000	\$60,000	\$60,000
	CONSUMER GAS COMPANY	LS	0	0	10,000	10,000	15,000	0	VARIES	\$0	\$0	\$10,000	\$10,000	\$15,000	\$0
	LUMOS NETWORKS	LS	0	0	0	0	35,000	0	VARIES	\$0	\$0	\$0	\$0	\$35,000	\$0
	RIGHT-OF-WAY COSTS²	LS	1	1	1	1	1	1	VARIES	\$580,000	\$550,000	\$600,000	\$580,000	\$940,000	\$580,000
		TOTAL UTILITY COST								\$0	\$50,000	\$65,000	\$60,000	\$230,000	\$60,000
		PROJECT SUBTOTAL								\$2,581,000	\$5,997,000	\$6,368,000	\$6,344,000	\$8,872,000	\$6,092,000
		MISCELLANEOUS ¹ (10%)								\$259,000	\$600,000	\$637,000	\$635,000	\$888,000	\$610,000
		TOTAL PROJECT COST								\$2,840,000	\$6,597,000	\$7,005,000	\$6,979,000	\$9,760,000	\$6,702,000
		PERCENT DIFFERENCE FROM LOWEST								0%	132%	147%	146%	244%	136%

¹ Miscellaneous includes Engineering, Construction Services, Legal, Permits, etc.

² Utility and R/W costs are adjusted based on new alternative layout and using estimates provide by WVDOT.

APPENDIX D

EXHIBITS

Court Street

100' min



Save a lot

100 min

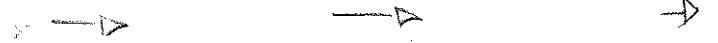


US 33 Main Street

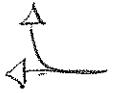


200'-250'

100' min



100 min



200'

As long as practical



US 119 Capitol Street

225'



175'



Ruby Memorial Bridge

250'



100 min

Williams Drive

Recommendations for 2033 Traffic Projections

From: Jim Porreca <J.Porreca@mabey.com>
Sent: Thursday, July 17, 2014 11:35 AM
To: Lewellyn, Matt
Subject: Mabey Bridge - Temporary Bridge Budgetary Results - Spencer, WV
Attachments: DDH with Footwalk.pdf; TSH with Footwalk.pdf; Typical Section for MU Box Bridge.pdf; 8FT WALKWAY MU SSH.pdf; Suggested guardrail attachment.pdf; 02162012 - MU Bridge Spec rev B.pdf

Matt,

Budgetary Results. Typical sections attached for each option.

Option #1 - Vehicular

Mabey Temp Bridge Description...

- Length: 177ft
- No. of spans: 1qty
- Roadway Width: 24ft (2qty-12ft lanes)
- Design Load: HS25
- Truss Constr: DDHR2H – see attached typical section
- Deck Surface: Steel raised checker plate w/ allowance of 2" of asphalt by others
- Footwalk: 5ft cantilevered walkway
- Guardrails: By others – standard W – Rail with posts – detail attached
- Budgetary Rental Pricing
 - \$80,000 for the first 13 weeks (min rental period)
 - \$4,800 per week thereafter
 - Freight to site: \$19,000 (approximate)

Option #2 - Vehicular

Mabey Temp Bridge Description...

- Length: 177ft
- No. of spans: 2qty
- Span Lengths: 88ft / 88ft
- Roadway Width: 24ft (2qty-12ft lanes)
- Design Load: HL93
- Truss Constr: TSH – see attached typical section
- Deck Surface: Steel raised checker plate w/ allowance of 2" of asphalt by others
- Footwalk: 5ft cantilevered walkway
- Guardrails: By others – standard W – Rail with posts – detail attached
- Budgetary Rental Pricing
 - \$60,000 for the first 13 weeks (min rental period)
 - \$3,600 per week thereafter
 - Freight to site: \$15,000 (approximate)

Option #3 - Pedestrian

Mabey Temp Pedestrian Bridge Description...

- Length: 177ft
- No. of spans: 1qty
- Walkway Width: 5ft
- Design Load: 85psf AASHTO Pedestrian Load
- Truss Constr: MU Box Truss – see attached typical section
- Deck Surface: Timber deck by others – typically 4x4 stringers spaced on 16" c/c with a 1" thick plywood atop
- Handrails: by others – typically scaffold tubing or timber clamped to our trusses
- Safety fencing: by others
- Budgetary Rental Pricing
 - \$40,000 for the first 13 weeks (min rental period)
 - \$2,800 per week thereafter
 - Freight to site: \$10,000 (approximate)

Option #4 - Pedestrian

Mabey Temp Pedestrian Bridge Description...

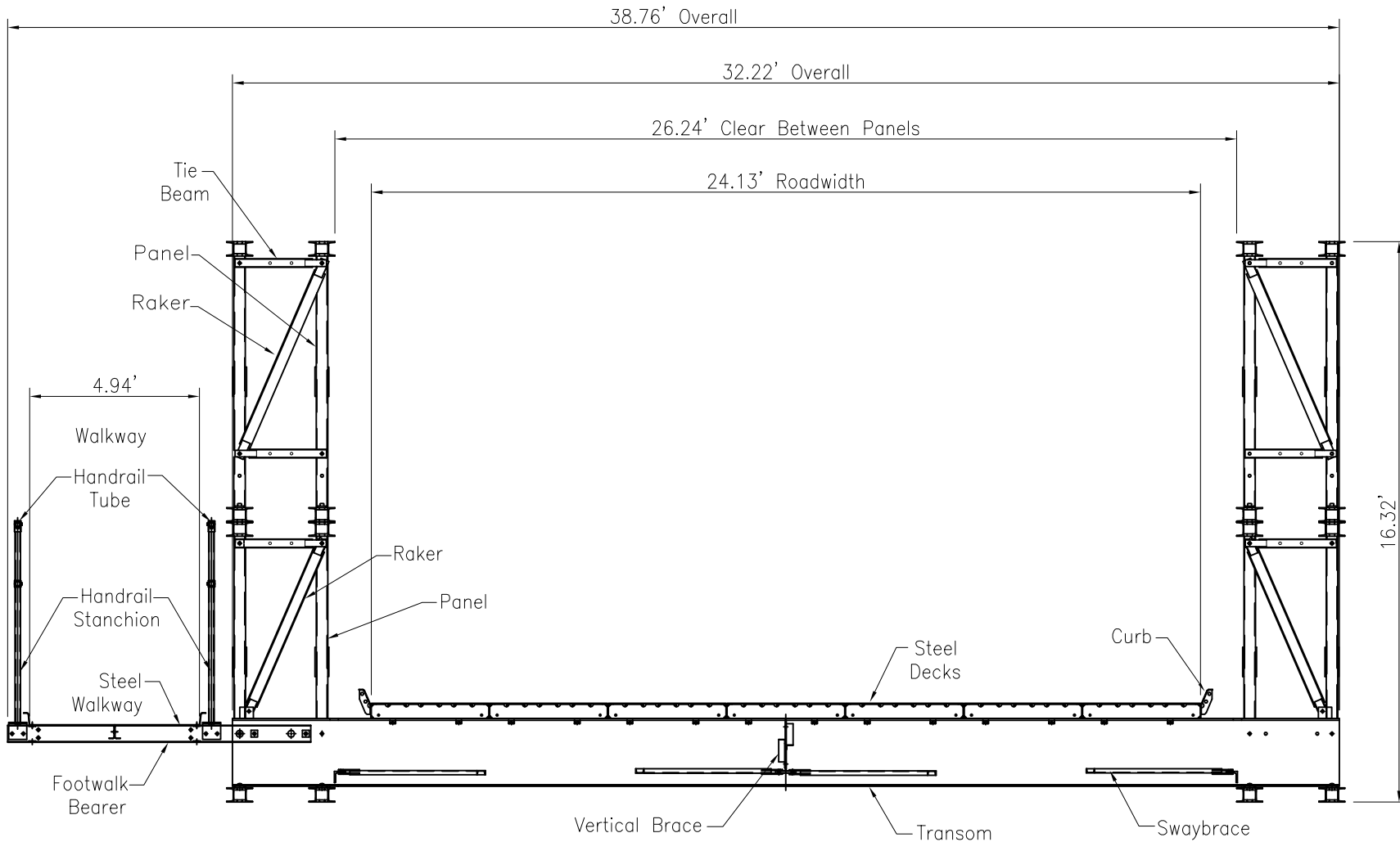
- Length: 177ft
- No. of spans: 2qty
- Span Lengths: 88ft / 88ft
- Walkway Width: 5ft
- Design Load: 85psf AASHTO Pedestrian Load
- Truss Constr: SSHRH – see attached typical section
- Deck Surface: Timber deck by others – typically 2x8 stringers spaced on 16" c/c with a 1" thick plywood atop
- Handrails: by others – typically scaffold tubing or timber clamped to our trusses
- Safety fencing: by others
- Budgetary Rental Pricing
 - \$30,000 for the first 13 weeks (min rental period)
 - \$1,800 per week thereafter
 - Freight to site: \$6,000 (approximate)

Budgetary pricing excludes taxes and return freight.

I trust this covers your request, please contact me with any comments or concerns.

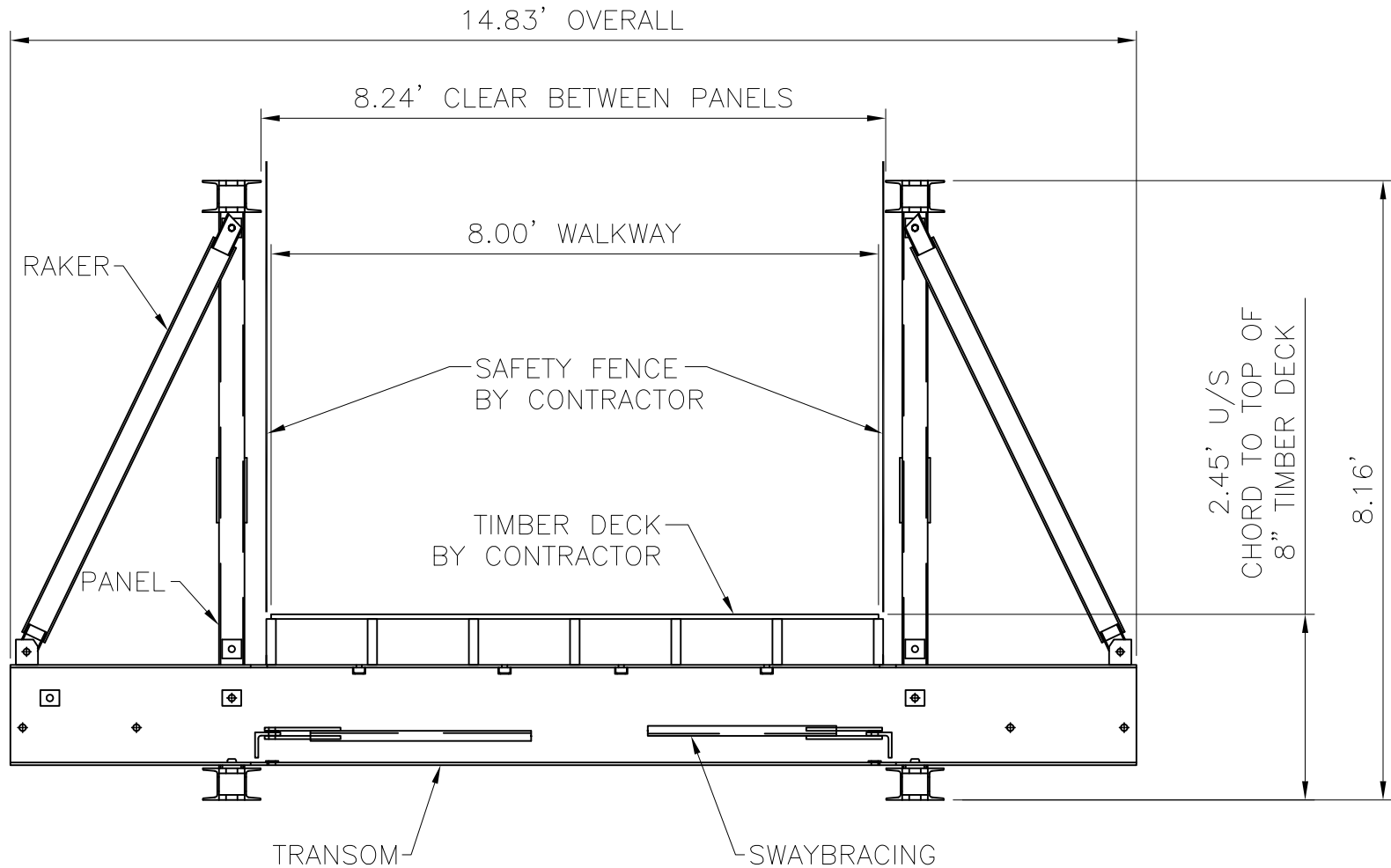
Respectfully,

James Porreca
 Bridging/Structural Shoring Division
 Mabey Inc.
 6770 Dorsey Rd.
 Elkridge, MD 21075
 M: 412.475.6087
 F: 1.866.574.0250
 E: j.porreca@mabey.com




TYPICAL SECTION

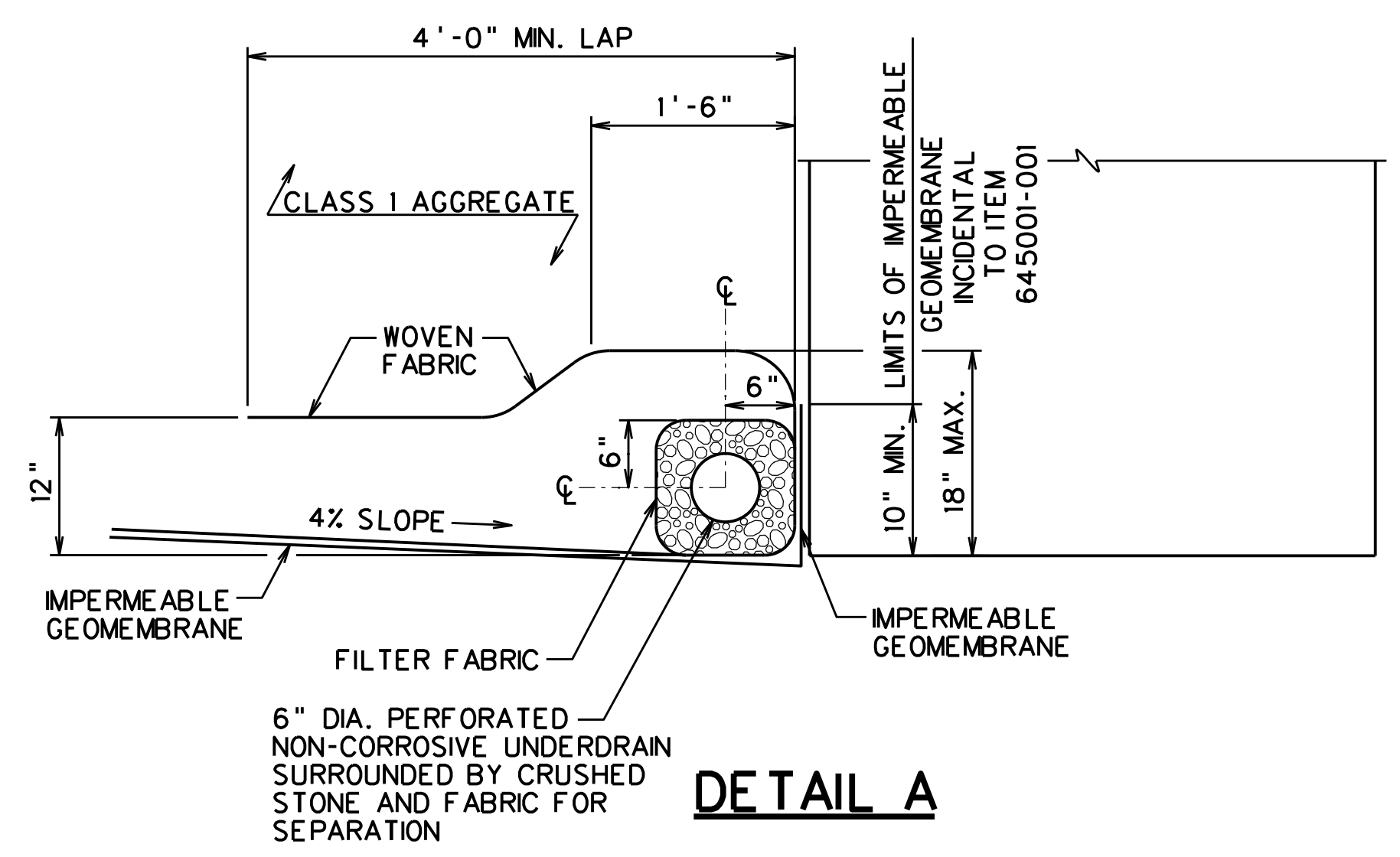
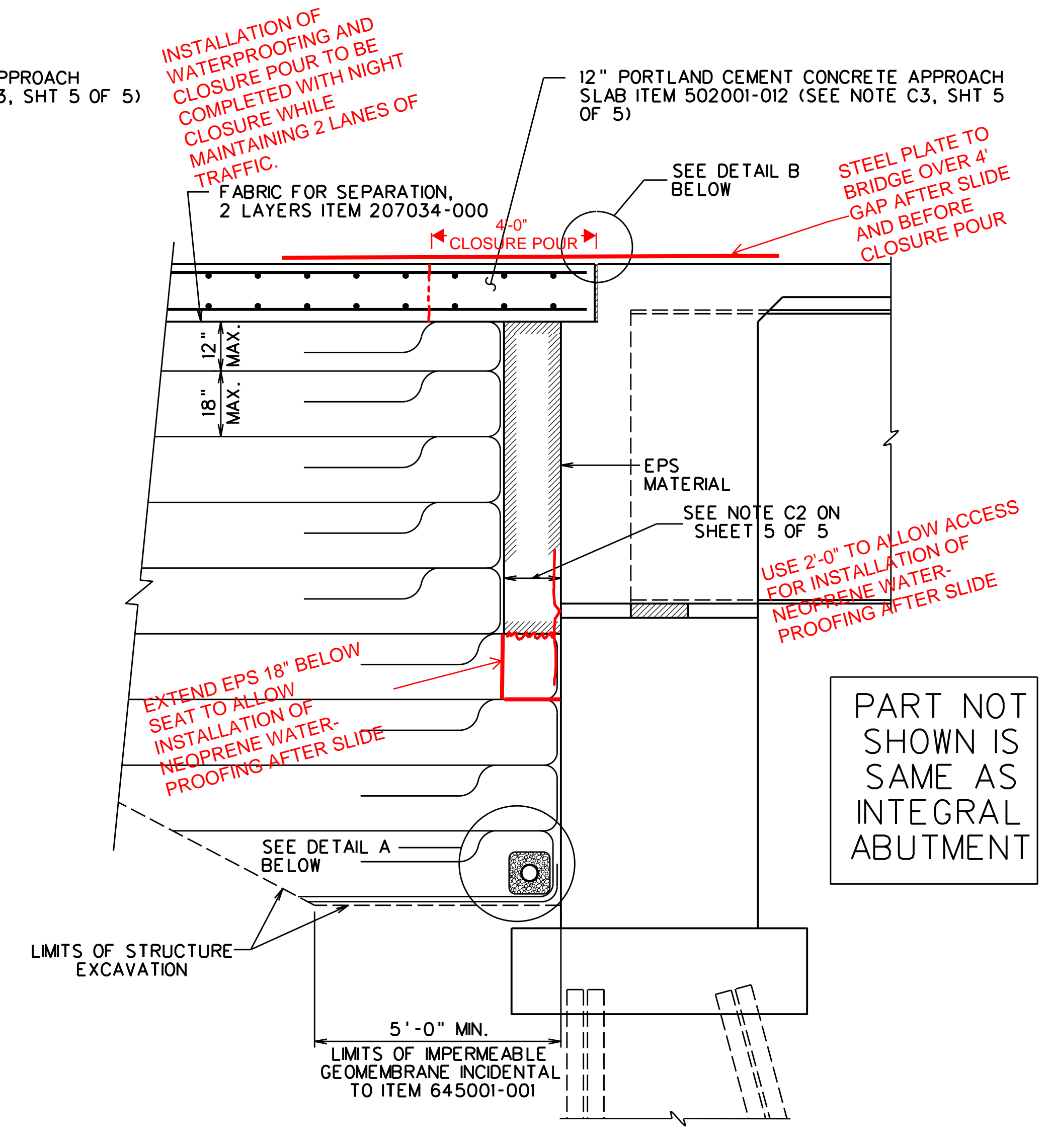
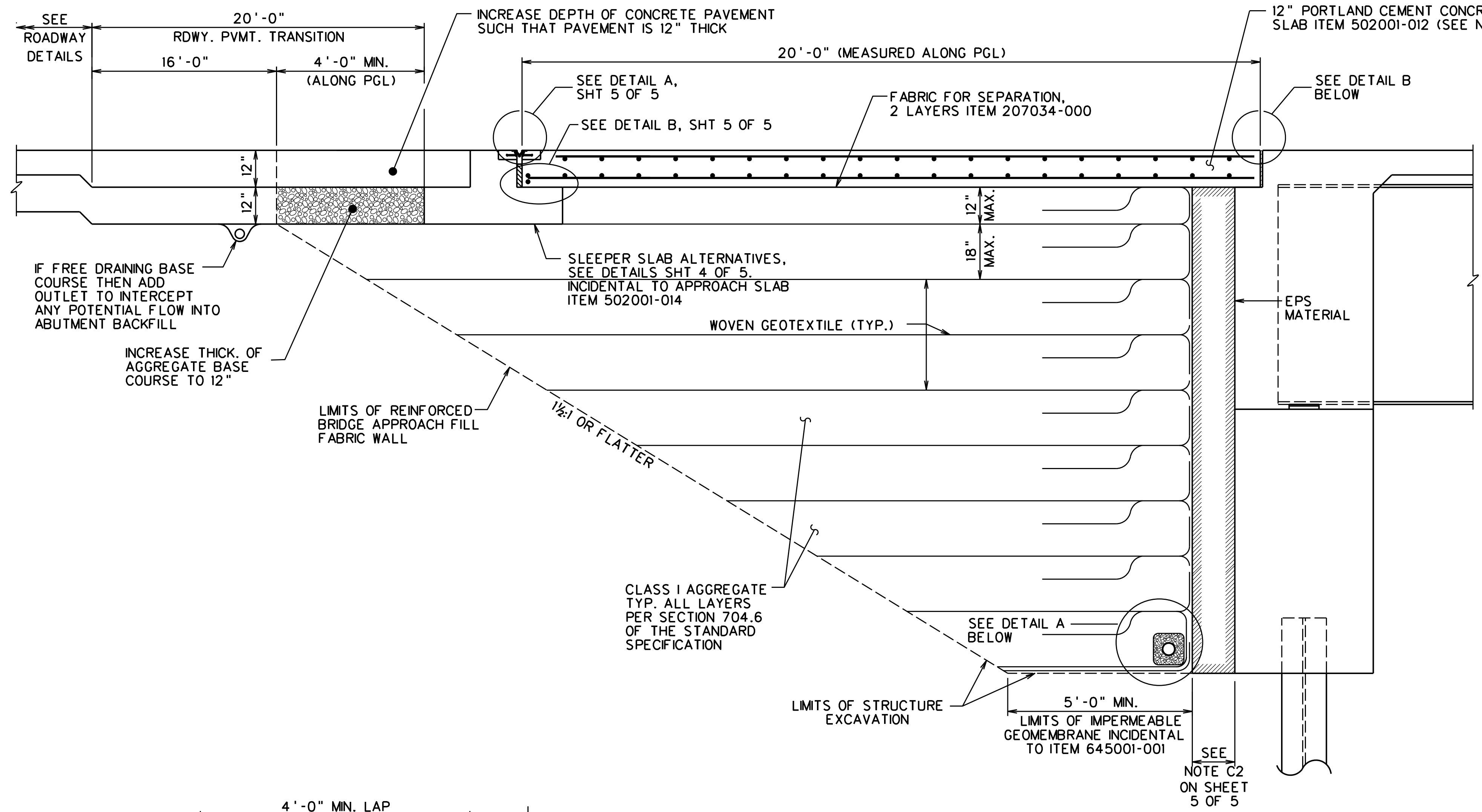
PRELIMINARY



TYPICAL SECTION

 <small>rent the right way</small>	JOB NO. ---	CUSTOMER: ---	PROJECT: ---	TITLE: MU ~ SSH ~ 8' WALKWAY		
	MABEY INC.	6770 DORSEY ROAD ELKRIDGE, MD. 21075	TEL: (410) 379-2800 FAX: (410) 379-2801	BY: C.J.	CK: --	DATE: 6-21-2013

PROJECT NUMBERS		DISTRICT	COUNTY	SHEET NO.	TOTAL
STATE	FEDERAL				
					Appendix D - Sheet D5 of 6

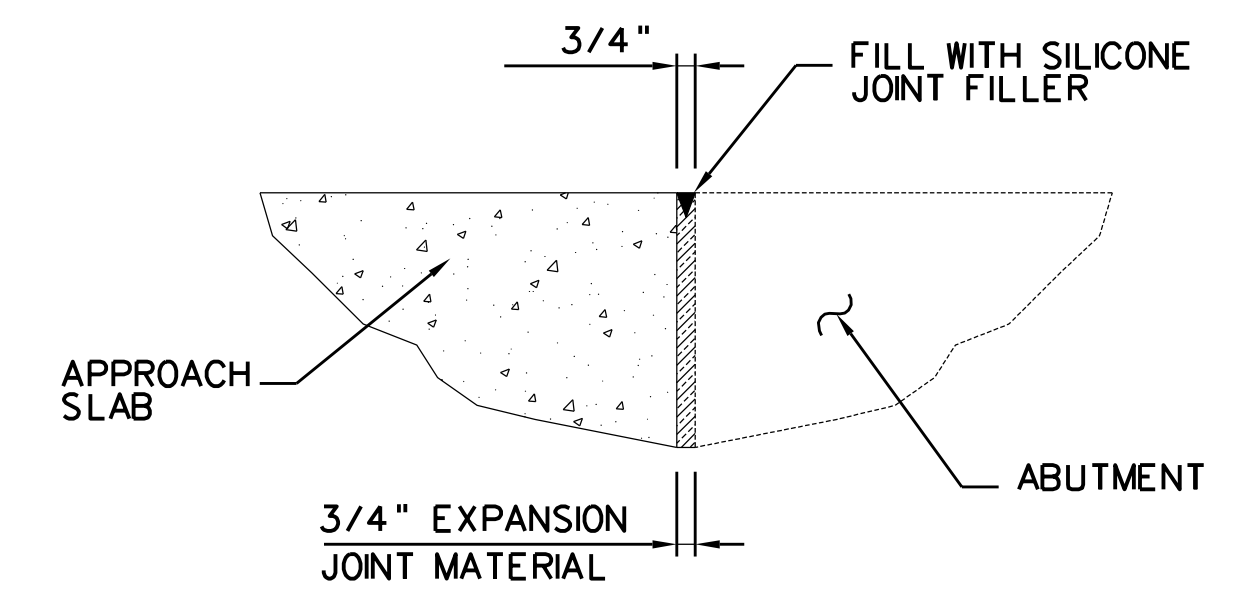


DETAIL A

FOR INTEGRAL ABUTMENTS WITH THERMAL MOVEMENTS GREATER THAN 2"

FOR SEMI-INTEGRAL ABUTMENTS WITH THERMAL MOVEMENTS GREATER THAN 2"

TYPICAL LONGITUDINAL SECTION THROUGH SLEEPER SLAB AND APPROACH SLAB



DETAIL B

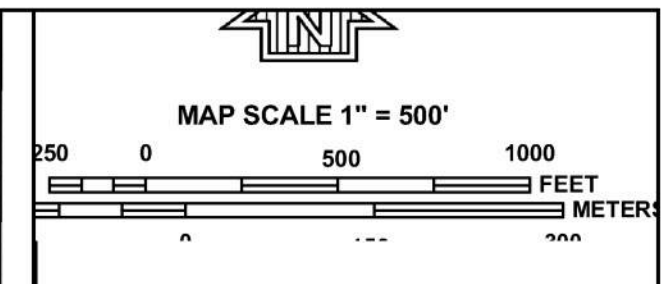
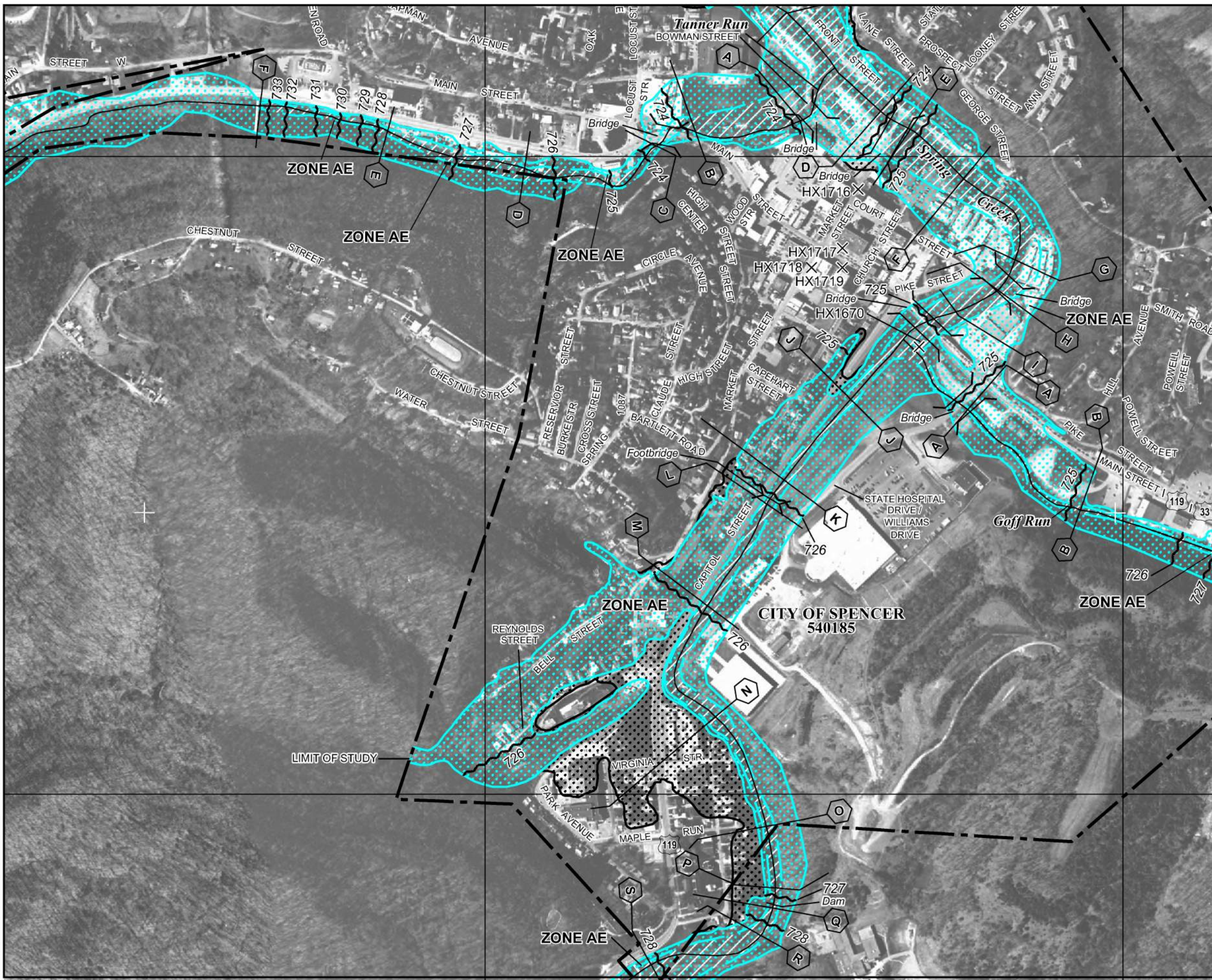
NO.	REVISION	DATE	BY

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ENGINEERING DIVISION

DESIGNED	DATE	CHECKED	DATE
DRAWN	DATE	REVIEWED	DATE

SAMPLE DRAWINGS FOR SLEEPER SLAB, JOINTS AND ABUTMENT BACKFILL

SHEET	2 of 5
DESIGN NUMBER	



JOINS PANEL 0162

NFP PANEL 0161D

FIRM
FLOOD INSURANCE RATE MAP
ROANE COUNTY,
WEST VIRGINIA
AND INCORPORATED AREAS

PANEL 161 OF 430
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
ROANE COUNTY, UNINCORPORATED AREAS	540183	0161	D
SPENCER, CITY OF	540185	0161	D

Notice to User: The **Map Number** shown below should be used when placing map orders; the **Community Number** shown above should be used on insurance applications for the subject community.

MAP NUMBER
54087C0161D
EFFECTIVE DATE
MARCH 2, 2012

Federal Emergency Management Agency

JOINS PANEL 0162

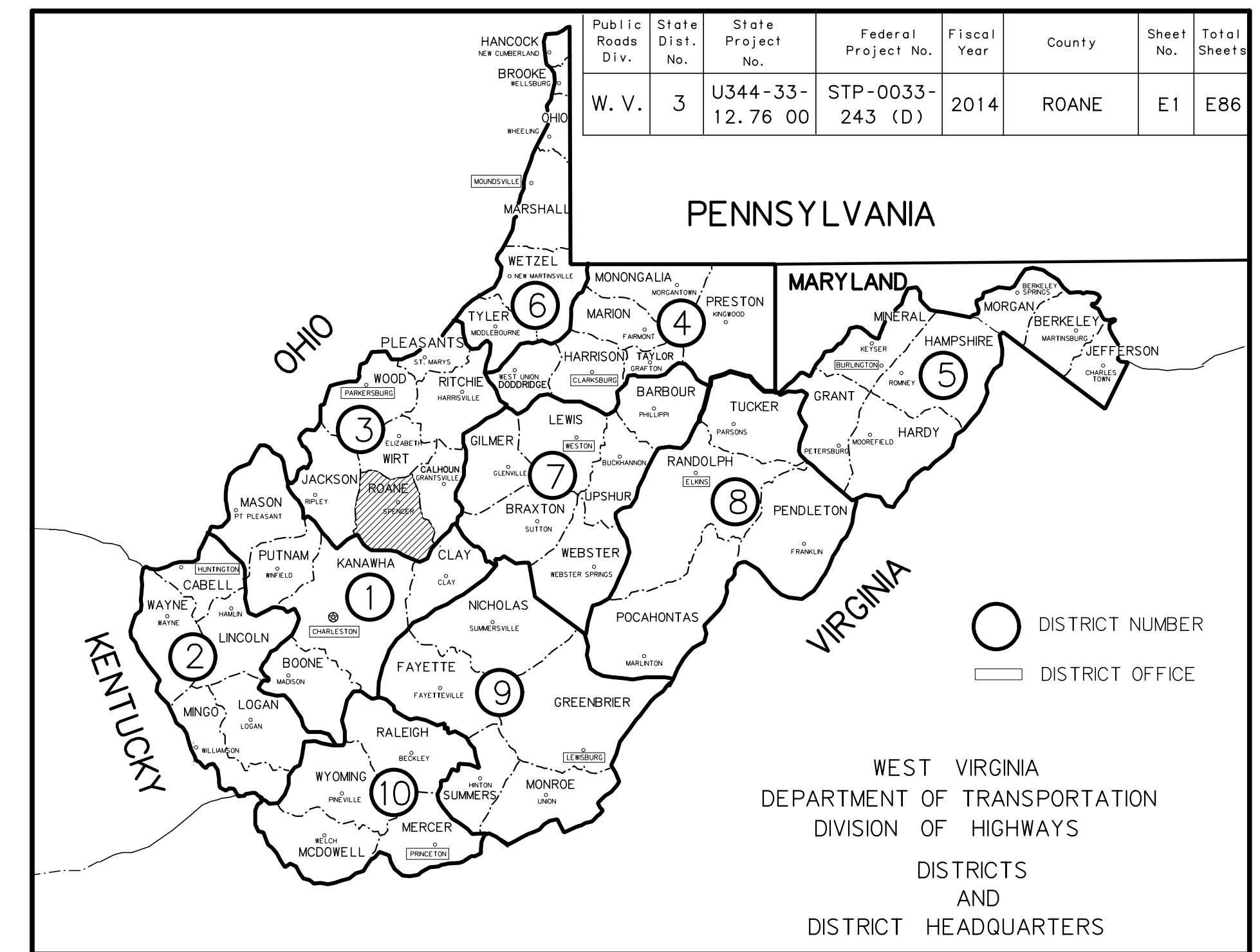
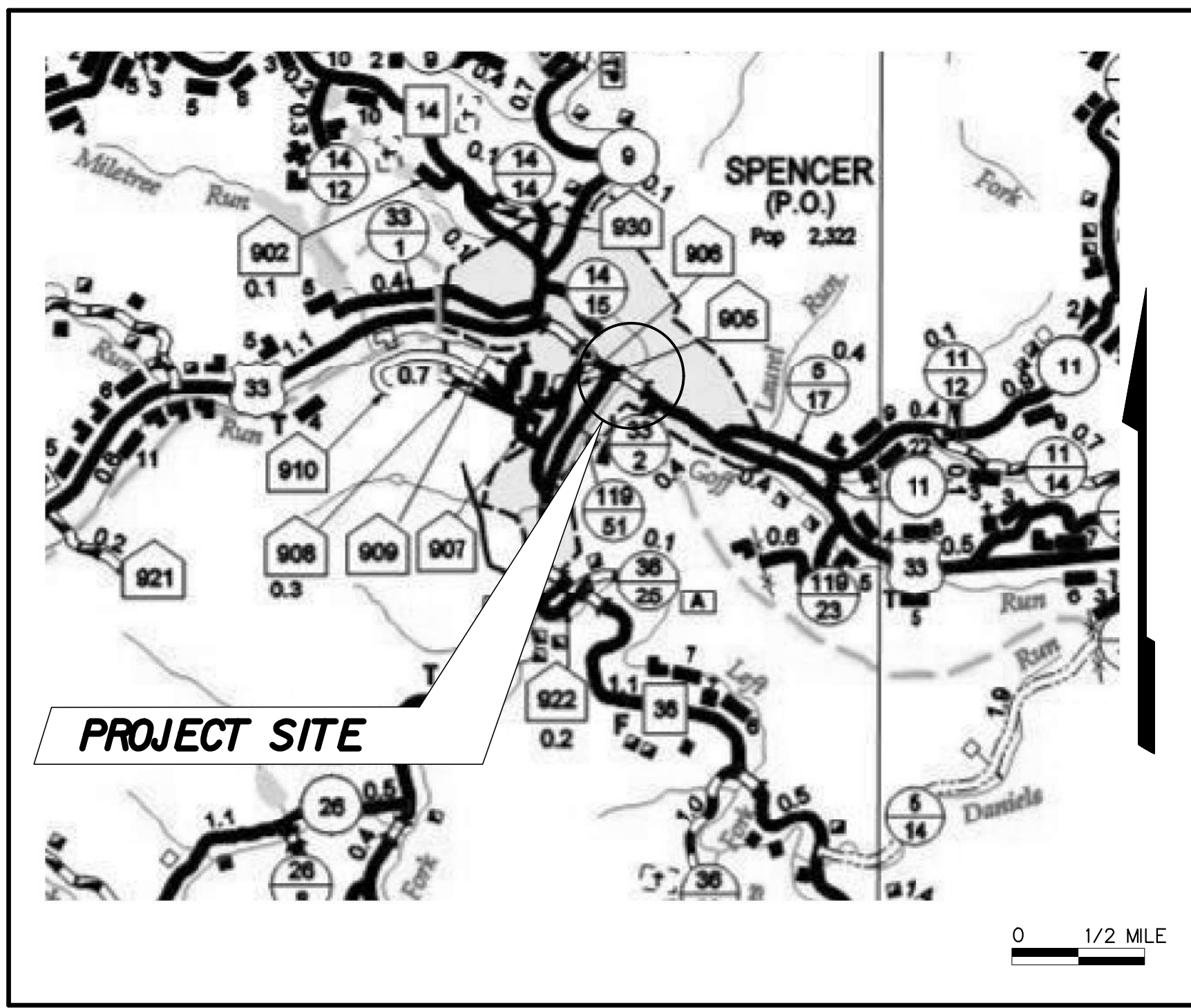
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

APPENDIX E
ALTERNATIVE PLANS

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS PLANS FOR CONSTRUCTION

OF
STATE HIGHWAY
FEDERAL PROJECT NO. STP-0033-243 (D)
STATE PROJECT NO. U344-33-12.76 00
US ROUTE 33 / US ROUTE 119
SPENCER CORP. DISTRICT
ROANE COUNTY

COLONEL RUBY BRADLEY BRIDGE DESIGN STUDY



Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E1	E86

TYPE OF CONSTRUCTION

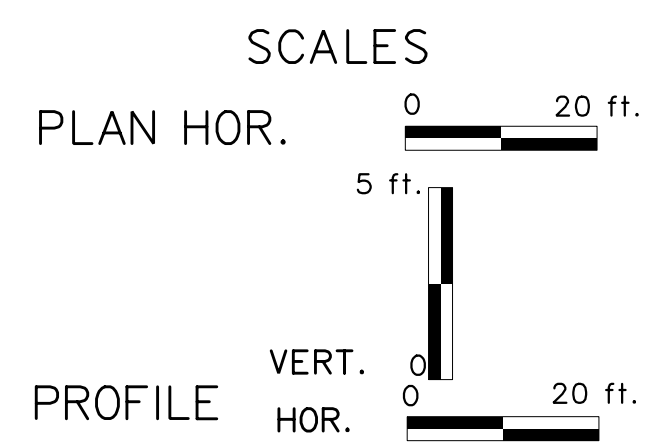
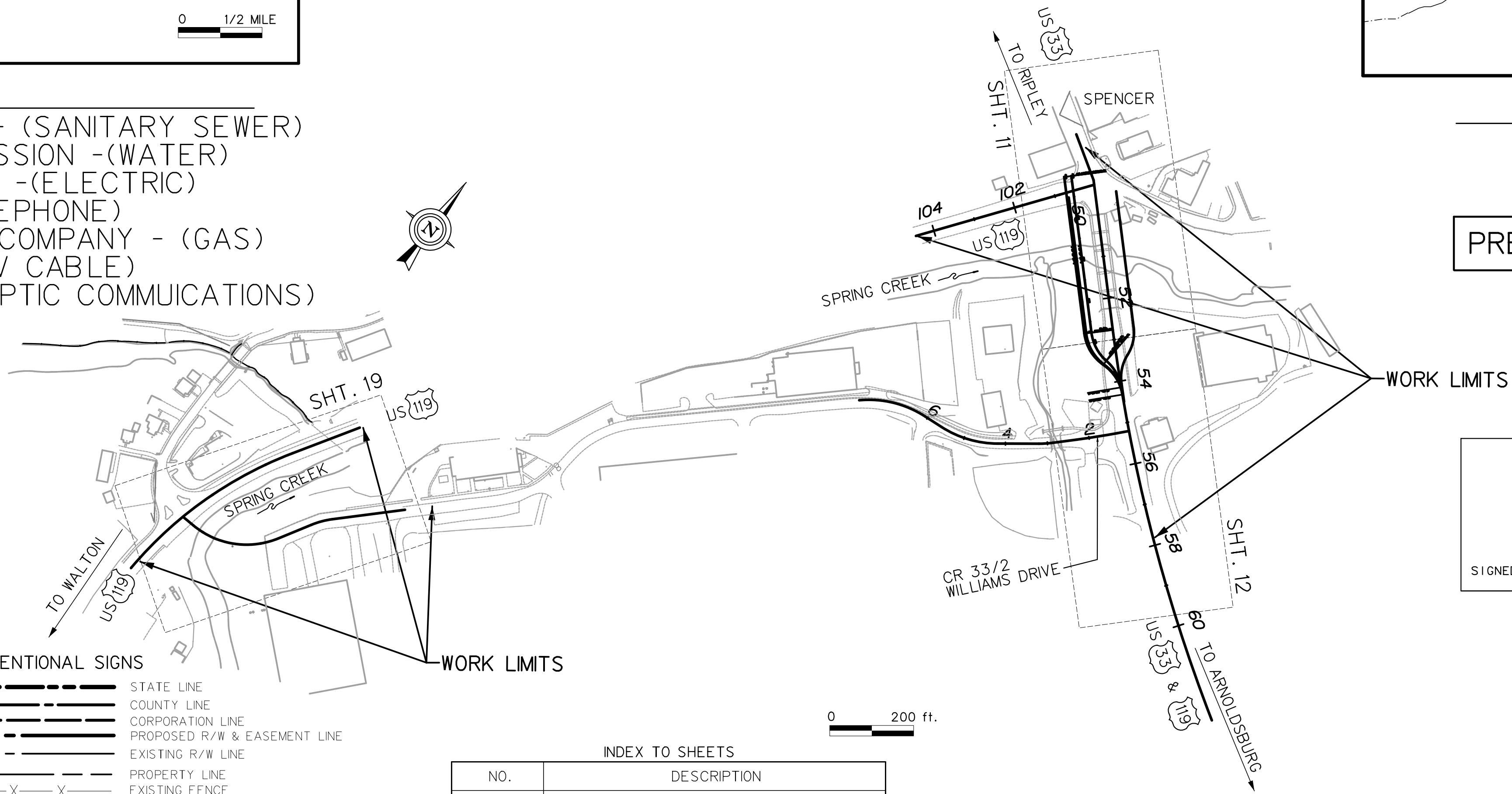
DESIGN STUDY OFFICE REVIEW

PRELIMINARY NOT FOR CONSTRUCTION

PLANS PREPARED BY
BURGESS & NIPLE, INC.
PARKERSBURG, WV

SIGNED.....DATE:.....WV REG. P.E.....

- UTILITIES**
- SPENCER SANITARY BOARD - (SANITARY SEWER)
 - SPENCER WATER COMMISSION -(WATER)
 - MON-POWER COMPANY -(ELECTRIC)
 - FRONTIER- (TELEPHONE)
 - CONSUMERS GAS UTILITY COMPANY - (GAS)
 - SUDDENLINK - (TV CABLE)
 - LUMOS NETWORKS - (FIBER OPTIC COMMUNICATIONS)



- CONVENTIONAL SIGNS**
- STATE LINE
 - COUNTY LINE
 - CORPORATION LINE
 - PROPOSED R/W & EASEMENT LINE
 - EXISTING R/W LINE
 - PROPERTY LINE
 - EXISTING FENCE
 - PROPOSED FENCE
 - EDGE OF STREAM
 - PROPOSED GUARD RAIL
 - EXISTING GUARD RAIL
 - RAILROAD
 - GAS LINE
 - WATER LINE
 - TELEPHONE LINE
 - ELECTRIC LINE
 - TELEPHONE POLE
 - POWER POLE
 - COMBINED POWER AND TELEPHONE POLE
 - TREE
 - SHRUB
 - RIGHT OF WAY MARKER

INDEX TO SHEETS

NO.	DESCRIPTION
E1	TITLE SHEET
E2	TYPICAL SECTIONS
E3 - E7	TRAFFIC SKETCH MAPS
E8 - E9	PROPERTY MAP AND OWNERSHIP INDEX
E10 - E23	ALTERNATIVE 1A
E24 - E36	ALTERNATIVE 1B
E37 - E48	ALTERNATIVE 2A
E49 - E58	ALTERNATIVE 2B
E59 - E71	ALTERNATIVE 3
E72 - E86	ALTERNATIVE 4

DESIGN DESIGNATION

A . D . T (2013 -)	10,200
A . D . T (2033 -)	13,800
D . H . V	7.14
D	55/45
T	2%
V	35 MPH

NOTES: STANDARD DETAIL BOOK VOL. I DATED JANUARY 1, 2000 & VOLUME II DATED JANUARY 1, 1994, SHALL APPLY TO THIS PROJECT.

REVISION NUMBER	SHEET NUMBER	REVISIONS	DATE	BY

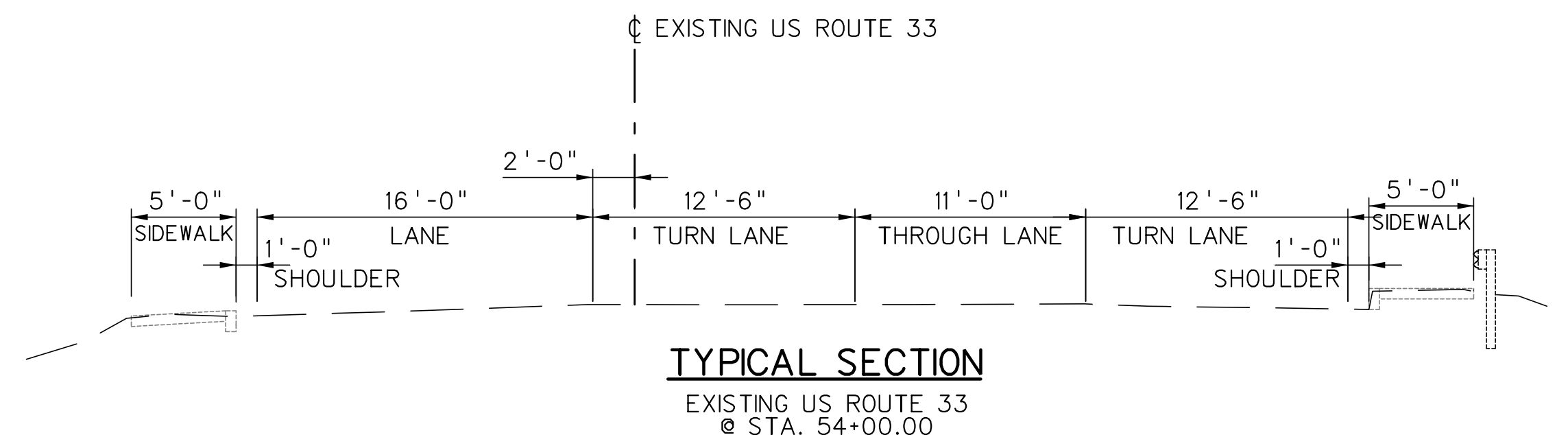
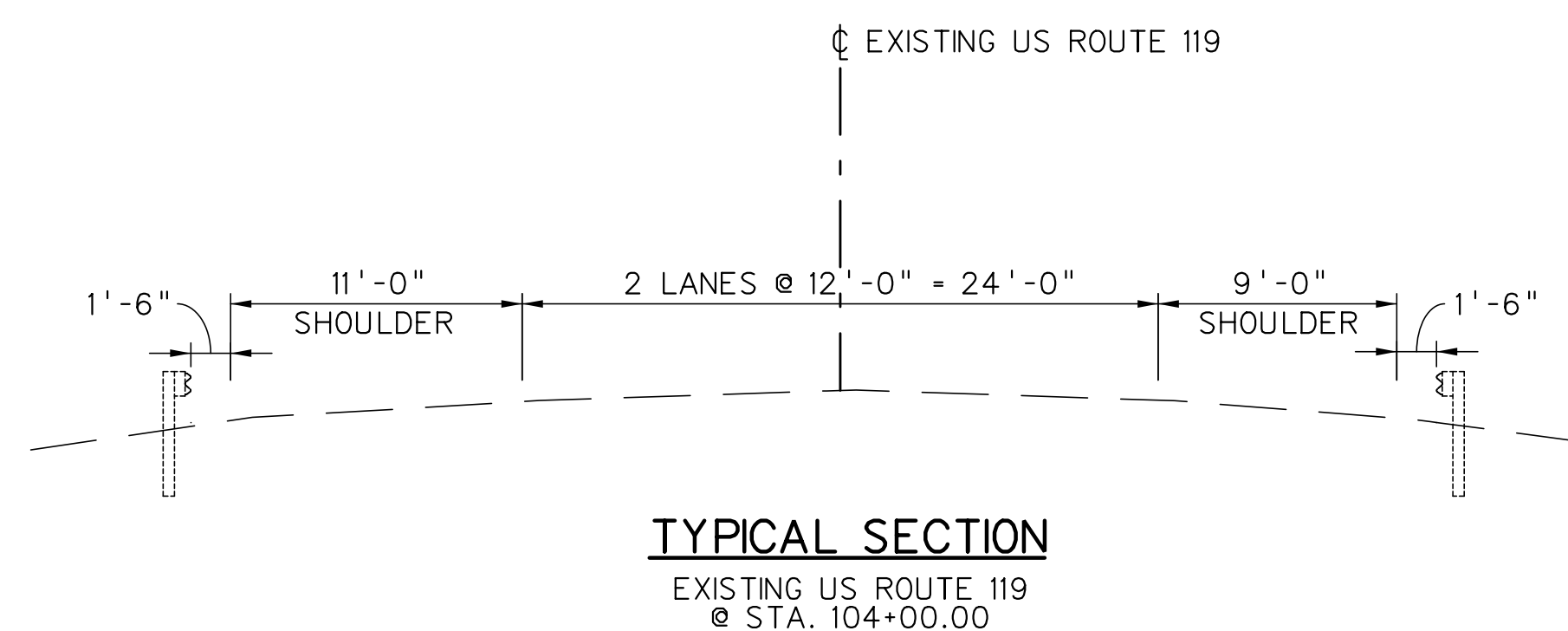
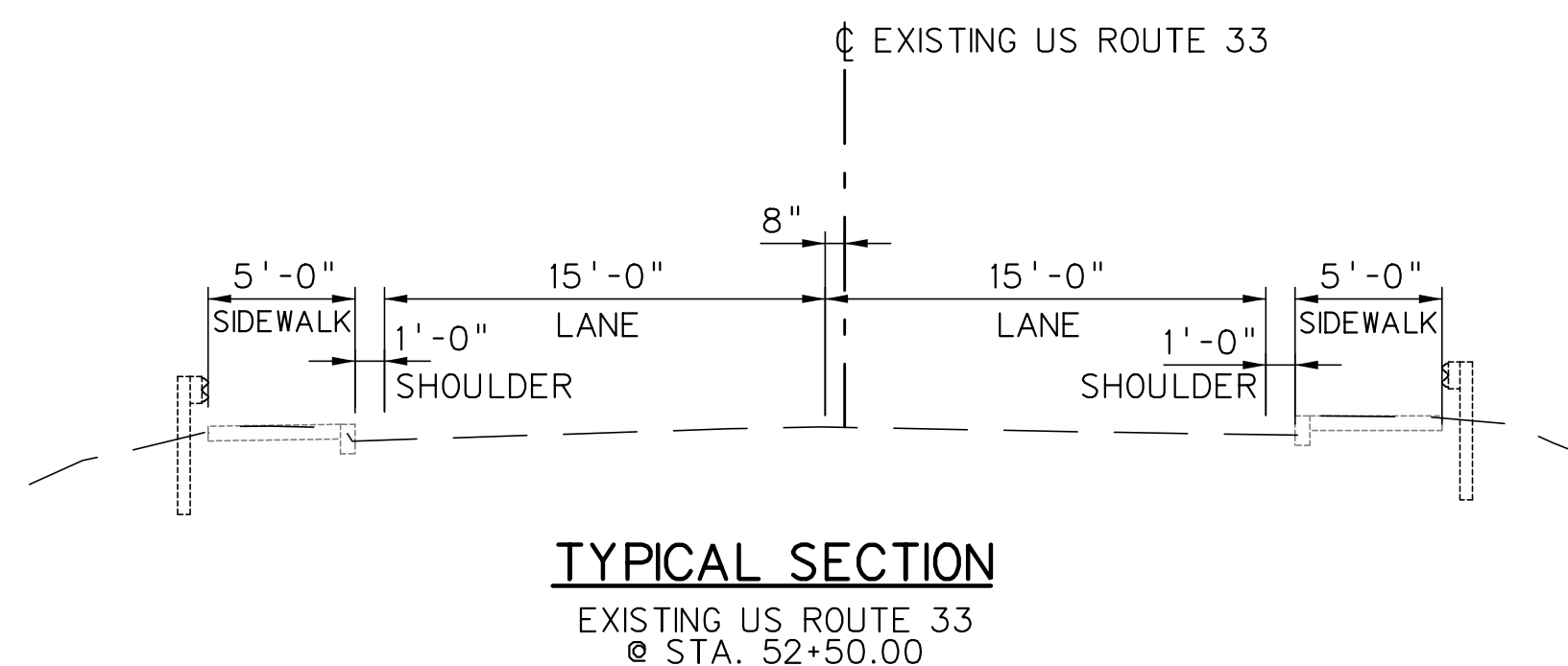
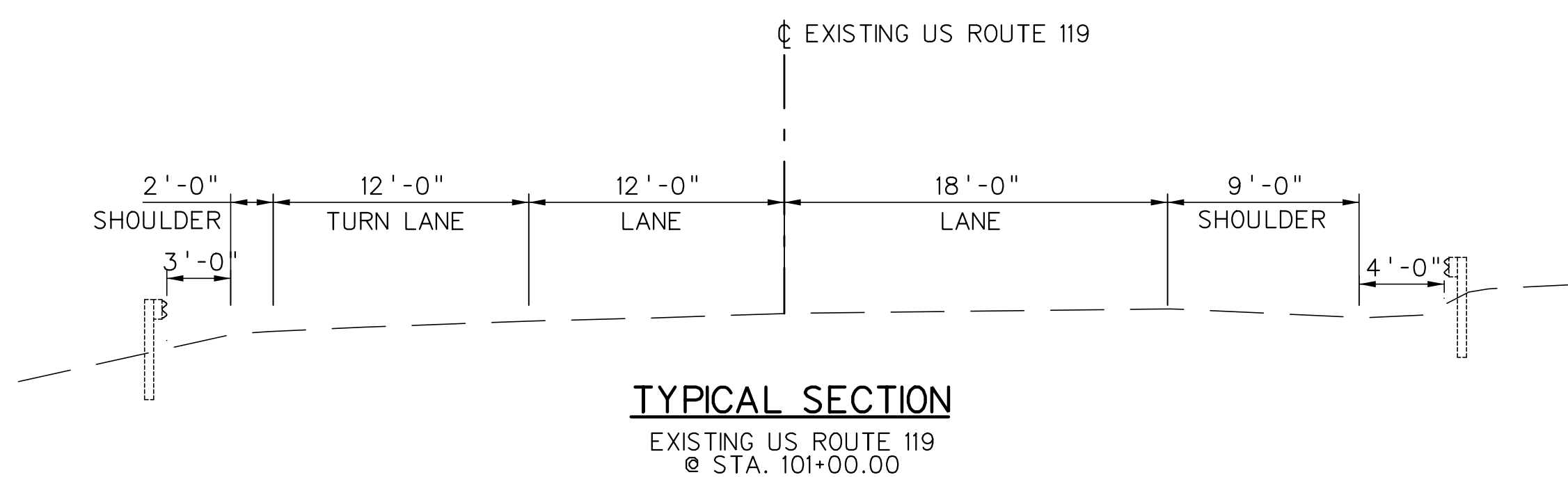
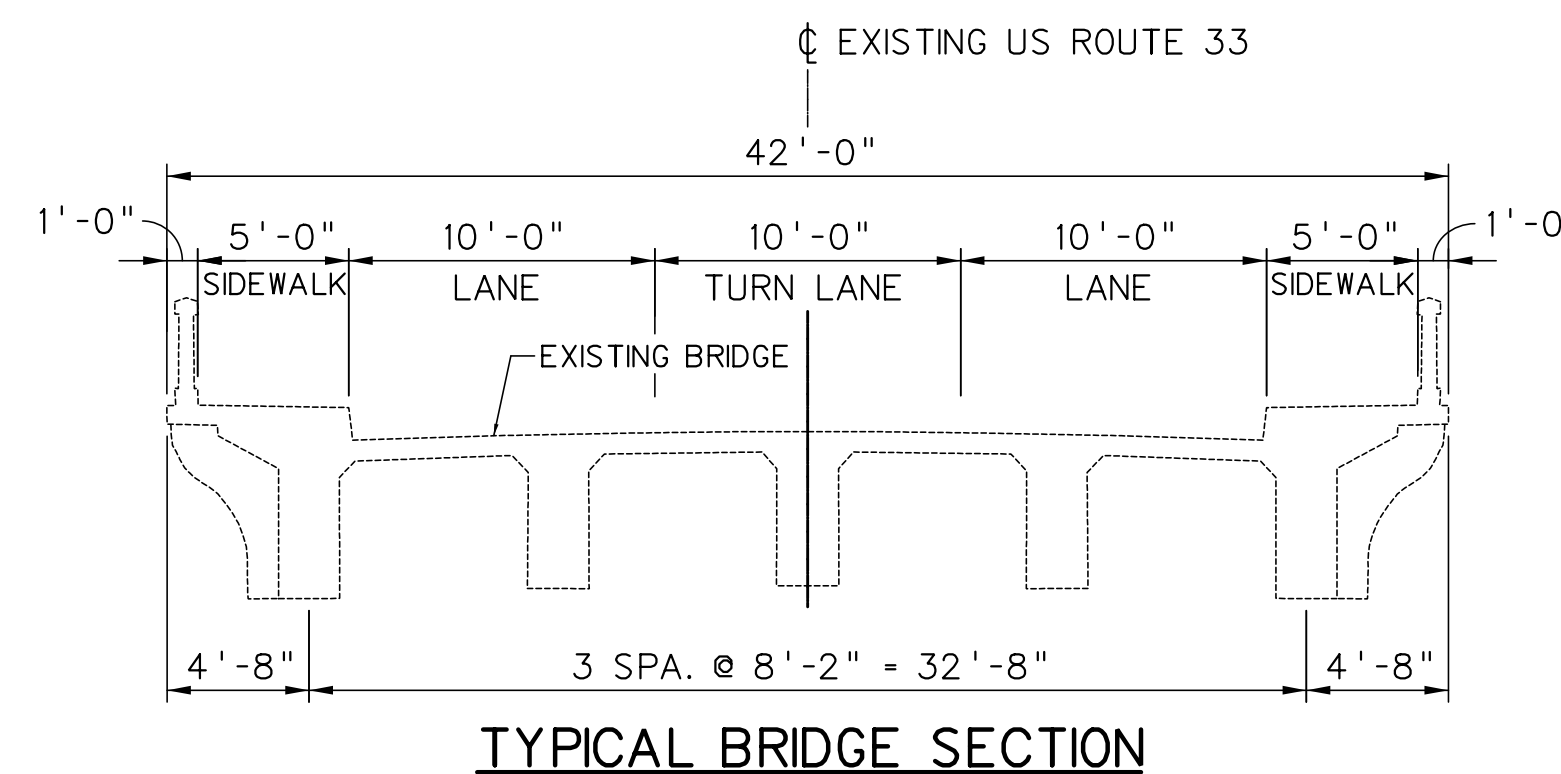
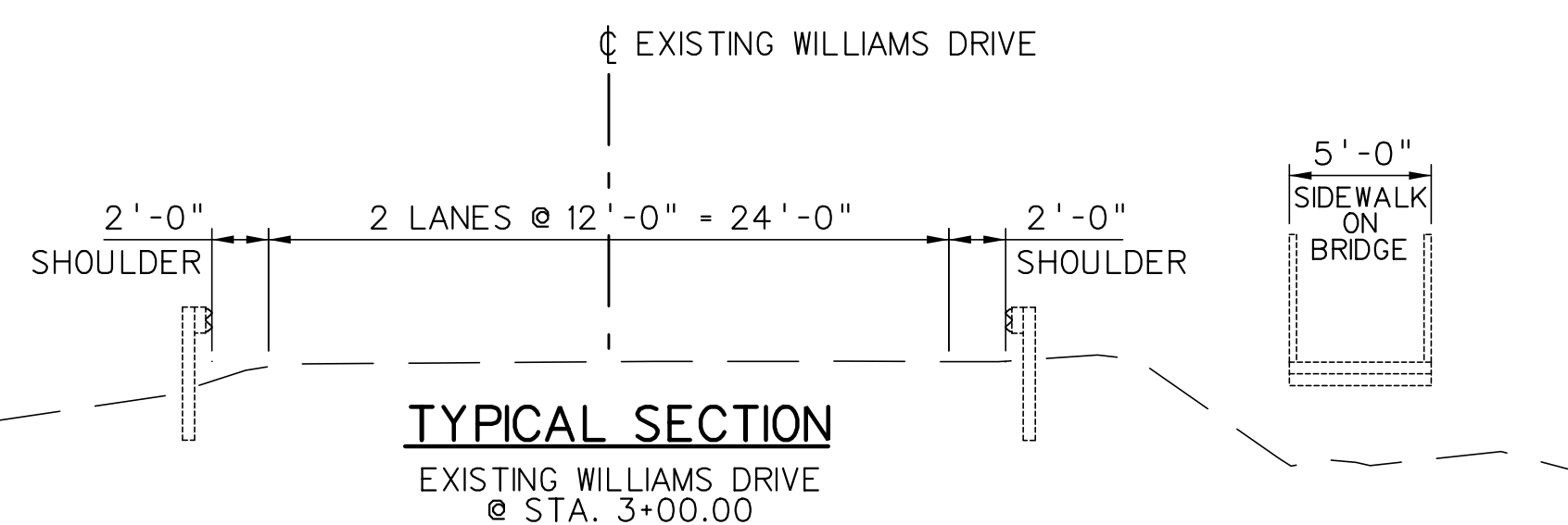
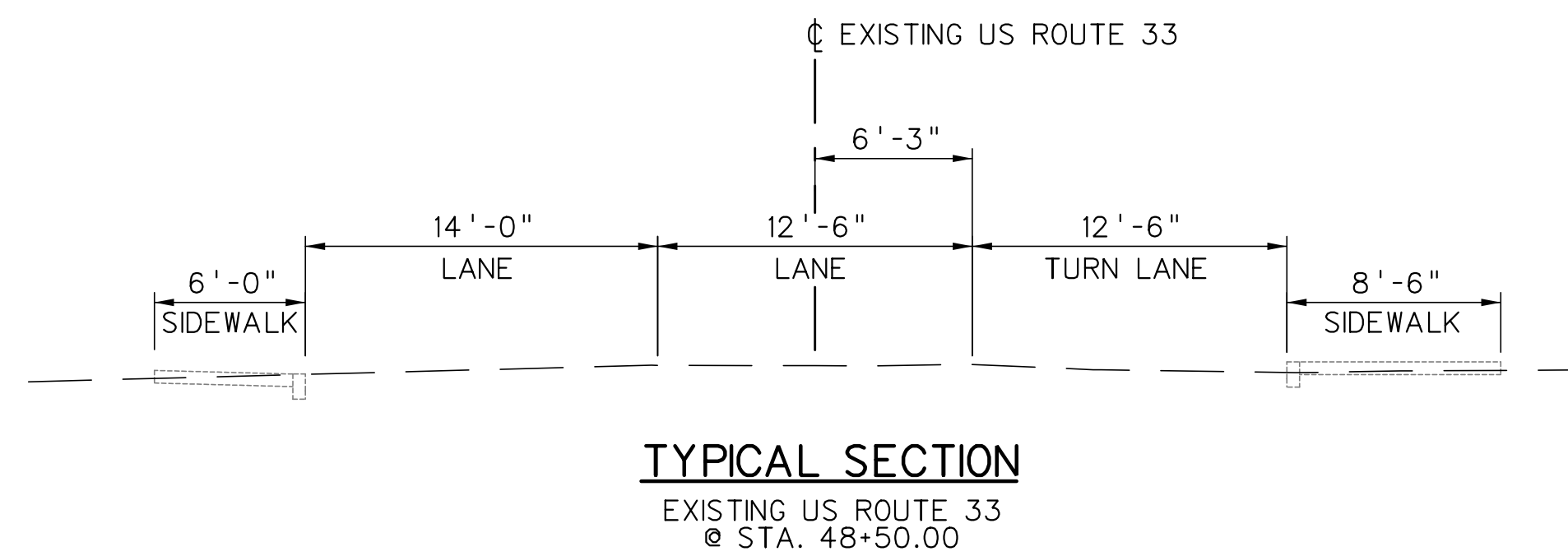
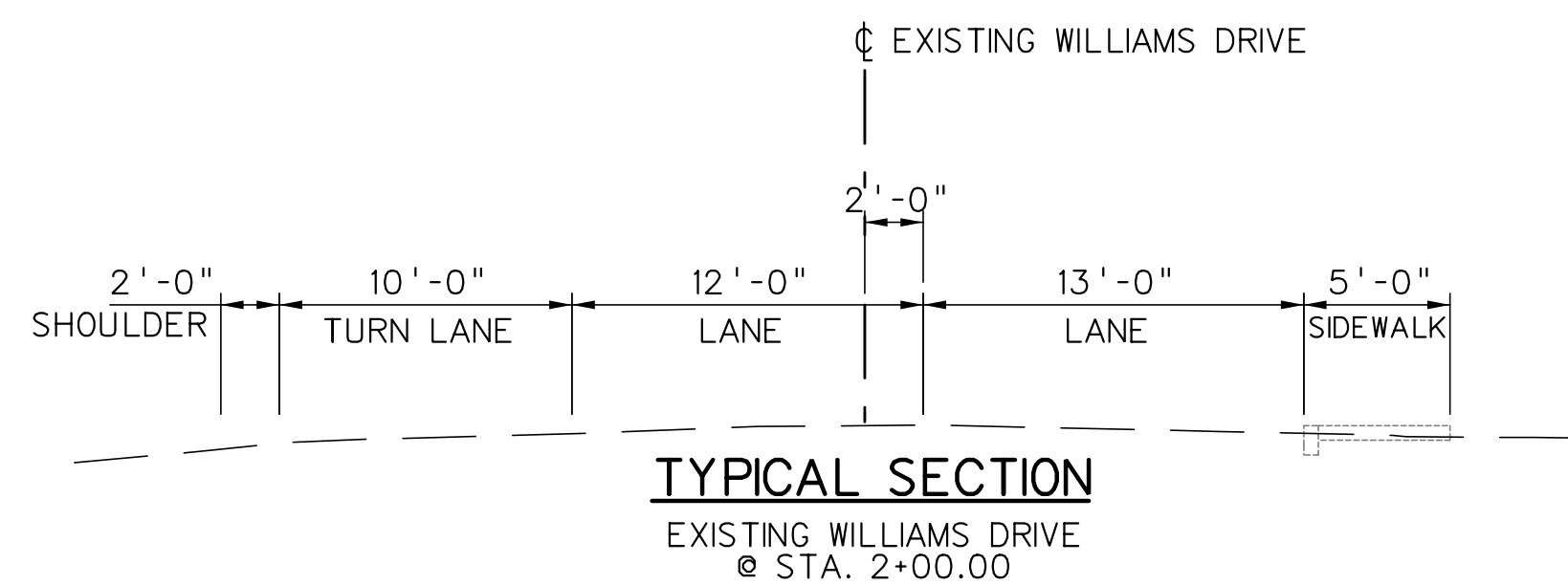
2014
I HEREBY CERTIFY THAT THIS IS A CORRECT COPY OF THE
PLANS OF PROJECT U344-33-12.76 00, STP-0033-243 (D)
EXECUTIVE SECRETARY

RECOMMENDED _____ PROJECT MANAGER

RECOMMENDED FOR APPROVAL _____ STATE HIGHWAY ENGINEER

APPROVED _____ COMMISSIONER OF HIGHWAYS

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E2	E86



NOTE: ALL DIMENSIONS ARE APPROXIMATE.



THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

EXISTING
TYPICAL SECTIONS

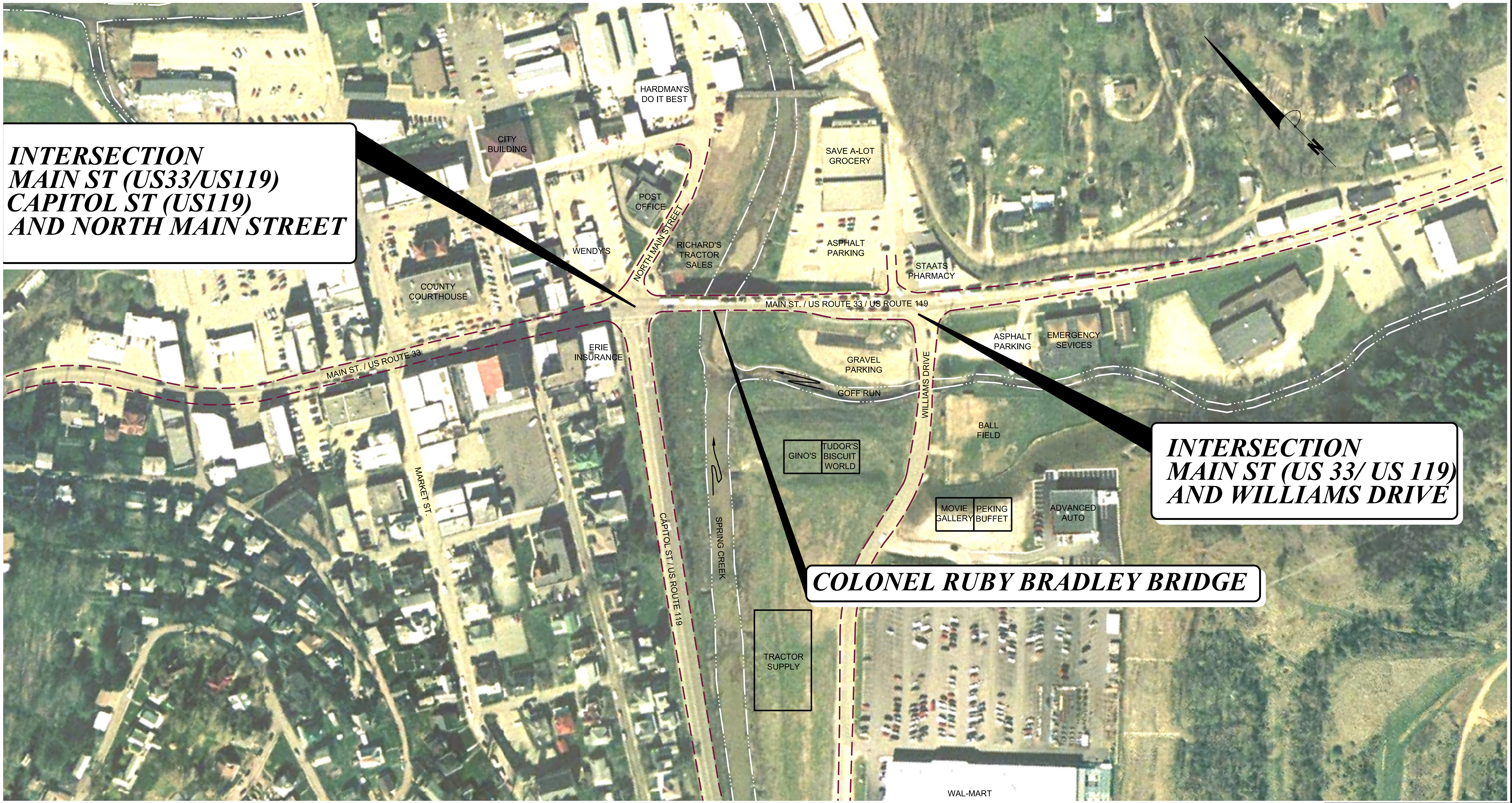
REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E3	E86

**INTERSECTION
MAIN ST (US33/US119)
CAPITOL ST (US119)
AND NORTH MAIN STREET**

**INTERSECTION
MAIN ST (US 33/ US 119)
AND WILLIAMS DRIVE**

COLONEL RUBY BRADLEY BRIDGE



BURGESS & NIPLÉ
PARKERSBURG, WV

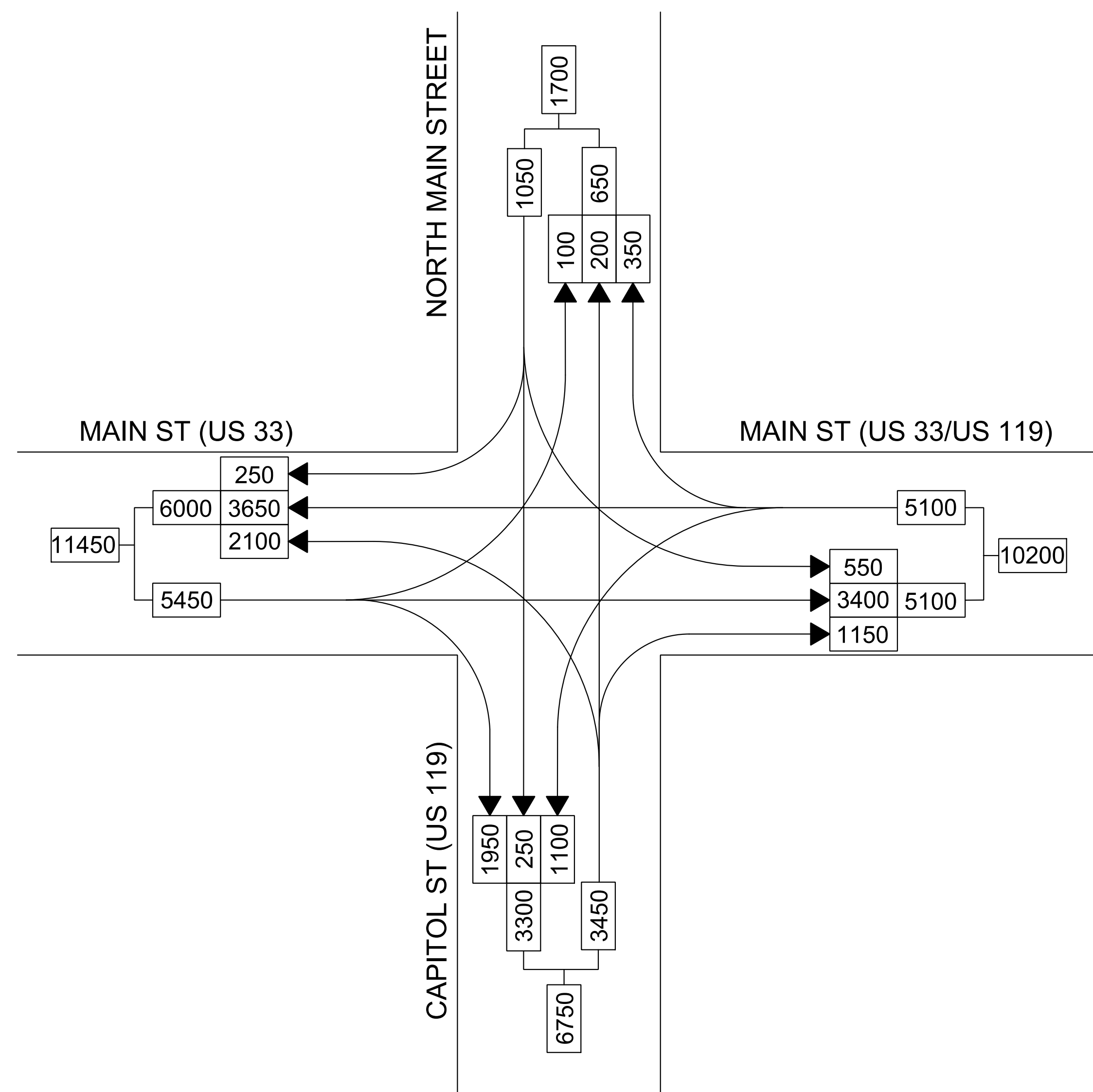
THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

TRAFFIC SKETCH MAPS

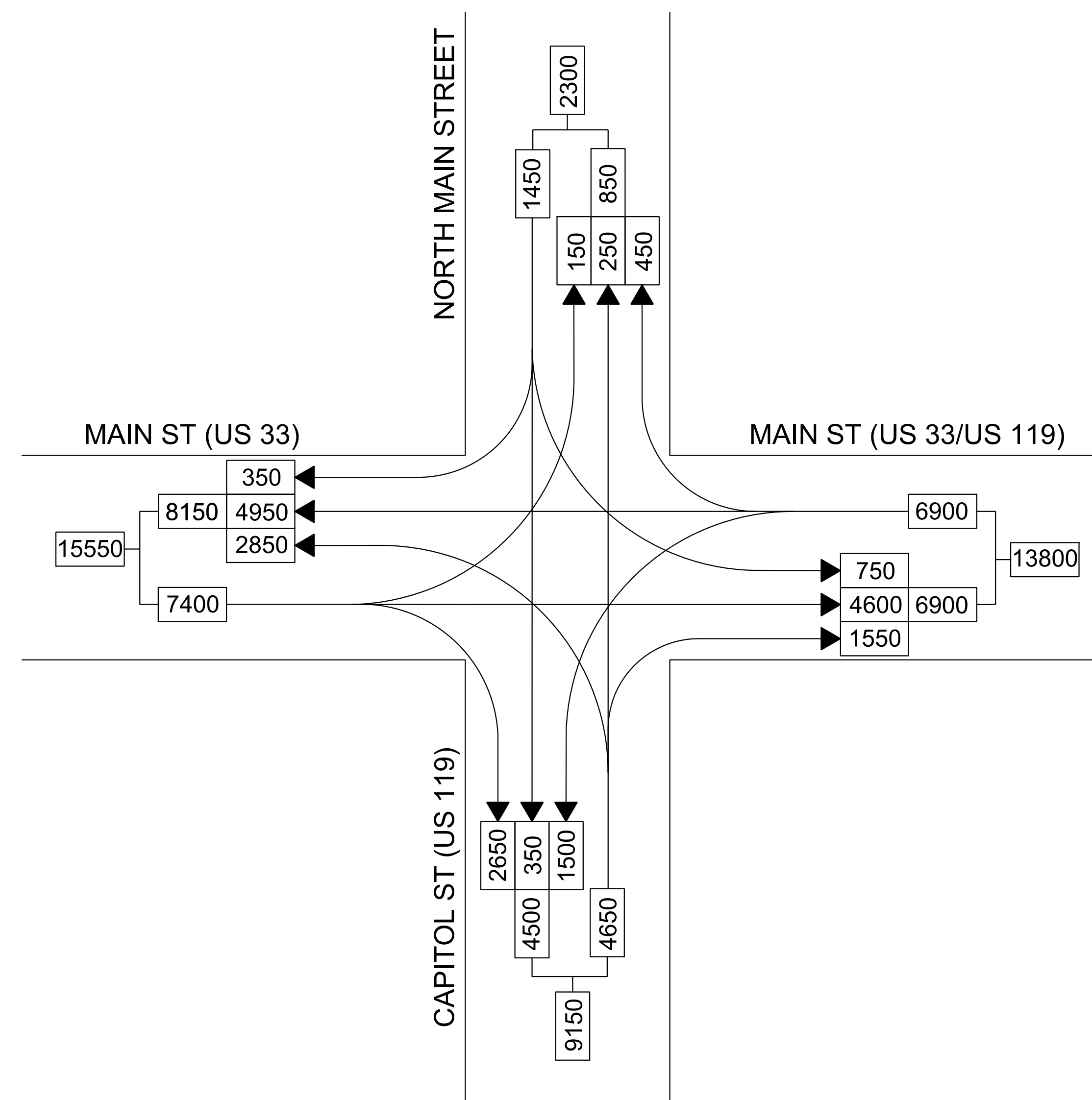
REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E5	E86

ADT 2013



ADT 2033

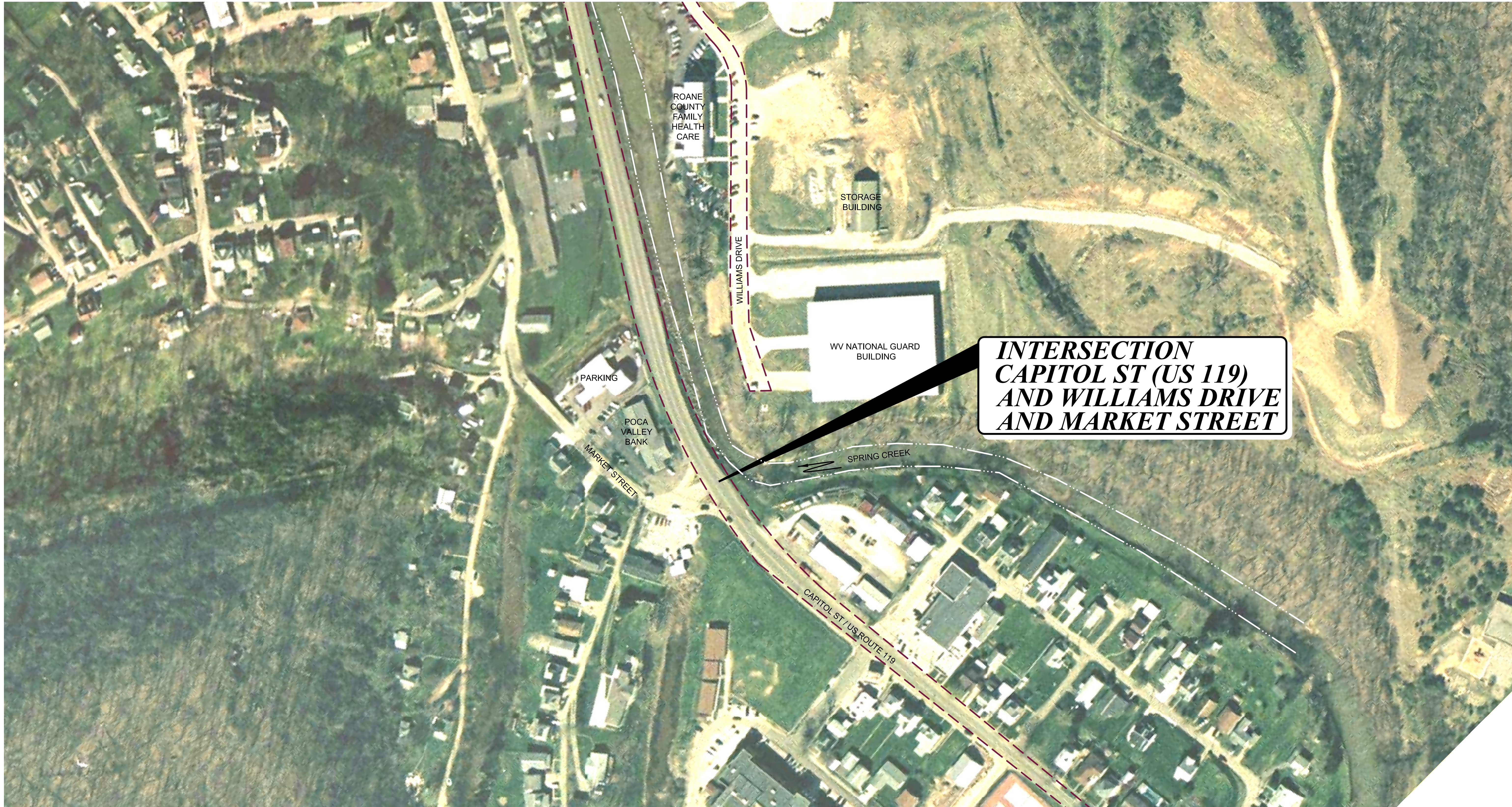


THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

TRAFFIC SKETCH MAPS

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E6	E86



**INTERSECTION
CAPITOL ST (US 119)
AND WILLIAMS DRIVE
AND MARKET STREET**

BURGESS & NIPLE
PARKERSBURG, WV

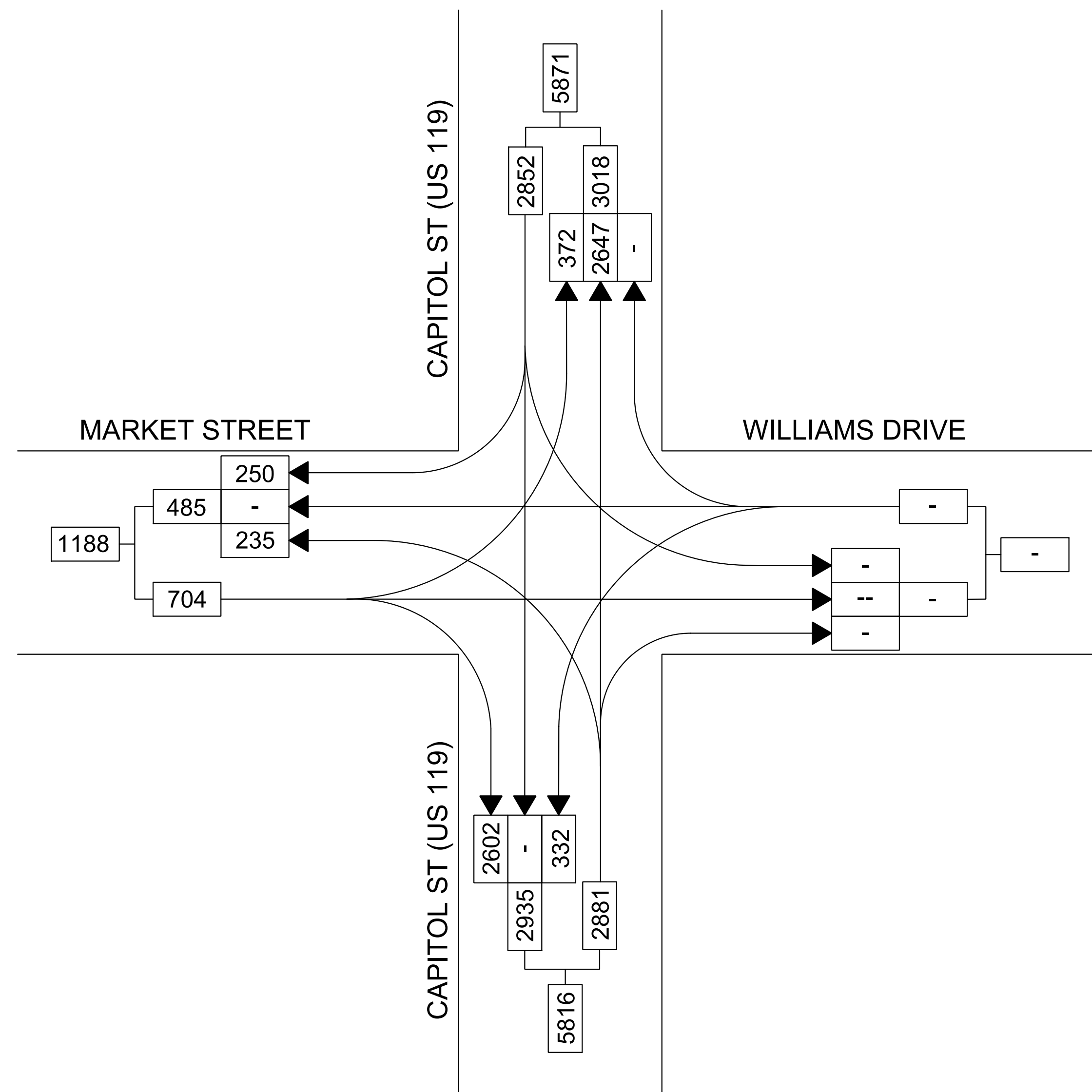
THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

TRAFFIC SKETCH MAPS

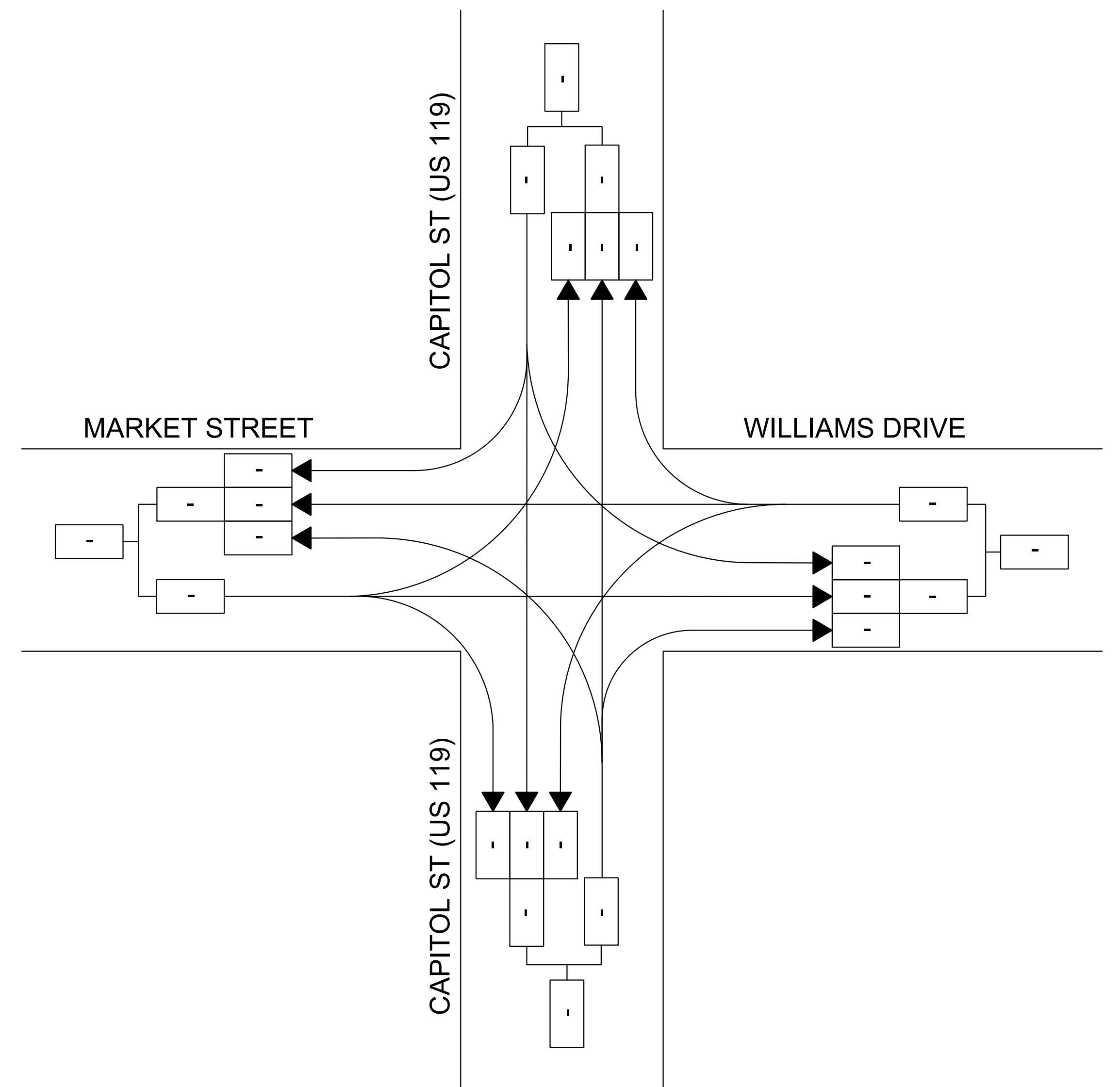
REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E7	E86

ADT 2013



ADT 2033

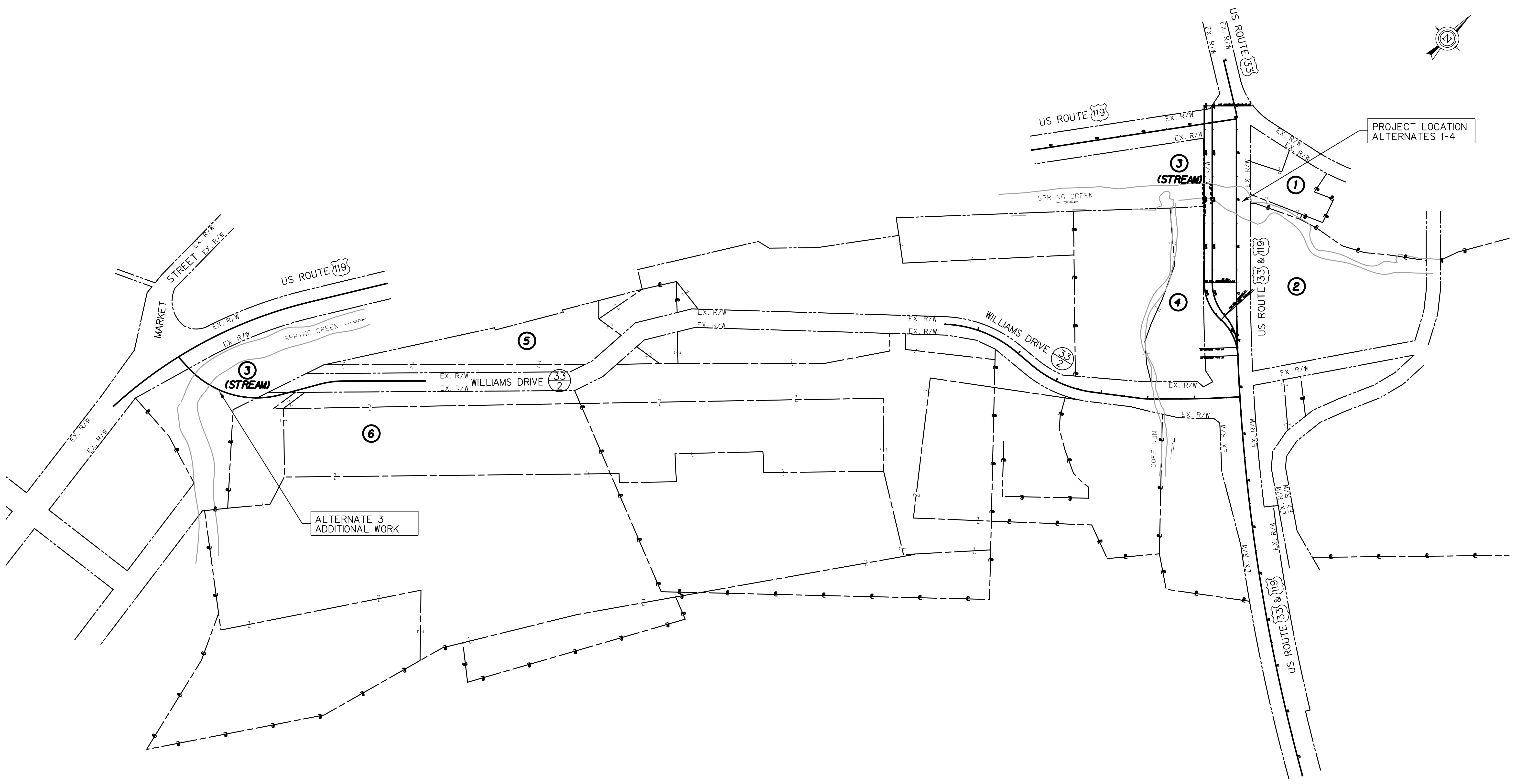
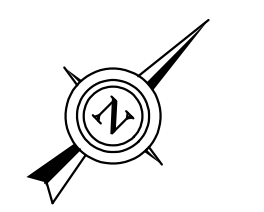


THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

TRAFFIC SKETCH MAPS

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E8	E86



PROJECT LOCATION ALTERNATES 1-4

ALTERNATE 3 ADDITIONAL WORK



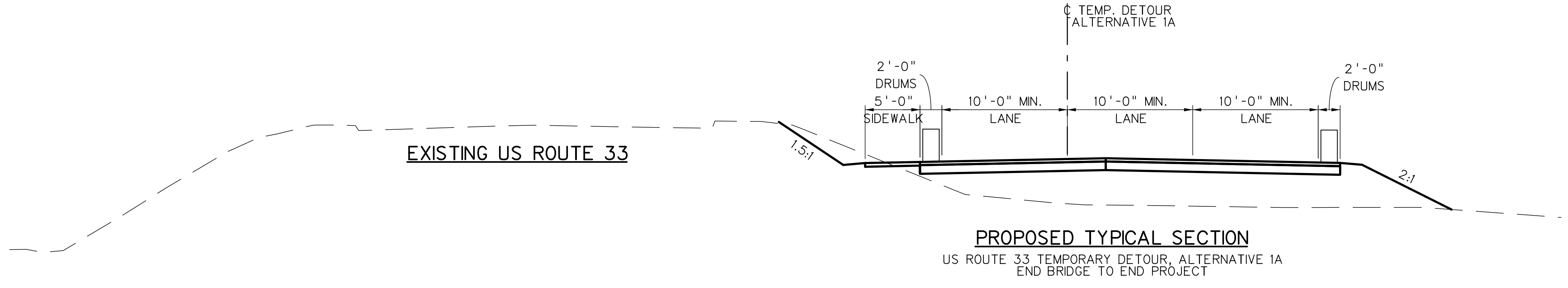
THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PROPERTY MAP

SCALE : 0 100 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E10	E86



PROPOSED TYPICAL SECTION
 US ROUTE 33 TEMPORARY DETOUR, ALTERNATIVE 1A
 END BRIDGE TO END PROJECT

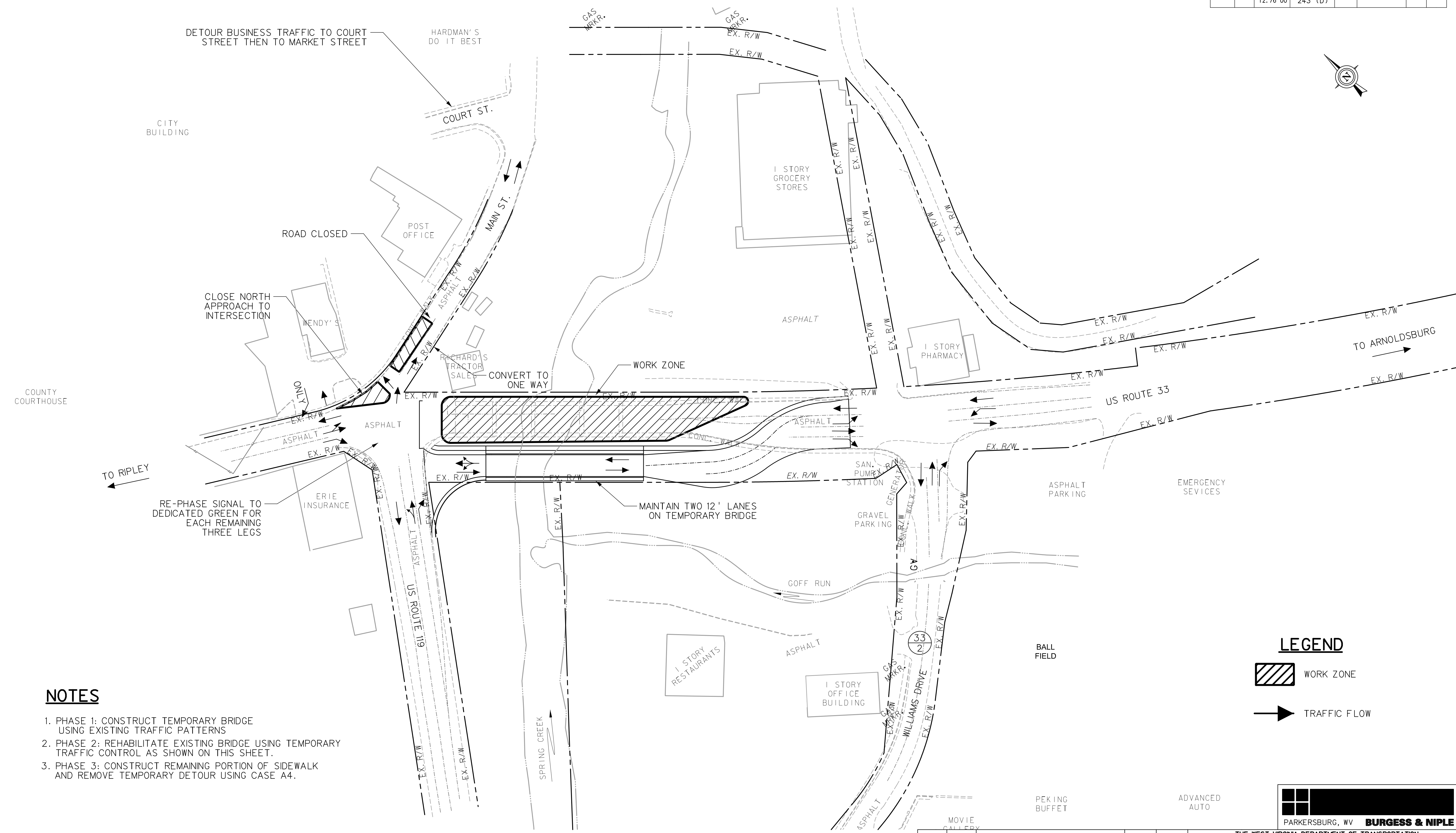
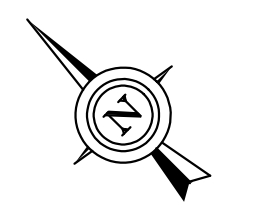
NOTES:
 SEE TYPICAL SHEET E2 FOR
 EXISTING TYPICAL SECTION DIMENSIONS



THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
ALTERNATIVE 1A
TYPICAL SECTIONS

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E11	E86



NOTES

1. PHASE 1: CONSTRUCT TEMPORARY BRIDGE USING EXISTING TRAFFIC PATTERNS
2. PHASE 2: REHABILITATE EXISTING BRIDGE USING TEMPORARY TRAFFIC CONTROL AS SHOWN ON THIS SHEET.
3. PHASE 3: CONSTRUCT REMAINING PORTION OF SIDEWALK AND REMOVE TEMPORARY DETOUR USING CASE A4.

LEGEND

- WORK ZONE
- TRAFFIC FLOW

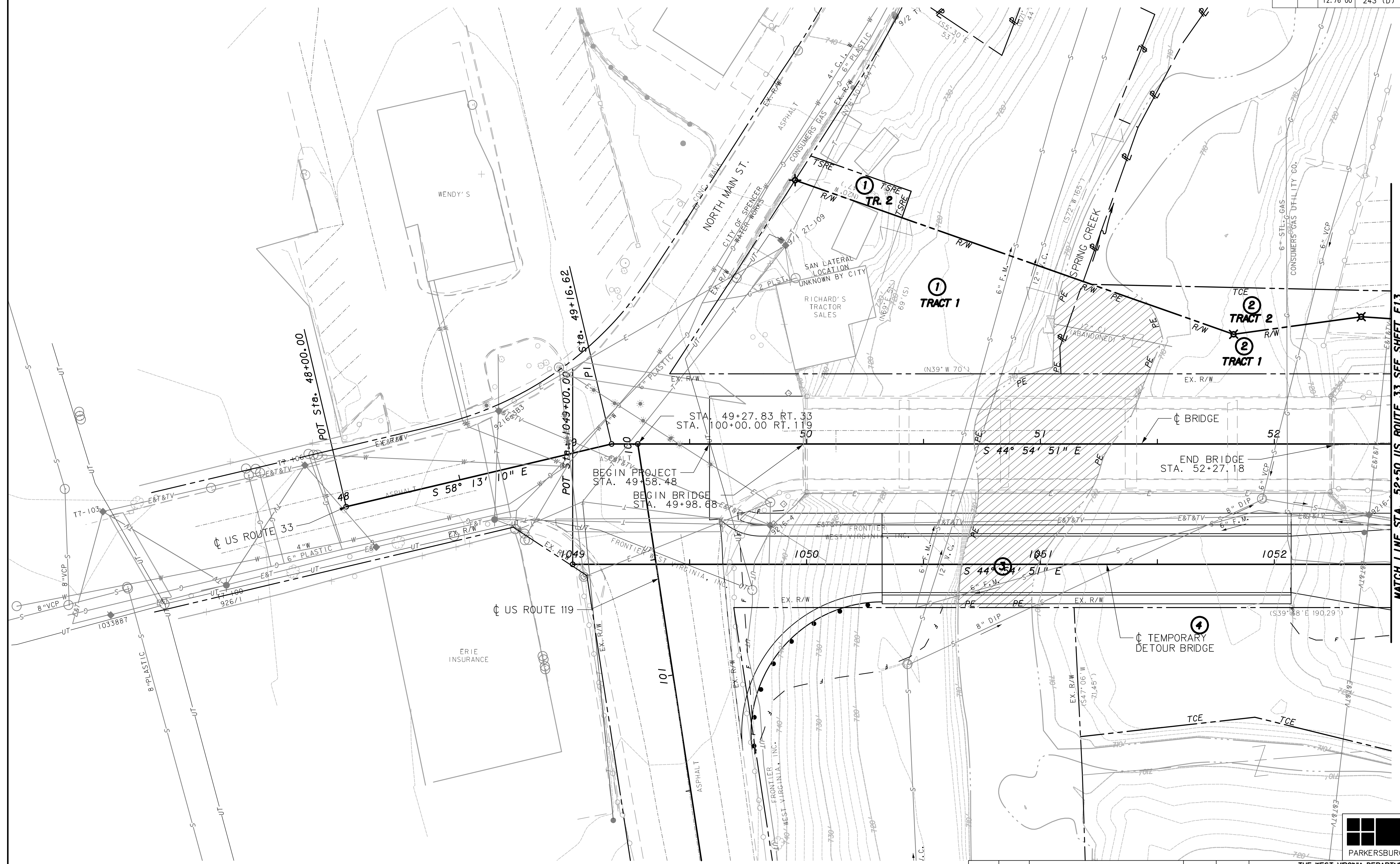
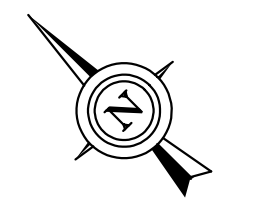
PARKERSBURG, WV **BURGESS & NIPLÉ**

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
**TEMPORARY TRAFFIC CONTROL
ALTERNATIVE 1A**

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

SCALE : 0 50 ft.

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E12	E86



MATCH LINE STA. 52+50 US ROUTE 33 SEE SHEET E13

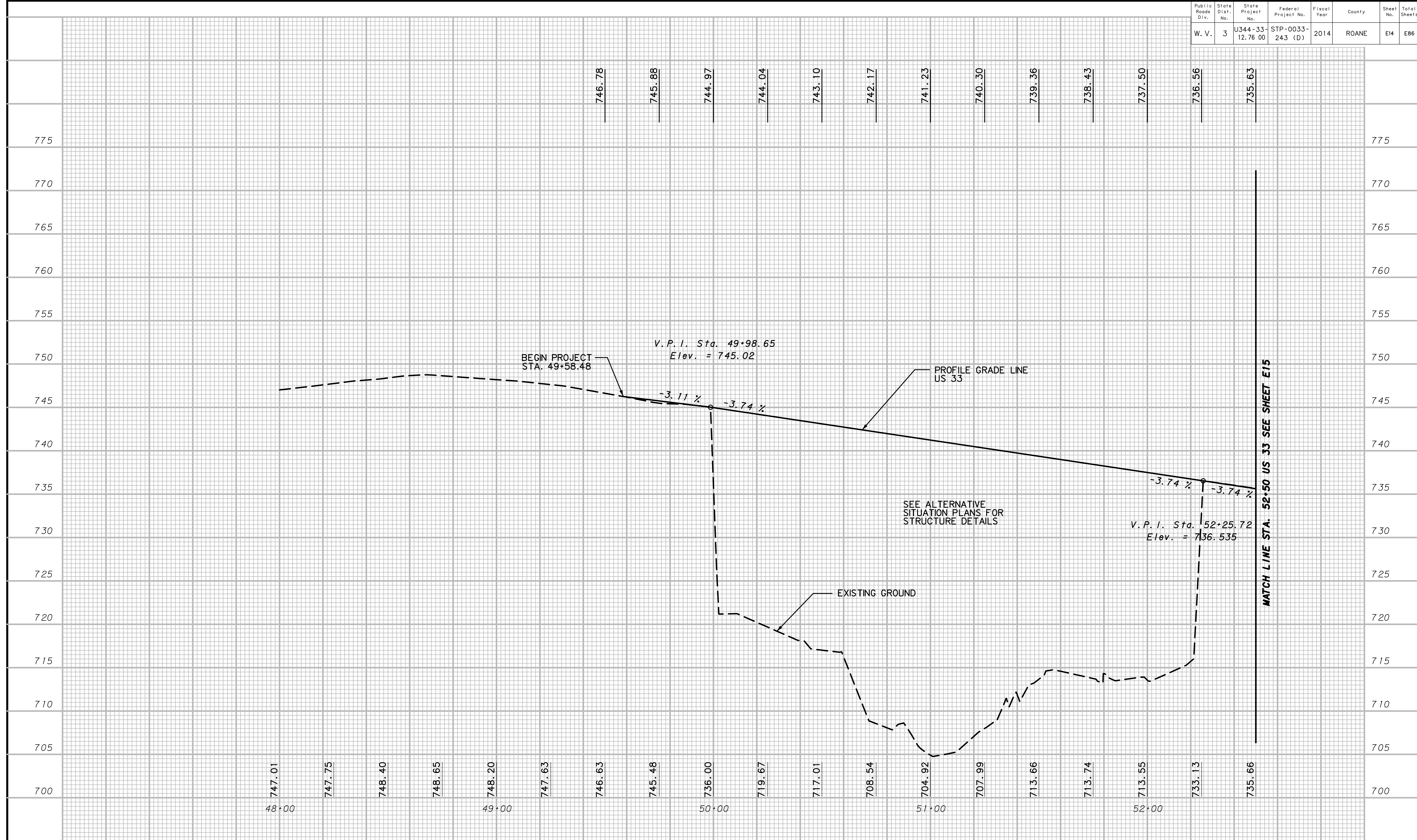
SCALE : 0 20 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY



THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 1A
PLAN SHEET
BEGN PROJECT TO STA. 52+50

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33- 12.76 00	STP-0033- 243 (D)	2014	ROANE	E14	E86



BEGIN PROJECT
STA. 49+58.48

V.P.I. Sta. 49+98.65
Elev. = 745.02

PROFILE GRADE LINE
US 33

-3.11% -3.74%

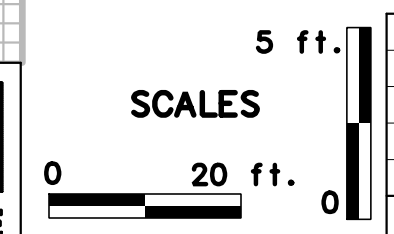
SEE ALTERNATIVE
SITUATION PLANS FOR
STRUCTURE DETAILS

EXISTING GROUND

V.P.I. Sta. 52+25.72
Elev. = 736.535

-3.74% -3.74%

MATCH LINE STA. 52+50 US 33 SEE SHEET E15



REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
US 33 - ALL ALTERNATIVES
PROFILE SHEET
BEGIN PROJECT TO STA. 52+50

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E15	E86

MATCH LINE STA. 52+50 US 33 SEE SHEET E14

735.63
734.69
733.76
732.83
731.89
730.96
730.03

735.66
734.85
733.99
733.07
732.08
731.10
730.08
719.10
728.21
727.46
726.81
726.07
725.97
725.62
725.43
725.26
725.10
725.04
724.97
724.38
724.33

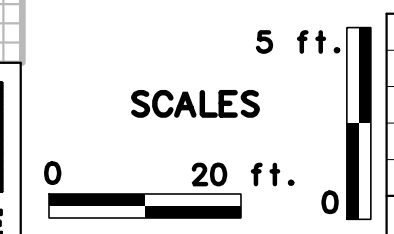
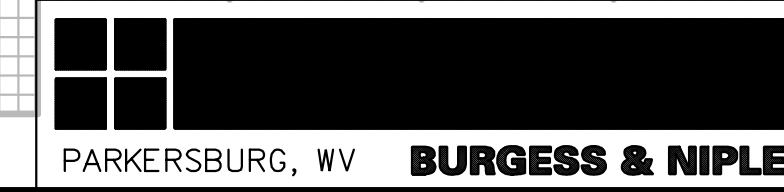
53+00
54+00
55+00
56+00
57+00

PROFILE GRADE LINE
US 33

-3.74 %

END PROJECT
STA. 54+35.47

EXISTING GROUND



REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
US 33 - ALL ALTERNATIVES
PROFILE SHEET
STA. 52+50 TO END PROJECT

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E16	E86

745.74 744.49 743.24 741.99 740.74 739.49 738.24 736.99 735.74 734.50 733.46 732.65 732.09 731.77 731.69 731.79

770 770

765 765

760 760

755 755

750 750

745 745

740 740

735 735

730 730

725 725

720 720

715 715

710 710

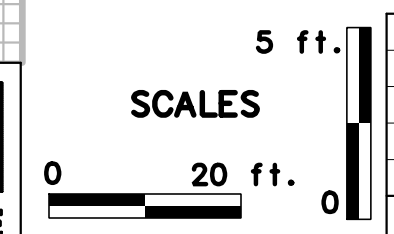
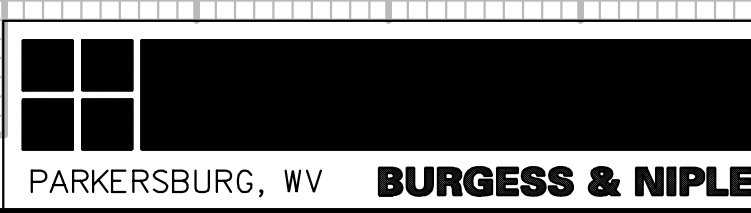
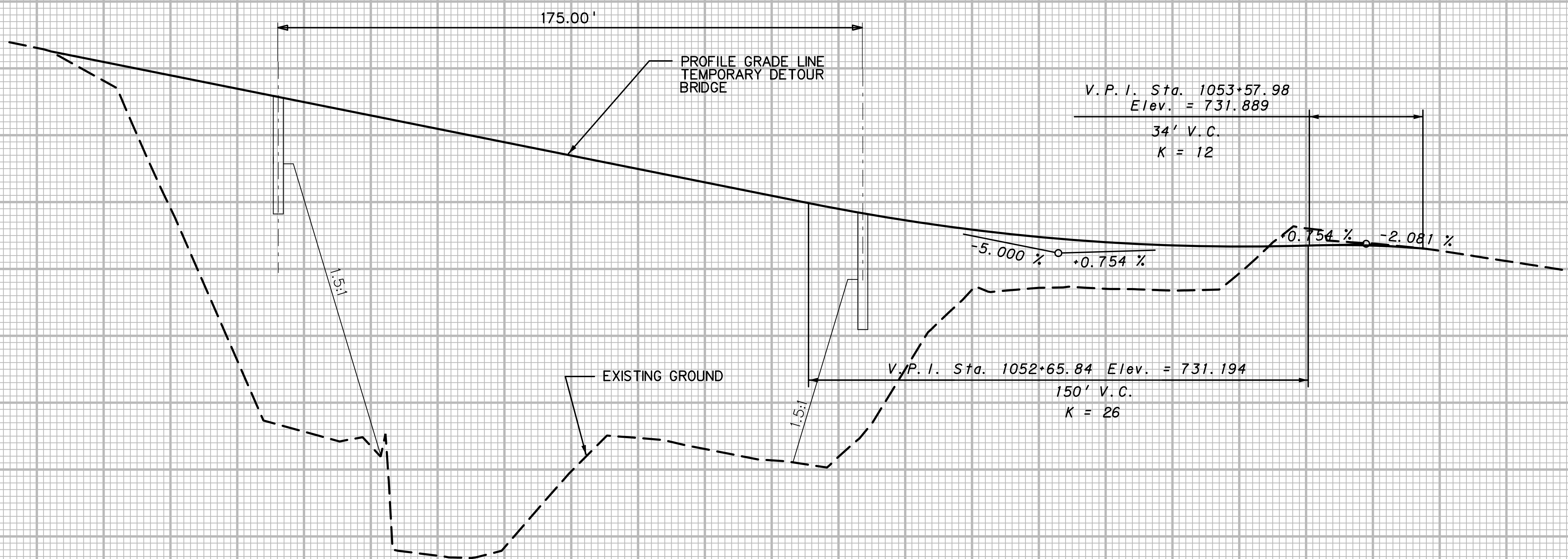
705 705

700 700

695 695

747.05 744.76 734.55 720.29 717.15 708.71 709.18 716.12 717.07 715.80 715.96 724.54 728.39 728.58 728.39 730.78 732.07 731.53 730.60

1050+00 1051+00 1052+00 1053+00 1054+00



REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 1A - TEMPORARY DETOUR BRIDGE
PROFILE SHEET
 STA. 249+50 TO STA. 254+20

3

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3

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E17	E86

770

770

765

765

760

760

755

755

750

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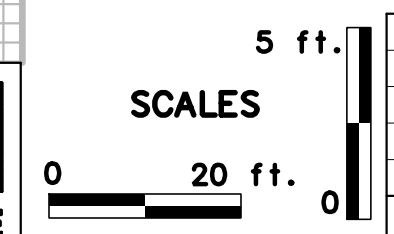
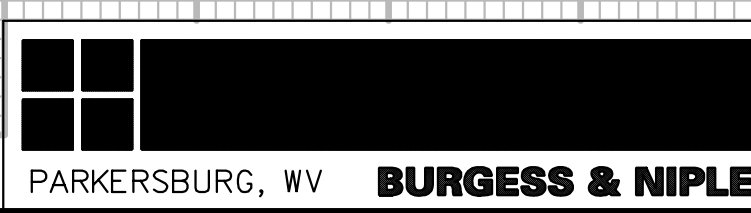
695

695

EXISTING GROUND

747.55 747.55 747.64 747.47 747.01 746.45 745.73 745.03 744.28 743.49 742.68 741.77 740.83 739.84 738.84 737.86 736.88 735.84

100+00 101+00 102+00 103+00 104+00



REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 US 119 NORTH
PROFILE SHEET
 STA. 100+00 TO STA. 104+40

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Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E19	E86

770

770

765

765

760

760

755

755

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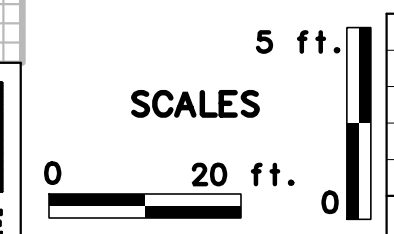
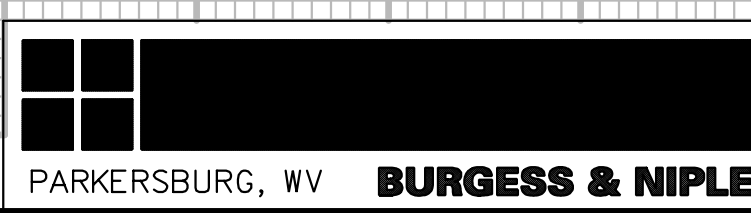
695

695

726.08 726.58 725.30 724.09 723.18 722.23 721.72 712.11 721.06 721.26 721.73 722.52 723.67 725.27 727.10 728.93 730.66 732.26 733.67 735.31 737.09 738.97 740.93

100+00 101+00 102+00 103+00 104+00 105+00

EXISTING GROUND



REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 WILLIAMS DRIVE
PROFILE SHEET
 STA. 100+00 TO STA. 105+50

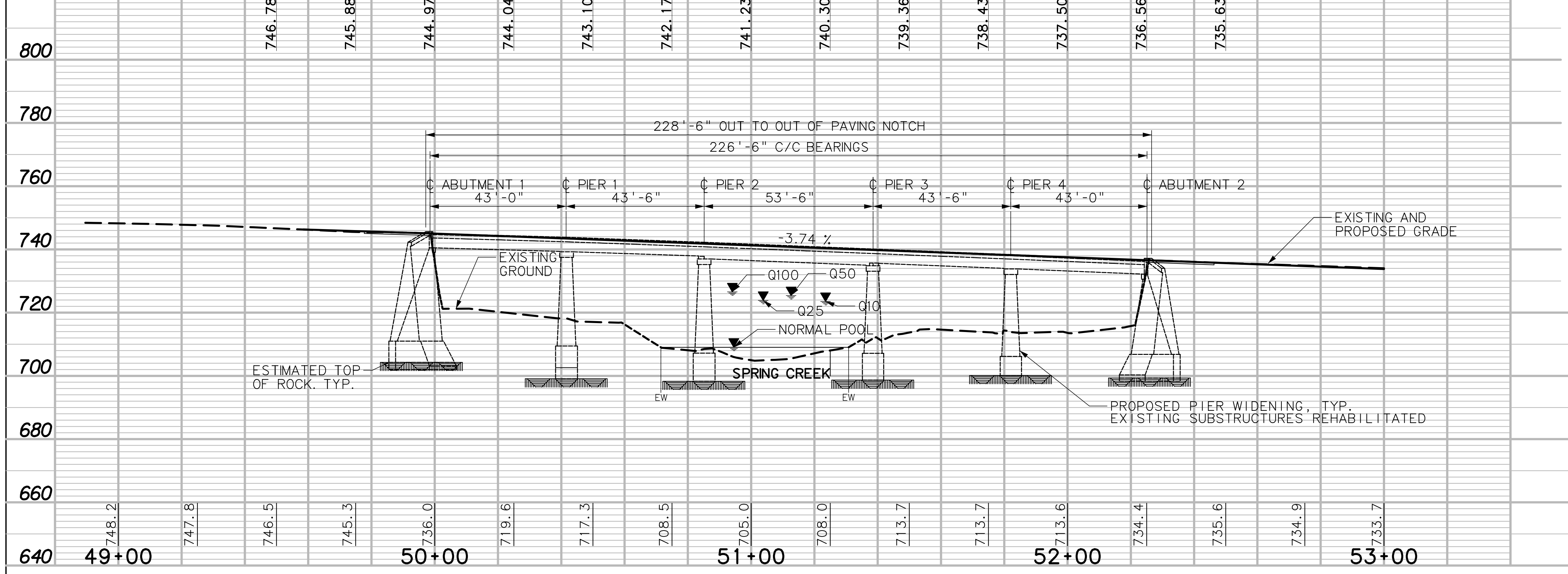
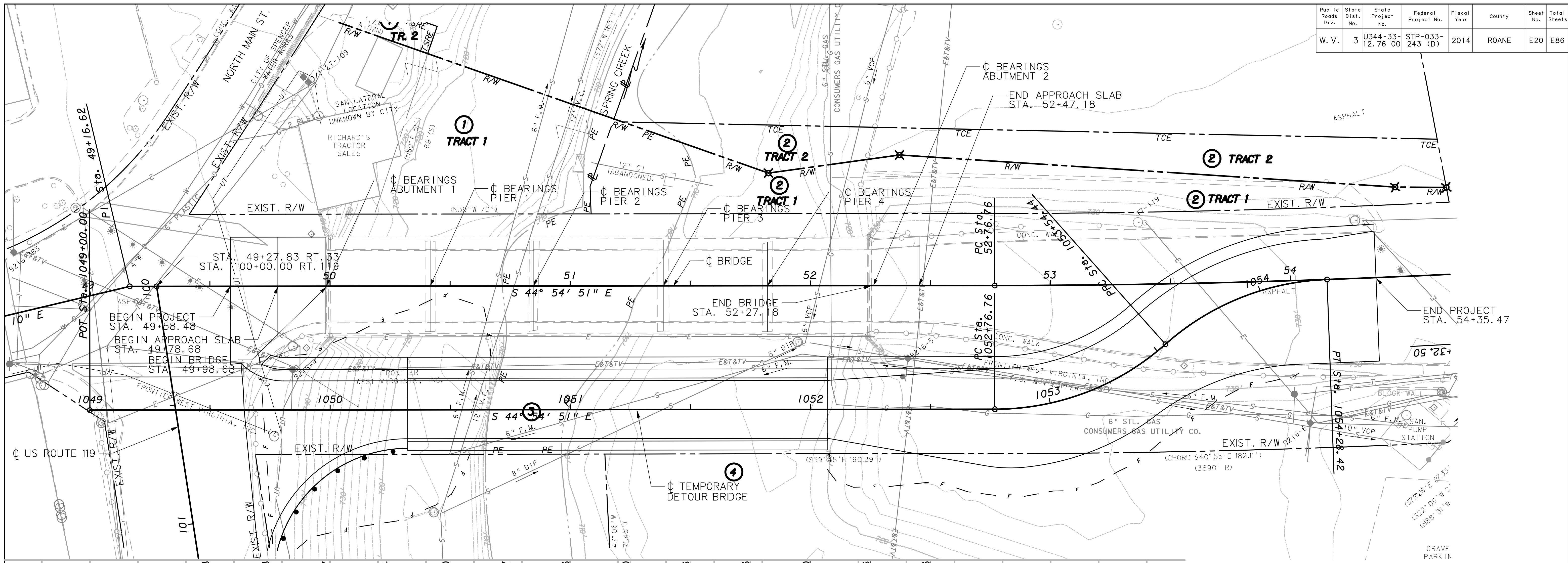
)

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Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-033-243 (D)	2014	ROANE	E20	E86



HYDRAULIC DATA AT NORTH MARKET ST.

	SPRING CREEK			
	HWE	HWE*	V(FPS)	Q(CFS)
Q10	721.61	723.11	2.63	3950
Q25	722.45	723.95	2.06	4500
Q50	723.90	725.40	2.64	5430
Q100	725.02	726.52	2.64	6200

DRAINAGE AREA = 39.6 SQ. MI.
 WATERWAY OPENING = 575 SF
 * ESTIMATED BASED ON SLOPE OF STREAM FOR RUBY BRADLEY.

20 ft. SCALE

DESIGNED: MWL 7/14
 DRAWN: ASG 7/14
 CHECKED: []
 CHECKED: []

REVISION NUMBER SHEET NUMBER REVISION DATE BY

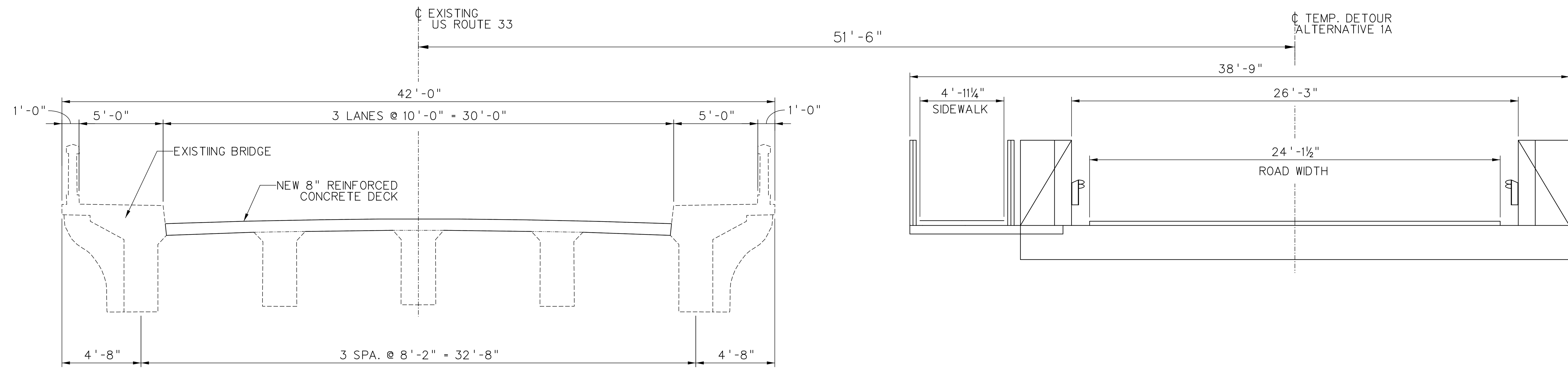
THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

COL. RUBY BRADLEY BRIDGE REPLACEMENT SITUATION PLAN ALTERNATIVE 1A

PARKERSBURG, WV **BURGESS & NIPLE**

SHEET OF BRIDGE NO.

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33 12.76 00	STP-0033 (243)D	2014	ROANE	E21	E86



COMPLETED TYPICAL SECTION

DESIGNED	DATE		
MWL	6/14		
DRAWN			
ASG	6/14		
CHECKED			
CHECKED			

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

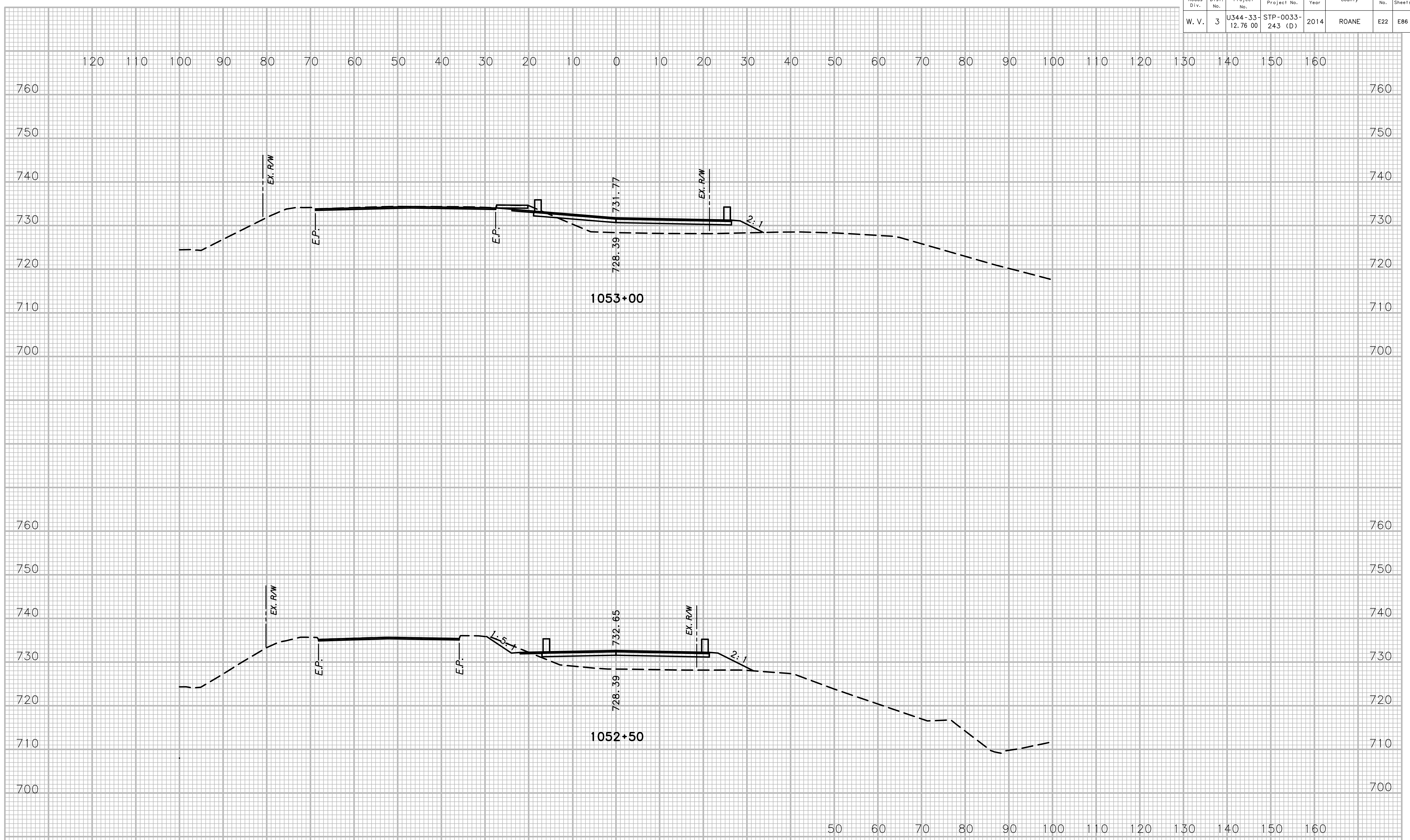
**COL. RUBY BRADLEY
BRIDGE REPLACEMENT
COMP. TYPICAL SECTION
ALTERNATIVE 1A**

PARKERSBURG, WV **BURGESS & NIPLE**

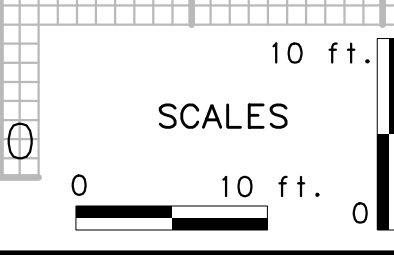
SHEET OF BRIDGE NO.

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Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E22	E86



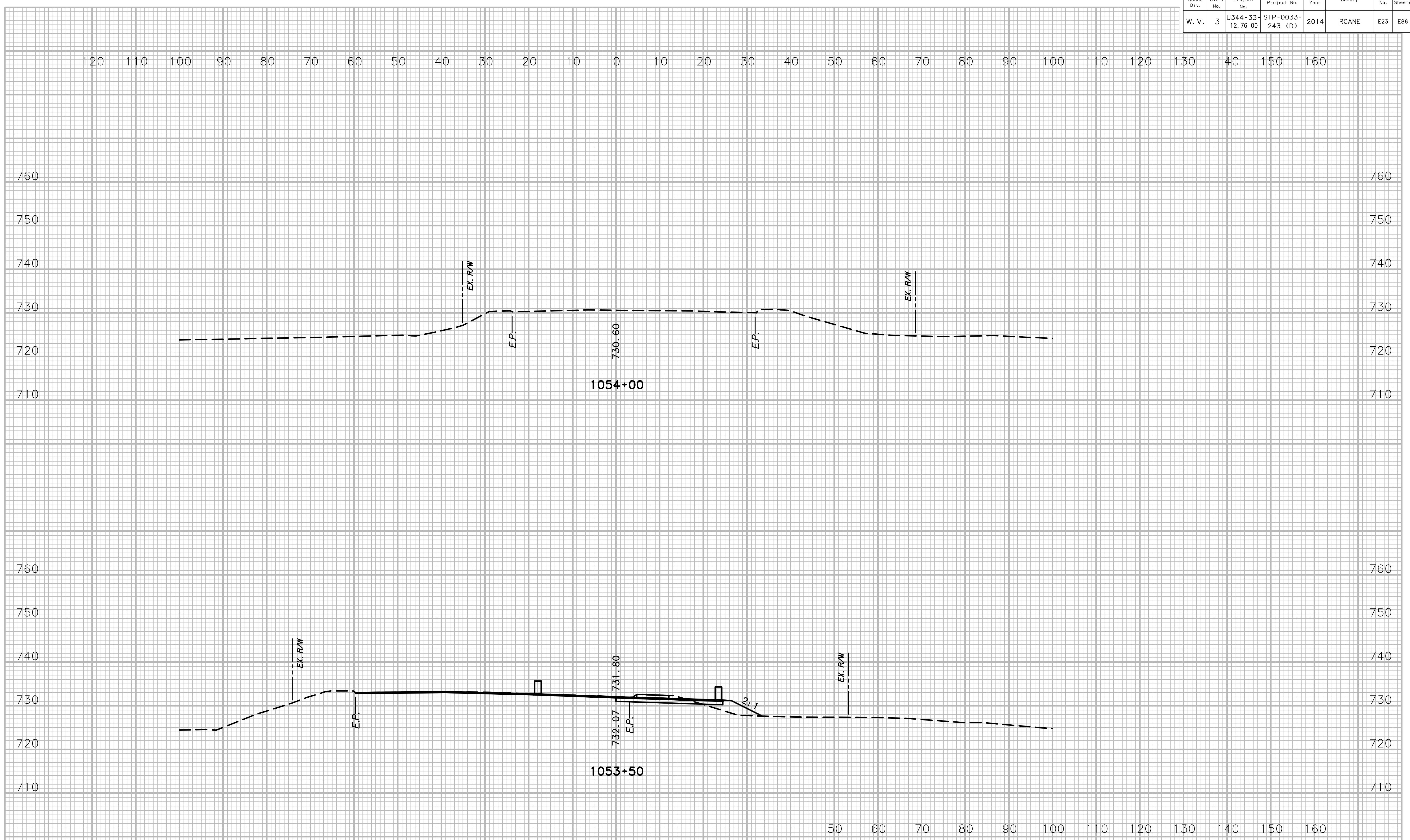
ORIGINAL SURVEY	DATE	BY	FINAL SURVEY	DATE	BY
BOOK NO.	///		BOOK NO.	///	
AREAS CHECKED	///		AREAS CHECKED	///	
	///			///	
	///			///	
	///			///	
	///			///	
	///			///	
	///			///	
	///			///	



REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 1A - US 33
CROSS-SECTION SHEET
 STA. 1052+50 TO STA. 1053+00

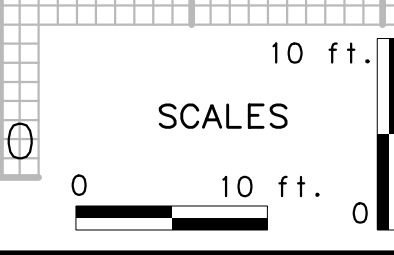
Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E23	E86



DATE	BY	DATE	BY	DATE	BY	DATE	BY
/ /		/ /		/ /		/ /	

ORIGINAL SURVEY	SURVEYED	FINAL SURVEY	SURVEYED
BOOK NO.	BOOK NO.	BOOK NO.	BOOK NO.

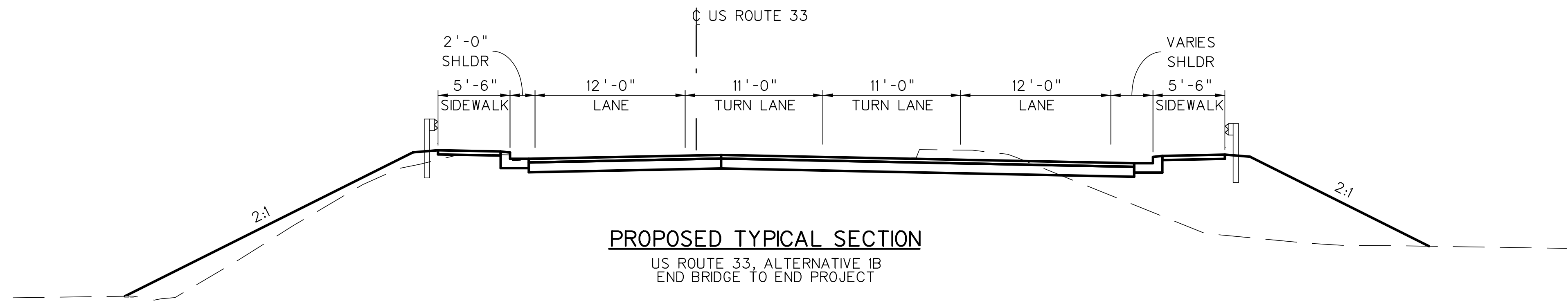
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/	/	/	/



REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 1A - US 33
CROSS-SECTION SHEET
 STA. 1053+50 TO STA. 1054+00

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E24	E86



PROPOSED TYPICAL SECTION

US ROUTE 33, ALTERNATIVE 1B
END BRIDGE TO END PROJECT



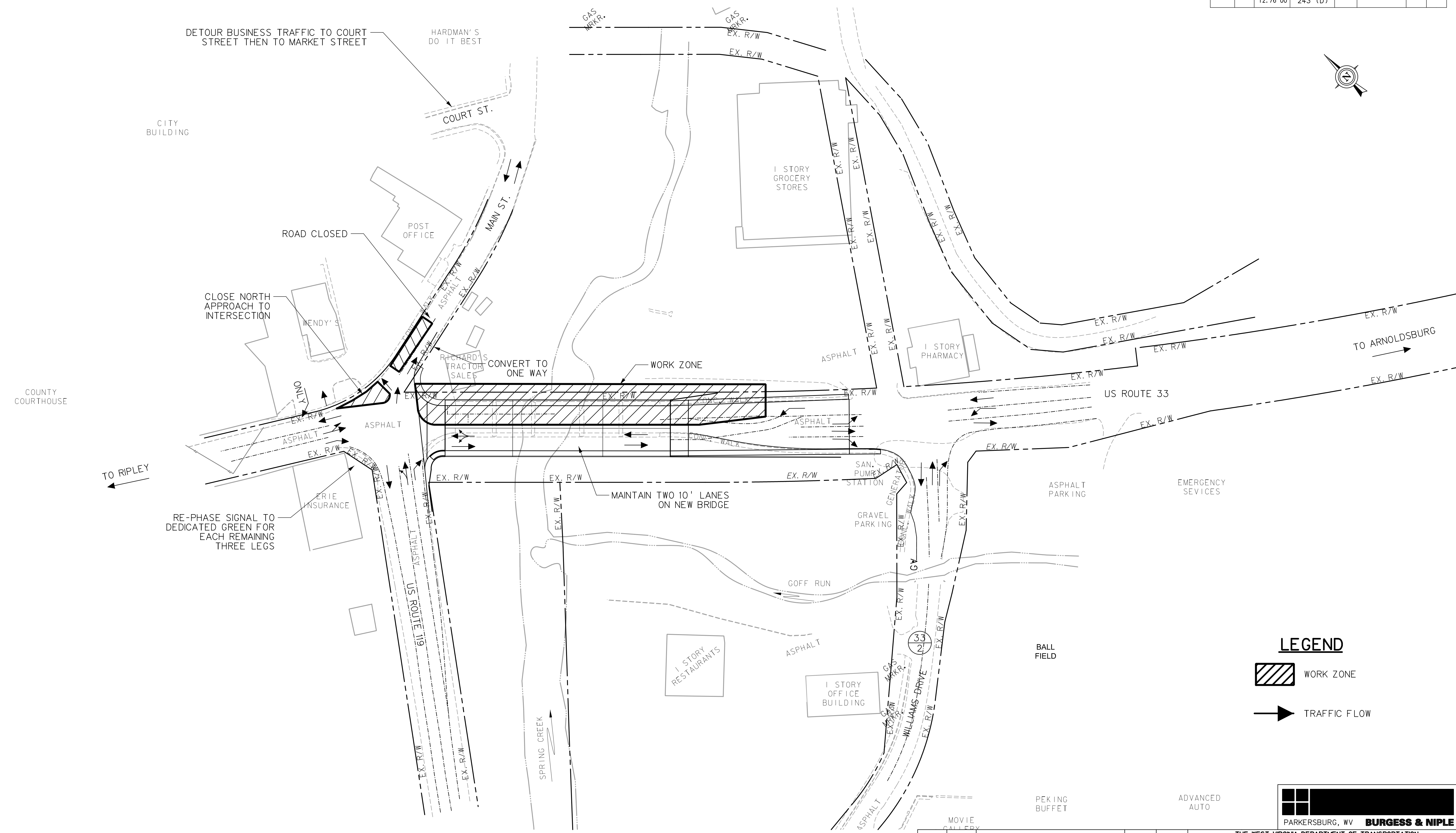
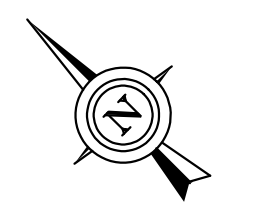
PARKERSBURG, WV **BURGESS & NIPLÉ**

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ALTERNATIVE 1B
TYPICAL SECTIONS

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E26	E86



LEGEND

- WORK ZONE
- TRAFFIC FLOW

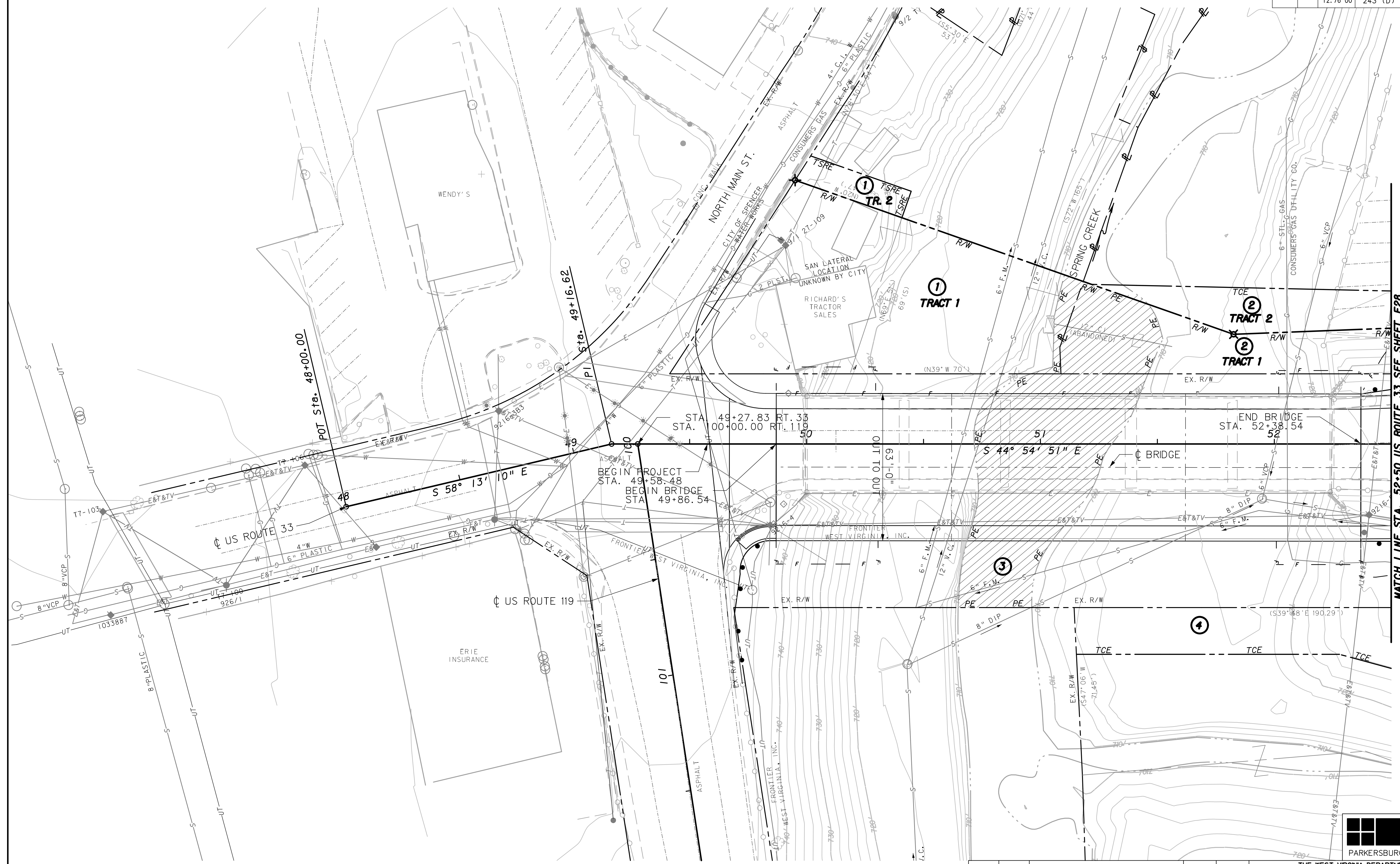
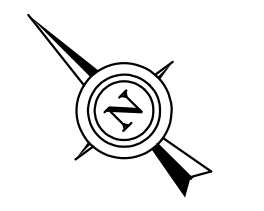
BURGESS & NIPLÉ
 PARKERSBURG, WV

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
**TEMPORARY TRAFFIC CONTROL
 ALTERNATIVE 1B PHASE 2**

SCALE : 0 50 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E27	E86



MATCH LINE STA. 52+50 US ROUTE 33 SEE SHEET E28

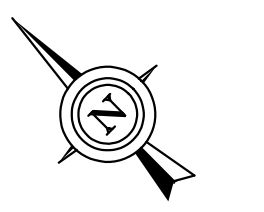
SCALE : 0 20 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY



THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 1B
PLAN SHEET
BEGIN PROJECT TO STA. 52+50

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E28	E86

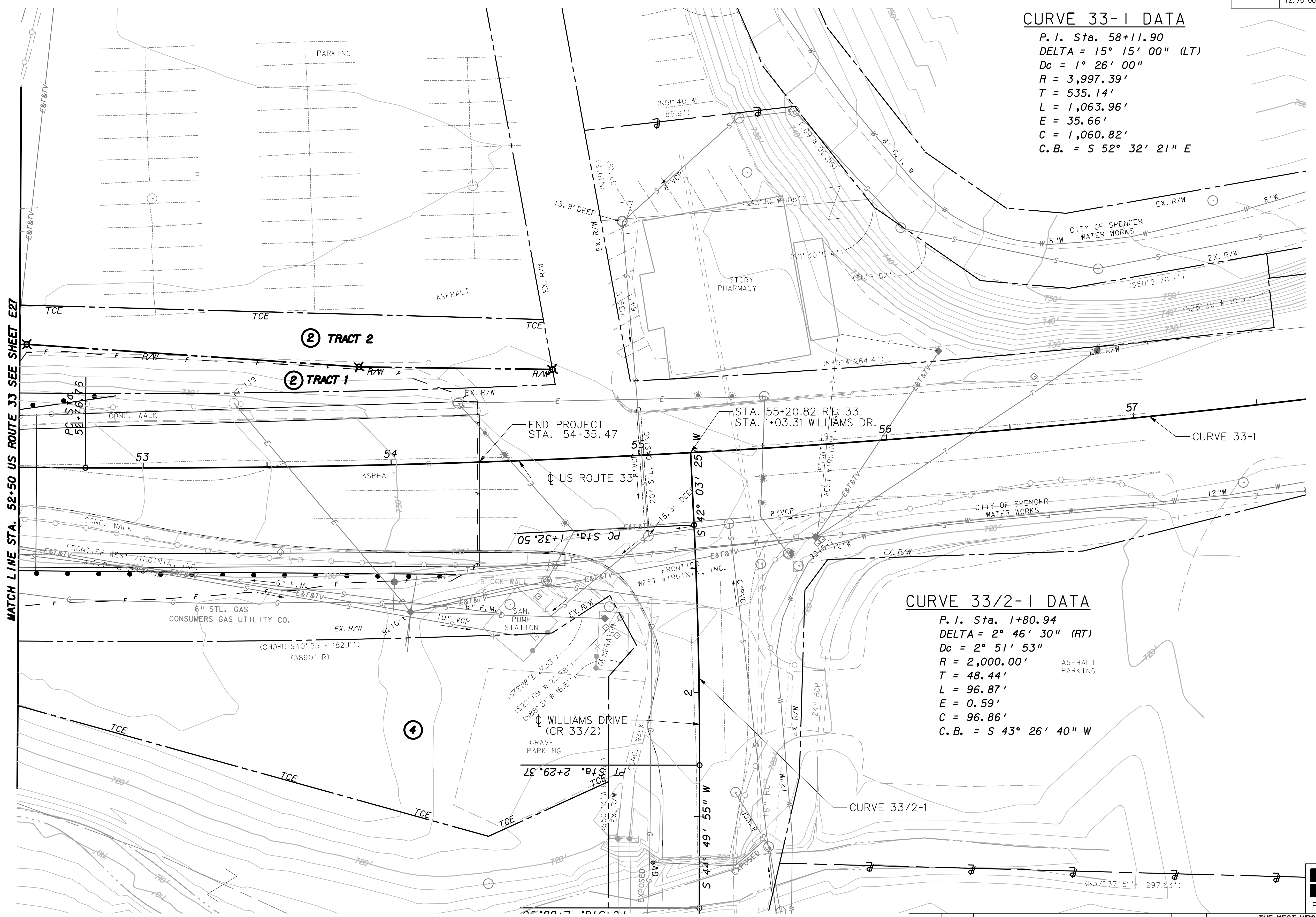


CURVE 33-1 DATA

P. I. Sta. 58+11.90
 DELTA = 15° 15' 00" (LT)
 Dc = 1° 26' 00"
 R = 3,997.39'
 T = 535.14'
 L = 1,063.96'
 E = 35.66'
 C = 1,060.82'
 C.B. = S 52° 32' 21" E

CURVE 33/2-1 DATA

P. I. Sta. 1+80.94
 DELTA = 2° 46' 30" (RT)
 Dc = 2° 51' 53"
 R = 2,000.00'
 T = 48.44'
 L = 96.87'
 E = 0.59'
 C = 96.86'
 C.B. = S 43° 26' 40" W



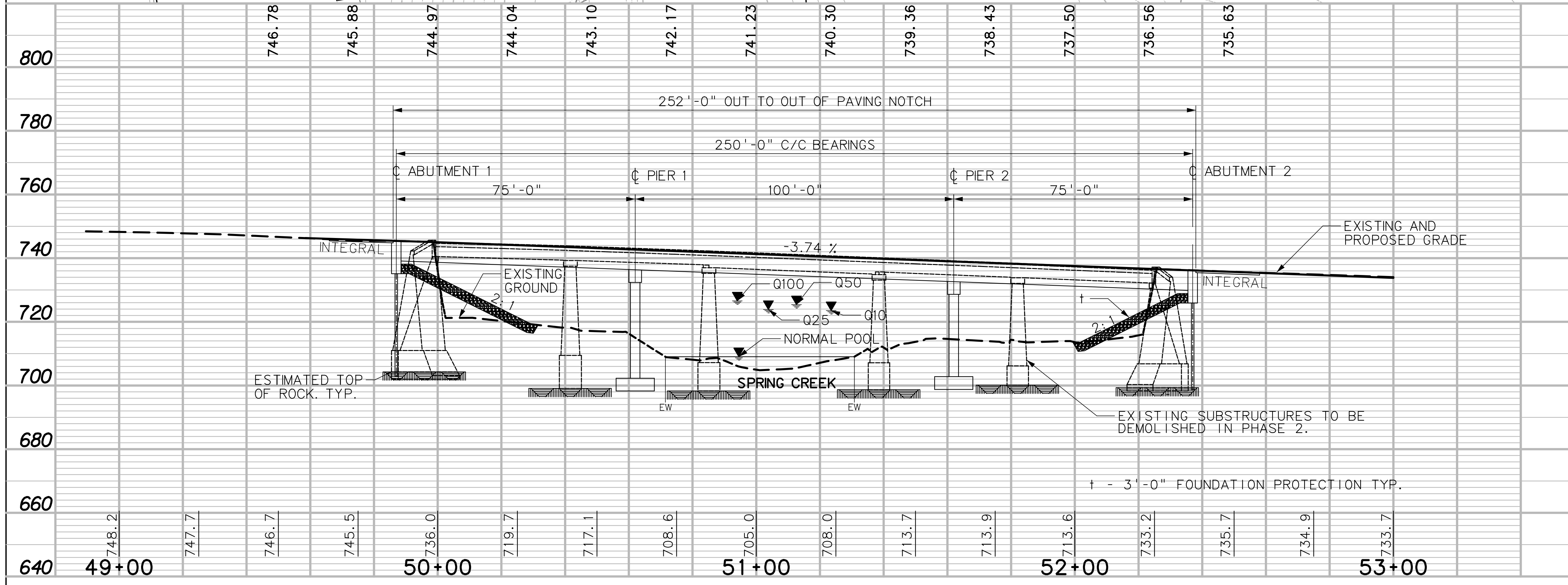
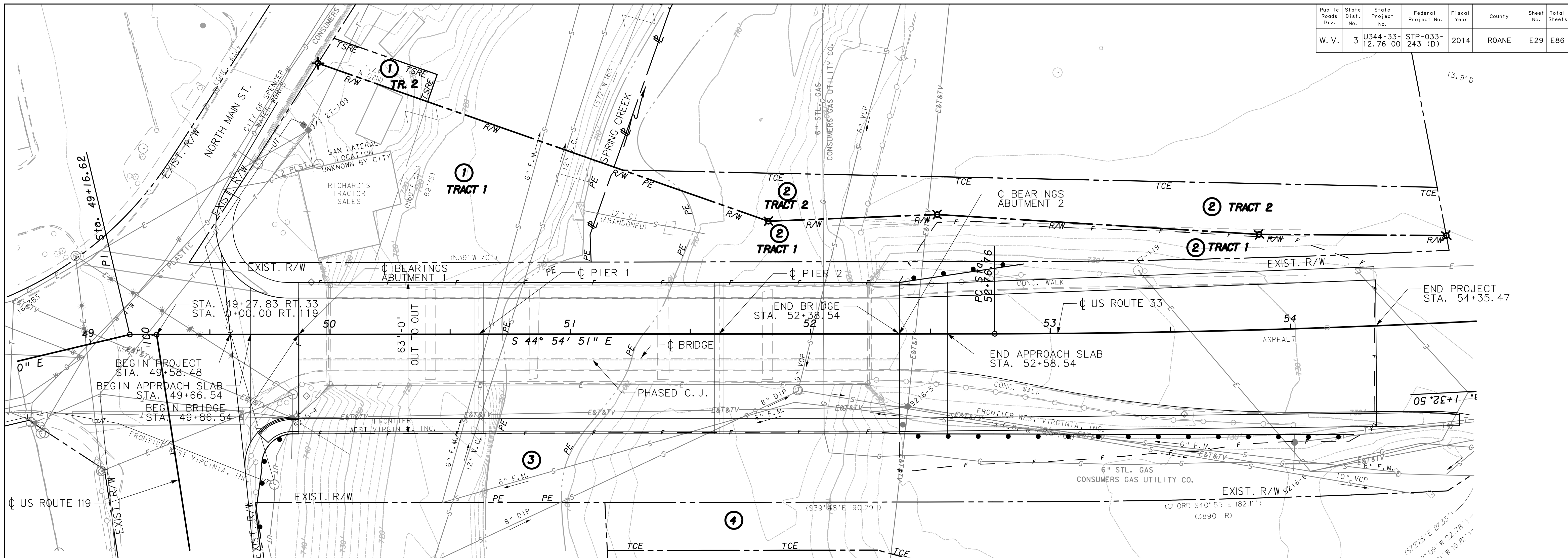
MATCH LINE STA. 52+50 US ROUTE 33 SEE SHEET E27

SCALE : 0 20 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY



THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 1B
PLAN SHEET
 STA. 52+50 TO END PROJECT



HYDRAULIC DATA AT NORTH MARKET ST.

	SPRING CREEK			
	HWE	HWE*	V(FPS)	Q(CFS)
Q10	721.61	723.11	2.63	3950
Q25	722.45	723.95	2.06	4500
Q50	723.90	725.40	2.64	5430
Q100	725.02	726.52	2.64	6200

DRAINAGE AREA = 39.6 SQ. MI.
WATERWAY OPENING = 575 SF
* ESTIMATED BASED ON SLOPE OF STREAM FOR RUBY BRADLEY.

20 ft. SCALES

DESIGNED	DATE
MWL	7/14
DRAWN	DATE
ASG	7/14
CHECKED	
CHECKED	

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

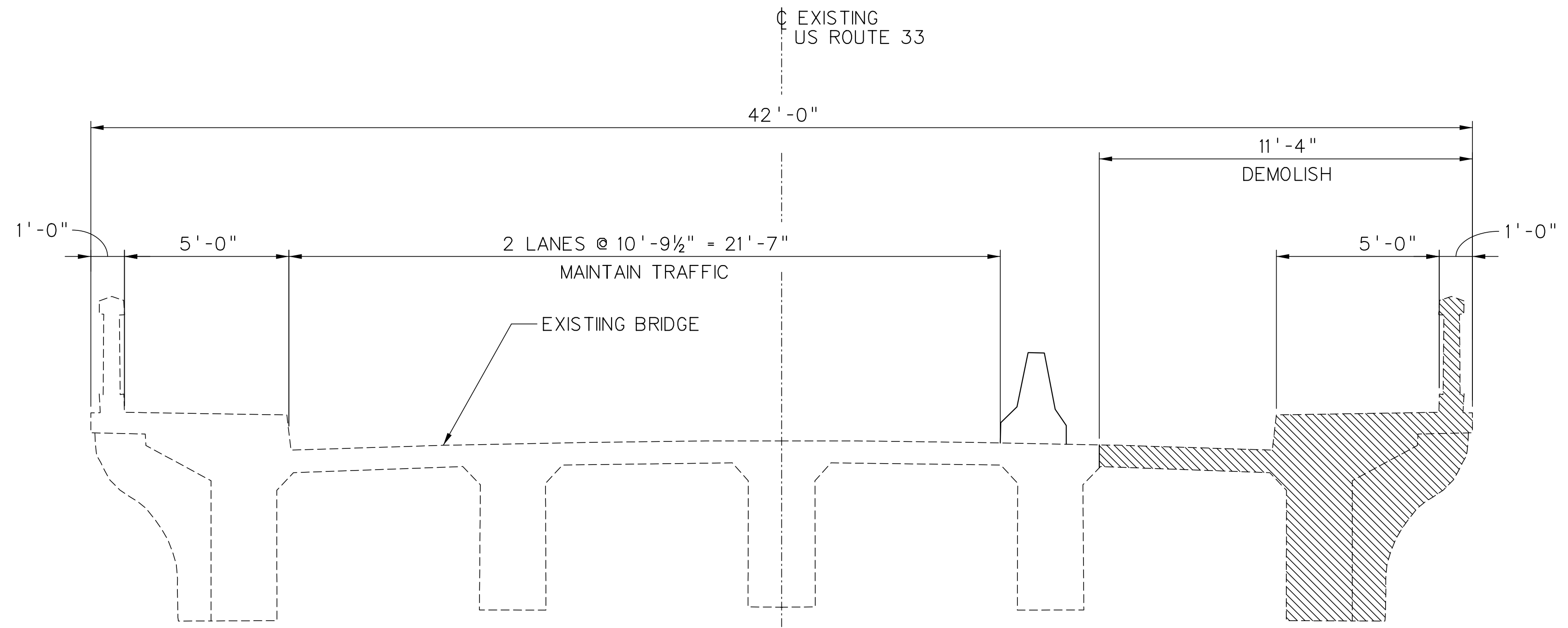
THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

COL. RUBY BRADLEY BRIDGE REPLACEMENT SITUATION PLAN ALTERNATIVE 1B

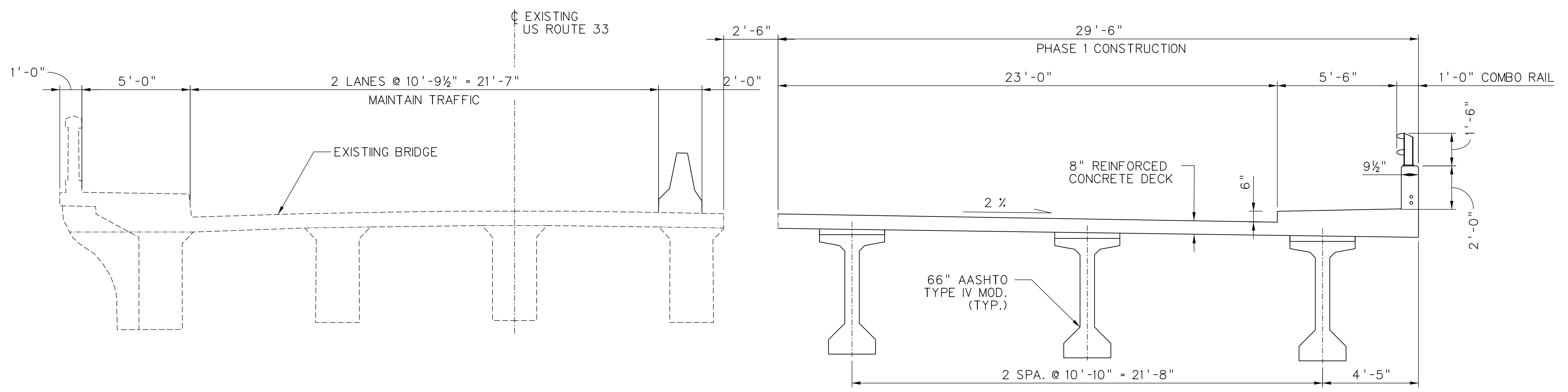
PARKERSBURG, WV **BURGESS & NIPLÉ**

SHEET OF BRIDGE NO.

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33 12.76 00	STP-0033 (243)D	2014	ROANE	E30	E86



PHASE I - DEMOLITION



PHASE I - CONSTRUCTION

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

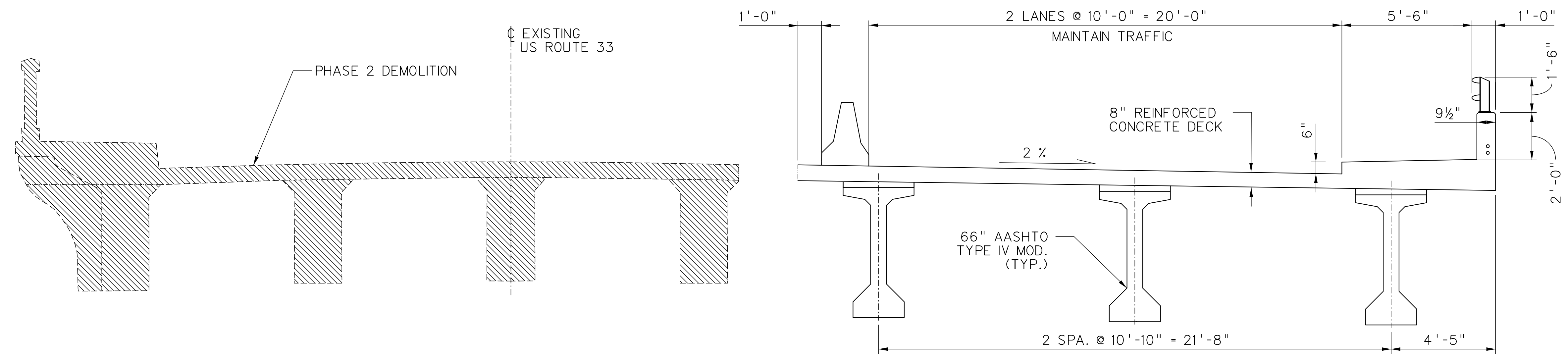
**COL. RUBY BRADLEY
BRIDGE REPLACEMENT
PHASE 1
ALTERNATIVE NO. 1B**

DESIGNED: **MWL** DATE: **6/14**
 DRAWN: **ASG** DATE: **6/14**
 CHECKED:
 CHECKED:
 SHEET OF
 BRIDGE NO.

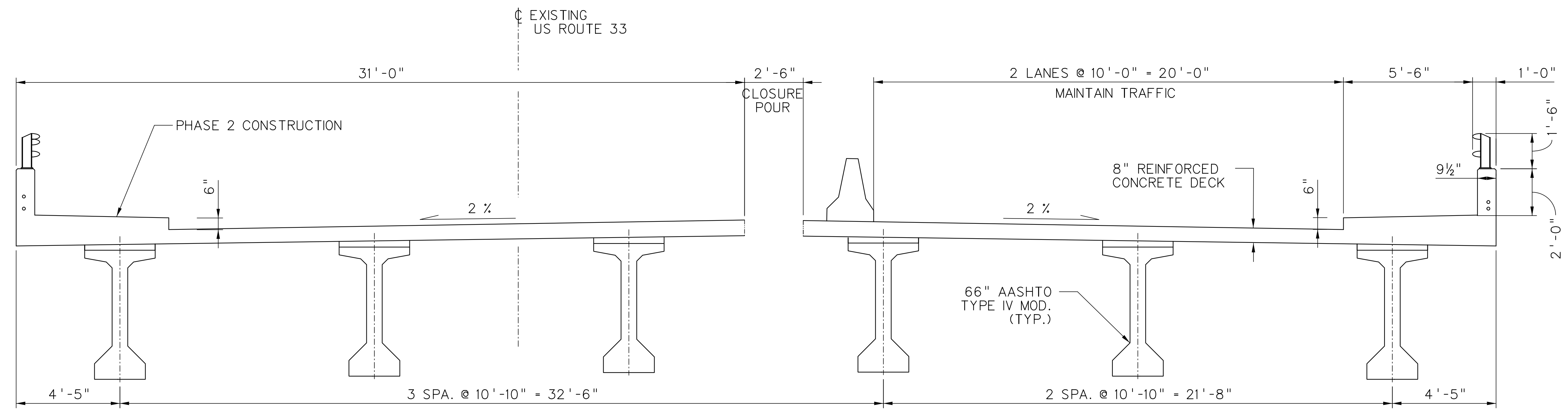
PARKERSBURG, WV **BURGESS & NIPLE**

10/09/2014 5:42:05 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33 12.76 00	STP-0033 (243)D	2014	ROANE	E31	E86



PHASE 2 - DEMOLITION



PHASE 2 - CONSTRUCTION

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**COL. RUBY BRADLEY
BRIDGE REPLACEMENT
PHASE 2
ALTERNATIVE NO. 1B**

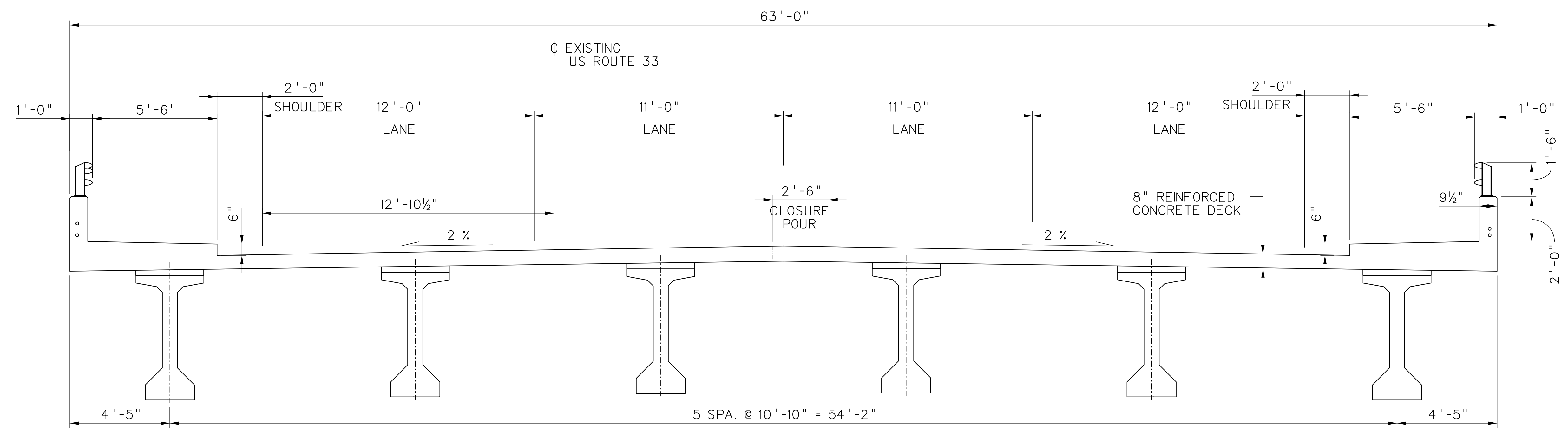
PARKERSBURG, WV **BURGESS & NIPLE**

DESIGNED	DATE
MWL	6/14
DRAWN	DATE
ASG	6/14
CHECKED	
CHECKED	

SHEET	OF
BRIDGE NO.	

10/09/21 AM 5/4/2015 10:09:21 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33 12.76 00	STP-0033 (243)D	2014	ROANE	E32	E86



COMPLETED TYPICAL SECTION

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
**COL. RUBY BRADLEY
BRIDGE REPLACEMENT
COMP. TYPICAL SECTION
ALTERNATIVE NO. 1B**

DESIGNED	DATE
MWL	6/14
DRAWN	
ASG	6/14
CHECKED	
CHECKED	

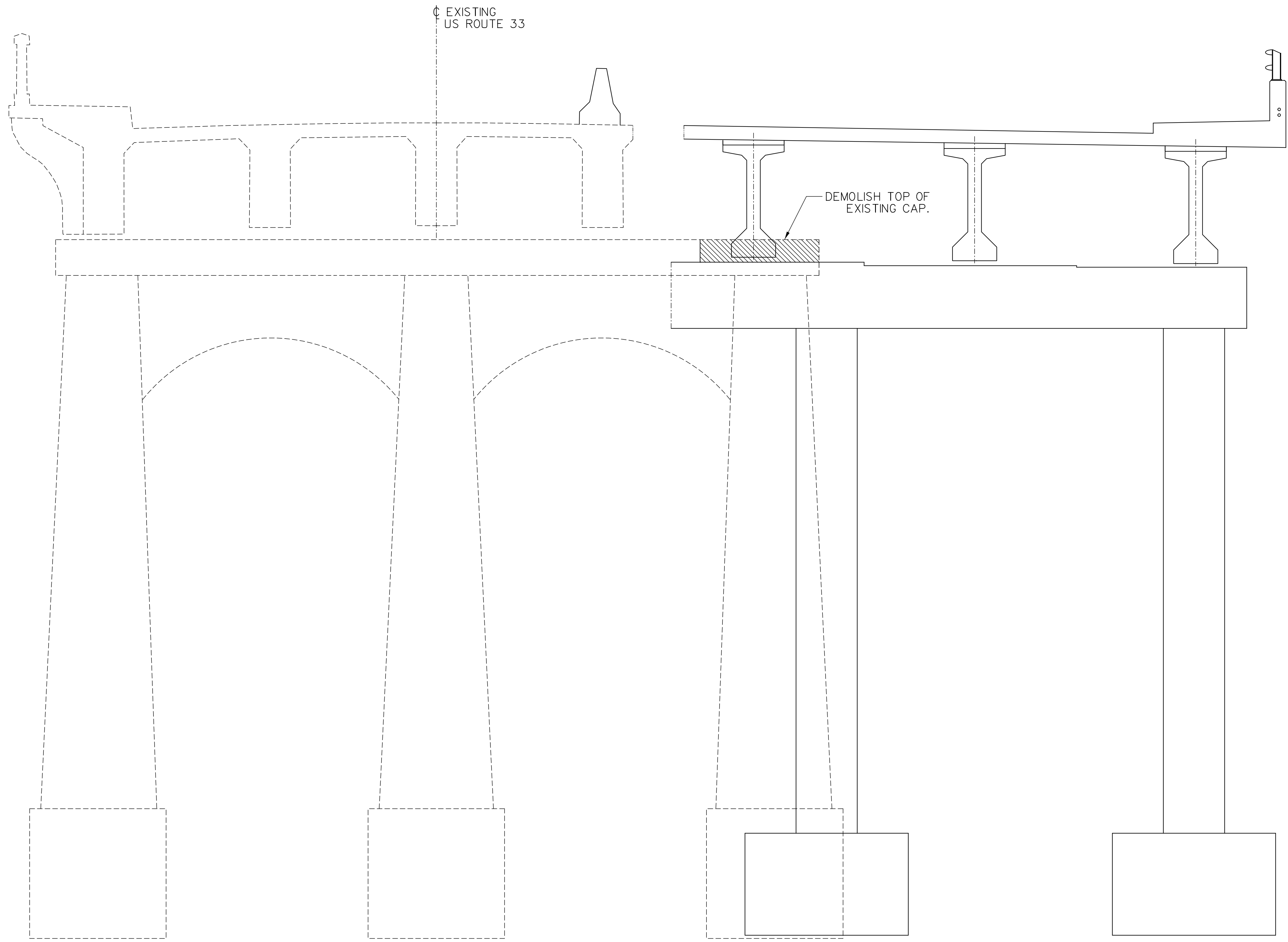


PARKERSBURG, WV **BURGESS & NIPLE**

SHEET OF BRIDGE NO.

10/09/21 AM 5/4/2015 5:42:05 PM P:\PR3310\cadd\shf\14_p\please1.com.dgn

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33 12.76 00	STP-0033 (243)D	2014	ROANE	E33	E86



PIER ELEVATION - PHASE 1 CONSTRUCTION

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
**COL. RUBY BRADLEY
BRIDGE REPLACEMENT
PIER ELEVATION 1
ALTERNATIVE NO. 1B**

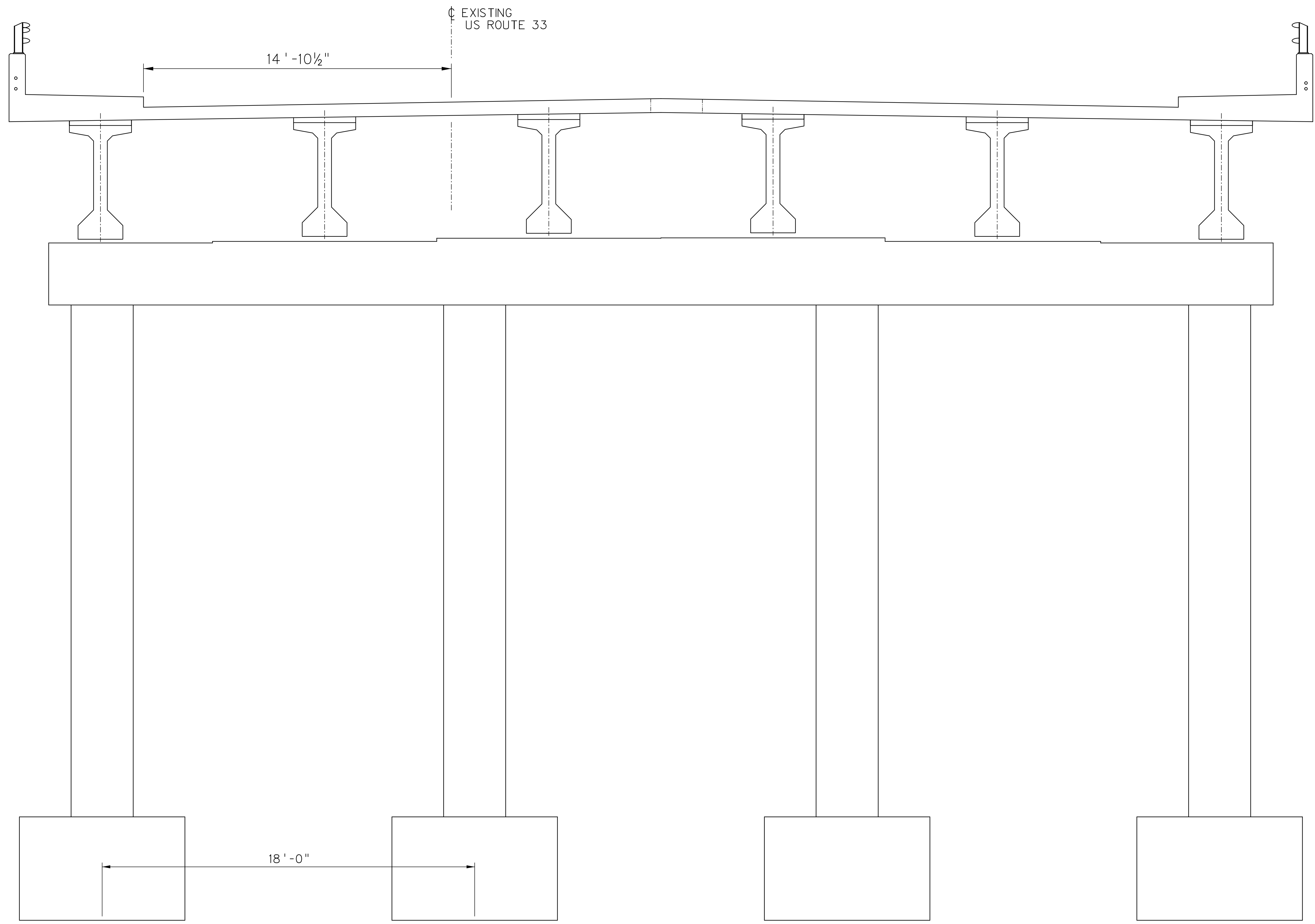
DESIGNED	DATE
MWL	6/14
DRAWN	DATE
ASG	6/14
CHECKED	
CHECKED	

BURGESS & NIPLE
PARKERSBURG, WV

SHEET OF BRIDGE NO.

10:09:21 AM 5/4/2015 P:\PRG310\cadd\shf\14_pier_phase1.com.dgn

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33 12.76 00	STP-0033 (243)D	2014	ROANE	E34	E86



PIER ELEVATION AFTER COMPLETION

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
**COL. RUBY BRADLEY
BRIDGE REPLACEMENT
PIER ELEVATION 2
ALTERNATIVE NO. 1B**

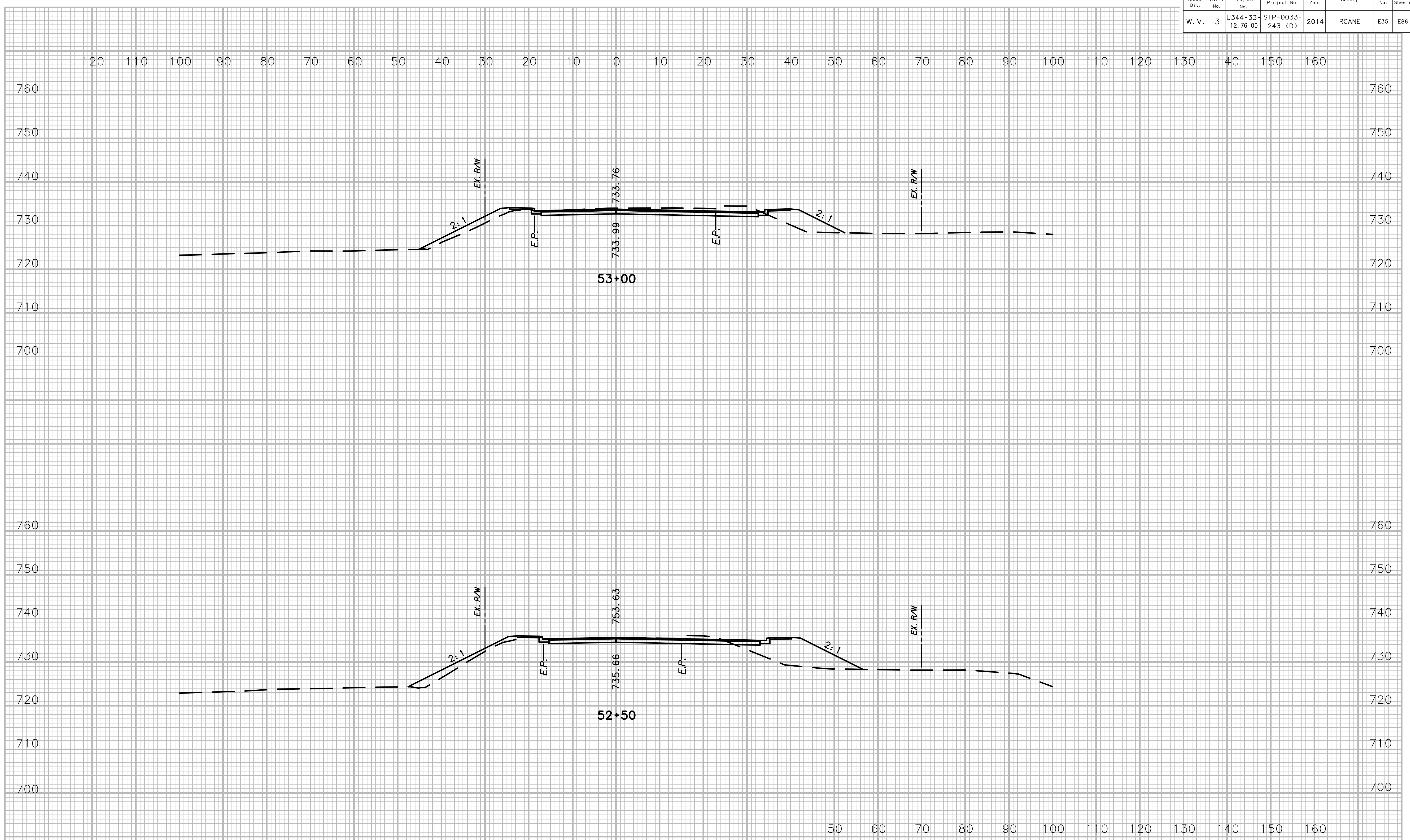
DESIGNED MWL	DATE 6/14
DRAWN ASG	DATE 6/14
CHECKED	
CHECKED	

BURGESS & NIPLE
PARKERSBURG, WV

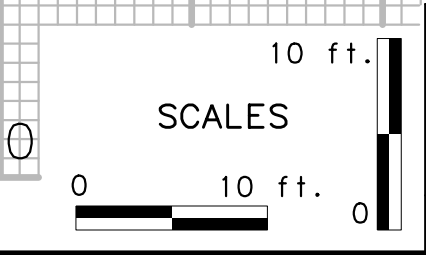
SHEET
OF
BRIDGE NO.

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Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E35	E86



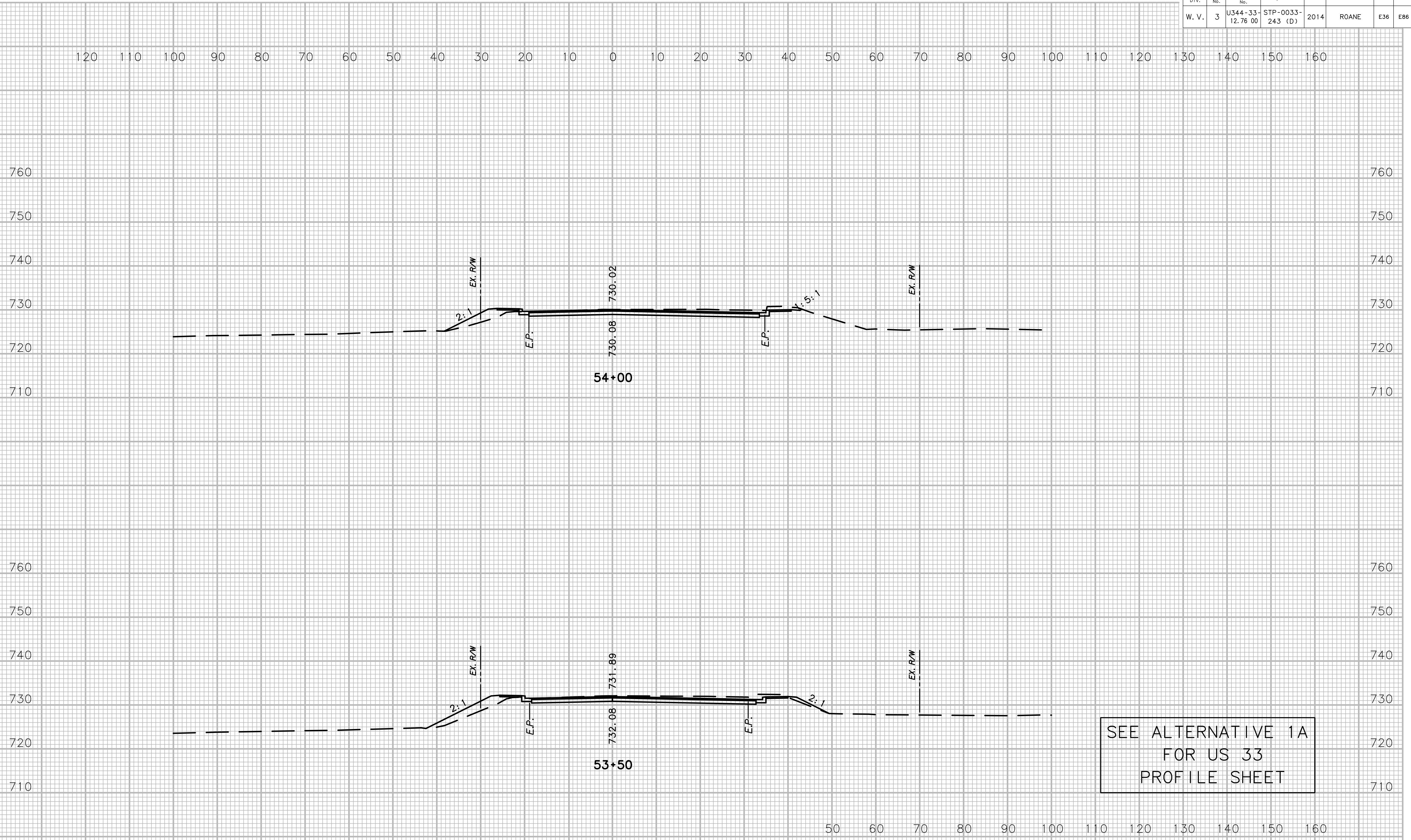
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BOOK NO.	///		BOOK NO.	///	
FLOTTED	///		PLOTTED	///	
TEMPLATE	///		TEMPLATE	///	
AREAS CHECKED	///		AREAS CHECKED	///	



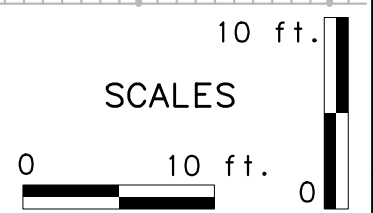
REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 1B - US 33
CROSS-SECTION SHEET
 STA. 52+50 TO STA. 53+00

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E36	E86



SEE ALTERNATIVE 1A
FOR US 33
PROFILE SHEET

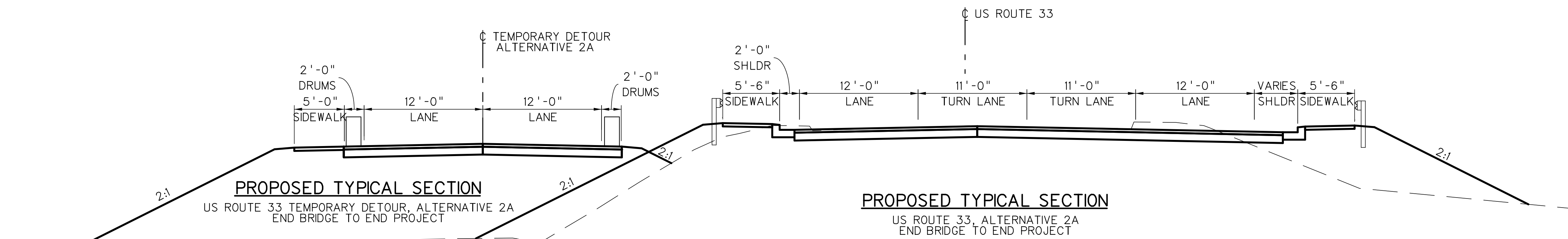


REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 1B - US 33
CROSS-SECTION SHEET
STA. 53+50 TO STA. 54+00

ORIGINAL SURVEY BOOK NO.	DATE	BY	FINAL SURVEY BOOK NO.	DATE	BY
SURVEYED	PLOTTED	TEMPERATURE	AREAS CHECKED		

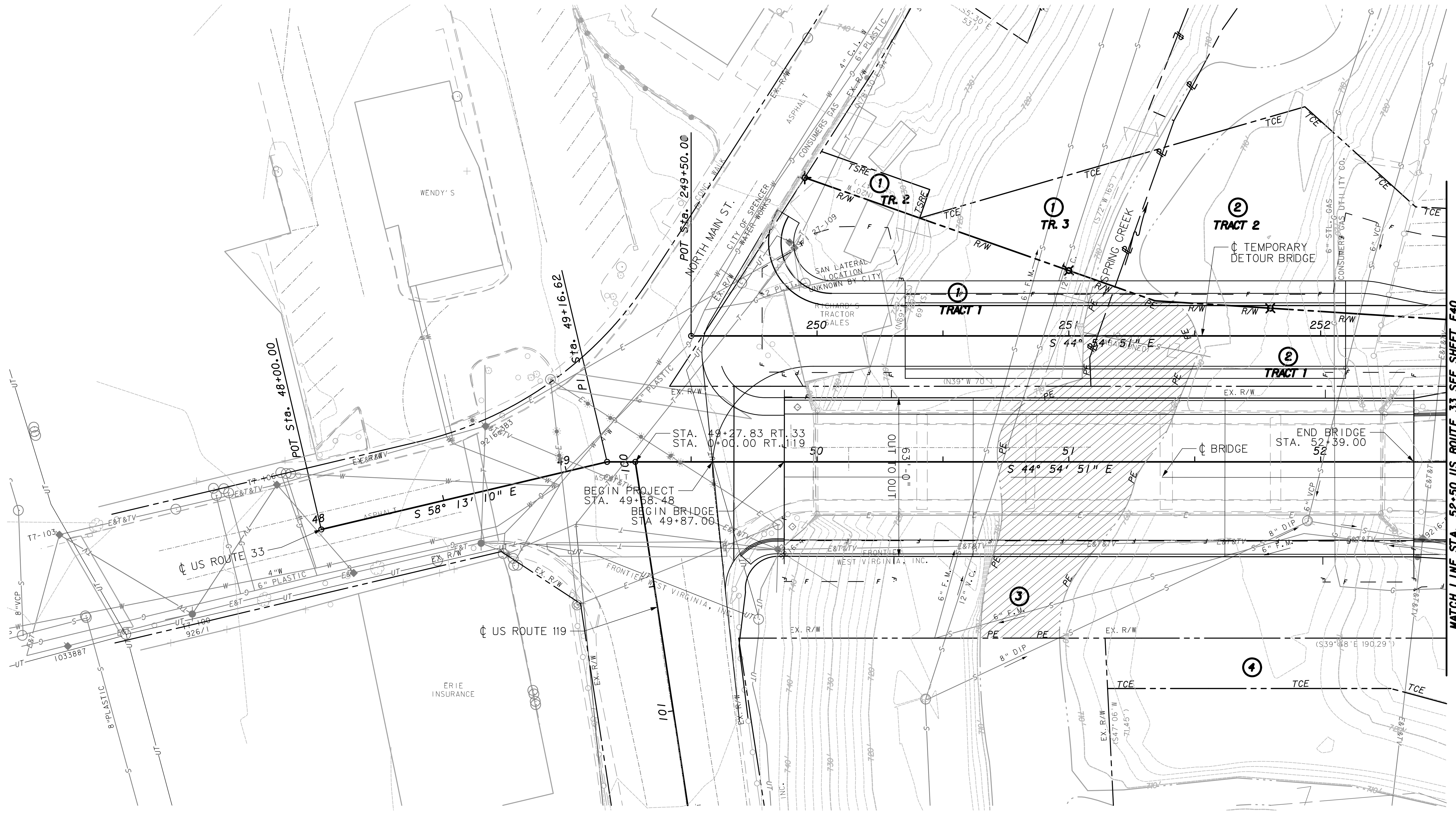
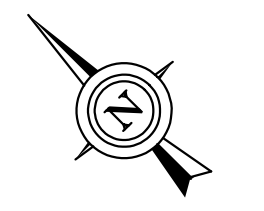
Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E37	E86



THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 2A
TYPICAL SECTIONS

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E39	E86



MATCH LINE STA. 52+50 US ROUTE 33 SEE SHEET E40



THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 2A
PLAN SHEET
BEGIN PROJECT TO STA. 52+50

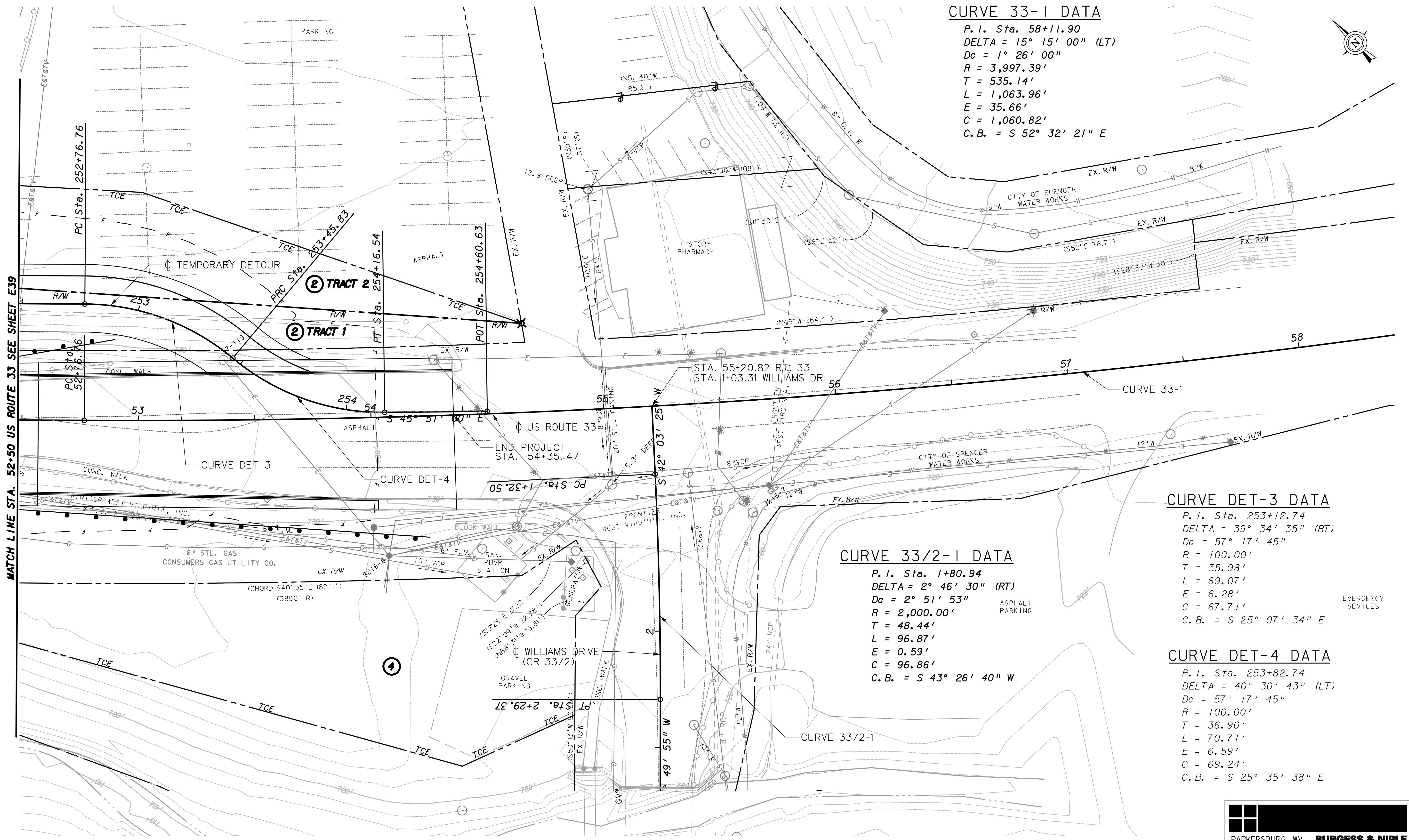
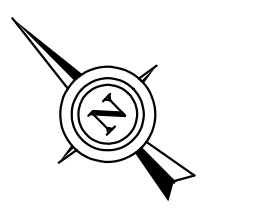
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REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E40	E86

CURVE 33-1 DATA

P.I. Sta. 58+11.90
 DELTA = 15° 15' 00" (LT)
 Dc = 1° 26' 00"
 R = 3,997.39'
 T = 535.14'
 L = 1,063.96'
 E = 35.66'
 C = 1,060.82'
 C.B. = S 52° 32' 21" E



CURVE 33/2-1 DATA

P.I. Sta. 1+80.94
 DELTA = 2° 46' 30" (RT)
 Dc = 2° 51' 53"
 R = 2,000.00'
 T = 48.44'
 L = 96.87'
 E = 0.59'
 C = 96.86'
 C.B. = S 43° 26' 40" W

CURVE DET-3 DATA

P.I. Sta. 253+12.74
 DELTA = 39° 34' 35" (RT)
 Dc = 57° 17' 45"
 R = 100.00'
 T = 35.98'
 L = 69.07'
 E = 6.28'
 C = 67.71'
 C.B. = S 25° 07' 34" E

CURVE DET-4 DATA

P.I. Sta. 253+82.74
 DELTA = 40° 30' 43" (LT)
 Dc = 57° 17' 45"
 R = 100.00'
 T = 36.90'
 L = 70.71'
 E = 6.59'
 C = 69.24'
 C.B. = S 25° 35' 38" E

MATCH LINE STA. 52+50 US ROUTE 33 SEE SHEET E39

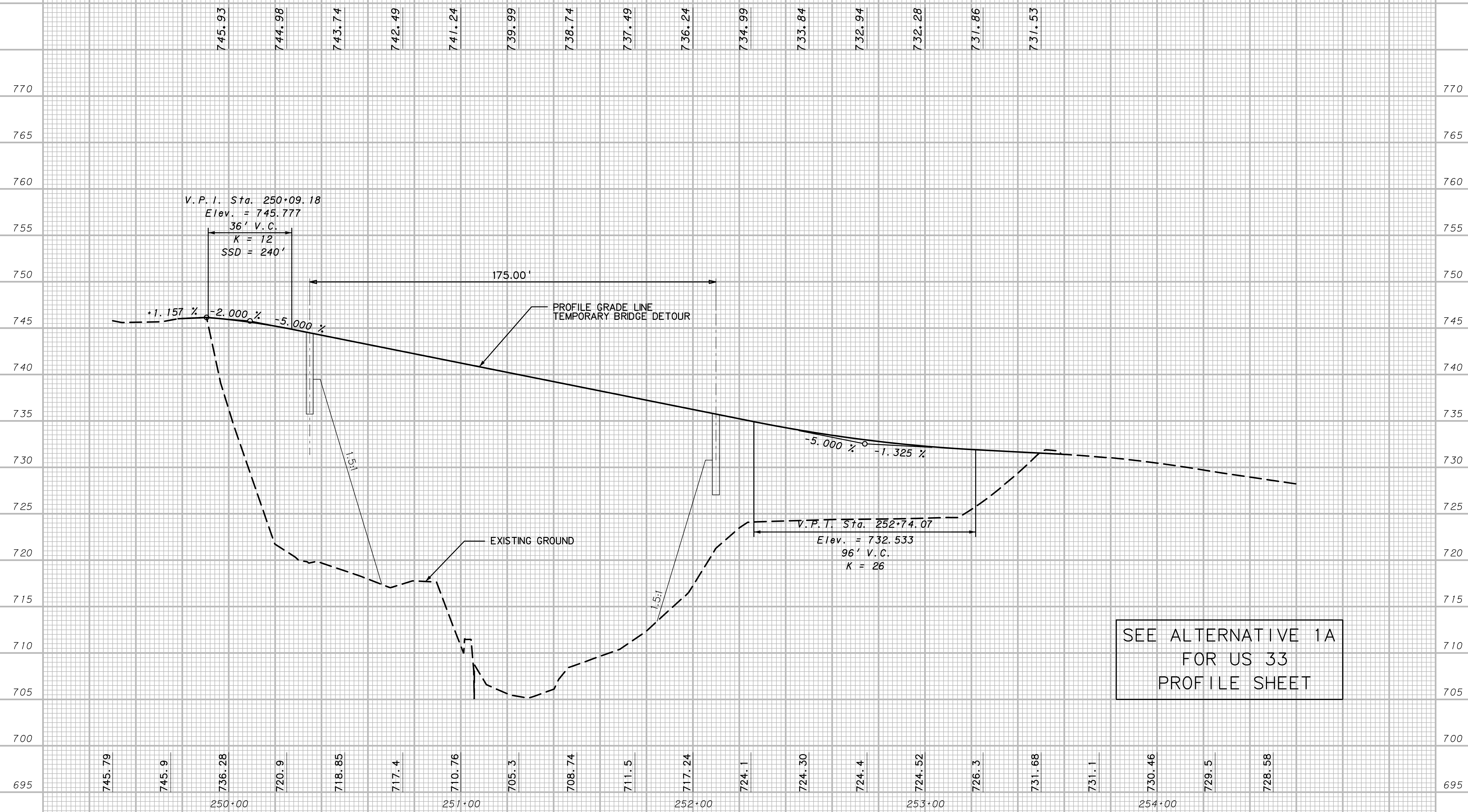


THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 2A
PLAN SHEET
 STA. 52+50 TO END PROJECT

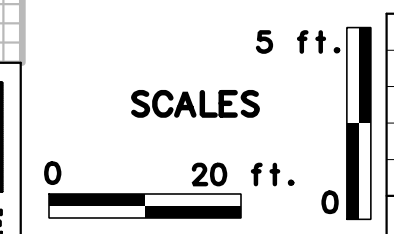
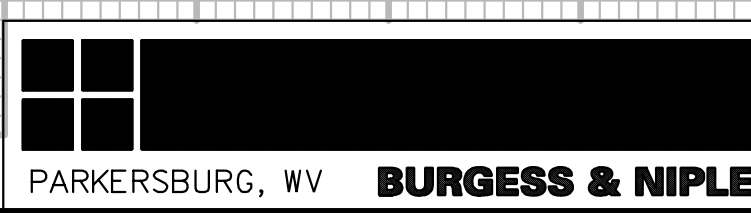
SCALE : 0 20 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33- 12.76 00	STP-0033- 243 (D)	2014	ROANE	E41	E86



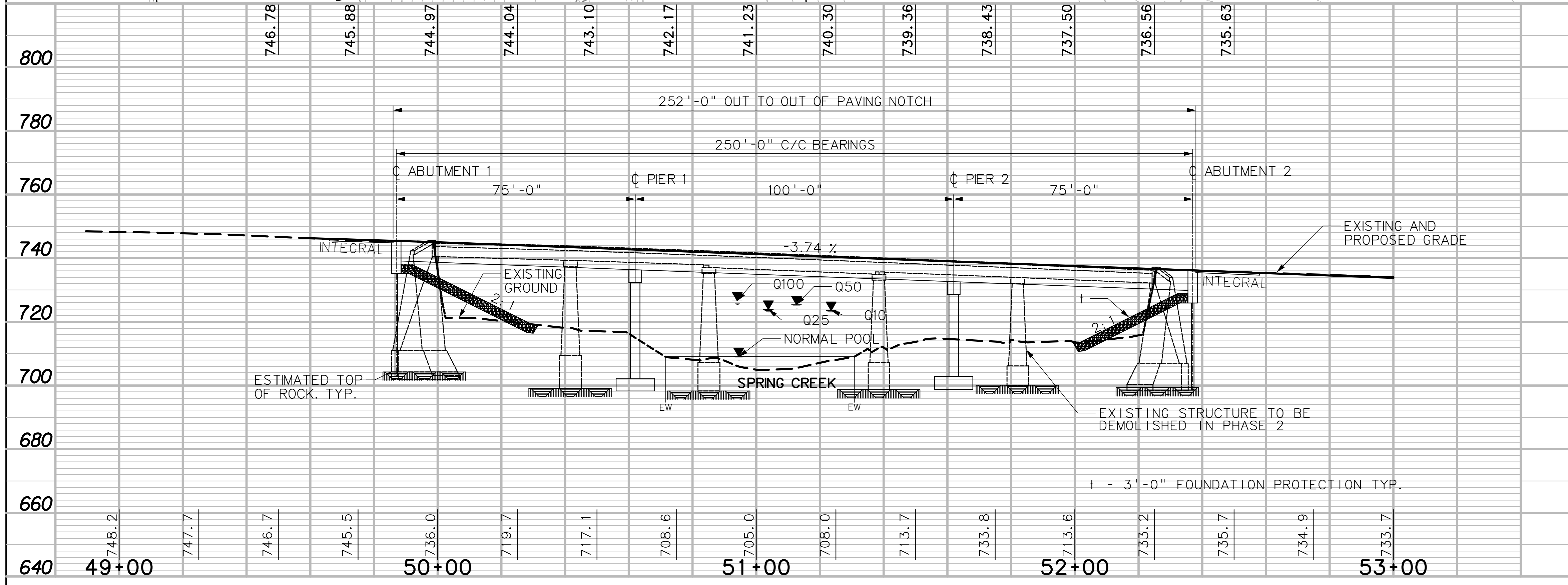
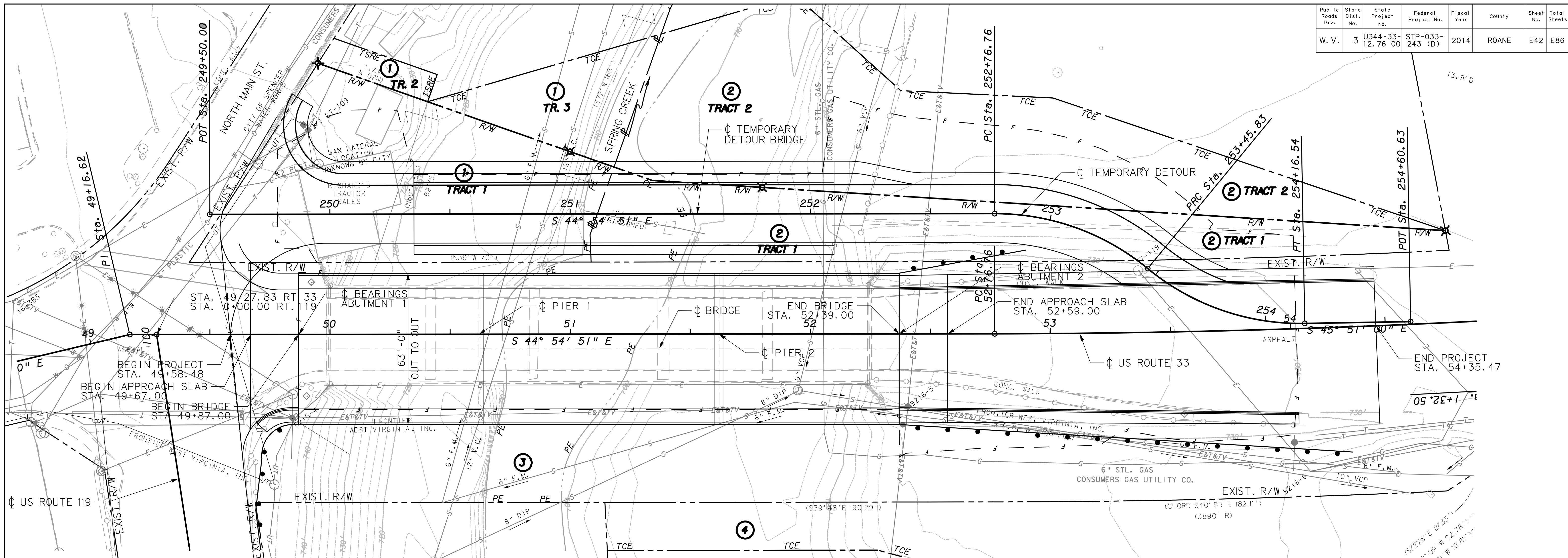
SEE ALTERNATIVE 1A
FOR US 33
PROFILE SHEET



REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 2A - TEMPORARY DETOUR BRIDGE
PROFILE SHEET
STA. 249+50 TO STA. 254+60

Public Roads Div.	State No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-033-243 (D)	2014	ROANE	E42	E86



HYDRAULIC DATA AT NORTH MARKET ST.

	SPRING CREEK			
	HWE	HWE*	V(FPS)	Q(CFS)
Q10	721.61	723.11	2.63	3950
Q25	722.45	723.95	2.06	4500
Q50	723.90	725.40	2.64	5430
Q100	725.02	726.52	2.64	6200

DRAINAGE AREA = 39.6 SQ. MI.
WATERWAY OPENING = 575 SF

* ESTIMATED BASED ON SLOPE OF
STREAM FOR RUBY BRADLEY.

20 ft.
0 20 ft. 0

DESIGNED	DATE
MWL	7/14
DRAWN	DATE
ASG	7/14
CHECKED	
CHECKED	

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

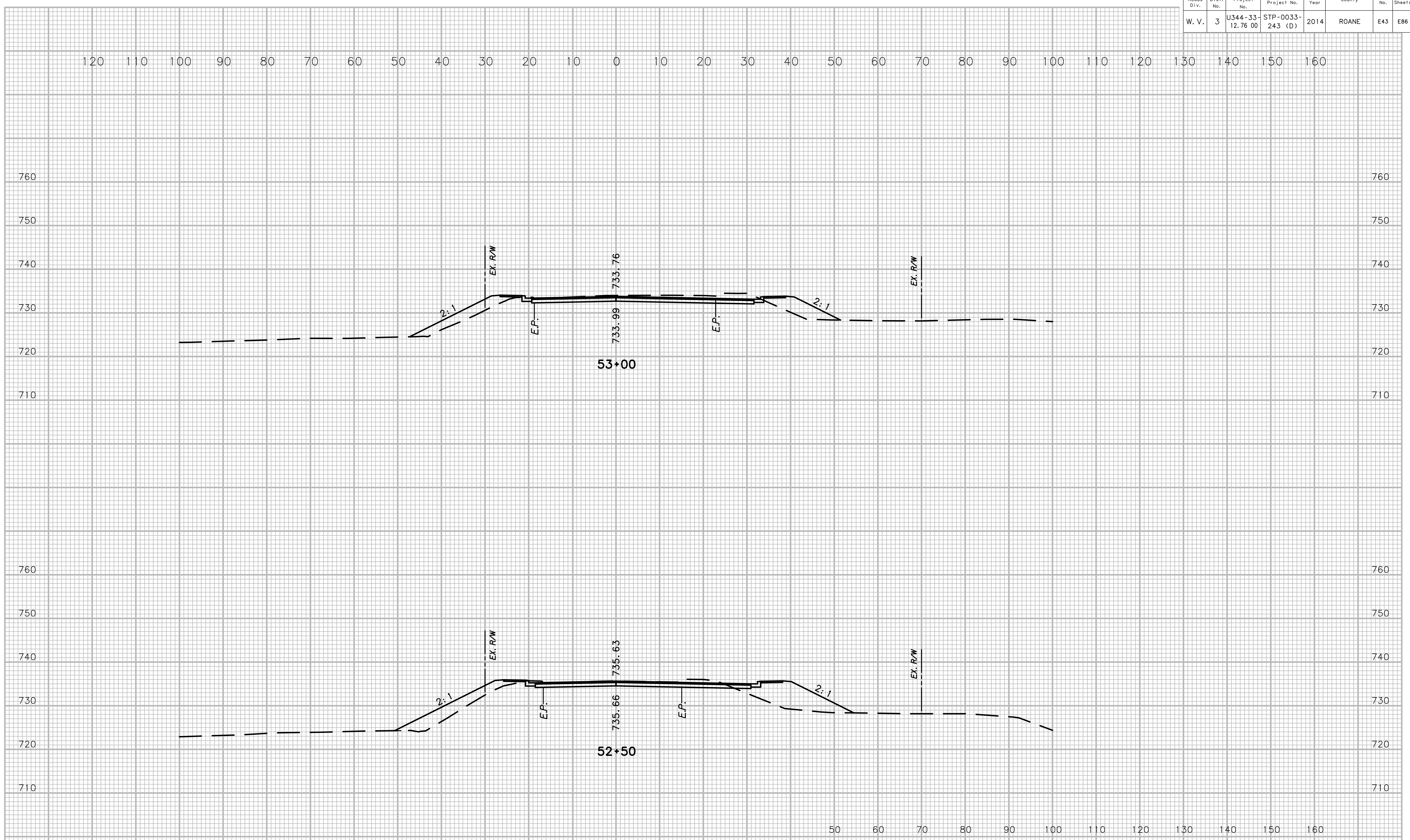
THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

COL. RUBY BRADLEY BRIDGE REPLACEMENT SITUATION PLAN ALTERNATIVE 2A

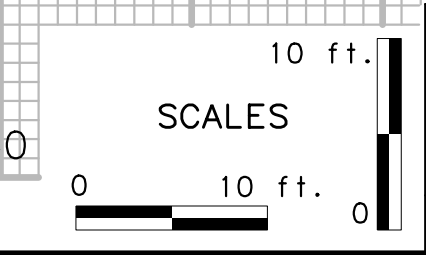
PARKERSBURG, WV **BURGESS & NIPLÉ**

SHEET
OF
BRIDGE NO.

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E43	E86



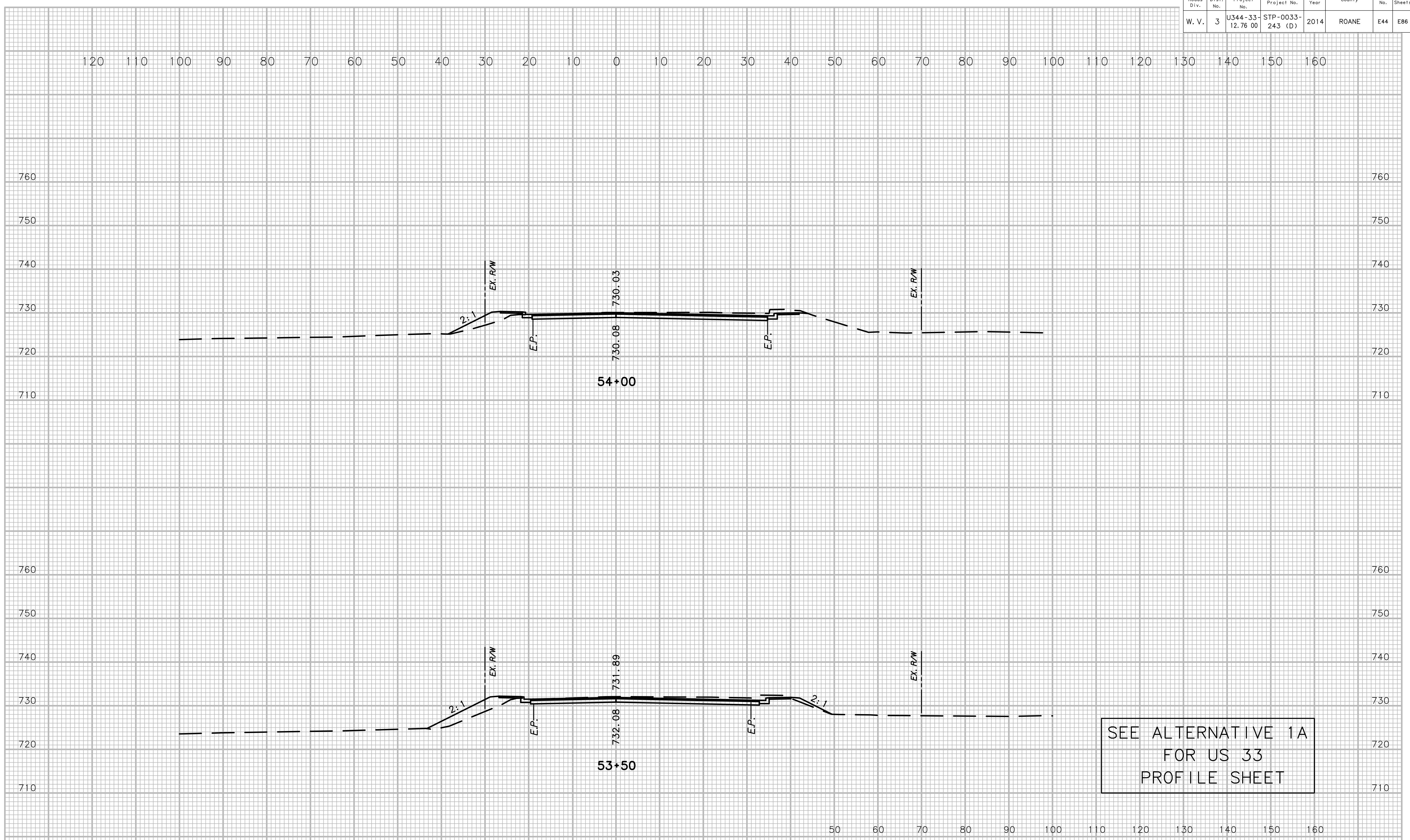
DATE	BY	FINAL SURVEYED
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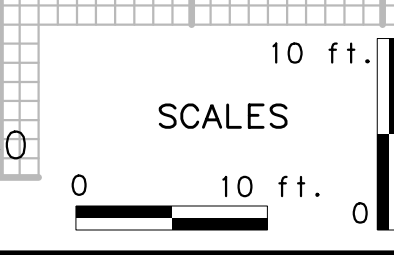
REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 2A, 2B & 3 - US 33
CROSS-SECTION SHEET
 STA. 52+50 TO STA. 53+00

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E44	E86



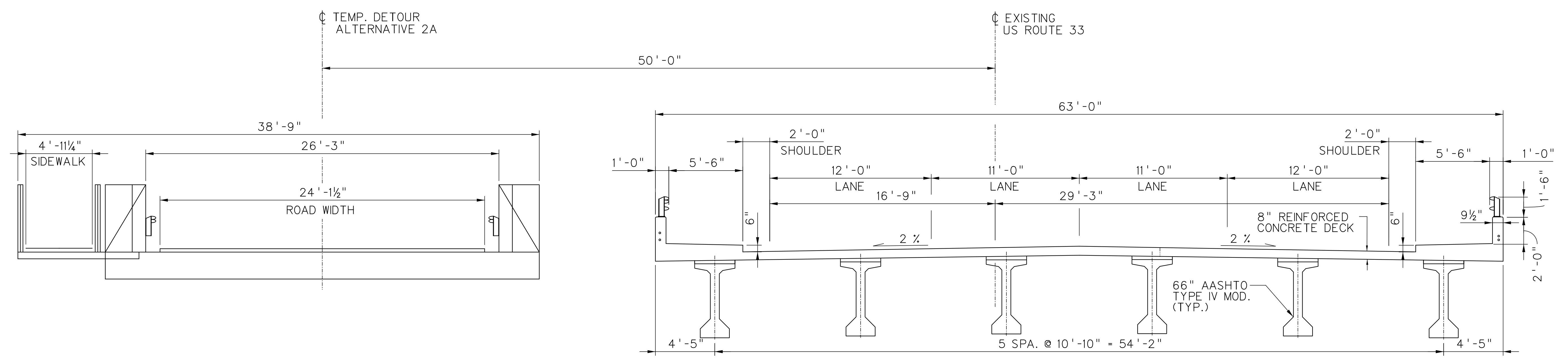
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REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY


THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 2A, 2B & 3 - US 33
CROSS-SECTION SHEET
 STA. 53+50 TO STA. 54+00

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33 12.76 00	STP-0033 (243)D	2014	ROANE	E45	E86



COMPLETED TYPICAL SECTION

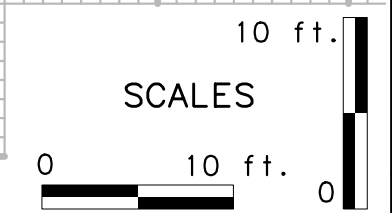
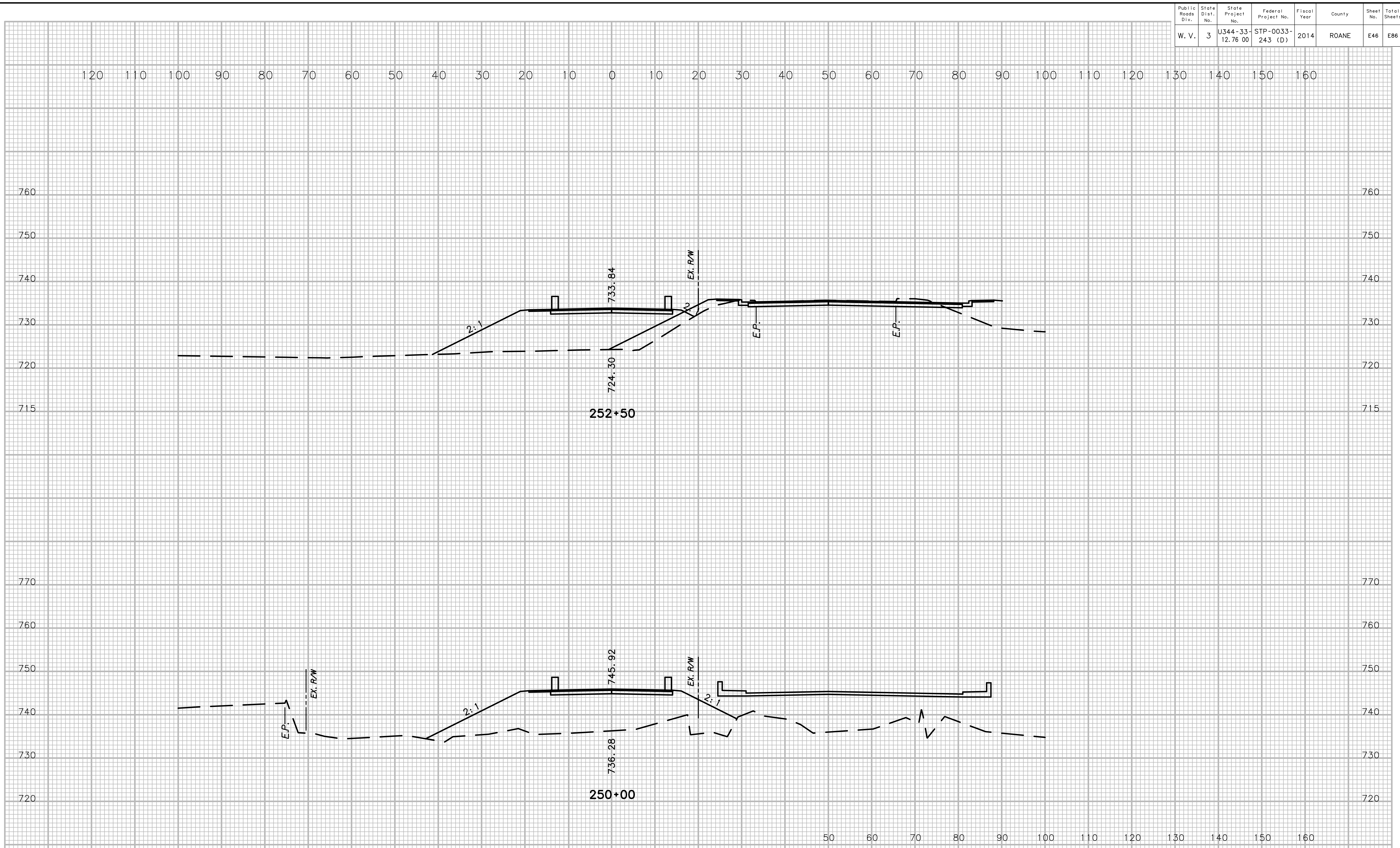
DESIGNED	DATE	THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS COL. RUBY BRADLEY BRIDGE REPLACEMENT COMP. TYPICAL SECTION ALTERNATIVE NO. 2A	SHEET OF BRIDGE NO.
DRAWN			
CHECKED			
CHECKED			


 PARKERSBURG, WV **BURGESS & NIPLE**

10:09:37 AM
 5/4/2015
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Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E46	E86

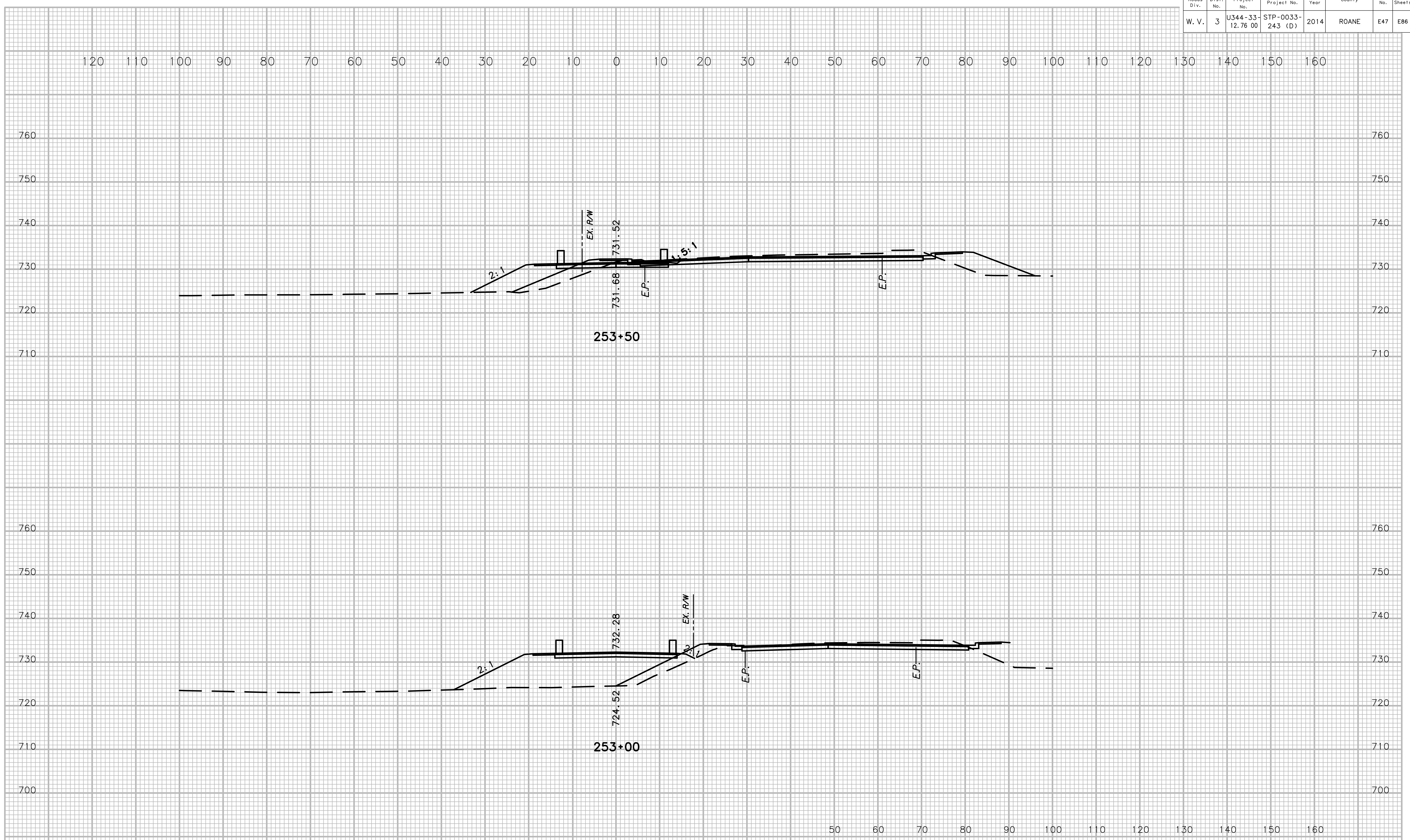
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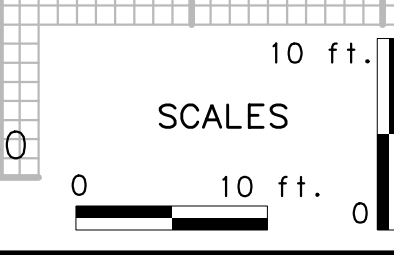
REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 2A - TEMPORARY DETOUR BRIDGE
CROSS-SECTION SHEET
 STA. 250+00 TO STA. 252+50

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E47	E86



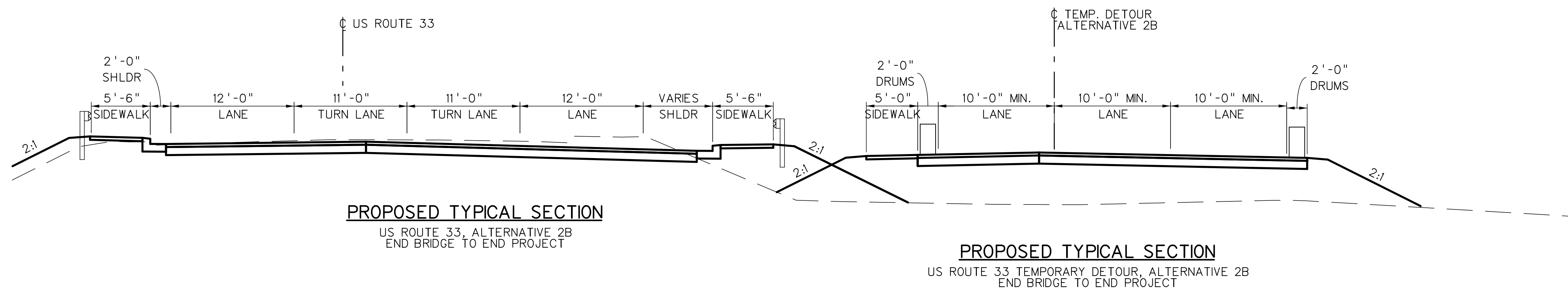
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REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 2A - TEMPORARY DETOUR BRIDGE
CROSS-SECTION SHEET
 STA. 253+00 TO STA. 253+50

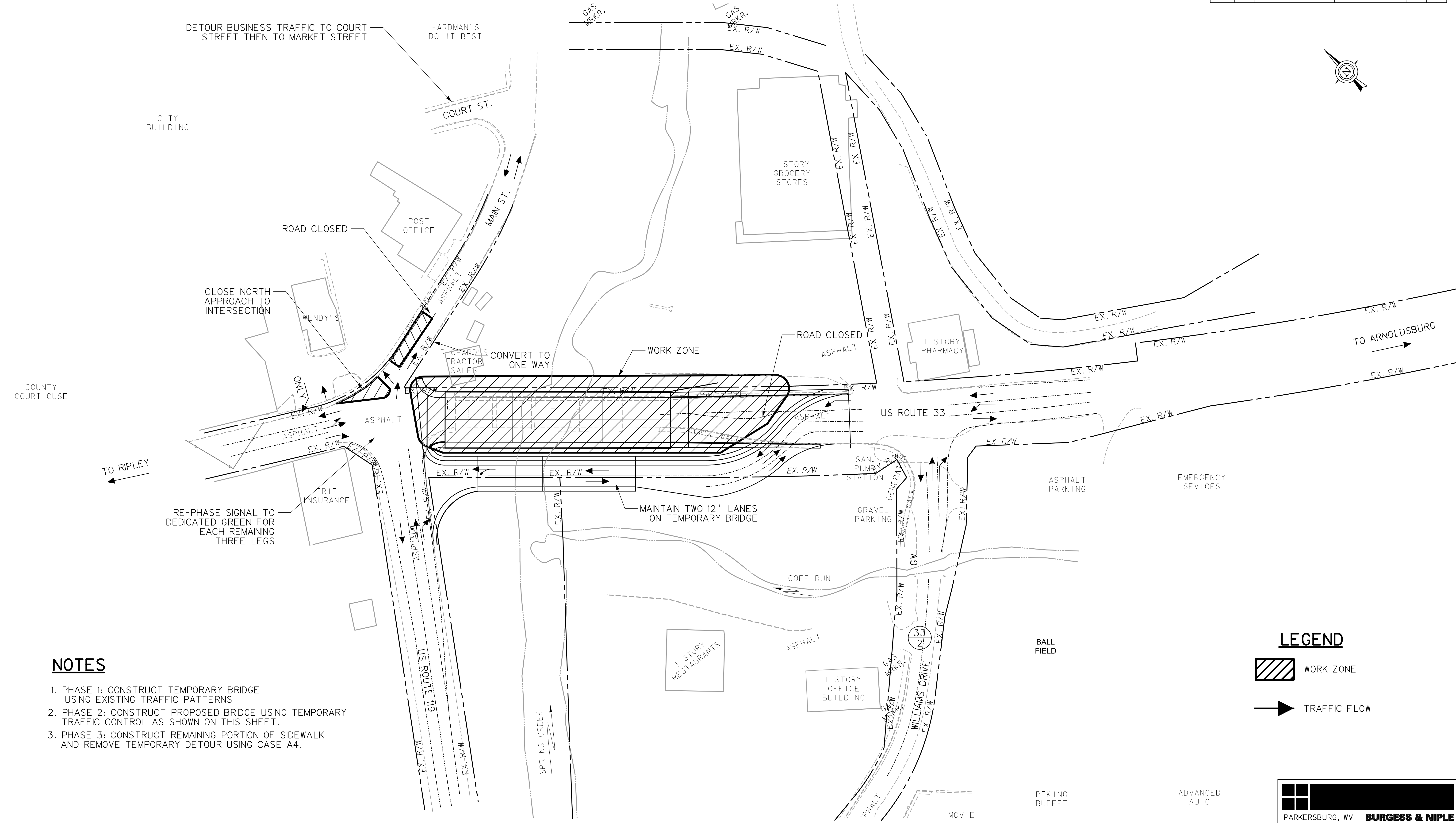
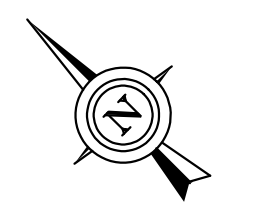
Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E49	E86



THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 2B
TYPICAL SECTIONS

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E50	E86



NOTES

1. PHASE 1: CONSTRUCT TEMPORARY BRIDGE USING EXISTING TRAFFIC PATTERNS
2. PHASE 2: CONSTRUCT PROPOSED BRIDGE USING TEMPORARY TRAFFIC CONTROL AS SHOWN ON THIS SHEET.
3. PHASE 3: CONSTRUCT REMAINING PORTION OF SIDEWALK AND REMOVE TEMPORARY DETOUR USING CASE A4.

LEGEND

- WORK ZONE
- TRAFFIC FLOW

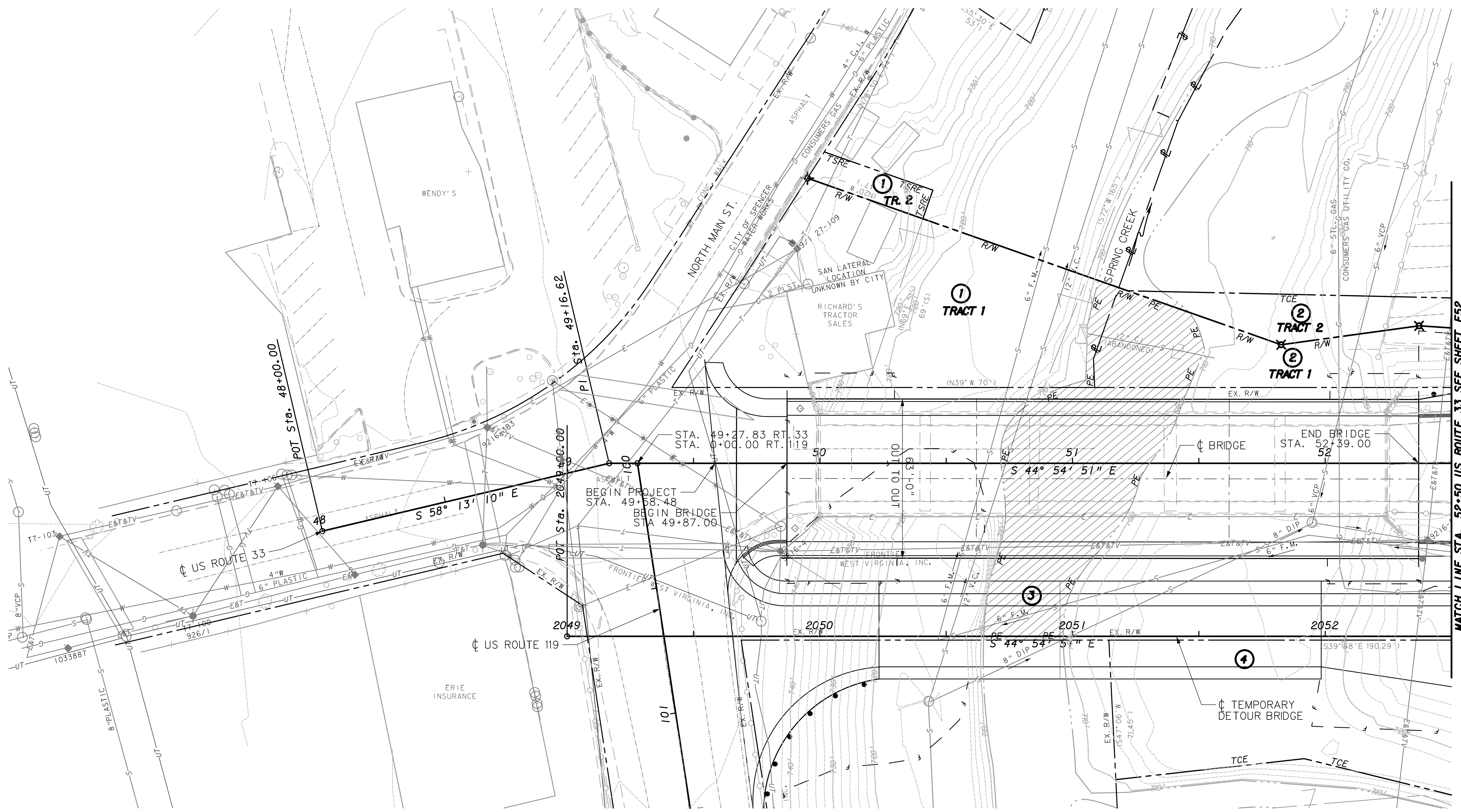
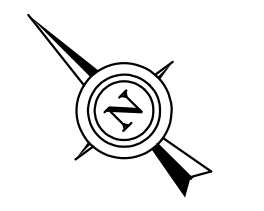
PARKERSBURG, WV **BURGESS & NIPLÉ**

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
**TEMPORARY TRAFFIC CONTROL
ALTERNATIVE 2B**

SCALE : 0 50 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E51	E86



MATCH LINE STA. 52+50 US ROUTE 33 SEE SHEET E52



THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

PLAN SHEET
BEGIN PROJECT TO STA. 52+50

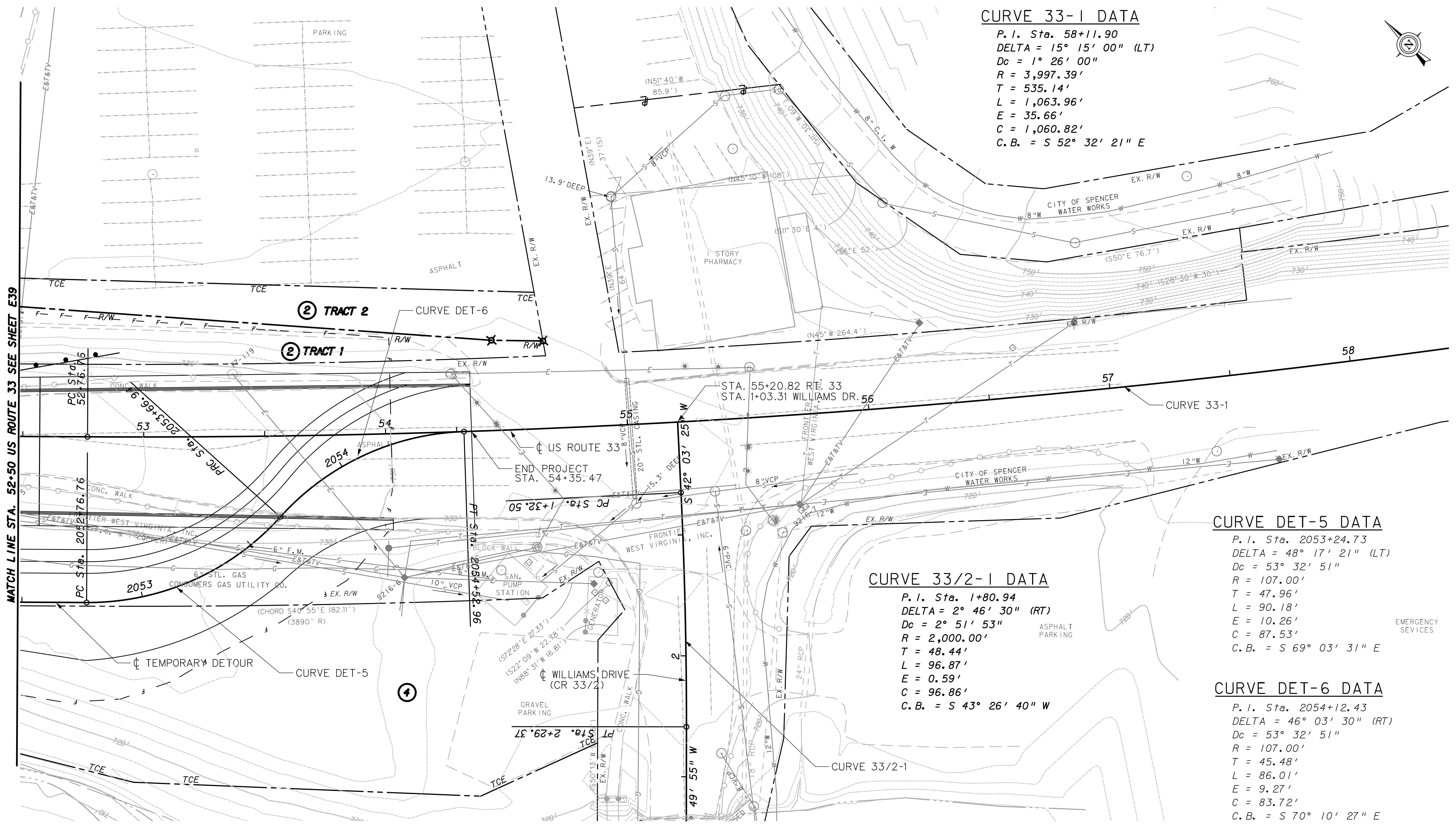
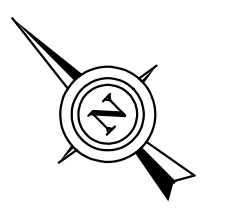
SCALE : 0 20 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E52	E86

CURVE 33-1 DATA

P.I. Sta. 58+11.90
 DELTA = 15° 15' 00" (LT)
 Dc = 1° 26' 00"
 R = 3,997.39'
 T = 535.14'
 L = 1,063.96'
 E = 35.66'
 C = 1,060.82'
 C.B. = S 52° 32' 21" E



CURVE 33/2-1 DATA

P.I. Sta. 1+80.94
 DELTA = 2° 46' 30" (RT)
 Dc = 2° 51' 53"
 R = 2,000.00'
 T = 48.44'
 L = 96.87'
 E = 0.59'
 C = 96.86'
 C.B. = S 43° 26' 40" W

CURVE DET-5 DATA

P.I. Sta. 2053+24.73
 DELTA = 48° 17' 21" (LT)
 Dc = 53° 32' 51"
 R = 107.00'
 T = 47.96'
 L = 90.18'
 E = 10.26'
 C = 87.53'
 C.B. = S 69° 03' 31" E

CURVE DET-6 DATA

P.I. Sta. 2054+12.43
 DELTA = 46° 03' 30" (RT)
 Dc = 53° 32' 51"
 R = 107.00'
 T = 45.48'
 L = 86.01'
 E = 9.27'
 C = 83.72'
 C.B. = S 70° 10' 27" E

MATCH LINE STA. 52+50 US ROUTE 33 SEE SHEET E39

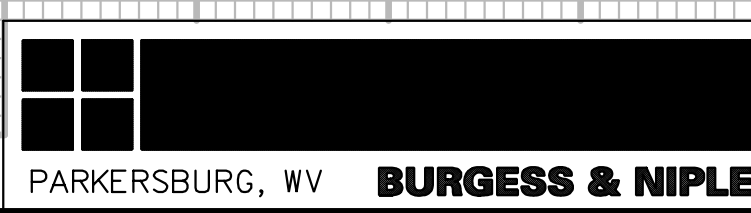
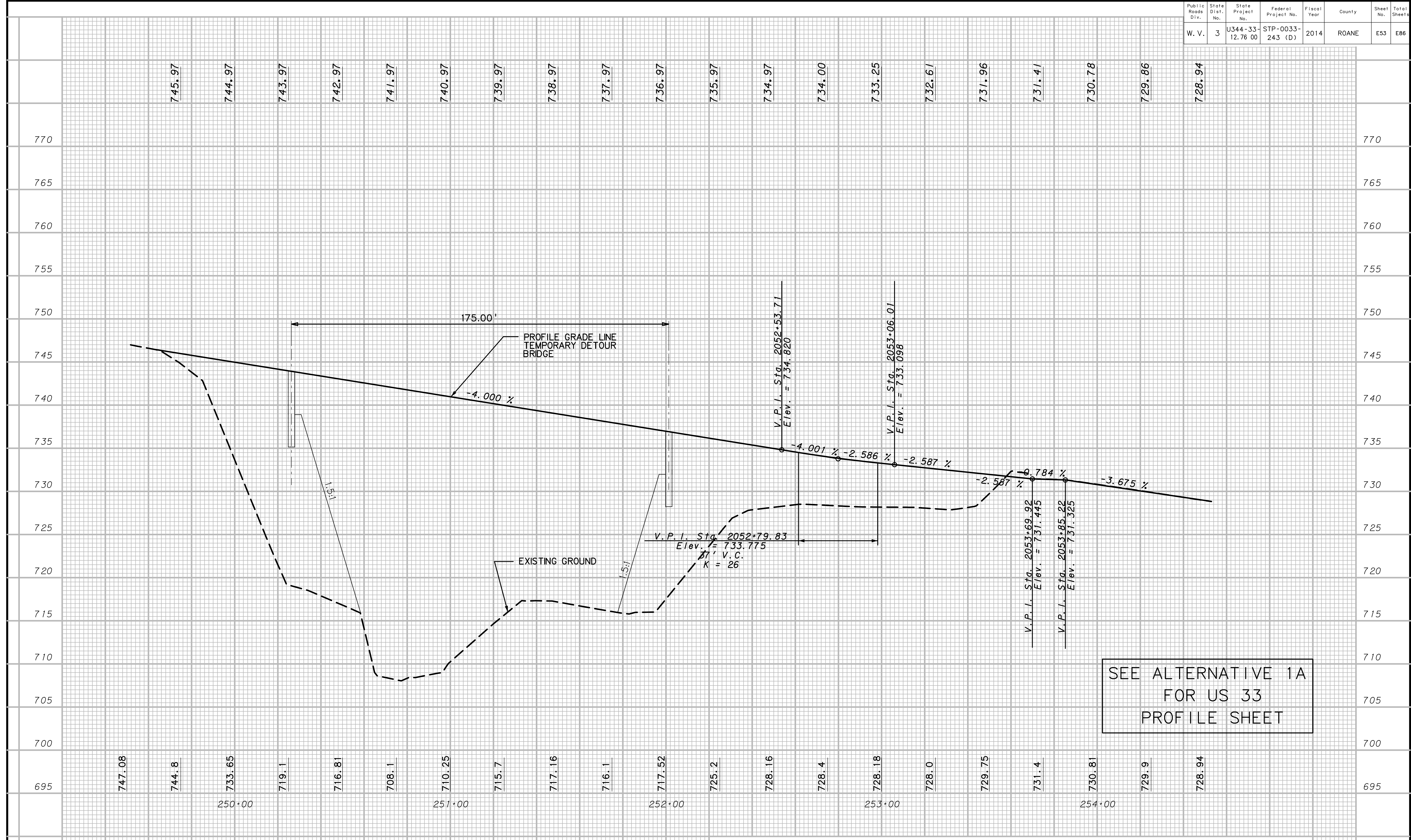


THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 2B
PLAN SHEET
 STA. 52+50 TO END PROJECT

SCALE : 0 20 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

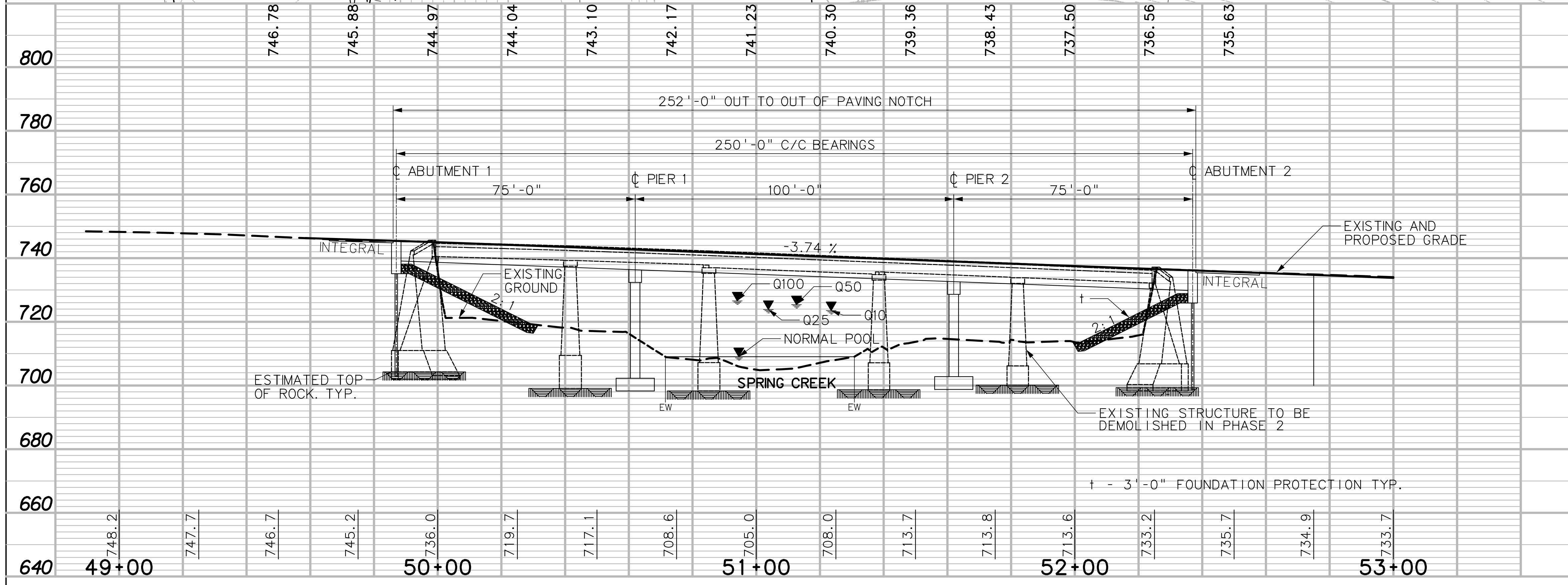
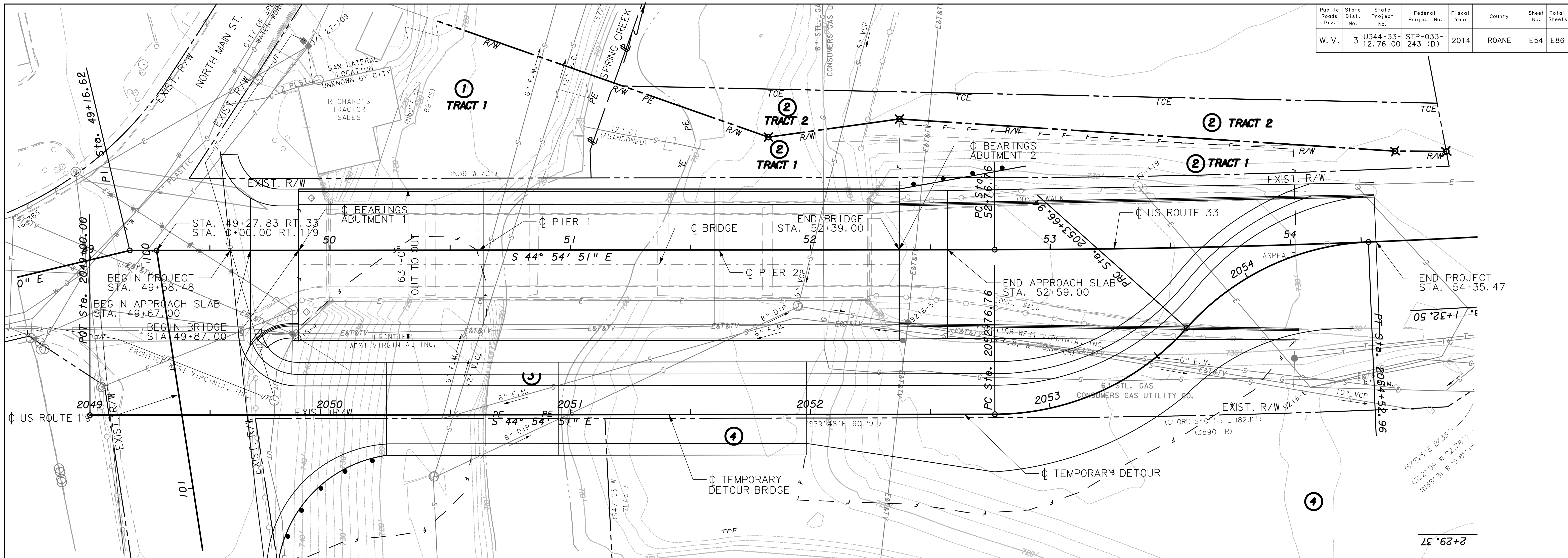
Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33- 12.76 00	STP-0033- 243 (D)	2014	ROANE	E53	E86



5 ft.		REVISION		DATE		BY	
SCALES		SHEET NUMBER		REVISION		DATE	
0 20 ft. 0							

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 2B - TEMPORARY DETOUR BRIDGE
PROFILE SHEET
STA. 249+50 TO STA. 254+60

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-033-243 (D)	2014	ROANE	E54	E86



HYDRAULIC DATA AT NORTH MARKET ST.

	SPRING CREEK			
	HWE	HWE*	V(FPS)	Q(CFS)
Q10	721.61	723.11	2.63	3950
Q25	722.45	723.95	2.06	4500
Q50	723.90	725.40	2.64	5430
Q100	725.02	726.52	2.64	6200

DRAINAGE AREA = 39.6 SQ. MI.
WATERWAY OPENING = 575 SF
* ESTIMATED BASED ON SLOPE OF STREAM FOR RUBY BRADLEY.

20 ft. SCALES

DESIGNED	DATE
MWL	7/14
DRAWN	DATE
ASG	7/14
CHECKED	
CHECKED	

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

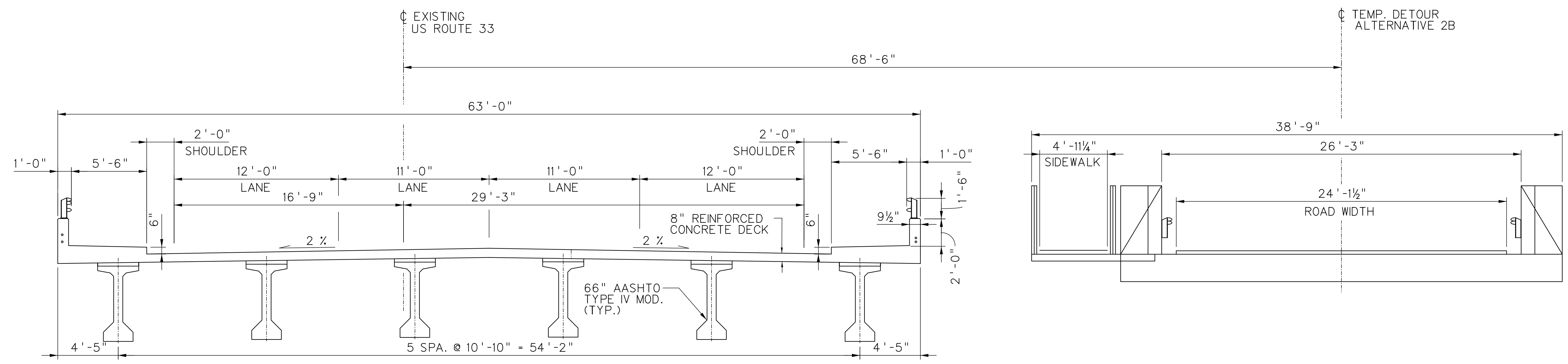
THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

COL. RUBY BRADLEY BRIDGE REPLACEMENT SITUATION PLAN ALTERNATIVE 2B

PARKERSBURG, WV **BURGESS & NIPLÉ**

SHEET OF BRIDGE NO.

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33 12.76 00	STP-0033 (243)D	2014	ROANE	E55	E86



COMPLETED TYPICAL SECTION

DESIGNED	DATE		
MWL	7/14		
DRAWN	DATE		
ASG	7/14		
CHECKED			
CHECKED			

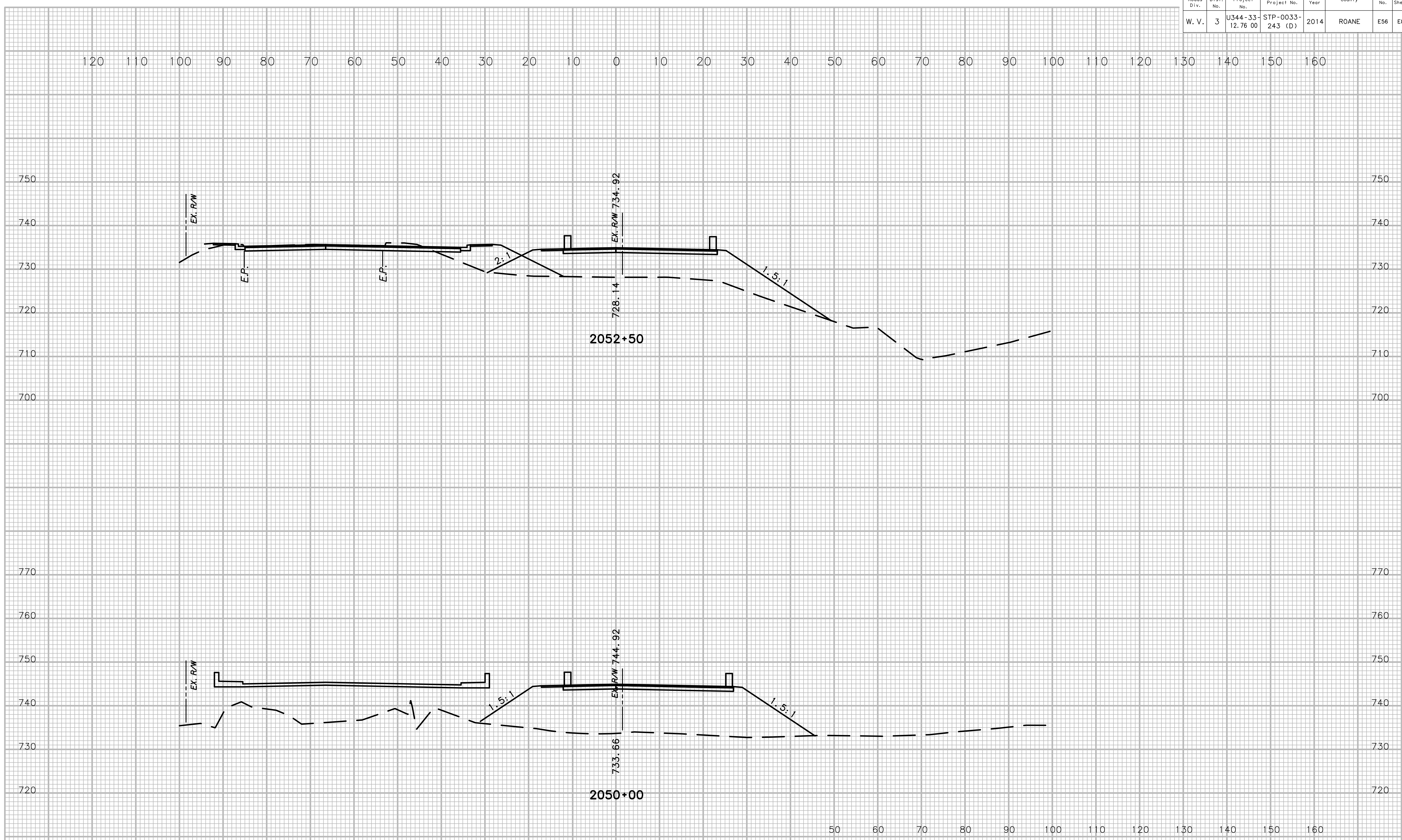
THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
**COL. RUBY BRADLEY
 BRIDGE REPLACEMENT
 COMP. TYPICAL SECTION
 ALTERNATIVE NO. 2B**

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

SHEET OF BRIDGE NO.
 PARKERSBURG, WV **BURGESS & NIPLE**

10:09:41 AM
 5/4/2015
 BUSERNAME\$

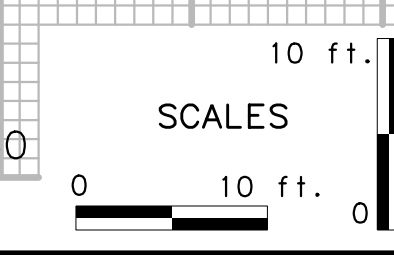
Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E56	E86



DATE	BY	DATE	BY
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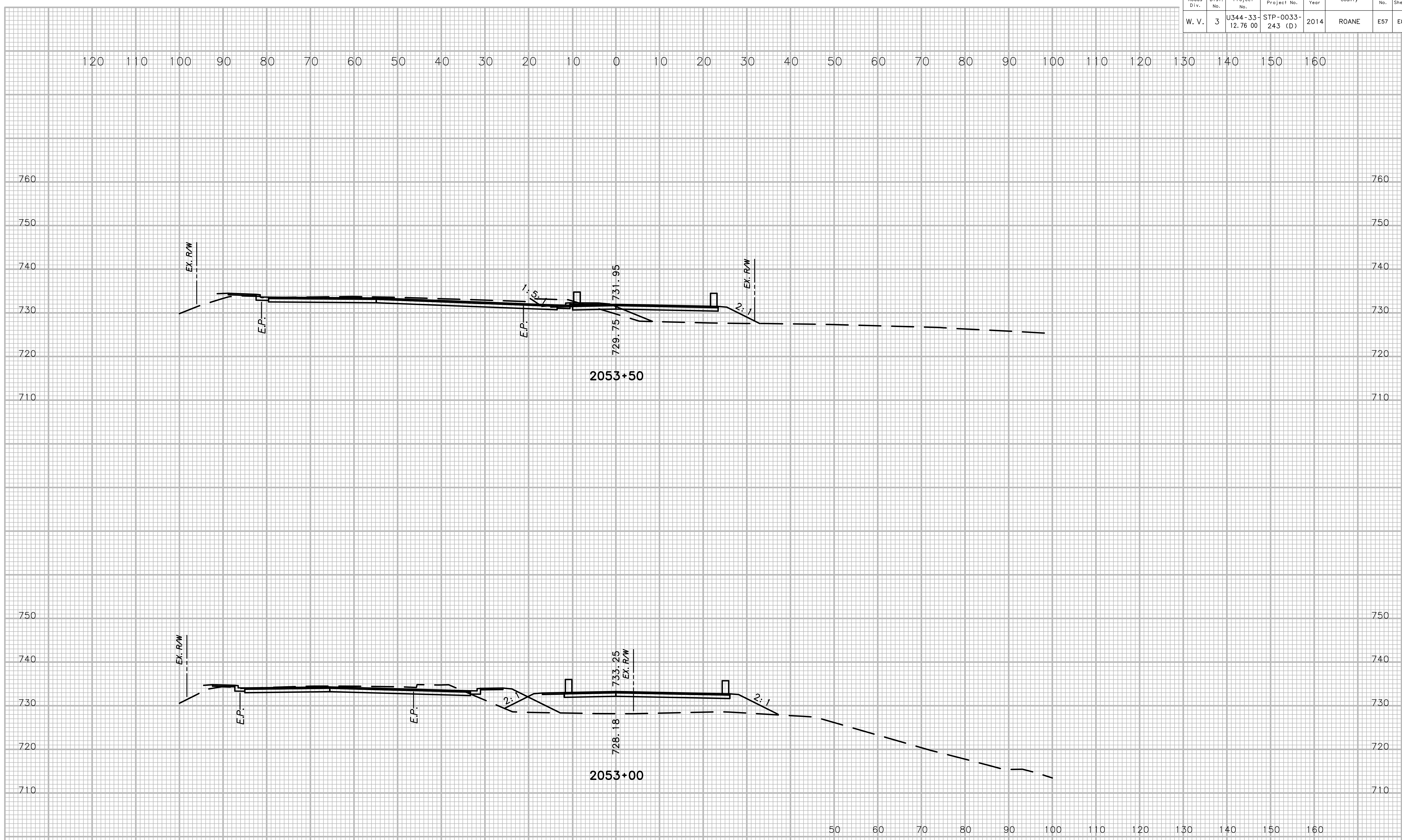
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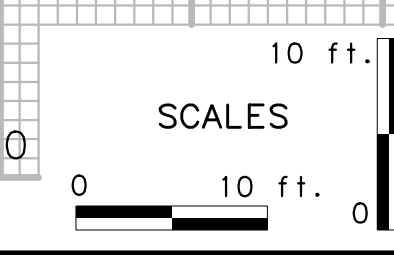
REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 2B - TEMPORARY DETOUR BRIDGE
CROSS-SECTION SHEET
STA. 2050+00 TO STA. 2052+50

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E57	E86



ORIGINAL SURVEY NO.	DATE	BY	FINAL SURVEY BOOK NO.	DATE	BY
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TEMPLATE	///		BOOK	///	
AREAS CHECKED	///		AREAS CHECKED	///	

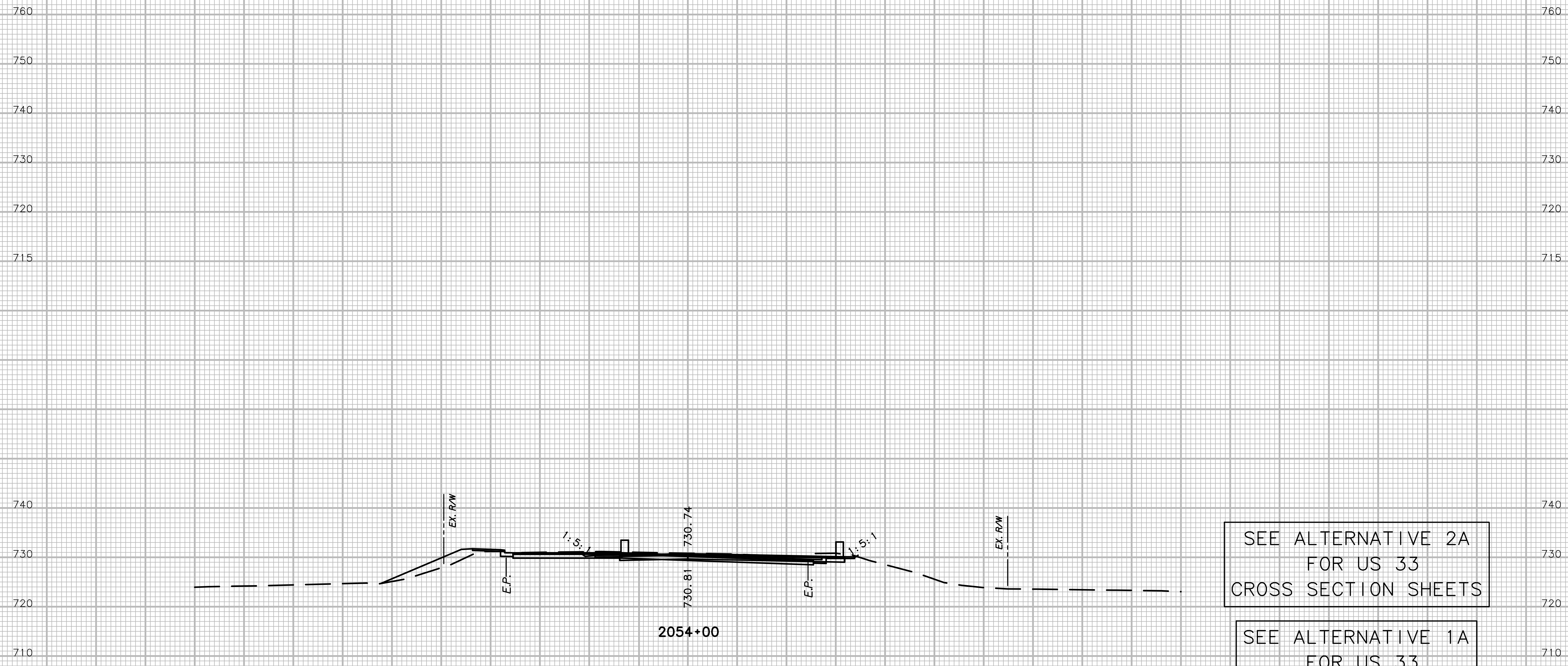


REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 2B - TEMPORARY DETOUR BRIDGE
CROSS-SECTION SHEET
 STA. 2053+00 TO STA. 2053+50

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33- 12.76 00	STP-0033- 243 (D)	2014	ROANE	E58	E86

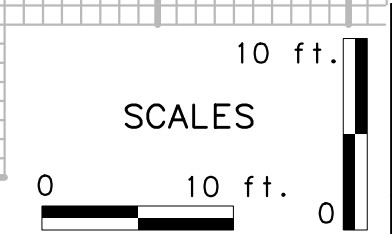
120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160



SEE ALTERNATIVE 2A
FOR US 33
CROSS SECTION SHEETS

SEE ALTERNATIVE 1A
FOR US 33
PROFILE SHEET

2054+00

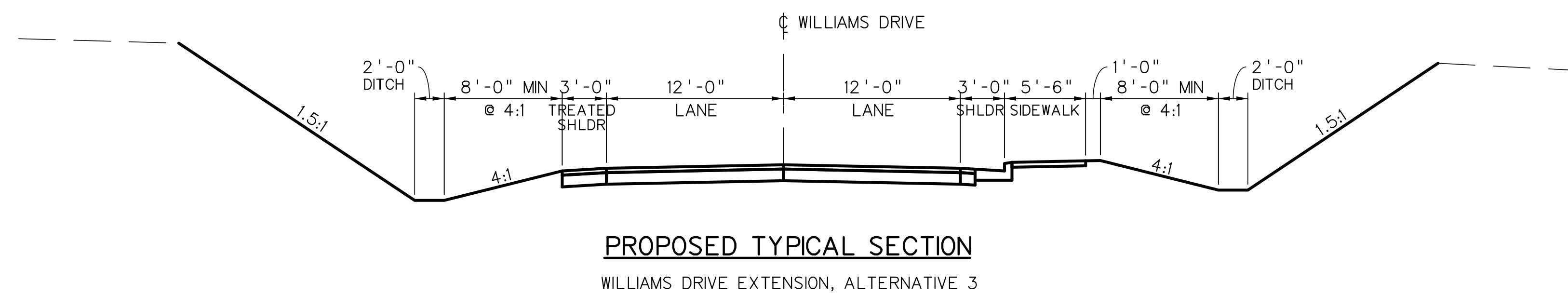
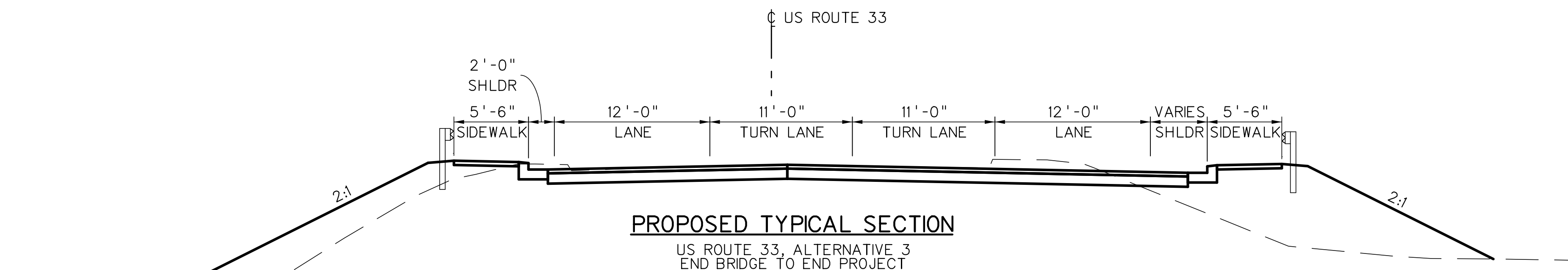


REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 2B - TEMPORARY DETOUR BRIDGE
CROSS-SECTION SHEET
STA. 2054+00

ORIGINAL SURVEYED, FLOTTED, BOOK NO.	DATE	BY	FINAL SURVEYED, FLOTTED, BOOK NO.	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E59	E86

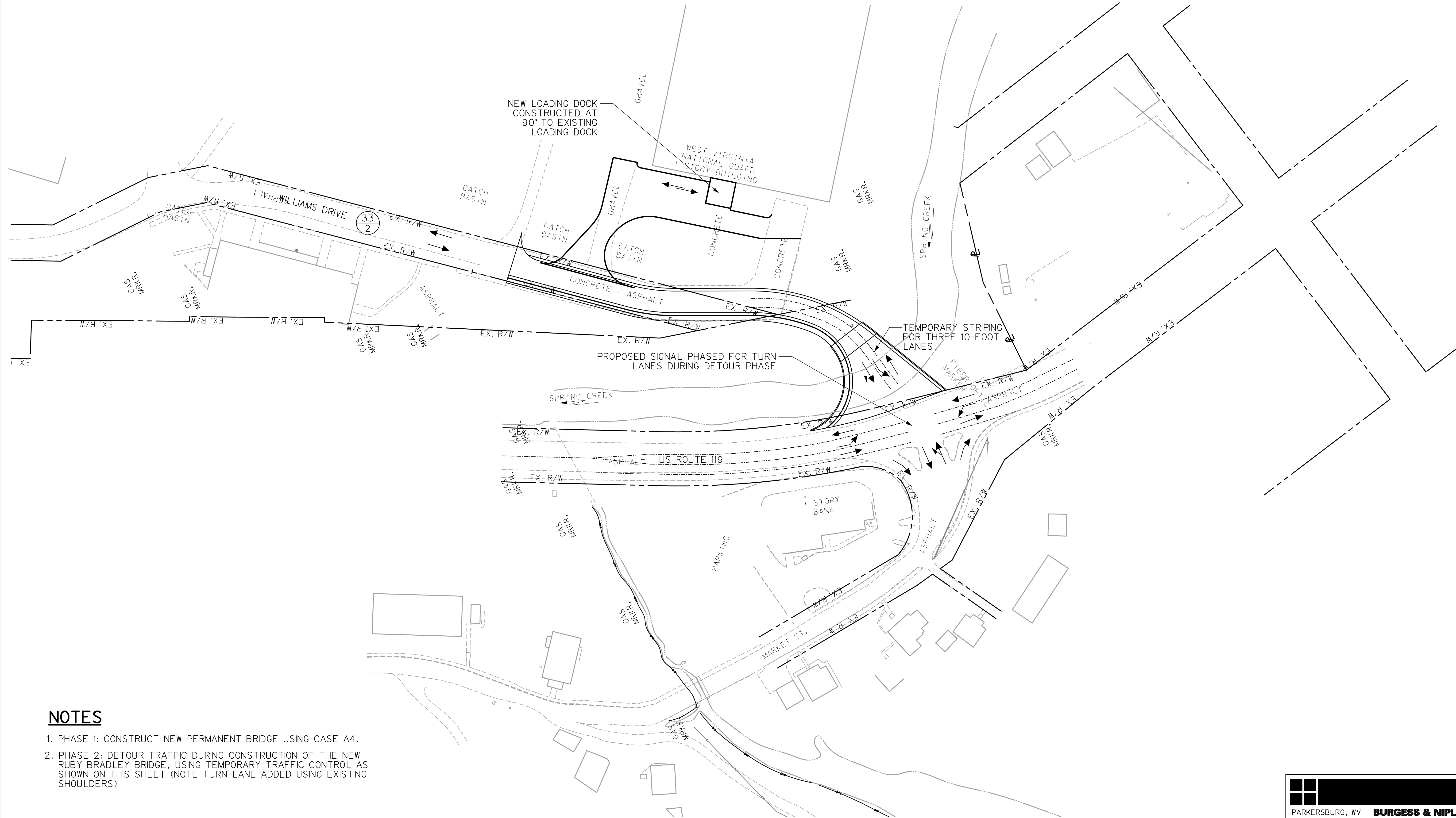
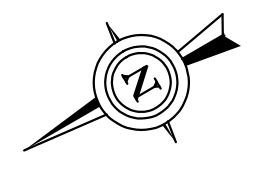


THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ALTERNATIVE 3
TYPICAL SECTIONS

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E60	E86



NOTES

1. PHASE 1: CONSTRUCT NEW PERMANENT BRIDGE USING CASE A4.
2. PHASE 2: DETOUR TRAFFIC DURING CONSTRUCTION OF THE NEW RUBY BRADLEY BRIDGE, USING TEMPORARY TRAFFIC CONTROL AS SHOWN ON THIS SHEET (NOTE TURN LANE ADDED USING EXISTING SHOULDERS)

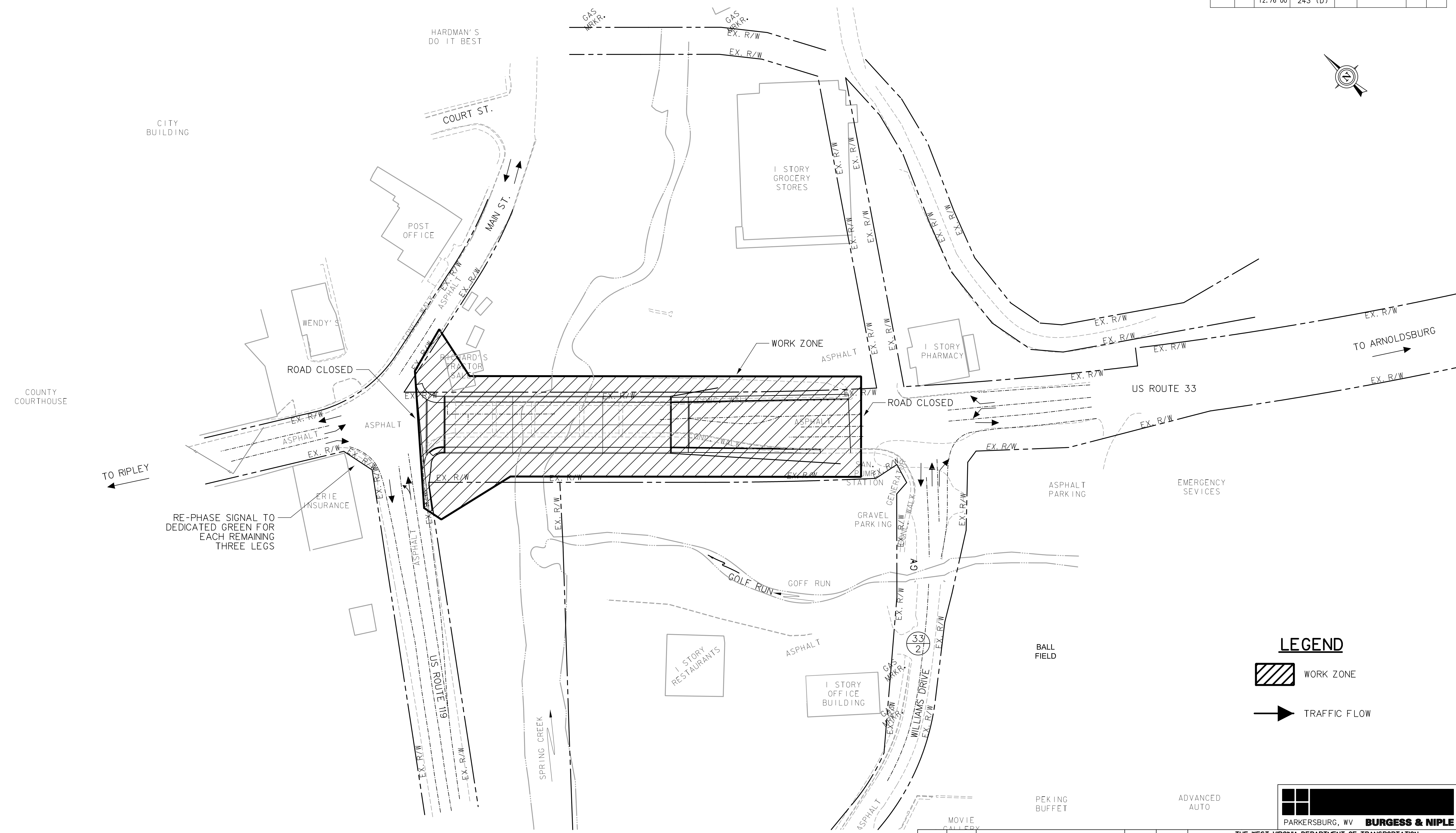
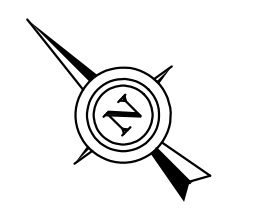
SCALE : 0 50 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY



THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
**TEMPORARY TRAFFIC CONTROL
ALTERNATIVE 3**

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E61	E86



LEGEND

- WORK ZONE
- TRAFFIC FLOW

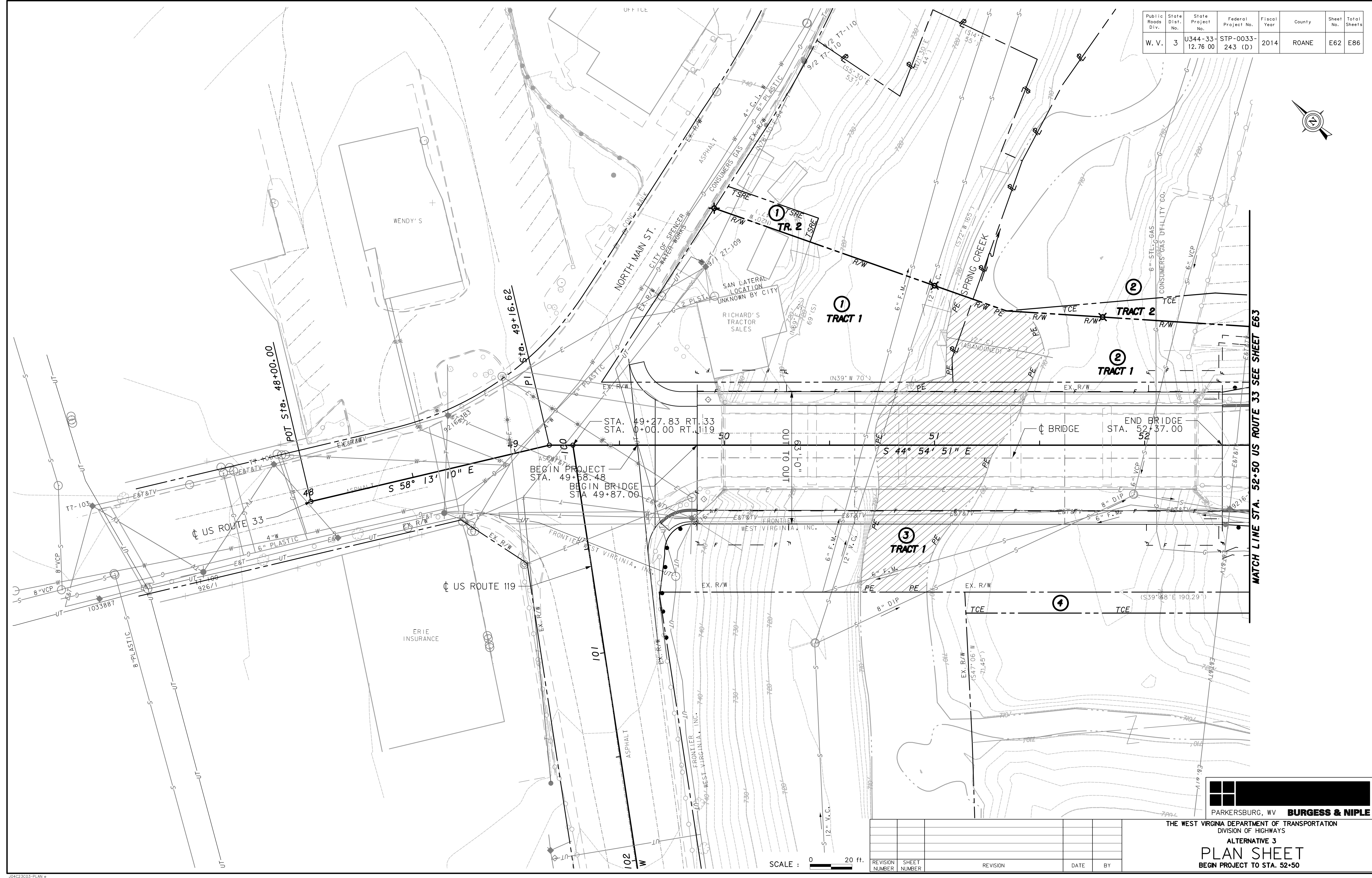
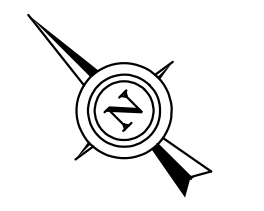
PARKERSBURG, WV **BURGESS & NIPLÉ**

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
**TEMPORARY TRAFFIC CONTROL
ALTERNATIVE 3**

SCALE : 0 50 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E62	E86



MATCH LINE STA. 52+50 US ROUTE 33 SEE SHEET E63

SCALE : 0 20 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

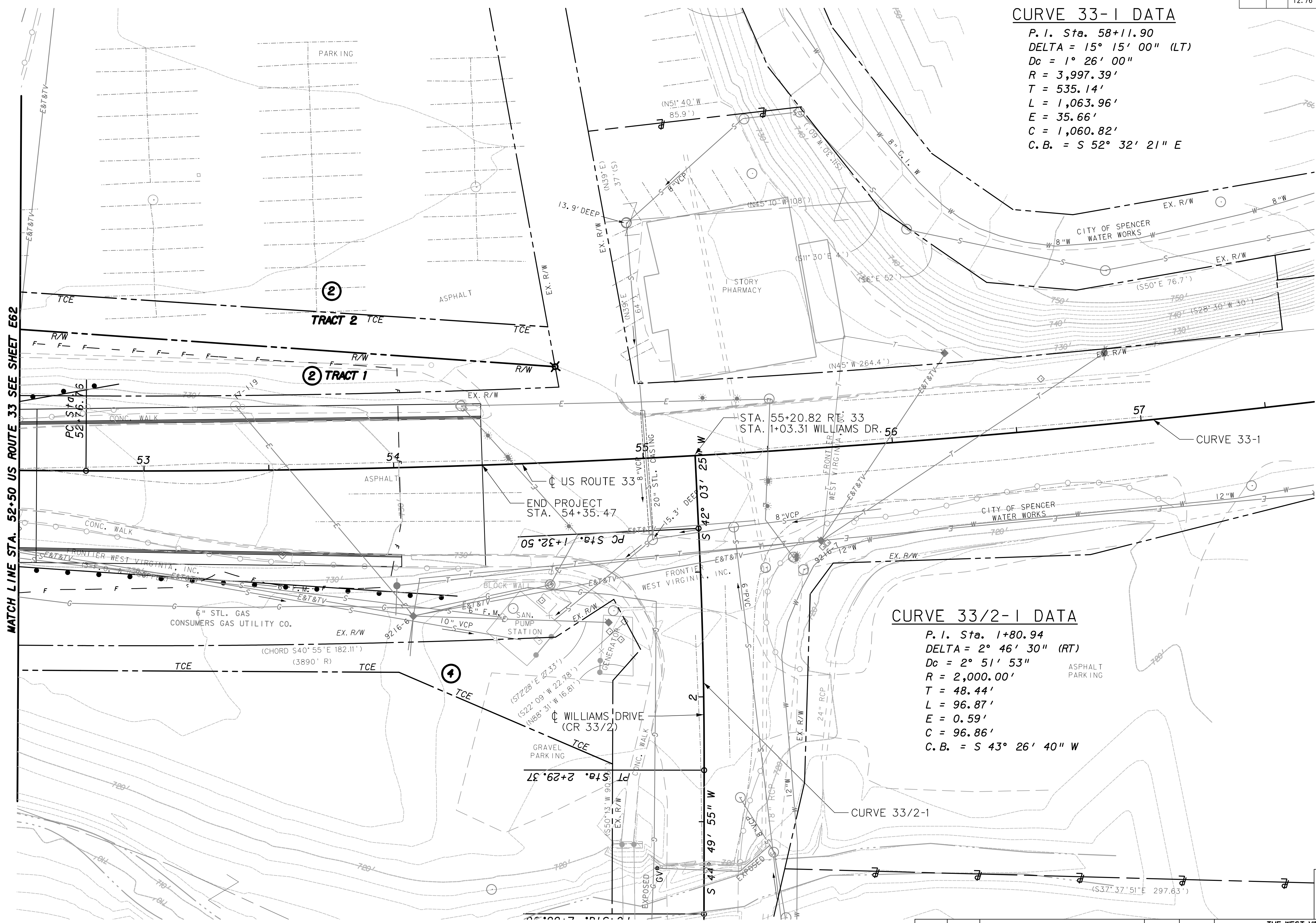
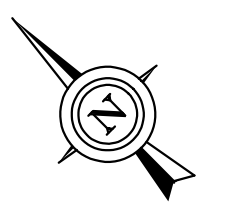


THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 3
PLAN SHEET
BEGIN PROJECT TO STA. 52+50

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E63	E86

CURVE 33-1 DATA

P.I. Sta. 58+11.90
 DELTA = 15° 15' 00" (LT)
 Dc = 1° 26' 00"
 R = 3,997.39'
 T = 535.14'
 L = 1,063.96'
 E = 35.66'
 C = 1,060.82'
 C.B. = S 52° 32' 21" E



CURVE 33/2-1 DATA

P.I. Sta. 1+80.94
 DELTA = 2° 46' 30" (RT)
 Dc = 2° 51' 53"
 R = 2,000.00'
 T = 48.44'
 L = 96.87'
 E = 0.59'
 C = 96.86'
 C.B. = S 43° 26' 40" W

MATCH LINE STA. 52+50 US ROUTE 33 SEE SHEET E62

BURGESS & NIPLE
 PARKERSBURG, WV

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 3
PLAN SHEET
 STA. 52+50 TO END PROJECT

SCALE : 0 20 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

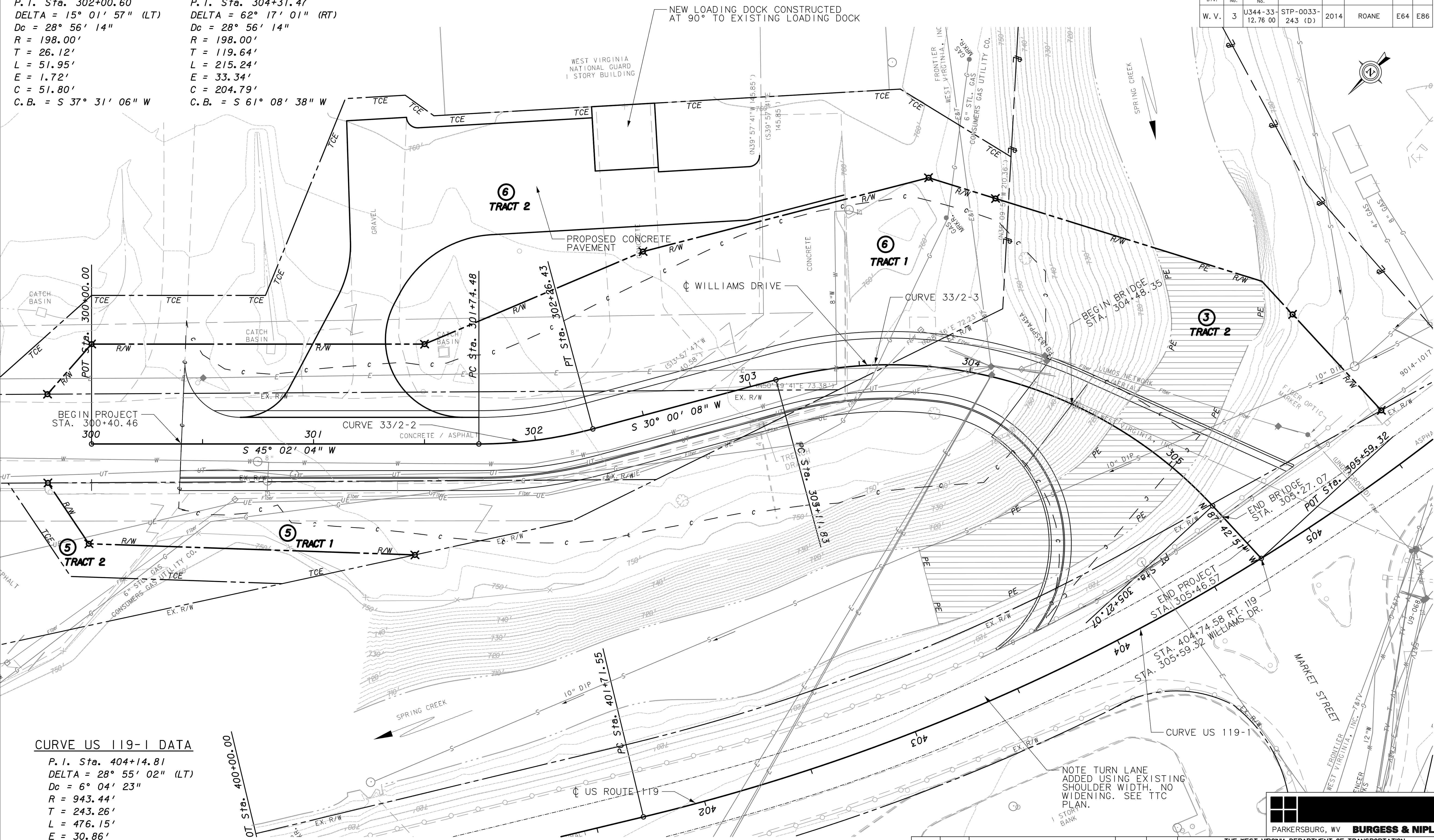
CURVE 33/2-2 DATA

P. I. Sta. 302+00.60
 DELTA = 15° 01' 57" (LT)
 Dc = 28° 56' 14"
 R = 198.00'
 T = 26.12'
 L = 51.95'
 E = 1.72'
 C = 51.80'
 C.B. = S 37° 31' 06" W

CURVE 33/2-3 DATA

P. I. Sta. 304+31.47
 DELTA = 62° 17' 01" (RT)
 Dc = 28° 56' 14"
 R = 198.00'
 T = 119.64'
 L = 215.24'
 E = 33.34'
 C = 204.79'
 C.B. = S 61° 08' 38" W

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E64	E86



CURVE US 119-1 DATA

P. I. Sta. 404+14.81
 DELTA = 28° 55' 02" (LT)
 Dc = 6° 04' 23"
 R = 943.44'
 T = 243.26'
 L = 476.15'
 E = 30.86'
 C = 471.12'
 C.B. = S 17° 03' 57" W

NOTE TURN LANE ADDED USING EXISTING SHOULDER WIDTH. NO WIDENING. SEE TTC PLAN.

SCALE : 0 20 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

PARKERSBURG, WV **BURGESS & NIPLE**

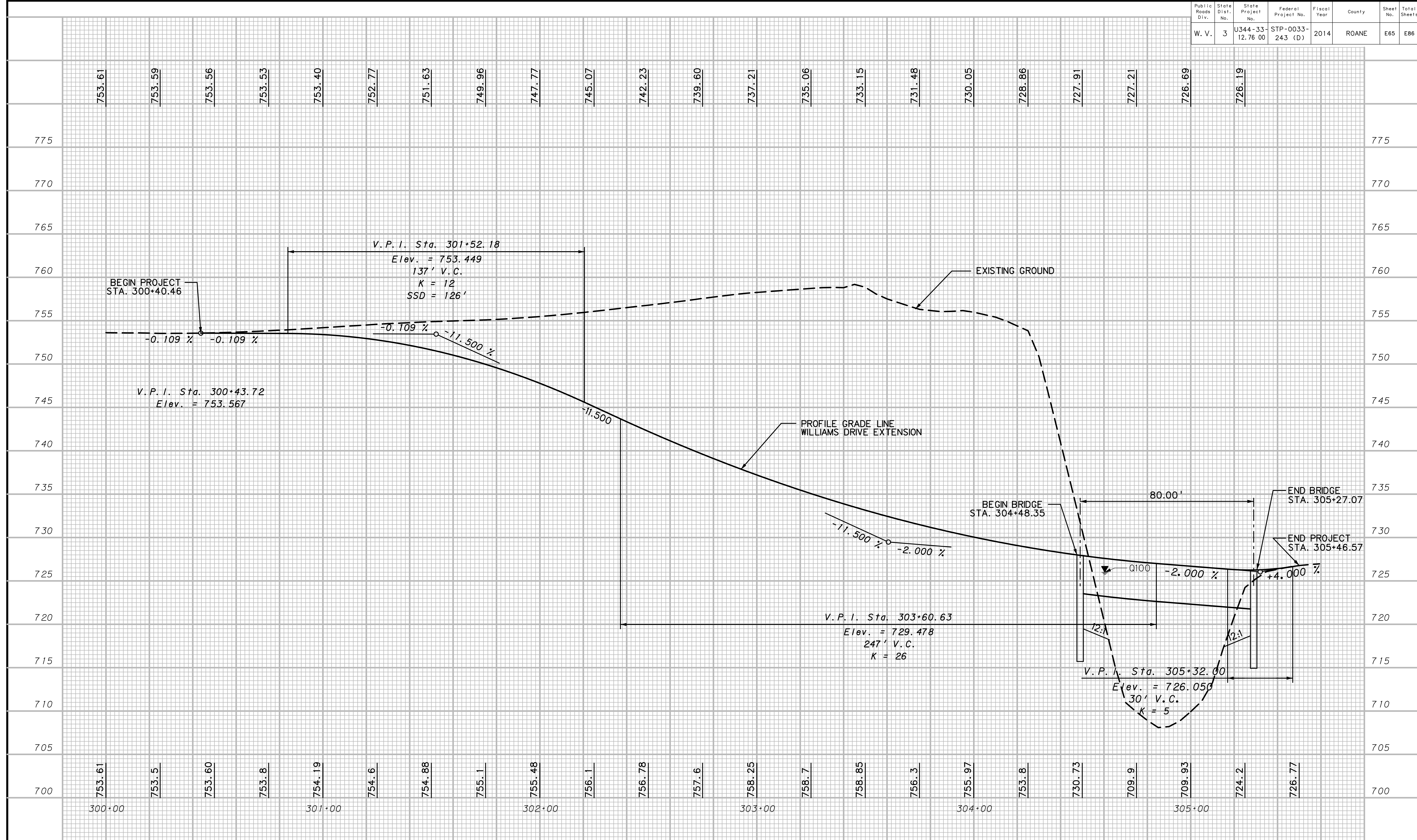
THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

ALTERNATIVE 3

PLAN SHEET

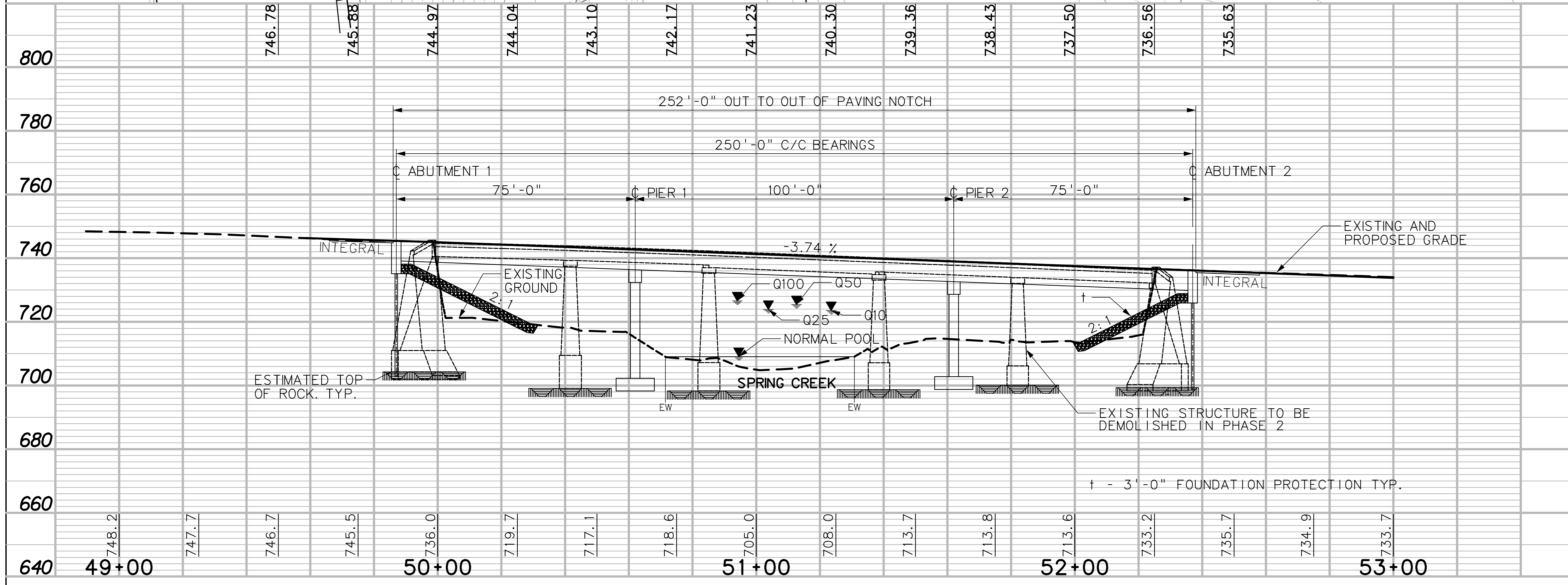
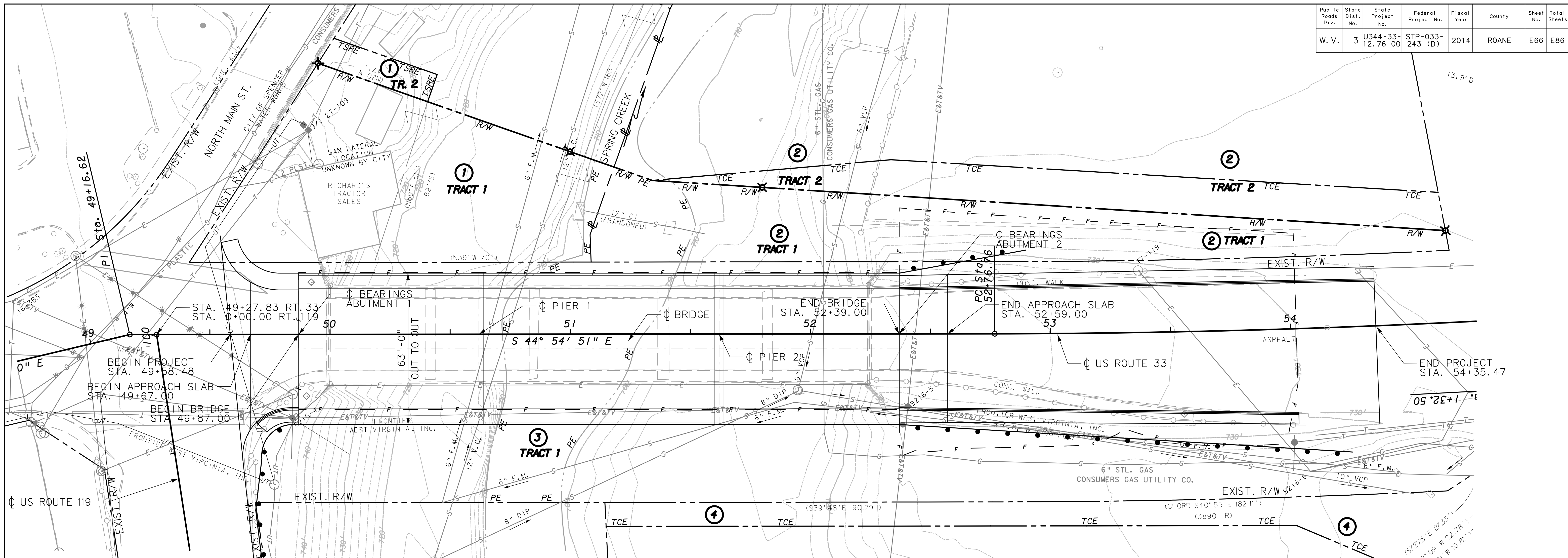
STA. 300+00 TO STA. 305+59.32

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E65	E86



REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
ALTERNATIVE 3 - WILLIAMS DR. EXTENSION
PROFILE SHEET
 STA. 300+00 TO STA. 305+50



HYDRAULIC DATA AT NORTH MARKET ST.

	SPRING CREEK			
	HWE	HWE*	V(FPS)	Q(CFS)
Q10	721.61	723.11	2.63	3950
Q25	722.45	723.95	2.06	4500
Q50	723.90	725.40	2.64	5430
Q100	725.02	726.52	2.64	6200

DRAINAGE AREA = 39.6 SQ. MI.
WATERWAY OPENING = 575 SF
* ESTIMATED BASED ON SLOPE OF STREAM FOR RUBY BRADLEY.

20 ft.
0 20 ft.
0

DESIGNED MWL 7/14
DRAWN ASG 7/14
CHECKED
CHECKED

REVISION NUMBER SHEET NUMBER REVISION DATE BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**COL. RUBY BRADLEY
BRIDGE REPLACEMENT
SITUATION PLAN
ALTERNATIVE 3**

PARKERSBURG, WV **BURGESS & NIPLÉ**

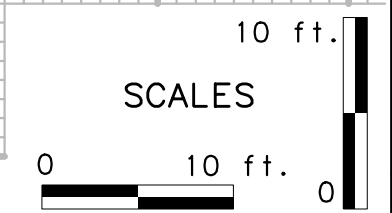
SHEET OF BRIDGE NO.

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E68	E86



ORIGINAL SURVEY	DATE	BY	NO.
SURVEYED	///		
FLOTTED	///		
TEMPLATE	///		
BOOK	///		
AREAS CHECKED	///		
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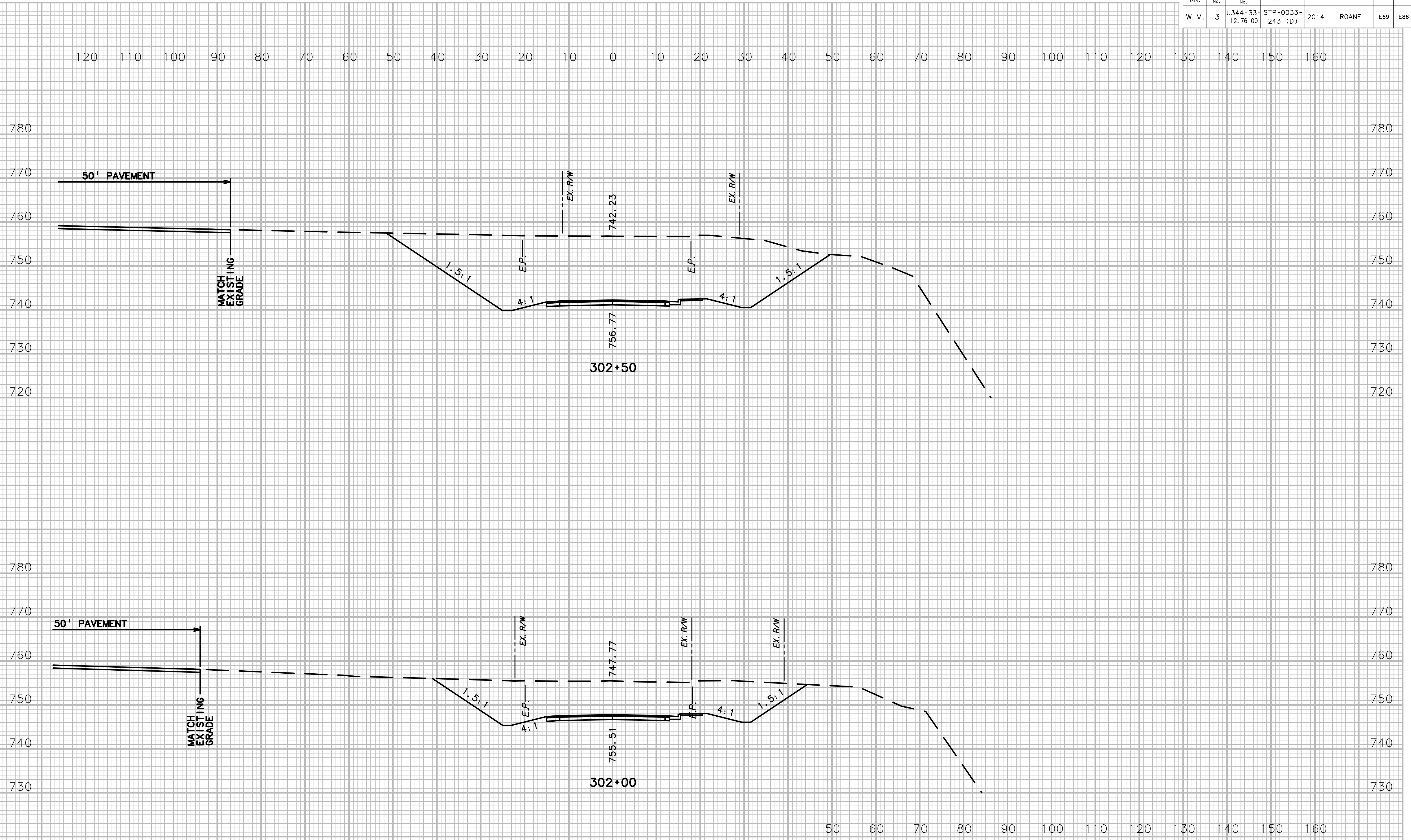
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BOOK	///		
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NO.	///		



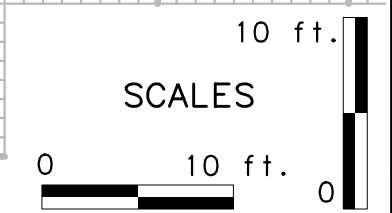
REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 3 - WILLIAMS DR. EXTENSION
CROSS-SECTION SHEET
STA. 301+00 TO STA. 301+50

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E69	E86



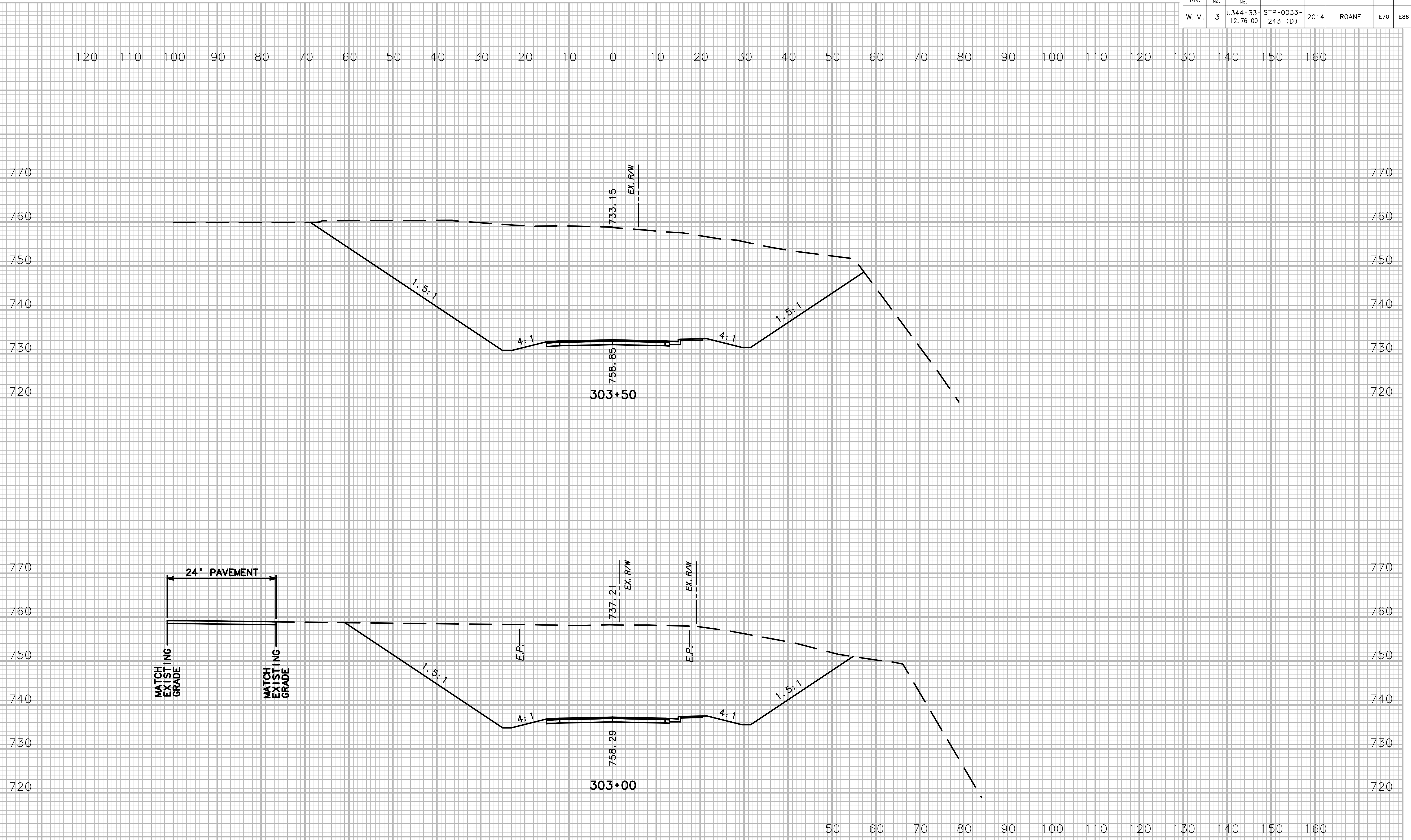
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///	///	BOOK NO.	///	///	BOOK NO.
///	///	AREAS CHECKED	///	///	AREAS CHECKED



REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

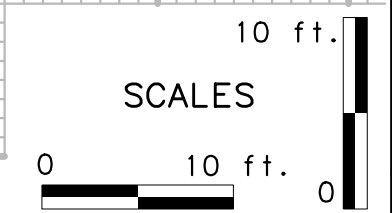
THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 3 - WILLIAMS DR. EXTENSION
CROSS-SECTION SHEET
 STA. 302+00 TO STA. 302+50

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E70	E86



DATE	BY	DATE	BY	DATE	BY	DATE	BY
///		///		///		///	
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ORIGINAL SURVEY NO.	SURVEYED	FLOTTED	TEMPLATE	BOOK	AREAS CHECKED
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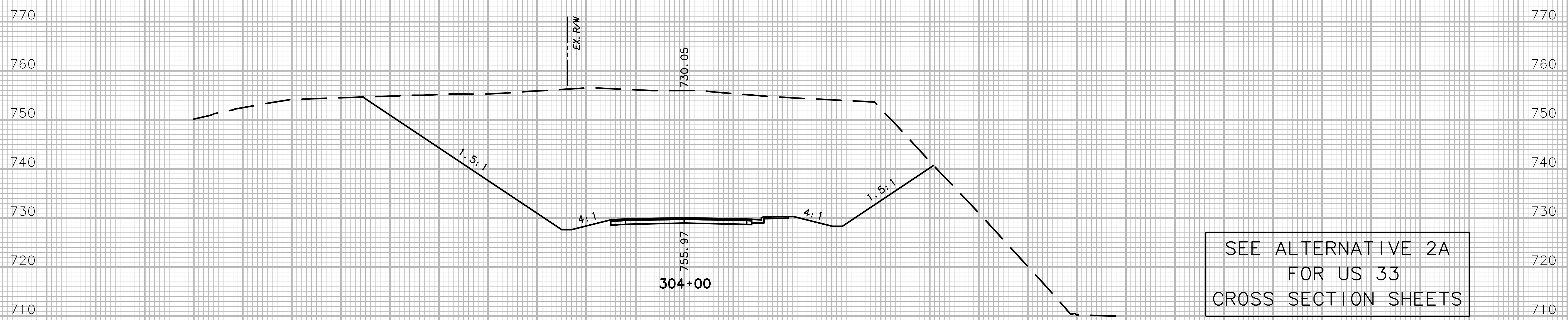
REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 3 - WILLIAMS DR. EXTENSION
CROSS-SECTION SHEET
 STA. 303+00 TO STA. 303+50

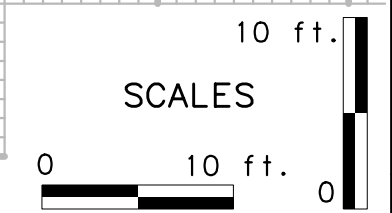
Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E71	E86

120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

ORIGINAL SURVEY BOOK NO.	SURVEYED, PLOTTED, TEMPLATE AREAS CHECKED	BY	DATE	FINAL SURVEY BOOK NO.	SURVEYED, PLOTTED, TEMPLATE AREAS CHECKED	BY	DATE



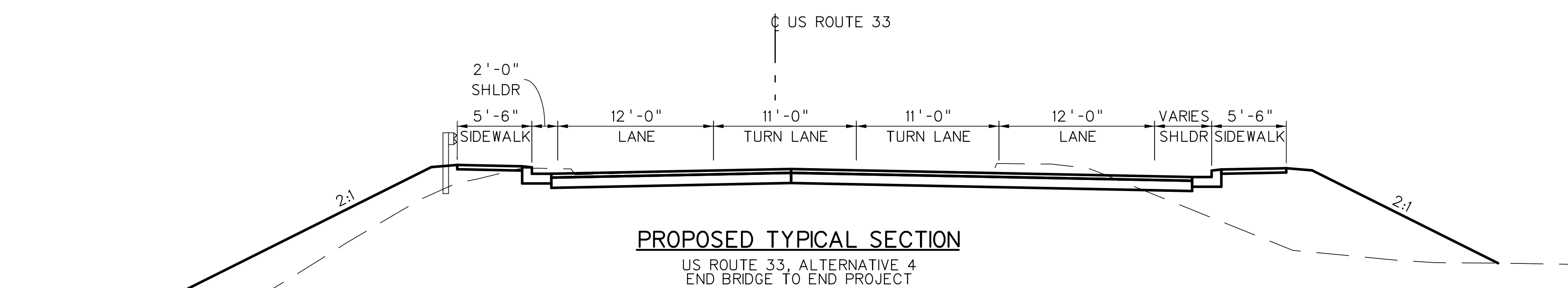
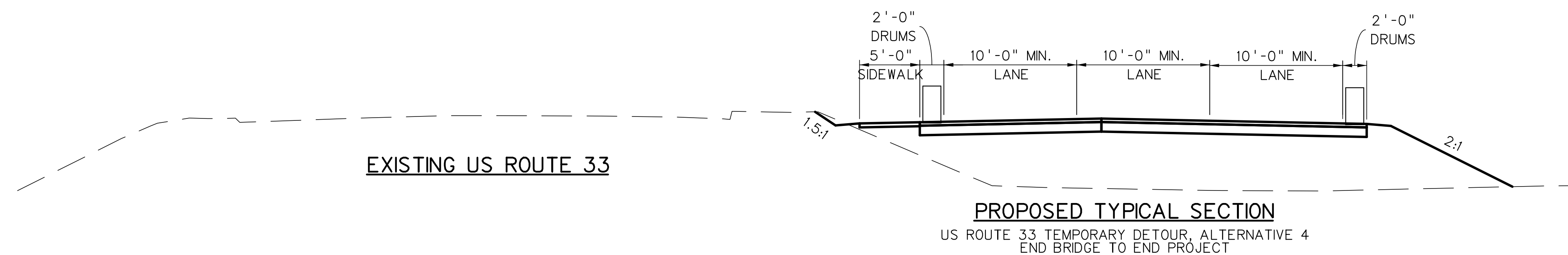
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REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 3 - WILLIAMS DR. EXTENSION
CROSS-SECTION SHEET
STA. 304+00

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E72	E86



NOTES:
SEE TYPICAL SHEET E2 FOR EXISTING TYPICAL SECTION DIMENSIONS

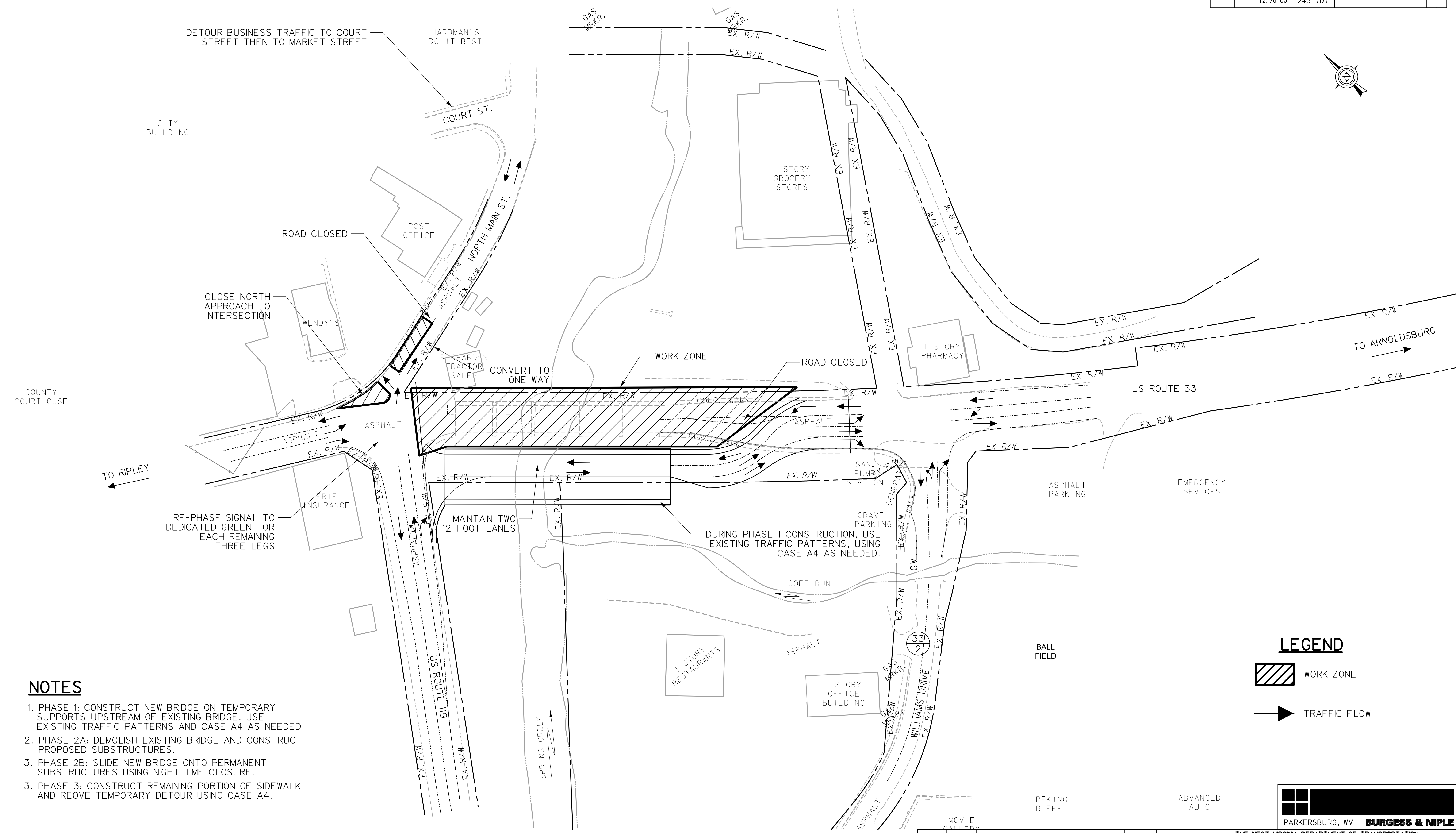
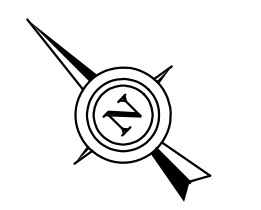


THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ALTERNATIVE 4
TYPICAL SECTIONS

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E73	E86



NOTES

1. PHASE 1: CONSTRUCT NEW BRIDGE ON TEMPORARY SUPPORTS UPSTREAM OF EXISTING BRIDGE. USE EXISTING TRAFFIC PATTERNS AND CASE A4 AS NEEDED.
2. PHASE 2A: DEMOLISH EXISTING BRIDGE AND CONSTRUCT PROPOSED SUBSTRUCTURES.
3. PHASE 2B: SLIDE NEW BRIDGE ONTO PERMANENT SUBSTRUCTURES USING NIGHT TIME CLOSURE.
3. PHASE 3: CONSTRUCT REMAINING PORTION OF SIDEWALK AND REOVE TEMPORARY DETOUR USING CASE A4.

LEGEND

- WORK ZONE
- TRAFFIC FLOW

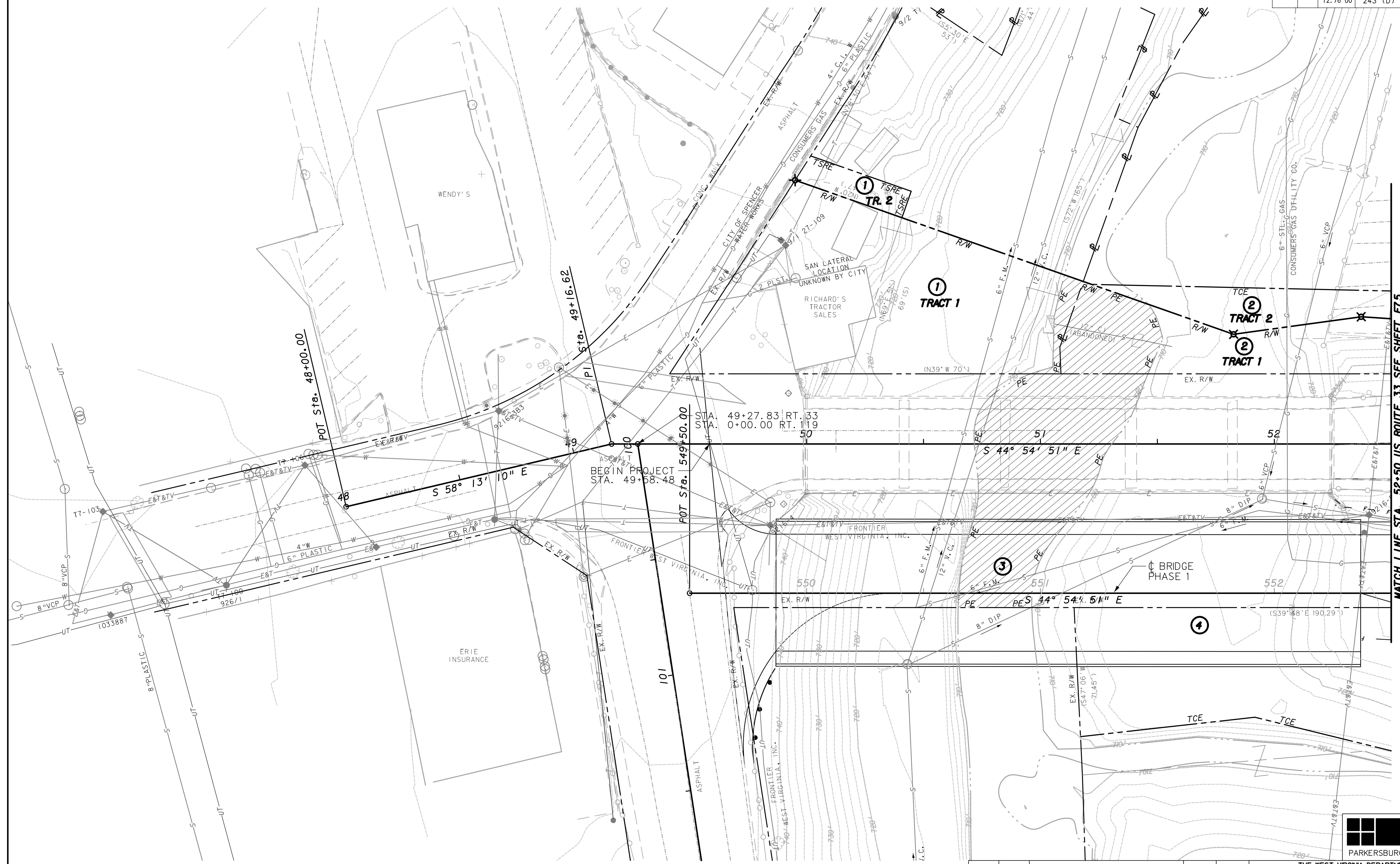
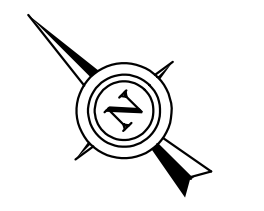
PARKERSBURG, WV **BURGESS & NIPLÉ**

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
**TEMPORARY TRAFFIC CONTROL
ALTERNATIVE 4, PHASE 2**

SCALE : 0 50 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E74	E86



MATCH LINE STA. 52+50 US ROUTE 33 SEE SHEET E75

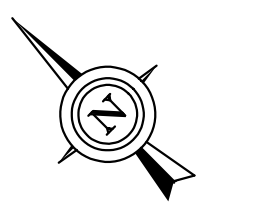
SCALE : 0 20 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY



THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 4 PHASE 1 - US 33
PLAN SHEET
BEGIN PROJECT TO STA. 52+50

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76.00	STP-0033-243 (D)	2014	ROANE	E75	E86



CURVE 33-1 DATA

P.I. Sta. 58+11.90
 DELTA = 15° 15' 00" (LT)
 Dc = 1° 26' 00"
 R = 3,997.39'
 T = 535.14'
 L = 1,063.96'
 E = 35.66'
 C = 1,060.82'
 C.B. = S 52° 32' 21" E

CURVE DET-7 DATA

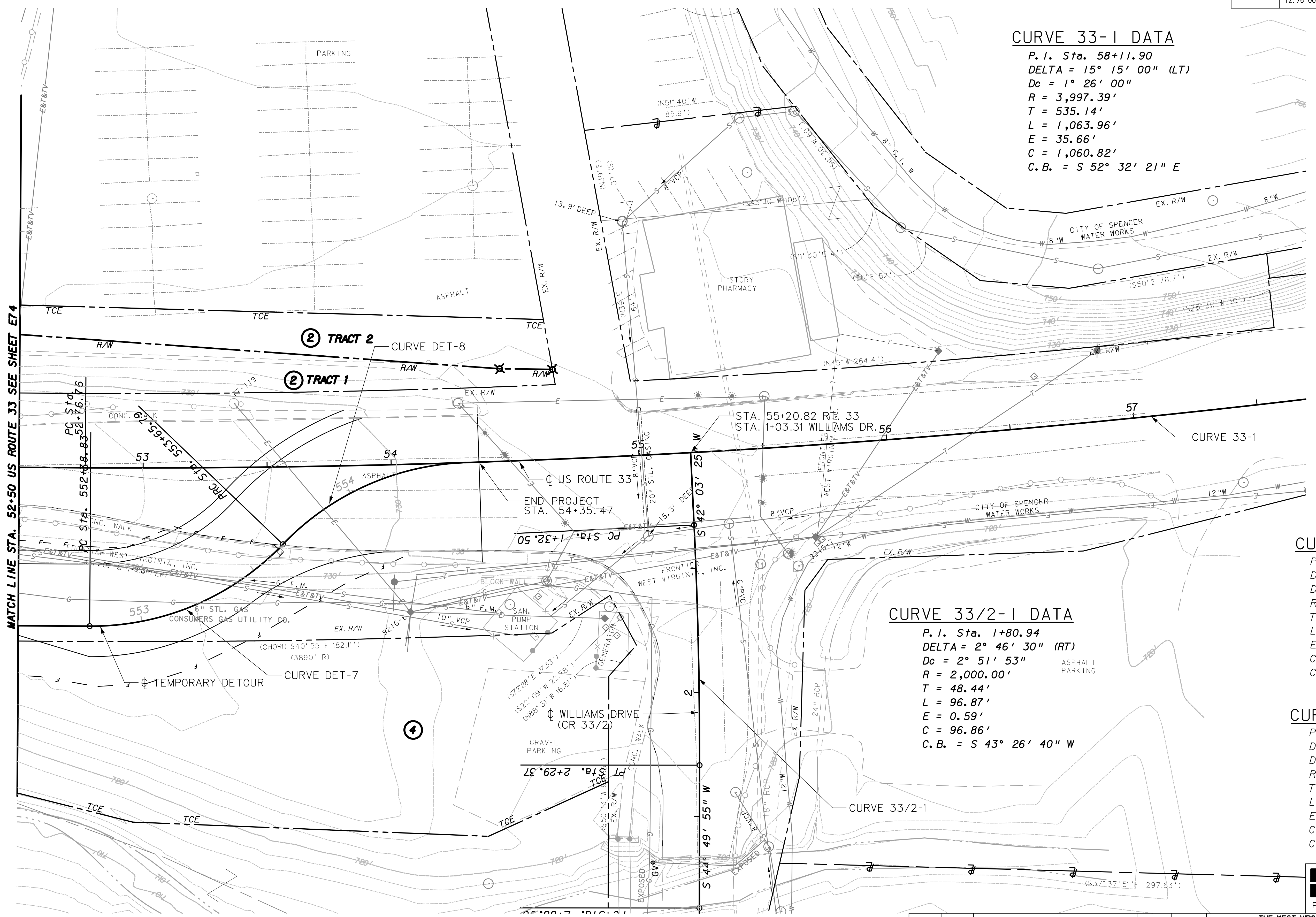
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 Dc = 53° 32' 51"
 R = 107.00'
 T = 46.04'
 L = 86.96'
 E = 9.49'
 C = 84.58'
 C.B. = S 68° 11' 46" E

CURVE 33/2-1 DATA

P.I. Sta. 1+80.94
 DELTA = 2° 46' 30" (RT)
 Dc = 2° 51' 53"
 R = 2,000.00'
 T = 48.44'
 L = 96.87'
 E = 0.59'
 C = 96.86'
 C.B. = S 43° 26' 40" W

CURVE DET-8 DATA

P.I. Sta. 554+09.42
 DELTA = 44° 21' 55" (RT)
 Dc = 53° 32' 51"
 R = 107.00'
 T = 43.63'
 L = 82.85'
 E = 8.55'
 C = 80.80'
 C.B. = S 69° 17' 44" E



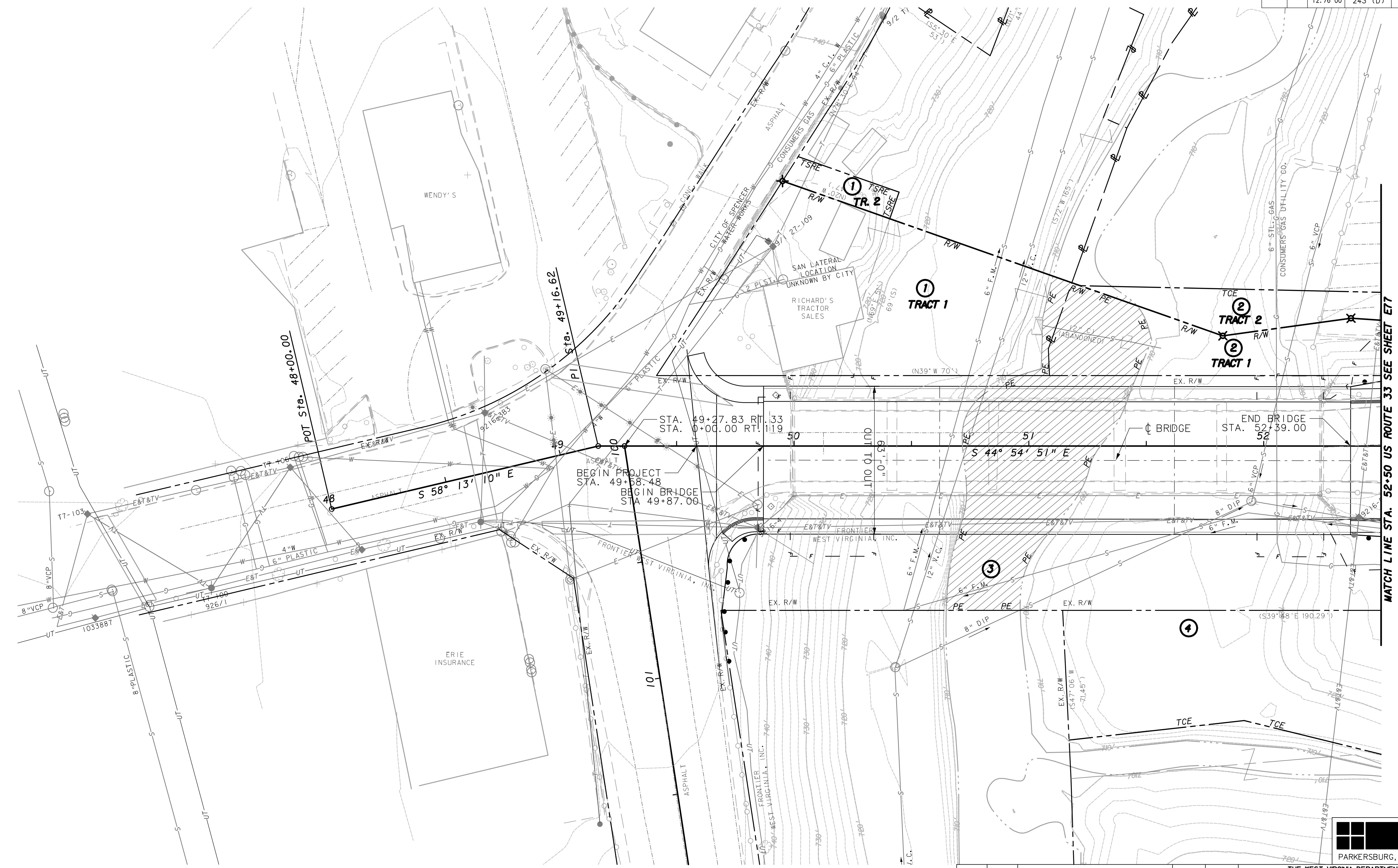
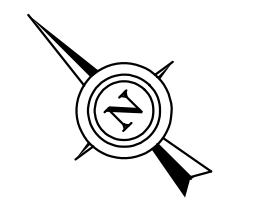
MATCH LINE STA. 52+50 US ROUTE 33 SEE SHEET E74

SCALE : 0 20 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

PARKERSBURG, WV **BURGESS & NIPLÉ**
 THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 4 PHASE 1 - US 33
PLAN SHEET
 STA. 52+50 TO END PROJECT

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E76	E86



MATCH LINE STA. 52+50 US ROUTE 33 SEE SHEET E77

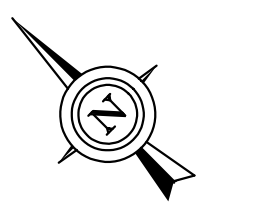
SCALE : 0 20 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY



THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 4 PHASE 2 - US 33
PLAN SHEET
BEGIN PROJECT TO STA. 52+50

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E77	E86

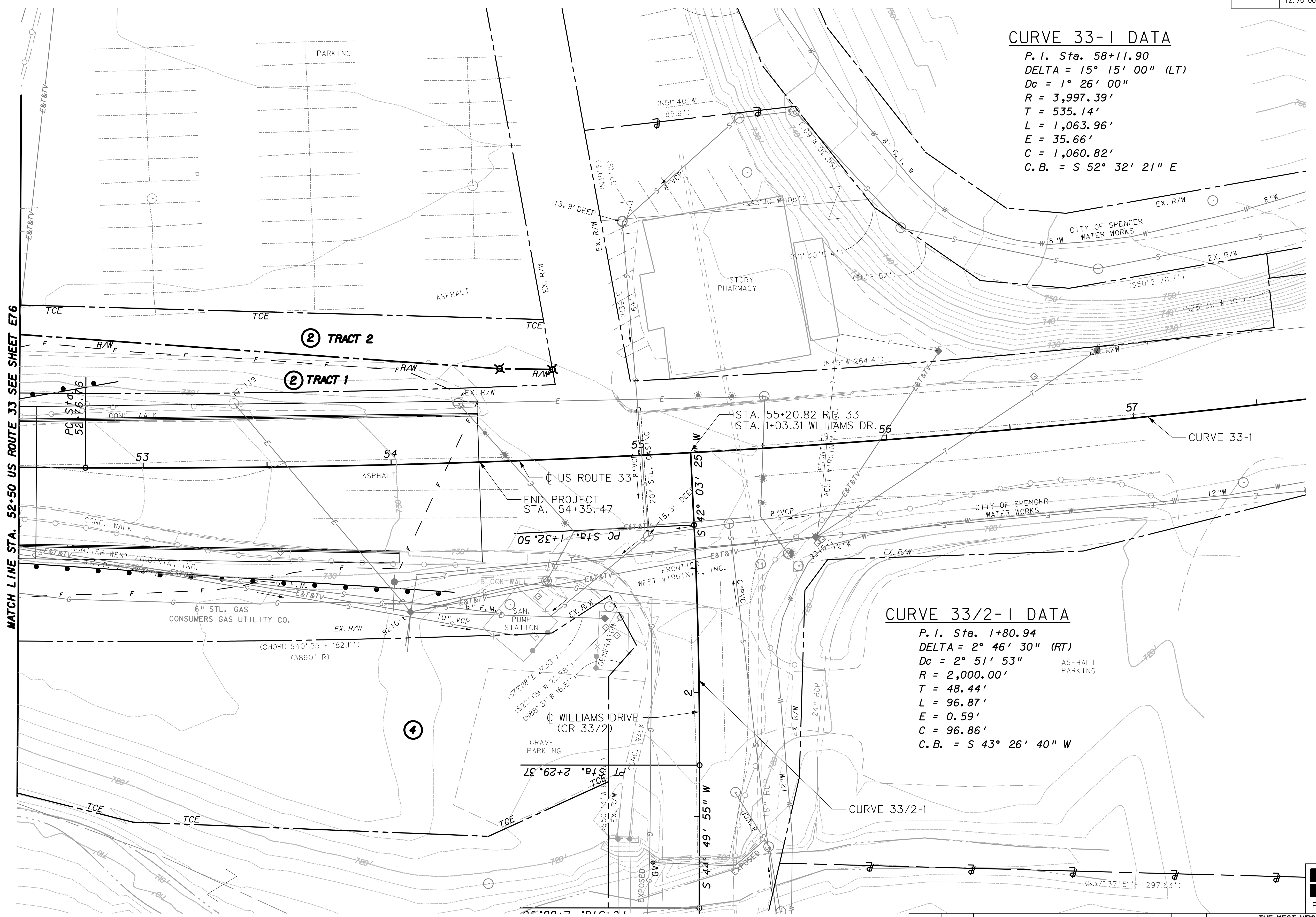


CURVE 33-1 DATA

P. I. Sta. 58+11.90
 DELTA = 15° 15' 00" (LT)
 Dc = 1° 26' 00"
 R = 3,997.39'
 T = 535.14'
 L = 1,063.96'
 E = 35.66'
 C = 1,060.82'
 C. B. = S 52° 32' 21" E

CURVE 33/2-1 DATA

P. I. Sta. 1+80.94
 DELTA = 2° 46' 30" (RT)
 Dc = 2° 51' 53"
 R = 2,000.00'
 T = 48.44'
 L = 96.87'
 E = 0.59'
 C = 96.86'
 C. B. = S 43° 26' 40" W



MATCH LINE STA. 52+50 US ROUTE 33 SEE SHEET E76

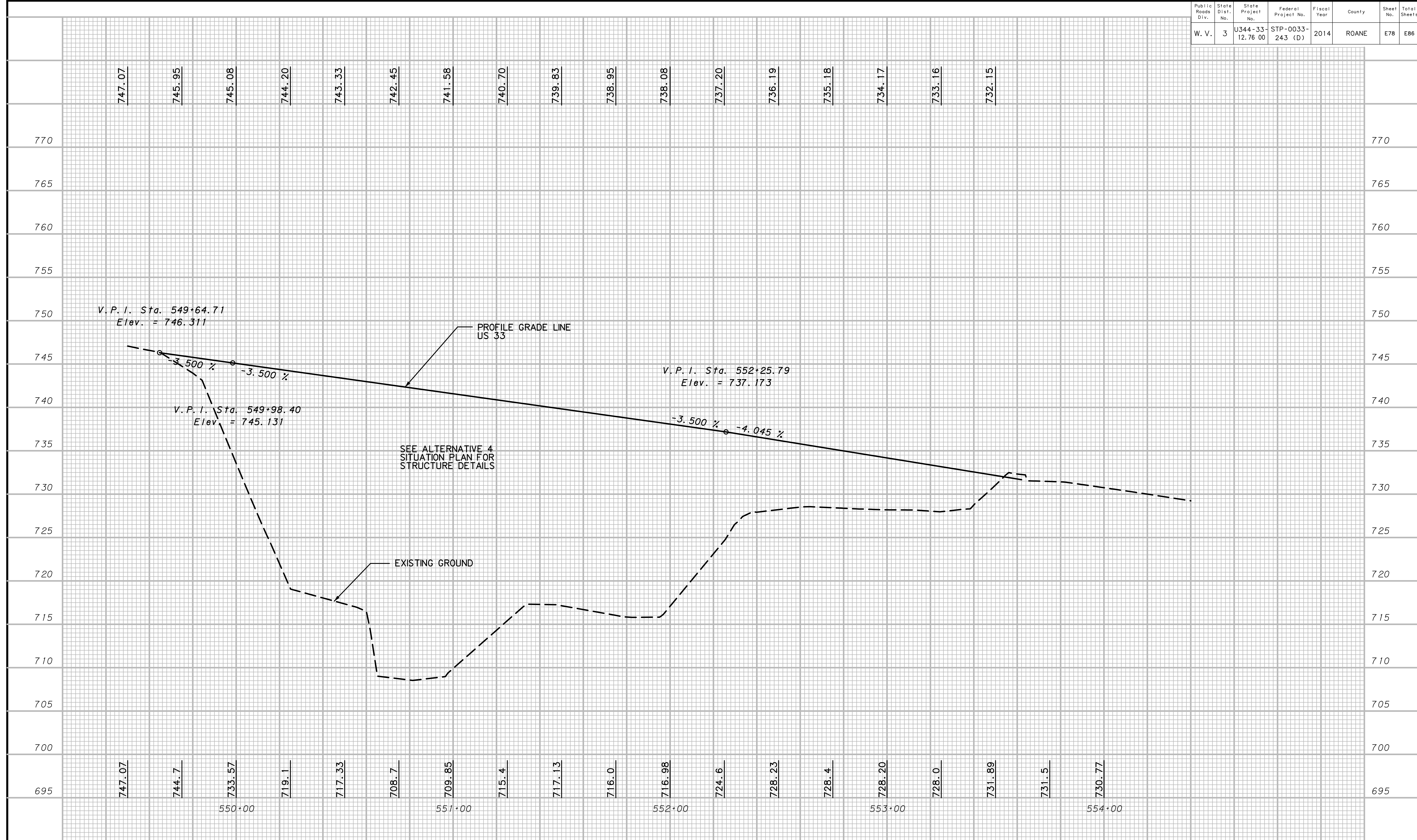
SCALE : 0 20 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY



THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 4 PHASE 2 - US 33
PLAN SHEET
 STA. 52+50 TO END PROJECT

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E78	E86



747.07

745.95

745.08

744.20

743.33

742.45

741.58

740.70

739.83

738.95

738.08

737.20

736.19

735.18

734.17

733.16

732.15

V.P.I. Sta. 549+64.71
Elev. = 746.311

V.P.I. Sta. 549+98.40
Elev. = 745.131

PROFILE GRADE LINE
US 33

V.P.I. Sta. 552+25.79
Elev. = 737.173

SEE ALTERNATIVE 4
SITUATION PLAN FOR
STRUCTURE DETAILS

EXISTING GROUND

747.07

744.7

733.57

719.1

717.33

708.7

709.85

715.4

717.13

716.0

716.98

724.6

728.23

728.4

728.20

728.0

731.89

731.5

730.77

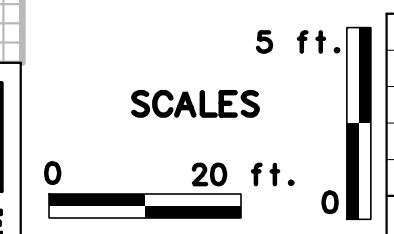
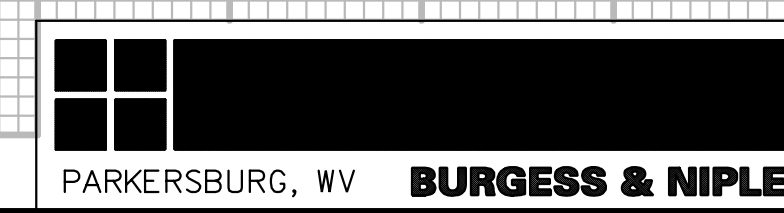
550+00

551+00

552+00

553+00

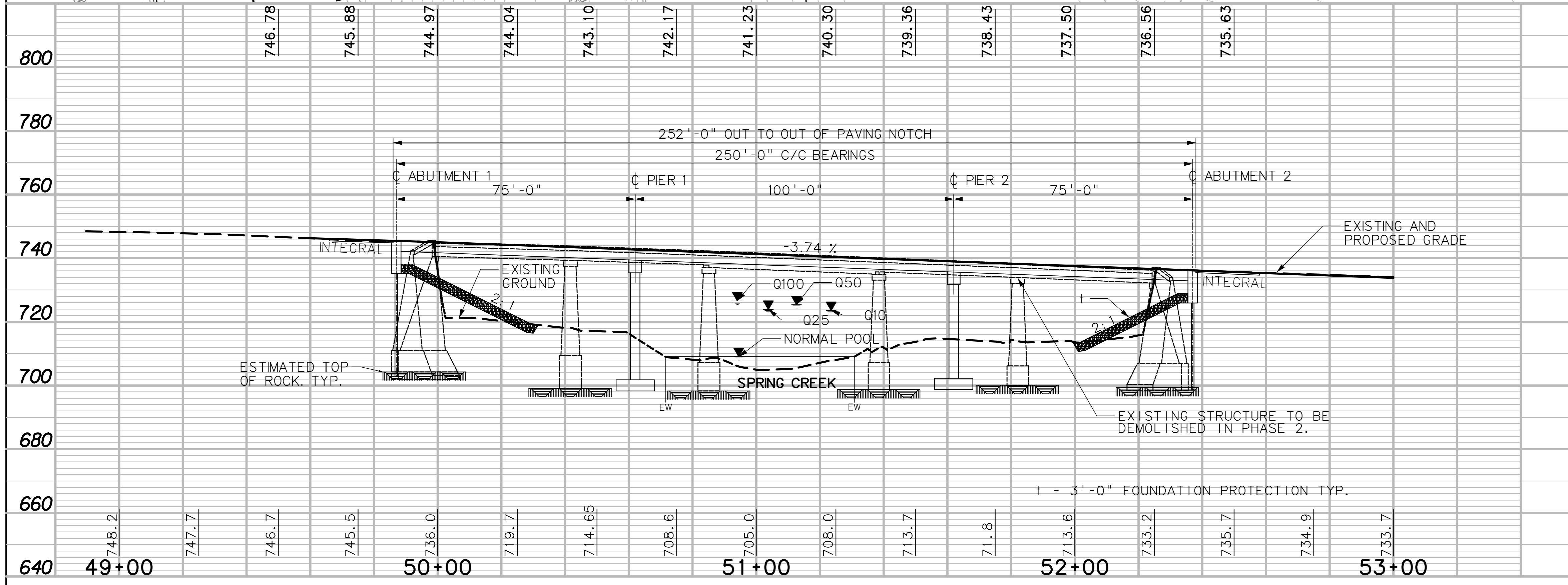
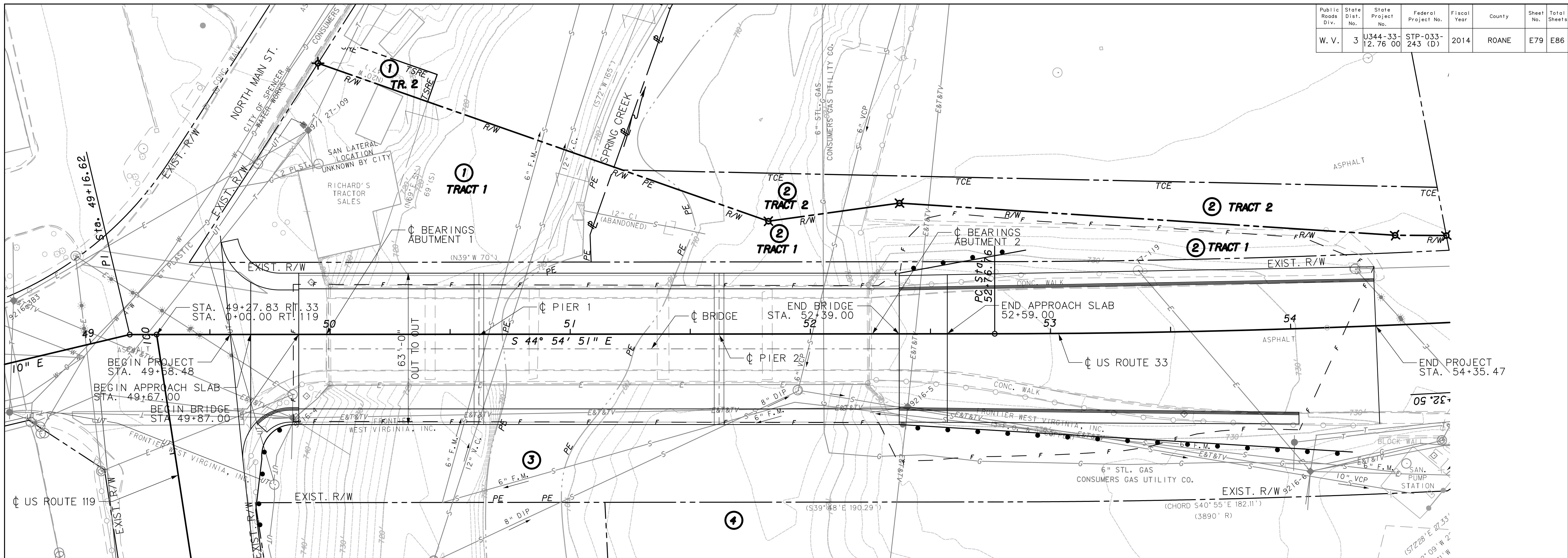
554+00



REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
ALTERNATIVE 4 PHASE 1 - US 33
PROFILE SHEET
STA. 549+50 TO STA. 554+40

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-033-243 (D)	2014	ROANE	E79	E86



HYDRAULIC DATA AT NORTH MARKET ST.

	SPRING CREEK			
	HWE	HWE*	V(FPS)	Q(CFS)
Q10	721.61	723.11	2.63	3950
Q25	722.45	723.95	2.06	4500
Q50	723.90	725.40	2.64	5430
Q100	725.02	726.52	2.64	6200

DRAINAGE AREA = 39.6 SQ. MI.
 WATERWAY OPENING = 575 SF
 * ESTIMATED BASED ON SLOPE OF STREAM FOR RUBY BRADLEY.

20 ft. SCALES

DESIGNED MWL 7/14
 DRAWN ASG 7/14
 CHECKED
 CHECKED

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS

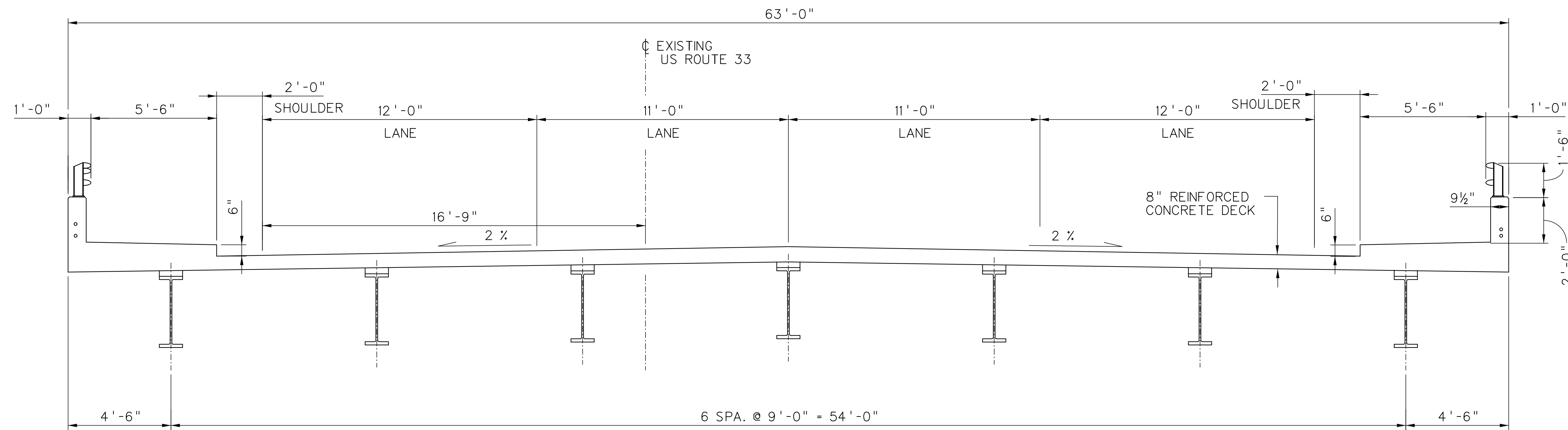
COL. RUBY BRADLEY BRIDGE REPLACEMENT SITUATION PLAN ALTERNATIVE 4

PARKERSBURG, WV **BURGESS & NIPLÉ**

REVISION NUMBER SHEET NUMBER REVISION DATE BY

SHEET OF BRIDGE NO.

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33 12.76 00	STP-0033 (243)D	2014	ROANE	E80	E86



COMPLETED TYPICAL SECTION

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**COL. RUBY BRADLEY
BRIDGE REPLACEMENT
COMP. TYPICAL SECTION
ALTERNATIVE NO. 4**

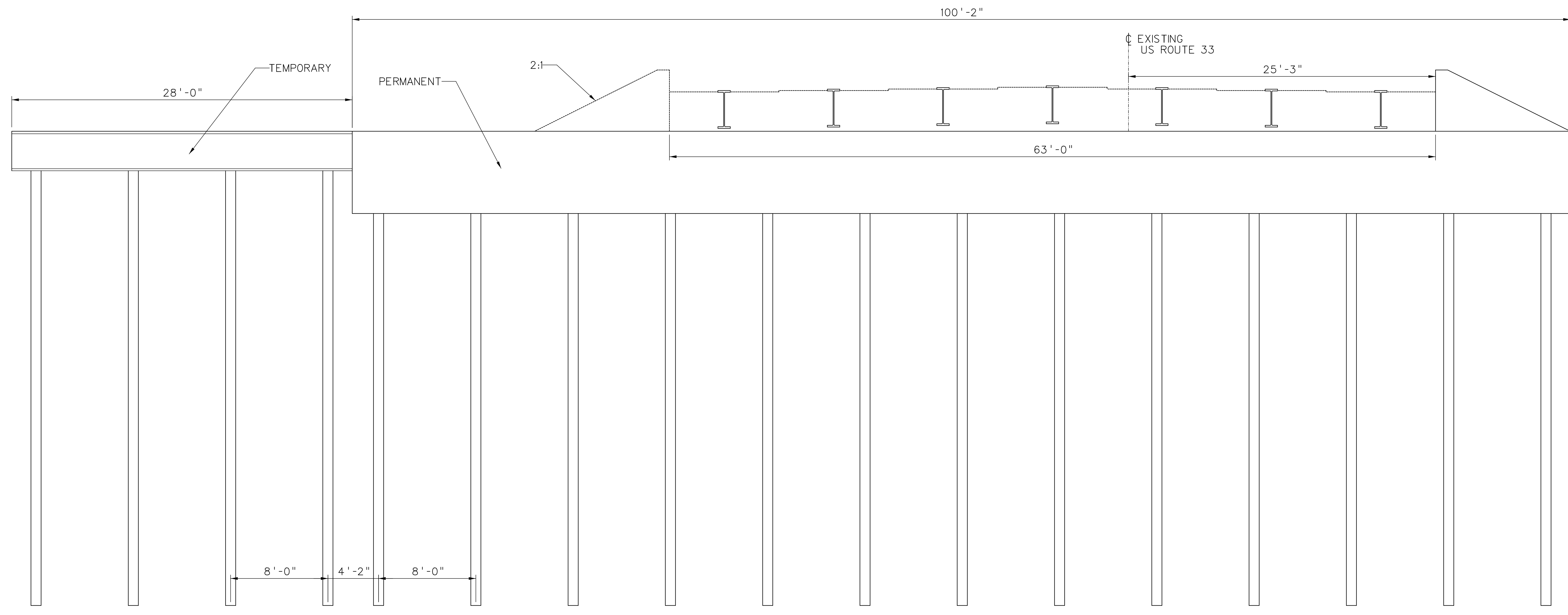
DESIGNED	DATE
MWL	6/14
DRAWN	DATE
ASG	7/14
CHECKED	
CHECKED	

BURGESS & NIPLE
PARKERSBURG, WV

SHEET OF BRIDGE NO.

10/10/02 AM 5/4/2015 10:02 AM

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33 12.76 00	STP-0033 (243)D	2014	ROANE	E81	E86



ABUTMENT 1

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS
**COL. RUBY BRADLEY
BRIDGE REPLACEMENT
ABUTMENT 1
ALTERNATIVE NO. 4**

DESIGNED	DATE
MWL	6/14
DRAWN	DATE
ASG	6/14
CHECKED	
CHECKED	

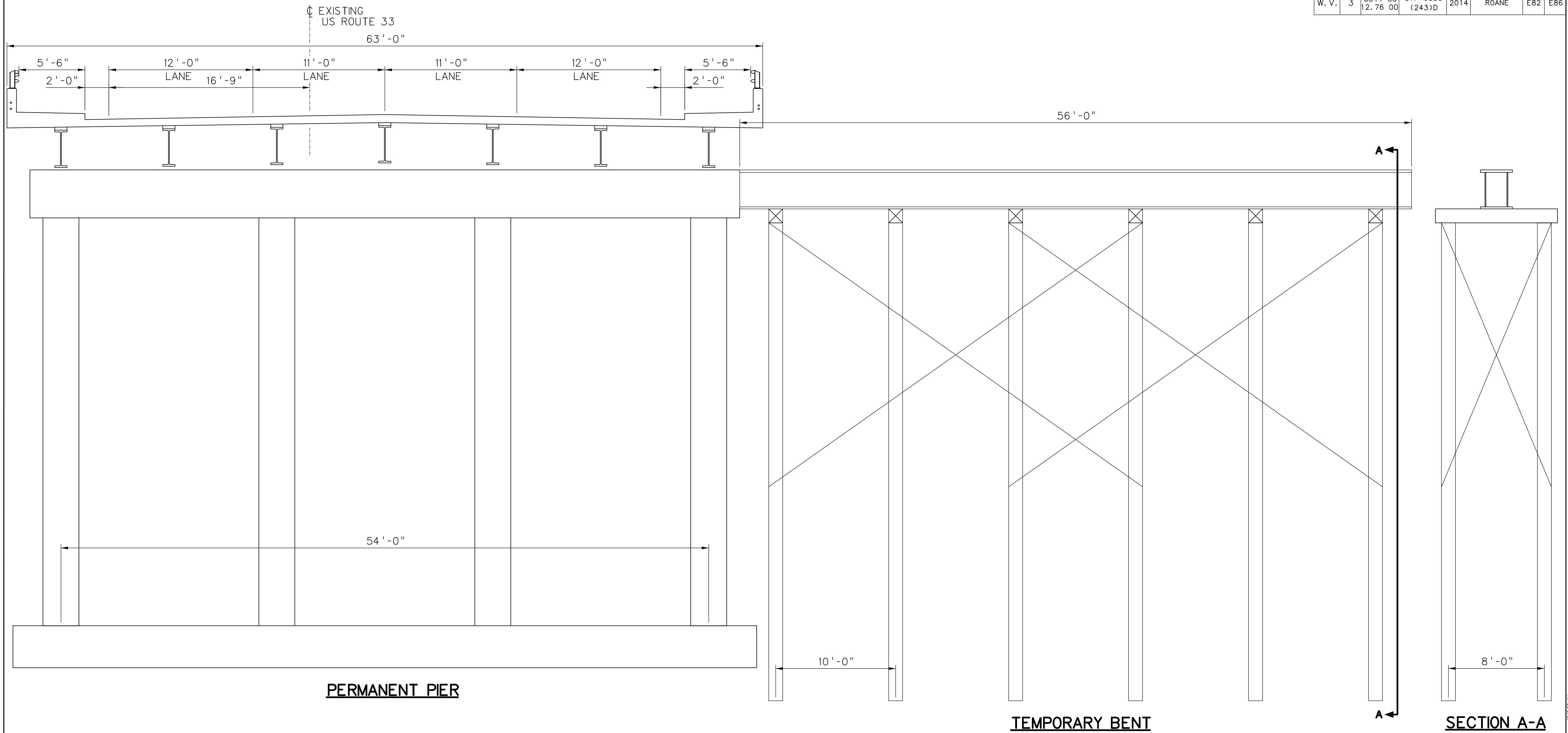


PARKERSBURG, WV **BURGESS & NIPLE**

SHEET OF BRIDGE NO.

10/10/03 AM 5/4/2015 P:\PRG310\road\sh1\13\p_release.com.rgn

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33 12.76 00	STP-0033 (243)D	2014	ROANE	E82	E86



REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

**COL. RUBY BRADLEY
BRIDGE REPLACEMENT
TEMPORARY BENT
ALTERNATIVE NO. 4**

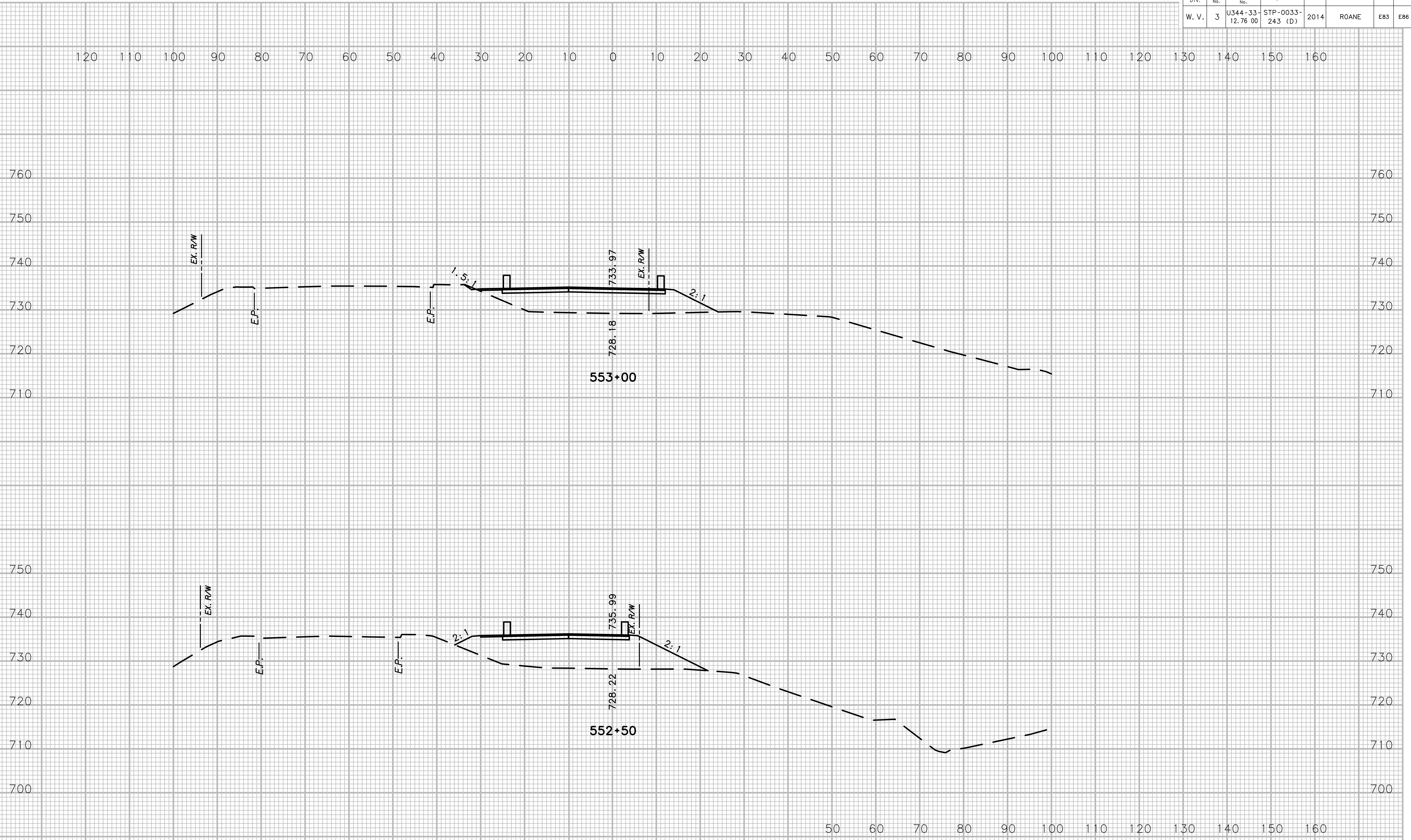
PARKERSBURG, WV **BURGESS & NIPLE**

DESIGNED	DATE
MWL	6/14
DRAWN	DATE
ASG	6/14
CHECKED	
CHECKED	

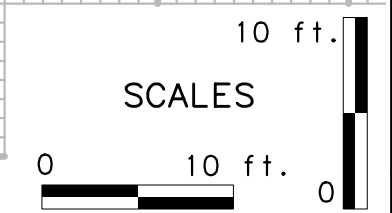
SHEET
OF
BRIDGE NO.

10/10/03 AM
P:\PRG310\road\h11\p1_p1.pleasd.com.rgn

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E83	E86



DATE	BY	FINAL SURVEYED
///		PLOTTED
///		TEMPLATE
///		BOOK
///		AREAS CHECKED
///		NO.



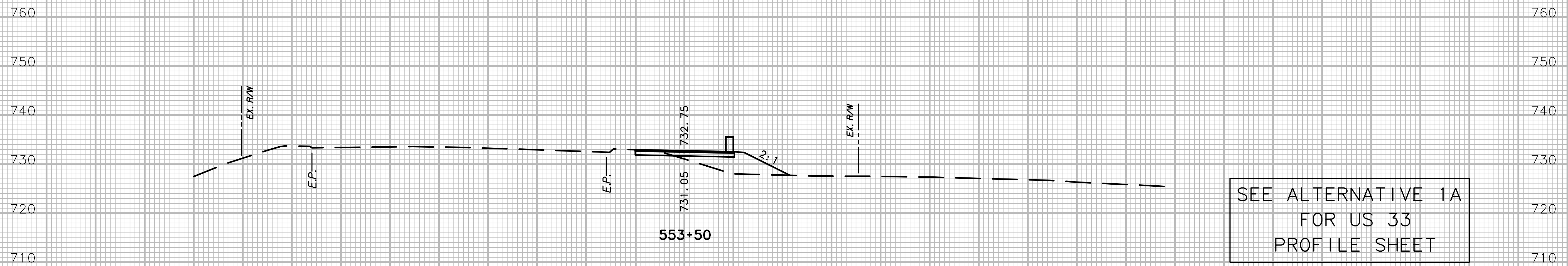
REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
CROSS-SECTION SHEET
 STA. 552+50 TO STA. 553+00

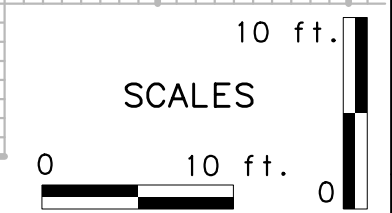
Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E84	E86

120 110 100 90 80 70 60 50 40 30 20 10 0 10 20 30 40 50 60 70 80 90 100 110 120 130 140 150 160

ORIGINAL SURVEY BOOK NO.	DATE	BY	FINAL SURVEY BOOK NO.	DATE	BY
	///			///	
	///			///	
	///			///	
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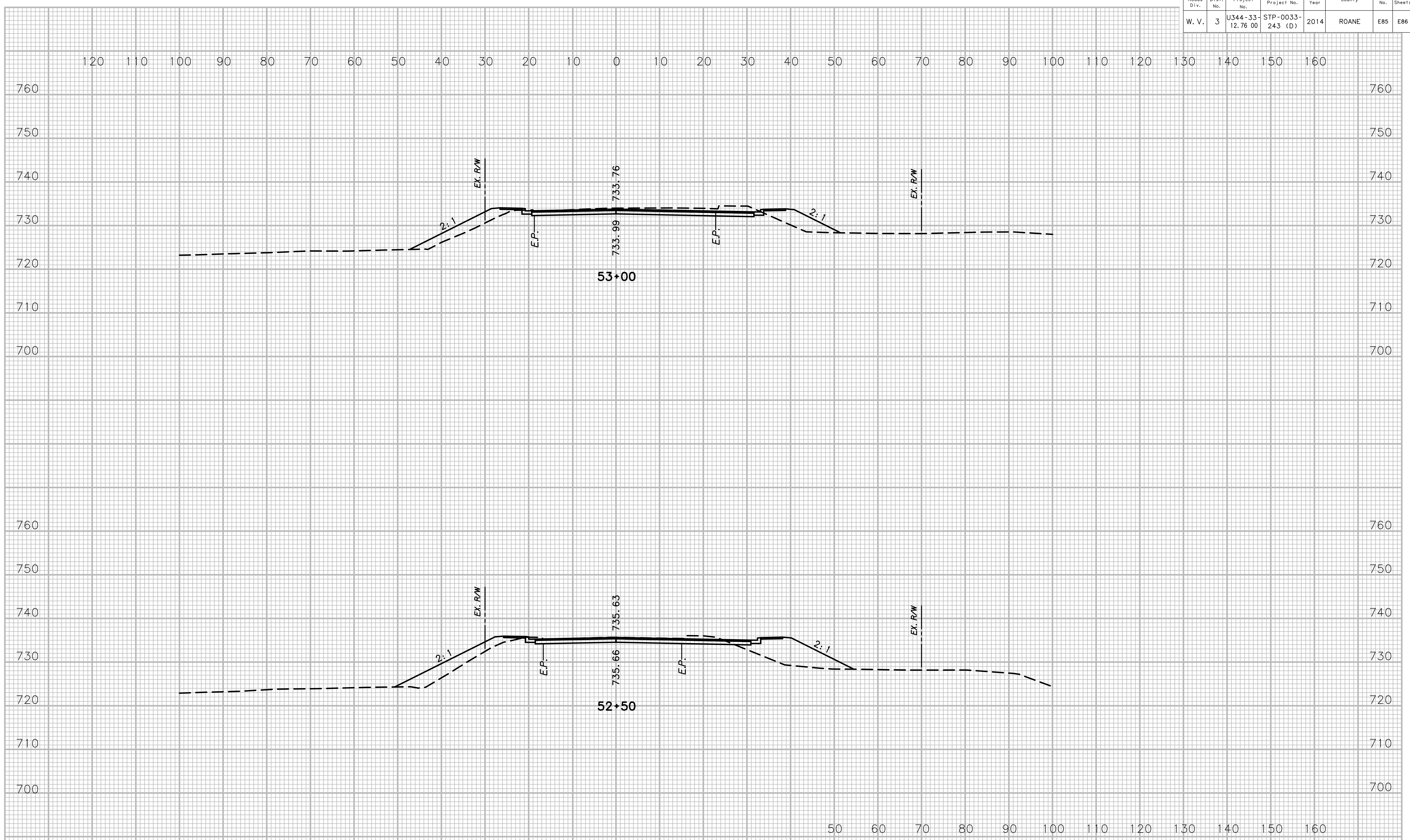
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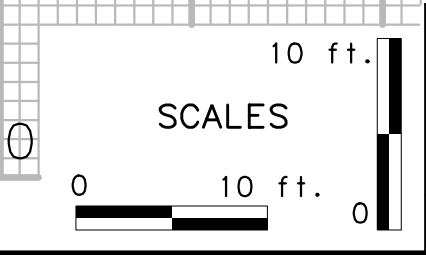
REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 4 PHASE 1 - US 33
CROSS-SECTION SHEET
 STA. 553+50

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W. V.	3	U344-33-12.76 00	STP-0033-243 (D)	2014	ROANE	E85	E86



ORIGINAL SURVEY	DATE	BY	FINAL SURVEY	DATE	BY
BOOK NO.	///		BOOK NO.	///	
AREAS CHECKED	///		AREAS CHECKED	///	
	///			///	
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	///			///	
	///			///	



REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
 DIVISION OF HIGHWAYS
 ALTERNATIVE 4 PHASE 2 - US 33
CROSS-SECTION SHEET
 STA. 52+50 TO STA. 53+00

APPENDIX F

COMMENTS AND RESPONSES FROM FIELD AND OFFICE REVIEWS

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

RUBY BRADLEY FIELD REVIEW
DESIGN STUDY FIELD REVIEW MEETING

COMMENTS AND RESPONSES

Review Date: September 4, 2014

Project Number: U334-33-12.76 00
Federal Project No.: STP-0033(243) D

Description of Project: Colonel Ruby Bradley Bridge Design Study
Spencer, West Virginia

Participants:

WV DOT: Chuck Bartley, R/W Dir
Ahmed Mongi, DDI (Bridges)
Feras Tolaymat, DDR
Cliff Essig, D3 (Bridge)
Mike Foley, D3 (Construction)
Brian Kucish, D3 (Construction)
Harry Hutchinson, D3 (Construction)
Jared Evans, D3 (Construction)
George Chappell, DDI (Geotech)
Sondra Mullins, DDI (Environmental)
Randy Epperly, DDE (Environmental)
Don Meadows, DT
Deanna Dehere, DT
Brad Fallecker, DDR

City of Spencer Rob Miller, Public Works

Consumers Gas Jerry Watson
Benny Caper

Frontier Communications B.J. Miller

Lumos Networks Brad Payne
Bob Durham

Consultant: Burgess & Niple
Rodney Holbert
Matt Lewellyn
Steph Chevalier

1. **Utilities and Right-of-way**

a. **Comment:** Consumers Gas indicated that 6" gas line that is located below the bridge is a one-way feed and needs to be maintained throughout the project.

Response: No action needed by B&N.

b. **Comment:** The overhead lines paralleling the upstream edge of the bridge consist of power (First Energy) on the top, with three fiber optics lines (Frontier), three copper telephone lines (Frontier), Cable TV, and a city owned 110V Christmas light feed.

Response: No action needed by B&N.

c. **Comment:** Frontier commented that the high tension power line near Williams Drive Extension would likely be costly to relocate.

Response: No action needed by B&N.

d. **Comment:** B&N to provide updated utility mapping once verifications are received. WV DOT to provide utility and right-of-way cost estimates.

Response: The utility mapping is updated. Utility and R.O.W. costs have been provided by WV DOT are included.

2. **Geotechnical Overview**

a. **Comment:** In the last sentence, George Chappell commented to not state that all alternatives will use spread footings on rock for the piers and abutments on H-Piles. George commented that this was a premature statement (prior to soil borings). He stated not to state at this point.

Response: The sentence was revised to not mention spread footings or H-piles.

3. **Design Criteria**

a. **Comment:** Add PROWAG 2014 to the specifications.

Response: PROWAG 2014 was added to the specifications.

4. Environmental Overview

a. **Comment:** Under the first bullet change the “The existing bridge is listed” to “The existing bridge is eligible for registration for”.

Response: The sentence was revised to say “The existing bridge is eligible for registration for”.

5. Alternatives

a. **Comment:** Alternate 1A – Please change Alternate 1A to the actual rehabilitation option instead of the widening option. Provide narrative discussion of the constructability issues and lack of meeting the purpose and need (traffic flow and durability). No cost estimate is needed.

Response: Alternative 1A was replaced with the rehab (no widening) option. Durability and traffic issues were mentioned in the discussion.

b. **Comment:** Cliff Essig prefers that the abutments would not be re-used in Alternative 4. Matt Lewellyn explained that re-using the abutments would reduce the amount of time the traffic would need to be maintained in the temporary condition.

Response: The existing abutments will not be used for Alternative 4.

d. **Comment:** Cliff Essig prefers clear coating on substructures. Ahmed Mongi indicated that the epoxy concrete protective coating has been used successfully on many bridges around the state and has become the standard.

Response: No action needed by B&N.

e. **Comment:** Chloride ion sampling and testing was performed by state forces. The results indicate the bridge substructures are highly contaminated and extraction of the chlorides is not possible. Consider cost increases to Alternative 1A. WVDOT Materials Division will provide a report to summarize the results.

Response: The construction cost of the rehabilitation was not increased due to the contamination, but on-going maintenance cost would increase over time.

f. **Comment:** On sheet 4, first paragraph, change analysis of the existing beams with the deck removed is “recommend” to “required and likelihood of passing is unknown at this time”.

Response: The sentence was revised

g. **Comment:** Use 3’ thick foundation protection.

Response: Drawings and calcs were revised to show 3’ thick foundation protection.

h. **Comment:** Page E19: Please assume a vertical wall to minimize cut on the loading dock and add a frontage road to connect to the loading dock for the National Guard. Please check that large trucks can make the turns at the loading dock. Cliff Essig indicated the loading dock at the National Guard Building could be reconstructed on a skew to accommodate Alternative 3.

Response: A retaining wall was evaluated but was found to not supply adequate room for large trucks. The loading dock will need to be reconstructed at 90°.

i. **Comment:** Cliff Essig indicated that it may be possible to add a pedestrian walkway between Tractor Supply and the Tutors Biscuit to connect the pedestrian bridges. This could be used an alternate route during construction of the bridge.

Response: This possible pedestrian walkway was mentioned in the narrative.

j. **Comment:** Should the existing 12” aerial sewer line be considered in the hydraulics? Is this line in service? Could it be removed to improve the hydraulics? The mapping indicates it is abandoned.

Response: The 12” aerial sewer line is not in service and should be removed as part of the project.

k. **Comment:** In the narrative for the existing conditions and all the proposed alternates please provide more details about the bridge like the length, spans, etc.

Response: Bridge details such as spans, length, and out-to-out width were provided in the narrative.

l. **Comment:** Alternative 1A – In the description of Alternate 1A it mentions that four new spread box beams will be constructed, but pages E45 and E46 show the construction of 3 new box beams.

Response: No action needed (Alternate 1A has been changed to rehab only).

m. **Comment:** Alternative 2 – Does the 175 foot long temporary bridge have any piers, if so please state in the narrative.

Response: The temporary bridge does not have any piers. Noted as single span.

n. **Comment:** Alternative 3 – Should there be any mention of the other bridge on Williams Drive crossing Goff Run. Will that bridge be able to take the detour traffic.

Response: Discussion added to report. This bridge should be adequate as it is a modern pre-cast slab bridge.

o. **Comment:** Alternative 4 – the 4th line of the description has the word “new” repeated twice. WVDOT does not agree with the option of reusing the existing abutments for Alternate 4.

Response: The sentence was revised. The existing abutments will not be re-used.

- p. **Comment:** Table 2 – Add the bridge detail, width, length, span etc.
Response: **The width, length and span length of each alternative was added to Table 2.**

6. Traffic

- a. **Comment:** Revise drawings to provide a minimum of 10' lanes for the temporary condition.
Response: **Drawings were revised to provide 10' min. temporary lanes.**
- b. **Comment:** Cliff Essig and Mike Foley prefer 12' lanes for the permanent condition. The Typical Section has been revised to two 12' outside lanes and two 11' inside lanes (46') on the bridge with two 2' shoulders for a total curb to curb width of 50'.
Response: **The drawings were revised to show two 11-foot lanes and two 12-foot lanes.**
- c. **Comment:** An analysis of the temporary signal phasing will need to be performed. It is assumed WVDOT Traffic Engineering will be performing this analysis.
Response: **Results of the analysis have not been provided to B&N to date.**
- d. **Comment:** The turning radius onto the bridge from US 119 will be tight in the temporary condition. Verify that it can be accomplished.
Response: **The turning radius from US 119 on to the bridge was evaluated and a larger radius was used to accommodate.**
- e. **Comment:** Add discussion that an incentive/disincentive clause will be used for Alternative 4.
Response: **An incentive/disincentive clause was mentioned in the write-up.**

7. Bridge Aesthetics and Lighting

- a. **Comment:** Cliff Essig likes the idea of staining the concrete in the form lined areas.
Response: **The form lined concrete will be stained.**

8. Cost (Appendix C)

- a. **Comment:** For Alternative 1A, has the cost of the rehabilitation of the existing structure been added.
Response: **Yes, the cost was included.**

- b. **Comment:** Please verify the cost of roadway paving and subgrade, concrete sidewalk and curb and gutter for Alternate 4.

Response: **The quantities are revised based on the revised layout.**

9. Drawings

- a. **Comment:** The drawings are hard to follow. Group the drawings by alternative and renumber.
Response: **The drawings were re-organized by alternative and number.**
- b. **Comment:** On sheet E19, show the upstream bridge barrier as a straight line without a kink.
Response: **The upstream bridge barrier was changed to a straight line.**
- c. **Comment:** On sheet E31, add a short vertical sag curve going from the 2% to the 4% near the intersection with US 119.
Response: **A vertical sag curve was added at this location near US 119.**
- d. **Comment:** Please Label the Station for Begin and End project and Begin and End Bridge on all plan sheets.
Response: **Stations for Begin & End Project and Begin & End Bridge were added to all plan sheets**
- e. **Comment:** Please show all Station Equations at the intersection of two centerlines.
Response: **Station equations were show at intersections of two centerlines**
- f. **Comment:** Please label all curves and show curve data.
Response: **Curve data was added to all plan sheets.**
- g. **Comment:** Please label the temporary detour bridges.
Response: **The temporary detour bridges were labeled.**
- h. **Comment:** Sheet E24, At Begin project location, the existing and proposed profile should match.
Response: **The existing and proposed profiles were changed to match.**

10. Alternates

a. **Comment:** Alternate 2 – Please make the detour upstream on Alternate 2.

Response: **Revised: Alt. 2A has downstream detour and Alt. 2B has upstream detour.**

b. **Comment:** Alternate 3 – Please add a left turn lane from US 119 onto the new Williams Drive Extension Bridge. Please show the storage lane and taper stripe for the left turn.

Response: **Striping was added to the traffic control sheet to show the left turn lane.**

c. **Comment:** Under Section 3.12 “Other Considerations” add a paragraph regarding looking at the one lane temporary detour behind the save-a-lot (location of old truss bridge), and dismiss this option for temporary traffic control because of narrow lanes and impacts to save a lot and the lumber facility.

Response: **A discussion was added regarding the 1-lane detour behind Save-A-Lot**

d. **Comment:** Alternate 4 – Under the temporary conditions Phase I, an additional lane will be required where the detour meets with US Route 33.

Response: **An additional lane was added to all alternatives that use an upstream temporary detour.**

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

RUBY BRADLEY FIELD REVIEW DESIGN STUDY OFFICE REVIEW MEETING

COMMENTS AND RESPONSES

Review Date: February 12, 2015

Project Number: U334-33-12.76 00
Federal Project No.: STP-0033(243) D

Description of Project: Colonel Ruby Bradley Bridge Design Study
Spencer, West Virginia

Participants:

WVDOT: Rubina Tabassum, DDR
Cliff Essig, D3 (Bridge)
Joe Carte, DDI (Geotech)
Brad Fallecker, DDR

Consultant: **Burgess & Niple**
Matt Lewellyn
Steph Chevalier

1. Utilities and Right-of-way

- a. **Comment:** Brad Fallecker commented that if we are waiting on any utilities to provide verification to let him know and he would follow up. B&N thought all verifications were received, but will verify and revise comment on sheet 5 as needed.

Response: All verifications have been received.

2. Geotechnical Overview

- a. **Comment:** Joe Carte provided an example geotechnical overview from another project. B&N to rework the overview to include available information from WVGS and WVDEP (TAGIS) webpages concerning coal bed mapping, mining permits, oil and gas wells. Reference a geological map of the state. The goal should be to avert any potential issues prior to the span arrangement with slips, mining, and oil/gas wells.

Response: The geotechnical overview has been reworked.

3. Comments from Dave Cramer, CD (Director of Economic Development) provided via red marks.

- a. **Comment:** Various red marks were provided on the word usage, punctuation, etc. Return set with final submission.

Response: The markup set will be returned with the final submission. Various marks were corrected.

- b. **Comment:** On page 1, is the bridge on the national register for historic structures?

Response: The bridge is eligible for registration. Discussion was added to page 1.

- c. **Comment:** On page 1, what is the current ADT?

Response: The current ADT of 10,300 was added in the discussion on page 1.

- d. **Comment:** On page 1, what is the green, dashed line on the map? Can we use a map that identifies Spring Creek?

Response: The green line shows a potential detour option. A note was added to the location map.

- e. **Comment:** On page 3, add last bullet under environmental overview, "Environmental Justice/Title VI Community Review. Roane County is considered a distressed county by the Appalachian Regional Commission (ARC). "

Response: The above bullet point was added to page 3.

- f. **Comment:** On page 3, under No Build Option, address what the eventual failure would be in respect to – operations, congestion, etc?

Response: Discussion was added regarding failure.

- g. **Comment:** On page 3, under Alternative 1A, address why particular care would be needed during demolition of the deck. Is it for contaminated debris falling into the stream, protecting the beams, etc.?

Response: Discussion was added describing why care would need to be taken when removing the deck.

- h. **Comment:** On page 4, under Alternative 1A, any estimate of the significant ongoing maintenance costs? This was discussed at the meeting and how an estimate of maintenance costs is beyond the scope of this study. Ruby Tabassum will check to see if any maintenance/life cycle costs should be included.

Response: Maintenance and life cycle costs will not be included.

- i. **Comment:** On page 6, under Bicycle Facilities, are bicycle facilities needed? If not, why? This was discussed at the meeting. B&N will revise this section to state that although dedicated bicycle lanes have not been included, the bicycles are accommodated within the proposed typical

section by using wider 12 foot lanes and two foot shoulders. B&N to verify statement complies with AASHTO Guide Specs and DDs.

Response: Section revised to discuss how bicycles will be accommodated.

4. Project Description and Purpose

- a. **Comment:** In the 3rd paragraph, add “The bridge was originally designed for two-lanes of traffic and was converted to three-lanes in the 2000’s.” In the 4th paragraph, replace “truck” with “vehicular” as the detour really is not practical for either.

Response: The above revisions were made.

5. Design Criteria

- a. **Comment:** In the 2nd paragraph, replace two 11’ “turning” lanes with “inside” lane. They may be through lanes in some cases.

Response: “Turning lanes” was changed to “inside lanes”.

6. Alternatives

- a. **Comment:** Alternate 1A – Add discussion that 1A using the three 10’ lane configurations. Add discussion that it does not meet the “purpose and need” of the project.

Response: Discussion was added about lane configuration and about not meeting the purpose and need.

- b. **Comment:** Alternative 1B – Cliff Essig mentioned that if a closure pour is used, he would prefer for the longitudinal construction joints to located overtop of the girders – a beam-to-beam closure pour.

Response: So noted

- c. **Comment:** Alternative 4 – Should we be included the cost of the incentive in the cost estimate? Ruby Tabassum will check with Steve Jarrell about the cost used on the Bassinette Bridge.

Response: An incentive cost will not be included.

- d. **Comment:** Chloride ion sampling and testing was performed by state forces. WVDOT Materials Division will provide a report to summarize the results. Ruby Tabassum will send the report to B&N. Reference report in narrative.

Response: The memorandum was referenced in the report.

- e. **Comment:** On sheet 8, under Impact During Construction, Alternative 4, change to “Low, due to shorter duration”. Under Hydraulic Performance, Alternatives 1B and 4, revise to “Best, Less Impact from Temporary Structure.”

Response: The above revisions were made.

7. Temporary Traffic Control

- a. **Comment:** B&N will perform a Synchro model of the temporary condition to confirm the LOS is acceptable to WVDOT. Include results in final study report.

Response: The results of the analysis are included in the report.

- b. **Comment:** Add, “The turning radius during the construction of Alternative 1B will be an issue for trucks coming from US 119. The proposed structure would need to be flared to accommodate this increasing the cost of the alternative.”

Response: The above sentence was added.

8. Bridge Aesthetics and Lighting

- a. **Comment:** Cliff Essig commented that aluminum light posts and railing should be considered.

Response: Discussion of aluminum lights and rails was added.

9. Conclusions

- a. **Comment:** 4th bullet point, appears use of 2A and 2B are reversed.

Response: Yes, it was reversed. The order was revised.

- b. **Comment:** WVDOT will hold another meeting to discuss the preferred alternative and provide further direction to B&N. Cliff Essig indicated there is a local preference for Alternative 3. He feels the hydraulic issues of the Williams Drive Extension Bridge should be confirmed prior to making a selection. Cliff also presented schematics of a few other possible alternatives to accommodate a new bridge (fly-over bridge and bridge connecting to a roundabout).

Response: A preferred alternative will not be selected at this time.

10. Cost (Appendix C)

- a. **Comment:** For Alternative 4, why is the cost of the sidewalk and curb and gutter so much lower than the other alternatives?

Response: The cost should be the same as for Alternatives 2A & 2B. Quantities were revised.

- b. **Comment:** Add cost of overlaying the entire length (full-width) of Williams Drive to Alternative 3.

Response: The cost of full-length full-width overlay on Williams Drive was added to the cost estimate.

11. Drawings

a. **Comment:** On sheet E12 and E13, the station equation does not match the stationing shown. Check this on all plan sheets, all alternatives.

Response: The stations were checked and revised if needed.

b. **Comment:** All profile sheets: provide the existing elevations on the same interval as the proposed elevations.

Response: Updated to show existing elevations on the same interval as the proposed elevations.

c. **Comment:** On sheet E15, end project label does not match the station location it points to. Check all.

Response: Sheet E15 was updated. Other sheets checked for same error.

d. **Comment:** On sheet E16, the grid station labels do not match plan sheet labels on sheet E12. Check all.

Response: All sheets checked and revised if needed.

e. **Comment:** Check all plan sheets for spelling of “Goff Run”, not “Golf”.

Response: All sheets were checked for spelling and revised if needed.