

Spring Valley – Alternative 5A

Rehabilitate and widen the existing spandrel arch span; replace the approach spans with new concrete girder spans. Final alignment to match the existing alignment. Traffic to be carried on a temporary shoofly bridge composed of temporary spans owned by MoDOT.

Table 9-24. Spring Valley Bridge Cost Analysis – Alternative 5A

Item	Unit Cost per Sq. Ft.	Cost
Temporary Bridge (Assumed 26' x 550')	\$102	\$1,460,000
Rehabilitate Concrete Spandrel Arch Bridge (Assumed 28' x 540')	\$238	\$3,600,000
Roadway Work	--	\$800,000
Mobilization (Assumed 11% of project)	11%	\$650,000
Total Cost	--	\$6,510,000

Spring Valley – Alternative 5B

Rehabilitate and widen the existing spandrel arch span; replace the approach spans with new haunched steel girder spans. Final alignment to match the existing alignment. Traffic to be carried on a temporary shoofly bridge composed of temporary spans owned by MoDOT.

Table 9-25. Spring Valley Bridge Cost Analysis – Alternative 5B

Item	Unit Cost per Sq. Ft.	Cost
Temporary Bridge (Assumed 26' x 550')	\$102	\$1,460,000
Rehabilitate Concrete Spandrel Arch Bridge (Assumed 28' x 540')	\$265	\$4,010,000
Roadway Work	--	\$800,000
Mobilization (Assumed 11% of project)	11%	\$690,000
Total Cost	--	\$6,960,000

10 Studied Alternatives Performance Summary

The following tables list the advantages and disadvantages identified for the various alternatives and options studied for this report. The estimated cost of the alternatives studied is included and cost estimates were ranked from most expensive to least expensive. 15 alternatives were studied to cross the Current River and the costs are ranked from 1 (highest) to 14 (lowest) with a tie in 4th place. The alternatives ranked 11 through 14 vary by approximately \$1,000,000 and are considered to have an advantage over the remaining alternatives. Eight alternatives were studied to cross Spring Valley and the costs are ranked from 1 (highest) to 8 (lowest). The variance is about \$2,000,000 the

alternatives ranked 5 to 8 are considered to have an advantage over the others. The selected bridge rail could be used on any of the alternatives and is not included in the performance tables.

Table 10-1. Current River – Alternative 1A, Option 1 Performance

New Concrete Filled Arch Bridge on Alignment, Two-Lane Temporary Bridge, Existing Pedestrian Bridge Removed.

Advantages	Disadvantages
Matches form of existing bridge.	Cost rank of alternatives studied = 1.
Less permanent roadway work.	Builds two bridges in the channel.
Replaces the original two-lane bridge during construction.	Extensive formwork in the channel.
Final configuration is a single bridge over the channel.	The cost of the temp. bridge is wasted.
	Ped. bridge must be removed prior to construction.
	New bridge has limited inspection access similar to existing.

Table 10-2. Current River – Alternative 1A, Option 2 Performance

New Concrete Filled Arch Bridge on Alignment, Two-Lane Temporary Bridge, Existing Pedestrian Bridge Remains.

Advantages	Disadvantages
Matches form of existing bridge.	Cost rank of alternatives studied = 5.
Less permanent roadway work.	Builds two bridges in the channel.
Replaces the original two-lane bridge during construction.	Extensive formwork in the channel.
Final configuration is a single bridge over the channel.	The cost of the temp. bridge is wasted.
Ped. bridge may remain in place during construction.	Pedestrian use of existing ped. bridge is practically limited during construction.
Utilities may remain in place during construction.	New bridge has limited inspection access similar to existing.

Table 10-3. Current River – Alternative 1B Performance

New Concrete Filled Arch Bridge on Alignment, One-Lane Temporary Bridge Converted to Pedestrian Bridge, Existing Pedestrian Bridge Removed.

Advantages	Disadvantages
Matches form of existing bridge.	Cost rank of alternatives studied = 4.
Less permanent roadway work.	Builds two bridges in the channel.
Cost of temp. bridge is not wasted.	Extensive formwork in the channel.
	Keeps single lane bridge throughout construction.
	Ped. bridge must be removed prior to construction.
	Final configuration is two bridges over the channel.
	New bridge has limited inspection access similar to existing.

Table 10-4. Current River – Alternative 2A, Option 1 Performance

New Haunched Steel Plate Girder Bridge on Alignment, Two-Lane Temporary Bridge, Existing Pedestrian Bridge Removed.

Advantages	Disadvantages
New bridge matches look of Sinking Creek.	New bridge looks different than existing.
Less permanent roadway work.	Cost rank of alternatives studied = 7.
Uses a two-lane bridge during construction.	Builds two bridges in the channel.
Final configuration is a single bridge over the channel.	The cost of the temp. bridge is wasted
Less formwork in the channel.	Ped. bridge must be removed prior to construction.
New bridge has more inspection access similar to existing.	

Table 10-5. Current River – Alternative 2A, Option 2 Performance

New Haunched Steel Plate Girder Bridge on Alignment, Two-Lane Temporary Bridge, Existing Pedestrian Bridge Remains.

Advantages	Disadvantages
New bridge matches look of Sinking Creek.	New bridge looks different than existing.
Cost rank of alternatives studied = 11.	Builds two bridges in the channel.
Less permanent roadway work.	The cost of the temp. bridge is wasted
Uses a two-lane bridge during construction.	Pedestrian use of existing ped. bridge is practically limited during construction.
Final configuration is a single bridge over the channel.	
Less formwork in the channel.	
Ped. bridge may remain in place during construction.	
Utilities may remain in place during construction.	
New bridge has more inspection access similar to existing.	

Table 10-6. Current River – Alternative 2B Performance

New Haunched Steel Plate Girder Bridge on Alignment, One-Lane Temporary Bridge, Existing Pedestrian Bridge Removed.

Advantages	Disadvantages
New bridge matches look of Sinking Creek.	New bridge looks different than existing.
Less permanent roadway work.	Cost rank of alternatives studied = 10.
Cost of temp. bridge is not wasted.	Keeps single lane bridge throughout construction.
Less formwork in the channel.	Ped. bridge must be removed prior to construction.
New bridge has more inspection access similar to existing.	Final configuration is two bridges over the channel.

Table 10-7. Current River – Alternative 3, Option 1 Performance

New Concrete Filled Arch Bridge on Offset Alignment, Existing Pedestrian Bridge Removed.

Advantages	Disadvantages
Matches form of existing bridge.	Cost rank of alternatives studied = 3.
Builds one bridge in the channel	Ped. bridge must be removed prior to construction.
No temp. bridge is built, avoiding wasted money.	Extensive formwork in the channel.
	More permanent roadway work.
	Keeps single lane of traffic on exist. bridge during construction.
	New bridge has limited inspection access similar to existing.

Table 10-8. Current River – Alternative 3, Option 2 Performance

New Concrete Filled Arch Bridge on Offset Alignment, Existing Pedestrian Bridge Remains.

Advantages	Disadvantages
Matches form of existing bridge.	Cost rank of alternatives studied = 2.
Builds one bridge in the channel	Extensive formwork in the channel.
No temp. bridge is built, avoiding wasted money.	More permanent roadway work.
Ped. bridge may remain in place during construction.	Keeps single lane of traffic on exist. bridge during construction.
Utilities may remain in place during construction.	New bridge has limited inspection access similar to existing.
	Pedestrian use of existing ped. bridge is practically limited during construction.

Table 10-9. Current River – Alternative 4, Option 1 Performance

New Haunched Steel Plate Girder Bridge on Offset Alignment, Existing Pedestrian Bridge Removed.

Advantages	Disadvantages
New bridge matches look of Sinking Creek.	New bridge looks different than existing.
Cost rank of alternatives studied = 13.	Ped. bridge must be removed prior to construction.
No temp. bridge is built, avoiding wasted money.	More permanent roadway work.
Builds one bridge in the channel	Keeps single lane of traffic on exist. bridge during construction.
Less formwork in the channel.	
New bridge has more inspection access similar to existing.	

Table 10-10. Current River – Alternative 4, Option 2 Performance

New Haunched Steel Plate Girder Bridge on Offset Alignment, Existing Pedestrian Bridge Remains.

Advantages	Disadvantages
New bridge matches look of Sinking Creek.	New bridge looks different than existing.
Cost rank of alternatives studied = 12.	More permanent roadway work.
No temp. bridge is built, avoiding wasted money.	Keeps single lane of traffic on exist. bridge during construction.
Builds one bridge in the channel.	Pedestrian use of existing ped. bridge is practically limited during construction.
Less formwork in the channel.	
Ped. bridge may remain in place during construction.	
Utilities may remain in place during construction.	
New bridge has more inspection access similar to existing.	

Table 10-11. Current River – Alternative 5A Performance

Phased Rehabilitation of Existing Bridge with No Temporary Bridge, Existing Pedestrian Bridge Remains.

Advantages	Disadvantages
Matches form of existing bridge.	Cost rank of alternatives studied = 8.
No temp. bridge is built, avoiding wasted money.	Extensive formwork in the channel.
Single bridge in channel in final configuration.	Keeps single lane of traffic on exist. bridge during construction.
Ped. bridge may remain in place during construction.	Builds on both sides of exist. bridge.
Utilities may remain in place during construction.	Two year construction project.
Less permanent roadway work.	Remediated concrete of existing bridge is buried in the structure, possibly requiring further rehabilitation in the future.
	Final bridge has limited inspection access similar to existing.
	Remediated concrete will require embedded galvanic anodes that have a life expectancy of approximately 30 years.

Table 10-12. Current River – Alternative 5B, Option 1 Performance

Single Phase Rehabilitation of Existing Bridge, Two-Lane Temporary Bridge, Existing Pedestrian Bridge Removed.

Advantages	Disadvantages
Matches form of existing bridge.	Cost rank of alternatives studied = 4.
Uses a two-lane bridge during construction.	Extensive formwork in the channel.
Single bridge in channel in final configuration.	The cost of the temp. bridge is wasted.
Less permanent roadway work.	Builds two bridges in the channel.
Ped. bridge may remain in place during construction.	Builds on both sides of exist. bridge.
Utilities may remain in place during construction.	Remediated concrete of existing bridge is buried in the structure, possibly requiring further rehabilitation in the future.
	Final bridge has limited inspection access similar to existing.
	Remediated concrete will require embedded galvanic anodes that have a life expectancy of approximately 30 years.

Table 10-13. Current River – Alternative 5B, Option 2 Performance

Single Phase Rehabilitation of Existing Bridge, Two-Lane Temporary Bridge, Existing Pedestrian Bridge Remains.

Advantages	Disadvantages
Matches form of existing bridge.	Cost rank of alternatives studied = 9.
Uses a two-lane bridge during construction.	Extensive formwork in the channel.
Single bridge in channel in final configuration.	The cost of the temp. bridge is wasted.
Less permanent roadway work.	Builds two bridges in the channel.
	Builds on both sides of exist. bridge.
	Remediated concrete of existing bridge is buried in the structure, possibly requiring further rehabilitation in the future.
	Final bridge has limited inspection access similar to existing.
	Remediated concrete will require embedded galvanic anodes that have a life expectancy of approximately 30 years.
	Pedestrian use of existing ped. bridge is practically limited during construction.

Table 10-14. Current River – Alternative 6 Performance

Phased Replacement of Existing Bridge with New Concrete Filled Arch Structure, Existing Pedestrian Bridge May Remain.

Advantages	Disadvantages
Matches form of existing bridge.	Cost rank of alternatives studied = 6.
No temp. bridge is built, avoiding wasted money.	Extensive formwork in the channel.
Single bridge in channel in final configuration.	Keeps single lane of traffic on exist. bridge or new bridge during construction.
Moderate amount of permanent roadway work.	Two year construction project.
Ped. bridge may remain in place during construction.	Final bridge has limited inspection access similar to existing.
Utilities may remain in place during construction.	

Table 10-15. Current River – Alternative 7 Performance

Phased Replacement of Existing Bridge with New Haunched Steel Plate Girder Structure, Existing Pedestrian Bridge May Remain.

Advantages	Disadvantages
New bridge matches look of Sinking Creek.	New bridge looks different than existing.
Cost rank of alternatives studied = 14.	Keeps single lane of traffic on exist. bridge or new bridge during construction.
No temp. bridge is built, avoiding wasted money.	Two year construction project.
Single bridge in channel in final configuration.	
Moderate amount of permanent roadway work.	
Less formwork in the channel.	
Ped. bridge may remain in place during construction.	
Utilities may remain in place during construction.	

Table 10-16. Spring Valley – Alternative 1A Performance

New Concrete Spandrel Arch Bridge on Alignment, Two-Lane Temporary Bridge, Concrete Girder Approach Spans.

Advantages	Disadvantages
New bridge maintains open spandrel arch.	Cost rank of alternatives studied = 3.
Less permanent roadway work. Avoids retaining walls or reinforced slopes.	Builds two bridges in the channel.
Concrete approach spans match existing approach span material.	Extensive formwork in the channel.
	The cost of the temp. bridge is wasted.
	Concrete approach spans do not have similar shape as the existing.

Table 10-17. Spring Valley – Alternative 1B Performance

New Concrete Spandrel Arch Bridge on Alignment, Two-Lane Temporary Bridge, Haunched Steel Plate Girder Approach Spans.

Advantages	Disadvantages
New bridge maintains open spandrel arch.	Cost rank of alternatives studied = 1.
Less permanent roadway work. Avoids retaining walls or reinforced slopes.	Builds two bridges in the channel.
Steel girder approach spans mimic the curved shape of the existing spans.	Extensive formwork in the channel.
	The cost of the temp. bridge is wasted.
	Steel girder approach spans are a different material and will have a different appearance than the existing approach spans.

Table 10-18. Spring Valley – Alternative 2 Performance

New Haunched Steel Plate Girder Bridge on Alignment, Two-Lane Temporary Bridge.

Advantages	Disadvantages
New bridge matches look of Sinking Creek.	New bridge looks different than existing.
Cost rank of alternatives studied = 7.	Builds two bridges in the channel.
Less permanent roadway work. Avoids retaining walls or reinforced slopes.	The cost of the temp. bridge is wasted.
Steel girder spans mimic the curved shape of the existing spans.	

Table 10-19. Spring Valley – Alternative 3A Performance

New Concrete Spandrel Arch Bridge on Offset Alignment, Concrete Girder Approach Spans.

Advantages	Disadvantages
New bridge maintains open spandrel arch.	More permanent roadway work.
Cost rank of alternatives studied = 5.	May need retaining walls or reinforced slope.
Builds one bridge in the channel.	Extensive formwork in the channel.
No temp. bridge is built, avoiding wasted money.	Concrete approach spans do not have similar shape as the existing.
Concrete approach spans match existing approach span material.	



Table 10-20. Spring Valley – Alternative 3B Performance

New Concrete Spandrel Arch Bridge on Offset Alignment, Haunched Steel Plate Girder Approach Spans.

Advantages	Disadvantages
New bridge maintains open spandrel arch.	Cost rank of alternatives studied = 2.
Builds one bridge in the channel.	More permanent roadway work.
No temp. bridge is built, avoiding wasted money.	May need retaining walls or reinforced slope.
Steel girder approach spans mimic the curved shape of the existing spans.	Extensive formwork in the channel.
	Steel girder approach spans are a different material and will have a different appearance than the existing approach spans.

Table 10-21. Spring Valley – Alternative 4 Performance

New Haunched Steel Plate Girder Bridge on Offset Alignment.

Advantages	Disadvantages
New bridge matches look of Sinking Creek.	New bridge looks different than existing.
Cost rank of alternatives studied = 8.	More permanent roadway work.
Builds one bridge in the channel.	May need retaining walls or reinforced slope.
No temp. bridge is built, avoiding wasted money.	Extensive formwork in the channel.
Steel girder spans mimic the curved shape of the existing spans.	

Table 10-22. Spring Valley – Alternative 5A Performance

Rehabilitate Concrete Spandrel Arch Bridge on Alignment, Two-Lane Temporary Bridge, Concrete Girder Approach Spans.

Advantages	Disadvantages
Rehabilitated bridge maintains existing open spandrel arch.	Builds two bridges in the channel.
Cost rank of alternatives studied = 6.	The cost of the temp. bridge is wasted.
Less permanent roadway work. Avoids retaining walls or reinforced slopes.	Concrete approach spans do not have similar shape as the existing.
Concrete approach spans match existing approach span material.	Keeps remediated concrete of existing bridge, possibly requiring further rehabilitation in the future.
Avoids extensive formwork in the channel.	Remediated concrete will require embedded galvanic anodes that have a life expectancy of approximately 30 years.
	Cannot carry design loading, but will not require posting.

Table 10-23. Spring Valley – Alternative 5B Performance

Rehabilitate Concrete Spandrel Arch Bridge on Alignment, Two-Lane Temporary Bridge, Haunched Steel Plate Girder Approach Spans.

Advantages	Disadvantages
Rehabilitated bridge maintains existing open spandrel arch.	Cost rank of alternatives studied = 4.
Less permanent roadway work. Avoids retaining walls or reinforced slopes.	Builds two bridges in the channel.
Steel girder approach spans mimic the curved shape of the existing spans.	The cost of the temp. bridge is wasted.
Avoids extensive formwork in the channel.	Steel girder approach spans are a different material and will have a different appearance than the existing approach spans.
	Keeps remediated concrete of existing bridge, possibly requiring further rehabilitation in the future.
	Remediated concrete will require embedded galvanic anodes that have a life expectancy of approximately 30 years.
	Cannot carry design loading, but will not require posting.