

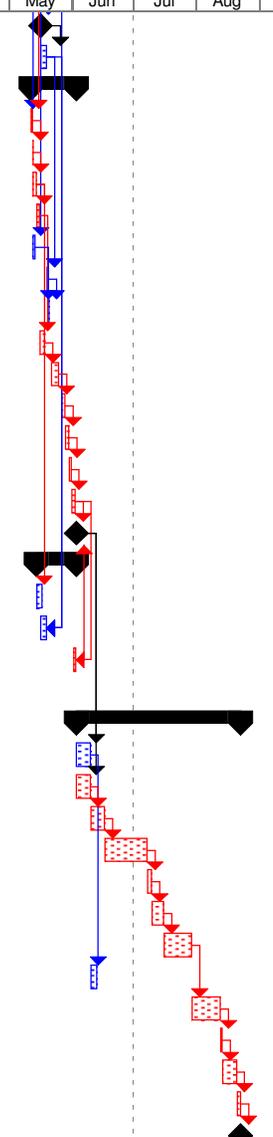
ID	Task Name	Duration	Start	Finish	Qtr 4, 2013				Qtr 1, 2014			Qtr 2, 2014			Qtr 3, 2014			
					Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
1	PRECONSTRUCTION ACTIVITIES	116 days	Fri 10/4/13	Fri 3/14/14														
2	Project Bid Date	1 day	Fri 10/4/13	Fri 10/4/13														
3	Preconstruction meeting	1 day	Thu 11/7/13	Thu 11/7/13														
4	Initial Project Submittals	91 days	Fri 11/8/13	Fri 3/14/14														
5	Erosion Control Plan	1 day	Tue 11/19/13	Tue 11/19/13														
6	Shop Drawings for Precast	60 days	Fri 11/8/13	Thu 1/30/14														
7	other applicable shop drawings	90 days	Fri 11/8/13	Thu 3/13/14														
8	Demo Plan	50 days	Fri 11/8/13	Thu 1/16/14														
9	Precast Erection plan	50 days	Fri 11/8/13	Thu 1/16/14														
10	Placement of precast pieces (JP CARRARA)	60 days	Mon 12/23/13	Fri 3/14/14														
11	PRE-CLOSURE ACTIVITIES (on site)	95 days	Mon 12/9/13	Fri 4/18/14														
12	Dig Safe / Initial Layout	3 days	Wed 2/19/14	Fri 2/21/14														
13	setup field office	3 days	Mon 12/9/13	Wed 12/11/13														
14	install Erosion control Mesures	3 days	Mon 2/24/14	Wed 2/26/14														
15	Cut and Cap Waterline	1 day	Mon 3/24/14	Mon 3/24/14														
16	install sign posts for detour	5 days	Tue 3/25/14	Mon 3/31/14														
17	Install and cover detour signs	8 days	Tue 4/1/14	Thu 4/10/14														
18	install access road on SW corner	2 days	Thu 2/27/14	Fri 2/28/14														
19	Install access road on NE corner	2 days	Mon 3/3/14	Tue 3/4/14														
20	install framing for platform under bridge	3 days	Wed 3/5/14	Fri 3/7/14														
21	install deck on platform w/ tower(s)	4 days	Mon 3/10/14	Thu 3/13/14														
22	Drill in prep for blast	5 days	Mon 4/14/14	Fri 4/18/14														
23	other items to prepare for shutdown	26 days	Fri 3/14/14	Fri 4/18/14														
24	CLOSURE PERIOD	45 days	Sat 4/19/14	Mon 6/2/14														
25	Demolition	11.38 days	Sat 4/19/14	Wed 4/30/14														
26	Close Road 7:00 am	0 days	Sat 4/19/14	Sat 4/19/14														
27	Blast Ledge on Abutment 2	5 hrs	Sat 4/19/14	Sat 4/19/14														
28	Remove Bridge railing / pavement	6 hrs	Sat 4/19/14	Sat 4/19/14														
29	excavate approaches	20 hrs	Sat 4/19/14	Tue 4/22/14														
30	demolish arch	25 hrs	Tue 4/22/14	Fri 4/25/14														
31	demolish southern wings	10 hrs	Tue 4/22/14	Wed 4/23/14														
32	demolish northern wings	10 hrs	Tue 4/22/14	Wed 4/23/14														
33	Excavate Ledge on Abutment 1 side	20 hrs	Fri 4/25/14	Sun 4/27/14														
34	Excavate ledge on Abutment 2 side	40 hrs	Fri 4/25/14	Wed 4/30/14														
35	<u>HOLD POINT FOR LEDGE INSPECTION</u>	<u>4 days</u>	<u>Tue 4/22/14</u>	<u>Fri 4/25/14</u>														
36	cleanup debris on platform	10 hrs	Fri 4/25/14	Sat 4/26/14														
37	Arch	14.25 days	Sat 4/26/14	Sat 5/10/14														

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38	install staging towers for arch support	12 hrs	Sat 4/26/14	Mon 4/28/14													
39	Prepare Ledge for installation of arch footing - abutment 1	8 hrs	Sun 4/27/14	Mon 4/28/14													
40	form and place northern arch footing	20 hrs	Mon 4/28/14	Thu 5/1/14													
41	Prepare Ledge for installation of arch footing - abutment 2	8 hrs	Wed 4/30/14	Thu 5/1/14													
42	form and place southern arch footing	20 hrs	Thu 5/1/14	Sat 5/3/14													
43	<u>CHECK STRENGTH OF FOOTING CONCRETE</u>	<u>0 days</u>	<u>Mon 5/5/14</u>	<u>Mon 5/5/14</u>													
44	deliver / install precast arch pieces	12 hrs	Mon 5/5/14	Wed 5/7/14													
45	grout arch where applicable (at footings)	8 hrs	Wed 5/7/14	Thu 5/8/14													
46	form and place "key stone" at top of arch	20 hrs	Thu 5/8/14	Sat 5/10/14													
47	ABUTMENT 1 SIDE (NORTH)	14.88 days	Sun 4/27/14	Mon 5/12/14													
48	prepare ledge for subfooting - abutment 1	12 hrs	Sun 4/27/14	Tue 4/29/14													
49	form and place subfooting on abutment 1	20 hrs	Tue 4/29/14	Thu 5/1/14													
50	<u>CHECK STRENGTH OF SUB FOOTING</u>	<u>0 days</u>	<u>Sat 5/3/14</u>	<u>Sat 5/3/14</u>													
51	deliver and set precast abutment 1 footing pieces	10 hrs	Sat 5/3/14	Mon 5/5/14													
52	grout under abutment 1 footing	4 hrs	Mon 5/5/14	Mon 5/5/14													
53	<u>CHECK STRENGTH OF GROUT UNDER FOOTING</u>	<u>0 days</u>	<u>Wed 5/7/14</u>	<u>Wed 5/7/14</u>													
54	deliver and install precast abutment breastwall pieces - abutment 1	8 hrs	Wed 5/7/14	Thu 5/8/14													
55	grout abutment pieces (connection to footing and shear keys)	8 hrs	Thu 5/8/14	Fri 5/9/14													
56	deliver and install wing wall 1 - abutment 1 side	4 hrs	Wed 5/7/14	Thu 5/8/14													
57	deliver and install wing wall 2 - abutment 1 side	4 hrs	Wed 5/7/14	Thu 5/8/14													
58	Grout Wing Walls as required (connection to footing and shear keys)	10 hrs	Thu 5/8/14	Fri 5/9/14													
59	<u>CHECK STRENGTH OF APPLICABLE CONCRETE & GROUT</u>	<u>0 days</u>	<u>Fri 5/9/14</u>	<u>Fri 5/9/14</u>													
60	backfill abutment 1	23 hrs	Fri 5/9/14	Mon 5/12/14													
61	ABUTMENT 2 SIDE (SOUTH)	18.88 days	Wed 4/30/14	Mon 5/19/14													
62	prepare ledge for subfooting - abutment 2	12 hrs	Wed 4/30/14	Thu 5/1/14													
63	form and place subfooting on abutment 2	20 hrs	Thu 5/1/14	Sun 5/4/14													
64	<u>CHECK STRENGTH OF SUB FOOTING CONCRETE</u>	<u>0 days</u>	<u>Sun 5/4/14</u>	<u>Sun 5/4/14</u>													
65	deliver and set precast for abutment 2 footing	10 hrs	Tue 5/6/14	Wed 5/7/14													
66	grout under abutment 2 footing	8 hrs	Wed 5/7/14	Thu 5/8/14													
67	<u>CHECK STRENGTH OF GROUT UNDER FOOTING</u>	<u>0 days</u>	<u>Sat 5/10/14</u>	<u>Sat 5/10/14</u>													
68	deliver and install precast abutment breastwall pieces - abutment 2	8 hrs	Sat 5/10/14	Sun 5/11/14													
69	grout abutment pieces (connection to footing and shear keys)	4 hrs	Sun 5/11/14	Mon 5/12/14													
70	deliver and install wing wall 3 - abutment 2 side	6 hrs	Sat 5/10/14	Sun 5/11/14													
71	deliver and install wing wall 4 - abutment 2 side	6 hrs	Sat 5/10/14	Sun 5/11/14													
72	form and place CIP wing wall #3	40 hrs	Sun 5/11/14	Fri 5/16/14													
73	form and place CIP wing wall #4	40 hrs	Sun 5/11/14	Fri 5/16/14													
74	Grout Wing Walls as required (connection to footing and shear keys)	10 hrs	Sun 5/11/14	Mon 5/12/14													

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75	<u>CHECK STRENGTH OF APPLICABLE CONCRETE & GROUT</u>	0 days	Fri 5/16/14	Fri 5/16/14													
76	backfill abutment 2	23 hrs	Fri 5/16/14	Mon 5/19/14													
77	SUPERSTRUCTURE	22.38 days	Sun 5/11/14	Mon 6/2/14													
78	Install Structural Steel beams	4 hrs	Sun 5/11/14	Mon 5/12/14													
79	prepare for NEXT beam installation	4 hrs	Mon 5/12/14	Mon 5/12/14													
80	deliver and install NEXT beams	12 hrs	Mon 5/12/14	Wed 5/14/14													
81	form and place closure strips	15 hrs	Wed 5/14/14	Thu 5/15/14													
82	deliver and install approach slabs - abutment 1	8 hrs	Mon 5/12/14	Tue 5/13/14													
83	deliver and install approach slabs - abutment 2	8 hrs	Mon 5/19/14	Tue 5/20/14													
84	form and place closure strips in approach slabs	4 hrs	Tue 5/20/14	Tue 5/20/14													
85	form and place leveling slab (overlay)	20 hrs	Fri 5/16/14	Sun 5/18/14													
86	form and place CIP bridge rail parapets	30 hrs	Wed 5/21/14	Sun 5/25/14													
87	form and place sidewalk	15 hrs	Mon 5/26/14	Wed 5/28/14													
88	install spray applied membrane	12 hrs	Wed 5/28/14	Fri 5/30/14													
89	finish backfill / approaches (fine grade)	12 hrs	Fri 5/30/14	Sat 5/31/14													
90	pave project - BASE ONLY	15 hrs	Sat 5/31/14	Mon 6/2/14													
91	Open Road	0 days	Mon 6/2/14	Mon 6/2/14													
92	Approaches / Utilities	19.88 days	Wed 5/14/14	Mon 6/2/14													
93	Install Waterline under bridge & activate	3 days	Wed 5/14/14	Sat 5/17/14													
94	install drainage materials	3 days	Fri 5/16/14	Mon 5/19/14													
95	install guardrail & Bridge rail	12 hrs	Sun 6/1/14	Mon 6/2/14													
96																	
97	POST CLOSURE ACTIVITIES	59 days	Tue 6/3/14	Fri 8/22/14													
98	Remove Detour Signs	5 days	Tue 6/3/14	Mon 6/9/14													
99	set precast Arch Panels	5 days	Tue 6/3/14	Mon 6/9/14													
100	form and place closure pours at low corners	5 days	Tue 6/10/14	Mon 6/16/14													
101	form and place CIP coping on Fascia(s)	15 days	Tue 6/17/14	Mon 7/7/14													
102	Form and place Type B Curb	2 days	Tue 7/8/14	Wed 7/9/14													
103	form and place sidewalk - off bridge	4 days	Thu 7/10/14	Tue 7/15/14													
104	remove staging and platform	10 days	Wed 7/16/14	Tue 7/29/14													
105	install arch lighting	3 days	Tue 6/10/14	Thu 6/12/14													
106	cleanup / shape all slopes	10 days	Wed 7/30/14	Tue 8/12/14													
107	Pave Surface	1 day	Wed 8/13/14	Wed 8/13/14													
108	misc cleanup / punchlist	5 days	Thu 8/14/14	Wed 8/20/14													
109	demobilize	2 days	Thu 8/21/14	Fri 8/22/14													
110	project complete	0 days	Fri 8/22/14	Fri 8/22/14													



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General Comments in response to VAOT memorandum dated 2/12/14

1) I included applicable hold points in the CPM schedule. Those key inspections or time frames when input from VAOT will be required are slightly moving targets. Again, we will be in constant daily communication with the onsite resident engineer as to the specific daily activities as well as any upcoming critical events. The most important inspection date will be the determination of an acceptable ledge foundation. We expect that activity to take place within a few days of beginning the shutdown.

2) The installation of the sleeves for the waterline will take place during the backfilling operation. As will the installation of the specified 4" drain lines and any other activities that must take place before the road way is completed.

3) I added a comment in the post closure activities stating that surface pavement will be installed once the work in the roadway is completed so not to damage the final wearing course.

4) I added a line item in the CPM schedule for drilling and blasting. The drilling will take place in the week leading up to the shutdown as discussed in the "over the shoulder" conference call which took place on 2/26.

5) The road is planned to be open on June 2nd before 7:00 pm as stated in the special provision. I changed the logic in the CPM schedule to reflect the correct opening date.

6) I crossed out comment #1 from the previous revision. The contact information for Joanne Frascella has been noted. We will work directly with Joanne and VAOT to provide any and all applicable schedule updates. Additionally, we will assist in any way we can in the distribution of the updates.

7) in addition to submitting the applicable engineering for the required strengths at each stage, we will be proposing a high early strength concrete for the sub-footings in particular in an attempt to speed up the time frame between placing the sub footing and setting the precast footings. The engineering data for the NMB splice sleeve system has been submitted and is currently under review by VAOT.

8) Blasting has become part of our critical path. As we discussed during the recent conference call, it quickly became apparent that NOT blasting would be more of a risk to the completion of the project because once the ledge is exposed it becomes much more difficult and time consuming to drill and blast if traditional excavation methods failed. In short, we decided to move forward with blasting in hopes it will speed up the excavation of the rock on abutment 2.

9) I added some ambiguous language about heating the concrete. The method of heating (if necessary) will include ground heaters which will be covered by concrete blankets. The ground heater hoses will lay directly on the concrete with the expectation that the heat will penetrate the concrete enough to speed up the curing process. As with any construction project, the ambient temp and weather conditions will determine our path when it comes to these activities. Any heating activities will take place after coordination with VAOT.

10) The lack of local materials and resources is noted. While we will do everything in our power to have all the necessary materials available onsite, it is inevitable that something will come up where it will be necessary to go get the missing materials. We plan to be able to make those adjustments after the materials are located so the overall schedule will be minimally impacted.

11) I added to the descriptions stating that the shear keys will also be grouted during the time frame when all the other grouting is taking place.

12) The closure placements in the lower corners of the architectural panels can be placed after the CIP coping.

General Comments about REVISION 1

- 1) ~~While it is unknown exactly who will be in charge of public relations at this point, we added some discussion with regards to how and when communication will be handled.~~
- 2) The working hours are somewhat variable until the closure. We will be working normal hours leading up to the closure, and then again after the closure. During the closure we are planning to work 24 hours per day as long as there are critical path items to complete.
- 3) Communication with VAOT will be paramount throughout the entire project. our on site superintendant (Harry Pottle) will be in continuously be in contact with Joe Knipes and all other interested parties. Inevitably, problems and questions will come up and we will relay those immediately.
- 4) The questions about the grout and concrete strength are noted and valid. In general we expect the concrete in the sub footing to be placed and curing while the arch is being erected. Then the grout bed under the footing will take be placed and some engineering will be done to determine actual strength required to set the abutment breast wall and wing walls. The specialized NMB grout sleeves should have sufficient strength (4000 psi) in around 18 hours.
- 5) The field office setup is almost complete and is shown on the schedule as being worked on this winter. Some more items were created on the schedule to reflect the installation of the Erosion Control Measures and anticipated dates for critical submittals.
- 6) see #4.
- 7) ~~As we have discussed, we believe the rock removal will be done using large excavators, hammers, and rippers.~~ We will be in contact with Maine Drilling and Blasting to develop a “back-up” plan and discuss with them how to present it to VTRANS. They will be available during the early part of the closure if necessary.
- 8) We expect to have the vast majority of the ledge removed before placing any concrete. The items on the schedule that say “prepare ledge...” are in there for inspection and cleaning time.
- 9) We adjusted the sequence of the superstructure. Because the manufacturer recommends 7 days of curing before application of the membrane, we will place the overlay first and while the curing is taking place, the parapet(s) and sidewalk can be formed and placed. This should give enough lag between the placement of the deck and the installation of the membrane to satisfy the manufacturer.
- 10) see #8

11) see #5

12) We also added a block of time in which the precast will be made. JP Carrara will ensure a VAOT inspector is present for all placements.

13) see #5

14) see #5

15) I did not specifically do that but one of our company policies is that our superintendents do “two-week” look ahead’s every week. we will include VAOT in the distribution of the look ahead’s and we should be able to give ample notice for any key inspections. The exact times may vary slightly but we should be able to get a good idea of when they will be necessary and give sufficient notice.

16) Consideration will be made if rock needs to be removed before the CIP concrete has developed its strength. We will work on the critical path as long as we can and if it is in the best interest of the project to shift priorities based on any set backs or unforeseen conditions, we will do so.

17) see #4

18) see #9

19) We will be paving surface once all other work is complete to avoid damage to the final course.

20) Details will be submitted with regards to the waterline materials. We added a few items in the schedule to indicate we plan to cut and cap the line before the closure and. We will keep in close contact with the interested utilities throughout the entire project.

21) Exact details are still being developed as to how the coping will be supported. Needless to say, more detail will be forthcoming in the comprehensive erection plan.

Introduction / Description

This narrative is written in accordance with section 900.645 – CPM schedule which is located on pages 48 – 52 of the special provisions. This project involves the removal and replacement of bridge 13 on a new alignment. The existing bridge is comprised of a cast-in-place arch which will be replaced by a NEXT beam style bridge with an aesthetic arch and precast arch panels in an effort to make the appearance of the new bridge similar to the existing.

This particular project presents its fair share of challenges with regards to the schedule. Perhaps the best way to navigate through this project is to break it down into 4 major categories; preconstruction activities, pre-closure activities, construction during closure, and post-closure activities.

PRECONSTRUCTION ACTIVITIES: Present time – Early March

This section is basically described as preparation and planning. This phase begins with the bid date of 10/4/13 and also includes the preconstruction meeting(s), and the initial submittal of all applicable working drawings, schedules, and the process of issuing subcontracts and material contracts.

Specifically, this phase will last most of the winter into early February 2014. At that point, T Buck hopes to have all major items submitted on and approved. Depending on several factors, the precast concrete should be cast during this phase. JP Carrara will be supplying the precast and they are located in Middlebury so it is convenient to say the least. Our goal is to have all the precast made and ready before we begin construction on site. Other long lead items include the bearings from DS Brown and structural steel from ARC Fabricators.

Coordination between T Buck and the state will be essential. VAOT will be designating a public relations officer (yet to be determined) to facilitate the communication to the town and general public. We plan to have a general meeting before the closure to discuss our general direction and to explain the inconveniences that may arise during the demolition and construction phases. We will be available to answer any and all questions with regards to the schedule to anyone who asks throughout the entire construction.

PRE-CLOSURE ACTIVITIES: Early December – April 19th

This phase begins with the mobilization of all the administrative materials (i.e. office trailers, phones, computers, temporary power, etc.). We plan to begin mobilizing the office trailers in early March so the process of installing phone and internet can begin and be completed for April 1st. Project demarcation fence, silt fence, and other erosion control measures will be installed per the approved ESPC. All the work completed in this phase will be done so using lane closures if necessary (to the least extent possible).

The EPSC installation will commence as soon as the office trailer(s) are setup and functional. The silt fence will be installed per plan and as needed around access roads and other soil disturbance. Special consideration and layout of the archeological area will be given and a demarcation fence will be installed around the area to avoid any disorder. After the erosion control measures are in place, we will be installing the access roads on the northeast corner at a minimum. We will also be preparing and constructing applicable lay down areas onsite. Once the access roads are constructed, we will be installing a platform under the bridge to facilitate debris containment and to provide a staging area for the precast arch installation. The platform will be constructed using old bridge beams with a crane mat deck. Some prep work may be completed while the access roads/crane mat is being constructed such as pockets chipped into ledge to accept the support beams that span the river. A more detailed explanation of how the platform will be constructed will be forth coming in the demolition plan.

All the detour signs will be laid out and dig safe will be called in for each location. The signs will be laid out and installed in close conformance with plan sheets 23-28. These signs will take about a week to install. The signs will be covered in preparation for the shutdown.

The waterline will be located, cut, and capped prior to the closure period. All applicable utilities will be notified with plenty of notice to assist if necessary.

Concerns / potential issues or conflicts:

This phase is critical for the preparation of the shutdown. Layout is vital in this phase and we will need to determine exactly how and where we will establish off sets and bench marks for quick reference while we are excavating and demolishing the existing arch. The platform installation will present some challenges because it is important not to install the platform so it will interfere with the precast arch or its footings. We have entertained placing some sacrificial concrete on the existing “ledge shelf” on each side to provide a level surface to install the platform framing in the event that cutting the pockets into the ledge is impossible. It will also have to be installed in such a way that we will need to take it out after the arch is installed.

Coordination with state and local officials / Crew Size:

During this phase we anticipate working normal working hours (6:00 – 5:00) with a crew size in the range of 8-10 people as needed. Daily and weekly “goals” will be set and achieved in order to make sure all prep work is completed before the bridge closure. The crew will be relatively consistent and key personnel will be involved with the project setup so nothing gets lost in translation later.

The coordination between T Buck, VAOT, and local residents will begin to pick up during this phase. The PRO will most likely be developing a method of distribution for schedule and establishing a method for concerns to be properly relayed to the contractor and/or VAOT. Local residents and the general public will be notified when and where schedule updates will be given. We intend on having a meeting towards the end of this phase (before closure) and invite residents to ask questions and voice concerns to see if there is anything we can do to accommodate any reasonable requests.

CONSTRUCTION DURING CLOSURE: April 19th – June 2nd.

This phase will begin with the closing of the road at 7:00 am on Saturday April 19th. The detour signs will be uncovered immediately before the road is closed.

We will immediately begin excavating the approaches to expose the Arch. The demolition process will last several shifts as we will be working 24 hours per day during the closure. There is a large amount of ledge to be removed on the abutment 2 side. We plan to expose the ledge during the excavation and attempt to rip it with a large excavator. The visible exposed ledge is layered and appears to be “excavatable” we acknowledge the hardness of the rock and we will utilize whatever means necessary to complete the rock removal in a timely manner. The excavation on abutment one side should be relatively simple when compared to abutment 2. The south side of the bridge will require around 300 CY of ledge to be removed which will take significantly longer than the excavation around the north abutment. The next step after the demolition of the existing arch and the removal of the specified ledge is to prepare for casting the arch footings and sub footings under the abutments.

The cast in place arch footings will be constructed and placed at the same time. We also hope to have the subfootings completed and placed within a day of the placement of the precast arch footings. While the concrete is setting up & curing, we will be constructing a shoring tower in the middle of our platform (which was installed in the pre-closure phase). Once the cast in place concrete for the arch footing has reached sufficient strength, we will begin the setting the precast Arch. The size and capacity of the tower has yet to be determined but needless to say it will be designed to support any and all applicable loads associated with the precast arch. During the installation of the arch, the concrete in the subfooting will be curing and developing strength. Once the majority of the ledge is removed, the preparation of the ledge prior to concrete will consist of cleaning and inspection by VAOT. Notice will be given before the inspection is required. Additionally we will plan to have as much of the project ready to inspect at one time to minimize the inconvenience to the geotechnical engineer.

Once the arch is set, we will set the abutment footings and place a 3” grout bed under them as shown in the contract drawings. Any applicable connection will also be grouted in accordance with the recommendation from JP Carrara. We anticipate using a redimix grout with a “non shrink additive.” Once the footings are set and the grout has reached an acceptable strength, the abutments will be set in the keyway of the footings. The abutments will be set on HDPE blocks/wedges to ensure the proper elevation is achieved, then the connection points will be grouted and the keyway will be flooded with grout under the breast wall(s). The splice sleeves used to develop the connection between the abutment footings and breast wall / wing walls are manufactured by NMB Splice Sleeve. The connections will be supplied in the breast wall & wing walls and they will fit down over the protruding rebar sticking out of the key way in the

footing. The grout in the splice sleeves is pumped into the bottom port until the sleeve is filled up and then the grout needs to develop 4000 psi before the wall can be loaded (backfilled against). The wings on Abutment 1 are completely precast while the wings on abutment 2 consist of a precast panel and the remainders of the wings are cast in place against a near vertical face of ledge. While wing wall #3 and #4 are being finished, the backfill operation can commence on Abutment 1. When the wings are completed on the abutment 2 side, backfilling operation can commence.

We will start with the installation of abutment 1 breast wall and move to abutment 2 provided it is ready because at this point the critical path will become the installation of the NEXT beams so the superstructure can be completed. The NEXT beams will be the biggest challenge to set because they weigh approximately 110 kips. When the NEXT beams are delivered, they will be picked up and set using an operation which will be shown in better detail when the erection plan is finalized and submitted.

After the beams are in place, the closure strips will be formed and placed using rapid-set concrete. Then the placement of a leveling slab that extends to each barrier will take place. At this point in time, we plan to request permission to use a light weight vibratory screed to speed up the process. After the overlay (leveling slab) is placed, the cast in place portion of the bridge rail will take place and finally the sidewalk on the west side of the bridge can be formed and placed. We plan to place the overlay first because the installation of the membrane is contingent upon proper curing of the concrete. The manufacture (Sterling Lloyd) generally requires 7 days of curing prior to application of spray applied membrane.

While the superstructure is being built, backfill operations will be taking place and all the drainage structures (3 of them) will be installed per plan. In addition to the drainage, we will also be installing and activating a waterline which will be installed under the bridge. When backfill has reached the approach slab elevation, the precast approach slabs will be installed the seams between each piece will be formed and placed using the rapid set concrete.

Once the approach slabs are backfilled and the approaches are fine graded, we will install pavement. At this time, final surface pavement will be left off while the remaining work is completed. Then the guardrail and bridge rail will be installed and a final walkthrough will take place to ensure all applicable items are taken care of prior to opening the bridge to traffic.

The waterline installation will take place during this phase. The waterline will be suspended under the bridge and will be located through the back walls and under the approach slabs through a steel sleeve.

Concerns / potential issues or conflicts:

The success of this schedule depends on everything going as planned during this phase. The first major hurdle will be demolishing the existing arch and establishing the proper ledge elevation for the installation of the cast in place sub footings and arch footings. The borings only tell part of the story and we will have enough equipment onsite to adapt to any “normal” conditions that arise (i.e. Hoe Rams, Grinders, jack hammers, Etc.). We plan to have a blasting and/or drilling plan completed and submitted so if blasting becomes necessary, we will be able to move immediately with interruption from submittals / approvals. As a result of doing a plan so far in advance, there will likely be several potential scenarios presented in case one method becomes more feasible than another.

The noise generated during the demolition process may be significant. We will do our best to keep the noise to a minimum during night time hours, but it should be noted that in general, we do not expect to delay the project to prevent noise at night.

The cast-in-place concrete and grout will need to be completed in a timely manner. Cylinders and grout cubes will be taken and tested to determine the strength of each material. There will be some engineering presented to VAOT showing the required strength each component will need to develop prior to moving forward. For example, the cast in place sub footing will need to develop at least 1000 psi before we install the precast footing and grout bed. A more detailed explanation of each material will be forthcoming. The NMB Splice sleeve data indicates that cure time is relative to the ambient temperature. The chart indicates that 4000 psi can be achieved within 24 hours at 68 degrees and only 12-18 hours at 86 degrees. We **MAY** plan on heating the immediate area to the best of our ability in an effort to speed up the curing process. The heating method will most likely include ground heaters so we can run circulating hose down each face of the concrete. Temporary supports for each wall are anticipated, they will be installed during the erection process and they will stay until the grout in the NMB Splice sleeve has reached 4000 psi. We anticipate removing any / all bracing prior to backfilling each abutment. The cast in place wing wall extensions on abutment 2 can develop the required strength without impacting the critical path as long as the breast wall can be installed so the NEXT beams can be installed. After the NEXT beams are installed, abutment 2 backfill operation is afforded some float in the schedule.

The precast concrete was designed to be at very specific elevation(s) so the removal of the ledge in the critical locations is a HUGE unknown. Based on the borings in the contract, there will most certainly be some ledge removal on both sides of the river. After an initial elevation is achieved, the preparation of the ledge on the back side of wing wall 3 & 4 is also very important to the timely completion of the substructure. We will have to cast the remaining portion of the aforementioned wings in place so the profile of the ledge will be “smoothed” out in an effort to

speed up the forming against the ledge. We feel it important to not include wing walls 3 & 4 in the critical path which is why it is very likely we will be setting the NEXT beams on the breast wall before the wings are completed on abutment two.

The NEXT beams are very heavy. We plan to use an enormous crane on the abutment one side near the end of wing wall 2 which should be able to set every piece of precast on the project. As soon as the backfill operations are completed, we will plan to use a rough terrain crane to set the approach slabs as the pad used for the big crane will have to be removed. A more detailed erection plan will be developed to ensure the installation of the NEXT beams is successful.

Once the NEXT beams are in place, the chain of events needs to take place in a flawless manner. The cure time for the concrete will be critical and may potentially come into play when moving from one step to the next. For example, after we place the Parapets on the bridge, we will need to wait a day (at least) before stripping the forms, and obviously the forms need to be stripped prior to placing the overlay. The same issue will come into play when we are getting ready to place the sidewalk after the overlay.

In general, this phase is obviously the most critical and the most important. We plan to have all the materials stockpiled and ready to go before the shutdown begins. The stockpiled materials will be readily available at all hours of the day or night so not to slow down production. We plan to have a "runner" available 24/7 to make any emergency runs to get a part or piece of something. By all accounts this schedule will be grueling and hard. We will be working through rain and all types of weather.

Coordination with state and local officials / Crew Size:

During the closure, we plan to work 24 hours per day, 7 days per week. We plan to have a crew of 10 people on site at all times. There will be a total of 4 crews that will work 12 hours per day. (i.e. day crew from 6:00 am to 6:00 pm and a night crew from 6:00 pm to 6:00 am). Each crew will work 4 days and then take 4 days off. Each employee will be working approximately 50 hours per week. Each crew will have a foreman and they will “overlap” each other during shift change to ensure proper communication is maintained so nothing is changed or missed from one crew to another.

When critical path items are completed and the predecessors of those activities have a lag time (i.e. curing grout / concrete) the crew will have a list of other activities that can be completed in preparation of future tasks (i.e. build forms for closure placements, bridge railing, project cleanup, etc.) Once the arch is set, and the cast-in-place key is placed on top, the staging can be removed and other site work can be completed in the event the critical path is stalled for some reason.

The specific details of how VAOT will advertise the closure will be discussed in the coming months. However that information is relayed to the public will be maintained by the PRO. We will be available for any questions and any major changes to the schedule will be relayed as soon as possible to the PRO and resident engineer. The resident engineer will be deeply involved with the daily/hourly progress of the project and if at any point he deems it necessary to issue a change in the distribution of information, we will be able to do so.

Coordination the all applicable utilities will be key towards the end of the closure period. We will keep in touch with the water district and other interested parties so everyone is involved with the pressure test(s), chlorination, and flushing of the lines.

POST CLOSURE ACTIVITIES: June 2nd – August 22nd

Once the road is opened to traffic, we will remove all the detour signs and stack/deliver the applicable signs to VAOT. A plan will be developed to leave the signs required for the remaining closures on the other concurrent projects in the area. Then we will begin the installation of the precast arch panels and the forming and placing of the Coping on each fascia. There will be some cast in place closure placements near the bottom of the arch at all four corners. The structural steel supports will be installed during the closure period and as long as everything is fabricated correctly. We should be able to connect everything with relative ease. Each connection point will have a slotted connection or other adjustment mechanisms to ensure proper alignment. There will be a staging system inside the arch so the connections can be made on the back side of the panels. The cast in place coping will be formed and placed during normal working hours while a single lane closure is utilized when necessary.

In addition to the remaining concrete items (precast & cast-in-place) there will be several other contract items to complete after the closure. We will be installing the Arch Lighting, removing our access platform and access roads, installation of approximately 500 cy of Type II stone, and installation of final slope stabilization / permanent erosion control measures. When the contract work is complete we will request and complete the final punch list and begin the demobilization process. Permanent surface pavement will be installed once all work on the roadway is completed so not to damage the wearing course.

Concerns / potential issues or conflicts:

The arch lighting is vague and is somewhat of an unknown at this time, the contract seems to imply that it's up to the contractor to design and implement something that is acceptable to VAOT. We will be working with a subcontractor to get something designed and installed that will be both economical and functional for the state.

The arch panels will be transported laying down and consequently will have to be flipped upright to be installed. The rigging and setting of the arch panels is somewhat of an unknown because it will be important for them to hang plumb so both connections can be made (at arch and at structural steel). Another potential issue is the cast in place coping. The details on the plans call for a very small "air gap" between the bottom of the cast in place coping and the top of the precast arch pieces. I suspect there will be a modified detail that will hang down over the face of the panel to avoid any eyesores with regards to inevitable variations in the elevation of the precast panels. A detail will be discussed and presented for approval that will be constructible while providing the aesthetic appearance the state desires. The removal of the platform and access roads will be done the same way we installed them, the deck will be

removed and the framing will be taken out. Then the sacrificial concrete (if necessary) will be removed and the area cleaned up to the satisfaction of the resident engineer.