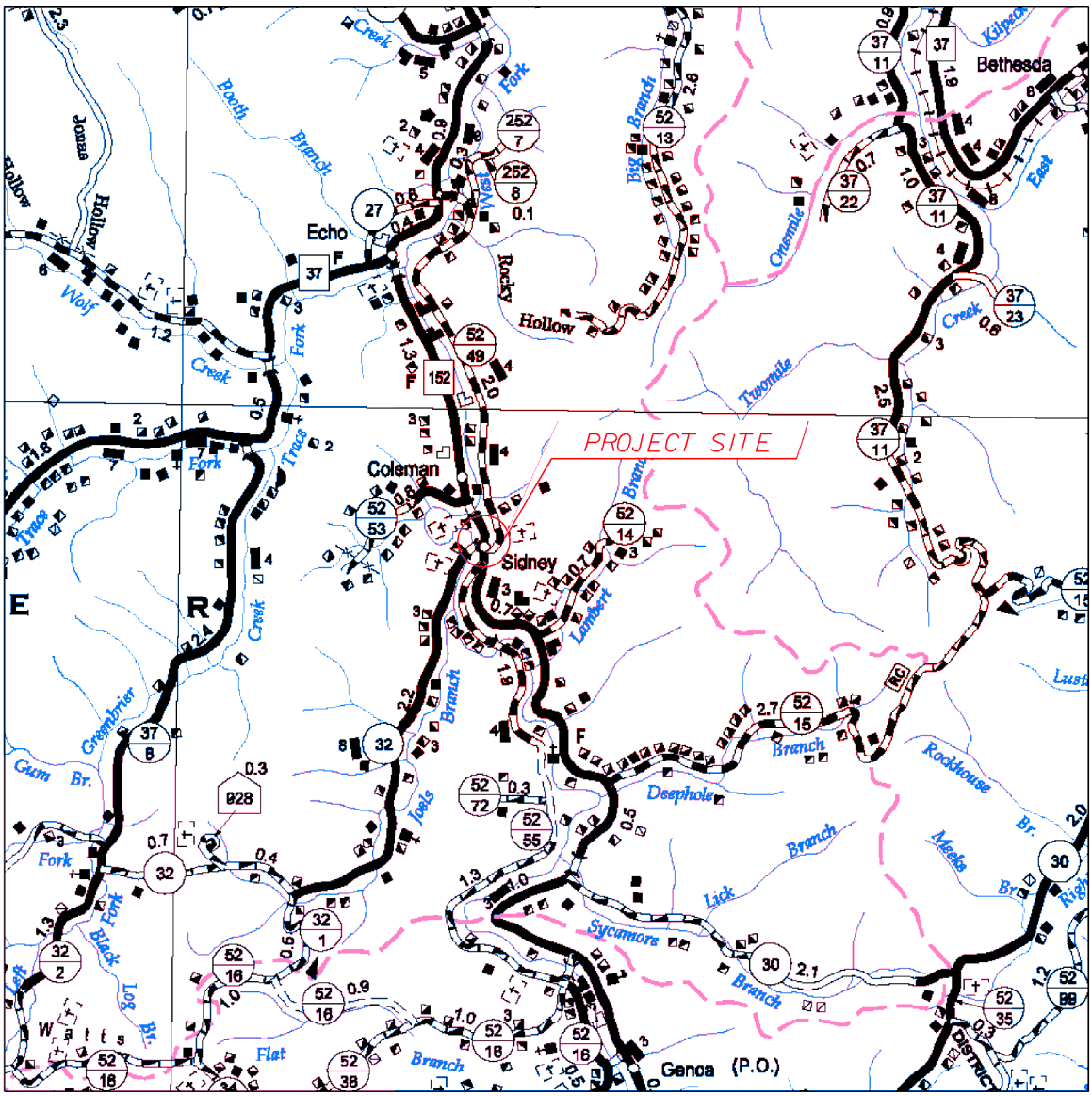
BRIDGE REPLACEMENT STUDY

SIDNEY BEAM SPAN BRIDGE

STATE PROJECT NO. S250-152-23.71

WAYNE COUNTY



WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

DIVISION OF HIGHWAYS

ENGINEERING DIVISION

SEPTEMBER 2012

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LOCATION MAP

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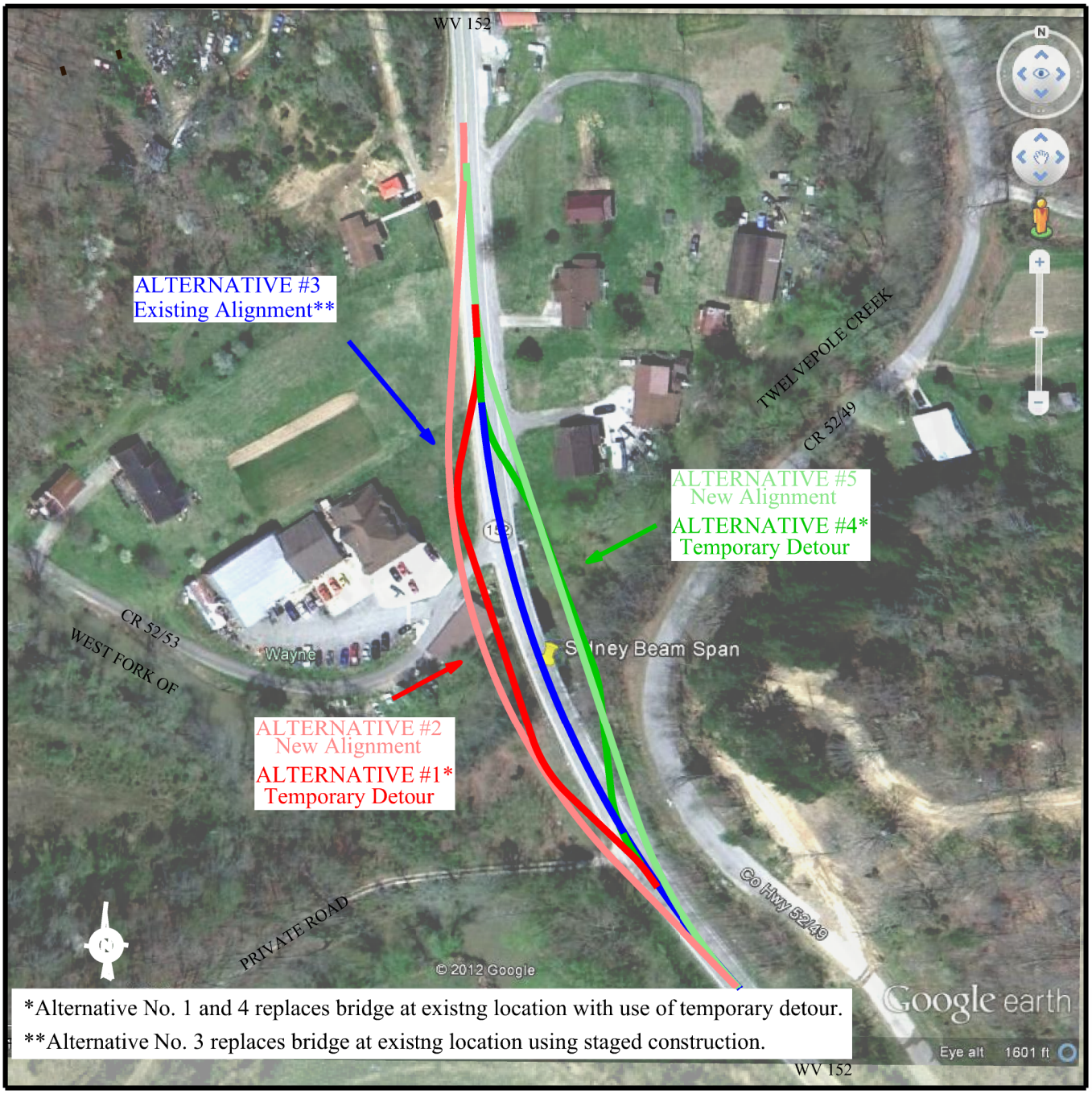

*Alternative No. 1 and 4 replaces bridge at existng location with use of temporary detour.

**Alternative No. 3 replaces bridge at existng location using staged construction.

WEST VIRGINIA DEPARTMENT OF TRANSPORTATION

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PROJECT SUMMARY

The Initial Design Section (DDC) conducted a study to evaluate and determine the most suitable and economical location for the replacement of the existing Sidney Beam Span Bridge (#50-152-23.71) in Wayne County. The bridge is on a section of roadway that carries West Virginia State Route (WV) 152 over West Fork of Twelvepole Creek, and is located approximately 0.01 of a mile south of Wayne County Route (CR) 52/53. West Virginia 152 is functionally classified as a Rural Major Collector and is not presently part of the Coal Resource Transportation Road System (CRTS). The section of roadway with the subject bridge is posted with a 55 mph speed limit. An updated traffic count has been requested for the subject bridge. The most recent count shows the 2012 Average Daily Traffic (ADT) to be 1,400 Vehicles per Day (VPD). Traffic using the bridge consists of all types including commercial traffic, mail carriers, and school buses.

The study was conducted utilizing information obtained from an initial site visit, bridge inspection reports, a detailed topographic survey, and information gathered from various other sources. Major factors taken into consideration were cost comparison of the alternative alignments, safety to all users of the facility, right-of-way acquisitions, constructability issues, and environmental impacts.

From the information collected and evaluated, it is recommended that a 130-foot single-span bridge be placed at the existing bridge location. It is also recommended that staged construction be used as the method of replacement. Based on the evaluations of all the alternatives studied, it is our recommendation that the West Virginia Department to Highways accept Alternative No. 3 as the preferred alignment.

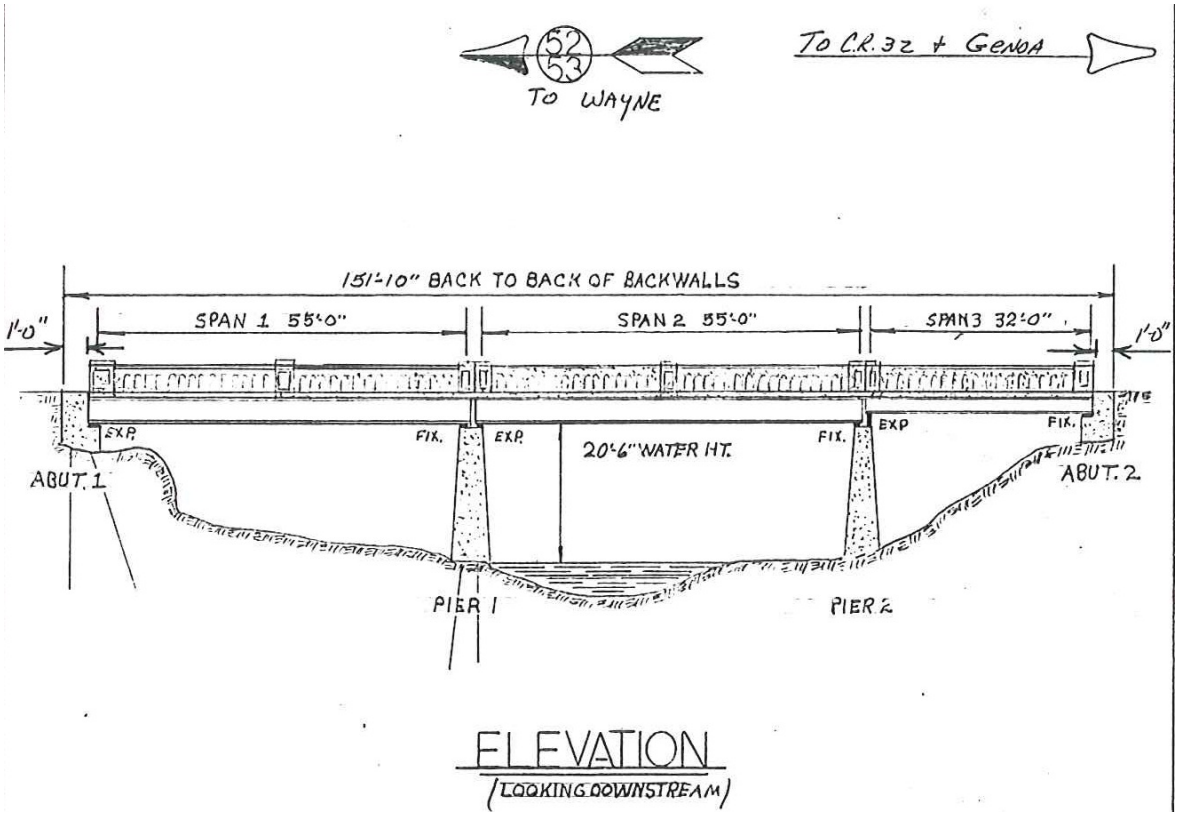
EXISTING CONDITIONS[1]

Existing Bridge Condition

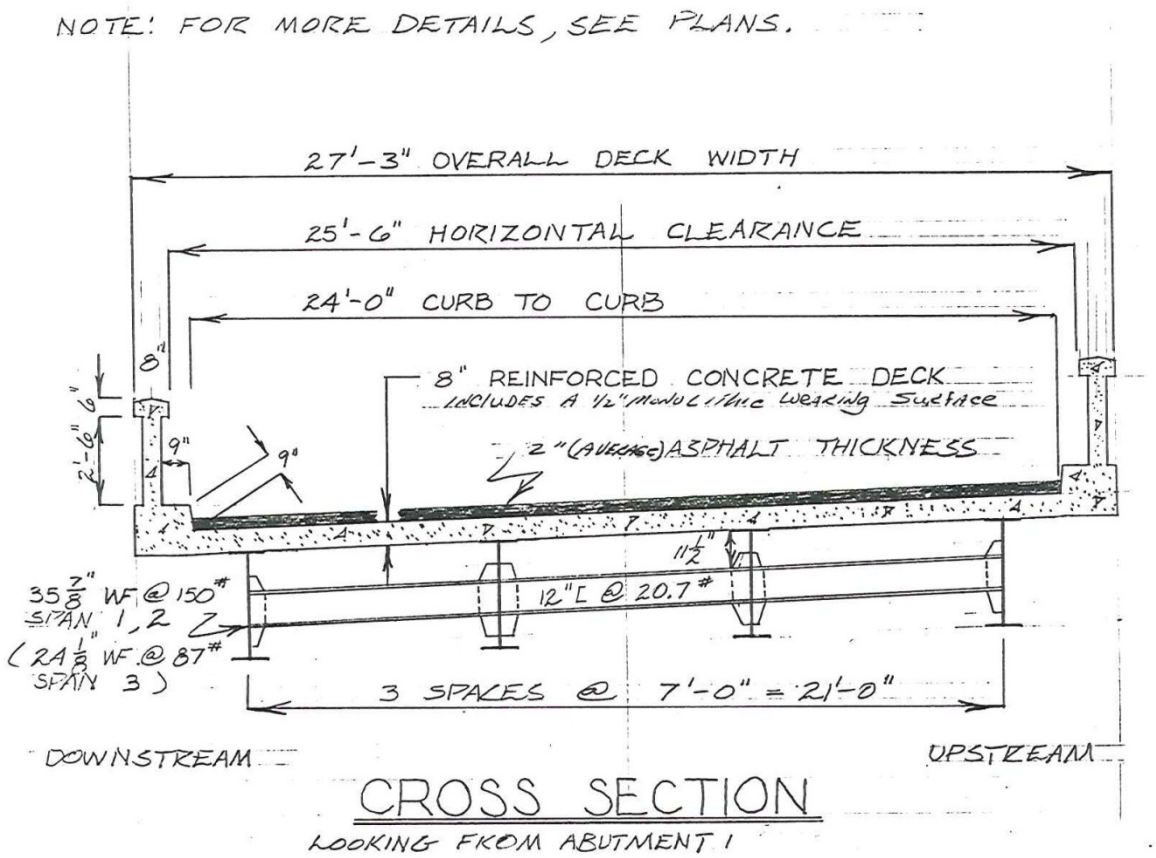
The structure was built by A.P. Peraldo and Son Contractors of Iaeger, WV in 1939. It currently has a sufficiency rating of 2.0 and is considered to be structurally deficient and functionally obsolete. The structure consists of three Simple Steel Wide Flange Beam (SSWB) spans supported at each end by reinforced concrete stub abutments. The bridge is supported intermediately by two solid reinforced concrete piers. Abutment No. 1 and Pier

[1] See Appendix A, Figure 1

No. 1 are founded on piling and the foundation for Abutment No. 2 and Pier No. 2 are not known. The overall length of the bridge is 151 feet 10 inches from back to back of backwalls. The span lengths measure 55 feet, 55 feet, and 32 feet from center to center of bearings.



The structure consists of four stringers and the steel is connected by bolts and rivets. The deck is 8-inch thick reinforced concrete with 2-inch Hot Mix Asphalt (HMA) overlay. The overall deck width is 27 feet 3 inches with a clear width of 24 feet from curb to curb. Reinforced concrete balustrades serve as parapets on each side of the structure. The bridge serves as a two-lane road with a 24-foot roadway width and no sidewalk is present.



Due to the narrow width, hazard warning paddles alert traffic to the narrow conditions and the weight limit on the bridge is currently posted with silhouette postings and ranges from 20 tons to 40 tons, depending on the type of truck.

Existing Roadway Geometry

The existing structure is curved and located in a curved section of roadway with the abutments parallel to the stream flow. Both abutments are skewed 25° right-forward with respect to the centerline of WV 152. Sight distance is rated as fair due to the curvature of the road.

The north approach to the bridge (Abutment No. 1) is tangent with a slightly curved section of roadway leading into the bridge. The approach roadway consists of a 24-foot HMA traveled way with 2-foot paved shoulders. The east shoulder contains an additional 5 feet of stone beyond the pavement while the west shoulder carries an additional 3 feet of stone. Dillon Branch Road (CR 52/53) intersects on the west side of WV 152 at the north end of the bridge.

The southern approach to the bridge (Abutment No. 2) is a moderately curved section of roadway. The approach roadway consists of a 24-foot HMA traveled way with 2-foot paved shoulders. A private road intersects on the west side of WV 152 approximately 130 feet south of the bridge.

West Fork of Twelvepole Creek Hydraulic Analysis

The FEMA Flood Insurance Rate Map[2] No. 54020001288B for Wayne County, dated September 18, 1987, shows base flood elevations. It does appear that part of the existing bridge superstructure is in the 100-year flood plain. The base flood elevation shown on the map is 626 feet on the upstream side of the bridge and drops to 622 feet on the downstream side.

A Flood Insurance Study was completed for the West Fork of Twelvepole Creek including the area of the subject bridge. The flood profile in this study shows the bridge deck is above the 100-year flood elevation and the water is forced under the girders. It is assumed that a larger opening is not necessary for the new bridge, but this was pursued in every alternative considered. A preliminary Hydrology and Hydraulic report will be completed by the Hydraulic Unit of Engineering Division for the final report.

Existing Properties and Utilities

The north approach of the bridge is located between multiple residences. A split-level home is located on the east side of the roadway approximately 70 feet from the abutment and has a driveway intersecting WV 152. Another single-level home, located on the same side of WV 152, is approximately 200 feet north of the bridge and also has a driveway intersecting WV 152. A new home has been constructed approximately 300 feet north of the bridge on the west side of the road. A two-story home is located approximately 70 feet from the bridge abutment, but its driveway intersects CR 52/53. A garage building located across the road from the two-story home on CR 52/53 appears to be part of a business. This business is labeled as “Maynard’s Body Shop” and the garage building appears to be encroaching on WVDOH right-of-way. The building is approximately 7 feet from the existing bridge deck. Another larger building is located next to the two-story house and appears to be part of the business.

[2] See Appendix C

The south end of the bridge has no buildings located in the vicinity of the bridge and only the private road mentioned earlier intersects in the vicinity of the bridge. Wayne County Route 52/49 does parallel WV 152 on the east side of the road along a bank approximately 25 feet higher than WV 152. The two roadways are approximately 50 feet apart. Based on available information, the right-of-way for these two routes merge in the area of the bridge.

Power and telephone lines are suspended on the north side of the bridge by one utility pole located approximately 75 feet from the bridge. A power line spans over the creek approximately 60 feet upstream of the structure. Based on the survey information, a buried waterline and gas line crosses under WV 152 approximately 180 feet north of the bridge. Also, a one-inch gas line crosses the road approximately 200 feet south of the bridge. No encroachments were noted on the bridge, but the bridge inspection report indicates that a utility conduit runs across the face of Abutment No. 2. Based on survey field notes, AEP has an underground power line north of the bridge; however it is not shown on the survey.

Based on preliminary information, the WVDOH right-of-way is a minimum of 80 feet for WV 152 and 115 feet of right-of-way at the bridge location. A 30-foot right-of-way was assumed for CR 52/53 in this report. CR 52/49 has been shown to have 30 feet of right-of-way for estimation purposes; however, the right-of-way is traveled portion plus ditches and shoulders including any additional width required for maintenance.

DESIGN CRITERIA AND GUIDELINES

The design guidelines used were based on WV 152 being classified as a Rural Major Collector in mountainous terrain with a 2012 Average Daily Traffic (ADT) count of 1,400 vehicles per day (vpd) and a 20-year design ADT of 2,000 vpd. The following table provides a summary of the design criteria used based on West Virginia Division of Highway's Design Directives (DD-601). During the site visit, and based on general observations, it was determined that the project fell within mountainous terrain criteria.

Design Criteria Description	Design Criteria As per DD-601
Terrain Type	Mountainous
Roadway Classification	Rural Major Collector
Design Speed	30 mph (Exhibit 6-1) DD-601
Maximum Grade	10% (Exhibit 6-4) DD-601
Minimum Traveled Way Width	22 feet (Exhibit 6-5) DD-601
Minimum Shoulder Width (each side)	6 feet (Exhibit 6-5) DD-601
Minimum Stopping Sight Distance	200 feet (Exhibit 6-2) DD-601
Minimum Radii for Design Speed (e=0.08)	214 feet (Exhibit 3-27) DD-603
Minimum K Value for Vertical Crest	19 (Exhibit 6-2) DD-601
Minimum K Value for Vertical Sag	37 (Exhibit 6-2) DD-601
Minimum Clear Width for Bridges > 100’	30 feet (Exhibit 6-6) DD-601

During the initial site visit no evidence of safety concerns or accidents were noted with the existing bridge. Traffic crash data for the last three years show that there have been no wrecks in the vicinity of this bridge. The rural location of this structure and the lack of any current pedestrian facilities leading to the existing bridge lead to a recommendation that no sidewalk or bicycle lane will be required on the replacement bridge.

GEOTECHNICAL OVERVIEW

A preliminary Geotechnical assessment will be provided for the final report.

ENVIRONMENTAL OVERVIEW

A preliminary Environmental assessment will be provided for the final report.

DESIGN ALTERNATIVES

Due to the location of the existing bridge and surrounding terrain, other alternative alignments not directly adjacent to the existing bridge would be costly but were given consideration. Wayne County Route 52/49, which runs parallel to WV 152, does create a detour route for the existing bridge. This detour route is 3.9 miles and takes approximately 8 minutes to drive. Echo Through Truss, a one-lane bridge located on this route at

milepost 0.05, would prevent the use of this detour route unless it was replaced. While the bridge does appear to need replaced, it is not presently scheduled for replacement in the near future. Even with the replacement of this bridge, CR 52/49 would need to be upgraded to temporarily handle the volume of traffic that would be using the detour. Taking into consideration the condition and schedule of Sidney Beam Span, the condition of CR 52/49, and Echo Through Truss, it would not be prudent to further consider an alternative that would use all of CR 52/49 as a detour during the replacement of the Sidney Beam Span. Another option would be to construct a temporary bridge across the creek at another location and using a section of CR 52/49 as a detour. As mentioned, due to the condition of Sidney Beam Span and the amount of work that would be needed on CR 52/49, this alternative was not considered practical and no further considerations were given to this alternative.

Five alternative alignments, a renovation alternative, and a No-Build alternative were evaluated for this project based on available information and site conditions. The first alternative proposes replacing the bridge at its existing location while using a temporary bridge upstream to maintain traffic during construction. The second alternative proposes a new structure upstream of its current location while utilizing the existing bridge and its approaches to maintain traffic during construction. The third alternative proposes replacing the bridge at its current location using staged construction to maintain traffic and complete the new bridge. The fourth alternative considers a temporary bridge downstream and replacing the bridge at its existing location. The final alternative would move the new bridge alignment downstream from the existing bridge.

It should be noted that at the onset of this study, traffic numbers available in existing databases showed a much higher ADT then the recent count for this study. This misinformation made consideration of a one-lane detour, like would be used in staged construction, unreasonable. With the updated traffic numbers it appears that a one-lane option, such as staged construction, is feasible with traffic alternating by use of a temporary signal. With this in mind, it was decided that any alternative using a temporary detour could maintain traffic with a one-lane detour and signal. This made for a more fair comparison with staged construction and significantly reduced impacts to surrounding properties and reduced the estimated costs.

In all of the proposed alternatives it is proposed that the approaches will have two (2) 12-foot lanes with 6-foot shoulders. An exception was made in the case of Alternative Nos. 2, 3 and 4 to minimize impacts to the rock cut slope at the southeast corner of the proposed bridge. A 3-foot shoulder was used in this area only. In Alternative No. 2 this exception eliminates impacts to CR 52/ 49 and minimizes impacts to CR 52/49 in the other alternatives. The new bridge will be two lanes with a minimum clear width of 30 feet.[3]

a) Alternative No. 1 (New Bridge at Existing Location)

Alternative No. 1[4] consists of placing the new bridge at the existing location while using a temporary detour to maintain traffic approximately 5 feet (edge to edge) upstream of the proposed bridge's location. Even though this alternative reconstructs the new bridge in the existing location, it is anticipated that a 130-foot single-span bridge can be constructed. It may even be possible that existing Abutment No. 2 could be cut off and reused with a newly constructed cap; however, this was not considered for the design study estimates. The new bridge would be skewed approximately 25 degrees right forward with respect to the centerline of US 52. This skew would allow the face of the abutments to be parallel to the flow of the creek. Based on the alignment, the new bridge would have a horizontal curve. For estimating purposes, it is assumed the bridge would be constructed of a concrete deck and steel girders. Based on the preliminary vertical alignment, the profile of the proposed bridge opening would be larger than the existing bridge opening and the girder bottom elevation would be approximately the same as the existing bridge. Approximately 50 feet of approach work would be necessary on each end of the new bridge. No improvement to the existing roadway geometry is anticipated.

The temporary roadway is estimated to be 630 feet long including the temporary bridge. The temporary bridge and roadway would be one-lane and traffic would alternate use of the bridge via a temporary signal. Since the proposed traffic maintenance would be one-lane, CR 52/53 would need to be maintained as part of the traffic plan. The temporary detour would meet a 25

[3] See Appendix A, Figures 2 and 3
[4] See Appendix A, Figures 4 and 5

mph design speed. This would be adequate given the stop conditions created by the one-lane detour.

Right-of-way acquisitions for the new alignment would be limited to temporary construction easements for the temporary bridge and roadway. Two private driveways and CR 52/53 would need to be connected to the temporary roadway during construction and reconnected to WV 152 when construction is finished. Based on the initial alignment of the temporary bridge, it appears that this alternative would directly impact three (3) parcels. One of the parcels includes the business garage encroaching on WVDOH right-of-way; the building would need to be razed.

Utility relocations are anticipated. Electric, telephone, television cable, gas lines, and waterlines would be impacted by this alternative. A significant portion of these utilities are within WVDOH right-of-way.

Estimated cost for Alternative No. 1 is as follows:

Bridge (130')	$1,084,100
Roadway	$ 725,700
Temporary Bridge Detour	$ 524,000
E&C (19%)	$ 542,900
Total Construction	$2,876,700
Future Value [5]	$3,211,000
Preliminary Engineering	$ 400,000
Right-of-Way	$ 240,000
Utilities	$ 31,000
Total	$3,882,000

b) Alternative No. 2 (New Bridge Upstream)[6]

While traffic is maintained on the existing bridge, Alternative No. 2 consists of constructing a new bridge approximately 5 to 10 feet (edge to edge) upstream of the existing bridge. The new bridge would be skewed approximately 25 degrees right-forward with respect to the centerline of US 52 and would be

[5] Note: Future value of construction cost using compound interest { FV=PV(1+i)^n} has been calculated from the estimate date of March, 2012 to construction period midpoint of spring 2015, using inflation rate of 4%.

[6] See Appendix A, Figures 6 and 7

horizontally curved. The new structure would consist of a 130-foot single-span bridge. For estimating purposes, it is assumed the bridge would be constructed of a concrete deck and steel girders. Based on the preliminary vertical alignment, the profile of the proposed bridge opening would be larger than the existing bridge opening and the girder bottom elevation would be higher than the existing. Approximately 440 feet of new roadway construction would be necessary on the southern end of the proposed bridge and 430 feet of construction work on the northern end of the proposed bridge. It should be noted that the shoulder on the southeast end of the approach would be reduced 3 feet to avoid impacting CR 52/49. The shoulder would taper out to 6 feet around Station 32+50.

Right-of-way acquisitions for the proposed alignment and temporary construction easements would be needed. It is estimated that eleven (11) parcels would be impacted, including the garage business. The home located northwest of the bridge would also be permanently impacted. Five private driveways and CR 52/53 would need to be reconstructed to intersect the new alignment of WV 52.

Utility relocations are anticipated to be similar to those described in Alternative No. 1. Electric, telephone, television cable, gas lines, and waterlines would be impacted by this alternative.

Estimated cost for Alternative No. 2 is as follows:

Bridge (130')	$1,025,600
Roadway	$1,137,900
E&C (19%)	$ 411,000
Total Construction	$2,574,500
Future Value [5]	$2,874,000
Preliminary Engineering	$ 400,000
Right-of-Way	$ 56,000
Utilities	$ 630,000
Total	$3,960,000

c) Alternative No. 3 (Staged Construction at Existing Location)

Alternative No. 3[7] consists of replacing the bridge at its current location using staged construction. During staged construction one lane would be kept open on the existing or proposed bridge deck for alternating traffic to use.

In the first stage of construction, one girder line and part of the deck of the existing bridge would be removed and a 15-foot 6-inch wide section of the proposed bridge would be constructed east of the existing bridge. This proposed section of the new bridge would have two girders and an approximate clear width of 12 feet 3 inches which would maintain one lane of traffic during the second stage of construction. The approach shoulders for the new bridge would have to be paved to handle traffic. One (1) 14-foot 10-inch lane would be kept open on the existing bridge for maintenance of traffic during construction of the new bridge deck. This new bridge deck would be approximately 2 feet (edge to edge) from the existing bridge deck.

In the second stage of construction, traffic would be diverted onto the portion of the new bridge constructed in stage one, which would function as a one-lane bridge for maintaining traffic. The remaining portion of the existing bridge would then be closed to traffic, removed, and the rest of the new bridge and approaches would be constructed.

The west edge of the new bridge deck would line up with the west edge of the existing bridge deck to prevent taking the garage building. Due to the method of construction, the geometry of the centerline would be improved slightly and the centerline would be shifted over 3 feet from existing centerline. This alignment would remove some of the rock cut wall southeast of the existing bridge, but would not impact CR 52/49 assuming that the new slope would be cut at the same vertical angle as the existing slope. Based on field observations of the rock cut wall, this is a reasonable assumption. The preliminary vertical alignment of the new bridge maintains a profile opening that is larger than the existing bridge. Approximately 375 feet of new roadway construction would be necessary on the southern end of the proposed bridge and 270 feet of construction work on the

[7] See Figures 8 and 9.

northern end of the proposed bridge. As described in Alternative No. 2, the southeastern approach shoulder would only be 3 feet wide.

Based on the method of construction and existing right-of-way, no temporary construction easements or permanent acquisitions would be required.

Utility relocations are anticipated to be minimal because all of the construction is within the existing right-of-way.

Estimated cost for Alternative No. 3 is as follows:

Bridge (130')	$1,210,800
Roadway	$1,195,300
E&C (19%)	$ 457,100
Total Construction	$2,863,200
Future Value [5]	$3,196,000
Preliminary Engineering	$ 400,000
Right-of-Way	$ 10,000
Utilities	$ 10,000
Total	$3,616,000

d) Alternative No. 4 (New Bridge at Existing Location)

Alternative No. 4[8] consists of placing the new bridge at the existing location while using a temporary detour to maintain traffic approximately 5 to 10 feet (edge to edge) downstream of the proposed bridge's location. Like Alternative No. 1, it is anticipated that a 130-foot single-span bridge would be constructed at the existing location and the same assumptions may be made regarding use of Abutment No. 2. All other assumptions and results would be the same as described in Alternative No. 1.

The temporary roadway is estimated to be 575 feet long including the temporary bridge. The temporary bridge and roadway would be one-lane and traffic would alternate use of the bridge via a temporary signal. Since the proposed traffic maintenance would be one-lane, CR 52/53 would need to be maintained as part of the traffic plan. The temporary detour would meet a 25 mph design speed. This would be adequate given the stop conditions created by the one-lane detour. To avoid impacting a house northeast of the temporary bridge, the temporary alignment profile is lower than the other alternatives.

[8] See Appendix A, Figures 10 and 11

Because of this decision, the temporary bridge profile is a few feet lower than the existing bridge profile.

The earthwork required for the temporary roadway would impact CR 52/49. This county route would have to be closed to through traffic during construction or the county route's alignment would need to be shifted east away from the temporary road construction. If the CR 52/49 was closed in this area during construction then access could only be maintained using Echo Thru Truss. This should not be a problem for passenger cars, but the load rating may not be adequate for larger emergency vehicles, such as fire trucks. Due to this condition, it would better serve the public to allow CR 52/49 to remain open and avoid detouring traffic across Echo Thru Truss.

It should also be noted that an alternate solution to shifting CR 52/49 would be to build a new connection with WV 152 in the area of the new bridge. This option is described in Alternative No. 5 and could be adapted to work with this alternative for the final report.

Right-of-way acquisitions for the new alignment would be limited to temporary construction easements for the temporary bridge and roadway. The relocation of CR 52/49 would require permanent right-of-way acquisition. Three private driveways and CR 52/53 would need to be connected to the temporary roadway during construction and reconnected to WV 152 when construction is finished. Based on the initial alignment of the temporary bridge, it appears that this alternative would directly impact three (3) parcels.

Utility relocations are anticipated. Electric, telephone, television cable, gas lines, and waterlines appear to be impacted by this alternative. A significant portion of these utilities are within WVDOH right-of-way. No survey information was available to determine the severity of utility impacts on CR 52/49. Based on field observations, a utility pole and gas line would be impacted.

Estimated cost for Alternative No. 4 is as follows:

Bridge (130')	$1,069,500
Roadway	$1,044,900
Temporary Bridge Detour	$ 648,300
E&C (19%)	$ 648,000
Total Construction	$3,410,700
Future Value [5]	$3,807,000
Preliminary Engineering	$ 400,000
Right-of-Way	$ 45,000
Utilities	$ 39,000
Total	$4,291,000

e) Alternative No. 5 (New Bridge Downstream)

While traffic is maintained on the existing bridge, Alternative No. 5[9] consists of constructing a new bridge approximately 5 to 10 feet (edge to edge) downstream of the existing bridge. The new bridge would be skewed approximately 30 degrees right-forward with respect to the centerline of US 52, but would not need to be curved. The roadway could meet a 40 mph design speed and maintain a tangent section on which the bridge would be located. The new structure would consist of a 130-foot single-span bridge. For estimating purposes, the bridge was assumed to be constructed of a concrete deck and steel girders. Based on the preliminary vertical alignment, the profile opening would be larger than the existing bridge and the girder bottom elevation would be higher than the existing bridge elevation. Approximately 425 feet of new roadway construction would be necessary on the southern end of the proposed bridge and 400 feet of construction work on the northern end of the proposed bridge.

The earthwork required for the new roadway would impact CR 52/49. As described in Alternative No. 4 this county route would have to be altered to maintain traffic in the area or closed to through traffic during construction.

[9] See Appendix A, Figures 12 and 13

Unlike the temporary detour in Alternative No. 4 that shifted CR 52/49; it is recommended in this alternative that a new intersection for CR 52/49 and WV 152 be created. As shown in the above aerial picture, the existing intersection of CR 52/49 and WV 152, approximately 1,100 feet south of this site, is severely skewed. It would be possible to construct a new connector road to intersect WV 152 with CR 52/49 near the new bridge and create a better intersection. This would require approximately 400 feet of CR 52/49 to be relocated. There may be a short time period where traffic would be forced to detour across Echo Thru Truss during construction of this new intersection.

It should also be noted that an alternate solution to a new intersection for CR 52/49 would be to shift CR 52/49 in the area of the new bridge. This option is described in Alternative No. 4 and could be adapted to work with this alternative for the final report.

Compared to Alternative No. 4, right-of-way requirements would be a little more involved. Right-of-way acquisitions for the new alignment and temporary construction easements would directly impact six (6) parcels. The home located northeast of the bridge would be permanently impacted. Two private driveways and CR 52/53 would need to be reconstructed to intersect the new alignment of WV 152.

Utility relocations are anticipated. A significant portion of these utilities are within WVDOH right-of-way. No survey information was available to determine the severity of utility impacts on CR 52/49. Based on field observations, a utility pole and gas line would be impacted.

Estimated cost for Alternative No. 5 is as follows:

Bridge (130')	$1,095,300
Roadway	$1,411,400
E&C (19%)	$ 476,300
Total Construction	$2,983,000
Future Value [5]	$3,330,000
Preliminary Engineering	$ 400,000
Right-of-Way	$ 48,000
Utilities	$ 270,000
Total	$4,048,000

f) Alternative No. 6 (Renovation of Existing Bridge)

A renovation assessment has been completed by the WVDOH's In-House Design Section of the Engineering Division. The full assessment is shown in Appendix D.

Alternative No. 6 consists of rehabilitation of the bridge at its existing location while using a temporary bridge to detour traffic. The rehabilitation estimate includes beam repair/replacement, clean and paint, construction of a new deck, and repair of the abutments and piers. With due consideration given to the rehabilitation cost and the structure still remaining functionally obsolete, the rehabilitation of this structure is not recommended.

Estimated cost for Alternative No. 6 is as follows:

Bridge (152')	$1,623,600
Roadway	$ 741,800
Temporary Bridge Detour	$ 524,000
E&C (19%)	$ 648,500
Total Construction	$3,537,900
Future Value [5]	$3,949,000
Preliminary Engineering	$ 400,000
Right-of-Way	$ 240,000
Utilities	$ 31,000
Total	$4,620,000

g) No-Build Alternative

Due to the deteriorating condition of the existing structure, the No-Build Alternative would eventually result in the permanent closure of the bridge to traffic. The amount of traffic would require an adequate detour with at least two (2) 11-foot lanes. The most adequate detour is about 25 miles long and would require traffic to travel WV 152 into Genoa and follow CR 52/17 and CR 30 to East Lynn and return to WV 152 on WV 37. Due to these conditions, permanent closure of the existing bridge is not a desirable alternative.

ALTERNATIVES SUMMARY

			Alternatives			
	1	**2**	**3**	**4**	**5**	**6**
Item	Existing location	Upstream location	Existing location (Staged)	Existing location	Downstream Location	Rehabilitation
Roadway Length (ft)	100	870	645	100	825	100
Bridge Length (ft)	130	130	130	130	130	152
Total Length (ft)	230	1,000	775	230	955	252
Maintenance of Traffic	Temporary Bridge	Existing Bridge	Staged Bridge (One-lane)	Temporary Bridge	Existing Bridge	Temporary Bridge
Temporary Detour Length (ft)	630	N/A	N/A	575	N/A	630
Design Speed (mph) -New Road -(Temporary Road)	40 (25)	40 N/A	40 N/A	40 (25)	40 N/A	40 (25)
Estimated No. of Parcels Impacted	3	11	0	3	7	3
No. of Buildings Impacted	1	2	0	0	1	1
Hydraulic clearance => existing	Yes	Yes	Yes	No (Temporary Bridge)	Yes	Yes
2012 Construction Cost	$ 2,876,700	$ 2,574,500	$ 2,863,200	$ 3,410,700	$ 2,983,000	$ 3,537,900
(Construction Year)	(2015)	(2015)	(2015)	(2015)	(2015)	(2015)
Future Value ****	$ 3,211,000	$ 2,874,000	$ 3,196,000	$ 3,807,000	$ 3,330,000	$ 3,949,000
Engineering Cost	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 400,000	$ 400,000
Right-of-Way Cost	$ 240,000	$ 630,000	$ 10,000	$ 45,000	$ 270,000	$ 240,000
Utility Cost	$ 31,000	$ 56,000	$ 10,000	$ 39,000	$ 48,000	$ 31,000
Total	**$ 3,882,000**	**$ 3,960,000**	**$ 3,616,000**	**$ 4,291,000**	**$ 4,048,000**	**$ 4,620,000**
Design Concerns	-Construction limits very close to taking 2 story brick house. -Additional cost for temporary detour. -M.O.T. at intersection of CR 52/53 with one-lane traffic.	-Significant right of way impacts.	-Staged construction of long, curved single span. -Existing Deck Condition.	-Additional cost for temporary detour. -Hydraulic Opening of temporary bridge. -Earthwork and maintaining access for properties on CR 52/49. M.O.T. on CR 52/53	-Significant right of way impacts. -Earthwork and maintaining access for properties on CR 52/49.	-Bridge will still be functionally obsolete. -Additional cost for temporary detour.

CONCLUSION / RECOMMENDATION

Based on information available at the time of this report, any of these alternatives are feasible and would serve to replace the existing bridge. Alternative No. 3, staged construction of the new bridge, would be the most desirable alternative in terms of cost and impacts to the surrounding properties. However, District Two has shown concern on the condition of the existing bridge deck and its ability to maintain traffic during staged

construction. Additional work may need to be performed on the bridge to reinforce the deck during staged construction and that is not accounted for in this preliminary estimate.

Alternative No. 1 has the next lowest estimated capital cost. It would impact part of a business and due to the temporary bridges proximity to a two-story home, has the potential to be more costly if this home needs to be acquired for final design.

Alternative No. 2 and No. 5 are the next most feasible in terms of estimated cost. Even though Alternative No. 2 does not have the additional cost of a temporary detour, it would definitely impact the business and home mentioned in Alternative No. 1. Alternative No. 5 impacts a home on the east side of WV 152 and has additional costs related to earthwork and maintaining access to CR 52/49. The practicality of these alternatives may change when more accurate right-of-way costs are received for the final report.

Alternative No. 4 has the same additional costs related to earthwork and CR 52/49 as found in Alternative No. 5, plus the additional cost of a temporary bridge. The benefit of this alternative is that no buildings would need to be acquired.

Alternative No. 6, rehabilitation of the existing bridge, is the most costly with the least amount of benefit.

Based on the information available, it is recommended that Alternative No. 3 be pursued as the preferred alternative. This alternative proposes construction of a new bridge at the existing location under staged construction. Alternative No. 3 has an estimated future capital cost of $3,616,000.00.

APPENDIX “A”

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
WV	02	S250-152-23.71			WAYNE		

NOTE:

PROPERTY LINES ARE BASED ON WAYNE COUNTY TAX MAPS AND AVAILABLE DEED INFORMATION

WV 152 HAS 115 OF R/W IN THE AREA OF THE BRIDGE. THIS IS BASED ON ROADWAY AND BRIDGE CONSTRUCTION PLANS.

CR 52/53 AND CR 52/49 ARE ASSUMED TO HAVE 30 FEET OF R/W

FIGURE 1

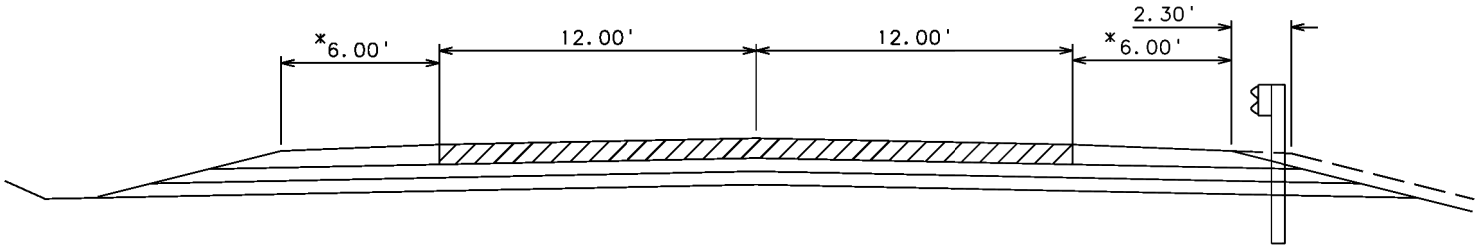
REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

EXISTING PLAN SHEET

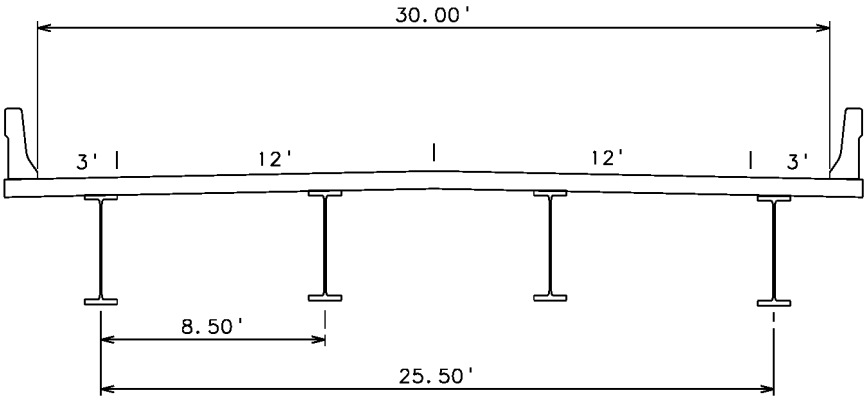
J04C23C03-PLAN e

C:\DESIGN STUDY PROJECTS\Sidney Beam Span\Roadway\rdy_plt, Exist_sidney.dwg, 8.5x11 23-SEP-2013 13:31



PROPOSED BRIDGE APPROACHES

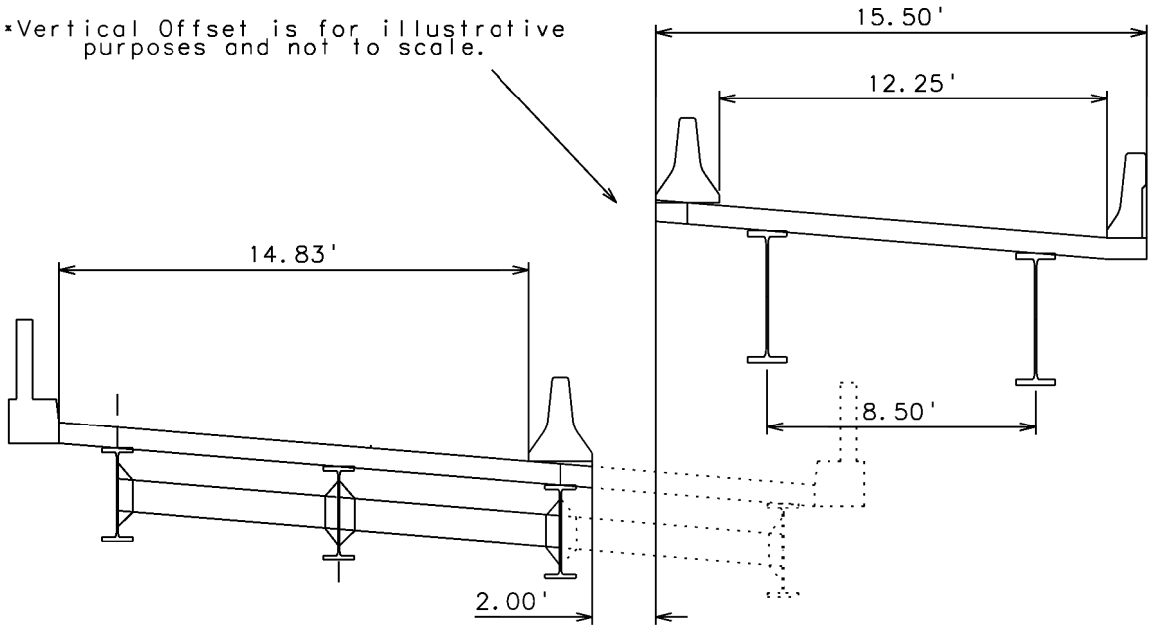
* PROPOSED SOUTHEAST SHOULDER IS REDUCED TO 3 FEET IN ALT. NO. 2 AND 3 TO AVOID IMPACTING CR 52/49.



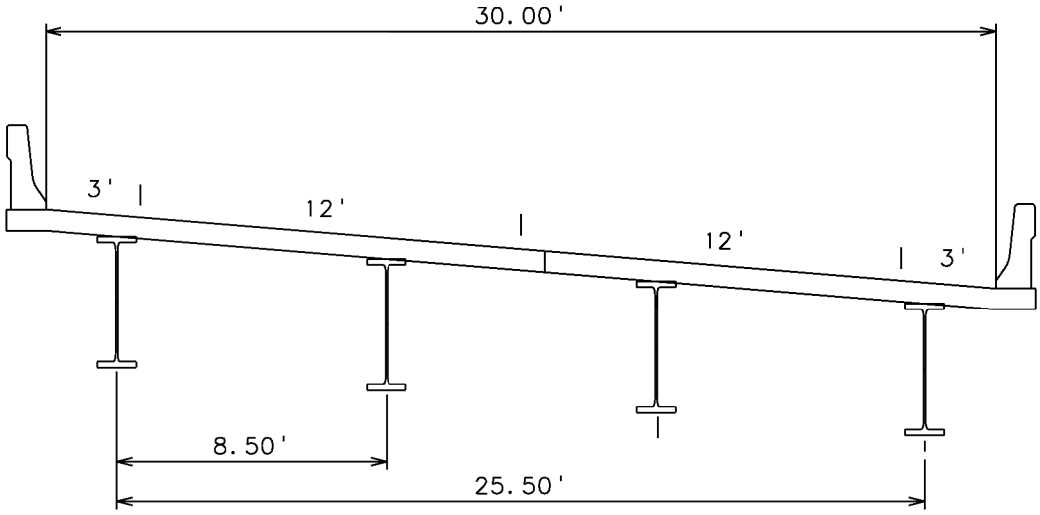
PROPOSED BRIDGE TYPICAL

FIGURE 2

ROADWAY FUNCTION CLASSIFICATION RURAL MAJOR COLLECTOR DESIGN EXCEPTION NEEDED NO	A.D.T. (2012) 1400	BRIDGE REPLACEMENT STUDY SIDNEY BEAM SPAN STATE PROJECT NO. S250-152-23.71 WAYNE COUNTY
SUFFICIENCY RATE. 2.0 INVENTORY NO. 50A110	(2032) 2000	THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS ENGINEERING DIVISION



ALTERNATIVE NO. 3
STAGE 1 CONSTRUCTION

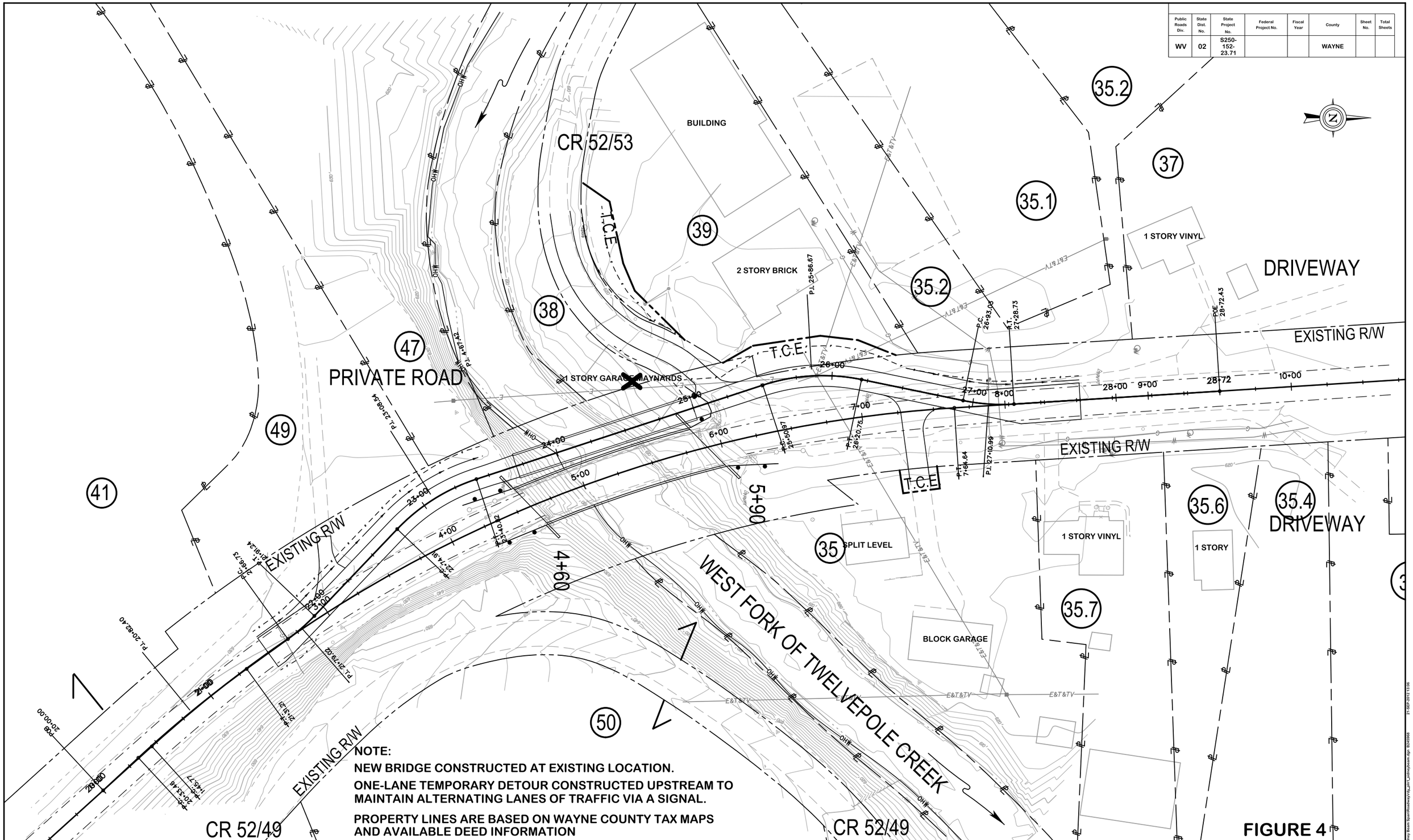


ALTERNATIVE NO. 3
STAGE 2 FINAL CONSTRUCTION

FIGURE 3

ROADWAY FUNCTION CLASSIFICATION RURAL MAJOR COLLECTOR DESIGN EXCEPTION NEEDED NO	A.D.T. (2012) 1400	BRIDGE REPLACEMENT STUDY SIDNEY BEAM SPAN STATE PROJECT NO. S250-152-23.71 WAYNE COUNTY
SUFFICIENCY RATE. 2.0 INVENTORY NO. 50A110	(2032) 2000	THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION DIVISION OF HIGHWAYS ENGINEERING DIVISION

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
WV	02	S250-152-23.71			WAYNE		



REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

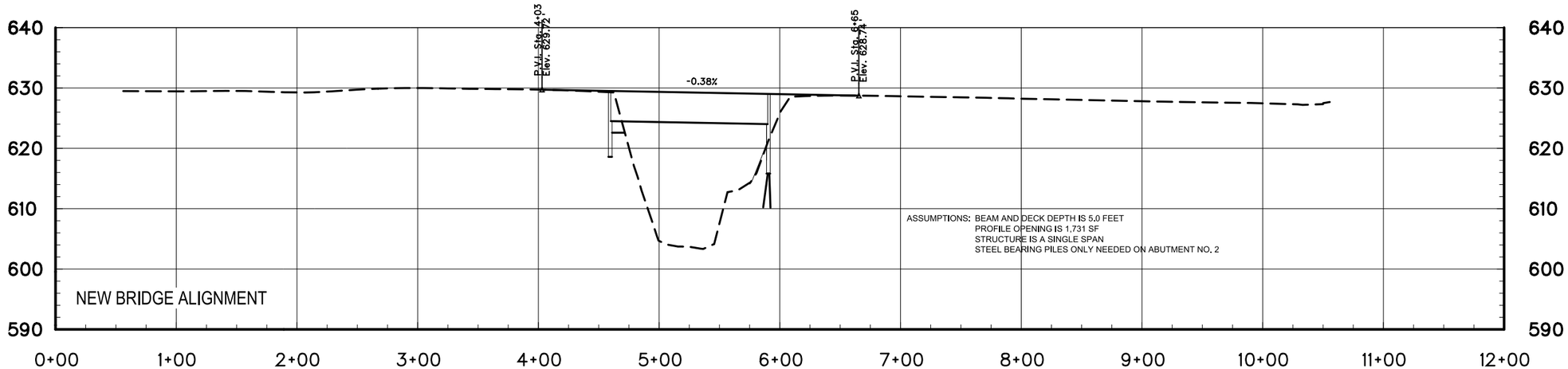
THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ALT NO. 1 PLAN SHEET

FIGURE 4

J04C23C03-PLAN e

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W.V.	02	S250-152-23.71			WAYNE	---	---



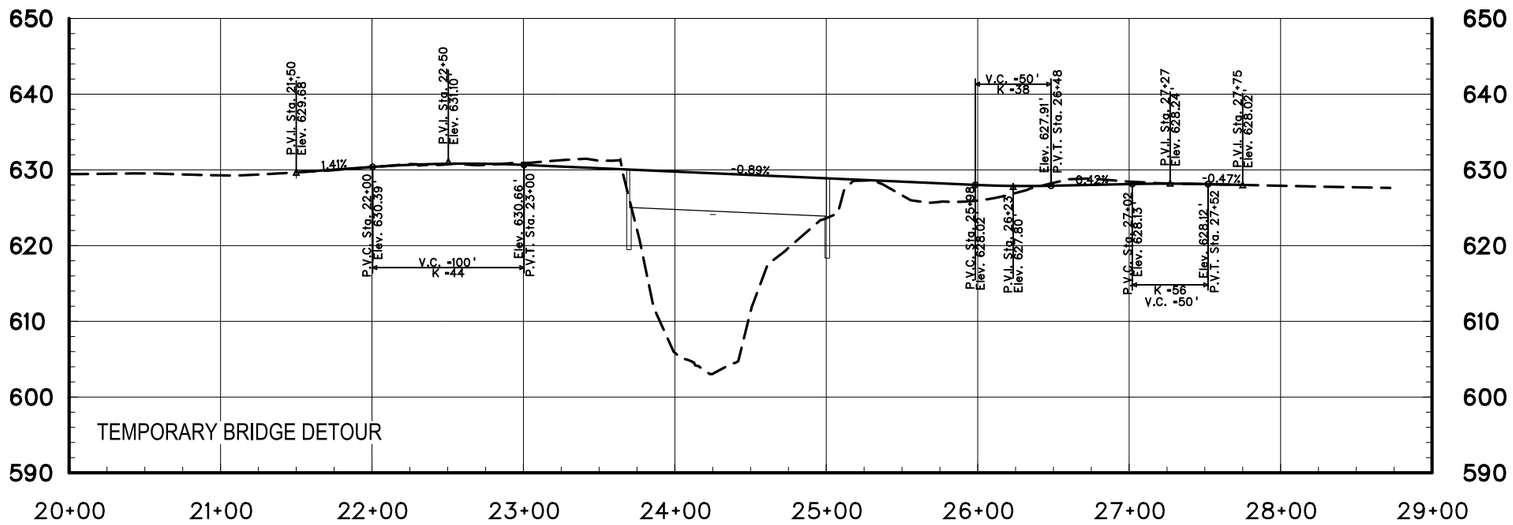


FIGURE 5
NEW BRIDGE AND DETOUR ALIGNMENT

NOTE: SCALE IS 10 FEET VERTICAL TO 50 FEET HORIZONTAL.

SCALE : 0 50 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

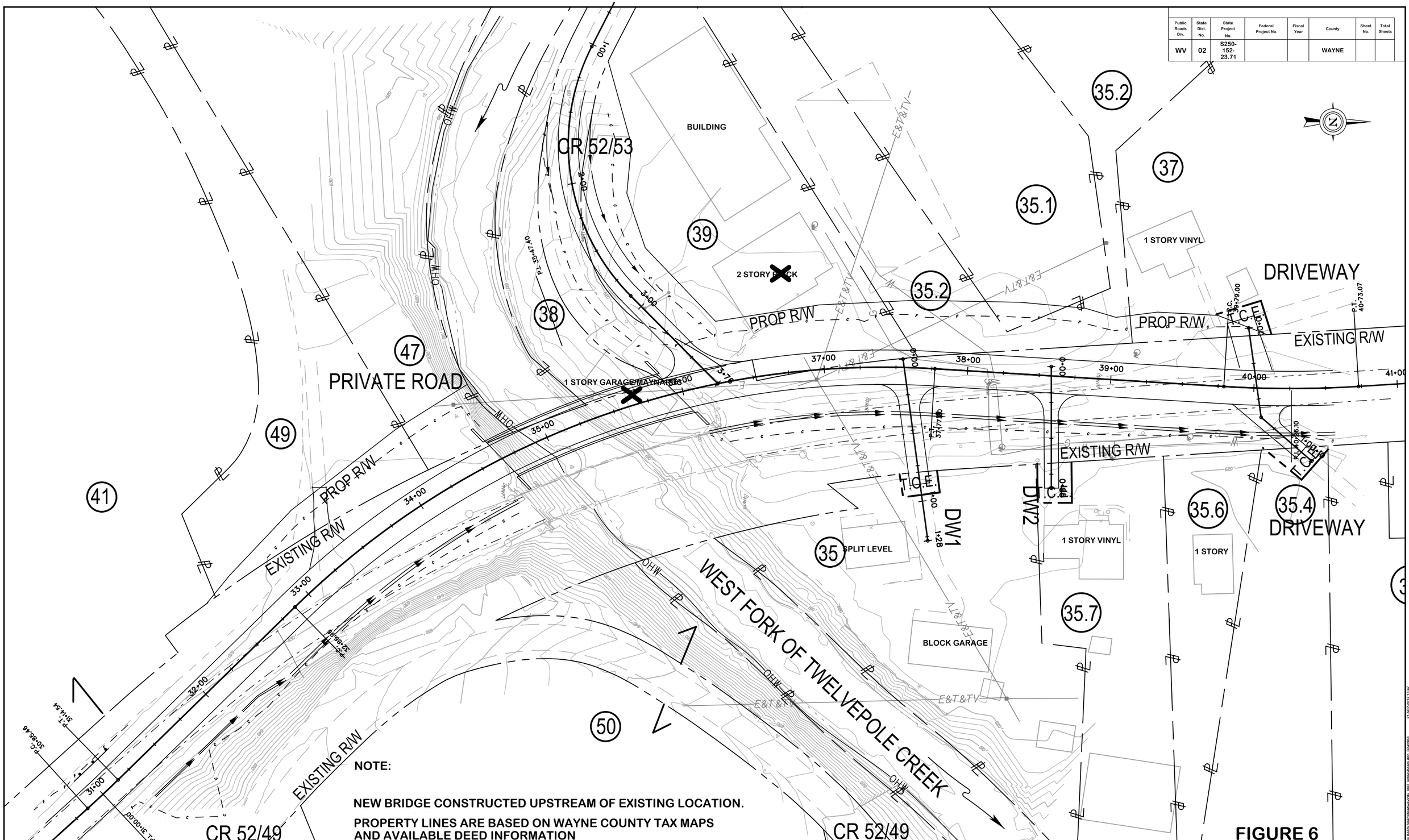
THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ALT NO. 1 PROFILE SHEET

J04C23C03-PLAN e

CROSSDA STUDY PROJECTS\Stoney Beam Spur\Rehabilitation\Alt_Alt1_alternatives.dgn 8/24/2018 21-SEP-2018 13:10:07

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
WV	02	S250-152-23.71			WAYNE		



NOTE:

NEW BRIDGE CONSTRUCTED UPSTREAM OF EXISTING LOCATION.

PROPERTY LINES ARE BASED ON WAYNE COUNTY TAX MAPS AND AVAILABLE DEED INFORMATION

WV 152 HAS 115 OF R/W IN THE AREA OF THE BRIDGE. THIS IS BASED ON ROADWAY AND BRIDGE CONSTRUCTION PLANS.

CR 52/53 AND CR 52/49 ARE ASSUMED TO HAVE 30 FEET OF R/W

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

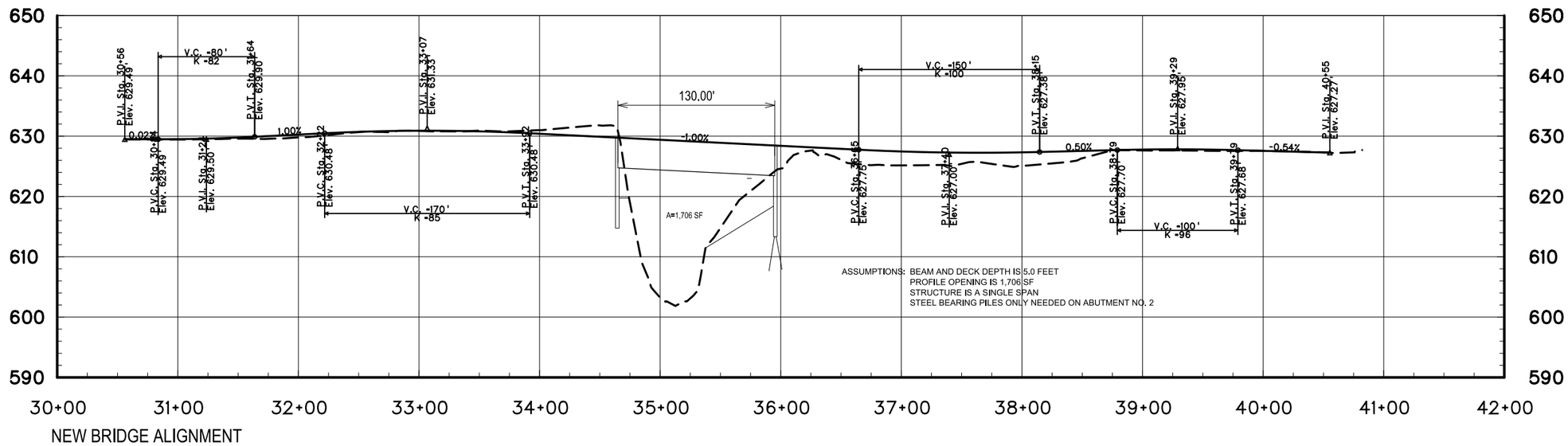
ALT NO. 2 PLAN SHEET

FIGURE 6

J04C23C03-PLAN e

DGN: S:\Projects\S250152T0023\Alt01\Plan\J04C23C03-PLAN.dgn

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W.V.	02	S250-152-23.71			WAYNE	---	---



ASSUMPTIONS: BEAM AND DECK DEPTH IS 5.0 FEET
PROFILE OPENING IS 1,706 SF
STRUCTURE IS A SINGLE SPAN
STEEL BEARING PILES ONLY NEEDED ON ABUTMENT NO. 2

FIGURE 7
NEW BRIDGE AND DETOUR ALIGNMENT

NOTE: SCALE IS 10 FEET VERTICAL TO 50 FEET HORIZONTAL.

SCALE : 0 50 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ALT NO. 2 PROFILE SHEET

J04C23C03-PLAN e

C:\BSDWA STUDY PROJECTS\Stoney Branch\Stoney_Branch_Alternatives.dgn 6/24/2008 21-SEP-2012 13:31

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
WV	02	S250-152-23.71			WAYNE		

NOTE:

PROPERTY LINES ARE BASED ON WAYNE COUNTY TAX MAPS AND AVAILABLE DEED INFORMATION

WV 152 HAS 115 OF R/W IN THE AREA OF THE BRIDGE.
THIS IS BASED ON ROADWAY AND BRIDGE CONSTRUCTION PLANS.

CR 52/53 AND CR 52/49 ARE ASSUMED TO HAVE 30 FEET OF R/W

CR 52/49 HAS R/W INCLUDING TRAVELED WAY, SHOULDERS, DITCHES AND ANY ADDITIONAL WIDTH REQUIRED FOR MAINTENANCE.

DURING STAGE 1 OF CONSTRUCTION, ONE LANE TRAFFIC IS MAINTAINED ON SECTION OF EXISTING BRIDGE WHILE A SECTION OF NEW BRIDGE IS CONSTRUCTED.

DURING STAGE 2 OF CONSTRUCTION, ONE LANE TRAFFIC IS MAINTAINED ON SECTION OF NEW BRIDGE WHILE THE REST OF EXISTING BRIDGE IS REMOVED AND NEW BRIDGE IS COMPLETED UNDER TRAFFIC.

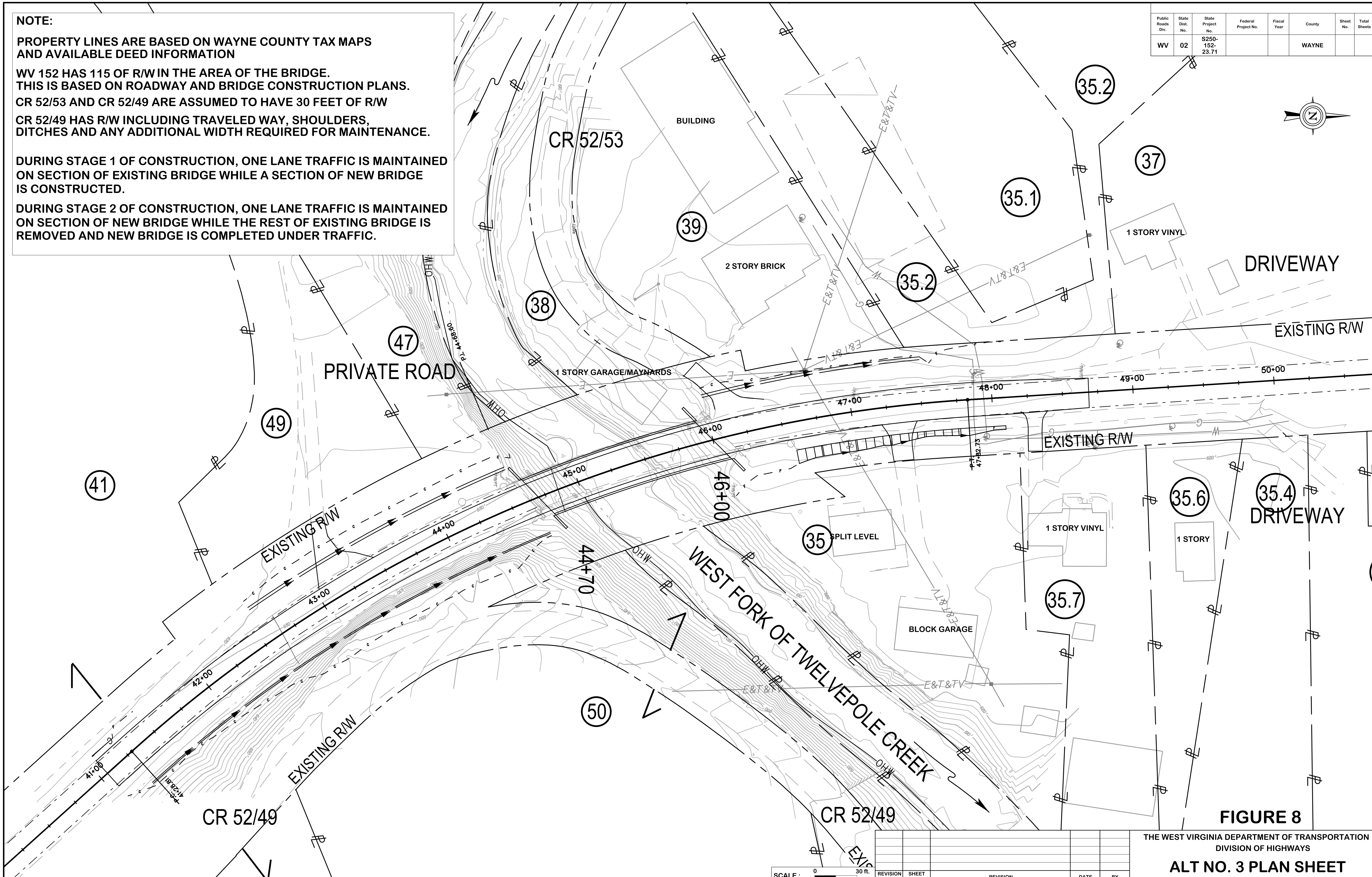


FIGURE 8

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

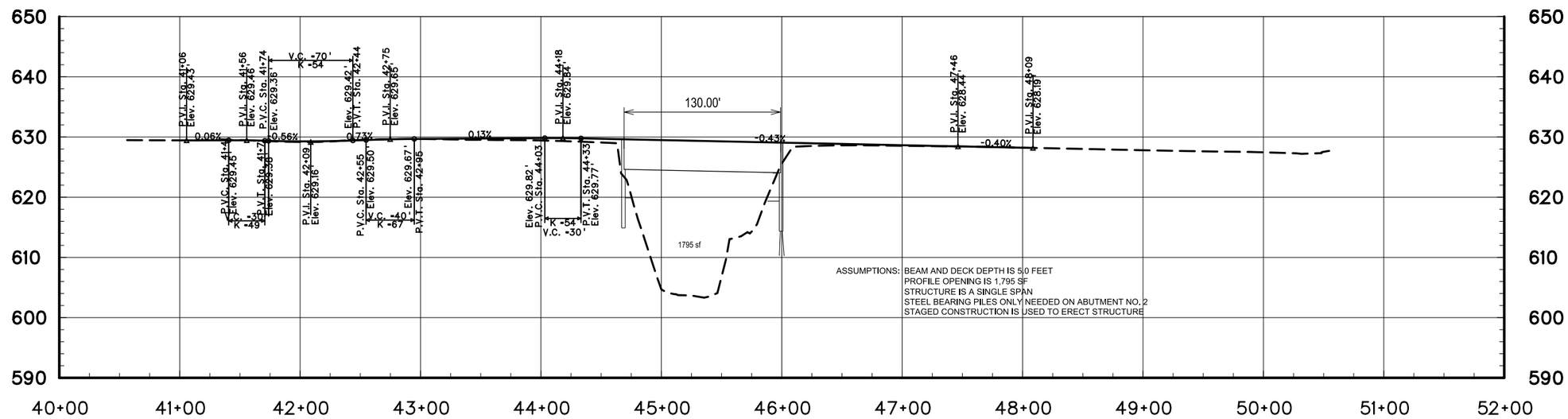
THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ALT NO. 3 PLAN SHEET

J04C23C03-PLAN e

C:\DESIGN STUDY PROJECTS\Sidney Beam Span\Roadway\rdy_pln3_sidneybeam.dgn B245968 21-SEP-2012 14:20

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W.V.	02	S250-152-23.71			WAYNE	---	---



ASSUMPTIONS: BEAM AND DECK DEPTH IS 5.0 FEET
PROFILE OPENING IS 1,795 SF
STRUCTURE IS A SINGLE SPAN
STEEL BEARING PILES ONLY NEEDED ON ABUTMENT NO. 2
STAGED CONSTRUCTION IS USED TO ERECT STRUCTURE

NEW BRIDGE ALIGNMENT

FIGURE 9
NEW BRIDGE AND DETOUR ALIGNMENT

NOTE: SCALE IS 10 FEET VERTICAL TO 50 FEET HORIZONTAL.

SCALE : 0 50 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ALT NO. 3 PROFILE SHEET

J04C23C03-PLAN e

CADD/GIS/STUDY PROJECTS/Stoney Run Sportsmans/alt3/alt3 profile.dgn 12/13/2013 12:21:12 PM

NOTE:

PROPERTY LINES ARE BASED ON WAYNE COUNTY TAX MAPS AND AVAILABLE DEED INFORMATION

WV 152 HAS 115 OF R/W IN THE AREA OF THE BRIDGE. THIS IS BASED ON ROADWAY AND BRIDGE CONSTRUCTION PLANS.

CR 52/53 AND CR 52/49 ARE ASSUMED TO HAVE 30 FEET OF R/W

ONE-LANE TEMPORARY DETOUR CONSTRUCTED DOWNSTREAM TO MAINTAIN ALTERNATING LANES OF TRAFFIC VIA A SIGNAL.

NEW BRIDGE WILL BE CONSTRUCTED IN EXISTING LOCATION.

CR 52/49 WILL PARTIALLY RECONSTRUCTED EAST AND REMAIN OPEN DURING CONSTRUCTION.

SEE ALTERNATIVE NO. 5 FOR ALTERNATE SOLUTION FOR CR 52/49.

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
WV	02	S250-152-23.71			WAYNE		

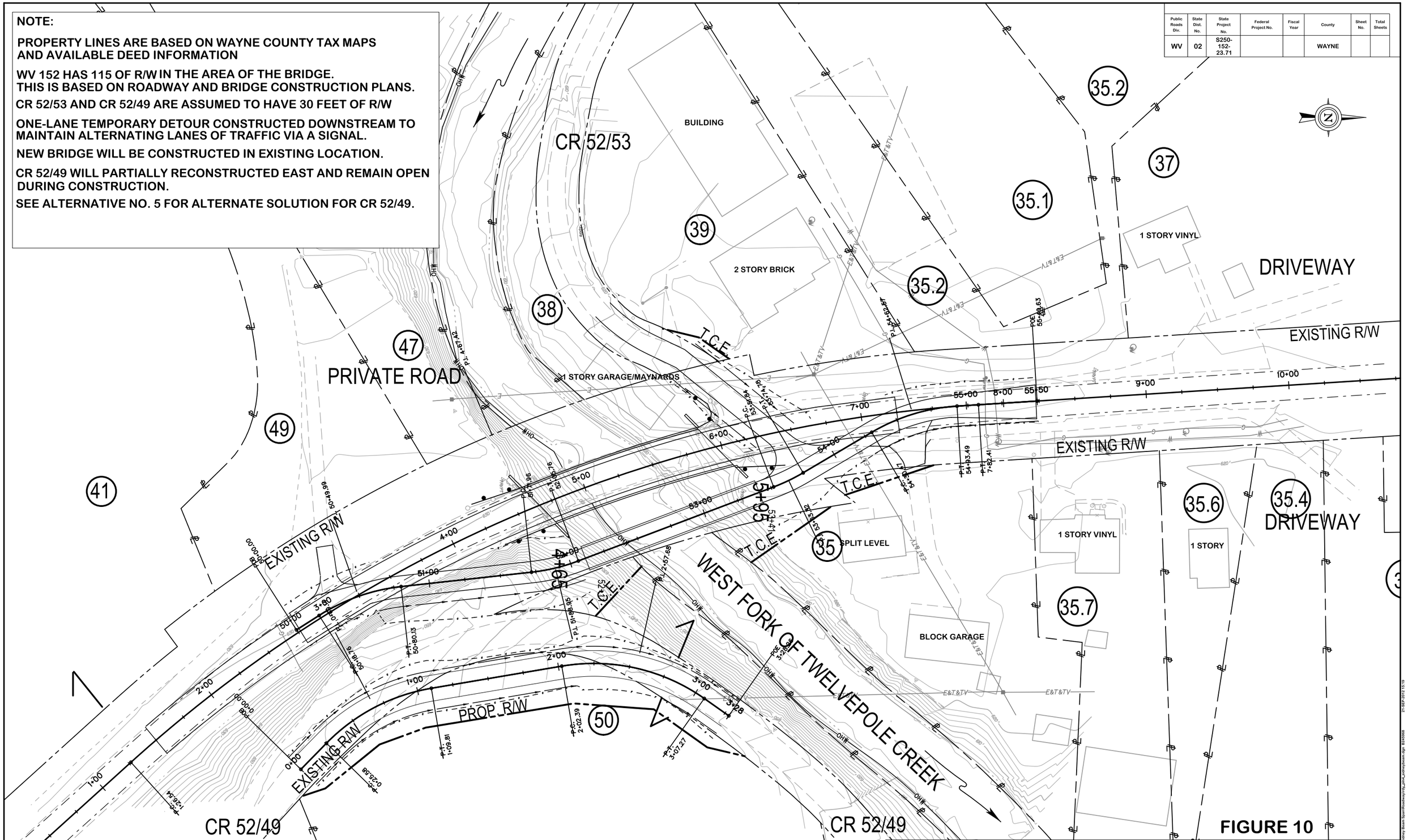


FIGURE 10

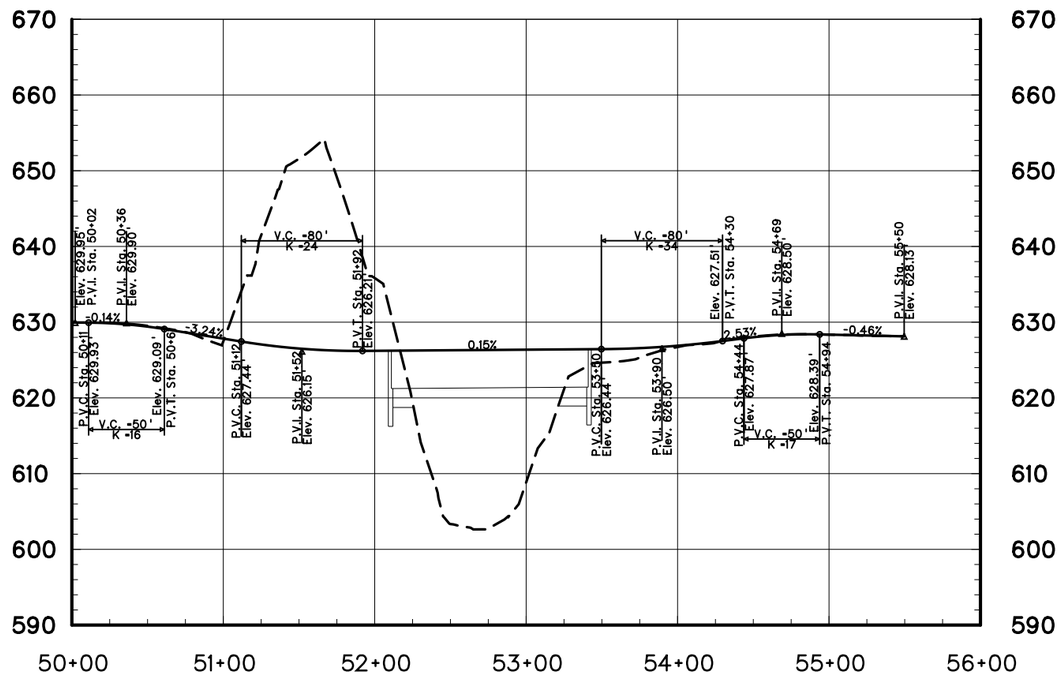
THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ALT NO. 4 PLAN SHEET

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

J04C23C03-PLAN e

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W.V.	02	S250-152-23.71			WAYNE	---	---



TEMPORARY BRIDGE DETOUR
(FOR NEW BRIDGE PROFILE SEE FIGURE 5)

FIGURE 11
DETOUR BRIDGE ALIGNMENT

NOTE: SCALE IS 10 FEET VERTICAL FOR 50 FEET HORIZONTAL.

SCALE : 0 50 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ALT NO. 4 PROFILE SHEET

J04C23C03-PLAN e

C:\DESIGN STUDY PROJECTS\Sheep Run\Roadway\rp_prof_alternatives.dgn 8/24/2006 2:14:37 10:30

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
WV	02	S250-152-23.71			WAYNE		

NOTE:

PROPERTY LINES ARE BASED ON WAYNE COUNTY TAX MAPS AND AVAILABLE DEED INFORMATION

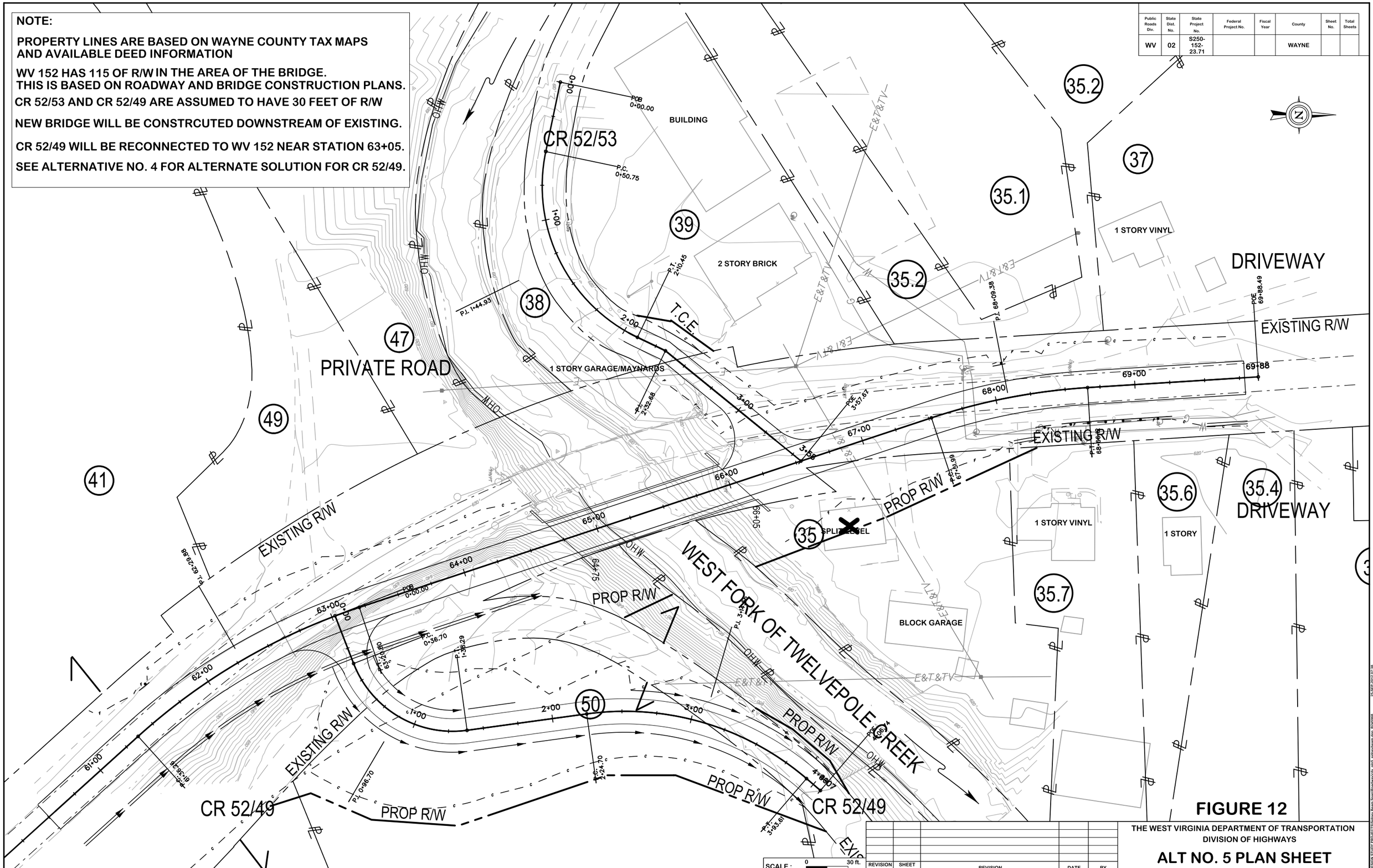
WV 152 HAS 115 OF R/W IN THE AREA OF THE BRIDGE. THIS IS BASED ON ROADWAY AND BRIDGE CONSTRUCTION PLANS.

CR 52/53 AND CR 52/49 ARE ASSUMED TO HAVE 30 FEET OF R/W

NEW BRIDGE WILL BE CONSTRCUTED DOWNSTREAM OF EXISTING.

CR 52/49 WILL BE RECONNECTED TO WV 152 NEAR STATION 63+05.

SEE ALTERNATIVE NO. 4 FOR ALTERNATE SOLUTION FOR CR 52/49.



REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ALT NO. 5 PLAN SHEET

FIGURE 12

J04C23C03-PLAN e

C:\DESIGN STUDY PROJECTS\Stillwater Bypass\Alternatives\Alt_Alternatives.dgn 8/24/2009 25-SEP-2012 07:18

Public Roads Div.	State Dist. No.	State Project No.	Federal Project No.	Fiscal Year	County	Sheet No.	Total Sheets
W.V.	02	S250-152-23.71			WAYNE	---	---

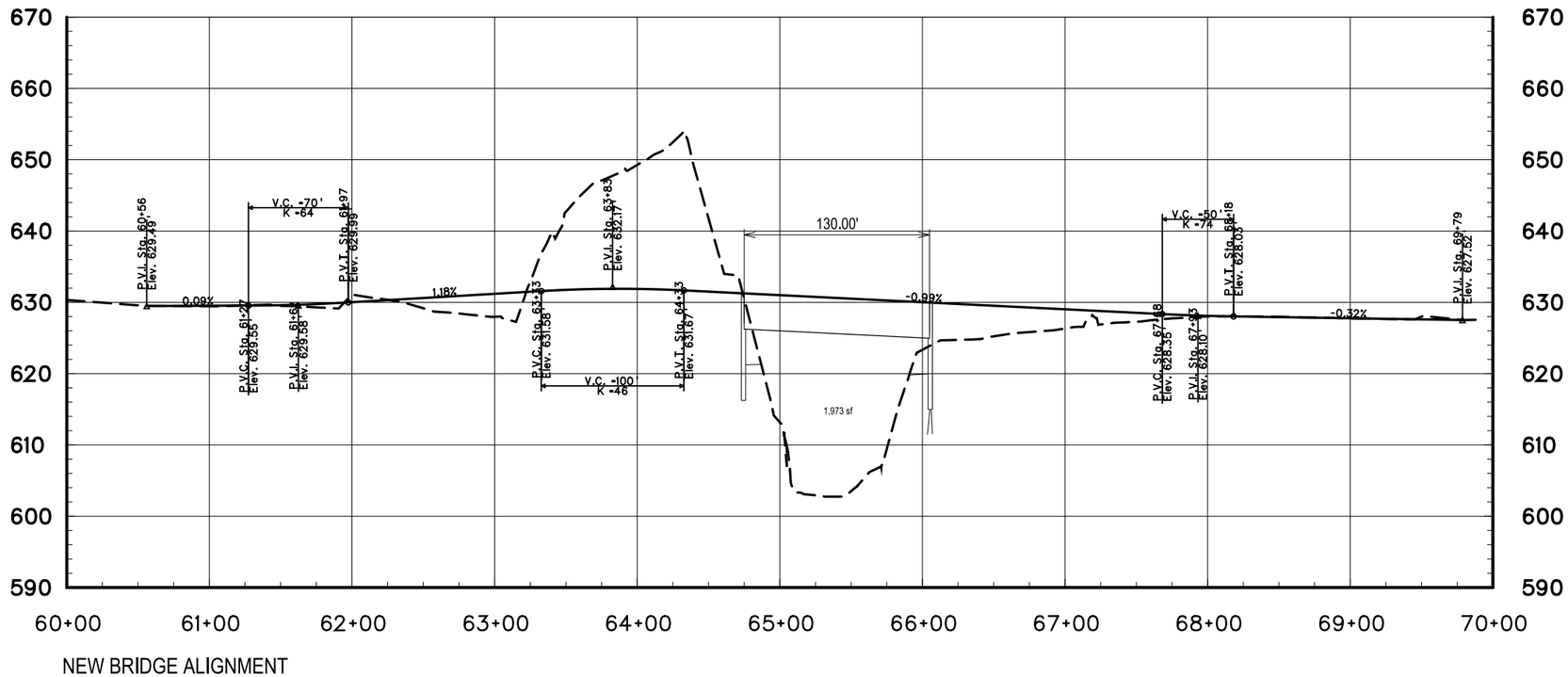


FIGURE 13

SCALE : 0 50 ft.

REVISION NUMBER	SHEET NUMBER	REVISION	DATE	BY

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

ALT NO. 5 PROFILE SHEET

J04C23C03-PLAN e

C:\DESIGN STUDY PROJECT\Stationing Sheets Spurlock\spurlock_Curve5_sameplanen.dgn 8/24/2006

25-SEP-2012 07:30

APPENDIX “B”

Bridge Cost Estimate
Sidney Beam Span
Alternative # 1-New Bridge at E

	Estimated Cost	
ROADWAY	Actual	Rounded
Clearing and Grubbing	$ 10,000.00	$ 10,000.00
Earthwork	$ 4,607.00	$ 4,600.00
HMA Wearing & Base	$ 70,327.10	$ 70,300.00
Aggregate (Base & Sh)	$ 6,592.59	$ 6,600.00
Subgrade	$ 3,328.63	$ 3,300.00
Drainage	$ 5,250.00	$ 5,300.00
M.O.T.	$ 216,300.00	$ 216,300.00
Erosion Control	$ 25,000.00	$ 25,000.00
Approach Slab	$ 29,072.47	$ 29,100.00
All Other Items	$ 271,901.95	$ 271,900.00
Mobilization	$ 83,231.62	$ 83,200.00
Total Roadway Construction	$ 725,611.37	$ 725,600.00

BRIDGE	Actual	Rounded
DISMANTLING STRUCTURE	$ 75,000.00	$ 75,000.00
STR. EX	$ 22,678.00	$ 22,700.00
SEL. MAT'L BACKFILL	$ 8,599.30	$ 8,600.00
SLOPE PROTECTION	$ 13,625.00	$ 13,600.00
CL B CONCRETE	$ 103,180.55	$ 103,200.00
CL K CONCRETE	$ 20,940.60	$ 20,900.00
CL H CONCRETE	$ 140,827.92	$ 140,800.00
REINF STL BAR	$ 25,174.48	$ 25,200.00
EP REINF STL BAR	$ 38,266.20	$ 38,300.00
STL SUPER	$ 370,472.96	$ 370,500.00
STL BEARING PILES	$ 48,504.30	$ 48,500.00
MISC ITEMS	$ 216,817.33	$ 216,800.00
Total Bridge Construction	$ 1,084,086.64	$ 1,084,100.00

	Estimated Cost	
	Actual	Rounded
Bridge	$ 1,084,100.00	$ 1,084,100.00
Roadway	$ 725,611.37	$ 725,700.00
Detour	$ 523,953.81	$ 524,000.00
E&C (19%)	$ 542,947.61	$ 542,900.00
	$ 2,876,612.79	$ 2,876,700.00
Future V alue	$3,210,512.43	$3,211,000.00
Pre Engineering	$ 400,000.00	$400,000.00
Utilities	$ 30,600.00	$31,000.00
R/W	$ 240,000.00	$ 240,000.00
Total	$3,881,112.43	$3,882,000.00

Bridge Cost Estimate
Sidney Beam Span
Alternative # 2-New Bridge Ups

	Estimated Cost	
ROADWAY	Actual	Rounded
Clearing and Grubbing	$ 50,000.00	$ 50,000.00
Earthwork	$ 332,860.00	$ 332,900.00
HMA Wearing & Base	$ 119,411.88	$ 119,400.00
Aggregate (Base & Sh)	$ 78,003.56	$ 78,000.00
Subgrade	$ 33,655.14	$ 33,700.00
Drainage	$ 9,000.00	$ 9,000.00
M.O.T.	$ 66,300.00	$ 66,300.00
Erosion Control	$ 25,000.00	$ 25,000.00
Approach Slab	$ 29,072.47	$ 29,100.00
All Other Items	$ 331,499.89	$ 331,500.00
Mobilization	$ 63,012.09	$ 63,000.00
Total Roadway Construction	$ 1,137,815.03	$ 1,137,900.00

BRIDGE	Actual	Rounded
DISMANTLING STRUCTURE	$ 75,000.00	$ 75,000.00
STR. EX	$ 18,009.00	$ 18,000.00
SEL. MAT'L BACKFILL	$ 6,544.60	$ 6,500.00
SLOPE PROTECTION	$ 13,625.00	$ 13,600.00
CL B CONCRETE	$ 74,005.36	$ 74,000.00
CL K CONCRETE	$ 20,940.60	$ 20,900.00
CL H CONCRETE	$ 140,827.92	$ 140,800.00
REINF STL BAR	$ 18,211.88	$ 18,200.00
EP REINF STL BAR	$ 38,166.80	$ 38,200.00
STL SUPER	$ 370,472.96	$ 370,500.00
STL BEARING PILES	$ 44,773.20	$ 44,800.00
MISC ITEMS	$ 205,144.33	$ 205,100.00
Total Bridge Construction	$ 1,025,721.65	$ 1,025,600.00

	Estimated Cost	
	Actual	Rounded
Bridge	$ 1,025,600.00	$ 1,025,600.00
Roadway	$ 1,137,815.03	$ 1,137,900.00
E&C (19%)	$ 411,048.86	$ 411,000.00
	$ 2,574,463.89	$ 2,574,500.00
Future V alue	$2,873,291.93	$2,874,000.00
Pre Engineering	$ 400,000.00	$400,000.00
Utilities	$ 55,650.00	$56,000.00
R/W	$ 630,000.00	$ 630,000.00
Total	$3,958,941.93	$3,960,000.00

Bridge Cost Estimate
Sidney Beam Span
Alternative # 3-Stage Construc

	Estimated Cost	
ROADWAY	Actual	Rounded
Clearing and Grubbing	$ 25,000.00	$ 25,000.00
Earthwork	$ 187,323.00	$ 187,300.00
HMA Wearing & Base	$ 132,794.25	$ 132,800.00
Aggregate (Base & Sh)	$ 42,522.22	$ 42,500.00
Subgrade	$ 26,111.75	$ 26,100.00
Drainage	$ 5,250.00	$ 5,300.00
M.O.T.	$ 230,300.00	$ 230,300.00
Erosion Control	$ 25,000.00	$ 25,000.00
Approach Slab	$ 29,072.47	$ 29,100.00
All Other Items	$ 421,770.56	$ 421,800.00
Mobilization	$ 70,078.33	$ 70,100.00
Total Roadway Construction	$ 1,195,222.58	$ 1,195,300.00

BRIDGE	Actual	Rounded
DISMANTLING STRUCTURE	$ 150,000.00	$ 150,000.00
STR. EX	$ 18,275.80	$ 18,300.00
SEL. MAT'L BACKFILL	$ 6,620.70	$ 6,600.00
SLOPE PROTECTION	$ 13,625.00	$ 13,600.00
CL B CONCRETE	$ 74,716.95	$ 74,700.00
CL K CONCRETE	$ 20,940.60	$ 20,900.00
CL H CONCRETE	$ 140,827.92	$ 140,800.00
REINF STL BAR	$ 18,387.96	$ 18,400.00
EP REINF STL BAR	$ 38,266.20	$ 38,300.00
STL SUPER	$ 370,472.96	$ 370,500.00
STL BEARING PILES	$ 44,773.20	$ 44,800.00
MISC ITEMS	$ 313,917.55	$ 313,900.00
Total Bridge Construction	$ 1,210,824.84	$ 1,210,800.00

	Estimated Cost	
	Actual	Rounded
Bridge	$ 1,210,800.00	$ 1,210,800.00
Roadway	$ 1,195,222.58	$ 1,195,300.00
E&C (19%)	$ 457,144.29	$ 457,100.00
	$ 2,863,166.87	$ 2,863,200.00
Future V alue	$3,195,505.79	$3,196,000.00
Pre Engineering	$ 400,000.00	$400,000.00
Utilities	$ 10,000.00	$10,000.00
R/W	$ 10,000.00	$ 10,000.00
Total	$3,615,505.79	$3,616,000.00

Bridge Cost Estimate
Sidney Beam Span
Alternative # 4-New Bridge at E

	Estimated Cost	
ROADWAY	Actual	Rounded
Clearing and Grubbing	$ 10,000.00	$ 10,000.00
Earthwork	$ 183,103.00	$ 183,100.00
HMA Wearing & Base	$ 107,120.09	$ 107,100.00
Aggregate (Base & Sh)	$ 39,898.37	$ 39,900.00
Subgrade	$ 17,214.41	$ 17,200.00
Drainage	$ 5,250.00	$ 5,300.00
M.O.T.	$ 216,300.00	$ 216,300.00
Erosion Control	$ 25,000.00	$ 25,000.00
Approach Slab	$ 29,072.47	$ 29,100.00
All Other Items	$ 312,562.25	$ 312,600.00
Mobilization	$ 99,343.13	$ 99,300.00
Total Roadway Construction	$ 1,044,863.73	$ 1,044,900.00

BRIDGE	Actual	Rounded
DISMANTLING STRUCTURE	$ 75,000.00	$ 75,000.00
STR. EX	$ 21,410.70	$ 21,400.00
SEL. MAT'L BACKFILL	$ 7,990.50	$ 8,000.00
SLOPE PROTECTION	$ 13,625.00	$ 13,600.00
CL B CONCRETE	$ 95,353.06	$ 95,400.00
CL K CONCRETE	$ 20,940.60	$ 20,900.00
CL H CONCRETE	$ 140,827.92	$ 140,800.00
REINF STL BAR	$ 23,235.12	$ 23,200.00
EP REINF STL BAR	$ 38,266.20	$ 38,300.00
STL SUPER	$ 370,472.96	$ 370,500.00
STL BEARING PILES	$ 48,504.30	$ 48,500.00
MISC ITEMS	$ 213,906.59	$ 213,900.00
Total Bridge Construction	$ 1,069,532.95	$ 1,069,500.00

	Estimated Cost	
	Actual	Rounded
Bridge	$ 1,069,500.00	$ 1,069,500.00
Roadway	$ 1,044,863.73	$ 1,044,900.00
Detour (including CR 52/49)	$ 648,208.48	$ 648,300.00
E&C (19%)	$ 648,048.33	$ 648,000.00
	$ 3,410,620.54	$ 3,410,700.00
Future V alue	$3,806,504.54	$3,807,000.00
Pre Engineering	$ 400,000.00	$400,000.00
Utilities	$ 39,000.00	$39,000.00
R/W	$ 45,000.00	$ 45,000.00
Total	$4,290,504.54	$4,291,000.00

Bridge Cost Estimate
Sidney Beam Span
Alternative # 5-New Bridge Downstream of Existing Location

	Estimated Cost	
ROADWAY	Actual	Rounded
Clearing and Grubbing	$ 50,000.00	$ 50,000.00
Earthwork	$ 288,266.64	$ 288,300.00
HMA Wearing & Base	$ 113,235.41	$ 113,200.00
Aggregate (Base & Sh)	$ 73,968.89	$ 74,000.00
Subgrade	$ 31,914.36	$ 31,900.00
Drainage	$ 9,000.00	$ 9,000.00
M.O.T.	$ 90,300.00	$ 90,300.00
Erosion Control	$ 25,000.00	$ 25,000.00
Approach Slab	$ 29,072.47	$ 29,100.00
All Other Items	$ 627,553.89	$ 627,600.00
Mobilization	$ 73,008.35	$ 73,000.00
Total Roadway Construction	$ 1,411,320.01	$ 1,411,400.00

BRIDGE	Actual	Rounded
DISMANTLING STRUCTURE	$ 75,000.00	$ 75,000.00
STR. EX	$ 28,014.00	$ 28,000.00
SEL. MAT'L BACKFILL	$ 10,806.20	$ 10,800.00
SLOPE PROTECTION	$ 13,625.00	$ 13,600.00
CL B CONCRETE	$ 135,202.10	$ 135,200.00
CL K CONCRETE	$ 20,940.60	$ 20,900.00
CL H CONCRETE	$ 142,731.00	$ 142,700.00
REINF STL BAR	$ 32,733.52	$ 32,700.00
EP REINF STL BAR	$ 38,497.20	$ 38,500.00
STL SUPER	$ 370,472.96	$ 370,500.00
STL BEARING PILES	$ 44,773.20	$ 44,800.00
MISC ITEMS	$ 182,559.16	$ 182,600.00
Total Bridge Construction	$ 1,095,354.94	$ 1,095,300.00

	Estimated Cost	
	Actual	Rounded
Bridge	$ 1,095,300.00	$ 1,095,300.00
Roadway	$ 1,411,320.01	$ 1,411,400.00
E&C (19%)	$ 476,257.80	$ 476,300.00
	$ 2,982,877.81	$ 2,983,000.00
Future V alue	$3,329,112.05	$3,330,000.00
Pre Engineering	$ 400,000.00	$400,000.00
Utilities	$ 47,500.00	$48,000.00
R/W	$ 270,000.00	$ 270,000.00
Total	$4,046,612.05	$4,048,000.00

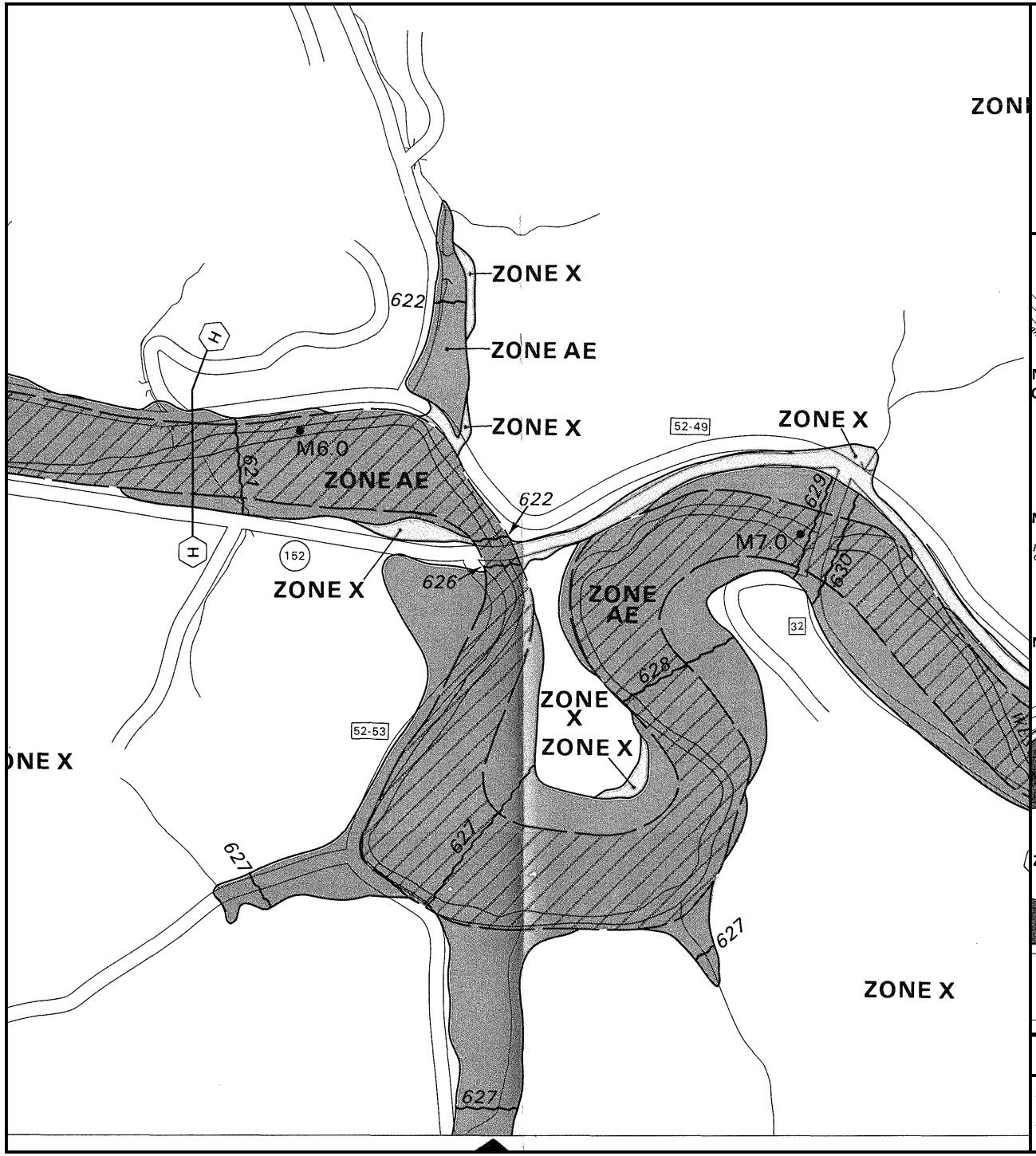
Bridge Cost Estimate
Sidney Beam Span
Alternative #6 - Rehabilitation

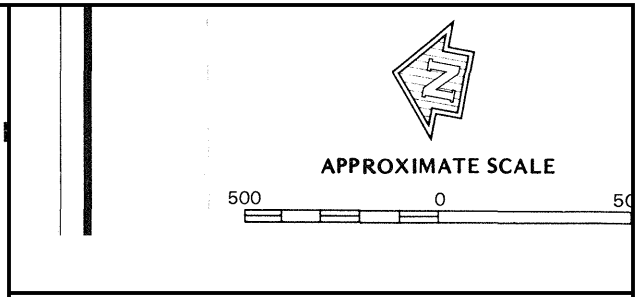
	Estimated Cost	
ROADWAY	Actual	Rounded
Clearing and Grubbing	$ 10,000.00	$ 10,000.00
Earthwork	$ 4,607.00	$ 4,600.00
HMA Wearing & Base	$ 70,327.10	$ 70,300.00
Aggregate (Base & Sh)	$ 6,592.59	$ 6,600.00
Subgrade	$ 3,328.63	$ 3,300.00
Drainage	$ 5,250.00	$ 5,300.00
M.O.T.	$ 216,300.00	$ 216,300.00
Erosion Control	$ 25,000.00	$ 25,000.00
Approach Slab	$ 29,072.47	$ 29,100.00
All Other Items	$ 271,901.95	$ 271,900.00
Mobilization	$ 99,416.62	$ 99,400.00
Total Roadway Construction	$ 741,796.37	$ 741,800.00

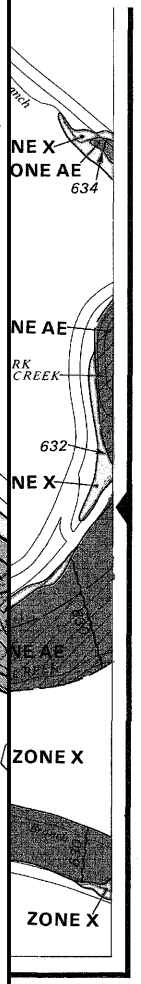
BRIDGE	Actual	Rounded
DISMANTLING STRUCTURE	$ 30,000.00	$ 30,000.00
REHABILITATE BEAMS	$ 220,000.00	$ 220,000.00
CLEAN AND PAINT	$ 213,000.00	$ 213,000.00
NEW DECK	$ 390,000.00	$ 390,000.00
ABUTMENT AND PIER RE.	$ 500,000.00	$ 500,000.00
MISC ITEMS	$ 270,600.00	$ 270,600.00
Total Bridge Construction	$ 1,623,600.00	$ 1,623,600.00

	Estimated Cost	
	Actual	Rounded
Bridge	$ 1,623,600.00	$ 1,623,600.00
Roadway	$ 741,796.37	$ 741,800.00
Detour	$ 523,953.81	$ 524,000.00
E&C (19%)	$ 648,527.76	$ 648,500.00
	$ 3,537,877.94	$ 3,537,900.00
Future V alue	$3,948,533.20	$3,949,000.00
Pre Engineering	$ 400,000.00	$400,000.00
Utilities	$ 30,600.00	$31,000.00
R/W	$ 240,000.00	$ 240,000.00
Total	$4,619,133.20	$4,620,000.00

APPENDIX “C”







NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

WAYNE COUNTY, WEST VIRGINIA
(UNINCORPORATED AREAS)

PANEL 128 OF 225
(SEE MAP INDEX FOR PANELS NOT PRINTED)

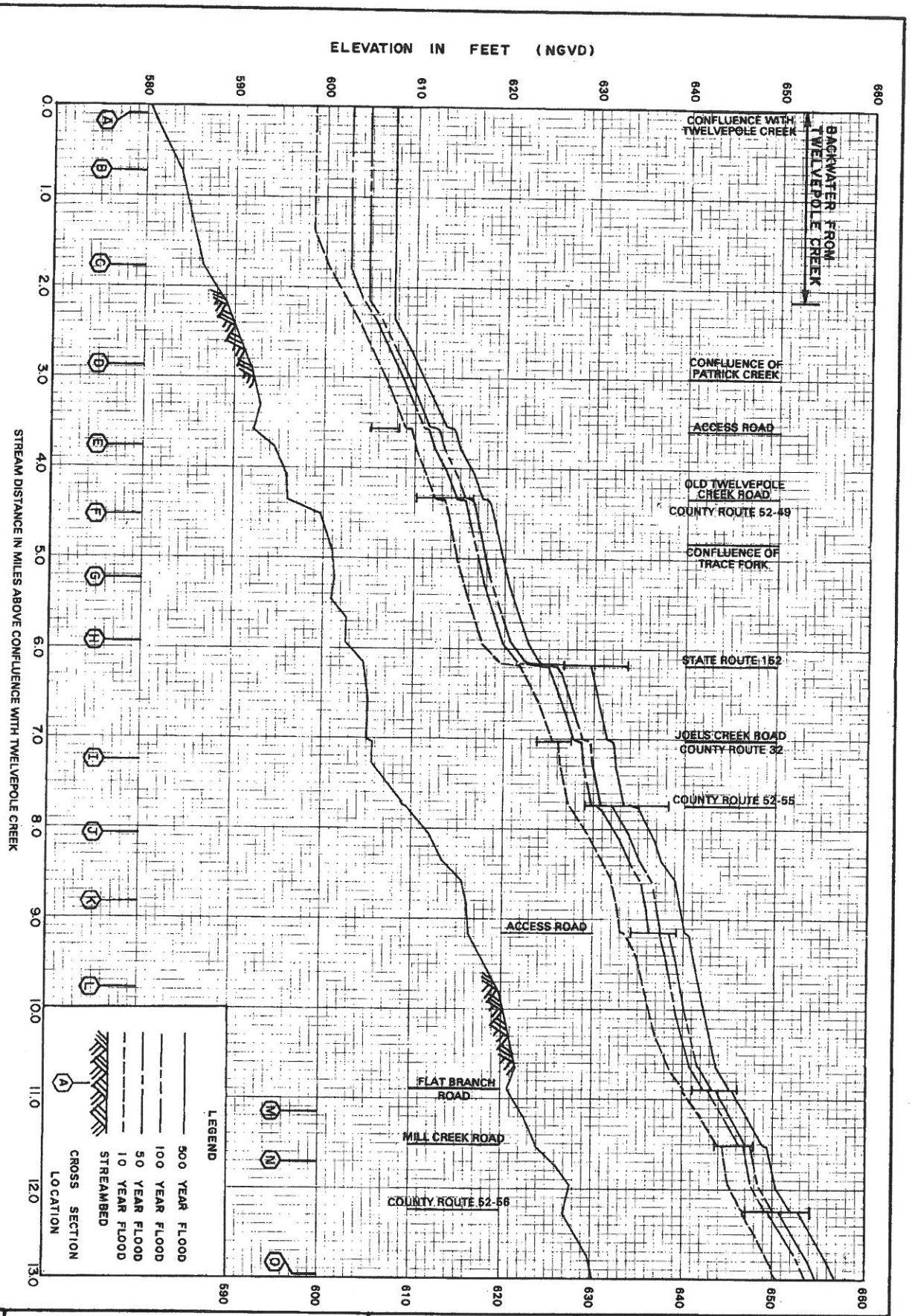
PANEL LOCATION

COMMUNITY-PANEL NUMBER
540200 0128 B

EFFECTIVE DATE:
SEPTEMBER 18, 1987

Federal Emergency Management Agency

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



FEDERAL EMERGENCY MANAGEMENT AGENCY

WAYNE COUNTY, WV

(UNINCORPORATED AREAS)

FLOOD PROFILES

WEST FORK TWELVEPOLE CREEK

10P

APPENDIX “D”

BRIDGE RENOVATION STUDY

SIDNEY BEAM SPAN BRIDGE

STATE PROJECT S350-152-23.71

WAYNE COUNTY

SEPTEMBER 4, 2012

PURPOSE, SCOPE AND LOCATION

This study was prepared as an additional alternate to the design study to determine the feasibility of renovating the Sidney Beam Span Bridge over West Fork of Twelvepole Creek located on WV 152, 0.03 mile South of CR 52/53.

EXISTING TYPICALS AND CONDITIONS

The Sidney Beam Span Bridge was constructed in 1939, by A. P. Peraldo and Son, Contractors, Iaeger, WV. The bridge consists of three simple steel beam spans at 55’05”, 55’-0” and 32’-0” with a clear roadway width of 25’-6”. The bridge is supported by concrete stub abutments and two solid reinforced concrete piers. Abutment No. 1 and Pier No. 1 are founded on piling. The structure has an overall length of 151’-10” with a reinforced concrete deck that includes a ½” monolithic asphalt wearing surface. The out to out width is 27’-3” with a horizontal clearance of 25’-6” balustrade to balustrade. The bridge has 9”x 9” curbs on each

side.

The structure is rated in fair condition. It is used by ordinary, mail, school bus and commercial traffic and is currently silhouette posted for 20T, 30T, 32T, 33T and 40T. The following conditions exist:

1) Beam One exhibits section loss and heavy rusting all along the structure. (See Photos 1,2)
2) The diaphragms under the expansion dam areas are heavily pitted at the bottom flanges with considerable rusting in isolated portions. (See Photo 3)
3) The bottom of the deck exhibits several full depth pop outs. (See Photos 4,5,6)
4) There is extensive hairline cracks and efflorescence under the deck throughout Spans One and Three. (See Photo 7,8,9)
5) There exhibits severe cracking and concrete loss along the outside of the deck. (See Photos 10,11,12,13)
6) The asphalt on the deck is cracking and falling out along the expansion dams. (See Photo 14)
7) Both curb faces exhibit heavy spalling and concrete loss. (See Photos 15,16,17)
8) Heavy spalling and exposed reinforcing bar is present on top of Pier 1 on the downstream side. (See Photo 18)

Photo 1

Photo 2

Photo 3

Photo 4

Photo 5

Photo 6

Photo 7

Photo 8

Photo 9

Photo 10

Photo 11

Photo 12

Photo 13

Photo 14

Photo 15

Photo 16

Photo 17

Photo 18

RECOMMENDATION

Rehabilitation costs are as follows:

Dismantle Bridge	$	30,000
Rehabilitate Beams	$	220,000
Cleaning and Painting	$	213,000
New Deck	$	390,000
Abutment and Pier repairs	$	500,000
Misc Items	$	270,600
Bridge Total	**$**	**1,623,600**
Roadway	$	741,800
Temporary Detour	$	524,000
E&C (19%)	$	648,500
Total	**$**	**3,537,900** [1]

With due consideration given to the cost of rehabilitation and that the bridge would remain functionally obsolete, rehabilitation of this structure is not recommended.

[1] Total Rehabilitation including PE and R/W has a Future Value Cost of $ 4,620,000

APPENDIX “E”

Looking south at the northern approach.

Looking north at the southern approach

Looking Downstream

Looking Upstream

Home impacted in Alternative No. 2

Business garage impacted in Alternatives No. 1 and 2

Business garage in relation to existing bridge location

Rock cut wall near southeast corner of bridge

Home impacted in Alternative No. 5

Section of CR 52/49 impacted by Alternatives No. 4 and 5