STATE OF VERMONT
AGENCY OF TRANSPORTATION

Scoping Report

FOR

Orleans Village BF 0310(7)

VT ROUTE 58 (TH 1), Bridge 10 over the Barton River

February 23, 2015

I. Contents

I. Site Information

The bridge is located in an urban area along VT Route 58 approximately 0.4 miles east of the junction with US Route 5. Bridge 10 is located on Main Street just outside the center of Orleans Village. The bridge is located on a curved segment of VT 58. Maple St. and Water St. intersect VT Route 58 approximately 30 feet and 75 feet east of the bridge respectively. The existing conditions were gathered from a combination of a Site Visit, the Inspection Report, the Route Log and the existing Survey. See correspondence in the Appendix for more detailed information.

Roadway Classification	Rural Major Collector (Class 1 Town Highway)
Bridge Type	Concrete T-Beam
Bridge Span	46 feet long
Year Built	1933
Year Rebuilt	1948
Ownership	Village of Orleans

Need

It is the primary access across the Barton River in this location. The following is a list of the deficiencies of Bridge 10 and VT 58 in this location;

1. The deck is in poor condition. There are areas of localized deterioration in the Concrete T-Beams.

2. Neither the horizontal nor the vertical alignments meet the current standard.

3. The approach rails do not meet current standard.

Traffic

A traffic study of this site was performed by the Vermont Agency of Transportation. The traffic volumes are projected for the years 2016 and 2036.

TRAFFIC DATA	2016	2036
ADT	4,600	4,900
DHV	520	550
ADTT	180	300
%T	2.0	3.0
%D	59	59

Design Criteria

The design standards for this bridge project are the Vermont State Standards, dated October 22, 1997. Minimum standards are based on an ADT > 2000 and a design speed of 30 mph.

Design Criteria	Source	Existing Condition	Minimum Standard	Comment
Approach Lane and Shoulder Widths	VSS Table 5.3	8/11/11/4'-6" (34'-6")	11'/3' (28')	
Bridge Lane and Shoulder Widths	VSS Table 5.3	8 (sidewalk)-6-11-11-4-5.5 (sidewalk)	11'/3' (28')	
Clear Zone Distance	VSS Table 5.5		14' fill / 12' cut (1:3), 12' cut (1:4), 3' Behind curb	
Banking	AASHTO Green Book Table 3-8	0.015ft/ft	0.040 ft/ft	No banking required in low speed village location (VSS Section 5.13)
Speed	VSS Section 5.3	30 mph (Posted)	30 mph (Design)	
Horizontal Alignment	AASHTO Green Book Table 3-8	R=100' , Bridge located on a horizontal curve	R_{min}=250'	Substandard
Vertical Grade	VSS Table 5.6	Bridge located primarily on a crest between two sagging curves.	11% (max) for rolling terrain	
K Values for Vertical Curves	VSS Table 5.1	Bridge located on crest (K = 18). Curves before and after bridge are both sags (K=41 & 21 respectively)	30 crest / 40 sag	Substandard
Vertical Clearance Issues	VSS Section 5.8	None noted	14'-3" (min)	
Stopping Sight Distance	VSS Table 5.1	569' on bridge 138' in the intersection after bridge along stationing	200'	Substandard
Bicycle/Pedestrian Criteria	VSS Table 5.8	4'	3' Shoulder	
Bridge Railing and Approach	Structures Manual Section 13	Concrete post with steel hand rail and balusters	TL-2	Substandard Rail and Approaches
Hydraulics	VTrans Hydraulics Section	Does not pass Q_{50} storm event with sufficient freeboard.	Passes Q_{50} storm event with 1.0' freeboard.	Substandard
Structural Capacity	SM, Ch. 3.4.1	Structurally Deficient	Design Live Load: HL-93	Substandard

Note: While the functional classification of this section of road is a Rural Major Collector, it is clearly in a Village setting. As such application of the Urban (Village) Major Collector standards may also be appropriate. There is latitude in the Vermont State Standards application of Village standards when the bridge and the bridge site are classified as a historic resource and/or surrounded by historic resources.

Inspection Report Summary

Deck Rating	4 Poor
Superstructure Rating	6 Satisfactory
Substructure Rating	6 Satisfactory
Channel Rating	8 Very Good

5/24/2011 - Structure should have a full deck replacement in the near future. ~FRE/DCP

05/19/2009 - Deck is generally poor with localized areas of advanced deterioration. Consider 5" thick reinforced concrete overlay or additional full depth bay replacement. Prestressed slab or box units would also be desirable. Even with the ailing deck, the superstructure and substructure still have many years of service life remaining. - MJ/DS

Hydraulics

From preliminary hydraulics report:

Recommendations

The bridge option selection criteria should provide a bridge opening that does not restrict the bank full width, nor provide an unrealistic widening, of the existing channel, or create any worse backwater flooding conditions than the existing conditions. The VANR Bank Full Width (BFW) equation estimates the width to be approximately 89 feet, but the actual field conditions have varying bank full stream widths within the study reach between 35 to 50 feet. Options to meet the hydraulic standard would require widening the existing 44-ft span to a minimum 90-ft span or by raising the roadway profile by 4-ft.

(For the full preliminary hydraulic report see Preliminary Hydraulics Report in the Appendix.)

Utilities

The Existing Bridge site has a lot of utilities surrounding and to some degree crossing the bridge. The existing bridge has both fiber optic and copper cables attached to the concrete beams under the bridge. Beyond either end of the bridge and beyond the downstream fascia are overhead power and communication lines. Municipal water and sewer lines also can be found within close proximity to the structure. All utilities on the bridge will need to be relocated during construction. Aerial power and communication lines on the eastern abutment will likely need to be relocated during construction as well. Depending on the bridge option an abandoned waterline along the western abutment may need to be removed. The town would like lights to be placed on the bridge. This would require bulb-outs along the fascia to accommodate a location to put the light posts as well as adding the conduit and wire necessary to provide a power source.

Right Of Way

The existing Bridge deck is outside of the town owned right of way on three out of the four quadrants. Each of the four wingwalls are outside the Right of Way. Three of the four properties are owned by the village. As such Right of Way will need to be obtained if any work is to be done to the bridge.

Resources

The resources present at this project are shown on the Existing Conditions Layout Sheet, and are as follows:

Biological:

Wetlands

There are no wetlands within the project area.

Wildlife Habitat

There are no wildlife corridor issues within the project area.

Rare, Threatened and Endangered Species

There are no mapped rare, threatened or endangered species within the project area.

Agricultural

There are prime agricultural soils to the south of the project area which have already been developed.

Archaeological:

Given the amount of historic buildup in the project area as well as the lack of undisturbed landforms, I've concluded that there are *no archaeological resources of concern.*

Historic:

Bridge 10 is a historic bridge, significant for its railing. Contributing features to the bridge include granite block abutments and wing walls. The bridge is located in the Orleans Village Historic District, which extends to Maple Street, Church Street, and Water Street.

Note on this project that there is a unique resource - the park in between Water and Maple Streets. It has been identified as a historic resource, as well as contributing to the historic district. The bridge is on this property and it is anticipated that additional permitting will be required.

Hazardous Materials:

According to the Vermont Agency of Natural Resources (VANR) Vermont Hazardous Sites List, there are hazardous materials in the area of the project. The current North Country Federal Credit Union site had a fuel spill and has been remediated. See Appendix (State of Vermont, SMAC 2001-2938)

Stormwater:

The Barton River is not listed as an impaired waterway according to the Vermont Department of Environmental Conservation, Water Quality Division.

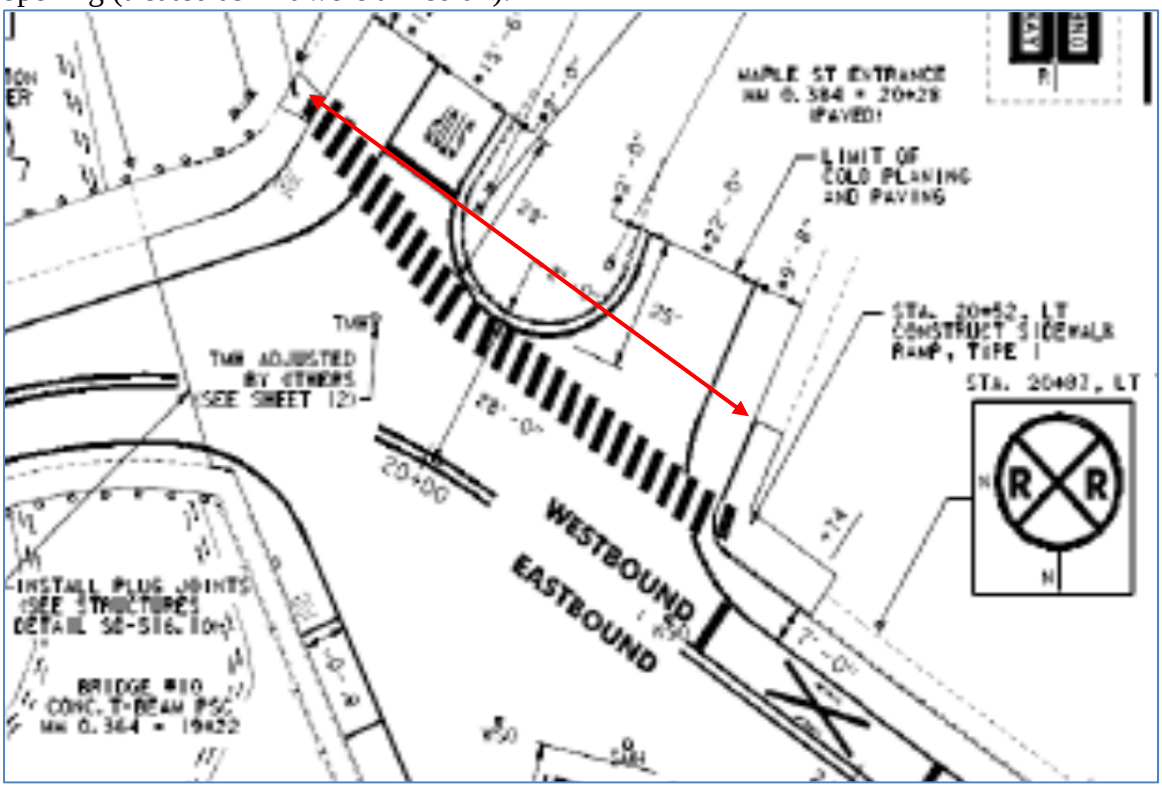
II. Safety

The stretch of VT Route 58 through the project area has had several crashes recorded in the last five year period. The VTrans Traffic Safety Engineer analyzed the crash data and the project site, and has made the following observations and recommendations:

- There is an issue with on-street parking in front of the North Country Federal Credit Union. The shoulder width is not large enough to accommodate a vehicle. Parked vehicles are either encroaching in the road or they are parked with the right wheels up on the sidewalk, thus interfering with pedestrians. Where parked vehicles are encroaching in the road is where westbound traffic is just coming off of the bridge.

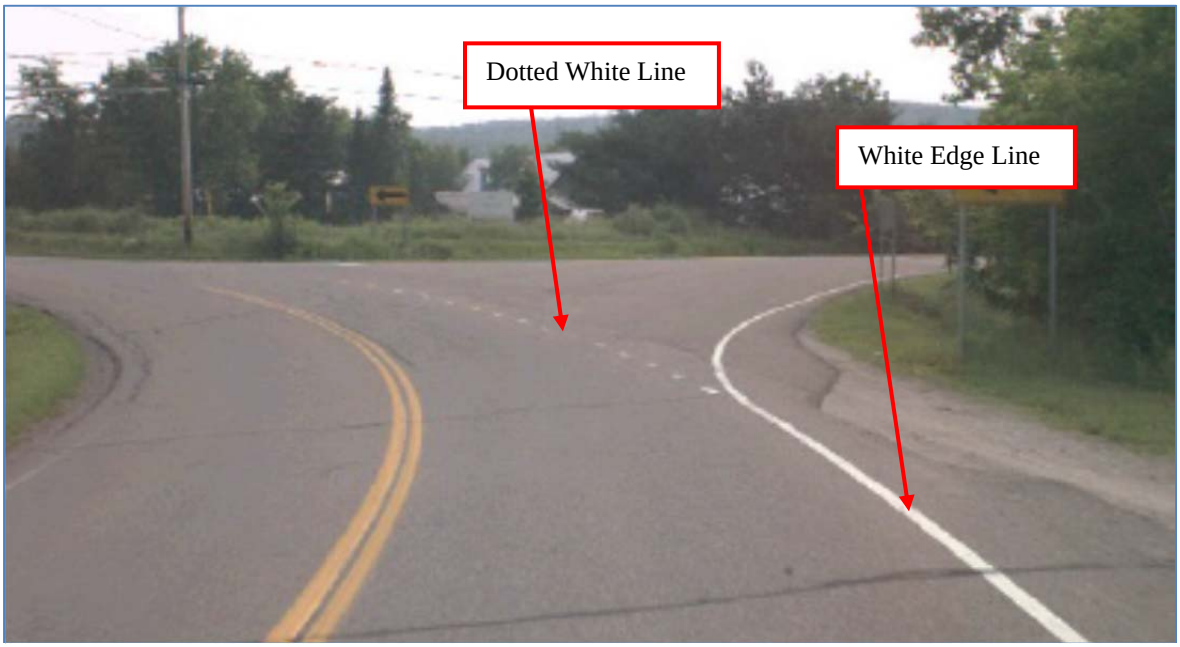
- There should not be a parking space next to the crosswalk on Maple Street. There should be at least 20 feet of free space. Additionally, the stop bar should be 4 feet behind the crosswalk.

- The crosswalk on the east side is close to westbound traffic. Under the current scheme, it would be safer to make the crosswalk go through the park by creating a cut through opening (treated as if it were a median).



- The top bar of the chain link fence is unsafe. Additionally, the trees should be kept low to maintain sight distance.

- To help guide westbound traffic around the curve, a dotted white line could be installed. See below for an example. The current location of the crosswalk may interfere.



- Consideration for the future design, angle parking on Maple Street: At 45 degrees, it requires a 17'-8" long by 8'-5" or 9' wide space. The width of the adjacent travel lane should be 12'-8".

All of the above suggestions should be considered during the design phase, regardless of the chosen scope of the project.

III. Maintenance of Traffic

The Vermont Agency of Transportation has created an Accelerated Bridge Program, which focuses on faster delivery of construction plans, permitting, and Right of Way, as well as faster construction of projects in the field. One practice that will help in this endeavor is closing bridges for portions of the construction period, rather than providing temporary bridges. In addition to saving money, the intention is to minimize the closure period with faster construction techniques and incentives to contractors to complete projects early. The Agency will consider the closure option on most projects where rapid reconstruction or rehabilitation is feasible. The use of precast elements in new bridges will also expedite construction schedules. This can apply to decks, superstructures, and substructures. Accelerated Construction should provide enhanced safety for the workers, pedestrians and the travelling public while maintaining project quality. For this site pedestrian traffic will be detoured along Water St. to East St. and across an existing pedestrian bridge back to Main St. The following options have been considered for vehicular traffic:

Option 1: Off-Site Detour

This option would close the bridge and reroute traffic onto an offsite detour. Since the bridge is located on a Class 1 Town Highway, it would be the responsibility of the State of Vermont to choose the preferred detour route, and to sign it according to the MUTCD manual.

This detour has an end-to-end distance of 36.2 miles, and adds approximately 29.6 miles to travel distance. The detour route is as follows:

1. VT58 (TH1), to VT5, to VT5a, back to VT58.

With a detour provided local traffic will find its own way around creating a "Local Bypass". While these routes are not endorsed by the state it is likely they will see an increase in traffic flow. The route that will likely see the largest increase in traffic as a result of this project;

1. Local traffic staying within town trying to get from one side of the project to the other will likely follow this route;

    - VT58 (TH 1), to Railroad Ave. (over bridge 63), South Street (class 3), and Water Street (class 3), back to VT58 (TH 1).

Option 2: Temporary Bridge

This location is less than ideal for a temporary bridge. There are historic properties and buildings in close proximity to the existing structure. The Barton River parallels VT 58 on the upstream side of the bridge. A temporary bridge on this side of the existing structure would need to turn rather sharply off VT 58 and join Water St. about 50 feet from the intersection of VT 58. This route would require temporary rights to be acquired within historic resources and likely require purchase and removal of the existing senior center. A temporary bridge downstream of the existing bridge would require the purchase and removal of the existing North Country Federal Credit Union, Feather's Discount store, and the out building to the Orleans village municipal building. This would shift traffic over to the temporary where the existing buildings stand and bring them back onto alignment after crossing through one of the historic resources. Since this option will have drastic and permanent impacts to the Village this option

Another temporary was considered where the current pedestrian bridge is located adjacent to the Ethan Allen Furniture Factory. This option would connect the end of East Street to Main Street, through the town park parking lot and the American Legion parking lot. It would require removing and replacing the existing truss bridge used by pedestrian traffic as well as creating an additional railway crossing. For these reasons a temporary bridge at this location will not be considered further.

Option 3: Phased Construction

Phased construction is the maintenance of one lane of two-way traffic on the existing bridge while building one lane at a time of the proposed structure. This allows keeping the road open during construction, while having minimal impacts to natural resources and adjacent property owners.

While the time necessary to develop a phased construction project remains the same, the time required to complete a phased construction project increases because some of the construction tasks have to be performed multiple times. In addition to the increased design and construction costs mentioned, the costs also increase for phased construction because of the inconvenience of working around traffic and the effort involved in coordinating the joints between the phases. Another issue with phased construction is the decrease in safety, for both the workers and vehicular traffic. This is caused by the proximity and extended duration that workers and moving vehicles are operating in the same confined space. Phased construction is usually considered when the benefits include reduced impacts to resources and decreased costs and development time by not requiring the purchase of additional ROW.

Advantages: This alternative will maintain traffic along the corridor.

Disadvantages: The time required to complete a phased construction project is increased because construction tasks have to be performed multiple times. In addition to performing those tasks multiple times the two halves will have to be mechanically connected. Cost of labor and the materials increase with the need to repeat tasks. Another issue with phased construction is the decrease in safety, for both the workers and vehicular traffic. During construction the bridge will be reduced to one lane. Stop conditions will be created near the begin and end approaches of the project. Temporary stop lights will be placed at these locations as well as along Water Street and Memorial Drive. The phased travel ways will be narrower than the existing lanes, slowing traffic further. With decreased traffic flow high levels of congestion along the corridor will develop especially at peak flows in traffic. Congestion will likely back up traffic through the village impeding access to businesses and side streets along the corridor at these times.

Option 4: Hybrid Phasing

This option blends the Full Closure Option with the Phasing detour. Using Accelerated bridge techniques a short closure can be used to remove the deck and replace the majority of it with manufactured bridge components. That center portion of the deck can then be opened to one way traffic while work is done along the fascias. The closure phase would be shorter than a full closure as traffic would be using the new bridge while the more time consuming tasks are completed during the second phase. The travelable portion of the superstructure would be wider during the one way phase as a larger portion of the deck could be constructed during the closure phase. Much of the difficulty in phased construction comes from forming the connection between the two portions of deck. With precast members much of the work is done before the deck reaches the project. This allows the contractor to install post tensioning cables and perform a full depth joint pour once the prefabricated units are set shortening the overall project duration

Advantages: This alternative would have traffic on a new superstructure the fastest of all options. This option balances the adverse impacts this project will have through the construction period by shortening the closure period compared to a full closure while providing a wider more navigable corridor during construction.

Disadvantages: While the detour portion of hybrid option will be used for a quarter the duration of the completely detoured option, that same route will have to be utilized during part of the construction process. Likewise while the bridge will be opened to one way traffic for roughly half the time it would take to phase traffic it will still cause decreased traffic flow high levels of congestion along the corridor will develop especially at peak flows in traffic. Congestion will likely back up traffic through the village impeding access to businesses and side streets along the corridor at these times. The overall closure period will also be longer for this option than it will for a full closure.

IV. Alternatives Discussion

The existing roadway at the bridge location does not meet current standards for geometry, it is also equipped with substandard Bridge Railings. Thus, the alternatives presented here are based on a replacement in kind with updates to the bridge rails and their transitions.

No Action

This alternative would involve leaving the bridge in its current condition. If no action is taken on this bridge, it will eventually be in too poor condition to repair, and the only option may be a full replacement, which is time consuming and costly. Current inspection reports suggest that the

existing bridge will not be able to safely support all associated loads in the near future though an exact timeframe is unknown. In the interest of safety to the traveling public, the No Action alternative is not recommended.

Deck Rehab:
Since the existing T-beams are integral with the deck, replacement of the deck only would be difficult. The process would involve cutting the existing deck free of the beams, removing and replacing sections of those beams, and drilling and grouting of shear connectors to reestablish the composite properties of the deck. The amount of labor and equipment needed to do this type of work would likely cost as much as a completely new superstructure. As such just replacing the deck is not an option.

Alternative 1: Superstructure Replacement
The existing substructure is in satisfactory condition, and it is reasonable to assume that the existing substructure can safely carry anticipated traffic loads for an additional 40 years. A rehabilitation option for this bridge would include superstructure replacement, removing the existing abutment down to a depth that will allow new bridge seats to be poured so that they can accommodate a new cast in place superstructure.

The existing rail has not been tested to current crash testing criteria per NCHRP 350 TL-2 criteria and as such its use is not approved by the Federal Highway Administration (FHWA) in this location. As part of a deck replacement the existing rail would be replaced by a FHWA approved rail system.

The existing vertical alignment is substandard. Currently it does not meet sight distance requirements or minimum "K values" for curves. These issues are compounded by the intersection off the eastern end of the bridge. An attempt will be made to improve these conditions as much as possible without increasing the impacts to the historic resources. With a change in alignment and horizontal banking, care should be taken to ensure that at grade entrances along the corridor will not be adversely affected (i.e. Lake Region Senior center)

Advantages: This alternative will improve upon the existing conditions as much as possible while minimizing impacts to the historic resources. The goal will be to deliver a small scope project quickly that addresses the most serious structural concerns with the bridge. This alternative would address the structural deficiencies of the existing bridge, with minimal upfront costs.

Disadvantages: The Bridge would remain hydraulically inadequate and would still have a substandard horizontal alignment. Additionally, this option would have impacts to the historic properties in the project vicinity.

Alternative 1c: Hybrid Superstructure Replacement
As was mentioned previously a rehabilitation option for this bridge would include superstructure replacement, as well as removing the existing abutment down to a depth that will allow new bridge seats to be poured such that they can accommodate a new superstructure at the bridge seats to accommodate a new superstructure. The existing substructure is in satisfactory condition, and it is reasonable to assume that the existing substructure can safely carry anticipated traffic loads for an additional 40 years. The existing rail has not been tested to current crash testing criteria and as such its use is not approved by the Federal Highway Administration (FHWA) in this location. The existing vertical alignment is substandard in both sight distance requirements and minimum

"K values" for curves. An attempt will be made to improve these conditions as much as possible without increasing the impacts to the historic resources.

Through the use of Precast Bridge Units (PBUs) the construction process can be greatly expedited minimizing traffic impacts. The process works by closing a bridge for a short time frame (typically a week) and performing enough work to open the bridge to temporary traffic. The superstructure is then removed, and necessary repairs are made to the bridge seats of the existing abutments. Once the bridge seats are ready PBUs are set in place and grouted together to form the majority of the new superstructure. At this point barriers will be placed on the bridge to accommodate one-way traffic while the remainder of the bridge is assembled. In this case the work will include casting the flared portion of bridge deck and the bridge rail.

Advantages: This alternative will improve upon the existing conditions as much as possible while minimizing impacts to the historic resources, traveling public and local property owners. The goal will be to deliver a small scope project quickly that addresses the most serious structural concerns with the bridge. This alternative would address the structural deficiencies of the existing bridge.

Disadvantages: The Bridge would remain hydraulically inadequate and would still have a substandard horizontal alignment. Additionally, this option would have impacts to the historic properties in the project vicinity.

Alternative 2: Full Bridge Replacement On Alignment

Due to the constraints at the project site, the current horizontal alignment will be considered even though it is substandard. By maintaining the existing alignment, impacts to historic resources and adjacent properties will be minimized.

The Town had a number of considerations they wanted taken into account when designing the new bridge. These considerations included traffic issues through the corridor, the geometry of the bridge, ensuring that both sidewalks be replaced as well as the existing street lighting, and including bays that allow for the addition of water and sewer lines to the bridge at a later date. The existing horizontal and vertical curves to the alignment are too tight, and as such, the traffic concerns would not be addressed with an on alignment bridge option. While the bridge feels too narrow it exceeds the minimum standard. This is the product of the substandard alignment, the proximity of buildings to the roadway in this portion of the corridor, and a roadside parking lane replacing a standard shoulder. Widening the bridge would do little to improve the sight distance and require encroachment onto the historic resources located at the southwest wingwall.

This alternative would replace the existing bridge with a new superstructure as well as a new substructure at the existing location. The various considerations under this option include: the bridge width, length and skew, superstructure type, and substructure type.

a. Bridge Width

The current curb to curb width is 34 feet. This exceeds the minimum standard of 28 feet due to a widened sidewalk and a large shoulder to accommodate parking spaces before and after the bridge. Since a new 80+ Year Bridge is being proposed, the bridge geometry should meet the minimum standards. Since existing conditions exceed the minimum standard a typical section matching the corridor will be proposed. Thus, a minimum curb to curb width of 34 feet would be

proposed with an 8 foot sidewalk on the downstream end and a 5.5 foot sidewalk on the upstream end.

b. Bridge Length and Skew

The existing bridge is 46 feet long with a 3° skew matching the existing channel. This provides a clearspan normal to the channel of approximately 44 feet. This clearspan does not match the ANR bank full width requirement of 89 feet. Due to walls along the stream both upstream and downstream, it does not make sense to lengthen the structure to match the ANR bankfull width. A 46 foot length structure with a 3° skew is recommended in order to match the site constraints.

c. Superstructure Type

A cast in-place structure will be the preferred choice, due to the irregular geometry of the bridge superstructure. The most common 46 foot length bridge type that can accommodate an irregular geometry is a steel beam bridge with a composite concrete deck. The town has expressed a wish to maintain sidewalks on both sides of the bridge and that our project continues to have lighting along both sides of the bridge. Since these fixtures already exist and the town wishes to maintain them new sidewalks and lights will be installed. However the existing lights are placed on the existing concrete rail, such modifications would void the crash testing, as such; bulb outs for proposed light posts will need to be installed. The town has requested that a bay be designed for a future water line and another bay be designed for a future sewer line. This request will be passed along to the designers so that the request can be incorporated during the design phase.

d. Substructure Type

There is no visible bedrock in the location of the project. However, the site consists of gravel and cobbles along with large boulders. This may be conducive to spread footings. Borings should be taken at the project site, to determine if the subsurface is competent to support a concrete abutment on a spread footing at this location. Depending on the structural details chosen, it is possible that this option would require the removal of Feathers Discount as the store and the bridge share the foundation. Care should be taken not to disturb the hazardous waste site more than necessary for the project scope. The retaining wall in the southeast quadrant will be partially replaced.

e. Maintenance of Traffic

To accommodate the depth at which the work would take place which will encroach into the existing five way intersection an off-site detour would be the preferred method of traffic control at this site. Phased construction is not recommended in this location and will be ruled out.

Alternative 3: Full Bridge Replacement Off Alignment

It is recommended that any new structure would be placed on a new alignment that meets minimum design standards. Realigning the current roadway would extend the project limits by hundreds of feet along the corridor and along Water Street, Maple Street, and Memorial Square. This work would also have adverse impacts to adjacent properties including both historic resources at the site and, the Lake Region Senior Center and Feathers Discount Store. The annualized cost for a full bridge replacement is less expensive than the superstructure replacement options.

The Town had a number of considerations they wanted taken into account when designing the new bridge. These considerations included traffic issues through the corridor, the geometry of the bridge, ensuring that both sidewalks be replaced as well as the existing street lighting, and including bays that allow for the addition of water and sewer lines to the bridge at a later date. The current traffic issues in this area are the product of several problems. The existing horizontal and vertical curves to the alignment are too tight creating sight distance issues for people approaching the intersection from Main St or for those turning onto or off from Water St. A rehab option does not address this concern. While the bridge feels too narrow it exceeds the minimum standard. This is the product of the substandard alignment, the proximity of buildings to the roadway in this portion of the corridor, and a roadside parking lane replacing a standard shoulder. Widening the bridge would do little to improve the sight distance and require encroachment onto the historic resources located at the southwest wingwall.

This alternative would replace the existing bridge with a new superstructure as well as a new substructure on an improved alignment. The various considerations under this option include: the bridge width and length, skew, superstructure type, substructure type, and alignment.

a. Bridge Width

The current curb to curb width is 33'-0". This exceeds the minimum standard of 28 feet due to a widened sidewalk and a large shoulder to accommodate parking spaces before and after the bridge. Since a new 80+ Year Bridge is being proposed, the bridge geometry should meet the minimum standards. Since existing conditions exceed the minimum standard a typical section (50'-1" fascia to fascia) matching the corridor will be proposed, details can be found in the Appendix.

b. Bridge Length and Skew

With a new structure, the bridge span can be lengthened to better match the existing channel width and the alignment changed to meet minimum design standards. The existing bridge is 44 feet long and with 3° skew. This does not match the existing channel. The preferred substructure type is a reinforced concrete abutment. The abutment is assumed to be on footings, pending the results of a subsurface investigation. While it is recommended that the hydraulic opening be improved it is not advised that the bank full width span length be met. Instead it is recommended that a 55.8 foot span be placed more appropriately in accordance with the river layout. To do this the park at sta. 41+80 would be reduced in size. The western abutment will be placed radial to the alignment while the eastern abutment will have a 25° askew angle. Please note that this bridge length and skew are assumed based on a bridge in the current bridges location and will have to be evaluated at a later date if appropriate.

c. Superstructure Type

A cast in-place structure will be the preferred choice, due to the irregular geometry of the bridge superstructure. The most common 46 foot length bridge type that can accommodate an irregular geometry is a steel beam bridge with a composite concrete deck. The town has expressed a wish to maintain sidewalks on both sides of the bridge and that our project continues to have lighting along both sides of the bridge. Since these fixtures already exist and the town wishes to maintain them new sidewalks and lights will be installed. However the existing lights are placed on the

existing concrete rail, such modifications would void the crash testing, as such; bulb outs for proposed light posts will need to be installed. The town has requested that a bay be designed for a future water line and another bay be designed for a future sewer line. This request will be passed along to the designers so that the request can be incorporated during the design phase.

d. Substructure Type

There is no visible bedrock in the location of the project. However, the site consists of gravel and cobbles along with large boulders. This may be conducive to spread footings. Borings should be taken at the project site, to determine if the subsurface is competent to support a concrete abutment on a spread footing at this location. Depending on the structural details chosen, it is possible that this option would require the removal of Feathers Discount as the store and the bridge share the foundation. Care should be taken not to disturb the hazardous waste site more than necessary for the project scope. The retaining wall in the southeast quadrant will be partially replaced.

e. Alignment

Both the existing horizontal and vertical alignments are substandard. Currently they do not meet the minimum radius for a curve, minimum sight distance requirements or minimum "K values" for curves. These issues are compounded by the intersection off from the eastern end of the bridge. The alignment can be modified to accommodate current design minimum standards. By doing so, the section 4(f) park located in the southwest quadrant would be partially removed. Extra green space could be added to the northwest west quadrant in order to remedy this loss of green space.

f. Maintenance of Traffic

To accommodate the depth at which the work would take place which will encroach into the existing five way intersection an off-site detour would be the preferred method of traffic control at this site. Phased construction is not recommended in this location and will be ruled out.

V. Alternatives Summary

Based on the existing site conditions, bridge condition, and recommendations from hydraulics, there are two viable alternatives:

Alternative 1a: Superstructure Replacement with traffic Maintained on an offsite detour.
Alternative 1b: Superstructure Replacement with traffic phased through construction.
Alternative 1c: Hybrid Superstructure Replacement.
Alternative 2: Full Bridge Replacement On Alignment with traffic maintained on an offsite detour.
Alternative 3: Full Bridge Replacement Off Alignment with traffic maintained on an offsite detour.

VI. Cost Matrix[1]

Orleans Village BF 0310(7)		Do Nothing	Alt 1a	Alt 1b	Alt 1c	Alt 2	Alt 3
			Superstructure Replacement			Full Bridge Replacement – ON Alignment	Full Bridge Replacement – OFF Alignment
			Offsite Detour	Phased	Hybrid	Offsite Detour	Offsite Detour
COST	Bridge Cost	$0	$518,000	$587,200	$587,200	$1,329,500	$1,437,000
	Removal of Structure	$0	$25,000	$35,000	$25,000	$70,000	$70,000
	Roadway	$0	$530,000	$601,950	$586,700	$617,400	$760,000
	Maintenance of Traffic	$0	$53,500	$124,750	$148,500	$53,500	$53,500
	Construction Costs	$0	$1,126,500	$1,348,900	$1,347,400	$2,070,400	$2,320,500
	Construction Engineering + Contingencies	$0	$337,950	$404,670	$404,220	$621,120	$696,150
	Total Construction Costs w CEC	**$0**	**$1,464,450**	**$1,753,570**	**$1,751,620**	**$2,691,520**	**$3,016,650**
	Preliminary Engineering[2]	**$0**	**$394,275**	**$472,115**	**$471,590**	**$621,120**	**$696,150**
	Right of Way	**$0**	**$70,000**	**$70,000**	**$70,000**	**$370,000**	**$370,000**
	Total Project Costs	$0	$1,928,725	$2,295,685	$2,293,210	$3,682,640	$4,082,800
VILLAGE SHARE	$Value (% of total)	$0	$48,220 (2.5%)	$114,780 (5%)	$57,330 (2.5%)	$184,130 (5%)	$204,140 (5%)
SCHEDULING	Project Development Duration[3]		4 years	4 years	4 years	6 years	6 years
	Construction Duration		3 months	6 months	4 months	18 months	18 months
	Closure Duration (If Applicable)		4 weeks	N/A	1 week	6 Months	6 Months
ENGINEERING	Typical Section - Roadway (feet)	34'	34'	34'	34'	34’	34’
	Typical Section - Bridge (feet)	8 (sidewalk)-6-11-11-4-5.5 (sidewalk)	8 (sidewalk)-6-11-11-4-5.5 (sidewalk)	8 (sidewalk)-6-11-11-4-5.5 (sidewalk)	8 (sidewalk)-6-11-11-4-5.5 (sidewalk)	8 (sidewalk)-6-11-11-4-5.5 (sidewalk)	8 (sidewalk)-6-11-11-4-5.5 (sidewalk)
	Geometric Design Criteria	Substandard Horizontal and Vertical Alignment	Substandard Horizontal and Vertical Alignment	Substandard Horizontal and Vertical Alignment	Substandard Horizontal and Vertical Alignment	Substandard Horizontal and Vertical Alignment	Substandard Vertical Alignment
	Traffic Safety	No Change	Improved	Improved	Improved	Improved	Improved
	Alignment Change	No	No Change	No Change	No Change	No Change	Horizontal Alignment Improved
	Bicycle Access	No Change	No Change	No Change	No Change	No Change	No Change
	Hydraulic Performance	No Change	Improved	Improved	Improved	Improved	Improved
	Pedestrian Access	No Change	No Change	No Change	No Change	No Change	No Change
	Utility	No Change	Relocation	Relocation	Relocation	Relocation	Relocation
OTHER	ROW Acquisition	No	Yes	Yes	Yes	Yes	Yes
	Road Closure	No	Yes	No	Yes	Yes	Yes
	Design Life	<10 years	40 years	40 years	40 years	80 years	80 years

[1] Costs are estimates only, used for comparison purposes.
[2] Preliminary Engineering costs are estimated starting from the end of the Project Definition Phase.
[3] Project Development Durations are staring from the end of the Project Definition Phase.

VII. Conclusion

We recommend **Alternative 1a**; to replace the existing superstructure while maintaining traffic on an offsite detour.

Structure:

Currently the superstructure is in poor shape while the substructure is in satisfactory condition and should last the life cycle of a new superstructure. A full replacement would have significant changes to the village setting, impacting multiple historic resources including the village green. As part of a full replacement of the bridge a new alignment meeting design minimum standards would in turn be used raising the grade of the Memorial Drive, Maple St, Water St. and Route 58 intersection. This would extend the project down these corridors as well greatly increasing the size of this project. Due to the poor shape of the superstructure, site constraints and the additional time permitting a full replacement option would take, replacing just the superstructure is recommended. The existing abutments are rated as stable for scour in the bridge inspection report with no visible signs of scour so no scour study or scour mitigation is anticipated in the scope of this project. There are obvious cracks in the existing laid up stone wall within and beyond the vicinity of the bridge. Crack investigation and repair should be limited to the immediate area of the bridge with repairs consisting repointing, epoxy injection or equivalent.

Town Concerns:

The Village's primary concerns are the curve of the bridge and the narrow feel of it. The bridge is in fact wider than minimum standards for the corridor. The issue has more to do with the tight radius and congestion caused by parking along both sides of the road south of the bridge. The radius cannot be corrected without performing a larger, lengthier, and more expensive project that will have a significant impact upon the current streetscape. While a Rehabilitation project does not address the towns concerns listed, given the poor nature of the current superstructure, a small superstructure replacement project that will rectify the structural concerns quickly is a prudent approach. The town has also requested that any new structure have bays able to accommodate future expansion of the municipal water and sewer systems as well as replacing the current lighting on the four corners of the bridge rail. The request to accommodate said load can be carried on to the designer at that stage of the process and lights can be mounted on bulb outs along the fascia as to avoid modifying crash tested rail options.

Traffic Control:

It is recommended that traffic be maintained on an offsite detour. The regional detour for this project location would add approximately 29.6 miles to the through route, and have an end-to-end distance of 36.2 miles. However, there is a local bypass route which would most likely be used by local traffic. This route adds 0.4 miles to the through route, and has an end-to-end distance of 1.2 miles. The duration of the closure would be approximately four weeks. This detour length is relatively short. Therefore, it is reasonable to close the road and reroute traffic while the new superstructure is constructed. By not maintaining traffic with phasing, both the project development time and the project cost are reduced. Additionally, by closing the bridge to traffic during construction, the local share is reduced by 50%.

VIII. Appendices

- Site Pictures
- Town Map
- Bridge Inspection Report
- Hydraulics Memo
- Preliminary Geotechnical Information
- Natural Resources Memo
- Archaeology Memo
- Historic Memo
- ANR Hazardous Site Listing
- Site Management Activity Completion Memo
- Resource ID Completion Memo
- Utilities Layout Plan
- Local Input (if town bridge)
- Detour Route
- Plans
    - Proposal
        - Existing Conditions Layout
        - Existing Conditions Profile
        - Alternate 1 Typical Section
        - Alternate 1A Layout
        - Alternate 1B Phasing Layout
        - Alternate 1C Typical Section
        - Alternate 1C Phasing Layout
        - Alternate 2 Typical Section
        - Alternate 2 Layout
        - Alternate 2 Profile
        - Alternate 3 Typical Section
        - Alternate 3 Layout
        - Alternate 3 Profile

Looking at Eastward Bridge Approach

Looking East at Bridge Location

Looking West at Bridge Location

Looking at Westward Bridge Approach

End of Bridge at Abutment 2

Bridge Rail Deterioration

Bridge Rail Deterioration

Deterioration of Northern Fascia

Deterioration of Southern Fascia

Deterioration of Southern Fascia

Existing Laid up Stone Abutment
and Substandard Approach Rail

Existing Laid up Stone Abutment

Existing Laid up Stone Abutment

Existing Laid up Stone Abutment

Existing Laid up Stone Abutment

Existing Laid up Stone Abutment

Spalling of Existing Bridge Deck

Spalling of Existing Bridge Deck

Spalling of Existing Bridge Deck

Spalling of Existing Bridge Deck

Communication Lines under Existing Bridge Deck

Spalling of Existing Bridge Deck

Efflorescence of Existing Bridge Deck and Beams

Efflorescence of Existing Bridge Beams

Spalling of Existing Bridge Beams

Spalling of Existing Bridge Beams

Cracking of Existing Diaphragms

Cracking of Existing Diaphragms

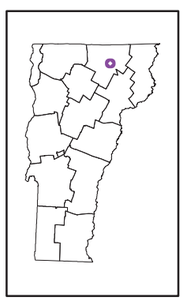
ORLEANS VILLAGE,
TH 1(VT 58), BR 10.

Scale 1:7,608

N

- INTERSTATE
- STATE LONG
- STATE SHORT
- TOWN LONG
- FAS/FAU
- FAS/FAU HWY
- INTERSTATE
- STATE HIGHWAY
- CLASS 1
- CLASS 2
- CLASS 3
- CLASS 4
- LEGAL TRAIL
- PRIVATE
- DISCONTINUED
- DISTRICT
- POLITICAL BOUNDARY
- NAMED RIVERS-STREAMS
- UNNAMED RIVERS-STREAMS

Produced by:
Mapping Unit
Vermont Agency of Transportation
August 2011



ORLEANS VILLAGE
ORLEANS COUNTY
DISTRICT # 9

STRUCTURE INSPECTION, INVENTORY and APPRAISAL SHEET

Vermont Agency of Transportation ~ Structures Section ~ Bridge Management and Inspection Unit

Inspection Report for ORLEANS VILLAGE **bridge no.:** 00010 **District:** 9

Located on: VT 00058 ML **over** BARTON RIVER **approximately** 0.3 MI E JCT. U.S.5 **Owner:** 03 TOWN-OWNED

CONDITION

Deck Rating: 4 POOR

Superstructure Rating: 6 SATISFACTORY

Substructure Rating: 6 SATISFACTORY

Channel Rating: 8 VERY GOOD

Culvert Rating: N NOT APPLICABLE

Federal Str. Number: 200310001010022

Federal Sufficiency Rating: 086.3

Deficiency Status of Structure: SD

AGE and SERVICE

Year Built: 1933 **Year Reconstructed:** 1948

Service On: 5 HIGHWAY-PEDESTRIAN

Service Under: 5 WATERWAY

Lanes On the Structure: 02

Lanes Under the Structure: 00

Bypass, Detour Length (miles): 19

ADT: 003700 **% Truck ADT:** 06

Year of ADT: 1998

GEOMETRIC DATA

Length of Maximum Span (ft): 0044

Structure Length (ft): 000046

Lt Curb/Sidewalk Width (ft): 8

Rt Curb/Sidewalk Width (ft): 5

Bridge Rdwy Width Curb-to-Curb (ft): 33

Deck Width Out-to-Out (ft): 48.5

Appr. Roadway Width (ft): 033

Skew: 10

Bridge Median: 0 NO MEDIAN

Min Vertical Clr Over (ft): 99 FT 99 IN

Feature Under: FEATURE NOT A HIGHWAY OR RAILROAD

Min Vertical Underclr (ft): 00 FT 00 IN

STRUCTURE TYPE and MATERIALS

Bridge Type: CONCRETE T-BEAM

Number of Approach Spans: 0000 **Number of Main Spans:** 001

Kind of Material and/or Design: 1 CONCRETE

Deck Structure Type: 1 CONCRETE CIP

Type of Wearing Surface: 6 BITUMINOUS

Type of Membrane 2 PREFORMED FABRIC

Deck Protection: 0 NONE

APPRAISAL *AS COMPARED TO FEDERAL STANDARDS

Bridge Railings: 0 DOES NOT MEET CURRENT STANDARD

Transitions: 0 DOES NOT MEET CURRENT STANDARD

Approach Guardrail: 0 DOES NOT MEET CURRENT STANDARD

Approach Guardrail Ends: 0 DOES NOT MEET CURRENT STANDARD

Structural Evaluation: 6 EQUAL TO MINIMUM CRITERIA

Deck Geometry: 4 MEETS MINIMUM TOLERABLE CRITERIA

Underclearances Vertical and Horizontal: N NOT APPLICABLE

Waterway Adequacy: 7 SLIGHT CHANCE OF OVERTOPPING BRIDGE & ROADWAY

Approach Roadway Alignment: 7 BETTER THAN MINIMUM CRITERIA

Scour Critical Bridges: 8 STABLE FOR SCOUR

DESIGN VEHICLE, RATING, and POSTING

Load Rating Method (Inv): 5 NO RATING ANALYSIS PERFORMED

Posting Status: A OPEN, NO RESTRICTION

Bridge Posting: 5 NO POSTING REQUIRED

Load Posting: 10 NO LOAD POSTING SIGNS ARE NEEDED

Posted Vehicle: POSTING NOT REQUIRED

Posted Weight (tons):

Design Load: 2 H 15

INSPECTION and CROSS REFERENCE

X-Ref. Route:

Insp. Date: 052011 **Insp. Freq. (months)** 24 **X-Ref. BrNum:**

INSPECTION SUMMARY and NEEDS

5/24/2011 Structure should have a full deck replacement in the near future. ~FRE/DCP

05/19/2009 - Deck is generally poor with localized areas of advanced deterioration. Consider 5" thick reinforced concrete overlay or additional full depth bay replacement. Prestressed slab or box units would also be desirable. Even with the ailing deck, the superstructure and substructure still have many years of service life remaining. - MJ/DS

VT AGENCY OF TRANSPORTATION PROGRAM DEVELOPMENT DIVISION

HYDRAULICS UNIT

TO: Chris Williams, Structures Project Manager

FROM: Ryan Lizewski, Hydraulics Project Engineer (VHB)
via Nick Wark, VTrans Hydraulic Engineer

DATE: July 16, 2013

SUBJECT: ORLEANS VILLAGE - BF-0310(7),VT 58 BR 10 over the BARTON RIVER

We have completed our preliminary hydraulic study for the above referenced site, and offer the following information for your use:

Existing Bridge Information

The original bridge was constructed in 1933 and rebuilt in 1948 based on available information. The bridge is a 2-lane single span concrete T-beam bridge. The total width of bridge is approximately 45 feet normal to the roadway. The total span for the structure between the abutment faces is approximately 44 feet, normal to the roadway. The existing bridge has a skew of approximately 0 degrees to the river at this location. The total existing superstructure depth is approximately 4 feet based on record plans. The existing abutments were constructed of granite blocks with unknown foundations. These abutments are orientated parallel with the stream channel at this location. The approximate maximum height to the bottom of the superstructure to the streambed varies but is approximately 13 feet on the upstream side. The streambed appears to consist of gravel and cobbles with boulders armoring both banks based on field and photographic observation conditions in the area. The bridge is located on the Barton River approximately 2,600 feet upstream of the confluence with the Willoughby River. The existing bridge will pass the Q_{100} storm event and overtop during larger storm events based on our preliminary project HEC-RAS model. However, based on the field survey and field investigation, the lowest depression along Route 58 is upstream from the bridge crossing. As a result, the Barton River will overtop Route 58 in the Q_{100} storm even though the river may not overtop the bridge. The existing bridge does not meet the hydraulic standard as it does not have sufficient freeboard during the Q_{50} storm. We did not evaluate the scour for the existing conditions or any proposed bridge configurations as part of the preliminary design. Scour calculations will be performed during final hydraulics.

Recommendations

The bridge option selection criteria should provide a bridge opening that does not restrict the bank full width, nor provide an unrealistic widening, of the existing channel, or create any worse backwater flooding conditions than the existing conditions. The VANR Bank Full Width (BFW) equation estimates the width to be approximately 89 feet, but the actual field conditions have varying bank full stream widths within the study reach between 35 to 50 feet.

It has been assumed that if the existing bridge is replaced a replacement structure will be located in the existing roadway alignment having the same basic surface geometry based on the site constraints. For a replacement structure, we have anticipated that the proposed abutments will be similar to the existing vertical face granite blocks abutments.

Based on our analysis, meeting the hydraulic standard will not be practicable due to unrealistic widening and significant impacts to surrounding properties and roadways give the village setting.

Options to meet the hydraulic standard would require widening the existing 44-ft span to a minimum 90-ft span or by raising the roadway profile by 4-ft.

Other options include installation of a thinner replacement bridge deck in place of the existing 4-ft superstructure and minor widening of the northern abutment. Minor widening of the northern bridge abutment will provide reduction in river stages for all storm events but will still not meet the hydraulic standard nor span the VANR BFW. Figure 1, attached, depicts this option. Ultimately ANR and the COE will sign off on the span length and we would recommend early coordination if anything less than the 89 foot span is selected.

As noted above, scour was not reviewed during the preliminary design. However based on the velocities from the analyses, it is anticipated that Type 3 or larger Stone Fill will be necessary for armoring the abutments and disturbed channel banks near the replacement structure. Stone fill sizing will be verified during final hydraulic design.

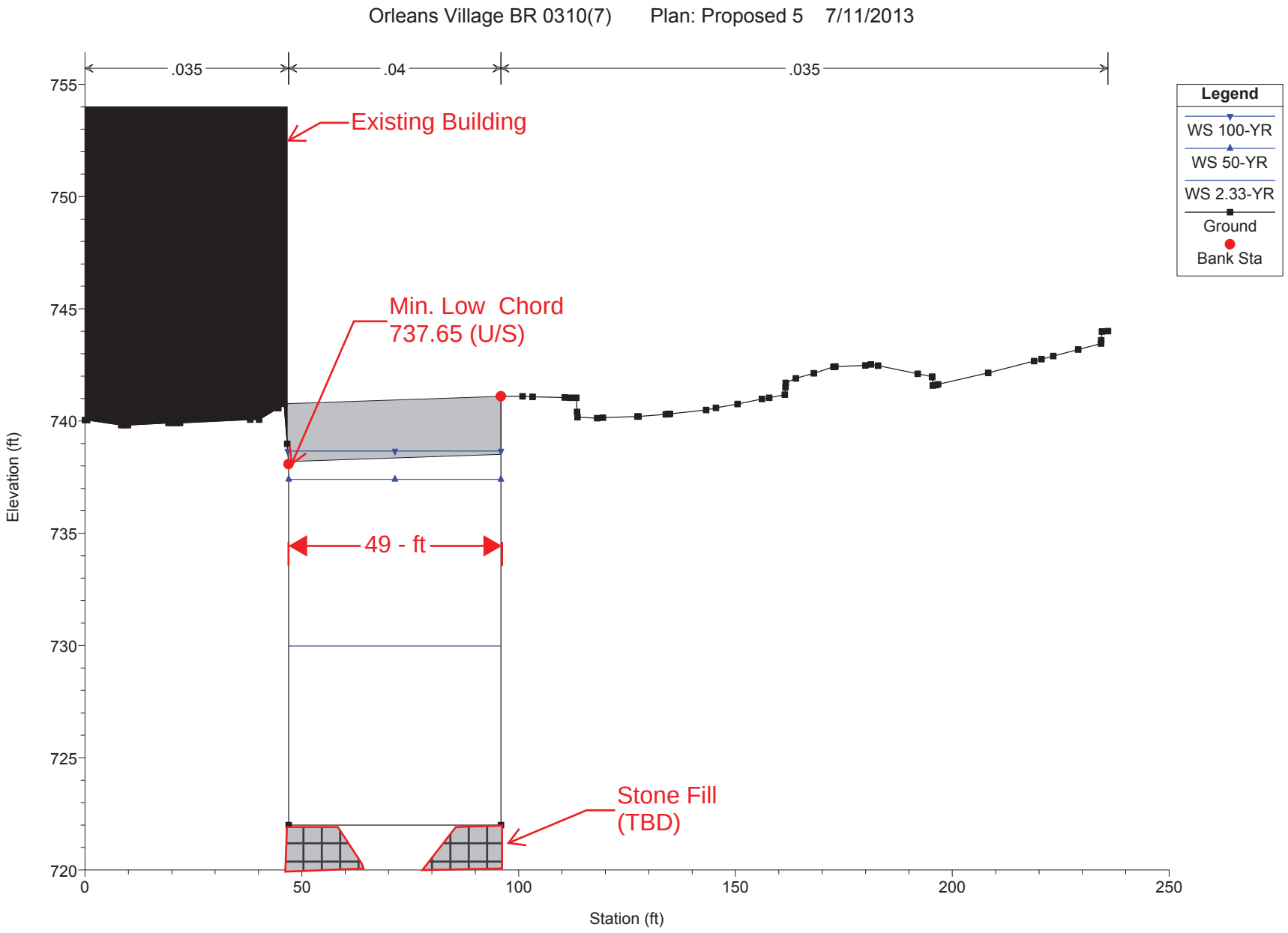
Temporary Bridge

As part of this analysis we did not size a temporary bridge. If a temporary bridge is determined to be necessary let us know and we will work with you to size one.

Please contact us if you have any questions or if we may be of further assistance.

cc: Hydraulics Project File via NJW
Hydraulics Chrono File

FIGURE 1


Orleans Village BR 0310(7)
Plan: Proposed 5
7/11/2013
.035
.04
.035
Existing Building
Min. Low Chord
737.65 (U/S)
49 - ft
Stone Fill
(TBD)
Legend
WS 100-YR
WS 50-YR
WS 2.33-YR
Ground
Bank Sta
Elevation (ft)
Station (ft)
755
750
745
740
735
730
725
720
0
50
100
150
200
250

AGENCY OF TRANSPORTATION **OFFICE MEMORANDUM**

To: Chris Williams, P.E., Structures Project Manager

MLM

From: Marcy Meyers, Geotechnical Engineer, via Christopher C. Benda, P.E., Soils and Foundations Engineer

CCB

Date: June 12th, 2013

Subject: Orleans Village BF 0310(7) – BR #10 Preliminary Geotechnical Information

1.0 INTRODUCTION

We have completed our preliminary geotechnical investigation for the replacement of Bridge #10 on VT 58 crossing over the Barton River, located in Orleans Village, VT. The subject project consists of replacing the existing single-span, concrete T-beam bridge. This report documents our initial search of historical information to determine the characteristics of the site. A number of materials were reviewed including: VTrans boring files and record plans, Agency of Natural Resources (ANR) Natural Resources Atlas, USDA Surficial Geologic maps and VTrans Bridge Inspection Photos.

2.0 SUBSURFACE INFORMATION

2.1 Previous Projects

No record plans were found on the DPR website, however scanned copies of 6 out of 10 pages of the original plans were found in the Z-drive Structures Folder for the subject project. According to these pages, the original bridge was constructed in 1946. Additional surrounding projects were searched for in the Soils & Foundations' GIS based historical record of subsurface investigations which contains electronic records for the majority of borings completed in the past 10 years. An exploration of this map revealed six borings drilled for the Barton (Orleans) BRO 1449(29) project (located approximately 0.5 miles from the subject project). Information for this project revealed a mix of silty sand and gravelly sand overlain by a shallow bedrock layer. Boulders were encountered in two of the borings.

2.2 Water Well Logs & USDA Soil Survey

The Agency of Natural Resources (ANR) documents and publishes all water wells that are drilled for residential or commercial purposes. Published online, the logs can be used to determine general characteristics of soil strata in the area. Based on subsurface information reported by well drilling reports on file at ANR and the USDA web soil survey, the surficial geology in the vicinity of the subject area is expected to consist of a mix of sand, silt, and gravel.

Figure 1 contains the project, surrounding well locations, surrounding hazardous waste sites and waste generators, and Barton (Orleans) BRO 1449(29) project used to estimate general soil strata characteristics. It should be noted that a hazardous waste site is located approximately 50 feet from the subject project, as depicted by a red arrow. The specific wells used to gain information on the subsurface conditions are highlighted by a red box. Two water wells within an approximate 1250 ft radius were used to get an estimate of the depth to bedrock likely to be encountered for the project.

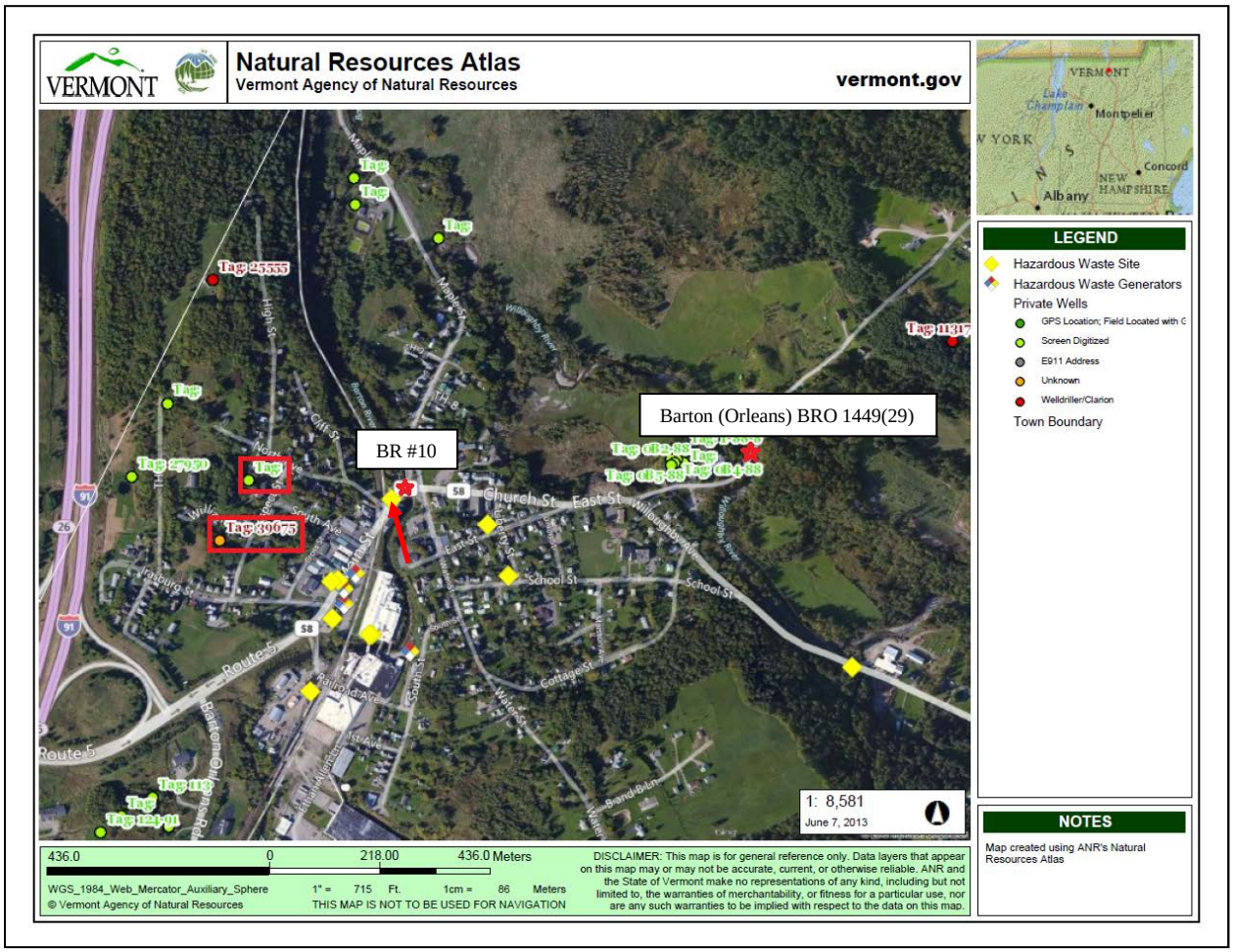


Figure 1. Highlighted Well Locations and Referenced Project near Bridge #10

Table 1 lists the well sites used in gathering the surrounding information and includes the approximate distance from the bridge project and depth to bedrock.

Table 1. Depths to Bedrock and Subsurface Strata of Surrounding Sites

Well Number	Approximate Distance From Project (feet)	Depth To Bedrock (feet)
N/A	1015	35
39675	1250	40

Information from these wells suggests the possibility of encountering shallow bedrock at the project area. Information about the bedrock, taken from the ANR Natural Resource Atlas, indicates "dark-gray to silvery-gray, lustrous, carbonaceous muscovite-biotite-quartz (+/-garnet) phyllite containing abundant beds of punky-brown-weathering, dark-bluish-gray micaceous quartz-rich limestone in beds ranging from 10 cm to 10 m". Based on the USDA Soil Map, the soils to be encountered at the project location are classified as a mix of Vershire-Lombard complex, fine sandy loam and rocky and Urban land-Adams-Nicholsville complex, fine sand. Both of which are moderately well draining to well draining and have a depth to water table of greater than 80 inches. The Vershire-Lombard complex has a depth to bedrock of approximately 20 to 40 inches while the Urban land-Adams-Nicholsville complex has a depth to bedrock of over 80 inches.

2.4 Bridge Inspection Photos

Based on the latest bridge inspection photos from May 2011, it appears that part of the stone wall on the southern abutment has cracked and settled, as seen in Figure 2.

Figure 2. Broken Stone under Southern Abutment

No visible erosion or undermining was evident on either abutment.

FIELD OBSERVATIONS

A preliminary site visit was conducted on June 11th, 2013 to determine possible obstructions inhibiting boring operations and other site information pertaining to various construction considerations. Information from this visit indicated power lines located with close proximity to the bridge, as seen in Figure 3.

Figure 3. Power Lines Located Close to Bridge

In addition to power lines, the subject bridge is surrounded by buildings along the southern abutment, and has very little access from the southwestern corner, as seen in Figure 4.

Figure 4. Surrounding Buildings along Southwest Corner of Bridge

No visible bedrock outcrops were seen in the area; however, boulders and cobbles were evident throughout the stream bed, as seen in Figure 5.

Figure 5. Boulders and Cobbles Evident in Stream Bed

No visible stream bank erosion was evident due to the boulders and rip rap lining the banks.

3.0 RECOMMENDATIONS

Based on this information, possible foundation options for a bridge replacement include the following:

- Pile caps on a single row of H-Piles
- Reinforced concrete abutments on spread footings or H-Piles

We recommend a minimum of two borings be taken at opposite corners of the proposed bridge, in order to more fully assess the subsurface conditions at the site including, but not limited to, the soil properties, groundwater conditions, and depth to bedrock. If shallow bedrock is present, borings should be performed at all four corners of the bridge to get an idea of the bedrock profile across the abutment.

5.0 CONCLUSION

If you have any questions or would like to discuss this report, please contact us by phone at (802) 828-6911.

cc: WEA/Read File
CCB/Project File
MLM

AGENCY OF TRANSPORTATION **OFFICE MEMORANDUM**

TO: Jeff Ramsey, Environmental Specialist

FROM: John Lepore, Transportation Biologist

DATE: May 16, 2013

SUBJECT: BARTON B_O 0310 (7)
VT 58, Bridge 10 over Barton River
Natural Resource ID & Comments

The initial resource identification for this project was conducted on April 25, 2013 and based on that, which included a site visit. I have concluded that the only regulated natural resource in the immediate area of Bridge 58 is the Barton River itself. This structure was reviewed in 2010 for a deck replacement, and more recently for D9 to perform a repair on the upstream retaining wall.

Bridge 10 is in a highly confined channel in this location (retaining walls) and is surrounded by urbanized development. If the hydraulic opening remains equal to or greater than the existing structure, I don't see any concerns for natural resources. As for a temporary bridge, if one is needed, placing it on either side of the existing structure would not be an issue, as long as it spans the limits of Ordinary High Water in entirety.

If you have any questions about this, call me at 828-3963.

VERMONT

Jeannine Russell
VTrans Archaeology Officer
State of Vermont
Environmental Section
One National Life Drive
Montpelier, VT 05633-5001
www.aot.state.vt.us

Agency of Transportation

[phone] 802-828-3981
[fax] 802-828-2334
[ttd] 800-253-0191

To: Jeff Ramsey, VTrans Environmental Specialist

From: Jeannine Russell, VTrans Archaeology Officer
via Brennan Gauthier, VTrans Assistant Archaeologist

Date: 5/9/2013

Subject: Orleans(Barton) BF 0310(7) – Archaeological Resource ID

Jeff,

A field visit was conducted on 4/25/2013 as part of the 2013 PIIT project package in order to assess archaeological sensitivity in the project area. Given the amount of historic buildup in the project area as well as the lack of undisturbed landforms, I've concluded that there are *no archaeological resources of concern* in the APE. Physical impacts to historic structures in the area may involve archaeological issues, but this will likely be addressed by the Historic Preservation section. As always, feel free to contact me with any questions or concerns that may arise as part of this project.

Sincerely,

Brennan

Brennan Gauthier
VTrans Archaeologist
Vermont Agency of Transportation
Program Development Division
Environmental Section
1 National Life Drive
Montpelier, VT 05633
tel. 802-828-3965
Brennan.Gauthier@state.vt.us

VTrans Working to Get You There
Vermont Agency of Transportation

Orleans Village (Barton) BF 0310(7) Historic Resource ID

O'Shea, Kaitlin

Sent: Tuesday, May 14, 2013 9:11 PM

To: Ramsey, Jeff

Cc: Newman, Scott; Williams, Chris

Hi Jeff,

The historic resource ID for Orleans Village BF 0310(7) is complete. Bridge 10 is a historic bridge, significant for its railing. Contributing features to the bridge include granite block abutments and wing walls. The bridge is located in the Orleans Village Historic District, which extends to Maple Street, Church Street, and Water Street. The contributing historic properties have been mapped in Arcmap and bookmarked under the project name.

Note on this project that there is a unique resource - the park in between Water and Maple Streets. It has been identified as a Section 4(f) resource, as well as contributing to the historic district.

Let me know if you have any questions.
Thanks,

Kaitlin

Kaitlin O'Shea
Historic Preservation Specialist
Program Development - Environmental Section
Vermont Agency of Transportation

One National Life Drive
Montpelier VT 05633

office: 802-828-3962
fax: 802-828-2334

Kaitlin.O'Shea@state.vt.us

VT DEC

Hazardous Site List

Help & Definitions

Enter the search criteria below and click the [Search] button when done. (Search will display a maximum of 500 results)

Site# 20012938 | Site Name

Site Town | List Towns | Address

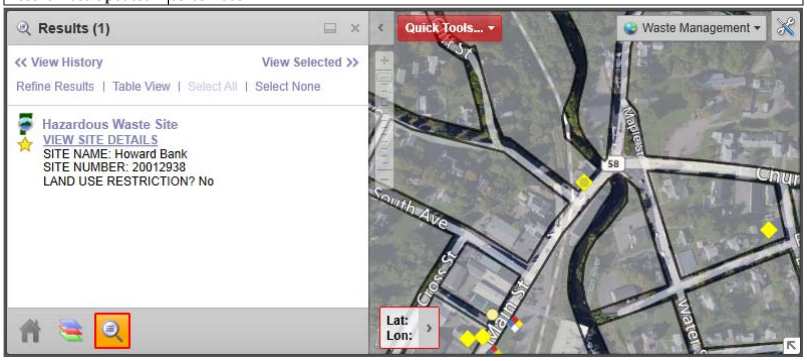
Primary Consultant | List Consultants

Priority: All

(•) All Sites ( ) Active Sites ( ) Inactive Sites

Search | Search Tips

Site Name	Howard Bank
Address	Main St
Town	Barton
Site Use	Business
Site Number	20012938
DEC Manager	Unassigned
Priority	SMAC - Site Management Activities Completed
Site Status	
Project Status	Underground storage tank removed. Contamination found. Investigation needed. No receptors impact. 3 VOC found below guidelines. SMAC
Source of Contamination	UST-Heating Oil
Contaminant	
Institutional Control	
Site Closure Date	04-12-2002
DEC Contact Email Address	Chuck.Schwer@state.vt.us
Record Last Updated	05-09-2005



Online Site Reports

Report
20012938smac.pdf

*The documents listed above do not represent a comprehensive list of available site reports. To view additional site files, please schedule a file review by calling 802-828-1138.

Relationships

	Type	ID 1	ID 2	Staff
View	Hazsite	20012938		Unassigned

*Relationships cited depict connections that this site has with other programs within the Waste Management and Prevention Division. This currently applies to hazardous sites, spills and underground storage tank facilities.

Back

Export All Hazsites to Excel

State of Vermont

Department of Fish and Wildlife
Department of Forests, Parks and Recreation
Department of Environmental Conservation
State Geologist
RELAY SERVICE FOR THE HEARING IMPAIRED
1-800-253-0191 TDD>Voice
1-800-253-0195 Voice>TDD

AGENCY OF NATURAL RESOURCES
Department of Environmental Conservation
•Waste Management Division
103 South Main Street/West Office
Waterbury, Vermont 05671-0404
(802) 241-3888
FAX (802) 241-3296

~~December 4, 2001~~
April 12, 2002

Mr. Wayne Snay
The Howard Bank
161 St. Paul Street
Burlington, Vermont 05401

RE: Site Management Activity Completed at the Howard Bank, Orleans, Vermont (SMS # 2001-2938)

Dear Mr. Snay:

The Sites Management Section (SMS) has completed a file review, for the above referenced site, referencing the contamination discovered during the closure in place of one (1) 1,000 gallon fuel oil underground storage tank (UST), at the Howard Bank, Orleans, Vermont. With this information the SMS can now make the following determination:

- On September 21, 2001 petroleum contaminated soils were encountered during the closure in place of one (1) 1,000 gallon fuel oil UST.
- Screened soils from beneath the UST, at a depth of approximately 4.0 feet, had peak volatile organic compounds (VOCs) concentrations up to 55.4 parts per million (ppm) as measured by a photoionization detector (PID).
- No groundwater was encountered to a depth of approximately 4.0 feet below ground surface (fbgs), and no free product or bedrock was observed to depth.
- Two confirmatory soil samples were collected directly beneath the UST for laboratory analysis. One grab sample was collected from the eastern end of the tank and one composite of two grab samples was collected from the western end of the tank.
- The grab sample and composite sample were analyzed for VOCs using EPA Method 8021B and Total Petroleum Hydrocarbons (TPH) diesel range organics using EPA Method 8015DRO.
- Laboratory analysis of the soil samples collect beneath the tank identified the presence of three VOC compounds and TPH. The concentrations of napthalene, 1,3,5-trimethylbenzene, and 1,2,4-trimethylbenzene. were below the EPA Region 9 Risk-based Concentration levels. TPH concentrations were below the recommenced guidelines.
- Drinking water for the site and surrounding properties is provided by a municipal system.
- No nearby receptors appear to be impacted by the former UST, and PID screening of the basement of the Howard Bank and nearby catch basins were non-detect.
- No unacceptable risk to human health and the environment is present due to the residual contamination remaining in the ground form the contaminated soils encountered during the removal of one (1) 1,000 gallon fuel oil UST at the Howard Bank, in Orleans, Vermont, in September 2001.

Based on the above, the SMS is assigning this site a Site Management Activity Completed (SMAC) designation. This SMAC designation will not release the Howard Bank from any past or future liability associated with the petroleum contamination at the site. It does, however, mean the SMS is not requesting any additional work in response to the UST closure in place at the Howard Bank in September of 2001.

Please feel free to call with any questions. I can be reached at (802) 241-3491.

Sincerely,

George Desch, Chief, P.E.
Sites Management Section

cc: DEC Regional Office
Robert Ross, Ross Environmental Associates, Inc.

OFFICE MEMORANDUM

AOT - PROGRAM DEVELOPMENT DIVISION

RESOURCE IDENTIFICATION COMPLETION MEMO

TO: Chris Williams, Project Manager
FROM: Jeff Ramsey, Environmental Specialist
DATE: May 20, 2013
PIN: 13J084

Project: ORLEANS (BARTON) BF 0310 (7)

ENVIRONMENTAL RESOURCES:

Wetlands:	___	Yes	X	No
Historic/Historic District:	X	Yes	___	No bridge and historic district
Archaeological Site:	___	Yes	X	No
4(f) Property:	X	Yes	___	No historic district and park between Water and Maple Streets
6(f) Property:	___	Yes	X	No
Agricultural Land:	X	Yes	___	No prime to the south, but highly developed area
Fish & Wildlife Habitat:	X	Yes	___	No Barton River
Endangered Species:	___	Yes	X	No
Hazardous Waste:	X	Yes	___	No Howard Bank UST removed, soil contamination, SMAC 20012938
Stormwater:	___	Yes	X	No
USDA-Forest Service Lands:	___	Yes	X	No
Wildlife Habitat Connectivity:	___	Yes	X	No
Scenic Highway/ Byway:	___	Yes	X	No
Act 250 Permits:	___	Yes	X	No

If you have any questions or need additional information please let me know.
Thanks,
Jeff

cc:
Project File

SEWER

WATER

BURIED CABLE/FIBER OPTIC

All Electric Lines (Aerial) owned by Orleans Village Electric

2 SEWER MAINS CROSS RIVER

8" SEWER AND 4" FORCE MAIN

SMH Aerial Electric and Aerial Telephone Cables (FairPoint and Comcast)

8" SEWER

SMH

8" SEWER

SMH

BENCH MARK
CGS W2
ELEV. = 739.69

BENCH MARK
TOP OF BOLT
AT BURY 7-0
ELEV. = 742.76

BARTON RIVER
FLOW

PI
STA 52+00.00

PAVED DRIVE

VENT PIPES

SEWER MANHOLE

COMB E UNDERGROUND

DI

18" PVC FLOW

STA 52+54.

SIGN RI-1

SIGN XX-X (BR 10 VT 58)

STREET LIGHT MOUNTED ON BRIDGE RAIL

STA 41+23.55

8" W.L.

Drainage Manhole

CHAIN LINK FENCE

LIGHT POLE

GATE VALVE

HYDRANT

12" PVC FLOW

8" W.L.

Telephone

Abandoned Water Main

UT (Fiber) (Copper)

8" SEWER

MEMORIAL SQUARE

SIGN VETERANS MEMORIAL

Abandoned 8" W.L.

8" W.L.

Abandoned 8" W.L.

TH-2 MAPLE ST

MW SIGN 0580 RI-1 1002 0038

SIGN XX-X XX-X

SIGN XX-X (MAIN ST) XX-X (MAPLE ST) XX-X

TELEPHONE MANHOLE

EL

SIGN RI-1 MW 0580 1002 0032

ROB

STA 39+92.06

COMB E

SIGN RI-1 XX-X (NORTH MW) XX-0580 (MAIN 1002 0034

SEWER MANHOLE

PAVED DRIVE

SEWER MANHOLE

8" SEWER

DI

SEWER MANHOLE

TH-1 (VT 58) MAIN ST. TO IRASBURG

WASHINGTON COUNTY RAILROAD

39+00

39+50+00

41+00

42+00

43+00

52+00

CURVE (1)
DELTA = 8° 19' 55"
D = 5° 43' 46"
R = 1000.00'
T = 72.84'
L = 145.42'
E = 2.65'

PC STA 40+50.71

6" SEWER SERVICE

PROPANE TANKS

SIGN XX-X (BR 10 VT 58)

STREET LIGHT MOUNTED ON BRIDGE RAIL

PT STA 41+86.13

PC STA 42+07.94

PT STA 42+29.66

CHAIN LINK FENCE

Aerial E and 2 Black Cables

PI
STA 50+00.000

UNKNOWN UNDERGROUND

SIGN RI-1 XX-X

COMB UNDERGROUND

GRAVEL DRIVE

8" W.L.

Could not get under bridge - water was too high

Manhole Cover Has "SEWER" on it - But this is not a SMH - This is a Telephone Manhole on a concrete vault to splice buried cable/fiber optics

CURVE (2)
DELTA = 49° 52' 27"
D = 57° 17' 45"
R = 100.00'
T = 46.50'
L = 87.05'
E = 10.28'

N

VT STATE PLANE GRID

12" W.L.

WATER ST

Abandoned 8" W.L.

UT (Fiber and Copper)

8" W.L.

12" W.L.

GATE VALVE

SEWER MANHOLE

SIGN XX-X

LIGHT POLE SIO880 RI1002 XX0038 (CHURCH ST) XX-X (MAIN ST)

44+00 TO BARTON

TH-1 (VT 58) CHURCH ST

6" SEWER

SMH

GRAVEL DRIVE

SIGN XX-X (VT 58) XX-X

SIGN XX-X

COMB 21 UNDERGROUND

8" SEWER

PAVED DRIVE

COMB I

PROJECT NAME:	ORLEANS VILLAGE
PROJECT NUMBER:	BF 0310(7)
FILE NAME: 13J084/sl13J084border.dgn	PLOT DATE: 23-MAY-2013
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: ------	CHECKED BY: ------
LAYOUT SHEET	SHEET 1 OF 9

Local & Regional Input Questionnaire

Community Considerations

1. Are there any scheduled public events in the community that will generate increased traffic (e.g. vehicular, bicycles and/or pedestrians), or may be difficult to stage if the bridge is closed during construction? Examples include: a bike race, festivals, cultural events, farmers market, concerts, etc. that could be impacted? If yes, please provide date, location and event organizers' contact info. Memorial Day Parade in May
2. Is there a "slow season" or period of time from May through October where traffic is less? There is not a slow season
3. Please describe the location of emergency responders (fire, police, ambulance) and emergency response routes. Orleans Fire Department is located on Main Street, Orleans Ambulance is located on route 5 in Orleans.
4. Where are the schools in your community and what are their schedules? Orleans Elementary is located on School Street in Orleans. Their schedule is late August – mid June.
5. Is the proposed project on an established or planned school bus or public transit route(s)? yes
6. Are there any businesses (including agricultural operations) that would be adversely impacted either by a detour or due to work zone proximity? Yes, TD Bank, Lake Region Senior Center, and Feathers Discount.
7. Are there any important public buildings (town hall or community center) or community facilities (recreational fields or library) in close proximity to the proposed project? Yes, Orleans Municipal Building and the Jones Memorial Library.
8. Are there any town highways that might be adversely impacted by traffic bypassing the construction on another local road? Yes, Railroad Avenue, South Street and Water Street
9. Are there any other municipal operations that could be adversely impacted if the bridge is closed during construction? If yes, please explain. NO
10. Please identify any local communication channels that are available—e.g. weekly or daily newspapers, blogs, radio, public access TV, Front Porch Forum, etc. Also include any unconventional means such as local low-power FM. 1490 am radio, 92.1 fm radio, Newport Daily Express, Orleans County Record, and The Chronicle
11. Is there a local business association, chamber of commerce or other downtown group that we should be working with? NO

Design Considerations

1. Are there any concerns with the alignment of the existing bridge? For example, if the bridge is located on a curve, has this created any problems that we should be aware of? Yes, it is on a curve and causes structural problems and vehicle problems.

2. Are there any concerns with the width of the existing bridge? Yes, currently bridge is too narrow and traffic struggles, especially truck traffic.

3. What is the current level of bicycle and pedestrian use on the bridge? Minimal

4. If a sidewalk or wide shoulder is present on the existing bridge, should the new structure have one? Yes, currently there is a sidewalk on both sides of the bridge. Since it is located on Main Street it gets a tremendous amount of use.

5. Is there a need for a sidewalk or widened shoulder if one does not currently exist? Please explain. Yes, currently there is a sidewalk on both sides of the bridge, since it is located on Main Street it gets a tremendous amount of use.

6. Does the bridge provide an important link in the town or statewide bicycle or pedestrian network such that bicycle and pedestrian traffic should be accommodated during construction? NO

7. Are there any special aesthetic considerations we should be aware of? NO

8. Are there any traffic, pedestrian or bicycle safety concerns associated with the current bridge? If yes, please explain. The biggest issues are the bridge is not wide enough and also has a curve to it which causes problems.

9. Does the location have a history of flooding? If yes, please explain. NO

10. Are you aware of any nearby Hazardous Material Sites? NO

11. Are you aware of any historic, archeological and/or other environmental resource issues? NO

12. Are there any other comments you feel are important for us to consider that we have not mentioned yet? When designed there should be a bay for potential water and sewer lines. Also there should be light posts installed in the railing of the bridge.

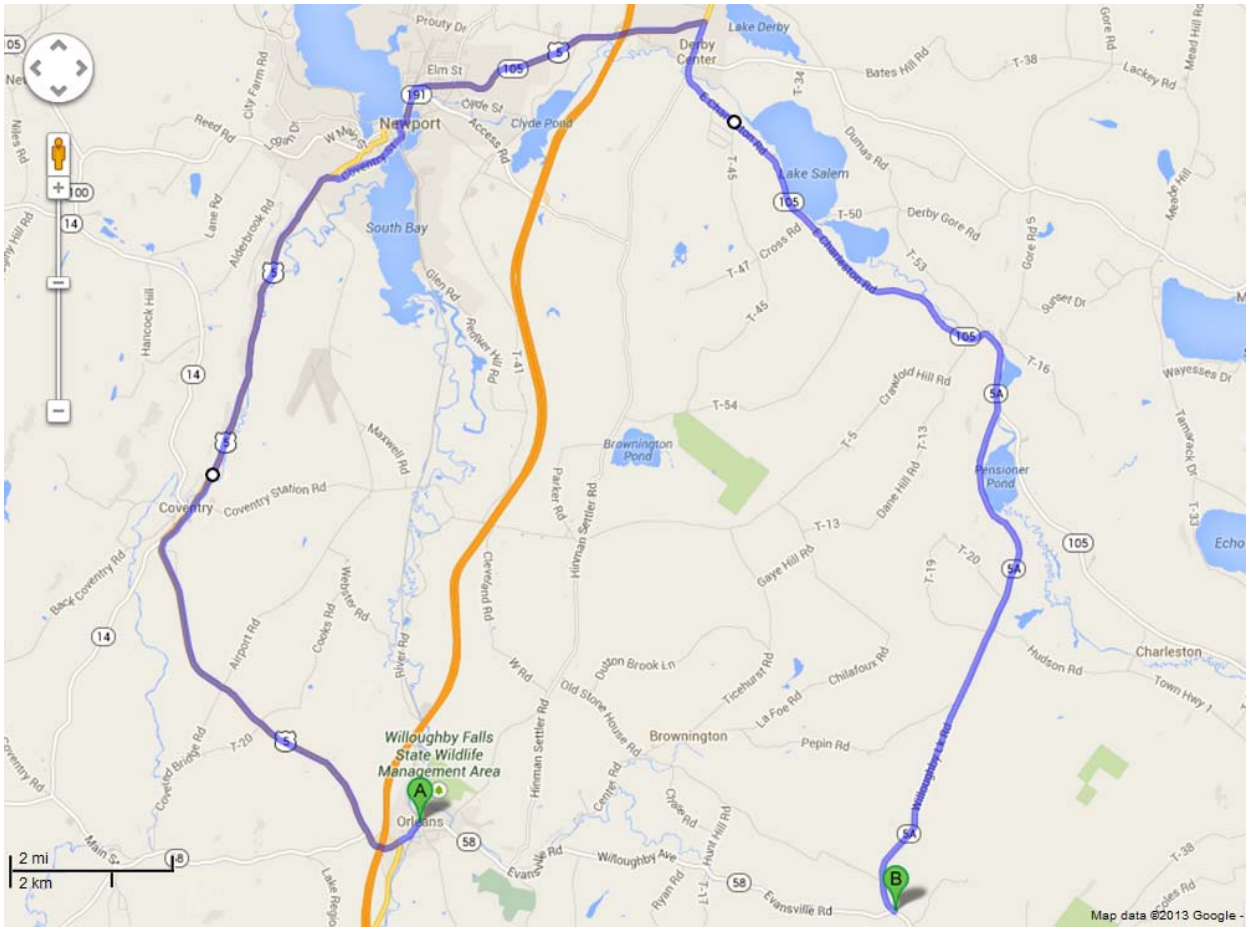
Land Use & Public Transit Considerations – to be filled out by the municipality or RPC.

1. Does your municipal land use plan reference the bridge in question? If so please provide a copy of the applicable section or sections of the plan. NO

2. Please provide a copy of your existing and future land use map, if applicable. N/A

3. Are there any existing, pending or planned development proposal that would impact future transportation patterns near the bridge? If so please explain. NO

4. Is there any planned expansion of public transit service in the project area? If not known please contact your Regional Public Transit Provider. NO

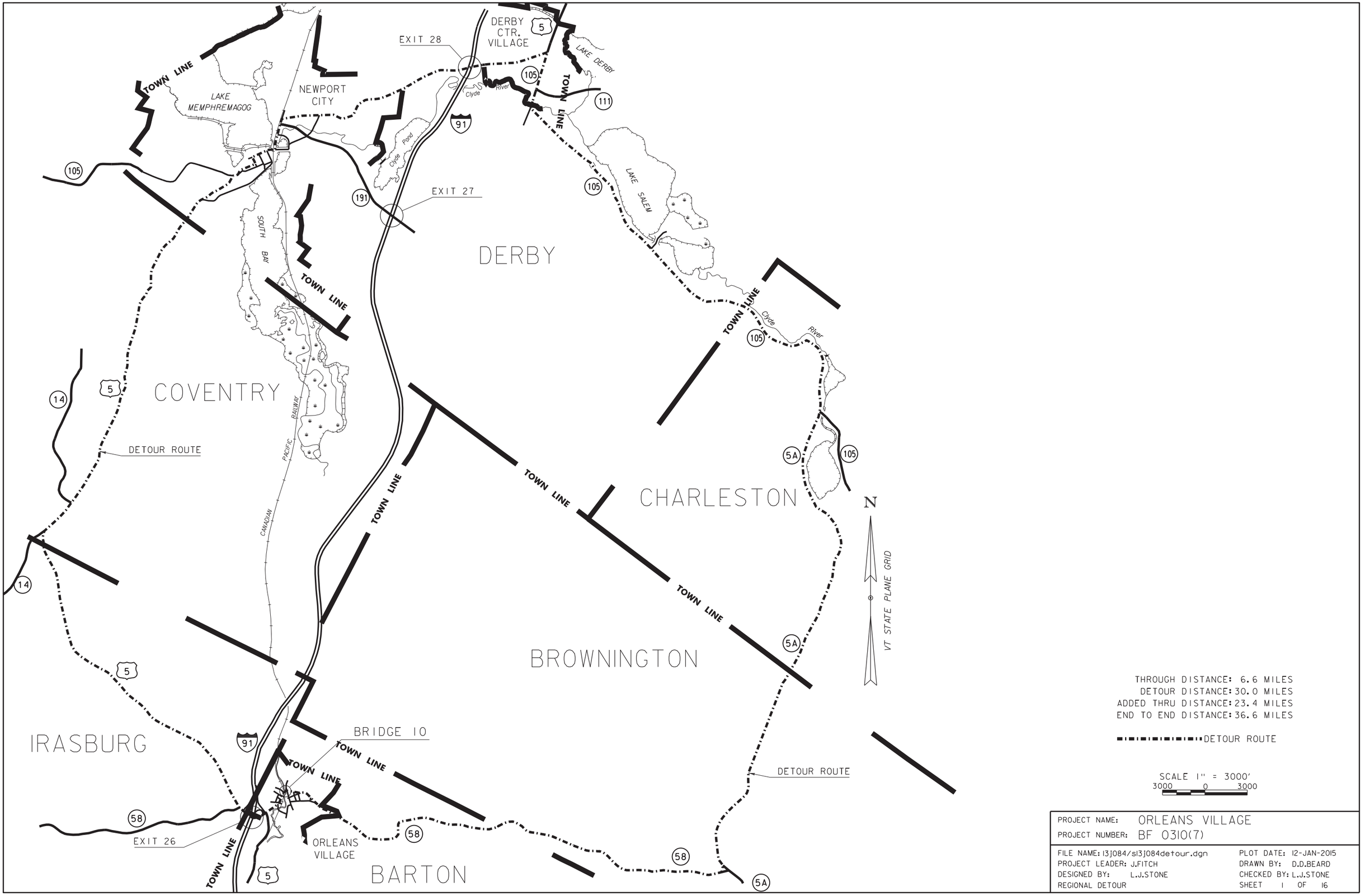


Detour Route – US5 to US5A

A-B on Through Route= 6.6 miles (9 minutes)

A-B on Detour Route= 30.0 miles (48 minutes)

End to End= 36.6 miles (57 minutes)

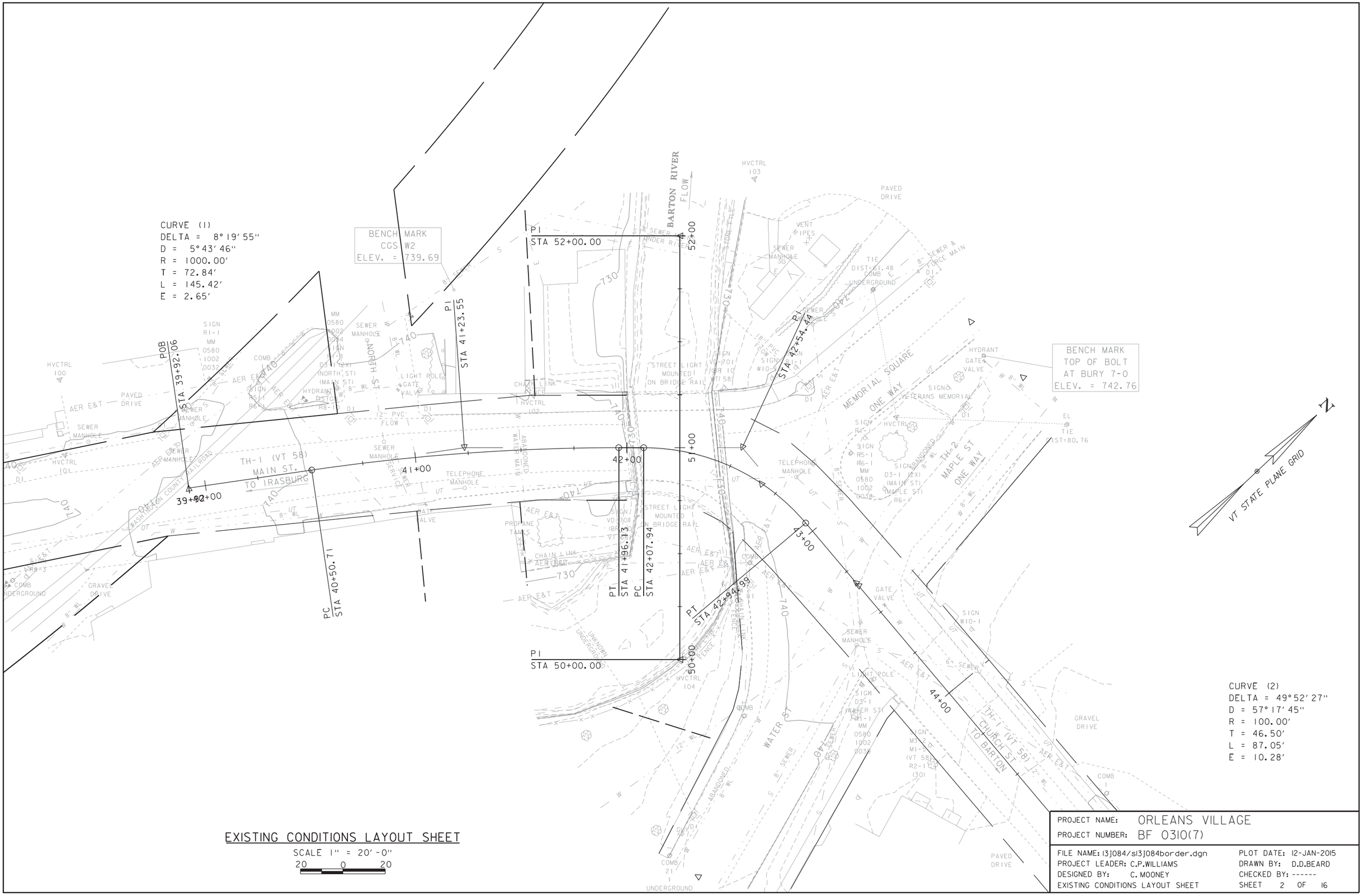


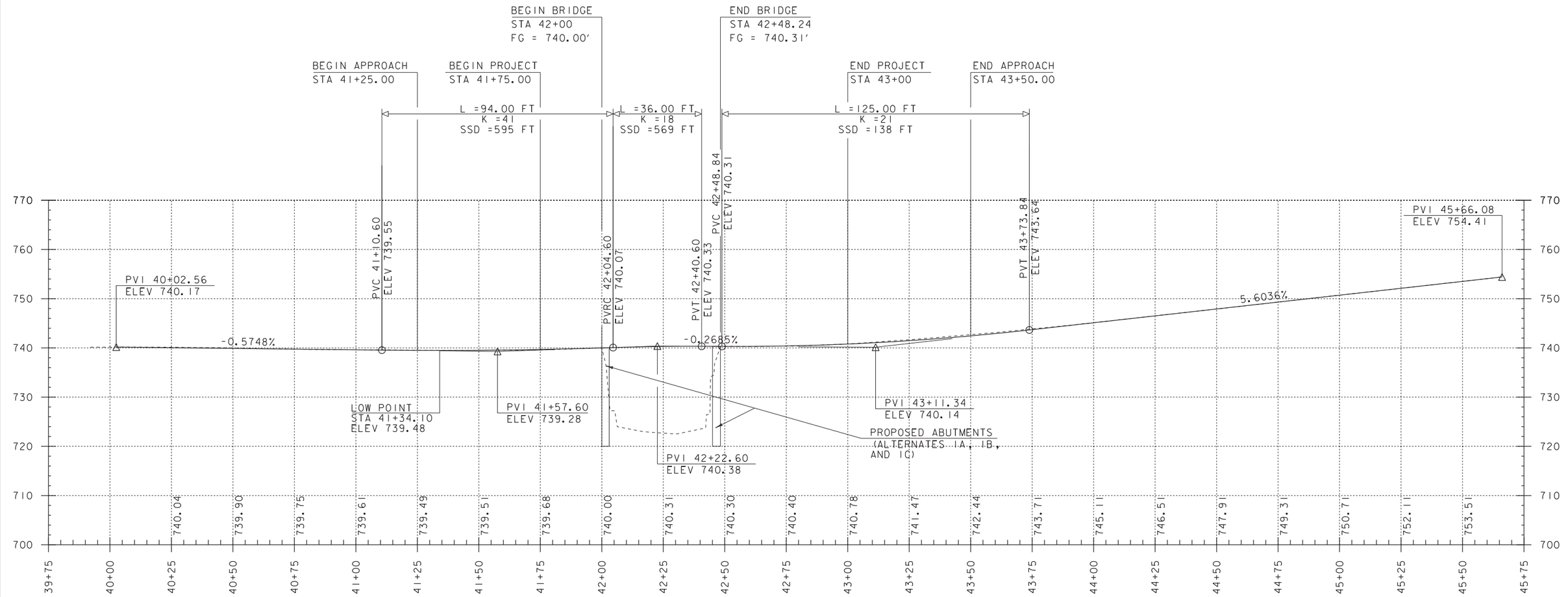
THROUGH DISTANCE: 6.6 MILES
DETOUR DISTANCE: 30.0 MILES
ADDED THRU DISTANCE: 23.4 MILES
END TO END DISTANCE: 36.6 MILES

DETOUR ROUTE

SCALE 1" = 3000'
3000 0 3000

PROJECT NAME:	ORLEANS VILLAGE
PROJECT NUMBER:	BF 0310(7)
FILE NAME: I3J084/sI3J084detour.dgn	PLOT DATE: 12-JAN-2015
PROJECT LEADER: J.FITCH	DRAWN BY: D.D.BEARD
DESIGNED BY: L.J.STONE	CHECKED BY: L.J.STONE
REGIONAL DETOUR	SHEET 1 OF 16


CURVE (1)
DELTA = 8°19'55"
D = 5°43'46"
R = 1000.00'
T = 72.84'
L = 145.42'
E = 2.65'
BENCH MARK
CGS W2
ELEV. = 739.69
BENCH MARK
TOP OF BOLT
AT BURY 7-0
ELEV. = 742.76
POB
STA 39+92.06
PI
STA 41+23.55
PI
STA 52+00.00
PI
STA 42+54.44
PI
STA 50+00.00
PC
STA 40+50.71
PT
STA 41+96.13
PC
STA 42+07.94
PT
STA 42+94.99
BARTON RIVER
FLOW
MEMORIAL SQUARE
ONE WAY
MAPLE ST
ONE WAY
TH-1 (VT 58)
MAIN ST.
TO IRASBURG
TH-1 (VT 58)
CHURCH ST
TO BARTON
TH-2
WATER ST
39+00
40+00
41+00
42+00
43+00
44+00
50+00
51+00
52+00
VT STATE PLANE GRID
CURVE (2)
DELTA = 49°52'27"
D = 57°17'45"
R = 100.00'
T = 46.50'
L = 87.05'
E = 10.28'
EXISTING CONDITIONS LAYOUT SHEET
SCALE 1" = 20'-0"
20 0 20
PROJECT NAME: ORLEANS VILLAGE
PROJECT NUMBER: BF 0310(7)
FILE NAME: 13j084/sl3j084border.dgn
PROJECT LEADER: C.P.WILLIAMS
DESIGNED BY: C. MOONEY
EXISTING CONDITIONS LAYOUT SHEET
PLOT DATE: 12-JAN-2015
DRAWN BY: D.D.BEARD
CHECKED BY: ------
SHEET 2 OF 16



TH-1 (VT 58) PROFILE (EXISTING, ALTERNATES IA,IB, AND IC)

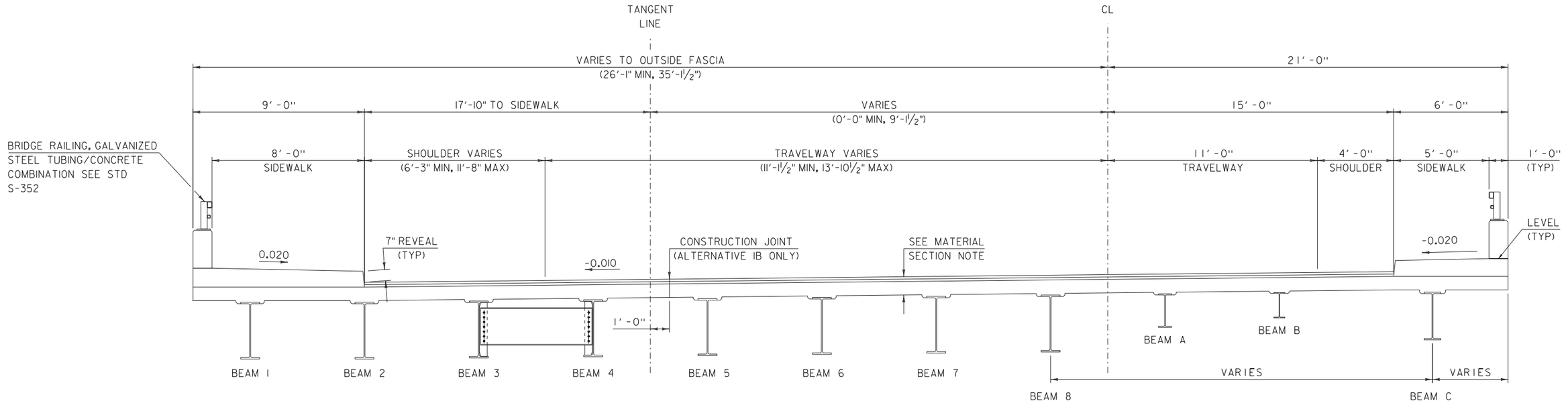
HORIZONTAL SCALE: 1" = 20'-0"
VERTICAL SCALE: 1" = 10'-0"

NOTE:

ELEVATIONS SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG PROPOSED CENTERLINE.

ELEVATIONS SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADES ALONG PROPOSED CENTERLINE.

PROJECT NAME:	ORLEANS VILLAGE
PROJECT NUMBER:	BF 0310(7)
FILE NAME: 13j084/sl3j084profile.dgn	PLOT DATE: 12-JAN-2015
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: D.D.BEARD
DESIGNED BY: ------	CHECKED BY: ------
PROFILE SHEET (EXISTING, ALT IA, IB, AND IC)	SHEET 3 OF 16

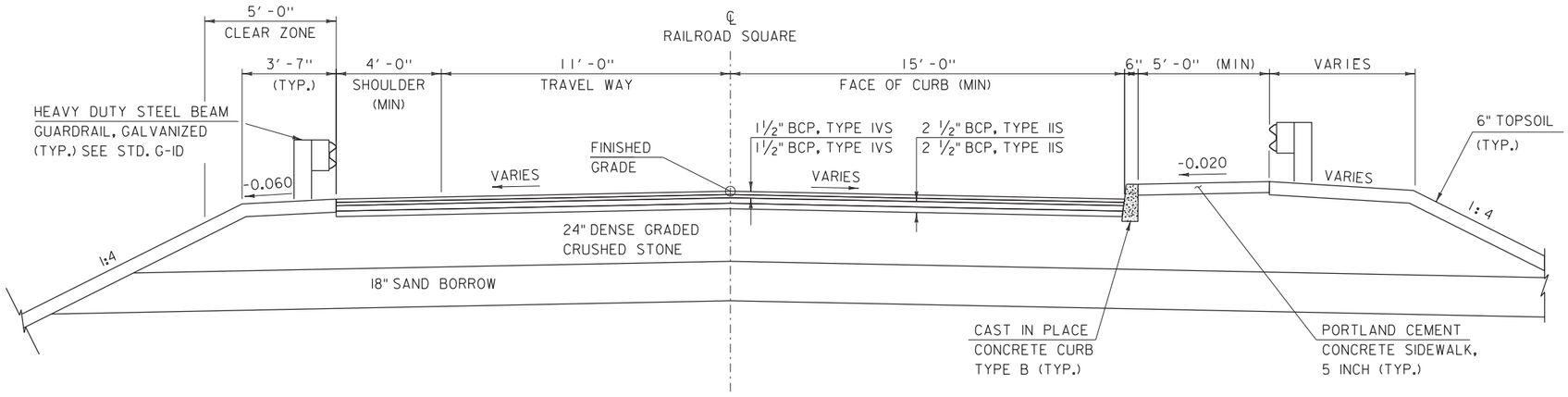


MATERIAL SECTION
- 1½" BCP, TYPE IVS
- 1½" BCP, TYPE IVS
- SHEET MEMBRANE WATERPROOFING, TORCH APPLIED
- 8½" SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, CLASS A LOW CEMENT)"

BCP SHOULD BE READ AS BITUMINOUS CONCRETE PAVEMENT AND SHALL BE PAID FOR UNDER ITEM 900.680 "SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)".

TYPICAL SECTION

SECTION SHOWN ON TANGENT AND DIMENSIONS VARY ALONG THE CURVE
SCALE ⅜" = 1'-0"



WITHOUT SIDEWALK

WITH SIDEWALK

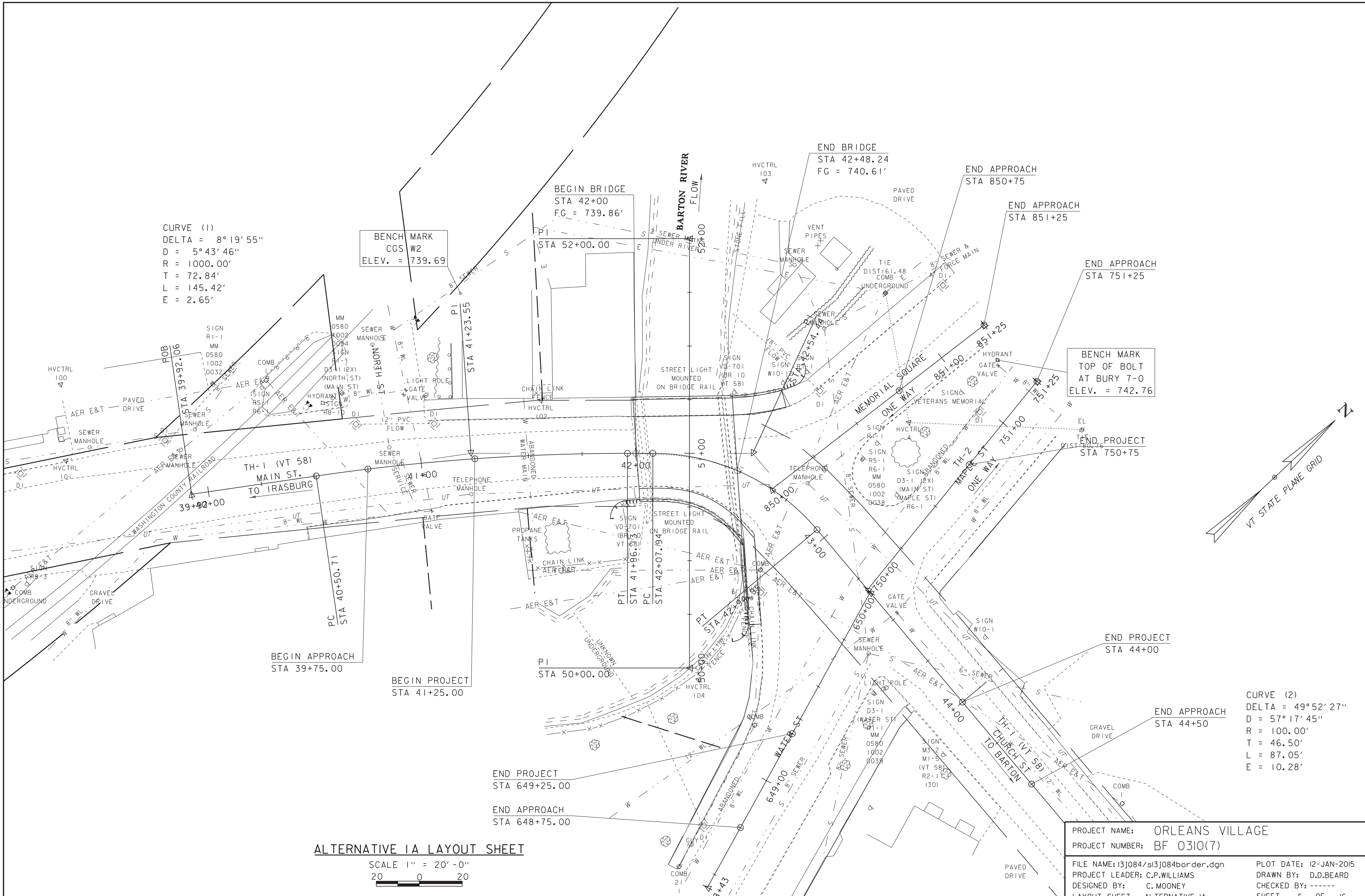
ROADWAY TYPICAL

SCALE ⅜" = 1'-0"

TACK COAT:
EMULSIFIED ASPHALT IS TO BE APPLIED AT THE RATE OF 0.025 GAL/SY

BETWEEN SUCCESSIVE COURSES OF PAVEMENT AS DIRECTED BY THE ENGINEER.

PROJECT NAME:	ORLEANS VILLAGE
PROJECT NUMBER:	BF 0310(7)
FILE NAME: s10j084_TYP.dgn	PLOT DATE: 12-JAN-2015
PROJECT LEADER: C. WILLIAMS	DRAWN BY: C. MOONEY
DESIGNED BY: C. MOONEY	CHECKED BY: ------
TYPICAL SECTIONS (ALT I)	SHEET 4 OF 16



PROJECT NAME: ORLEANS VILLAGE
PROJECT NUMBER: BF 0310(7)

FILE NAME: 13j084/sl3j084border.dgn
PROJECT LEADER: C.P.WILLIAMS
DESIGNED BY: C. MOONEY
LAYOUT SHEET - ALTERNATIVE 1A

PLOT DATE: 12-JAN-2015
DRAWN BY: D.D.BEARD
CHECKED BY: ------
SHEET 5 OF 16

LEGEND

- SIGN AND POSTS
- TYPE III BARRICADES
- TYPE III BARRICADES (MOD.)
- TEMP. TRAFFIC BARRIER

CURVE (1)
DELTA = 8°19'55"
D = 5°43'46"
R = 1000.00'
T = 72.84'
L = 145.42'
E = 2.65'

BENCH MARK
CGS W2
ELEV. = 739.69

BENCH MARK
TOP OF BOLT
AT BURY 7-0
ELEV. = 742.76

TEMPORARY
TRAFFIC SIGNAL

TEMPORARY
TRAFFIC SIGNAL

TEMPORARY
TRAFFIC SIGNAL

BARTON RIVER
FLOW

TH-1 (VT 58)
MAIN ST.
TO IRASBURG

TH-1 (VT 58)
CHURCH ST
TO BARTON

TH-2
MAPLE ST
ONE WAY

MEMORIAL SQUARE
ONE WAY

WATER ST

VT STATE PLANE GRID

CURVE (2)
DELTA = 49°52'27"
D = 57°17'45"
R = 100.00'
T = 46.50'
L = 87.05'
E = 10.28'

ALTERNATIVE IB PHASING LAYOUT SHEET (PHASE I)

SCALE 1" = 20'-0"
20 0 20

PROJECT NAME:	ORLEANS VILLAGE
PROJECT NUMBER:	BF 0310(7)
FILE NAME: i3j084/si3j084border.dgn	PLOT DATE: 12-JAN-2015
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: C. MOONEY
DESIGNED BY: C. MOONEY	CHECKED BY: ------
ALTERNATIVE IB - PHASE I LAYOUT SHEET	SHEET 6 OF 16

LEGEND

- SIGN AND POSTS
- TYPE III BARRICADES
- TYPE III BARRICADES (MOD.)
- TEMP. TRAFFIC BARRIER

CURVE (1)
DELTA = 8°19'55"
D = 5°43'46"
R = 1000.00'
T = 72.84'
L = 145.42'
E = 2.65'

BENCH MARK
CGS W2
ELEV. = 739.69

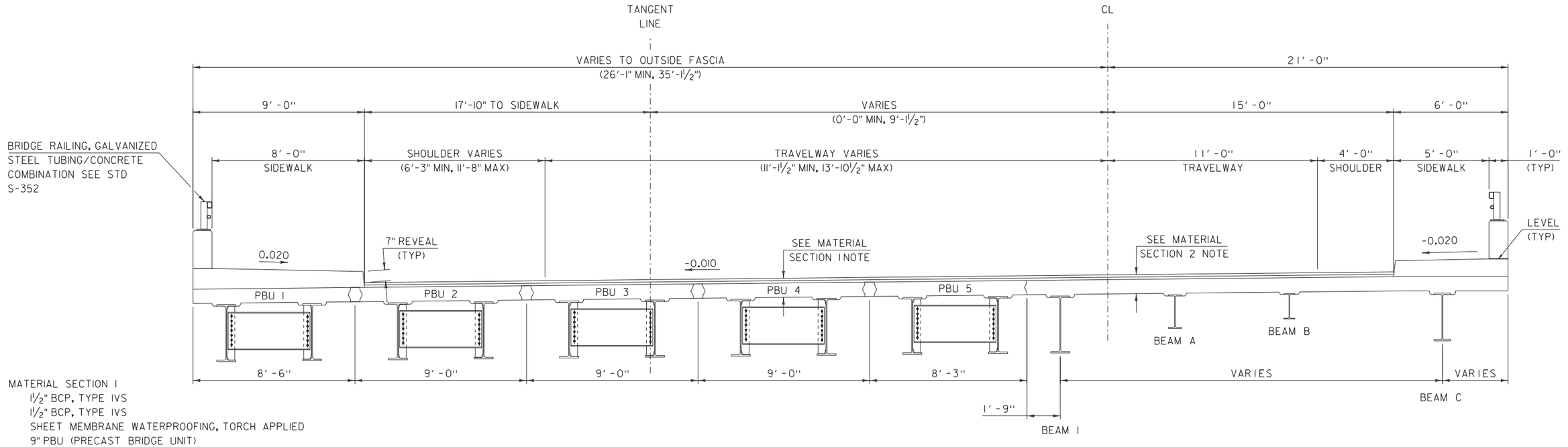
BENCH MARK
TOP OF BOLT
AT BURY 7-0
ELEV. = 742.76

CURVE (2)
DELTA = 49°52'27"
D = 57°17'45"
R = 100.00'
T = 46.50'
L = 87.05'
E = 10.28'

ALTERNATIVE IB PHASING LAYOUT SHEET (PHASE 2)

SCALE 1" = 20'-0"
20 0 20

PROJECT NAME:	ORLEANS VILLAGE
PROJECT NUMBER:	BF 0310(7)
FILE NAME:	13J084/sl3J084border.dgn
PROJECT LEADER:	C.P.WILLIAMS
DESIGNED BY:	C. MOONEY
ALTERNATIVE IB - PHASE 2 LAYOUT SHEET	
PLOT DATE:	12-JAN-2015
DRAWN BY:	C. MOONEY
CHECKED BY:	------
SHEET	7 OF 16



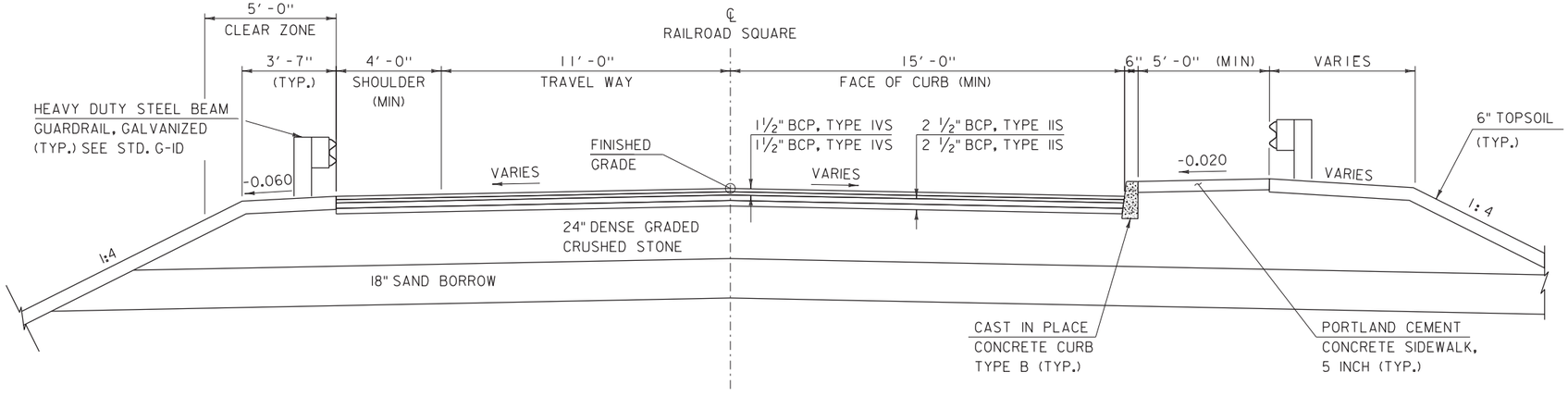
MATERIAL SECTION 1
- 1½" BCP, TYPE IVS
- 1½" BCP, TYPE IVS
- SHEET MEMBRANE WATERPROOFING, TORCH APPLIED
- 9" PBU (PRECAST BRIDGE UNIT)

MATERIAL SECTION 2
- 1½" BCP, TYPE IVS
- 1½" BCP, TYPE IVS
- SHEET MEMBRANE WATERPROOFING, TORCH APPLIED
- 9" SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, CLASS A LOW CEMENT)"

BCP SHOULD BE READ AS BITUMINOUS CONCRETE PAVEMENT AND SHALL BE PAID FOR UNDER ITEM 900.680 "SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)".

TYPICAL SECTION

SECTION SHOWN ON TANGENT AND DIMENSIONS VARY ALONG THE CURVE
SCALE ⅜" = 1'-0"



WITHOUT SIDEWALK

WITH SIDEWALK

ROADWAY TYPICAL

SCALE ⅜" = 1'-0"

TACK COAT:
EMULSIFIED ASPHALT IS TO BE APPLIED AT THE RATE OF 0.025 GAL/SY

BETWEEN SUCCESSIVE COURSES OF PAVEMENT AS DIRECTED BY THE ENGINEER.

PROJECT NAME:	ORLEANS VILLAGE
PROJECT NUMBER:	BF 0310(7)
FILE NAME: s10j084_TYP.dgn	PLOT DATE: 12-JAN-2015
PROJECT LEADER: C. WILLIAMS	DRAWN BY: C. MOONEY
DESIGNED BY: C. MOONEY	CHECKED BY: ------
TYPICAL SECTIONS (ALT 1C)	SHEET 8 OF 16

LEGEND

- SIGN AND POSTS
- TYPE III BARRICADES
- TYPE III BARRICADES (MOD.)
- TEMP. TRAFFIC BARRIER

CURVE (1)
DELTA = 8°19'55"
D = 5°43'46"
R = 1000.00'
T = 72.84'
L = 145.42'
E = 2.65'

BENCH MARK
CGS W2
ELEV. = 739.69

BEGIN BRIDGE
STA 42+00
FG = 739.86'

END BRIDGE
STA 42+48.24
FG = 740.61'

END APPROACH
STA 850+75

END APPROACH
STA 851+25

END APPROACH
STA 751+25

BENCH MARK
TOP OF BOLT
AT BURY 7-0
ELEV. = 742.76

END PROJECT
STA 750+75
DIST=80.76

BEGIN APPROACH
STA 39+75.00

BEGIN PROJECT
STA 41+25.00

END PROJECT
STA 649+25.00

END APPROACH
STA 648+75.00

END PROJECT
STA 44+00

END APPROACH
STA 44+50

CURVE (2)
DELTA = 49°52'27"
D = 57°17'45"
R = 100.00'
T = 46.50'
L = 87.05'
E = 10.28'

BARTON RIVER
FLOW

TH-1 (VT 58)
MAIN ST.
TO IRASBURG

TH-1 (VT 58)
CHURCH ST
TO BARTON

TH-2
MAPLE ST
ONE WAY

MEMORIAL SQUARE
ONE WAY

WATER ST

VT STATE PLANE GRID

ALTERNATIVE IC PHASING LAYOUT SHEET PHASE I(CLOSURE)

SCALE 1" = 20'-0"
20 0 20

PROJECT NAME:	ORLEANS VILLAGE
PROJECT NUMBER:	BF 0310(7)
FILE NAME: I3J084/sI3J084AIt3.dgn	PLOT DATE: 12-JAN-2015
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: C. MOONEY
DESIGNED BY: C. MOONEY	CHECKED BY: ------
ALTERNATIVE IC - PHASE I LAYOUT SHEET	SHEET 9 OF 16

LEGEND

- SIGN AND POSTS
- TYPE III BARRICADES
- TYPE III BARRICADES (MOD.)
- TEMP. TRAFFIC BARRIER

CURVE (1)
DELTA = 8°19'55"
D = 5°43'46"
R = 1000.00'
T = 72.84'
L = 145.42'
E = 2.65'

BENCH MARK
CGS W2
ELEV. = 739.69

BEGIN BRIDGE
STA 42+00
FG = 739.86'

END BRIDGE
TEMPORARY
STA 42+48.24
TRAFFIC SIGNAL
FG = 740.61

END APPROACH
STA 850+75

END APPROACH
STA 851+25

END APPROACH
STA 751+25

BENCH MARK
TOP OF BOLT
AT BURY 7-0
ELEV. = 742.76

END PROJECT
STA 750+75
DIST=80.76

BARTON RIVER
FLOW

BEGIN APPROACH
STA 39+75.00

BEGIN PROJECT
STA 41+25.00

TEMPORARY
TRAFFIC SIGNAL

END PROJECT
STA 649+25.00

END APPROACH
STA 648+75.00

TEMPORARY
TRAFFIC SIGNAL

END PROJECT
STA 44+00

END APPROACH
STA 44+50

CURVE (2)
DELTA = 49°52'27"
D = 57°17'45"
R = 100.00'
T = 46.50'
L = 87.05'
E = 10.28'

TH-1 (VT 58)
MAIN ST.
TO IRASBURG

TH-1 (VT 58)
CHURCH ST
TO BARTON

TH-2
MAPLE ST
ONE WAY

MEMORIAL SQUARE
ONE WAY

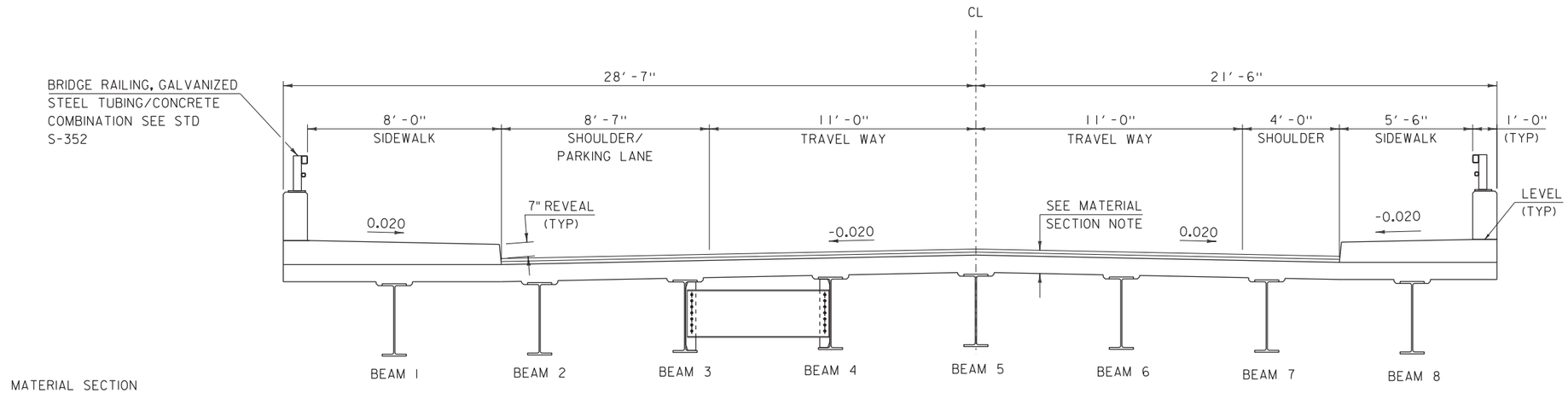
WATER ST

WASHINGTON COUNTY RAILROAD

ALTERNATIVE IC PHASING LAYOUT SHEET PHASE 2 - (ONE WAY TRAFFIC)

SCALE 1" = 20'-0"
20 0 20

PROJECT NAME:	ORLEANS VILLAGE
PROJECT NUMBER:	BF 0310(7)
FILE NAME: 13J084/sl3J084Alt3.dgn	PLOT DATE: 12-JAN-2015
PROJECT LEADER: C.P.WILLIAMS	DRAWN BY: C. MOONEY
DESIGNED BY: C. MOONEY	CHECKED BY: ------
ALTERNATIVE IC - PHASE 2 LAYOUT SHEET	SHEET 10 OF 16



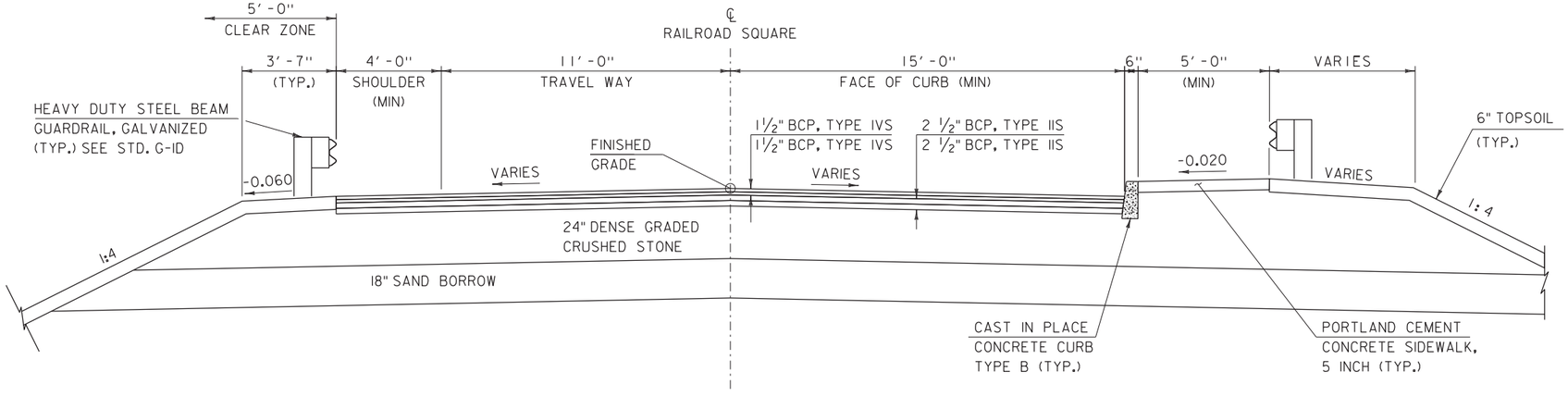
MATERIAL SECTION

- 1½" BCP, TYPE IVS
- 1½" BCP, TYPE IVS
- SHEET MEMBRANE WATERPROOFING, TORCH APPLIED
- 8½" SPECIAL PROVISION (HIGH PERFORMANCE CONCRETE, CLASS A LOW CEMENT)"

BCP SHOULD BE READ AS BITUMINOUS CONCRETE PAVEMENT AND SHALL BE PAID FOR UNDER ITEM 900.680 "SPECIAL PROVISION (BITUMINOUS CONCRETE PAVEMENT, SMALL QUANTITY)".

TYPICAL SECTION

SCALE 3/8" = 1'-0"



WITHOUT SIDEWALK

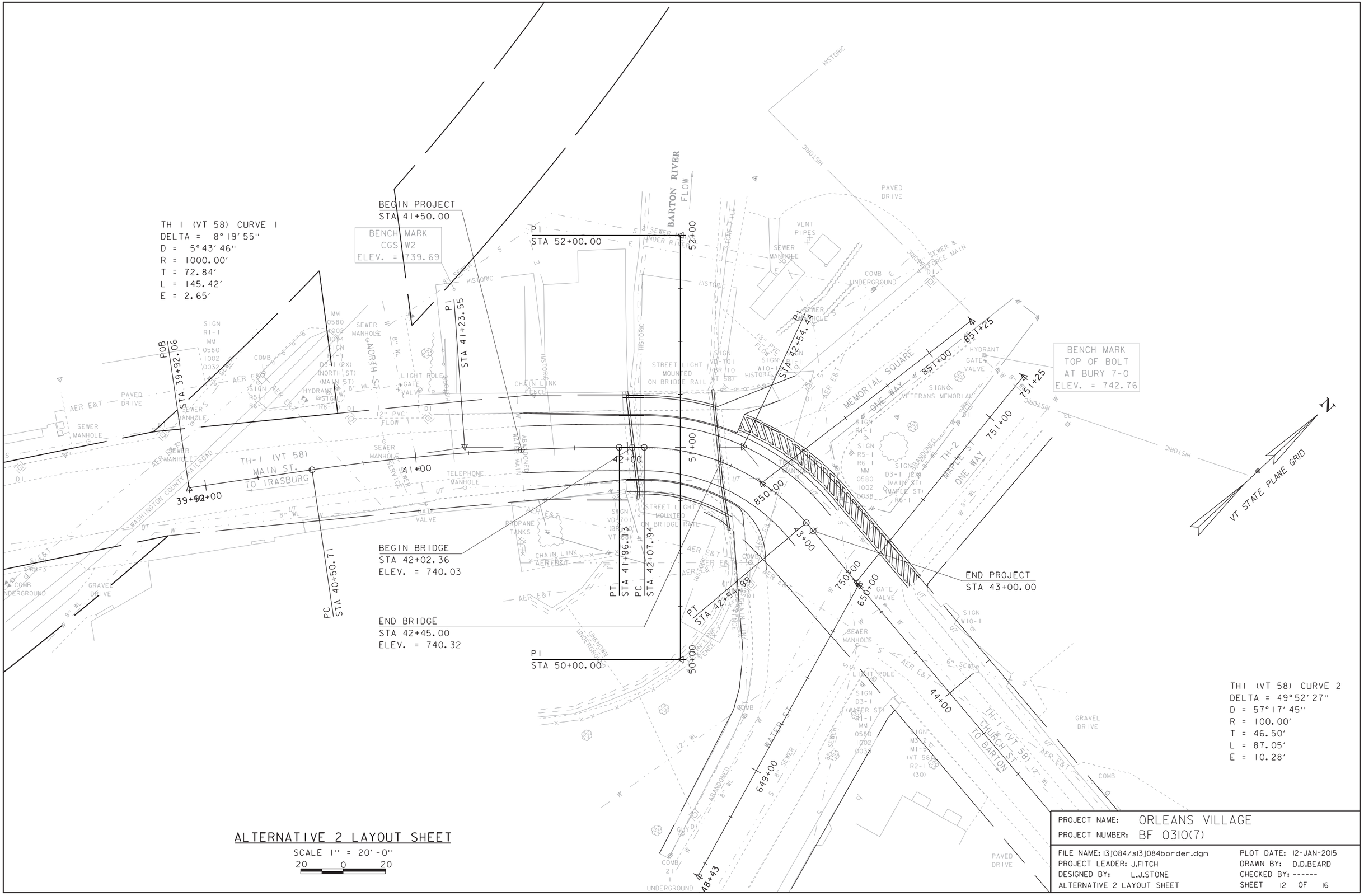
WITH SIDEWALK

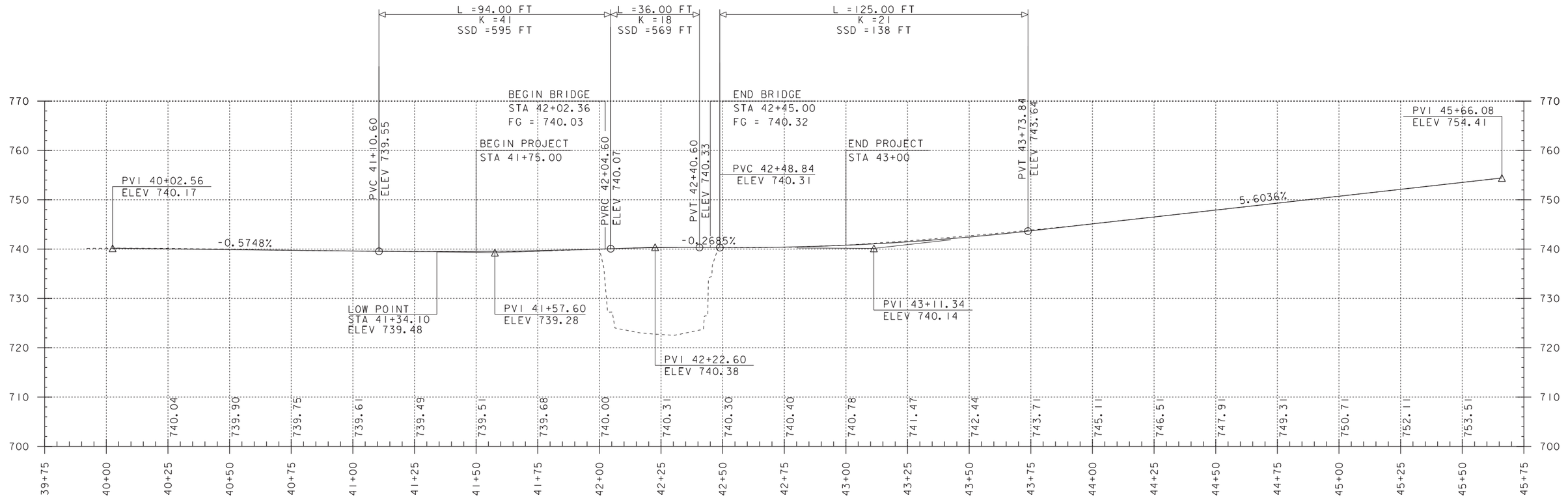
ROADWAY TYPICAL

SCALE 3/8" = 1'-0"

TACK COAT:
EMULSIFIED ASPHALT IS TO BE APPLIED AT THE RATE OF 0.025 GAL/SY BETWEEN SUCCESSIVE COURSES OF PAVEMENT AS DIRECTED BY THE ENGINEER.

PROJECT NAME:	ORLEANS VILLAGE
PROJECT NUMBER:	BF 0310(7)
FILE NAME: s10j084_TYP.dgn	PLOT DATE: 12-JAN-2015
PROJECT LEADER: C. WILLIAMS	DRAWN BY: C. MOONEY
DESIGNED BY: C. MOONEY	CHECKED BY: ------
TYPICAL SECTIONS (ALTS 2 & 3)	SHEET 11 OF 16


TH 1 (VT 58) CURVE 1
DELTA = 8°19'55"
D = 5°43'46"
R = 1000.00'
T = 72.84'
L = 145.42'
E = 2.65'
BEGIN PROJECT
STA 41+50.00
BENCH MARK
CGS W2
ELEV. = 739.69
PI
STA 52+00.00
PI
STA 41+23.55
POB
STA 39+92.06
BARTON RIVER
FLOW
HISTORIC
PAVED DRIVE
VENT PIPES
SEWER MANIHOLE
COMB UNDERGROUND
SEWER & FORCE MAIN
STONE FILL
SEWER MANHOLE
STREET LIGHT MOUNTED ON BRIDGE RAIL
SIGN VD-701 (BR 10 VT 58)
SIGN W10-1
CHAIN LINK FENCE
HYDRANT
GATE VALVE
SIGN VETERANS MEMORIAL
MEMORIAL SQUARE
4' ONE WAY
SIGN R5-1
SIGN R6-1
MM 0580 1002 0038
SIGN D3-1 (2X) (MAIN ST) (MAPLE ST)
R6-1
TH-2 MAPLE ST
ONE WAY
ABANDONED
BENCH MARK
TOP OF BOLT
AT BURY 7-0
ELEV. = 742.76
PI
STA 42+54.44
TH-1 (VT 58)
MAIN ST.
TO IRASBURG
TELEPHONE MANHOLE
SEWER SERVICE
ABANDONED WATER MAIN
GAS VALVE
PROPANE TANKS
AER E&T
GRAVEL DRIVE
WASHINGTON COUNTY RAILROAD
SIGN R1-1
MM 0580 1002 0034
SIGN R5-1
SIGN R8-3
SIGN D3-1 (2X) (NORTH ST) (MAIN ST)
R8-10
LIGHT POLE
12" PVC FLOW
8" WL
12" WL
6" SEWER
8" SEWER
ABANDONED 8" WL
UNKNOWN UNDERGROUND
WATER ST
SIGN D3-1 (WATER ST) R1-1
MM 0580 1002 0038
SIGN M3-2S MI-5S (VT 58) R2-1 (30)
TH-1 (VT 58) CHURCH ST TO BARTON
BEGIN BRIDGE
STA 42+02.36
ELEV. = 740.03
END BRIDGE
STA 42+45.00
ELEV. = 740.32
PC
STA 40+50.71
PT
STA 41+96.13
PC
STA 42+07.94
PT
STA 42+94.99
PI
STA 50+00.00
END PROJECT
STA 43+00.00
39+00
40+00
41+00
42+00
43+00
44+00
48+43
50+00
51+00
52+00
649+00
650+00
750+00
751+00
850+00
851+00
N
VT STATE PLANE GRID
TH1 (VT 58) CURVE 2
DELTA = 49°52'27"
D = 57°17'45"
R = 100.00'
T = 46.50'
L = 87.05'
E = 10.28'
ALTERNATIVE 2 LAYOUT SHEET
SCALE 1" = 20'-0"
20 0 20
PROJECT NAME: ORLEANS VILLAGE
PROJECT NUMBER: BF 0310(7)
FILE NAME: 13j084/sl3j084border.dgn
PROJECT LEADER: J.FITCH
DESIGNED BY: L.J.STONE
ALTERNATIVE 2 LAYOUT SHEET
PLOT DATE: 12-JAN-2015
DRAWN BY: D.D.BEARD
CHECKED BY: ------
SHEET 12 OF 16



TH-1 (VT 58) PROFILE (ALTERNATIVE 2)

HORIZONTAL SCALE: 1" = 20'-0"
VERTICAL SCALE: 1" = 10'-0"

NOTE:

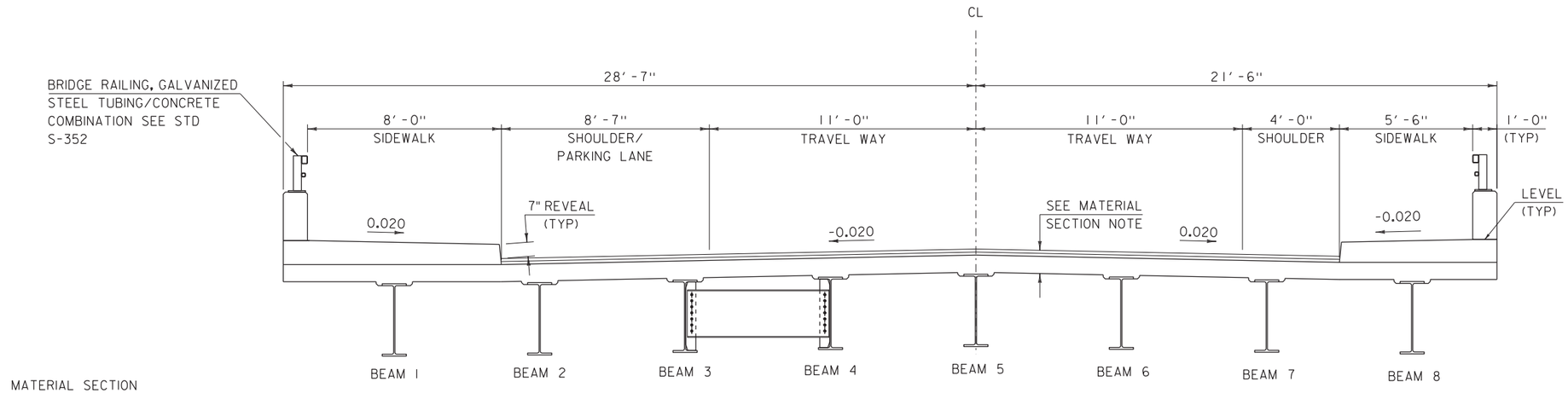
ELEVATIONS SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG PROPOSED CENTERLINE.

ELEVATIONS SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADES ALONG PROPOSED CENTERLINE.

PROJECT NAME: ORLEANS VILLAGE
PROJECT NUMBER: BF 0310(7)

FILE NAME: 13j084/sl3j084profile.dgn
PROJECT LEADER: J.FITCH
DESIGNED BY: L.J.STONE
PROFILE SHEET (ALT 2)

PLOT DATE: 12-JAN-2015
DRAWN BY: D.D.BEARD
CHECKED BY: ------



MATERIAL SECTION

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- SHEET MEMBRANE WATERPROOFING, TORCH APPLIED
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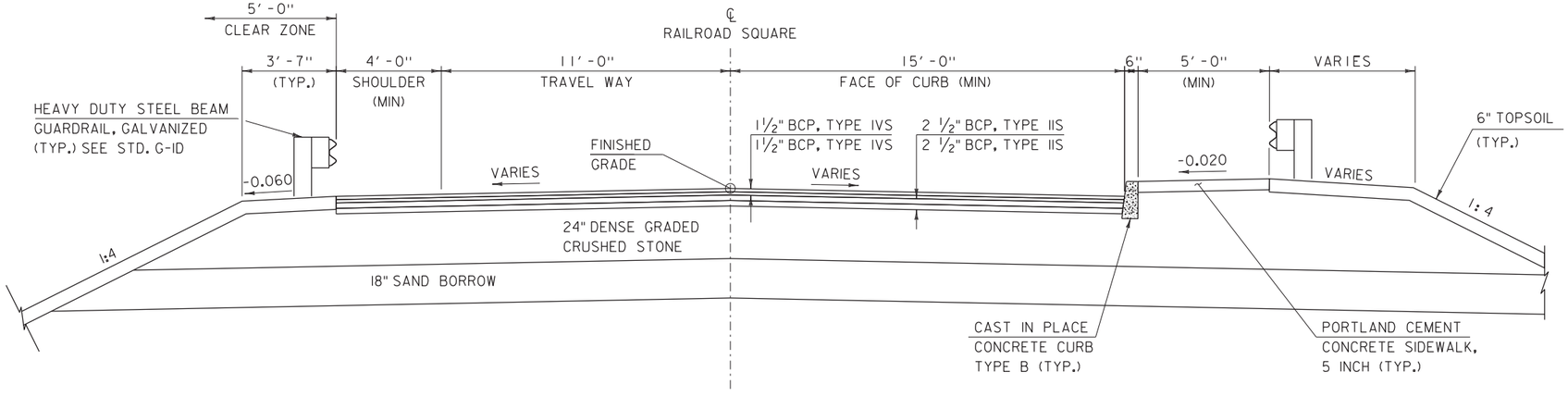
TYPICAL SECTION

SCALE 3/8" = 1'-0"



WITHOUT SIDEWALK

WITH SIDEWALK

ROADWAY TYPICAL

SCALE 3/8" = 1'-0"

TACK COAT:
EMULSIFIED ASPHALT IS TO BE APPLIED AT THE RATE OF 0.025 GAL/SY BETWEEN SUCCESSIVE COURSES OF PAVEMENT AS DIRECTED BY THE ENGINEER.

PROJECT NAME:	ORLEANS VILLAGE
PROJECT NUMBER:	BF 0310(7)
FILE NAME: s10j084_TYP.dgn	PLOT DATE: 12-JAN-2015
PROJECT LEADER: C. WILLIAMS	DRAWN BY: C. MOONEY
DESIGNED BY: C. MOONEY	CHECKED BY: ------
TYPICAL SECTIONS (ALTS 2 & 3)	SHEET 14 OF 16

TH 1 (VT 58) CURVE 1
DELTA = 58°00'50"
D = 19°05'55"
R = 300.00'
T = 166.34'
L = 303.76'
E = 43.03'

TH 2 CURVE 1
DELTA = 22°03'59"
D = 22°55'06"
R = 250.00'
T = 48.75'
L = 96.28'
E = 4.71'

POB
STA 40+00.00

40+00

41+00

42+00

43+00

STA 40+82.86 PC

BEGIN APPROACH
STA 40+25.00

BEGIN PROJECT
STA 40+75.00

BEGIN BRIDGE
STA 42+13.40
FG = 740.11

END BRIDGE
STA 42+60.00
FG = 740.91

PI
STA 42+49.20

PI
STA 801+60.63

801+00

STA 801+11.88 PC

802+00

STA 802+08.17 PT

END APPROACH
STA 803+00

803+00

END PROJECT
STA 802+50

800+00

900+00

STA 900+00.00 PI

899+50

44+00

PT
STA 43+86.62

END PROJECT
STA 899+00.00

END APPROACH
STA 898+50.00

898+50

END PROJECT
STA 44+00

END APPROACH
STA 44+50.00

N

VT STATE PLANE GRID

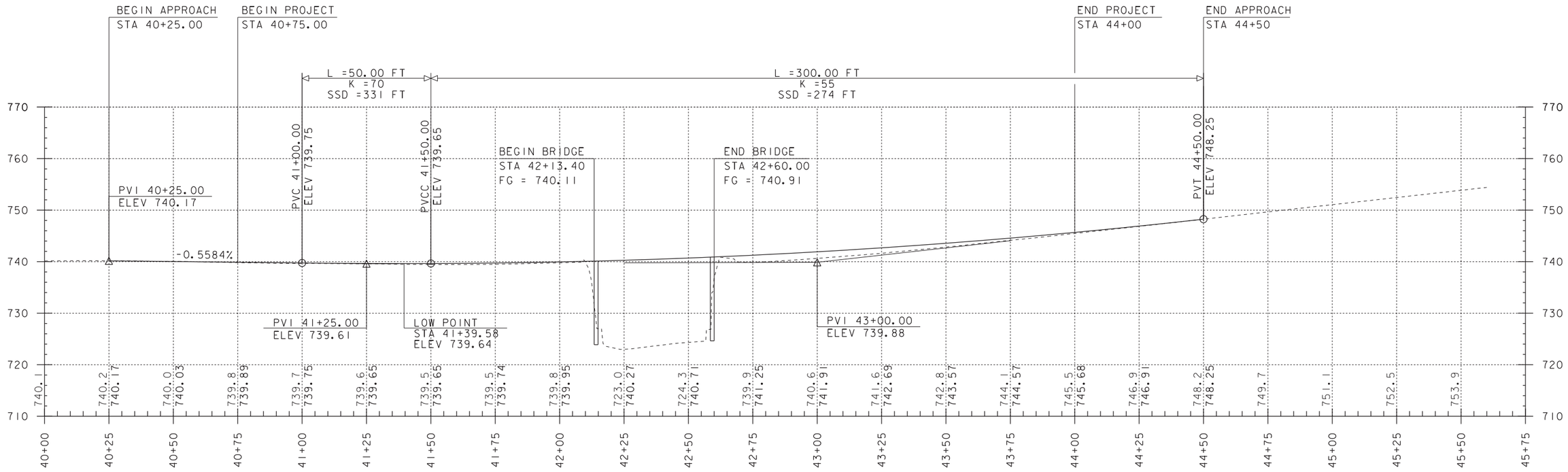
ALTERNATIVE 3 LAYOUT SHEET

SCALE 1" = 20'-0"
20 0 20

PROJECT NAME: ORLEANS VILLAGE
PROJECT NUMBER: BF 0310(7)

FILE NAME: I3J084/sI3J084Alternative2.dgn
PROJECT LEADER: C.P.WILLIAMS
DESIGNED BY: C. MOONEY
LAYOUT SHEET - ALTERNATIVE 3

PLOT DATE: 23-FEB-2015
DRAWN BY: C. MOONEY
CHECKED BY: ------
SHEET 1 OF 1



PROPOSED (ALT 3) TH-1 (VT 58) PROFILE

HORIZONTAL SCALE: 1" = 20'-0"
VERTICAL SCALE: 1" = 10'-0"

NOTE:

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PROJECT NAME: ORLEANS VILLAGE
PROJECT NUMBER: BF 0310(7)

FILE NAME: 13j084/sl3j084profile.dgn
PROJECT LEADER: C.P.WILLIAMS
DESIGNED BY: C. MOONEY
PROFILE SHEET (ALT 3)

PLOT DATE: 12-JAN-2015
DRAWN BY: C. MOONEY
CHECKED BY: ------
SHEET 16 OF 16