T. Buck Construction, Inc.

249 Merrow Road, Auburn, Maine 04210-8319

(207) 783-6223 * (FAX) 783-3970

TRAFFIC CONTROL PLAN

Vermont Agency of Transportation

Bridge Replacement in town of Burke, VT
BRF 0269(13)

VT PE STAMP REQUIRED HERE, NOT JUST ON PLANS.

Submitted 3/30/15

SHOP DRAWING REVIEW

☐ REVIEWED AS REQUIRED BY THE CONSTRUCTION CONTRACT DOCUMENTS AND APPROVED, BUT ONLY FOR CONFORMANCE TO THE DESIGN CONCEPT OF THE WORK, AND SUBJECT TO FURTHER LIMITATIONS AND REQUIREMENTS CONTAINED IN THE CONSTRUCTION CONTRACT DOCUMENTS.

☐ REJECTED ☒ REVISE AND RESUBMIT ☐ APPROVED AS NOTED

CORRECTIONS OR COMMENTS MADE ON THE SHOP DRAWINGS DURING THIS REVIEW DID NOT RELIEVE CONTRACTOR FROM COMPLIANCEWITH REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS. THIS CHECK IS ONLY FOR REVIEW OF GENERAL CONFORMANCE WITH THE DESIGN CONCEPT OF THE PROJECT AND GENERAL COMPLIANCE WITH THE INFORMATION GIVEN IN THE CONTRACT DOCUMENTS. THE CONTRACTOR IS RESPOINSIBLE FOR: CONFIRMING AND CORRELATING ALL QUANTITIES AND DIMENSIONS: SELECTING FABRICATION PROCESSES AND TECHNIQUES OF CONSTRUCTION: COORDINATING THEIR WORK WITH THAT OF ALL OTHER TRADES: AND PERFORMING THEIR WORK IN A SAFE AND SATISFACTORY MANNER.

CLD Consulting Engineers
540 Commercial Street
Manchester, NH 03101
603-668-8223

Job Number: 120121
Reviewed by: SRB
Date: 04/14/2015

Vermont Agency of Transportation

RECEIVED

CK'D BY _____ **OK'D BY** _____

March 30, 2015

RESUBMIT Yes **Rejected** _____

BY Rob Young **DATE** 04/14/2015

A. DESCRIPTION OF PROJECT:

This project involves the removal of bridge 13 and portions of its abutments and foundation. Bridge 13 will be replaced with a precast structure, spanning 56 Feet over Dish Mill Brook, on new footings along the same alignment. Bridge 13 is located in the town of Burke, on VT Route 114, approximately .47 miles easterly of the Lyndon/Burke Town line. The width of the bridge will be increased to 36 feet – 10 inches.

This plan will illustrate T Buck's intensions on how to safely move traffic and pedestrians through or around the project site at each stage of the process. In General, T Buck will attempt to minimize the impacts to the traveling public by channelizing them around the work and away from the project as the contract specifications describe.

B. APPLICABLE CONTACT INFORMAITON

- Key Personnel Contract Info

- Site Superintendent, T Buck Construction:
  - Harry Pottle 207-754-2169
    harry@tbuckcon.net
- Project Manager, T Buck Construction:
  - Brian Emmons 207-212-0960 (cell)
    207-783-6223 x 205 (office)
    brian@tbuckcon.net
- Resident Engineer, Vermont Agency of Transportation:
  - Kevin McClure 802-917-4624 (cell)
    TBD (Field office)
    Kevin.McClure@state.vt.us
- Lyndonville, VT Police Station
  - Non-Emergency 802-626-1721
  - Emergency 9-1-1

Note: other individuals may be added as necessary.

* Burke, Fire Station - Non-Emergency & Emergency

Please list all the Emergency Contacts?

C. SCHEDULE OF PHASING

This project will be divided into three phases: Pre-closure, Closure, and Post Closure. The phases are described below and shown on the applicable sketches in the appendix of this plan.

- Pre-closure: Mid April – May 25th

Description	Start	Stop
Project Survey / Layout	4/20	4/24
Installation of erosion control devices	4/20	4/23
Installation of traffic control devices	4/20	4/24
Installation of temporary bridge	4/27	5/1
Pre-excavation of abutment 2 piles	5/4	5/8
Installation of abutment 1 piles	5/4	5/9
Installation abutment 2 piles	5/11	5/16

- Closure: May 26th – June 15th

  See Critical Path Method Schedule (spec section 900.645)

- Post-closure: June 15th – August 22nd

Description	Start	Stop
Form and place retaining wall footing	6/15	6/26
Form and place retaining wall	6/29	7/3
Form and place sidewalk (on bridge)	6/15	6/19
Form and place Northern Texas rail	6/22	6/26
Form and place Southern Texas rail	6/29	7/3
Form and place C.I.P. sidewalks	7/6	7/17
Install guardrail and approach rail	7/20	7/24
Remove temp traffic barrier	7/24	7/24
Final Pavement	7/27	7/30

Site specific traffic control plans should include:

• Layouts showing existing site conditions (may be based on CADD layouts, aerial photo, map, or hand drawn)

- o Location of pertinent features such as sidewalks, utility poles, ramps, drives, and side roads
- o Lane configurations
- o Existing traffic control devices such as signs, signals, and pavement markings
- o Location of pertinent traffic generators, such as shopping centers, schools, large businesses
- o Pertinent dimensions should be labeled
- o Layout may need to include features which are outside the project limits if they affect traffic control considerations, such as nearby intersections or ramps

• Proposed Temporary Traffic Control on layouts

- o Location of devices such as cones, temporary signals, barriers, temporary markings
- o Location of flagger stations if used
- o Taper lengths and device spacing
- o Pedestrian accommodations where appropriate
- o Pertinent dimensions should be labeled

• Narrative describing work activities and how materials and equipment will be transported to and from the work area and stored, as they relate to temporary traffic control. Narrative may also address emergency vehicle accommodations.

SPECIFY THAT THE INTENT DURING THE CLOSURE PERIOD IS TO STOP VEHICULAR TRAFFIC ACROSS THE TEMPORARY BRIDGE TO ALLOW PEDESTRIANS AND BICYCLISTS TO CROSS THE BRIDGE.

D. EXPLANTION OF PHASING

Pre-closure:

During this phase, traffic will be maintained in one alternating lane controlled by flaggers during daytime hours and maintained on the existing two lane alignment at night or whenever possible.

The construction activities related to traffic during this phase will be limited to day time hours and will consist of installing the temporary traffic bridge and the pre-excavation of abutment 2 piles and pile installation. The contract requires a minimum of 4 of the 6 abutment 2 piles be installed prior to the bridge closure period. The contract also states that daily lane closures for the purposes of pre-excavating and installing abutment 2 piles can occur for a maximum of 2 weeks leading up to the bridge closure.

T Buck plans to install a one lane temporary bridge immediately upstream of the existing bridge to accommodate the single lane of traffic during the day time. ~~The existing bridge does not offer sufficient width to complete the required work and maintain traffic.~~ The sketch and calculations in appendix B of this plan depict the short location and details for the temporary bridge. T Buck will need brief sporadic lane closures during the installation of the temporary bridge before the pile work begins. Brief sporadic lane closures are defined to be sort in duration (2-3 hours) and only when necessary (i.e. during equipment moves, material delivery, and launching of temporary)

A sign layout for lane closure needs to be provided?

THE TCP SHOULD INCLUDE ALL SIGNS AND PAVEMENT MARKINGS NECESSARY TO DIRECT PEDESTRIANS AND BICYCLISTS TO AND FROM THE TEMPORARY BRIDGE AND WARN MOTORISTS OF THE REVISED PEDESTRIAN ROUTES.

During this phase pedestrians will either utilize the existing bridge (night time) or the temporary bridge (day time). Flaggers will control the jobsite during day.

Specify that the project will be ADA compliant at all times.

Closure Period:

During this phase, traffic will be detoured around the project site while the bridge is replaced. The detour plan is given in the contract documents and can be seen on plan sheet(s) 21-23. Those applicable contract sheets can be seen in appendix B of this plan. A detailed description of the vehicle detour can be seen in section G of this plan

During this phase pedestrians and bicycles will be able to utilize the temporary bridge from the pre-closure phase. The bridge will be moved upstream and temporary ramps will be constructed up to and off of the bridge to minimize any unnecessary earth disturbance outside of the construction limits. T Buck has obtained permission from abutting land owners for use of a walkway during the bridge closure. Typical land use agreements will be available upon request.

Specify that the DMV will be notified for oversize bridge permit information

Post Closure:

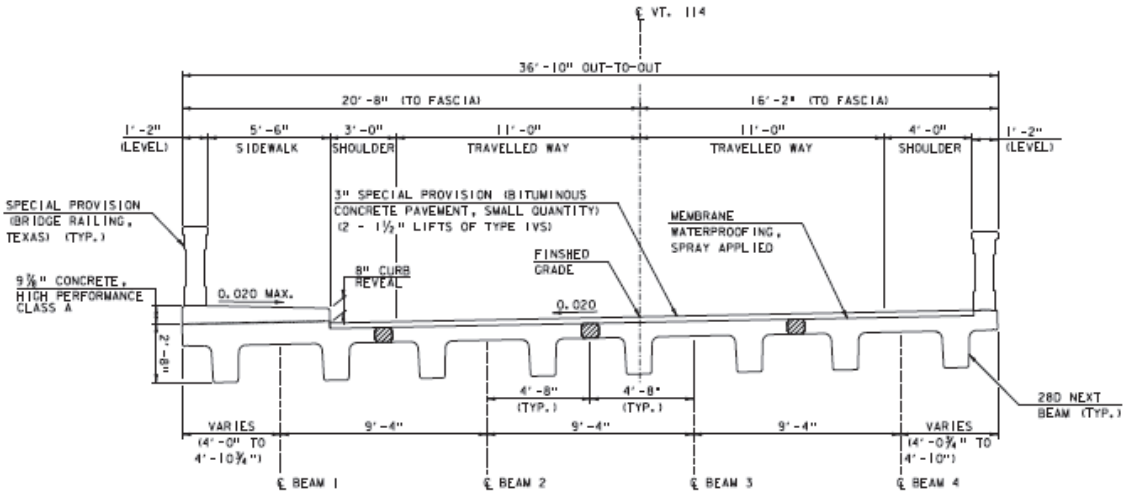
This phase will begin with the opening of the new bridge. T Buck intends to open the bridge to traffic using temporary traffic barrier to delineate 2 lanes 11' wide as described in the contract documents. The typical section can be seen in the picture below. During daytime hours, traffic may be reduced to one lane during concrete placements, material delivery, subcontractor work, etc. each night, the bridge will be opened to the 2 specified 11' lanes.

The construction activities during the phase will include the forming & placing of the

Specify what precautions are being followed for the overhead lines in the vicinity of the bridge?

sidewalk(s) and Texas style bridge railing. It will also include the forming and placing of the retaining wall for the bed & breakfast located near station 26+50 (LT). Once the guardrail and approach railing is installed, the temporary traffic barrier will be removed. As soon as the project is relatively complete in terms of curbing, railings, etc, the final lift(s) of pavement will be installed full width.

Pedestrians will use the new bridge to move through the project limits and when the barrier is removed, the new permanent sidewalks will be available for use.



TYPICAL BRIDGE SECTION
SCALE: ⅜" = 1'-0"

E. TEMPORARY TRAFFIC CONTROL DEVICES

Site Specific

The temporary traffic control devices will be installed in accordance with the current version of the MUTCD and will generally consist of the following

- Typical Approach Signing
- Temporary Traffic Barrier (Jersey barrier)
- Type III Barricades
- Traffic Drums and/or Cones

Detour

The detour signing will be layout in accordance with the plans and specifications. The resident engineer will in involved with the layout and approve any/all changes and locations of each sign assembly

Portable Changeable Message signs will be placed in the general location shown on the plans. Again, the resident engineer will have final approval of locations. The signs will switch between two screens. And the messages can be seen on sheet 23 of the contract drawings. The message may be changed if requested by the resident engineer

Please elaborate on what is being done for Emergency & Contingency planning - spare parts - emergency protocol

F. FLAGGING

The flagging subcontractor that will be utilized on this project is ADA Traffic Control and is located in Bridgewater, VT. Daily and/or weekly slips will be turned into the resident engineer for payment under item 630.15. In general a discussion will take place with the resident before the flaggers are scheduled so that all interested parties will be aware and may comment prior to implementing flagging operations.

The flagging operations should be limited to the pre-closure and post-closure periods.

Flaggers will be equipped with radios and will be able to communicate with all flaggers to properly direct traffic through the project site.

G. SPECIAL DETOURS

Onsite Temporary Bridge:

The temporary bridge will be installed so to keep traffic away from pile driving operations during the pre-closure phase. When the temporary bridge is no longer needed for traffic, it will be relocated upstream of the bridge and utilized as a pedestrian bridge during the closure period.

During the closure, traffic will be maintained on a regional detour via routs VT114, VT 105, VT 5A, VT 16 and US 5 between East Burke, Brighton, Charleston, Westmore, and Lyndon. Interstate 91 between exits 23 and 25 will also be used. The off-site vehicle detour is shown in great detail on plan sheets 21-22 of the contract drawings. For reference, those sheets are included in this plan in ~~Appendix A~~

APPENDIX B

H. NIGHT WORKING PLAN

There is no night work anticipated during the pre-closure period.

During the closure period, all night work will be performed in accordance with local and state regulations including adhering to the approved lighting plan.

There is no night work anticipated in the post-closure period.

APPENDIX A

SIGN SCHEDULE

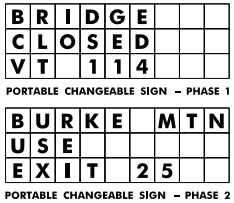
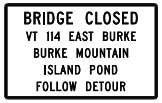
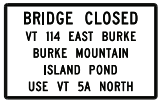
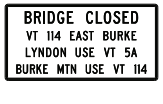
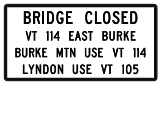
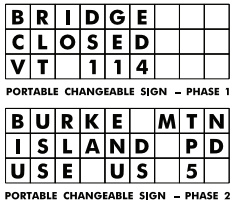
A layout indicating where these are used is required.

IMAGE	MUTCD ID NO.	QUANT.	SIZE	TEXT
	W20-1	2	48"X48"	ROAD WORK AHEAD
	W20-1	2	48”X48”	ROAD WORK 1000 FT
	W20-1	2	48"X48"	ROAD WORK 500 FT
	W20-4	2	48"X48"	ONE LANE ROAD AHEAD
	G20-2A	2	48"X24"	END ROAD WORK
	W20-7A	2	48"X48"	FLAGGER SYMBOL
	W3-4	2	48 x 48	BE PREPARED TO STOP
	W8-3	2	48”x48”	PAVEMENT ENDS
	W8-1	2	48”X48”	BUMP
	W1-6	2	48”X24”	ARROW

NOTE: 1. TYPICAL SIGNGS SHOWN. Other signs may be used as needed or as directed by the Resident Engineer.
NOTE: 2. Detour sign package included in Appendix B – Plan and Details (see sheet 23 of contract drawings.

APENDIX B

PLANS AND DETAILS

A (4) B/O G/W G/W	B (5) B/O G/W G/W	C (1) B/O G/W G/W	D (1) B/O G/W G/W	E (3) B/O G/W G/W B/O
F (13) B/O G/W G/W B/O	G (1) B/O G/W G/W B/O	H (5) B/O G/W G/W B/O	I (2) B/O G/W G/W B/O	J (3) B/O G/W G/W B/O B/O
K (10) B/O G/W G/W B/O B/O	L (1) 	M (2)  B/W	N (2)  B/W	O (2)  B/W
P (1)  B/W	Q (2) 	R (2) B/W	S (2) B/W	T (2) B/W
U (1) B/O G/W				

BRIDGE
CLOSED
VT 114
PORTABLE CHANGEABLE SIGN – PHASE 1

BURKE MTN
USE
EXIT 25
PORTABLE CHANGEABLE SIGN – PHASE 2

BRIDGE
CLOSED
VT 114
PORTABLE CHANGEABLE SIGN – PHASE 1

BURKE MTN
ISLAND PD
USE US 5
PORTABLE CHANGEABLE SIGN – PHASE 2

SIGN COLORS

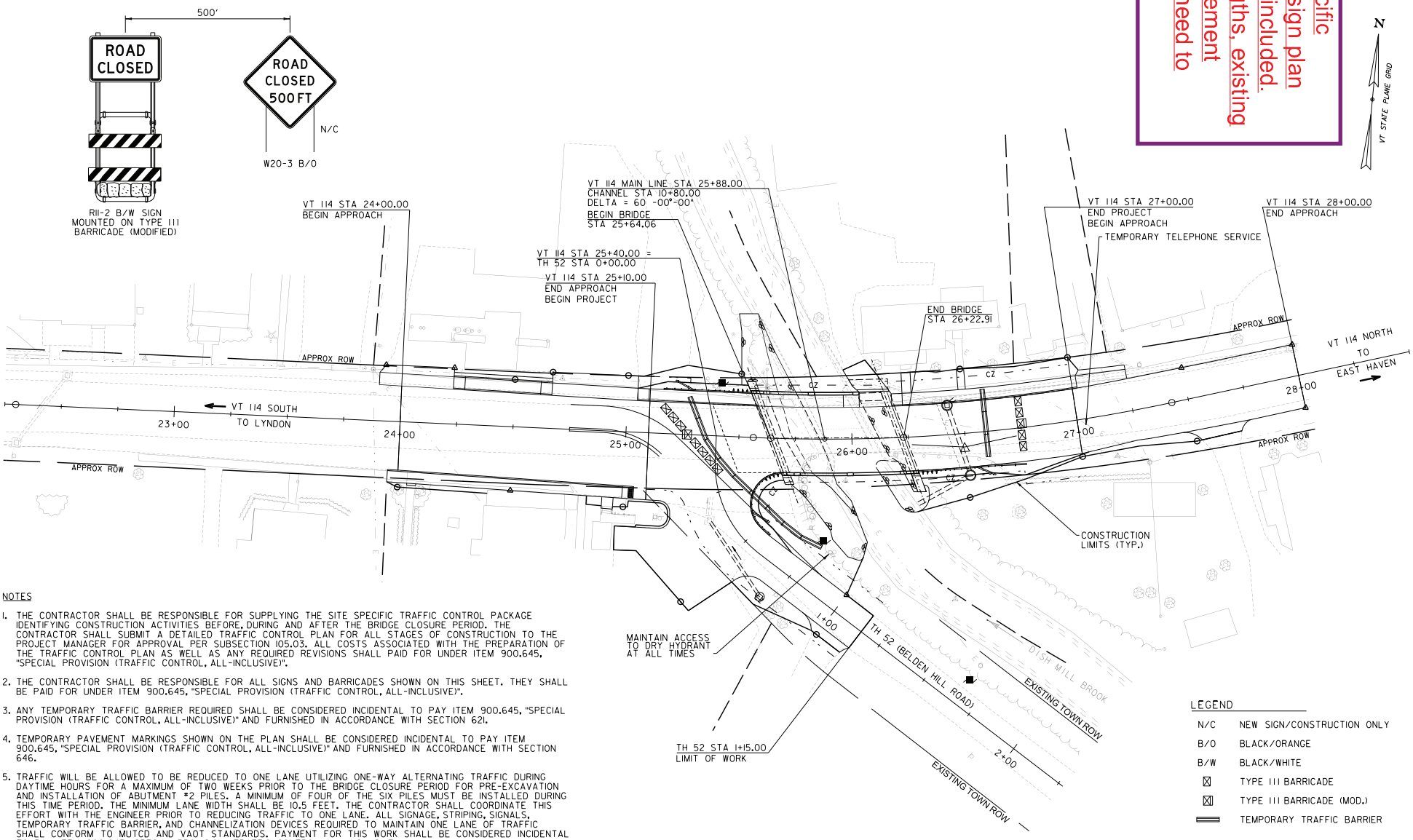
B/W: BLACK LETTERING ON WHITE BACKGROUND
G/W: GREEN LETTERING ON WHITE BACKGROUND
B/O: BLACK LETTERING ON ORANGE BACKGROUND

THE ESTIMATED NUMBER OF EACH SIGN PACKAGE REQUIRED IS REPRESENTED BY THE NUMBER UNDERNEATH EACH LETTER DESIGINATOR

PROJECT NAME: BURKE	
PROJECT NUMBER: BRF 0269(13)	
FILE NAME: 10c412/cos/z10c412regdtr.dgn	PLOT DATE: 10/14/2014
PROJECT LEADER: J. BYATT	DRAWN BY: W. GORDON
DESIGNED BY: M. HALEY	CHECKED BY: P. SHEDD
DETOUR SIGNS	SHEET 23 OF 73

CLD 12-0121 MODEL: L03

A site specific approach sign plan should be included. Taper lengths, existing signs, pavement markings need to specified.



NOTES

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING THE SITE SPECIFIC TRAFFIC CONTROL PACKAGE IDENTIFYING CONSTRUCTION ACTIVITIES BEFORE, DURING AND AFTER THE BRIDGE CLOSURE PERIOD. THE CONTRACTOR SHALL SUBMIT A DETAILED TRAFFIC CONTROL PLAN FOR ALL STAGES OF CONSTRUCTION TO THE PROJECT MANAGER FOR APPROVAL PER SUBSECTION 105.03. ALL COSTS ASSOCIATED WITH THE PREPARATION OF THE TRAFFIC CONTROL PLAN AS WELL AS ANY REQUIRED REVISIONS SHALL PAID FOR UNDER ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL SIGNS AND BARRICADES SHOWN ON THIS SHEET. THEY SHALL BE PAID FOR UNDER ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".

3. ANY TEMPORARY TRAFFIC BARRIER REQUIRED SHALL BE CONSIDERED INCIDENTAL TO PAY ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)" AND FURNISHED IN ACCORDANCE WITH SECTION 621.

4. TEMPORARY PAVEMENT MARKINGS SHOWN ON THE PLAN SHALL BE CONSIDERED INCIDENTAL TO PAY ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)" AND FURNISHED IN ACCORDANCE WITH SECTION 646.

5. TRAFFIC WILL BE ALLOWED TO BE REDUCED TO ONE LANE UTILIZING ONE-WAY ALTERNATING TRAFFIC DURING DAYTIME HOURS FOR A MAXIMUM OF TWO WEEKS PRIOR TO THE BRIDGE CLOSURE PERIOD FOR PRE-EXCAVATION AND INSTALLATION OF ABUTMENT #2 PILES. A MINIMUM OF FOUR OF THE SIX PILES MUST BE INSTALLED DURING THIS TIME PERIOD. THE MINIMUM LANE WIDTH SHALL BE 10.5 FEET. THE CONTRACTOR SHALL COORDINATE THIS EFFORT WITH THE ENGINEER PRIOR TO REDUCING TRAFFIC TO ONE LANE. ALL SIGNAGE, STRIPING, SIGNALS, TEMPORARY TRAFFIC BARRIER, AND CHANNELIZATION DEVICES REQUIRED TO MAINTAIN ONE LANE OF TRAFFIC SHALL CONFORM TO MUTCD AND VAOT STANDARDS. PAYMENT FOR THIS WORK SHALL BE CONSIDERED INCIDENTAL TO PAY ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".

6. SEE STANDARD T-10 FOR TYPICAL APPROACH SIGNING AND REGIONAL DETOUR MAP ON SHEET 21 FOR ADDITIONAL INFORMATION.

LEGEND

N/C	NEW SIGN/CONSTRUCTION ONLY
B/O	BLACK/ORANGE
B/W	BLACK/WHITE
⊠	TYPE III BARRICADE
⊠	TYPE III BARRICADE (MOD.)
▬	TEMPORARY TRAFFIC BARRIER

0 20 40
(SCALE 1" = 20')

CONSULTING ENGINEERS

PROJECT NAME: BURKE	
PROJECT NUMBER: BRF 0269(13)	
FILE NAME: 10c412/cos/z10c412bdrtcp.dgn	PLOT DATE: 11/19/2014
PROJECT LEADER: J. BYATT	DRAWN BY: M. HALEY
DESIGNED BY: M. HALEY	CHECKED BY: P. SHEDD
TRAFFIC CONTROL SHEET	SHEET 20 OF 73

CLD 12-0121 MODEL: L01

PEDESTRIAN TEMPORARY TRAFFIC CONTROL NOTES

1. THE CONTRACTOR SHALL MAINTAIN PEDESTRIAN THROUGH MOVEMENTS FROM ONE END OF THE CONSTRUCTION AREA TO THE OTHER UTILIZING A SHUTTLE SERVICE OR PEDESTRIAN BRIDGE DURING CONSTRUCTION. THE PEDESTRIAN BRIDGE SHALL MEET THE REQUIREMENTS OF SECTION 528. ALL EASEMENTS AND APPLICABLE PERMITS SHALL BE THE CONTRACTOR'S RESPONSIBILITY. PAYMENT FOR THIS WORK SHALL BE PAID FOR UNDER ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)". WHEN THE SHUTTLE SERVICE IS NOT NECESSARY, PEDESTRIAN THROUGH MOVEMENTS SHALL BE MAINTAINED ON AT LEAST ONE SIDE OF THE STREET. ANY SIDEWALK CLOSURES SHALL MEET THE REQUIREMENTS OF MUTCD, PART 6.

2. PEDESTRIAN ACCESS SHALL BE PROVIDED TO ALL ADJACENT PROPERTIES, BUILDINGS, RESIDENCES AND COMMERCIAL PROPERTIES AT ALL TIMES. THIS MAY INCLUDE TEMPORARY WALKWAYS SPANNING THE CONSTRUCTION AREA.

3. THE CONTRACTOR SHALL NOT STORE OR PLACE ANY CONSTRUCTION MATERIALS, EQUIPMENT OR SIGNS IN THE PEDESTRIAN PATH OF TRAVEL.

4. THE CONTRACTOR'S OPERATIONS SHALL NOT OCCUPY SIDEWALKS, EXCEPT WHERE PROPER PROTECTION AND A TEMPORARY PEDESTRIAN ACCESS ROUTE (TPAR) HAVE BEEN PROVIDED.

5. THE CONTRACTOR SHALL PROVIDE A TEMPORARY PEDESTRIAN TRAFFIC CONTROL PLAN FOR REVIEW AND WRITTEN APPROVAL BY THE ENGINEER A MINIMUM OF THREE WEEKS BEFORE SUCH PLAN IS IMPLEMENTED. THIS PLAN SHALL DETAIL THE CONSTRUCTION PHASING, SCHEDULE AND THE SPECIFIC METHODS OF MAINTAINING SAFE PEDESTRIAN ACCESS THROUGHOUT THE CONSTRUCTION AREA. THIS PLAN SHALL PROVIDE THE LOCATION AND DETAILS OF TEMPORARY CONSTRUCTION SIGNING, MARKINGS, BARRICADES, RESIDENCES, ETC. IF A SHUTTLE SERVICE IS CHOSEN TO PROVIDE ACCESS, A SCHEDULE WITH STOPPING POINTS SHALL BE INCLUDED IN THE SUBMITTAL.

6. PROVISION OF THE TPAR AND ALL OF ITS ELEMENTS, INCLUDING BUT NOT LIMITED TO SIGNS, CHANNELIZING DEVICES, BARRICADES, TEMPORARY PAVEMENT MARKINGS AND OTHER TRAFFIC CONTROL DEVICES IS TO BE PAID FOR INCIDENTAL TO ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".

TRAFFIC CONTROL NOTES

1. TRAFFIC WILL BE MAINTAINED ON A REGIONAL DETOUR VIA ROUTES VT 114, VT 105, VT 5A, VT 16 AND US 5 BETWEEN EAST BURKE, BRIGHTON, CHARLESTON, WESTMORE, AND LYNDON. INTERSTATE 91 BETWEEN EXITS 23 AND 25 WILL ALSO BE USED.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DETOUR AND CONSTRUCTION SIGNING. THE EXACT LOCATION WILL BE COORDINATED WITH THE ENGINEER AND SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE MUTCD.

3. TRAFFIC CONTROL WARNING SIGNS SHALL BE PROVIDED PER STANDARDS T-1 AND T-10 AND THE LATEST EDITION OF THE MUTCD. ADDITIONAL PROJECT CONSTRUCTION SIGNS SHALL BE INSTALLED AS SHOWN ON THE PLANS AND AS DIRECTED BY THE ENGINEER. ALL ON AND OFF PROJECT SIGNS AND BARRICADES AS REQUIRED FOR THE DETOUR WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE PAID FOR UNDER THE ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)". ALL SIGNS AND BARRICADES SHALL BE INSPECTED DAILY AND REPAIRED AS NECESSARY. ALL SIGNS AND BARRICADES SHALL BE CLEARED OF DUST AND DEBRIS WEEKLY.

4. PORTABLE CHANGEABLE MESSAGE SIGNS (PCMS) SHALL BE PLACED AT THE APPROXIMATE LOCATIONS SHOWN ON THE PLANS OR WHERE DIRECTED BY THE ENGINEER. TWO PCMS SHALL BE PLACED AT THE PROJECT LOCATION 14 DAYS PRIOR TO THE START OF CONSTRUCTION TO WARN OF THE IMPENDING DETOUR. THESE PCMS SHALL THEN BE REMOVED AND DEPLOYED TO THE LOCATIONS SHOWN ONCE CONSTRUCTION HAS BEGUN. PAYMENT FOR THESE SIGNS, INCLUDING ANY RELOCATING REQUIRED, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM 641.15 "PORTABLE CHANGEABLE MESSAGE SIGN".

5. THE ROUTE MARKERS USED FOR THE DETOUR AS SHOWN ON THE PLANS SHALL FOLLOW STANDARDS E-127 AND E-136B. THESE SIGNS SHALL BE REMOVED AT THE END OF THE CONSTRUCTION PERIOD. THESE SIGNS AND THEIR REMOVAL SHALL BE PAID FOR UNDER ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".

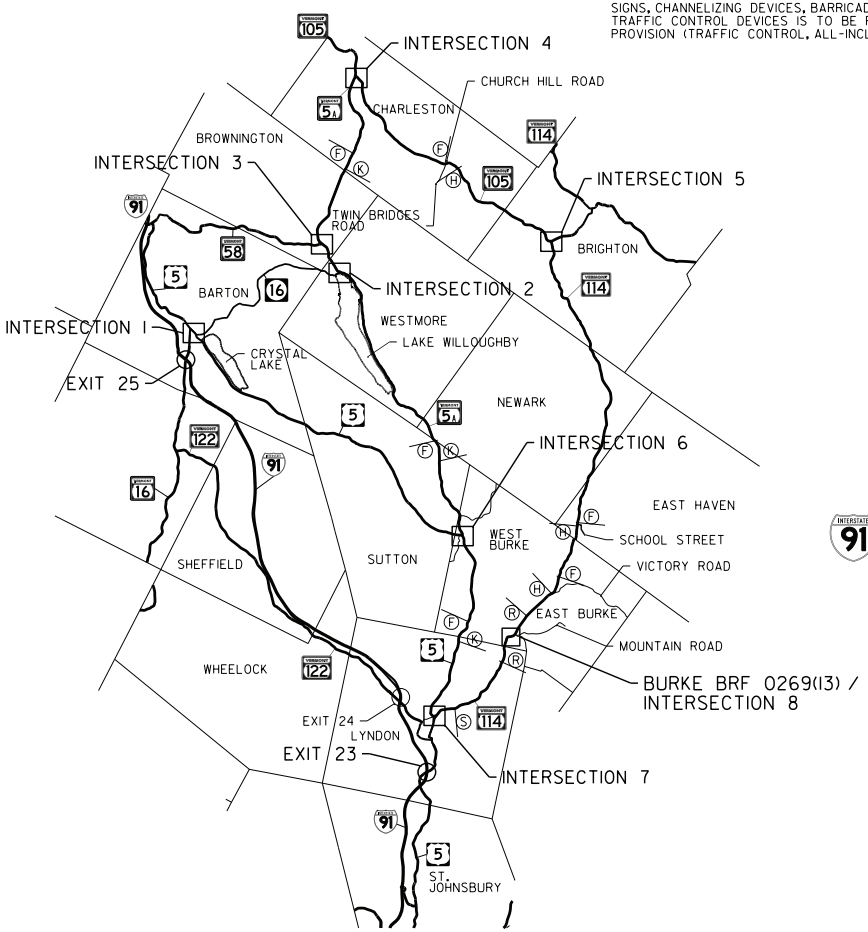
6. ACCESS TO ALL EXISTING DRIVES AND SIDE ROADS SHALL BE MAINTAINED AT ALL TIMES DURING ALL PHASES OF CONSTRUCTION.

7. INSTALLATION OF DETOUR SIGNS SHALL NOT BLOCK ANY EXISTING TRAFFIC CONTROL SIGN ASSEMBLIES AND SHALL MODIFY OR BE PLACED ADJACENT TO EXISTING SIGN ASSEMBLIES WHEN POSSIBLE. THE CONTRACTOR SHALL MAINTAIN AT LEAST 200 FEET BETWEEN SIGN ASSEMBLIES WHENEVER POSSIBLE.

8. EXISTING SIGNS THAT ARE IN CONFLICT WITH THE TRAFFIC FLOW OF THE DETOUR SHALL BE REMOVED OR COVERED BY THE CONTRACTOR. ALL SIGNS REMOVED OR COVERED SHALL BE REPLACED OR UNCOVERED WHEN THE TRAFFIC CONTROL PLAN IS DISASSEMBLED. PAYMENT FOR THIS WORK SHALL BE INCIDENTAL TO ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)".

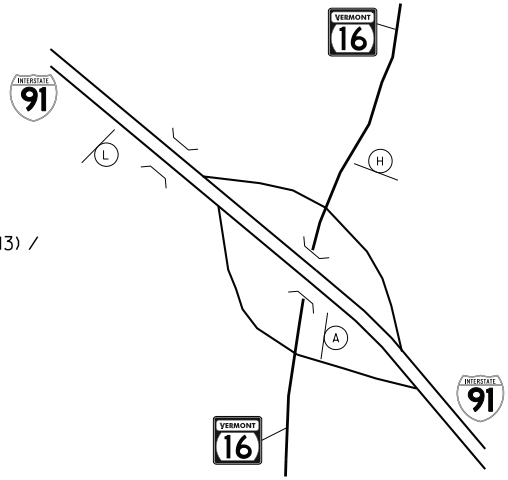
9. CONTACT DIG-SAFE AT LEAST 48 HOURS PRIOR TO BREAKING GROUND TO INSTALL ANY SIGN POSTS.

10. TEMPORARY TRAFFIC BARRIER SHALL BE PAID FOR UNDER ITEM 900.645, "SPECIAL PROVISION (TRAFFIC CONTROL, ALL-INCLUSIVE)" AND SHALL BE USED FOR THE CLOSURE OF THE BRIDGE. CONTRACTOR SHALL INSTALL BARRIER AS NECESSARY TO PREVENT THE TRAVELLING PUBLIC FROM ENTERING THE CONSTRUCTION SITE.

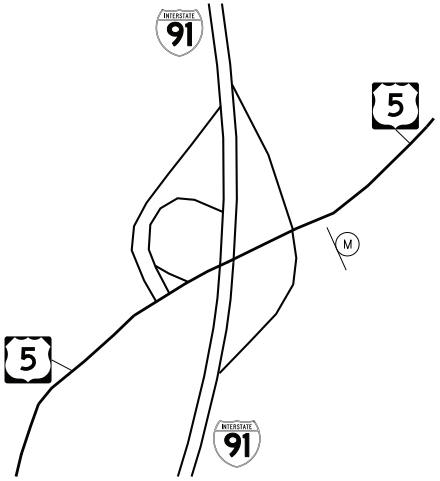


REGIONAL TRAFFIC CONTROL PLAN

NOT TO SCALE



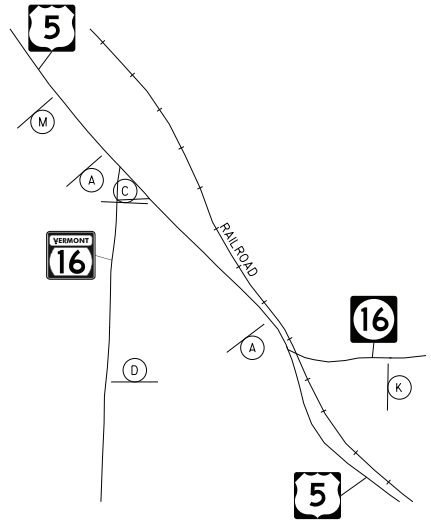
EXIT 25



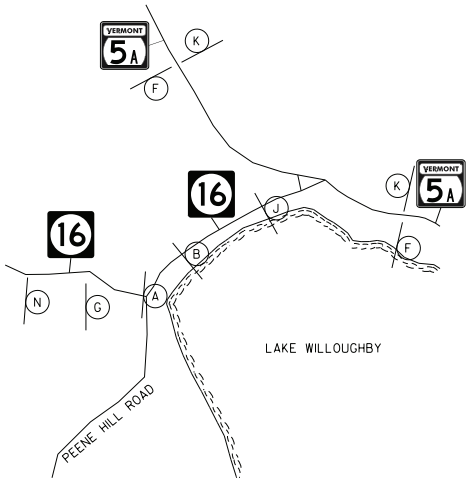
EXIT 23

PROJECT NAME: BURKE	
PROJECT NUMBER: BRF 0269(13)	
FILE NAME: 10c412/cos/z10c412regdtr.dgn	PLOT DATE: 10/14/2014
PROJECT LEADER: J. BYATT	DRAWN BY: M. HALEY
DESIGNED BY: M. HALEY	CHECKED BY: P. SHEDD
REGIONAL DETOUR MAP	SHEET 21 OF 73

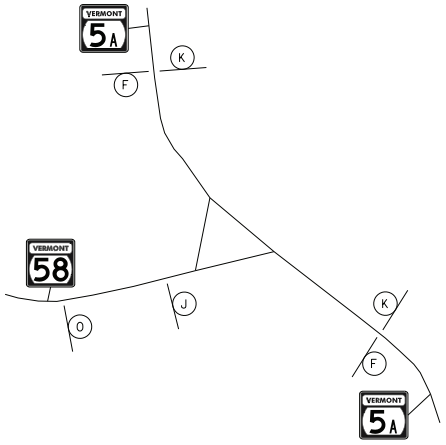
CLD 12-0121 MODEL: L01



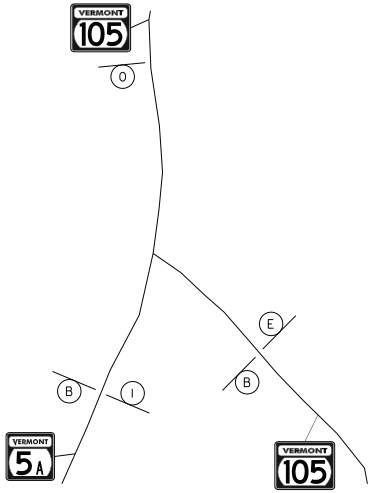
INTERSECTION 1
US 5 AND VT 16



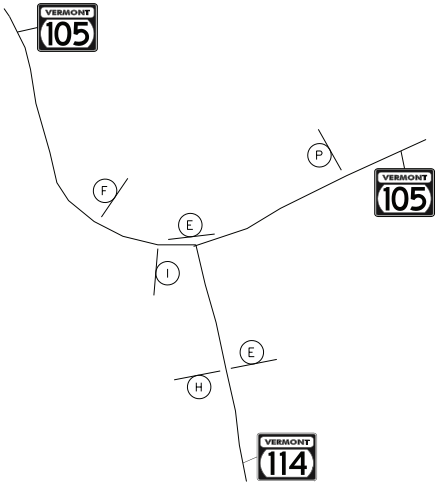
INTERSECTION 2
VT 16 AND VT 5A



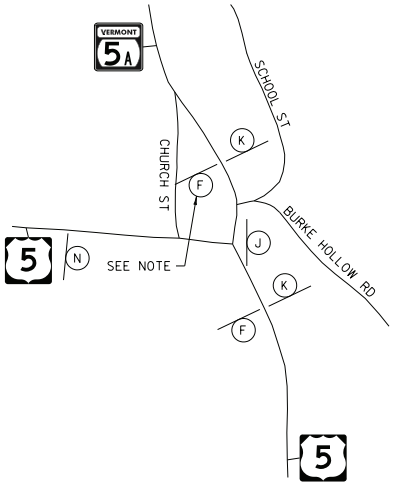
INTERSECTION 3
VT 5A AND VT 58



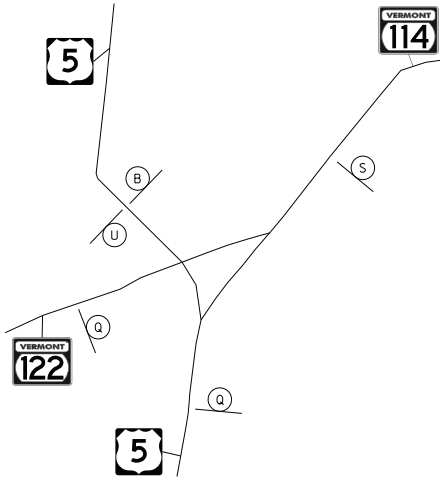
INTERSECTION 4
VT 5A AND VT 105



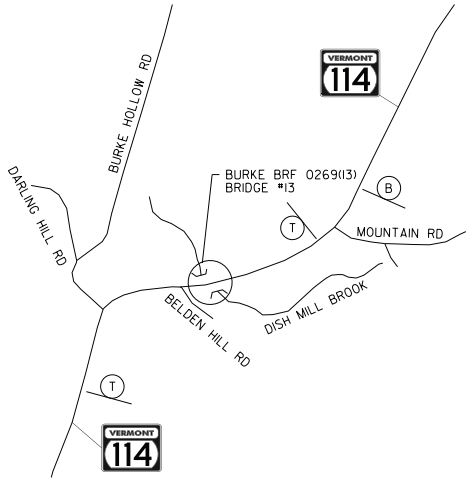
INTERSECTION 5
VT 105 AND VT 114



INTERSECTION 6
US 5 AND VT 5A



INTERSECTION 7
US 5 AND VT 114

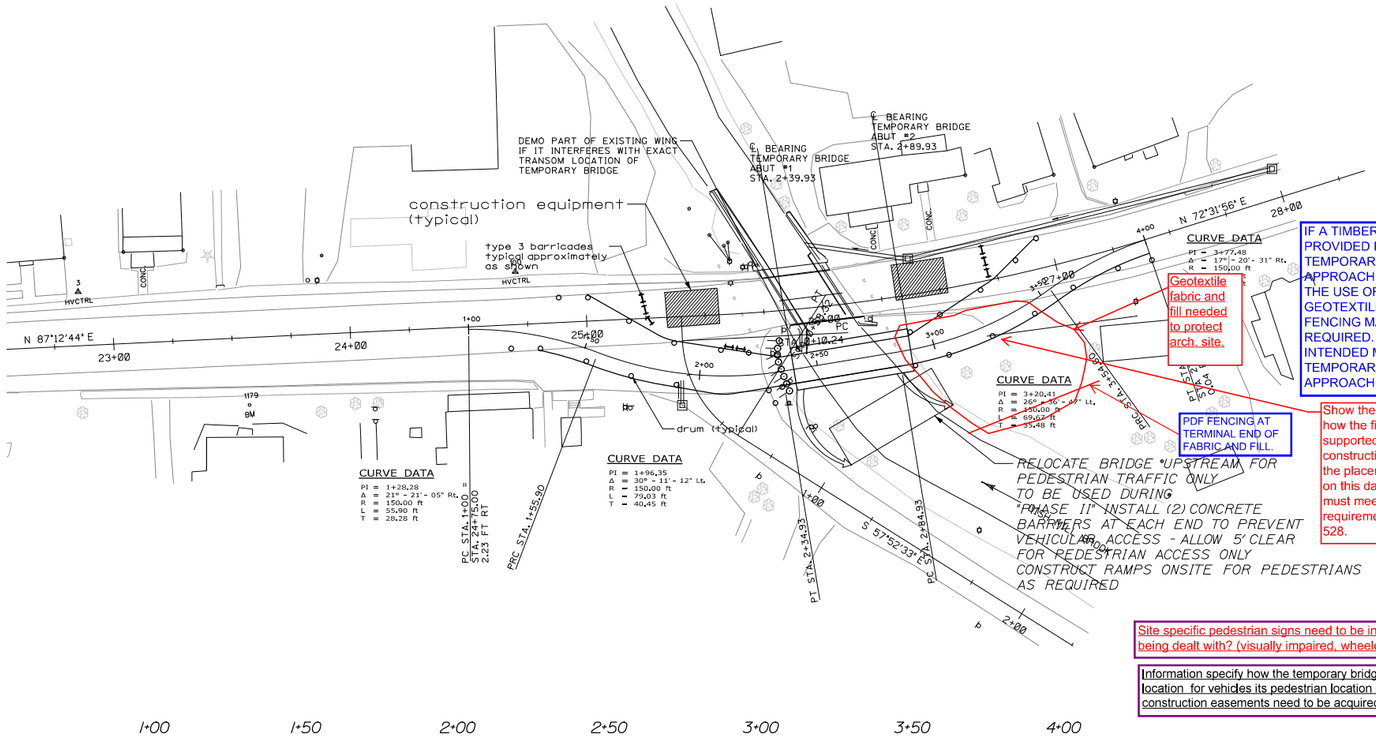


INTERSECTION 8
VT 114 AND MOUNTAIN ROAD

NOTE
CONTRACTOR TO COVER EXISTING DIRECTIONAL SIGN
TO EAST BURKE AT THIS LOCATION

PROJECT NAME: BURKE	
PROJECT NUMBER: BRF 0269(13)	
FILE NAME: 10c412/cos/z10c412regdtr.dgn	PLOT DATE: 10/14/2014
PROJECT LEADER: J. BYATT	DRAWN BY: W. GORDON
DESIGNED BY: M. HALEY	CHECKED BY: P. SHEDD
DETOUR DETAILS	SHEET 22 OF 73

CLD 12-0121 MODEL: L02



IF A TIMBER RAMP IS PROVIDED FOR THE TEMPORARY BRIDGE APPROACH RATHER THAN THE USE OF FILL, GEOTEXTILE AND/OR PDF FENCING MAY NOT BE REQUIRED. SHOW THE INTENDED METHOD OF TEMPORARY BRIDGE APPROACH ON PLAN.

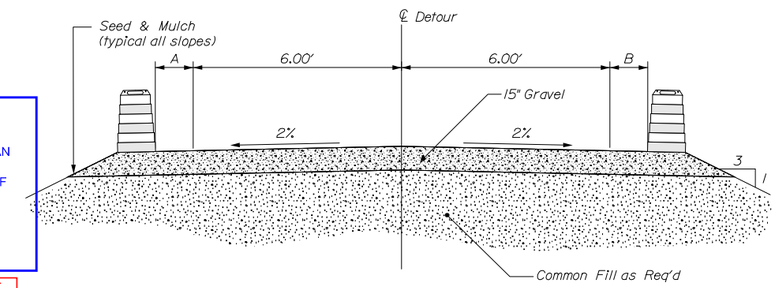
Geotextile fabric and fill needed to protect arch. site.

PDF FENCING AT TERMINAL END OF FABRIC AND FILL.

Show the toe of slope or how the fill will be supported to stay in the construction limits. With the placement of all traffic on this daytime detour it must meet the requirements of section 528.

Site specific pedestrian signs need to be indicated. How are ADA provisions being dealt with? (visually impaired, wheelchair access, etc.?

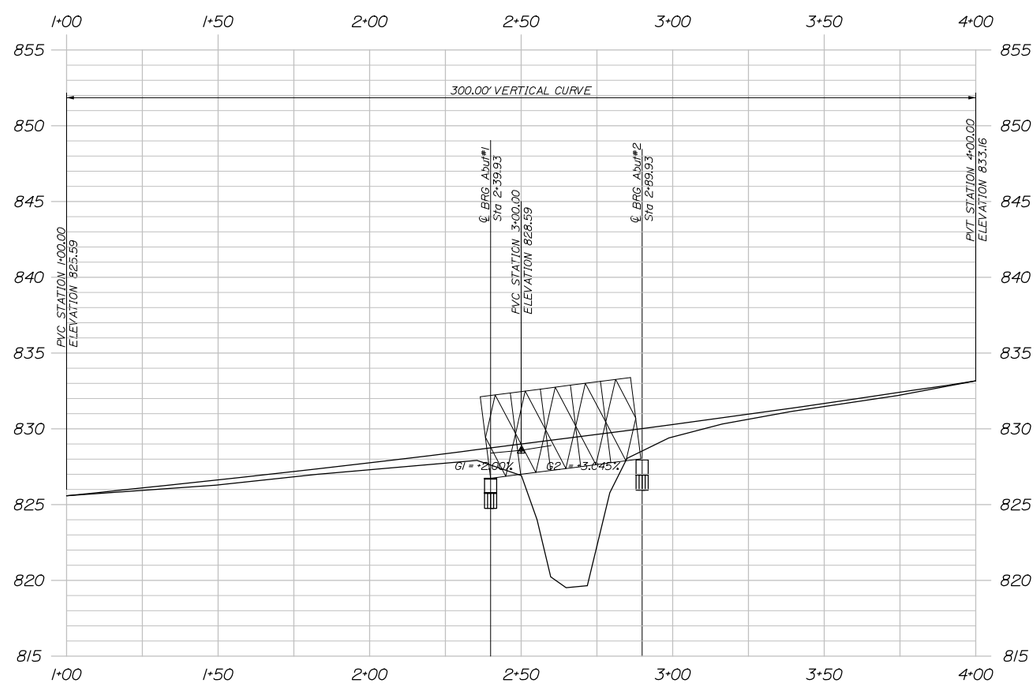
Information specify how the temporary bridge will be moved from it's lane detour location for vehicles its pedestrian location needs to be addressed. Will additional construction easements need to be acquired? ROW? Other impacts?



TYPICAL TEMPORARY APPROACH SECTION

(not to scale)
Dimension A- Additional Width provided on the Left for off tracking vehicles
Dimension B- Additional Width provided on the Right for off tracking vehicles

STA.	DIM A	DIM B
1+00	n/a	n/a
1+50	12.0'	0.0'
2+00	6.5'	1.0'
2+50	0.0'	0.0'
3+00	5.0'	0.0'
3+50	12.0'	0.0'
4+00	n/a	n/a



A/1 TEMPORARY PROFILE
HORIZONTAL: 1"=20'-0"
VERTICAL: 1"=4'-0"

GENERAL NOTES

1. THESE PLANS ARE NOT INTENDED TO BE USED ALONE BUT ARE INTENDED TO BE WORKED WITH THE CONTRACT DOCUMENTS FOR THE BRIDGE IN QUESTION VTRANS PROJECT NUMBER BRF-0269(13)
2. STEEL GRADE 50 KSI YIELD MIN. IN NEW OR GOOD USED CONDITION FOR DISTRIBUTION BEAMS - STEEL AS PROVIDED BY ACROW FOR ACROW 300 BRIDGE
3. REPORT ANY OBSERVED DISCREPANCY BETWEEN ACTUAL FIELD CONDITIONS AND THESE PLANS TO THE TEMPORARY BRIDGE ENGINEER OF RECORD IMMEDIATELY
4. DO NOT PROCEED WITH ANY DEPENDENT WORK UNTIL ANY SUCH REPORTED DISCREPANCY IS ADDRESSED TO THE SATISFACTION OF THE TEMPORARY BRIDGE ENGINEER OF RECORD.
5. FOR ABUTMENT NOTES REFER TO PLAN SHEET #2

CALDERWOOD ENGINEERING, ETC.
STRUCTURAL ENGINEERING • DETAILING SERVICES
222 RIVER RD, RICHMOND, ME 04357 PH/FX (207)737-2007/(207) 737-2008

PREPARED FOR:
TBUCK CONSTRUCTION, INC

CEE 032-BR-15

STATE OF VERMONT
ERIC T. CALDERWOOD
NO. 8274
STRUCTURAL
LICENSED
PROFESSIONAL ENGINEER

P.E. NUMBER

DATE:

	BY	DATE
DESIGN-DETAILED	ETC	2015
CHECKED-REVIEWED		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

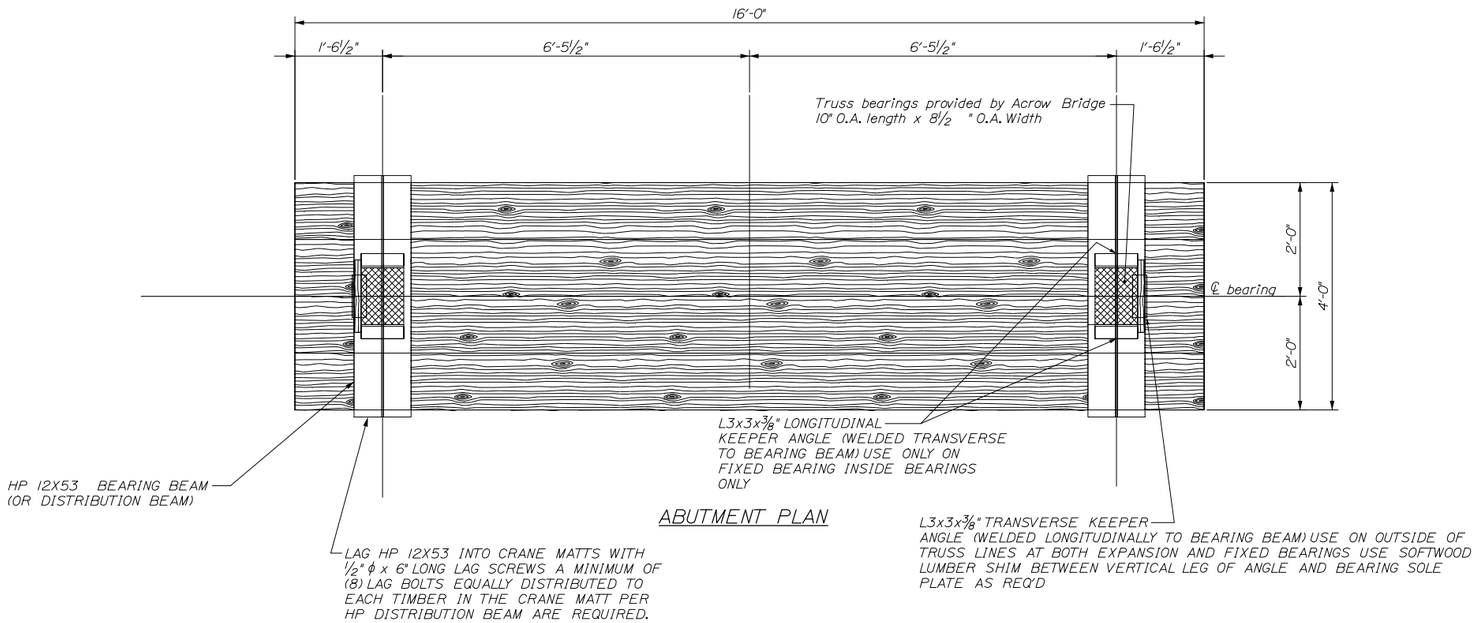
BURKE, VT RTE 114
OVER DISH MILL BROOK

TEMPORARY DETOUR PLAN & PROFILE
GENERAL NOTES

SHEET NUMBER

1

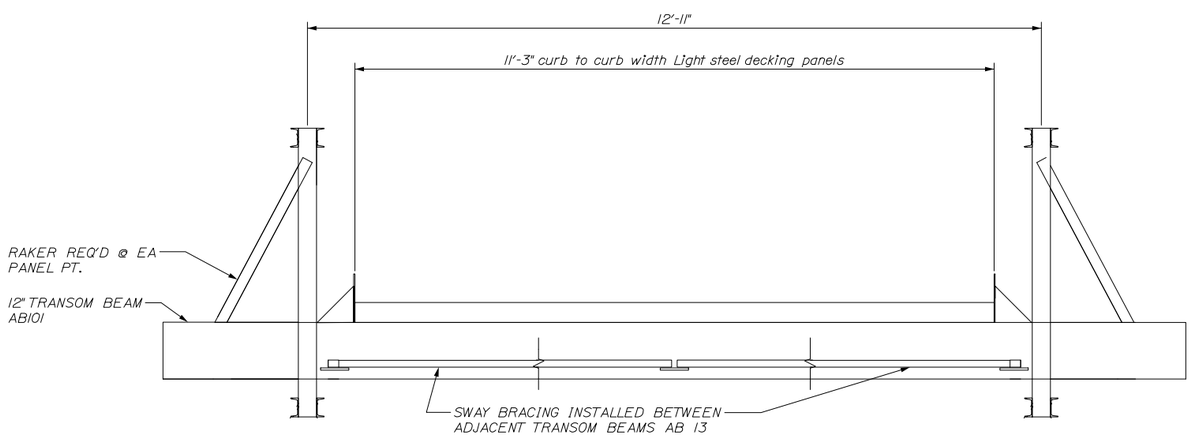
CALDERWOOD ENGINEERING
222 RIVER ROAD
RICHMOND, ME 04357
PH. (207)737-2007 FAX (207)737-2008



ABUTMENT PLAN

TOP OF DISTRIBUTION BEAM ELEVATIONS:
ABUTMENT #1 - 826.69
ABUTMENT #2 - 827.97

(vertical curve is approximated at each abutment)



2/2 DIMENSIONAL SECTION
¾"=1'-0"

GENERAL NOTES

1. STEEL HP SECTIONS SHALL BE IN NEW OR GOOD USED CONDITION

2. TIMBER BACKWALL SHALL BE CONSTRUCTED OF 8X8 TIMBERS USE SPF #2 OR EASTERN HEMLOCK #2 AT THE CONTRACTORS OPTION. BACKWALL MAY BEAR AT ENDS OF TRUSSES, EXACT DETAILS TO BE DETERMINED IN THE FIELD.

3. CRANE MATTS SHALL BE INSTALLED LEVEL ON UNDISTURBED NATIVE SOIL OR ON FULLY COMPACTED GRANULAR BORROW. CRUSHED STONE MAY BE USED IN LIEU OF GRANULAR BORROW, BUT ANY FILL MATERIALS SHALL BE FULLY COMPACTED IN ACCORDANCE WITH INDUSTRY STANDARD OF PRACTICE FOR TEMPORARY BRIDGE ABUTMENTS.

4. CRANE MATTS SHALL BE SOUND MATERIAL EITHER NEW OR GOOD USED CONDITION AND SHALL BE MIXED HARDWOOD, MIXED MAPLE OR MIXED OAK. CRANE MATTS SHALL BE THROUGH BOLTED AND SHALL BE A MINIMUM OF 12" THICK.

5. REPORT ANY OBSERVED DISCREPANCY BETWEEN THESE PLANS AND ACTUAL OBSERVED FIELD CONDITIONS TO THE TEMPORARY BRIDGE ENGINEER OF RECORD IMMEDIATELY.

6. DO NOT PROCEED WITH ANY DEPENDENT WORK UNTIL ANY SUCH REPORTED DISCREPANCY HAS BEEN RESOLVED TO THE SATISFACTION OF THE TEMPORARY BRIDGE ENGINEER OF RECORD.

7. THESE PLANS ARE NOT MEANT TO BE USED ALONE, BUT ARE TO BE WORKED IN CONJUNCTION WITH THE CONTRACT PLANS FOR THE HELMS BRIDGE REPLACEMENT.

CALDERWOOD ENGINEERING, ETC.
STRUCTURAL ENGINEERING • DETAILING SERVICES
222 RIVER RD, RICHMOND, ME 04357 PH/FX (207)737-2007/(207) 737-2008

PREPARED FOR:
TBUCK CONSTRUCTION, INC

CEE 032-BR-15

STATE OF VERMONT
ERIC T. CALDERWOOD
NO. 87
Structural
LICENSED
PROFESSIONAL ENGINEER

P.E. NUMBER

DATE:

	BY	DATE
DESIGN-DETAILED	ETC	2015
CHECKED-REVIEWED		
REVISIONS 1		
REVISIONS 2		
REVISIONS 3		
REVISIONS 4		
FIELD CHANGES		

BURKE, VT RTE 114
OVER DISH MILL BROOK

TEMPORARY BRIDGE ABUTMENTS AND SECTION

SHEET NUMBER
2

CALDERWOOD ENGINEERING
222 RIVER ROAD
RICHMOND, ME 04357
PH. (207) 737-2007 FAX (207) 737-2008

Temporary Bridge -
Rte 114 over Dishmill Brook
Supporting Calculations

In the Town of

Burke

032-br-15

Prepared for:

TBuck Construction Inc

By:

Calderwood Engineering etc

March, 2015

STATE OF VERMONT
ERIC T. CALDERWOOD
NO. 8711
Structural
LICENSED
PROFESSIONAL ENGINEER

Photo: US Rte 1 over the Mousam River in Kennebunk Me (Temporary Bridge
Courtesy of TBuck Construction, Inc & MaineDOT

CHAPTER EIGHT – CONSTRUCTION

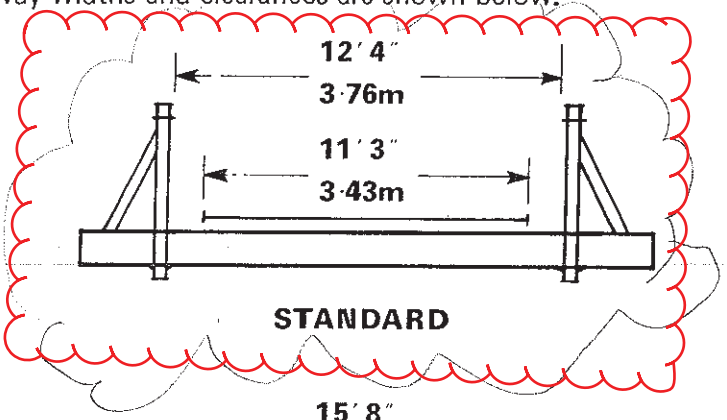
GENERAL

Acrow Panel Bridge is supplied in four roadway widths.

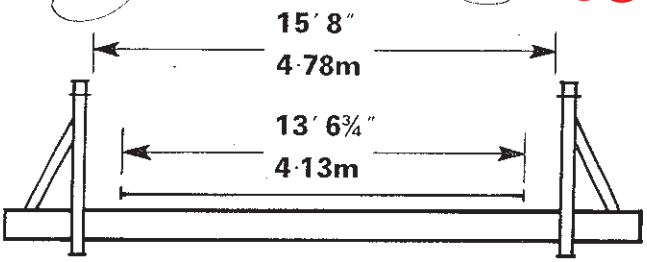
Standard	Single Lane.
Extra Wide	Single Lane.
Ultra Wide	Single Lane.
Double Wide	Two Lane.

Roadway widths and clearances are shown below.

TRANSOM
12"
DECK 4 3/16

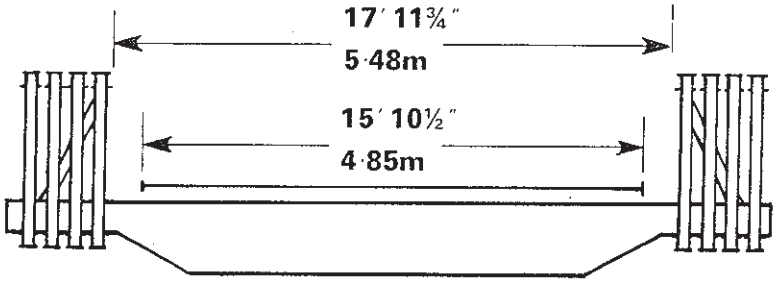


STANDARD

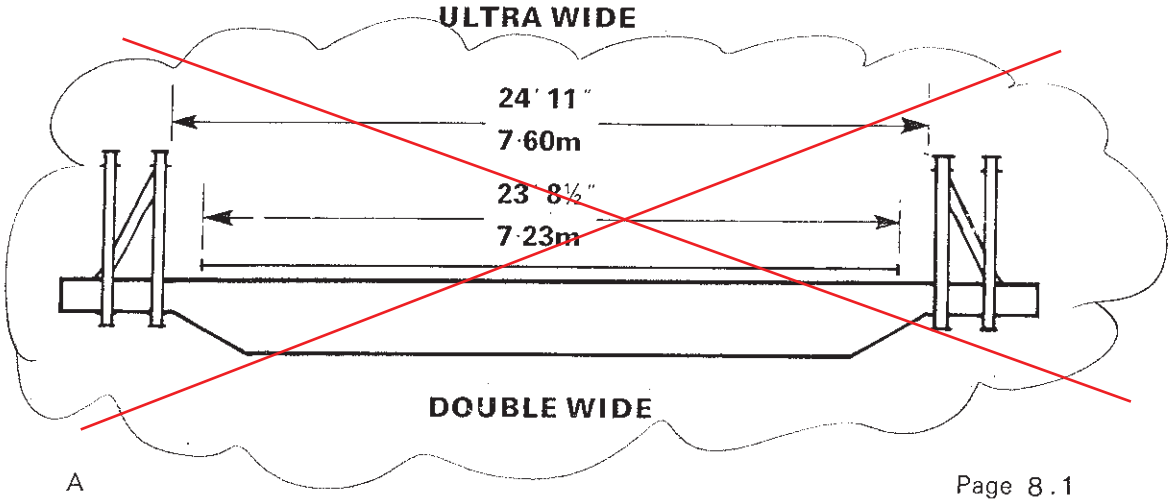


EXTRA WIDE

GIVEN THE NARROW WIDTH OF THE TEMPORARY BRIDGE, PLEASE CHECK THE TURNING RADII OF LARGER VEHICLES ALONG THE TEMPORARY BRIDGE ALIGNMENT TO ENSURE THEY WILL BE ABLE TO ACCESS THE BRIDGE WITHOUT HITTING THE RAIL.



ULTRA WIDE



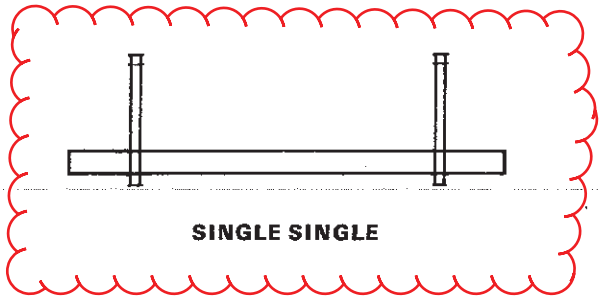
DOUBLE WIDE

Standard, Extra Wide and Double Wide bridges are for Highway use and are supplied with either light or heavy decking to suit various Highway Loading Specifications.

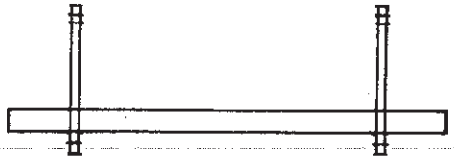
Extra Wide bridges can also be supplied with Super Heavy decking where very heavy axle and wheel loadings are involved.

The Ultra Wide bridge is specifically designed for the latest types of heavy earth moving plant and is therefore usually only supplied with Super Heavy decking.

Single lane Highway bridges can be built in all available forms of construction, which are as follows:—

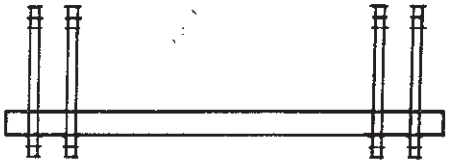


SINGLE SINGLE

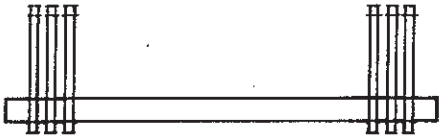


SINGLE SINGLE REINFORCED

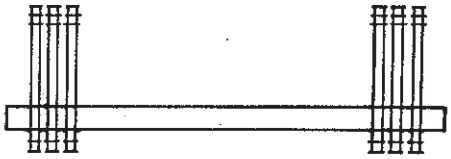
DOUBLE SINGLE



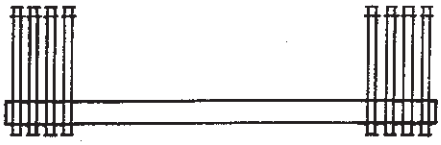
DOUBLE SINGLE REINFORCED



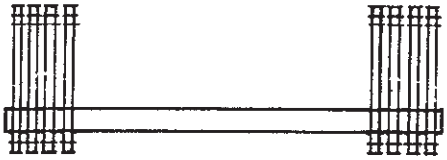
TRIPLE SINGLE



TRIPLE SINGLE REINFORCED



QUADRUPLE SINGLE



QUADRUPLE SINGLE REINFORCED

TABLE 7 – Continued

WEIGHTS OF BRIDGES (long tons)

		TWO END BAYS	ONE INTERNAL BAY	EXTENSIONS
TRUSSES ONLY	SS	2.30	0.58	–
	SSR	2.50	0.98	–
	DS	3.99	1.18	–
	DSR	4.39	1.98	–
	TS	5.47	1.74	–
	TSR	6.07	2.94	–
	QS	7.12	2.30	–
	QSR	7.92	3.90	–
	DD	6.39	2.36	–
	DDR	6.79	3.16	–
	TD	9.08	3.48	–
	TDR	9.68	4.68	–
	QD	11.83	4.62	–
	QDR	12.63	6.22	–
STD LS		2.76	1.62	1.05
STD LT		2.48	1.44	0.85
STD LTw/oT		2.08	1.17	0.58
STD HS		3.32	1.94	1.20
STD HT		3.39	2.00	1.24
STD HTw/oT		2.60	1.47	0.72
EW LS		3.36	1.97	1.24
EW LT		3.17	1.85	1.10
EW LTw/oT		2.54	1.43	0.68
EW HS		4.05	2.37	1.42
EW HT		4.13	2.42	1.47
EW HTw/oT		3.20	1.80	0.84
EW SHS		5.10	2.94	1.79
EW SHT		5.20	3.01	1.84
EW SHTw/oT		4.26	2.38	1.22
UW SHS		7.50	4.20	2.07
DW LS		7.89	4.43	2.10
DW LT		7.70	4.31	1.94
DW LTw/oT		6.49	3.50	1.14
DW HS		9.36	5.25	2.39
DW HT		9.70	5.49	2.61
DW HTw/oT		7.90	4.28	1.41

TABLE 7 – WEIGHTS & VOLUMES OF BRIDGES

Key to Symbols

STD = Standard
EW = Extra Wide
UW = Ultra Wide
DW = Double Wide
LS = Light Steel Decking
LT = Light Timber Decking
LTw/oT = Light Timber Decking excluding Timber components
HS = Heavy Steel Decking
HT = Heavy Timber Decking
HTw/oT = Heavy Timber Decking excluding Timber components
SHS = Super Heavy Steel Decking
SHT = Super Heavy Timber Decking
SHTw/oT = Super Heavy Timber Decking excluding Timber components

NOTES

1. The weights and volumes of Two End Bays include End Posts Baseplates Bearings etc.
2. When calculating bridge weights for launching purposes the bridge should be considered as being made up of Internal Bays only.

TABLE 8 – PROPERTIES OF BRIDGES AND COMPONENTS

BRIDGES

CONSTRUCTION	I (ins⁴)	I (cm⁴)	Z (ins³)	Z (cm³)
SS	13600	566070	446	7308
SSR	31300	1302800	906	14846
DS	27200	1132140	892	14617
DSR	62600	2605600	1812	29693
TS	40800	1698200	1338	21925
TSR	93900	3908400	2718	44540
QS	54400	2264290	1784	29234
QSR	125200	5211200	3624	59380
DD	116688	4856900	1912	31331
DDR	249488	10384440	3838	62890
TD	175032	7285350	2868	47000
TDR	374232	15576650	5757	94340
QD	233376	9713800	3824	62664
QDR	498976	20768880	7676	125780

Light Decking

a. American Association of State Highway Officials (AASHO) loading HS20–44.

b. Up to a 14 long ton (14200kg) axle load (with maximum of 7 long ton (7100kg) wheel) at not less than 5ft (1·52m) spacing.

Heavy Decking

a. British Standard (BS) 153 Pt. 3A HA loading.

b. Up to 45 Units of Type HB loading to BS153 Pt. 3A.

Super Heavy Decking

a. Extra Wide Decking

1. Up to 50 ton (50,802kg) axle (plus additional 33% Impact factor).
2. Four wheels/axle 11ft 6in (3·5m) outside of tyres to 3ft 10in (1·17m) inside of tyres (tvre pressure not exceeding 70 psi).
3. The number of trusses should be such that individual transom seat loading does not exceed 14 tons (14224 kg.).

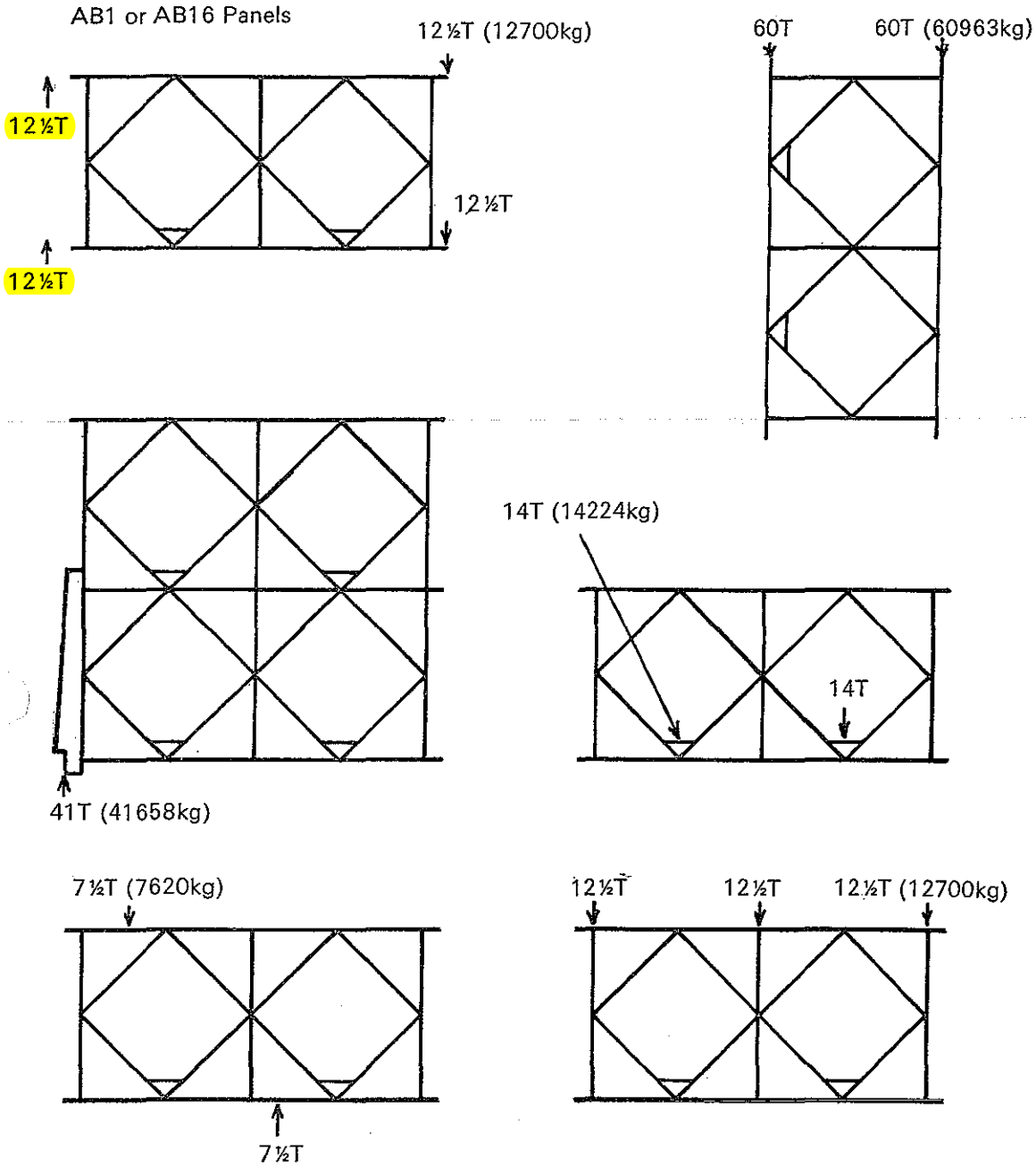
b. Ultra wide decking

1. Up to 60 ton (60,963kg) axle (plus additional 33% Impact Factor).
2. Two wheels/axle, 8ft 9in (2·67m) centre-to-centre of tyres (tyre pressure not exceeding 55 psi).
3. The number of trusses should be such that individual transom seat loading does not exceed 14 tons (14224 kg.).

Moment of Inertia of Panel = Ixx = 6800in⁴ = 282,035cm⁴
Section Modulus of Panel = Zxx = 223in³ = 3654cm³
Permissible Bending Moment under static conditions = 330 long tons feet (1002 kNm).
Permissible Bending Moment under dynamic conditions = 245 long tons feet (744kNm).
Permissible stresses on Transoms and Deck Units= 14·2 tons/in².

TABLE 8 – Continued

COMPONENTS
AB1 or AB16 Panels



TABLES 9, 10, 11, 12, 13 & 14 – SHEAR AND BENDING MOMENT CAPACITIES

Tables 9, 10, 11, 12, 13 and 14 are based on the following permissible bending stress and shear capacities:

a) Permissible Bending Stress fb = 13·2 tons/in² (2079 kg/cm²)

b) 1. Permissible Shear Capacity single storey/truss = 25 tons (25400 kg)

   2. Permissible Shear Capacity double storey/truss = 41 tons (41658 kg)

Where fatigue is not a criterion of design (e.g. in formwork design and bridges for temporary use where the number of maximum load cycles is low) the permissible bending stress may be increased to 17·9 tons/in² (2819 kg/cm²). In this case the available bending moment for live load given in Tables 9, 10, 11, 12, 13 and 14 may be increased by the following amounts:

Construction	*Increased Available LLBM (tons feet)*
SS	176
SSR	354
DS	349
DSR	710
TS	523
TSR	1062
QS	697
QSR	1415
DD	748
DDR	1500
TD	1123
TDR	2250
QD	1495
QDR	3005

Shear capacities can NOT be increased above the value given in the Tables.

TABLE 9 – ACROW PANEL BRIDGE – STANDARD WIDTH

LIGHT STEEL DECKING

TABLE OF SHEAR CAPACITY AVAILABLE FOR LIVE LOAD (TONS OF 2,240 LB)

SPAN FT.	M.	SS	SSR	DS	DSR	TS	TSR	QS	QSR	DD	DDR	TD	TDR	QD	QDR
10	3·05	48	48	98	98	148	147	197	196	161	161	243	242	324	323
20	6·10	47	47	96	96	146	144	195	193	159	158	240	239	320	319
30	9·15	46	45	95	94	144	142	193	191	157	156	237	236	317	315
40	12·20	45	44	93	92	142	140	191	188	155	154	235	232	314	311
50	15·25	44	42	92	90	141	138	189	185	153	151	232	229	311	307
60	18·30	43	41	90	88	139	136	187	182	151	149	230	226	308	303
70	21·35	42	40	89	86	137	133	185	179	149	147	227	223	305	300
80	24·40	41	38	87	84	136	131	183	176	147	144	225	220	302	296
90	27·45	39	37	86	82	134	128	181	173	146	142	222	217	299	292
100	30·50	38	36	85	81	132	126	179	171	145	139	219	213	295	287
110	33·35	37	35	83	79	129	122	177	168	142	137	217	210	292	283
120	36·60	36	33	82	78	127	120	175	165	140	135	215	207	289	279
130	39·65	35	32	80	76	125	118	173	162	138	133	212	204	286	275
140	42·70	34	30	79	74	123	115	171	159	136	130	209	201	283	271
150	45·75	33	29	77	73	121	113	169	156	134	128	207	198	280	267
160	48·80	32	28	76	71	119	110	167	153	132	125	204	195	277	263
170	51·85	31	26	74	69	117	108	165	150	130	123	202	192	274	259
180	54·90	30	25	73	67	115	106	163	147	128	120	199	188	270	255
190	57·95	28	24	71	65	113	104	161	144	126	117	196	184	266	251
200	61·00	27	23	70	62	111	102	159	142	124	114	192	180	262	246

A

TABLE 9 – ACROW PANEL BRIDGE – STANDARD WIDTH
LIGHT STEEL DECKING
TABLE OF BENDING MOMENT AVAILABLE FOR LIVE LOAD (TONS (2,240 LB) FEET)

SPAN FT.	M.	SS	SSR	DS	DSR	TS	TSR	QS	QSR	DD	DDR	TD	TDR	QD	QDR
10	3·05	492	—	—	—	—	—	—	—	—	—	—	—	—	—
20	6·10	483	—	—	—	—	—	—	—	—	—	—	—	—	—
30	9·15	469	969	957	—	—	—	—	—	—	—	—	—	—	—
40	12·20	450	946	932	—	—	—	—	—	—	—	—	—	—	—
50	15·25	424	917	900	1883	1376	—	1852	—	—	—	—	—	—	—
60	18·30	395	881	861	1835	1330	—	1798	—	—	—	—	—	—	—
70	21·35	359	830	815	1776	1274	2714	1732	—	1855	—	—	—	—	—
80	24·40	318	792	764	1708	1212	2630	1658	3566	1782	3834	2742	—	—	—
90	27·45	273	738	704	1633	1139	2532	1575	3428	1697	3733	2633	—	3558	—
100	30·50	223	675	637	1547	1060	2425	1478	3297	1604	3620	2510	5535	3408	—
110	33·55	166	612	565	1455	970	2302	1374	3149	1500	3496	2376	5370	3242	7242
120	36·60	106	538	485	1352	876	2175	1261	2992	1387	3359	2230	5187	3059	7015
130	39·65	—	460	397	1239	768	2032	1137	2820	1261	3214	2068	4990	2863	6767
140	42·70	—	373	306	1120	658	1980	1006	2631	1130	3050	1895	4778	2648	6502
150	45·75	—	282	204	992	535	1715	863	2429	1086	2880	1712	4550	2423	6210
160	48·80	—	—	—	856	408	1540	712	2220	836	2696	1512	4310	2180	5912
170	51·85	—	—	—	707	258	1354	547	1985	671	2502	1300	4045	1918	5580
180	54·90	—	—	—	550	—	1108	378	1750	501	2290	1080	3770	1638	5240
190	57·45	—	—	—	387	—	900	—	1485	318	2075	845	3480	1348	4880
200	61·00	—	—	—	215	—	675	—	1225	—	1865	595	3180	1043	4500

A

LOADING—HS 20-44 (MS18)

TABLE OF MAXIMUM MOMENTS, SHEARS, AND REACTIONS—SIMPLE SPANS, ONE LANE

Spans in feet; moments in thousands of foot-pounds; shears and reactions in thousands of pounds.

These values are subject to specification reduction for loading of multiple lanes. Impact not included.

Span	Moment	End shear and end reaction (a)	Span	Moment	End shear and end reaction (a)
1	8.0(b)	32.0(b)	42	485.3(b)	56.0(b)
2	16.0(b)	32.0(b)	44	520.9(b)	56.7(b)
3	24.0(b)	32.0(b)	46	556.5(b)	57.3(b)
4	32.0(b)	32.0(b)	48	592.1(b)	58.0(b)
5	40.0(b)	32.0(b)	50	627.9(b)	58.5(b)
6	48.0(b)	32.0(b)	52	663.6(b)	59.1(b)
7	56.0(b)	32.0(b)	54	699.3(b)	59.6(b)
8	64.0(b)	32.0(b)	56	735.1(b)	60.0(b)
9	72.0(b)	32.0(b)	58	770.8(b)	60.4(b)
10	80.0(b)	32.0(b)	60	806.5(b)	60.8(b)
11	88.0(b)	32.0(b)	62	842.4(b)	61.2(b)
12	96.0(b)	32.0(b)	64	878.1(b)	61.5(b)
13	104.0(b)	32.0(b)	66	914.0(b)	61.9(b)
14	112.0(b)	32.0(b)	68	949.7(b)	62.1(b)
15	120.0(b)	34.1(b)	70	985.6(b)	62.4(b)
16	128.0(b)	36.0(b)	75	1,075.1(b)	63.1(b)
17	136.0(b)	37.7(b)	80	1,164.9(b)	63.6(b)
18	144.0(b)	39.1(b)	85	1,254.7(b)	64.1(b)
19	152.0(b)	40.4(b)	90	1,344.4(b)	64.5(b)
20	160.0(b)	41.6(b)	95	1,434.1(b)	64.9(b)
21	168.0(b)	42.7(b)	100	1,524.0(b)	65.3(b)
22	176.0(b)	43.6(b)	110	1,703.6(b)	65.9(b)
23	184.0(b)	44.5(b)	120	1,883.3(b)	66.4(b)
24	192.7(b)	45.3(b)	130	2,063.1(b)	67.6
25	207.4(b)	46.1(b)	140	2,242.8(b)	70.8
26	222.2(b)	46.8(b)	150	2,475.1	74.0
27	237.0(b)	47.4(b)	160	2,768.0	77.2
28	252.0(b)	48.0(b)	170	3,077.1	80.4
29	267.0(b)	48.8(b)	180	3,402.1	83.6
30	282.1(b)	49.6(b)	190	3,743.1	86.8
31	297.3(b)	50.3(b)	200	4,100.0	90.0
32	312.5(b)	51.0(b)	220	4,862.0	96.4
33	327.8(b)	51.6(b)	240	5,688.0	102.8
34	343.5(b)	52.2(b)	260	6,578.0	109.2
35	361.2(b)	52.8(b)	280	7,532.0	115.6
36	378.9(b)	53.3(b)	300	8,550.0	122.0
37	396.6(b)	53.8(b)			
38	414.3(b)	54.3(b)			
39	432.1(b)	54.8(b)			
40	449.8(b)	55.2(b)			

(a) Concentrated load is considered placed at the support. Loads used are those stipulated for shear.
(b) Maximum value determined by Standard Truck Loading. Otherwise the Standard Lane Loading governs.

CALDERWOOD ENGINEERING
222 RIVER ROAD
RICHMOND, ME 04357
PH. (207) 737-2007 FAX (207) 737-2008

Project: Burke, Vt
Contractor: TBuck Construction Inc

Value Engineering Design: Calderwood Engineering
Design Computations by: Eric T. Calderwood, PE

Project Notes:
Vermont Agency of Transportation project Number BRF-0269(13)
Vermont State Rte 114 over Dishmill Brook
Bridge Number 13

Temporary Bridge using Acrow 300 Single Single unreinforced
Timber Crane Matt Abutments

Design Specification: From Acrow manual for 300 for allowable live loads on system

Timber: NDS for wood construction ASD 2005

Live Load: HS20-44

$\gamma_{wood} := 45\ pcf$ $\quad L_{sp} := 50\ ft$

$\gamma_{soil} := 125\ pcf$ $\quad k_0 := 0.5$ *at rest soil pressure coefficient for typical granular backfill*

Check Flexure:

$SS_{50f} := 424 \cdot 2240\ ft{\cdot}lbf = 949.76\ ft{\cdot}kip$ *Capacity of Single-Single Standard width Bridge for live load translated from Long Tonnes - ft to Kip-Ft*

$SS_{add'l} := 176 \cdot 2240\ ft{\cdot}lbf = 394.24\ ft{\cdot}kip$ *Addl Flexural Capacity due to temporary application*

$SS_{moment} := SS_{50f} + SS_{add'l} = 1344\ ft{\cdot}kip$

$IM := min\left(\frac{50\ ft}{L_{sp} + 125\ ft}, 30\%\right) = 28.57\%$ *Impact 3.8.2 AASHTO Std Specifications 17th edition*

$LL_{mom} := 627.9\ ft{\cdot}kip \cdot (100\% + IM) = 807.3\ ft{\cdot}kip$ *Capacity of Bridge is > demand therefor Acrow 300 Single-Single standard width w/ light steel decking is okay for this application*

CALDERWOOD ENGINEERING
222 RIVER ROAD
RICHMOND, ME 04357
PH. (207) 737-2007 FAX (207) 737-2008

Check Shear:

$SS_{50v} := 44 \cdot 2240\ lbf = 98.56\ kip$

Capacity of Single-Single Standard width Bridge for live load translated from Long Tonnes to Kips (shear Cap)

$LL_{shear} := 58.5\ kip \cdot (100\% + IM) = 75.21\ kip$

Capacity of Bridge is > demand therefor Acrow 300 Single-Single standard width w/ light steel decking is okay for this application

Check Soil Bearing Capacity & Abutment timber footing/ distribution beams:

$$Acrow_{dead} := \frac{((1) \cdot 2.30 + (3) \cdot 0.58 + (1) \cdot 2.76 + (3) \cdot 1.62) \cdot 2240\ lbf}{2} = 13.0592\ kip$$

$$LL_{React} := \frac{LL_{shear}}{(100\% + IM)} = 58.5\ kip$$

$A_{width} := 4\ ft$ $\qquad$ $t_{abut} := 12\ in$

$A_{length} := 16\ ft$

$$BP_{abut} := \frac{Acrow_{dead} + LL_{React} + A_{width} \cdot A_{length} \cdot t_{abut} \cdot \gamma_{wood}}{A_{width} \cdot A_{length}} = 1163.1125\ psf$$

This is pretty much okay on just about any soil type