BRIDGE MAINTENANCE PROGRAM




Submitted to:

TOWN OF WOLFEBORO, NH
9 UNION STREET, PO BOX 629
WOLFEBORO, NH 03894
JULY 10, 2018

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BRIDGE MAINTENANCE PROGRAM
WOLFEBORO, NEW HAMPSHIRE
July 10, 2018

This Bridge Maintenance Program was developed to assist the Town of Wolfeboro in performing routine maintenance, as well as minor repairs on the Town's four municipally owned bridges. Currently, only one of the Town's bridges, Pleasant Valley Road over Heath Brook, resides on the NHDOT's Municipal Redlist.

This program will serve as a tool for the Town to maintain its bridges, thereby prolonging the useful life of its bridges. The maintenance checklists provided with the program were established to help the Town monitor and record the status of each bridge's components. Recommendations of condition based repairs, as well as cost for these recommendations, are identified in this program to help the Town plan and budget for repairs.

The Field Observations in this plan are intended to provide summary information for each bridge, and are not intended to replace the NHDOT Inspection Reports. The available NHDOT Inspection Reports are included with this program.

II

PLEASANT VALLEY ROAD OVER HEATH BROOK

NHDOT BRIDGE #116/072

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Pleasant Valley Road over Heath Brook
Wolfeboro, New Hampshire
Bridge #116/072
July 10, 2018

Bridge Description

Pleasant Valley Road Bridge over Heath Brook consists of two corrugated metal pipe (CMP) arches constructed in 1960. Each pipe is 8.4 feet wide and 5.9 feet high and 32 feet long. The bridge has a span length of 8 feet with a total bridge length of 20 feet. The roadway over the culverts is about 22 feet wide. The NHDOT Bridge Inspection Report, dated December 29, 2016, reports the bridge to be in serious condition. This bridge is currently on the Municipal Redlist and is posted E-2.

The Bridge is currently scheduled for replacement in FY2026 under the NHDOT Municipally Managed Bridge Aid Program. The proposed bridge is a 28-foot span precast deck slab structure founded on H-piles with a concrete cap and wingwalls. The proposed curb to curb width of the bridge is 28'-4" with T4 approach and bridge rail. Preliminary Plans for this replacement structure are currently under review by NHDOT.

Field Observations

QCC conducted a site visit on June 13, 2017 and again on October 4, 2017 to observe the bridge structure and roadway approaches. Observations made during the site visit were able to confirm deficiencies noted in the NHDOT Inspection Report.


Fallen stones from the headwalls were observed in the water of the Brook. Additionally, heavy corrosion of the corrugated metal pipes was observed.


The sandy shoulders of the roadways were observed to be severely eroded, with sinkholes behind the stone headwalls.


A sinkhole at one boring location was observed, indicating movement of fines beneath the roadway. Cracking in the pavement along the outside of the CMP was also observed.

Recommended Maintenance Efforts

It is recommended that a yearly bridge evaluation be done by the Town in order to monitor the condition of the bridge and its components. This bridge is in serious condition and is waiting on funding by the NHDOT. The items below are to attempt to prolong use of the bridge until replacement.

TEMPORARY REPAIRS (FOR EXISTING BRIDGE)		
Item		**Frequency**
Fill Sinkhole with Gravel	While filling the sinkholes with gravel will not prevent settlement, but it will help to monitor the condition by revealing the time it takes for the sinkhole to reappear. Filling the sinkhole with a grout may only hide the problem from view.	As required
Fill Headwall Voids with Grout Bags	Filling the headwall voids with grout bags or reconstructing the masonry with mortar may help to reduce the impact of flowing water into the backfill of the pipes, thereby reducing the migration of fines until the bridge can be replaced.	As required

Once the bridge is replaced, it is recommended that the following maintenance actions are completed, at the suggested frequency, in order to prolong the life of the bridge.

CYCLICAL MAINTENANCE (FOR PROPOSED REPLACEMENT BRIDGE)		
Item		**Frequency**
Superstructure Washing	It is important that debris and salt contaminated dirt that collect on the superstructure are cleaned to prevent the intrusion of moisture into the structure which would cause accelerated deterioration.	Every year
Concrete Surface Washing	Washing the concrete surface is important in order to minimize exposure to salt which can cause cracking in the concrete and allow moisture into the structure causing deterioration.	Every year

Vegetation Control	Clearing excess vegetation on or around the structural elements is essential to prevent growth into the joints or cracks of the structure. It is recommended that the excess brush be removed from around the abutment structure, as well as around the fire hydrant so the area is accessible for when it may be needed.	Every year
Debris Removal from Channel	It is important to remove large debris from the channel to prevent the channel bed material from scouring and to reduce the possibility of creating blockages.	Every year
Water Repellent	Coating the curbs, slabs, fascia's, and wingwalls with NHDOT Item 534.3, Water Repellent (Silane Siloxane), will prolong the life span of the concrete component. This item seals out moisture and salts that can infiltrate the concrete thereby causing deterioration.	Every 3 years (see Appendix F)
Crack Seal (Pavement)	Cracks in pavement are typically caused by repetitive loading over time. Sealing pavement cracks with NHDOT Item 413.1, Hot Poured Crack Sealant, will prevent further cracking in the pavement structure and avoid infiltration of moisture which will deteriorate the pavement over time.	As required

Cost of Recommend Preservation Items

QCC has provided a 2017 cost estimate for the recommended maintenance efforts to be completed on the proposed replacement bridge. The table below summarizes the associated costs.

Maintenance Item	NHDOT Item	Unit Cost (2017)	Total Cost (2017)
Water Repellent	Item 534.3 Water Repellent (Silane Siloxane)	$93.41/gal	$1,200
Crack Seal (Pavement)	Item 413.1 Hot Poured Crack Sealant	$1.78/lb	-

Maintenance Checklist

As part of the program, a maintenance checklist was developed for the replacement bridge. Once the bridge is replaced the checklist can be utilized to complete the recommended yearly evaluation of the bridge. The maintenance checklist for Pleasant Valley Road can be found in Appendix D.

Bridge Maintenance Checklist: Pleasant Valley Road over Heath Brook

Date: _____ Performed by: _____

	Item	Satisfactory Condition	Needs Action	Comments
Deck Elements	Wearing Surface			
	Curbs			
	Sidewalk			
	Bridge Rail			
Superstructure	Deck Beams			
	Bearings			
Abutment	Bridge Seat			
	Erosion or Scour			
	Pile Cap			
	Piles			

Wingwalls	Concrete			
	Erosion or Scour			
	Footing			
Stream Channel	Erosion or Scour			
	Waterway opening			
	Riprap			
Approaches	Guardrail			
	Pavement			

III

BAY STREET OVER BROOK
(INLET TO BACK BAY)

NHDOT BRIDGE #104/116

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Bay Street over Brook (Inlet to Back Bay)
Wolfeboro, New Hampshire
Bridge #104/116
July 10, 2018

Bridge Description

Bay Street over an inlet to Back Bay is a 16-foot single span, precast rigid frame bridge constructed in 2009. The bridge has an approximate total length of 18 feet and is approximately 35 feet wide. The curb-to-curb width of the bridge is 29.3 feet, with no sidewalks. The NHDOT Bridge Inspection report, dated December 29, 2016, reports the bridge to be in very good condition. The bridge is not currently on the Municipal Redlist and is not posted.

The abutments consist of precast concrete pile caps supported on helical screw piles. The precast rigid frame is overlain with a barrier membrane and pavement that varies from 3 to 5 inches of thickness to form the roadway cross slope. Railing on the bridge consists of timber bridge rails mounted onto steel rail posts.

Field Observations

QCC conducted a site visit on June 13, 2017 and again on October 4, 2017 to examine the bridge structure and roadway approaches. Observations made were able to confirm deficiencies noted in the NHDOT Inspection Report as well as an identify additional items of concern. The additional items noted were brush, and vegetation on top of wingwalls.


Pavement cracks at the deck ends as well as minor longitudinal cracks on the roadway approaches were noted.


It was observed that the roadway approaches were settled on both sides of the bridge.


Minor checking and splitting were noted in the timber bridge and approach railing. This is a common occurrence in timber. It was also noted that the existing bridge and approach rail are substandard.

A concrete spall, approximately six inches long, exists north corner of the rigid frame. It is likely the result of something hitting the concrete.

Vegetation was observed growing on top of the wingwalls. Additionally, plants were found growing on and along the guardrail.

It was noted that the top of the wingwalls do not match the top of the bridge curb. Fill was placed behind the granite curb and over the top of the wingwall.

Recommended Maintenance Efforts and Repairs

It is suggested that a yearly bridge evaluation be conducted by the Town in efforts to monitor the condition of the structure and its components. QCC has supplied a maintenance checklist (see Appendix D) specific to the Bay Street Bridge with all items listed that should be monitored yearly.

In addition to a yearly Town evaluation of the bridge it is suggested that maintenance efforts and rehabilitation, as well as minor repairs are done on the bridge to preserve its life. The following table summarizes the recommended maintenance that should be completed on the bridge.

CYCLICAL MAINTENANCE		
Item		**Frequency**
Superstructure Washing	It is important that debris and salt contaminated dirt that collect on the superstructure are cleaned to prevent the intrusion of moisture into the structure which would cause accelerated deterioration.	Every year
Concrete Surface Washing	Washing the concrete surface is important in order to minimize exposure to salt which can cause cracking in the concrete and allow moisture into the structure causing deterioration.	Every year
Vegetation Control	Clearing excess vegetation on or around the structural elements is essential to prevent growth into the joints or cracks of the structure. It is recommended that the excess brush be removed from around the abutment structure, as well as around the fire hydrant so the area is accessible for when it may be needed.	Every year
Debris Removal from Channel	It is important to remove large debris from the channel to prevent the channel bed material from scouring and to reduce the possibility of creating blockages.	Every year
Water Repellent	Coating the curbs, slabs, fascias, and wingwalls with NHDOT Item 534.3, Water Repellent (Silane Siloxane), will prolong the life span of the concrete component. This item seals out moisture and salts that can infiltrate the concrete thereby causing deterioration.	Every 3 years (see Appendix F)
Crack Seal (Pavement)	Cracks in pavement are typically caused by repetitive loading over time. Sealing pavement cracks with NHDOT Item 413, Hot Poured Crack Sealant, will prevent further cracking in the pavement structure and avoid infiltration of moisture which will deteriorate the pavement over time.	As required

It is important to complete minor repairs on the bridge in order to prolong the useful life. The following table summarizes the recommended repairs, as well as the repairs to complete when additional deficiencies occur.

RECOMMENDED REPAIRS				
Item Number	**Item**		**Frequency**	**Programmed Year**
1	Reconstruct, Compact, Regrade and Repave Approaches	Settlement of roadway approaches are often a consequence of poorly compacted subgrade. It is recommended that the roadway approaches are reconstructed, compacted, regraded, and repaved in order to restore a smooth and safe transition for vehicles.	As required	2018
2	Replace Membrane	It is important to replace the membrane to minimize the infiltration of water and contaminates into the concrete which can cause deterioration of the concrete as well as corrosion of the reinforcing steel.	Every 20 years	2029
3	Patch Spalls in Concrete	Spalling in concrete is important to repair to prevent the degradation of the reinforcing steel. Spalling is often caused by numerous sources and should be reviewed on a case by case basis to ensure proper and complete repair. It is recommended that the spall on the north corner of the frame to prevent further damage to the concrete.	As required	2018 (see picture)
4	Install Scour Countermeasures	Scour is caused by swiftly moving water that causes sediment such as sand, gravel and stone intended to protect the substructure to be eroded away. It is important to install scour countermeasures when needed to protect the substructure elements from failure due to scour.	As required	-
5	Crack Seal (Concrete)	Cracks in concrete occur over time due to various reasons, including shrinkage and repetitive loading. It is important to look for and then apply concrete sealants, that will protect the reinforcing steel from corrosion by minimizing the intrusion of the water and contaminates, to the concrete surface.	As required	-

6	Joint Installation	Cracking at the deck ends of the pavement are a common occurrence. Installing NHDOT Item 559.41, Asphaltic Plug for Crack Control, at the ends of the deck will help to seal and prevent water from running down the back of the leg of the rigid frame structure.	As required	2018 (see Appendix G for details)
7	Curb Crack Repairs	Curb cracking of the concrete is a common occurrence in concrete bridge curbs due to the shrinkage of the concrete. It is important to seal concrete cracks in the bridge curb with NHDOT Item 526.3, Methacrylate Crack Sealer for Concrete Bridge Decks, to prevent the penetration of moisture into the concrete which over time will accelerate the deterioration of the concrete.	As required	2018 (see Appendix E for details)
8	Replace Bridge and Approach Rail	Install NHDOT Item 563.23, Bridge Rail T3, and NHDOT Item 565.2325, Bridge Approach Rail T3 (Steel Posts), in place of the existing bridge and approach rails to meet current standards. This action of replacement is recommended within the next 5 years.		2018-2023
9	Raise Height of Wingwalls	The fill placed behind the granite curb and over the top of the wingwall holds moisture on the top of the wingwall, which causes deterioration of the concrete. It is recommended to raise the height of the wingwall in order to remove the fill and to provide support to the granite curb.		2018

Cost of Recommended Repairs and Maintenance Efforts

QCC has provided a 2017 construction cost estimate for the recommended repairs as well as maintenance items associated with a NHDOT Item. The table below summarizes the unit costs and total costs, when suitable, for the recommended maintenance efforts.

Maintenance Item	NHDOT Item	Unit Cost (2017)	Total Cost (2017)
Water Repellent	Item 534.3 Water Repellent (Silane Siloxane)	$93.41/GAL	$500
Crack Seal (Pavement)	Item 413.1 Hot Poured Crack Sealant	$1.78/LB	-

The following table summarizes the costs of the recommended repairs. Approximate total costs and unit costs are given for the items that require action now, while only unit costs are given for the items that do not need action now but may need action in the future.

Repair Item	NHDOT Item	Unit Cost (2017)	Construction Cost (2017)
Reconstruct, Compact, Regrade and Repave Approaches (2018)	Item 203.1 Common Excavation	$11.28/CY	$16,500
	Item 214 Fine Grading	$2,500/U	
	Item 403.11 Hot Bituminous Pavement, Machine Method	$80.80/TON	
	Item 417 Cold Planing Bituminous Surfaces	$160.00/SY	
Replace Membrane (2029)	Item 538.5 Barrier Membrane, Heat Welded	$32.85/SY	-
Patch Spalls in Concrete (2018)	Item 521.21 Fast-Set Concrete Patching Mortar (Horizontal)	$620.00/CF	$1,000
	Item 521.22 Fast-Set Concrete Patching Mortar (Vertical and Overhead)	$800.00/CF	
Install Scour Countermeasures	Item 583.3 Riprap Class III	$46.00/CY	-
Crack Seal (Concrete)	Item 526.2 Epoxy for Non-Moving Cracks	-	-
Joint Installation (2018)	Item 628.22 Sawed Bituminous Pavement (Bridge)	$3.23/LF	$7,200
	Item 559.41 Asphaltic Plug for Crack Control	$130.00/LF	
Curb Crack Repairs (2018)	Item 526.3 Methacrylate Crack Sealer for Concrete Bridge Decks	$525.00/GAL	-

Replace Bridge and Approach Rail (2018-2023)	Item 202.7 Removal of Guardrail	$2.53/LF	$29,000
	Item 563.23 Bridge Rail T3	$128.00/LF	
	Item 565.2325 Bridge Approach Rail T3	$6,000/U	
Raise Height of Wingwalls (2018)	Item 520.7002 Concrete Bridge Deck	$1300/CY	$1,300

Maintenance Checklist

As part of QCC's October 4, 2017 site visit the following maintenance checklist was completed. This checklist will serve as a tool to the Town to evaluate the bridge and its components on a yearly basis. Blank checklists can be found in Appendix D for the Towns use.

Bridge Maintenance Checklist: Bay Street over Brook

Date: 10/4/17 Performed by: QCC

	Item	Satisfactory Condition	Needs Action	Comments
Deck Elements	Wearing Surface		√	Cracked at the ends of bridge
	Curbs		√	Microcracking
	Bridge Rail		√	Minor checking in timber, substandard
	Striping	√		
Superstructure	Rigid Frame		√	Spall at the north corner of the frame
	Bearings	√		Not visible
	Longitudinal Joints	√		
Abutment	Erosion or Scour	√		None observed
	Pile Caps	√		
	Piles			Not visible
Wingwalls	Erosion or Scour	√		None observed
	Concrete		√	Top of wingwall 10” below bridge curb (See recommended repair)
	Piles			Not visible

Stream Channel	Erosion or Scour	√		None observed
	Waterway opening		√	Minor debris on rip rap
	Riprap	√		
Approaches	Guardrail		√	Minor checking, substandard
	Pavement		√	Settled (See recommended repair)
Other	Beaver Grate	√		No debris observed

Bridge Maintenance Checklist: Bay Street over Brook

Date: _____ Performed by: _____

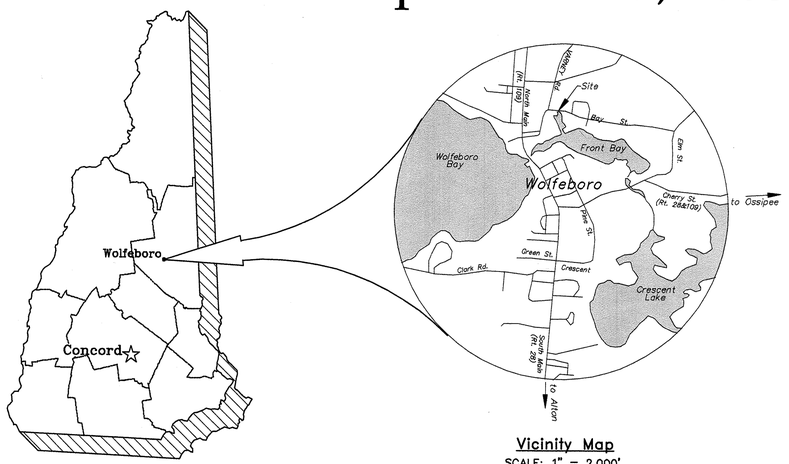
	Item	Satisfactory Condition	Needs Action	Comments
Deck Elements	Wearing Surface			
	Curbs			
	Bridge Rail			
	Striping			
Superstructure	Rigid Frame			
	Bearings			
	Longitudinal Joints			
Abutment	Erosion or Scour			
	Pile Caps			
	Piles			
Wingwalls	Erosion or Scour			
	Concrete			
	Piles			

Stream Channel	Erosion or Scour			
	Waterway opening			
	Riprap			
Approaches	Guardrail			
	Pavement			
Other	Beaver Grate			

C0.01
SHEET 1 OF 21

Final Drawings
of
Bay Street Bridge, Water & Sewer Upgrades
over an
Inlet to Back Bay
prepared for the
Town of Wolfeboro, New Hampshire

NHDOT Project No. 14032
NHDOT Bridge #104/116
Issued: July 03, 2008
Revised: September 19, 2008



Vicinity Map
SCALE: 1" = 2,000'
SOURCE: USGS MAP "WOLFEBORO, N.H."

SHEET INDEX

Approved By:

Selectmen

Selectmen

Selectmen

Selectmen

ENGINEER/SURVEYOR

H.E. BERGERON ENGINEERS, INC.
P.O. BOX 440
NORTH CONWAY, NH
03860 · (603) 356-6936

General Notes:

1. Specifications for design, materials and construction shall meet or exceed the following:
   A. AASHTO – American Association of State Highway and Transportation Officials "Standard Specification for Highway Bridges," seventeenth edition, 2002, and additional interim specifications as amended.
   B. NHDOT – New Hampshire Department of Transportation "Standard Specifications for Road and Bridge Construction," 2006, with current standard plans and supplemental specifications.
   C. This plan set and all conditions, specifications and supplements to NHDOT standard specifications contained within the project manual.
2. Final resolution to conflicts within the specifications or any substitutions shall be determined by the Engineer.
3. Utilities:
   A. The Contractor shall be responsible for determining the location of all utilities prior to any construction procedure. There are overhead power transmission lines and other utilities with roadway crossings and lines in the immediate vicinity of the bridge. The Contractor is advised that extreme caution will be required in the operation of equipment, especially cranes. Contact DIG–SAFE at 1–888–DIG–SAFE.
   B. Temporary relocation of utilities during construction is responsibility of the Contractor.
   C. Damage to a utility by the Contractor shall be reported to the utility company. Repair of the utility shall be paid for by the Contractor.

General Construction Notes:

1. See sheet C5.11 for notes on the construction sequence for sedimentation control.
2. All testing shall be ordered by the Engineer and coordinated by the Contractor in accordance with NHDOT, AASHTO, and project specifications. Contractor shall give the Engineer 24 hours advance notice prior to placing materials requiring testing.
3. Concrete testing is outlined in NHDOT specifications section 520.3.1.6 and in the supplemental conditions. Concrete testing costs to be included in the NHDOT item unit price.
4. Soil testing is outlined in the NHDOT specifications and is to be performed by a qualified person approved by the Engineer. Soil testing costs to be included in the NHDOT item unit price.
5. Determination of maximum densities for sand and gravels are the responsibility of the Contractor. Proctor tests ordered by the Engineer shall be sampled & performed by an independent lab and paid for by the Contractor. Control strips, if required, shall be performed by the Contractor under the supervision of the Engineer, and paid for by the Contractor. Include all costs in the NHDOT item unit price.
6. Roadway & bridge layout are the responsibility of the Contractor.

Structure Notes:

1. NHDOT Item 502 – Removal of Existing Structure. This item shall include removal, and legal disposal off the project of the existing culvert, head walls, and any other materials associated with removal of the bridge structure. All materials, shall become property of the Contractor. The town will retain ownership of the culverts. Contractor is to remove and stockpile material as directed by the town.
2. NHDOT Item 593.322 – Medium Strength Geotextile. This work to consist of furnishing and installing Mirafi filter weave 300 fabric (or equivalent) under the stone fill Class B & other locations as noted on plans. Where fabric is to be spliced, the minimum lap shall be 12". The fabric shall be anchored around the lined channel perimeter by burying 12" into natural soil. This item will be paid for by the square yard.

Design Data:

1. Design speed = 30 MPH
2. Design loading: HS–25
3. Design method: Load Factor Design (LFD)
4. CHANNEL DATA:

STORM	FLOW	VELOCITY	W.S. ELEVATION
10 YR	210 CFS	5.9. FPS	98.2 FT.
50 YR	449 CFS	6.7 FPS	99.4 FT.
100 YR	560 CFS	6.9. FPS	100.0 FT.

5. Drainage area = 902 Acres
6. Foundation data:
   Soil type = Muck & Peat & Paxton
   Allowable bearing capacity = 1,500 psf
7. Seismic performance category A (Rock acceleration coeff. = 0.09)

Structural Timber:

1. Timber bridge rail shall be AITC combination SP 16F–V3 glulam or approved western species glulam. Dimensions shall be those shown on the plans or approved alternate.
2. Bridge rail, posts, post anchor assemebly, anchor plate, anchor bolts, nuts and washers will be paid under Item 550.1 strucutral steel.
3. Item 568.1 structural timber–posts shall be 8"x10" southern yellow pine No. 2 or better having a minimum allowable bending stress of 1200 psi. This item will be paid by the thousand board foot (MBF) of timber post.
4. Item 568.2 Structural Timber–rails shall be 6"x 8" Soutern Yellow Pine No. 2 or better having a minimum allowable bending stress of 850 psi. This item also includes connection, splice, and spacer hardware. Rail will be measured and paid for by the thousand board foot (MBF) of timber rail.

Wood Preservative:

1. Timber shall be pressure treated using an empty–cell process with pentachlorophenol conforming to AWPA Standard p8 in hydrocarbon solvent, type A, conforming to AWPA standard p9 to a minimum net retention of 0.30 pcf in accordance with AWPA standards C28 & C14.
2. All members shall be fabricated before treatment.
3. All members shall be clean and free of excess preservative and solvent at the conclusion of the treating process. Materials with excessive residual preservative material as determined by the Engineer will be rejected.
4. The treated wood products used in this project shall be produced in accordance with the current version of "Best Management Practices for the Use of Treated Wood in Aquatic Environments," as per the Western Wood Preservers Institute and Canadian Institute of Treated Wood.
5. The Contractor shall provide written certification that BMPS were utilized including a description and appropriate documentation of the BMPS used.

Concrete:

1. All concrete, reinforcement, and workmanship shall comply with NHDOT specifications as indicated and AASHTO Section 8 (Reinforced Concrete).
2. All reinforcement shall be epoxy coated Grade 60. NHDOT Item 544.2.
3. Cover for reinforcing bars in concrete cap shall be 2".
4. Chamfer all exposed corners ¾".

Helical Piles:

1. Design compressive load of 30 kips minimum (60kip ultimate) and lateral capacity of 5% of design compressive load.
2. Contractor to submit calculations and shop drawings, stamped from manufacturer by a New Hampshire P.E.
3. See boring sheet V1.11 for soil conditions.
4. Helical piles to bear in the till material where refusal is shown in borings.

Traffic Control:

1. Road wil be closed during construction. Contractor to provide detour signage under NHDOT Item 619.1.

Summary of Quantities:

STA: 1+10 – 4+00 (NHDOT/TOWN)

Item #	Item Description	Unit	Qty
	Earthwork		
202.42	Removal of Existing pipe >24" dia. (Including conc. Headwalls)	Unit	1.00
203.1	Common Excavation (Road)	C.Y.	300.00
203.6	Embankment in Place	C.Y.	25.00
206.1	Common Structure Excavation	C.Y.	280.00
209.201	Granular Backfill (Bridge)	C.Y.	92.00
	Bases		
304.2	Gravel (Road)	C.Y.	280.00
304.3	Crushed Gravel (Road & drives)	C.Y.	150.00
304.4	6" Crushed Stone	C.Y.	42.00
	Pavements		
403.11	Bituminous Pavement (Machine method)	Ton	240.00
	Structures		
503.1	Water Diversion Structures	Ea.	1.00
510	Helical Piles	Unit	1.00
520.12	Concrete Class A Above Footings (pile Cap Bridge)	C.Y.	34.00
528.3	Precast Structure & Wingwalls	Unit	1.00
534.3	Water Repellent	Gal.	8.00
538.5	Barrier Membrane	S.Y.	100.00
544.2	Reinforcing Steel - Epoxy Coated	Lb.	3,000.00
550.1	Structural Steel (Posts, splices, bolts, anchors)	Lb.	1,200.00
568.1	Structural Timber (Posts)	L.F.	128.00
568.2	Structural Timber (Rails)	L.F.	322.00
585.2	Stone Fill Class B	C.Y.	150.00
585.3	Stone Fill Class C	C.Y.	45.00
593.22	Geotextile Fabric	S.Y.	1,100.00
	Incidental Construction		
609.01	Straight Granite Curb	L.F.	48.00
619.1	Maintenance of traffic	Unit	1.00
628.2	Saw -Cut Bituminous Pavement	L.F.	170.00
632.0104	Retroreflective paint marking 4" line	L.F.	1,505.00
641	Loam-4" deep	C.Y.	0.00
645.531	Silt Fence	L.F.	500.00
646.31	Turf Establishment with Mulch	S.Y.	150.00
692	Mobilization	Unit	1.00
699.1	Temp. Water Pollution Control - Sedimentation Basin	Unit	1.00
644.2	Wetland Wilow stakes	unit	220.00

STA: 4+00 – 6+80 (TOWN ONLY)

Item #	Item Description	Unit	Qty
	Earthwork		
202.42	Removal of Existing pipe >24" dia. (Including conc. Headwalls)	Unit	0.00
203.1	Common Excavation (Road)	C.Y.	500.00
203.6	Embankment in Place	C.Y.	0.00
206.1	Common Structure Excavation	C.Y.	0.00
209.201	Granular Backfill (Bridge)	C.Y.	0.00
	Bases		
304.2	Gravel (Road)	C.Y.	300.00
304.3	Crushed Gravel (Road & drives)	C.Y.	140.00
304.4	6" Crushed Stone	C.Y.	0.00
	Pavements		
403.11	Bituminous Pavement (Machine method)	Ton	150.00
	Structures		
503.1	Water Diversion Structures	Ea.	0.00
510	Helical Piles	Unit	0.00
520.12	Concrete Class A Above Footings (Pile Cap Bridge)	C.Y.	0.00
528.3	Precast Structure & Wingwalls	Unit	0.00
534.3	Water Repellent	Gal.	0.00
538.5	Barrier Membrane	S.Y.	0.00
544.2	Reinforcing Steel - Epoxy Coated	Lb.	0.00
550.1	Structural Steel (Posts, splices, bolts, anchors)	Lb.	0.00
568.1	Structural Timber (Posts)	L.F.	0.00
568.2	Structural Timber (Rails)	L.F.	0.00
585.2	Stone Fill Class B	C.Y.	0.00
585.3	Stone Fill Class C	C.Y.	0.00
593.22	Geotextile Fabric	S.Y.	300.00
	Incidental Construction		
609.01	Straight Granite Curb	L.F.	0.00
619.1	Maintenance of traffic	Unit	1.00
628.2	Saw-Cut Bituminous Pavement	L.F.	280.00
632.0104	Retroreflective paint marking 4" line	L.F.	1,095.00
641	Loam-4" deep	C.Y.	20.00
645.531	Silt Fence	L.F.	0.00
646.31	Turf Establishment with Mulch (New England Wetmix)	S.Y.	120.00
692	Mobilization	Unit	1.00
699.1	Temp. Water Pollution Control - Sedimentation Basin	Unit	0.00

NO.	REVISION	DATE	BY
1	UPDATED QUANTITIES	08/07/08	BSG

H.E. BERGERON ENGINEERS, INC.
P.O. BOX 440
NORTH CONWAY, NH
03860 · (603) 356-6936

SURVEYED BY	JP/KLT
DESIGNED BY	JCK
DRAWN BY	BCL/BSG
CHECKED BY	JWK
FIELD BOOK	307,309,328
SCALE	NONE
DATE	07/03/08

General Notes & Quantities
of
Bay Street Bridge #104/116
over an
Inlet to Back Bay
prepared for
Town of Wolfeboro, New Hampshire

2004–016
C0.02
SHEET 2 OF 21

2004–016
C0.02
SHEET 2 OF 21
General Notes & Quantities
Bay Street Bridge #104/116

V1.11
SHEET 3 OF 21

T.L. 203/78
Varney Road, LLC
375 Stoneham Road
Wolfeboro, NH 03894

T.L. 203/77
Vincent & Theresa Politano
33 Lake St.
Saugus, MA 01906

T.L. 203/76
Connie M. Maratos
P.O. Box 866
Wolfeboro, NH 03894

T.L. 203/23
Paul A. Kimball & Ronald J. Evans
P.O. Box 725
Wolfeboro, NH 03894

T.L. 203/22
Kimball Family Realty Trust
P.O. Box 725
Wolfeboro, NH 03894

T.L. 203/75
Bay Supply Company, Inc.
P.O. Box 1755
Wolfeboro, NH 03894

T.L. 203/72
Barbara Naramore Revocable Trust
P.O. Box 1800
Wolfeboro, NH 03894

T.L. 203/24-II
Rose S. LeBlanc Rev. Trust Andrew E. Terragni Rev. Trust
P.O. Box 1180
Wolfeboro, NH 03894

T.L. 203/25
Kimball Family Realty Trust
P.O. Box 725
Wolfeboro, NH 03894

T.L. 203/26
Bowen Trust
226 Middle Road
Tuftonboro, NH 03816

T.L. 203/70
George D. & Virginia M. Schou
P.O. Box 1137
Wolfeboro, NH 03894

T.L. 203/69
Barbara Naramore Revocable Trust
P.O. Box 1800
Wolfeboro, NH 03894

T.L. 203/68
Sawmill Marina Realty Trust
P.O. Box 1680
Wolfeboro, NH 03894

Varney Rd.
Mill St.
King St.
Bay Street

TBM #1: Nail set 2' up S. side of utility pole Elev.= 102.14'
TBM #2: Nail set 1.7' up S. side of utility pole Elev.= 101.67'
TBM #3: Nail set in root of 18" white pine Elev.= 104.37'

STA: 0+00 N: 4831.94 E: 4835.34
STA: 9+41 N: 5364.20 E: 5602.51

"NAPA Auto Parts" · "True Value Hardware Store" · "Wet Wolfe Rentals Office" · "Wolfeboro Power Equipment" · "Sawmill Marina"

Ponded flow to Back Bay

Legend

- Wetland/boundary
- S — S — Maintenance hole/municipal sewer line
- W — W — Water line
- OHU — OHU — Overhead utility poles/wires

PLAN REFERENCES:

1. February 8, 2002 revision of "Site Plan prepared for Kimball Family Realty Trust" by White Mountain Survey Co., Inc.
2. January 23, 2002 revision of "Road Relayout Bay Street for Town of Wolfeboro" by Lindon Design Associates.

SURVEY NOTES:

1. Bearings are magnetic, based on a compass observation in June 2004; coordinate grid is assumed. Vertical datum is assumed.
2. Site features are per field surveys performed June 2004 using a geodetic total station & Apr. 2008 using a robotic total station; under the direct supervision of Douglas C. Burnell, LLS #520; and conforming with the technical standards for topographic surveys per the NH Code of Administrative Rules of the Board of Licensure for Land Surveyors.
3. Right-of-way lines shown are best-fit from surveyed monuments per Plan Ref. 2. Property lines shown are per Town of Wolfeboro tax maps. No boundary survey was performed by HEB.
4. Sewer service connections to buildings are approximate.
5. Wetland boundaries shown were delineated June 4, 2004, by Gregory W. Howard, CWS #78, and surveyed by HEB.

Existing Roadway Plan
Scale: 1"=40'

B-1
ELEV. = 99.50'

DEPTH IN FEET	SAMP. NO.	SAMPLE DEPTH	SAMPLE BLOWS PER 6 INCHES	RECOV.	SOIL DESCRIPTION
0'					
5'	S1	5–7	5–4–2–2	3"	Black, loose, organic, medium SAND and SILT
					Depth to water = 7.0'
10'	S2	10–12	1–1–1–1	8"	Brown, very loose, organic, fine SAND and SILT
15'	S3	15–17	WOR–2 10–12	14"	Gray, loose, fine SAND and SILT
20'	S4	20–22	2–4–5–11	18"	Gray, loose, fine SAND and SILT
25'	S5	25–27	30–58–37–94	18"	Gray, very dense, medium SAND and SILT, some Gravel, TILL
30'	S6	30–31.83	64–119 90–100/4"	18"	Very dense, gray, fine SAND and SILT, trace gravel
					BOTTOM OF BORING 31'–10"

B-2
ELEV. = 99.90'

DEPTH IN FEET	SAMP. NO.	SAMPLE DEPTH	SAMPLE BLOWS PER 6 INCHES	RECOV.	SOIL DESCRIPTION
0'					
5'	S1	5–7	1–2–1–2	18"	Brown, very loose, fine SAND and SILT, some medium gravel
					Depth to water = 7.0'
10'	S2	10–12	WOH/18" 4	22"	Brown, very loose, organic, fine SAND and SILT
15'	S3	15–17	3–7–10–10	14"	Gray, medium dense, fine SAND and SILT
20'	S4	20–22	10–10–12–14	14"	Gray, medium dense, fine SAND and SILT, trace clay
25'	S5	25–27	28–42–48–62	14"	Gray, very dense, fine SAND and SILT, trace Gravel, TILL
30'	S6	30–32	39–48–38–67	22"	Very dense, gray, fine SAND and SILT, trace gravel
	S7	32–33.25	47–120 100/3"	22"	Gray, very dense, fine SAND and SILT, some gravel
35'					BOTTOM OF BORING 33'–3"

Bay Street Centerline Stationing Table

LINE TABLE

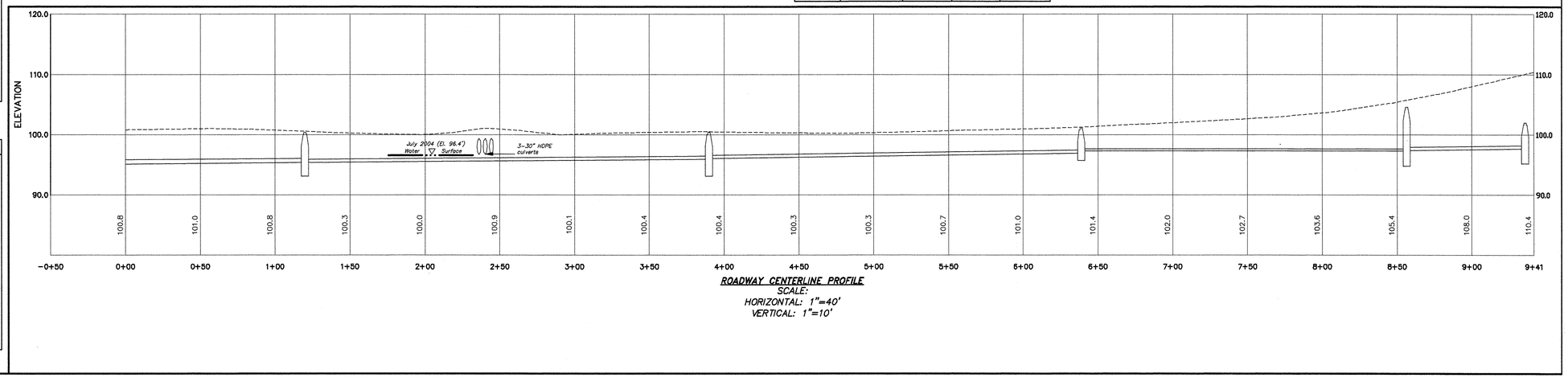
LINE	BEARING	LENGTH	BEGIN & END STATION
L1	N44°39'12"E	351.44'	0+00.00 – 3+51.44
L2	N70°14'44"E	120.00'	6+86.44 – 8+06.44

CURVE TABLE:

CURVE	RADIUS	LENGTH	CHORD	BEGIN & END STATION
C1	750.00'	335.00'	N57°26'58"E 332.22'	3+51.44 – 6+86.44
C2	475.00'	135.00'	N62°06'12"E 134.55'	8+06.44 – 9+41.44

Control Point Table

Point #	Description	Northing	Easting	Elevation
3	Mag Nail	5090.18	5103.75	100.38
4	Mag Nail	4929.83	4919.26	100.28
5	Stone Post	4808.96	4818.45	101.53
8	Stone Post	5252.81	5287.68	100.89
10	Spike	5315.55	5595.32	103.43



ROADWAY CENTERLINE PROFILE
SCALE:
HORIZONTAL: 1"=40'
VERTICAL: 1"=10'

DRAWINGS ARE HALF SCALE WHEN PRINTED ON 11x17
40 0 40 80 160 ft
8 0 20 40 m
1 inch = 40 feet
(1 : 480)

NO.	REVISION	DATE	BY

H.E. BERGERON ENGINEERS, INC.
P.O. BOX 440
NORTH CONWAY, NH
03860 · (603) 356-6936

SURVEYED BY	JP/KLT
DESIGNED BY	–
DRAWN BY	BCL/BSG
CHECKED BY	DCB
FIELD BOOK	307,309,328
SCALE	1"=40'
DATE	07/03/08

Existing Plan & Profile
of
Bay Street Bridge #104/116
over an
Inlet to Back Bay
prepared for
Town of Wolfeboro, New Hampshire

2004-016
V1.11
SHEET 3 OF 21

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2004-016
Existing Plan & Profile
Bay Street Bridge #104/116

C1.11
SHEET 4 OF 21

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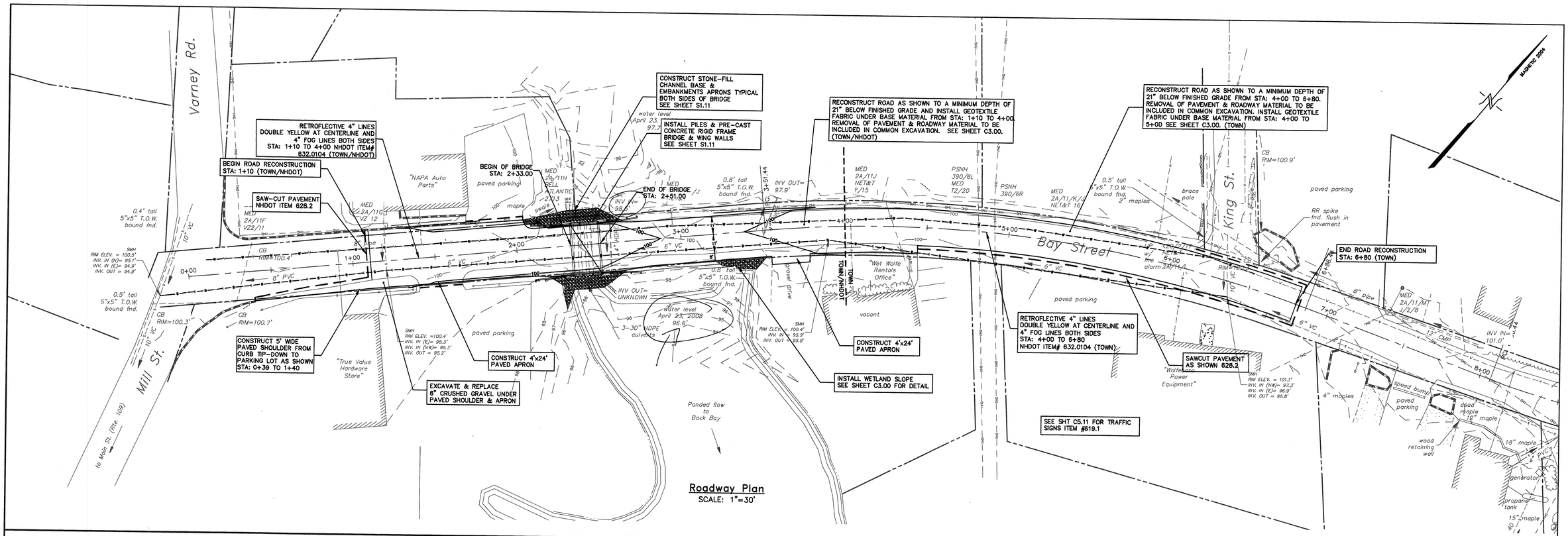
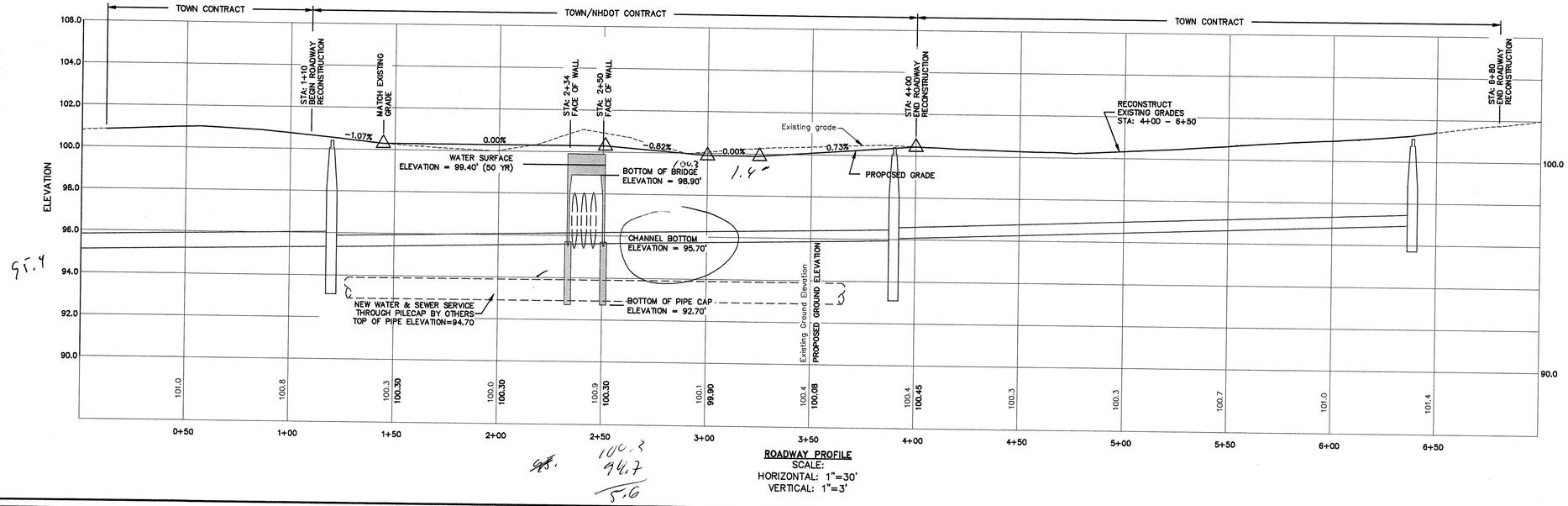
2004-016
Bridge Area Plan & Profile
Bay Street Bridge #104/116





ROADWAY PROFILE
SCALE:
HORIZONTAL: 1"=30'
VERTICAL: 1"=3'

DRAWINGS ARE HALF SCALE WHEN PRINTED ON 11x17

30 0 30 60 120 ft
6 0 15 30 m

1 inch = 30 feet
(1 : 360)

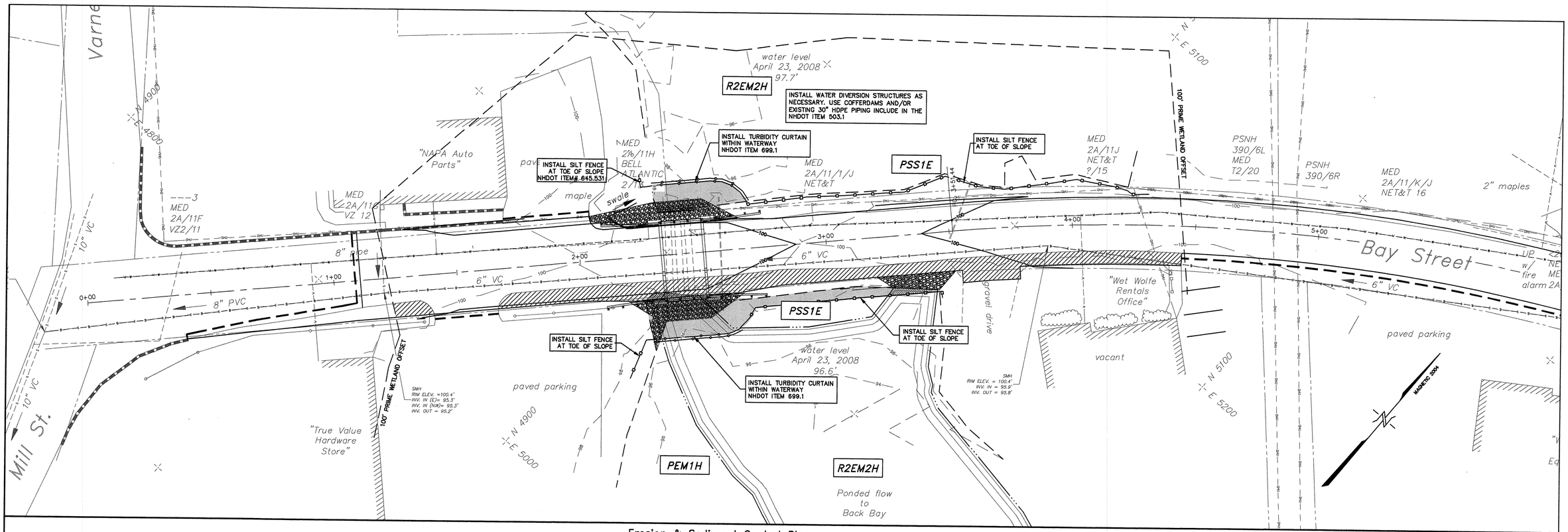
NO.	REVISION	DATE	BY
1	UPDATED NOTES	08/07/08	BSG

H.E. BERGERON ENGINEERS, INC.
P.O. BOX 440
NORTH CONWAY, NH
03860 · (603) 356-6936

SURVEYED BY	JP/KLT
DESIGNED BY	JCK
DRAWN BY	BCL/BSG
CHECKED BY	JWK
FIELD BOOK	307,309,328
SCALE	1"=20'
DATE	07/03/08

Bridge Area Plan & Profile
of
Bay Street Bridge #104/116
over an
Inlet to Back Bay
prepared for
Town of Wolfeboro, New Hampshire

2004-016
C1.11
SHEET 4 OF 21



Erosion & Sediment Control Plan
SCALE: 1" = 20'

Wetland Delineation Certification

These wetland delineations are a representation of a compilation of field data collected on July 3, 2008 by Gregory W. Howard of North Country Soil Services. The delineated wetland areas meet the criteria for freshwater wetlands as noted in the New Hampshire Code of Administrative Rules CHAPTER Wt 100, PART Wt 101, Section Wt 101.01 "Freshwater wetlands". The wetland delineations were conducted in accordance with NH Code of Administrative Rules CHAPTER Wt 300, PART Wt 301, Section Wt 301.01 "Delineation of Wetland Boundaries" effective April 25, 2005, utilizing the Corps of Engineers Wetlands Delineation Manual, January 1987, Technical Report Y-87-1.

The wetland delineations shown on this plan are based on my best knowledge and opinion thereof as of the date of this mapping.

_____ _____

Date — Gregory W. Howard, Certified Wetland Scientist #078

General Notes

1. Segregate and stockpile all organic matter and soil materials for re-use.
2. Contractor is responsible for obtaining all necessary temporary construction easements.
3. All temporary mulching is to be included in NHDOT Item 699.1.
4. Contractor is responsible for preparing & submitting Stormwater Pollution Prevention Plan. NHDOT Item 645.7.

General Construction And Wetland Restoration Sequence

This recommended construction sequence is for demolition and construction involving the immediate stream area and its banks. This construction sequence assumes that one stream bank (footing, abutment and wing walls) will be constructed at a time. alternate construction sequences recommended by the Contractor shall be approved by the Engineer.

Construction Sequences

The NHDES requires that the following steps be taken in order to minimize the erosion of soil within the limits of work. These measures are integral to the successful restoration of the project site.

1. Install erosion and sediment control measures prior to any earth moving activity that will influence or affect stormwater runoff.
2. Use existing culverts for water diversions during construction.
3. Segregate and stockpile the excavated stone materials, soil materials and woody debris. The stockpiled stone materials, soil materials and woody debris will be utilized in the restoration of the wetland and upland areas to be temporarily impacted.
4. Install helical piles and construct pile caps.
5. Construct new channel bottom using stockpiled stone material and soil materials, using additonal stone where necessary.
6. Backfill and compact as required. Install fill on banks, slopes and in channel as required. Construction sequence details to be determined by Contractor and approved by the Engineer.
7. Install pre-cast concrete ridgid frame, backfill and compact
8. Install guardrail and place asphalt.
9. Remove erosion and sedimentation barriers and restore impacted areas.

Legend

- Overhead utility wires/pole
- Major contour (100)
- Minor contour (98)
- Sedimentation Barrier
- Silt fence
- Vegetation line
- Edge of pavement
- Delineated wetland
- PF04Y — Wetland Classification

Wetland Impacts

Total Wetland Impact Area	= 1,280 SF
Permanent Wetland Impact Area	= 476 SF
Temporary Wetland Impact Area	= 804 SF
PSS1E Impact Area	= 447 SF
PEM1H Impact Area	= 67 SF
R2EM2H Impact Area	= 766 SF
100' Prime Wetland Area	= 1,777 SF

DRAWINGS ARE HALF SCALE WHEN PRINTED ON 11x17

20 0 20 40 80 ft

4 0 10 20 m

1 inch = 20 feet

(1 : 240)

NO.	REVISION	DATE	BY

H.E. BERGERON ENGINEERS, INC.
P.O. BOX 440
NORTH CONWAY, NH
03860 · (603) 356-6936

SURVEYED BY	JP/KLT
DESIGNED BY	JCK
DRAWN BY	BCL/BSG
CHECKED BY	JWK
FIELD BOOK	307,309,328
SCALE	1"=20'
DATE	07/03/08

Erosion & Sediment Control Plan
of
Bay Street Bridge #104/116
over an
Inlet to Back Bay
prepared for
Town of Wolfeboro, New Hampshire

2004-016
C1.12
SHEET 5 OF 21

C1.12
SHEET 5 OF 21

Erosion & Sediment Control Plan
Bay Street Bridge #104/116
2004-016

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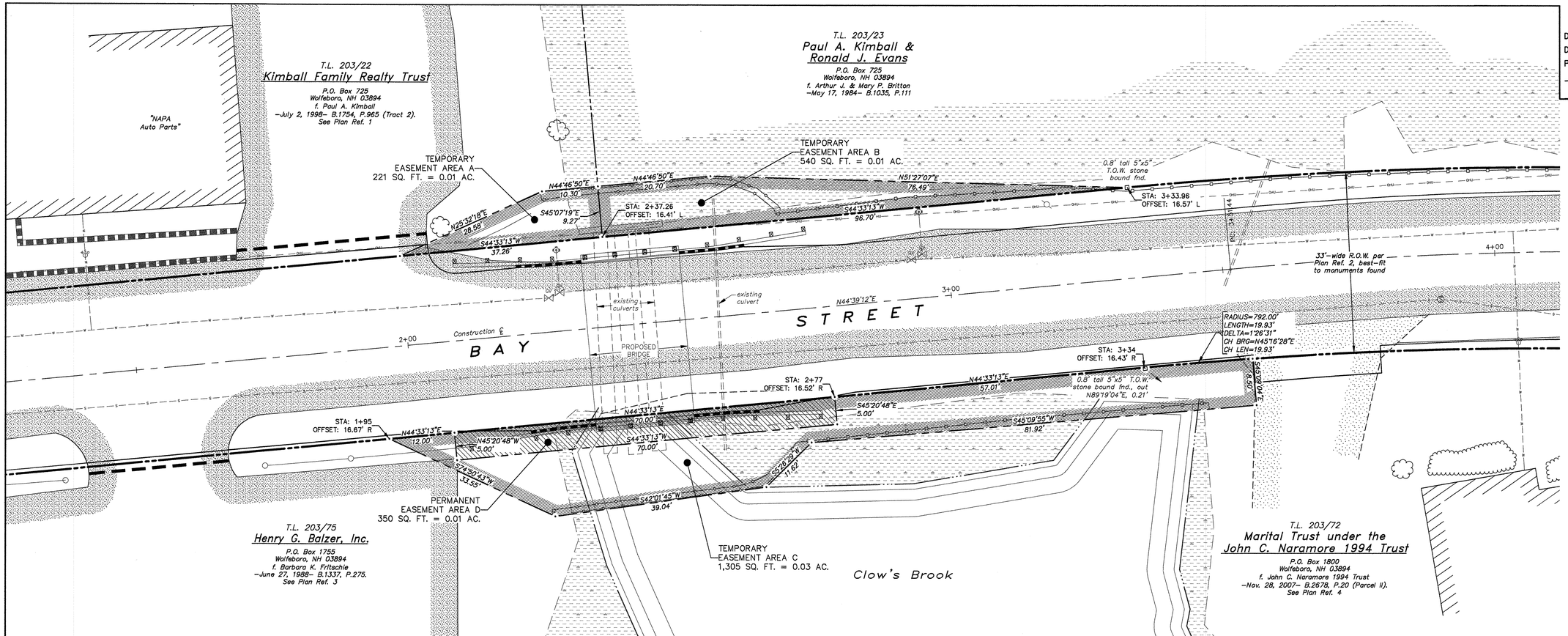
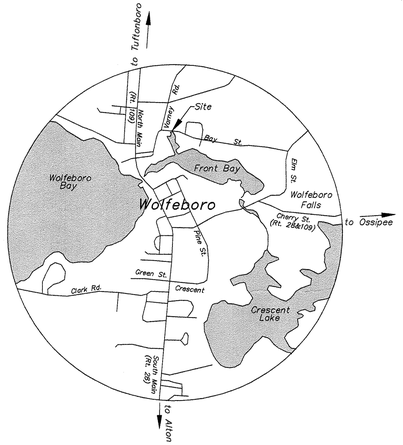
2004-016
Construction-Easement Plan
Bay Street Bridge #104/116

CARROLL COUNTY
REGISTRY OF DEEDS
DOCKET #_____
DATE_____TIME_____M
PLAN BOOK_____PAGE_____
_____
REGISTER





VICINITY MAP

SCALE: 1" = 2,000'
SOURCE: USGS MAP "WOLFEBORO, N.H."

LEGEND

- Overhead utility wires/pole
- Sewerline/access hole
- Waterline/shut-off valve
- Silt fence
- Erosion control fence
- Vertical granite curb
- Vegetation line
- Delineated wetland
- Temporary construction easement
- Permanent easement

PLAN REFERENCES:

1. February 4, 2002 revision of "Existing Conditions and Boundary Plan prepared for Kimball Family Realty Trust" by White Mountain Survey Co., Inc.
2. January 23, 2002 revision of "Road Relayout, Bay Street for Town of Wolfeboro" by Lindon Design Associates.
3. Aug. 1983 "Plan of Subdivision for Thomas W. Sweeney, Jr." by Lakes Region Survey Service, Inc., recorded Carroll County Registry of Deeds Plan Book 64, Page 19.
4. Feb. 8, 1983 "Plan of Land for Alexander J. McKenzie, IV" by Lakes Region Survey Service, Inc., recorded P.B. 62, P. 20.

SURVEY NOTES:

1. Bearings are magnetic, based on a compass observation in June 2004; coordinate grid is assumed.
2. Site features are per field surveys performed June 2004 using a geodetic total station & April 2008 using a robotic total station; under the direct supervision of Douglas C. Burnell, LLS #520; and conforming with the technical standards for topographic surveys per the NH Code of Administrative Rules of the Board of Licensure for Land Surveyors.
3. Right-of-way lines shown are best-fit from surveyed monuments per Plan Ref. 2.
4. Sewer service connections to buildings are approximate.
5. Wetland boundaries shown were delineated June 4, 2004, by Gregory W. Howard, CWS #78, and surveyed by HEB.

I certify that this survey plat is not a subdivision pursuant to this title and that the lines of streets shown are those of public or private streets or ways already established and that no new ways are shown. (NHRSA 676:18)

Date _____ Licensed Land Surveyor (SEAL)

DRAWINGS ARE HALF SCALE WHEN PRINTED ON 11x17

10 0 10 20 40 ft
2 0 5 10 m

1 inch = 10 feet
(1 : 120)

NO.	REVISION	DATE	BY

H.E. BERGERON ENGINEERS, INC.
P.O. BOX 440
NORTH CONWAY, NH
03860 · (603) 356-6936

SURVEYED BY	JP/KLT
DESIGNED BY	JCK
DRAWN BY	SEB/BSG
CHECKED BY	DCB
FIELD BOOK	307,309,328
SCALE	1"=10'
DATE	08/13/08

Construction-Easement Plan

on properties of

Kimball Family Realty Trust – Paul A. Kimball
PO Box 725
Wolfeboro, NH 03894
& Ronald J. Evans – Marital Trust under the
PO Box 725
Wolfeboro, NH 03894
John C. Naramore 1994 Trust – Henry G. Balzer, Inc.
PO Box 1800 PO Box 1755
Wolfeboro, NH 03894 for the Wolfeboro, NH 03894

Bay Street Bridge #104/116

prepared for

Town of Wolfeboro, New Hampshire

2004-016

C1.13

SHEET 6 OF 21

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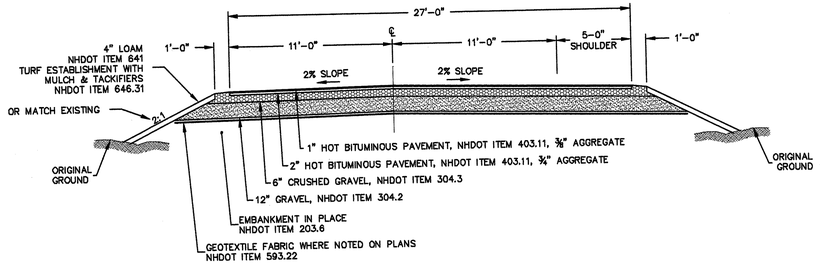
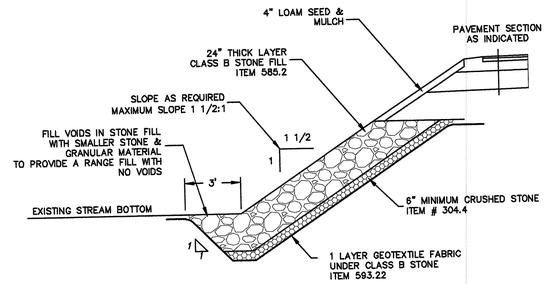


NOTES:

1. HOT BITUMINOUS PAVEMENT TO BE COMPACTED TO 95% OF MAXIMUM DENISTY AS DETERMINED BY THE AI MARSHALL TEST.

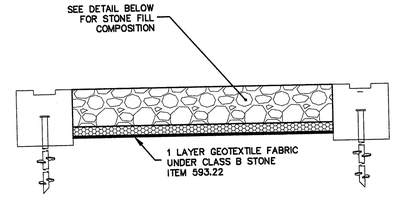
PAVED ROADWAY SECTION @ STA: 0+40 TO 4+45

SCALE: 1"=5'



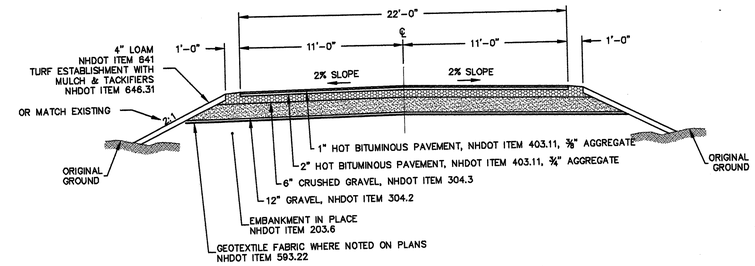
STONE FILL INSTALLATION FOR SLOPE PROTECTION

SCALE: ¼" = 1'-0"



STONE FILL INSTALLATION @ CHANNEL

SCALE: ¼" = 1'-0"

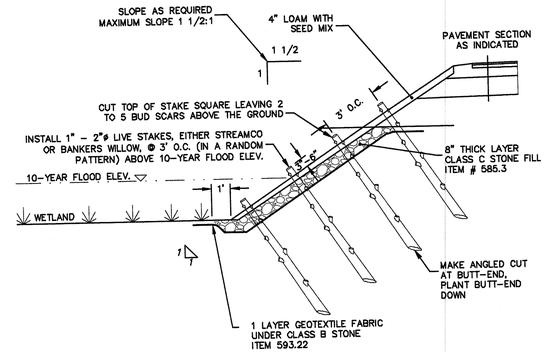


NOTES:

1. HOT BITUMINOUS PAVEMENT TO BE COMPACTED TO 95% OF MAXIMUM DENISTY AS DETERMINED BY THE AI MARSHALL TEST.

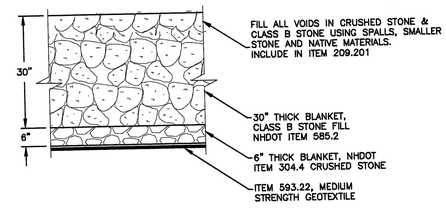
PAVED ROADWAY SECTION @ STA: 4+45 TO 6+80

SCALE: 1"=5'



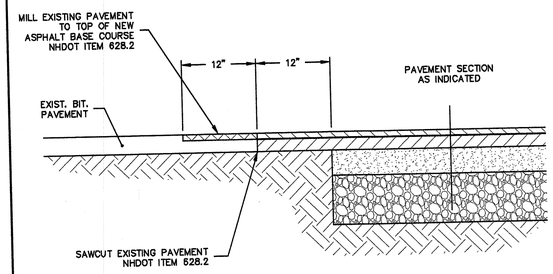
WETLAND SLOPE DETAIL

SCALE: ¼" = 1'-0"



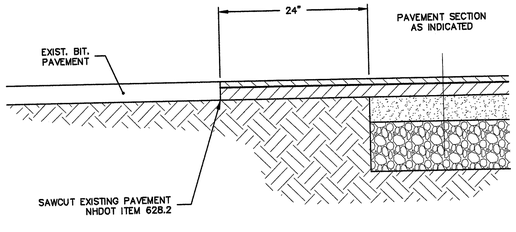
STONE FILL DETAIL

SCALE: ½" = 1'-0"



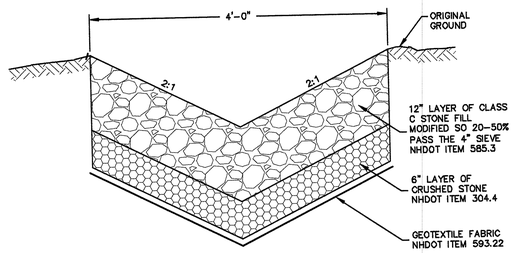
PAVEMENT LAP JOINT IN ROADWAYS

SCALE: 1" = 1'-0"



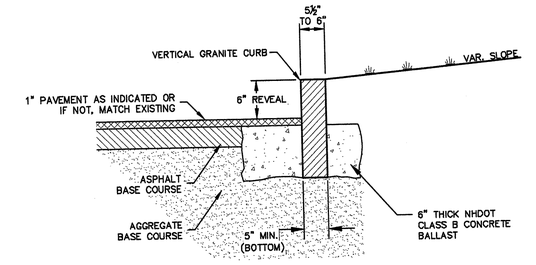
PAVEMENT BUTT JOINT AT PARKING AND DRIVES

SCALE: 1" = 1'-0"



STONE LINED DITCH

SCALE: 1" = 1'-0"



NHDOT ITEM 609.01

VERTICAL GRANITE CURB

COPYRIGHT 2008 H.E. BERGERON ENGINEERS, INC.			
2	ADDED ROADWAY SECTION & JOINT DETAILS	08/07/08	BSG
1	ADDED WETLAND SLOPE & STONE FILL DETAILS	07/11/08	BSG
NO.	REVISION	DATE	BY

H.E. BERGERON ENGINEERS, INC.
P.O. BOX 440
NORTH CONWAY, NH
03860 · (603) 356-6936

SURVEYED BY	JP/KLT
DESIGNED BY	JCK
DRAWN BY	BCL/BSG
CHECKED BY	JWK
FIELD BOOK	307,309,328
SCALE	AS NOTED
DATE	07/03/08

Typical Roadway Sections
of
Bay Street Bridge #104/116
over an
Inlet to Back Bay
prepared for
Town of Wolfeboro, New Hampshire

2004-016

C3.00

SHEET 7 OF 21

C3.00
SHEET 7 OF 21

2004-016
Typical Roadway Sections
Bay Street Bridge #104/116

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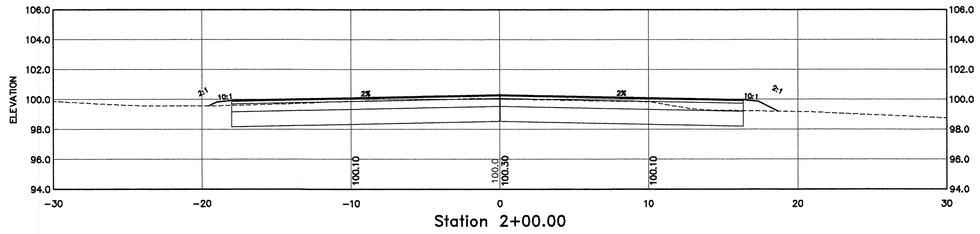

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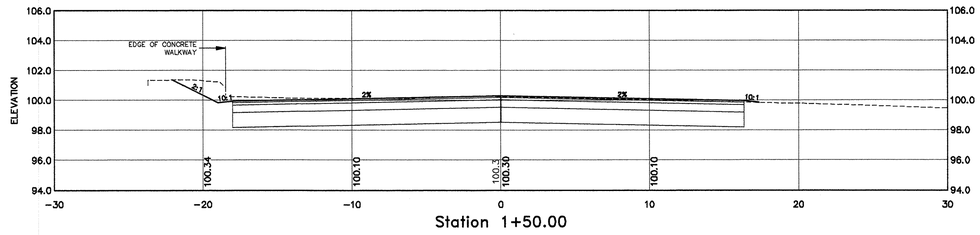

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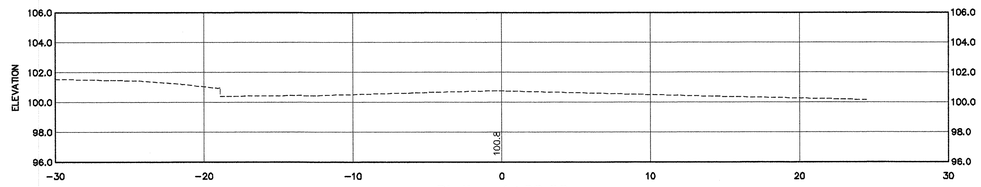

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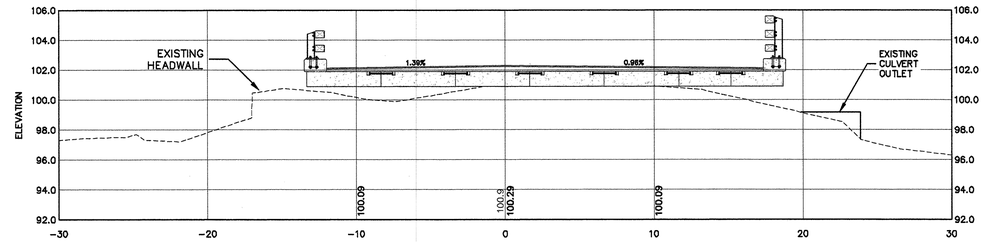

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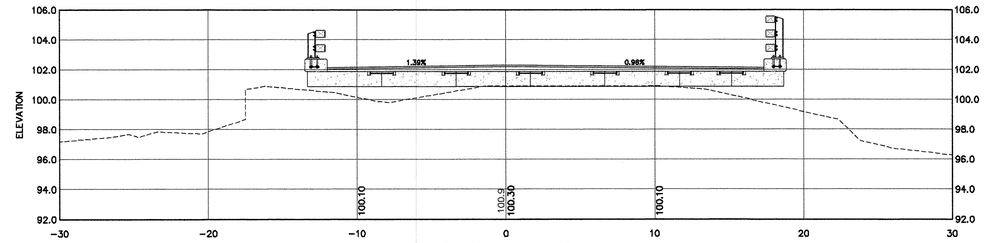

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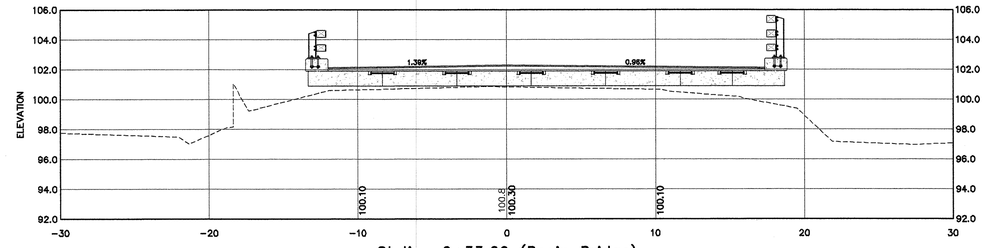

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C3.11
SHEET 8 OF 21

2004-016
Roadway Sections
Bay Street Bridge #104/116

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DRAWINGS ARE HALF SCALE WHEN PRINTED ON 11x17

5 0 5 10 20 ft

1 0 2.5 5 m

1 inch = 5 feet

(1 : 60)

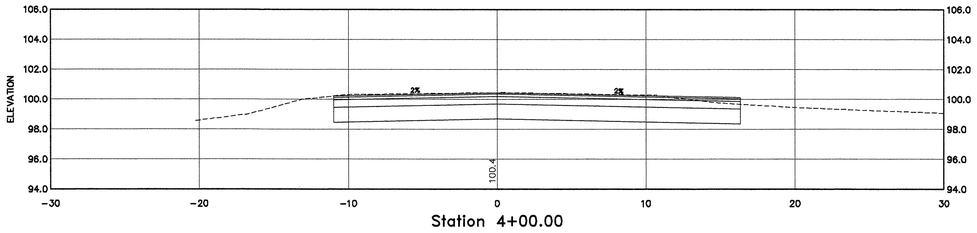
NO.	REVISION	DATE	BY

H.E. BERGERON ENGINEERS, INC.
P.O. BOX 440
NORTH CONWAY, NH
03860 · (603) 356-6936

SURVEYED BY	JP/KLT
DESIGNED BY	JCK
DRAWN BY	BCL/BSG
CHECKED BY	JWK
FIELD BOOK	307,309,328
SCALE	1"=5'
DATE	07/03/08

Roadway Sections
of
Bay Street Bridge #104/116
over an
Inlet to Back Bay
prepared for
Town of Wolfeboro, New Hampshire

2004-016
C3.11
SHEET 8 OF 21



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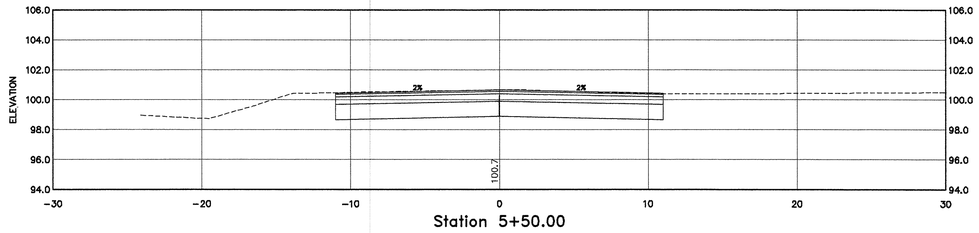

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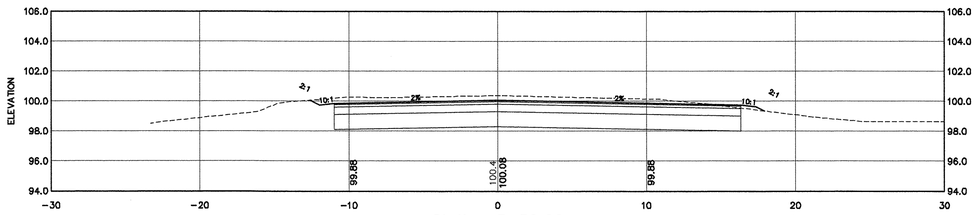

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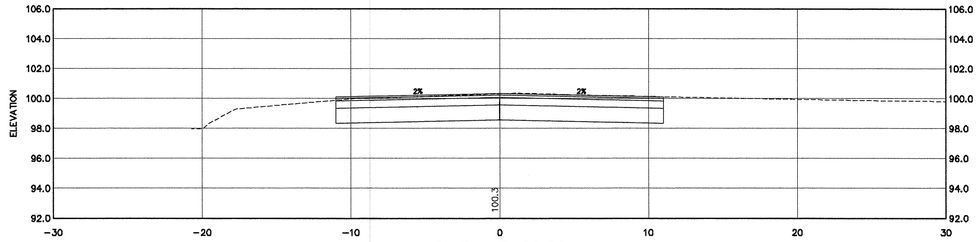

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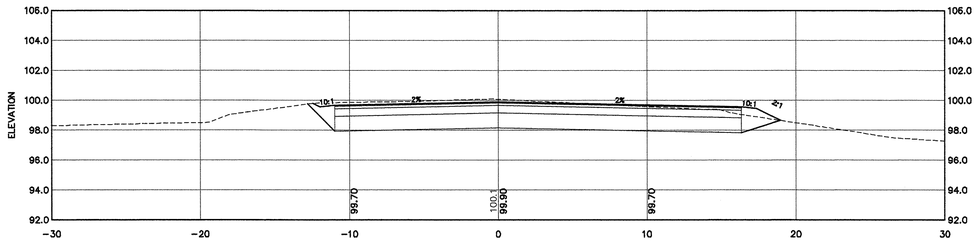

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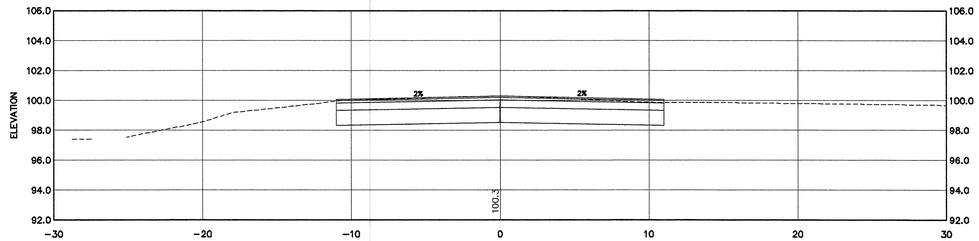

Station 4+50.00

C3.12
SHEET 9 OF 21

Roadway Sections
Bay Street Bridge #104/116
2004-016

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DRAWINGS ARE HALF SCALE WHEN PRINTED ON 11x17

5 0 5 10 20 ft

1 0 2.5 5 m

1 inch = 5 feet

(1 : 60)

NO.	REVISION	DATE	BY
1	UPDATED CUT LINES FOR 2+75 TO 3+25	08/07/08	BSG

H.E. BERGERON ENGINEERS, INC.
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NORTH CONWAY, NH
03860 · (603) 356-6936

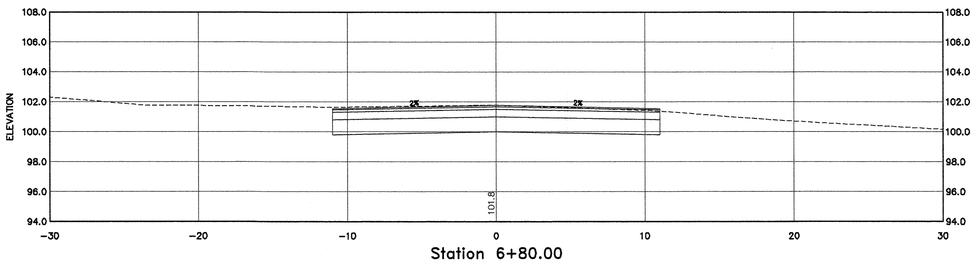
SURVEYED BY	JP/KLT
DESIGNED BY	JCK
DRAWN BY	BCL/BSG
CHECKED BY	JWK
FIELD BOOK	307,309,328
SCALE	1"=5'
DATE	07/03/08

Roadway Sections
of
Bay Street Bridge #104/116
over an
Inlet to Back Bay
prepared for
Town of Wolfeboro, New Hampshire

2004-016

C3.12

SHEET 9 OF 21



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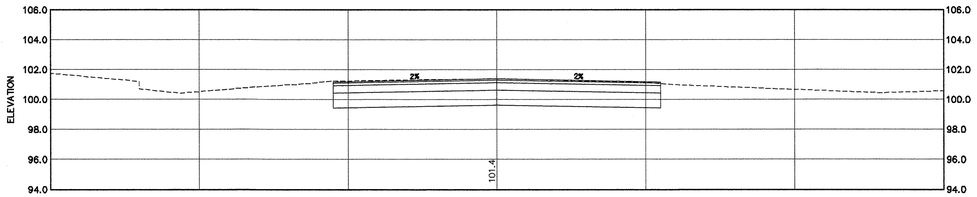

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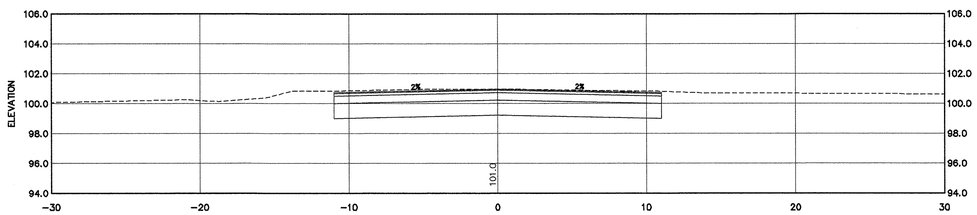

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C3.13
SHEET 10 OF 21

2004-016
Roadway Sections
Bay Street Bridge #104/116

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DRAWINGS ARE HALF SCALE WHEN PRINTED ON 11x17

5 0 5 10 20 ft

1 0 2.5 5 m

1 inch = 5 feet

(1 : 60)

NO.	REVISION	DATE	BY
1	UPDATED BOX OUT FOR 4+75	08/07/08	BSG

H.E. BERGERON ENGINEERS, INC.
P.O. BOX 440
NORTH CONWAY, NH
03860 · (603) 356-6936

SURVEYED BY	JP/KLT
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SCALE	1"=5'
DATE	07/03/08

Roadway Sections
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Bay Street Bridge #104/116
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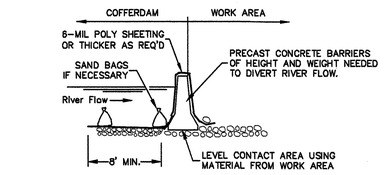
Town of Wolfeboro, New Hampshire

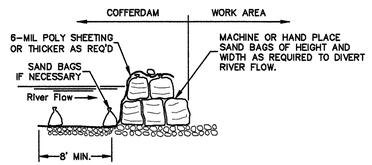
2004-016

C3.13

SHEET 10 OF 21

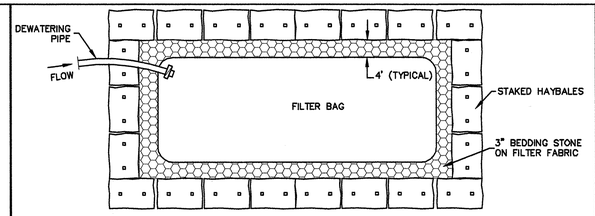


PRECAST CONCRETE OPTION

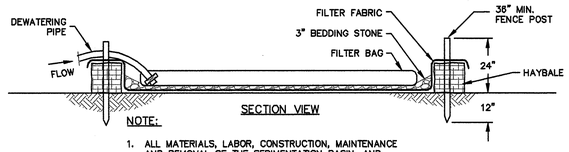


SAND BAG OPTION

TEMPORARY COFFERDAMS
N.T.S.



PLAN VIEW



SECTION VIEW

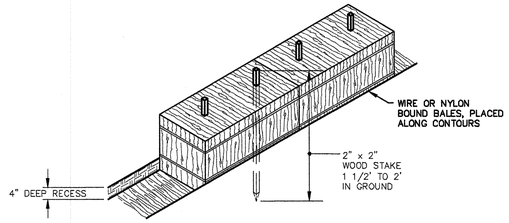
NOTE:

1. ALL MATERIALS, LABOR, CONSTRUCTION, MAINTENANCE AND REMOVAL OF THE SEDIMENTATION BASIN, AND RESTORATION OF THE AREA SHALL BE INCLUDED IN ITEM 699.1. DISPOSE OF FILTER BAGS WHEN FULL & REPLACE.

SEDIMENTATION BASIN DETAILS
N.T.S.

Erosion Control Construction Sequence:

1. Install temporary erosion control facilities. This includes, but is not limited to, silt fencing down slope of all proposed fill areas and hay bales around all existing and proposed culverts and catch basins tributary to the disturbed areas.
2. Clear, grub, and dispose of debris.
3. Strip topsoil and haul materials away from site.
4. Upon completion of final grading, spread loam, fertilize, seed, and apply mulch.
5. Maintain erosion control devices at seeded areas until 75% of the grass is established, then remove and dispose all temporary erosion control devices.
6. Remove silt and debris from all drainage structures



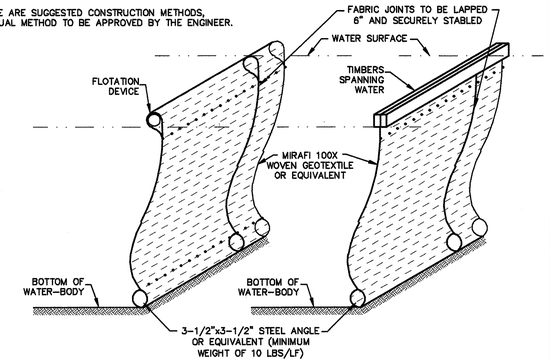
NOTES:

1. ADJACENT BALES SHALL BE TIGHTLY BUTTED.
2. SPOILS FROM RECESS SHALL BE PLACED ALONG THE UPSTREAM SIDE OF THE BALES.
3. INSPECT BALES WEEKLY AND AFTER EACH RAIN. REPAIR IF DAMAGED AND REMOVE EXCESS SEDIMENT.
4. REMOVE BARRIER ONLY AFTER UPSTREAM WORK AREA IS REVEGETATED.

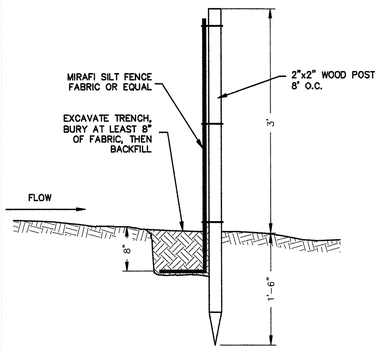
HAY BALE INSTALLATION
N.T.S. (ISOMETRIC)

NOTE:

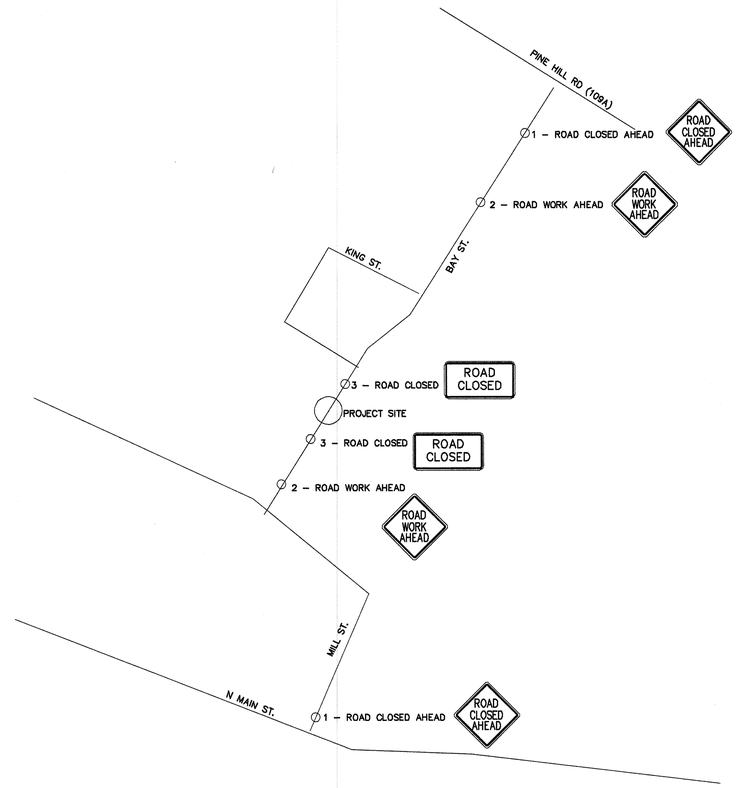
THESE ARE SUGGESTED CONSTRUCTION METHODS, ACTUAL METHOD TO BE APPROVED BY THE ENGINEER.



NHDOT ITEM 699.1
TURBIDITY CURTAIN
N.T.S.



NHDOT ITEM 645.531
SILT FENCE INSTALLATION
SCALE: 1" = 1'-0"



NHDOT ITEM 619.1
TRAFFIC MAINTENANCE PLAN
SCALE: NTS

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H.E. BERGERON ENGINEERS, INC.
P.O. BOX 440
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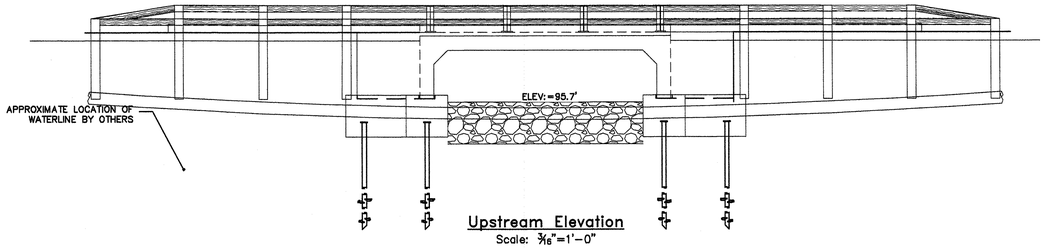
03860 · (603) 356-6936

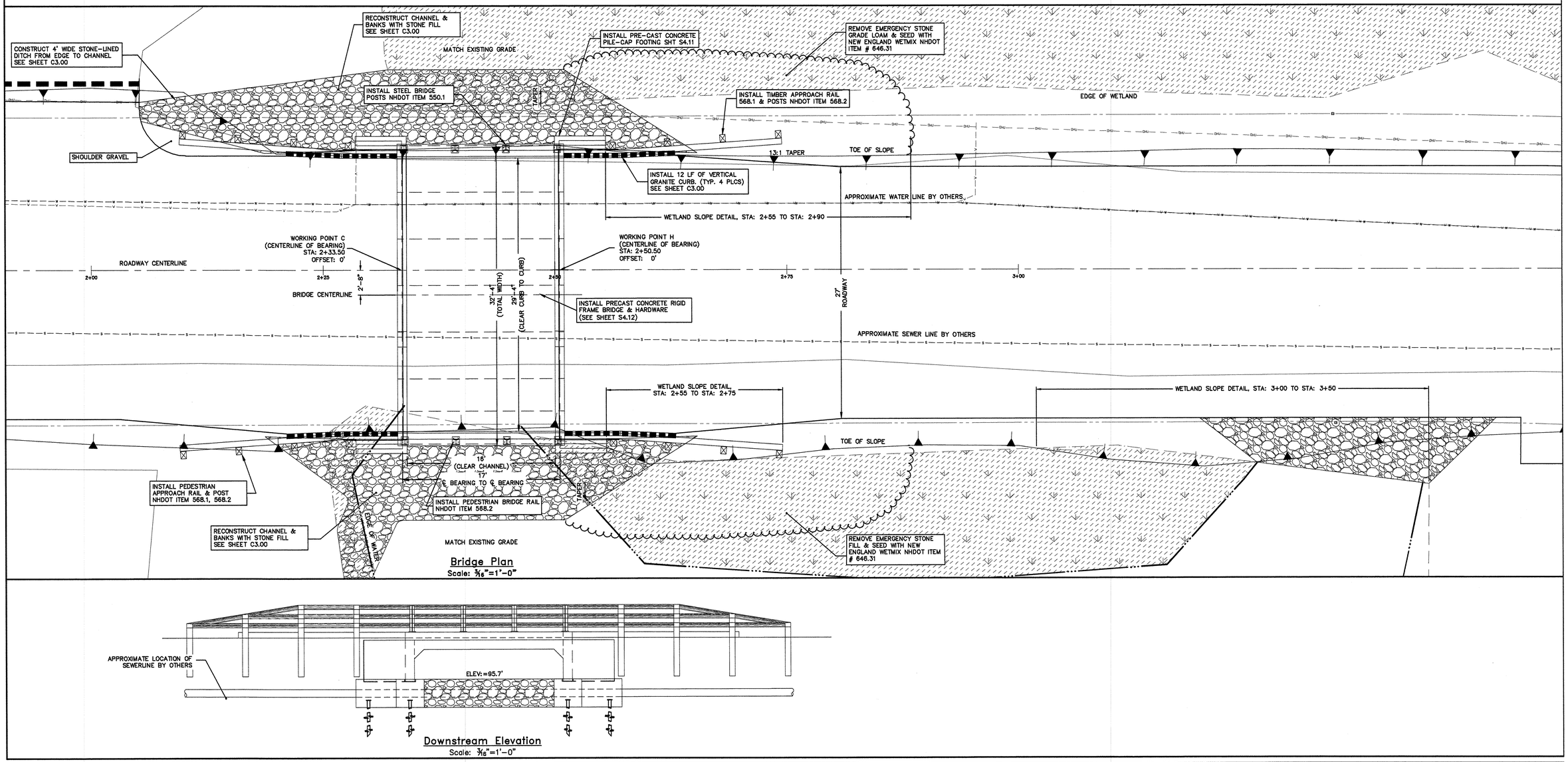
SURVEYED BY	JP/KLT
DESIGNED BY	JCK
DRAWN BY	BCL/BSG
CHECKED BY	JWK
FIELD BOOK	307,309,328
SCALE	AS NOTED
DATE	07/03/08

Erosion Control Details
of
Bay Street Bridge #104/116
over an
Inlet to Back Bay
prepared for
Town of Wolfeboro, New Hampshire

2004-016
C5.11
SHEET 11 OF 21



Upstream Elevation
Scale: 3/16"=1'-0"



Bridge Plan
Scale: 3/16"=1'-0"

Downstream Elevation
Scale: 3/16"=1'-0"

NO.	REVISION	DATE	BY
1	UPDATED WETLAND SLOPE INFORMATION	07/16/08	BSG

H.E. BERGERON ENGINEERS, INC.
P.O. BOX 440
NORTH CONWAY, NH
03860 · (603) 356-6936

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DESIGNED BY	JCK
DRAWN BY	BCL/BSG
CHECKED BY	JWK
FIELD BOOK	307,309,328
SCALE	3/16"=1'-0"
DATE	07/03/08

Bridge Plan & Elevation
of
Bay Street Bridge #104/116
over an
Inlet to Back Bay
prepared for
Town of Wolfeboro, New Hampshire

2004-016

S1.11

SHEET 12 OF 21

S1.11
SHEET 12 OF 21

2004-016
Bridge Plan & Elevation
Bay Street Bridge #104/116

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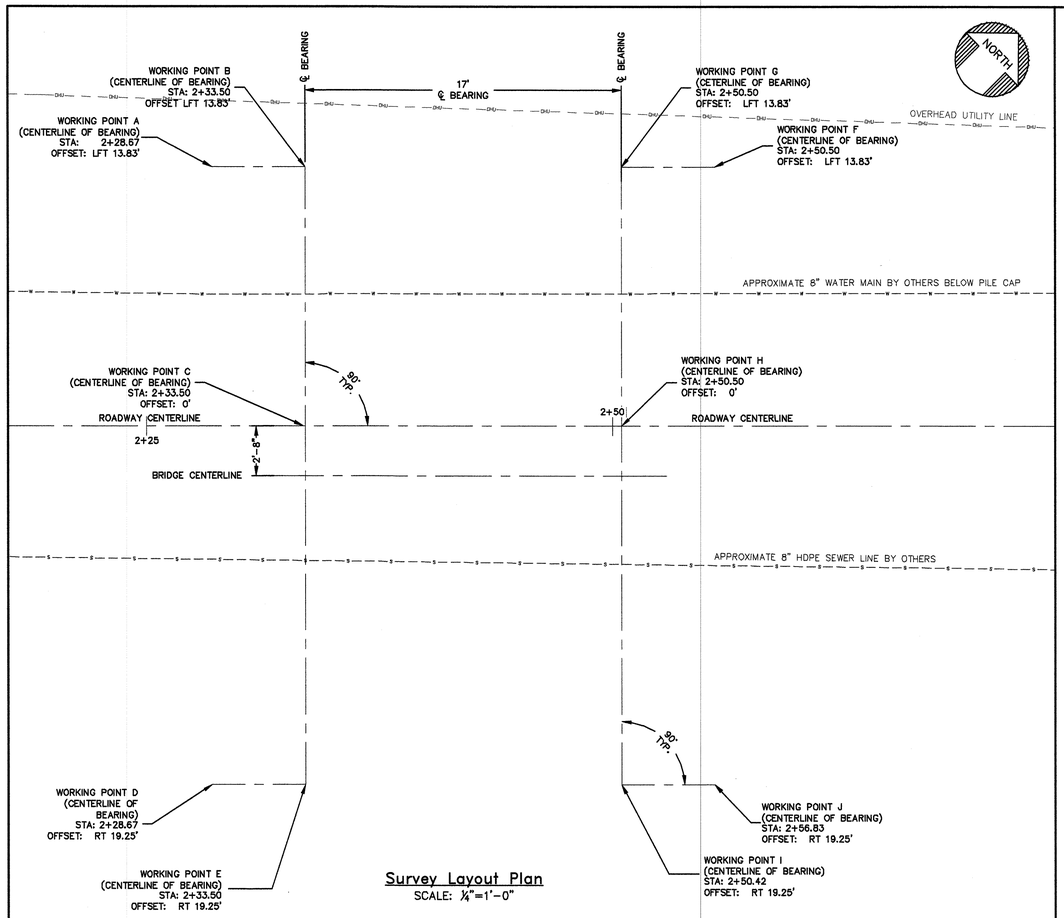
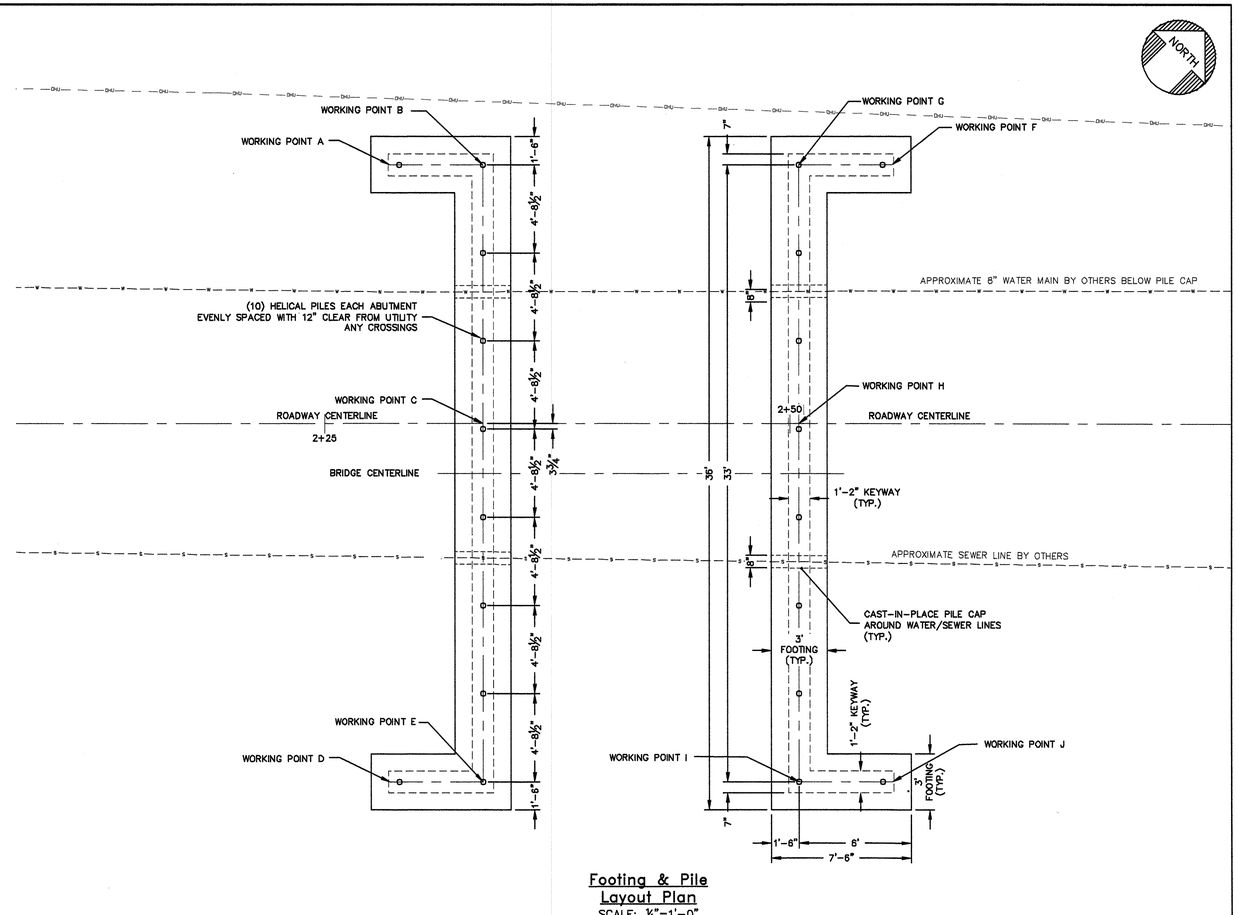
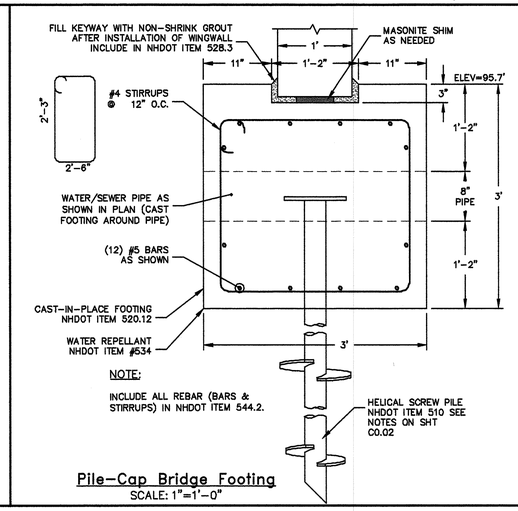


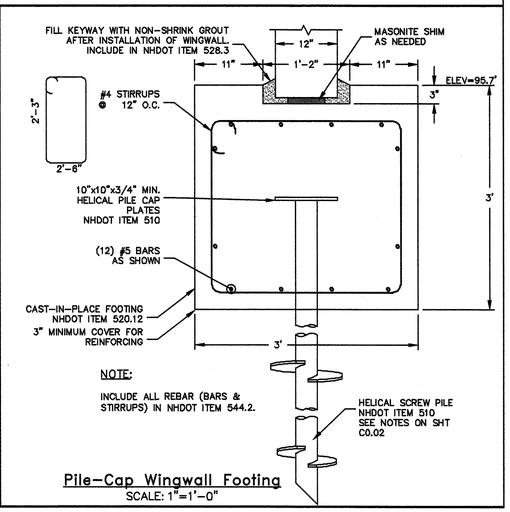
Survey Layout Plan
SCALE: ¼"=1'-0"



Footing & Pile
Layout Plan
SCALE: ¼"=1'-0"



Pile-Cap Bridge Footing
SCALE: 1"=1'-0"



Pile-Cap Wingwall Footing
SCALE: 1"=1'-0"

S4.11
SHEET 13 OF 21

2004-016
Abutment Plan & Details
Bay Street Bridge #104/116

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NO.	REVISION	DATE	BY
1	ADDED SURVEY LAYOUT; UPDATED FOOTING DETAILS	08/07/08	BSG

H.E. BERGERON
ENGINEERS, INC.
P.O. BOX 440
NORTH CONWAY, NH
03860 · (603) 356-6936

SURVEYED BY	JP/KLT
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FIELD BOOK	307,309,328
SCALE	AS NOTED
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Abutment Plan & Details
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Bay Street Bridge #104/116
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Inlet to Back Bay
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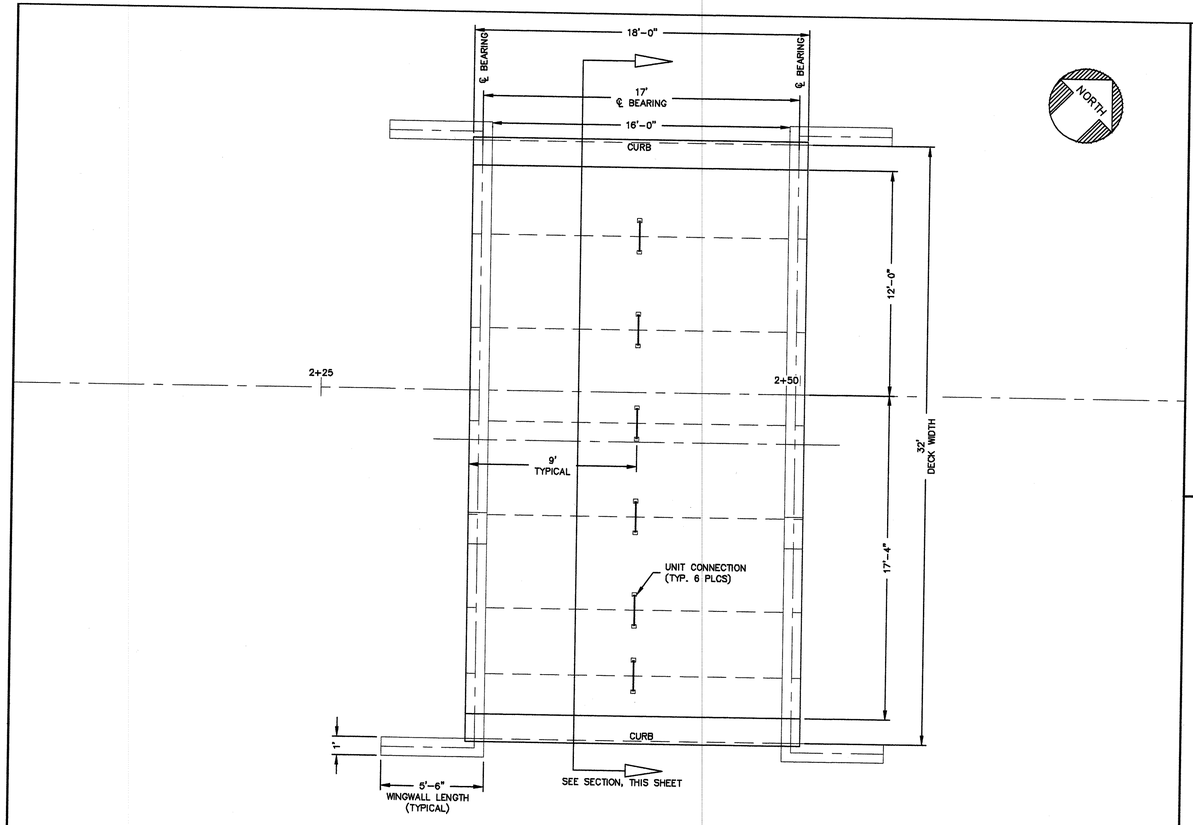
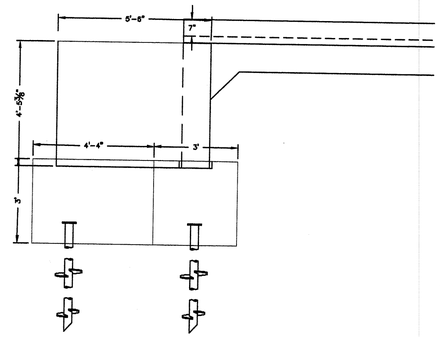
Town of Wolfeboro, New Hampshire

2004-016
S4.11
SHEET 13 OF 21



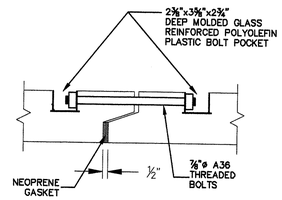
Pre-Cast Rigid Frame Plan

SCALE: ¼"=1'-0"



Wingwall Elevation

Scale: ½"=1'-0"



NOTE:

FILL ALL POCKETS WITH DAYTON SUPERIOR SURE GRIP GROUT PRIOR TO APPLYING BARRIER MEMBRANE

Unit Connection Detail

SCALE: 1½"=1'-0"

Three-Sided Box Culvert Notes:

1. Three-sided box culvert sections shall be designed in accordance with AASHTO "Standard Specification for Highway Bridges," Section 17.8, "Precast Reinforced Concrete Three-Sided Structures" & ASTM C 1504-03, "Standard Specification for Manufacture of Precast Reinforced Concrete Three-Sided Structures for Culverts, Storm Drains". The design live load is AASHTO HS 25-44 and 125% alternate military.
2. All superstructure concrete shall have a 28-day compressive strength of 6,000 p.s.i. All foundation concrete shall have a 28-day compressive strength of 3,000 p.s.i. Cement used shall be Type III and meet the requirements of ASTM C-150.
3. Unless noted otherwise, all reinforcing shall meet the requirements of ASTM A-615 Grade 60 deformed steel bars for concrete reinforcing. When epoxy-coated reinforcing is called for, they shall conform to ASTM A-775. All bars shall be bent cold.
4. All backfill shall be bankrun gravel, crushed bankrun gravel, or crushed stone and compacted to 95% of ASTM 1557, Method D.
5. All footings shall be placed on compacted backfill. All topsoil, loose fill, and deleterious materials shall be removed before placing any concrete. Footings shall not be placed in water or on frozen ground. All structural fill shall be bankrun gravel, crushed bankrun gravel or crushed stone. The maximum stone size in the gravels shall be 2" in diameter. The crushed stone shall be a washed stone that conforms to ASTM C-33, "Concrete Aggregate". The structural fill shall be placed in a maximum of 12" lifts and be compacted to 95% of ASTM 1557, Method D.
6. Curing shall conform to the NHDOT "Standard Specification for Road and Bridge Construction," 2006, Division 520, Section 2.6
7. Shop drawings and calculations stamped by a Professional Engineer Registered in the State of New Hampshire for the pre-cast structure shall be submitted and approved by the Engineer prior to fabrication.

Accessory Notes:

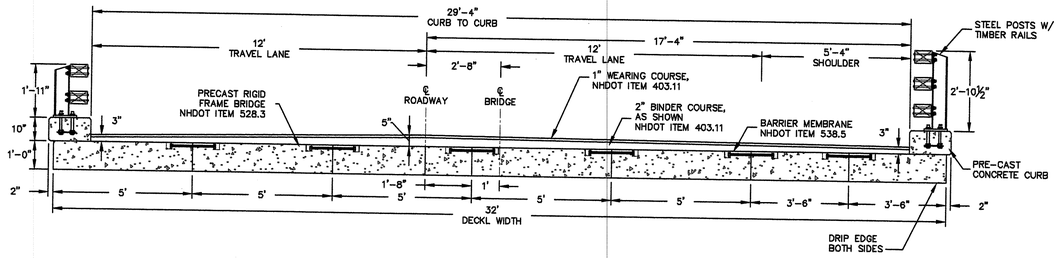
1. Each section shall be provided with (4) polyolefin pockets per joint for attachment to adjacent sections. ⅞"ø threaded rod, washers and nuts shall be provided for assembly in the field. Closed cell neoprene joint sealant shall be provide for all joints.
2. (4) Meadow-Burke "Tech Anchors" (8 ton) shall be cast into each section for handling. Bridge sections will be shipped upside down.

Cast-In-Place Concrete Notes:

1. All concrete work shall be in compliance with AASHTO 17th Edition "Standard Specification for Highway Bridges" Section 520 & ACI 318 "Building Code Requirements for Reinforced Concrete and Commentary".
2. All curb concrete shall have a minimum 28-day compressive strength of 4000 pounds per square inch (P.S.I.). The concrete shall be placed with a maximum 4" slump and shall be vibrated in a workman like manner. The concrete shall be air-entrained concrete, containing 4% to 6% entrained air, and conform to ASTM C-260. The aggregate shall conform to ASTM C-33 shall have a maximum diameter of ¾".
3. The concrete shall be mixed, placed and cured without the use of calcium chloride. The placement of concrete shall comply with the latest American Concrete Institute (ACI) codes, including ACI 306.1 "Cold Weather Concreting", ACI 305R "Hot Weather Concreting", & NHDOT Specification Section 520.
4. The concrete shall have attained at least fifty percent (50%) of its 28-day compressive strength prior to the removal of the forms.
5. All reinforcing steel shall be grade 60 and conform to the standards in ASTM A 775, "Standard Specifications for Epoxy-Coated Reinforcing Steel Bars". All reinforcing shall be bent cold. Unless otherwise noted, reinforcing splice lengths shall be as follows:

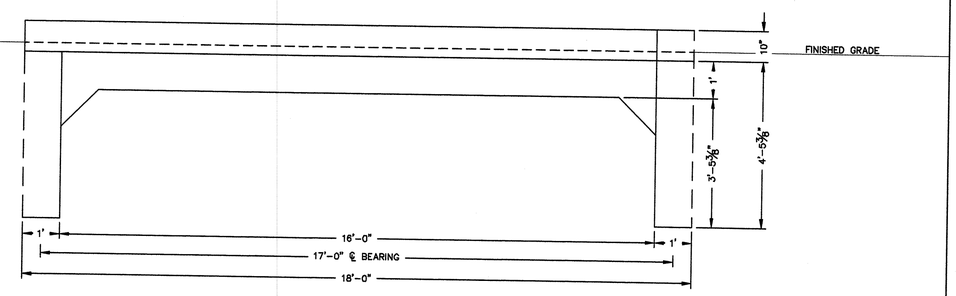
BAR SIZE	SPLICE LENGTH (IN.)
#4	30
#5	40

6. Minimum cover for all reinforcing steel is 2".



Pre-Cast Rigid Frame Section

SCALE: ⅜"=1'-0"



Pre-Cast Rigid Frame Elevation

Scale: ½"=1'-0"

NO.	REVISION	DATE	BY
2	ADDED "WINGWALL ELEVATION" DETAIL	09/04/08	BSG
1	UPDATED PRECAST RIGID FRAME NHDOT ITEM NUMBER	08/07/08	BSG

H.E. BERGERON ENGINEERS, INC.
P.O. BOX 440
NORTH CONWAY, NH
03860 · (603) 356-6936

SURVEYED BY	JP/KLT
DESIGNED BY	JCK
DRAWN BY	BCL/BSG
CHECKED BY	JWK
FIELD BOOK	307,309,328
SCALE	AS NOTED
DATE	07/03/08

Pre-Cast Rigid Frame Plan & Details
of
Bay Street Bridge #104/116
over an
Inlet to Back Bay
prepared for
Town of Wolfeboro, New Hampshire

2004-016

S4.21

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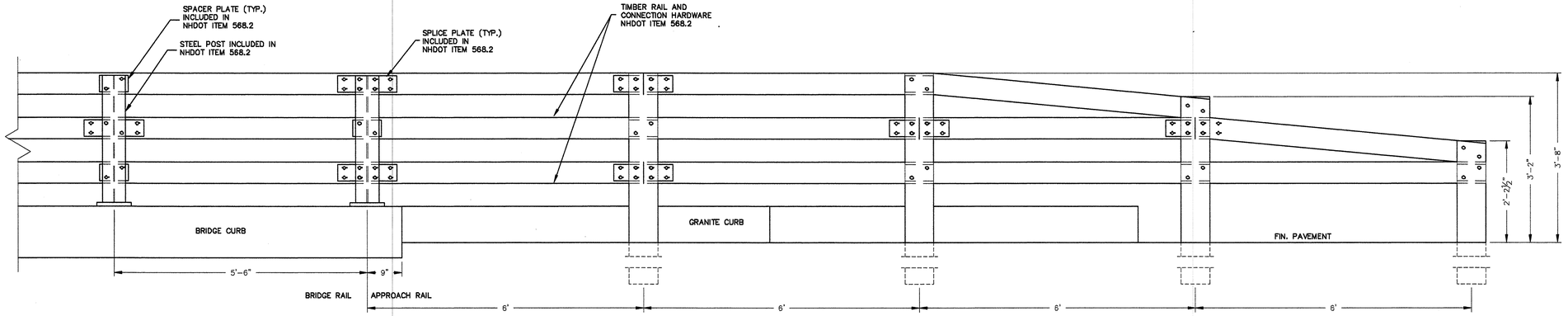
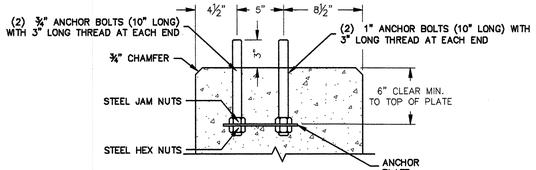
2004-016
Pre-Cast Rigid Frame Plan & Details
Bay Street Bridge #104/116

P:\Jobs\2004\2004-016 Bay Street Bridge Wolfeboro\dwg\Bridge Plans\Sheet Files\S4.21 Pre-Cast Rigid Frame Plan & Details.dwg, S4.21, 9/18/2008 4:28:46 PM, bgibson

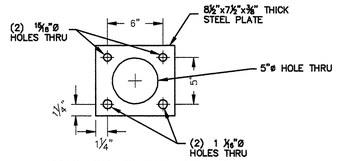
2004-016
Bridge Rail Details
Bay Street Bridge #104/116



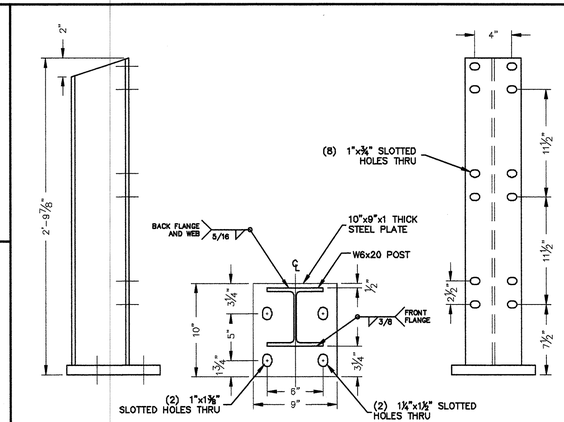
BRIDGE RAIL ASSEMBLY DETAIL
SCALE: ¾"=1'-0"
NHDOT ITEM 550.1



POST ANCHOR ASSEMBLY & NOSE DETAIL
SCALE: 1½"=1'-0"
NHDOT ITEM 568.2



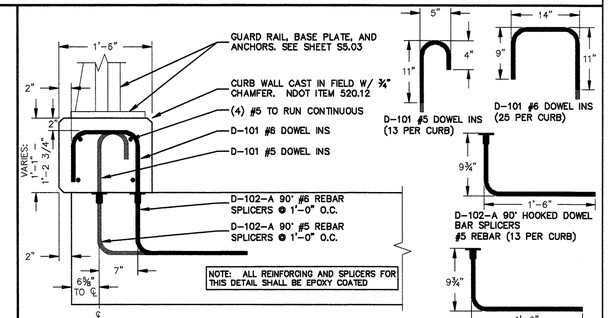
ANCHOR PLATE DETAIL
SCALE: 1½"=1'-0"
NHDOT ITEM 550.1



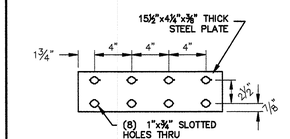
PEDESTRIAN BRIDGE RAIL POST DETAIL
SCALE: 1½"=1'-0"
NHDOT ITEM 550.1

NOTES:

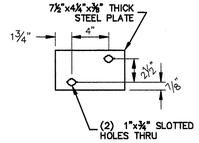
1. ALL steel and connection hardware material specifications shall comply with NHDOT Section 563.2–Bridge Railing.
2. All steel and hardware shall be hot–dip galvanized.
3. All fabricated parts shall be galvanized after fabrication is complete.
4. Bridge rail posts, post anchor assembly, anchor plate, anchor bolts, nuts and washers will be paid under NHDOT Item 550.1 Structural Steel.
5. Item 568.1 Structural Timber–posts shall be 8"x10" Southern Yellow Pine NO. 2 or better having a minimum allowable bending stress of 1200 psi. This item will be paid by the thousand board foot (mbf) of timber post.
6. Item 568.2 structural timber–rails shall be 6"x8" Southern Yellow Pine NO. 2 or better having a minimum allowable bending stress of 850 psi. This item also includes connection, splice, and spacer hardware. Rail will be measured and paid for by the linear foot 6"x8" timber rail.
7. Timber posts and rails shall be treated with CCA, Type–A system, after fabrication, to a minimum net retention of 0.6 pcf, in accordance with the requirements of AASHTO M133, the current standards of the American Wood Preservers Association and the current version of the Western Wood Preservers Institute's "Best Management Practices for the use of Treated Wood in Aquatic Environments." Note that materials with excessive residual preservative material will be rejected.



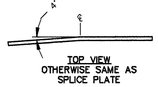
CURB REINFORCING DETAIL
SCALE: ¾"=1'-0"



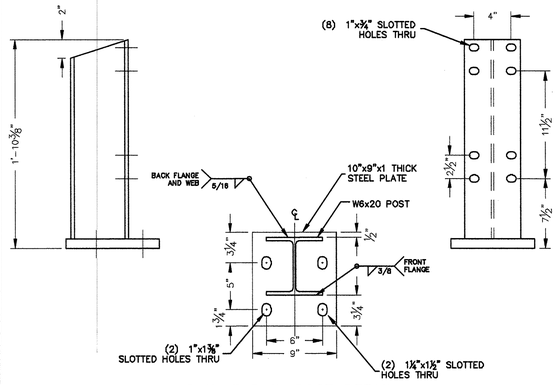
SPLICE PLATE DETAIL
SCALE: 1½"=1'-0"
NHDOT ITEM 568.2



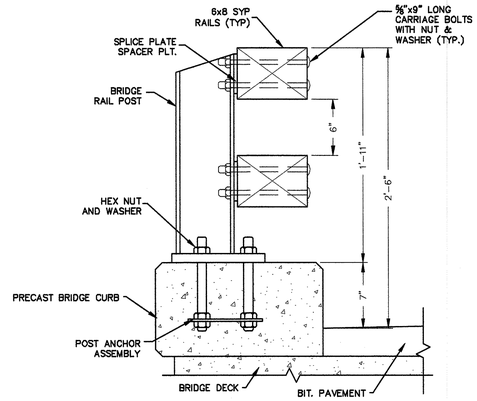
SPACER PLATE DETAIL
SCALE: 1½"=1'-0"
NHDOT ITEM 568.2



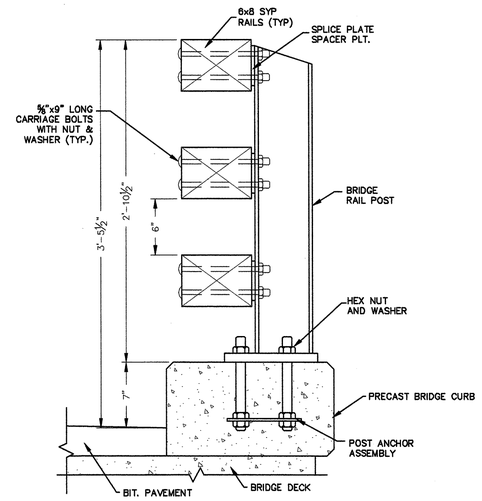
BENT SPLICE PLATE DETAIL
SCALE: 1½"=1'-0"
NHDOT ITEM 550.1



BRIDGE RAIL POST DETAIL
SCALE: 1½"=1'-0"
NHDOT ITEM 550.1



BRIDGE RAIL ASSEMBLY SECTION
SCALE: 1½"=1'-0"
NHDOT ITEM 550.1



PEDESTRIAN BRIDGE RAIL ASSEMBLY SECTION
SCALE: 1½"=1'-0"
NHDOT ITEM 550.1

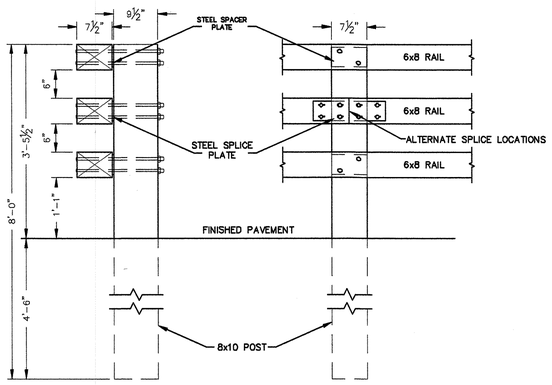
NO.	REVISION	DATE	BY
1	ADDED CURB REINFORCING DETAIL	08/07/08	BSG

H.E. BERGERON ENGINEERS, INC.
P.O. BOX 440
NORTH CONWAY, NH
03860 · (603) 356-6936

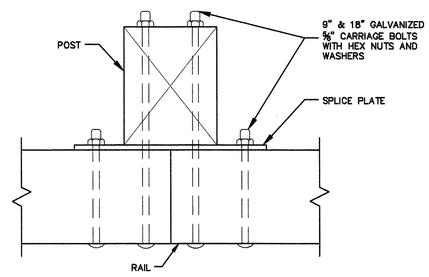
SURVEYED BY	JP/KLT
DESIGNED BY	JCK
DRAWN BY	BCL/BSG
CHECKED BY	JWK
FIELD BOOK	307,309,328
SCALE	AS NOTED
DATE	07/03/08

Bridge Rail Details
of
Bay Street Bridge #104/116
over an
Inlet to Back Bay
prepared for
Town of Wolfeboro, New Hampshire

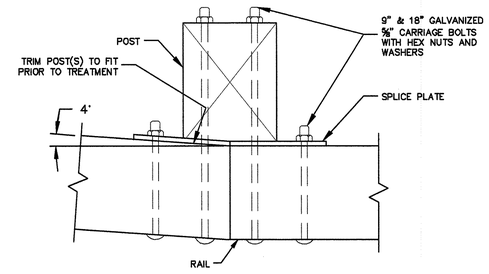
2004-016
S5.11
SHEET 15 OF 21



PEDESTRIAN TIMBER APPROACH RAIL
SCALE: ¾"=1'-0"



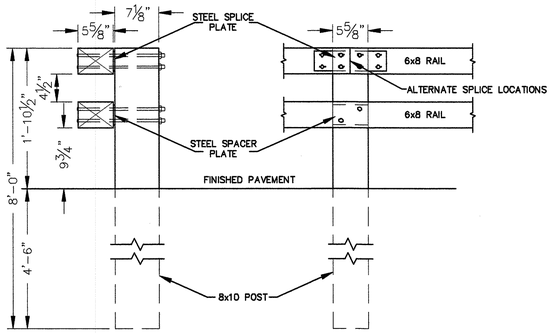
TYPICAL SPLICE CONNECTION
SCALE: 6"=1'-0"



BENT SPLICE CONNECTION
SCALE: 6"=1'-0"

Notes:

1. Timber posts shall be spaced 6'-0" O.C. Unless otherwise noted on drawing.
2. Timber posts to be included in NHDOT Item 568.1
3. Timber rails to be included in NHDOT Item 568.2



2-RAIL TIMBER APPROACH RAIL
SCALE: ¾"=1'-0"

S5.12
SHEET 16 OF 21

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2004-016
Approach Rail Details
Bay Street Bridge #104/116

NO.	REVISION	DATE	BY

H.E. BERGERON ENGINEERS, INC.
P.O. BOX 440
NORTH CONWAY, NH
03860 · (603) 356-6936

SURVEYED BY	JP/KLT
DESIGNED BY	JCK
DRAWN BY	BCL/BSG
CHECKED BY	JWK
FIELD BOOK	307,309,328
SCALE	AS NOTED
DATE	07/03/08

Approach Rail Details
of
Bay Street Bridge #104/116
over an
Inlet to Back Bay
prepared for
Town of Wolfeboro, New Hampshire

2004-016
S5.12
SHEET 16 OF 21

IV

COLLEGE ROAD OVER WILLEY BROOK

NHDOT BRIDGE #176/099

QUANTUM CONSTRUCTION CONSULTANTS, LLC

27 LOCKE ROAD, CONCORD, NH 03301-5417 TEL: 603-224-0859 FAX: 603-224-3625

QUANTUM CONSTRUCTION CONSULTANTS, LLC
27 LOCKE ROAD, CONCORD, NH 03301-5417 TEL: 603-224-0859 FAX: 603-224-3625

College Road over Willey Brook
Bridge #176/099
Wolfeboro, New Hampshire
July 10, 2018

Bridge Description

College Road over Willey Brook is a 27-foot single span, precast concrete voided slab bridge constructed in 2002. The bridge has a total length of 29 feet and is approximately 29 feet wide with a curb-to-curb width of 26 feet. The bridge has a skew of 35 degrees. The NHDOT Inspection Report, dated December 29, 2016, reports the bridge to be in very good condition.

The structure is supported on cast-in-place concrete abutments with spread footings. The precast slab has a concrete overlay to form the roadway cross slope, with a barrier membrane and 2" of pavement. Railing on the bridge is a timber, 2-rail system.

The bridge is not on the Municipal Redlist and is posted E-2 on the west side of the bridge. However, a posting is not required per NHDOT Inspection Report dated December 29, 2016.

Field Observations

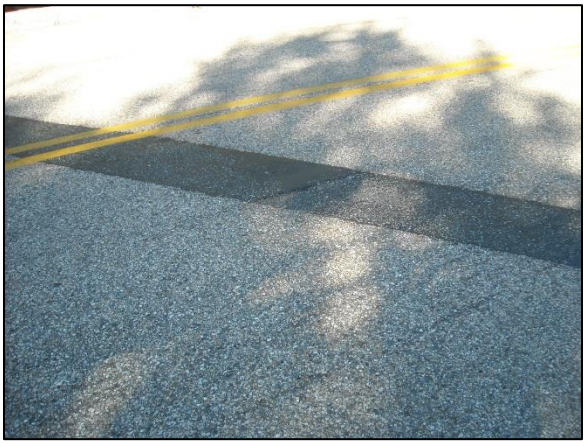
QCC conducted a site visit on June 13, 2017 and again on October 4, 2017 to observe the bridge and roadway approaches. Observations made were able to confirm deficiencies noted in the NHDOT Inspection Report as well as identify additional items of concern. The additional items of concern include damage to the elastomeric plug joint and brush growing around the bridge abutments.

It was observed that cracking at the joint between the abutment and wingwall was occurring, as well as leaking from this joint. Additionally, fine cracks in the concrete curb were noted.

Efflorescence, as well as rust stains were noted leaking between deck beams at the northeast end of the bridge.

Pavement cracking at the end of the approach slabs was noted as well as pavement cracking on the roadway approaches and shoulders.

A deformation of pavement was noted on the south side of the bridge. It was determined that this pothole occurs 8’ off of the downstream bridge curb.



It was observed that areas of the asphaltic plug expansion joint were damaged.

Checking and splitting were noted in the timber bridge and guardrail. It was also noted that the existing bridge and approach rail are substandard.

Vegetation was observed around the abutments and growing into the rip rap.

Recommended Maintenance Efforts and Repairs

In order to closely monitor the condition of the bridge and its components it is suggested that an annual bridge evaluation be performed by the Town. QCC has supplied a maintenance checklist, with all relevant items listed that should be inspected by the Town (see Appendix D).

Additionally, it is also recommended that the cyclical maintenance efforts, as well as condition based repairs be completed on the bridge to prolong its useful life. The following table summarizes the suggested maintenance efforts that should be performed on the bridge in order to preserve its life span.

CYCLICAL MAINTENANCE		
Item		**Frequency**
Superstructure Washing	It is important that debris and salt contaminated dirt that collect on the superstructure are cleaned to prevent the intrusion of moisture into the structure which would cause accelerated deterioration.	Every year
Concrete Surface Washing	Washing the concrete surface is important in order to minimize exposure to salt which can cause cracking in the concrete and allow moisture into the structure causing deterioration.	Every year
Vegetation Control	Clearing excess vegetation on or around the structural elements is essential to prevent growth into the joints or cracks of the structure. It is recommended that the excess brush be removed from around the abutment structure.	Every year

Debris Removal from Channel	It is important to remove large debris from the channel to prevent the channel bed material from scouring and to reduce the possibility of creating blockages.	Every year
Water Repellent	Coating the curbs, slabs, fascias, and wingwalls with NHDOT Item 534.3, Water Repellent (Silane Siloxane), will prolong the life span of the concrete component. This item seals out moisture and salts that can infiltrate the concrete thereby causing deterioration.	Every 3 years (see Appendix F for details)
Crack Seal (Pavement)	Cracks in pavement are typically caused by repetitive loading over time. Sealing pavement cracks with NHDOT Item 413, Hot Poured Crack Sealant, will prevent further cracking in the pavement structure and avoid infiltration of moisture which will deteriorate the pavement over time.	As required

Minor repairs are recommended to be completed on the bridge in order to prolong its life. The following table summarizes the recommended repairs, as well as the repairs to complete when additional deficiencies occur.

REPAIRS				
Item Number	**Item**		**Frequency**	**Programmed Year**
1	Repair Pavement Deformation	The pavement deformation occurring on the bridge is likely due to bubbling of the bridge membrane. Trapped air between the membrane and concrete during application causes a blister within the membrane which results in asphalt failures under traffic loadings. It is recommended that the membrane be replaced or repaired.	As required	Repair 2018 Replace 2022
2	Replace Membrane	It is important to replace the membrane to minimize the infiltration of water and contaminates into the concrete which can cause deterioration of the concrete as well as corrosion of the reinforcing steel.	Every 20 years	2022
3	Patch Spalls in Concrete	Spalling in concrete is important to repair to prevent the degradation of the reinforcing steel. Spalling is often caused by numerous sources and should be reviewed on a case by case basis to ensure proper and complete repair.	As required	-

4	Install Scour Countermeasures	Scour is caused by swiftly moving water that causes sediment such as sand, gravel and stone intended to protect the substructure to be eroded away. It is important to install scour countermeasures when needed to protect the substructure elements from failure due to scour.	As required	-
5	Crack Seal (Concrete)	Cracks in concrete occur over time due to various reasons, including shrinkage and repetitive loading. It is important to look for and then apply concrete sealants, that will protect the reinforcing steel from corrosion by minimizing the intrusion of the water and contaminates, to the concrete surface. It is recommended that the vertical crack in the abutment (shown in picture above) be sealed to prevent further intrusion of water into the concrete.	As required	2018 (see Appendix E for details)
6	Joint Installation at Approach Slab	Wide cracks in pavement are occurring at the end of the approach slabs. Installing NHDOT Item 559.41, Asphaltic Plug for Crack Control, at the ends of the approach slab will help to prevent degradation of the approach pavement.	As required	2018
7	Curb Crack Repairs	Curb cracking of the concrete is a common occurrence in concrete bridge curbs due to the shrinkage of the concrete. It is important to seal concrete cracks in the bridge curb with NHDOT Item 526.3, Methacrylate Crack Sealer for Concrete Bridge Decks, to prevent the penetration of moisture into the concrete which over time will accelerate its deterioration.	As required	2018 (see Appendix E for details)

8	Replace Bridge and Approach Rail	Install NHDOT Item 563.23, Bridge Rail T3, and NHDOT Item 565.2325, Bridge Approach Rail T3 (Steel Posts), in place of the existing bridge and approach rails to meet current standards. This action of replacement is recommended within the next 5 years.		2018-2023
9	Remove Membrane from Approach Slab	Approach slabs should not have membranes. The membrane traps moisture from ground causing blisters and pavement deterioration.	As required	2022
10	Repair Joint between Deck and Abutment/Wing wall	It is recommended that the joint be repaired between the deck in order to prevent the intrusion of water into the superstructure. Water in the superstructure causes deterioration of the concrete, and can also causing rusting of the reinforcing steel.	As required	2018
11	Repair Asphaltic Plug Expansion Joint	It is recommended to repair the damage, with Repair Item 1, in order to prevent further damage to the joint.	As required	2022

Cost of Recommended Repairs

QCC has provided a 2017 construction cost estimate for the recommended repairs as well as recommended maintenance efforts associated with a NHDOT Item. The table below summarizes the unit costs and total costs for the recommended maintenance efforts.

Maintenance Item	NHDOT Item	Unit Cost (2017)	Total Cost (2017)
Water Repellent	Item 534.3 Water Repellent (Silane Siloxane)	$93.41/GAL	$1000
Crack Seal (Pavement)	Item 413.1 Hot Poured Crack Sealant	$1.78/LB	-

The following table summarizes the costs of the recommended repairs. Total costs and unit costs are given for the items that require action now, while only unit costs are given for the items that do not need action now but may need action in the future.

Repair Item	NHDOT Item	Unit Cost (2017)	Construction Cost (2017)
Repair Pavement Deformation (2018)	Item 628.22 Sawed Bituminous Pavement (Bridge)	-	$1,000
	Item 538.1 Barrier Membrane, Peel and Stick		
	Item 403.1 Hot Bituminous Pavement, Hand Method		
Remove and Replace Membrane (2022)	Item 538.5 Barrier Membrane, Heat Welded (Unit cost including removal of membrane)	$55.00/SY	-
Patch Spalls in Concrete	Item 521.21 Fast-Set Concrete Patching Mortar (Horizontal)	$620.00/CF	-
	Item 521.22 Fast-Set Concrete Patching Mortar (Vertical and Overhead)	$800.00/CF	
Install Scour Countermeasures	Item 583.3 Riprap Class III	$46.00/CY	-
Crack Seal (Concrete) (2018)	Item 526.2 Epoxy for Non-Moving Cracks	$75.00/GAL	-
Joint Installation at Approach Slab (2018)	Item 628.22 Sawed Bituminous Pavement (Bridge)	$3.23/LF	$4,700
	Item 559.41 Asphaltic Plug for Crack Control	$130.00/LF	
Curb Crack Repair (2018)	Item 526.3 Methacrylate Crack Sealer for Concrete Bridge Decks	$525.00/GAL	-
Replace Bridge and Approach Rail (2018-2023)	Item 202.7 Removal of Guardrail	$2.53/LF	$32,000
	Item 563.23 Bridge Rail T3	$128.00/LF	
	Item 565.2325 Bridge Approach Rail T3	$6,000/U	
Remove Membrane from Approach Slab (2022)	Removal of Item 538.5 Barrier Membrane, Heat Welded and Pavement Removal (Not a NHDOT Item, approximate cost)	$50.00/SY	-
Repair Joint between Deck and Abutment/Wingwall (2018)	Hand Excavate, Install Item 538.1 Barrier Membrane Peel and Stick (4 places) (Not a NHDOT Item, approximate cost)	-	$3,000
Repair Asphaltic Plug Expansion Joint (2022)	Item 559.4 Asphaltic Plug Expansion Joint	$137.50/LF	-

Maintenance Checklist

As part of QCC's October 4, 2017 site visit the following maintenance checklist was completed. This checklist will serve as a tool to the Town to evaluate the bridge and its components on a yearly basis. Blank checklists can be found in Appendix D for the Towns use.

Bridge Maintenance Checklist: College Road over Willey Brook

Date: 10/4/17 Performed by: QCC

	Item	Satisfactory Condition	Needs Action	Comments
Deck Elements	Wearing Surface		√	Minor cracking
	Curbs		√	Microcracking
	Bridge Rail		√	Minor checking, substandard
	Striping	√		
Superstructure	Deck Beams	√		
	Bearings	√		
	Joints		√	Leakage noted at NE and SE corners, damage to asphaltic expansion joint
Abutment	Concrete		√	Vertical cracks (non-moving crack)
	Bridge Seat	√		
	Erosion or Scour	√		None
	Footings	√		Not visible
Wingwalls	Concrete		√	Minor cracking
	Footings	√		Not visible
	Erosion or Scour	√		None observed

Stream Channel	Stream Alignment	√		
	Erosion or Scour	√		None observed
	Waterway opening	√		Clear
	Riprap	√		
Approaches	Approach Slab		√	Pavement cracked at ends
	Guardrail		√	Minor checking
	Pavement		√	Cracking
	Settlement	√		None observed

Bridge Maintenance Checklist: College Road over Willey Brook

Date: _____ Performed by: _____

	Item	Satisfactory Condition	Needs Action	Comments
Deck Elements	Wearing Surface			
	Curbs			
	Bridge Rail			
	Striping			
Superstructure	Deck Beams			
	Bearings			
	Joints			
Abutment	Concrete			
	Joint with Deck			
	Bridge Seat			
	Erosion or Scour			
	Footings			

Wingwalls	Concrete			
	Footings			
	Erosion or Scour			
Stream Channel	Stream Alignment			
	Erosion or Scour			
	Waterway opening			
	Riprap			
Approaches	Approach Slab			
	Guardrail			
	Pavement			
	Settlement			

CVR
SHEET 1 OF 28

95006.2
COLLEGE ROAD BRIDGE

Proposed Plans for
College Road Bridge No.176/099
over Willey Brook
Town of Wolfeboro, N.H.
Project No. 13417

VICINITY MAP
SCALE: 1" = 0.75 MILE
SOURCE: DELORME MAPS

APPROVED BY:

Marty Bilafer, Director of Public Works

STATE OF NEW HAMPSHIRE
JAMES M. KARMOZYN
NO. 9544
LICENSED
PROFESSIONAL ENGINEER

H.E. BERGERON
ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

Date: 7/09/2001
Revised: 10/15/2001

College Rd Bridge

N-1
SHEET 2 OF 28

95006.2
SHEET INDEX & QUANTITY SUMMARY
COLLEGE ROAD BRIDGE

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3	N-2	GENERAL NOTES	10/15/01
4	SP-1	EXISTING FEATURES SITE PLAN	--
5	SP-2	PROPOSED SITE PLAN	--
6	SP-3	PROPOSED PROFILE	--
7	SP-4	TEMPORARY DETOUR PLAN	1/21/02
8	SP-5	TEMPORARY DETOUR PROFILE	1/21/02
9	SP-6	PROPOSED TEMPORARY CONSTRUCTION EASEMENT	1/21/02
10	SP-7	LANDSCAPING PLAN	1/21/02
11	S-1	PROPOSED BRIDGE PLAN	10/15/01
12	S-2	PROPOSED BRIDGE ELEVATIONS	10/15/01
13	S-3	FOOTINGS & ABUTMENT DETAILS	10/15/01
14	S-4	PRECAST DECK LAYOUT	10/15/01
15	S-5	PRECAST DECK DETAILS	10/15/01
16	S-6	BRIDGE APPROACH RAIL DETAILS	10/15/01
17	S-7	BRIDGE RAILING DETAILS	10/15/01
18	CD-1	TYPICAL ROAD SECTION	10/15/01
19	CD-2	CHANNEL DETAILS	10/15/01
20	CD-3	DETOUR DETAILS & TRAFFIC CONTROL DEVICES	10/15/01
21	E-1	EROSION CONTROL PLAN	1/21/02
22	E-2	WATER DIVERSION AND EROSION CONTROL DETAILS	--
23	XS-1	ROAD CROSS SECTIONS	--
24	XS-2	ROAD CROSS SECTIONS	--
25	XS-3	ROAD CROSS SECTIONS	--
26	XS-4	ROAD CROSS SECTIONS	--
27	XS-5	STREAM CROSS SECTIONS	--
28	B-1	SOIL BORINGS AND LAYOUT	--

QUANTITY SUMMARY

ITEM NO.	DESCRIPTION	UNIT	ESTIMATED QUANTITY
201.1	CLEARING & GRUBBING	Ac	0.45
202.7	REMOVAL OF GUARDRAIL	L.F.	100
203.1	COMMON EXCAVATION (ROAD)	C.Y.	600
209.201	GRANULAR BACKFILL - BRIDGE	C.Y.	1,055
209.4	GRANULAR BACKFILL - GRAVEL	C.Y.	54
214	FINE GRADING	Unit	1
304.2	GRAVEL (ROAD)	C.Y.	575
304.3	CRUSHED GRAVEL (ROAD)	C.Y.	280
304.35	CRUSHED GRAVEL FOR DRIVES	C.Y.	10
304.4	CRUSHED STONE (FINE GRADATION)	C.Y.	4
403.11	HOT BITUMINOUS PAVEMENT (MACHINE METHOD)	Ton	225
501.2	TEMPORARY DETOUR	Unit	1
502	REMOVAL OF EXISTING BRIDGE STRUCTURE	Unit	1
503.101	WATER DIVERSION STRUCTURES	Unit	1
504.1	COMMON BRIDGE EXCAVATION	C.Y.	1,850
504.2	ROCK BRIDGE EXCAVATION (ALLOWANCE)	C.Y.	85
508	STRUCTURAL FILL	C.Y.	30
520.011	CONCRETE CLASS AA WITH HIGH RANGE WATER REDUCING ADMIXTURE	C.Y.	19
520.03	CONCRETE CLASS AA APPROACH SLABS	C.Y.	42
520.12	CONCRETE CLASS A ABOVE FOOTINGS	C.Y.	88
520.21	CONCRETE CLASS B FOOTINGS	C.Y.	69
529	PRECAST DECK AND ACCESSORIES	Unit	1
534.3	WATER REPELLENT - SILANE-SILOXANE	S.F.	1,925
538.1	BARRIER MEMBRANE	S.Y.	210
544	REINFORCING STEEL	Lb.	19,000
544.2	REINFORCING STEEL - EPOXY COATED	Lb.	9,360
550.1	STRUCTURAL STEEL	LBS.	1,400
559.4	ELASTOMERIC PLUG TYPE EXPANSION JOINT	L.F.	64
568.1	STRUCTURAL TIMBER - POST	L.F.	266
568.2	STRUCTURAL TIMBER - RAIL - AND CONNECTING HARDWARE	L.F.	580
572.2	RECONSTRUCT STONE WALL MULTIPLE STONES WIDE	L.F.	32
585.2	STONE FILL CLASS B	C.Y.	275
585.3	STONE FILL CLASS C	C.Y.	8
593.22	MEDIUM STRENGTH GEOTEXTILE, NON-WOVEN	S.Y.	170
603.59012	12" PIPE FOR DRIVES & MINOR APPROACHES (CONTRACTORS OPTION)	L.F.	30
609.01	STRAIGHT GRANITE CURB	L.F.	94
615.03	TRAFFIC SIGN TYPE C	S.F.	12
616.161	TRAFFIC SIGNALS (TEMP.)	Unit	1
619.1	MAINTENANCE OF TRAFFIC	Unit	1
632.0304	RETROREFLECTIVE PAINT PAVEMENT MARKING, DOUBLE SOLID LINE 4"	L.F.	600
641	LOAM-4" DEEP	C.Y.	230
642	LIMESTONE	Ton	0.60
643.11	FERTILIZER FOR INITIAL APPLICATION (10-10-10)	Lb.	400
644.15	SEED	Lb.	100
644.2	WETLAND RESTORATION	S.Y.	60
645.51	HAY BALES FOR TEMPORARY EROSION CONTROL	Ea.	50
645.531	SILT FENCE	L.F.	600
646.11	TURF ESTABLISHMENT WITH MULCH	S.Y.	2,000
651.1	EVERGREEN - PINUS STROBUS (WHITE PINE)	Ea.	13
652.1	DECIDUOUS - BETULA ALLEGANIENSIS (YELLOW BIRCH)	Ea.	2
652.2	DECIDUOUS - FAGUS GRANDIFOLIA (AMERICAN BEECH)	Ea.	3
652.3	DECIDUOUS - ACER RUBRUM (RED MAPLE)	Ea.	3
652.4	DECIDUOUS - ACER SACCHARINUM (SILVER MAPLE)	Ea.	2
658.1	TRANSPLANTATION - EVERGREENS	Ea.	4
692	MOBILIZATION	Unit	1
699.1	TEMP. WATER POLLUTION CONTROL - SEDIMENTATION BASIN	Unit	1
699.2	TEMP. WATER POLLUTION CONTROL - STONE FOR OUTLET PROTECTION	C.Y.	10

NO.	REVISION	DATE	BY
2	UPDATED REVISIONS AND QUANTITY PER RELOCATION OF DETOUR	1/21/02	BCL
1	UPDATED QUANTITY SUMMARY PER DOT COMMENTS	10/15/01	BCL

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Plotted 03/13/2002, 14:08

H.E. BERGERON
ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

SHEET INDEX & QUANTITY SUMMARY
OF
COLLEGE ROAD BRIDGE NO.176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	NA
DESIGNED BY	JWK
DRAWN BY	SAB
CHECKED BY	HEB
FIELD BOOK	263
SCALE	NONE
DATE	7/09/2001

95006.2
N-1
SHEET 2 OF 28

N-2
SHEET 3 OF 28

95006.2
GENERAL NOTES
COLLEGE ROAD BRIDGE

GENERAL NOTES:

1. SPECIFICATIONS FOR DESIGN, MATERIALS AND CONSTRUCTION SHALL MEET OR EXCEED THE FOLLOWING:

   A. AASHTO – AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS STANDARD SPECIFICATION FOR HIGHWAY BRIDGES, SIXTEENTH EDITION, 1996, AND ADDITIONAL INTERIM SPECIFICATIONS AS AMENDED.

   B. NHDOT – NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 1997, WITH CURRENT ADDITIONS AND MODIFICATIONS.

   C. THIS PLAN SET AND ALL CONDITIONS, SPECIFICATIONS AND SUPPLEMENTS TO NHDOT STANDARD SPECIFICATIONS CONTAINED WITHIN THE PROJECT MANUAL.

2. FINAL RESOLUTION TO CONFLICTS WITHIN THE SPECIFICATIONS OR ANY SUBSTITUTIONS SHALL BE DETERMINED BY THE ENGINEER.

3. UTILITIES:

   A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DETERMINING THE LOCATION OF ALL UTILITIES PRIOR TO ANY CONSTRUCTION PROCEDURE.

   B. RELOCATION OF UTILITIES SHALL BE COORDINATED & PAID FOR BY THE OWNER.

   C. DAMAGE TO A UTILITY BY THE CONTRACTOR SHALL BE REPORTED TO THE UTILITY COMPANY. REPAIR OF THE UTILITY SHALL BE PAID FOR BY THE CONTRACTOR

4. DESIGN BRIDGE LOADING IS H–25, AND 125% MILITARY LOADING.

5. AVERAGE DAILY TRAFFIC FOR JUNE 1995 WAS 550 VEHICLES PER DAY.

GENERAL CONSTRUCTION NOTES:

1. SEE SHEET E–1 FOR NOTES ON THE CONSTRUCTION SEQUENCE NEAR THE STREAM.

2. ALL TESTING SHALL BE ORDERED BY THE ENGINEER AND COORDINATED BY THE CONTRACTOR IN ACCORDANCE WITH NHDOT, AASHTO, AND PROJECT SPECIFICATIONS. CONTRACTOR SHALL GIVE THE ENGINEER 24 HOURS ADVANCE NOTICE PRIOR TO PLACING MATERIALS REQUIRING TESTING.

3. CONCRETE TESTING IS OUTLINED IN THE PROJECT MANUAL UNDER THE SUPPLEMENTAL NHDOT SPECIFICATIONS AMENDMENT TO SECTION 520. CONCRETE TESTING COSTS TO BE INCLUDED IN THE ITEM.

4. SOIL TESTING WILL BE PERFORMED BY THE ENGINEER OR BY A QUALIFIED PERSON APPOINTED BY THE ENGINEER. SOIL TESTING WILL BE PAID DIRECTLY BY THE OWNER.

5. DETERMINATION OF MAXIMUM DENSITIES FOR SAND AND GRAVELS ARE THE RESPONSIBILITY OF THE CONTRACTOR. PROCTOR TESTS ORDERED BY THE ENGINEER SHALL BE SAMPLED & PERFORMED BY AN INDEPENDENT LAB AND PAID FOR BY THE CONTRACTOR. CONTROL STRIPS SHALL BE PERFORMED BY THE CONTRACTOR UNDER THE SUPERVISION OF THE ENGINEER, AND PAID FOR BY THE CONTRACTOR.

6. ROADWAY, BRIDGE & DETOUR LAYOUT ARE THE RESPONSIBILITY OF THE CONTRACTOR.

EARTHWORK NOTES:

1. ITEM 201.1 CLEARING AND GRUBBING SHALL COMPLY WITH NHDOT SPECIFICATIONS WITH THE FOLLOWING ONE EXCEPTION: SECTION 3.1.3 CLEARING AND GRUBBING SHALL EXTEND NO MORE THAN 3 FT BEYOND AREAS OF EXCAVATION AND EMBANKMENT SLOPES. SEE SHEET SP–4 AND ROADWAY CROSS SECTIONS.

2. ITEM 202.7 REMOVAL OF GUARDRAIL. CONTRACTOR IS RESPONSIBLE FOR SALVAGE OR PROPER DISPOSAL OF MATERIALS OFF THE PROJECT SITE. ALL MATERIALS BECOME PROPERTY OF THE CONTRACTOR.

3. ITEM 203.1 COMMON EXCAVATION. THIS ITEM INCLUDES ALL EXCAVATION EXCEPT COMMON BRIDGE EXCAVATION AND ROCK BRIDGE EXCAVATION THIS EXCAVATION ALSO INCLUDES: (1) REMOVAL OF ASPHALT PAVEMENT AND BASE TO A 1 FT DEPTH BELOW EXISTING GRADE IN SHALLOW CUTS; (2) EXCAVATION TO A 1 FT DEPTH IN SHALLOW CUTS ON SLOPES; (3) EXCAVATION TO A 1 FT DEPTH BELOW EXISTING SLOPES IN FILL AREAS. ITEM TO BE PAID ON ACTUAL QUANTITIES EXCAVATED.

4. ITEM 209.201 GRANULAR BACKFILL BRIDGE. THIS ITEM TO BE USED FOR BACKFILL BEHIND THE BRIDGE AND WINGWALLS. THE MATERIAL SHALL MEET THE REQUIREMENTS OF ITEM 304.2 ADDITIONALLY, THE MATERIAL SHALL BE COMPACTED TO 98% OF ITS MAXIMUM DENSITY

5. ITEM 209.4 GRANULAR BACKFILL–GRAVEL. THIS ITEM TO BE USED AS A 6" GRAVEL BLANKET UNDER ITEM 585.2–STONE FILL CLASS B.

BASE COURSE NOTES:

1. ITEM 304.2 GRAVEL. THIS ITEM SHALL INCLUDE THE 12" ROADWAY BASE COURSE AND ANY EMBANKMENT MATERIAL REQUIRED.

2. ITEM 304.3 CRUSHED GRAVEL. THIS ITEM SHALL INCLUDE THE 6" ROADWAY BASE COURSE (SHEET CD–1).

PAVEMENT NOTES:

1. ITEM 403.11 HOT BITUMINOUS PAVEMENT, MACHINE METHOD. THIS ITEM TO INCLUDE ALL BITUMINOUS PAVING. THIS SHALL INCLUDE A 2" BASE COURSE AND A 1" TOP COURSE; SEE SHEETS SP–2, S–1, AND CD–1 FOR ROADWAY DETAILS.

STRUCTURE NOTES:

1. ITEM 502 REMOVAL OF EXISTING BRIDGE STRUCTURE. THIS ITEM SHALL INCLUDE REMOVAL, SALVAGE AND DISPOSAL OFF PROJECT OF THE EXISTING BRIDGE DECKING, PAVEMENT, STRINGERS, GUARDRAIL, CUT GRANITE ABUTMENTS AND WING WALLS, CONCRETE CHANNEL FLOOR, AND ANY OTHER MATERIALS ASSOCIATED WITH REMOVAL OF THE BRIDGE STRUCTURE. ALL MATERIALS EXCEPT CUT GRANITE SHALL BECOME PROPERTY OF THE CONTRACTOR. ALL CUT GRANITE SHALL BE SALVAGED, REMAIN PROPERTY OF THE TOWN AND SHALL BE TAKEN TO A LOCATION SPECIFIED BY THE TOWN. (SEE SHEET S–1)

2. ITEM 508 STRUCTURAL FILL. THIS ITEM TO BE USED FOR STRUCTURAL FILL UNDER THE FOOTINGS AS NECESSARY. EITHER CRUSHED GRAVEL FOR STRUCTURAL FILL, BANK RUN GRAVEL FOR STRUCTURAL FILL, OR CLEAN STONE FILL FOR STRUCTURAL FILL MAY BE USED FOR THIS ITEM. GRADATION SHALL MEET THE REQUIREMENTS OF THIS SPECIFICATION.

3. ITEM 520.12 CONCRETE CLASS A ABOVE FOOTINGS. SEE SHEETS S–3, S–5, AND SUPPLEMENTS TO NHDOT SPECIFICATIONS. (SECTION 520) IN THE PROJECT MANUAL FOR DETAILS. THIS ITEM SHALL INCLUDE ALL TESTING AND ASSOCIATED COSTS.

4. ITEM 520.011 CONCRETE CLASS AA–WITH HIGH RANGE WATER REDUCING ADMIXTURE. SEE SHEET S–4 AND SUPPLEMENTS TO NHDOT SPECIFICATIONS (SECTION 520) IN THE PROJECT MANUAL FOR DETAILS. THIS ITEM SHALL INCLUDE ALL TESTING AND ASSOCIATED COSTS.

5. ITEM 520.03 CONCRETE CLASS AA–APPROACH SLAB. SEE SHEETS S–1, S–2, S–3 AND SUPPLEMENTS TO NHDOT SPECIFICATIONS (SECTION 520) IN THE PROJECT MANUAL FOR DETAILS. THIS ITEM SHALL INCLUDE ALL TESTING AND ASSOCIATED COSTS.

6. ITEM 520.21 CONCRETE CLASS B–FOOTINGS. SEE SHEETS S–3, S–5, AND SUPPLEMENTS TO NHDOT SPECIFICATIONS (SECTION 520) IN THE PROJECT MANUAL FOR DETAILS. THIS ITEM SHALL INCLUDE ALL TESTING AND ASSOCIATED COSTS.

7. ITEM 529 PRECAST DECK. THIS ITEM SHALL INCLUDE ALL MATERIAL AND PROCEDURES REQUIRED FOR PURCHASING, DELIVERY, STORAGE, INSTALLATION, AND PROTECTION OF THE PRECAST BRIDGE ASSEMBLY AND ACCESSORIES. THIS INCLUDES, BUT NOT LIMITED TO, PRECAST CONCRETE PARTS, MOUNTING HARDWARE, ELASTOMERIC BEARING PADS, SEALING AND GROUTING MATERIALS, CRANE AND RIGGING. SEE SUPPLEMENTS TO NHDOT SPECIFICATIONS IN THE PROJECT MANUAL FOR DETAILS.

8. ITEM 538.1 BARRIER MEMBRANE THIS ITEM INCLUDES BARRIER MEMBRANE INSTALLED ON THE TOP PORTION OF THE PRECAST BRIDGE DECK & APPROACH SLABS. (SEE SHEETS S–4 & S–5)

9. ITEM 544 REINFORCING STEEL. THIS ITEM INCLUDES ALL REINFORCING STEEL IN THE FOOTINGS AND ABUTMENTS. SEE SHEET S–3 FOR DETAILS.

10. ITEM 544.2 REINFORCING STEEL – EPOXY COATED THIS INCLUDES ALL REINFORCING STEEL IN THE CONCRETE DECK OVERLAY & APPROACH SLABS.

11. ITEM 550.1 STRUCTURAL STEEL. THIS ITEM INCLUDES ALL STEEL ASSOCIATED WITH BRIDGE RAILING POSTS AND CURB ANGLE. THIS INCLUDES: (1) BRIDGE RAIL POST/FABRICATION, ANCHOR ASSEMBLY, NUTS, BOLTS, AND WASHERS; (2) ANGLE FABRICATION INSTALLED AT CURB LEVEL. SEE SHEETS S–4 AND S–7 FOR DETAILS AND MATERIAL SPECIFICATIONS.

12. ITEM 585.3 STONE FILL CLASS "C" SHALL COMPLY WITH NHDOT SPECIFICATION 585.3 WITH THE FOLLOWING ONE EXCEPTION: (1) GRADATION SHALL BE MODIFIED SO 20–50 % PASS THE 4" SIEVE. THIS ITEM TO BE USED FOR DITCH LINING AS SHOWN ON SHEETS S–1 AND CD–2.

13. ITEM 593.22 MEDIUM STRENGTH GEOTEXTILE. THIS WORK TO CONSIST OF FURNISHING AND INSTALLING MIRAFI FILTER WEAVE 300 FABRIC (OR EQUIVALENT) UNDER THE STONE FILL CLASS B. WHERE FABRIC IS TO BE SPLICED, THE MINIMUM LAP SHALL BE 12". THE FABRIC SHALL BE ANCHORED AROUND THE LINED CHANNEL PERIMETER BY BURYING 12" INTO NATURAL SOIL. THIS ITEM WILL BE MEASURED IN PLACE, ALONG SLOPES, AND PAID FOR BY THE SQUARE YARD AS SHOWN IN PLAN VIEW. SEE SHEET CD–2 FOR DETAILS.

INCIDENTAL CONSTRUCTION NOTES:

1. ITEM 615.03 TRAFFIC SIGNS TYPE C SHALL COMPLY WITH NHDOT SPECIFICATIONS WITH THE FOLLOWING ONE EXCEPTION: (1) THIS ITEM SHALL BE PAID FOR BY THE UNIT. THIS ITEM INCLUDES 4 PERMANENT TYPE "C" OBJECT MARKERS (OM–3) WITH POSTS, INSTALLED. SEE SHEET CD–3.

2. ITEM 646.11 TURF ESTABLISHMENT WITH MULCH. THIS ITEM INCLUDES PLACING HAY MULCH ON ALL SLOPES AND CUTS FROM STA 2+00 TO STA 6+50 THAT HAVE BEEN SEEDED. THIS MAY EXTEND TO THE EDGE OF CLEARING AND GRUBBING, AND TO STREAM BANKS/STONE FILL. ALSO INCLUDES AREAS USED FOR TEMPORARY WATER POLLUTION CONTROL AND DETOUR.

NO.	REVISION	DATE	BY
1	UPDATED GENERAL NOTES PER DOT COMMENTS	10/15/01	BCL

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GENERAL NOTES
FOR
COLLEGE ROAD BRIDGE NO. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	NA
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	NA
SCALE	NONE
DATE	7/09/2001

95006.2
N–2
SHEET 3 OF 28

SP-1
SHEET 4 OF 28

95006.2
EXISTING FEATURES SITE PLAN
COLLEGE ROAD BRIDGE

T.L. 16-3-6 (OLD FORM)
RHEAUME J.
LAMOUREUX REV. TRUST
(F. FARMINGTON NATIONAL BANK -SEPT. 16, 1994- B.1590, P.351; ALSO SEE ROBERTS TO TEARE & LEONE -DEC. 17,1966- B.410, P.64, TRACT #1)

T.L. 116-17
ESTHER D. TEARE
(F. HELENA FURNEE -MAY 12, 1960- B.514, P.343, PARCEL TWO)

T.L. 117-1
JOSEPH I., IV &
ELAINE L. MELANSON
(F. FARMINGTON NATIONAL BANK -SEPT. 8, 1994- B.1588, P.625, FIRST PARCEL; SEE ALSO PLAN REF. 2)

T.L. 116-16
CHRISTOPHER &
ANGELA D. KEEF
(FORMERLY FRANCIS G. & SANDRA N. HANKUS -OCT. 23, 2000- B.1867, P.847; SEE ALSO TEARE TO HANKUS -AUG. 3, 1992- B.1495, P.297; AND BOUNDARY LINE AGREEMENT WITH JOSEPH I., IV & ELAINE L. MELANSON -FEB. 22, 1996- B.1646, P.401; SEE PLAN REF. 3)

LAMOUREUX TRUST
(SEE B.410, P.64, TRACT #2)

WILLEY BROOK

DRAINAGE POND

DRAINAGE DITCH

DRAINAGE SWALE

R.O.W. LINE APPROXIMATING FORMER STONEWALL ALIGNMENT PER PLAN REF. 1

BOUNDARY FENCE PER PLAN REF. 2

PROPERTY LINE IS THREAD OF BROOK

TBM #1
EL. 495.83'
P.K. NAIL SET IN
ROOT OF 18" W. PINE

TBM #2 EL. 492.44'
VERT. P.K. NAIL SET IN
BASE OF 34" W. PINE
WITH BARBED WIRE

TBM #3
EL. 497.85'
P.K. NAIL SET IN
ROOT OF 20" W. PINE

SURVEY POINT 1
STA: 2+00
OFFSET: 10.23 R

SURVEY POINT 2
STA: 4+01.09
OFFSET: 10.03 L
RIVER BASELINE 1+50

SURVEY POINT 3
STA: 6+03.91
OFFSET: 10.27 L

RIVER BASELINE

TO ROUTE 28
WOLFEBORO CENTER

COLLEGE ROAD

TO COTTON VALLEY & COTTONBOROUGH DISTRICT

S77°44'47"E

ANG = 22-49-52
RAD = 300.00'
TAN = 60.58'
ARC = 119.54'

(4) EVERGREEN

STEEL STAKE W/ CAP "RLS 638" FND.

1-STORY WOOD-FRAME HOUSE

DECK

PORCH

SEPTIC TANK

GRAVEL DRIVE

ELECTRIC METER

SHED

WETLAND DELINEATION

MAGNETIC VAR.

LEGEND

- PROPERTY LINE
- ROAD CENTERLINE
- EDGE OF PAVEMENT
- EDGE OF GRAVEL
- CONTOUR MAJOR
- CONTOUR MINOR
- RIGHT-OF-WAY
- EXISTING TREE LINE
- EDGE OF WATER
- OVERHEAD UTILITY LINE/POLE
- FENCE
- WETLAND
- STONE WALLS
- OHU/T/P — OVERHEAD UTILITY LINE/ TELEPHONE/ POWER
- OHU/C — OVERHEAD UTILITY LINE/ CABLE

20 0 20 40 80 ft
4 0 10 20 m
1 inch = 20 feet
(1 : 240)

ROAD BASELINE SURVEY POINT COORDINATES (ALL ARE P.K. NAILS SET IN EDGE OF PAVEMENT)

POINT	NORTHING	EASTING	ELEVATION	STATION
1	10000.00	10000.00	500.00 (ASSUMED)	0+00.00
2	9977.12	10200.81	495.10	2+02.11
3	9898.06	10389.33	502.23	4+06.54

SURVEY NOTES:

1. CONTOUR INTERVAL = 2 FT. ELEVATIONS ARE BASED ON AN ASSUMED DATUM.
2. SITE FEATURES AND TOPOGRAPHY SHOWN ARE FROM A FEB. 1995 FIELD SURVEY PERFORMED WITH A GEODETIC TOTAL STATION & ELECTRONIC DATA COLLECTOR, USING TRIGONOMETRIC LEVELING. DIFFERENTIAL LEVELING WAS PERFORMED WITH AN AUTOMATIC LEVEL THROUGH ROAD BASE-LINE STATIONS, SURVEY POINTS & TBM'S.
3. GRID COORDINATES ARE ASSUMED. BEARINGS ARE MAGNETIC 1995.
4. SURVEY POINTS SHOWN ARE TIED TO TREES MARKED WITH TACK AND PAINT OR FLAGGING.
5. COLLEGE ROAD RIGHT-OF-WAY IS VARIABLE-WIDTH; LINES SHOWN APPROXIMATE ALIGNMENTS OF ROADS WALLS FOUND PER SURVEY REF. 1, MOST OF WHICH WERE DESTROYED BY SUBSEQUENT ROAD-IMPROVEMENT WORK. NO LAYOUT WAS FOUND; SEE NOTE ON PLAN REF. 3.

PLAN REFERENCES:

1. OCTOBER 18, 1968 PLAN AND PROFILE MAPS OF COLLEGE RD. (SHEETS 2 & 3) BY LAKES REGION SURVEY SERVICE.
2. NOVEMBER 21, 1978 "PLAN OF SUBDIVISION FOR PAUL M. & CAROL M. FURNEE" BY LAKES REGION SURVEY SERVICE, RECORDED CARROLL COUNTY REGISTRY OF DEEDS PLAN BOOK 43, PAGE 53.
3. FEBRUARY 3, 1996 PLAN "BOUNDARY LINE AGREEMENT FOR FRANCIS G. HANKUS & JOSEPH I. MELANSON IV" BY LINDON DESIGN ASSOCIATES, RECORDED P.B.155, P.50.

NO.	REVISION	DATE	BY

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H.E. BERGERON ENGINEERS, P.A.
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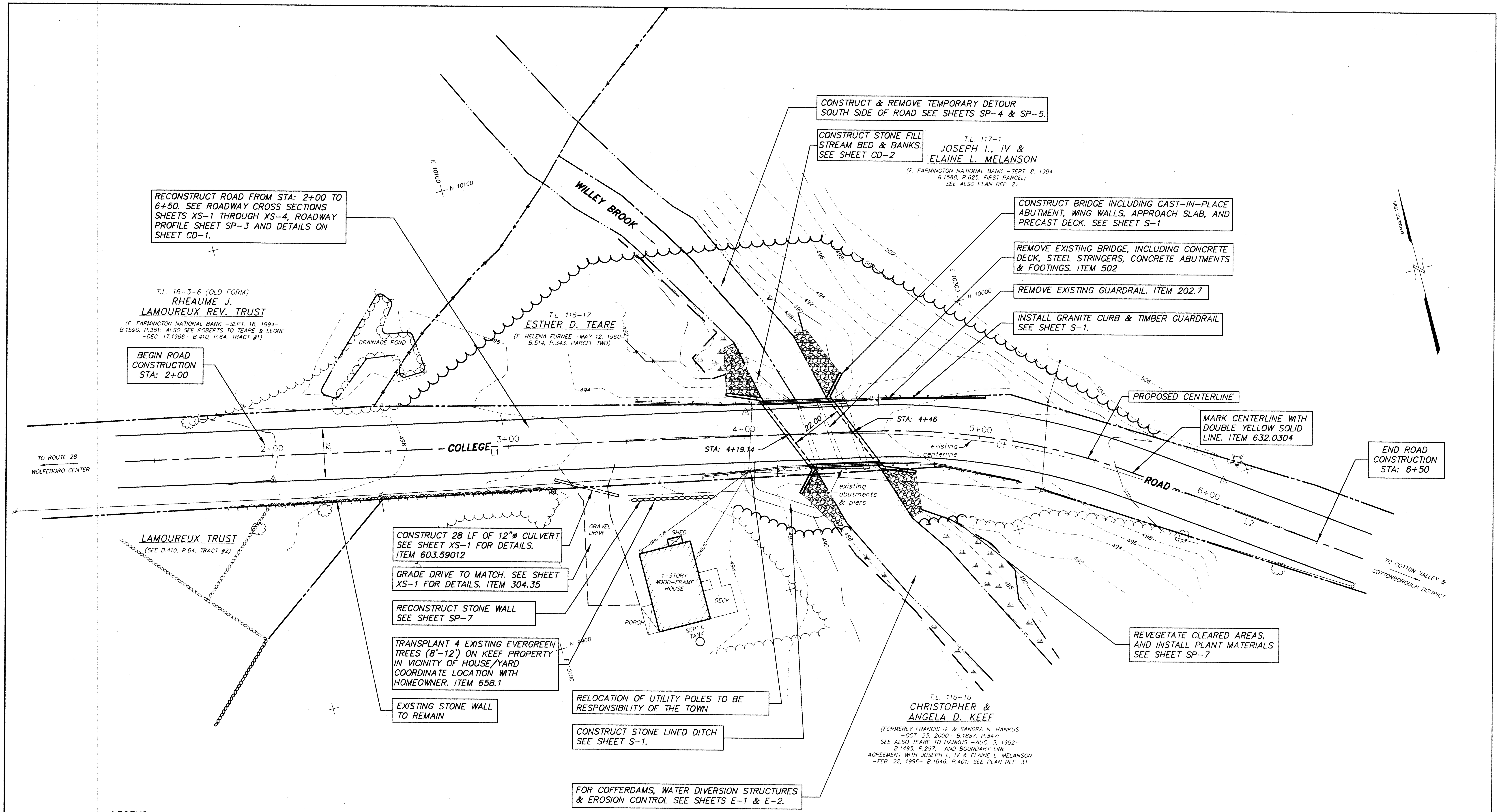
EXISTING-FEATURES SITE PLAN
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	TDA/PWG
DESIGNED BY	JWK
DRAWN BY	SAB
CHECKED BY	HEB
FIELD BOOK	263
SCALE	1"=20'
DATE	7/09/2001

95006.2
SP-1
SHEET 4 OF 28

SP-2
SHEET 5 OF 28

95006.2
PROPOSED SITE PLAN
COLLEGE ROAD BRIDGE



CONSTRUCT & REMOVE TEMPORARY DETOUR SOUTH SIDE OF ROAD SEE SHEETS SP-4 & SP-5.
CONSTRUCT STONE FILL STREAM BED & BANKS. SEE SHEET CD-2
T.L. 117-1
JOSEPH I., IV & ELAINE L. MELANSON
(F. FARMINGTON NATIONAL BANK -SEPT. 8, 1994- B.1588, P.625, FIRST PARCEL; SEE ALSO PLAN REF. 2)
RECONSTRUCT ROAD FROM STA: 2+00 TO 6+50. SEE ROADWAY CROSS SECTIONS SHEETS XS-1 THROUGH XS-4, ROADWAY PROFILE SHEET SP-3 AND DETAILS ON SHEET CD-1.
WILLEY BROOK
CONSTRUCT BRIDGE INCLUDING CAST-IN-PLACE ABUTMENT, WING WALLS, APPROACH SLAB, AND PRECAST DECK. SEE SHEET S-1
REMOVE EXISTING BRIDGE, INCLUDING CONCRETE DECK, STEEL STRINGERS, CONCRETE ABUTMENTS & FOOTINGS. ITEM 502
REMOVE EXISTING GUARDRAIL. ITEM 202.7
INSTALL GRANITE CURB & TIMBER GUARDRAIL SEE SHEET S-1.
T.L. 16-3-6 (OLD FORM)
RHEAUME J. LAMOUREUX REV. TRUST
(F. FARMINGTON NATIONAL BANK -SEPT. 16, 1994- B.1590, P.351; ALSO SEE ROBERTS TO TEARE & LEONE -DEC. 17,1966- B.410, P.64, TRACT #1)
T.L. 116-17
ESTHER D. TEARE
(F. HELENA FURNEE -MAY 12, 1960- B.514, P.343, PARCEL TWO)
DRAINAGE POND
BEGIN ROAD CONSTRUCTION STA: 2+00
PROPOSED CENTERLINE
MARK CENTERLINE WITH DOUBLE YELLOW SOLID LINE. ITEM 632.0304
STA: 4+46
STA: 4+19.14
COLLEGE
ROAD
TO ROUTE 28
WOLFEBORO CENTER
existing centerline
existing obutments & piers
END ROAD CONSTRUCTION STA: 6+50
TO COTTON VALLEY & COTTONBOROUGH DISTRICT
LAMOUREUX TRUST
(SEE B.410, P.64, TRACT #2)
CONSTRUCT 28 LF OF 12"ø CULVERT SEE SHEET XS-1 FOR DETAILS. ITEM 603.59012
GRAVEL DRIVE
SHED
1-STORY WOOD-FRAME HOUSE
DECK
PORCH
SEPTIC TANK
GRADE DRIVE TO MATCH. SEE SHEET XS-1 FOR DETAILS. ITEM 304.35
RECONSTRUCT STONE WALL SEE SHEET SP-7
TRANSPLANT 4 EXISTING EVERGREEN TREES (8'-12') ON KEEF PROPERTY IN VICINITY OF HOUSE/YARD COORDINATE LOCATION WITH HOMEOWNER. ITEM 658.1
EXISTING STONE WALL TO REMAIN
RELOCATION OF UTILITY POLES TO BE RESPONSIBILITY OF THE TOWN
CONSTRUCT STONE LINED DITCH SEE SHEET S-1.
REVEGETATE CLEARED AREAS, AND INSTALL PLANT MATERIALS SEE SHEET SP-7
T.L. 116-16
CHRISTOPHER & ANGELA D. KEEF
(FORMERLY FRANCIS G. & SANDRA N. HANKUS -OCT. 23, 2000- B.1887, P.847; SEE ALSO TEARE TO HANKUS -AUG. 3, 1992- B.1495, P.297; AND BOUNDARY LINE AGREEMENT WITH JOSEPH I., IV & ELAINE L. MELANSON -FEB. 22, 1996- B.1646, P.401, SEE PLAN REF. 3)
FOR COFFERDAMS, WATER DIVERSION STRUCTURES & EROSION CONTROL SEE SHEETS E-1 & E-2.

LEGEND

- PROPOSED PAVEMENT
- PROPOSED ROADWAY CENTERLINE
- PROPOSED CONTOUR
- PROPOSED TREELINE
- PROPOSED RIPRAP
- PROPOSED CULVERT

1 inch = 20 feet
(1 : 240)

ROADWAY TANGENT TABLE

LINE	LENGTH	BEARING
L1	312.46	S77°44'47"E
L2	100.78	S54°54'55"E

ROADWAY CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA	PT STATION	PC STATION
C1	119.54	300.00	22°49'52"	5+69.94	4+50.40

NO.	REVISION	DATE	BY

FILE: 95006_2_SP2.DWG
Plotted: 07/10/2001, 09:29

HEB
H.E. BERGERON ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

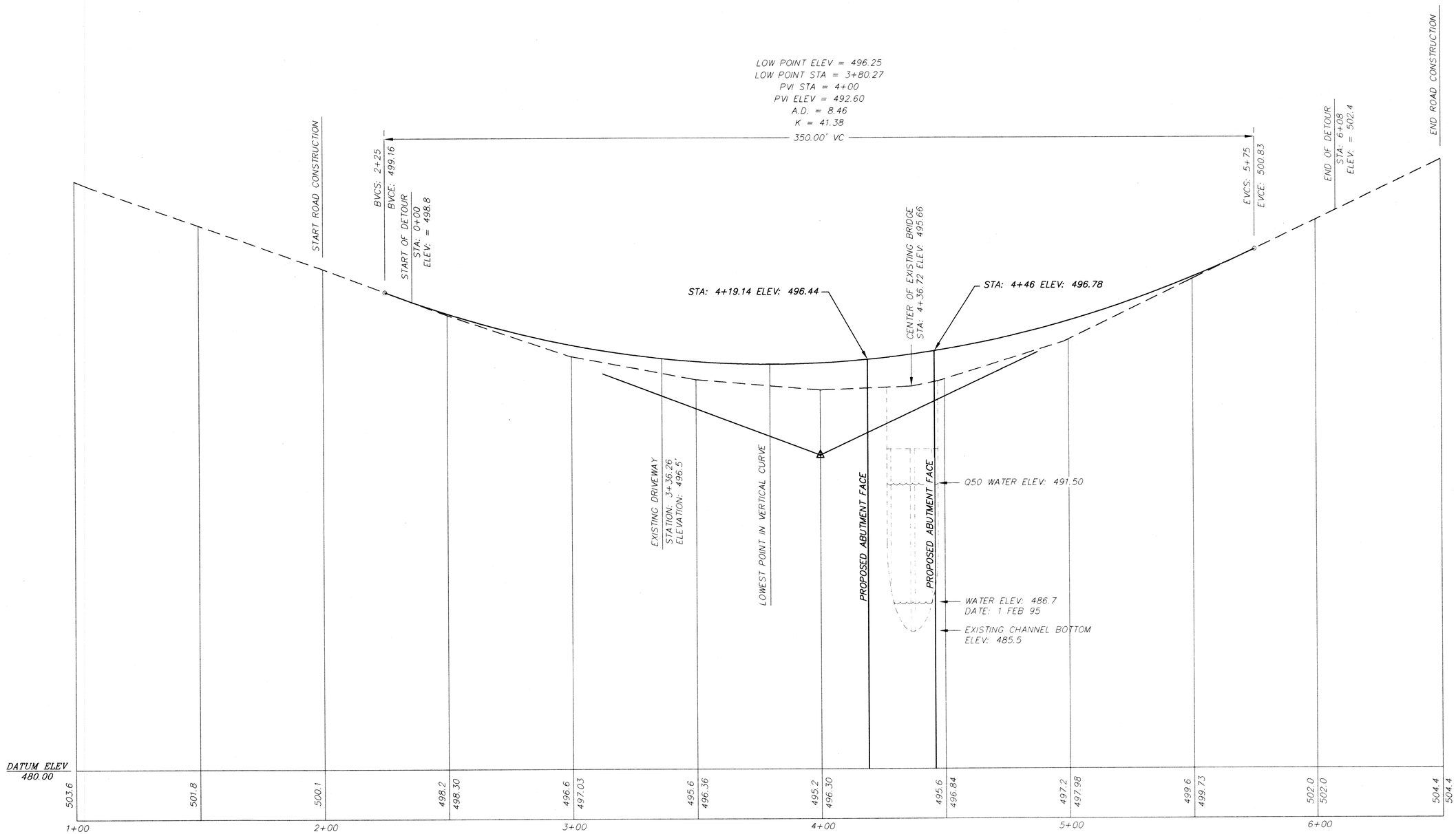
PROPOSED SITE PLAN
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	TDA/PWG
DESIGNED BY	JWK
DRAWN BY	SAB
CHECKED BY	HEB
FIELD BOOK	263
SCALE	1"=20'
DATE	7/09/2001

95006.2
SP-2
SHEET 5 OF 28

SP-3
SHEET 6 OF 28

95006.2
PROPOSED PROFILE
COLLEGE ROAD BRIDGE



PROFILE

SCALE:
HORIZONTAL: 1" = 20'
VERTICAL: 1" = 2'

PEAK FLOWS		
Q2	=	350 CFS
Q10	=	725 CFS
Q50	=	1,320 CFS

20 0 20 40 80 ft
4 0 10 20 m
1 inch = 20 feet
(1 : 240)

NO.	REVISION	DATE	BY

FILE: 95006_2_SP3.DWG
Plotted: 07/10/2001 09:57

H.E. BERGERON ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

PROPOSED PROFILE
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	TDA/PWG
DESIGNED BY	JWK
DRAWN BY	SAB
CHECKED BY	HEB
FIELD BOOK	263
SCALE	1"=20'
DATE	7/09/2001

95006.2
SP-3
SHEET 6 OF 28

SP-4
SHEET 7 OF 28

95006.2
TEMPORARY DETOUR PLAN
COLLEGE ROAD BRIDGE

1:1 SLOPE FOR TEMPORARY CULVERT OPTION

TEMPORARY BRIDGE OPTION OR TEMPORARY CULVERT OPTION SEE SHEET CD-3

INSTALL BARRIERS ENTIRE LENGTH OF DETOUR SEE DETOUR SECTION SHEET CD-3

TEMPORARY CONSTRUCTION EASEMENT SEE SHEET SP-6 FOR DETAILS

INSTALL GABIONS, CONCRETE BLOCKS, OR SHEETING AS REQUIRED TO STABILIZE EXCAVATION SUBSIDIARY TO ITEM 501.2

TEMPORARY DETOUR CENTERLINE

CLEARING LIMITS

DRAINAGE POND

ROAD STA: 2+35.47 = DETOUR STA: 0+00 ELEVATION: 498.8'

FOUNDATION EXCAVATION LIMITS (APX.)

TEMPORARY TRAFFIC SIGNAL APX. 200' EAST OF DETOUR ITEM 616.161

ROAD STA: 6+8.04 = DETOUR STA: 4+10.04 ELEVATION: 502.4'

TEMPORARY TRAFFIC SIGNAL APX. 200' WEST OF DETOUR ITEM 616.161

TEMPORARY CONSTRUCTION EASEMENT SEE SHEET SP-6 FOR DETAILS

CLEARING LIMITS

OHU/P

OHU/C

SEPTIC TANK

existing treeline

wetland

NOTES:

1. SEE SHEET CD-3 FOR DETOUR DETAILS & TRAFFIC CONTROL DEVICES.
2. SEE SHEET SP-5 FOR DETOUR PROFILE.
3. TEMPORARY DETOUR, INCLUDING CULVERTS, STONE, GRAVEL & GEOTEXTILE FABRIC TO BE PAID FOR UNDER ITEM 501.2
4. CONSTRUCTION SIGNS, BARRICADES, CHANNELING DEVICES & TEMPORARY FENCE TO BE INCLUDED IN ITEM 619.1
5. TEMPORARY SIGNALS TO BE INCLUDED IN ITEM 616.161. SEE SUPPLEMENTAL NHDOT SPECIFICATION IN PROJECT MANUAL.

15 0 15 30 60 ft
3 0 7 15 m
1 inch = 15 feet
(1 : 180)

DETOUR CURVE TABLE

CURVE	LENGTH	RADIUS	DELTA	PC STATION	PT STATION
C1	47.54	75.00	36°18'53"	0+00	0+47.54
C2	44.44	75.00	33°56'46"	0+95.86	1+40.29
C3	46.65	75.00	35°38'30"	2+03.98	2+50.64
C4	13.67	75.00	10°26'31"	3+96.37	4+10.04

DETOUR TANGENT TABLE

LINE	LENGTH	BEARING
L1	48.32	N65°56'20"E
L2	63.69	N80°06'54"W
L3	145.73	N44°28'24"W

NO.	REVISION	DATE	BY

FILE: 95006_2_SP4.DWG
Plotted: 07/10/2001 10:18

H.E. BERGERON ENGINEERS, P.A.
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(603) 356-6936

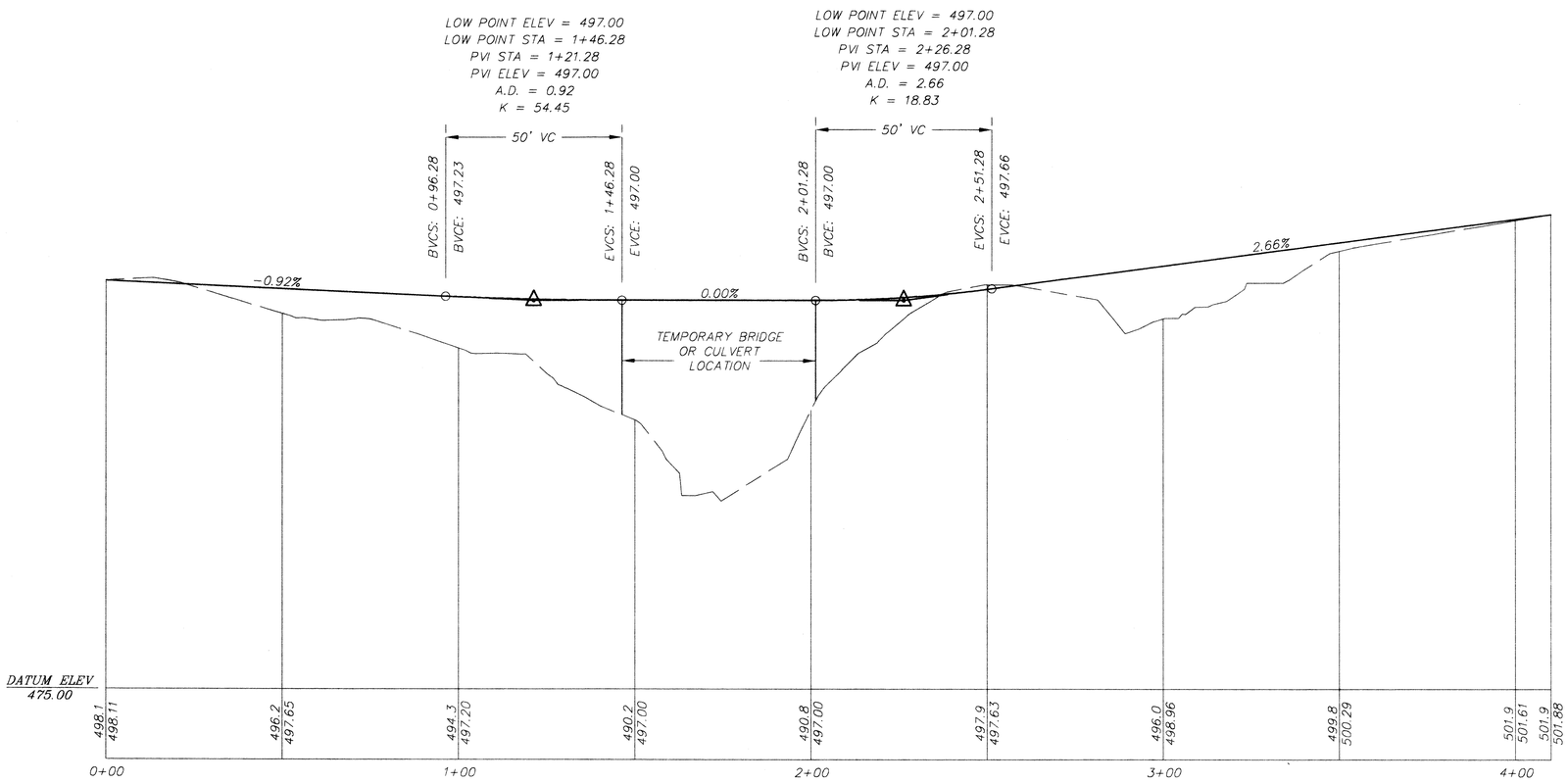
TEMPORARY DETOUR PLAN
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	TDA/PWG
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	263
SCALE	1"=15'
DATE	7/09/2001

95006.2
SP-4
SHEET 7 OF 28

SP-5
SHEET 8 OF 28

95006.2
TEMPORARY DETOUR PROFILE
COLLEGE ROAD BRIDGE



DETOUR PROFILE

SCALE:
HORIZONTAL: 1" = 20'
VERTICAL: 1" = 4'

20 0 20 40 80 ft
4 0 10 20 m
1 inch = 20 feet
(1 : 240)

NO.	REVISION	DATE	BY

FILE: 95006_2_SP5.DWG
Plotted: 07/10/2001, 10:22

H.E. BERGERON ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

TEMPORARY DETOUR PROFILE
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

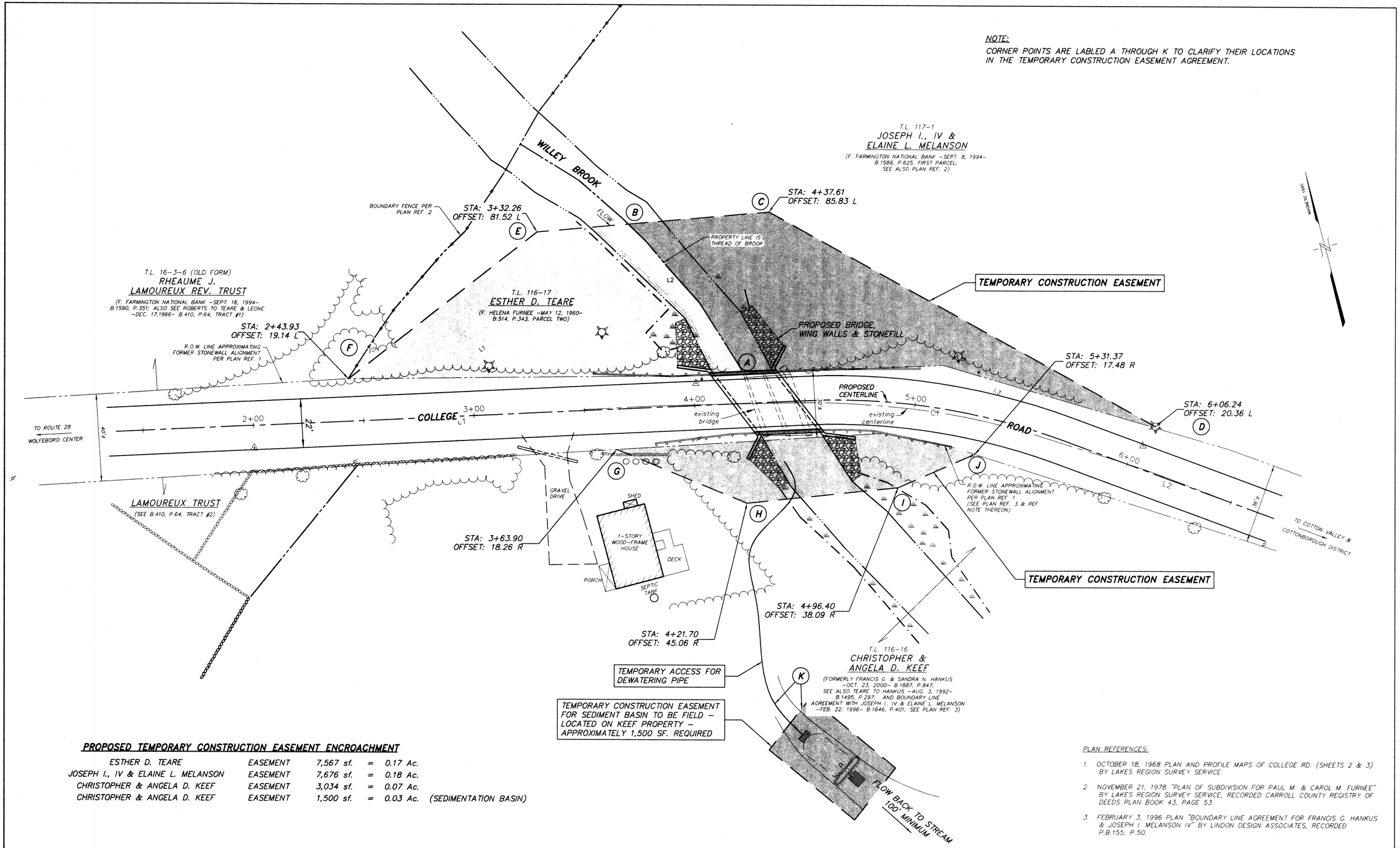
SURVEYED BY	TDA
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	263
SCALE	1"=10'
DATE	7/09/2001

95006.2
SP-5
SHEET 8 OF 28

SP-6
SHEET 9 OF 28

95006.2
PROPOSED TEMPORARY CONSTRUCTION EASEMENT
COLLEGE ROAD BRIDGE

NOTE:
CORNER POINTS ARE LABLED A THROUGH K TO CLARIFY THEIR LOCATIONS IN THE TEMPORARY CONSTRUCTION EASEMENT AGREEMENT.



PROPOSED TEMPORARY CONSTRUCTION EASEMENT ENCROACHMENT

ESTHER D. TEARE	EASEMENT	7,567 sf.	=	0.17 Ac.	
JOSEPH I., IV & ELAINE L. MELANSON	EASEMENT	7,676 sf.	=	0.18 Ac.	
CHRISTOPHER & ANGELA D. KEEF	EASEMENT	3,034 sf.	=	0.07 Ac.	
CHRISTOPHER & ANGELA D. KEEF	EASEMENT	1,500 sf.	=	0.03 Ac.	(SEDIMENTATION BASIN)

PLAN REFERENCES:

1. OCTOBER 18, 1968 PLAN AND PROFILE MAPS OF COLLEGE RD. (SHEETS 2 & 3) BY LAKES REGION SURVEY SERVICE.
2. NOVEMBER 21, 1978 "PLAN OF SUBDIVISION FOR PAUL M. & CAROL M. FURNEE" BY LAKES REGION SURVEY SERVICE, RECORDED CARROLL COUNTY REGISTRY OF DEEDS PLAN BOOK 43, PAGE 53.
3. FEBRUARY 3, 1996 PLAN "BOUNDARY LINE AGREEMENT FOR FRANCIS G. HANKUS & JOSEPH I. MELANSON IV" BY LINDON DESIGN ASSOCIATES, RECORDED P.B.155, P.50.

20 0 20 40 80 ft
4 0 10 20 m
1 inch = 20 feet
(1 : 240)

NO.	REVISION	DATE	BY
1	RELOCATED DETOUR	1/21/02	BCL

FILE: 95006_2_SP6.DWG
Plotted: 01/21/2002, 10:55

H.E. BERGERON
ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

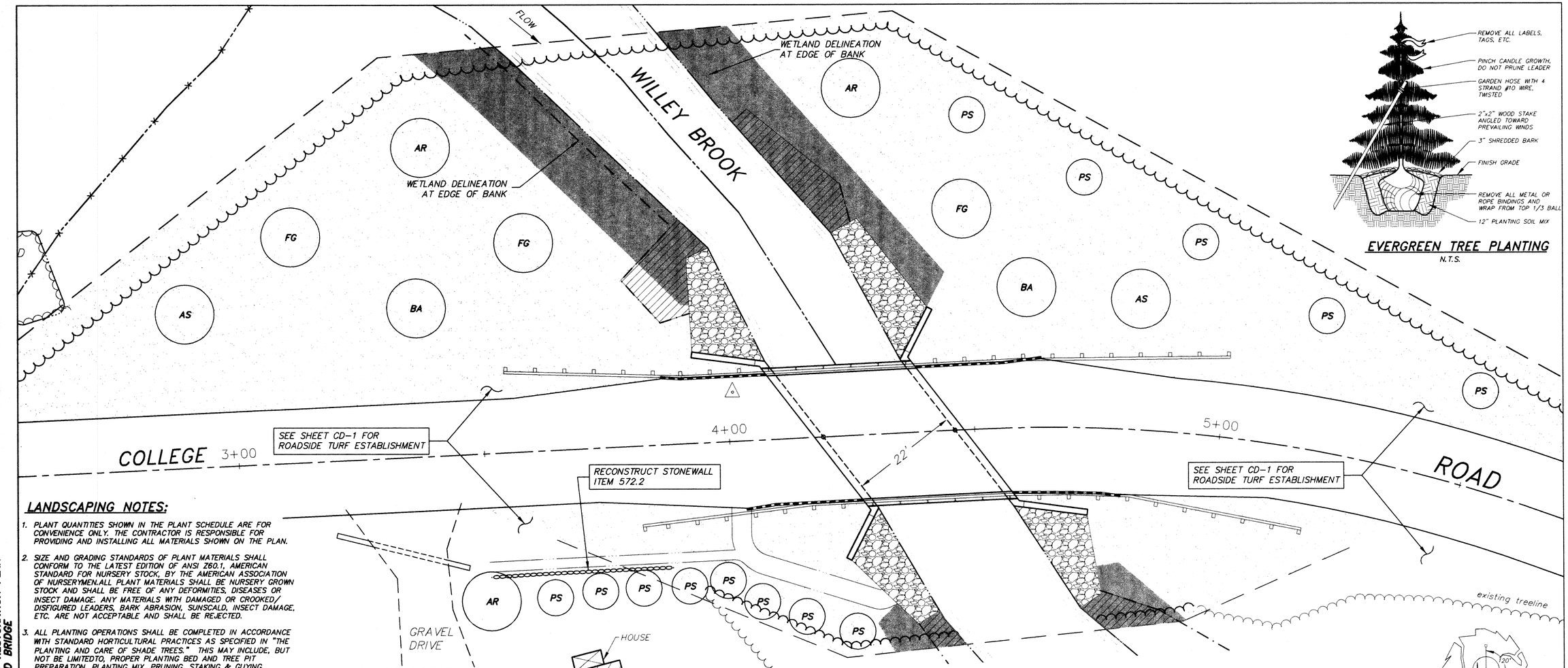
PROPOSED TEMPORARY CONSTRUCTION EASEMENT
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	TDA/PWG
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	263
SCALE	1"=20'
DATE	7/09/2001

95006.2
SP-6
SHEET 9 OF 28

SP-7
SHEET 10 OF 28

95006.2
LANDSCAPING & WETLAND RESTORATION PLAN
COLLEGE ROAD BRIDGE



EVERGREEN TREE PLANTING
N.T.S.

LANDSCAPING NOTES:

1. PLANT QUANTITIES SHOWN IN THE PLANT SCHEDULE ARE FOR CONVENIENCE ONLY. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND INSTALLING ALL MATERIALS SHOWN ON THE PLAN.
2. SIZE AND GRADING STANDARDS OF PLANT MATERIALS SHALL CONFORM TO THE LATEST EDITION OF ANSI Z60.1, AMERICAN STANDARD FOR NURSERY STOCK, BY THE AMERICAN ASSOCIATION OF NURSERYMEN.ALL PLANT MATERIALS SHALL BE NURSERY GROWN STOCK AND SHALL BE FREE OF ANY DEFORMITIES, DISEASES OR INSECT DAMAGE. ANY MATERIALS WITH DAMAGED OR CROOKED/ DISFIGURED LEADERS, BARK ABRASION, SUNSCALD, INSECT DAMAGE, ETC. ARE NOT ACCEPTABLE AND SHALL BE REJECTED.
3. ALL PLANTING OPERATIONS SHALL BE COMPLETED IN ACCORDANCE WITH STANDARD HORTICULTURAL PRACTICES AS SPECIFIED IN "THE PLANTING AND CARE OF SHADE TREES." THIS MAY INCLUDE, BUT NOT BE LIMITEDTO, PROPER PLANTING BED AND TREE PIT PREPARATION, PLANTING MIX, PRUNING, STAKING & GUYING, WRAPPING, SPRAYING, FERTILIZATION, PLANTING AND ADEQUATE MAINTENANCE OF MATERIALS DURING CONSTRUCTION ACTIVITIES.
4. PLANT MATERIALS SHALL BE GUARANTEED FOR A PERIOD OF ONE YEAR FROM DATE OF ACCEPTANCE BY OWNER. THE CONTRACTOR SHALL OUTLINE PROPER MAINTENANCE PROCEDURES TO THE OWNER AT THE TIME OF OWNER ACCEPTANCE. DURING THE GUARANTEE PERIOD, DEAD OR DISEASED MATERIALS SHALL BE REPLACED AT NO COST TO THE OWNER. AT THE END OF THE GUARANTEE PERIOD THE CONTRACTOR SHALL OBTAIN FINAL ACCEPTANCE.
5. EXISTING TREES TO BE RETAINED SHALL BE PROTECTED FROM SOIL COMPACTION AND OTHER DAMAGES WHICH MAY OCCUR DURING CONSTRUCTION ACTIVITIES BY ERECTING A SNOW FENCE AROUND SUCH MATERIALS AT A DISTANCE OF AT LEAST 8.5' FROM THE TRUNK.
6. ALL GRASS, CLUMPS, OTHER VEGETATION, DEBRIS, STONES, ETC. SHALL BE RAKED OR OTHERWISE REMOVED FROM PLANTING AREAS PRIOR TO THE INITIATION OF INSTALLATION PROCEDURES.
7. ALL PLANTING BEDS SHALL BE MULCHED WITH A MINIMUM 3" LAYER OF SCREENED, SHREDDED BARK MULCH.
8. ALL AREAS TO BE LOAMED AND SEEDED WHICH HAVE BEEN DISTURBED BY CONSTRUCTION ACTIVITY SHALL RECEIVE 4" OF LOAM IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.
9. ALL AREAS TO BE LOAMED AND SEEDED WHICH HAVE NOT DISTURBED BY CONSTRUCTION ACTIVITIES SHALL RECEIVE 1 1/2– 2" OF LOAM OVER SCARIFIED EXISTING SOILS. CARE SHOULD BE GIVEN TO NOT PLACE GREATER THAN 2" OF SOIL OVER EXPOSED ROOTS OF EXISTING TREES IN SUCH AREAS.
10. THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL UNDERGROUND UTILITIES PRIOR TO INITIATING PLANTING OPERATIONS. THE CONTRACTOR SHALL REPAIR/ REPLACE ANY UTILITY, PAVING, CURBING, ETC. WHICH IS DAMAGED DURING PLANTING OPERATIONS.

PLANTING NOTES:

1. THE WETLAND SEED MIXTURE TO BE UTILIZED IS THE NEW ENGLAND WETMIX OR EQUIVALENT WETLAND PLANT MIXTURE THAT INCLUDES FRINGED SEDGE (CAREX CRINITA), LURID SEDGE (CAREX LURIDA), SWAMP ASTER (ASTER PUNICEUS) AND SOFT RUSH (JUNCUS EFFUSUS). RECOMMENDED SEEDING RATE IS 9 LBS/ACRE. PAY FOR UNDER ITEM 644.2
2. THE PREFERRED SPECIES OF DECIDUOUS WOODY SHRUB TO BE UTILIZED WITHIN THE IMPACTED WETLAND AREAS IS RED OSIER DOGWOOD (CORNUS SERICEA SSP. SERICEAL..) WITH INTERSPERSED PLANTINGS OF WINTERBERRY (ILEX VERTICILLATA) AND SPECKLED ALDER (ALNUS INCANA RUGOSA). ONE YEAR OLD ROOTED CUTTINGS OR 18 TO 24" CONTAINERIZED STOCK SHOULD BE USED FOR PLANTING. PLANT CUTTINGS AND CONTAINERIZED STOCK TWO FEET APART. PAY FOR UNDER ITEM 644.2.
3. THE DECIDUOUS WOODY SHRUBS TO BE UTILIZED ARE TO BE PLANTED DURING THE EARLY SPRING, NO LATER THAN JUNE 1ST.
4. PRIOR TO SEEDING AND MULCHING DISTURBED UPLAND SURFACES, APPLY LIME AT 2 TONS/ACRE AND FERTILIZER (10–10–10) AT 600 LBS/ACRE TO RESTORED AREAS
5. THE GRASS SEED MIXTURE TO BE UTILIZED ON UPLAND AREAS IS THE CARROLL COUNTY CONSERVATION MIX OR EQUIVALENT COOL SEASON GRASS MIXTURES THAT INCLUDE TALL FESCUE, CREEPING FESCUE, REDTOP AND BIRDSFOOT TREFOIL. RECOMMENDED SEEDING RATE IS 100 POUNDS PER ACRE. PAY FOR UNDER ITEM 644.15
6. THE PREFERRED METHOD FOR STABILIZING THE DISTURBED UPLAND SURFACES IS TO BE SEEDED AND MULCHED IS TO HYDROSEED THOSE SURFACES.
7. USE A COMMERCIAL PREMIUM QUALITY LAWN SEED MIX RECOMMENDED FOR THIS AREA IN LAWNS THAT WERE PREVIOUSLY ESTABLISHED BY THE HOME OWNER.[1]PAY FOR UNDER ITEM 644.15
8. TURF REINFORCEMENT MAT TO BE NORTH AMERICAN GREEN, TYPE C350 OR EQUIVALANT.

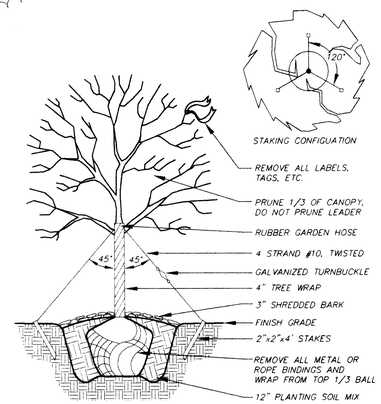
TREE SCHEDULE

Sym Scientific Name / Common Name	Item Number	Size	Notes
BA Betula alleganiensis / Yellow Birch	652.1	8–10'	Single leader or Multiple leader
FG Fagus grandifolia / American Beech	652.2	1"	Single leader
AR Acer rubrum / Red Maple/ Swamp Maple	652.3	1"	Single leader
AS Acer saccharinum / Silver Maple	652.4	1"	Single leader
PS Pinus strobus / Eastern White Pine	651.1	5–6'	Single leader

SEE GENERAL CONSTRUCTION AND WETLAND RESTORATION SEQUENCE ON SHEET E-1.

PLANTING LEGEND

- ESTABLISH TURF IN DISTURBED UPLAND AREAS ITEM 641, 642, 643.11, 644.15, 646.11. SEE SHEET CD-1
- INSTALL 12' WIDE TURF REINFORCEMENT MAT AT EDGE OF STREAM IN ADDITION TO TURF ESTABLISH. SEE PLANTING NOTE #8
- WETLAND RESTORATION. WETLAND SEED MIX AND RED OSIER DOGWOOD. SEE PLANTING NOTES 1, 2, 3, ITEM 644.2



DECIDUOUS TREE PLANTING
N.T.S.

NO.	REVISION	DATE	BY
2	RELOCATED DETOUR	1/21/02	BCL
1	CLEANED UP TEXT CONFLICTS PER DOT COMMENTS	10/15/01	BCL

FILE: 95006_2_SP7.DWG
Plotted: 02/08/2002, 14:21

H.E. BERGERON ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

LANDSCAPING & WETLAND RESTORATION PLAN
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	TDA/PWG
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	263
SCALE	1"=10'
DATE	7/09/2001

95006.2
SP-7
SHEET 10 OF 28

S-1
SHEET 11 OF 28

95006.2
PROPOSED BRIDGE PLAN
COLLEGE ROAD BRIDGE

ITEM 585.2 STONE FILL CLASS B
RECONSTRUCT CHANNEL & BANKS
WITH STONE FILL, GRANULAR MATERIAL
& FABRIC. SEE SHEET CD-2 FOR DETAILS
EXCAVATION INCLUDED IN ITEM 504.1

ITEM 609.01 STRAIGHT GRANITE CURB
CONSTRUCT GRANITE CURB @ 13.5' LEFT
FROM STA 4+38.5 TO STA 4+64.5
SEE NOTE BELOW AND SHT CD-1
FOR DETAILS.

ITEM 609.01 STRAIGHT GRANITE CURB
CONSTRUCT GRANITE CURB @ 13.5' LEFT
FROM STA 3+86 TO STA 4+08
SEE NOTE BELOW AND SHT CD-1
FOR DETAILS

BRIDGE AND APPROACH RAILING.
CONSTRUCT FROM STA 3+55 TO STA 5+00
LEFT. SEE SHEETS S-2, S-6 & S-7 FOR
ITEM NUMBERS AND DETAILS.

NORTH

LIMITS OF
STONE FILL

6' SINGLE PIECE - TAPERED TO GRADE
MAINTAIN ADEQUATE FILL
BEHIND CURB

8"

CURB FLARE
SCALE: 1/4"=1'-0"

10'

STA 3+56 - 3+86
PAVEMENT WIDTH
TRANSITIONS

APPROACH
SLAB

35'

22.00'

STA 4+64 - 4+94
PAVEMENT WIDTH
TRANSITIONS

4+00

5+00

CENTERLINE ROAD

22'

WORKING POINT C
STA: 4+19.14

WORKING POINT H
STA: 4+46

APPROACH
SLAB

STA 3+73 - 4+03
PAVEMENT WIDTH
TRANSITIONS

STA 4+79 - 5+09
PAVEMENT WIDTH
TRANSITIONS

60'

ROADWAY DITCH

CONSTRUCT 4 FT WIDE STONE
LINED DITCH FROM END OF
CURB TO EDGE OF BROOK.
SEE SHT CD-2 FOR ITEM
NUMBERS AND DETAILS.

ITEM 609.01 STRAIGHT GRANITE CURB
CONSTRUCT GRANITE CURB 13.5' RIGHT
FROM STA 4+03 TO STA 4+27
SEE NOTE BELOW AND SHT CD-1
FOR DETAILS

CONSTRUCT CAST-IN-PLACE FOOTINGS,
ABUTMENTS AND APPROACH SLAB. SEE
SHTS S-2, S-3, S-4, & S-5 FOR DETAILS.

ITEM 529 - PRECAST DECK.
INSTALL PRECAST CONCRETE
DECK AND HARDWARE. SEE SHEET
S-3, S-4, & S-5 FOR DETAILS.

BRIDGE AND APPROACH RAILING.
CONSTRUCT FROM STA 3+82 TO STA 5+20 RT
SEE SHEETS S-2, S-6 & S-7 FOR ITEM
NUMBERS AND DETAILS.

ITEM 615.03 TRAFFIC
SIGNS TYPE C (OM-3), AT 4
LOCATIONS AS INDICATED.
SEE SHEET CD-3 FOR DETAILS

ITEM 609.01 STRAIGHT GRANITE CURB
CONSTRUCT GRANITE CURB @ 13.5' RIGHT
FROM STA 4+57 TO STA 4+79
SEE NOTE BELOW AND SHT CD-1
FOR DETAILS

GRAVEL
DRIVE

1-STORY
WOOD-FRAME
HOUSE

NOTES:
1. STRAIGHT GRANITE CURB - MATCH CURB HEIGHT TO BRIDGE CURB. TAPER AS REQUIRED. SEE SHT CD-1 FOR DETAILS.

NO.	REVISION	DATE	BY
1	ADDED CURB FLARE DIM. PER DOT COMMENT	10/15/01	BCL

FILE: 95006_2_S1.DWG
Plotted: 10/15/2001, 11:53

H.E. BERGERON
ENGINEERS, P.A.
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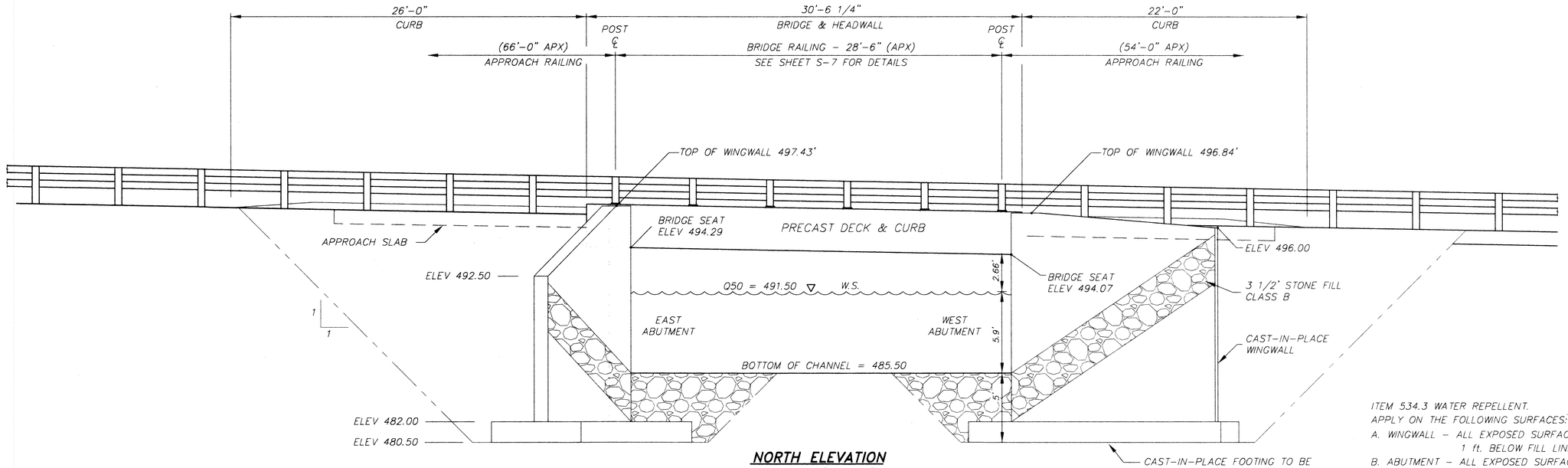
PROPOSED BRIDGE PLAN
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	NA
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	NA
SCALE	1/8"=1'-0"
DATE	7/09/2001

95006.2
S-1
SHEET 11 OF 28

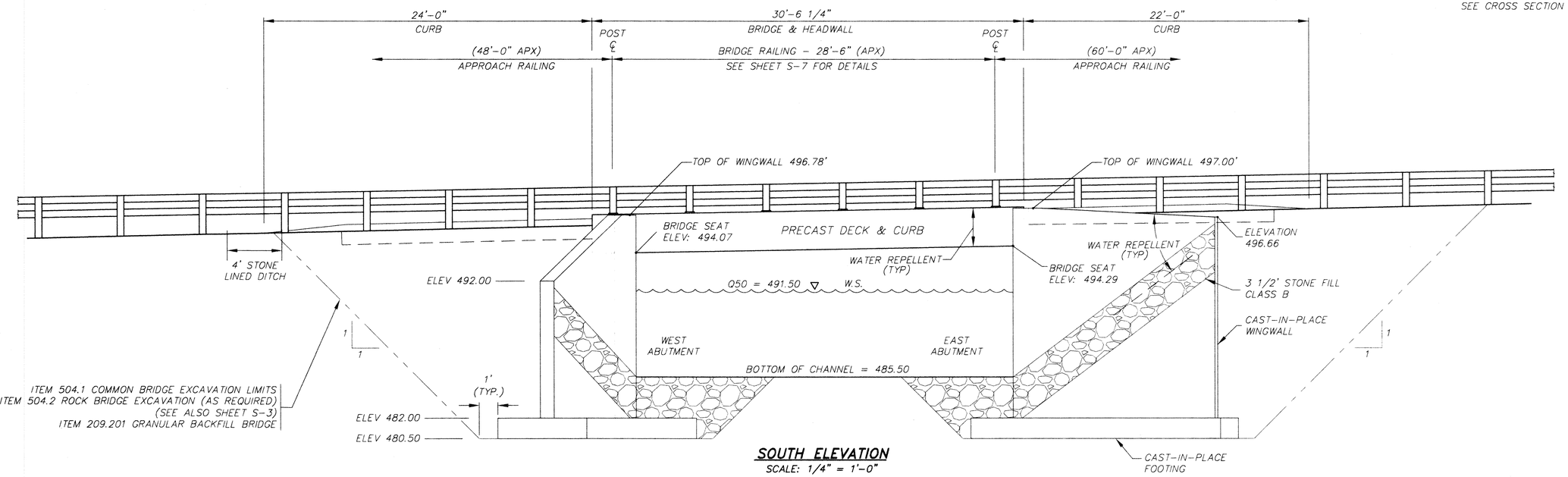
S-2
SHEET 12 OF 28

95006.2
PROPOSED BRIDGE ELEVATIONS
COLLEGE ROAD BRIDGE



NORTH ELEVATION
SCALE: 1/4" = 1'-0"

ITEM 534.3 WATER REPELLENT.
APPLY ON THE FOLLOWING SURFACES:
A. WINGWALL - ALL EXPOSED SURFACES TO 1 ft. BELOW FILL LINES.
B. ABUTMENT - ALL EXPOSED SURFACES TO 1 ft. BELOW FILL LINES.
C. DECK CURB - ALL VERTICAL SURFACES AND FLAT SURFACES.
SEE CROSS SECTION C / S-4



SOUTH ELEVATION
SCALE: 1/4" = 1'-0"

NO.	REVISION	DATE	BY
1	TAPERED CUB TO GRADE PER DOT COMMENT	10/15/01	BCL

FILE: 95006_2_S2.DWG
Plotted: 10/15/2001 11:55

H.E BERGERON
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(603) 356-6936

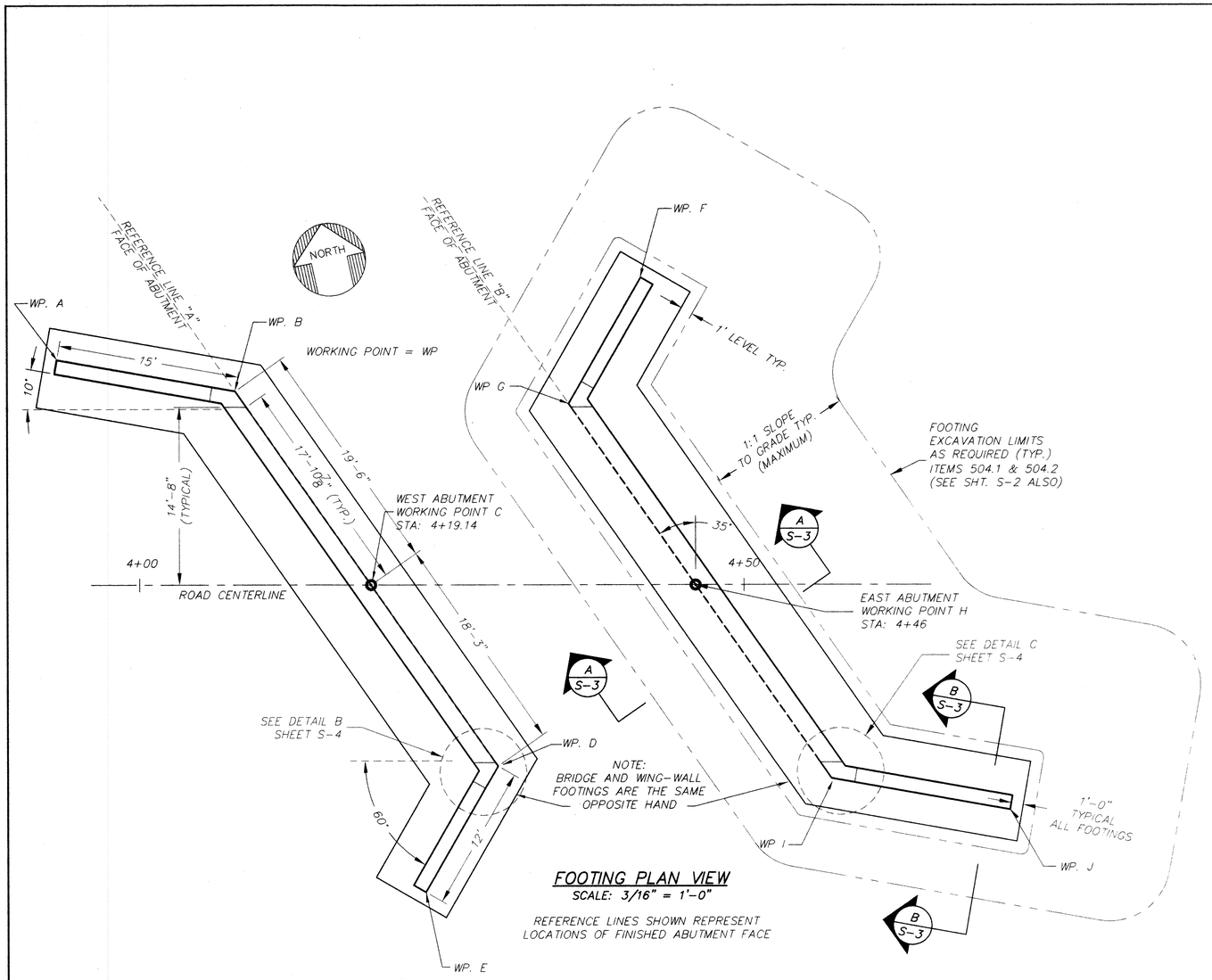
PROPOSED BRIDGE ELEVATIONS
OF
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	NA
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	NA
SCALE	1/4"=1'-0"
DATE	7/09/2001

95006.2
S-2
SHEET 12 OF 28

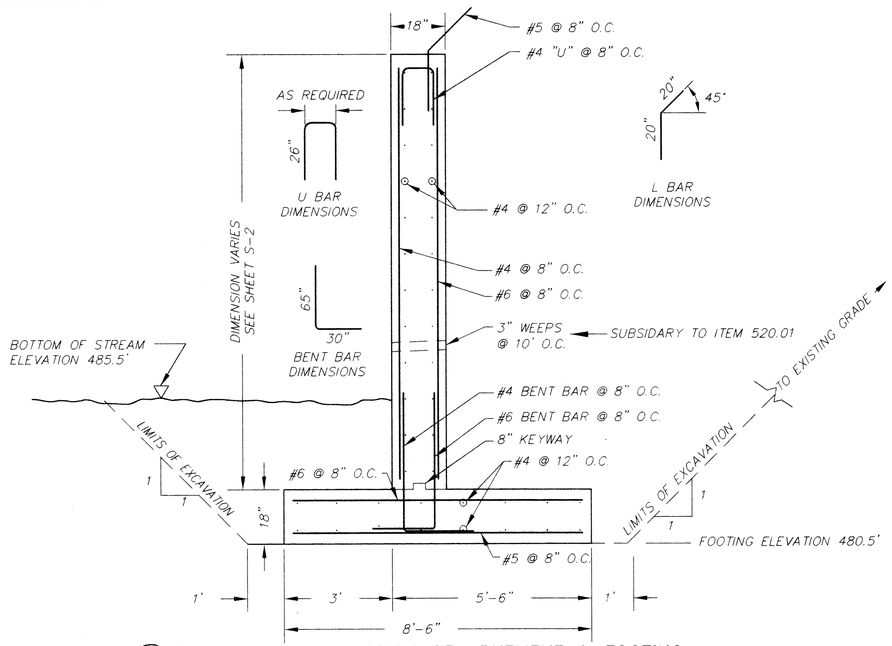
S-3
SHEET 13 OF 28

95006.2
FOOTING & ABUTMENT DETAILS
COLLEGE ROAD BRIDGE

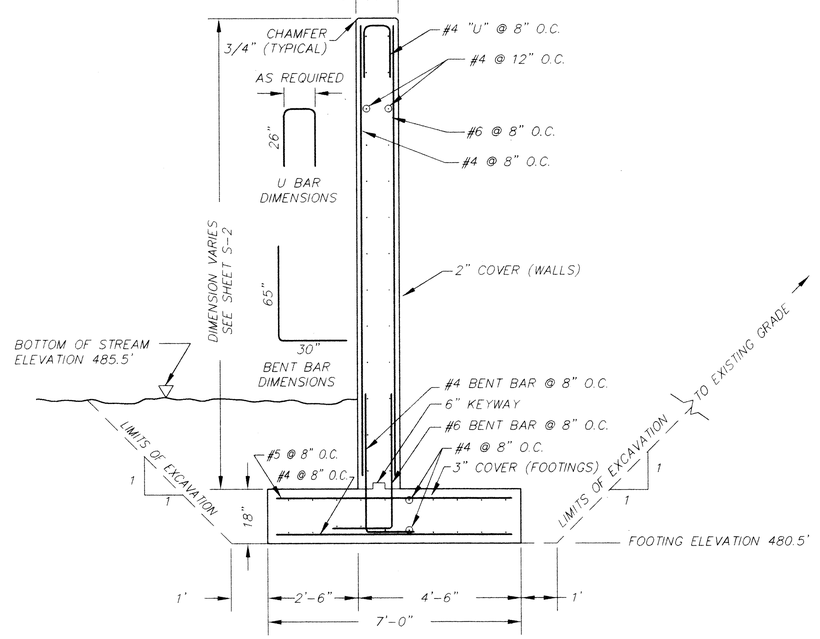


FOOTING PLAN VIEW
SCALE: 3/16" = 1'-0"

REFERENCE LINES SHOWN REPRESENT LOCATIONS OF FINISHED ABUTMENT FACE



A S-3 TYPICAL CROSS-SECTION OF ABUTMENT & FOOTING
SCALE: 1/2"=1'-0"



B S-3 TYPICAL CROSS-SECTION OF WING WALL & FOOTING
SCALE: 1/2"=1'-0"

PAYMENT ITEMS – FOOTINGS & ABUTMENTS

REINFORCING STEEL	– ITEM 544
CONCRETE CLASS A ABOVE FOOTINGS	– ITEM 520.12
CONCRETE CLASS B FOOTINGS	– ITEM 520.21

NOTES:

1. ALL CONCRETE, REINFORCEMENT AND WORKMANSHIP SHALL COMPLY WITH NHDOT SPECIFICATIONS AS INDICATED AND AASHTO SECTION 8-REINFORCED CONCRETE.
2. REINFORCEMENT SHALL BE GRADE 60.
3. COVER FOR REINFORCING BARS IN FOOTING SHALL BE 3" AND COVER FOR REINFORCING BARS IN WALLS SHALL BE 2"
4. IF LEDGE IS ENCOUNTERED BEFORE FOOTING DEPTH IS REACHED, NOTIFY ENGINEER. FOOTING REDESIGN WILL BE REQUIRED. PAY FOR LEDGE EXCAVATION UNDER ITEM 504.2.
5. CHAMFER ALL EXPOSED CORNERS 3/4"

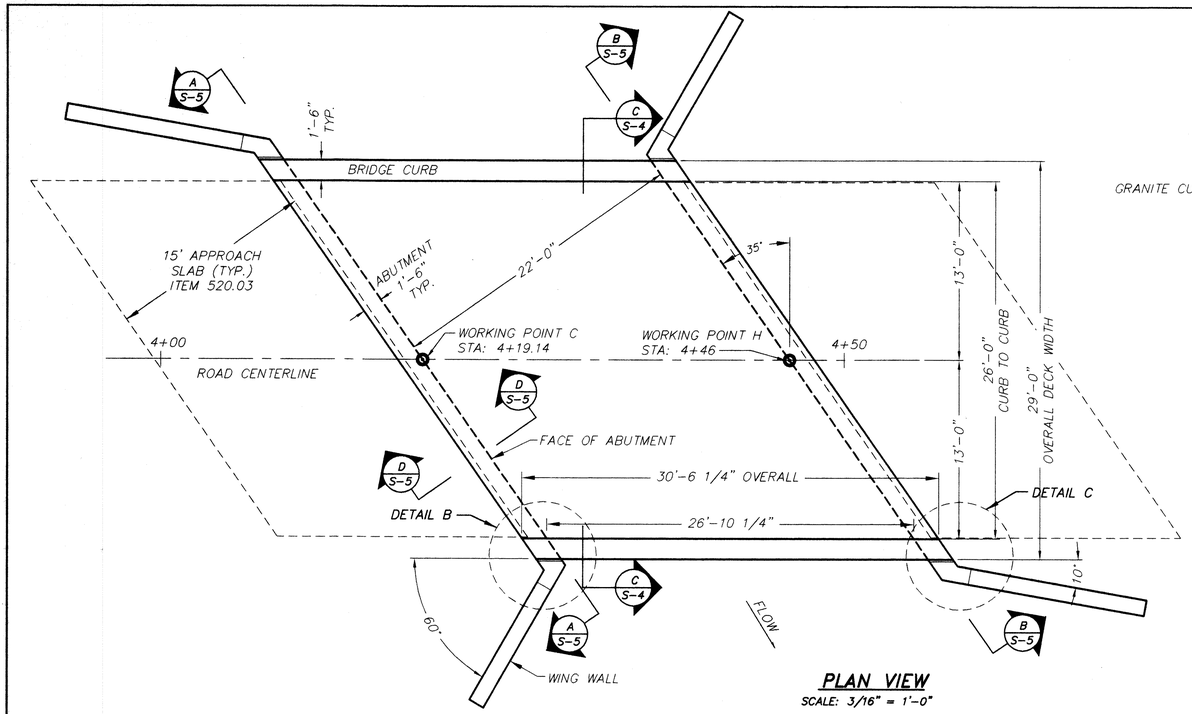
NO.	REVISION	DATE	BY
1	UPDATED PAYMENT ITEMS AND 8" KEYWAY PER DOT COMMENTS	10/15/01	BCL

FILE: 95006_2_S3.DWG
Plotted: 10/15/2001 11:6

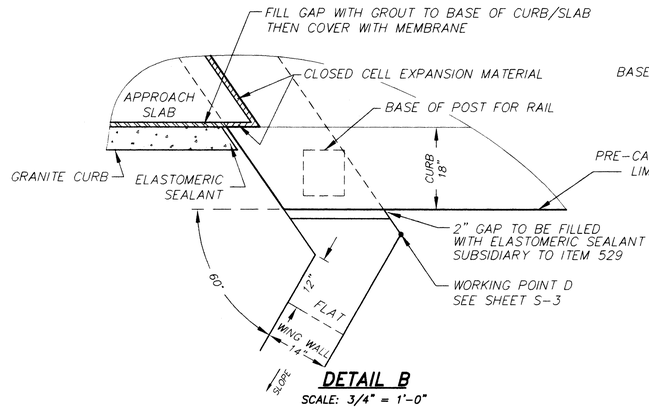
HEB
H.E. BERGERON ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

FOOTING & ABUTMENT DETAILS OF COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

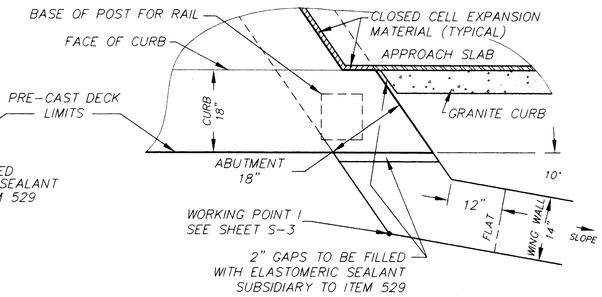
SURVEYED BY	NA	95006.2
DESIGNED BY	JWK	S-3
DRAWN BY	SAB	
CHECKED BY	HEB	
FIELD BOOK	NA	
SCALE	AS NOTED	
DATE	7/09/2001	SHEET 13 OF 28



PLAN VIEW
SCALE: 3/16" = 1'-0"



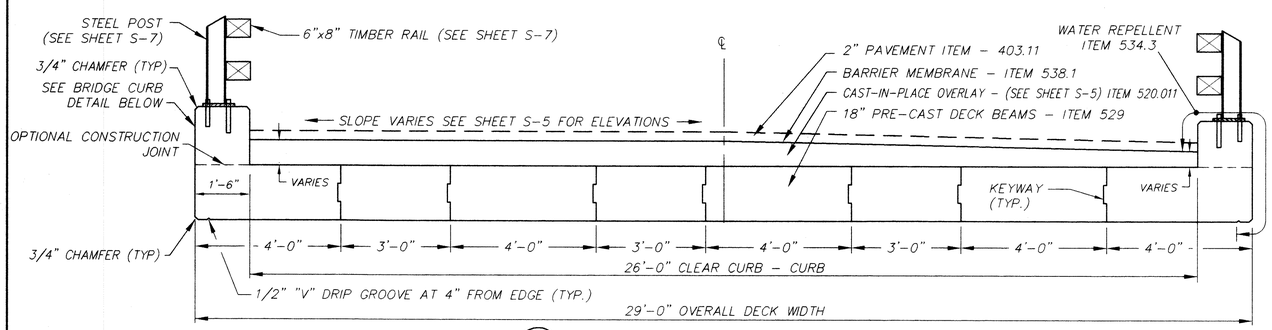
DETAIL B
SCALE: 3/4" = 1'-0"



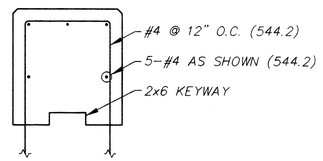
DETAIL C
SCALE: 3/4" = 1'-0"

PRE-STRESSED CONCRETE BRIDGE DECK NOTES:

1. THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING AND INSTALLING A PRE-STRESSED CONCRETE DECK AND PRECAST OR CAST-IN-PLACE CURB. THIS INCLUDES, BUT NOT LIMITED TO, SELECTING A VENDOR TO DESIGN AND MANUFACTURE THE ITEMS, FURNISHING AND INSTALLING THE DECK AND ALL ASSOCIATED HARDWARE, ALL BEARING AND EXPANSION MATERIALS, ALL SEALANT MATERIALS, CORING THE ABUTMENTS, GROUTING, INSTALLING TRANSVERSE TIES, AND PERFORMING ANY OTHER ITEMS AS DIRECTED BY THE MANUFACTURER, OR AS REQUIRED TO MEET THE PROVISIONS OF THESE PLANS AND SPECIFICATIONS.
2. THE CONTRACTOR IS RESPONSIBLE FOR SUPPLYING MATERIALS AND FABRICATIONS LISTED UNDER ITEM #550.1 STRUCTURAL STEEL, TO THE PRECAST MANUFACTURER. THIS ITEM INCLUDES THE GUARD RAIL POST ANCHORAGE. SEE SHEET S-7 FOR DETAILS.
3. THE PRECAST MANUFACTURER IS RESPONSIBLE FOR DESIGN AND MANUFACTURE OF THE PRE-STRESSED DECK BEAMS AND CURB ACCORDING TO THE DIMENSIONS AND DETAILS AS PRESCRIBED IN THESE PLANS AND SHOP DRAWINGS AND CALCULATIONS PROVIDED BY THE MANUFACTURER.
4. THE MANUFACTURER SHALL SUBMIT TO THE ENGINEER, FOR REVIEW, A FULL SET OF SHOP DRAWINGS AND CALCULATIONS A MINIMUM OF 14 DAYS PRIOR TO MANUFACTURE OR 14 DAYS PRIOR TO PURCHASE IF THE ITEMS ARE CONSIDERED TO BE A "STOCK" ITEM. SHOP DRAWINGS AND CALCULATIONS SHALL BE STAMPED AND SIGNED BY A LICENSED PROFESSIONAL ENGINEER LICENSED IN THE STATE OF NEW HAMPSHIRE.
5. THE DESIGN AND MANUFACTURE SHALL MEET THE REQUIREMENTS OF THE LATEST REVISION OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES.
6. THE TOPS OF THE PRECAST DECK BEAMS WHERE THE CONCRETE DECK OVERLAY IS TO BE APPLIED SHALL HAVE A RAKED FINISH WITH A ¼" AMPLITUDE NORMAL TO THE CENTERLINE OF THE ROADWAY.
7. LIFTING DEVICES SHALL BE CAST IN THE DECK BEAM UNITS AT THE DISCRETION OF THE MANUFACTURER. THE TYPE OF LIFTING DEVICE INTENDED FOR USE SHALL BE INDICATED ON THE SHOP DRAWINGS AND SUBMITTED FOR APPROVAL PRIOR TO THE FABRICATION OF THE DECK BEAM UNITS.
8. ALL PRECAST WORK AND MATERIALS TO BE INCLUDED IN ITEM #529 PRECAST DECK.
9. CONCRETE: MINIMUM 28 DAY STRENGTH, F'C=5000 PSI
   MINIMUM STRENGTH @ PRESTRESS TRANSFER, F'C=4000 PSI
10. PRESTRESSING STEEL SHALL BE 1/2" DIAMETER, UNCOATED SEVEN WIRE STRAND CONFORMING TO AASHTO M203 (ASTM A416) GRADE 270. PRESTRESSING FORCE PER STRAND=28,910 POUNDS.
11. POST-TENSIONING STRANDS SHALL BE 1/2" DIAMETER, SEVEN WIRE STRANDS CONFORMING TO AASHTO M203 (ASTM A416) GRTADE 270. POST-TENSIONING STRANDS SHALL BE COMPLETELY COATED WITH A CORROSION PREVENTIVE COATING SUCH AS FLO-GARD, AS MANUFACTURED BY FLORIDA WIRE AND CABLE COMPANY, JACKSONVILLE, FLORIDA; POLYSTRAND, AS MANUFACTURED BY LANG TENDONS, INC., TOUGHKENAMON, PA.; OR DSI USA, INC. OF LEMONT, IL. OR APPROVED EQUAL.
12. ALL REINFORCEMENT CAST IN PRE-STRESSED DECK BEAMS SHALL CONFORM TO AASHTO M31(ASTM A615) GRADE 60 AND SHALL BE EPOXY COATED. COST SHALL BE INCLUDED IN ITEM 529. ALL REINFORCING THAT EXTENDS FROM DECK BEAMS INTO CURB SECTIONS SHALL BE EPOXY COATED.
13. ALL REINFORCEMENT IN PRE-STRESSED DECK BEAMS SHALL HAVE 1 1/4" CLEAR CONCRETE COVER, UNLESS OTHERWISE NOTED.
14. ALL EXPOSED CORNERS OF DECK BEAM UNITS SHALL HAVE A 3/4" CHAMFER, UNLESS OTHERWISE NOTED.
15. GROUTING OF THE LONGITUDINAL JOINTS SHALL BE DONE WHEN AIR TEMPERATURE IS ABOVE 40 DEGREES FAHRENHEIT. NO TRAFFIC OR CONSTRUCTION EQUIPMENT SHALL BE PERMITTED ON THE BRIDGE UNTIL THE GROUT HAS BEEN CURED FOR AT LEAST 72 HOURS.



C S-4 **TYPICAL DECK CROSS-SECTION**
SCALE: 1/2" = 1'-0"



BRIDGE CURB REINFORCING
(CAST-IN-PLACE OPTION)
TYPICAL EACH SIDE
SCALE: 1" = 1'-0"

NO.	REVISION	DATE	BY
1	UPDATED NOTES AND DETAILS PER DOT COMMENTS	10/15/01	BCL

FILE: 95006_2_S4.DWG
Plotted: 10/15/2001 13:19

H.E. BERGERON ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

PRECAST DECK LAYOUT
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

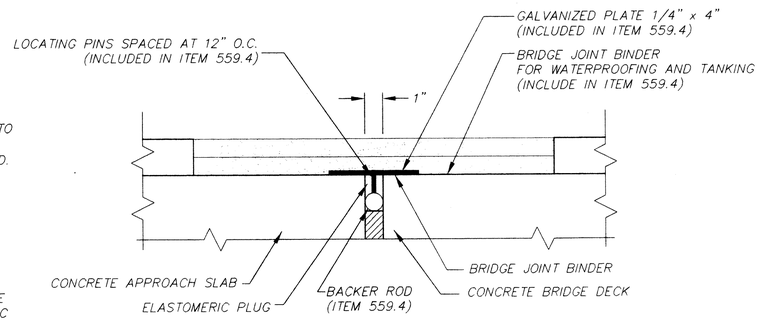
SURVEYED BY	NA
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	NA
SCALE	AS NOTED
DATE	7/09/2001

95006.2
S-4
SHEET 14 OF 28

EXPANSION JOINT NOTES:

1. COVER JOINT OPENINGS TEMPORARILY DURING THE PLACING OF THE ASPHALT PAVEMENT.
2. ALL STEEL COMPONENTS SHALL BE GALVANIZED IN ACCORDANCE WITH ASSMTO M 111 (ASTM A123) AND AASHTO M 232 (ASTM A153). ALL COST FOR STEEL PLATES, BOLTS, AND BACKER ROD. INCLUDING INSTALLATION, SHALL BE INCLUDED IN ITEM 559.4.
3. ELASTOMERIC EXPANSION JOINT SYSTEM MATERIALS SHALL BE PLACED AS PER MANUFACTURER'S RECOMMENDATIONS.
4. THE FABRICATION AND INSTALLATION OF THE 1/4" STEEL PLATE SHALL SHALL BE SUBSIDIARY TO ITEM 559.4. ELASTOMERIC PLUG TYPE EXPANSION JOINT.

TEMPERATURE ADJUSTMENT TABLE	
TEMPERATURE	"T"
15° F	1 5/8"
30° F	1 1/2"
45° F	1 3/8"
60° F	1 1/4"
75° F	1 1/8"
90° F	1"

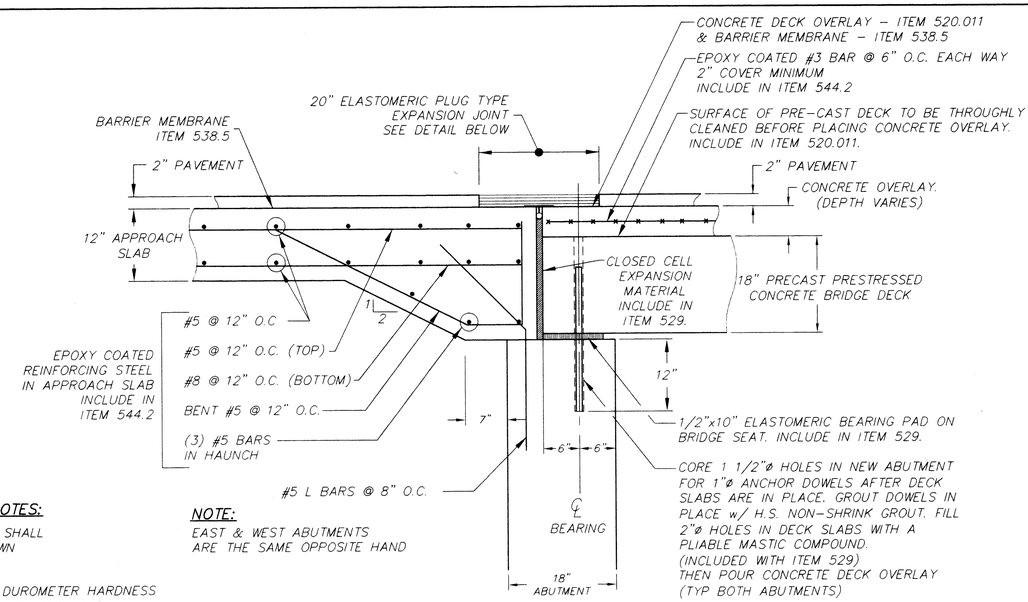


ELASTOMERIC PLUG TYPE EXPANSION JOINT DETAIL

SCALE: 3" = 1'-0"

ELASTOMERIC BEARING PAD NOTES:

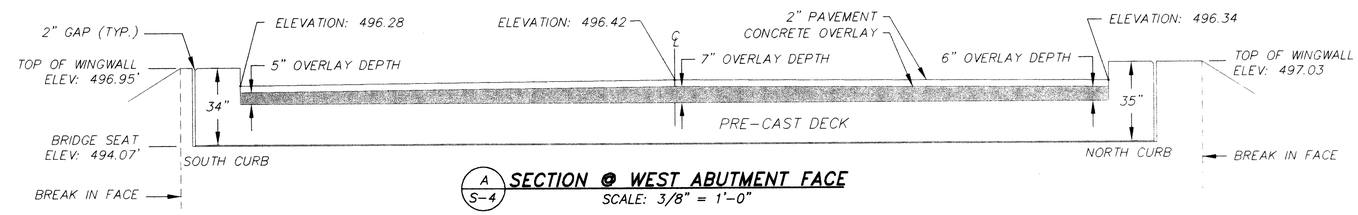
1. ELASTOMERIC BEARING PADS, SHALL BE 1/2"x10" PLACED AS SHOWN IN CROSS SECTION.
2. BEARING PADS SHALL BE 60 DUROMETER HARDNESS AND SHALL CONFORM TO AASHTO M251 AND AASHTO DIVISION II, SECTION 18.
3. THE BEARING PADS SHALL BE MANUFACTURED BY AN APPROVED SUPPLIER.
4. SEE SUPPLEMENTAL NHDOT SPECIFICATIONS IN PROJECT MANUAL FOR ADDITIONAL ELASTOMERIC BEARING PAD NOTES.



NOTE:
EAST & WEST ABUTMENTS ARE THE SAME OPPOSITE HAND

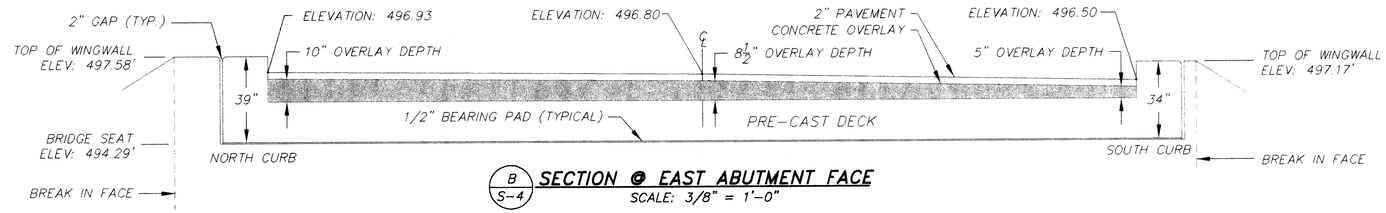
D / S-4 TYPICAL CROSS-SECTION AT ABUTMENTS

SCALE: 1" = 1'-0"



A / S-4 SECTION ℄ WEST ABUTMENT FACE

SCALE: 3/8" = 1'-0"



B / S-4 SECTION ℄ EAST ABUTMENT FACE

SCALE: 3/8" = 1'-0"

NO.	REVISION	DATE	BY
2	UPDATED ELASTOMERIC PLUG TYPE EXPANSION JOINT	01/11/02	BCL
1	UPDATED PAYMENT ITEMS, TOP OF WINGWALLS AND PAVEMENT PER DOT COMMENTS	10/15/01	BCL

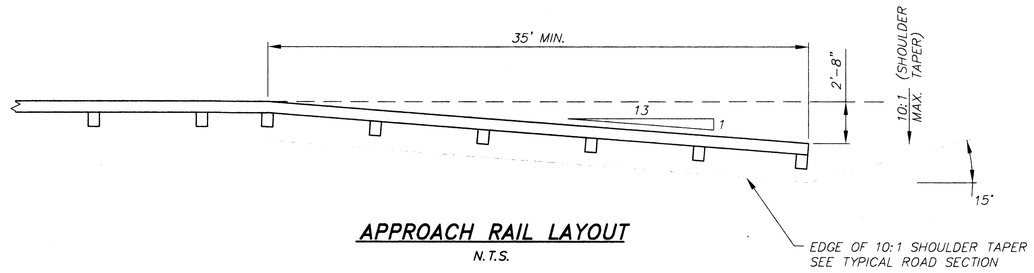
FILE: 95006_2_S5.DWG
Plotted 01/11/2002, 14:26

H.E. BERGERON ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

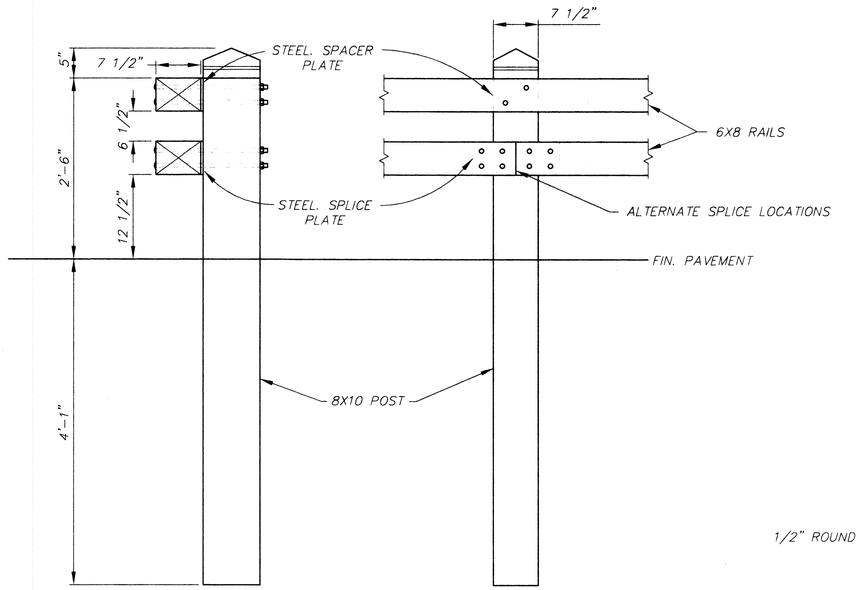
PRECAST DECK DETAILS
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	NA
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	NA
SCALE	AS NOTED
DATE	7/09/2001

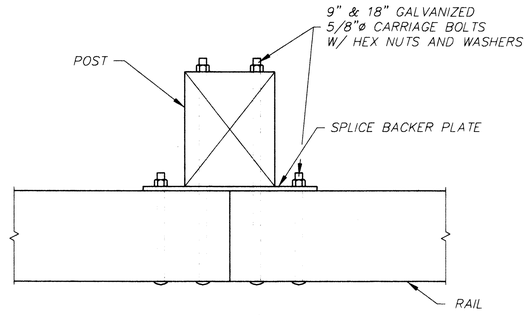
95006.2
S-5
SHEET 15 OF 28



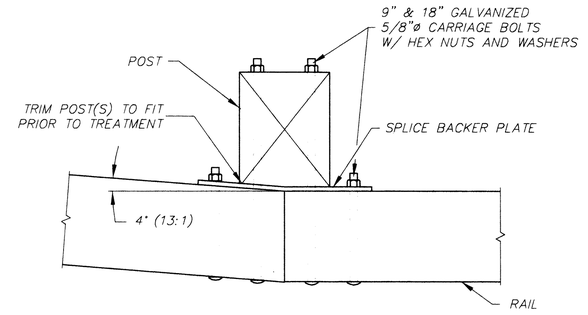
APPROACH RAIL LAYOUT
N.T.S.



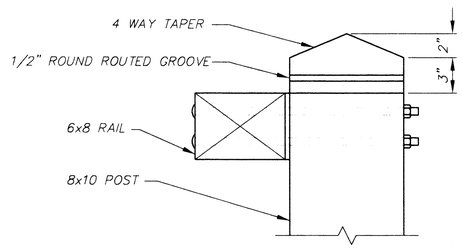
TIMBER APPROACH RAIL
SCALE: 1"=1'-0"



TYPICAL SPLICE CONNECTION
SCALE: 2"=1'-0"



BENT SPLICE CONNECTION
SCALE: 2"=1'-0"



POST DETAIL
SCALE: 2"=1'-0"

NOTES:

1. SEE SHEET S-7 NOTES 1-7 FOR MATERIAL SPECIFICATIONS AND PAYMENT.
2. TIMBER POSTS SHALL BE SPACED 6'-0" O.C. UNLESS OTHWISE NOTED ON DRAWING.

NO.	REVISION	DATE	BY
1	ADDED NOTE TO TRIM POST PRIOR TO TREATMENT PER DOT COMMENT	10/15/01	BCL

FILE: 95006_2_S6.DWG
Plotted: 10/15/2001, 13:43

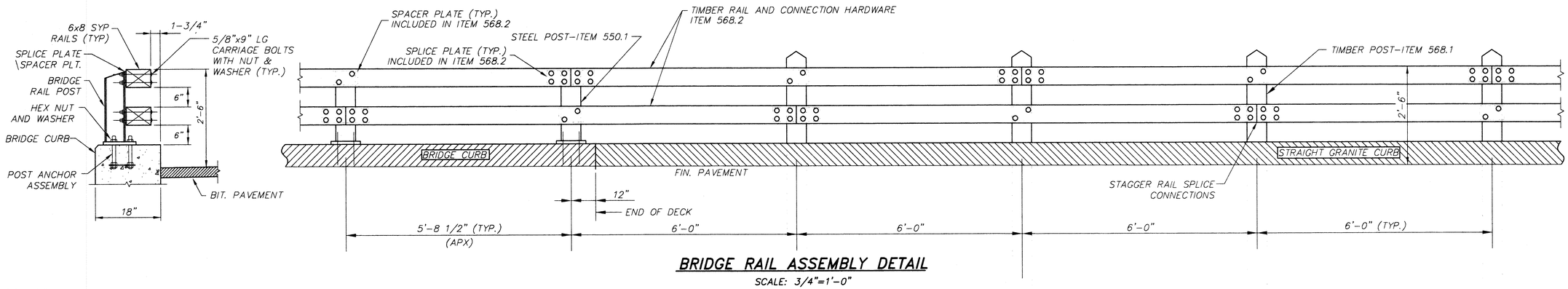
H.E. BERGERON ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

BRIDGE APPROACH RAIL DETAILS
OF
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	NA
DESIGNED BY	JWK
DRAWN BY	SAB
CHECKED BY	HEB
FIELD BOOK	NA
SCALE	AS SHOWN
DATE	7/09/2001

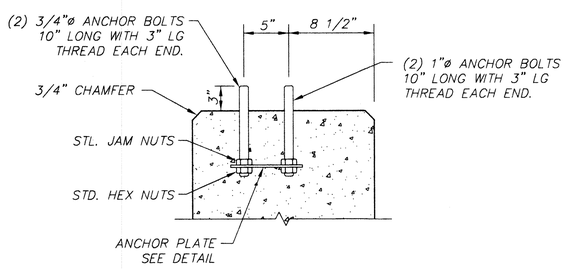
95006.2
S-6
SHEET 16 OF 28

95006.2
BRIDGE APPROACH RAIL DETAILS
COLLEGE ROAD BRIDGE



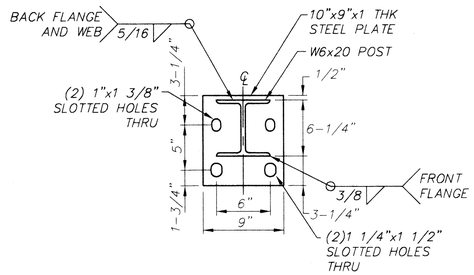
BRIDGE RAIL ASSEMBLY DETAIL

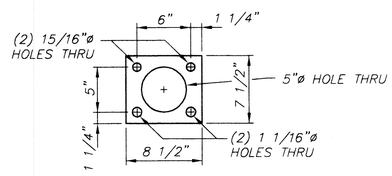
SCALE: 3/4"=1'-0"



POST ANCHOR ASSEMBLY & NOSE ANGLE

SCALE: 1 1/2" = 1'-0"

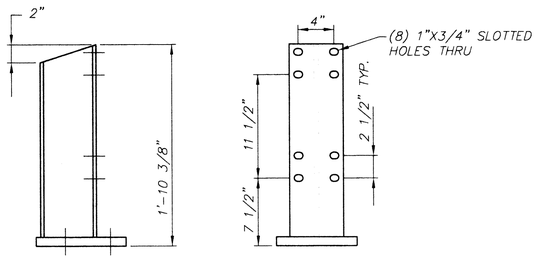




MATL: 1/8" THK A36 STL PLATE

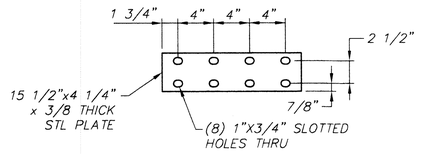
ANCHOR PLATE DETAIL

SCALE: 1 1/2" = 1'-0"
(ITEM 550.1)



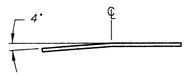
BRIDGE RAIL POST DETAIL

SCALE: 1 1/2" = 1'-0"
(ITEM 550.1)



SPLICE PLATE DETAIL

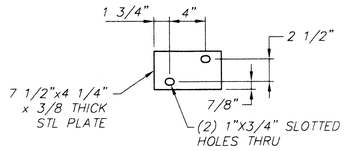
SCALE: 1 1/2" = 1'-0"
(ITEM 568.2)



TOP VIEW
OTHERWISE SAME AS SPLICE PLATE

BENT SPLICE PLATE DETAIL

SCALE: 1 1/2" = 1'-0"
(ITEM 568.2)



SPACER PLATE DETAIL

SCALE: 1 1/2" = 1'-0"
(ITEM 568.2)

NOTES:

1. ALL STEEL AND CONNECTION HARDWARE MATERIAL SPECIFICATIONS SHALL COMPLY WITH NHDOT SECTION 563.2-BRIDGE RAILING.
2. ALL STEEL AND HARDWARE SHALL BE GALVANIZED.
3. ALL FABRICATED PARTS SHALL BE GALVANIZED AFTER FABRICATION IS COMPLETE.
4. BRIDGE RAIL POSTS, POST ANCHOR ASSEMBLY, ANCHOR PLATE, ANCHOR BOLTS, NUTS AND WASHERS WILL BE PAID UNDER ITEM 550.1 STRUCTURAL STEEL.
5. ITEM 568.1 STRUCTURAL TIMBER-POSTS SHALL BE 8"X10" SOUTHERN YELLOW PINE NO. 2 OR BETTER HAVING A MINIMUM ALLOWABLE BENDING STRESS OF 1200 PSI. THIS ITEM WILL BE PAID BY THE LINEAR FOOT OF POST IN PLACE.
6. ITEM 568.2 STRUCTURAL TIMBER-RAILS SHALL BE 6"X8" SOUTHERN YELLOW PINE NO. 2 OR BETTER HAVING A MINIMUM ALLOWABLE BENDING STRESS OF 850 PSI. THIS ITEM ALSO INCLUDES CONNECTION, SPLICE, AND SPACER HARDWARE. RAIL WILL BE MEASURED AND PAID FOR BY THE LINEAL FOOT FOR EACH 6"x 8" RAIL INSTALLED.
7. TIMBER POSTS AND RAILS SHALL BE TREATED WITH PENTACHLOROPHENAL, TYPE-A SYSTEM, AFTER FABRICATION, TO A MINIMUM NET RETENTION OF 0.6 PCF, IN ACCORDANCE WITH THE REQUIREMENTS OF AASHTO M133, THE CURRENT STANDARDS OF THE AMERICAN WOOD PRESERVERS ASSOCIATION AND THE CURRENT VERSION OF THE WESTERN WOOD PRESERVERS INSTITUTE'S "BEST MANAGEMENT PRACTICES FOR THE USE OF TREATED WOOD IN AQUATIC ENVIRONMENTS." NOTE THAT MATERIALS WITH EXCESSIVE RESIDUAL PRESERVATIVE MATERIAL WILL BE REJECTED.

NO.	REVISION	DATE	BY
1	REMOVED CURB ANGLE PER DOT COMMENTS	10/15/01	BCL

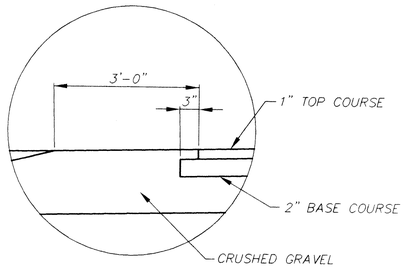
FILE: 95006_2_S7.DWG
Plotted 07/10/2001, 09:17

H.E. BERGERON ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

BRIDGE RAILING DETAILS
OF
COLLEGE ROAD BRIDGE NO. 176/099
PREPARED FOR THE
TOWN OF WOLFBORO, N.H.

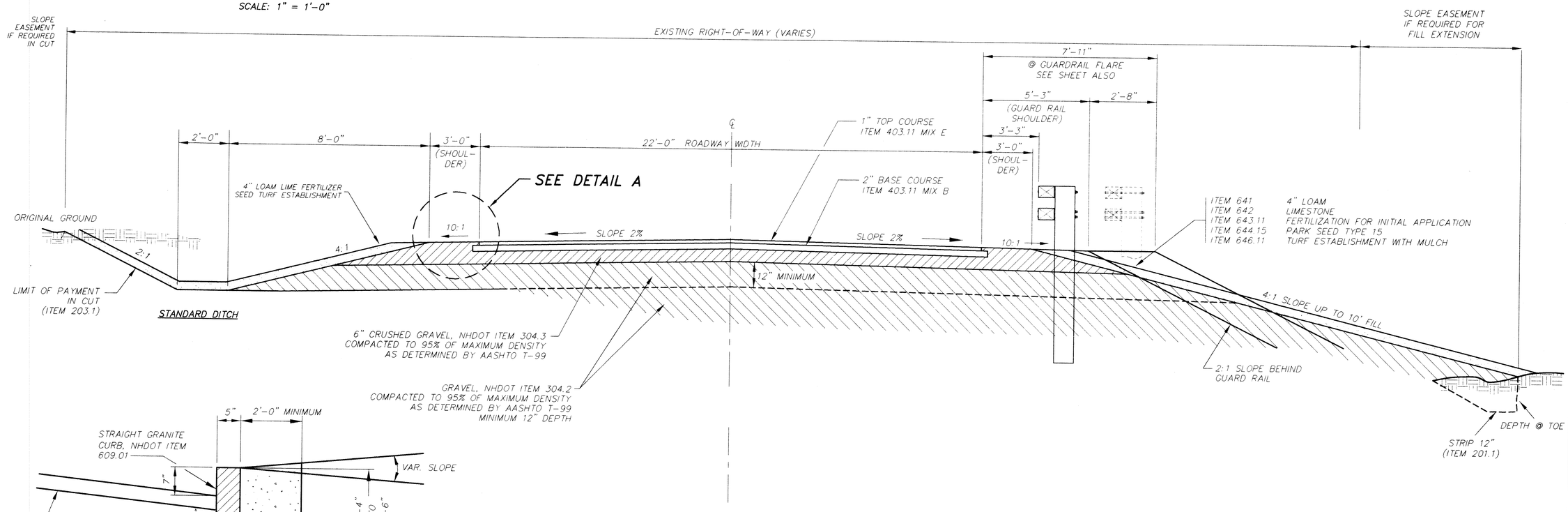
SURVEYED BY	NA
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	NA
SCALE	AS SHOWN
DATE	7/09/2001

95006.2
S-7
SHEET 17 OF 28



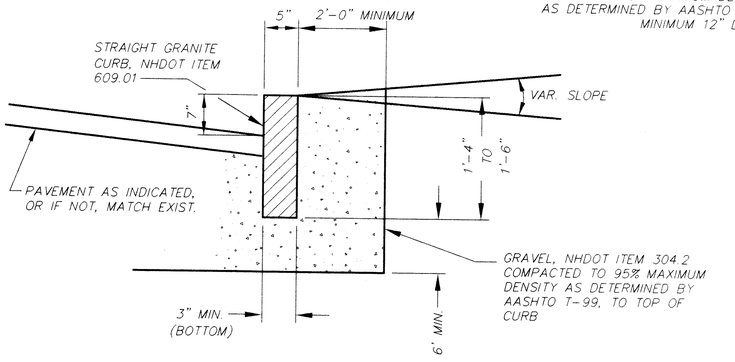
DETAIL A

SCALE: 1" = 1'-0"



TYPICAL ROADWAY SECTION

NOT TO SCALE



STRAIGHT GRANITE CURB

SCALE: 3/4" = 1'-0"

NOTES:

1. "NHDOT" REFERS TO THE NEW HAMPSHIRE DEPT. OF TRANSPORTATION'S STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION, LATEST EDITION.

NO.	REVISION	DATE	BY
1	REMOVED CONCRETE FROM BOTTOM OF GRANITE CURB PER DOT COMMENT	10/15/01	BCL

FILE: 95006_2_CD1.DWG
Plotted: 10/15/2001 14:02

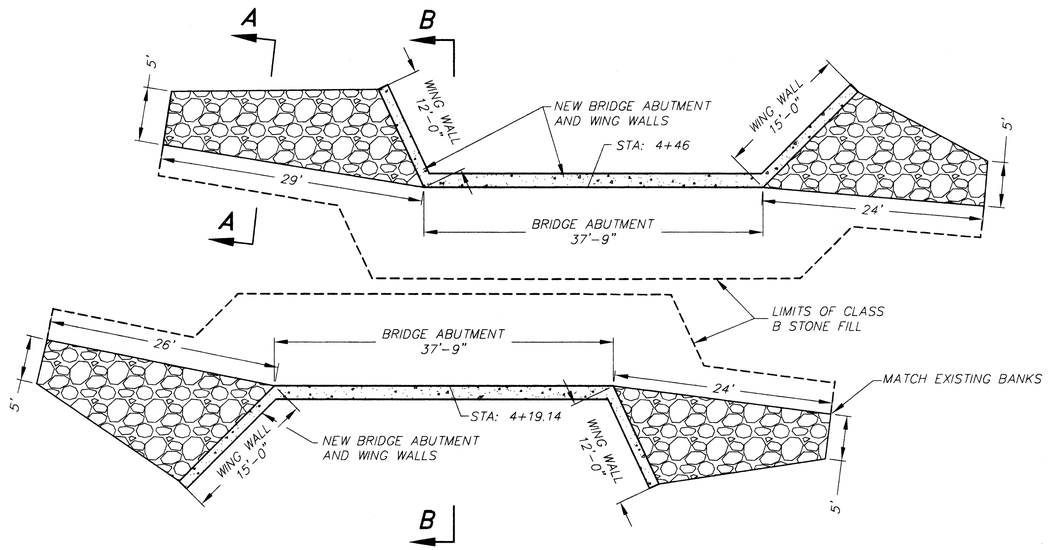
H.E. BERGERON ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

TYPICAL ROAD SECTION
OF
COLLEGE ROAD BRIDGE NO.176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	NA
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	NA
SCALE	AS SHOWN
DATE	7/09/2001

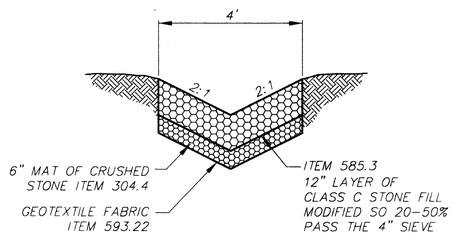
95006.2
CD-1
SHEET 18 OF 28

95006.2
TYPICAL ROAD SECTION
COLLEGE ROAD BRIDGE



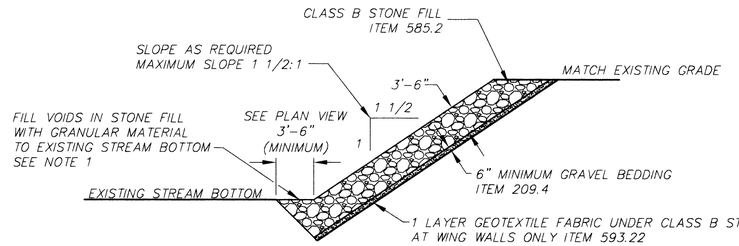
CHANNEL RECONSTRUCTION PLAN

SCALE: 1/8" = 1'-0"



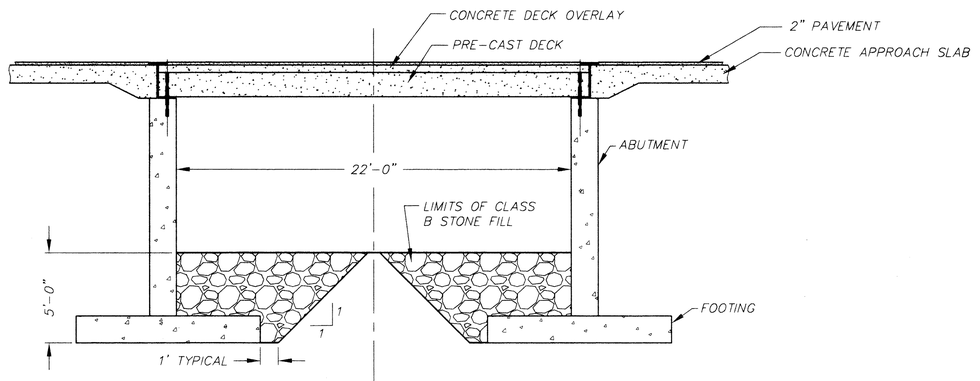
STONE LINED DITCH SECTION

SCALE: 1/2" = 1'-0"



SECTION "A-A"

SCALE: 1/4" = 1'-0"



SECTION "B-B"

SCALE: 1/4" = 1'-0"

NOTE:

1. CLASS B STONE FILL. FILL REMAINING VOIDS WITH APPROVED GRANULAR MATERIAL TO EXISTING STREAM BOTTOM AT ALL LOCATIONS. SUBSIDIARY TO ITEM 585.2

NO.	REVISION	DATE	BY
1	ADDED DECK DETAILS PER DOT COMMENTS	10/15/01	BCL

FILE: 95006_2_CD2.DWG
Plotted: 10/15/2001, 17:01

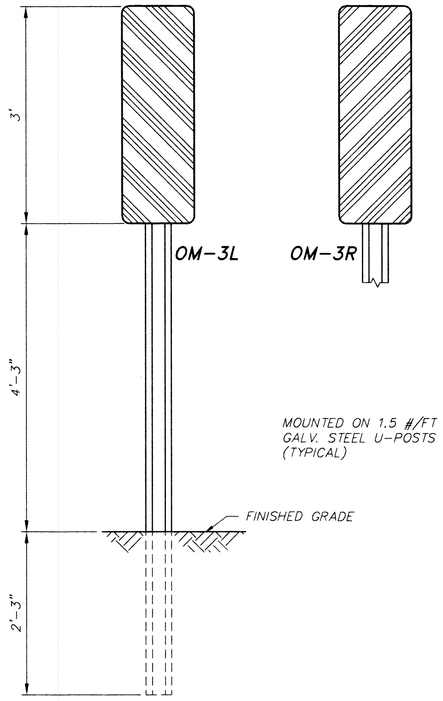
H.E. BERGERON ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

CHANNEL DETAILS
OF
COLLEGE ROAD BRIDGE NO.176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	NA
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	NA
SCALE	AS SHOWN
DATE	7/09/2001

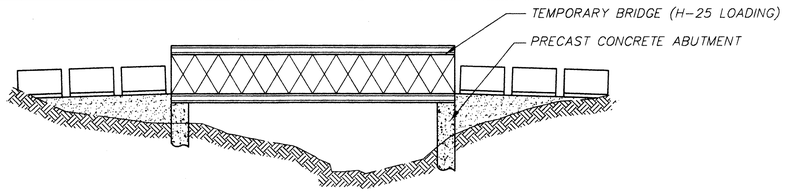
95006.2
CD-2
SHEET 19 OF 28

95006.2
DETOUR DETAILS & TRAFFIC CONTROL DEVICES
COLLEGE ROAD BRIDGE



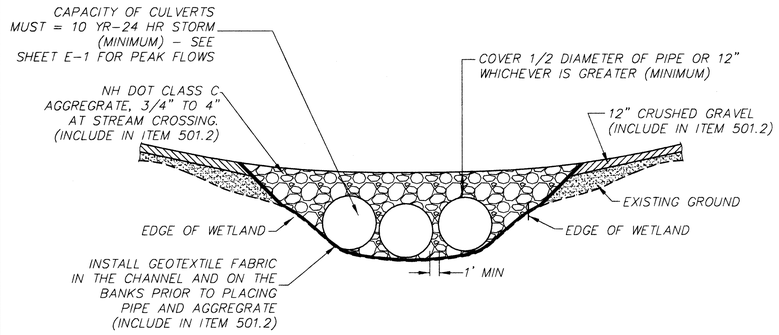
PERMANENT OBJECT MARKERS

QUANTITY: 2 EACH
(ITEM 615.03)



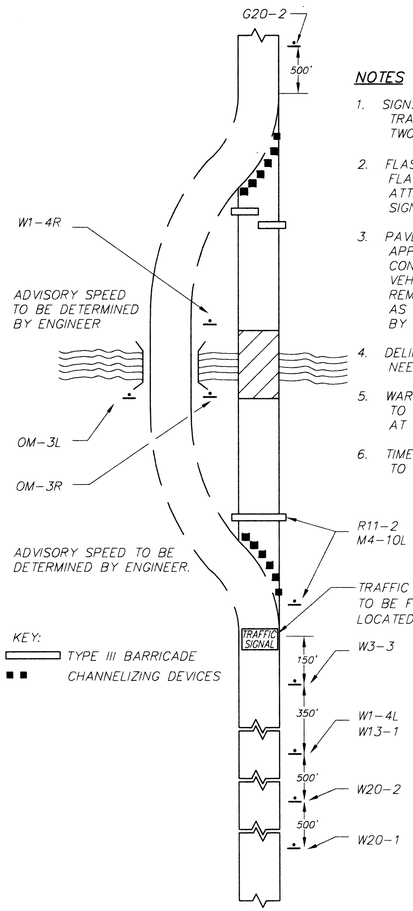
TEMPORARY DETOUR ELEVATION TEMPORARY BRIDGE OPTION

(SHOWN AT CENTERLINE OF STREAM – SEE NOTE 2)
(NOT TO SCALE)



TEMPORARY DETOUR ELEVATION–CULVERT OPTION

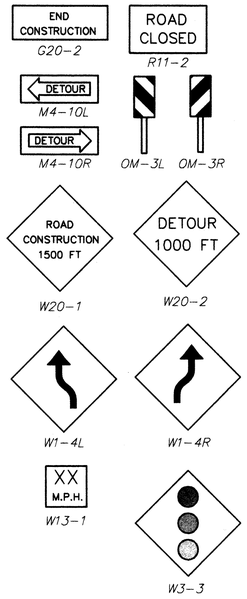
(SHOWN AT CENTERLINE OF STREAM – SEE NOTE 2)
(NOT TO SCALE)



NOTES

1. SIGNS SHOWN FOR ONE DIRECTION OF TRAVEL ONLY. TYPICAL EACH END FOR TWO WAY TRAFFIC.
2. FLASHING WARNING LIGHTS AND/OR FLAGS MAY BE USED TO CALL ATTENTION TO THE EARLY WARNING SIGNS.
3. PAVEMENT MARKINGS NO LONGER APPLICABLE WHICH MIGHT CREATE CONFUSION IN THE MINDS OF VEHICLE OPERATORS SHALL BE REMOVED OR OBLITERED AS SOON AS PRACTICABLE AS DIRECTED BY ENGINEER.
4. DELINEATORS ON DETOUR WHERE NEEDED.
5. WARNING LIGHTS SHOULD BE USED TO MARK CHANNELIZING DEVICES AT NIGHT AS NEEDED.
6. TIME TRAFFIC SIGNALS TO ALLOW TRAFFIC TO FLOW IN ONE DIRECTION AT A TIME

DETOUR SIGNS & SIGNALS FOR TWO WAY TRAFFIC INCLUDE IN ITEM 619.1	
QTY.	SIGN DESIGNATION
2	G20-2
4	R11-2
2	M4-10R
2	M4-10L
2	OM-3L
2	OM-3R
2	W20-1
2	W20-2
2	W1-4L
2	W1-4R
2	W13-1
2	W3-3



CONSTRUCTION SIGNS, BARRICADES, & CHANNELING DEVICES INCLUDE IN ITEM 619.1

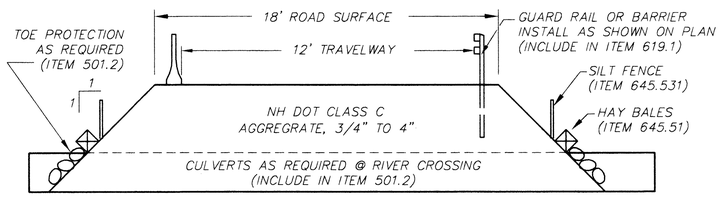
TEMPORARY TRAFFIC SIGNALS INCLUDE IN ITEM 616.161

SEE SUPPLEMENTAL NHDOT SPECIFICATIONS IN THE PROJECT MANUAL

TRAFFIC CONTROL DEVICES

NOTES

1. ALL SIGNS SHALL COMPLY WITH STANDARDS IN THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" CONCERNING SIZE, SHAPE CONTRAST, COLORS, COMPOSITION AND LETTERING.
2. TEMPORARY STREAM CROSSING SHALL COMPLY WITH NHDES STORMWATER MANAGEMENT & EROSION & SEDIMENT CONTROL HANDBOOK, FOR CULVERTS.
3. TEMPORARY FENCE TO BE WOODEN, HOMEOWNER QUALITY, 6 FEET TALL & 80 FEET LONG – MINIMUM. POST TO BE 4x4 PRESSURE TREATED . CONTRACTOR TO OBTAIN "NEW QUALITY" FENCING MATERIALS, AND TYPE THAT WILL BLOCK VIEW FROM EITHER SIDE. FENCING TO BE APPROVED BY THE ENGINEER. SUBSIDIARY TO ITEM 501.2.
4. BERM ROADWAY SHOULDER AS REQUIRED TO MAINTAIN FENCE ELEVATION. CONTRACTOR HAS OPTION OF INSTALLING TALLER FENCE, UP TO 10' MAXIMUM, TO MAINTAIN FENCE ELEVATION.



TEMPORARY DETOUR SECTION–CULVERT OPTION

(SHOWN AT CENTERLINE OF STREAM)
(NOT TO SCALE)

NO.	REVISION	DATE	BY
1	ADDED TEMPORARY BRIDGE OPTION, UPDATED SECTIONS	01/11/02	BCL
1	UPDATED NOTE #3 PER DOT COMMENT	10/15/01	BCL

FILE: 95006_2_CD3.DWG
Plotted: 01/11/2002: 14:46

H.E. BERGERON ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

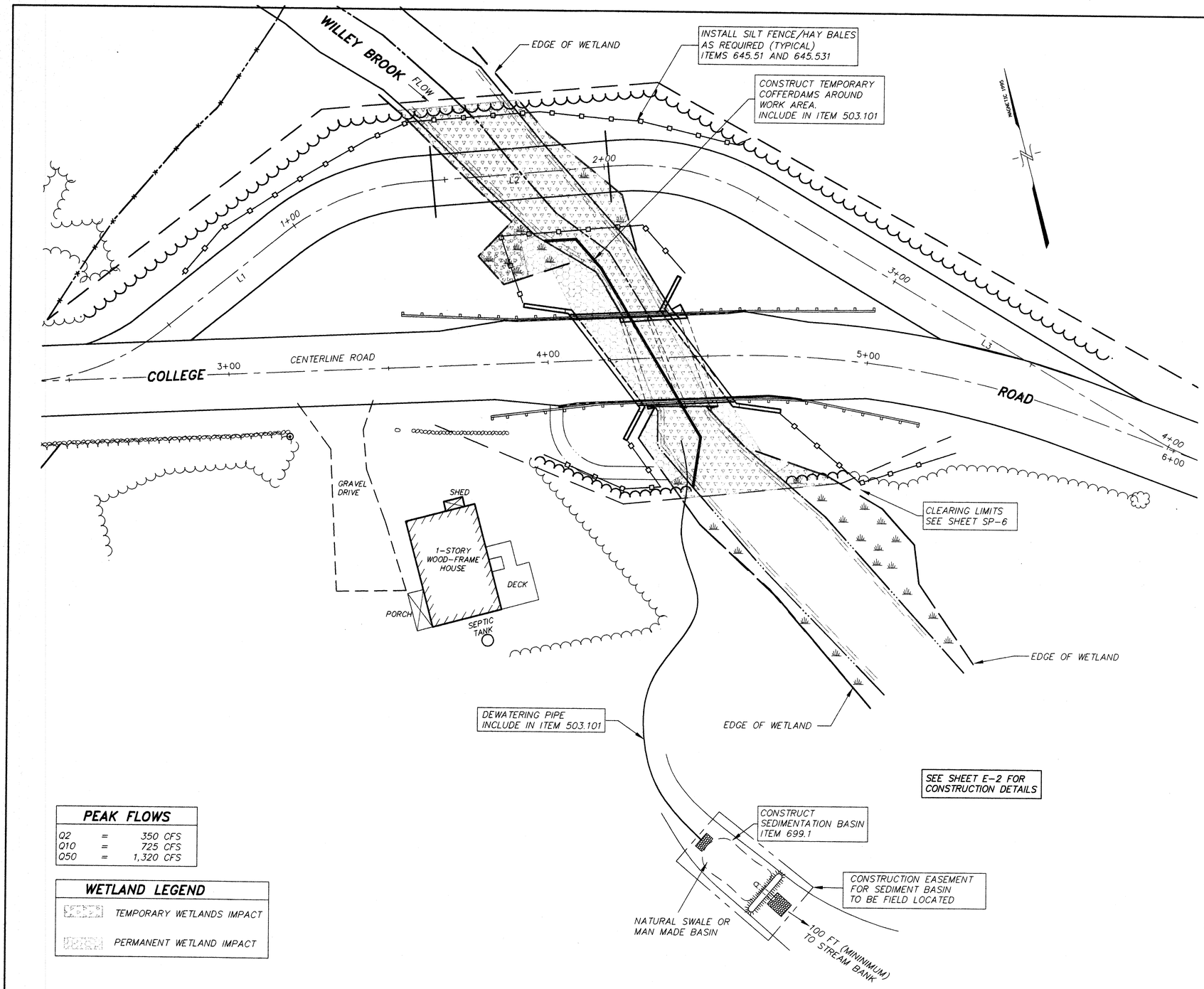
DETOUR DETAILS & TRAFFIC CONTROL DEVICES
OF
COLLEGE ROAD BRIDGE NO.176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	NA
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	NA
SCALE	AS SHOWN
DATE	7/09/2001

95006.2
CD-3
SHEET 20 OF 28

E-1
SHEET 21 OF 28

95006.2
EROSION CONTROL PLAN
COLLEGE ROAD BRIDGE



PEAK FLOWS		
Q2	=	350 CFS
Q10	=	725 CFS
Q50	=	1,320 CFS

WETLAND LEGEND	
	TEMPORARY WETLANDS IMPACT
	PERMANENT WETLAND IMPACT

GENERAL CONSTRUCTION AND WETLAND RESTORATION SEQUENCE:

THIS RECOMMENDED CONSTRUCTION SEQUENCE IS FOR DEMOLITION AND CONSTRUCTION INVOLVING THE IMMEDIATE STREAM AREA AND ITS BANKS. SEE SHEETS S-1, E-1, E-2, SP-4 FOR DETAILS. THIS CONSTRUCTION SEQUENCE ASSUMES THAT ONE STREAM BANK (FOOTING, ABUTMENT AND (WING WALLS) WILL BE CONSTRUCTED AT A TIME. ALTERNATE CONSTRUCTION SEQUENCES RECOMMENDED BY THE CONTRACTOR SHALL BE APPROVED BY THE ENGINEER.

1. INSTALL TEMPORARY SILTATION MEASURES FIRST, THEN INSTALL TEMPORARY DETOUR, CULVERTS, OTHER SURFACE EROSION CONTROL MEASURES AND SEDIMENTATION BASIN(S). SEE SHEETS SP-4, E-1 AND E-2 FOR DETAILS. LOCATION OF SEDIMENTATION BASIN(S) TO BE FIELD LOCATED AND COORDINATED WITH ABUTTER.
2. REMOVE BRIDGE SUPERSTRUCTURE, GUARDRAIL, AND ANY OTHER ITEM ABOVE THE WATER LINE THAT WOULD INTERFERE WITH THE INSTALLATION OF COFFERDAMS.
3. INSTALL TEMPORARY SILTATION MEASURES THEN INSTALL COFFERDAMS AND DIVERT WATER TO ONE SIDE OF STREAMBED.
4. REMOVE EXISTING ABUTMENT, WING WALLS AND FOOTING ON "DRY" SIDE OF COFFERDAM AND CONSTRUCT NEW FOOTINGS, ABUTMENT, AND WINGWALLS. BACKFILL AND COMPACT AS REQUIRED. INSTALL FILL ON BANKS AND IN CHANNEL AS REQUIRED. CONSTRUCTION SEQUENCE DETAILS TO BE DETERMINED BY CONTRACTOR AND APPROVED BY ENGINEER. COMPLETE CHANNEL WORK PRIOR TO REMOVING COFFERDAM.
5. DIVERT STREAM FLOW TO OTHER SIDE OF COFFERDAM AND REPEAT STEP 4.
6. INSTALL TEMPORARY SILTATION MEASURES THEN REMOVE COFFERDAMS AFTER CHANNEL WORK IS COMPLETE. COMPLETE CONSTRUCTION OF BRIDGE SUPERSTRUCTURE AND ROADWAY.
7. INSTALL TEMPORARY SILTATION MEASURES THEN REMOVE TEMPORARY DETOUR.
8. IN WETLAND AREAS TO BE RESTORED, REGRADE AREA TO ORIGINAL SURFACE AND SCARIFY SURFACE TO PREPARE FOR SEEDING. SEED IMPACTED WETLAND AREA WITH NEW ENGLAND WET MIX OR EQUIVALENT. PLANT RED OSIER DOGWOOD CUTTINGS AT TWO FEET ON CENTER IN WETLAND RESTORATION AREAS.
9. SEED, FERTILIZE AND MULCH DISTURBED OR FILLED UPLAND AREAS WITH CARROLL COUNTY CONSERVATION MIX OR EQUIVALENT. APPLY LIME AT 2 TONS PER ACRE AND FERTILIZER (10-10-10) AT 600 LBS PER ACRE.
10. ONCE ALL CONTRIBUTING, UPSLOPE AREAS HAVE BEEN PERMANENTLY STABILIZED AND VEGETATED, REMOVE TRAPPED SEDIMENT FROM BEHIND ALL SILT FENCE, HAY BALES AND ANY OTHER TEMPORARY SEDIMENT CONTROL DEVICES. REMOVE ALL TEMPORARY SEDIMENT CONTROL DEVICES.

NO.	REVISION	DATE	BY
1	RELOCATED DETOUR	1/21/02	BCL

FILE: 95006_2_E1.DWG
Plotted: 01/21/2002, 1:14

H.E. BERGERON ENGINEERS, P.A.
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EROSION CONTROL PLAN OF COLLEGE ROAD BRIDGE NO.176/099
PREPARED FOR THE TOWN OF WOLFEBORO, N.H.

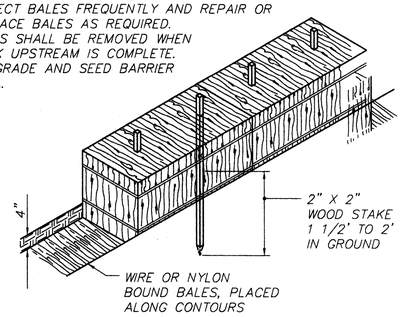
SURVEYED BY	TDA/PWG
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	263
SCALE	NTS
DATE	7/09/2001

95006.2
E-1
SHEET 21 OF 28

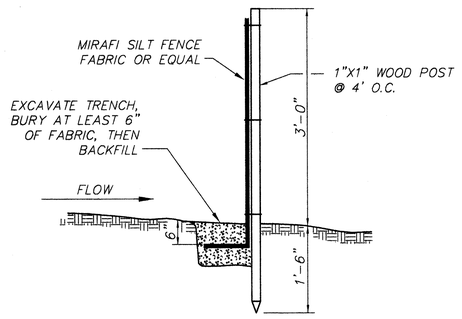
95006.2
PROPOSED EROSION CONTROL DETAILS
COLLEGE ROAD BRIDGE

HAY BALE NOTES:

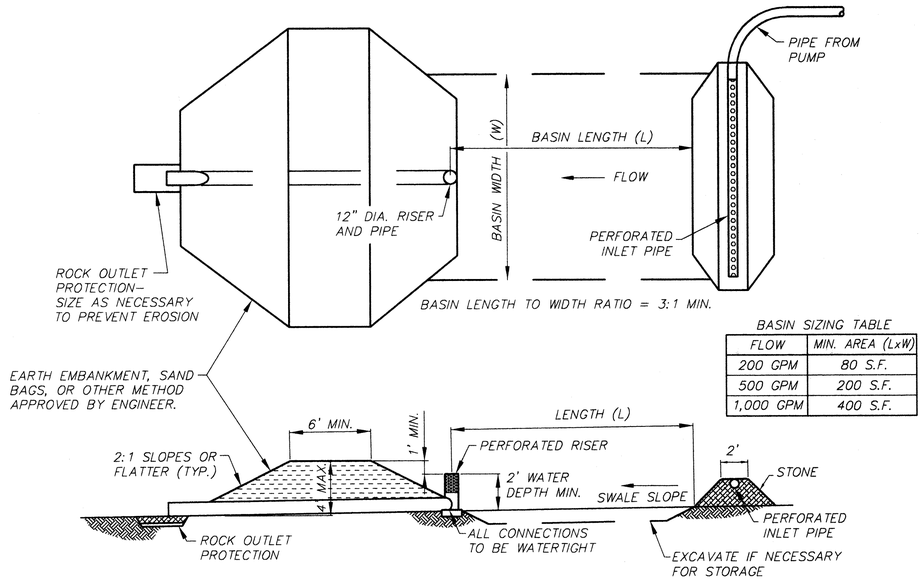
1. BALES SHALL BE PLACED IN A ROW WITH ENDS TIGHTLY ABUTTING THE ADJACENT BALES.
2. EACH BALE SHALL BE EMBEDDED IN THE SOIL A MINIMUM OF 4".
3. BALES SHALL BE SECURELY ANCHORED IN PLACE BY 2" X 2" WOODEN STAKES DRIVEN THROUGH THE BALES. ANGLE STAKES AS REQUIRED TO PREVENT LATERAL MOVEMENT.
4. INSPECT BALES FREQUENTLY AND REPAIR OR REPLACE BALES AS REQUIRED.
5. BALES SHALL BE REMOVED WHEN WORK UPSTREAM IS COMPLETE. RE-GRADE AND SEED BARRIER AREA.



HAY BALE DETAIL
N.T.S.



SILT FENCE INSTALLATION
N.T.S.



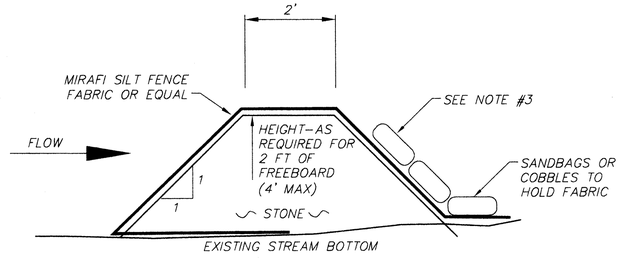
BASIN SIZING TABLE

FLOW	MIN. AREA (LxW)
200 GPM	80 S.F.
500 GPM	200 S.F.
1,000 GPM	400 S.F.

SEDIMENTATION BASIN DETAILS
N.T.S

EROSION CONTROL CONSTRUCTION SEQUENCE

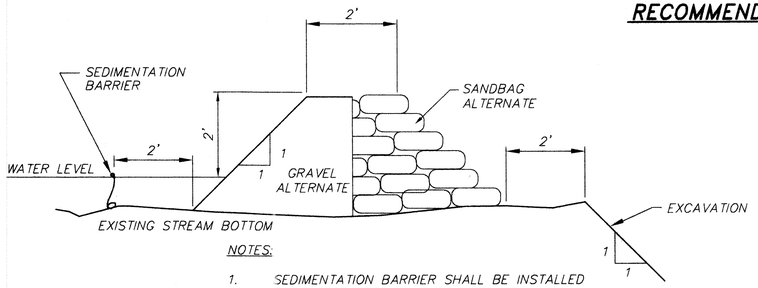
1. INSTALL TEMPORARY EROSION CONTROL FACILITIES. THIS INCLUDES, BUT IS NOT LIMITED TO, SILT FENCING DOWN SLOPE OF ALL PROPOSED FILL AREAS AND HAY BALES AROUND ALL EXISTING AND PROPOSED CULVERTS AND CATCH BASINS TRIBUTARY TO THE DISTURBED AREAS.
2. CLEAR, GRUB, AND DISPOSE OF DEBRIS.
3. STRIP TOPSOIL AND HAUL MATERIALS AWAY FROM SITE.
4. UPON COMPLETION OF FINAL GRADING, SPREAD LOAM, FERTILIZE, SEED, AND APPLY MULCH.
5. MAINTAIN EROSION CONTROL DEVICES AT SEEDED AREAS UNTIL 75% OF THE GRASS IS ESTABLISHED, THEN REMOVE AND DISPOSE ALL TEMPORARY EROSION CONTROL DEVICES.
6. REMOVE SILT AND DEBRIS FROM ALL DRAINAGE STRUCTURES



NOTES:

1. DOWNSTREAM COFFERDAM DESIGNED TO ACT AS LOW FLOW FILTER WHEN REMOVING EXISTING BRIDGE AND EXISTING CONCRETE CHANNEL FLOOR.
2. STONE TO BE NHDOT 585.3 STONE FILL CLASS C OR STANDARD STONE SIZE # 467 UNDER NHDOT 520, COARSE AGGREGATE.
3. PLACE SANDBAGS OR IMPERVIOUS MEMBRANE ON DAM TO PREVENT BACKFLOW WHEN NECESSARY (DEWATERING).
4. FABRIC FILTER SHALL BE CLEARED OF SILT AND DEBRIS BEFORE REMOVAL.

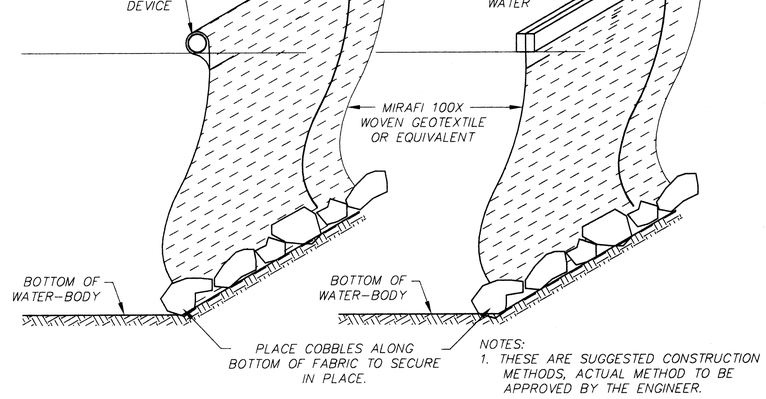
RECOMMENDED DOWNSTREAM TEMPORARY COFFERDAM
N.T.S.



NOTES:

1. SEDIMENTATION BARRIER SHALL BE INSTALLED BEFORE COFFERDAM IS CONSTRUCTED.
2. SEDIMENTATION BARRIER SHALL BE BE CLEARED OF ANY SILT OR DEBRIS BEFORE REMOVAL
3. COFFERDAM SHALL BE REMOVED BEFORE SEDIMENTATION BARRIER IS REMOVED

RECOMMENDED TEMPORARY COFFERDAM ALTERNATES
N.T.S.



SEDIMENTATION BARRIER
N.T.S

FILE: 95006.2.E2.DWG
Plotted: 01/15/2001. 11:18

H.EDMUND BERGERON ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

WATER DIVERSION AND EROSION CONTROL DETAILS OF COLLEGE ROAD BRIDGE NO.176/099
PREPARED FOR THE
TOWN OF WOLFBORO, N.H.

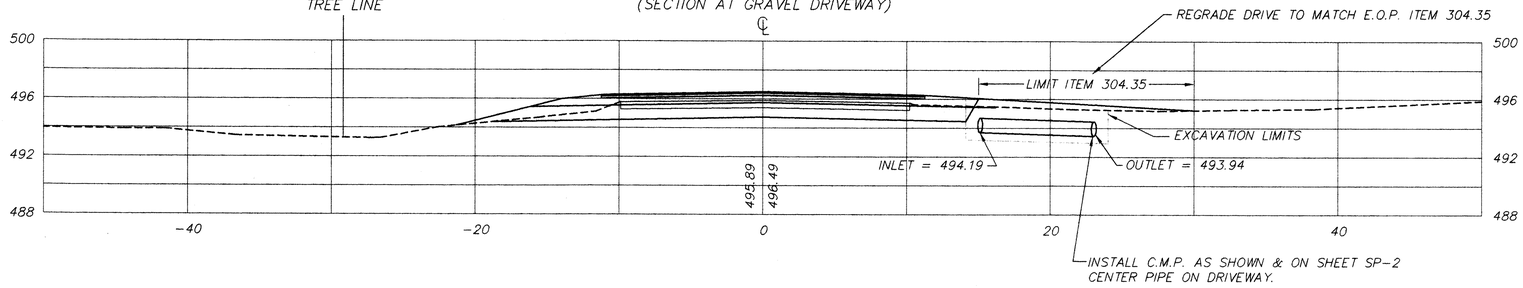
SURVEYED BY	
DESIGNED BY	JK
DRAWN BY	SAB
CHECKED BY	HEB
FIELD BOOK	
SCALE	AS SHOWN
DATE	15 JAN 01

95006.2
E-2
SHEET 28 OF 28

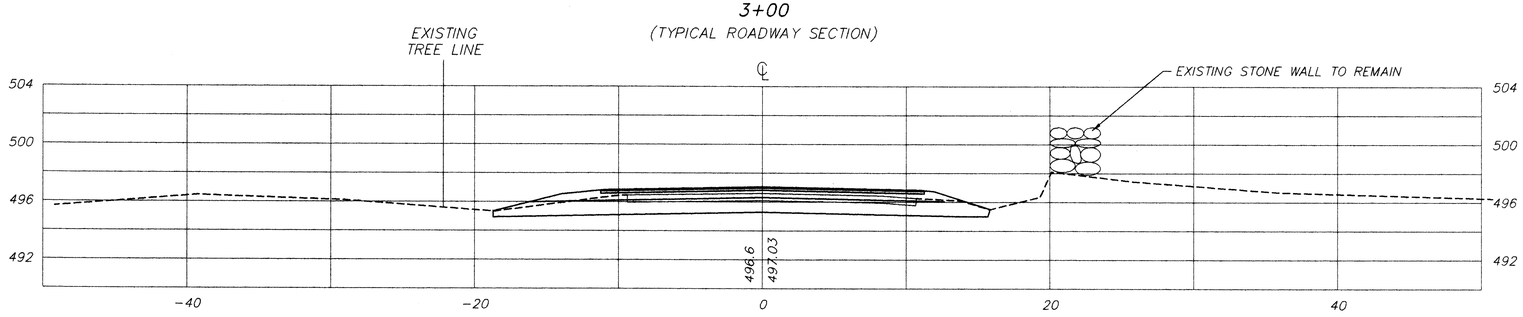
XS-1
SHEET 23 OF 28

95006.2
ROAD CROSS SECTIONS
COLLEGE ROAD BRIDGE

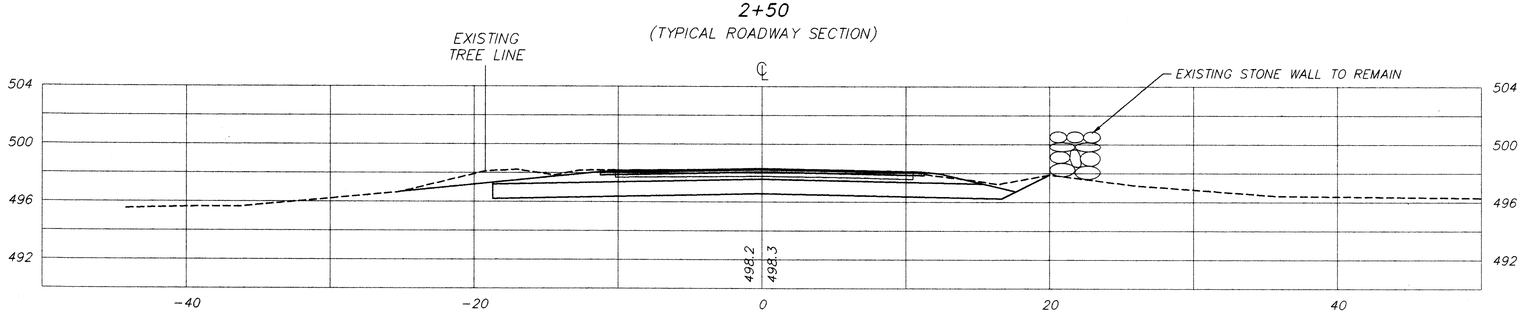
3+36.26
(TYPICAL ROADWAY SECTION)
(SECTION AT GRAVEL DRIVEWAY)



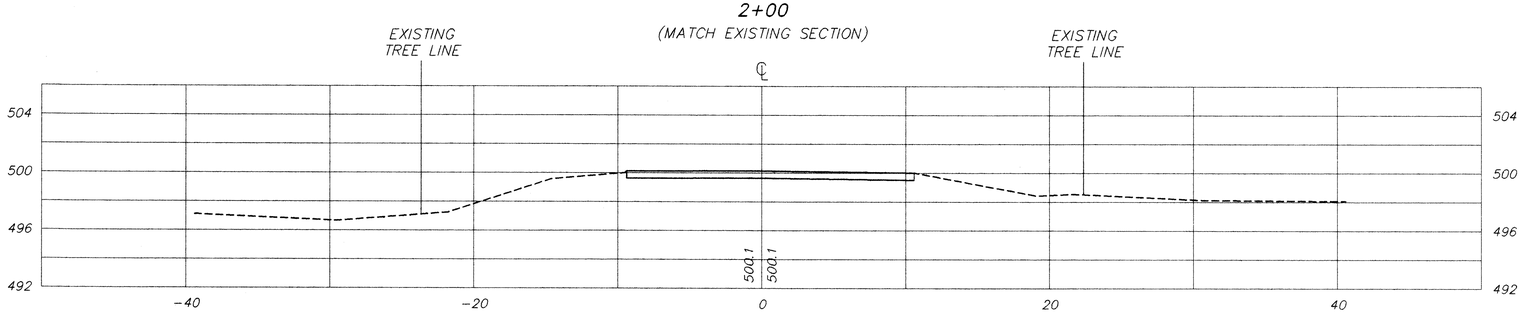
3+00
(TYPICAL ROADWAY SECTION)



2+50
(TYPICAL ROADWAY SECTION)



2+00
(MATCH EXISTING SECTION)



NO.	REVISION	DATE	BY

FILE: 95006_2_XS1.DWG
LAYOUT XS1
Plotted 07/10/2001 10:13

H.E. BERGERON
ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

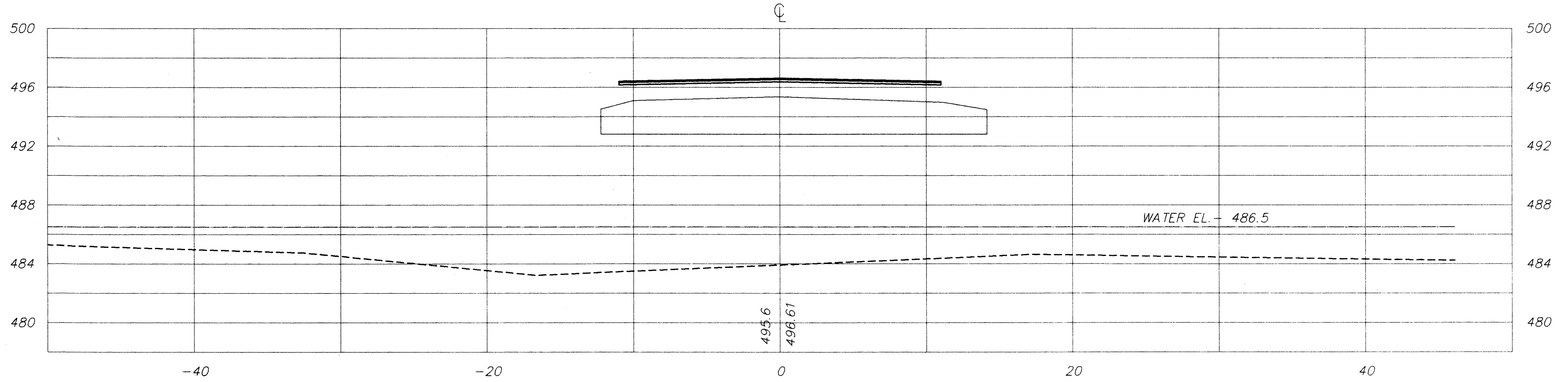
ROAD CROSS SECTIONS
STA 2+00 - 6+00
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	TDA/PWG
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	263
SCALE	1" = 5'
DATE	7/09/2001

95006.2
XS-1
SHEET 23 OF 28

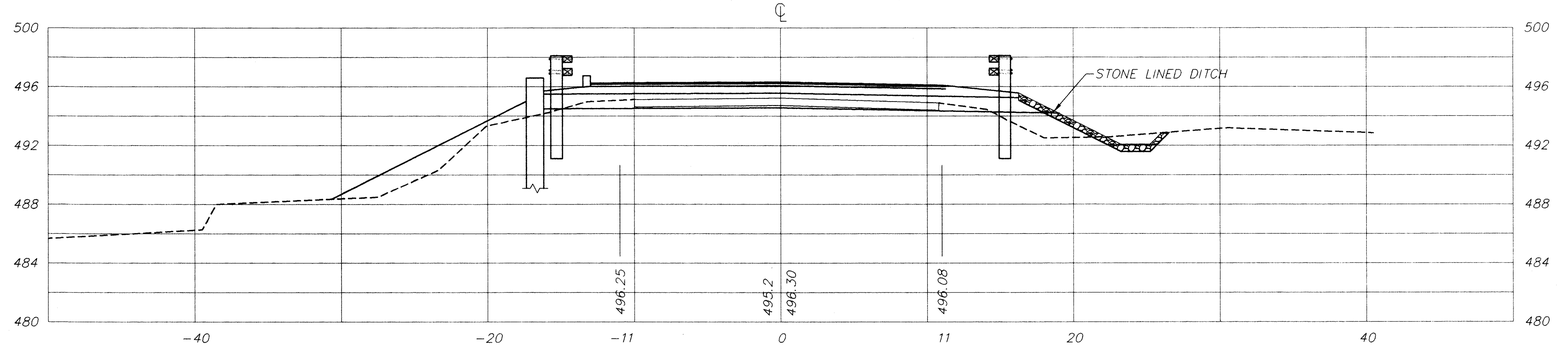
4+36.7

(CENTERLINE OF EXISTING BRIDGE)
(GRADE LINE FOLLOWS STREAM THREAD)



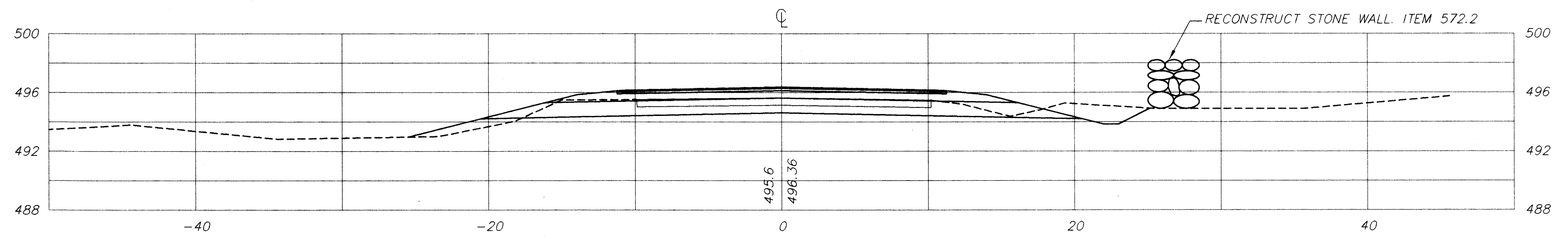
4+00

(SUPERELEVATION TRANSITION)
(TRANSITION STARTS @ STA: 3+80)



3+50

(TYPICAL ROADWAY SECTION)



NO.	REVISION	DATE	BY

FILE: 95006_2_XS1.DWG
LAYOUT: XS-2
Plotted: 07/10/2001, 11:13

H.E. BERGERON
ENGINEERS, P.A.
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ROAD CROSS SECTIONS
STA 2+00 - 6+00
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

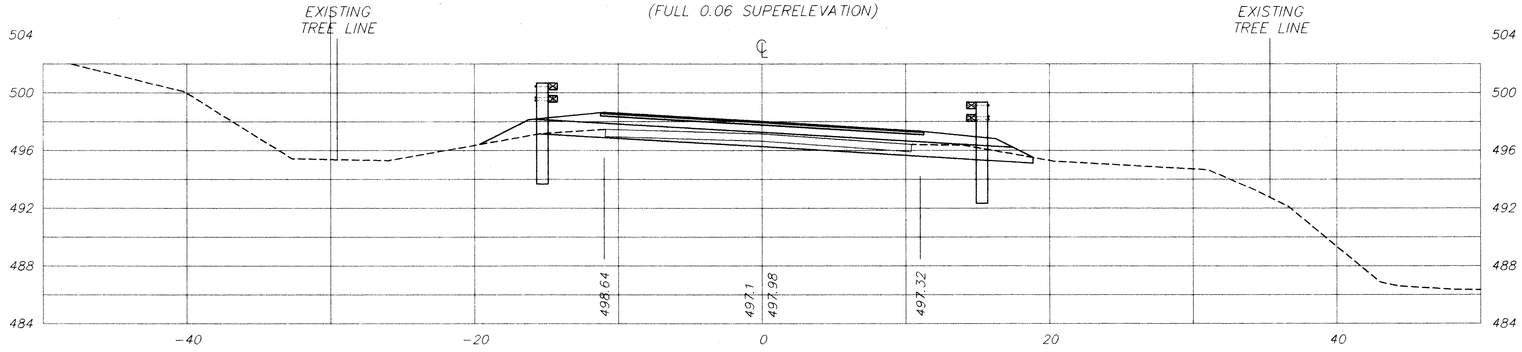
SURVEYED BY	TDA/PWC
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	263
SCALE	1" = 5'
DATE	7/09/2001

95006.2
XS-2
SHEET 24 OF 28

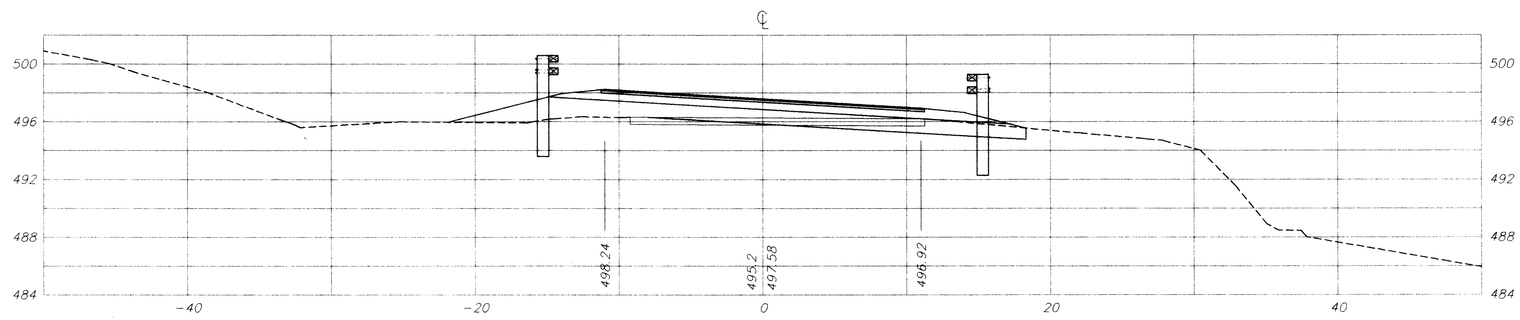
XS-3
SHEET 25 OF 28

95006.2
ROAD CROSS SECTIONS
COLLEGE ROAD BRIDGE

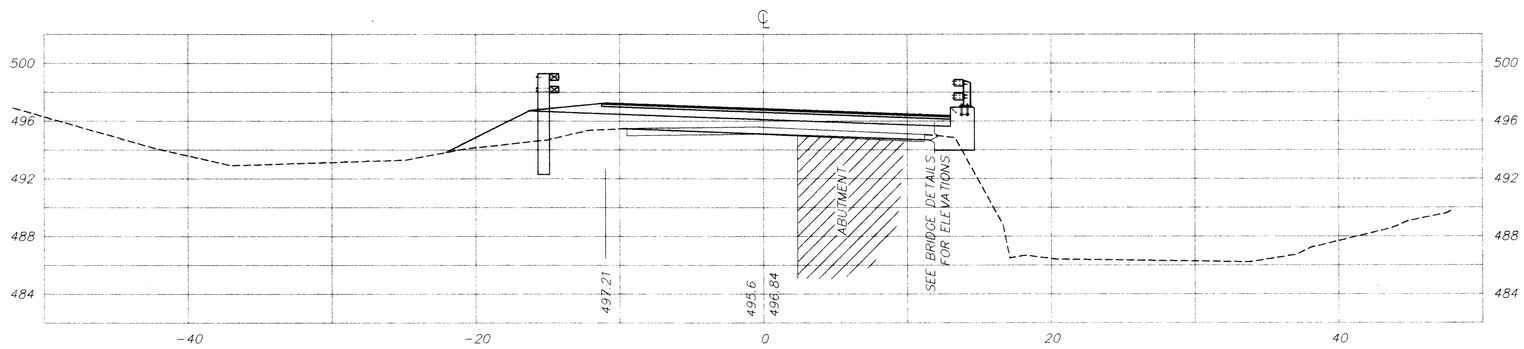
5+00
(FULL 0.06 SUPERELEVATION)



4+85
(START OF FULL 0.06 SUPERELEVATION)



4+50
(SUPERELEVATION TRANSITION)



NO.	REVISION	DATE	BY

FILE: 95006.2_XS1.DWG
LAYOUT XS3
Plotted 07/19/2001, 1113

H.E. BERGERON
ENGINEERS, P.A.
NORTH CONWAY, N.H.
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ROAD CROSS SECTIONS
STA 2+00 - 6+00
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	TDA/PWG
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	263
SCALE	1" = 5'
DATE	7/09/2001

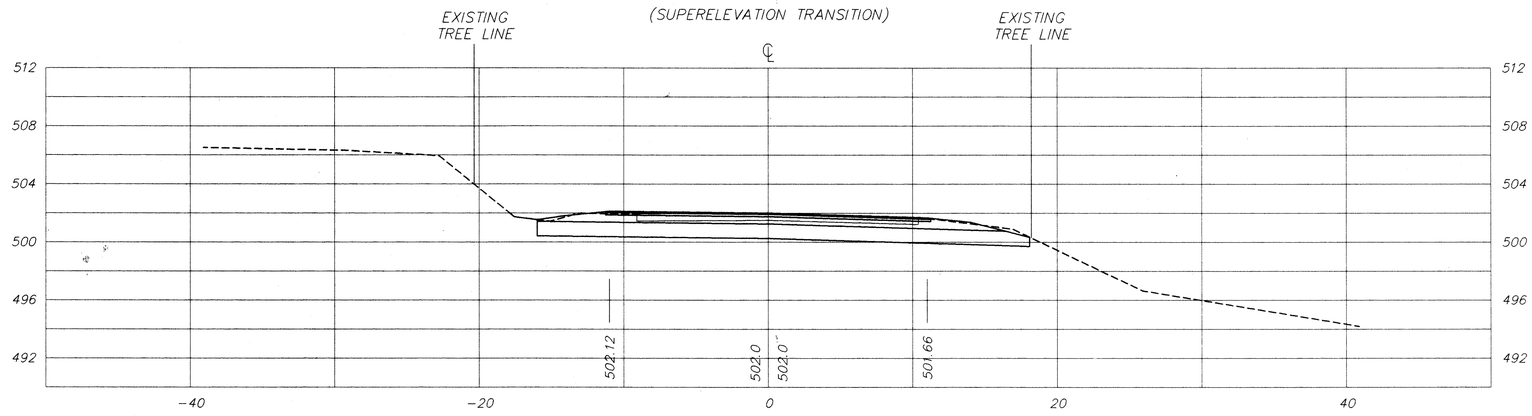
95006.2
XS-3
SHEET 25 OF 28

XS-4
SHEET 26 OF 28

95006.2
ROAD CROSS SECTIONS
COLLEGE ROAD BRIDGE

6+50
(MATCH EXISTING SECTION)

6+00
(SUPERELEVATION TRANSITION)



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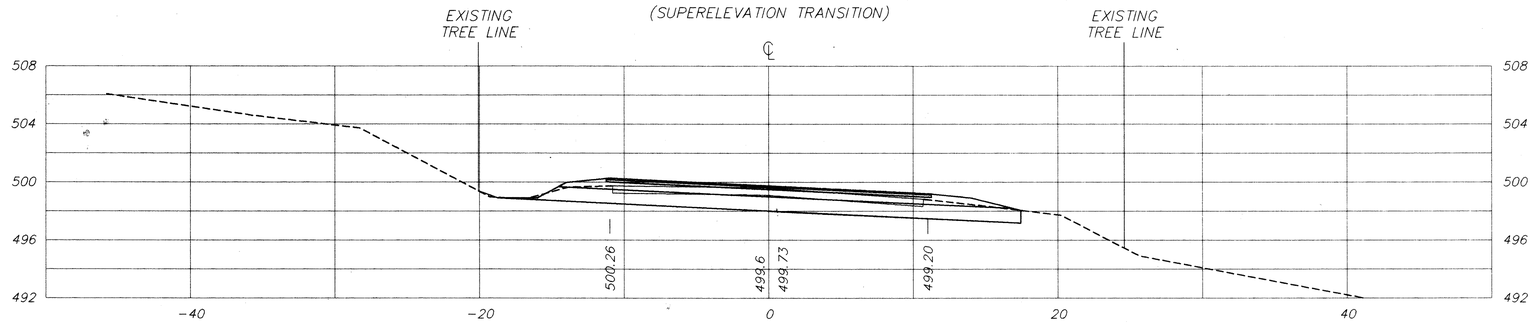
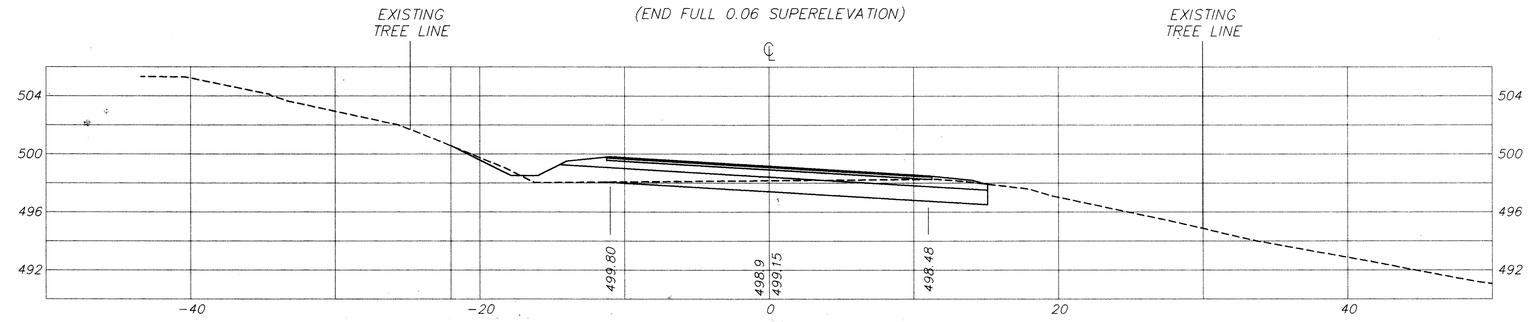
(SUPERELEVATION TRANSITION)



5+35
(END FULL 0.06 SUPERELEVATION)



NO.	REVISION	DATE	BY

FILE: 95006_2_XS1.DWG
LAYOUT: XS-4
Plotted: 07/10/2001, 11:13

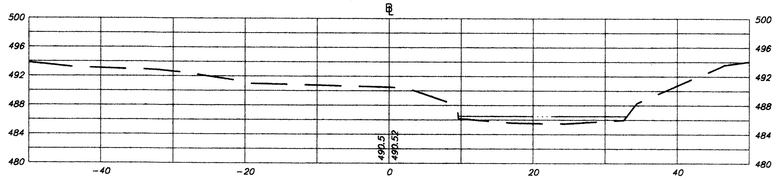
H.E. BERGERON
ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

ROAD CROSS SECTIONS
STA 2+00 - 6+00
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

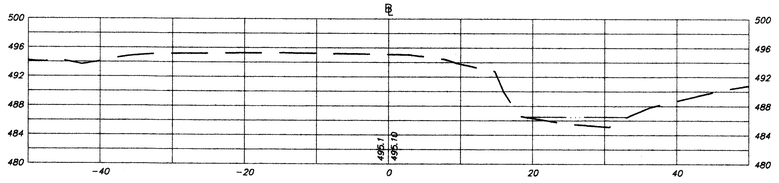
SURVEYED BY	TDA/PWG
DESIGNED BY	JWK
DRAWN BY	BCL
CHECKED BY	HEB
FIELD BOOK	263
SCALE	1" = 5'
DATE	7/09/2001

95006.2
XS-4
SHEET 26 OF 28

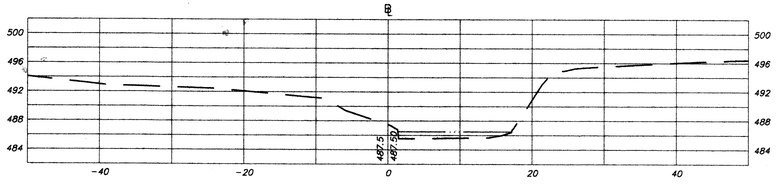
2+00



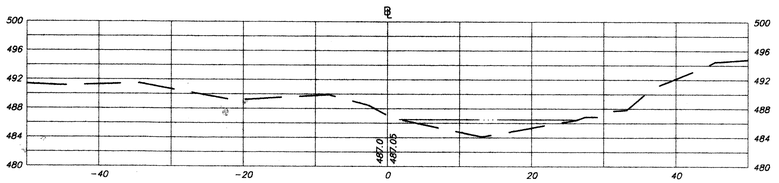
1+50



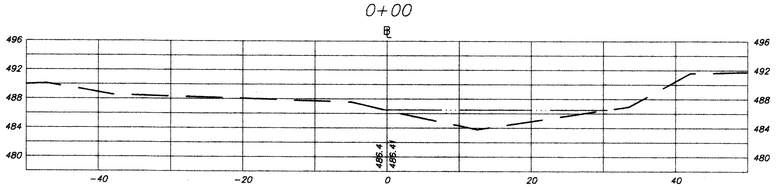
1+00



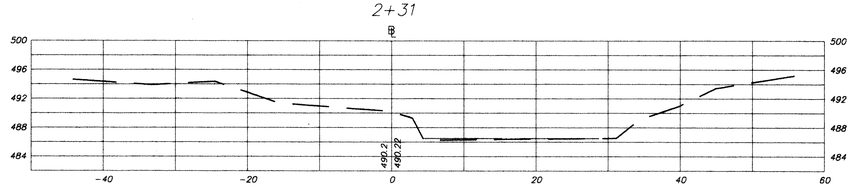
0+50



0+00



2+31



NOTE:

WATER SURFACE ELEVATION
FEBRUARY 1995

NO.	REVISION	DATE	BY

FILE: 95006_2_XSLONG
Plotted: 9/10/2001 15:40

H.E. BERGERON
ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

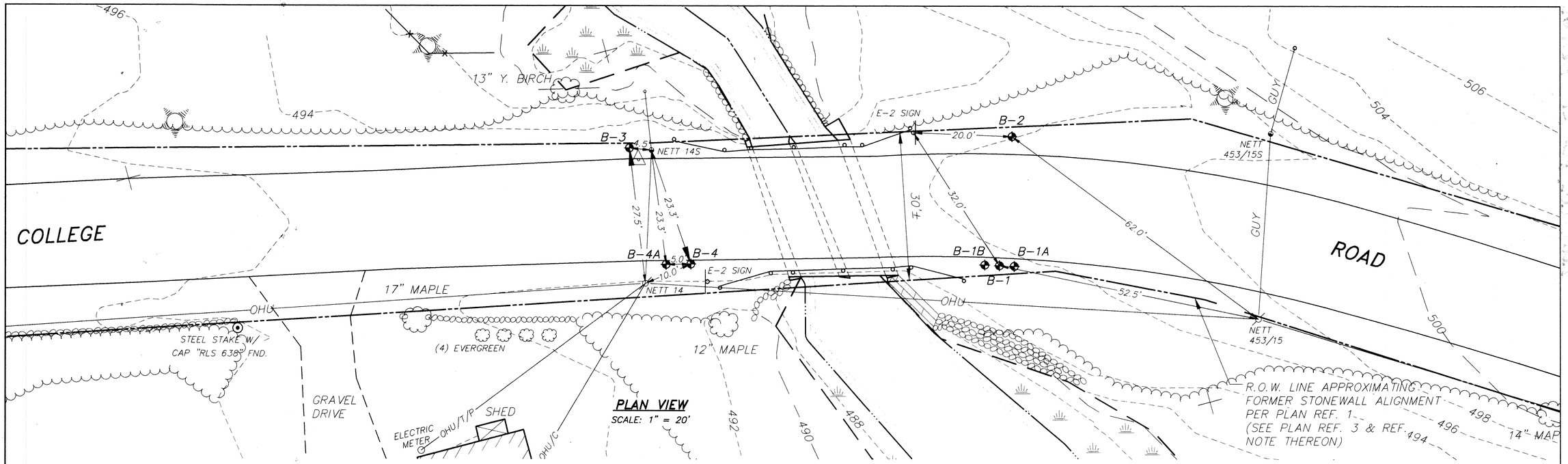
STREAM CROSS SECTIONS
STA 0+00 – 2+31
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

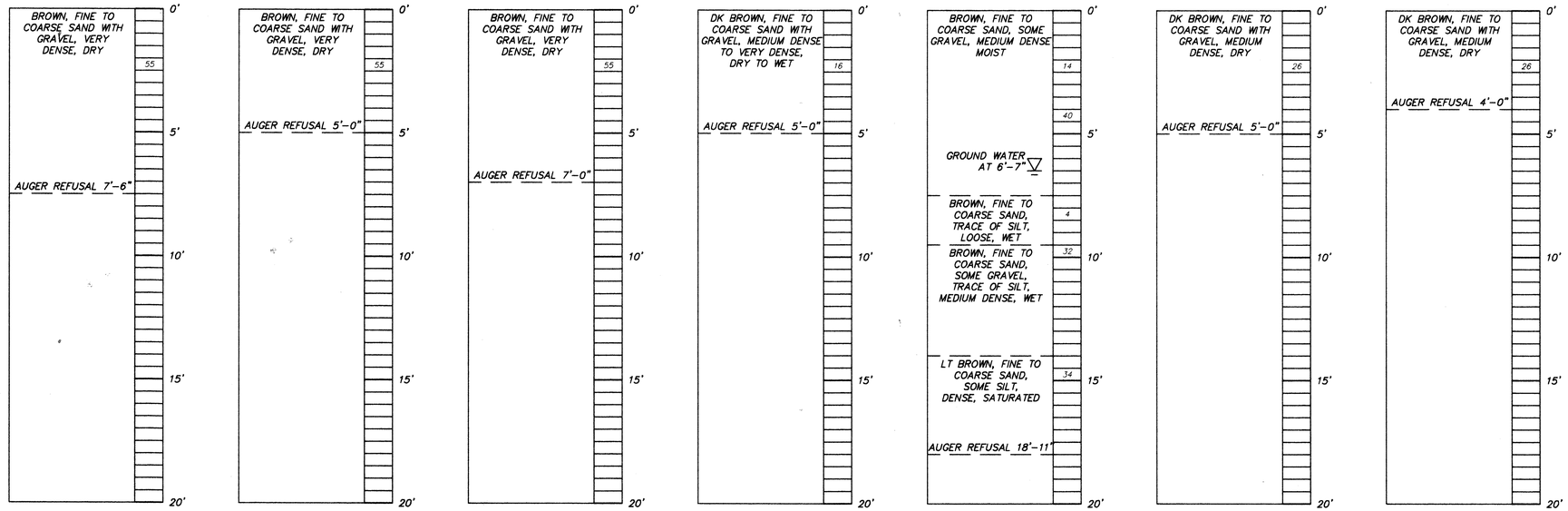
SURVEYED BY	TDA/PWG
DESIGNED BY	JMK
DRAWN BY	SAB
CHECKED BY	HEB
FIELD BOOK	263
SCALE	1" = 10'
DATE	7/09/2001

95006.2
XS-5
SHEET 27 OF 28

B-1
SHEET 28 OF 28

95006.2
SOIL BORINGS & LAYOUT
COLLEGE ROAD BRIDGE





LOCATION OF B-1A & B-1B WITHIN 3' RADIUS OF B-1

BORING NOTES

1. BORINGS INDICATED THUS ⌖ WERE MADE BY PROFESSIONAL SERVICE INDUSTRIES, INC. ON FEBRUARY 7, 1995 WITH A B-53 TRUCK MOUNTED MOBILE DRILL. FIGURES IN THE RIGHT HAND COLUMN INDICATE THE NUMBER OF BLOWS REQUIRED TO DRIVE A 2" O.D. STANDARD SPLIT SPOON SAMPLER SIX INCHES, USING A 140 LB. WEIGHT DROPPING 30 INCHES.
2. BORINGS ARE FOR DESIGN PURPOSES INDICATING CONDITIONS AT BORING POINTS ONLY, AND DO NOT NECCESSARILY INDICATE MATERIAL TO BE FOUND DURING CONSTRUCTION.
3. THE SOIL SAMPLES ARE AVAILABLE FROM HEB FOR A MORE DETAILED INSPECTION OF MATERIALS.
4. ALL BORINGS TAKEN ON SHOULDER OF ROAD WITHIN 3 ft EDGE OF PAVEMENT.

NO.	REVISION	DATE	BY

FILE: 95006_2_B1.DWG
Plotted 07/10/2001, 11:18

HEB
H.E. BERGERON ENGINEERS, P.A.
NORTH CONWAY, N.H.
(603) 356-6936

SOIL BORINGS & LAYOUT
COLLEGE ROAD BRIDGE No. 176/099
PREPARED FOR THE
TOWN OF WOLFEBORO, N.H.

SURVEYED BY	TDA/PWG
DESIGNED BY	JG
DRAWN BY	SAB
CHECKED BY	HEB
FIELD BOOK	263
SCALE	1"=20'
DATE	7/09/2001

95006.2
B-1
SHEET 28 OF 28

V

WHITTEN NECK ROAD OVER CRESCENT LAKE INLET

NHDOT BRIDGE #126/107

QUANTUM CONSTRUCTION CONSULTANTS, LLC
27 LOCKE ROAD, CONCORD, NH 03301-5417 TEL: 603-224-0859 FAX: 603-224-3625

QUANTUM CONSTRUCTION CONSULTANTS, LLC
27 LOCKE ROAD, CONCORD, NH 03301-5417 TEL: 603-224-0859 FAX: 603-224-3625

Whitten Neck Road over Crescent Lake Inlet
Bridge #126/107
Wolfeboro, New Hampshire
July 10, 2018

Bridge Description

Whitten Neck Road over the Crescent Lake Inlet is a 40-foot single span, precast voided slab bridge constructed in 2005 to replace an earlier superstructure. The bridge has a total length of approximately 44 feet and is approximately 32 feet wide. The curb-to-curb width of the bridge is 24 feet, with a 5'-10" sidewalk on the downstream (west) side. The NHDOT Bridge Inspection Report, dated December 29, 2016, reports this bridge to be in very good condition. This bridge is not on the Municipal Redlist and is posted E-2.

The abutments of the bridge consist of cast-in-place concrete cantilever walls, set on steel piles. The precast slab has a concrete overlay to form the roadway cross slope, with a barrier membrane and 2½ inches of pavement. Railing on the bridge is a timber, 3-rail system.

Field Observations

QCC performed a site visit on June 13, 2017 and again on October 4, 2017 to observe the bridge structure and roadway approaches. Observations made were able to confirm deficiencies noted in the NHDOT Inspection Report as well as identify additional items of concern. Additional items of concern include brush growing around the abutments, and a tripping hazard where the concrete and bituminous sidewalk meet.

Minor pavement cracks were noted on the bridge and approaches, as well as more significant pavement cracking at the deck ends.

Fine concrete cracks along the guardrail curbing were also noted. Additionally, previously sealed abutment cracks were noted. Rust staining along these cracks was also observed.

Excess brush and vegetation were observed around the abutments and the fire hydrant.

Checking and splitting were noted in the existing timber bridge and approach rail. This is a very common occurrence in timber. It was also noted that the existing bridge and guardrail are substandard.

Lastly, on the downstream side of the bridge where the concrete and bituminous sidewalk meet, the concrete sidewalk elevation is higher than the bituminous sidewalk. It was noted that this could be a potential tripping hazard to pedestrians.

Recommended Maintenance Efforts

It is recommended that a bridge evaluation be done by the Town each year in order to monitor the condition of the bridge and its components. QCC has provided a maintenance checklist to the Town (see Appendix D) with all items listed that should be inspected annually.

In addition to a yearly evaluation of the bridge it is recommended that cyclical maintenance efforts, as well as minor repairs be completed on the bridge in order to preserve the useful life. The following table summarizes the recommended cyclical maintenance efforts.

CYCLICAL MAINTENANCE		
Item		**Frequency**
Superstructure Washing	It is important that debris and salt contaminated dirt that collect on the superstructure are cleaned to prevent the intrusion of moisture into the structure which would cause accelerated deterioration.	Every year
Concrete Surface Washing	Washing the concrete surface is important in order to minimize exposure to salt which can cause cracking in the concrete and allow moisture into the structure causing deterioration.	Every year
Vegetation Control	Clearing excess vegetation on or around the structural elements is essential to prevent growth into the joints or cracks of the structure. It is recommended that the excess brush be removed from around the abutment structure, as well as around the fire hydrant so the area is accessible for when it may be needed.	Every year
Debris Removal from Channel	It is important to remove large debris from the channel to prevent the channel bed material from scouring and to reduce the possibility of creating blockages.	Every year
Drainage System Clean-Out/Repair	Lack of regular drainage maintenance can cause the system to get clogged with debris and risk damage to the drainage elements.	Every 2 years
Water Repellent	Coating the curbs, slabs, fascias, and wingwalls with NHDOT Item 534.3, Water Repellent (Silane Siloxane), will prolong the life span of the concrete component. This item seals out moisture and salts that can infiltrate the concrete thereby causing deterioration.	Every 3 years (see Appendix F for details)
Crack Seal (Pavement)	Cracks in pavement are typically caused by repetitive loading over time. Sealing pavement cracks with NHDOT Item 413, Hot Poured Crack Sealant, will prevent further cracking in the pavement structure and avoid infiltration of moisture which will deteriorate the pavement over time.	As required

It is important to complete minor repairs on the bridge in order to prolong the useful life. The following table summarizes the recommended repairs, as well as the repairs to complete when additional deficiencies occur.

RECOMMENDED REPAIRS				
Item Number	**Item**		**Frequency**	**Programmed Year**
1	Replace Membrane	It is important to replace the membrane to minimize the infiltration of water and contaminates into the concrete which can cause deterioration of the concrete as well as corrosion of the reinforcing steel.	Every 20 years	2025
2	Patch Spalls in Concrete	Spalling in concrete is important to repair to prevent the degradation of the reinforcing steel. Spalling is often caused by numerous sources and should be reviewed on a case by case basis to ensure proper and complete repair.	As required	-
3	Install Scour Countermeasures	Scour is caused by swiftly moving water that causes sediment such as sand, gravel and stone intended to protect the substructure to be eroded away. It is important to install scour countermeasures when needed to protect the substructure elements from failure due to scour.	As required	-
4	Crack Seal (Concrete)	Cracks in concrete occur over time due to various reasons, including shrinkage and repetitive loading. It is important to look for and then apply concrete sealants, that will protect the reinforcing steel from corrosion by minimizing the intrusion of the water and contaminates, to the concrete surface.	As required	2018 (See Appendix D for details)
5	Sidewalk Repairs	It is recommended to install pavement at the bituminous sidewalk on the downstream side of the bridge to eliminate the tripping hazard where the bituminous and concrete sidewalk meet.	As required	2018

6	Joint Installation	Cracking at the deck ends of the pavement are a common occurrence. Installing NHDOT Item 559.41, Asphaltic Plug for Crack Control, at the ends of the deck will help to seal and prevent water intrusion into the bearing seats.	As required	2018
7	Curb Crack Repairs	Curb cracking of the concrete is a common occurrence in concrete bridge curbs due to the shrinkage of the concrete. It is important to seal concrete cracks in the bridge curb with NHDOT Item 526.3, Methacrylate Crack Sealer for Concrete Bridge Decks, to prevent the penetration of moisture into the concrete which over time will accelerate the deterioration of the concrete.	As required	2018 (See Appendix D for details)
8	Replace Bridge and Approach Rail	Install NHDOT Item 563.23, Bridge Rail T3, and NHDOT Item 565.2325, Bridge Approach Rail T3 (Steel Posts), in place of the existing bridge and approach rail on the upstream side of the bridge, and Item 563.24, Bridge Rail T4, and Item 565.24, Bridge Approach Rail T4, in place of the railing on the downstream side to bring the railing up to current standards. This action of replacement is recommended within the next 5 years.		2018-2023

Cost of Recommended Repairs

QCC has provided a 2017 construction cost estimate for the recommended repairs as well as maintenance items associated with a NHDOT Item. The table below summarizes the unit costs and total costs for the recommended maintenance efforts.

Maintenance Item	NHDOT Item	Unit Cost (2017)	Total Cost (2017)
Water Repellent	Item 534.3 Water Repellent (Silane Siloxane)	$93.41/GAL	$1,500
Crack Seal (Pavement)	Item 413.1 Hot Poured Crack Sealant	$1.78/LB	-

The following table summarizes the costs of the recommended repairs. Total costs and unit costs are given for the items that require action now, while only unit costs are given for the items that do not need action now but may need action in the future.

Repair Item	NHDOT Item	Unit Cost (2017)	Construction Cost (2017)
Replace Membrane (2025)	Item 538.5 Barrier Membrane, Heat Welded	$32.85/SY	-
Patch Spalls in Concrete	Item 521.21 Fast-Set Concrete Patching Mortar (Horizontal)	$620.00/CF	-
	Item 521.22 Fast-Set Concrete Patching Mortar (Vertical and Overhead)	$800.00/CF	
Install Scour Countermeasures	Item 583.3 Riprap Class III	$46.00/CY	-
Crack Seal (Concrete)	Item 526.2 Epoxy for Non-Moving Cracks	-	-
Sidewalk Repairs (2018)	Item 403.12 Hot Bituminous, Hand Method	$118.78/TON	$1,500
Pavement Joint Installation (2018)	Item 628.22 Sawed Bituminous Pavement (Bridge)	$3.23/LF	$8,700
	Item 559.41 Asphaltic Plug for Crack Control	$130.00/LF	
Curb Crack Repairs	Item 526.3 Methacrylate Crack Sealer for Concrete Bridge Decks	$525.00/GAL	-

Replace Bridge and Approach Rail (2018-2023)	Item 202.7 Removal of Guardrail	$2.53/LF	$44,500
	Item 563.23 Bridge Rail T3	$128.00/LF	
	Item 565.2325 Bridge Approach Rail T3	$6,000/U	

Maintenance Checklist

As part of QCC's October 4,2017 site visit the following maintenance checklist was completed. This checklist will serve as a tool to the Town to evaluate the bridge and its components on a yearly basis. Blank checklists can be found in Appendix D for the Towns use.

Bridge Maintenance Checklist: Whitten Neck Road over Crescent Lake Inlet

Date: 10/4/17 Performed by: QCC

	Item	Satisfactory Condition	Needs Action	Comments
Deck Elements	Wearing Surface		√	Cracked at the ends of the bridge
	Curbs		√	Microcracking
	Sidewalk		√	Joint between concrete and bituminous sidewalk tripping hazard.
	Bridge Rail		√	Minor checking, substandard
Superstructure	Deck Beams	√		
	Bearings			
Abutment	Bridge Seat	√		
	Erosion or Scour	√		None observed
	Pile Cap			Not visible
	Piles			Not visible
Wingwalls	Concrete		√	Fine cracks
	Erosion or Scour	√		None observed
	Piles			Not visible

Stream Channel	Erosion or Scour	√		None observed
	Waterway opening	√		Clear
	Riprap	√		
Approaches	Guardrail		√	Minor checking, substandard
	Drainage	√		Clear
	Pavement		√	Minor cracking
Other	Water Level Gage	√		

Bridge Maintenance Checklist: Whitten Neck Road over Crescent Lake Inlet

Date: _____ Performed by: _____

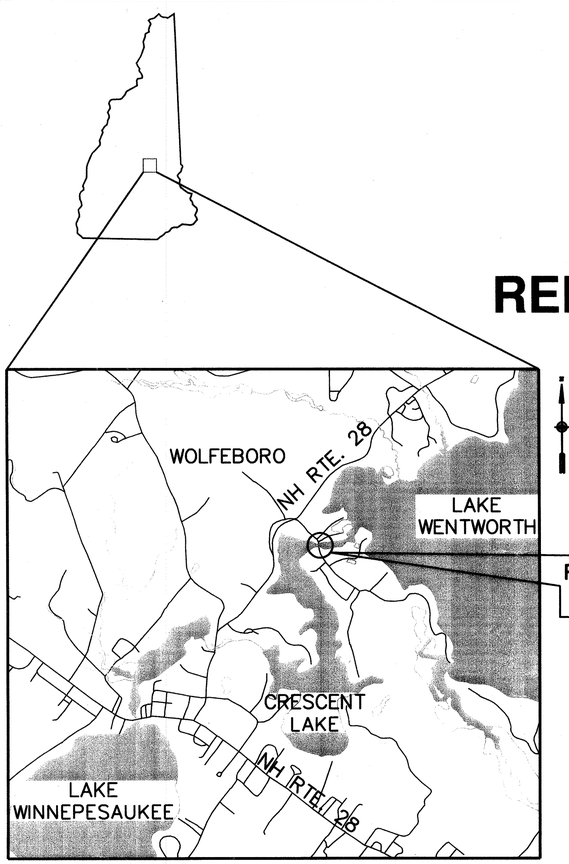
	Item	Satisfactory Condition	Needs Action	Comments
Deck Elements	Wearing Surface			
	Curbs			
	Sidewalk			
	Bridge Rail			
Superstructure	Deck Beams			
	Bearings			
Abutment	Bridge Seat			
	Erosion or Scour			
	Pile Cap			
	Piles			
Wingwalls	Concrete			
	Erosion or Scour			
	Piles			

Stream Channel	Erosion or Scour			
	Waterway opening			
	Riprap			
Approaches	Guardrail			
	Drainage			
	Pavement			
Other	Water Level Gage			

TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE

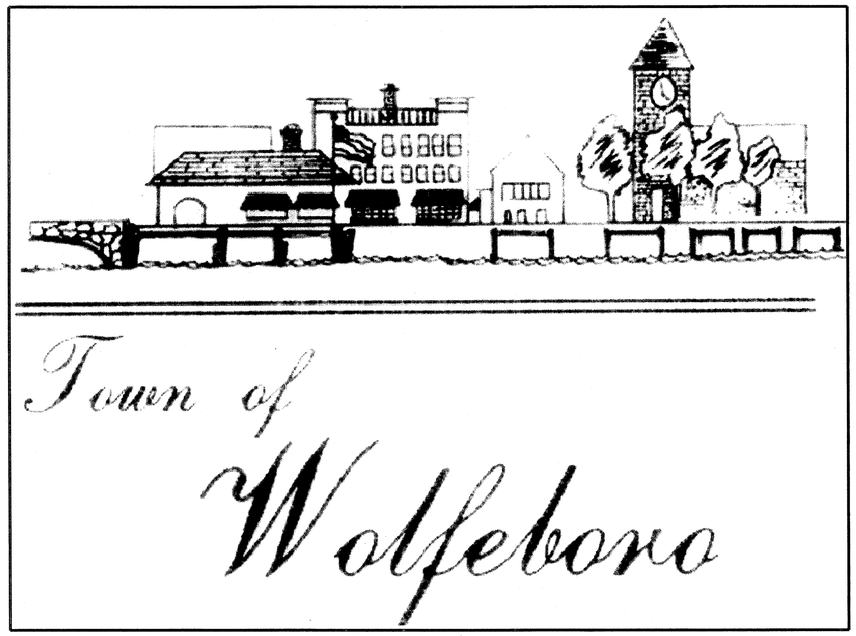
PLANS OF PROPOSED
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
OVER CRESCENT LAKE INLET (126/107)
NHDOT PROJECT 13416

AUGUST, 2004



LOCATION MAP
SCALE: 1" = 2000'

INDEX OF SHEETS



RECORD DRAWINGS (2)
AUGUST, 2005

THE "RECORD COPY" NOTATIONS WITHIN THE HTA DRAWINGS ARE SHOWN FOR GENERAL PURPOSES ONLY. USERS ARE CAUTIONED TO FIELD VERIFY THE AS-BUILT DATA.

(1) ADD PILES

(2) RECORD COPY DRAWINGS

GENERAL NOTES

G–1. GENERAL NOTES SHALL APPLY TO ALL DRAWINGS PREPARED BY HOYLE, TANNER & ASSOCIATES (HTA) AND THE WORK THEY CONVEY.

G–2. ALL WORK SHALL CONFORM TO ALL FEDERAL, STATE AND LOCAL CODES, REGULATIONS AND STANDARDS, THE MORE STRINGENT SHALL GOVERN.

G–3. THE GENERAL CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS AND COORDINATION OF OTHER TRADES.

G–4. THESE DOCUMENTS DO NOT INCLUDE THE NECESSARY COMPONENTS FOR CONSTRUCTION SAFETY. CARE OF ADJACENT PROPERTIES DURING CONSTRUCTION AND COMPLIANCE WITH STATE AND FEDERAL REGULATIONS REGARDING SITE SAFETY SHALL SOLELY BE THE CONTRACTORS RESPONSIBILITY.

G–5. ALL DIMENSIONS, ELEVATIONS AND CONDITIONS MUST BE VERIFIED BY THE GENERAL CONTRACTOR OR RESPONSIBLE TRADES PRIOR TO COMMENCING WITH THE WORK, FABRICATION OR ORDERING MATERIALS. DO NOT SCALE DRAWINGS, USE DIMENSIONS SHOWN.

G–6. ANY DISCREPANCIES BETWEEN THESE DRAWINGS AND AS–BUILT CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER IMMEDIATELY PRIOR TO PROCEEDING WITH THE WORK.

G–7. THE INFORMATION SHOWN ON THESE PLANS CONCERNING THE TYPE AND LOCATION OF UNDERGROUND UTILITIES IS NOT GUARANTEED TO BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR MAKING HIS OWN DETERMINATIONS AS TO THE TYPE AND LOCATION OF UNDERGROUND UTILITIES AS MAY BE NECESSARY TO AVOID DAMAGE THERETO.

G–8. ALL APPLICABLE UTILITY DEPARTMENTS AND COMPANIES SHALL BE NOTIFIED BEFORE EXCAVATION IS STARTED. UTILITIES WITHIN 50 FEET OF AN EXCAVATION SHALL BE MARKED IN THE FIELD.

G–9. HOYLE, TANNER & ASSOCIATES, INC. WAIVES ANY AND ALL RESPONSIBILITY AND LIABILITY FOR PROBLEMS THAT ARISE DUE TO THE FAILURE OF THE CONTRACTOR:

* TO FOLLOW THESE DRAWINGS AND SPECIFICATIONS AND THE DESIGN INTENT THEY CONVEY.
* TO NOTIFY HTA OF ANY DISCREPANCIES, ERRORS, OMISSIONS OR CONFLICTS AND OBTAIN THEIR GUIDANCE TO RESOLVE.

G–10. THE CONTRACTOR SHALL REFERENCE THE NHDOT "STANDARD PLANS FOR ROAD AND BRIDGE CONSTRUCTION", 2001. STANDARD PLANS APPLICABLE TO THIS PROJECT ARE AS FOLLOWS:

CR–1 – GRANITE CURB DETAILS
DL–1 – ROADSIDE DELINEATION
PM–1 – LAYOUT DETAILS
PM–2 – TOLERANCES FOR PAVEMENT MARKING LINES

ENGINEER

REV.	DESCRIPTION	DR. BY	CHKD. BY	APPD. BY	DATE

PROJECT NO. 906301
FILE NAME 9063Titl
DO NOT SCALE DRAWING

DR. BY JDG
CHKD. BY RHD
DES. BY MJL

HTA
150 Dow Street – Manchester, NH 03101–1227
Tel 603–669–5555 Fax 603–669–4168
Web Page: www.hoyletanner.com E–Mail: hry.mail@hta–nh.com
Consulting Engineers

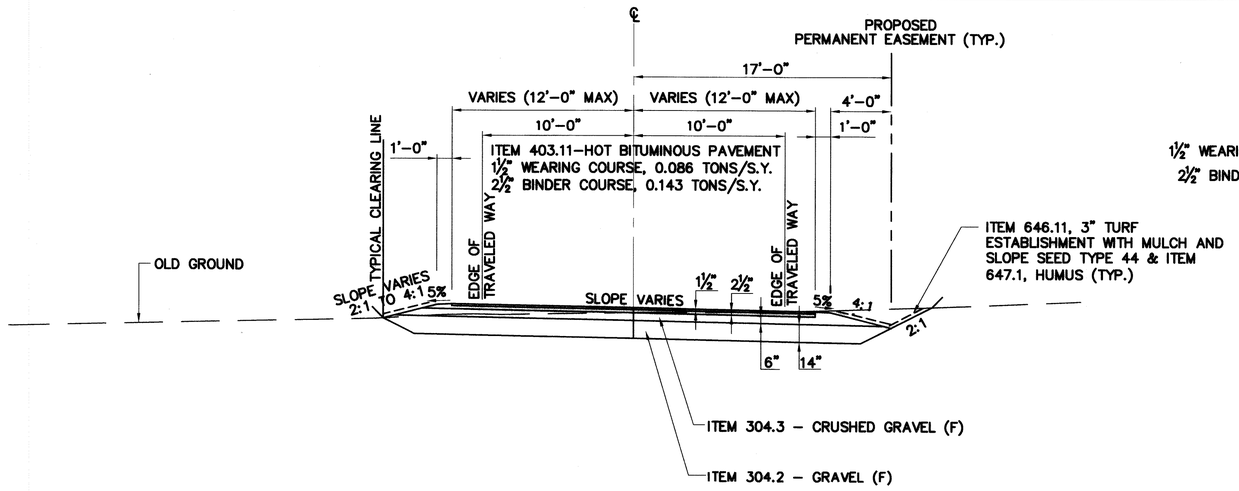
DATE: AUGUST 2004
SCALE: AS SHOWN

TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 126/107

TITLE SHEET

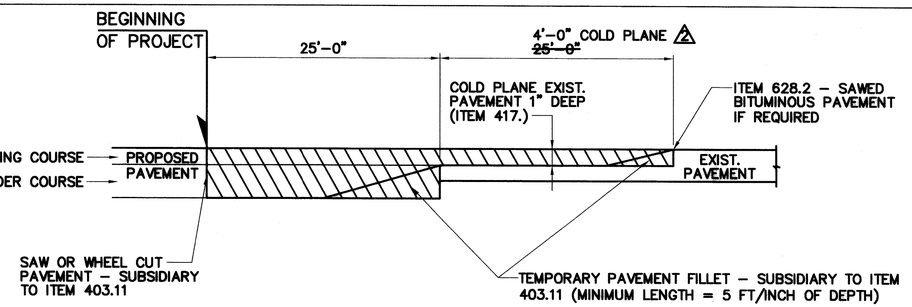
DRAWING NO. 1

SHEET 1 OF 21



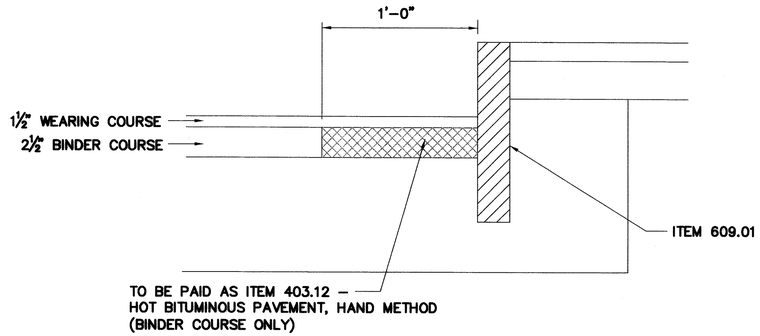
TYPICAL CROSS SECTION WITHOUT SIDEWALK
STA. 100+50 TO STA. 102+86 LEFT
STA. 105+70 TO STA. 106+28.12 LEFT
STA. 100+50 TO STA. 102+76 RIGHT
STA. 104+93 TO STA. 106+28.12 RIGHT

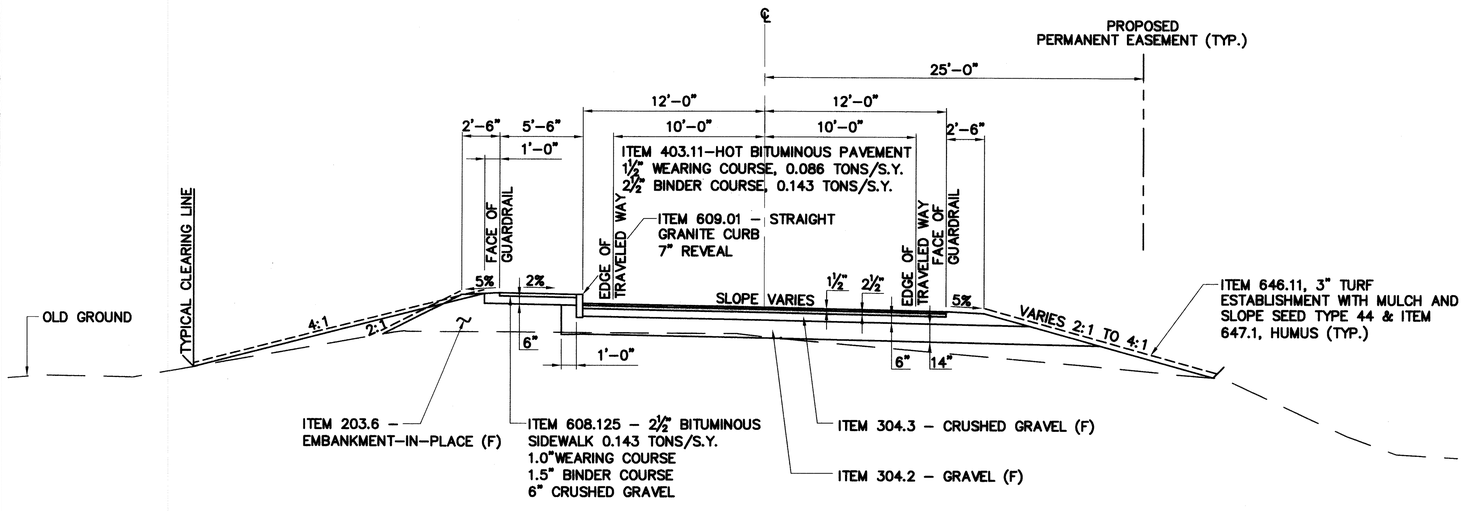
NOT TO SCALE



INLAY PAVEMENT MATCH TYPICAL
(SOUTH END ONLY)

NOT TO SCALE



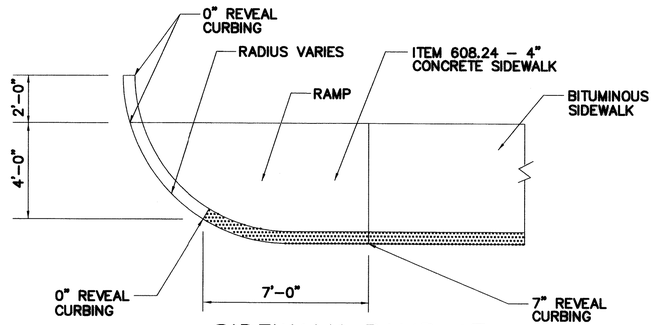


TYPICAL CROSS SECTION WITH SIDEWALK
STA. 102+86 TO STA. 103+64 LEFT
STA. 104+08 TO STA. 105+31 LEFT
STA. 102+76 TO STA. 103+64 RIGHT
STA. 104+08 TO STA. 104+93 RIGHT

NOT TO SCALE

CURB PAVEMENT MATCH TYPICAL

NOT TO SCALE



SIDEWALK RAMP AT UNCURBED DRIVE

NOT TO SCALE

SIDEWALK NOTES:

1. THE MAXIMUM RUNNING SLOPE OF ANY SIDEWALK CURB RAMP IS 12:1, THE MAXIMUM CROSS-SLOPE IS 2%. THE SLOPE OF THE LANDING SHALL NOT EXCEED 2% IN ANY DIRECTION.
2. TRANSITIONS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES. ROADWAY SHOULDER SLOPES ADJOINING SIDEWALK CURB RAMPS SHALL BE A MAXIMUM OF 5% (FULL WIDTH) FOR A DISTANCE OF 2'-0" FROM THE ROADWAY CURBLINE.
3. INTERCEPT DRAINAGE ALONG THE CURB IN ADVANCE OF THE SIDEWALK CURB RAMPS OR LANDINGS. CATCH BASINS, MANHOLES, ETC. SHALL NOT BE LOCATED IN, OR AT THE BASE OF, SIDEWALK CURB RAMPS OR LANDINGS.
4. THE BOTTOM OF THE SIDEWALK CURB RAMP OR LANDING, EXCLUSIVE OF THE FLARED SIDES, SHALL BE WHOLLY CONTAINED WITHIN THE CROSSWALK MARKINGS.
5. PORTLAND CEMENT CONCRETE SHALL BE CONSTRUCTED AT ALL RAMP LOCATIONS WHICH INTERSECT WITH ROADWAYS. THE RAMPS SHALL BE CONSTRUCTED WITH 3000 PSI CONCRETE HAVING A MINIMUM THICKNESS OF 4". THE SURFACES OF THE RAMPS ARE TO BE TEXTURED WITH A BRUSHED BROOM.
6. PAVEMENT & BASE COURSE DEPTHS FOR RESIDENTIAL DRIVES ARE TYPICALLY 6" CRUSHED GRAVEL WITH 2" H.B.P. (HAND METHOD) SINGLE COURSE. FOR DESIGN CRITERIA AND OTHER ADDITIONAL INFORMATION, REFER TO THE NHDOT DRIVEWAY MANUAL.

ENGINEER
STATE OF NEW HAMPSHIRE
JOHN D. GOLDSMITH
No. 9683
PROFESSIONAL ENGINEER

NO.	REVISION DESCRIPTION	DR. BY	CHKD. BY	APPD. BY	DATE
	RECORD COPY DRAWINGS	JDG	JB	MJB	8/05

PROJECT NO. 906301
FILE NAME 9063TYP
DO NOT SCALE DRAWING

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CHKD. BY RHD
DR. BY JDG
DES. BY JPC

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SCALE: AS SHOWN
DATE: AUGUST 2004

TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 128/107

APPROACH ROADWAY SECTIONS AND DETAILS

DRAWING NO. 2

SHEET 2 OF 21

SUMMARY OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY
201.21	REMOVING SMALL TREES	EA	~~2~~ 8
210.22	REMOVING LARGE TREES	EA	2
203.1	COMMON EXCAVATION	CY	750
203.2	ROCK EXCAVATION	CY	~~15~~ 0
203.6	EMBANKMENT-IN-PLACE (F)	CY	525
206.1	COMMON STRUCTURE EXCAVATION	CY	~~5~~ 0
206.2	ROCK STRUCTURE EXCAVATION	CY	~~5~~ 0
209.201	GRANULAR BACKFILL (BRIDGE) (F)	CY	~~400~~ 324
304.2	GRAVEL (F)	CY	700
304.3	CRUSHED GRAVEL (F)	CY	325
304.35	CRUSHED GRAVEL FOR DRIVES	CY	~~40~~ 48
403.11	HOT BITUMINOUS PAVEMENT, MACHINE METHOD	TON	330
403.12	HOT BITUMINOUS PAVEMENT, HAND METHOD	TON	~~50~~ 20
403.911	HOT BITUMINOUS BRIDGE PAVEMENT, 1" BASE COURSE	TON	7
417	COLD PLANING BITUMINOUS SURFACES (F)	SY	~~120~~ 9
501.2	TEMPORARY BRIDGE WITH APPROACHES	UNIT	1
502	REMOVAL OF EXISTING BRIDGE STRUCTURE	UNIT	1
503.201	COFFERDAMS	UNIT	1
503.202	COFFERDAMS	UNIT	1
504.1	COMMON BRIDGE EXCAVATION (F)	CY	~~740~~ 574
504.2	ROCK BRIDGE EXCAVATION	CY	~~110~~ 200
508	STRUCTURAL FILL	CY	~~50~~ 78
520.011	CONCRETE CLASS AA WITH HIGH RANGE WATER REDUC. ADM.	CY	~~10~~ 17
520.12	CONCRETE CLASS A, ABOVE FOOTINGS	CY	~~140~~ 131
520.213	CONCRETE CLASS B, FOOTINGS (ON SOIL) (F)	CY	~~100~~ 76
528.311	PRESTRESSED CONCRETE BRIDGE DECK, BUTTED DECK BEAMS (F)	SF	1328
534.3	WATER REPELLENT (SILANE-SILOXANE) (F)	SF	780
538.2	BARRIER MEMBRANE, VERTICAL SURFACES (F)	SY	~~10~~ 9
538.5	BARRIER MEMBRANE, WELDED BY TORCH (F)	SY	~~115~~ 123.2
544	REINFORCING STEEL	LB	15410
544.11	REINFORCING STEEL, MECH. CONN.	LB	~~555~~ 0
544.2	REINFORCING STEEL , EPOXY COATED	LB	1575
544.7	SYNTHETIC FIBER REINFORCEMENT	LB	~~185~~ 102
548.11	ELASTOMERIC BEARING PADS (F)	EA	32
559.5	SILICONE JOINT SEALANT (F)	LF	70
563.52767	TIMBER BRIDGE RAIL (3-RAIL)	LF	~~163.5~~ 147
585.1	STONE FILL, CLASS A	CY	~~115~~ 200
585.3	STONE FILL, CLASS C	CY	~~5~~ 0
593.23	HIGH STRENGTH GEOTEXTILE, NON-WOVEN	SY	~~45~~ 56
603.00215	15" RCP CLASS III (2000D)	LF	~~170~~ 154
603.30115	15" RCP END SECTION	EA	~~1~~ 0
603.6	RELAYING 0-24" DRAINAGE PIPE	LF	8
604.0007	POLYETHYLENE LINER	EA	4
604.12	CATCH BASIN TYPE B	UNIT	3
604.32	DRAINAGE MANHOLE	UNIT	1
606.417	PORTABLE CONCRETE BARRIER	LF	~~270~~ 360
606.5266	TIMBER RAIL (2-RAIL)	LF	~~246.6~~ 244
608.125	2" BITUMINOUS SIDEWALK	SY	~~125~~ 118
608.24	4" CONCRETE SIDEWALK	SY	~~10~~ 13
609.01	STRAIGHT GRANITE CURB	LF	~~214~~ 274
609.02	CURVED GRANITE CURB	LF	~~25~~ 29.5
609.3	STRAIGHT GRANITE CURB (BRIDGE)	LF	118
611.90001	ADJUSTING WATER GATES AND SHUTOFFS SET BY OTHERS	EA	~~8~~ 7
613.41	STORMWATER TREATMENT SYSTEM	UNIT	1
615.5	FRP LEVEL GAUGE	EA	1
619.1	MAINTENANCE OF TRAFFIC	UNIT	1
621.21	RETROREFLECTIVE BEAM GUARDRAIL DELINEATOR (WHITE)	EA	~~15~~ 0
621.31	SINGLE DELINEATOR WITH POST (WHITE)	EA	~~20~~ 5
628.2	SAWED BITUMINOUS PAVEMENT	LF	~~100~~ 37
632.0104	RETROREFLECTIVE PAINT PAVEMENT MARKING, 4" LINE	LF	~~1200~~ 1274
645.51	HAYBALES FOR TEMPORARY EROSION CONTROL	EA	~~355~~ 112
645.531	SILT FENCE	LF	~~1100~~ 250
645.7	EROSION AND SEDIMENT CONTROL STORMWATER MANAGEMENT PLAN	UNIT	1
645.71	MONITORING EROSION AND SEDIMENT CONTROL	HR	~~80~~ 42
646.11	TURF ESTABLISHMENT WITH MULCH AND SLOPE SEED TYPE 44	SY	~~1400~~ 1666.7
647.1	HUMUS	CY	160
665.1	OUTDOOR LIGHTING SYSTEM	UNIT	1
692	MOBILIZATION	UNIT	1
699	TEMPORARY PROJECT WATER POLLUTION CONTROL	ALLOW.	1
1008.1	ALTERATIONS AND ADDITIONS AS NEEDED - TEMPORARY LIGHTING	ALLOW.	1

ENGINEER
MATTHEW J. LOW
No. 9293
LICENSED PROFESSIONAL ENGINEER
STATE OF NEW HAMPSHIRE

REV.	DESCRIPTION	DRWN. BY	CHKD. BY	APPD. BY	DATE
2	RECORD COPY DRAWINGS	JDG	JB	MJL	8/05

PROJECT NO. 906301
FILE NAME 906301y
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DR. BY JDG
CHKD. BY RHD
DES. BY MJL

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TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 126/107

QUANTITIES SHEET

DRAWING NO.
2A

CONSTRUCTION ℄ CURVE DATA 1
P.I. = 101+77.86
N 4877.127
E 5003.556
Δ = 25°26'31"
R = 716.0'
T = 161.63'
L = 317.94'
D℄ = 8°0'8"
E = 18.02'

CONSTRUCTION ℄ CURVE DATA 2
P.I. = 105+31.18
N 5232.026
E 5058.362
Δ = 34°55'59"
R = 318.0'
T = 100.06'
L = 193.88'
D℄ = 18°1'3"
E = 15.37'

MAP 191 / LOT 74
HOWARD D. HOYT
PO BOX 5485
HAMDEN, CT. 06518

MAP 191 / LOT 75
JOHN V. & HELEN MALONEY
PO BOX 2104
WOLFEBORO, NH 03894

MAP 191 / LOT 76
DOUGLAS & MARY FALLON
80 ACADEMY DRIVE
WOLFEBORO, NH 03894

MAP 191 / LOT 77
ROSAMOND LITTLE REVOCABLE TRUST
ROSAMOND LITTLE TRUSTEE
7 RIVERWOOD DRIVE D217
EXETER, NH 03833

MAP 191 / LOT 78
THOMAS & KAREN OUHRABKA
242 CEDAR STREET
WARWICK, RI 02818

MAP 191 / LOT 73
FRANK J. & MARY L. GUARINO
24 MONTMORENCI AVENUE
BOSTON, MA. 02128

MAP 191 / LOT 9
MARIA & MICHAEL FOY
10 GREEN STREET
WOLFEBORO, NH 03894

MAP 191 / LOT 6
KB REALTY TRUST
CATHY KIBBEY TRUSTEE
216 EUCLID AVE.
LYNN, MA 01904

MAP 191 / LOT 6
MARY BARKAS & PAUL KIMBALL
P.O. BOX 70
WOLFEBORO FALLS, NH 03898

MAP 191 / LOT 7
KIMBALL FAMILY REALTY TRUST
PAUL KIMBALL, TRUSTEE
P.O. BOX 725
WOLFEBORO, NH 03894

BEGIN 30:1 TAPER
STA. 100+60, LT,RT

END 30:1 TAPER
STA. 101+07.1, RT
CLEAR TO SLOPE
LIMITS ONLY

END 30:1 TAPER
STA. 101+37.4, LT

SAVE TREES

EXISTING WATERLINE EASEMENT

CONSTRUCTION EASEMENT

4" DSL

PERMANENT EASEMENT

CONSTRUCTION EASEMENT

12'x19' PAVED DRIVE

PERMANENT EASEMENT

GUARDRAIL EASEMENT

CLEAR TO SLOPE LIMITS ONLY

RELOCATE UTILITY POLE BY OTHERS

TBM#1
BENCHMARK
SPIKE SET IN UTILITY POLE (NET&T #9)
ELEV. 541.44'

TBM#2
BENCHMARK
EASTERLY FLANGE BOLT HYDRANT
ELEV. 542.18'

TBM#3
BENCHMARK
SPIKE SET IN UTILITY POLE (NET&T #6/6)
ELEV. 543.34'

TBM#4
ELEVATION DATUM BASED ON NGVD RM 9
DISK ON SE CNR BRIDGE
ELEV. 543.03'

OPENING PROVIDED ON TIMBER RAIL FOR FIRE HYDRANT ACCESS

HYDRANT RAISED 2 FT.± ~~RELOCATE HYDRANT~~

CONSTRUCTION EASEMENT

EXISTING ROW

ITEM 201.21

ITEM 201.22

SEASONAL TO SUMMER COTTAGES

CLEAR TO SLOPE LIMITS ONLY

~~SAVE TREES~~
~~TREES REMOVED~~

BEGIN 30:1 TAPER
STA. 105+11.9, LT

BEGIN 30:1 TAPER
STA. 105+63.7, RT

12'x5' PAVED DRIVE

END 30:1 TAPERS
STA. 106+28.12, LT,RT

EXISTING ROW

40 LF x12" DRAINAGE PIPE WITH 2 PLASTIC END SECTIONS

(X) DRAINAGE NOTE

[X] GUARDRAIL NOTE

STA. 100+50.00
BEGIN PROJECT
NORTHING: 4752.28
EASTING: 5041.63

33±
STA. 106+~~28.12~~
END PROJECT 5326.22
NORTHING: ~~5321.84~~
EASTING: ~~5014.26~~
5012.11

PLAN
SCALE: 1" = 40'

BENCHMARK INFORMATION			
TBM NO.	NORTHING	EASTING	ELEVATION
TBM#1	4995.51	4990.50	541.44'
TBM#2	5170.77	5025.23	542.18'
TBM#3	5362.76	4976.51	543.34'
TBM#4	~~5063.94~~	~~5033.00~~	543.03'
2	5060.94	5032.99	

LOW POINT ELEV = 543.290
LOW POINT STA = 102+69.76
PVI STA = 102+09.89
PVI ELEV = 542.737
A.D. = 4.75
K = 36.84
175.00' VC

HIGH POINT ELEV = 543.449
HIGH POINT STA = 103+12.20
PVI STA = 103+14.67
PVI ELEV = 543.523
A.D. = −1.75
K = 19.75
34.56' VC

LOW POINT ELEV = 541.505
LOW POINT STA = 105+29.37
PVI STA = 105+61.07
PVI ELEV = 541.059
A.D. = 4.46
K = 25.80
115.00' VC

PVC: 101+22.39
PVC ELEV.: 546.237
PROPOSED FINISHED GRADE
-4.00%
PVRC: 102+97.39
PVRC ELEV.: 543.394
PVT: 103+31.95
PVT ELEV.: 543.351
℄ BRG. ABUT. A
STA. 103+66.00
EL. 543.01
℄ BRG. ABUT. B
STA. 104+06.00
EL. 542.61
0.75%
-1.00%
PVC: 105+03.57
PVC ELEV.: 541.634
APPROXIMATE EXISTING GROUND
PVT: 106+18.57
PVT ELEV.: 543.047
3.46%

DATUM ELEV 515.000

551.2	549.2	547.0	547.13	544.9	545.24	543.0	543.95	541.4	543.34	540.6	543.41	541.8	543.17
542.3	542.67	540.9	542.17	540.0	541.67	540.7	541.59	542.4	542.47	544.8			

101+00 102+00 103+00 104+00 105+00 106+00

PROFILE
SCALE: 1" = 40' HORIZONTAL
1" = 8' VERTICAL

CONSTRUCTION NOTES:

GUARDRAIL NOTES:

[1] STA. 102+87.03 RT. 16.15' TO STA. 103+40.25 RT. 12.0'
CONSTRUCT 2 RAIL TIMBER RAIL WITH FLARE.
SEE TIMBER RAIL DETAILS.

[2] STA. 103+00.78 LT. 21.66 TO STA. 103+42.50 LT. 17.50'
CONSTRUCT 2 RAIL TIMBER RAIL WITH FLARE.
SEE TIMBER RAIL DETAILS.

[3] STA. 104+26.75 RT. 12.0 TO STA. 104+77.07 RT. 16.15'
CONSTRUCT 2 RAIL TIMBER RAIL WITH FLARE.
SEE TIMBER RAIL DETAILS.

[4] STA. 104+19.50 LT. 17.50' TO STA. 104+50.14 LT. 17.50'
CONSTRUCT 2 RAIL TIMBER RAIL.
SEE TIMBER RAIL DETAILS.

[5] STA. 104+50.14 LT 17.50' TO STA. 105+08.32 LT 21.66'
CONSTRUCT 2 RAIL TIMBER RAIL WITH FLARE.
SEE TIMBER RAIL DETAILS.

WATERGATES TO RAISE TO GRADE (ITEM 611.90001):

STA. 101+31 – 13' LT.
STA. 102+20 – 13' LT.
STA. 102+21 –10' RT.
STA. 102+66 – 27' LT.
STA. 104+84– 26' LT.
STA. 104+84 – 25' LT. *
STA. 105+59 –23' LT..
STA. 105+99 – 4' LT.

NOTES:

* EXTEND 3/4" COPPER BLOW OFF TO GRADE AND CONSTRUCT 6' OF 3' DIA. WELL TILE TO GRADE WITH CONCRETE COVER. COST SUBSIDIARY TO ITEM 611.90001 ALL WATERGATE LOCATIONS ARE APPROXIMATE AND ARE TO BE ACCURATELY LOCATED PRIOR TO RAISING TO ROADWAY PROFILE.

* CLEARING AND GRUBBING AND FINE GRADING ARE SUBSIDIARY TO THE WORK.

DRAINAGE NOTES:

104+16, LT 33.5' 104+37, LT 26.7'

(2)(1) STA. ~~104+25, LT 31.6'~~ TO STA. ~~104+47, LT 25.0'~~
CONST. ~~15" CONCRETE END SECTION ● +25, LT 31.6'~~
15" HDPE END SECTION +16, LT 26.7'
CONST. 15" – 1/8TH BEND ● +33.7, LT 26.7'
15" INV OUTLET = 534.75
CONST. CLASS C STONE FILL
CONST. 16 LF x 15" ~~RCP, CLASS III~~ PLASTIC PIPE
CONST. STORMWATER TREATMENT SYSTEM – ITEM 613.41
15" INV OUT = 534.85
15" INV IN = 534.95
RIM ELEV. = 541.36

(2) STA. 104+47 LT 25.0' TO STA. 104+47, LT 11.0'
CONST. 10 LF x 15" RCP, CLASS III
CONST. CB–B ● +47, LT 11.0'
15" INV OUT = 535.00
15" INV IN (N) = 535.25
15" INV IN (E) = 536.60
GRATE ELEV. = 542.01

(3) STA. 104+47, LT 11.0' TO STA. 104+25, RT 11.0'
CONST. 27 LF x 15" RCP, CLASS III
CONST. CB–B W/ SLAB TOP ● +25, RT 11.0'
15" INV OUT = 537.00
GRATE ELEV. = 542.39

(4) STA. 104+47, LT 11.0' TO STA. 105+29, LT 10.43'
CONST. 75 LF x 15" RCP, CLASS III
CONST. CB–B ● +29, LT 10.43'
15" INV OUT = 535.60
15" INV IN = 535.85
GRATE ELEV. = 540.47

(5) STA. 105+29, LT 10.43' TO STA. 105+45, RT 14.21'
CONST. 26 LF x 15" RCP, CLASS III
CONST. MH W/ SLAB TOP ● +45, RT 14.21'
REMOVE 43 LF x 12" CMP (8 LF SUBSIDIARY)
RELAY 8 LF x 12" CMP
15" INV OUT = 536.40
12" INV IN = 539.22± (FIELD VERIFY)
RIM ELEV. = 541.55

UTILITY NOTES:

1. THE CONTRACTOR SHALL COORDINATE THE LOCATION AND SCHEDULE FOR RELOCATION OF TWO (2) UTILITY POLES WITH THE WOLFEBORO ELECTRIC DEPARTMENT.

2. THE CONTRACTOR SHALL COORDINATE THE LOCATION AND SCHEDULE FOR RELOCATION OF ONE (1) FIRE HYDRANT WITH THE WOLFEBORO WATER DEPARTMENT.

ENGINEER
MATTHEW LOW
No. 16253
STATE OF NEW HAMPSHIRE

REV.	DESCRIPTION	DATE	BY
2	RECORD COPY DRAWINGS	8/05	JDC
1		MAR.	BY
			BY

PROJECT NO. 906301
FILE NAME 906302ROAD
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CHKD. BY RHD
DR. BY JBM
DES. BY JPC

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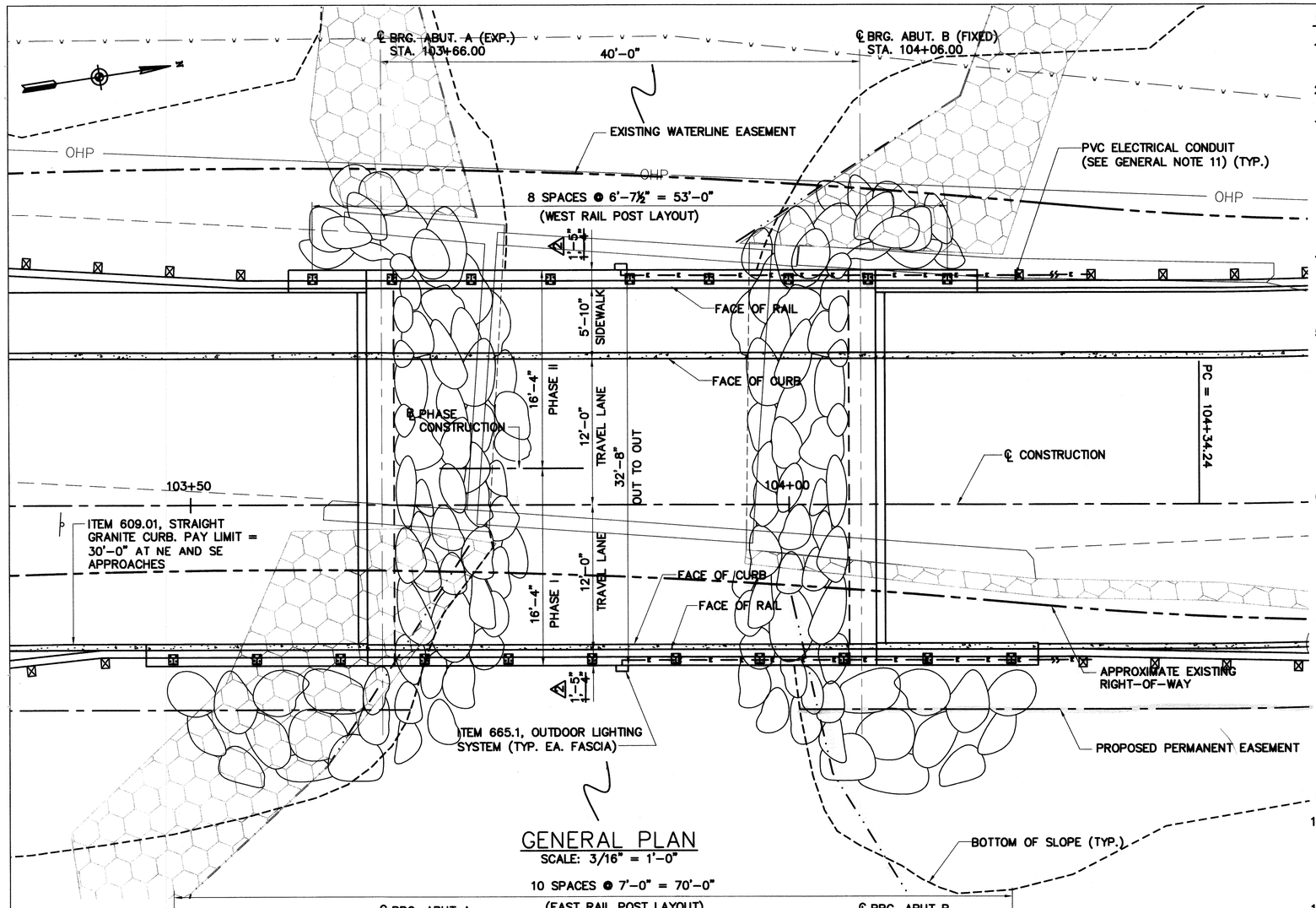
Consulting Engineers

DATE: AUGUST 2004
SCALE: AS SHOWN

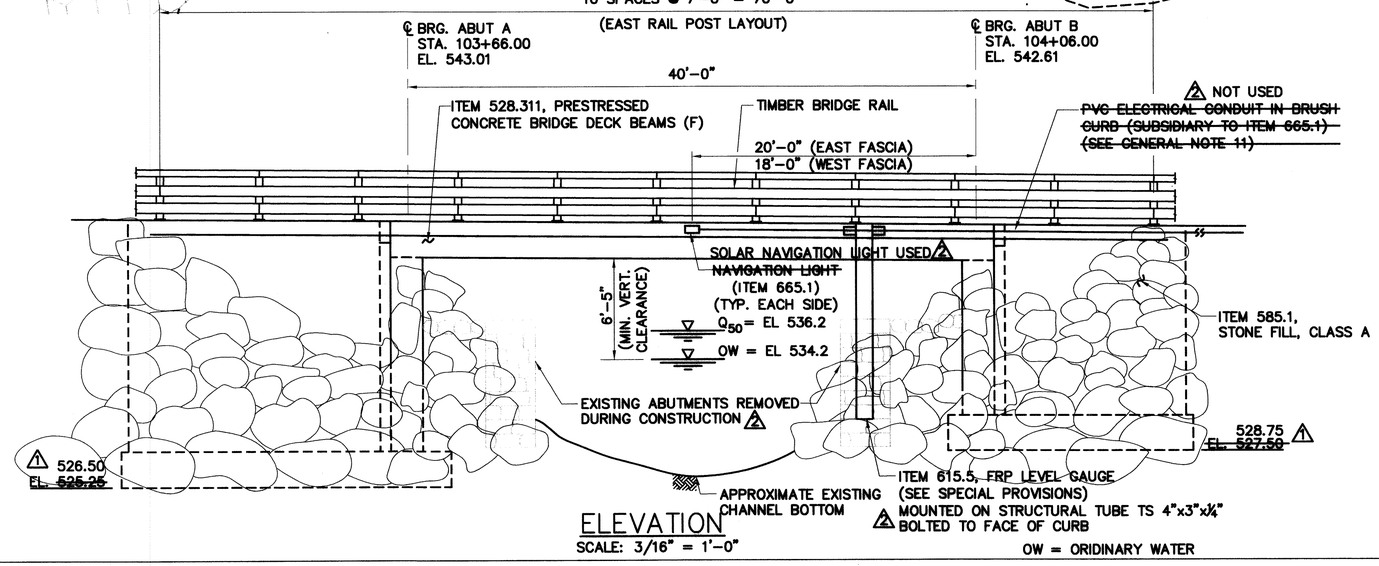
TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 126/107
ROADWAY PLAN AND PROFILE

DRAWING NO. 3

SHEET 3 OF 21



GENERAL PLAN
SCALE: 3/16" = 1'-0"



ELEVATION
SCALE: 3/16" = 1'-0"

OW = ORIDINARY WATER

GENERAL BRIDGE NOTES:

1. **DESIGN LIVE LOAD:** HS25

2. **DESIGN METHOD:** LOAD FACTOR DESIGN, EXCEPT FOOTINGS.

3. **DESIGN SPECIFICATIONS:** STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SEVENTEENTH EDITION 2002, INCLUDING INTERIM SPECIFICATIONS BY AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS.
   STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2002, WITH CURRENT ADDITIONS AND MODIFICATIONS BY STATE OF NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION.
   NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION, 2001, WITH SUPPLEMENTS AND INTERIMS BY THE AMERICAN FOREST & PAPER ASSOCIATION AND AMERICAN WOOD COUNCIL.

4. **FOUNDATION DATA:**
   PROPOSED FOOTINGS
   – SPREAD FOOTING FOUNDED ON STRUCTURAL FILL. MAXIMUM ALLOWABLE DESIGN FOUNDATION PRESSURE = 2.5 TSF.

5. **CONCRETE:**
   BRUSH CURBS, WINGWALLS AND HEADWALLS
   $f'c$ = 4,000 PSI
   FOOTINGS
   $f'c$ = 3,000 PSI
   PRECAST CONCRETE
   $f'c$ = 6,000 PSI
   $f'ci$ = 4,000 PSI

6. **REINFORCING STEEL:**
   REINFORCING STEEL SHALL CONFORM TO AASHTO M 31 (ASTM A615) GRADE 60 (EPOXY-COATED WHERE INDICATED).

7. **PRESTRESSING STEEL:**
   PRESTRESSING STEEL SHALL BE ½"ø, UNCOATED, SEVEN-WIRE LOW RELAXATION STRANDS CONFORMING TO AASHTO M203 (ASTM A416) GRADE 270.

8. **EXISTING DIMENSIONS AND ELEVATIONS:**
   EXISTING DIMENSIONS ARE FROM FIELD MEASUREMENTS AND FIELD SURVEY.
   THE CONTRACTOR SHALL BE AWARE THAT ALL EXISTING STRUCTURE ELEVATIONS SHOWN ON THESE PLANS ARE FROM FIELD INVESTIGATION OF THE "AS BUILT" CONDITION.
   THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS OF THE EXISTING STRUCTURE AND SHALL BE PREPARED TO MAKE ANY ADJUSTMENTS AS REQUIRED TO PROPERLY FIT THE WORK TO THE EXISTING BRIDGE.

9. SEISMIC PERFORMANCE CATEGORY A, A=0.09

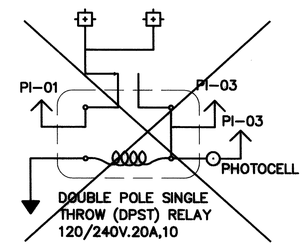
10. WATER VESSEL TRAFFIC BENEATH THE STRUCTURE SHALL NOT BE RESTRICTED PRIOR TO SEPTEMBER 7, 2004 NOR AFTER MAY 27, 2005. AFTER SEPTEMBER 7, 2004, TEMPORARY CHANNEL CLOSURES MUST BE CLEARLY POSTED 24 HOURS IN ADVANCE AT THE BRIDGE SITE AND AT MAST LANDING. THE TOWN OF WOLFEBORO DEPARTMENT OF PUBLIC WORKS MUST BE NOTIFIED IN WRITING AT LEAST 24 HOURS IN ADVANCE OF TEMPORARY CHANNEL CLOSURES.

11. CONTRACTOR SHALL COORDINATE SERVICE LOCATION, OPERATION AND TESTING OF NAVIGATION LIGHTS, ITEM 665.1, OUTDOOR LIGHTING SYSTEM, WITH TOWN OF WOLFEBORO ELECTRICAL DEPARTMENT.

12. TEMPORARY AND PERMANENT EASEMENTS SHALL BE AS SHOWN ON THE PLAN ENTITLED "EASEMENT PLAN WHITTEN NECK ROAD TAX MAP 191 LOTS 6, 7, 8, 9, 75, 76, 77 & 78" BY SANDFORD SURVEY, INC., AS PROVIDED BY THE TOWN OF WOLFEBORO.

60 AMP MAIN BREAKER					
NO	AMP	DESCRIPTION	NO	AMP	DESCRIPTION
01	20	LIGHTS (PROP.)	02	20	FACE (PROP.)
03			04		
05			06		

LIGHTING AND LOAD PANEL P1



WIRING SCHEMATIC

~~LIGHTING DETAIL~~
NOT TO SCALE
SOLAR NAVIGATION LIGHT USED 2

ENGINEER

REV.	DESCRIPTION	DR. BY	CHKD. BY	DATE
	RECORD COPY DRAWINGS	JDG	JB	MJL 8/05
1	ADD PILES	JDG	MJM/MJL	1/05

PROJECT NO. 906301
FILE NAME 906306pln
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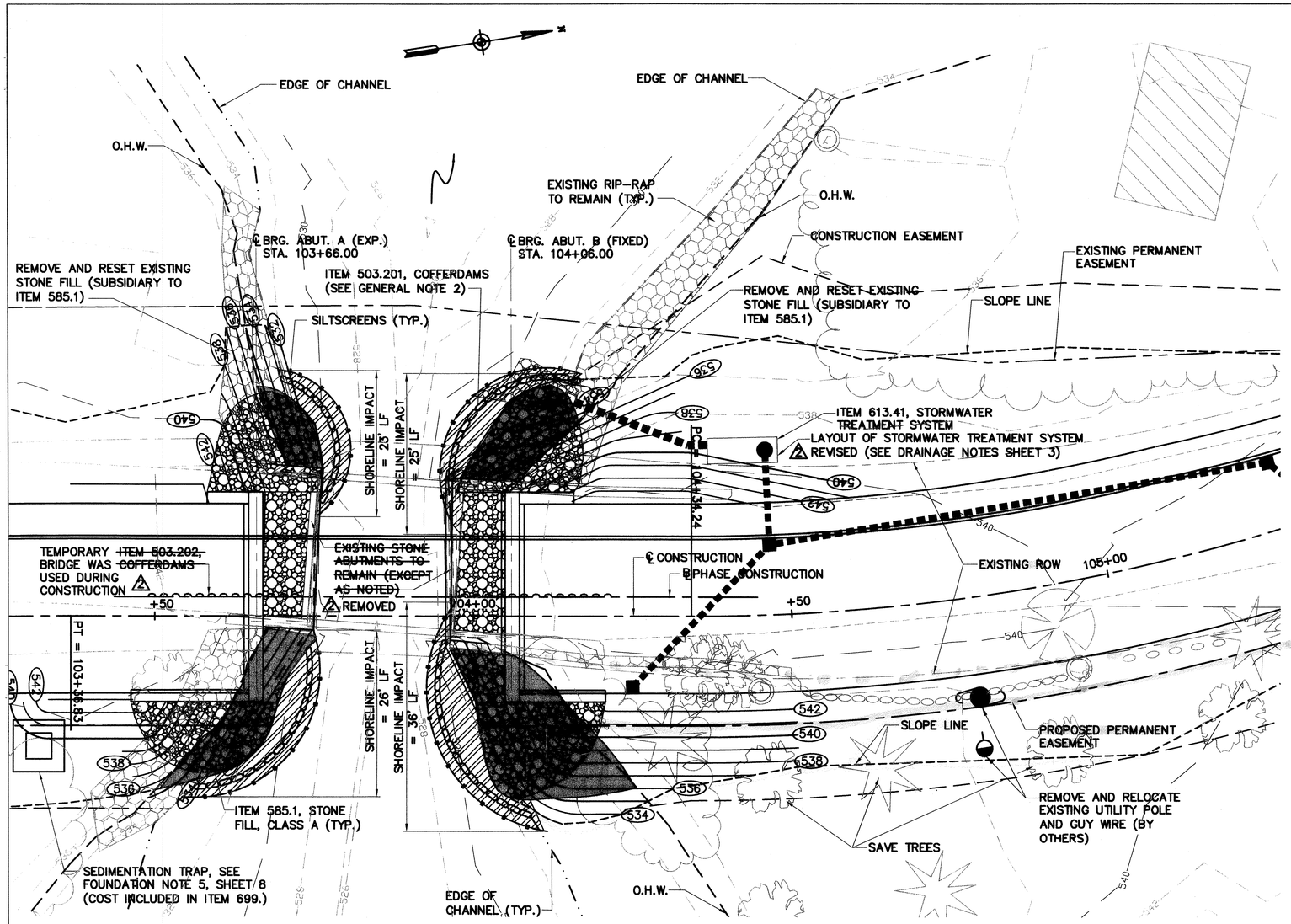
DES. BY MJL
DATE: AUGUST 2004
SCALE: AS SHOWN

TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 128/107

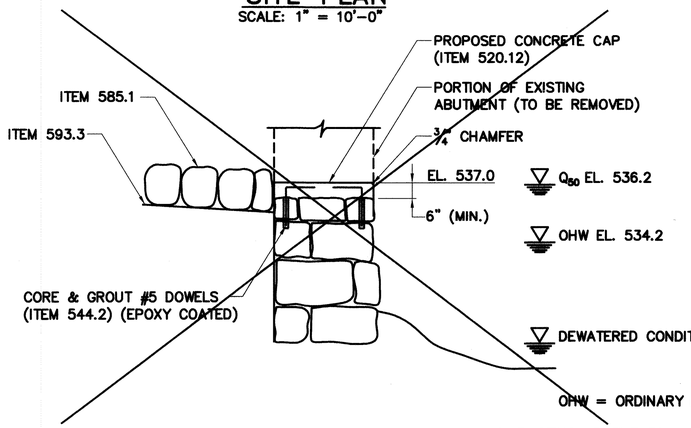
GENERAL PLAN AND ELEVATION

DRAWING NO. 4

SHEET 4 OF 21

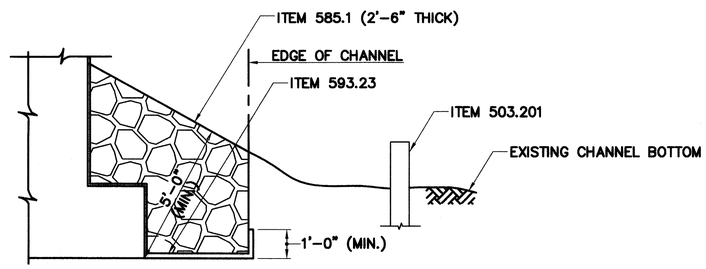


SITE PLAN
SCALE: 1" = 10'-0"

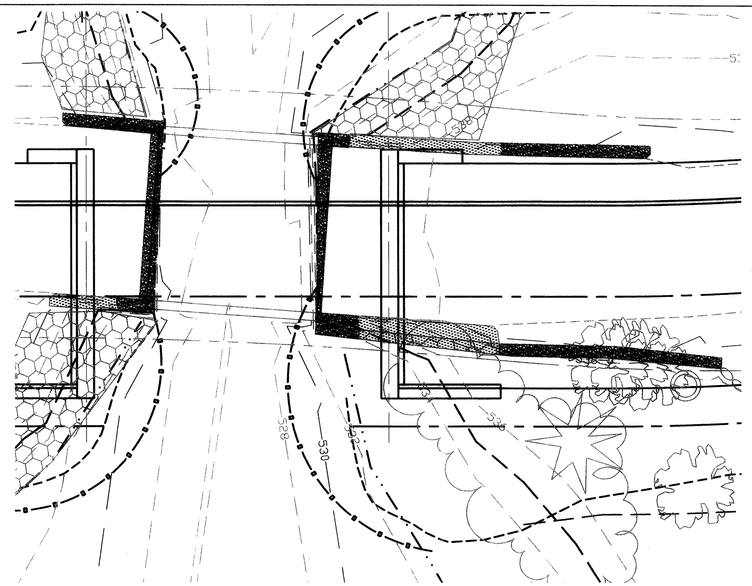


~~ABUTMENT CAP DETAIL~~
SCALE: 3/8" = 1'-0"

⚠ EXISTING ABUTMENTS WERE REMOVED DURING CONSTRUCTION



STONE FILL DETAIL
SCALE: 3/8" = 1'-0"



EXISTING SUBSTRUCTURE REMOVAL PLAN
SCALE: 1" = 10'-0"

LEGEND:

COMPLETE REMOVAL ⚠ ~~REMOVE TO ELEVATION 537.0~~

COMPLETE REMOVAL

LEGEND:

PERMANENT WETLAND IMPACT

TEMPORARY WETLAND IMPACT

(XXX) PROPOSED CONTOUR

GENERAL NOTES:

1. WETLAND IMPACT:

   TEMPORARY WETLAND IMPACTS = 540 SF±
   PERMANENT WETLAND IMPACTS = 850 SF±
   TOTAL WETLAND IMPACTS = 1390 SF±
   TOTAL LENGTH OF SHORELINE IMPACT = 110 LF±
   FILL BELOW ORDINARY HIGH WATER (O.H.W.) = 65 CY±
   RIPRAP IMPACT = 928 SF±

2. SEE FOUNDATION NOTES, SHEET 8.
3. ORDINARY HIGH WATER (O.H.W.) ELEVATION IS EL. 534.2±

COFFERDAM NOTES (ITEM 503.202):

1. THE USE OF COFFERDAMS TO SUPPORT EMBANKMENTS AND MAINTAIN TRAFFIC DURING CONSTRUCTION MAY BE REQUIRED.
2. THE COFFERDAMS SHOWN ARE CONCEPTUAL AND SCHEMATIC ONLY AND ARE NOT INTENDED TO INDICATE REQUIRED OR PREFERRED METHODS OF CONSTRUCTION.
3. THE CONTRACTOR SHALL SUBMIT PLANS AND CALCULATIONS FOR COFFERDAMS IN ACCORDANCE WITH 105.02. THE MINIMUM DESIGN LIVE LOAD SHALL BE 2 FEET OF SURCHARGE CAUSED BY AASHTO HS20-44.
4. ALL COST FOR THE DESIGN, INSTALLATION MAINTENANCE, AND REMOVAL OF THE COFFERDAMS SHALL BE INCLUDED IN ITEM 503.202.

REMOVAL NOTES:

1. ITEM 502.101, REMOVAL OF EXISTING BRIDGE STRUCTURE, SHALL INCLUDE THE REMOVAL OF ENTIRE EXISTING SUPERSTRUCTURE, INCLUDING RAILS, DECKING, BEAMS, ETC.
2. THE EXISTING STONE ABUTMENTS SHALL BE REMOVED TO EL. 537.0 AND A CONCRETE CAP SHALL BE CONSTRUCTED AS SHOWN. STONE FROM EXISTING ABUTMENT SHALL BE UTILIZED AS STONE FILL OR BE STOCKPILED AT A LOCATION SELECTED BY THE TOWN.
3. THE EXISTING CONCRETE WINGWALLS SHALL BE REMOVED AS SHOWN IN THE EXISTING SUPERSTRUCTURE REMOVAL PLAN, THIS SHEET. ALL ABUTMENT AND WINGWALL REMOVAL SHALL BE PAID FOR AS ITEM 504.2, ROCK BRIDGE EXCAVATION.

ENGINEER
STATE OF NEW HAMPSHIRE
MATTHEW J. LOK
PE 9295
11/8/05

REV.	DESCRIPTION	DRAWN BY	APPD. BY	DATE
⚠	RECORD COPY DRAWINGS	JDG	MJL	8/05

PROJECT NO. 906301
FILE NAME 906303pln
DO NOT SCALE DRAWING

CHKD. BY RHD
DR. BY JDG
DES. BY MJL
DATE: AUGUST 2004
SCALE: AS SHOWN

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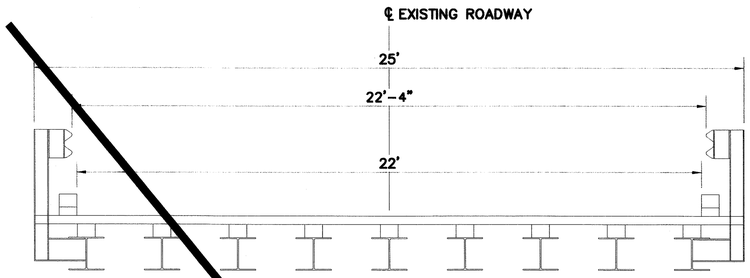
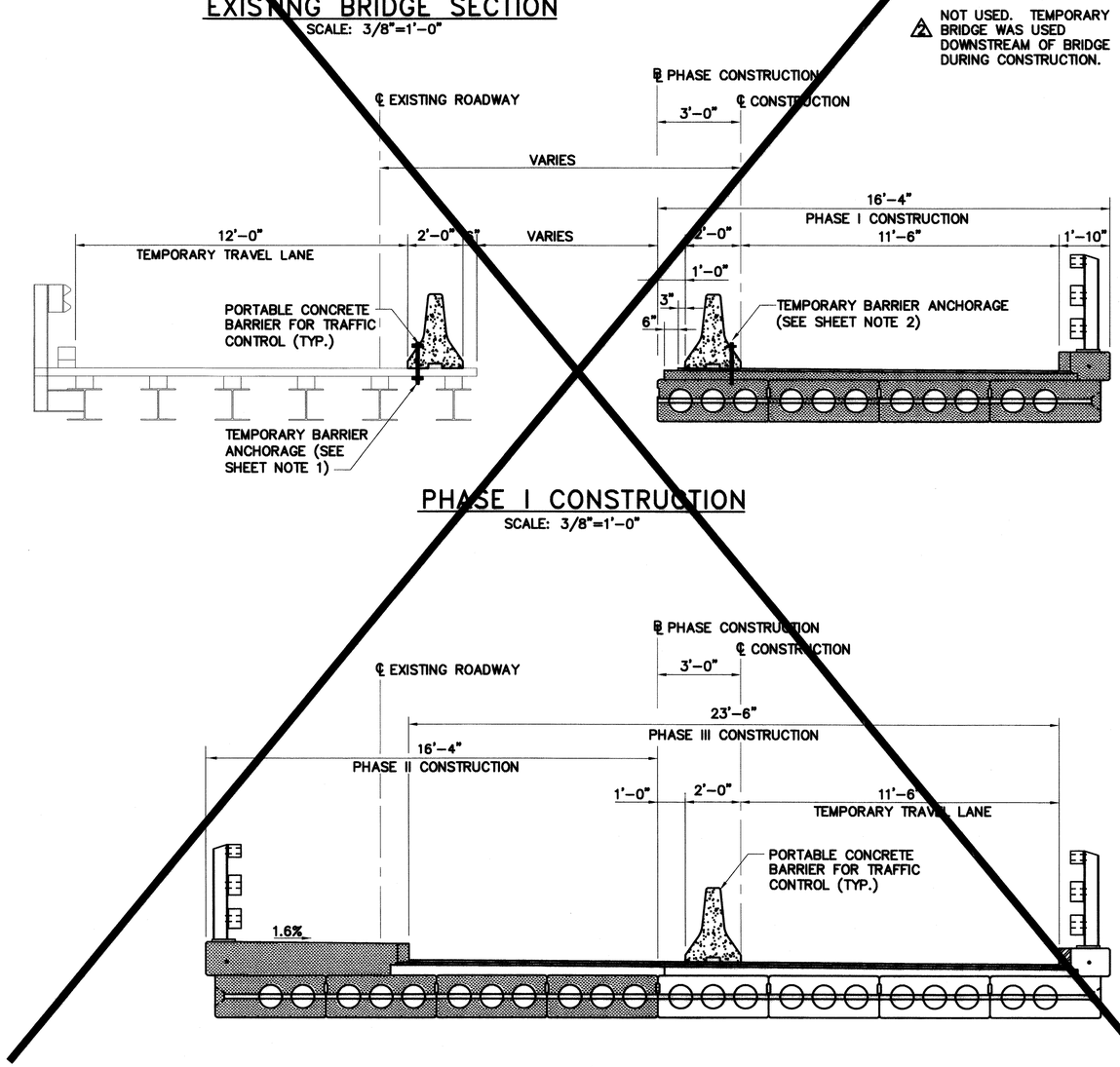
TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 126/107

SITE PLAN

DRAWING NO. 5



EXISTING BRIDGE SECTION
SCALE: 3/8"=1'-0"



PHASE I CONSTRUCTION
SCALE: 3/8"=1'-0"

PHASE II/III CONSTRUCTION
SCALE: 3/8"=1'-0"

2 NOT USED. TEMPORARY BRIDGE WAS USED DOWNSTREAM OF BRIDGE DURING CONSTRUCTION.

SUGGESTED CONSTRUCTION SEQUENCE

PHASE I:

A. USING APPROVED TRAFFIC CONTROL PROCEDURES, MAINTAIN ONE LANE OF ALTERNATING STOP CONTROLLED TRAFFIC ON WESTERLY (CRESCENT LAKE) SIDE OF BRIDGE.

B. REMOVE EASTERLY (LAKE WENTWORTH) SIDE PORTION OF EXISTING BRIDGE TO LIMITS SHOWN.

C. CONSTRUCT EASTERLY PORTION OF PROPOSED BRIDGE, INCLUDING PRESTRESSED DECK BEAMS, BRUSH CURB, BRIDGE RAIL, BRIDGE APPROACH RAIL AND CONCRETE OVERLAY.

D. RECONSTRUCT THE EASTERLY SIDE OF WHITTEN NECK ROAD FROM STATION 100+50 TO 106+28.

E. CONSTRUCT PROPOSED BITUMINOUS PAVEMENT BINDER COURSE.

F. INSTALL PORTABLE CONCRETE BARRIER FOR TRAFFIC CONTROL FOR PHASE II CONSTRUCTION.

PHASE II:

A. USING APPROVED TRAFFIC CONTROL PROCEDURES, MAINTAIN ONE LANE OF ONE-WAY ALTERNATING STOP CONTROLLED TRAFFIC ON EASTERLY PORTION OF STRUCTURE CONSTRUCTED IN PHASE I.

B. REMOVE WESTERLY (CRESCENT LAKE) SIDE PORTION OF EXISTING BRIDGE TO LIMITS SHOWN.

C. CONSTRUCT WESTERLY PORTION OF PROPOSED BRIDGE. INCLUDING PRESTRESSED DECK BEAMS, BRUSH CURB, SIDEWALK, BRIDGE RAIL, BRIDGE APPROACH RAIL AND CONCRETE OVERLAY.

D. RECONSTRUCT THE WESTERLY SIDE OF WHITTEN NECK ROAD FROM STATION 100+50 TO 106+28.

E. CONSTRUCT PROPOSED BITUMINOUS PAVEMENT BINDER COURSE.

PHASE III:

A. USING APPROVED TRAFFIC CONTROL PROCEDURES, MAINTAIN ONE LANE OF ALTERNATING TRAFFIC BY USE OF FLAGGERS.

B. CONSTRUCT BITUMINOUS PAVEMENT WEARING COURSE AND PAVEMENT MARKINGS.

SHEET NOTES:

1. CONTRACTOR SHALL SUBMIT DETAILS DRAWINGS TO THE ENGINEER FOR APPROVAL. ALL COSTS FOR ANCHORAGE INCLUDED IN ITEM 606.417.

2. ATTACH BARRIER TO PROPOSED DECK BEAMS. SECURE BARRIER WITH TWO ⅞" ø ASTM A325 BOLTS PER 10'-0" UNIT. AFTER REMOVING BOLTS, FILL INSERTS WITH EPOXY MORTAR, REPAIR BARRIER MEMBRANE PER MANUFACTURER'S RECOMMENDATION, AND REPAIR PAVEMENT (ALL COST SHALL BE INCLUDED IN ITEM 606.417)

ENGINEER
MATTHEW J. LOW No. 9581
STATE OF NEW HAMPSHIRE
PROFESSIONAL ENGINEER

NO.	DESCRIPTION	DR. BY	CHKD. BY	APPD. BY	DATE
4	RECORD COPY DRAWINGS	JDG	JB	MJL	8/05

PROJECT NO. 906301
FILE NAME 906-3Phas
DO NOT SCALE DRAWING

DR. BY JDG
CHKD. BY RHD
DES. BY MJL

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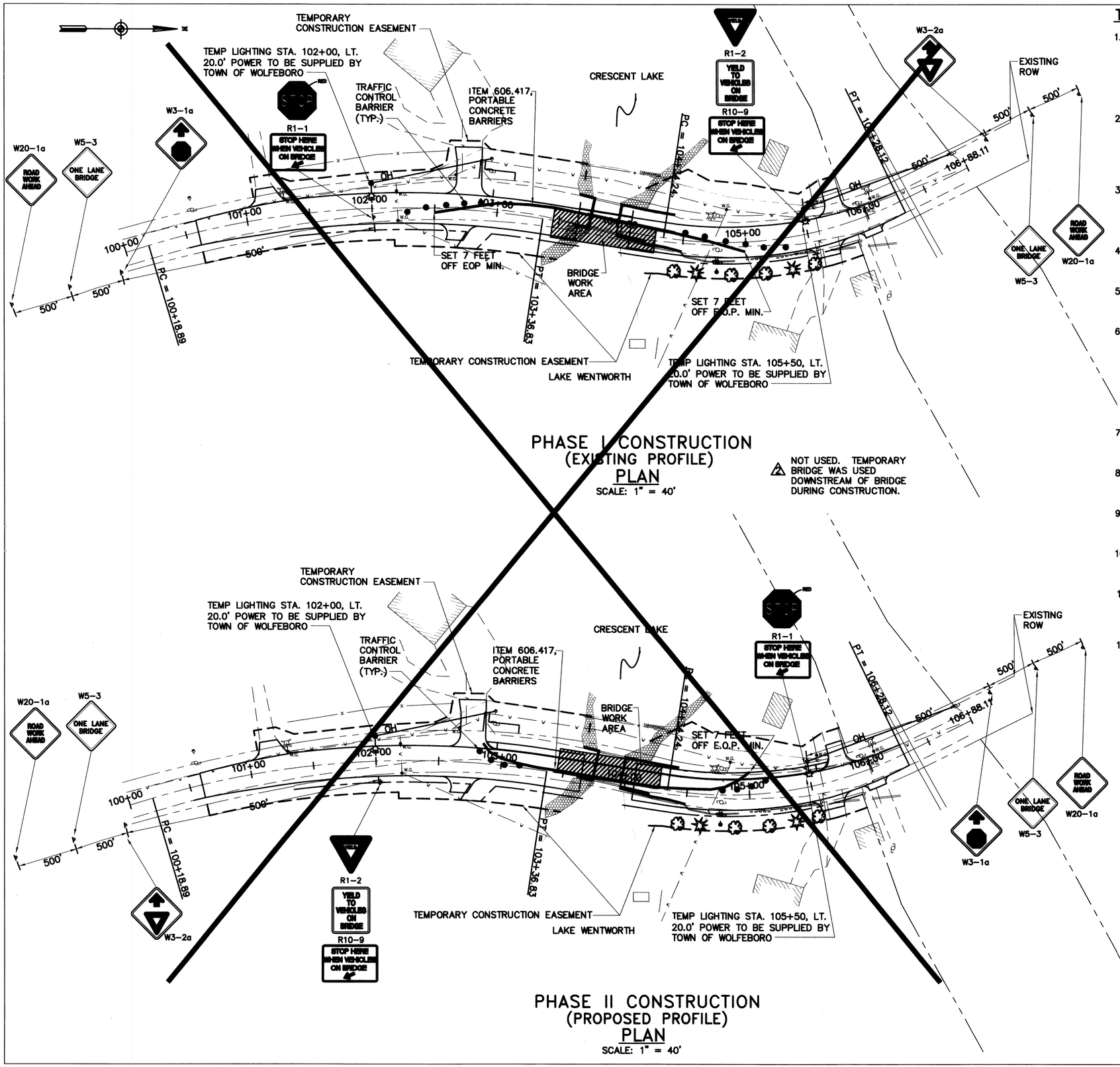
SCALE: AS SHOWN
DATE: AUGUST 2004

TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 126/107

CONSTRUCTION PHASING (1 OF 2)

DRAWING NO. 6

SHEET 6 OF 21



PHASE I CONSTRUCTION (EXISTING PROFILE) PLAN

SCALE: 1" = 40'

2 NOT USED. TEMPORARY BRIDGE WAS USED DOWNSTREAM OF BRIDGE DURING CONSTRUCTION.

PHASE II CONSTRUCTION (PROPOSED PROFILE) PLAN

SCALE: 1" = 40'

TRAFFIC CONTROL NOTES:

1. TRAFFIC CONTROL DEVICES SHALL CONFORM TO SECTION 619 OF THE NHDOT STANDARD SPECIFICATIONS, AND THE CURRENT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), AS PUBLISHED BY THE U.S. DEPARTMENT OF TRANSPORTATION AND ADOPTED BY THE COMMISSIONER OF THE NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION. SIGNS SHALL ALSO CONFORM TO USDOT STANDARD HIGHWAY SIGNS AND NHDOT CONSTRUCTION SIGN STANDARDS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SUPPLYING, ERECTING AND MAINTAINING PERMANENT CONSTRUCTION SIGNS AND WARNING DEVICES AS LISTED ON THE PLANS, AND SHALL BE RESPONSIBLE FOR SUPPLYING, ERECTING AND MAINTAINING ALL OPERATIONAL SIGNS AND WARNING SERVICES FOR PLANNED METHODS OF OPERATION IN CONFORMANCE WITH THE MUTCD.
3. THE CONTRACTOR SHALL MARK ALL HAZARDS WITHIN THE LIMITS OF THE PROJECT AND CONNECTING ROADS WITH WELL MAINTAINED SIGNS AND WARNING DEVICES. ALL SIGNS AND WARNING DEVICES SHALL BE MOVED, SUPPLEMENTED, CHANGED OR REMOVED DURING THE PROGRESS OF THE CONSTRUCTION AS DIRECTED BY THE ENGINEER.
4. TRAFFIC CONTROL DEVICES SHALL BE REMOVED, AND SIGNS SHALL BE COVERED OR REMOVED, WHEN THEY NO LONGER APPLY TO THE EXISTING CONDITIONS.
5. PLYWOOD SUBSTRATE FOR CONSTRUCTION SIGNS SHALL CONFORM TO SECTION 619 AND FLAT ALUMINUM SHEETS SHALL CONFORM TO SECTION 615 OF THE NHDOT STANDARD SPECIFICATIONS.
6. DETOURS INVOLVING THE ROUTING OF TRAFFIC OVER ROADS OUTSIDE THE LIMITS OF THE PROJECT SHALL BE MARKED AND MAINTAINED BY THE CONTRACTOR (UNLESS OTHERWISE NOTED). THE CONTRACTOR SHALL BE REQUIRED TO ERECT AND MAINTAIN ANY REQUIRED SIGNS AND WARNING DEVICES AT THE BEGINNING AND END OF THE WORK AND AT INTERSECTING ROADWAYS. THE LOCATION AND POSITION OF THESE SIGNS AND WARNING DEVICES SHALL BE APPROVED BY THE ENGINEER. THE CONTRACTOR MAY ALSO BE REQUIRED TO UNCOVER, COVER AND OTHERWISE MAINTAIN DETOUR SIGNS SUPPLIED BY OTHERS.
7. WORK ON THE PROJECT, OR ANY SEPARATE ACTIVITY THEREIN, SHALL NOT START UNTIL ALL THE REQUIRED SIGNS AND WARNING DEVICES ARE INSTALLED AND APPROVED BY THE ENGINEER.
8. SIGN LOCATIONS SHOWN ON THESE PLANS ARE RECOMMENDED AND MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER. TYPICAL LAYOUTS SHOWN ARE NOT TO SCALE.
9. THE CONTRACTOR SHALL BE REQUIRED TO PROVIDE THE ENGINEER WITH CERTIFICATION THAT ALL THE SIGNS AND WARNING DEVICES USE ON THE PROJECT MEET THE SPECIFICATIONS.
10. THE USE OF CONSTRUCTION SIGNS AND WARNING DEVICES NOT SHOWN ON THESE PLANS OR MUTCD, UNLESS APPROVED BY THE ENGINEER, WILL BE PROHIBITED.
11. ALL COSTS FOR TRAFFIC CONTROL DEVICES, INCLUDING PLACEMENT, RELOCATION AND REMOVAL OF SIGNS, FLAGGERS, DRUMS, AND OTHER INCIDENTAL TRAFFIC CONTROL DEVICES SHALL BE INCLUDED IN ITEM 619.1, MAINTENANCE OF TRAFFIC.
12. THE CONTRACTOR SHALL MAINTAIN SAFE, CONTINUOUS ACCESS TO ALL PROPERTIES ADJACENT TO THE PROJECT LOCATION.

ENGINEER

REV.	DESCRIPTION	CHK'D BY	APP'D BY	DATE
	RECORD COPY DRAWINGS	JDG	MJL	8/05

PROJECT NO. 906301

FILE NAME 9063TRAF

DO NOT SCALE DRAWING

DR. BY JBM | CHK'D BY MJL | DES. BY JPC

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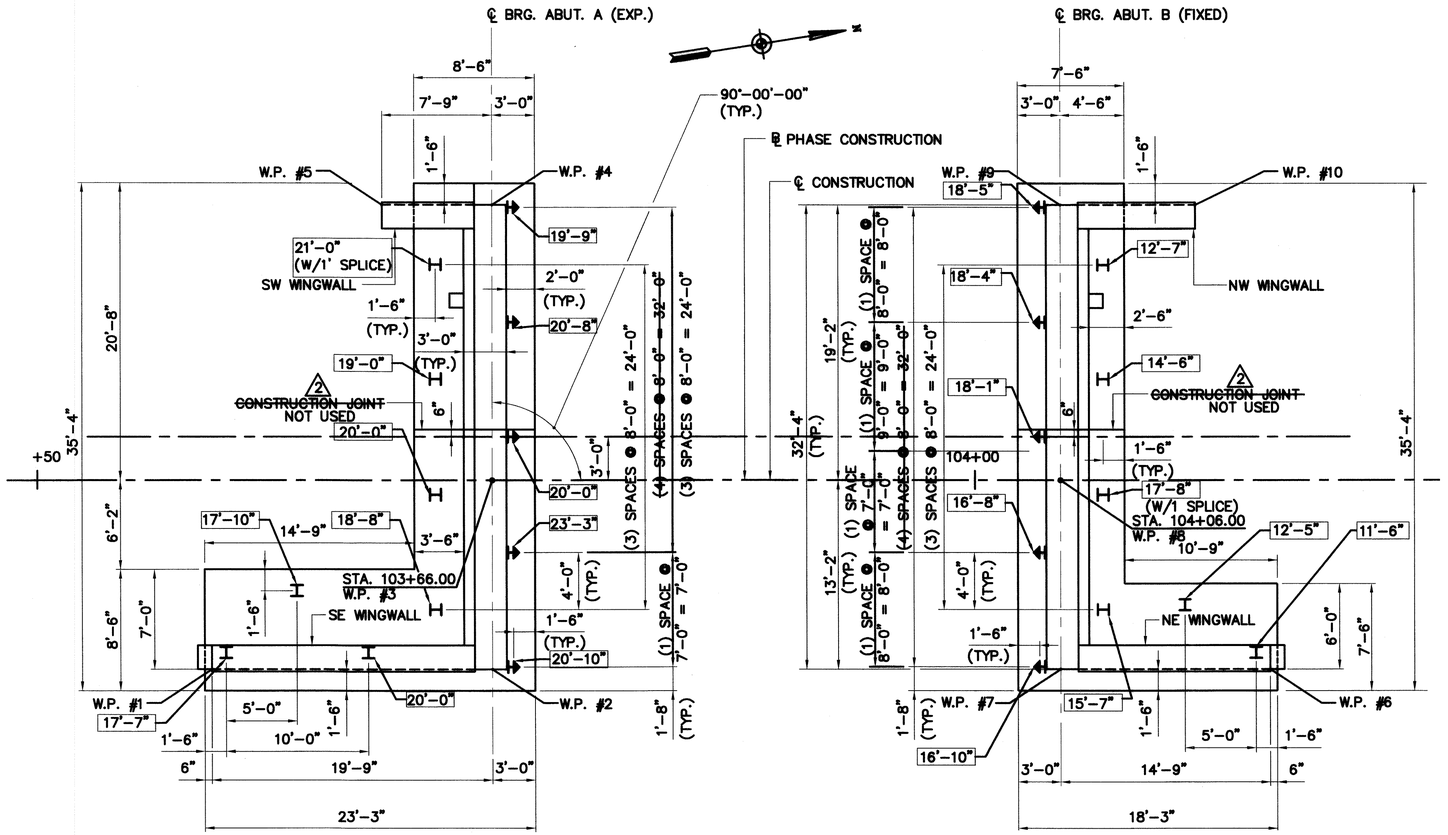
SCALE: AS SHOWN | DATE: AUGUST 2004

TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 126/107

CONSTRUCTION PHASING (2 OF 2)

DRAWING NO. 7

SHEET 7 OF 21



FOOTING LAYOUT PLAN ⚠2

SCALE: 3/16" = 1'-0"

FOUNDATION NOTES:

1. ANY UNSUITABLE MATERIALS, SUCH AS WEATHERED ROCK, ENCOUNTERED AT THE PROPOSED BOTTOM OF EXCAVATION ELEVATION SHALL BE REMOVED AND REPLACED WITH ITEM 520.213, CONCRETE CLASS B, FOOTINGS (ON SOIL) (F), AS DIRECTED BY THE ENGINEER.

2. COFFERDAMS SHALL BE REQUIRED AT EACH FOUNDATION LOCATION TO CONTROL THE WATER INFLOW AND ADEQUATELY DEWATER THE FOOTING EXCAVATION. SUMP PUMPING AREAS AROUND THE ENTIRE PERIMETER WILL BE REQUIRED TO ADEQUATELY CONTROL THE GROUNDWATER WITHIN THE FOOTING EXCAVATION. THE CONTRACTOR SHALL SUBMIT DRAWINGS, SHOWING HIS METHOD OF DEWATERING AND HIS PROPOSED METHOD OF HANDLING THE WATER FROM THE EXCAVATION FOR APPROVAL, TO THE ENGINEER BEFORE BEGINNING EXCAVATION. ALL COSTS (MATERIALS AND LABOR REQUIRED FOR DEWATERING) SHALL BE INCLUDED IN ITEM 503.201. IT IS ANTICIPATED THAT A COFFERDAM CONSISTING OF STEEL SHEETING WILL BE REQUIRED.

3. THE CONTRACTOR SHALL PLACE SUBSTRUCTURE CONCRETE IN THE DRY.

4. DEWATERING SHALL BE CONTINUOUS UNTIL SUBSTRUCTURES ARE BACKFILLED TO THE ELEVATIONS OF THE SURROUNDING WATER TABLE, UNLESS OTHERWISE DIRECTED.

5. WATER PUMPED FROM DEWATERING LOCATIONS SHALL BE FILTERED ADEQUATELY TO REMOVE FINE MATERIALS PRIOR TO RETURNING THE WATER TO THE LAKE. ALL COSTS FOR CONSTRUCTION AND MAINTENANCE OF SEDIMENTATION BASINS OR OTHER SUCH METHODS TO CONTROL WATER POLLUTION SHALL BE INCLUDED IN ITEM 699, TEMPORARY PROJECT WATER POLLUTION CONTROL. LOCATION OF SEDIMENTATION BASIN SHOWN ON SHEET 5 IS SUGGESTED. ACTUAL LOCATION TO BE DETERMINED BY CONTRACTOR AND APPROVED BY THE ENGINEER.

6. BEGINNING APPROXIMATELY SEPTEMBER 7, 2004, THE LAKE WATER LEVEL WILL BE DRAWN DOWN. THE ANTICIPATED DRAW DOWN SCHEDULE IS AS FOLLOWS:

   SEPTEMBER 7, 2004 TO OCTOBER 13, 2004 THE ELEVATION WILL DROP FROM APPROXIMATELY EL. 534.2 TO EL. 530.7.

   BEGINING NOVEMBER 15, 2004, THE LAKE LEVEL WILL BEGIN RISING TO THE ORDINARY WATER ELEVATION.

WORKING POINT COORDINATES ⚠2		
W.P.	NORTHING	EASTING
WP#1	5044.17	5042.67
WP#2	5063.69	5045.69
WP#3	5065.70	5032.68
WP#4	5068.62	5013.73
WP#5	5060.96	5012.55
WP#6	5117.79	5054.04
WP#7	5103.22	5051.79
WP#8	5105.23	5038.78
WP#9	5108.15	5019.84
WP#10	5117.79	5021.33

BID FORM A

BID FORM A IS BASED UPON CONSTRUCTION AND TRAFFIC CONTROL PRESENTED IN THESE PLANS. TRAFFIC CONTROL FOR BID FORM A CONSISTS OF THE SUBSTRUCTURE AND SUPERSTRUCTURE.

BID FORM B

BID FORM B IS BASED UPON CONSTRUCTION AND TRAFFIC CONTROL UTILIZING A TEMPORARY VEHICULAR BRIDGE TO MAINTAIN ONE LANE OF ALTERNATING TRAFFIC DURING A PARTIAL DURATION OF THE PROJECT. THE CRITERIA FOR IMPLEMENTATION OF A TEMPORARY BRIDGE IS A FOLLOWS:

- BOAT TRAFFIC MUST BE MAINTAINED AS OUTLINED IN THESE PLANS.
- ALL WORK MUST BE WITHIN THE EXISTING RIGHT-OF-WAY OR EASEMENT AREAS WHICH HAVE BEEN NEGOTIATED BETWEEN THE TOWN AND ABUTTERS. ANY ADDITIONAL EASEMENT AREAS REQUIRED BY THE CONTRACTOR SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO NEGOTIATE AND OBTAIN ADDITIONAL EASEMENTS, IF REQUIRED. FAILURE OF THE CONTRACTOR TO OBTAIN ADDITIONAL EASEMENTS SHALL NOT RELIEVE THE CONTRACTOR FROM THE WORK.
- ALL WORK MUST BE IN ACCORDANCE WITH THE APPROVED WETLANDS PERMIT (2002-00608). FOR ANY ADDITIONAL IMPACT AREAS BEYOND THOSE OUTLINED IN THE PERMIT AND THESE PLANS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY ENGINEERING, FEES, ETC. TO COORDINATE AND OBTAIN PERMISSION FROM THE NEW HAMPSHIRE DEPARTMENT OF ENVIRONMENTAL SERVICES.

ADDITIONAL CRITERIA FOR DESIGN AND CONSTRUCTION OF THE TEMPORARY VEHICULAR BRIDGE IS INCLUDED IN SECTION 501 OF THE NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION AND THE TECHNICAL SPECIFICATIONS, SPECIAL PROVISION FOR ITEM 501.2. TEMPORARY BRIDGE INCLUDING APPROACHES.

A SUGGESTED CONSTRUCTION SEQUENCE IS AS FOLLOWS:

A. USING APPROACH TRAFFIC CONTROL PROCEDURES, MAINTAIN ONE LANE OF ALTERNATING STOP CONTROLLED ON THE EASTERLY SIDE (LAKE WENTWORTH) OF THE EXISTING BRIDGE.

B. INSTALL WESTERLY PORTION OF COFFERDAMS FOR FOOTING CONSTRUCTION.

C. USING APPROACH TRAFFIC CONTROL PROCEDURES, MAINTAIN ONE LANE OF ALTERNATING STOP CONTROLLED ON THE WESTERLY SIDE (CRESCENT LAKE) OF THE EXISTING BRIDGE.

D. INSTALL EASTERLY PORTION OF COFFERDAMS FOR FOOTING CONSTRUCTION.

E. INSTALL TEMPORARY BRIDGE, INCLUDING ABUTMENTS, SUBSTRUCTURE, RAIL, RETAINING STRUCTURES, APPROACHES, ETC., ON THE WESTERLY SIDE OF THE EXISTING ROADWAY. IT IS ANTICIPATED THAT THE TEMPORARY BRIDGE WILL SPAN OVER A PORTION OF THE EXISTING BRIDGE.

F. ROUTE TRAFFIC OVER THE TEMPORARY BRIDGE.

G. REMOVE EXISTING BRIDGE SUPERSTRUCTURE.

H. CONSTRUCT THE PROPOSED ABUTMENT A AND ABUTMENT B AND WINGWALL FOOTINGS.

I. CONSTRUCT THE EASTERLY WINGWALLS, EASTERLY PORTION OF ABUTMENT STEMS AND A PORTION OF THE WESTERLY ABUTMENT STEMS.

J. CONSTRUCT THE EASTERLY PORTION OF THE OF THE SUPERSTRUCTURE. THE PORTION CONSTRUCTED SHALL BE AT LEAST THAT SHOWN IN PHASE I OF CONSTRUCTION, SHEET NO. 6.

K. ROUTE TRAFFIC TO THE NEWLY CONSTRUCTED EASTERLY PORTION OF THE BRIDGE.

L. DISASSEMBLE THE TEMPORARY BRIDGE, ABUTMENTS, APPROACHES, RAIL, ETC.

M. CONSTRUCT THE WESTERLY PORTION OF THE PROPOSED SUPERSTRUCTURE.

⚠ PILE NOTES

1. ALL PILES SHALL BE HP 10X42 WITH APPROVED PILE POINTS. DESIGN LOADING IS 65 TONS PER PILE.
2. THE CAST STEEL PILE POINTS SHALL CONFORM TO SECTION 510.2.1.4 OF THE NHDOT STANDARD SPECIFICATIONS. THE PILE POINT DETAIL SHALL BE SUBJECT TO APPROVAL. SEE APPROVED PRODUCTS LIST FOR STANDARD MANUFACTURED PILE POINTS.
3. PILES SHALL BE DRIVEN IN ACCORDANCE WITH SECTION 510 TO A DRIVING RESISTANCE BASED ON WAVE EQUATION ANALYSIS AND AN ULTIMATE RESISTANCE OF 358 KIPS.
4. PILE LOADING TESTS SHALL BE MADE ONLY IF DIRECTED BY THE ENGINEER, AND SHALL BE PAID FOR AS EXTRA WORK.
5. ESTIMATED PILE LENGTH IS 30 LF FOR BOTH ABUTMENTS. NO PAYMENT FOR PILE SPLICES SHALL BE MADE WITHIN THE ESTIMATED PILE LENGTH UNLESS ORDERED BY THE ENGINEER. IF A PILE SPLICE IS ORDERED BY THE ENGINEER THE PILE SPLICE SHALL BE PAID FOR AS EXTRA WORK.
6. PILE LAYOUT DIMENSIONS ARE GIVEN AT THE BOTTOM OF THE FOOTINGS.
7. PLACE REINFORCING STEEL TO CLEAR PILES.

⚠ LEGEND

I – VERTICAL STEEL PILE

⏷ – BATTERED STEEL PILE (1:5 BATTER)

X'-X" – PILE EMBEDMENT DEPTH

ENGINEER

REV.	DESCRIPTION	BY	DATE
⚠1	RECORD COPY DRAWINGS	JDG	8/05
⚠2	ADD PILES	JB	1/05

PROJECT NO. 906301

FILE NAME 906TFpln

DO NOT SCALE DRAWING

DR. BY JDG | CHKD. BY RHD | DES. BY MJL

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DATE: AUGUST 2004

SCALE: AS SHOWN

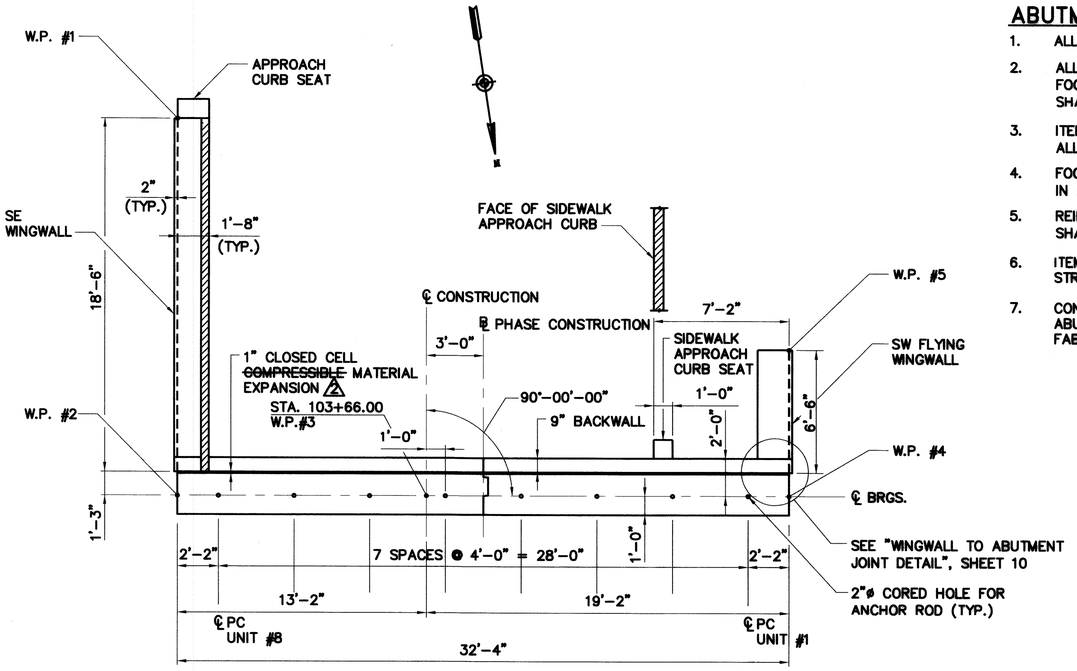
TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE

REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 126/107

FOOTING LAYOUT PLAN, DETAILS AND NOTES

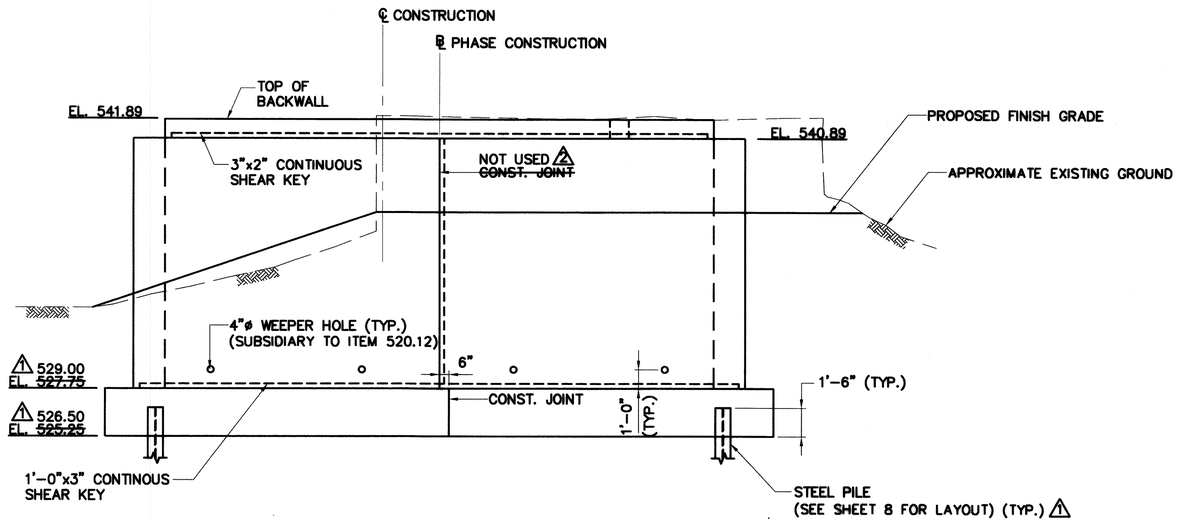
DRAWING NO. 8

SHEET 8 OF 21



PLAN – ABUTMENT A 2

SCALE: 1/4" = 1'-0"

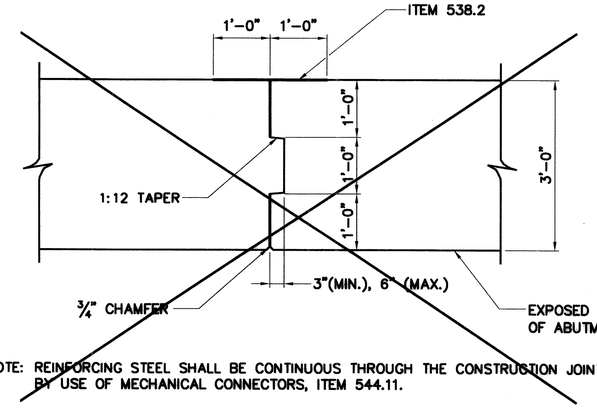


ELEVATION – ABUTMENT A 1 2

SCALE: 1/4" = 1'-0"

ABUTMENT AND WINGWALL NOTES:

1. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED ¾".
2. ALL FOOTING CONCRETE SHALL BE PAID AS ITEM 520.213, CONCRETE CLASS B, FOOTINGS (ON SOIL) (F). ALL OTHER CONCRETE IN THE ABUTMENT AND WINGWALLS SHALL BE PAID AS ITEM 520.12, CONCRETE CLASS A, ABOVE FOOTINGS.
3. ITEM 534.3 WATER REPELLENT (SILANE–SILOXANE) (F), SHALL BE APPLIED TO ALL EXPOSED SURFACES ON ABUTMENTS AND WINGWALLS 1'–0" BELOW THE FILL LINE.
4. FOOTING REINFORCEMENT SHALL HAVE 3" CLEAR COVER. ALL OTHER REINFORCING IN ABUTMENTS AND WINGWALLS SHALL HAVE 2½" CLEAR COVER.
5. REINFORCING STEEL IN SIDEWALK, BRUSH CURB, BACKWALL AND WINGWALL COPING SHALL BE EPOXY COATED.
6. ITEM 508, STRUCTURAL FILL, SHALL BE WRAPPED WITH ITEM 593.23, HIGH STRENGTH GEOTEXTILE, NON–WOVEN.
7. CONTRACTOR SHALL PROVIDE DETAILED REINFORCING STEEL SHOP DRAWINGS FOR ABUTMENTS AND WINGWALLS FOR REVIEW AND APPROVAL PRIOR TO STEEL FABRICATION.

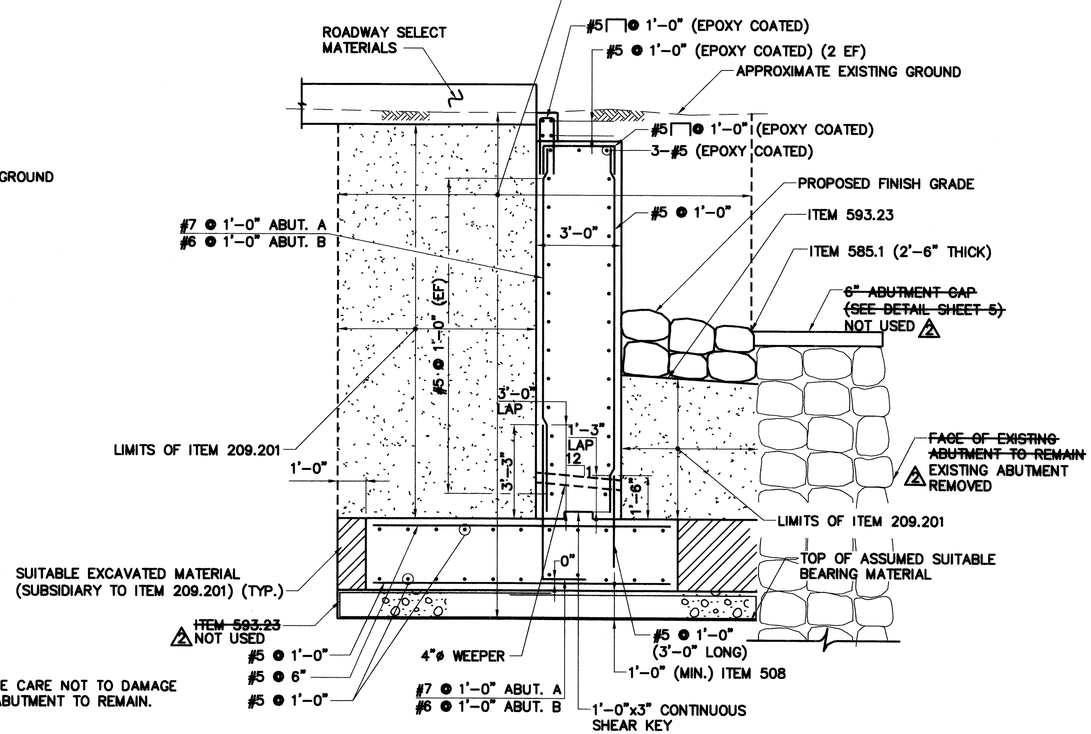


NOTE: REINFORCING STEEL SHALL BE CONTINUOUS THROUGH THE CONSTRUCTION JOINT BY USE OF MECHANICAL CONNECTORS, ITEM 544.11.

~~ABUTMENT CONSTRUCTION JOINT DETAIL~~

SCALE: 3/4" = 1'-0"

NOT USED 2



NOTE: THE CONTRACTOR SHALL TAKE CARE NOT TO DAMAGE PORTIONS OF THE EXISTING ABUTMENT TO REMAIN.

TYPICAL ABUTMENT SECTION (MASONRY & REINFORCING) 2

SCALE: 3/8" = 1'-0"

ENGINEER

DATE	BY	CHKD.	DESCRIPTION	REV.
M.J.L 8/05	JDG	JB	RECORD COPY DRAWINGS	
M.J.L 1/05	M.J.L	JDG	ADD PILES	2

PROJECT NO. 906301

FILE NAME 90633ab1A

DO NOT SCALE DRAWING

CHKD. BY RHD

DR. BY JDG

DES. BY M.J.L

DATE: AUGUST 2004

SCALE: AS SHOWN

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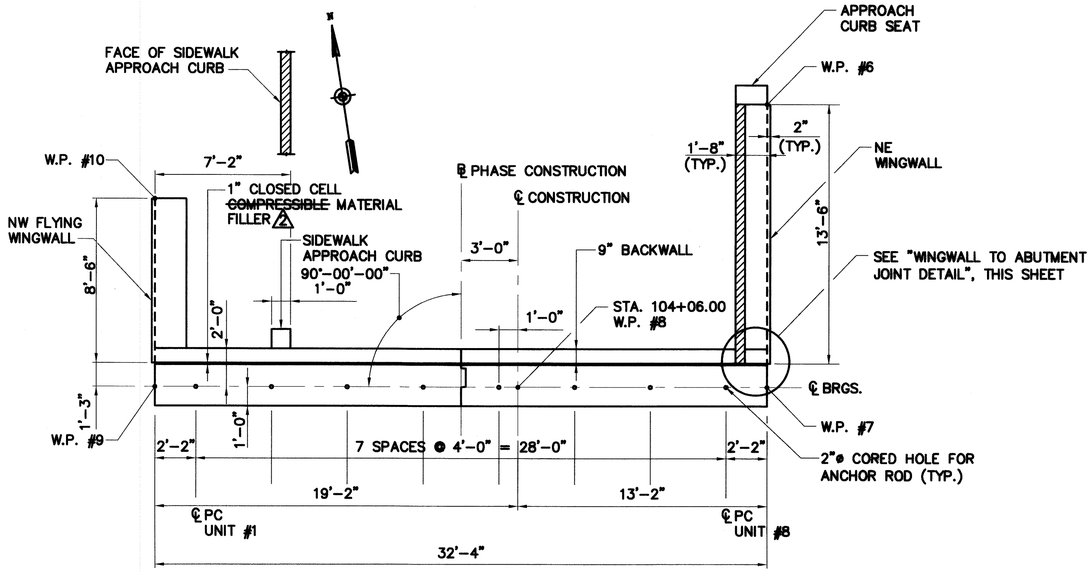
TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 126/107

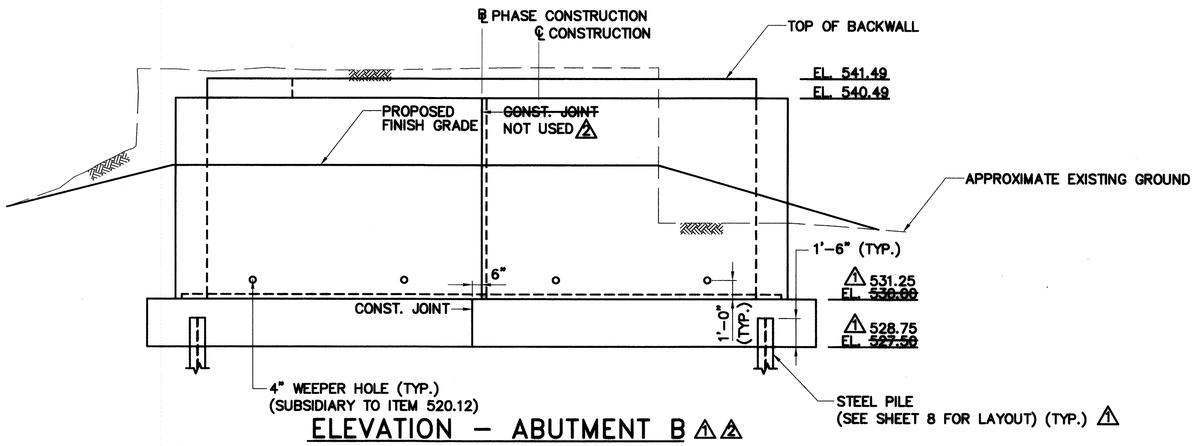
ABUTMENT A – MASONRY & REINFORCING

DRAWING NO. 9



PLAN – ABUTMENT B ⚠

SCALE: 1/4" = 1'-0"



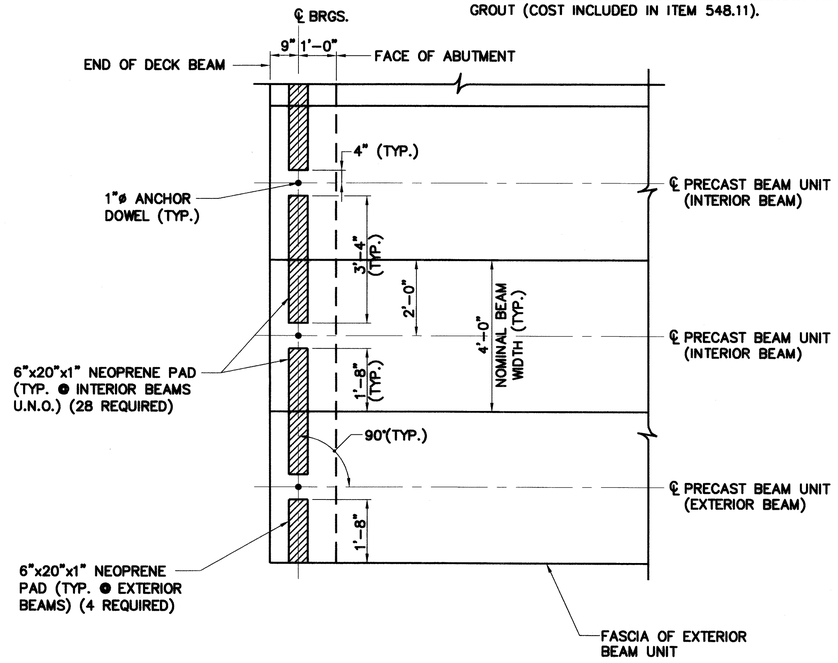
ELEVATION – ABUTMENT B ⚠⚠

SCALE: 1/4" = 1'-0"

NOTE: FOR ABUTMENT REINFORCING, SEE SHEET 9.

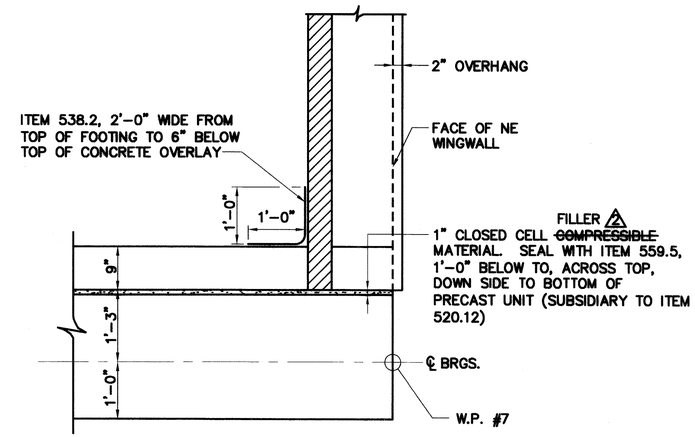
ELASTOMERIC BEARING NOTES:

1. ELASTOMERIC BEARING PADS SHALL BE NEOPRENE, HARDNESS (SHORE "A" DUROMETER) OF 60, GRADE 3.
2. THE COST OF THE ELASTOMERIC BEARING PADS, INCLUDING ANCHOR BOLTS, SHALL BE PAID UNDER ITEM 548.11, ELASTOMERIC BEARING PADS (F).
3. DESIGN LOADS: (DESIGN METHOD = AASHTO METHOD B)
   MAXIMUM DEAD LOAD 19.3 KIPS
   MAXIMUM LIVE LOAD 24.4 KIPS
4. ANCHOR BOLTS SHALL BE GALVANIZED AND FABRICATED IN ACCORDANCE WITH SECTION 550.2.5 OF THE NHDOT STANDARD SPECIFICATIONS, 2002, AS AMENDED.
5. THE ENDS OF THE BEAMS SHALL BE VERTICAL 1/4"+/- UNDER FULL DEAD LOAD AND GRADE. THE ANCHOR BOLTS SHALL BE GROUTED INTO THE ABUTMENT WITH AN APPROVED HIGH STRENGTH IMPACT RESISTANT, NON-SHRINK GROUT (COST INCLUDED IN ITEM 548.11).



BEARING LAYOUT PLAN

SCALE: 1/2" = 1'-0"



NOTE: NE WINGWALL SHOWN. ALL OTHER WINGWALL JOINTS ARE SIMILAR. AT SW AND NW WINGWALLS, ELIMINATE GRANITE CURB.

WINGWALL TO ABUTMENT JOINT DETAIL ⚠

SCALE: 3/4" = 1'-0"

ENGINEER

DATE	BY	DESCRIPTION	REV.
1/05	MJL	RECORD COPY DRAWINGS	⚠
8/05	MJL	ADD PILES	⚠

PROJECT NO. 906301
FILE NAME 906-3Ab1B
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DR. BY JDG
CHKD. BY RHD
DES. BY MJL

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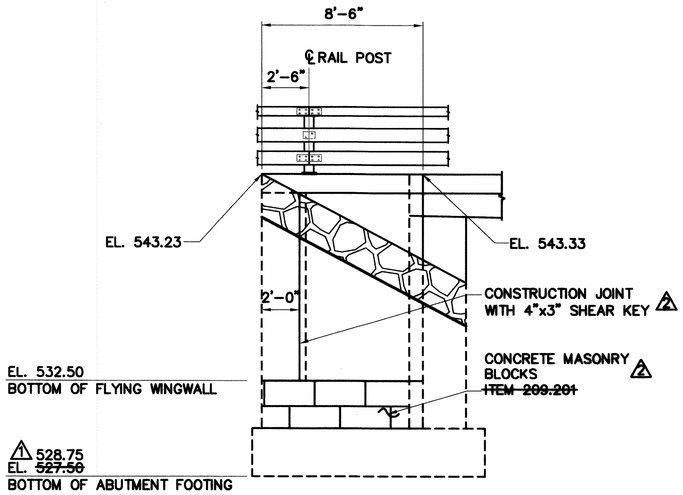
TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 128/107

ABUTMENT B – MASONRY & REINFORCING

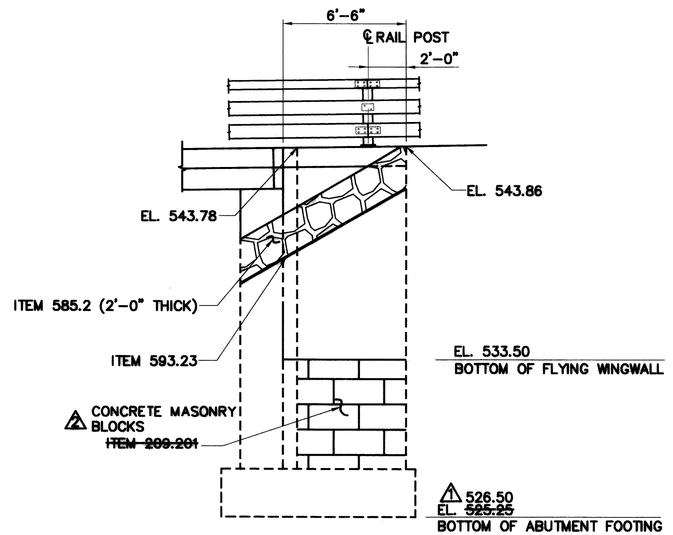
DRAWING NO.
10

SHEET 10 OF 21



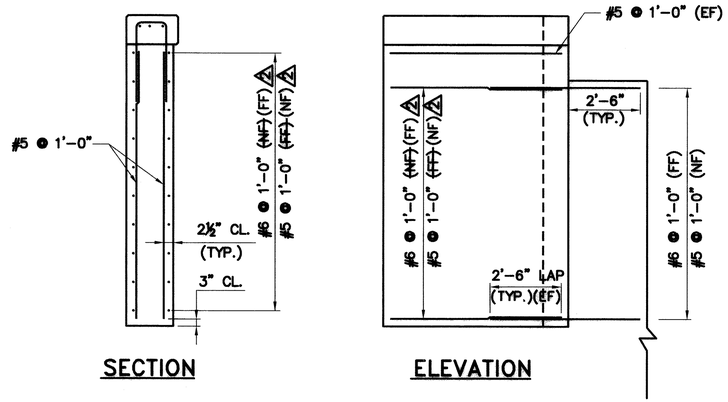
NW FLYING WINGWALL ELEVATION 1 2

SCALE: 1/4" = 1'-0"



SW FLYING WINGWALL ELEVATION 1 2

SCALE: 1/4" = 1'-0"

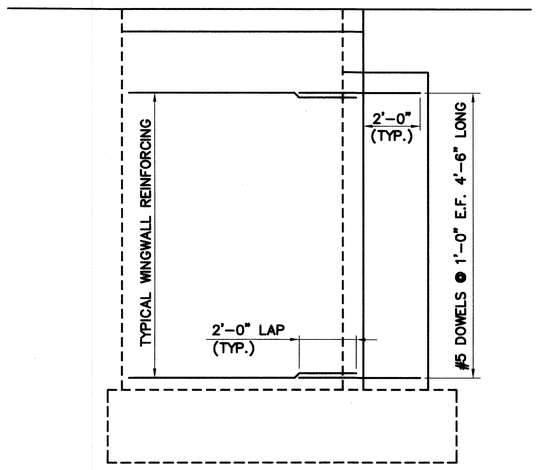


FLYING WINGWALL REINFORCING DETAILS 2

(SW & NW WINGWALLS)

SCALE: ⅜" = 1'-0"

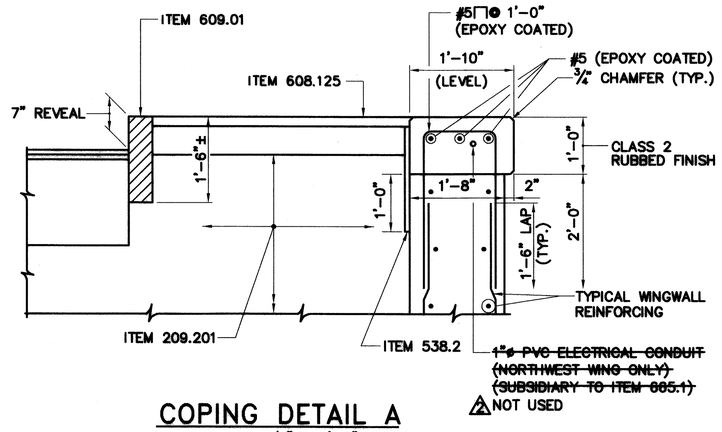
NOTE: AT NW WINGWALL #6 @ 1'-0" WAS USED AT NF AND #5 @ 6" AT FF. 2



WINGWALL TO ABUTMENT REINFORCING

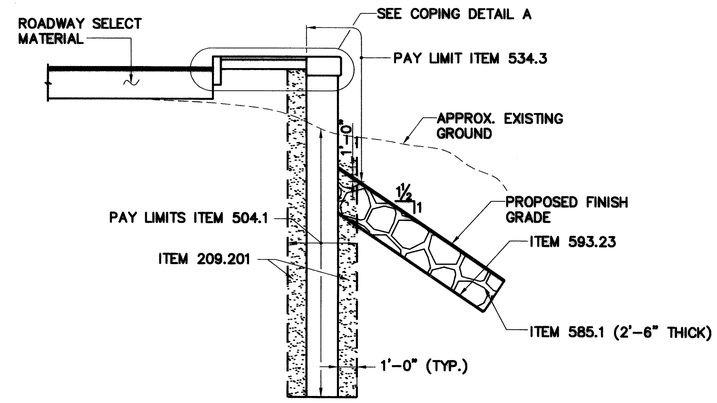
(SE & NE WINGWALLS)

SCALE: ⅜" = 1'-0"



COPING DETAIL A

SCALE: 3/4" = 1'-0"



TYPICAL SECTION – SW&NW FLYING WINGWALLS

SCALE: 1/4" = 1'-0"

ENGINEER
STATE OF NEW HAMPSHIRE
MATTHEW J. LOW
NO. 9293
PROFESSIONAL
12/31/12

REV.	DESCRIPTION	BY	DATE
1	RECORD COPY DRAWINGS	JDG	M.J.L 8/05
2	ADD PILES	JDG	M.J.L 1/05
		JDG	
		JDG	

PROJECT NO. 906301

FILE NAME 906305wnw

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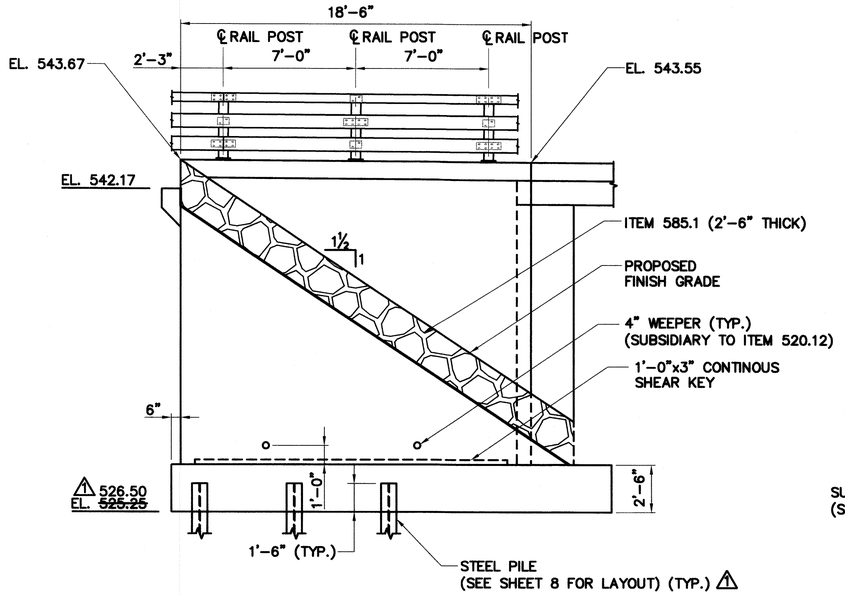
TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 126/107

SW & NW WINGWALLS – MASONRY & REINFORCING

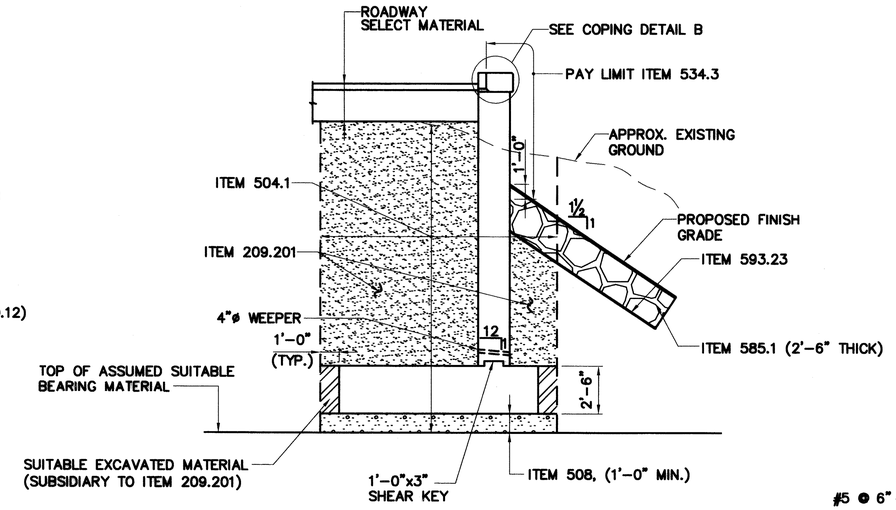
DRAWING NO. 11

SHEET 11 OF 21



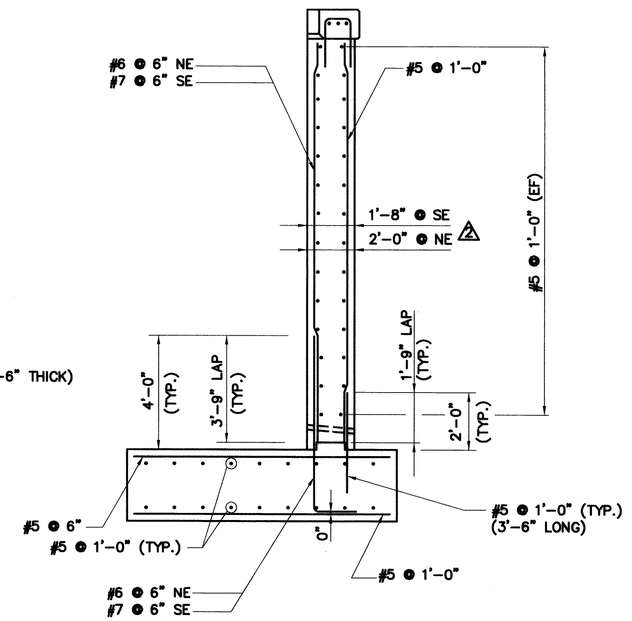
SE WINGWALL – ELEVATION ⚠

SCALE: 1/4" = 1'-0"



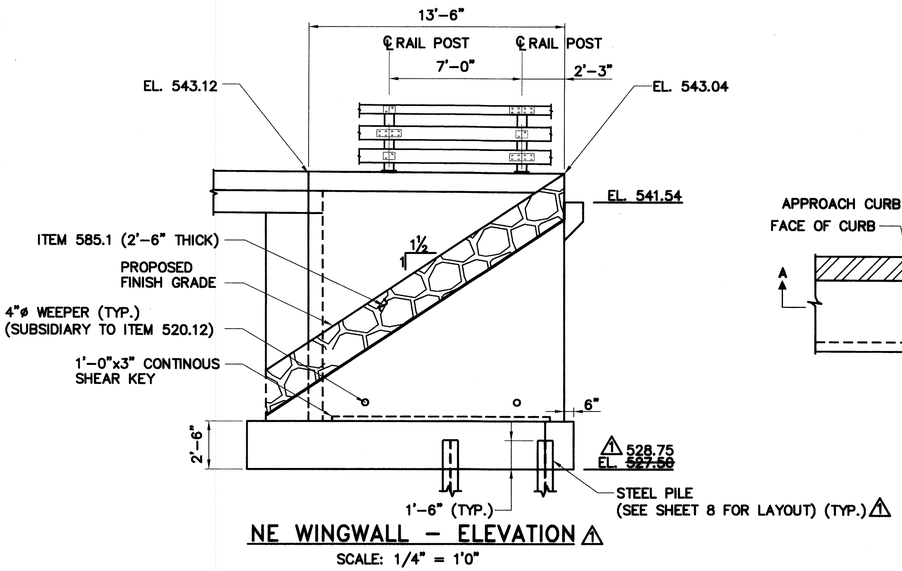
TYPICAL SECTION – SE&NE WINGWALLS

SCALE: 1/4" = 1'-0"



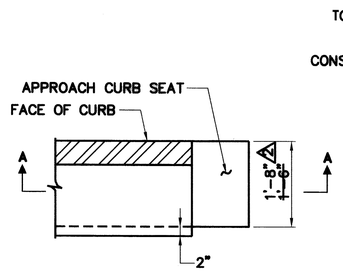
TYPICAL SE & NE WINGWALL REINFORCING ⚠2

SCALE: 3/8" = 1'-0"

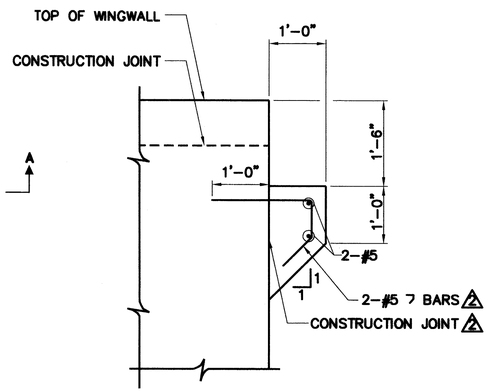


NE WINGWALL – ELEVATION ⚠

SCALE: 1/4" = 1'0"



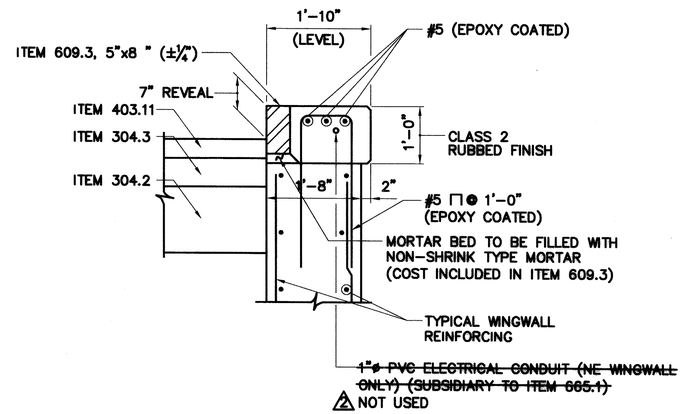
PLAN



SECTION A–A

APPROACH CURB SEAT DETAILS ⚠2

SCALE: 3/4" = 1'-0"



⚠2 NOT USED

COPING DETAIL B

SCALE: 3/4" = 1'-0"

ENGINEER
MATTHEW J. LOW
No. 9293
STATE OF NEW HAMPSHIRE
PROFESSIONAL

DATE	BY	DESCRIPTION
1/05	MJL	ADD PILES
8/05	MJL	RECORD COPY DRAWINGS

PROJECT NO. 906301
FILE NAME 906.3SeNe
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DR: JDG CHKD: RHD

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DES: MJL

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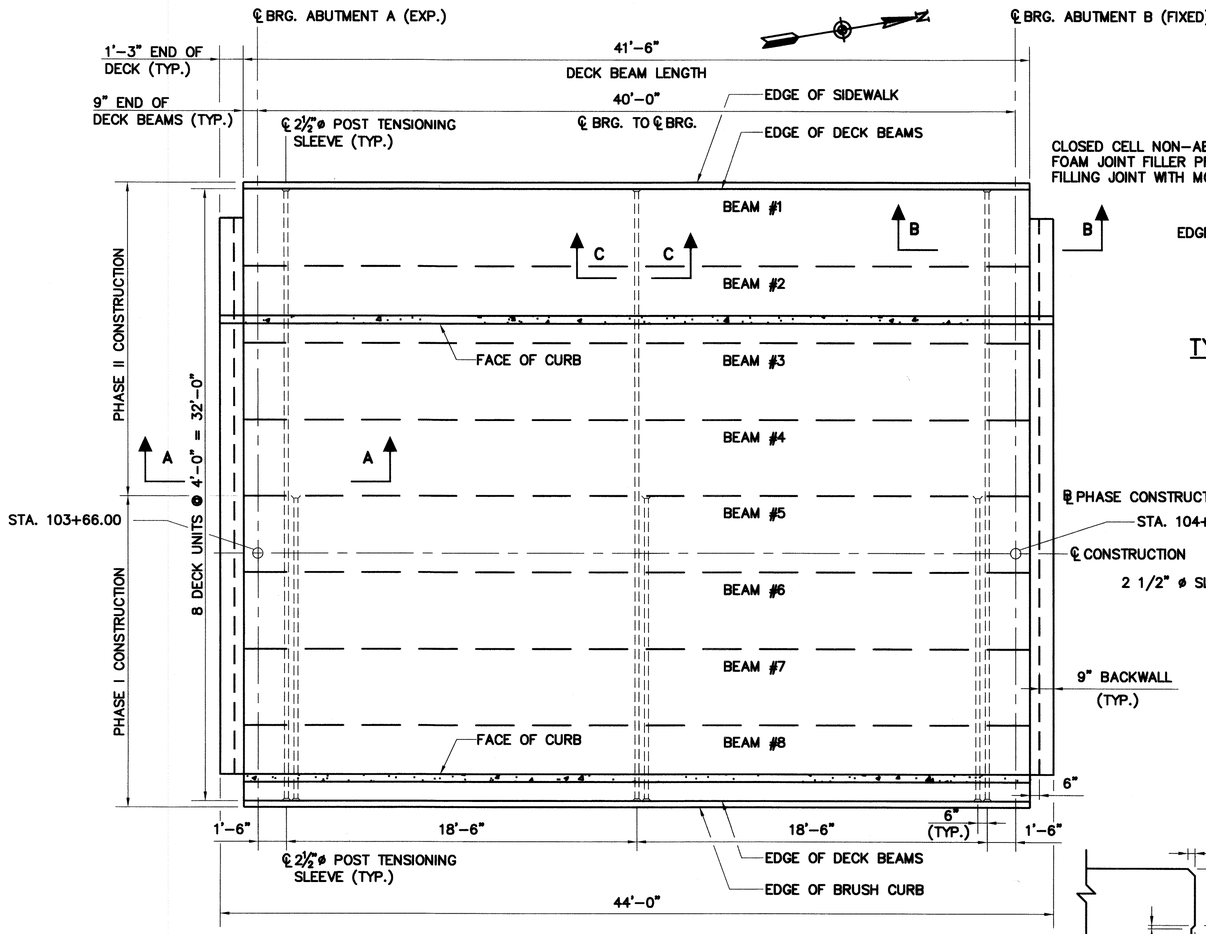
TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE

REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NBIDOT BRIDGE NO. 128/107

SE & NE WINGWALLS – MASONRY & REINFORCING

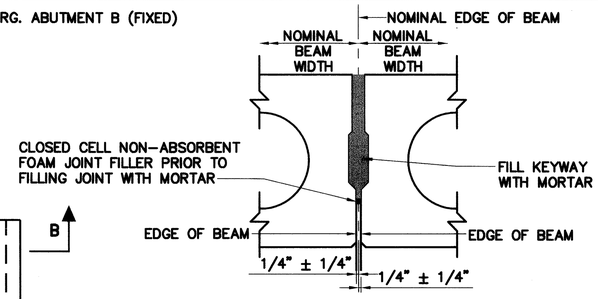
DRAWING NO.
12

SHEET 13 OF 21



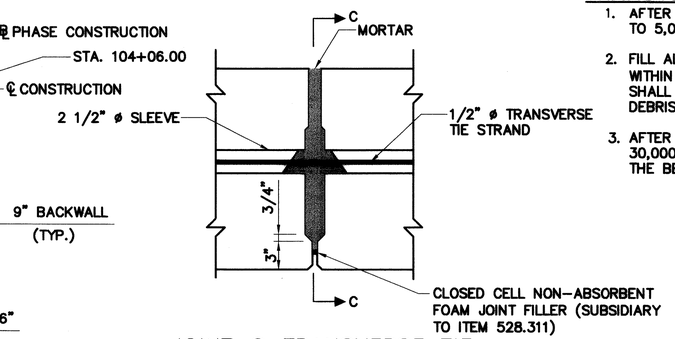
SUPERSTRUCTURE PLAN

SCALE: 1/4" = 1'-0"



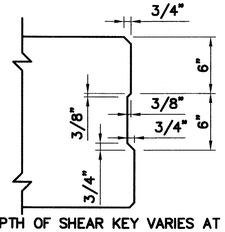
TYPICAL LONGITUDINAL JOINT SECTION

SCALE: 1 1/2" = 1'-0"



JOINT @ TRANSVERSE TIE

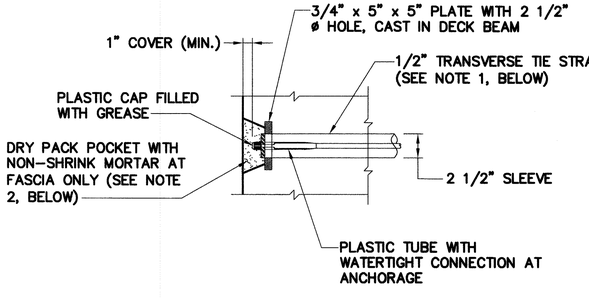
SCALE: 1 1/2" = 1'-0"



NOTE: DEPTH OF SHEAR KEY VARIES AT TRANSVERSE TIE LOCATIONS.

SHEAR KEY DETAIL

SCALE: 1 1/2" = 1'-0"



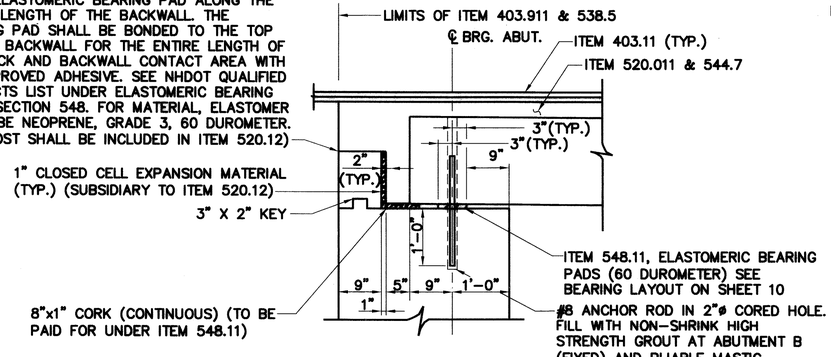
TRANSVERSE TIE POCKET DETAIL

SCALE: 1 1/2" = 1'-0"

NOTES:

1. TRANSVERSE-TIE STRANDS SHALL BE COMPLETELY COATED WITH A SEAMLESS POLYPROPYLENE SHEATH (WITH A CORROSION PREVENTITIVE COATING BETWEEN THE STRAND AND SHEATH) FOR THE FULL LENGTH OF THE STRAND EXCEPT AT THE ANCHORAGE. COST TO BE SUBSIDIARY TO ITEM 528.311.
2. MORTAR FOR EXTERIOR POCKETS SHALL BE AN APPROVED NON-SHRINK TYPE. MORTAR SHALL BE THE SAME COLOR AND TEXTURE AS THE BEAM CONCRETE. COST TO BE SUBSIDIARY TO ITEM 528.311.
3. OTHER ANCHORAGE SYSTEMS MAY BE SUBSTITUTED WITH THE APPROVAL OF THE ENGINEER. ALTERNATE ANCHORAGE SYSTEMS SHALL BE WATERTIGHT AND CORROSION RESISTANT.

GRIND THE TOP OF THE BACKWALL TO A SMOOTH FLAT PLANE. PLACE A 9" WIDE BY ½" THICK ELASTOMERIC BEARING PAD ALONG THE ENTIRE LENGTH OF THE BACKWALL. THE BEARING PAD SHALL BE BONDED TO THE TOP OF THE BACKWALL FOR THE ENTIRE LENGTH OF THE DECK AND BACKWALL CONTACT AREA WITH AN APPROVED ADHESIVE. SEE NHDOT QUALIFIED PRODUCTS LIST UNDER ELASTOMERIC BEARING PADS. SECTION 548. FOR MATERIAL, ELASTOMER SHALL BE NEOPRENE, GRADE 3, 60 DUROMETER. (ALL COST SHALL BE INCLUDED IN ITEM 520.12)



SECTION A-A

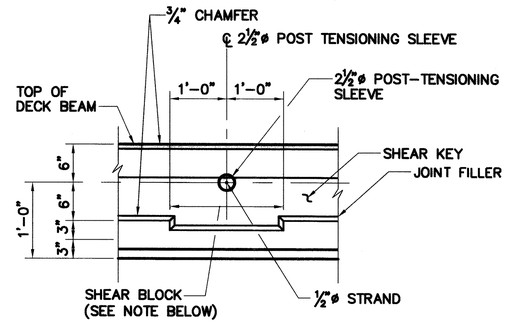
SCALE: 3/4" = 1'-0"

PRESTRESSED DECK BEAM NOTES:

1. PRESTRESSING STRAND SHALL BE UNCOATED 1/2" DIAMETER SEVEN WIRE STRAND, CONFORMING TO AASHTO M 203 (ASTM A416), GRADE 270 KSI LOW RELAXATION, INITIAL PRESTRESSING FORCE = 30.9 KIPS PER STRAND.
2. MINIMUM CONCRETE STRENGTH: AT RELEASE fci = 4,000 PSI
   AT 28 DAYS f'c = 6,000 PSI
3. REINFORCING STEEL, SLEEVES, THREADED INSERTS AND STEEL STRANDS USED IN PRESTRESSED BEAMS SHALL BE PAID UNDER ITEM 528.311 PRESTRESSED CONCRETE BRIDGE DECK, BUTTED DECK BEAMS (F).
4. THE BEAM HANDLING AND ERECTION PLAN SHALL BE SUBMITTED TO THE ENGINEER FOR DOCUMENTATION. SEE SPECIAL PROVISIONS.
5. PRESTRESSED CONCRETE DECK BEAMS SHALL NOT BE ERECTED UNTIL THE ABUTMENTS HAVE BEEN BACKFILLED TO THE LEVEL OF THE BEAM SEATS.
6. THE DRILLING OF HOLES IN THE PRESTRESSED BEAMS AND THE USE OF POWER ACTUATED TOOLS ON THE BEAMS WILL NOT BE PERMITTED.
7. ALL STRAND ENDS SHALL BE RECESSED AND PATCHED. THE RECESS SHALL BE 1 1/2" SQUARE AND 3/4" DEEP. THE PROJECTING STRAND SHALL BE BURNED OUT AND THE RECESS CLEANED PRIOR TO PATCHING WITH AN APPROVED MATERIAL. THE ENTIRE END CROSS-SECTION OF THE BEAM SHALL THEN BE COATED WITH AN APPROVED BITUMASTIC MATERIAL. ALL COSTS ARE TO BE INCLUDED IN ITEM 528.311.

TRANSVERSE TIE TENSIONING NOTES:

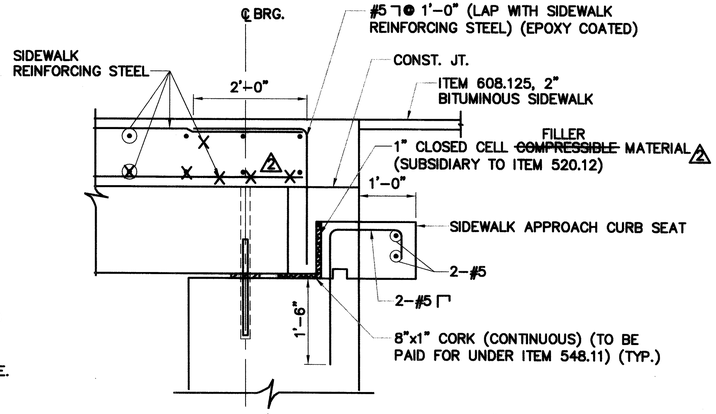
1. AFTER ALL BEAMS HAVE BEEN ERECTED, TENSION EACH TRANSVERSE TIE TO 5,000 LBS.
2. FILL ALL KEYWAYS WITH MORTAR. IF THE KEYWAYS ARE NOT FILLED WITHIN FIVE (5) DAYS AFTER THE BEAMS ARE ERECTED, THE CONTRACTOR SHALL COVER AND PROTECT THE KEYWAYS FROM THE WEATHER AND DEBRIS UNTIL THEY ARE FILLED.
3. AFTER THE MORTAR HAS CURED, TENSION EACH TRANSVERSE TIE TO 30,000 LBS. NO TRAFFIC OR HEAVY EQUIPMENT WILL BE PERMITTED ON THE BEAMS UNTIL ALL TIES HAVE BEEN FULLY TENSIONED.



SECTION C-C

SCALE: 1"= 1'-0"

NOTE: WHERE TWO SETS OF TIES ARE USED FOR PHASE CONSTRUCTION, THE WIDTH OF THE SHEAR BLOCK SHALL BE INCREASED BY THE LONGINTUDINAL SPACING OF THE TWO SLEEVES. MAINTAIN 1'-0" CLEARANCE FROM THE CENTER OF THE SLEEVE TO THE EDGE OF SHEAR BLOCK.



SECTION B-B (THRU SIDEWALK)

SCALE: 3/4" = 1'-0"

ENGINEER

NO.	DESCRIPTION	BY	DATE
	RECORD COPY DRAWINGS	JDG	8/05
		JB	
		MJL	

PROJECT NO. 906301
FILE NAME 906306km
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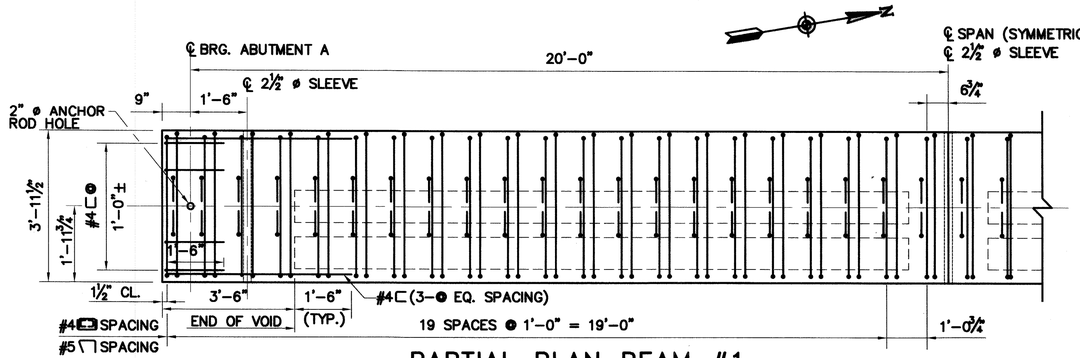
TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 126/107

SUPERSTRUCTURE PLAN AND DETAILS

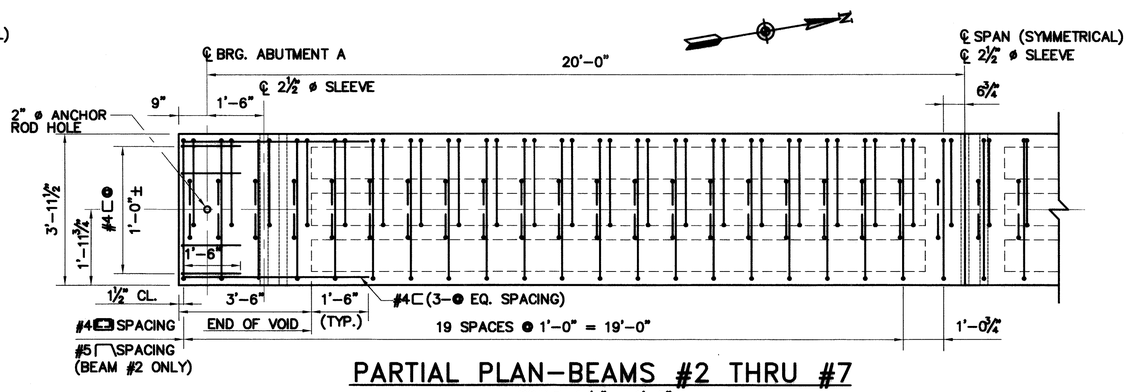
DRAWING NO. 13

SHEET 13 OF 21



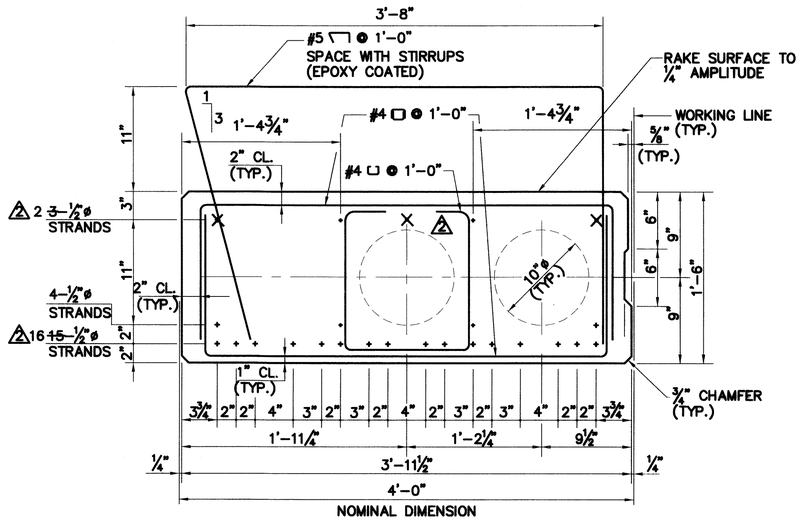
PARTIAL PLAN BEAM #1

SCALE: 1/2" = 1'-0"



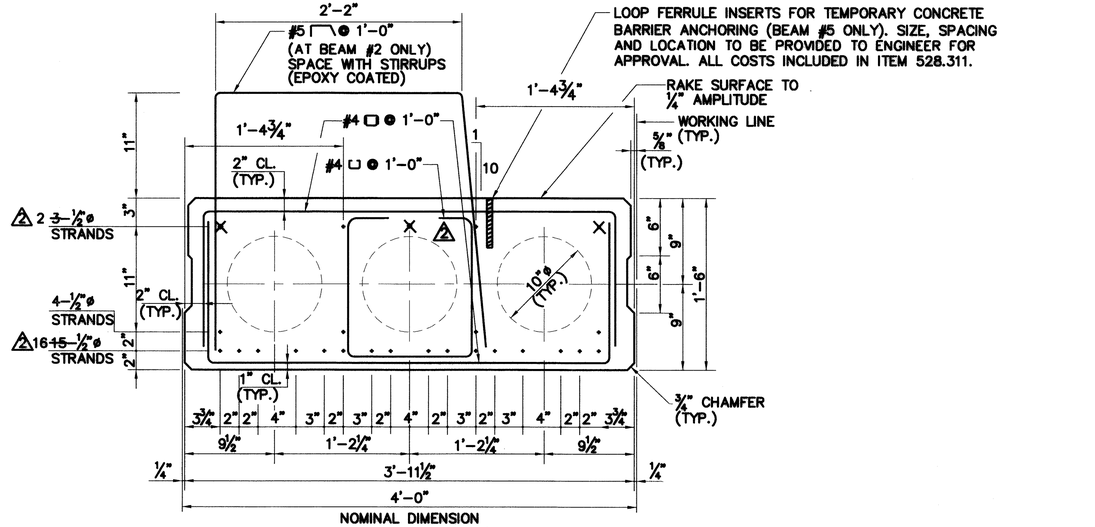
PARTIAL PLAN-BEAMS #2 THRU #7

SCALE: 1/2" = 1'-0"



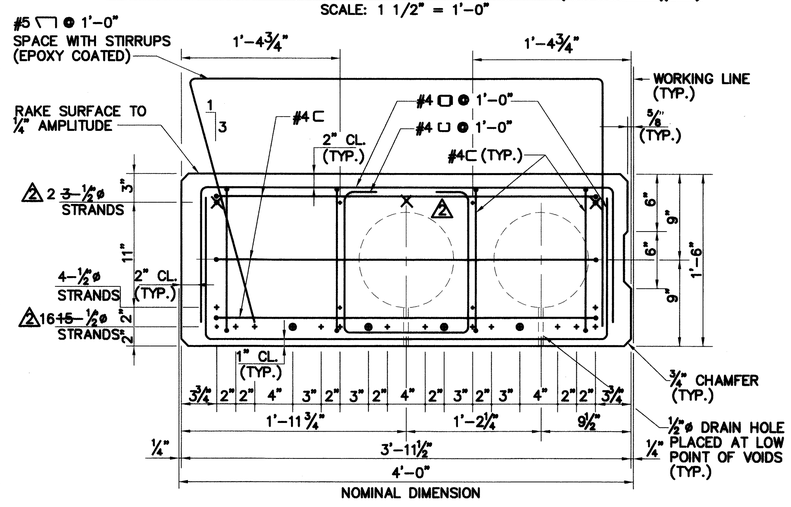
DECK BEAM MIDSPAN SECTION (BEAM #1) ⚠2

SCALE: 1 1/2" = 1'-0"



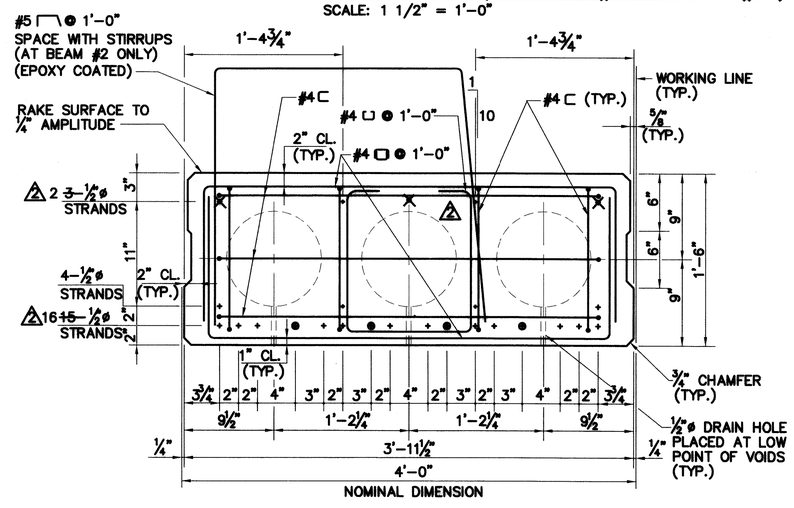
DECK BEAM MIDSPAN SECTION (BEAMS #2 THRU #7) ⚠2

SCALE: 1 1/2" = 1'-0"



DECK BEAM END SECTION (BEAM #1) ⚠2

SCALE: 1 1/2" = 1'-0"



DECK BEAM END SECTION (#2 THRU #7) ⚠2

SCALE: 1 1/2" = 1'-0"

LEGEND:

+ DENOTES STRAIGHT STRAND
⊕ DENOTES DEBONDED STRAND ⚠2
3'-0" FROM ENDS

ENGINEER
STATE OF NEW HAMPSHIRE
MATTHEW J. LOW
No. 16293
PROFESSIONAL ENGINEER

NO.	DESCRIPTION	BY	DATE
⚠	RECORD COPY DRAWINGS	JDG	8/05
		MJL	
		CHKD BY	
		APP'D BY	

PROJECT NO. 906301
FILE NAME 906303bm
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DES. BY MJL

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Web Page: www.hoyletanner.com E-Mail: tmp.email@tmp-nh.com

DATE: AUGUST 2004
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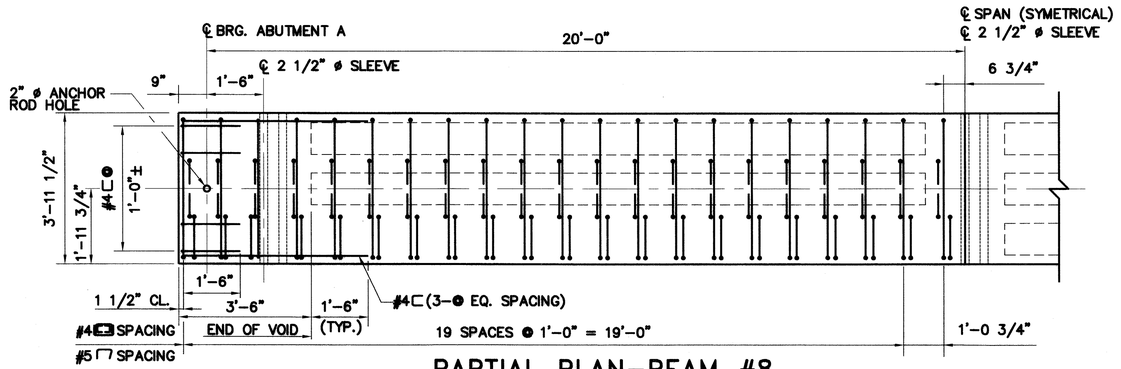
TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 126/107

DECK BEAM DETAILS (1 OF 2)

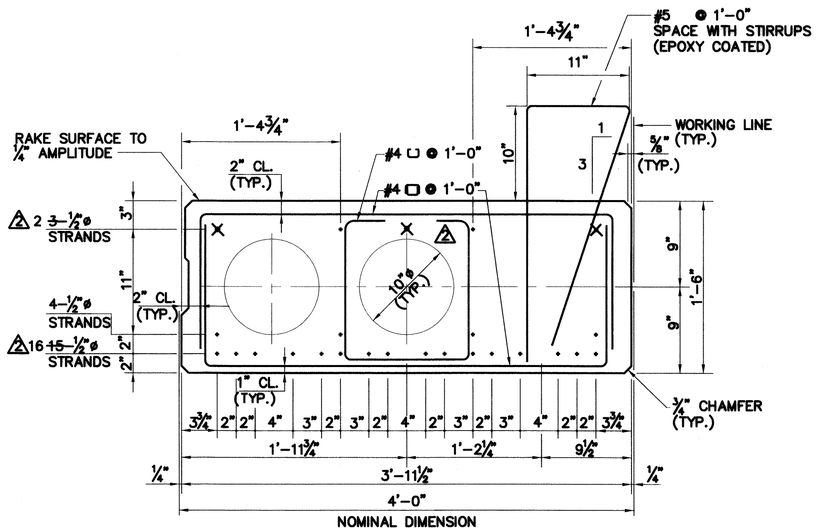
DRAWING NO. 14

SHEET 14 OF 21



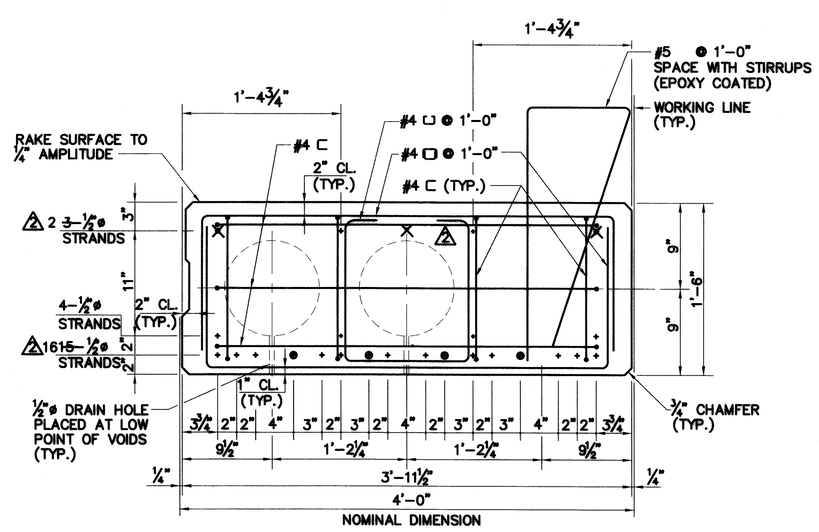
PARTIAL PLAN-BEAM #8

SCALE: 1/2" = 1'-0"



DECK BEAM MIDSPAN SECTION (BEAM #8)△2

SCALE: 1 1/2" = 1'-0"



DECK BEAM END SECTION (BEAM #8)△2

SCALE: 1 1/2" = 1'-0"

LEGEND:

+ DENOTES STRAIGHT STRAND
⊕ DENOTES DEBONDED STRAND △2
3'-0" FROM ENDS

ENGINEER
STATE OF NEW HAMPSHIRE
MATTHEW J. LOW
No. 9248
PROFESSIONAL ENGINEER

REV.	DESCRIPTION	DR. BY	CHKD. BY	APPD. BY	DATE
△	RECORD COPY DRAWINGS	JDG	JB	MJL	8/05

PROJECT NO. 906301
FILE NAME 906303drm2
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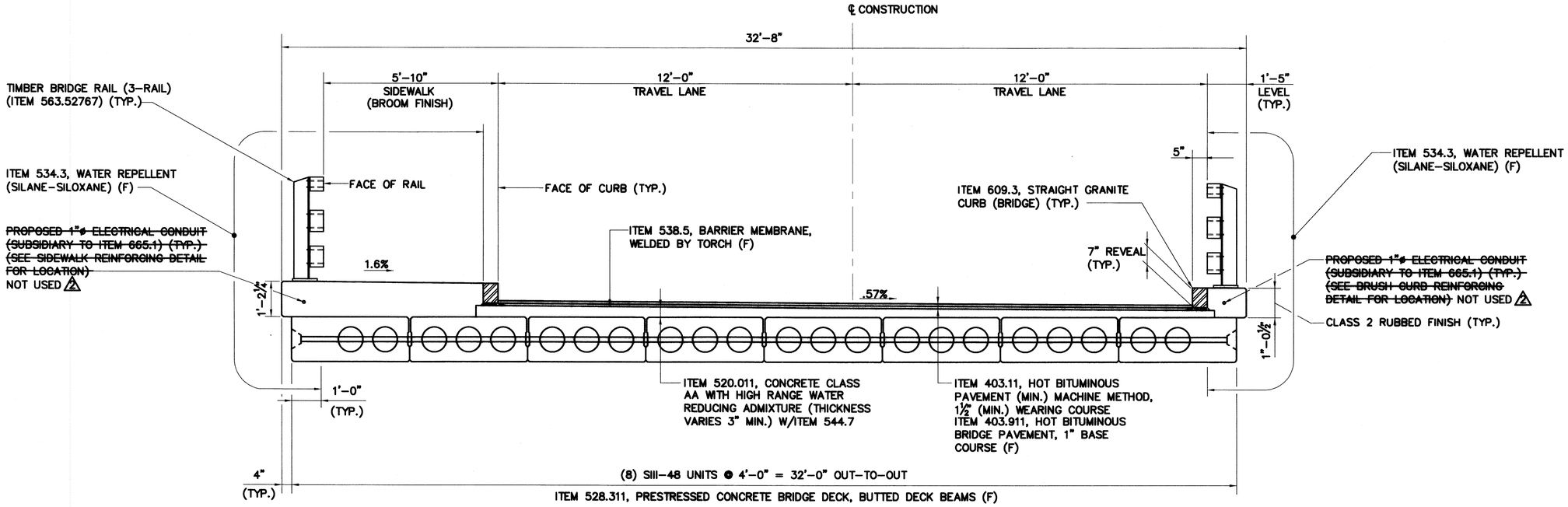
TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 126/107

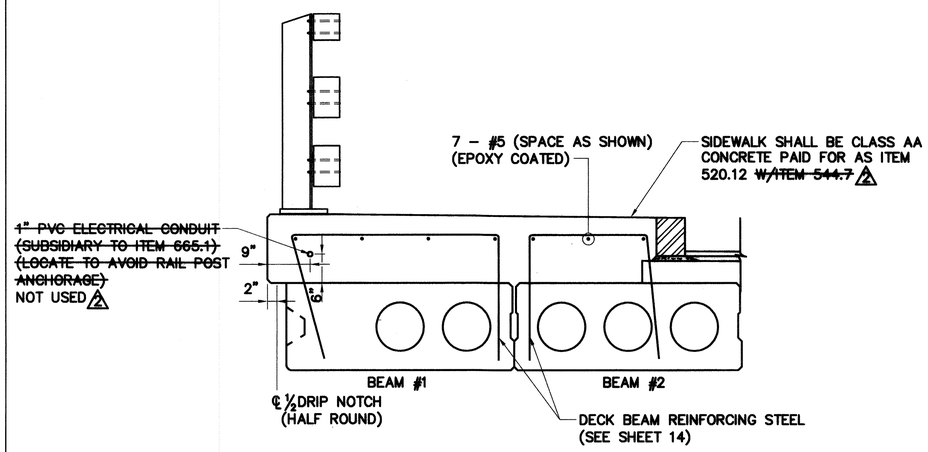
DECK BEAM DETAILS (2 OF 2)

DRAWING NO. 15

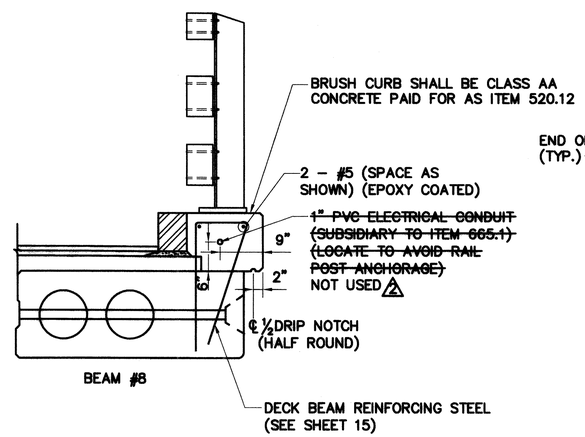
SHEET 15 OF 21



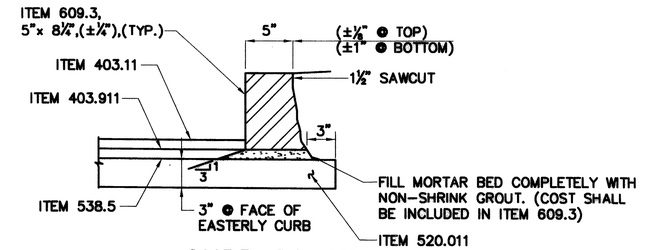
TYPICAL SECTION
SCALE: 1/2"=1'-0"



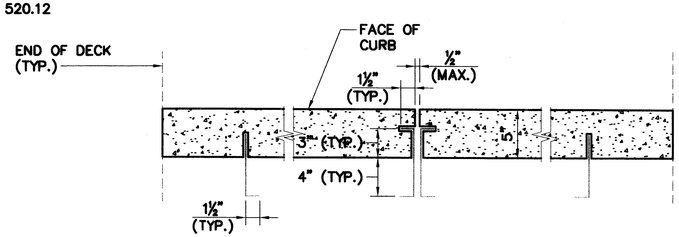
SIDEWALK REINFORCING DETAIL
SCALE: 3/4" = 1'-0"



BRUSH CURB REINFORCING DETAIL
SCALE: 3/4" = 1'-0"



CURB DETAIL
SCALE: 1½" = 1'-0"



INTERIOR CURB JOINT

NOTE: CURB ANCHORS SHALL BE 1/4"ø GALVANIZED RODS, TWO PER STONE, STAGGERED IN ADJACENT STONES AND COUNTERSUNK (COST SHALL BE INCLUDED IN ITEM 609.3)

CURB ANCHOR DETAIL
SCALE: 1½" = 1'-0"

ENGINEER
MATTHEW J. LAPOINTE
No. 9295
PROFESSIONAL ENGINEER
STATE OF NEW HAMPSHIRE

REV.	DESCRIPTION	DRC. APPD. BY	DATE
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FILE NAME 90631TSCT
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CHKD. BY RHD

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DATE: AUGUST 2004
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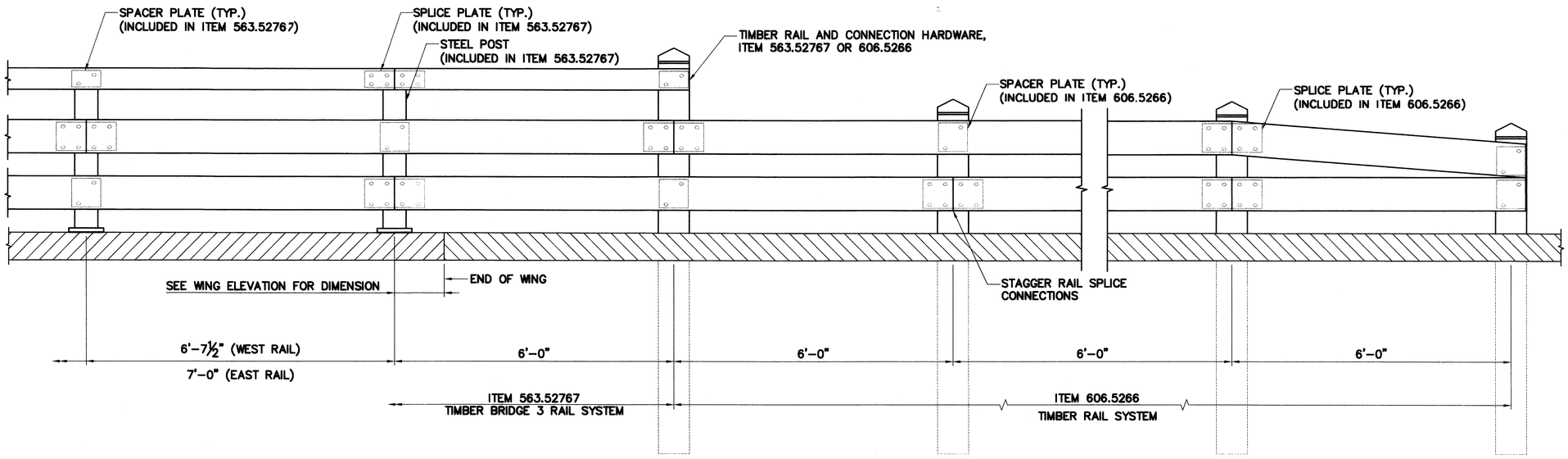
TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 126/107

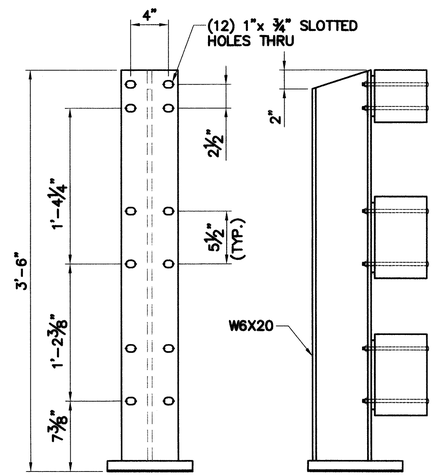
TYPICAL SECTION

DRAWING NO.
16



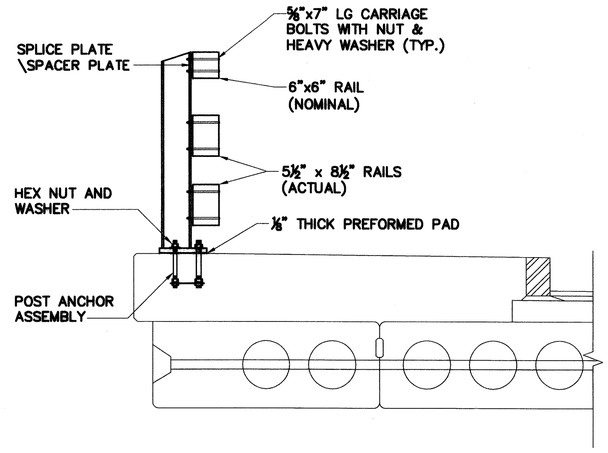
BRIDGE RAIL ASSEMBLY ELEVATION

SCALE: ¾" = 1'-0"



BRIDGE RAIL POST DETAIL

SCALE: 1½" = 1'-0"



BRIDGE RAIL ASSEMBLY SECTION

(WEST RAIL SHOWN)
SCALE: ¾" = 1'-0"

ENGINEER
STATE OF NEW HAMPSHIRE
JOHN
NO. 9203
PROFESSIONAL ENGINEER

REV.	DESCRIPTION	DR. BY	CHKD. APPR. BY	DATE

PROJECT NO. 906301
FILE NAME 906RAIL
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CHKD. BY WJL
DES. BY JBW
DR. BY JMA

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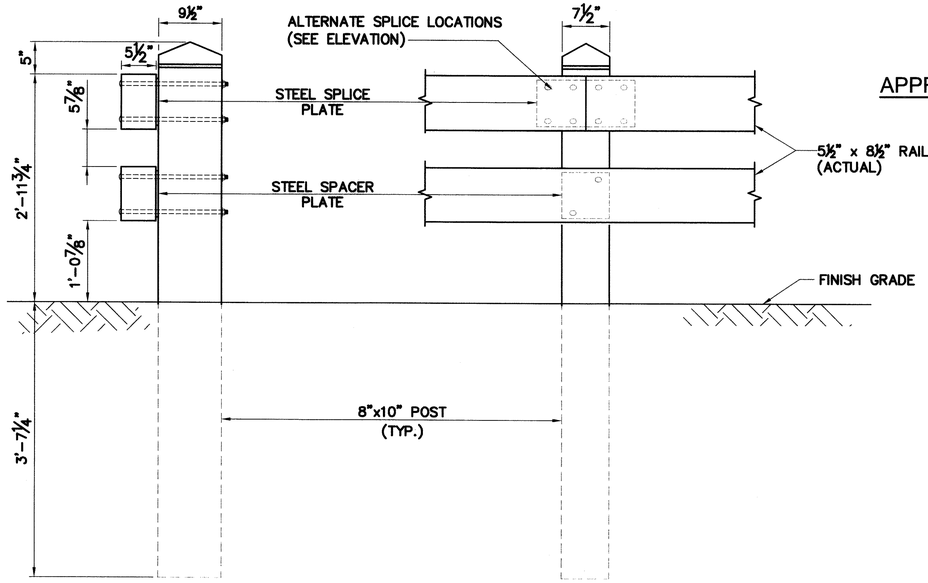
TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 126/107
TIMBER RAIL DETAILS
(1 OF 2)

DRAWING NO.
17

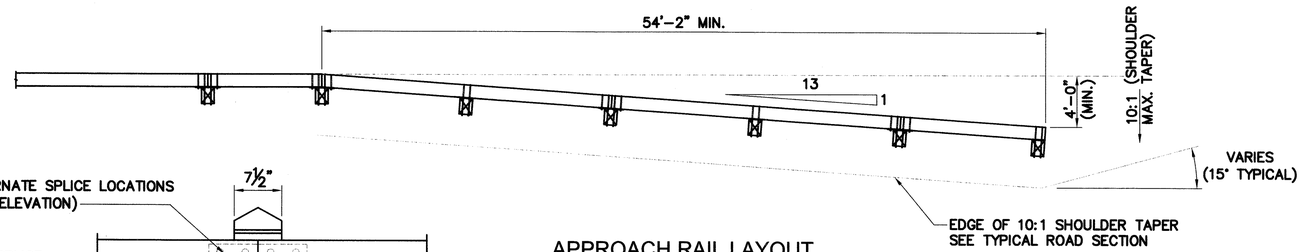
SHEET 17 OF 21

TIMBER RAIL NOTES:

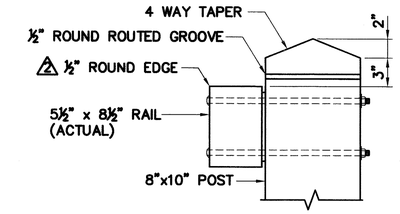
1. ITEM 563.52767 AND ITEM 606.5266 SHALL INCLUDE POSTS, BASE PLATES, ANCHOR PLATES, SPACER PLATES, SPLICE PLATES, ANCHOR STUDS, PREFORMED PADS, RAIL ASSEMBLY BOLTS, NUTS AND WASHERS, AS APPROPRIATE.
   - ASTM A572 GRADE 50 : POSTS, BASE PLATES
   - ASTM A36 : ANCHOR PLATES, SPACER PLATES, SPLICE PLATES
   - A449 : ANCHOR STUDS, NUTS, & WASHERS
   - A307 : RAIL BOLTS, NUTS, & WASHERS
   - ASTM F844 : WASHERS
   - ASTM A563 : NUTS
2. ALL STEEL COMPONENTS SHALL BE GALVANIZED AFTER FABRICATION IN CONFORMANCE WITH AASHTO M232 (ASTM A153) AND AASHTO M111 (ASTM A123). GALVANIZED SURFACES SHALL HAVE A UNIFORM APPEARANCE AND GALVANIZED MATERIAL SHALL BE PROPERLY STORED.
3. HOLES IN BASE PLATES SHALL BE FILLED FLUSH WITH ELASTOMERIC SEALANT. AFTER RAIL INSTALLATION. (SUBSIDIARY TO TIMBER BRIDGE RAIL).
4. PREFORMED BEARING PADS SHALL CONFORM TO AASHTO M251. (SUBSIDIARY TO TIMBER BRIDGE RAIL).
5. NUTS FOR THREADED ANCHOR STUDS CONNECTING THE BASE PLATE TO THE CONCRETE SHALL BE TIGHTENED TO A SNUG FIT AND GIVEN AN ADDITIONAL 1/8 TURN.
6. STRUCTURAL TIMBER–POSTS SHALL BE 8"x10" SOUTHERN YELLOW PINE NO. 1 OR BETTER HAVING A MINIMUM ALLOWABLE BENDING STRESS OF 1350 PSI. (COST INCLUDED IN ITEM 606.5266).
7. STRUCTURAL TIMBER–RAILS SHALL BE SOUTHERN YELLOW PINE NO. 1 OR BETTER HAVING A MINIMUM ALLOWABLE BENDING STRESS OF 1350 PSI. RAIL WILL BE MEASURED AND PAID FOR BY THE LINEAR FOOT INSTALLED.
8. ALL TIMBER RAILS AND POSTS SHALL BE TREATED IN ACCORDANCE WITH NHDOT STANDARD SPECIFICATION SECTION 568 USING A WATER BASED PRESERVATIVE TREATMENT. EXCESSIVE RESIDUAL PRESERVATIVE MATERIAL WILL BE REJECTED.
9. ALL WOOD CONSTRUCTION SHALL COMPLY WITH THE LATEST AASHTO SPECIFICATIONS, THE NATIONAL DESIGN SPECIFICATION (NDS) AND SUPPLEMENT FOR WOOD CONSTRUCTION, AND THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION (AITC) SPECIFICATIONS.
10. EACH PIECE OF WOOD OR TIMBER SHALL BE GRADED, BY A RECOGNIZED LUMBER GRADING AGENCY. A CERTIFICATE OF COMPLIANCE SHALL BE SUBMITTED FOR ALL WOOD.
11. ALL JOB SITE FABRICATION CUTS AND BORINGS OF WOOD TO BE TREATED SHALL HAVE TWO COATS OF AN APPROVED PRESERVATIVE LIBERALLY APPLIED. THE PRESERVATIVE SHALL BE COMPATIBLE WITH THE PRESSURE TREATMENT PERSERVATIVE USED IN ACCORDANCE WITH AWPA STANDARD M4.
12. RAILS SHALL BE CONTINUOUS OVER A MINIMUM OF TWO (2) POSTS.



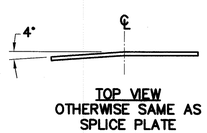
TIMBER APPROACH RAIL
SCALE: 1" = 1'–0"



APPROACH RAIL LAYOUT
NOT TO SCALE

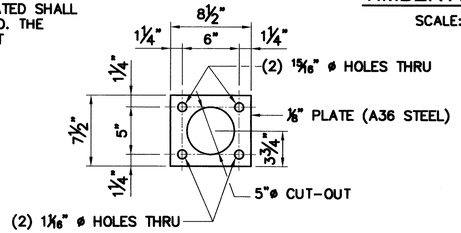


WOOD POST DETAIL
SCALE: 1½" = 1'–0"

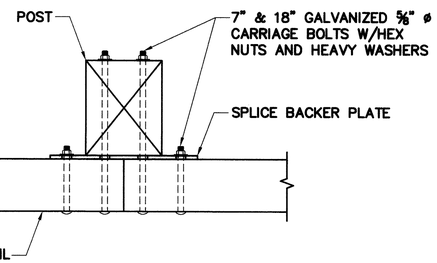


TOP VIEW
OTHERWISE SAME AS
SPLICE PLATE

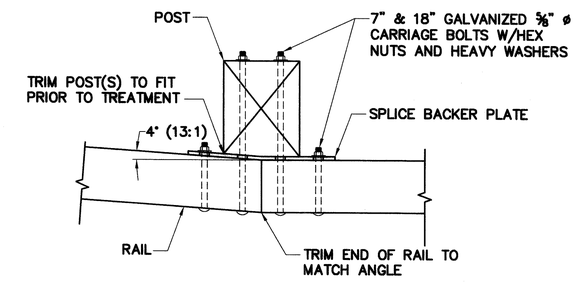
BENT SPLICE PLATE DETAIL
SCALE: 1½" = 1'–0"



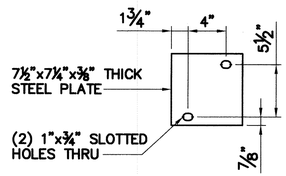
ANCHOR PLATE DETAIL
SCALE: 1½" = 1'–0"



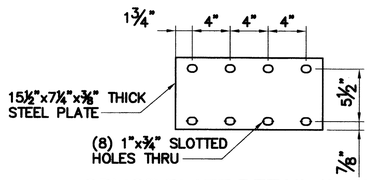
TYPICAL SPLICE CONNECTION
SCALE: 1½" = 1'–0"



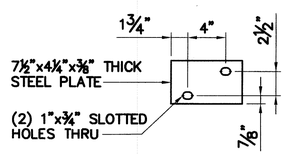
BENT SPLICE CONNECTION
SCALE: 1½" = 1'–0"



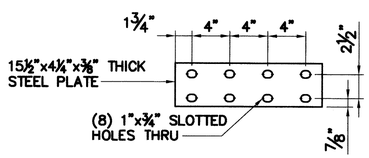
SPACER PLATE DETAIL (8 1/2" RAIL)
SCALE: 1½" = 1'–0"



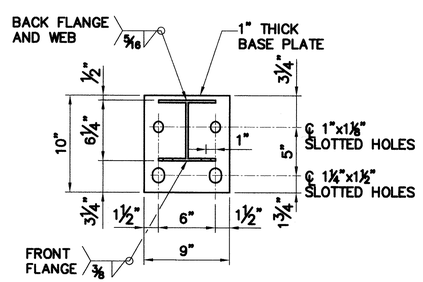
SPLICE PLATE DETAIL (8 1/2" RAIL)
SCALE: 1½" = 1'–0"



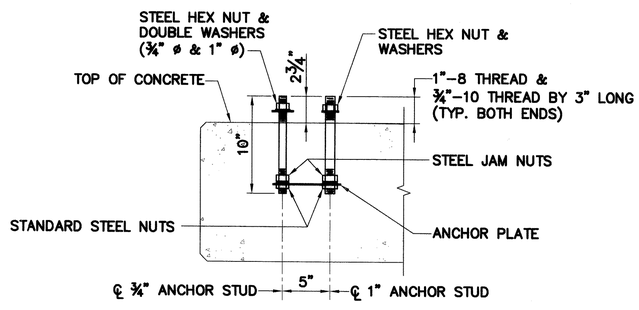
SPACER PLATE DETAIL (6" RAIL)
SCALE: 1½" = 1'–0"



SPLICE PLATE DETAIL (6"RAIL)
SCALE: 1½" = 1'–0"



BASE PLATE DETAIL
SCALE: 1½" = 1'–0"



POST ANCHOR ASSEMBLY
SCALE: 1½" = 1'–0"

ENGINEER
STATE OF NEW HAMPSHIRE
PROFESSIONAL ENGINEER

NO.	DESCRIPTION	BY	CHKD.	DATE
4	RECORD COPY DRAWINGS	JDG	JB	MJL 8/05

PROJECT NO. 906301
FILE NAME 906APRAIL
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DR. BY JBM
CHKD. BY MJL
DES. BY JMA
DATE: AUGUST 2004
SCALE: AS SHOWN

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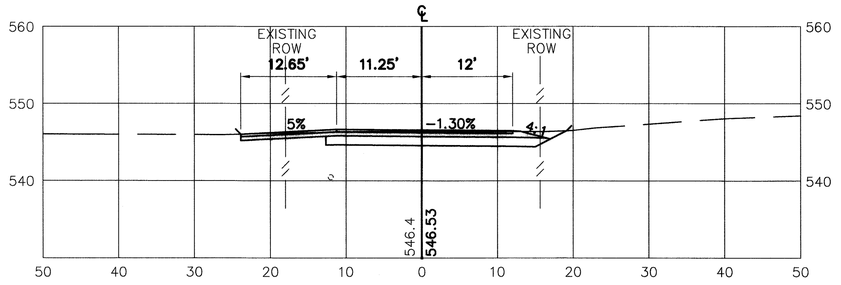
TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 126/107

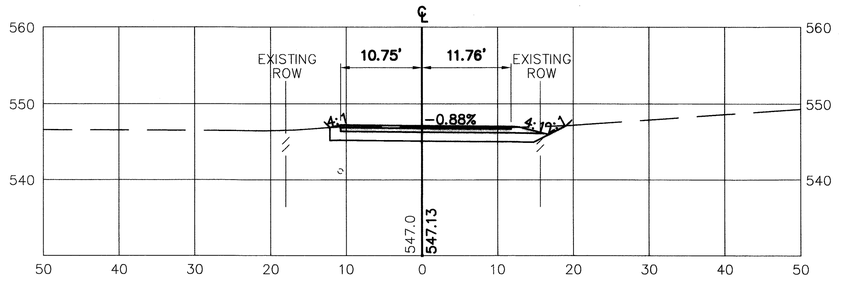
TIMBER RAIL DETAILS (2 OF 2)

DRAWING NO. 18

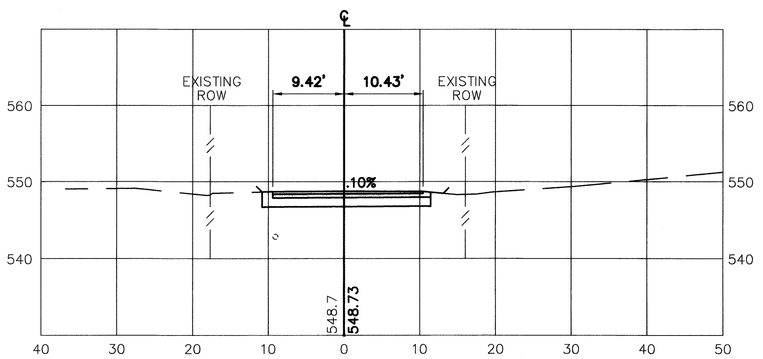
SHEET 18 OF 21



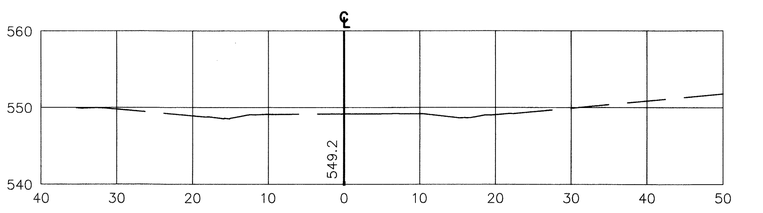
101+15



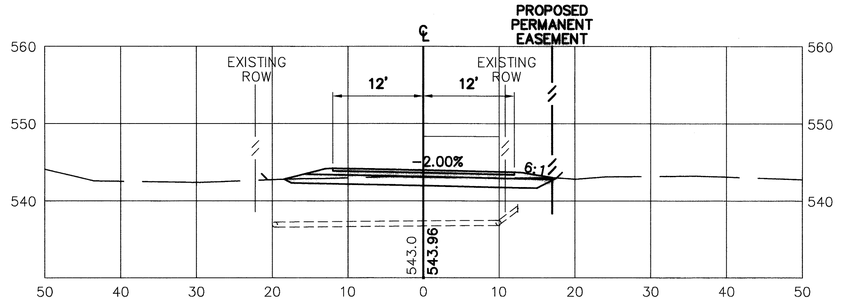
101+00



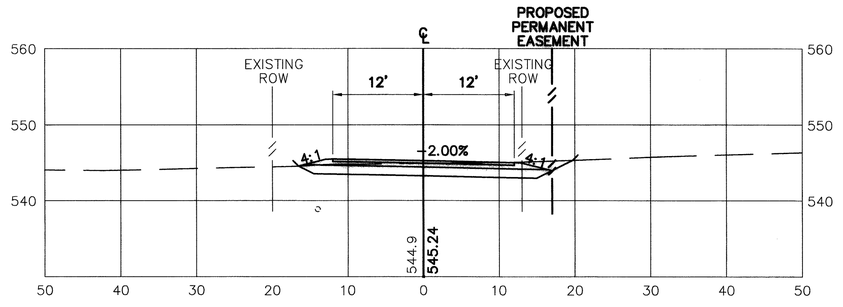
100+60



100+50



102+00



101+50

WHITTEN NECK ROAD SUPERELEVATION TABLE

		LEFT TW			RIGHT TW			
STATION	OFFSET	SLOPE	ELEV. DIFF,	OFFSET	SLOPE	ELEV. DIFF,	DESCRIPTION	SECTION
100+60	MEET EXISTING						MEET	Y
100+75	9.92	-0.194%	-0.02	10.93	0.194%	0.02		N
101+00	10.75	0.880%	0.09	11.76	-0.880%	-0.10		Y
101+15	11.25	1.300%	0.15	12.00	-1.300%	-0.16	DRIVE LEFT	Y
101+25	11.59	1.580%	0.18	12.00	-0.158%	-0.02		N
101+40	12.00	2.000%	0.24	12.00	-2.000%	-0.24	BEGIN 2%	N
101+50	12.00	2.000%	0.24	12.00	-2.000%	-0.24		Y
102+00	12.00	2.000%	0.24	12.00	-2.000%	-0.24		Y
102+50	12.00	2.000%	0.24	12.00	-2.000%	-0.24		Y
102+75	12.00	2.000%	0.24	12.00	-2.000%	-0.24	DRIVE LEFT	Y
103+00	12.00	2.000%	0.24	12.00	-2.000%	-0.24		Y
103+13.53	12.00	2.000%	0.24	12.00	-2.000%	-0.24	END 2%	N
103+36.83 PT	12.00	1.350%	0.16	12.00	-1.350%	-0.16	PT	Y
103+50	12.00	0.986%	0.12	12.00	-0.986%	-0.12		Y
103+65	12.00	0.570%	0.07	12.00	-0.570%	-0.07		N
104+00	12.00	0.570%	0.07	12.00	-0.570%	-0.07		Y
104+05	12.00	0.570%	0.07	12.00	-0.570%	-0.07		N
104+25.52	12.00	0.000%	0.00	12.00	0.000%	0.00		N
104+34.24 PC	12.00	-0.240%	-0.03	12.00	0.240%	0.03	PC	Y
104+50	12.00	-0.680%	-0.08	12.00	0.680%	0.08		Y
104+97.53	12.00	-2.000%	-0.24	12.00	2.000%	0.24	BEGIN 2%	N
105+00	12.00	-2.000%	-0.24	12.00	2.000%	0.24		Y
105+50	10.73	-2.000%	-0.21	12.00	2.000%	0.24		Y
105+60	10.39	-2.000%	-0.21	12.00	2.000%	0.24	DRIVES BOTH	Y
106+00	9.06	-2.000%	-0.18	10.79	2.000%	0.22		Y
106+28.12 PT	8.12	MEETING EXISTING		9.85			PT-MEET	Y

ENGINEER
STATE OF NEW HAMPSHIRE
MATTHEW J. CHW
No. 9283
PROFESSIONAL ENGINEER

REV.	DESCRIPTION	DR. BY	CHKD. BY	APPD. BY	DATE

PROJECT NO. 906301
FILE NAME 906 3Xsec
DO NOT SCALE DRAWING

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DR. BY JPC
DES. BY JPC

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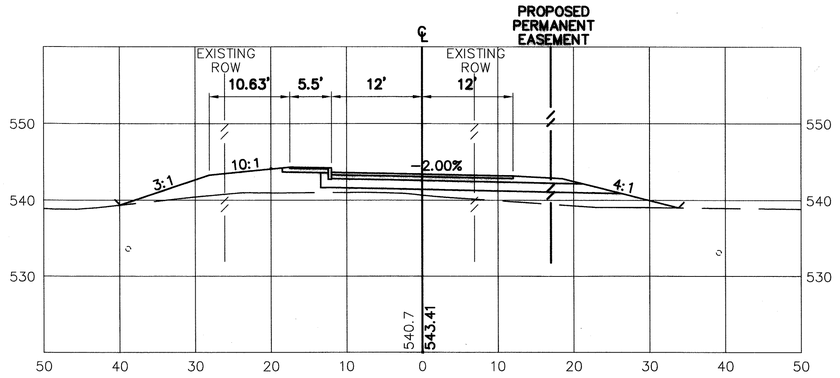
DATE: AUGUST 2004
SCALE: 1" = 10'-0"

TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE

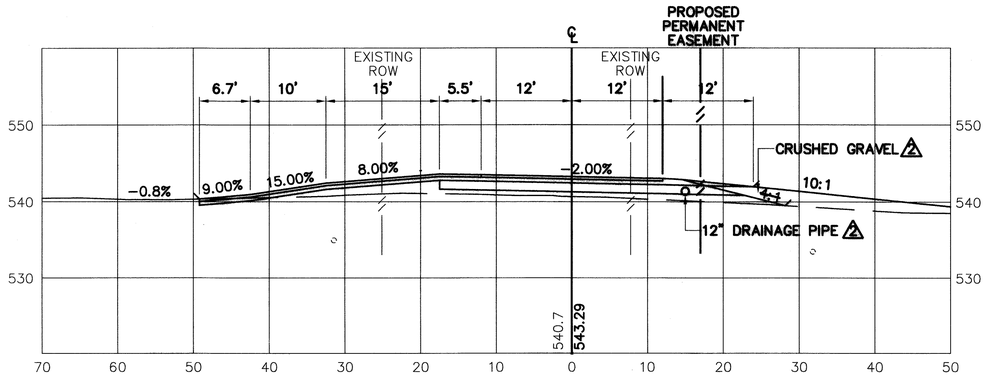
REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 126/107

ROAD CROSS SECTIONS
STA. 100+60 TO 102+00

DRAWING NO.
19



103+00



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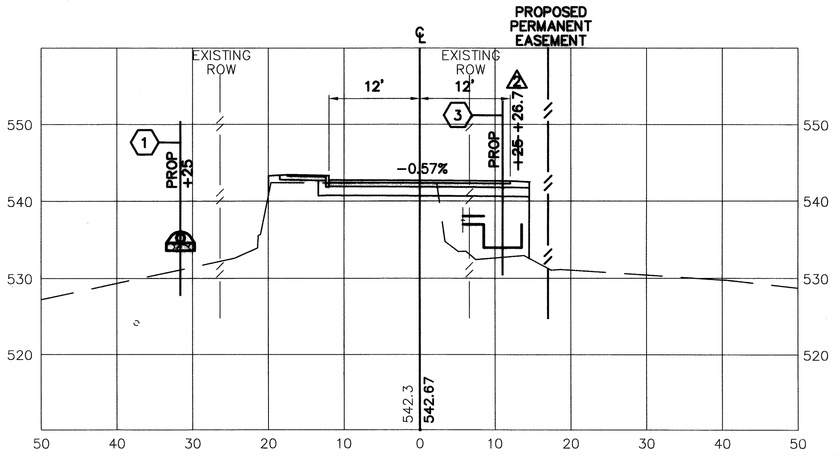

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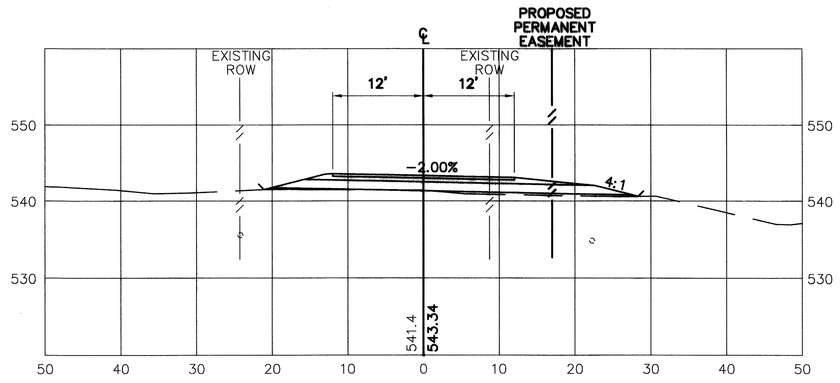

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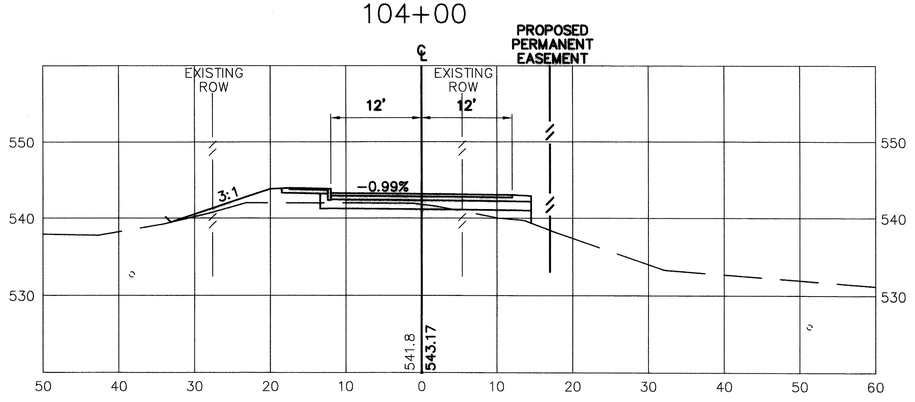


103+50

ENGINEER

REV.	DESCRIPTION	BY	CHKD. BY	DATE
1	RECORD COPY DRAWINGS	JDG	JB	MJL 8/05

PROJECT NO. 906301

FILE NAME 906SXsec

DO NOT SCALE DRAWING

DR. BY JPC

CHKD. BY JPC

DES. BY JPC

DATE: AUGUST 2004

SCALE: 1" = 10'-0"

HTA
Consulting Engineers
150 Dow Street – Manchester, NH 03101–1227
Tel 603–669–5555 Fax 603–669–4168
Web Page www.hoyletanner.com E-Mail hta@hoyletanner.com

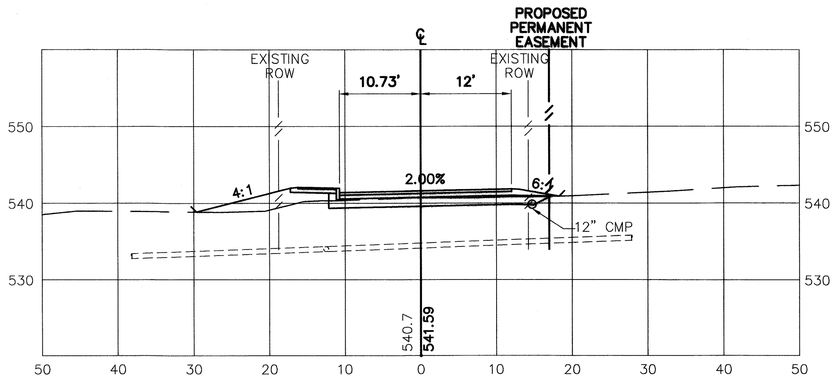
TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE

REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 128/107

ROAD CROSS SECTIONS
STA. 102+50 TO 104+00

DRAWING NO.
20

SHEET 20 OF 21



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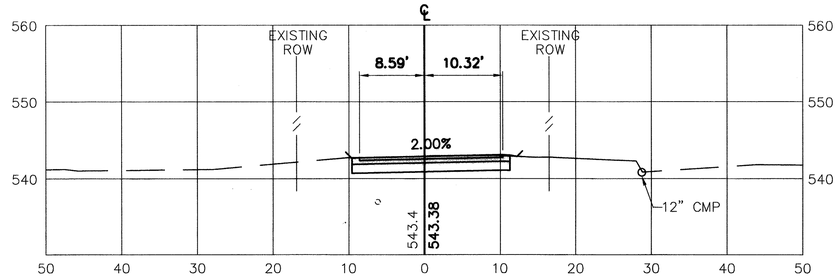

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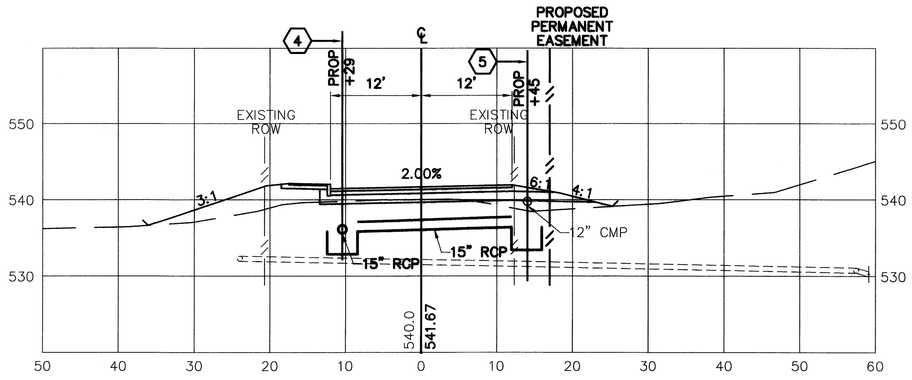

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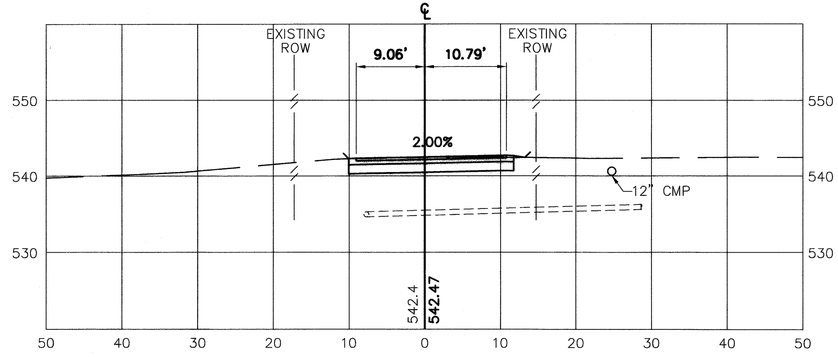

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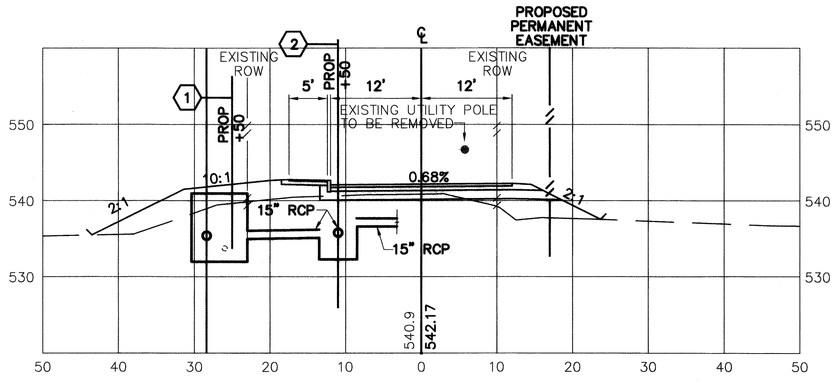

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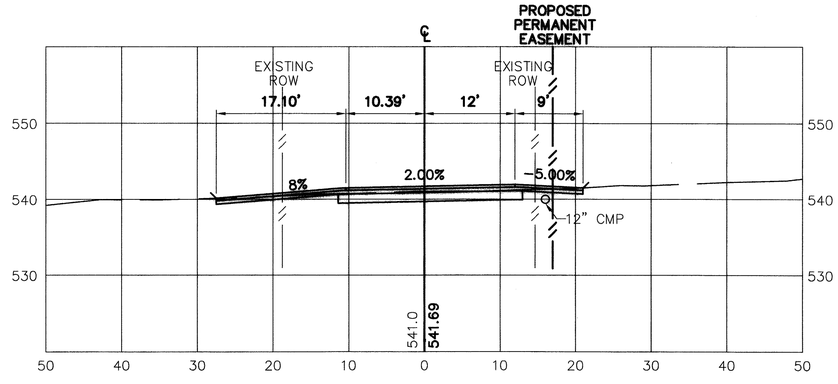


105+60

ENGINEER
STATE OF NEW HAMPSHIRE
MATTHEW J. CUM
No. 12053
PROFESSIONAL ENGINEER

REV.	DESCRIPTION	DR. BY	CHKD. BY	APPD. BY	DATE

PROJECT NO. 906301

FILE NAME 906.3Xsec

DO NOT SCALE DRAWING

DR. BY JPC

CHKD. BY JPC

HTA
Consulting Engineers
150 Dow Street – Manchester, NH 03101-1227
Tel 603-669-3555 Fax 603-669-4168
Web Page: www.hoyletanner.com E-Mail: hoyle@hoyletanner.com

DES. BY JPC

DATE: AUGUST 2004

SCALE: 1" = 10'-0"

TOWN OF WOLFEBORO
WOLFEBORO, NEW HAMPSHIRE

REPLACEMENT OF THE WHITTEN NECK ROAD BRIDGE
NHDOT BRIDGE NO. 126/107

ROAD CROSS SECTIONS
STA. 104+50 TO 106+28.12

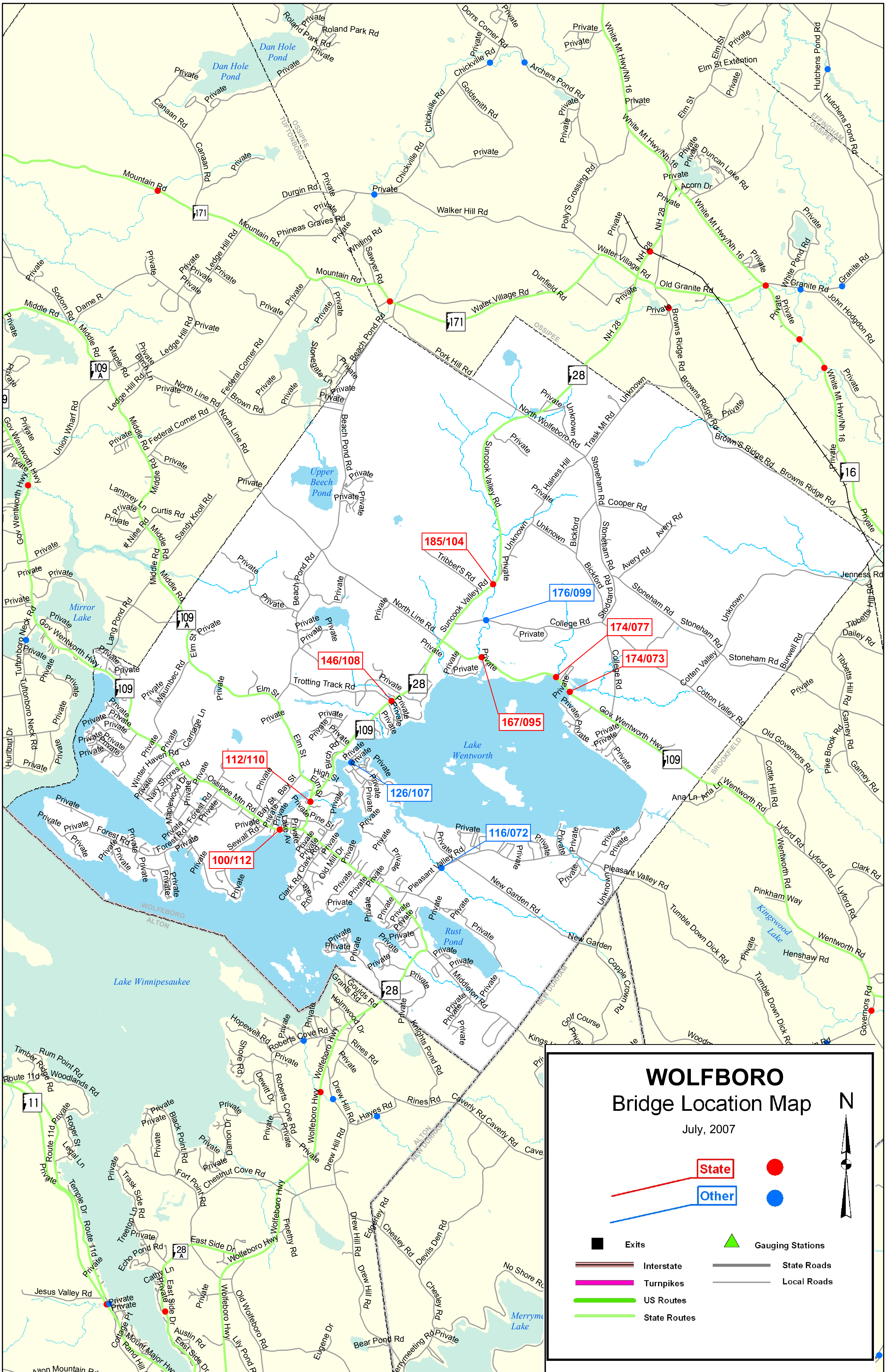
DRAWING NO.

21

SHEET 21 OF 21

APPENDIX A

LOCATION MAP


WOLFBORO
Bridge Location Map
July, 2007
N
State
Other
Exits
Gauging Stations
Interstate
Turnpikes
US Routes
State Routes
State Roads
Local Roads
185/104
176/099
174/077
174/073
167/095
146/108
126/107
116/072
112/110
100/112
Lake Wentworth
Lake Winnipesaukee
Dan Hole Pond
Upper Beech Pond
Mirror Lake
Rust Pond
Kingswood Lake
Merrymeeting Lake
OSSIPEE
TUFTONBORO
EFFINGHAM
BROOKFIELD
NEW DURHAM
ALTON
WOLFEBORO
Mountain Rd
Gov Wentworth Hwy
Middle Rd
North Line Rd
Beach Pond Rd
Suncook Valley Rd
College Rd
Stoneham Rd
Cotton Valley Rd
Pleasant Valley Rd
New Garden Rd
Wentworth Rd
Wolfeboro Hwy
White Mt Hwy/Nh 16
Water Village Rd
Browns Ridge Rd
North Wolfeboro Rd
Elm St
Ossipee Mtn Rd
Route 11d
Mount Major Hwy
East Side Dr
Alton Mountain Rd
Drew Hill Rd
Rines Rd
Caverly Rd

APPENDIX B

NHDOT INSPECTION REPORTS

New Hampshire Department of Transportation

Bridge Inspection Report

☑ NBI ☑ Element ☐ FC ☐ U/W ☐ Special

Existing Bridge Section
Bureau of Bridge Design

Wolfeboro 116/072

Date of Inspection: 08/18/2016
Date Report Sent: 12/29/2016
☑ Picture taken during inspection
Owner: Municipality

PLEASANT VALLEY RD
Over
HEATH BROOK

Recommended Postings:

Weight: E2 ☑ Weight Sign OK

Width: Not Required ☑ Width Sign OK

Primary Height Sign Recommendation: *None*
Optional Centerline Height Sign Rec: *None*

Clearances: (Feet) Over:
Under: 0.00
Route:

☑ Height Signs OK

Condition: Municipal Redlist
Deck: N N/A (NBI)
Superstructure: N N/A (NBI)
Substructure: N N/A (NBI)
Culvert: 3 Serious

Structure Type and Materials:
Number of Spans Main Unit: 2
Number of Approach Spans: 0

Main Span Material and Design Type
Steel Culvert

Sufficiency Rating: 38.6%
NBI Status: Structurally Deficient

Bridge Rail: N/A or Not Required
Rail Transition: N/A or Not Required
Bridge Approach Rail: Meets Standards
Approach Rail Ends: Substandard

NH Bridge Type: Metal Pipe
Deck Type: No Deck (N/A - NBI)
Wearing Surface: No Deck (N/A - NBI)
Membrane: No Deck (N/A - NBI)
Deck Protection: No Deck (N/A - NBI)
Pavement thickness: 3.0 in
Curb Reveal: Not Applicable
Plan Location: Unknown

Bridge Dimensions:

Length Maximum Span: 8.0 ft
Total Bridge Length: 20.0 ft
Left Curb/Sidewalk Width: 0.0 ft
Right Curb/Sidewalk Width: 0.0 ft
Width Curb to Curb: 0.0 ft
Total Bridge Width: 0.0 ft
Approach Roadway Width (W/ Shoulders): 22.0 ft
Median: No median
Bridge Skew: 0.00 °

Bridge Service:

Type of Service on Bridge: Highway
Type of Service under: Waterway
Lanes on bridge: 2
Lanes Under: NA
Year Built: 1960
Year Rebuilt: Not Rebuilt
Detour Length: 8.0 mi

AADT: 1200
Percent Trucks: 4%
Year of AADT: 2013
Future AADT: 1776
Year of Future AADT: 2035

Federal or State Definition Bridge: Fed. Definition Bridge
Roadway Functional Class: Rural Local
New Hampshire Highway System and Class: Municipal Highway
Eligibility for the National Register of Historic Places: Possibly eligible
Traffic Direction: Two-way traffic

National Bridge Inventory (NBI) Appraisal Ratings:

Deck Geometry: Not Applicable (NBI)
Underclearances: Not Applicable (NBI)
Approach Alignment: Above Mininimum Criteria
Structural Evaluation: Intolerable, Replacement
Channel/Channel Protection: Bank Slumping
Waterway Adequacy: Equal Minimum Criteria
Bridge Scour Critical Status: Stable for extreme flood
Riprap Condition: Poor Condition
Debris Present: Debris Present
DEBRIS IN MP's. UNDERMINING AT SOUTH ENDS.
Date of Underwater Inspection: Not Applicable

AASHTO CoRe Element Condition State Data:

No.	Description	Env.	Material Notes and Condition Notes
217	Other Material Abutment	Low	*STONEWORK UNSTABLE, LOOSE, VOIDS AND SETTLED. EROSION HOLE AT SOUTH HEADWALL.*
240	Culvert (includes Steel, Aluminum and Galvanized)	Moderate	*MINOR DAMAGE. HEAVY RUSTING, PITTING AND SCALING ON LOWER HALF OF INVERTS. ENDS ARE UNDERMINED AT SOUTH. VERY THIN AREAS WITH HOLES AT WEST MP. EAST MP VERY THIN ALONG ENTIRE LENGTH, CRACKED AND HOLED AT ENDS. DEBRIS IN MP'S.*
363	Section Loss Condition Warning Flag	Moderate	*Element record added 2012-08-10.* *EAST MP HOLED AT NORTH AND SOUTH FOR ABOUT 3' AT EACH CORNER. AREAS OF UP TO 70% SECTION LOSS, PARTICULARLY AT EAST MP.*

No.	Description	Env.	Quantity	Units	State 1	State 2	State 3	State 4	State 5
217	Other Material Abutment	Low	49	(LF)	0 %	0 %	0 %	100 %	
240	Culvert (includes Steel, Aluminum and C	Moderate	66	(LF)	0 %	0 %	0 %	100 %	
363	Section Loss Condition Warning Flag	Moderate	1	(EA)	0 %	0 %	100 %	0 %	

Bridge Notes:
ADD TO MRL 8/6/10.

Inspection Notes: 08/18/2016
KJT - inspection comments -
CULVERT: ASPHALT - GOOD CONDITION. STONE HEADWALLS - LOOSE AND FALLING STONE, VOIDS AND UNSTABLE. WEST MP - HEAVY RUST AND SCALE, PITTING WITH FEW HOLES, VERY THIN IN AREAS. EAST MP - CRACKED AND HOLED AT ENDS; HEAVY RUST AND SCALE, PITTING, VERY THIN ALONG ENTIRE STRUCTURE. DEFLECTION NOTED AT EAST MP ABOUT MIDSPAN UNDER LOAD OF A CONCRETE TRUCK (2012). UNDERMINING AT SOUTH ENDS. EAST MP HOLED AT NORTH AND SOUTH FOR ABOUT 3' AT EACH CORNER. AREAS OF UP TO 70% SECTION LOSS, PARTICULARLY AT EAST MP.

PICTURES: C559.
01.EAST MP HOLED AT ENDS.
02.EAST MP HOLED AT ENDS.

Approach and Roadway Notes: *ASPHALT - (6) CRACKED AND DEPRESSED.*
W- BEAM RAIL - MINOR DAMAGE.
HEAVY EROSION AT WINGS AND AT HEADWALLS.

Inspection History:

Inspection Date	Inspector	Major Element Condition Ratings
08/18/2016	KJT	Deck: N Super: N Substr: N Culvert: 3
12/21/2015	KJT	Deck: N Super: N Substr: N Culvert: 3
08/12/2014	MAS	Deck: N Super: N Substr: N Culvert: 3
12/02/2013	KJT	Deck: N Super: N Substr: N Culvert: 3
08/10/2012	MAS	Deck: N Super: N Substr: N Culvert: 3
12/12/2011	MAS	Deck: N Super: N Substr: N Culvert: 4
08/06/2010	DPC	Deck: N Super: N Substr: N Culvert: 4
09/05/2008	KJT	Deck: N Super: N Substr: N Culvert: 5
12/26/2007	KJT	Deck: N Super: N Substr: N Culvert: 5
12/26/2007	KJT	Deck: N Super: N Substr: N Culvert: 5
07/22/2004	RLM	Deck: N Super: N Substr: N Culvert: 5
08/15/2002	DPC	Deck: N Super: N Substr: N Culvert: 5
08/09/2000	DPC	Deck: N Super: N Substr: N Culvert: 6
10/30/1998	DPC	Deck: N Super: N Substr: N Culvert: 6
09/01/1996	Not Available	Deck: N Super: N Substr: N Culvert: 6
09/01/1994	Not Available	Deck: N Super: N Substr: N Culvert: 6
10/01/1992	Not Available	Deck: N Super: N Substr: N Culvert: N

Copy Distribution:

- ☑ (2) Bureau of Municipal Hghways
- ☐ (3) Bureau of Municipal Hghways
- ☐ Bureau of Turnpikes
- ☐ Border State
- ☐ Bureau of Rail and Transit
- ☐ Army Corps Of Engineers
- ☐ Railroad
- ☐ Dept. of Res. and Econ. Dev.
- ☐ Dept. of Environmental Services
- ☐ USDA Forest Service
- ☐ Bureau of Traffic

Form 4
N.H. D.O.T.

TOWN: WOLFEBORO

BRIDGE CAPACITY SUMMARY

BRIDGE NUMBER: 116/072

DESIGN LOAD: UNKNOWN DESIGN METHOD: UNKNOWN RATED BY: NBG DATE: 11/9/2012

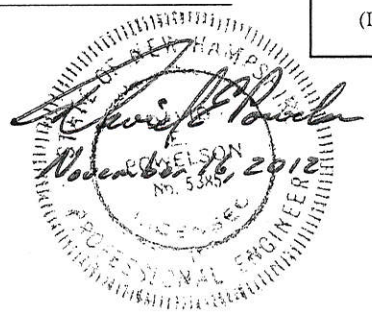
RATING METHOD: LOAD FACTOR PLAN FILE: UNKNOWN CHECK BY: DEP DATE: 11-16-12

ROUTE: PLEASANT VALLEY ROAD OVER: HEATH BROOK

RATED MEMBER	LONGITUD. EFFECTIVE SPAN LENGTH	REQUIRED CAPACITY (HS Tons)			AVAILABLE CAPACITY (HS Tons)					
		CURRENT LEGAL LOADS	CERTIFIED VEHICLES		MULTIPLE LANES LOADED			SINGLE LANES LOADED		
			SINGLE UNIT	MULTIPLE UNIT	INVENTORY	OPERATING	POSTING	INVENTORY	OPERATING	POSTING
Corrugated Metal Pipes (under 2'-0" of fill, 70% losses)										
-Wall Area (buckling)	3'-6"	HS 14.0	HS 15.4	HS 15.4	HS 20.8	HS 34.7		HS 20.8	HS 34.7	
-Seam Strength	3'-6"	HS 14.0	HS 15.4	HS 15.4	HS 10.9	HS 18.2		HS 10.9	HS 18.2	

Rating Method	English Tons	Metric Tons
(Op.) 63. LF	64. (Op.) 32.7	29.6
(Inv.) 65. LF	66. (Inv.) 19.6	17.7

RECOMMENDED POSTING: "E-2"



New Hampshire Department of Transportation

Bridge Inspection Report

☑ NBI ☑ Element ☐ FC ☐ U/W ☐ Special

Existing Bridge Section
Bureau of Bridge Design

Wolfeboro 104/116

Date of Inspection: 08/18/2016
Date Report Sent: 12/29/2016
☐ Picture taken during inspection
Owner: Municipality

BAY STREET
Over
BROOK

Recommended Postings:

Weight: No Posting Required ☑ Weight Sign OK

Width: Not Required ☑ Width Sign OK

Primary Height Sign Recommendation: *None*
Optional Centerline Height Sign Rec: *None*

Clearances: (Feet) Over:
Under: 0.00
Route:

☑ Height Signs OK

Condition: Not on the Redlist
Deck: 8 Very Good
Superstructure: 8 Very Good
Substructure: 8 Very Good
Culvert: N N/A (NBI)

Structure Type and Materials:
Number of Spans Main Unit: 1
Number of Approach Spans: 0

Main Span Material and Design Type
Concrete Frame

Sufficiency Rating: 96%
NBI Status: Not Deficient

Bridge Rail: Substandard
Rail Transition: Substandard
Bridge Approach Rail: Substandard
Approach Rail Ends: Substandard

NH Bridge Type: Conc Rigid Frame-Precast
Deck Type: Concrete Precast Panel
Wearing Surface: Bituminous
Membrane: Preformed Fabric
Deck Protection: Epoxy Coated Reinforcing
Pavement thickness: 2.0 in
Curb Reveal: 6.0 in
Plan Location: Unknown

Bridge Dimensions:

Length Maximum Span: 16.0 ft
Total Bridge Length: 18.0 ft
Left Curb/Sidewalk Width: 0.0 ft
Right Curb/Sidewalk Width: 0.0 ft
Width Curb to Curb: 29.3 ft
Total Bridge Width: 35.0 ft
Approach Roadway Width (W/ Shoulders): 28.0 ft
Median: No median
Bridge Skew: 0.00 °

Bridge Service:

Type of Service on Bridge: Highway and Pedestrian
Type of Service under: Waterway
Lanes on bridge: 2
Lanes Under: NA

Year Built: 2009
Year Rebuilt: Not Rebuilt
Detour Length: 0.0 mi

AADT: 500
Percent Trucks: 3%
Year of AADT: 2009

Future AADT: 740 Year of Future AADT: 2035

Federal or State Definition Bridge: NH Definition Bridge
Roadway Functional Class: Rural Local
New Hampshire Highway System and Class: Secondary-Municip Maint.
Eligibility for the National Register of Historic Places: Not Eligible
Traffic Direction: Two-way traffic

National Bridge Inventory (NBI) Appraisal Ratings:

Deck Geometry: Above Min. Tolerable
Underclearances: Not Applicable (NBI)
Approach Alignment: Above Desirable Criteria
Structural Evaluation: Equal Desirable Criteria
Channel/Channel Protection: No Deficiencies
Waterway Adequacy: Above Desirable Criteria
Bridge Scour Critical Status: Stable for extreme flood
Riprap Condition: Good Condition
Debris Present: No Debris Present
CAGE AT UPSTREAM.
Date of Underwater Inspection: Not Applicable

AASHTO CoRe Element Condition State Data:

No.	Description	Env.	Material Notes and Condition Notes
215	Reinforced Concrete Abutment	Moderate	*FINE CRACKS.*
241	Reinforced Concrete Culvert	Moderate	*CRF-P - 7 SECTIONS AT 5 FEET EACH.* *ASPHALT IS CRACKED AT DECK ENDS, APPROACHES ARE SETTLED. CURBS HAVE FINE CRACKS.*
332	Timber Bridge Railing	Severe	*3 RAILS - 5 1/2 INCH BY 7 1/2 INCH ON STEEL POST.* *FEW CHECKS AND SPLITS. MINOR DAMAGE.*
359	Soffit of Conc Deck or Slab Condition Warning Flag	Moderate	*GOOD CONDITION, NO LEAKING EVIDENT.*

No.	Description	Env.	Quantity	Units	State 1	State 2	State 3	State 4	State 5
215	Reinforced Concrete Abutment	Moderate	60	(LF)	100 %	0 %	0 %	0 %	
241	Reinforced Concrete Culvert	Moderate	35	(LF)	100 %	0 %	0 %	0 %	
332	Timber Bridge Railing	Severe	36	(LF)	98 %	2 %	0 %		
359	Soffit of Conc Deck or Slab Condition W	Moderate	1	(EA)	100 %	0 %	0 %	0 %	0 %

Bridge Notes:

Inspection Notes: 08/18/2016
MAS - inspection comments -
DECK / SUPERSTRUCTURE: ASPHALT - CRACKED AT DECK ENDS AND APPROACHES ARE SETTLED. CURBS - FINE CRACKS. RAIL - MINOR DAMAGE, FEW CHECKS AND SPLITS. SOFFIT - GOOD CONDITION, NO LEAKING EVIDENT. SUBSTRUCTURE: WINGS HAVE FINE CRACKS. VERY MINOR SPALL AT UPSTREAM HEADWALL. CAGE AT UPSTREAM SIDE OF BRIDGE.

Approach and Roadway Notes: *ASPHALT - (8) GOOD CONDITION, APPROACHES ARE SETTLED. TIMBER RAIL - FEW CHECKS AND SPLITS.*

Inspection History:

Inspection Date	Inspector	Major Element Condition Ratings
08/18/2016	MAS	**Deck:** 8 **Super:** 8 **Substr:** 8 **Culvert:** N
08/20/2014	KJT	**Deck:** 8 **Super:** 8 **Substr:** 8 **Culvert:** N
08/13/2012	MAS	**Deck:** 8 **Super:** 8 **Substr:** 8 **Culvert:** N
08/06/2010	DPC	**Deck:** 9 **Super:** 9 **Substr:** 9 **Culvert:** N
07/17/2009	DPC	**Deck:** 9 **Super:** 9 **Substr:** 9 **Culvert:** N

Copy Distribution:

- ☑ (2) Bureau of Municipal Hghways
- ☐ (3) Bureau of Municipal Hghways
- ☐ Bureau of Turnpikes
- ☐ Border State
- ☐ Bureau of Rail and Transit
- ☐ Army Corps Of Engineers
- ☐ Railroad
- ☐ Dept. of Res. and Econ. Dev.
- ☐ Dept. of Environmental Services
- ☐ USDA Forest Service
- ☐ Bureau of Traffic

028301040011600

Form 4

N.H. D.O.T.

BRIDGE CAPACITY SUMMARY

TOWN/CITY **WOLFEBORO** WOLFEBORO

BRIDGE NUMBER **104/116**

DESIGN LOAD **HS-25** DESIGN METHOD **LFD**

RATED BY **T L** DATE **10/23/09**

RATING METHOD **LFD** PLAN FILE TBD

CHECKED BY **TAF** DATE **10/26/09**

ROAD **BAY STREET**

OVER ~~**INLET TO BACK BAY**~~ BROOK (SCL)

RATED MEMBER	LONGITUDINAL EFFECTIVE SPAN LENGTH	REQUIRED CAPACITY			AVAILABLE CAPACITY					
		CURRENT LEGAL LOADS	CERTIFIED VEHICLES		MULTIPLE LANES LOADED			SINGLE LANE LOADED		
			SINGLE UNIT	MULTIPLE UNIT	INVENTORY	OPERATING	POSTING	INVENTORY	OPERATING	POSTING
Deck (shear) (6S)	**16' - 0"**	**HS 22.5**	**HS 27.5**	**HS 24.7**	**HS 30.4**	**HS 50.7**	**HS 45.6**	**HS 30.4**	**HS 50.7**	**HS 45.6**
Knee (moment) (4M)	**16' - 0"**	**HS 22.5**	**HS 27.5**	**HS 24.7**	**HS 34.0**	**HS 56.7**	**HS 51.1**	**HS 34.0**	**HS 56.7**	**HS 51.1**
Knee (moment) (1M)	**16' - 0"**	**HS 22.5**	**HS 27.5**	**HS 24.7**	**HS 38.8**	**HS 64.8**	**HS 58.3**	**HS 38.8**	**HS 64.8**	**HS 58.3**
Deck (moment) (5M)	**16' - 0"**	**HS 22.5**	**HS 27.5**	**HS 24.7**	**HS 35.0**	**HS 58.5**	**HS 52.6**	**HS 35.0**	**HS 58.5**	**HS 52.6**
Side Wall (shear) (3S)	**16' - 0"**	**HS 22.5**	**HS 27.5**	**HS 24.7**	**HS 52.8**	**HS 88.2**	**HS 79.3**	**HS 52.8**	**HS 88.2**	**HS 79.3**

RATING METHOD	ENGLISH TONS	METRIC TONS
63. (Op) LFD .	64. (Op) 91.3 .	82.8 .
65. (Inv.) LFD .	66. (Inv.) 54.7 .	49.6 .

RECOMMENDED POSTING: **NO POSTING RECOMENDED**

STATE OF NEW HAMPSHIRE
THOMAS A. FRENCH
No. 9745
LICENSED PROFESSIONAL ENGINEER

New Hampshire Department of Transportation

Bridge Inspection Report

☑ NBI ☑ Element ☐ FC ☐ U/W ☐ Special

Existing Bridge Section
Bureau of Bridge Design

Wolfeboro 176/099

Date of Inspection: 08/02/2016
Date Report Sent: 12/29/2016
☑ Picture taken during inspection
Owner: Municipality

COLLEGE ROAD
Over
WILLEY BROOK

Recommended Postings:

Weight: No Posting Required
E-2 SIGN AT WEST, NOT REQUIRED.
☑ Weight Sign OK

Width: Not Required
☑ Width Sign OK

Primary Height Sign Recommendation: *None*
Optional Centerline Height Sign Rec: *None*

Clearances: (Feet) Over:
Under: 0.00
Route:

☑ Height Signs OK

Condition: Not on the Redlist
Deck: 8 Very Good
Superstructure: 8 Very Good
Substructure: 8 Very Good
Culvert: N N/A (NBI)

Structure Type and Materials:
Number of Spans Main Unit: 1
Number of Approach Spans: 0

Main Span Material and Design Type
Prestressed Concrete Slab

Sufficiency Rating: 91.4%
NBI Status: Not Deficient

Bridge Rail: Substandard
Rail Transition: Substandard
Bridge Approach Rail: Substandard
Approach Rail Ends: Substandard

NH Bridge Type: Prestressed Voided Slabs
Deck Type: Concrete Precast Panel
Wearing Surface: Bituminous
Membrane: Other
Deck Protection: Epoxy Coated Reinforcing
Pavement thickness: 3.0 in
Curb Reveal: 9.0 in
Plan Location: M1-5-2-3

Bridge Dimensions:

Length Maximum Span: 27.0 ft
Total Bridge Length: 29.0 ft
Left Curb/Sidewalk Width: 0.0 ft
Right Curb/Sidewalk Width: 0.0 ft
Width Curb to Curb: 26.0 ft
Total Bridge Width: 29.0 ft
Approach Roadway Width (W/ Shoulders): 22.0 ft
Median: No median
Bridge Skew: 35.00 °

Bridge Service:

Type of Service on Bridge: Highway
Type of Service under: Waterway
Lanes on bridge: 2
Lanes Under: NA
Year Built: 2002
Year Rebuilt: Not Rebuilt
Detour Length: 3.0 mi

AADT: 600
Percent Trucks: 4%
Year of AADT: 2013
Future AADT: 888
Year of Future AADT: 2035

Federal or State Definition Bridge:	Fed. Definition Bridge
Roadway Functional Class:	Rural Local
New Hampshire Highway System and Class:	Municipal Highway
Eligibility for the National Register of Historic Places:	Not Eligible
Traffic Direction:	Two-way traffic

National Bridge Inventory (NBI) Appraisal Ratings:

Deck Geometry:	Above Min. Tolerable
Underclearances:	Not Applicable (NBI)
Approach Alignment:	Equal Minimum Criteria
Structural Evaluation:	Equal Desirable Criteria
Channel/Channel Protection:	Protection Undermined
Waterway Adequacy:	Above Mininimum Criteria
Bridge Scour Critical Status:	Stable for extreme flood
Riprap Condition:	Good Condition
Debris Present:	No Debris Present
Date of Underwater Inspection:	Not Applicable

AASHTO CoRe Element Condition State Data:

No.	Description	Env.	Material Notes and Condition Notes
52	Concrete Slab - Protected with Coated Bars	Moderate	*AVERAGE 7" CONCRETE RIGID OVERLAY. EPOXY COATED #3 REBAR @ 6" O.C. BARRIER MEMBRANE, 2" PAVEMENT.*
			ASPHALT CRACKED, MEMBRANE BUBBLES. CURBS HAVE FINE CRACKS.
104	Prestressed Concrete Box Girder (Closed Web)	Moderate	*8- PRECAST/PRESTRESSED CONCRETE DECK BEAMS. 18" D X 3' & 4' W*
			LEAKING EFFLORESCENCE BETWEEN SLABS 7 AND 8 AT NORTHEAST.
215	Reinforced Concrete Abutment	Moderate	
			VERTICAL CRACK IN ABUTMENTS.
301	Pourable Joint Seal (Includes Asphaltic Plug)	Moderate	*12" WIDE ELASTOMERIC PLUG JOINT.*
			GOOD CONDITION.
321	Reinforced Concrete Approach Slab (Paved or Bare)	Moderate	*12" D SLAB, EPOXY COATED REBAR.*
			ASPHALT IS CRACKED AT ENDS.
332	Timber Bridge Railing	Moderate	*2 LINES 6" X 8" RAIL ON 8" X 10" POSTS, 6' O.C.*
			FEW CHECKS AND SPLITS.
359	Soffit of Conc Deck or Slab Condition Warning Flag	Moderate	
			LEAKING EFFLORESCENCE BETWEEN SLABS 7 AND 8 AT NORTHEAST.

No.	Description	Env.	Quantity	Units	State 1	State 2	State 3	State 4	State 5
52	Concrete Slab - Protected with Coated E	Moderate	807	(SF)	0 %	100 %	0 %	0 %	0 %
104	Prestressed Concrete Box Girder (Close	Moderate	243	(LF)	100 %	0 %	0 %	0 %	
215	Reinforced Concrete Abutment	Moderate	112	(LF)	99 %	1 %	0 %	0 %	
301	Pourable Joint Seal (Includes Asphaltic	Moderate	66	(LF)	100 %	0 %	0 %		
321	Reinforced Concrete Approach Slab (Pa	Moderate	2	(EA)	100 %	0 %	0 %	0 %	
332	Timber Bridge Railing	Moderate	59	(LF)	100 %	0 %	0 %		
359	Soffit of Conc Deck or Slab Condition W	Moderate	1	(EA)	0 %	100 %	0 %	0 %	0 %

Bridge Notes:
NEW BRIDGE 11/26/02. (MUNICIPALLY MANAGED)

Inspection Notes: 08/02/2016
KJT - inspection comments -
DECK / SUPERSTRUCTURE: ASPHALT - CRACKED, MEMBRANE BUBBLES. CURB - FINE CRACKS. RAIL - FEW MINOR CHECKS AND SPLITS. SOFFIT - LEAKING WITH EFFLORESCENCE BETWEEN SLABS 7 AND 8 AT NORTHEAST. SUBSTRUCTURE: CRACKS AND LIGHT LEAKING.

PICTURE: C556.
35.ASPHALT CRACKS, MEMBRANE BUBBLES.

Approach and Roadway Notes: *ASPHALT - (6) CRACKS, FEW DEPRESSED AREAS.*
TIMBER ON TIMBER POST - DAMAGED AT ENDS.

Inspection History:

Inspection Date	Inspector	Major Element Condition Ratings
08/02/2016	KJT	Deck: 8 Super: 8 Substr: 8 Culvert: N
08/13/2014	MAS	Deck: 8 Super: 8 Substr: 8 Culvert: N
08/13/2012	KJT	Deck: 8 Super: 8 Substr: 8 Culvert: N
08/06/2010	DPC	Deck: 9 Super: 9 Substr: 9 Culvert: N
09/05/2008	KJT	Deck: 9 Super: 9 Substr: 9 Culvert: N
12/26/2007	KJT	Deck: 9 Super: 9 Substr: 9 Culvert: N
07/22/2004	RLM	Deck: 9 Super: 9 Substr: 9 Culvert: N
11/26/2002	DPC	Deck: 9 Super: 9 Substr: 9 Culvert: N

Copy Distribution:

☑ (2) Bureau of Municipal Hghways
☐ (3) Bureau of Municipal Hghways
☐ Bureau of Turnpikes
☐ Border State
☐ Bureau of Rail and Transit
☐ Army Corps Of Engineers
☐ Railroad
☐ Dept. of Res. and Econ. Dev.
☐ Dept. of Environmental Services
☐ USDA Forest Service
☐ Bureau of Traffic

Form 4
N.H. D.O.T.

TOWN: Wolfeboro

BRIDGE CAPACITY SUMMARY

BRIDGE NUMBER: 176/099

DESIGN LOAD: HS25 *DESIGN METHOD:* LFD *RATED BY:* EJB DATE 2/5/2003

RATING METHOD: LFD *PLAN FILE:* M1-5-2-3 *CHECK BY:* JWK DATE 3/25/2003

ROUTE: College Road *OVER:* Willey Brook

RATED MEMBER	LONGITUDINAL EFFECTIVE SPAN LENGTH	REQUIRED CAPACITY (HS Tons)			AVAILABLE CAPACITY (HS Tons)					
		CURRENT	CERTIFIED VEHICLES		MULTIPLE LANES LOADED			SINGLE LANES LOADED		
		LEGAL LOADS	SINGLE UNIT	MULTIPLE UNIT	INVENTORY	OPERATING	POSTING	INVENTORY	OPERATING	POSTING
3'-0" Precast Beam	28'-1"	HS 24.3	HS 29.7	HS 26.7	HS 44.4	HS 74.0	HS 66.6	HS 44.4	HS 74.0	HS 66.6
4'-0" Precast Beam	28'-1"	HS 24.3	HS 29.7	HS 26.7	HS 42.5	HS 70.9	HS 63.8	HS 42.5	HS 70.9	HS 63.8

STATE OF NEW HAMPSHIRE
JAMES W. KARMOZYN
No. 9414
LICENSED PROFESSIONAL ENGINEER

RECOMMENDED POSTING: No Posting Recommended

Rating Method		English Tons		Metric Tons
(Op.) 63.	LFD	64. (Op.)	127.6	115.8
(Inv.) 65.	LFD	66. (Inv.)	76.5	69.4

New Hampshire Department of Transportation

Bridge Inspection Report

☑ NBI ☑ Element ☐ FC ☐ U/W ☐ Special

Existing Bridge Section
Bureau of Bridge Design

Wolfeboro 126/107

Date of Inspection: 08/02/2016
Date Report Sent: 12/29/2016
☐ Picture taken during inspection
Owner: Municipality

WHITTEN NECK ROAD
Over
CRESCENT LAKE INLET

Recommended Postings:

Weight: No Posting Required ☑ Weight Sign OK
SIGNED "E-2" 8/2/2016.
NOT REQUIRED, COULD REMOVE IF DESIRED.

Width: Not Required ☑ Width Sign OK

Primary Height Sign Recommendation: *None*
Optional Centerline Height Sign Rec: *None*

Clearances: (Feet) Over:
Under: 0.00
Route:

☑ Height Signs OK

Condition: Not on the Redlist
Deck: 8 Very Good
Superstructure: 8 Very Good
Substructure: 8 Very Good
Culvert: N N/A (NBI)

Structure Type and Materials:
Number of Spans Main Unit: 1
Number of Approach Spans: 0

Main Span Material and Design Type
Prestressed Concrete Slab

Sufficiency Rating: 76.5%
NBI Status: Not Deficient

Bridge Rail: Substandard
Rail Transition: Substandard
Bridge Approach Rail: Substandard
Approach Rail Ends: Substandard

NH Bridge Type: Prestressed Voided Slabs
Deck Type: Concrete Precast Panel
Wearing Surface: Bituminous
Membrane: Other
Deck Protection: None
Pavement thickness: 2.5 in
Curb Reveal: 7.0 in
Plan Location: M1-10-2-2

Bridge Dimensions:
Length Maximum Span: 40.0 ft
Left Curb/Sidewalk Width: 5.4 ft
Width Curb to Curb: 24.0 ft
Approach Roadway Width (W/ Shoulders): 18.0 ft

Total Bridge Length: 44.0 ft
Right Curb/Sidewalk Width: 0.5 ft
Total Bridge Width: 32.0 ft
Median: No median
Bridge Skew: 0.00 °

Bridge Service:
Type of Service on Bridge: Highway
Type of Service under: Waterway
Lanes on bridge: 2
Lanes Under: NA

Year Built: 2005
Year Rebuilt: Not Rebuilt
Detour Length: 99.0 mi

AADT: 530 Percent Trucks: 4% Year of AADT: 2013
Future AADT: 784 Year of Future AADT: 2035

Federal or State Definition Bridge: Fed. Definition Bridge
Roadway Functional Class: Rural Local
New Hampshire Highway System and Class: Municipal Highway
Eligibility for the National Register of Historic Places: Not Eligible
Traffic Direction: Two-way traffic

National Bridge Inventory (NBI) Appraisal Ratings:

Deck Geometry: Minimum Tolerable
Underclearances: Not Applicable (NBI)
Approach Alignment: Above Mininimum Criteria
Structural Evaluation: Equal Desirable Criteria
Channel/Channel Protection: Protected
Waterway Adequacy: Above Desirable Criteria
Bridge Scour Critical Status: Stable for extreme flood
Riprap Condition: Good Condition
Debris Present: No Debris Present
Date of Underwater Inspection: Jul. 2004
NO LONGER REQUIRED AFTER RECONSTRUCTION.

AASHTO CoRe Element Condition State Data:

No.	Description	Env.	Material Notes and Condition Notes
52	Concrete Slab - Protected with Coated Bars	Moderate	*3" MIN, THICKNESS VARIES. TORCH APPLIED MEMBRANE. 2.5" PAVEMENT. ASPHALT IS IN GOOD CONDITION, CRACKED AT DECK ENDS. CURB / SIDEWALK - FINE CRACKS.*
104	Prestressed Concrete Box Girder (Closed Web)	Moderate	*8 - 4'W X 41.5' L X 18"D. PRESTRESSING STRANDS 1/2" UNCOATED, SEVEN WIRE STRAND. GOOD CONDITION.*
215	Reinforced Concrete Abutment	Moderate	*SPREAD FOOTINGS SET ON STEEL PILES. (6 PILES ABUTMENT B. 7 PILES ABUTMENT A.) FINE CRACKS.*
310	Elastomeric Bearing	Moderate	*6"W X 20"L X 1"T. PLACED SO ANCHOR DOWEL DOES NOT PIERCE. 32 UNITS USED GOOD CONDITION.*
333	Other Material Bridge Railing	Moderate	*TIMBER 3-RAIL SYSTEM; 2 LOWER RAILS 5.5" X 8.5". TOP RAIL 6" X 6". TIMBER - SCRAPES, FEW SPLITS. WEATHERED.*
359	Soffit of Conc Deck or Slab Condition Warning Flag	Moderate	*GOOD CONDITION. NO LEAKING EVIDENT.*

No.	Description	Env.	Quantity	Units	State 1	State 2	State 3	State 4	State 5
52	Concrete Slab - Protected with Coated E	Moderate	1,328	(SF)	100 %	0 %	0 %	0 %	0 %
104	Prestressed Concrete Box Girder (Close	Moderate	332	(LF)	100 %	0 %	0 %	0 %	

No.	Description	Env.	Quantity	Units	State 1	State 2	State 3	State 4	State 5
215	Reinforced Concrete Abutment	Moderate	120	(LF)	100 %	0 %	0 %	0 %	
310	Elastomeric Bearing	Moderate	32	(EA)	100 %	0 %	0 %		
333	Other Material Bridge Railing	Moderate	108	(LF)	100 %	0 %	0 %		
359	Soffit of Conc Deck or Slab Condition W	Moderate	1	(EA)	100 %	0 %	0 %	0 %	0 %

Bridge Notes:
NEW BRIDGE 7/5/05.

Inspection Notes: 08/02/2016
MAS - inspection comments -
DECK: ASPHALT - GOOD CONDITION, CRACKED AT DECK ENDS. CURB / SIDEWALK - FINE CRACKS. RAIL - WEATHERED, FEW CHECKS AND SPLITS. SOFFIT - GOOD CONDITION, NO LEAKING EVIDENT.
SUPERSTRUCTURE: PSC BOX GIRDER - GOOD CONDITION. ELASTOMERIC BEARINGS - GOOD CONDITION.
SUBSTRUCTURE: FINE CRACKS.

Approach and Roadway Notes: *ASPHALT - (7) NORTH SIDE IS IN GOOD CONDITION, FEW CRACKS. SOUTH SIDE IS UNDER CONSTRUCTION.*
2 RAIL TIMBER SYSTEM (244 LF) - WEATHERED, FEW CHECKS AND SPLITS.

Inspection History:

Inspection Date	Inspector	Major Element Condition Ratings
08/02/2016	MAS	**Deck:** 8 **Super:** 8 **Substr:** 8 **Culvert:** N
08/13/2014	KJT	**Deck:** 8 **Super:** 8 **Substr:** 8 **Culvert:** N
08/13/2012	MAS	**Deck:** 8 **Super:** 8 **Substr:** 8 **Culvert:** N
08/06/2010	DPC	**Deck:** 9 **Super:** 9 **Substr:** 9 **Culvert:** N
02/15/2008	DPC	**Deck:** 9 **Super:** 9 **Substr:** 9 **Culvert:** N
07/05/2005	DPC	**Deck:** 9 **Super:** 9 **Substr:** 9 **Culvert:** N

Copy Distribution:

- ☑ (2) Bureau of Municipal Hghways
- ☐ (3) Bureau of Municipal Hghways
- ☐ Bureau of Turnpikes
- ☐ Border State
- ☐ Bureau of Rail and Transit
- ☐ Army Corps Of Engineers
- ☐ Railroad
- ☐ Dept. of Res. and Econ. Dev.
- ☐ Dept. of Environmental Services
- ☐ USDA Forest Service
- ☐ Bureau of Traffic

orm 4

N.H. D.O.T.

BRIDGE CAPACITY SUMMARY

TOWN Wolfeboro

BRIDGE NUMBER 126/107

)ESIGN LOAD HS25 DESIGN METHOD LFD RATED BY MJL DATE 8/01/05

?ATING METHOD LFD PLAN FILE M1-10-2-2 CHECKED BY JB DATE 8/01/05

?OUTE Whitten Neck Road OVER Crescent Lake Inlet

RATED MEMBER	LONGITUDINAL EFFECTIVE SPAN LENGTH	REQUIRED CAPACITY			AVAILABLE CAPACITY					
		CURRENT LEGAL LOADS	CERTIFIED VEHICLES		MULTIPLE LANES LOADED			SINGLE LANE LOADED		
			SINGLE UNIT	MULTIPLE UNIT	INVENTORY	OPERATING	POSTING	INVENTORY	OPERATING	POSTING
Deck Beam (Moment Capacity)	40'-0"	HS21.4	HS26.5	HS23.5	HS26.5	HS44.2	HS39.8	HS26.5	HS44.2	HS39.8

RECOMMENDED POSTING: No Posting Required

STATE OF NEW HAMPSHIRE – MATTHEW J. LOW No. 9293 LICENSED PROFESSIONAL ENGINEER

RATING METHOD	ENGLISH TONS	METRIC TONS
63. (Op) LFD	64. (Op) 79.5	71.5
65. (Inv.) LFD	66. (Inv.) 47.7	42.9

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APPENDIX D

MAINTENANCE CHECKLISTS

Bridge Maintenance Checklist: Pleasant Valley Road over Heath Brook

Date: _____ Performed by: _____

	Item	Satisfactory Condition	Needs Action	Comments
Deck Elements	Wearing Surface			
	Curbs			
	Sidewalk			
	Bridge Rail			
Superstructure	Deck Beams			
	Bearings			
Abutment	Bridge Seat			
	Erosion or Scour			
	Pile Cap			
	Piles			

Wingwalls	Concrete			
	Erosion or Scour			
	Footing			
Stream Channel	Erosion or Scour			
	Waterway opening			
	Riprap			
Approaches	Guardrail			
	Pavement			

Bridge Maintenance Checklist: Bay Street over Brook

Date: _____ Performed by: _____

	Item	Satisfactory Condition	Needs Action	Comments
Deck Elements	Wearing Surface			
	Curbs			
	Bridge Rail			
	Striping			
Superstructure	Rigid Frame			
	Bearings			
	Longitudinal Joints			
Abutment	Erosion or Scour			
	Pile Caps			
	Piles			
Wingwalls	Erosion or Scour			
	Concrete			
	Piles			

Stream Channel	Erosion or Scour			
	Waterway opening			
	Riprap			
Approaches	Guardrail			
	Pavement			
Other	Beaver Grate			

Bridge Maintenance Checklist: College Road over Willey Brook

Date: _____ Performed by: _____

	Item	Satisfactory Condition	Needs Action	Comments
Deck Elements	Wearing Surface			
	Curbs			
	Bridge Rail			
	Striping			
Superstructure	Deck Beams			
	Bearings			
	Joints			
Abutment	Concrete			
	Joint with Deck			
	Bridge Seat			
	Erosion or Scour			
	Footings			

Wingwalls	Concrete			
	Footings			
	Erosion or Scour			
Stream Channel	Stream Alignment			
	Erosion or Scour			
	Waterway opening			
	Riprap			
Approaches	Approach Slab			
	Guardrail			
	Pavement			
	Settlement			

Bridge Maintenance Checklist: Whitten Neck Road over Crescent Lake Inlet

Date: _____ Performed by: _____

	Item	Satisfactory Condition	Needs Action	Comments
Deck Elements	Wearing Surface			
	Curbs			
	Sidewalk			
	Bridge Rail			
Superstructure	Deck Beams			
	Bearings			
Abutment	Bridge Seat			
	Erosion or Scour			
	Pile Cap			
	Piles			
Wingwalls	Concrete			
	Erosion or Scour			
	Piles			

Stream Channel	Erosion or Scour			
	Waterway opening			
	Riprap			
Approaches	Guardrail			
	Drainage			
	Pavement			
Other	Water Level Gage			

APPENDIX E

CONCRETE CRACK SEALERS MEMOS

August 16, 2017

New Hampshire Department of Transportation
Bureau of Materials & Research

Qualified Products List – Qualification Criteria

Section 526 – Concrete Crack Sealers

A. Item 526.2 - Epoxy for Non-Moving Cracks

Specification

Products in the epoxy for non-moving cracks category should be designed to bond with Portland cement concrete, reducing the opportunity for water to freely enter the interior of a concrete element. Non-moving cracks are those that have been determined to undergo insignificant changes in width from loading (e.g. crack expansion due to beam flexure), from temperature fluctuations (e.g. thermal expansion and contraction), or from other processes.

Required Submissions

QPL Product Submittal Form

The submitted form must be completely filled out and must be the current, on-line version of the form. The QPL Product Submittal Form can be obtained at www.nh.gov/dot/research.

Product Literature

Submit all product literature, including technical data sheets relevant to the material's use, limitations, material properties, storage, application/installation, and precautions, as applicable.

Safety Data Sheets (SDS)

Submit complete SDS for the product.

Lab Test Results

Submit test results demonstrating that the product meets the applicable specifications. *Test documentation may be from the AASHTO National Transportation Product Evaluation Program (NTPEP), a State transportation agency, or appropriately qualified independent lab.* Documentation of test results must be on the testing laboratory's letterhead. Qualifications of the independent lab must also be submitted for review.

Letter of Compliance

Submit a notarized letter on the manufacturer's letterhead affirming that the product meets all requirements described herein.

VOC Certification

Submit certification on the manufacturer's letterhead affirming the product meets all Federal and State requirements for volatile organic compound (VOC) limits.

Qualification Criteria

Product submittals will be reviewed to assure compliance with the applicable specifications and NHDOT requirements.

Product Minimum Requirements

- Must be AASHTO M235 Type I and/or Type IV meeting class and grade specifications as defined in AASHTO M235
- Must have a minimum shelf life of one year

Documentation

The Department will review submitted lab test results and documentation to assure conformance with all requirements.

Contingent on the submittal review, a field test of the product may be conducted. When requested, samples must be provided in containers that are labeled and packaged for general purchase. Unsolicited samples will not be accepted.

Product Packaging

The container label of the delivered products will clearly show the product name, manufacturer name, and batch, lot, or other identifier for the product. It should also show the date of manufacture and shelf life, and/or expiration date.

Department Notification of Changes to Currently Approved Products

Manufacturers are required to notify the Department Product Evaluation Unit if there has been a change to either of the following:

- Product Name
- Manufacturer

In either of these cases, forward notarized certification that the product application, properties, formulation, and performance of the previously approved product have not changed.

Formulation Changes

Manufacturers are required to notify the Department Product Evaluation Unit of formulation changes to a currently-qualified product. When the formulation changes, products are considered new, and are removed from the QPL until re-evaluated.

Qualification Criteria Approved by:

Chief of Materials Technology, Bureau of Materials & Research

Administrator, Bureau of Materials & Research

The Department continues to evaluate its qualification criteria as well as products that have been qualified against them, and reserves the right to revise the criteria and/or withdraw product qualification at any time for any reason without notice.

Qualification of a product does not constitute an endorsement of the product, nor does it imply intent to purchase or specify the product.

November 14, 2016

New Hampshire Department of Transportation
Bureau of Materials & Research

Qualified Products List – Qualification Criteria

Section 526 – Concrete Crack Sealers

B. ITEM 526.3 – HIGH MOLECULAR WEIGHT METHACRYLATE (HMWM) CRACK SEALER for Concrete Bridge Decks

Specification – NHDOT Standard Specifications for Road and Bridge Construction, Section 526

High molecular weight methacrylate crack sealers shall be products that are low in viscosity and are specifically formulated for healing / sealing individual cracks in Portland cement concrete.

Required Submissions

QPL Product Submittal Form
The submitted form must be completely filled out and must be the current, on-line version. The QPL Product Submittal Form can be obtained at www.nh.gov/dot/research.

Product Literature
Submit all product literature, including technical data sheets relevant to the material's use, limitations, and material properties.

SDS / MSDS
Submit complete SDS / MSDS information for the product

Independent Test Results
Submit independent test results from either a State transportation agency, accredited independent lab, or the AASHTO National Transportation Product Evaluation Program (NTPEP) demonstrating conformance with the requirements and material properties specified herein. Documentation of test results must be on the testing laboratory's letterhead.

Letter of Compliance
Submit a notarized letter on the manufacturer's letterhead affirming that the product meets all requirements described herein.

Qualification Criteria

Documentation
The Department will review submitted documentation to assure conformance with all requirements as well as the values of the properties listed in the following table.

NH DOT Test Requirements for HMWM Crack Sealers		
Property	**Test Method**	**Required Value**
Shear Bond Adhesion	ASTM C882	*≥ 1,500 psi*
Viscosity	ASTM D1084	*≤ 25 cP*
Compressive Strength	ASTM D695	*(Not Specified - For Reference Only)*
Tensile Strength	ASTM D638	*(Not Specified - For Reference Only)*
Tensile Elongation	ASTM D638	*(Not Specified - For Reference Only)*

November 14, 2016

Product Packaging
The container label of the delivered products will clearly show the product name, manufacturer name, and batch, lot, or other identifying number of the product.

Qualification Criteria Approved by:

Chief of Materials Technology, Bureau of Materials & Research

Administrator, Bureau of Materials & Research

The Department continues to evaluate its qualification criteria as well as products that have been qualified against them, and reserves the right to revise the criteria and/or withdraw product qualification at any time for any reason without notice.

Qualification of a product does not constitute an endorsement of the product, nor does it imply intent to purchase or specify the product.

APPENDIX F

SILANE SILOXANE SPECIFICATIONS

SECTION 530 -- WATERPROOFING CONCRETE SURFACES

Description

1.1 This work shall consist of waterproofing concrete surfaces shown on the plans or ordered with two coats of a cement base waterproof coating for concrete.

Materials

2.1 All components of this system shall be compatible and shall be furnished by the same supplier.

2.2 All materials shall be delivered to the job site in sealed containers bearing the manufacturer's original labels.

2.3 The color when dry shall be a shade of gray matching the concrete.

2.4 Materials used for this specification shall be a product as included on the Qualified Products List.

2.5 The mixture shall not contain calcium chloride or sodium chloride.

Construction Requirements

3.1 Preparation or Surfaces.

3.1.1 The concrete face to be coated shall be cleaned of all laitance, dirt, dust, oil, efflorescence, paint, and other foreign material by the use of sandblasting or waterblasting. Suitable traps shall be installed in sandblasting or waterblasting equipment to prevent oil from being deposited on the surface.

3.1.2 Surfaces which have been cured by the use of curing compound shall not be coated with waterproof finish until at least 30 days have elapsed since curing compound application.

3.2 Brush and Flat Waterproofed Finish.

3.2.1 All work shall be performed by an experienced Contractor who is familiar with waterproofing work and with the materials specified herein.

3.2.2 No application is to be made when atmospheric temperature is 45 °F or below, or if it is expected to drop below 45 °F within 24 hours after application. Do not apply to frozen or frost-filled surfaces. If the application is made during hot weather, cool the surface with clean water first.

3.2.3 All materials shall be mixed according to the manufacturer's printed instructions and a copy of such instructions shall be maintained on the project.

3.2.4 The cement base waterproof coatings shall be applied by the use of a masonry brush to a slightly dampened surface. The material shall be cured in accordance with the manufacturer's recommendations. Sufficient material must be applied to fill and seal all pores and voids to achieve a uniform appearance.

3.2.5 The cement base, acrylic latex, coating shall be applied at the rate recommended by the manufacturer.

3.2.6 The cement base, polymer-modified, coating shall be applied at the rate recommended by the manufacturer.

3.2.7 Whenever construction or contraction joints appear in the existing or new concrete to be coated, the joints shall be tooled to allow bond breakage of the coating at the joint.

Method of Measurement

4.1 Waterproofing concrete surfaces will not be measured, but shall be the square yard final pay quantity in accordance with 109.11 of coated surface within the limits shown on the plans.

Basis of Payment

5.1 Waterproofing concrete surfaces is a final pay quantity item and will be paid for at the Contract unit price per square yard complete in place in accordance with 109.11.

Pay item and unit:

530.3	Waterproofing Concrete Surfaces (F)	Square Yard

New Hampshire Department of Transportation
Bureau of Materials & Research

Qualified Products List – Qualification Criteria

Section 534 – Water Repellent

B. ITEM 534.3 – Water Repellent (Silane/Siloxane)

C. ITEM 534.3 – Water Repellent (Silane/Siloxane) – Cold Weather

Specification - 2010 NHDOT Standard Specifications for Road and Bridge Construction, Section 534

Water repellent (silane/siloxane) shall be a product as included on the Qualified Products List.

Required Submissions

QPL Product Submittal Form
The submitted form must be completely filled out and must be the current version of the form. The QPL Product Submittal Form can be obtained at www.nh.gov/dot/research.

Product Literature
Submit any product literature that is relevant to evaluation of the product.

MSDS
Submit complete MSDS information for the submitted product

VOC Certification
Submit a notarized letter that states the VOC content of the product.

Qualification Criteria

Documentation
The Department will review submitted documentation to assure conformance with the specifications. These products must conform to NH Code of Administrative Rules Chapter Env-A 4200 Architectural and Industrial Maintenance Coatings. This document is available from the NH Department of Environmental Services. The VOC content of water repellents shall not exceed 250 g/l.

Water repellent (silane/siloxane) shall be a single component, ready to apply product.

Published product literature for products submitted for possible inclusion on the QPL listing for "Silane/Siloxane – Cold Weather" must indicate that the product can be applied at temperatures as low as 20 ° F.

Lab Testing
After review of all submitted documentation, the Department may request a product sample for laboratory testing. **Unsolicited samples will not be accepted.**

Requested samples will be tested by the Department using a modified version of the test procedure outlined in NCHRP Report 244, as described herein. When tested per this method, products must demonstrate the ability to reduce water absorption in sample cubes by 79%

when compared to untreated control cubes. They must also demonstrate the ability to reduce chloride intrusion in sample cubes by 87% when compared to the untreated control cubes.

Summary of NHDOT Test Method for Water Repellants

- Mortar cubes, made in accordance with AASHTO T-106, are cured in a wet room for 7 days.
- The cubes are then allowed to air dry for 21 days.
- The cubes, now 28 days old, are wire brushed and coated with the water repellent product being tested.
- The treated cubes, along with untreated control cubes, are allowed to air dry for 14 days. They are then weighed.
- The cubes are placed in a 15% NaCl solution bath for 21 days. They are periodically removed from the bath and weighed at 1 day, 7 days, and 14 days.
- The cubes are removed from the NaCL bath after 21 days and a final weight is recorded.
- Each cube is split in half. One half is tested to determine chloride content as described in AASHTO T 260. The other half is immersed in a water bath for 24 hours after which time the depth of water repellent penetration can be measured.

Qualification Criteria Approved by:

Administrator, Bureau of Materials & Research

Qualification Criteria Accepted by:

FHWA, NH Division

The Department continues to evaluate its qualification criteria as well as products that have been qualified against them, and reserves the right to revise the criteria and/or withdraw product qualification at any time for any reason without notice.

Qualification of a product does not constitute an endorsement of the product, nor does it imply intent to purchase or specify the product.

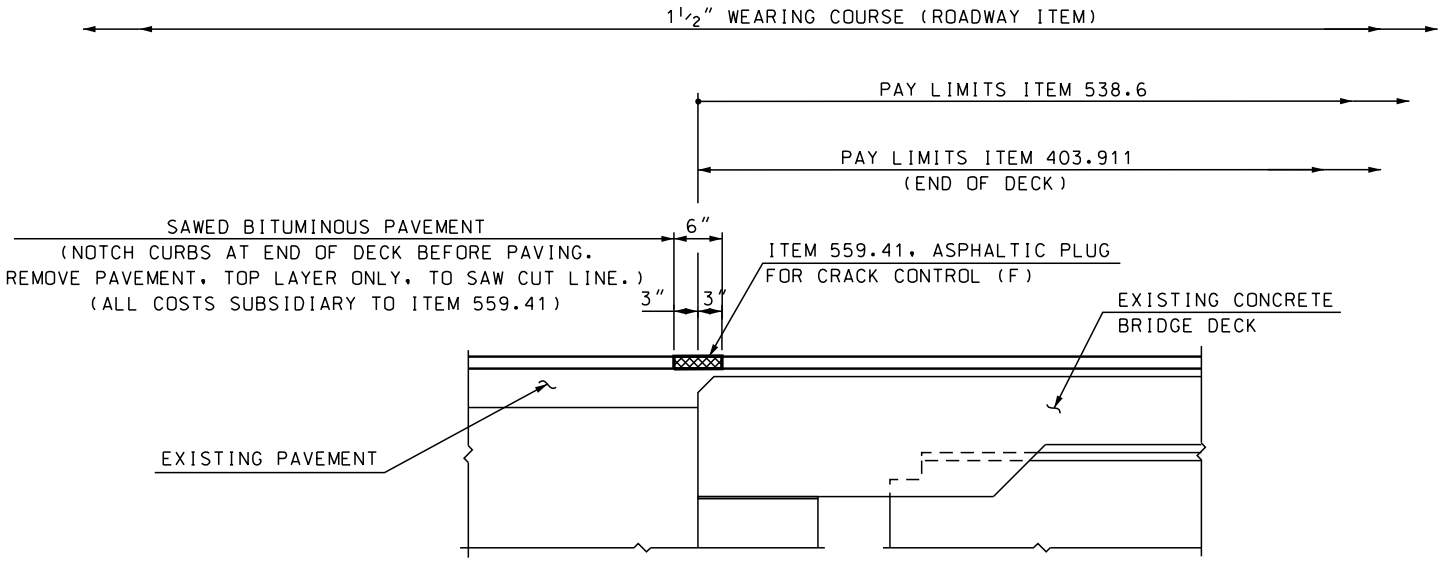
APPENDIX G

PLUG JOINT DETAIL

NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION

BUREAU OF BRIDGE DESIGN

DESCRIPTION:	DATE REVISED:
ASPHALTIC PLUG FOR CRACK CONTROL - NO APPROACH SLAB	2-24-2015



MODIFY TO FIT PROJECT

ASPHALTIC PLUG FOR CRACK CONTROL
(NO APPROACH SLAB - FIXED END)