STATE OF VERMONT
AGENCY OF TRANSPORTATION

Scoping Report

FOR

Berlin BF 026-1(43)

US 302 Bridge 3 over Stevens Branch

January 11, 2018

I. Contents

I. Site Information

Bridge 3 is located 0.7 miles East of the intersection of US 302 and the Berlin State Highway approximately 300' north of an at grade railroad crossing. The bridge is located in the town of Berlin, Washington County, in VTrans Maintenance district 7. The existing conditions were gathered from a combination of Site Visits, Inspection Reports, Route Log and Orthophotos. See correspondence in the Appendix for more detailed information.

Roadway Classification	Urban Principal Arterial
Bride Type	Single Span Rolled Beam
Bridge Span	60' Single Span
Year Built	1928 (Widened in 1941)
Ownership	State of Vermont

Need

The following are needs of Bridge 3 along US 302 over Stevens Branch.

1. The bridge/approach rail on Bridge 3 are substandard and do not meet current safety standards.

2. Bridge 3 is considered structurally deficient given the condition of the bridge deck. The deck is at risk for full depth holes.

3. Bridge 3 doesn't match the roadway geometry immediately east and west of the structure and the shoulders on Bridge 3 are substandard by 4 feet. The existing sidewalk width does not comply with the Americans with Disabilities Act (ADA) standards.

4. The bridge does not pass the design flood for hydraulics and does not provide the minimum Bank Full Width.

Traffic

A traffic study of this site was performed by the Vermont Agency of Transportation. The traffic volumes are projected for the years 2017 and 2037.

TRAFFIC DATA	2017	2037
AADT	13,600	14,400
DHV	1,400	1,500
ADTT	650	1,000
%T	3.8	5.6
%D	51	51

Design Criteria

The design standards for this project are the Vermont State Standards (VSS), dated October 22, 1997, A Policy on Geometric Design of Highways and Streets (Green Book), 6th Edition, and the VTrans Structures Design Manual, dated 2010. Minimum standards are based on the traffic volumes listed above and a design speed of 40 mph.

Design Criteria	Source	Existing Condition	Minimum Standard	Comment
Approach Lane and Shoulder Widths	VSS 3.5	Varies Constantly, see existing conditions layout.	11'/8'[1]	Substandard
Bridge Lane and Shoulder Widths	VSS 3.5	13'/4' (41'-7"), with 3.5' sidewalk on downstream side of bridge	11'/8'[1] • 11' Turning lane between WB and EB lanes • 3.5' sidewalk located on northern side of bridge	Substandard
Clear Zone Distance	VSS Table 3.4	Unshielded utility pole and parking outside project limits	14' fill / 12' cut	Meets Standard within Project Limits
Banking	VSS Section 3.13	Varies – Approximately 2%	8% (max), 6% (max) at side roads[2]	Acceptable for Urban areas
Speed	VSS Section 3.3	40 mph (Posted)	40 mph (Design)	
Horizontal Alignment	AASHTO Green Book Table 3-10b	Tangent – No Curve	NA – No Curve	
Vertical Grade	VSS Table 3.5	Bridge located on a crest, less than 2%	7% (max) for level terrain	Exceeds Standard
K Values for Vertical Curves	VSS Table 3.1	Crest K=169	60 crest / 60 sag	Exceeds Standard
Vertical Clearance Issues	VSS Section 3.8	None noted	16'-3" (min)	
Stopping Sight Distance	VSS Table 3.1	Does not appear to be limited by bridge.	275'	
Bicycle/Pedestrian Criteria	VSS Table 3.8	3.5' sidewalk width 4' shoulder width	4' Minimum sidewalk width 4' Minimum shoulder width	Substandard sidewalk width
Bridge Railing	Structures Manual Section 13	Concrete Parapet and Tubular Metal Rail	TL-4	Substandard
Hydraulics	VTrans Hydraulics Section	Does not pass Q_{50} storm event without overtopping Bank Full Width: 60'	Pass Q_{50} storm event with 1.0' of freeboard Bank Full Width: 88'	Substandard
Structural Capacity	SM, Ch. 3.4.1	Structurally Deficient (By Rating – Deck 4)	Design Live Load: HL-93	

Inspection Report Summary

Deck Rating	4 Poor
Superstructure Rating	6 Satisfactory
Substructure Rating	6 Satisfactory
Channel Rating	6 Satisfactory

[1] The desirable minimum typical section is 11'/8'. Per section 3.5 of the Vermont State Standards, a minimum typical section of 11'/6' is allowed.

[2] From Section 3.13 of the Vermont State Standards superelevation is not generally used on low speed (45 mph or less) curbed urban and village streets.

6/30/2016 - This structure should be considered for a full deck replacement with new bridge guardrail installed that meets standards. JW/AC
6/11/2015 - Bridge deck is quite poor with extensive deterioration along the underside and has the potential for full depth failure to develop over the next few years. Bridge needs extensive reconstruction with a new deck, or perhaps an RC rigid overlay. ~ MJ/JS

6/17/2014 – Deck is in poor condition and needs replacement. Deck surface is quite rough and has hot spots for full depth holes to punch through in beam bays 3 and 4. Additional popouts since last inspection in beam bay #4 (centerline bay). See photos. Has potential for rigid overlay if needed, but full replacement of deck desirable with stage construction and should be within the next 2 years. ~ MJ

6/06/2013 - * Bridge deck is poor with potential for full depth failures and needs replacement or option of a reinforced concrete overlay. Beams and abutments are quite good. Abutments could use some minor repairs. Some stone filled should be placed in the eroded area along the steep slope, upstream west side, to prevent further avulsion. ~ MJ/JS

Hydraulics

The current structure does not meet hydraulic standards. Per the hydraulics report the roadway is overtopped below the design Q50 flood event. The structure also does not meet the standard for spanning bank full width and would need a clear span of 88’ if a full replacement is recommended. Given that there is a flood insurance study for this river no increase in elevation of the roadway is acceptable. Additional restrictions include maintaining the existing waterway opening by ensuring the current low beam elevations is not exceeded as well as any scour mitigation such as stone fill doesn’t further constrict the channel. For more information please see the appendices for the complete Hydraulics report.

Utilities

The utility descriptions below were provided by Lawrence Wheeler at the request of structures. Please see the appendices for additional information.

Municipal Utilities (Water)

“There are two existing water mains which pass in under the Stevens Branch, downstream from the existing bridge (see existing municipal utilities attachment). These water mains were constructed for the Berlin Fire District #1 but they are now maintained and managed by the City of Montpelier.

Closest to the bridge is an existing 8’’ cast iron water main that passes under the stream approximately 5’ to 6’ below the stream bed. This main passes approximately 10’ from the end of wing wall at the northwest corner of the bridge. This main crosses to the south side of U.S. Route 302 approximately 275’ west of the bridge. Approximately 70’ east of the bridge, on the northern side of U.S. Route 302, there is a “T” in the 8’’ main where another 8’’ cast iron main branches off to the shopping plaza.

Approximately 45’ downstream from the existing bridge is a newer 12’’ ductile iron water main which is approximately 4’ below the stream bed. This main is capped just to the east of the bridge adjacent to an existing fire hydrant.”

Municipal Utilities (Sewer)

"There is an existing 12'' Asbestos Cement (AC) sewer main which passes under the Stevens Branch approximately 25' downstream from the existing bridge (see existing municipal utilities attachment). This sewer main generally runs along the northern side of U.S. Route 302 thru the entire project area, crossing to the south side approximately 275' west of the existing bridge.

At plan stations 42+70 (+/-) LT and 44+15 (+/-) LT are concrete sewer siphon stations. Between these siphon stations, passing under the river, are two 12'' AC sewer mains; these mains are 6' to 7' below the stream bed.

Flowing into the siphon station at 44+15 (+/-) LT is a 10'' AC sewer main that extends along the northern edge of U.S. 302 beyond the project area.

Approximately 70' east of the bridge, on the northern side of U.S. Route 302, there is an existing Sewer Manhole where an 8'' AC sewer main branches off to the shopping plaza."

Public Utilities (Underground)

"Located adjacent to existing utility pole # 147/27/82919 (plan station 40+80 (+/-) RT) is an existing underground telephone vault and an existing pedestal. According to FairPoint these underground facilities were relocated in 2003 to accommodate the construction of the F EGC F 026-1(34); all underground facilities in this area have now been abandoned."

Public Utilities (Aerial)

"There is an existing aerial 3 phase electric line with 5 Communication Cables which runs along the southern edge of U.S. Route 302 thru the entire project area (see attached existing aerial utility plan sheet). Comcast does not currently have facilities adjacent to the existing bridge, but they may have by the time this project begins; currently their facilities end approximately 350' west of the bridge. Because they are so close I will provide contact information for Comcast as well.

There is an existing electric line (for street lights) which crosses U.S. Route 302 approximately 80' west of the existing bridge.

There is an existing guy wire crossing U.S. Route 302 to a stub pole/anchor approximately 50' west of the existing bridge.

There is an existing 3 Phase electric line which crosses U.S. Route 302 approximately 325' east of the existing bridge."

Right Of Way

The existing Right-of-Way is shown on the Layout sheet. There are two large irregular shaped parcels owned by the State of Vermont. One is north west of the structure and the other is south east. The North west parcel is part of the VAST trail and the South West parcel is an active railroad.

It is anticipated that Right of Way acquisitions will be required for any alternative due to the fact that the wing walls on the upstream side of the bridge both extend beyond the existing Right of Way.

Resources

Archaeological:
No Archaeological resources identified.

Historic:
The bridge has been identified as historic due to its 1940's ornamental railing. The project will require a Section 4(f) Bridge Programmatic evaluation however according to correspondence between Kaitlin O'Shea and Chris Williams, Historic preservation regulations would not require a particular railing on the replacement bridge.

Natural Resources:

Wetlands/Watercourses

There are not wetlands identified within the project area.

Wildlife Habitat

No wildlife habitat or species of special concern were identified within the limits of the project. See the appendices for the Agency of Transportation Office Memorandum from John Lepore.

Rare, Threatened and Endangered Species (R/T/E)

The project is within the summer range of the northern long-eared bat, Myotis septenrionalis, which is federally listed as threated under the Endangered Species Act; the species is also state listed endangered. The species known summer habitat is forested areas, hedge rows, riparian areas. Potential roost trees would likely be trees greater or equal to 3" DBH with specific features on to include; crevices, cracks, and exfoliating bark. This species is also known to occur within bridge structures as well. Further analysis will likely be needed during project permitting.

Agricultural Soils:
No impacts will occur to any prime agricultural soils as the result of this project.

Hazardous Materials:
There are three known hazardous waste site near this project. Site Number 982558 (Simons Berlin Store), Site Number 921208 (Former Bulk Fuel Storage Facility), and Site Number 20124342 (Hooker's Plaza-Warehouse). Each site appears to be outside of the limits of the project therefor Hazardous Materials are not expected to be encountered.

Stormwater:
No known issues.

II. Alternatives Discussion

No Action

This alternative would involve leaving the bridge in its current condition. At this time the bridge deck is rated as a 4 which is considered structurally deficient. If we choose no action the deck will continue to deteriorate which will result in one or more full depth holes causing a safety hazard for the traffic that passes over the bridge. The No Action alternative will not be considered further in this report as it is not a viable alternative given the current condition of this structure.

Rehabilitation

This alternative would involve leaving the bridge deck in place and attempting to patch the existing concrete deck. There are several reasons why this is not a good alternative for this project. The first is that a lot of patching is overhead; this requires the work to take place in difficult circumstances and as a result may produce a lower quality product. Second, there is no certainty what reaction will occur when new concrete is placed adjacent to the existing concrete. Depending on the chemical reaction that occurs the rate of deterioration of the existing concrete which surrounds the patch may expedite. This can be mitigated for by testing and customizing a concrete mixture which will hopefully have an inert reaction when placed against the existing structural concrete but it remains a risk. Third, this work still requires the implementation of a significant traffic control plan and only provides a short duration fix when compared to a deck replacement. The Rehabilitation alternative will not be considered further in this report as it is not a practical alternative given the condition of the existing deck.

Deck Replacement

Given the ratings for the superstructure and substructure a deck replacement is considered a viable alternative. Both the superstructure and the substructure are rated as 6 (satisfactory). Based on the inspection reports, age of the substructure, and site visits, it is anticipated that both the steel beams and the substructure would be able to last at least as long as a new bridge deck ensuring a capital investment in the deck wouldn't be wasted in the near future by discovering the components supporting the deck are no good.

There are multiple options for a deck replacement using either a cast in place (CIP) concrete deck or precast concrete deck panels. Each could be constructed in a number of ways using road closures, phasing, a temporary bridge or some combination of maintenance of traffic alternatives. The advantages of deck panels are rapid construction which limit the time traffic is impacted by construction. This bridge is an ideal candidate for precast concrete deck panels for three reasons, first it currently has a non-composite bridge deck. New structures circa 1960's provided spiral reinforcement or shear studs to physically attach the deck to the girders. This presents problems in construction when using short duration closures and pre-cast concrete deck panels due to the time required to remove the existing deck prior to placing the new precast deck. Second, this structure is short which facilitates quick removal and replacement of the bridge deck. Third, this bridge is wide enough where the bridge railing can be installed after a closure without additional traffic disruptions, keeping the inconvenience and impacts associated

with bridge closures as minimal as possible. Conversely CIP concrete decks require time to form, tie reinforcing, pour, and cure the concrete in place. Constructing the decks using conventional methods would take an entire construction season meaning traffic would be using temporary or reduced facilities while being maintained on alignment.

A deck replacement would meet the needs of the structure, it would take the bridge off the structurally deficient list, provide a crash tested bridge railing, and increase the bridge width enough to match the newly installed "road diet". The proposed deck replacement typical section removes the existing sidewalk from the bridge and provides two shared use shoulders of 5' in width as well as a center turning lane that matches the road diet immediately east and west of the bridge.

Superstructure Replacement

A superstructure replacement was also evaluated for this bridge for the same reason as a deck replacement. While the existing girders are in good condition and could be easily salvaged there are benefits of a superstructure replacement similar to that of a precast concrete deck replacement. The entire superstructure could be fabricated off site and installed rapidly during a short duration closure. The existing steel beams would be replaced with a newer higher strength steel beam or a precast concrete section eliminating the necessity of a future cleaning and painting project for the existing steel beams.

If a new superstructure were selected the width would be the same as the proposed deck replacement alternative. In order to provide a wider typical section the existing abutments would either require widening or a new bridge would be required.

Bridge Replacement

A full bridge replacement would include replacing the deck, superstructure, and substructure at the existing location. The various considerations for this option include the bridge width and length, skew, superstructure type and substructure type.

a. Bridge Width

The current bridge with is 41'-7" with a travel and shoulder area of 34'-6". This does not match the existing roadway typical section through the corridor, which includes two eleven foot wide through lanes, a single eleven foot center turning lane, and two 5' bicycle lanes with a 3' buffer area. Given the town has completed a scoping study for the addition of sidewalks through this corridor, the addition of a 5' wide sidewalk would also need to be included as part of the considerations for a new bridge replacement. It is assumed the sidewalk would be on the same side as the existing sidewalk, since the sidewalk scoping study recommends a sidewalk on the westbound side of the road. For a new bridge the minimum width including bridge railing should be 56' assuming concrete combination bridge railing.

b. Bridge Length and Skew

The existing bridge has a clearspan of approximately 60' along the centerline of the roadway. This does not meet the minimum standard of 88' to achieve bank full width per the hydraulics

report. If a new bridge is selected the recommended minimum span length will be 91’ with a 15 degree skew and minimum clear span between abutments of 88’.

c. Superstructure Type

Given the hydraulic recommendations to maintain the existing finish grade, existing low beam elevation and to increase the span length by 30’ the new superstructure will need to be built using shallow steel beams closely spaced. The depth of the girders, beam spacing, and beam size will need to be determined in design. If a new structure is built it will include a sidewalk which further limits the service deflection criteria which may be difficult or impossible to achieve with the proposed span length and superstructure depth. If the AASHTO requirements for Live Load deflection cannot be achieved within the existing superstructure depth the design team should work closely with Hydraulics to determine if the minimum low beam elevation can be lowered or the span length decreased.

d. Substructure Type

Record plans show the existing abutments are spread footings founded on soil. Based on borings found in the record plans bedrock depths range from 13.5-17.5 feet. Based on these findings there are multiple substructure types available. Integral abutment bridges are the Agency’s first option for new substructures, while a viable candidate at this location the depth to bedrock is relatively shallow meaning the simplified design method would not be applicable. The agency has pre drilled into bedrock in the past for integral abutments and that may be the best alternative for this site. Other substructures include traditional spread footings founded on piles. This abutment type is not required to be as flexible as the integral abutments therefore shorter pile lengths are acceptable and would not require pre-drilling. Additionally there would likely be two rows of piles rather than a single row compared to the integral abutment option. Finally a traditional spread footing founded 6’ below streambed or directly on bedrock is the final option. Gathering additional subsurface information at the location of the proposed abutments will be critical to determining the best substructure for this site. If bedrock is further from the surface than indicated on the record plans then the integral abutments would likely be the preferred alternative, resulting in an approximate 120’ span. If bedrock is closer to the surface, founding a spread footing directly on bedrock will likely be the preferred substructure. The advantage of the spread footing founded on piles is placing the new footing above ordinary high water saving the cost of installation of a cofferdam.

III. Maintenance of Traffic

The Vermont Agency of Transportation developed an Accelerated Bridge Program in 2012, which focuses on expedited delivery of construction plans, permitting, and Right-of-Way, as well as accelerated 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 accelerated construction techniques and incentives to encourage contractors to complete projects early. The Agency will consider the closure option on projects where rapid reconstruction or rehabilitation is feasible. The use of prefabricated elements and systems for new bridges also expedites construction schedules. This can apply to decks, superstructures,

and substructures. Accelerated Bridge Construction should provide enhanced safety for the workers and the travelling public while maintaining project quality.

Based on the volume of traffic at this location providing alternating one-way traffic was not considered feasible.

Option 1: Off-Site Detour

This option would close the bridge and reroute US Route 302 traffic onto US Route 2, and VT Route 14 back to US Route 302. This regional detour has an end-to-end distance of 14.1 miles, and adds approximately 5.3 miles to travel distance.

There are several local bypass routes that may see an increase in traffic from local passenger cars. The shortest route has an end-to-end distance of 7.9 miles. It is likely that this route could see increased traffic if US 302 were closed during construction. The possible local bypass route is as follows:

1. US Route 302, to Addison Drive, Paine Turnpike, Fisher Road and VT Route 62 back to US Route 302 (7.9 mi end-to-end)

A map of the detour route and possible local bypass route, which could see an increase in traffic, can be found in the appendix.

Pedestrian traffic would need to be accommodated during a bridge closure. The proposed detour is too long for pedestrians, and as such, a temporary pedestrian bridge would need to be constructed prior to the closure. The temporary pedestrian bridge could be constructed upstream or downstream of the existing bridge. Additionally, the railroad VAST bridge located downstream could potentially be used as a temporary pedestrian bridge.

Advantages: This option would eliminate the need for a temporary bridge, which would significantly decrease cost and time of construction. This option would not require the need to obtain rights from adjacent property owners for a temporary bridge. This option reduces the time and cost of the project both at the development stage and construction.

Disadvantages: Traffic flow would not be maintained along the corridor during construction.

Option 2: Temporary Bridges

A temporary bridge was considered both upstream and downstream of the structure. The upstream location comes within 5.5’ of the entrance of Capstone Head Start. Capstone Head Start would also lose their entire parking area during construction and their customers would be required to park at the Computer barn. This alternative would also have major impacts on the location of overhead aerial utilities which are currently in the way. Given the impacts of this location compared to the impacts of the Downstream Location this option will not be considered further.

The downstream location of the temporary bridge would also have impacts on local business by reducing the parking area of the Vermont State Employees Credit Union. Customers would still have access to parking there will just be fewer spaces. If the bridge were installed in this location the sewer siphon station would either have to be temporarily raised, relocated, or buried for the duration of construction as the proposed road would be directly above it.

Advantages: A temporary bridge maintains traffic along the existing corridor during construction.

Disadvantages: Temporary bridges increase the overall project cost due to increased ROW, increased earthwork, and additional expenses to provide the temporary structure. They also increase project impacts by requiring additional tree removal, clearing and grubbing, and larger earth disturbance areas. In addition to cost and impacts there is also an overall increase in the construction duration due to installation and removal of the temporary infrastructure before and after the actual project is constructed. While traffic is maintained on alignment many of these activities will require lane reductions or even mini road closures to permit construction vehicles access to the construction site.

Option 3: Phased Construction

Another method of maintaining traffic along the corridor during construction is to build a new structure one lane at a time, or in phases. Construction activities could be phased but would have significant impacts to traffic particularly for the phase of work that requires the contractor to maintain traffic on each side of their construction operations. With the proposed phasing options two lanes of traffic could be maintained at all times however the bridge would need to be constructed in three phases.

Advantages: This would maintain traffic along the existing corridor during construction.

Disadvantages: The time required to construct a phased construction project is longer than a project constructed without phasing, because some of the construction tasks have to be performed multiple times and cannot be performed concurrently. The costs of construction also increase over un-phased work because of this increase in the length of time, the additional inconvenience of working around traffic, and the effort involved in coordinating the joints between the phases. Once again, while the corridor will be open to traffic during construction, traffic will still be delayed and disrupted by the shifting of lanes and by construction vehicles and equipment entering and exiting the site. The construction workers and equipment will still be in close proximity to vehicular traffic increasing the probability of crashes and injures.

IV. Alternatives Summary

Based on the existing site conditions, bridge condition, and maintenance of traffic options three treatments are being considered for comparison with three maintenance of traffic options.

Alternative 1a: Deck Replacement with Traffic Maintained by an Offsite Detour.
Alternative 1b: Deck Replacement with Traffic Maintained by a Temporary Bridge.
Alternative 1c: Deck Replacement with Traffic Maintained by Phased Construction.
Alternative 2a: Superstructure Replacement with Traffic Maintained by an Offsite Detour.
Alternative 2b: Superstructure Replacement with Traffic Maintained by a Temporary Bridge.
Alternative 2c: Superstructure Replacement with Traffic Maintained by Phased Construction.
Alternative 3a: Full Bridge Replacement with Traffic Maintained by an Offsite Detour.
Alternative 3b: Full Bridge Replacement with Traffic Maintained by a Temporary Bridge.
Alternative 3c: Full Bridge Replacement with Traffic Maintained by Phased Construction.

V. Cost Matrix[3]

Berlin BF 026(43)		Do Nothing	Alt 1a	Alt 1b	Alt 1c	Alt 2a	Alt 2b	Alt 2c	Alt 3a	Alt 3b	Alt 3c
			Deck Replacement			Superstructure Replacement			Full Bridge Replacement		
			Closure	Temporary Bridge	Phasing	Closure	Temporary Bridge	Phasing	Closure	Temporary Bridge	Phasing
COST	Bridge Cost	$0	$937,200	$937,200	$1,166,400	$930,100	$930,100	$1,157,600	$2,456,300	$2,456,300	$3,061,600
	Future Painting	$0	$222,400	$222,400	$222,400	$0	$0	$0	$0	$0	$0
	Removal of Structure	$0	$159,360	$159,360	$159,360	$132,800	$132,800	$132,800	$292,160	$292,160	$292,160
	Roadway	$0	$293,000	$293,000	$286,000	$292,000	$292,000	$285,000	$408,000	$408,000	$396,000
	Maintenance of Traffic	$0	$67,122	$250,000	$178,574	$67,122	$250,000	$178,574	$78,322	$250,000	$206,574
	Construction Costs	$0	$1,456,682	$1,639,560	$1,790,334	$1,422,022	$1,604,900	$1,753,974	$3,234,782	$3,406,460	$3,956,334
	Construction Costs W/ Paint	$0	$1,679,082	$1,861,960	$2,012,734	$0	$0	$0	$0	$0	$0
	Construction Engineering + Contingencies	$0	$364,171	$491,521	$537,100	$213,303	$240,561	$263,096	$549,913	$716,900	$989,083
	Total Construction Costs w CEC	$0	$1,820,853	$2,131,081	$2,327,434	$1,635,325	$1,845,461	$2,017,070	$3,784,695	$4,123,360	$4,945,417
	Preliminary Engineering[4]	$0	$145,668	$163,840	$179,033	$284,404	$320,748	$350,795	$291,130	$322,605	$356,070
	Right of Way	$0	$10,000	$160,000	$10,000	$10,000	$160,000	$10,000	$10,000	$160,000	$10,000
	Total Project Costs	$0	$1,976,521	$2,454,921	$2,516,467	$1,929,730	$2,326,210	$2,377,864	$4,085,825	$4,605,966	$5,311,487
	Total Project Costs W/ Paint	$0	$2,198,921	$2,677,321	$2,738,867	$0	$0	$0	$0	$0	$0
SCHEDULING	Project Development Duration[5]	N/A	2 years	4 years	2 years	3 years	4 years	3 Years	3 years	4 years	3 years
	Construction Duration	N/A	3 months	12 months	12 months	4 months	24 months	24 months	6 months	24 months	24 months
	Closure Duration (If Applicable)	N/A	5 Days	N/A	N/A	5 Days	N/A	N/A	30 Days	N/A	N/A
ENGINEERING	Typical Section - Roadway (feet)	5-11-11-11-5	5-11-11-11-5	5-11-11-11-5	5-11-11-11-5	5-11-11-11-5	5-11-11-11-5	5-11-11-11-5	8-11-11-11-8	8-11-11-11-8	8-11-11-11-8
	Typical Section - Bridge (feet)	6-11-11-6	5-11-11-11-5	5-11-11-11-5	5-11-11-11-5	5-11-11-11-5	5-11-11-11-5	5-11-11-11-5	5(Sidewalk)-8-11-11-11-8	5(Sidewalk)-8-11-11-11-8	5(Sidewalk)-8-11-11-11-8
	Geometric Design Criteria	No Change	Substandard Width	Substandard Width	Substandard Width	Substandard Width	Substandard Width	Substandard Width	Meets Standard	Meets Standard	Meets Standard
	Traffic Safety	No Change	Improved	Improved	Improved	Improved	Improved	Improved	Improved	Improved	Improved
	Alignment Change	No	No	No	No	No	No	No	No	No	No
	Bicycle Access	No Change	Improved	Improved	Improved	Improved	Improved	Improved	Improved	Improved	Improved
	Hydraulic Performance	No Change	No Change	No Change	No Change	No Change	No Change	No Change	Improved	Improved	Improved
	Pedestrian Access	No Change	Removed Sidewalk	Removed Sidewalk	Removed Sidewalk	Removed Sidewalk	Removed Sidewalk	Removed Sidewalk	Improved	Improved	Improved
	Utility	No	Relocation	Relocation	Relocation	Relocation	Relocation	Relocation	Relocation	Relocation	Relocation
OTHER	ROW Acquisition	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Road Closure	No	Yes	No	No	Yes	No	No	Yes	No	No
	Design Life[6]	<10 years	40	40	40	40	40	40	80	80	80

[3] Costs are estimates only, used for comparison purposes.
[4] Preliminary Engineering costs are estimated starting from the end of the Project Definition Phase.
[5] Project Development Durations are starting from the end of the Project Definition Phase.
[6] A design life of 40 years will be assumed for the deck and superstructure replacement option based on the existing substructure rating of “satisfactory”.

VI. Conclusion

The recommendation is to proceed with Alternative 3b: Full Bridge Replacement with Traffic Maintained on a Temporary Bridge.

While the substructures are in satisfactory condition, the bridge does not meet the minimum standard for Bank Full Width. The bridge is substandard in width and does not match the typical section of the corridor. Additionally, the bridge is 90 years old and it can be assumed that it has reached the end of its design life.

Structure:

The new bridge will be widened to meet the current typical section of the corridor. This includes 8 foot shoulders and two 11 foot travel lanes with an 11 foot middle turning lane. A sidewalk will also be constructed on the north side of the bridge to match existing conditions and provide continuous service after the planned sidewalk on that side of the roadway is constructed. Geotechnical borings should be requested early on in the design phase to determine the substructure type, which will determine the span length. Additionally, the low beam elevation should not be lowered, and as such the configuration resulting is the shallowest superstructure should be considered. A minimum bank full width of 88' is required.

Traffic Maintenance

It is recommended that traffic is maintained on a 2-way temporary bridge during construction. The temporary bridge should either have a sidewalk to maintain pedestrian traffic or the downstream VAST bridge should be utilized as a temporary pedestrian bridge during construction. If a downstream temporary bridge can be placed without needing to relocate underground sewer and water mains located on the westbound side of the road, then a downstream bridge will be recommended to reduce impacts to adjacent business parking. If an underground utility relocation cannot be avoided with a downstream temporary bridge, then the temporary bridge should be placed on the upstream side of the road.

US Route 302 has a traffic volume of 13,600 which is considered relatively high. Additionally, the bridge is located within an area of significant commercial development, with Central Vermont Hospital, numerous shops, grocery stores, and doctors' offices located in close proximity to the bridge. There are several public transit routes that use US Route 302, and service would be significantly impacted if the route were to close during construction, leaving some with no access to transportation. Utilizing a detour is not recommended due to the impacts to the traveling public. Additionally, the traffic volumes are too high to maintain traffic with phased construction utilizing 2-phases.

VII. Appendices

Site Pictures


06/06/2013


06/06/2013


06/06/2013


06/06/2013

BERLIN BR. 3
BF 026-1(43)

Scale 1:51,291

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

BERLIN
WASHINGTON COUNTY
DISTRICT # 6

STRUCTURE INSPECTION, INVENTORY and APPRAISAL SHEET

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

Inspection Report for BERLIN **bridge no.:** 00003 **District:** 7

Located on: US 00302 ML **over** STEVENS BRANCH **approximately** 1.8 MI E JCT. U.S.2 E **Owner:** 01 STATE-OWNED

CONDITION

Deck Rating: 4 POOR

Superstructure Rating: 6 SATISFACTORY

Substructure Rating: 6 SATISFACTORY

Channel Rating: 6 SATISFACTORY

Culvert Rating: N NOT APPLICABLE

Federal Str. Number: 206200000312032

Federal Sufficiency Rating: 067.1

Deficiency Status of Structure: SD

AGE and SERVICE

Year Built: 1928 **Year Reconstructed:** 1941

Service On: 5 HIGHWAY-PEDESTRIAN

Service Under: 5 WATERWAY

Lanes On the Structure: 02

Lanes Under the Structure: 00

Bypass, Detour Length (miles): 08

ADT: 015500 **% Truck ADT:** 11

Year of ADT: 1998

GEOMETRIC DATA

Length of Maximum Span (ft): 0060

Structure Length (ft): 000064

Lt Curb/Sidewalk Width (ft): 5

Rt Curb/Sidewalk Width (ft): 0.6

Bridge Rdwy Width Curb-to-Curb (ft): 38.9

Deck Width Out-to-Out (ft): 41.5

Appr. Roadway Width (ft): 042

Skew: 15

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: ROLLED BEAM

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

Kind of Material and/or Design: 3 STEEL

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: 1 MEETS CURRENT STANDARD

Approach Guardrail 1 MEETS CURRENT STANDARD

Approach Guardrail Ends: 1 MEETS CURRENT STANDARD

Structural Evaluation: 5 BETTER THAN MINIMUM TOLERABLE CRITERIA

Deck Geometry: 5 BETTER THAN MINIMUM TOLERABLE CRITERIA

Underclearances Vertical and Horizontal: N NOT APPLICABLE

Waterway Adequacy: 7 SLIGHT CHANCE OF OVERTOPPING BRIDGE & ROADWAY

Approach Roadway Alignment: 8 EQUAL TO DESIRABLE CRITERIA

Scour Critical Bridges: 5 STABLE FOR CALCULATED SCOUR

DESIGN VEHICLE, RATING, and POSTING

Load Rating Method (Inv): 1 LOAD FACTOR (LF)

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: 3 HS 15

INSPECTION and CROSS REFERENCE

X-Ref. Route:

Insp. Date: 042017 **Insp. Freq. (months)** 12 **X-Ref. BrNum:**

INSPECTION SUMMARY and NEEDS

4/10/2017 The deck has extensive saturation with large spalls and delams. The spalling has penetrated up to the third layer of reinforcing. This structure needs to have a full deck replacement as soon as possible. A replacement structure should be considered to allow for unrestricted channel flow along abutment 1. JW/SP

6/30/2016 This structure should be considered for a full deck replacement with new bridge guardrail installed that meets standards. JW/AC

06/11/2015 - Bridge deck is quite poor with extensive deterioration along the underside and has the potential for full depth failure to develop over the next few years. Bridge needs extensive reconstruction with a new deck, or perhaps an RC rigid overlay. ~ MJ/JS

06/17/2014 - Deck is in poor condition and needs replacement. Deck surface is quite rough and has hot spots for full depth holes to punch through in beam bays 3 and 4. Additional popouts since last inspection in beam bay #4 (centerline bay). See photos. Has potential for rigid overlay if needed, but full replacement of deck desirable with stage construction and should be within the next 2 years. ~ MJ

AGENCY OF TRANSPORTATION **OFFICE MEMORANDUM**

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

END

From: Eric Denardo, Geotechnical Engineer, via Christopher C. Benda P. E., Geotechnical Engineering Manager

CCB

Date: August 20, 2014

Subject: Berlin BF 026-1(43) Preliminary Geotechnical Information

1.0 INTRODUCTION

We have completed our preliminary geotechnical investigation for the replacement of Bridge 3 on US Route 302 (Barre-Montpelier Road) in Berlin, which crosses over the Stevens Branch of the Winooski River. The existing structure is a single span rolled beam bridge with a cast in place concrete deck. This review included observations made during a site visit, the examination of historical in-house bridge boring files, as-built record plans, USDA Natural Resources Conservation soil survey records, published surficial and bedrock geologic maps, and water well logs on-file at the Agency of Natural Resources.

2.0 SUBSURFACE INFORMATION

2.1 Previous Projects

Record plans were found for the project, which show that the bridge abutments are supported on spread footings. Data from three borings was included in the record plans. The soil was reported as sand, silt, and gravel with cobbles and boulders. The logs did not include bedrock descriptions or blow counts. Bedrock depths ranged from 13.5 to 17.5 feet.

The Geotechnical Engineering Section maintains a 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 database revealed one nearby project, Berlin STPG SGNL(40), approximately 0.6 miles away. Borings were completed to 26-27 feet below ground surface elevation. Boring logs indicated silt with no bedrock encountered.

2.2 Water Well Logs

Figure 1 contains the subject project as well as surrounding well locations found using the ANR Natural Resources Atlas. Published online, the logs can be used to determine general characteristics of soil strata in the area. The soil description given on the logs is done in the field, by unknown personnel, and as such, should only be used as an approximation. Four water wells within an approximate 1700 foot radius of the project were used to get an estimate of the depth to bedrock likely to be encountered for Bridge

3. The specific wells used to gain information on the subsurface conditions are highlighted below by red boxes.

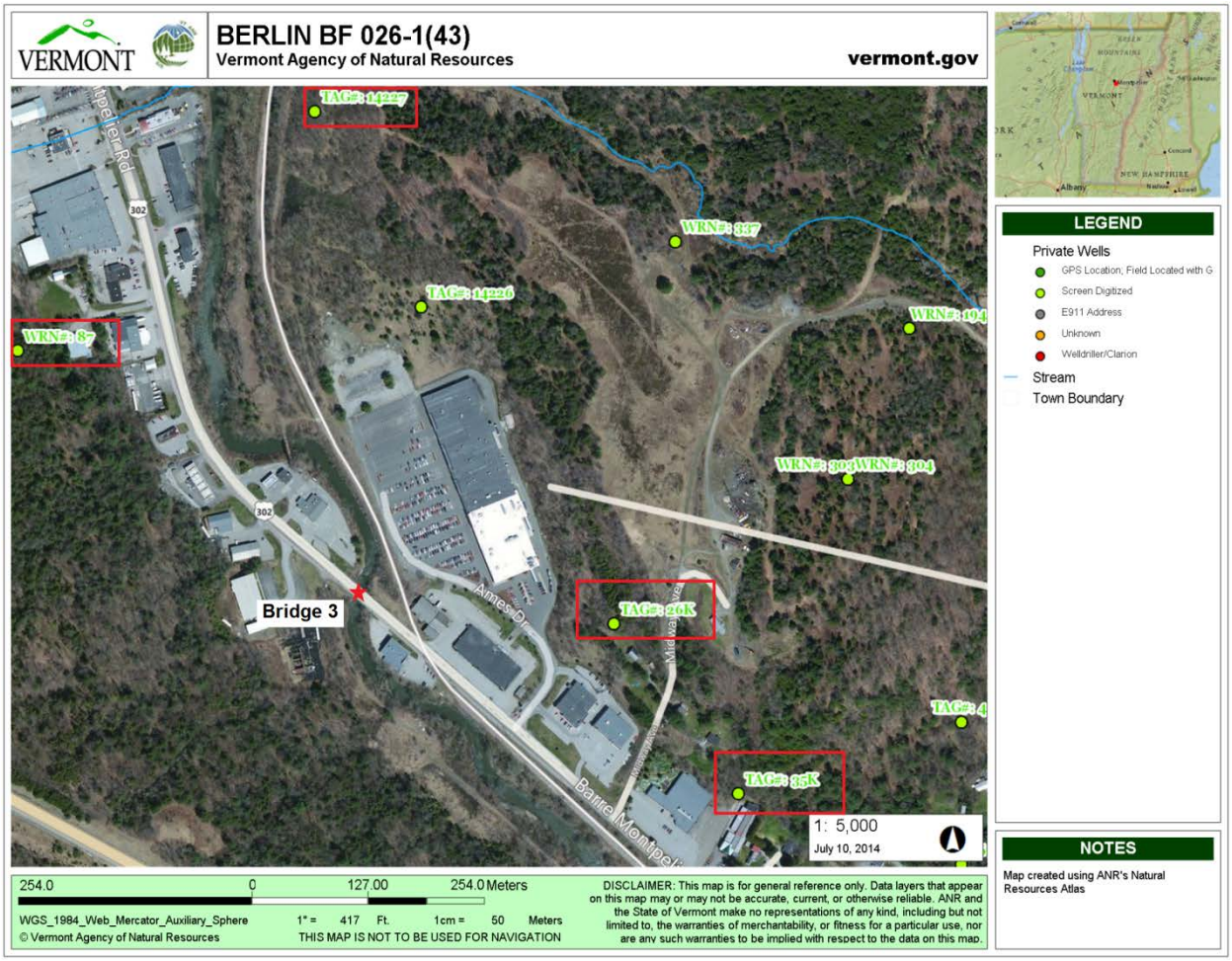


Figure 1. Highlighted well locations near subject project

Table 1 lists the well sites used in gathering the surrounding information. Wells are listed with the distance from the bridge project, depth to bedrock, and overlying soils encountered.

Table 1. Depths to bedrock of surrounding wells

Well ID	Distance From Project (feet)	Depth To Bedrock (feet)	Overlying Strata
14227	1700	35	Not Specified
26K	900	49	Hardpan/Gravel
87	1500	30	Clay/Hardpan
35K	1500	38	Clay/Hardpan

2.3 USDA Soil Survey

The United States Department of Agriculture Natural Resources Conservation Service maintains an online surficial geology map of the United States. According to the Web

Soil Survey, the strata directly underlying the project site consists of very stony, moderately well drained Buckland very fine sandy loam, with 15-35% slopes, with depth to bedrock of 20 to 40 inches and depth to groundwater of 12 to 24 inches and Urban land-Udipsamments complex with a depth to bedrock of greater than 80 inches and a depth to groundwater of greater than 80 inches.

2.4 Geologic Maps of Vermont

Mapping conducted in 1970 for the Surficial Geologic map of Vermont shows that the project area is underlain by glaciolacustrine silt, silty clay, and clay deposits on top of glacial till.

According to the 2011 Bedrock Map of Vermont, the project site is underlain with carbonaceous phyllite and limestone bedrock in beds ranging from 4 inches to 30 feet thick.

3.0 FIELD OBSERVATIONS

A preliminary site visit was conducted on August 14, 2014 to determine possible obstructions inhibiting boring operations and to make any other pertinent observations about the project. Overhead power lines run along the south side of the bridge and cross over the west end of the bridge. As shown in Figure 2.

Figure 2: View of the Bridge Looking East

According to record plans from previous construction, the existing abutments are founded on spread footings. No visible bedrock was seen during the site visit. The sides of the stream were armored with stone, shown in Figure 3. Because of the high turbidity of the river during the site visit it was difficult to see if there was bedrock or cobbles in the river.

Figure 3: Stevens Branch, North side of the Bridge

4.0 RECOMMENDATIONS

Based on the site visit and a review of the bridge inspection report and photos, the existing foundations appear to be in satisfactory condition. For this reason, reuse of the existing foundations with minor repairs and replacement of the superstructure should be considered. If this is not the preferred option, possible foundation alternatives for a bridge replacement include the following:

- Reinforced concrete abutments on spread footings
- Reinforced concrete abutments founded on micropiles drilled into bedrock

We recommend borings be taken at opposite corners of the abutments in order to more fully assess the subsurface conditions at the site including, but not limited to, the soil properties,

ground water conditions and depth to bedrock. If shallow bedrock or problematic soils are encountered, additional borings should be completed.

When a preliminary alignment has been chosen, the Geotechnical Engineering Section should be contacted to help determine a subsurface investigation that efficiently gathers the most information.

If you have any questions or would like to discuss this report, please contact us by phone at (802) 828-6910, or via email at chris.benda@state.vt.us.

cc: Project File/CCB
END

Z:\Highways\ConstructionMaterials\GeotechEngineering\Projects\Berlin BF 026-1(43)\REPORTS\Berlin BF 026-1(43) Preliminary Geotechnical Information.docx

VT AGENCY OF TRANSPORTATION PROGRAM DEVELOPMENT DIVISION

HYDRAULICS UNIT

TO: Chris Williams, Structures Project Manager

FROM: David Willey, Hydraulics Project Supervisor

DATE: August 27, 2014

SUBJECT: Berlin BF 026-1(43), US 302 BR 3 over Stevens Branch

---

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

Existing Conditions

The existing structure was rebuilt in 1928 and rehabilitated and widened in 1941. It is a single span steel beam bridge with a concrete deck. The bridge abutments are skewed about 75 degrees to the road. It has a clear span length of about 57' along the roadway and a hydraulic clear span length of about 53', measured perpendicular to the abutments. Clear height is about 19', providing a waterway opening of about 825 sq. ft. Abutments are partially laid up stone and partially concrete.

This is a developed area. The channel and floodplain through this area have been affected by the roads, railroads, buildings and parking areas. Site conditions affect hydraulics and will limit project options.

The existing bridge does not meet the current hydraulic standards. Water overtops the bridge and roadway below the design Q50. A Q10 event will pass under the bridge. Water is up onto the beams at a Q25, based on a low bottom of beam elevation of 556.4' and a Q25 water surface elevation of about 558.8'. The Q50 water surface elevation is about 560.6'. So the bridge does not have the required 1' of freeboard at the design flow.

Proposed Project

There is a Flood Insurance Study for this river. That and all the development in the floodplain dictate there be no increase in water surface elevations. So there should be no decrease in the waterway area of the bridge.

Superstructure replacement

One option that may be considered is a new deck or superstructure on the existing abutments. This option would not meet the current hydraulic standards, but may be acceptable provided the waterway area of the bridge is not reduced. Bottoms of beams should be kept at least as high as the existing. Any increase in the bottom of beam elevation, by using a shallower superstructure, would be beneficial hydraulically. The roadway grade should not be raised, as that would raise the overtopping relief elevation and could increase upstream water levels. No fill should be placed between the abutments that would reduce the waterway area of the bridge.

Due to the channel alignment coming into the bridge, the flow is directed toward the westerly abutment. There is a sand and gravel bar in front of the easterly abutment, with scour in front of the westerly abutment. Bridge inspection reports show the top of the westerly abutment footing is exposed about 1' to 2' with no undermining. Record plans show the top of both footings should have been about 1' to 2' below streambed. So the streambed may have scoured 2' to 4' in front of the westerly abutment since the bridge was reconstructed in 1941. Bridge inspection records appear to show the streambed is fairly stable with no long term changes noted. Based on the record plans the bottom of the westerly abutment footing would now be about 3' to 4' below streambed. Calculated contraction scour is low at this bridge, likely due to the floodplain relief for flood flows. Therefore it may be acceptable to reuse the existing abutments if they are adequate structurally. However, the westerly abutment is not founded 6' below streambed, as is the current practice. If scour in front of that abutment is a concern, scour countermeasures that do not reduce the waterway area of the bridge should be considered.

The existing wingwall on the upstream end of abutment 1 extends straight upstream from the abutment, parallel to the river. There is a large area with no fill behind that wingwall. That area should be filled in to prevent water from getting behind the wingwall and to direct water into the bridge opening.

Complete Bridge Replacement

In sizing a new structure we attempt to select structures that meet both the current VTrans hydraulic standards, state environmental standards with regard to span length and opening height, and allow for roadway grade and other site constraints.

A longer bridge is needed to span the bank full width. We recommend a new bridge have an 88' minimum clear span length, measured perpendicular to the channel, with abutments aligned with the channel. This is based on using spill-through abutments with the stone fill in front of the abutments matching into the upstream and downstream channel banks. If the abutments are not aligned with the channel, a longer bridge may be needed to provide the recommend clear span length. This length bridge will lower upstream water surface elevations by about 1' at Q100. Although an 88' clear span bridge is recommended to span the bank full width, it may not be practical to design a bridge that long and maintain the existing roadway grade and not lower the bottom of beam elevations. If lengthening the bridge to an 88' clear span will require a deeper superstructure, the ANR should be contacted to determine if they will accept a bridge shorter than 88'.

It may not be practical to build a bridge within the confines of the site that will meet hydraulic standards with Q50 at approximately 560'. The bottom of beams would need to be at least elevation 561' to have 1' of freeboard at the design Q50. If a new bridge is built the bottoms of beams should be kept at least as high as the existing. Any increase in the bottom of beam elevation, by using a shallower superstructure, would be beneficial hydraulically. The roadway grade should not be raised, and no fill should be placed between the abutments that would reduce the waterway area of the bridge.

This is a low bridge with a lot of water overtopping the road. Many variables are in play such as span, low beam and finish grade. There are limitless combinations, all with different impacts. We have done our best to describe the ideal solution above, but if you are unable to meet those recommendations and would like to have us test other options, please let us know.

General Comments

There is stream bank erosion upstream and downstream of the westerly abutment. The stream banks in those areas should be protected with new stone fill as part of any bridge project here.

If a new bridge is installed, the bottom of abutment footings should be at least six feet below the channel bottom, or to ledge, to prevent undermining. Abutments on piles should be designed to be free standing for a scour depth at least 6' below channel bottom.

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

DCW

Attachments

cc: Hydraulics Project File via NJW
Hydraulics Chrono File

AGENCY OF TRANSPORTATION **OFFICE MEMORANDUM**

TO: Jeff Ramsey, Environmental Specialist

FROM: John Lepore, Transportation Biologist

DATE: January 2, 2014

SUBJECT: BERLIN B_F 026-1 (43)
US 302 over the Stevens Branch

The purpose of this memorandum is to let you know that I have completed the initial resource identification of this site which was based on ArcMap and site familiarity.

WETLANDS

Wetlands are not located in the immediate project area. For the sake this effort, the study area extended 250 on either side of the bridge along US 302, with 150 feet of offsets. The Stevens Branch is confined within steep sided channel in this location.

AGRICULTURAL SOILS

Prime agricultural soils are not present within the vicinity of this bridge.

SPECIES / HABITAT OF SPECIAL CONCERN

According to the Significant Habitat Map for the Town of Berlin, there are no known species or habitats of special concern within the potential limits of the project.

FISHERIES

The Stevens Branch is a cold-water stream known to host a variety of native fish species, and although it is not classified as *Essential Fish Habitat*, standard time-of-year restrictions will apply for all in-stream work.

PERMITS

The Stevens Branch is not classified as either a *Navigable Waterway* or *Essential Fish Habitat* but any in-stream impacts would need both state and federal permits. Any widening of the approaches, temporary bridges, or construction access pads will trigger additional permit concerns. Increasing the hydraulic opening at this crossing would have many ecological advantages, and would help facilitate the speed of obtaining permits.

CONSTRUCTION

This portion of US 302 has high traffic volumes and thus, it is assumed that traffic will need to be maintained at all times. As the utilities and a building are both located on the southern side of US 302, it appears that the most logical place for a temporary detour would be to the north of US 302, between the Vermont State Employees Credit Union building and the at-grade crossing of the WACR.

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, Environmental Specialist

From: Jeannine Russell, VTrans Archaeology Officer

Date: January 29, 2014

Subject: Berlin BF 026-1(43) – Archaeological Resource ID

The scope of this project has not yet been determined but includes the area surrounding Bridge 3 on US 302 in Berlin, VT. An Archaeological Resources ID was completed on 1-16-14. For the purposes of this resource ID, a 200 foot radius around the bridges was used as the project area.

The VTrans Archaeology Officer has concluded that there are no archaeological resources within the current project area. A formal clearance will be issued once plans are available.

Please contact me if you have any questions.

Thank you,
Jen Russell
VTrans Archaeology Officer

VTrans Working to Get You There
Vermont Agency of Transportation

From: O"Shea, Kaitlin
To: Williams, Chris
Cc: Ramsey, Jeff; Newman, Scott
Subject: Berlin BF 026-1(43) Historic Resource ID
Date: Thursday, January 02, 2014 11:58:08 AM

Hi Chris,

I have completed the historic resource ID for Bridge 3, which carries US 302 over the Stephens Branch in Berlin. Bridge 3 is a historic bridge, significant for its 1940s ornamental railing. It is eligible for listing in the National Register of Historic Places. This project will require a Section 4(f) Bridge Programmatic evaluation.

The bridge is not located adjacent to any historic resources or Section 4(f) resources. Prior to removal, photographic documentation would be required. Historic preservation regulations would not require a particular railing on the replacement bridge.

Let me know if you need additional information.

Thanks,

Kaitlin

Kaitlin O'Shea
Historic Preservation Specialist
Vermont Agency of Transportation

802-828-3962
Kaitlin.O'Shea@state.vt.us

From: Newman, Scott
Sent: Tuesday, December 24, 2013 10:55 AM
To: Williams, Chris; Ramsey, Jeff; Brady, James; Goldstein, Lee; O'Shea, Kaitlin; Lepore, John; Gingras, Glenn; Russell, Jeannine; Gauthier, Brennan; Slesar, Chris
Cc: Hedges, Mike; Symonds, Wayne; Thurber, Pam
Subject: RE: 2014 Scoping Projects

You'll be able to access historic resource ID status for these bridges at:

Z:\PDD\EnvironmentalHydraulics\Historic Preservation\Williams 24 Bridges ID.xls

Historic resource ID will be complete by the end of March, '14 – ID'd in ArcMap and heads-up comments to CW and the appropriate specialist.

Happy Holidays All !!

Local & Regional Input Questionnaire

Project Name: Berlin BR. 3 **Project Number: BF 026-1(43)**

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. We are not aware of any upcoming events in this area during the upcoming year.

2. Is there a "slow season" or period of time from May through October where traffic is less? No.

3. Please describe the location of emergency responders (fire, police, ambulance) and emergency response routes. Berlin's police station is located at the municipal office building at 108 Shed Road. Berlin's Fire station (which also serves as a sub-station for Barre Town Ambulance) is located at the corner of VT Route 62 and Paine Turnpike. US Route 302 and VT Route 62 are critical emergency response routes for Berlin and regional responders in this area. However, Route 62 would serve as an adequate alternate response route to areas east of the project site if needed.

4. Where are the schools in your community and what are their schedules? The only public school in Berlin is Berlin Elementary, which is located near the corner of Paine Turnpike and Route 62. Berlin Elementary's schedule is September to June. There are two private schools in Berlin: the Central VT Academy School on Vine Street (off US Route 302), and the Montessori School on VT Route 2.

5. In the vicinity of the bridge, is there a land use pattern, existing generators of pedestrian and/or bicycle traffic, or zoning that will support development that is likely to lead to significant levels of walking and bicycling? Please explain. The project site is within an area of significant commercial development and relatively high volumes of vehicle traffic. However, currently there are no pedestrian facilities in this area or on Route 302, and as a result, there are low levels of bicycle and pedestrian traffic in this area.

6. Are there any businesses (including agricultural operations) that would be adversely impacted either by a detour or due to work zone proximity? This area of Berlin consists of significant local and regional commercial uses that would be negatively impacted by a detour.

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? No.

8. Are there any town highways that might be adversely impacted by traffic bypassing the construction on another local road? No.

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. The Town of Berlin of web site (www.berlinvt.org), Berlin front porch forum, ORCA channel 17, the World weekly newspaper.

11. Is there a local business association, chamber of commerce or other downtown group that we should be working with? Central Vermont Chamber of Commerce.

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? No.

2. Are there any concerns with the width of the existing bridge? The Town of Berlin is currently undertaking a bike and pedestrian scoping study along Route 302 to develop a plan for future bike and pedestrian opportunities in this area. The narrow width of the current bridge limits the addition of bike and pedestrian lanes in this area along Route 302. The Town of Berlin asks that Vtrans take these concerns into consideration when designing the new bridge.

3. What is the current level of bicycle and pedestrian use on the bridge? Low. However, that is because there is a lack of bike and pedestrian facilities along Route 302. The level of use should increase with the installation of these facilities.

4. If a sidewalk or wide shoulder is present on the existing bridge, should the new structure have one? Are there existing bicycle and/or pedestrian facilities on the approaches to the bridge? There are no bike or pedestrian facilities on the bridge or the approaches. The new structure should include bike and pedestrian facilities.

5. Does the Town have plans to construct either bicycle or pedestrian facilities leading up to the bridge? Please provide a copy of the planning document that demonstrates this (e.g. scoping study, master plan, corridor study) Please explain and provide documentation. A scoping Study is in process (see attached).

6. Does the bridge provide an important link in the town or statewide bicycle or pedestrian network such that you feel that bicycle and pedestrian traffic should be accommodated during construction? As noted above, the Town is undertaking a bike and pedestrian scoping study for this area. Also, the local and regional plans identify the need for bike paths along the Route 302 Corridor.

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 current bridge is too narrow to accommodate bike or pedestrian lanes.

9. Does the location have a history of flooding? If yes, please explain. We are not aware of any recent flooding on the approaches or the bridge.

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? No.

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.

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.

A detour would significantly impact the City Commuter and Midday routes and be difficult to serve passengers in the deviation vicinity. If GMTA had to detour, using Sherwood Drive in Montpelier to Route 62 would be the best alternative however most of the Barre-Montpelier Road would be missed and many people go to Price Chopper and medical appointments in this area.

Vermont Agency of Transportation

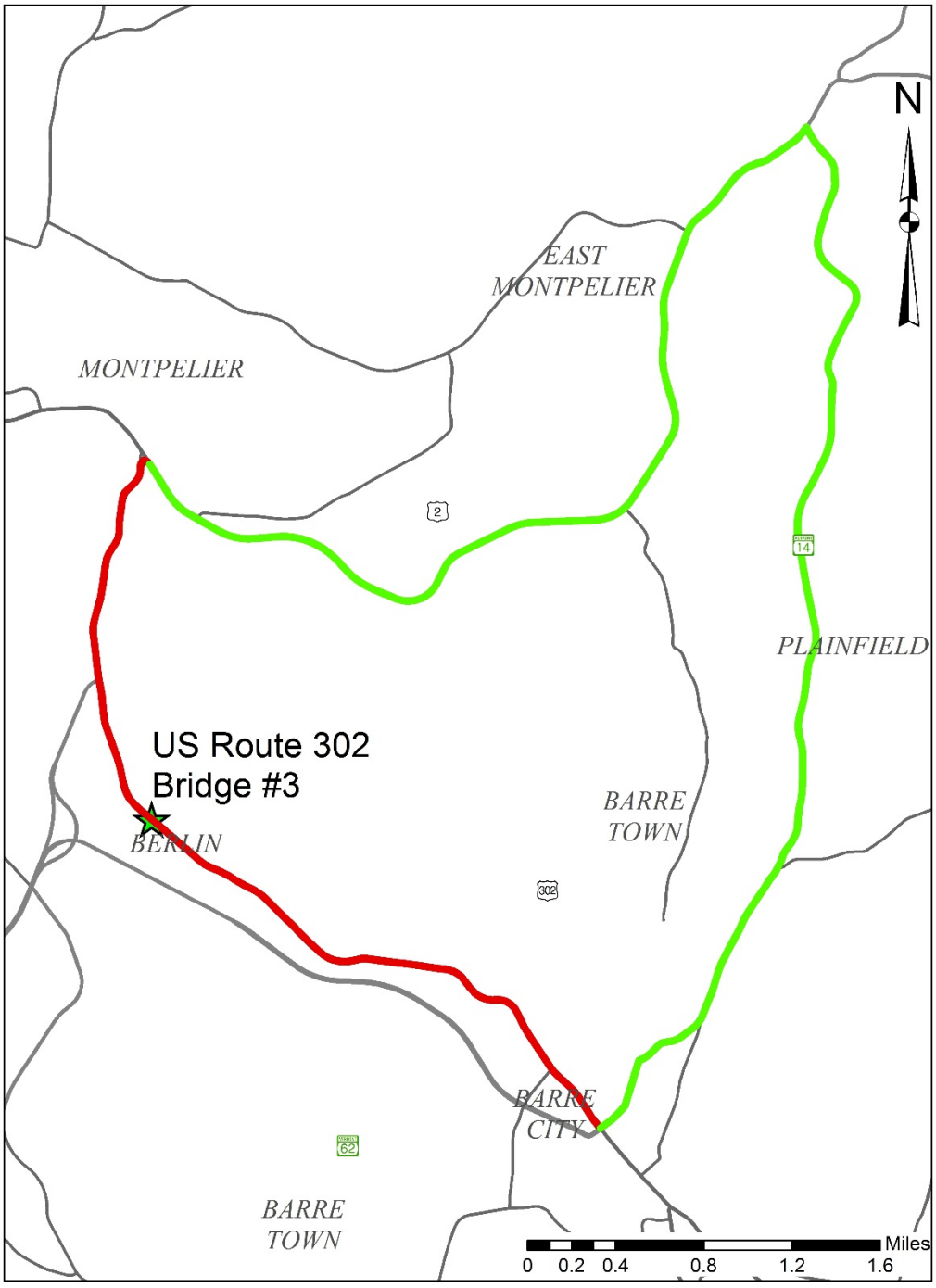
General Yearly Summaries - Crash Listing: State Highways and All Federal Aid Highway Systems

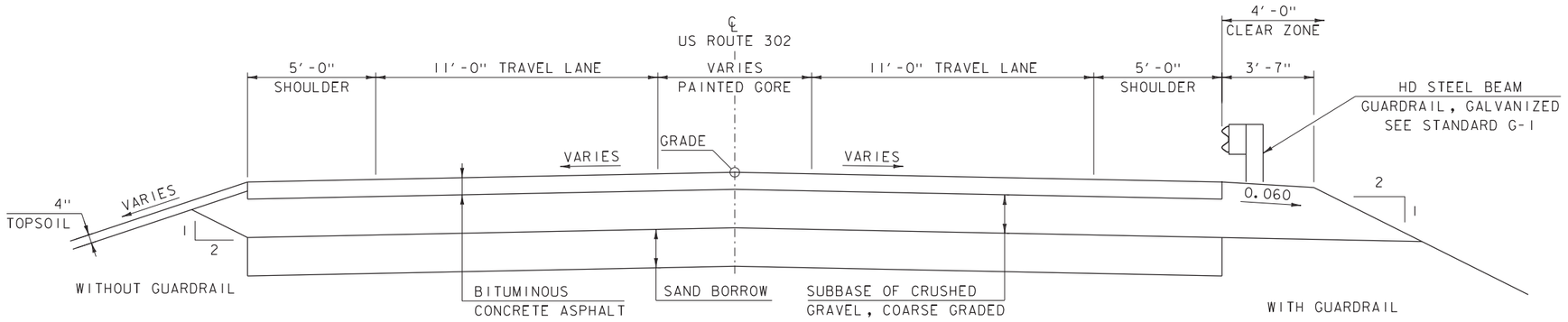
From 01/01/12 To 12/31/16 General Yearly Summaries Information

*	Reporting Agency/ Number	Town	Mile Marker	Date MM/DD/YY	Time	Weather	Contributing Circumstances	Direction Of Collision	Number Of Injuries	Number Of Fatalities	Number Of Untimely Deaths	Direction	Road Group
Route: US-302 Continued ...													
	VT0120600/14BL0 0138	Berlin	0.64	01/17/2014	11:24	Clear	Failed to yield right of way, No improper driving	No Turns, Thru moves only, Broadside ^<	0	0	0	E	SH
	VT0120600/14BL0 1431	Berlin	0.64	06/20/2014	13:20	Clear	Failed to yield right of way, No improper driving	Left Turn and Thru, Angle Broadside -->v--	0	0	0	N	SH
	VT0120600/13BL0 1535	Berlin	0.65	06/18/2013	12:29	Clear	No improper driving, Operating vehicle in erratic, reckless, careless, negligent, or aggressive manner, Unknown	Head On	0	0	0		SH
	VT0120600/12BL0 0168	Berlin	0.7	01/20/2012	05:25	Snow	No improper driving, Distracted, Unknown	No Turns, Thru moves only, Broadside ^<	0	0	0	E	SH
	VT0120600/13BL0 0335	Berlin	0.76	02/08/2013	12:48	Snow	No improper driving, Failure to keep in proper lane	Opp Direction Sideswipe	0	0	0	E	SH
	VT0120600/14BL0 0140	Berlin	0.81	01/17/2014	16:54	Clear	No improper driving, Inattention, Distracted	Rear End	1	0	0		SH
	VT0120600/12BL0 1030	Berlin	0.82	05/01/2012	13:47	Cloudy	No improper driving, Failed to yield right of way		0	0	0	W	SH
	VT0120600/12BL0 0342	Berlin	0.83	02/10/2012	08:23	Clear	No improper driving, Failed to yield right of way	Left Turn and Thru, Angle Broadside -->v--	0	0	0	E	SH
	VT0120600/14BL0 1631	Berlin	0.83	07/10/2014	08:48	Clear	Failure to keep in proper lane	Single Vehicle Crash	1	0	0		SH
	VT0120600/15BL0 2378	Berlin	0.85	09/04/2015	13:01	Clear	No improper driving, Inattention	Rear End	0	0	0	E	SH
	VT0120600/13BL0 1381	Berlin	0.86	05/31/2013	17:35	Clear	No improper driving, Failure to keep in proper lane, Under the influence of medication/drugs/alcohol	Opp Direction Sideswipe	1	0	0		SH
	VT0120600/12BL0 3168	Berlin	0.87	12/22/2012	09:35	Cloudy	Failure to keep in proper lane, Unknown, No improper driving	Same Direction Sideswipe	0	0	0	E	SH
	VT0120600/12BL0 1203	Berlin	0.97	05/21/2012	15:02	Clear	No improper driving, Inattention	Rear End	1	0	0	E	SH
	VT0120600/14BL0 0580	Berlin	1.06	03/17/2014	11:30	Clear	No improper driving, Distracted	Rear End	0	0	0	W	SH
	VT0120600/12BL0 1158	Berlin	1.07	05/16/2012	12:33	Clear	No improper driving, Inattention, Distracted	Left Turn and Thru, Same Direction Sideswipe/Angle Crash vv--	0	0	0	W	SH
	VT0120600/13BL0 1143	Berlin	1.07	05/06/2013	11:39	Clear	Technology Related Distraction, Followed too closely, No improper driving	Rear End	0	0	0	W	SH
	VT0120600/15BL0 1392	Berlin	1.16	05/21/2015	16:42	Clear	No improper driving, Inattention	Rear End	0	0	0	W	SH
	VT0120600/14BL0 3159	Berlin	1.25	12/20/2014	12:42	Clear	No improper driving, Followed too closely	Rear End	0	0	0	E	SH
	VT0120600/12BL0 0673	Berlin	1.32	03/20/2012	15:03	Clear	No improper driving, Followed too closely, Driving too fast for conditions	Rear End	0	0	0		SH
	VT0120600/15BL0 3056	Berlin	1.32	11/21/2015	12:43	Clear	No improper driving, Inattention	Rear End	0	0	0	W	SH
	VT0120600/12BL0 2262	Berlin	1.33	09/12/2012	17:54	Clear	Visibility obstructed, No improper driving	No Turns, Thru moves only, Broadside ^<	0	0	0	S	SH
	VT0120600/13BL0 0344	Berlin	1.35	02/09/2013	11:28	Clear	Failed to yield right of way, Visibility obstructed, No improper driving	No Turns, Thru moves only, Broadside ^<	0	0	0	S	SH
	VT0120600/13BL0 2757	Berlin	1.35	11/03/2013	09:59	Clear	No improper driving, Failed to yield right of way	Left Turn and Thru, Angle Broadside -->v--	0	0	0		SH
	VTVSP1200/13A30 5333	Berlin	1.35	12/17/2013	14:48				0	0	0		SH
	VT0120600/12BL0 1338	Berlin	1.38	06/02/2012	08:54	Rain	No improper driving, Failed to yield right of way, Visibility obstructed	No Turns, Thru moves only, Broadside ^<	0	0	0		SH
	VT0120600/15BL0 1125	Berlin	1.5	04/27/2015	12:28	Clear	No improper driving, Failed to yield right of way	Other - Explain in Narrative	0	0	0	N	SH
	VT0120600/14BL0 0703	Berlin	1.58	04/01/2014	00:23	Clear	Followed too closely, No improper driving	Rear End	0	0	0	W	SH
	VT0120600/14BL0 1151	Berlin	1.6	05/21/2014	09:21	Clear	Distracted, Followed too closely	Rear End	1	0	0	W	SH

**Crash occurred prior to the last Highway Improvement Project. This data should not be used in a crash analysis. UNK indicates the Mile Marker is Unknown.*

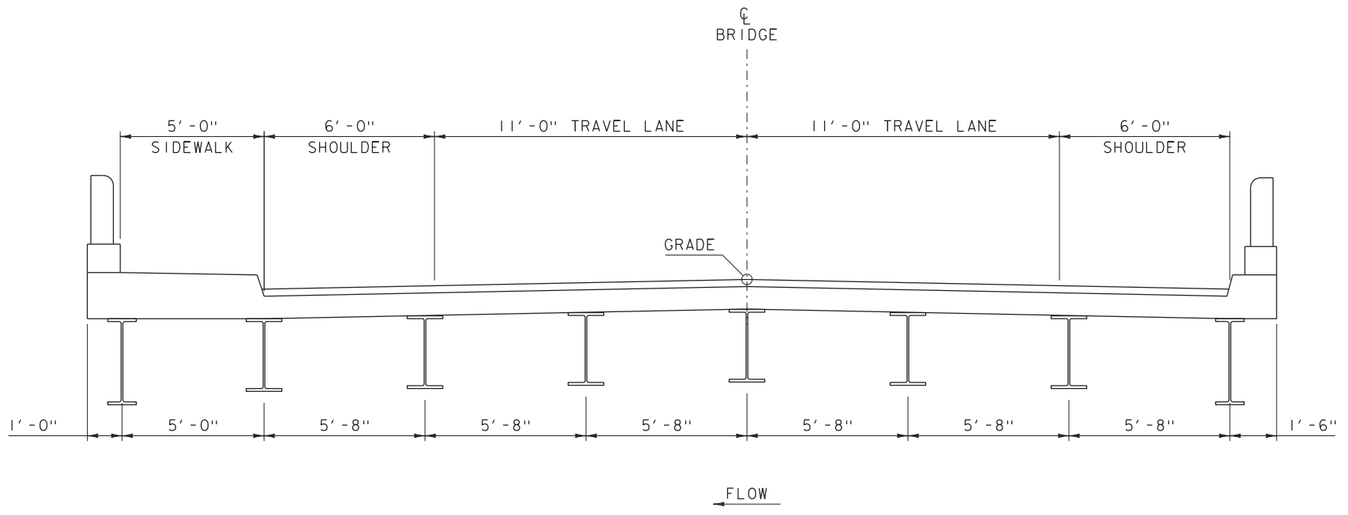
Detour Route





EXISTING US ROUTE 302 TYPICAL SECTION

SCALE 3/8" = 1'-0"



EXISTING BRIDGE TYPICAL SECTION

SCALE 3/8" = 1'-0"

GIRDER SPACING TAKEN FROM AS BUILT PLANS

MATERIAL TOLERANCES

(IF USED ON PROJECT)

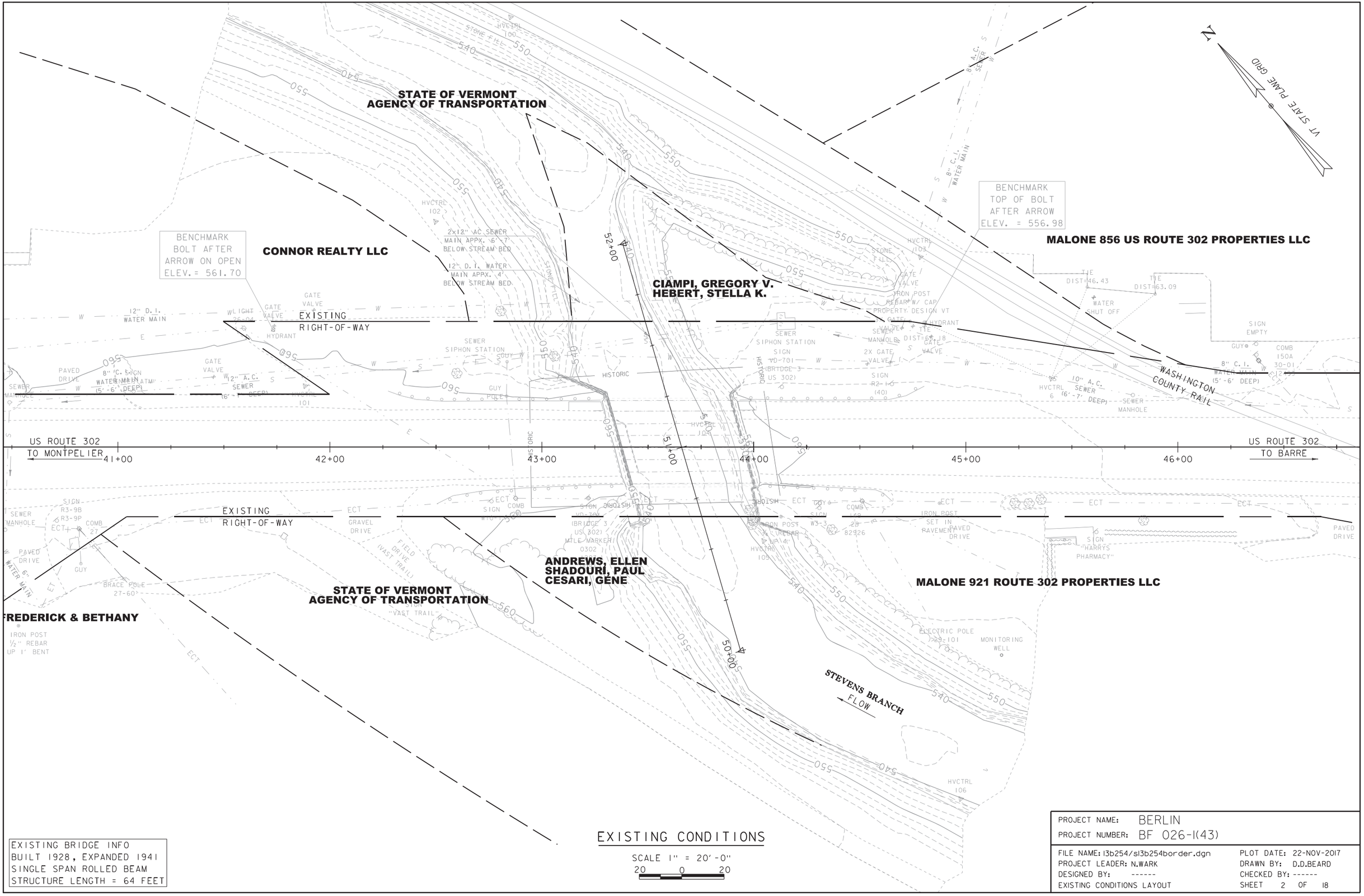
SURFACE	
- PAVEMENT (TOTAL THICKNESS)	+/- 1/4"
- AGGREGATE SURFACE COURSE	+/- 1/2"
SUBBASE	+/- 1"
SAND BORROW	+/- 1"

PROJECT NAME: BERLIN

PROJECT NUMBER: BF 026-1(43)

FILE NAME: 13b254\sl3b254typical.dgn
PROJECT LEADER: N.WARK
DESIGNED BY: L.J.STONE
EXISTING TYPICAL SECTIONS

PLOT DATE: 22-NOV-2017
DRAWN BY: D.D.BEARD
CHECKED BY: L.J.STONE
SHEET 1 OF 18

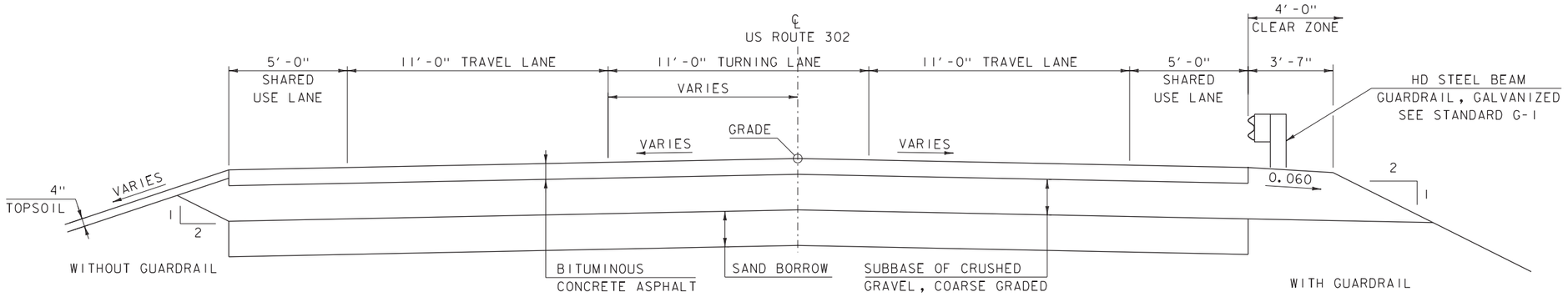


EXISTING BRIDGE INFO
BUILT 1928, EXPANDED 1941
SINGLE SPAN ROLLED BEAM
STRUCTURE LENGTH = 64 FEET

EXISTING CONDITIONS

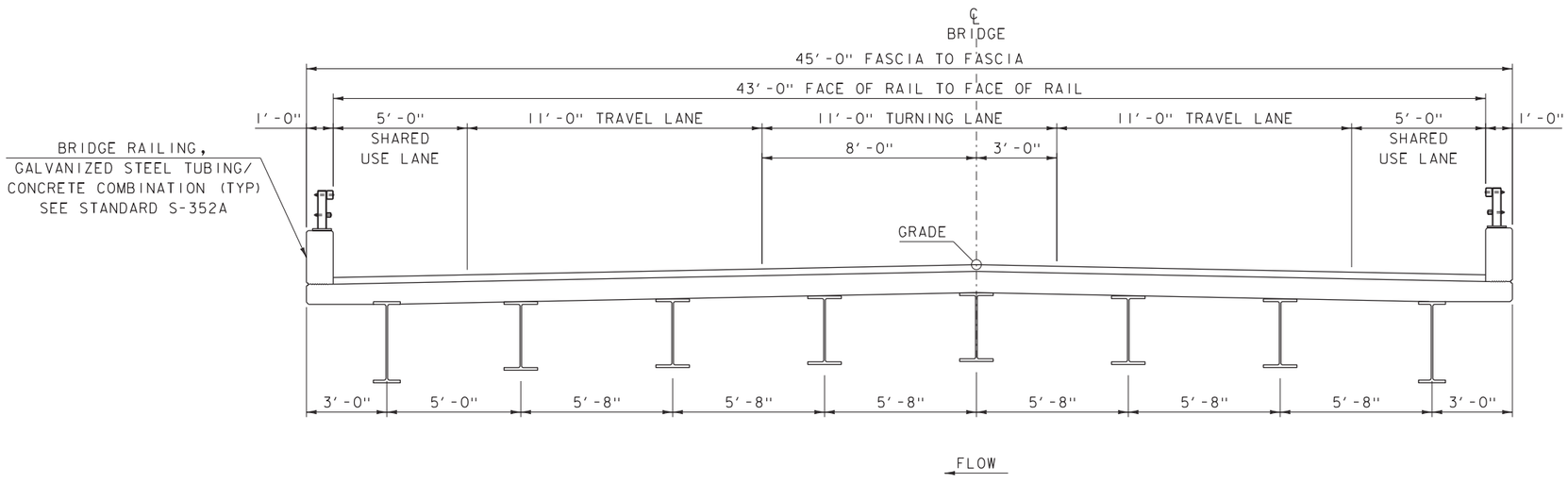
SCALE 1" = 20'-0"
20 0 20

PROJECT NAME:	BERLIN
PROJECT NUMBER:	BF 026-1(43)
FILE NAME: l3b254/sl3b254border.dgn	PLOT DATE: 22-NOV-2017
PROJECT LEADER: N.WARK	DRAWN BY: D.D.BEARD
DESIGNED BY: ------	CHECKED BY: ------
EXISTING CONDITIONS LAYOUT	SHEET 2 OF 18



ALTERNATIVE #1 PROPOSED US ROUTE 302 TYPICAL SECTION

SCALE 3/8" = 1'-0"



ALTERNATIVE #1 PROPOSED BRIDGE TYPICAL SECTION

SCALE 3/8" = 1'-0"

GIRDER SPACING TAKEN FROM AS BUILT PLANS

MATERIAL TOLERANCES

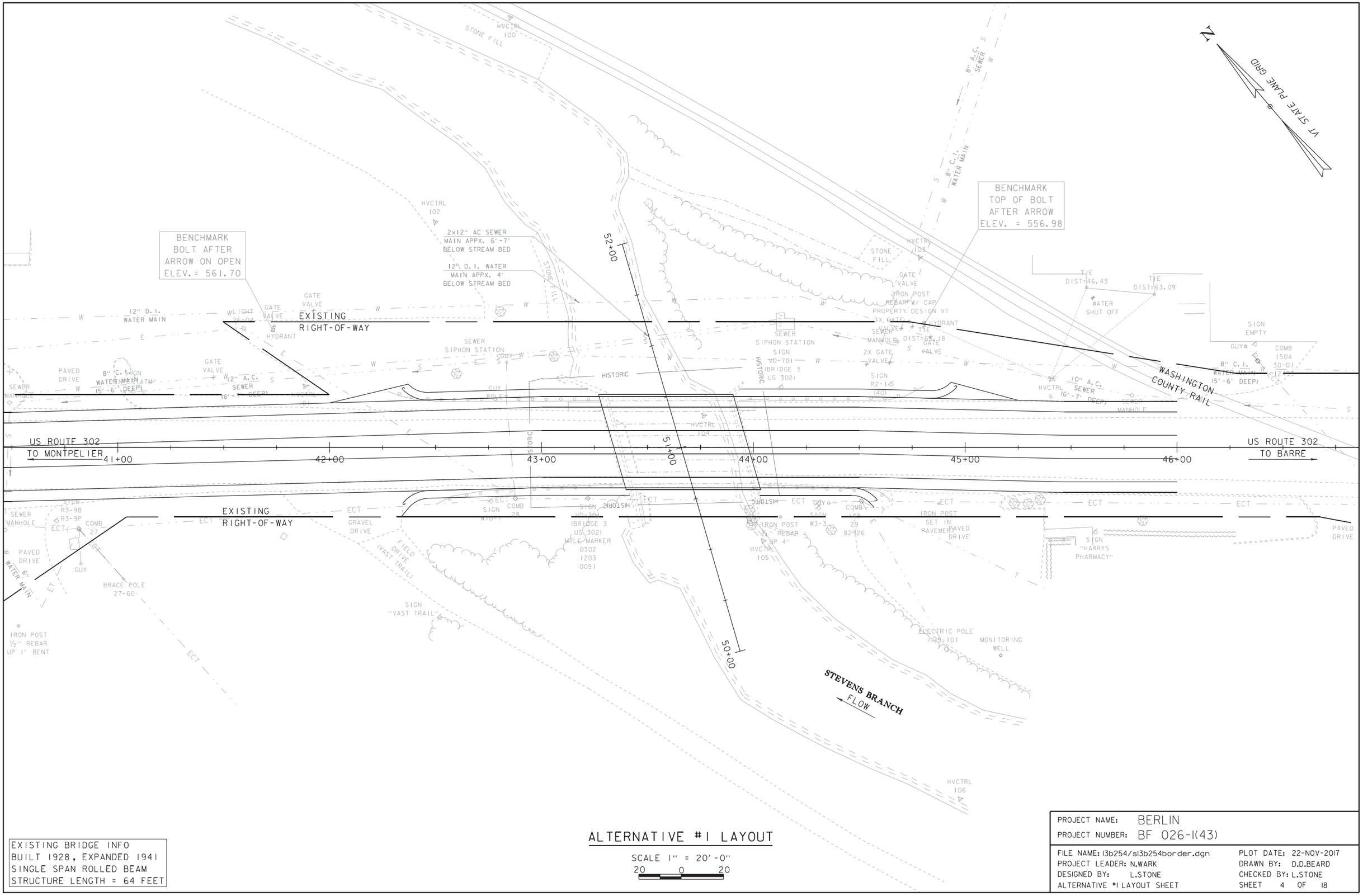
(IF USED ON PROJECT)

SURFACE	
- PAVEMENT (TOTAL THICKNESS)	+/- 1/4"
- AGGREGATE SURFACE COURSE	+/- 1/2"
SUBBASE	+/- 1"
SAND BORROW	+/- 1"

PROJECT NAME: BERLIN
PROJECT NUMBER: BF 026-1(43)

FILE NAME: 13b254\sl3b254typical.dgn
PROJECT LEADER: N.WARK
DESIGNED BY: L.J.STONE
ALTERNATIVE #1 TYPICAL SECTIONS

PLOT DATE: 22-NOV-2017
DRAWN BY: D.D.BEARD
CHECKED BY: L.J.STONE
SHEET 3 OF 18

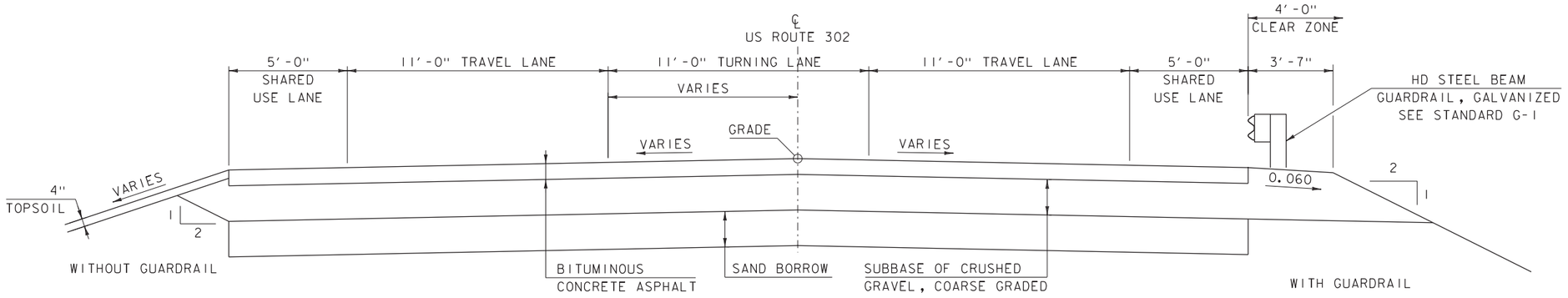


EXISTING BRIDGE INFO
BUILT 1928, EXPANDED 1941
SINGLE SPAN ROLLED BEAM
STRUCTURE LENGTH = 64 FEET

ALTERNATIVE #1 LAYOUT

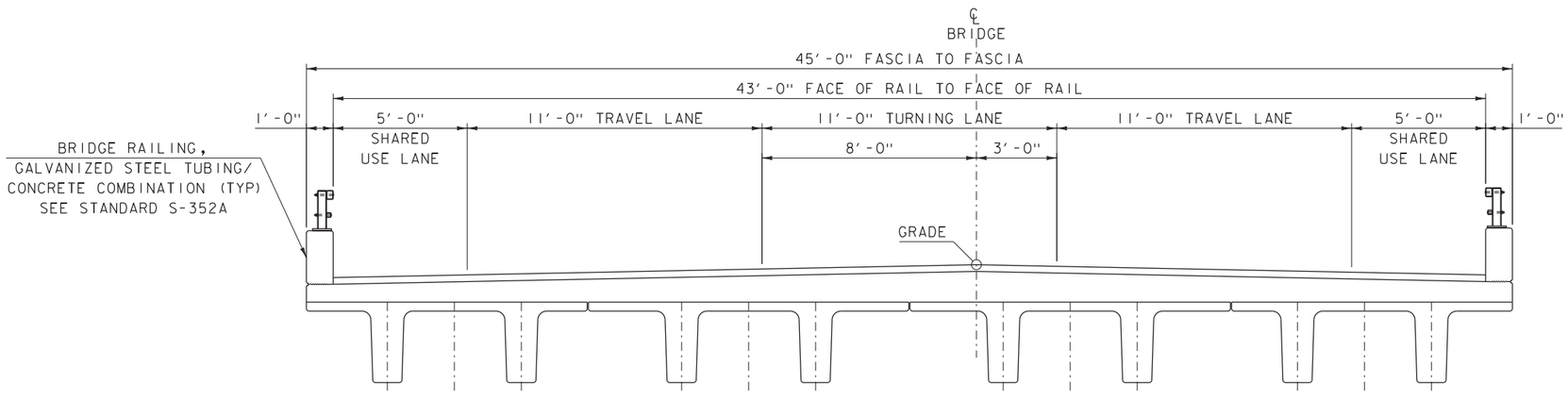
SCALE 1" = 20'-0"
20 0 20

PROJECT NAME:	BERLIN
PROJECT NUMBER:	BF 026-1(43)
FILE NAME: l3b254/sl3b254border.dgn	PLOT DATE: 22-NOV-2017
PROJECT LEADER: N.WARK	DRAWN BY: D.D.BEARD
DESIGNED BY: L.STONE	CHECKED BY: L.STONE
ALTERNATIVE #1 LAYOUT SHEET	SHEET 4 OF 18



ALTERNATIVE #2 PROPOSED US ROUTE 302 TYPICAL SECTION

SCALE 3/8" = 1'-0"



ALTERNATIVE #2 PROPOSED BRIDGE TYPICAL SECTION

SCALE 3/8" = 1'-0"

GIRDER SPACING TAKEN FROM AS BUILT PLANS

MATERIAL TOLERANCES

(IF USED ON PROJECT)

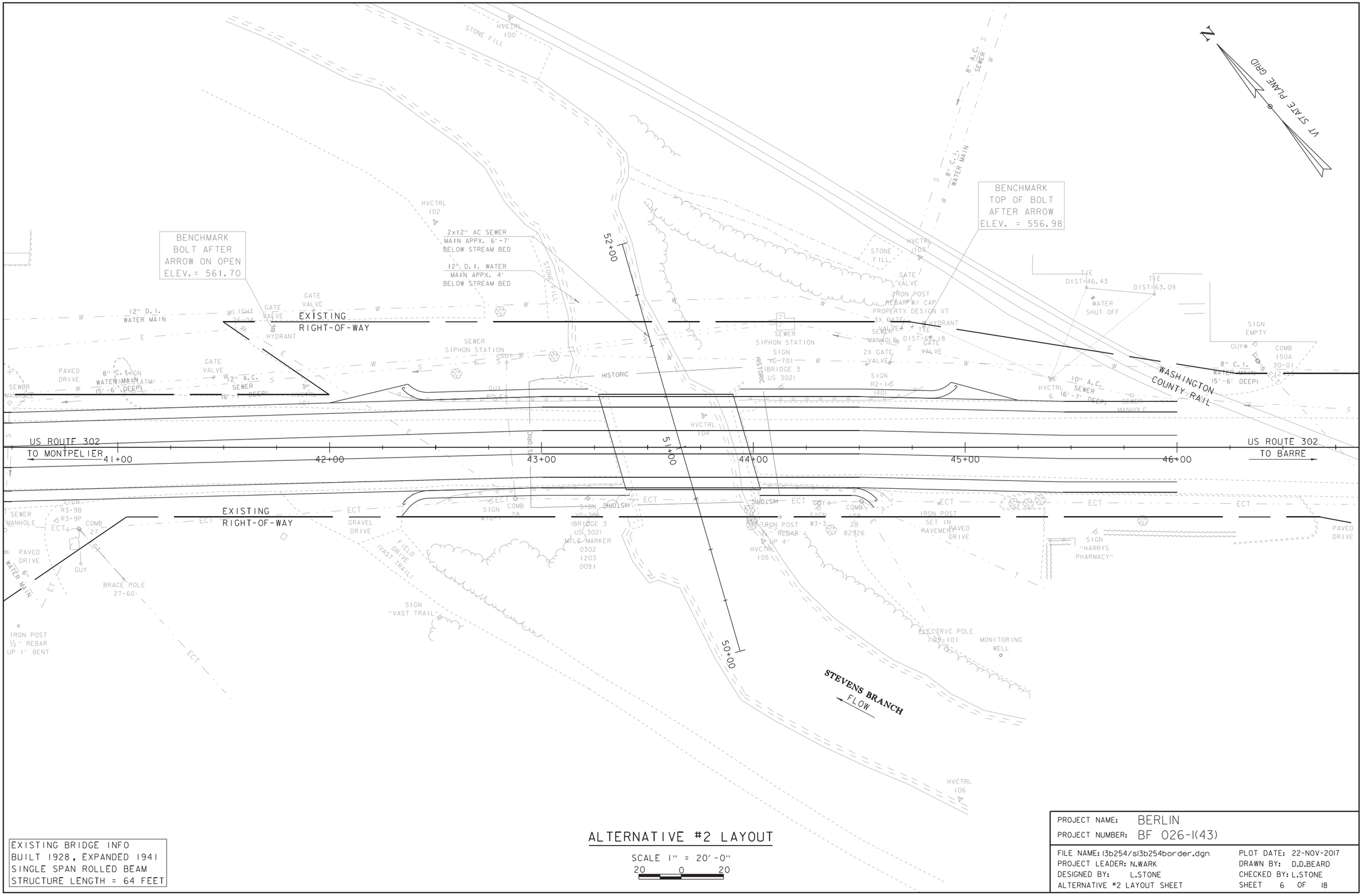
SURFACE	
- PAVEMENT (TOTAL THICKNESS)	+/- 1/4"
- AGGREGATE SURFACE COURSE	+/- 1/2"
SUBBASE	+/- 1"
SAND BORROW	+/- 1"

PROJECT NAME: BERLIN

PROJECT NUMBER: BF 026-1(43)

FILE NAME: 13b254\sl3b254typical.dgn
PROJECT LEADER: N.WARK
DESIGNED BY: L.J.STONE
ALTERNATIVE #2 TYPICAL SECTIONS

PLOT DATE: 22-NOV-2017
DRAWN BY: D.D.BEARD
CHECKED BY: L.J.STONE
SHEET 5 OF 18



EXISTING BRIDGE INFO
BUILT 1928, EXPANDED 1941
SINGLE SPAN ROLLED BEAM
STRUCTURE LENGTH = 64 FEET

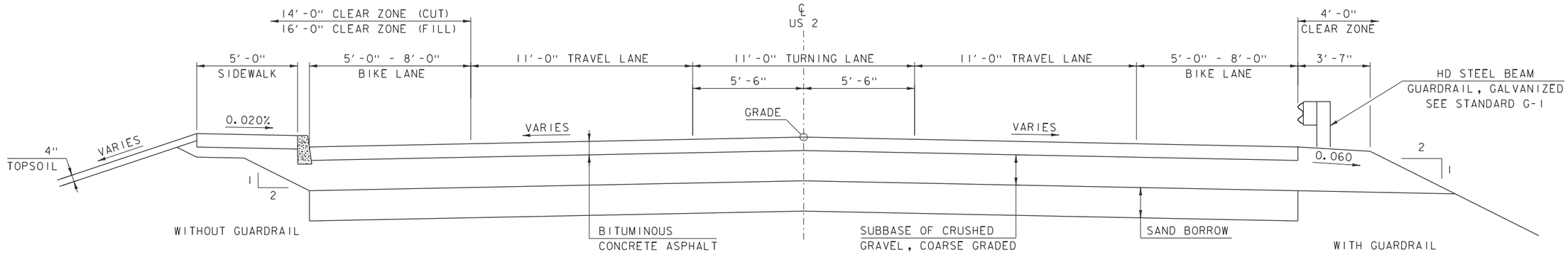
ALTERNATIVE #2 LAYOUT

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

PROJECT NAME: BERLIN
PROJECT NUMBER: BF 026-1(43)

FILE NAME: l3b254/sl3b254border.dgn
PROJECT LEADER: N.WARK
DESIGNED BY: L.STONE
ALTERNATIVE #2 LAYOUT SHEET

PLOT DATE: 22-NOV-2017
DRAWN BY: D.D.BEARD
CHECKED BY: L.STONE
SHEET 6 OF 18



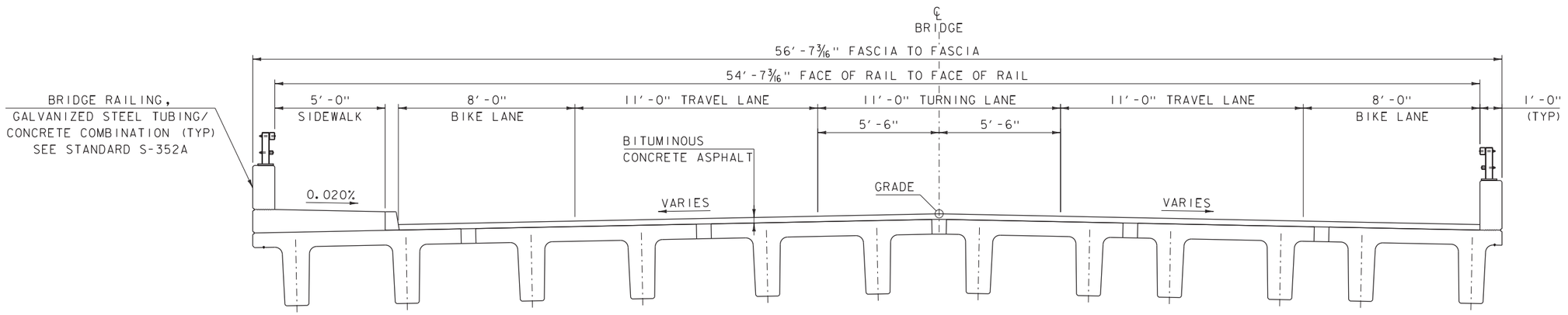
ALTERNATIVE #3 PROPOSED US ROUTE 302 TYPICAL SECTION

SCALE 3/8" = 1'-0"

MATERIAL TOLERANCES

(IF USED ON PROJECT)

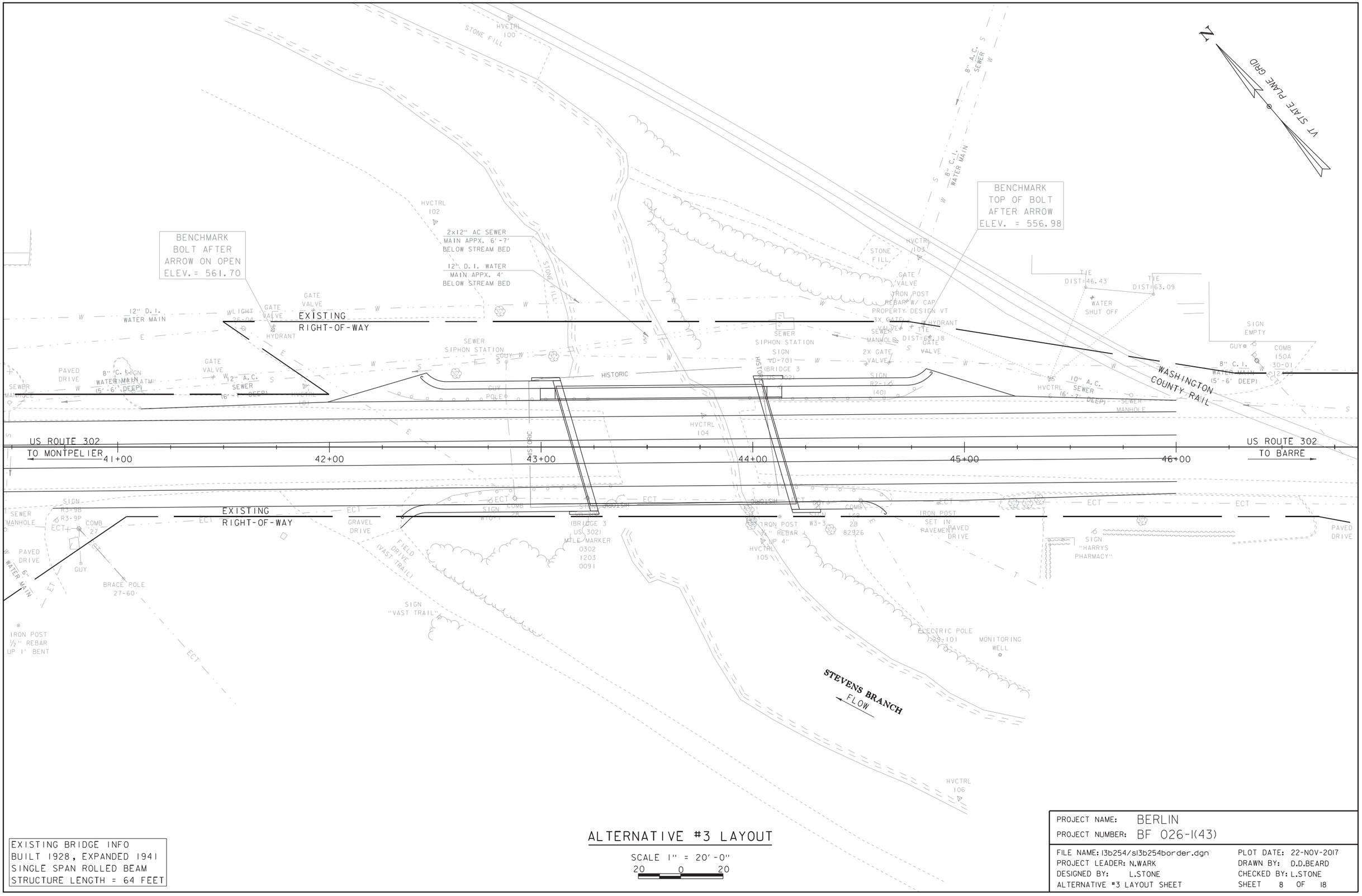
SURFACE	
- PAVEMENT (TOTAL THICKNESS)	+/- 1/4"
- AGGREGATE SURFACE COURSE	+/- 1/2"
SUBBASE	+/- 1"
SAND BORROW	+/- 1"



ALTERNATIVE #3 PROPOSED BRIDGE TYPICAL SECTION

SCALE 3/8" = 1'-0"

PROJECT NAME:	BERLIN
PROJECT NUMBER:	BF 026-1(43)
FILE NAME: 13b254\sl3b254typical.dgn	PLOT DATE: 22-NOV-2017
PROJECT LEADER: N.WARK	DRAWN BY: D.D.BEARD
DESIGNED BY: L.J.STONE	CHECKED BY: L.J.STONE
ALTERNATIVE #3 TYPICAL SECTIONS	SHEET 7 OF 18

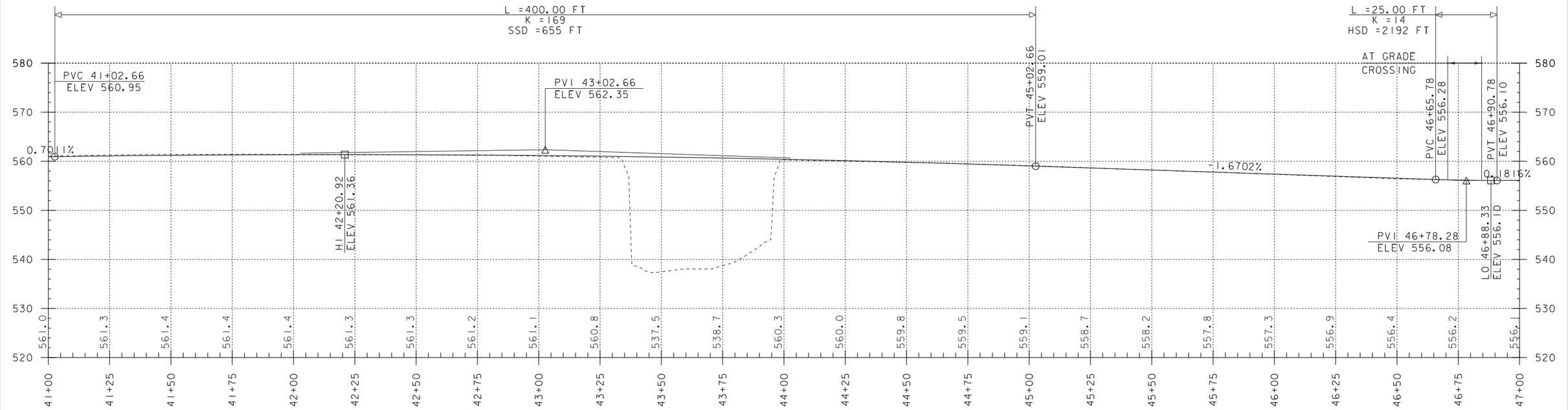


EXISTING BRIDGE INFO
BUILT 1928, EXPANDED 1941
SINGLE SPAN ROLLED BEAM
STRUCTURE LENGTH = 64 FEET

ALTERNATIVE #3 LAYOUT

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

PROJECT NAME:	BERLIN
PROJECT NUMBER:	BF 026-1(43)
FILE NAME: l3b254/sl3b254border.dgn	PLOT DATE: 22-NOV-2017
PROJECT LEADER: N.WARK	DRAWN BY: D.D.BEARD
DESIGNED BY: L.STONE	CHECKED BY: L.STONE
ALTERNATIVE #3 LAYOUT SHEET	SHEET 8 OF 18



US RT 302 PROFILE

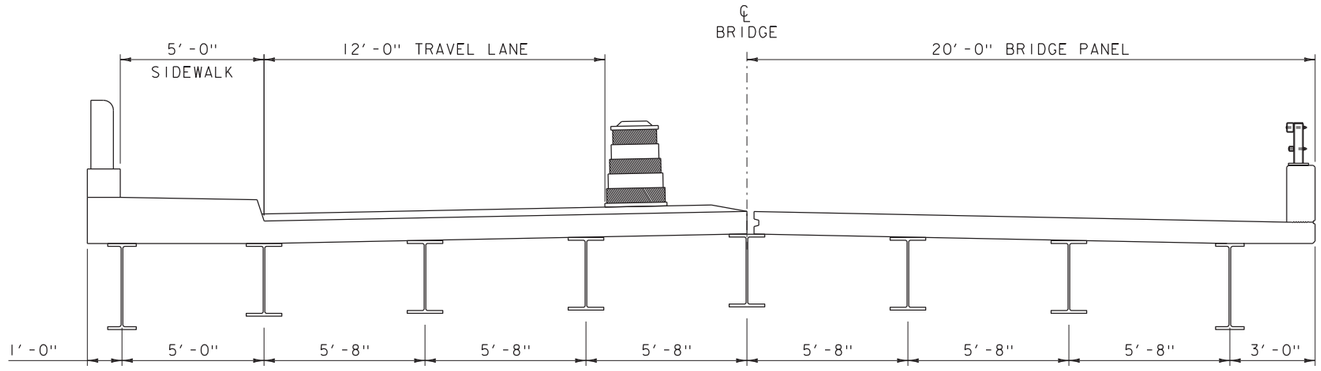
SCALE: HORIZONTAL 1"=20'-0"
VERTICAL 1"=10'-0"

NOTE:
GRADES SHOWN TO THE NEAREST TENTH ARE EXISTING GROUND ALONG ℄
GRADES SHOWN TO THE NEAREST HUNDREDTH ARE FINISH GRADE ALONG ℄

PROJECT NAME: BERLIN
PROJECT NUMBER: BF 026-1(43)

FILE NAME: 13b254/sl3b254profile.dgn
PROJECT LEADER: N.WARK
DESIGNED BY: L.J.STONE
PROFILE SHEET

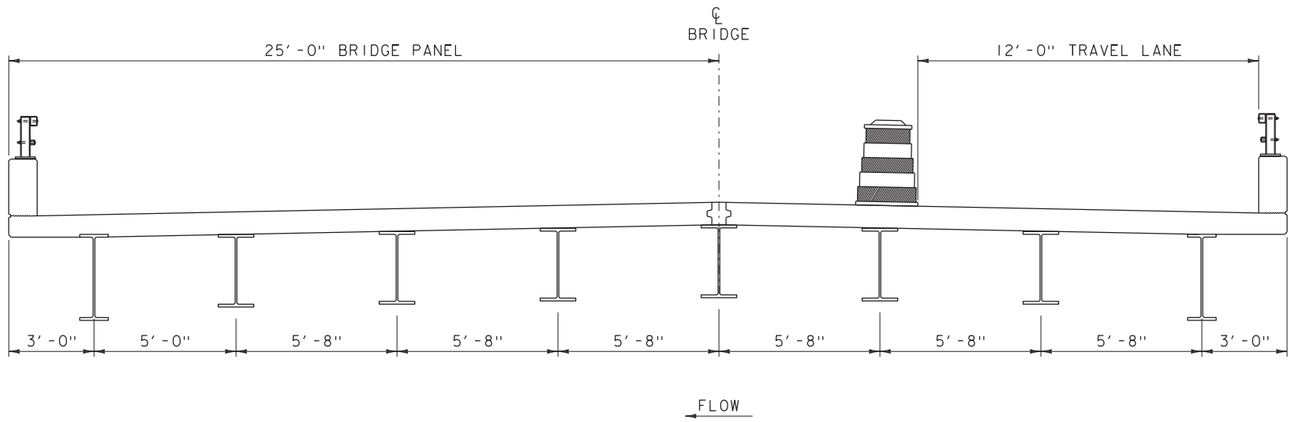
PLOT DATE: 22-NOV-2017
DRAWN BY: D.D.BEARD
CHECKED BY: L.J.STONE
SHEET 9 OF 18



PHASE 1 TYPICAL SECTION

SCALE 3/8″ = 1′-0″

GIRDER SPACING TAKEN FROM AS BUILT PLANS

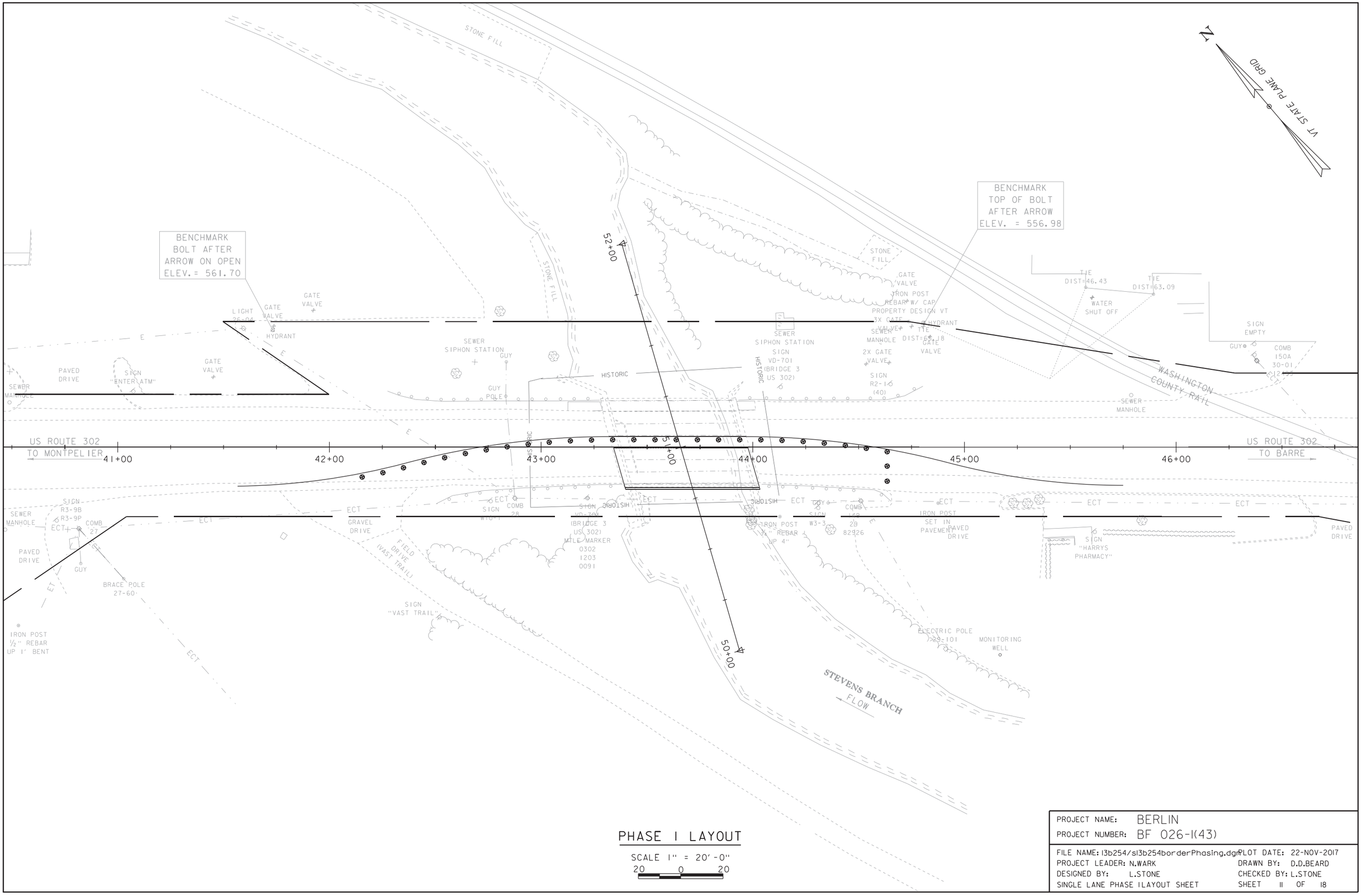


PHASE 2 TYPICAL SECTION

SCALE 3/8″ = 1′-0″

GIRDER SPACING TAKEN FROM AS BUILT PLANS

PROJECT NAME:	BERLIN
PROJECT NUMBER:	BF 026-1(43)
FILE NAME: l3b254\sl3b254typical.dgn	PLOT DATE: 22-NOV-2017
PROJECT LEADER: J.FITCH	DRAWN BY: D.D.BEARD
DESIGNED BY: J.GRIFFITH	CHECKED BY: J.GRIFFITH
SINGLE LANE PHASING TYPICAL SECTIONS	SHEET 10 OF 18

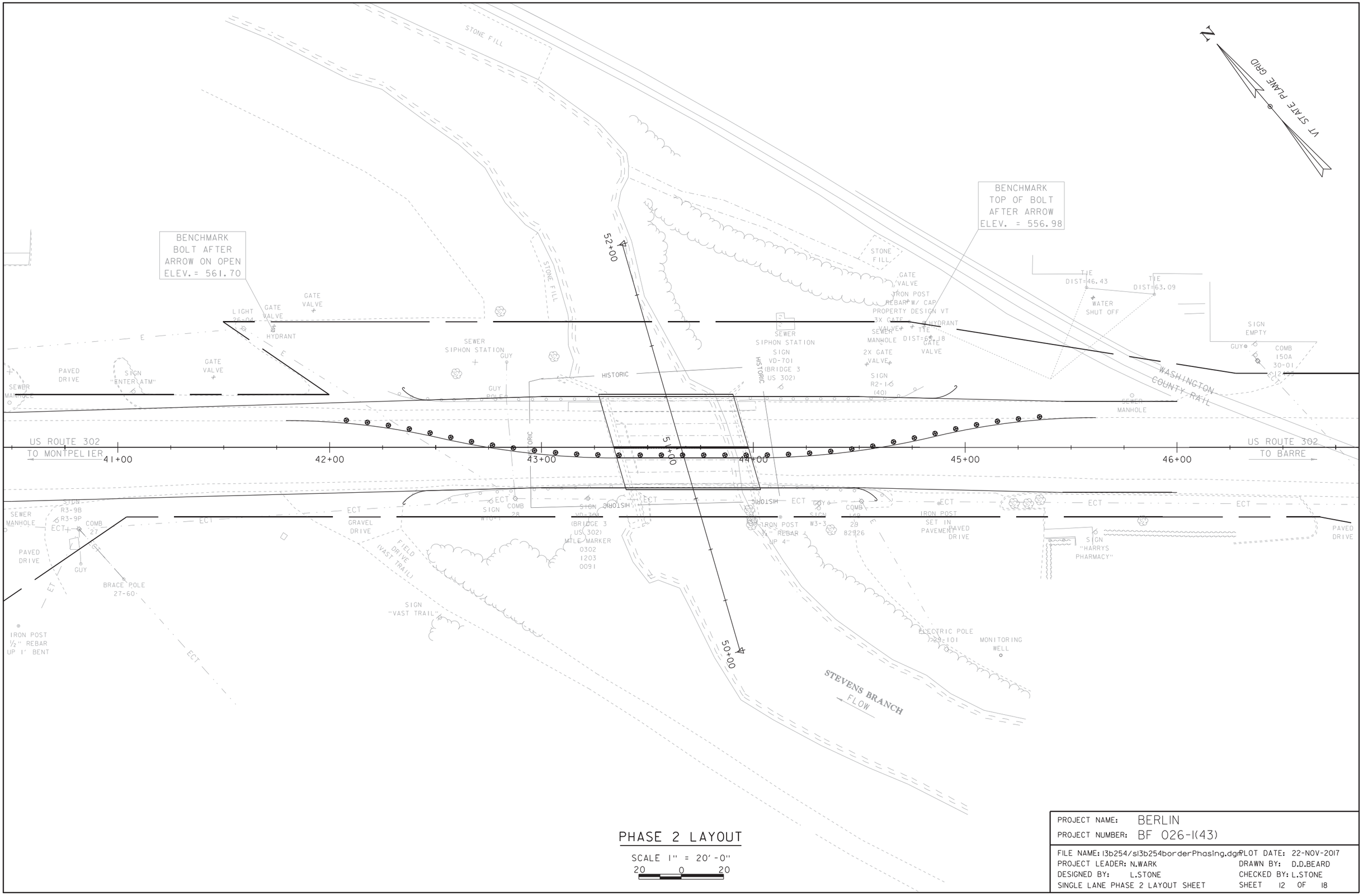


PHASE I LAYOUT

SCALE 1" = 20'-0"

20 0 20

PROJECT NAME:	BERLIN
PROJECT NUMBER:	BF 026-1(43)
FILE NAME:	I3b254/sI3b254borderPhasing.dgn
PLOT DATE:	22-NOV-2017
PROJECT LEADER:	N.WARK
DRAWN BY:	D.D.BEARD
DESIGNED BY:	L.STONE
CHECKED BY:	L.STONE
SINGLE LANE PHASE ILAYOUT SHEET	SHEET 11 OF 18

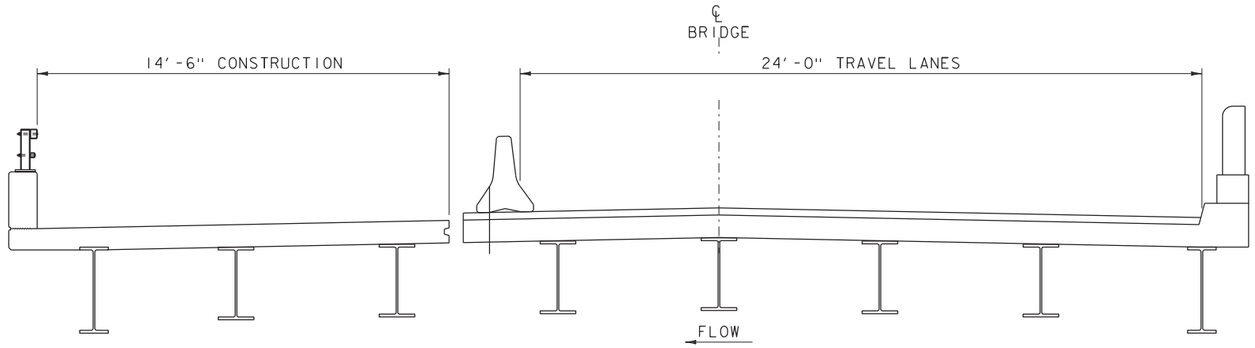


PHASE 2 LAYOUT

SCALE 1" = 20'-0"

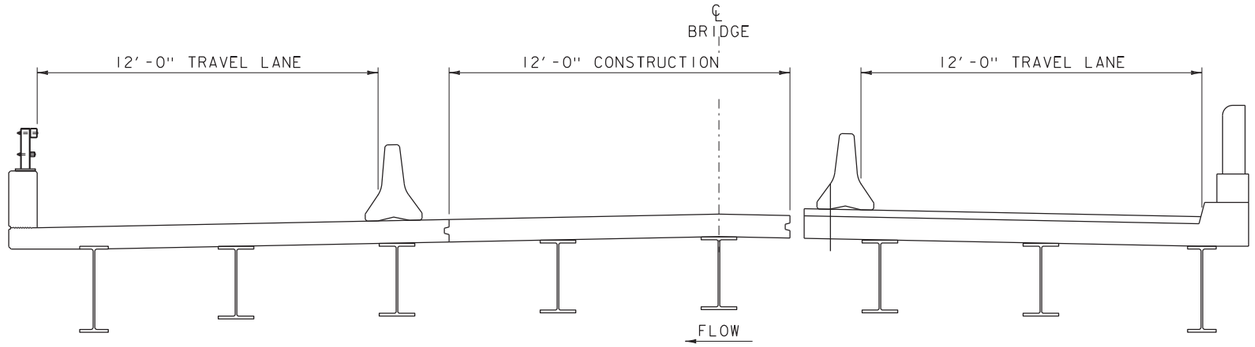
20 0 20

PROJECT NAME:	BERLIN
PROJECT NUMBER:	BF 026-1(43)
FILE NAME:	13b254/sl3b254borderPhasing.dgn
PLOT DATE:	22-NOV-2017
PROJECT LEADER:	N.WARK
DRAWN BY:	D.D.BEARD
DESIGNED BY:	L.STONE
CHECKED BY:	L.STONE
SINGLE LANE PHASE 2 LAYOUT SHEET	SHEET 12 OF 18



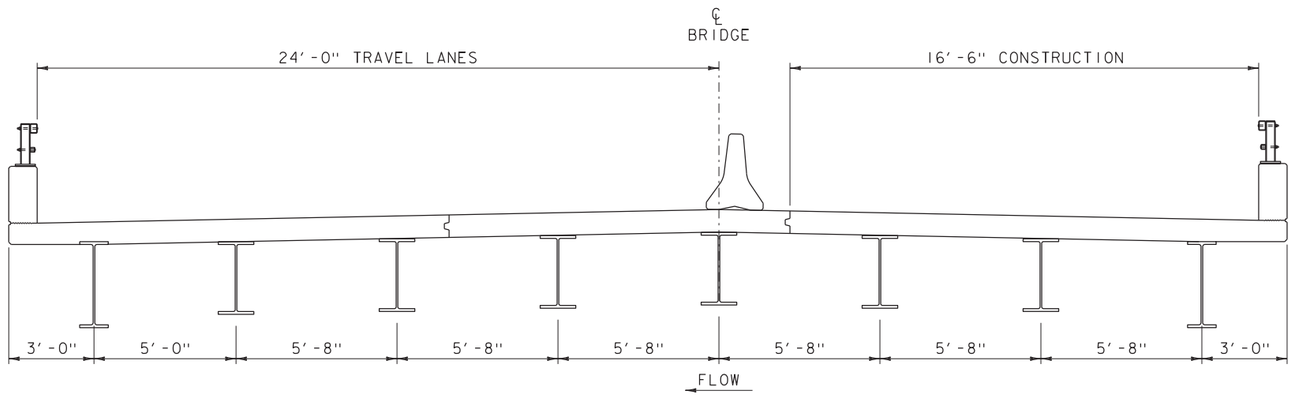
PHASE 1 TYPICAL SECTION

SCALE 3/8" = 1′-0"



PHASE 2 TYPICAL SECTION

SCALE 3/8" = 1′-0"



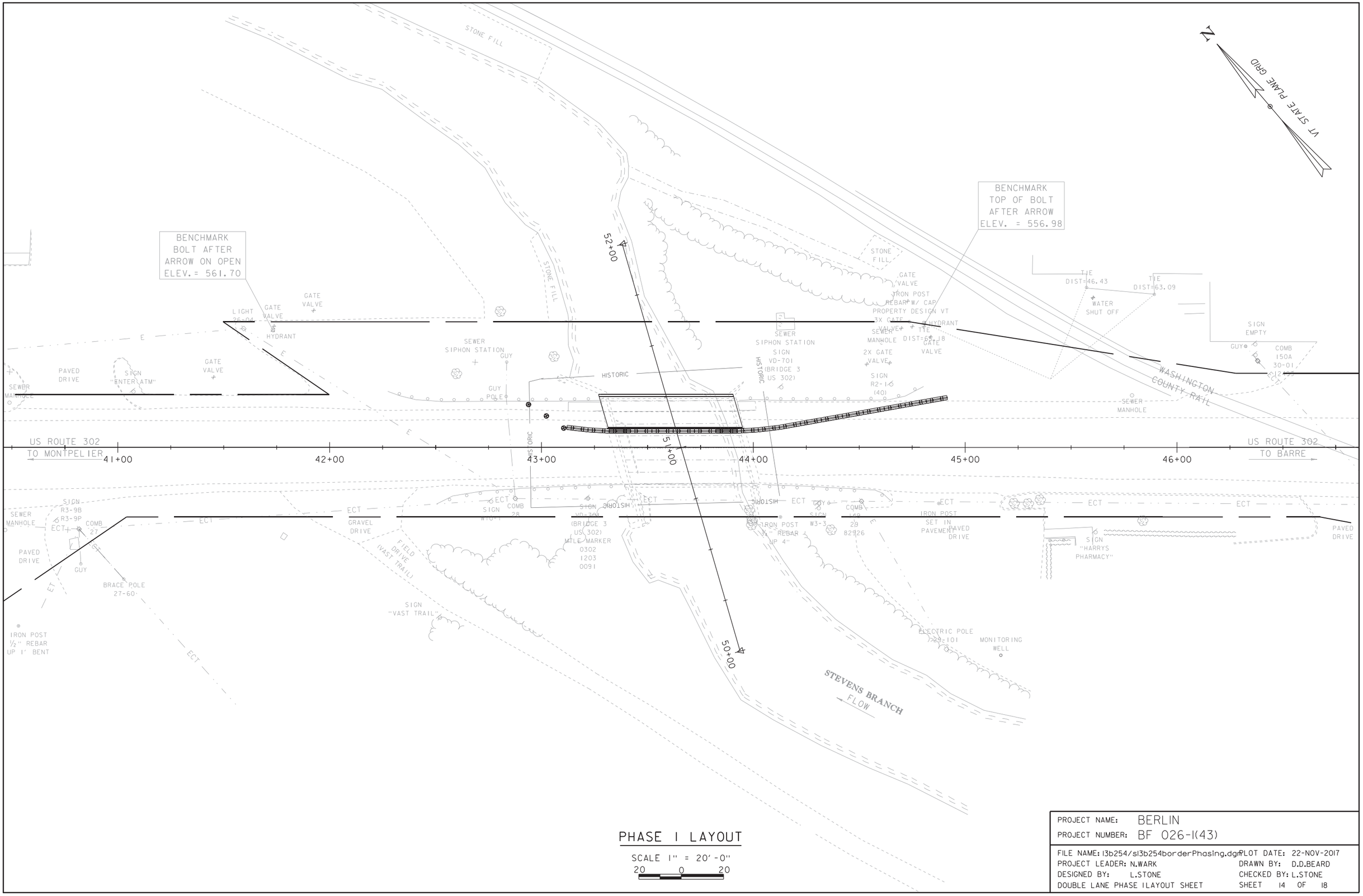
PHASE 3 TYPICAL SECTION

SCALE 3/8" = 1′-0"

GIRDER SPACING TAKEN FROM AS BUILT PLANS

PROJECT NAME:	BERLIN
PROJECT NUMBER:	BF 026-1(43)

FILE NAME: 13b254\s13b254typical.dgn	PLOT DATE: 22-NOV-2017
PROJECT LEADER: J.FITCH	DRAWN BY: D.D.BEARD
DESIGNED BY: J.GRIFFITH	CHECKED BY: J.GRIFFITH
TWO LANE PHASING TYPICAL SECTIONS	SHEET 13 OF 18

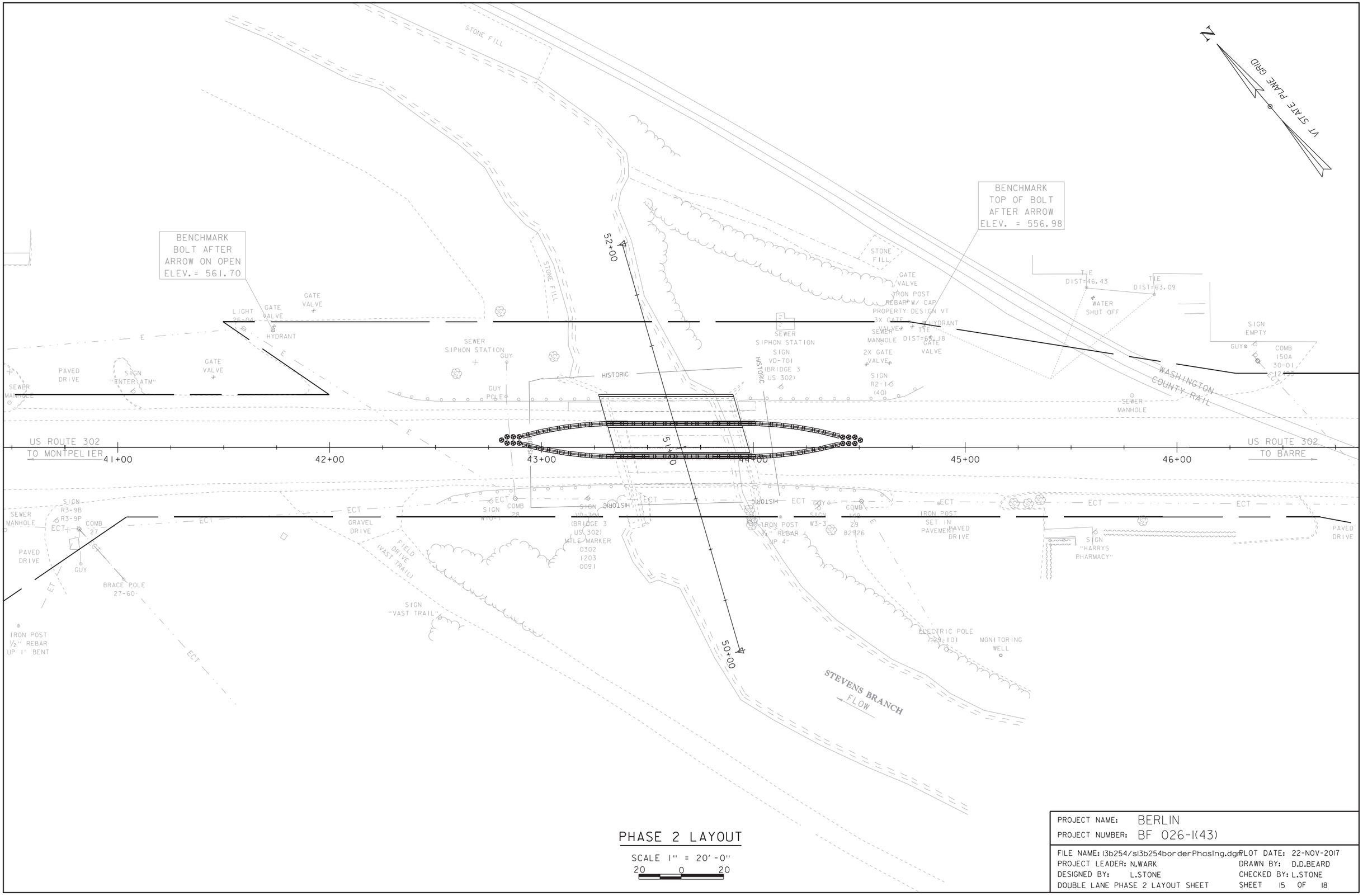


PHASE I LAYOUT

SCALE 1" = 20'-0"

20 0 20

PROJECT NAME:	BERLIN
PROJECT NUMBER:	BF 026-1(43)
FILE NAME: I3b254/si3b254borderPhasing.dgn	PLOT DATE: 22-NOV-2017
PROJECT LEADER: N.WARK	DRAWN BY: D.D.BEARD
DESIGNED BY: L.STONE	CHECKED BY: L.STONE
DOUBLE LANE PHASE I LAYOUT SHEET	SHEET 14 OF 18

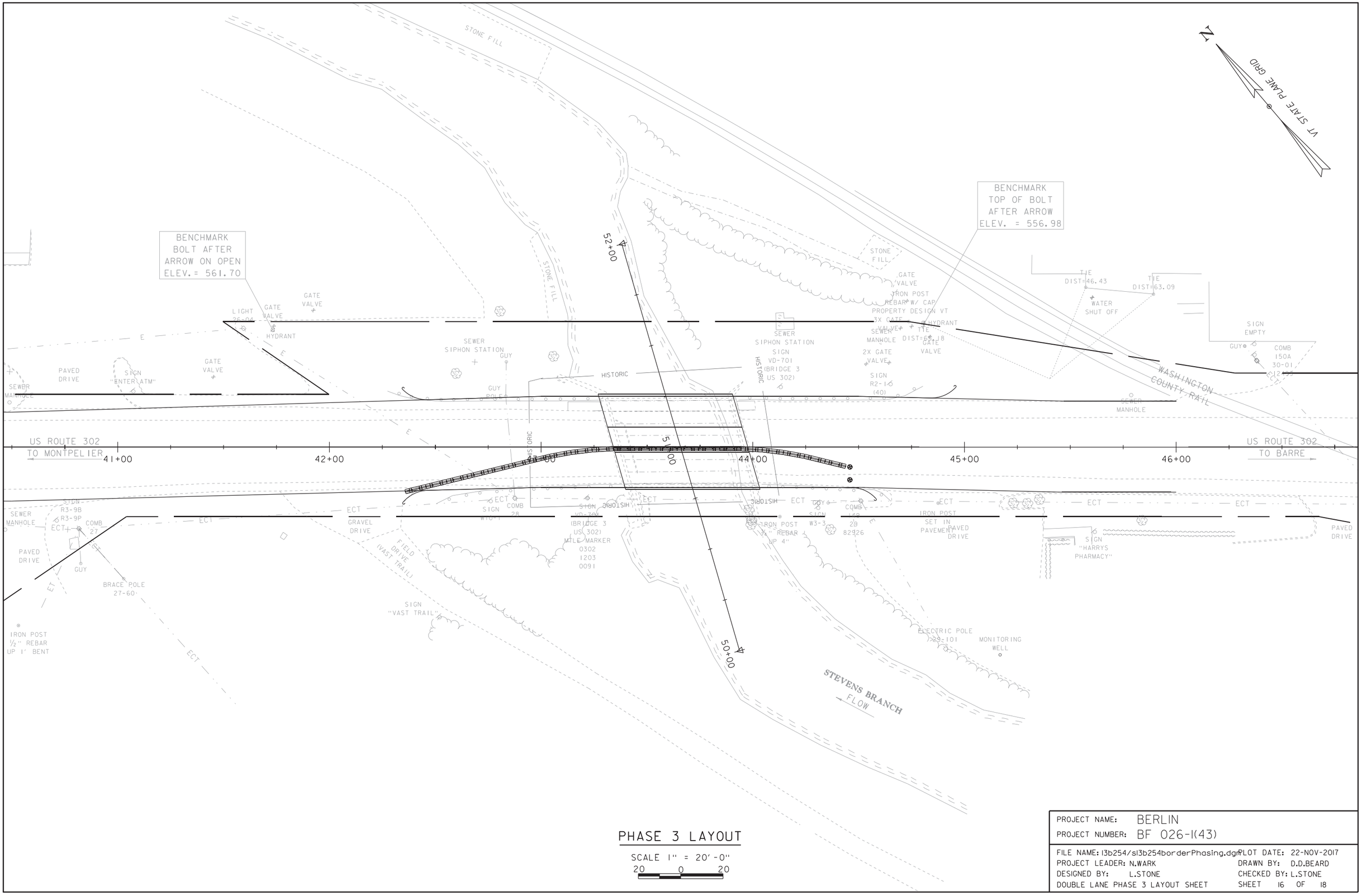


PHASE 2 LAYOUT

SCALE 1" = 20'-0"

20 0 20

PROJECT NAME:	BERLIN
PROJECT NUMBER:	BF 026-1(43)
FILE NAME: l3b254/sl3b254borderPhasing.dgn	PLOT DATE: 22-NOV-2017
PROJECT LEADER: N.WARK	DRAWN BY: D.D.BEARD
DESIGNED BY: L.STONE	CHECKED BY: L.STONE
DOUBLE LANE PHASE 2 LAYOUT SHEET	SHEET 15 OF 18

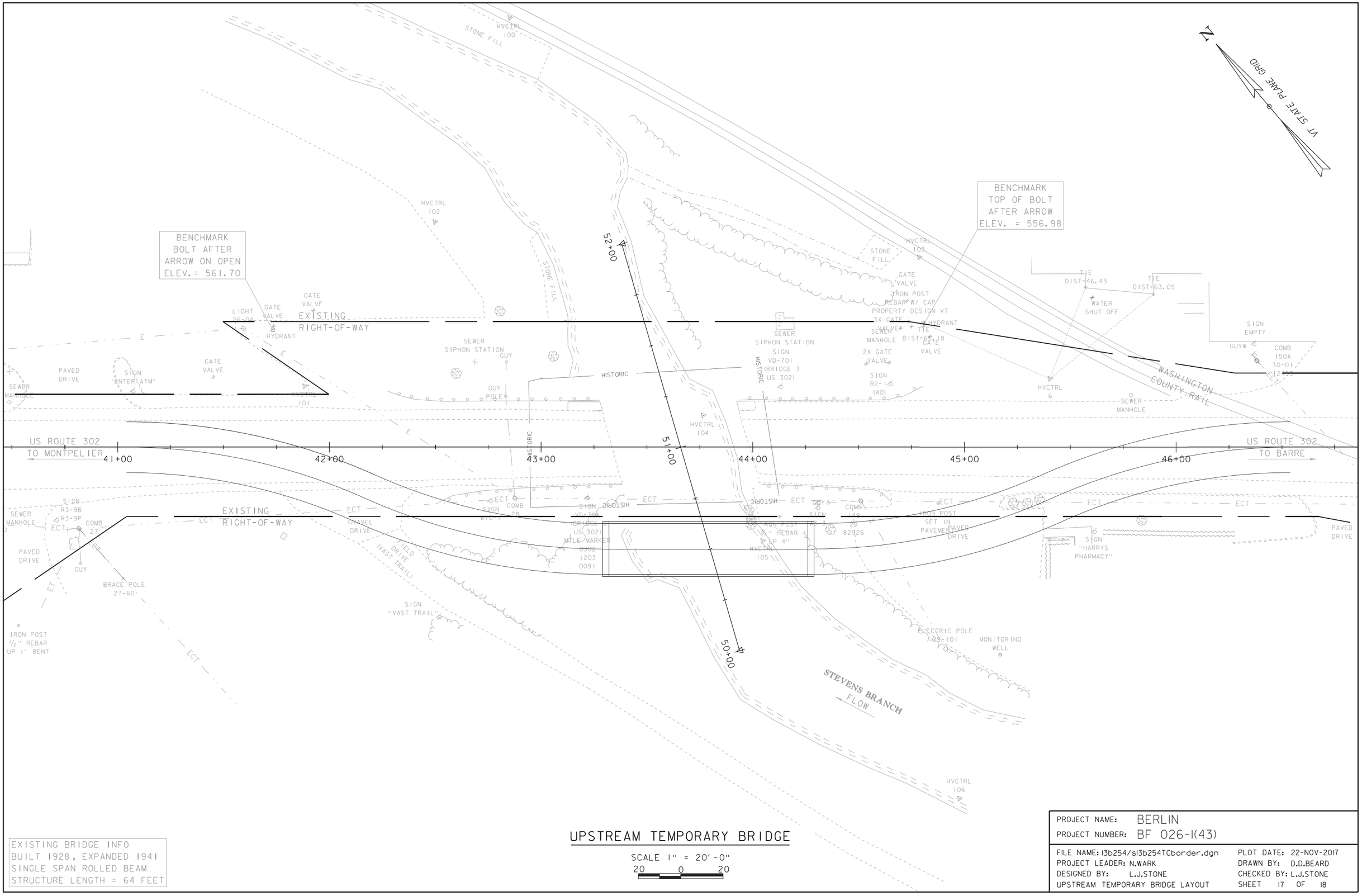


PHASE 3 LAYOUT

SCALE 1" = 20'-0"

20 0 20

PROJECT NAME:	BERLIN
PROJECT NUMBER:	BF 026-1(43)
FILE NAME: l3b254/sl3b254borderPhasing.dgn	PLOT DATE: 22-NOV-2017
PROJECT LEADER: N.WARK	DRAWN BY: D.D.BEARD
DESIGNED BY: L.STONE	CHECKED BY: L.STONE
DOUBLE LANE PHASE 3 LAYOUT SHEET	SHEET 16 OF 18



UPSTREAM TEMPORARY BRIDGE

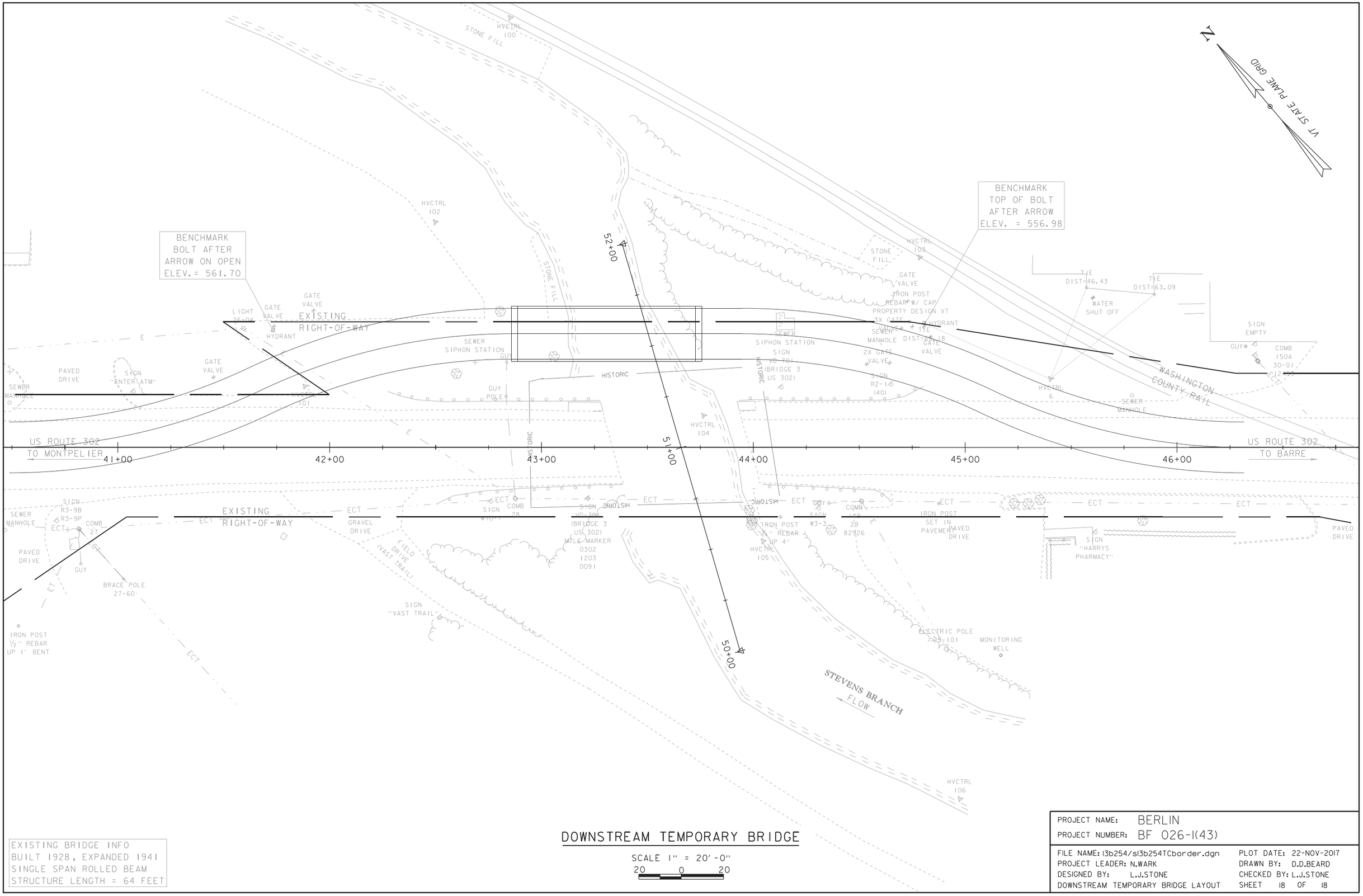
SCALE 1" = 20'-0"
20 0 20

EXISTING BRIDGE INFO
BUILT 1928, EXPANDED 1941
SINGLE SPAN ROLLED BEAM
STRUCTURE LENGTH = 64 FEET

PROJECT NAME: BERLIN
PROJECT NUMBER: BF 026-1(43)

FILE NAME: l3b254/sl3b254TCborder.dgn
PROJECT LEADER: N.WARK
DESIGNED BY: L.J.STONE
UPSTREAM TEMPORARY BRIDGE LAYOUT

PLOT DATE: 22-NOV-2017
DRAWN BY: D.D.BEARD
CHECKED BY: L.J.STONE
SHEET 17 OF 18



EXISTING BRIDGE INFO
BUILT 1928, EXPANDED 1941
SINGLE SPAN ROLLED BEAM
STRUCTURE LENGTH = 64 FEET

DOWNSTREAM TEMPORARY BRIDGE

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

PROJECT NAME:	BERLIN
PROJECT NUMBER:	BF 026-1(43)
FILE NAME:	13b254/sl3b254TCborder.dgn
PROJECT LEADER:	N.WARK
DESIGNED BY:	L.J.STONE
DOWNSTREAM TEMPORARY BRIDGE LAYOUT	
PLOT DATE:	22-NOV-2017
DRAWN BY:	D.D.BEARD
CHECKED BY:	L.J.STONE
SHEET	18 OF 18