

STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION

PRELIMINARY DESIGN REPORT

PUTNAM BRIDGE

BRIDGE NO. 00417

ROUTE 3 OVER CONNECTICUT RIVER

AND GREAT MEADOW ROAD

STATE PROJECT NO. 53-175

TOWNS OF GLASTONBURY AND WETHERSFIELD

March 11, 2011

Close, Jensen and Miller, P.C.
1137 Silas Deane Highway
Wethersfield, Connecticut

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Table of Contents

	<u>Page No.</u>
Introduction	1
Location Plan	2
Existing Description and Conditions	3,4
Proposed Rehabilitation	5,6
Deck and Parapet Replacement Options	7
Maintenance and Protection of Traffic	8
Construction Methods and Access	9
Permitting	10
Construction Cost and Duration	11-15

Figures

Index	16
Existing Bridge	17
Bridge Cross Section	18,19
Maintenance and Protection of Traffic	20-31
Deck and Parapet Replacement	32-34
Median Reconstruction	35,36
Deck Joint Replacement	37
Bearing Replacement and Rehabilitation	38-41
Construction Methods and Access	42,43

Appendix

Appendix A - Reports of Meetings	A-1, A-2
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INTRODUCTION

The Putnam Bridge was built in 1958 and rehabilitated in 1986. Extensive deterioration recently necessitated three emergency declaration projects to patch the deck and repair superstructure steel. These repairs were intended as short-term measures and were not intended to address the long-term needs of the bridge.

In May 2010 a "Special Bridge Safety Inspection Report", prepared by Baker Engineering, Inc., provided updated section loss information and downgraded the overall condition rating of the superstructure from serious (Rated 3), to critical (Rated 2) based on the condition of the deck joints, rocker bearings, floorbeams and stringer ends over the substructure units. An Emergency Declaration Steel Repair Project (Project No. 53-183) commenced construction on July 21, 2010 and was completed on January 31, 2011.

Emergency steel repairs were performed on stringers and floor beams with significant section losses in critical zones, as determined by CTDOT Bridge Safety and Evaluation load ratings. The section losses occurred at the deck joints (over the pier locations), and along the fascia beam. Emergency repairs were constructed at approximately 42 stringer end locations, and seven floorbeam locations. The bridge is currently posted to prohibit Permit vehicles.

A recent in-depth bridge inspection performed between December 2010 and February 2011 by Pennoni Associates, Inc. indicates that active leakage is occurring, particularly at the deck joints over the pier locations, behind copolymers panels along the inside face of the original concrete parapets, and at the median gutter lines beneath the precast concrete median barrier. These conditions are causing the superstructure to deteriorate at a rapid pace.

The focus of this project is to address these leakage issues. The proposed new parapets, median barrier, partial deck replacement, deck joint replacement, fascia stringer replacement, scuppers and drainage repairs are needed to resolve the leakage issues. The proposed replacement and rehabilitation of the bearings, and the structural steel and catwalk repairs are needed to address the bridges major deficiencies, restore its load carrying capacity, and to remove the bridge from the structurally deficient list.

EXISTING DESCRIPTION AND CONDITIONS

Summary

The Putnam Bridge is a 14-span bridge 2,400 feet in length. It carries four lanes of Route 3 traffic, two lanes in each direction. The superstructure consists of a girder and floor beam framing system and steel stringers supporting a reinforced concrete deck. Updated component ratings are pending the completion of the recent inspection by Pennoni, and will likely result in a reduction of the condition rating of the bearings. Presently, the bridge contains the following major deficiencies:

<u>Deficiency</u>	<u>Primary Causes</u>
Deck (Rating: 4)	- Underside spalling, cracking and leakage at the gutter lines and parapet deterioration
Superstructure (Rating: 2)	- Stringer and floor beam deterioration, primarily a result of joint and gutter leakage
Deck Joints (Rating: 4)	- Plow damage and non-functioning seals
Bearings (Rating: 5)	- Rusted impacted rocker surfaces, frozen and non-functioning due to joint leakage.
Paint (Rating: 4)	- Rusting of steel surfaces
Drainage (Rating: 4)	- Damaged drain piping

Of primary concern are the following areas:

Parapets and Outside Portions of the Deck

The inside faces of the original concrete parapets are concealed from view by a safety shaped copolymer concrete cover. There are spalls along the tops of the covers and several areas of collision damage, with sections shifted up to 5 inches towards the roadway and up to 2 inches of differential shifting at the joints. The two rail aluminum bridge rail on both parapets has numerous missing anchor bolt nuts, random broken-off or missing anchor bolts, and several cracked stanchions. The base plates are undermined due to spalls and scaling along the top of the parapets. Leakage is occurring along the top of the parapet cover, behind the panels, and through the deck along at the location of a concrete filled steel drainage grating. This drainage grating was originally open, and it runs throughout the bridge along the outside gutterlines.

Concrete Median Barrier

The concrete median barrier consists of a precast 32-inch high jersey shaped barrier placed on top of the concrete slab. Water is infiltrating the joint along the bottom of the barrier at the top of the slab. The barrier exhibits spalls along the gutterline, and at random locations throughout.

Deck Joints

The May 10, 2010 Special Inspection Report by Baker notes several problems with the modular expansion joints (Pier Nos. 1, 3, 5, 9 and 11) and the pourable seal joints (Abutments and Pier Nos. 2, 4, 10 and 12). The Baker Report downgraded the condition of the superstructure to a 2 based in part, on the condition of these joints. Based on the more recent in-depth inspection by Pennoni, the modular joints exhibit deep gouges in steel armoring, torn and missing trough material, neoprene deterioration and debris, settlement of inner joint bars, support bars not bearing on floorbeams, support bar impacts under traffic loading, vertical misalignment in extrusions up to 7/8-inch, middle extrusion settlement up to 3/4-inch, and sunken joint material. The pourable seal joints exhibit spalls in the concrete header underside, exposed and corroded reinforcement, depression of joint material up to 1 inch+/- below the concrete header, adhesion failure and active leakage throughout.

Bearings

The Special Inspection Report, dated May 10, 2010, downgraded the overall condition rating of the superstructure to a 2, based in part on the condition of the bearings. The steel rocker approach span bearings exhibit moderate to heavy laminated rust under the rockers, and up to 3/8-inch impacted rust between the rocker and the masonry bearing plate. Based on the more recent inspection by Pennoni, the steel rocker expansion bearings at the end river spans (Pier Nos. 5 and 9) exhibit moderate corrosion with up to 1/8-inch pack rust between the rocker and the masonry bearing plates. The steel rocker bearings at the interior river spans (Pier Nos. 6 and 8) exhibit similar areas of moderate to severe corrosion with up to 1/4-inch pack rust between the rocker and masonry bearing plates.

Structural Steel and Catwalk

Structural steel repairs were recently completed under Emergency Declaration Steel Repair Project No. 53-183. An updated assessment of the stringer and floorbeam condition is pending as-built information from this project. The catwalk is in poor to critical condition and exhibits areas of heavy rust and laminar rust, mainly under the deck weep holes and deck joints.

Drainage

The bridge drainage system consists of scuppers and PVC deck weep holes. The scupper drain pipes free fall over the river spans, and they are piped along the substructure units to the ground on the approach spans. The scupper drain pipes are clogged at several locations, and there are missing and cracked sections at a few locations. The PVC deck weep pipes direct water onto the catwalk. Drainage damage has also occurred at the west abutment. This damage includes major wash-outs of the slopes.

Paint

There are several areas of peeling paint with exposed primer especially at the deck joint locations.

PROPOSED REHABILITATION

The following rehabilitation repairs have been prepared with the objectives to restore the bridges load rating, reopen the bridge to permit vehicles, and correct deficiencies causing serious/poor ratings:

- Replace the outside parapets, fascia stringers and deck up to the first interior stringer.
- Replace the precast concrete median barrier with a cast-in-place concrete barrier.
- Replace the modular expansion joints and pourable seal joints.
- Bearing replacement and rehabilitation.
- Structural steel and catwalk repairs.
- Touch-up paint.
- Drainage repairs including replacement of outside scuppers.

Specifically, these measures will include the following:

Parapets, Deck and Fascia Stringer Replacement

Due to the condition of the parapets and the leakage associated with the concrete filled old steel drainage grating, this portion of the superstructure will be removed and replaced. The construction will consist of new fascia stringers, reinforced concrete deck, scuppers, membrane waterproofing, bituminous pavement and a 42-inch high concrete parapet.

Median Reconstruction

Due to the condition of the median barrier and the leakage associated with the cold joint between the existing median and bridge deck, the existing barrier will be removed and replaced with a new cast-in-place median barrier construction that will be integral with the existing deck slab. The height and width of the median barrier will match the existing approach roadways.

Joint Replacement

All of the bridge deck joints will be removed and replaced. New joints will be constructed in accordance with current Department practice. The existing concrete headers will be removed and a new cast-in-place concrete deck will be constructed on top of the floorbeams at these location. New modular expansion joints will be constructed at Pier Nos. 5 and 8. The remaining joint replacements will consist of Silicone Expansion or Asphaltic Plug Joint Systems.

Bearing Replacement and Rehabilitation

The approach span expansion bearings and the end river span bearings will be replaced. The proposed bearings will consist of either elastomeric expansion bearings and/or pot bearings. The remaining bearings will be cleaned, lubricated, and painted. The existing expansion bearings at the interior of the river span (Piers Nos. 6 and 8) will require cleaning and painting of the bottom curved surface of the rocker and the top surface of the masonry plate. The interface of this surface is presently impacted with rust.

Structural Steel and Catwalk Repairs

Pending a review of the as-built Emergency Declaration Steel Repair Project (Project No. 53-183), additional steel repairs will be made to restore the bridges load rating. A rating analysis of all members will be performed to determine the needed steel repairs. The existing catwalks will require extensive repairs at the deck joint locations.

Drainage

New scuppers will be constructed along the outside gutterlines. The existing freefall drainage system over the river will remain. The existing drainage pipes on the approach spans will be repaired or replaced in kind to accommodate the new scuppers, and to correct sections of missing or broken piping. The remaining portions of the bridge drainage system, including the west abutment slopes, will be repaired.

Paint

Touch-up paint areas throughout the existing superstructure including the main girders, floor beams, stringers and diaphragms.

DECK AND PARAPET REPLACEMENT OPTIONS

A cast-in-place deck replacement option and a precast concrete steel/concrete superstructure deck replacement option are described below and Figures of these option are shown on pages 33 and 34. respectively. A decision will need to be made regarding inclusion of both alternatives in final design or selection of one for inclusion. Construction methodologies and access are discussed separately.

The cast-in-place deck type consists of a poured in place reinforced concrete slab and parapets and independent replacement of the fascia stringer. The existing slab will be removed together with the fascia stringers. The slab will be removed up to the first interior stringer. The top flange of the first interior stringer will require jack hammer work to access and remove the original bolted attachment hardware used to connect the drainage grate frame shown on page 32. The top flange will be cleaned and new shear studs will be installed. The proposed fascia stringer and connection details will match the existing conditions. The new reinforced concrete slab will require mechanical couplers or hooked lap splices to provide continuity in the deck at the stage construction joint.

The precast steel/concrete composite superstructure deck type consists of a precast slab together with a new composite fascia beam. These precast "modules" will be approximately 28 feet long, 5 feet wide, and will weigh approximately 14 tons. The upper portion of the parapets will be cast-in-place to better facilitate lighting conduit installation and reduce weight. The slab and fascia stringer removal work will be similar to the cast-in-place option. Closure pours similar to the cast-in-place option will be required along the longitudinal stage construction joint and at the transverse floorbeam locations, which are spaced every 30 feet+/- . The proposed scuppers will either require additional cast-in-place construction or they will be incorporated into the precast design, pending a review by the precast manufacture and coordination of the proposed scupper locations with the joint replacement work.

MAINTENANCE AND PROTECTION OF TRAFFIC

A four stage maintenance and protection of traffic (MPT) scheme has been selected as the best method for maximizing the work areas necessary for construction while minimizing the impacts to traffic. This MPT scheme, shown on pages 20 to 31, will maintain two lanes of traffic in each direction during peak hours. Weekend directional traffic closures or lane closures will be required to remove and set the fascia stringers and portions of the parapets, and deck slab during Stage 2 and Stage 3. The proposed new deck joint construction work will require weekend directional traffic closures during Stage 4. Live loads will not be allowed on the bridge during the jacking work required to replace the existing bearings.

Stage 1: This stage consists of removing the bridge and approach roadway median barrier for a distance of approximately 200 feet beyond the abutments. Temporary pavement will be constructed in the impacted median area. The existing median scuppers will remain in service. Stage 1 is essentially a pre-stage since there is no new construction on the deck. Any proposed superstructure work which does not impact traffic, (i.e., bearing replacement, steel and catwalk repairs, painting, and drainage repairs), can be started Stage 1.

Stage 2 and Stage 3: These stages consist of shifting traffic as far as possible to one side of the bridge to facilitate construction of the new fascia stringers, deck, parapet, scuppers, membrane, and pavement on the opposite side of the bridge.

Stage 4: Traffic in both directions will be shifted to the outside portions of the bridge to facilitate construction of the new median barrier. Stage 4 work will include completing the bearing replacement work prior to removing and replacing the existing deck joints. The approach roadways will be restored to their preconstruction condition, and the bridge deck will be milled and paved.

CONSTRUCTION METHODS AND ACCESS

The project design will allow the Contractor the flexibility of performing the slab and or stringer demolition and erection from either the existing bridge deck, or from temporary access roads beneath the bridge. It is intended to allow access roads to be constructed along both sides of the bridge on both sides of the river for access to the bearing replacement work, and the slab and stringer demolition and erection. The access roads will be temporary and are a necessity for the bearing replacement work.

The slab and stringer demolition and erection can be performed from the deck with off-peak single lane closures allowing crane and truck access as shown on pages 42 and 43, which depict Rubber Tire Crane and Outrigger Extended Crane Schemes, respectively. Small cranes are anticipated. The maximum load to be realized would be removal of an existing stringer deck and parapet section between floor beams (30 feet +/- long), which weighs about 21 tons.

Permits will be secured upon the basis that the haul roads which are necessary for bearing replacement will also be used for the slab and stringer demolition and erection. The access roads would consist of crushed stone or gravel constructed upon geotextile fabric to allow for their complete removal upon construction completion. The roads would be constructed between the high tide line and the abutments.

A similar option in construction access exists for the river spans. Work from cranes placed on barges or off-peak single lane closures allowing crane and truck access could be utilized.

PERMITTING

Construction activities are being planned to exclude any in water activities and be conducted above the high tide line. Based upon this assumption and the current scope the following permits would be required:

- CTDEP Inland Wetlands and Watercourse Individual Permit
- Army Corps of Engineers Individual Permit
- CTDEP Flood Management Certification General Permit
- CTDEP Stream Channel Encroachment General Permit

Impacts from the project are considered minimal. The only impacts will be the installation of the access roads which will be considered a temporary impact with the exception of the tree removal on the Glastonbury side.

CONSTRUCTION COST AND DURATION

Construction cost estimates for the Cast-in-Place and Precast Steel/Concrete Composite options are \$24 million and \$26 million, respectively. Itemized cost estimates for each option are provided herein.

The construction duration is estimated at two years. The Precast Steel/Concrete Composite option would reduce the overall duration by an estimated 20% or approximately five months, pending a final design review of the proposed construction methodologies.

During final design, a study of the possibility of using movable barrier to facilitate the temporary lane closures and allow control over the direction of traffic that will be maintained during the proposed weekend directional traffic closures can be performed. It appears by substituting Movable Barrier for Temporary Precast Barrier throughout construction (Stages 1 – 4) it will afford flexibility to detour northbound traffic onto the southbound side of the bridge, and vice-versa. This would lessen the traffic impacts and thereby minimize the construction duration.

**PRELIMINARY COST ESTIMATE
CAST-IN-PLACE DECK REPLACEMENT OPTION**

ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
<u>CAST-IN-PLACE, DECK/PARAPET REPLACEMENT</u>				
Removal of Superstructure	s.f.	30,200	\$ 100.00	\$ 3,020,000
Class "F" Concrete	c.y.	1,765	\$ 900.00	1,588,500
Reinforcing Steel - Epoxy Coated	lbs.	325,300	\$ 2.00	650,600
Structural Steel Stringers	lb.	418,300	\$ 3.00	1,254,900
Membrane Waterproofing	s.y.	2,280	\$ 25.00	57,000
Bituminous Concrete Paving	tons	400	\$ 150.00	60,000
Bridge Lighting	l.s.	l.s.	\$ 500,000.00	500,000
			<i>SUBTOTAL</i>	\$ 7,131,000
			<i>MISC. ITEMS (25%)</i>	\$ 1,782,750
			<i>TOTAL</i>	\$ 8,913,750
			<i>SAY</i>	\$ 9,000,000
<u>MEDIAN BARRIER REPLACEMENT</u>				
Remove Existing Median Barrier (Bridge)	l.f.	2,400	\$ 25.00	\$ 60,000
Class "F" Concrete	c.y.	325	\$ 800.00	260,000
Reinforcing Steel - Epoxy Coated	lb.	31,250	\$ 2.00	62,500
Membrane Waterproofing	s.y.	280	\$ 25.00	7,000
Bituminous Concrete Paving	tons	50	\$ 150.00	7,500
			<i>SUBTOTAL</i>	\$ 397,000
			<i>MISC. ITEMS (25%)</i>	\$ 99,250
			<i>TOTAL</i>	\$ 496,250
			<i>SAY</i>	\$ 500,000
<u>TOUCH-UP PAINT</u>				
Total Area = 650,000 s.f. x 30% to be Painted @ \$33/s.f.				
			<i>TOTAL</i>	\$ 6,435,000
<u>STEEL REPAIRS</u>				
Assume 2000lb./100 ft. of Bridge @ \$20/lb.				
			<i>TOTAL</i>	\$ 960,000
<u>SCUPPERS AND DRAINAGE REPAIR/REPLACEMENT</u>				
Bridge Scupper-Fiberglass Hopper	ea.	36	\$ 7,500.00	\$ 270,000
Clean Bridge Drainage System	ea.	36	\$ 3,000.00	\$ 108,000
			<i>TOTAL</i>	\$ 378,000

**PRELIMINARY COST ESTIMATE
CAST-IN-PLACE DECK REPLACEMENT OPTION**

ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
<u>DECK JOINT REPLACEMENT/REPAIR</u>				
Removal of Existing Masonry	c.y.	20	\$ 800.00	\$ 16,000
Class "F" Concrete	c.y.	20	\$ 2,000.00	40,000
Modular Expansion Joint	l.f.	136	\$ 850.00	115,600
Silicone Expansion Joint System	l.f.	265	\$ 325.00	86,125
Asphaltic Plug Expansion Joint System	cft	165	\$ 300.00	49,500
			<i>SUBTOTAL</i>	\$ 307,225
			<i>MISC. ITEMS (25%)</i>	\$ 76,806
			<i>TOTAL</i>	\$ 384,031
			<i>SAY</i>	\$ 390,000
<u>BEARING REPLACEMENT/RETROFIT</u>				
Clean and Paint Rocker Bearings	ea.	26	\$ 5,000.00	\$ 130,000
Bearing Replacement	ea.	24	\$ 10,000.00	240,000
Jacking for Bearing Replacement	ea.	24	\$ 30,000.00	720,000
			<i>SUBTOTAL</i>	\$ 1,090,000
			<i>MISC. ITEMS (25%)</i>	\$ 272,500
			<i>TOTAL</i>	\$ 1,362,500
			<i>SAY</i>	\$ 1,400,000
<u>BRIDGE SUPERPAVE</u>				
Miling of HMA (0" - 4")	s.y.	16,980	\$ 5.75	97,635
Superpave 0.375"	tons	1,440	\$ 110.00	158,400
			<i>TOTAL</i>	\$ 256,035
<u>MAINTENANCE AND PROTECTION OF TRAFFIC</u>				
Precast Concrete Barrier and Relocation				\$ 500,000
State Police				300,000
Misc. Items				200,000
Lump Sum				500,000
			<i>TOTAL</i>	\$ 1,500,000
<u>MOBILIZATION</u>			<i>TOTAL</i>	\$ 1,000,000
<u>APPROACH ROADWAY RECONSTRUCTION</u> (200' Each Side of Bridge)			<i>TOTAL</i>	\$ 500,000
<u>MISC. ITEMS</u>			<i>TOTAL</i>	\$ 1,000,000
			<i>GRAND TOTAL</i>	\$ 23,319,035
			<i>SAY</i>	\$ 24,000,000

**PRELIMINARY COST ESTIMATE
 PRECAST CONCRETE/STEEL COMPOSITE SUPERSTRUCTURE
 DECK REPLACEMENT OPTION**

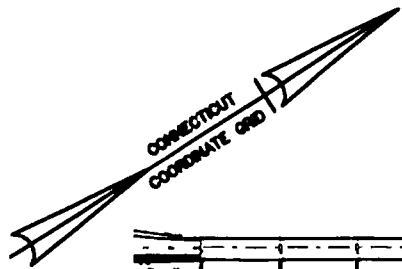
ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
<u>PRECAST, DECK/PARAPET REPLACEMENT</u>				
Removal of Superstructure	s.f.	33,100	\$ 100.00	\$ 3,310,000
Precast Concrete/Steel Composite Superstructure	s.f.	25,545	\$ 95.00	\$ 2,426,775
Class "F" Concrete	c.y.	780	\$ 800.00	624,000
Reinforcing Steel - Epoxy Coated	lbs.	68,600	\$ 2.00	137,200
Splicing Deformed Bars (Couplers)	ea.	15,320	\$ 100.00	1,532,000
Membrane Waterproofing	s.y.	2,610	\$ 25.00	65,250
Bituminous Concrete Paving	tons	440	\$ 150.00	66,000
Bridge Lighting	l.s.	l.s.	\$ 500,000.00	500,000
			<i>SUBTOTAL</i>	\$ 8,661,225
			<i>MISC. ITEMS (25%)</i>	\$ 2,165,306
			<i>TOTAL</i>	\$ 10,826,531
			<i>SAY</i>	\$ 11,000,000
<u>MEDIAN BARRIER REPLACEMENT</u>				
Remove Existing Median Barrier (Bridge)	l.f.	2,400	\$ 25.00	\$ 60,000
Class "F" Concrete	c.y.	325	\$ 800.00	260,000
Reinforcing Steel - Epoxy Coated	lb.	31,250	\$ 2.00	62,500
Membrane Waterproofing	s.y.	280	\$ 25.00	7,000
Bituminous Concrete Paving	tons	50	\$ 150.00	7,500
			<i>SUBTOTAL</i>	\$ 397,000
			<i>MISC. ITEMS (25%)</i>	\$ 99,250
			<i>TOTAL</i>	\$ 496,250
			<i>SAY</i>	\$ 500,000
<u>TOUCH-UP PAINT</u>				
Total Area = 650,000 s.f. x 30% to be Painted @ \$33/s.f.				
			<i>TOTAL</i>	\$ 6,435,000
<u>STEEL REPAIRS</u>				
Assume 2000lb./100 ft. of Bridge @ \$20/lb.				
			<i>TOTAL</i>	\$ 960,000
<u>SCUPPERS AND DRAINAGE REPAIR/REPLACEMENT</u>				
Bridge Scupper-Fiberglass Hopper	ea.	36	\$ 7,500.00	\$ 270,000
Clean Bridge Drainage System	ea.	36	\$ 3,000.00	108,000
			<i>TOTAL</i>	\$ 378,000

**PRELIMINARY COST ESTIMATE
 PRECAST CONCRETE/STEEL COMPOSITE SUPERSTRUCTURE
 DECK REPLACEMENT OPTION**

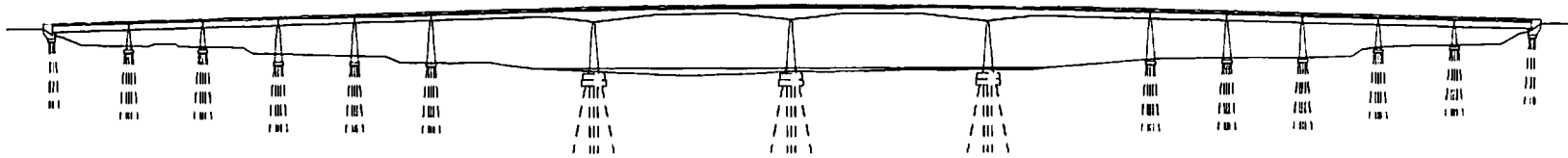
ITEM DESCRIPTION	UNIT	QUANTITY	PRICE	AMOUNT
<u>DECK JOINT REPLACEMENT/REPAIR</u>				
Removal of Existing Masonry	c.y.	20	\$ 800.00	\$ 16,000
Class "F" Concrete	c.y.	20	\$ 2,000.00	40,000
Modular Expansion Joint	l.f.	136	\$ 850.00	115,600
Silicone Expansion Joint System	l.f.	265	\$ 325.00	86,125
Asphaltic Plug Expansion Joint System	cft	165	\$ 300.00	49,500
			<i>SUBTOTAL</i>	\$ 307,225
			<i>MISC. ITEMS (25%)</i>	\$ 76,806
			<i>TOTAL</i>	\$ 384,031
			<i>SAY</i>	\$ 390,000
<u>BEARING REPLACEMENT/RETROFIT</u>				
Clean and Paint Rocker Bearings	ea.	26	\$ 5,000.00	\$ 130,000
Bearing Replacement	ea.	24	\$ 10,000.00	240,000
Jacking for Bearing Replacement	ea.	24	\$ 30,000.00	720,000
			<i>SUBTOTAL</i>	\$ 1,090,000
			<i>MISC. ITEMS (25%)</i>	\$ 272,500
			<i>TOTAL</i>	\$ 1,362,500
			<i>SAY</i>	\$ 1,400,000
<u>BRIDGE SUPERPAVE</u>				
Miling of HMA (0" - 4")	s.y.	16,980	\$ 5.75	97,635
Superpave 0.375"	tons	1,450	\$ 110.00	159,500
			<i>TOTAL</i>	\$ 257,135
<u>MAINTENANCE AND PROTECTION OF TRAFFIC</u>				
Precast Concrete Barrier and Relocation				\$ 500,000
State Police				300,000
Misc. Items				200,000
Lump Sum				500,000
			<i>TOTAL</i>	\$ 1,500,000
<u>MOBILIZATION</u>				
			<i>TOTAL</i>	\$ 1,000,000
<u>APPROACH ROADWAY RECONSTRUCTION</u>				
(200' Each Side of Bridge)			<i>TOTAL</i>	\$ 500,000
<u>MISC. ITEMS</u>				
			<i>TOTAL</i>	\$ 1,000,000
			<i>GRAND TOTAL</i>	\$ 25,320,135
			<i>SAY</i>	\$ 26,000,000

LIST OF FIGURES

<u>Index of Figures</u>	<u>Page No.</u>
Existing Bridge	
• Plan and Elevation	17
Bridge Cross Section	
• Existing Section	18
• Proposed Section	19
Maintenance and Protection of Traffic	
• Section and Plan Views (Stage 1 to Stage 4)	20-23
• Plan Views (Stage 1 to Stage 4)	24-31
Deck and Parapet Replacement	
• Existing Deck and Parapet	32
• Cast-in-Place Deck and Parapet	33
• Precast Concrete/Steel Composite Superstructure	34
Median Reconstruction	
• Existing Median Section	35
• Proposed Median Section	36
Deck Joint Replacement	
• Existing Bridge Deck Joints	37
Bearing Replacement and Rehabilitation	
• Existing and Proposed Bearings – Approach Spans	38.39
• Existing and Proposed Bearings – River Span	40.41
Construction Methods and Access	
• Rubber Tire Crane	42
• Outrigger Extended Crane	43



PLAN
NOT TO SCALE



ELEVATION
NOT TO SCALE

ROUTE 3 OVER THE CONNECTICUT RIVER

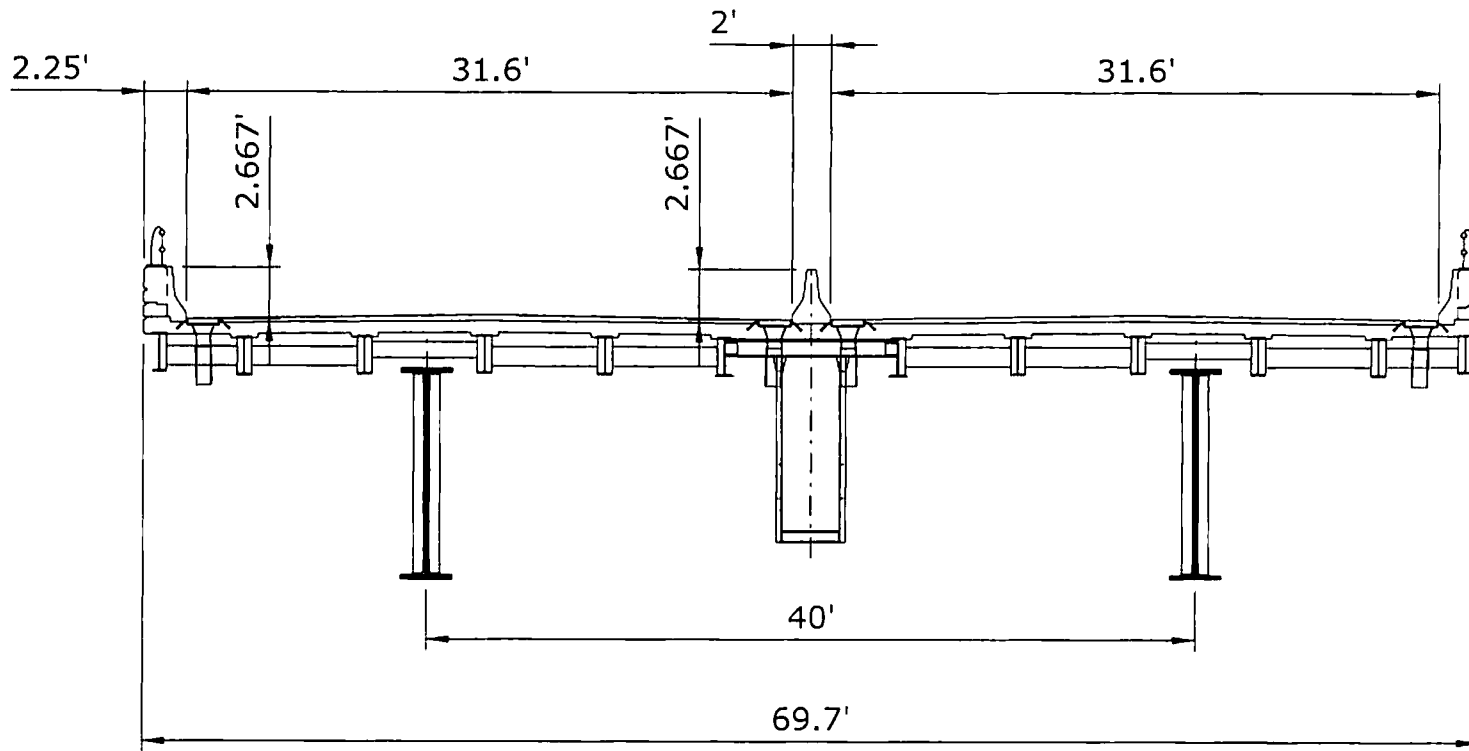
EXISTING BRIDGE

TOWN:
GLASTONBURY/WETHERSFIELD

BRIDGE NO.
00417

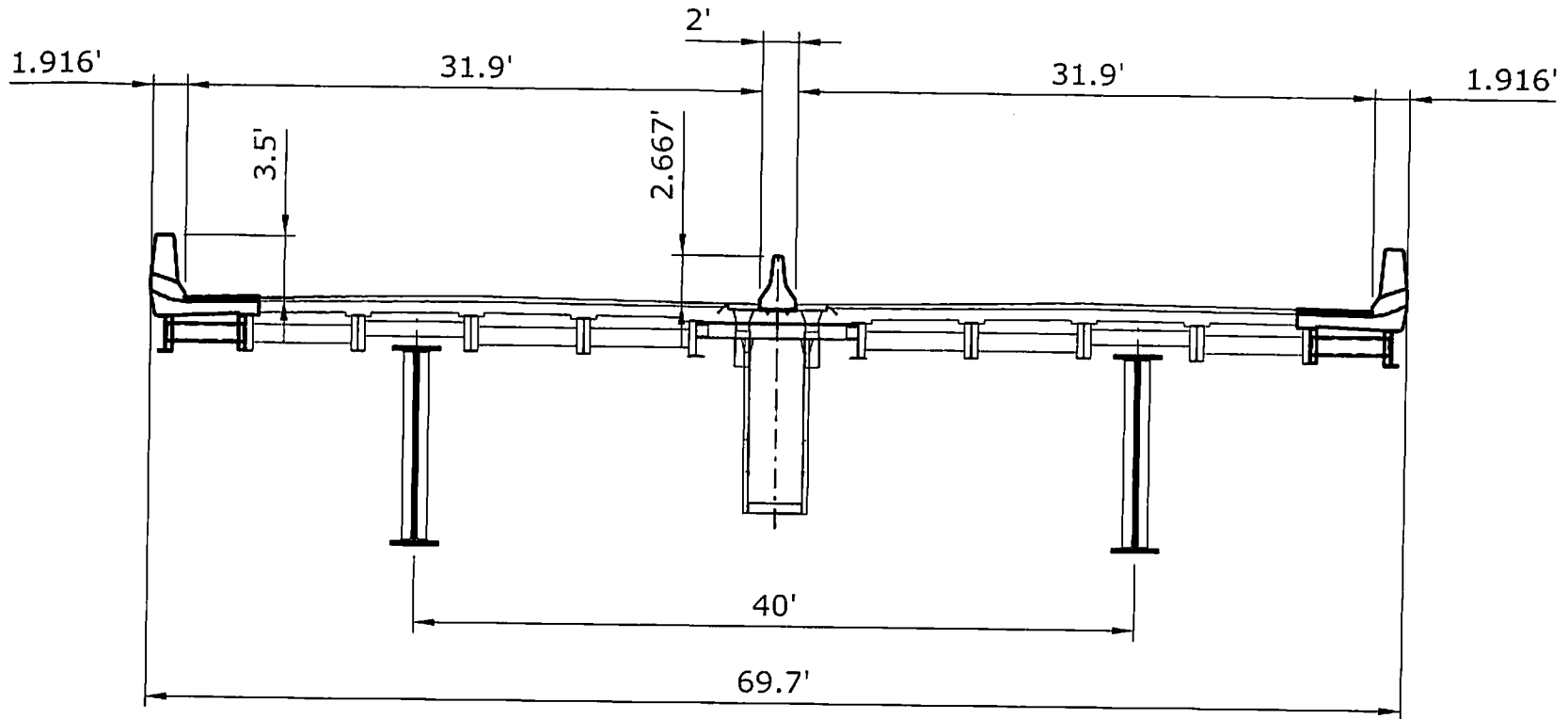
STATE PROJECT NO.: 053-175

DATE: 3/4/2011



EXISTING SECTION
 SCALE: 1" = 10'

ROUTE 3 OVER THE CONNECTICUT RIVER	
BRIDGE CROSS SECTION	
TOWN: GLASTONBURY/WETHERSFIELD	BRIDGE NO. 00417
STATE PROJECT NO.: 053-175	DATE: 3/3/2011



PROPOSED SECTION

SCALE: 1" = 10'

ROUTE 3 OVER THE CONNECTICUT RIVER

BRIDGE CROSS SECTION

TOWN:

GLASTONBURY/WETHERSFIELD

BRIDGE NO.

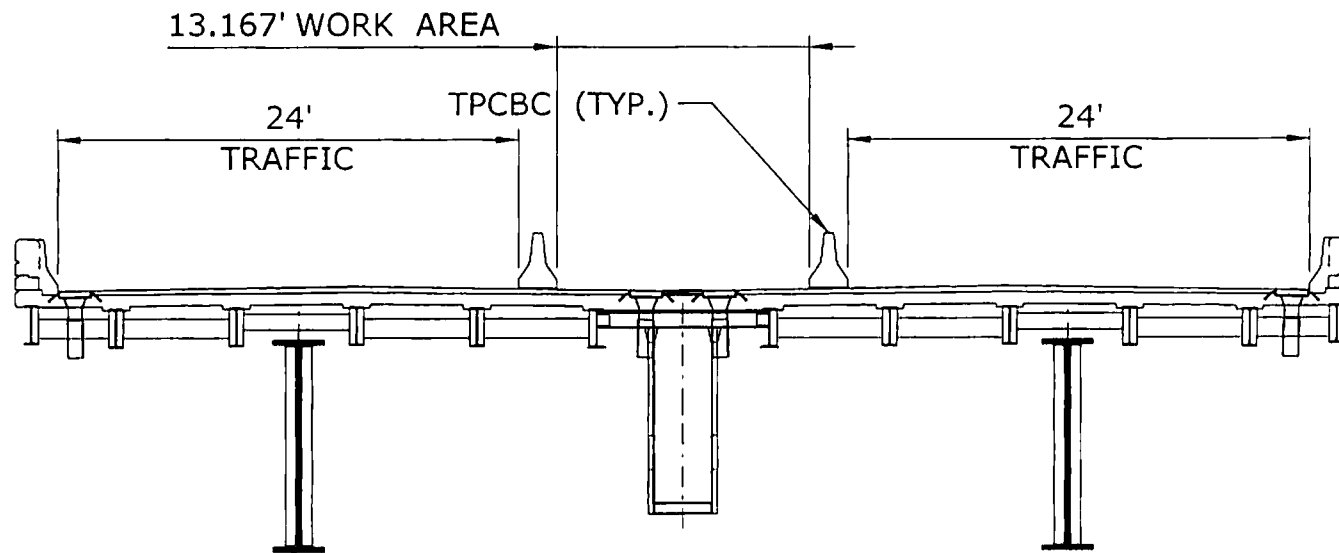
00417

STATE PROJECT NO.:

053-175

DATE:

3/3/2011



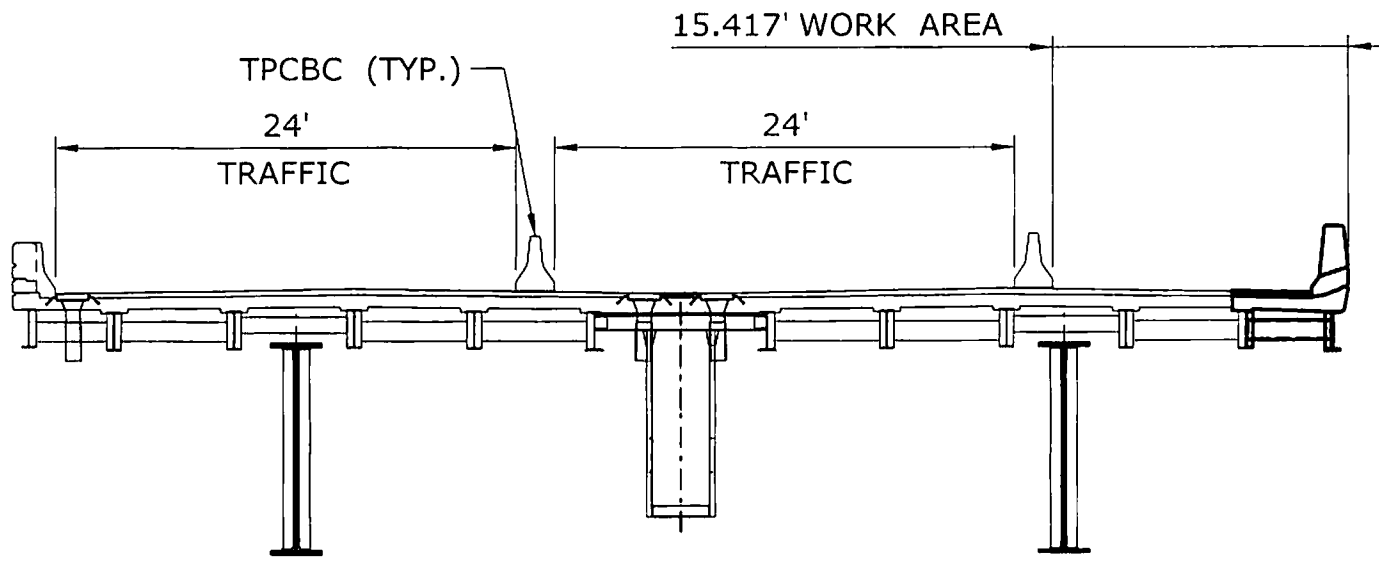
STAGE 1 CONSTRUCTION

SCALE: 1" = 10'

STAGE 1 NOTES:

1. PLACE TEMPORARY BARRIER CURB AND SHIFT TRAFFIC.
2. REMOVE EXISTING MEDIAN BARRIER (BRIDGE AND APPROACH ROADWAY).
3. CONSTRUCT TEMPORARY PAVEMENT.

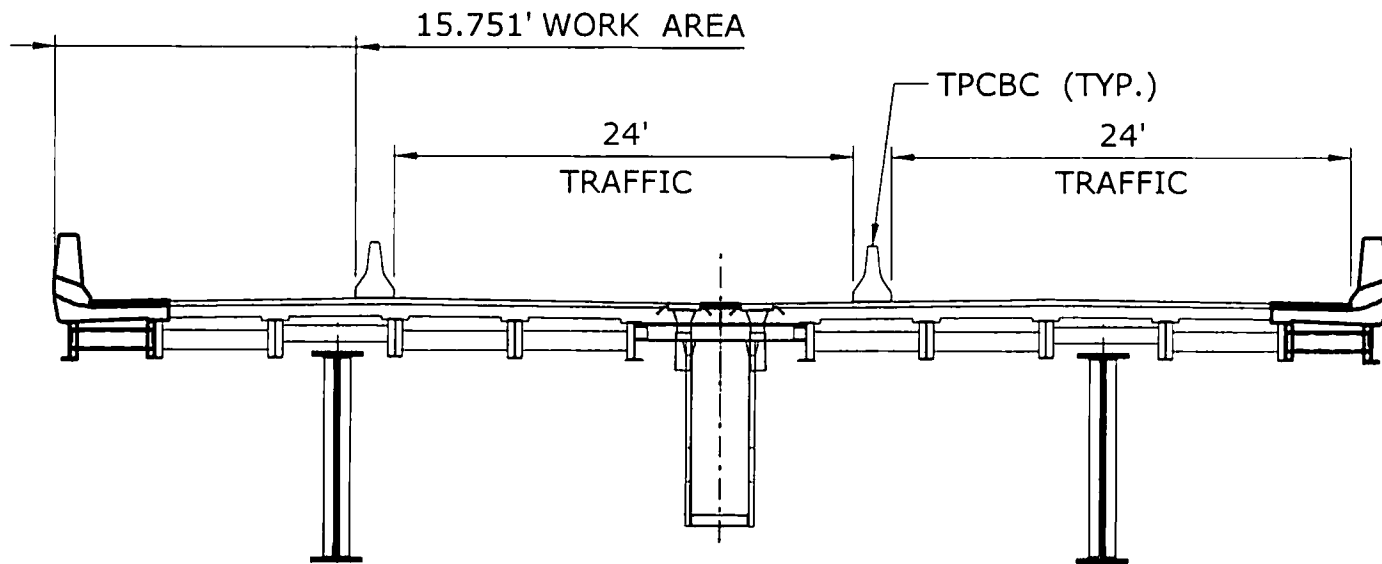
ROUTE 3 OVER THE CONNECTICUT RIVER	
MAINTENANCE AND PROTECTION OF TRAFFIC	
TOWN: GLASTONBURY/WETHERSFIELD	BRIDGE NO. 00417
STATE PROJECT NO.: 053-0175	DATE: 3/2/2011



STAGE 2 CONSTRUCTION
SCALE: 1" = 10'

- STAGE 2 NOTES:
1. RELOCATE TEMPORARY BARRIER CURB AND SHIFT TRAFFIC.
 2. REMOVE STAGE 2 PORTION OF THE EXISTING SUPERSTRUCTURE.
 3. CONSTRUCT STAGE 2 PORTION OF THE NEW SUPERSTRUCTURE.
 4. CONSTRUCT DECK WATERPROOFING AND BITUMINOUS PAVEMENT.

ROUTE 3 OVER THE CONNECTICUT RIVER	
MAINTENANCE AND PROTECTION OF TRAFFIC	
TOWN: GLASTONBURY/WETHERSFIELD	BRIDGE NO. 00417
STATE PROJECT NO.: 053-0175	DATE: 3/2/2011



STAGE 3 CONSTRUCTION

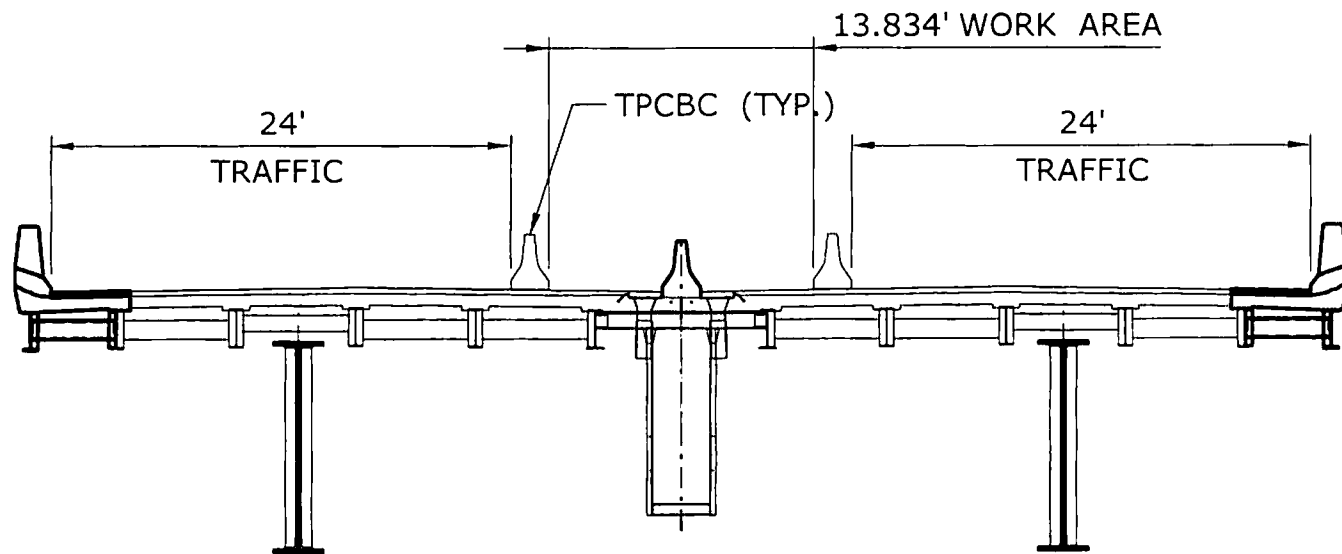
SCALE: 1" = 10'

STAGE 3 NOTES:

1. RELOCATE TEMPORARY BARRIER CURB AND SHIFT TRAFFIC.
2. REMOVE STAGE 3 PORTION OF THE EXISTING SUPERSTRUCTURE.
3. CONSTRUCT STAGE 3 PORTION OF THE NEW SUPERSTRUTURE.
4. CONSTRUCT DECK WATERPROOFING AND BITUMINOUS PAVEMENT.

-22-

ROUTE 3 OVER THE CONNECTICUT RIVER	
MAINTENANCE AND PROTECTION OF TRAFFIC	
TOWN: GLASTONBURY/WETHERSFIELD	BRIDGE NO. 00417
STATE PROJECT NO.: 053-0175	DATE: 3/2/2011



STAGE 4 CONSTRUCTION

SCALE: 1" = 10'

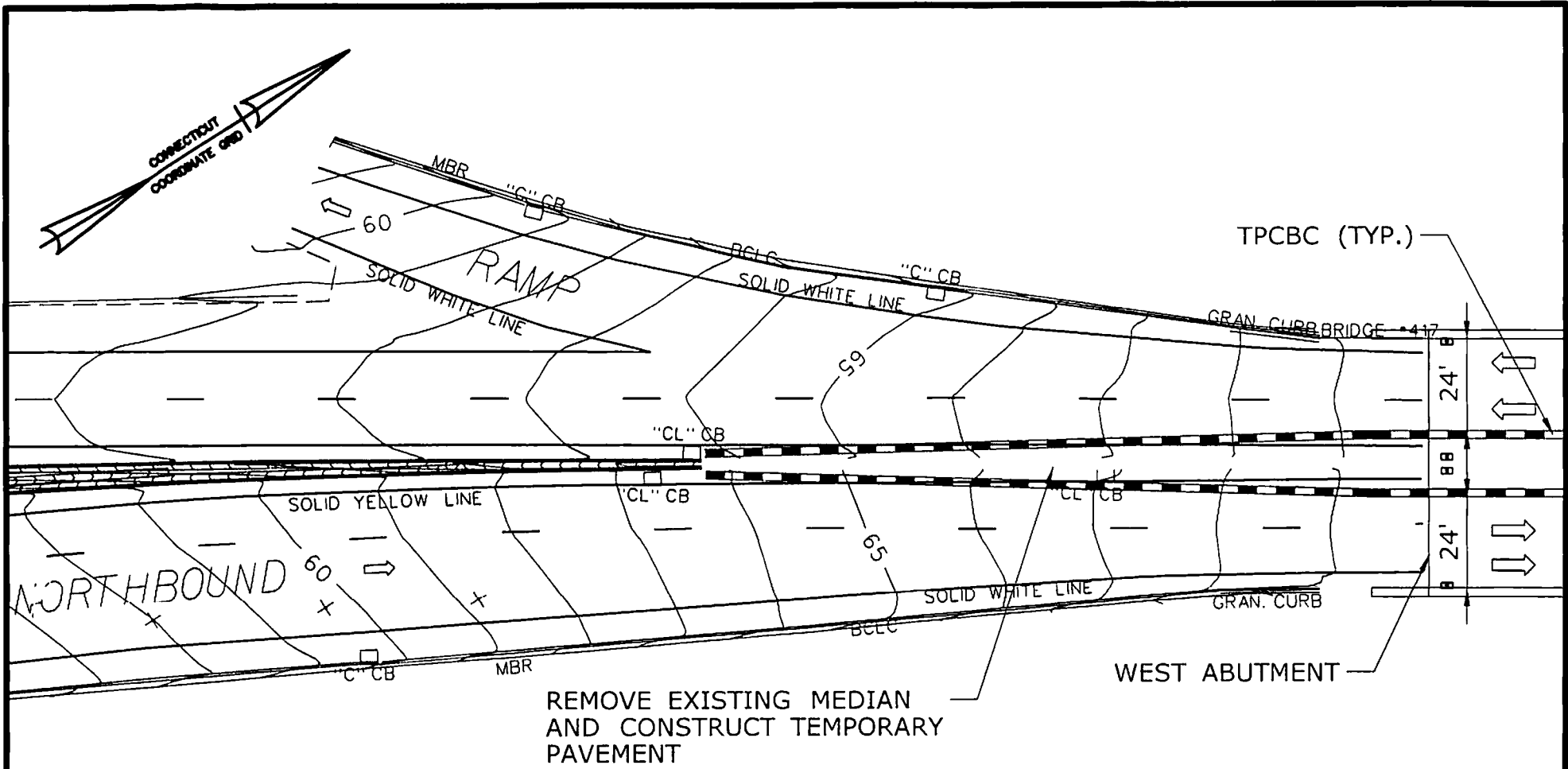
STAGE 4 NOTES:

1. RELOCATE TEMPORARY BARRIER CURB AND SHIFT TRAFFIC.
2. CONSTRUCT NEW MEDIAN BARRIER (BRIDGE AND APPROACH ROADWAY).
3. COMPLETE ALL BEARING REPLACEMENT (ONGOING STAGES 1-4).
4. MILL AND PAVE THE ENTIRE BRIDGE/APPROACH ROADWAY.
5. REMOVE AND RECONSTRUCT THE BRIDGE DECK JOINTS.

ROUTE 3 OVER THE CONNECTICUT RIVER

MAINTENANCE AND PROTECTION OF TRAFFIC

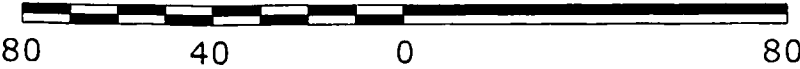
TOWN:	BRIDGE NO.
GLASTONBURY/WETHERSFIELD	00417
STATE PROJECT NO.:	DATE:
053-0175	3/2/2011



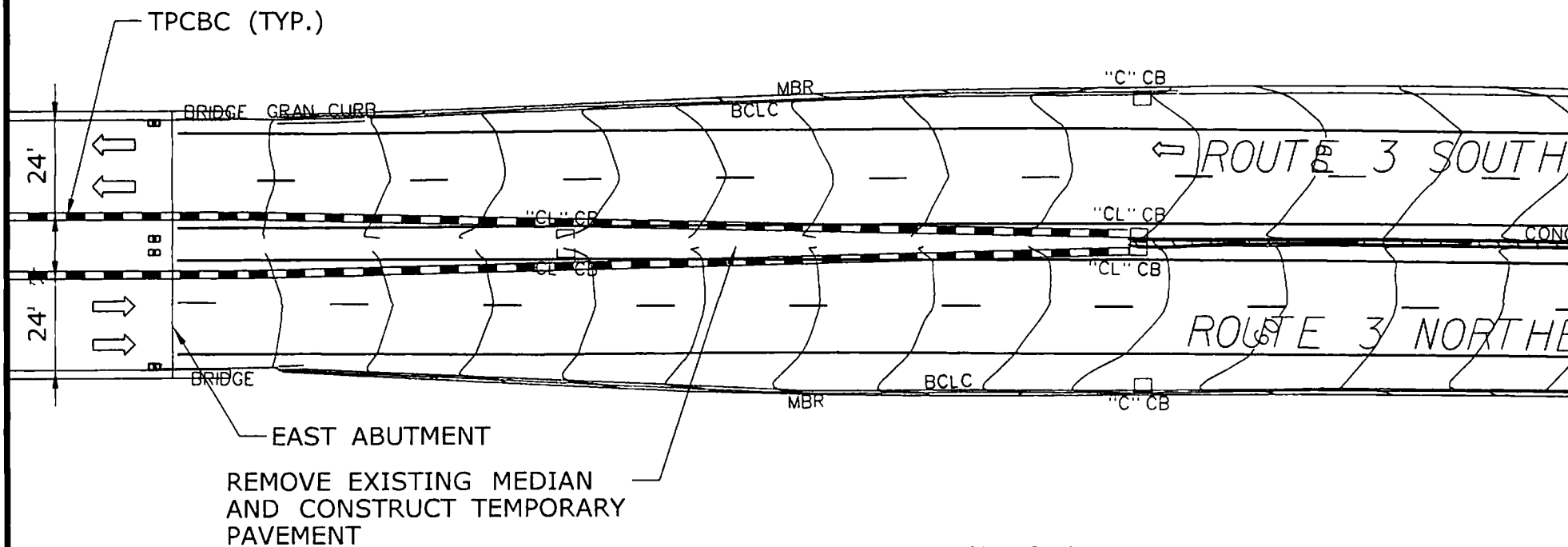
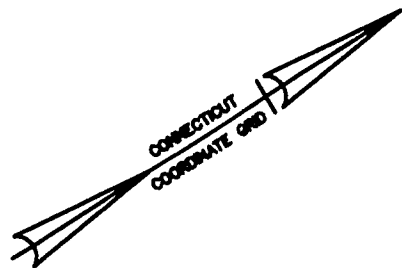
MPT STAGE 1 CONSTRUCTION
WETHERSFIELD APPROACH

ROUTE 3 OVER THE CONNECTICUT RIVER	
MAINTENANCE AND PROTECTION OF TRAFFIC	
TOWN: GLASTONBURY/WETHERSFIELD	BRIDGE NO. 00417
STATE PROJECT NO.: 053-175	DATE: 3/3/2011

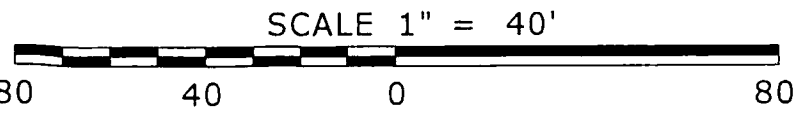
SCALE 1" = 40'



-24-

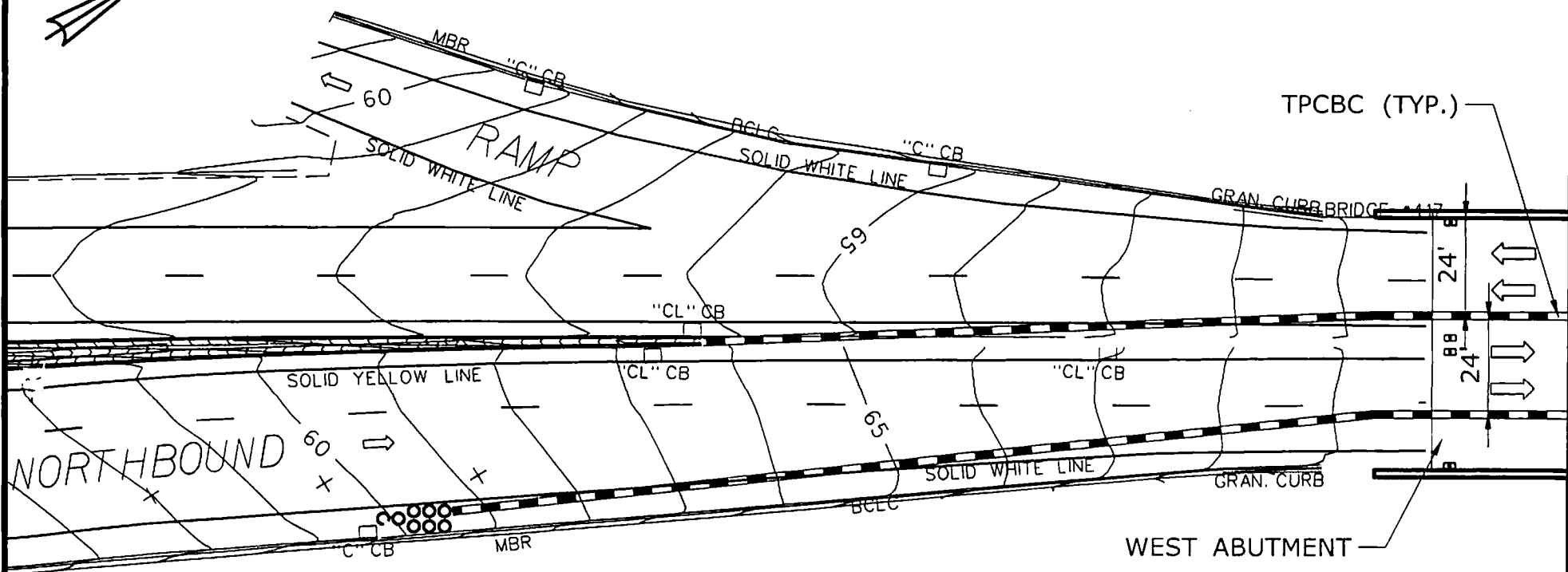
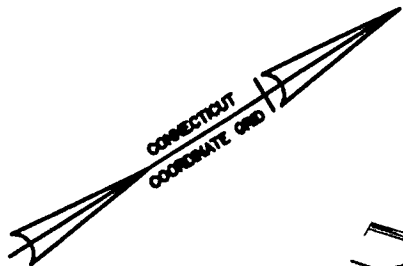


MPT STAGE 1 CONSTRUCTION
GLASTONBURY APPROACH



ROUTE 3 OVER THE CONNECTICUT RIVER	
MAINTENANCE AND PROTECTION OF TRAFFIC	
TOWN: GLASTONBURY/WETHERSFIELD	BRIDGE NO. 00417
STATE PROJECT NO.: 053-175	DATE: 3/3/2011

-25-

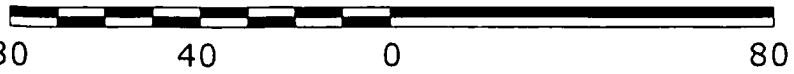


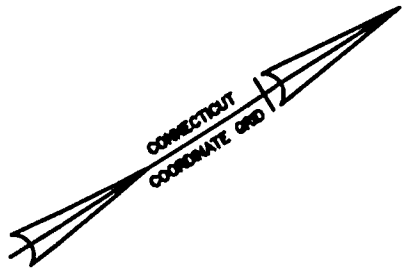
-26-

MPT STAGE 2 CONSTRUCTION
WETHERSFIELD APPROACH

ROUTE 3 OVER THE CONNECTICUT RIVER	
MAINTENANCE AND PROTECTION OF TRAFFIC	
TOWN: GLASTONBURY/WETHERSFIELD	BRIDGE NO. 00417
STATE PROJECT NO.: 053-175	DATE: 3/3/2011

SCALE 1" = 40'





TPCBC (TYP.)

BRIDGE GRAN CURB

MBR

"C" CB

BCLC

ROUTE 3 SOUTH

"CL" CB

"CL" CB

CONC

"CL" CB

"CL" CB

ROUTE 3 NORTH

BRIDGE

MBR

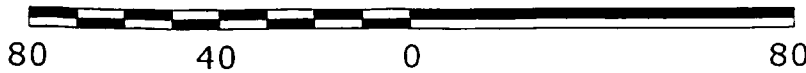
BCLC

"C" CB

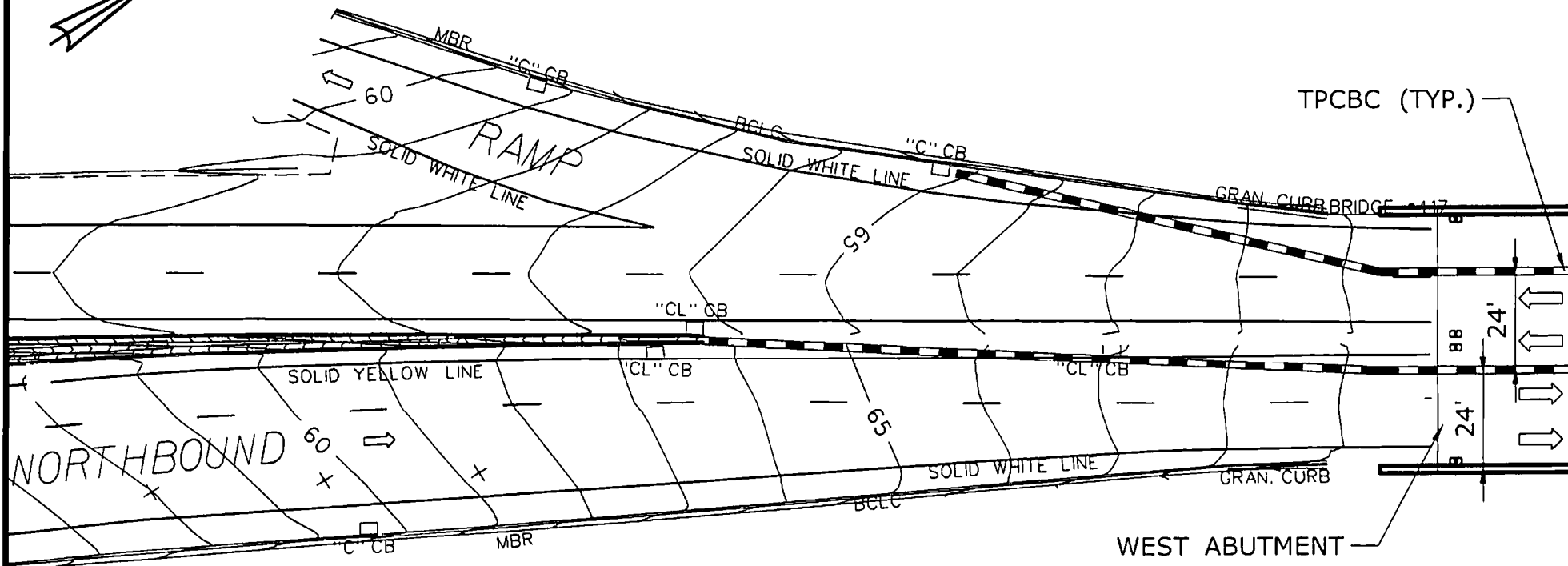
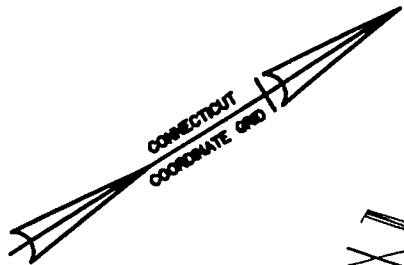
EAST ABUTMENT

MPT STAGE 2 CONSTRUCTION GLASTONBURY APPROACH

SCALE 1" = 40'



ROUTE 3 OVER THE CONNECTICUT RIVER	
MAINTENANCE AND PROTECTION OF TRAFFIC	
TOWN: GLASTONBURY/WETHERSFIELD	BRIDGE NO. 00417
STATE PROJECT NO.: 053-175	DATE: 3/3/2011



MPT STAGE 3 CONSTRUCTION
WETHERSFIELD APPROACH

ROUTE 3 OVER THE CONNECTICUT RIVER

MAINTENANCE AND PROTECTION OF TRAFFIC

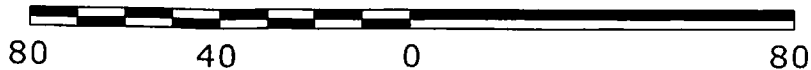
TOWN:
GLASTONBURY/WETHERSFIELD

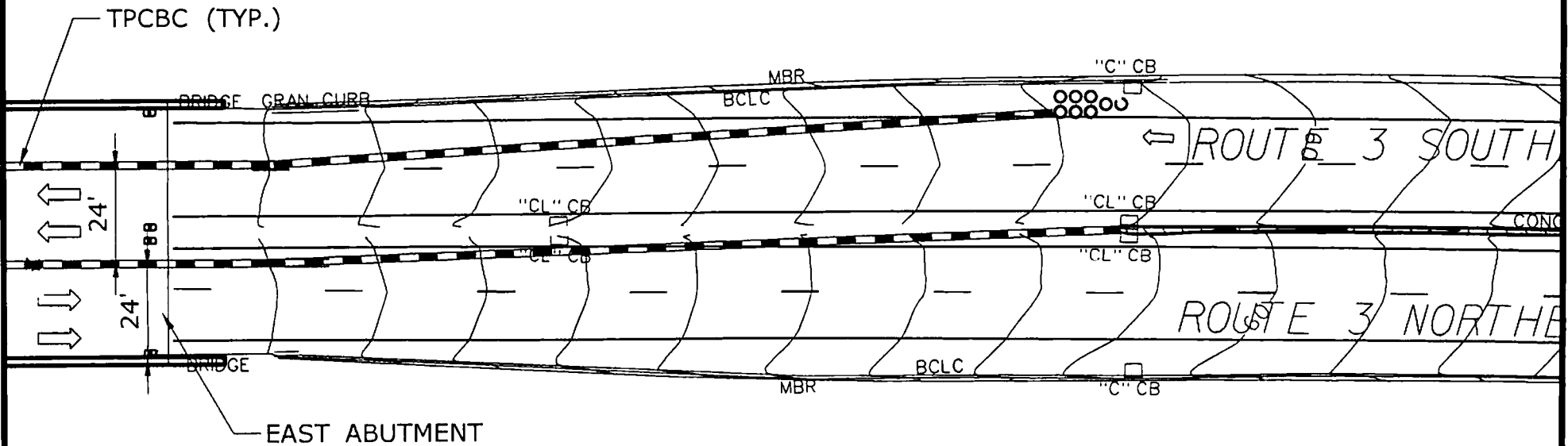
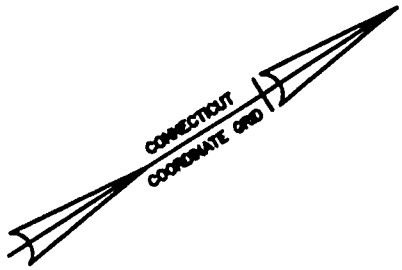
BRIDGE NO.
00417

STATE PROJECT NO.: 053-175

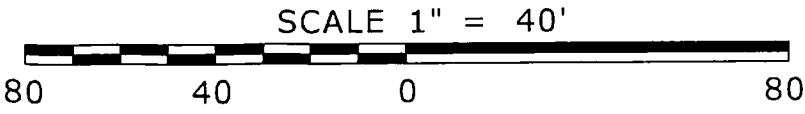
DATE: 3/3/2011

SCALE 1" = 40'



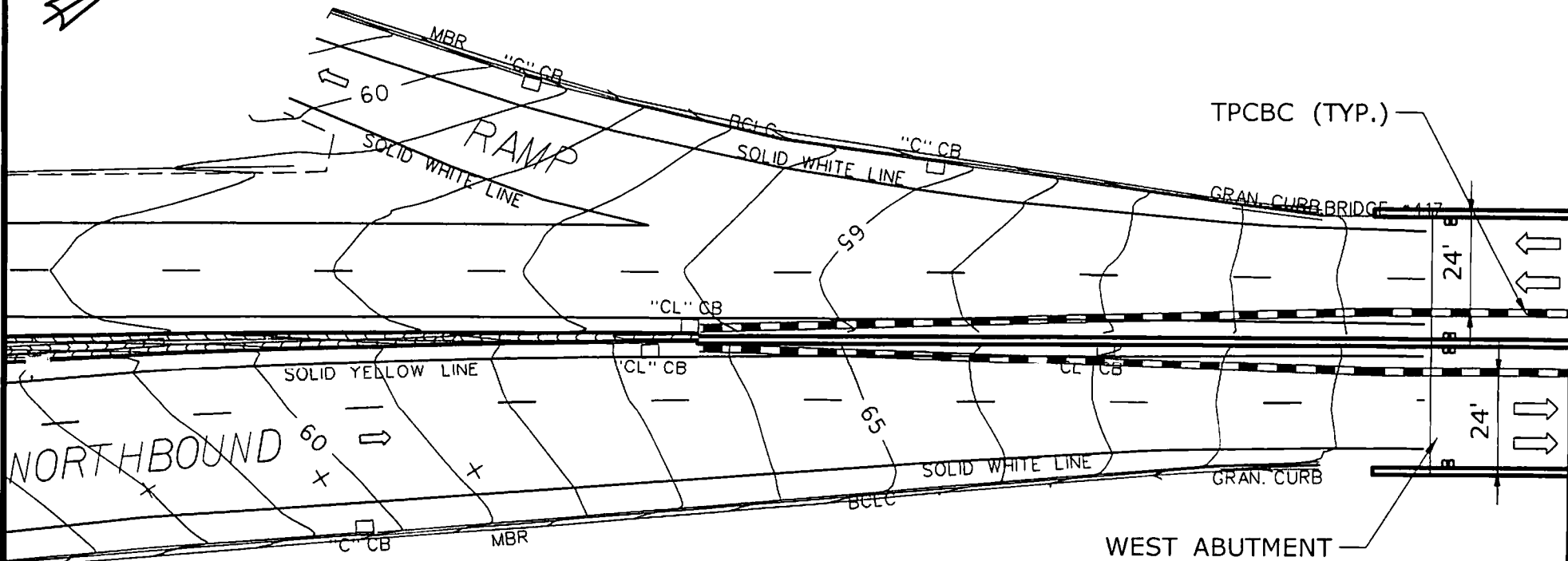
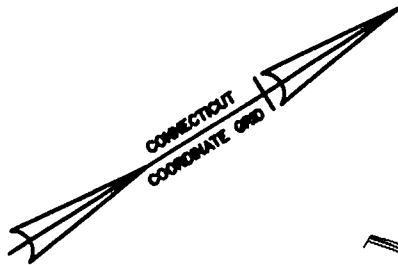


MPT STAGE 3 CONSTRUCTION
GLASTONBURY APPROACH

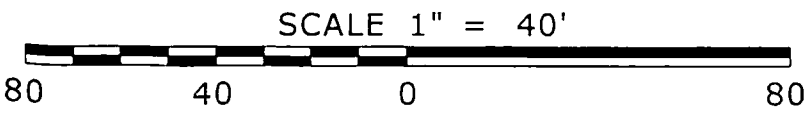


ROUTE 3 OVER THE CONNECTICUT RIVER	
MAINTENANCE AND PROTECTION OF TRAFFIC	
TOWN: GLASTONBURY/WETHERSFIELD	BRIDGE NO. 00417
STATE PROJECT NO.: 053-175	DATE: 3/3/2011

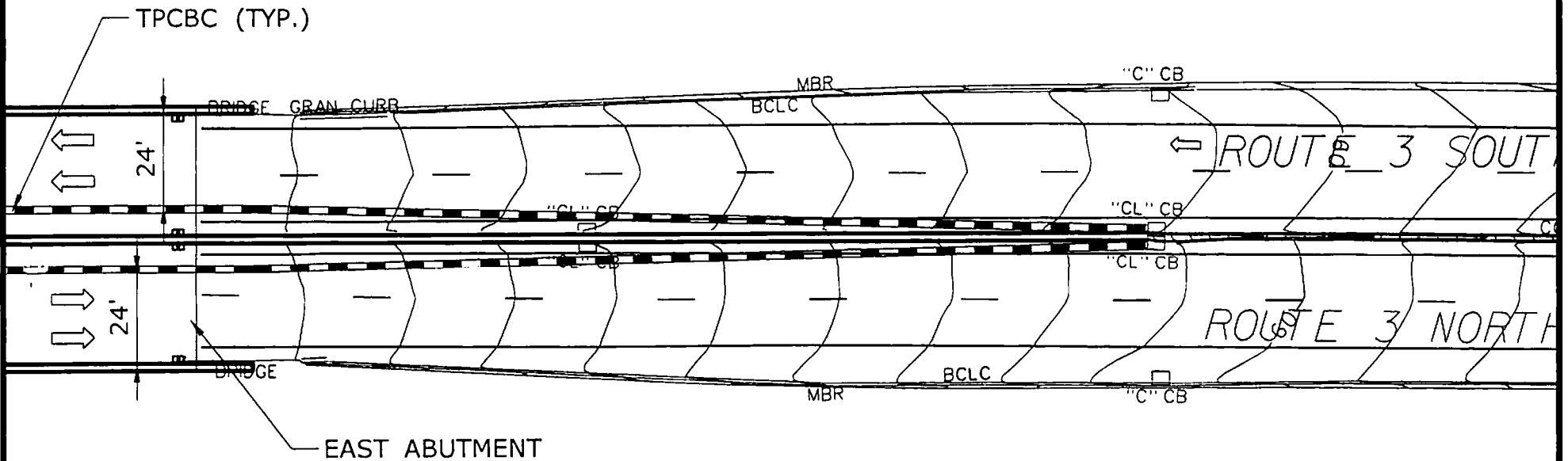
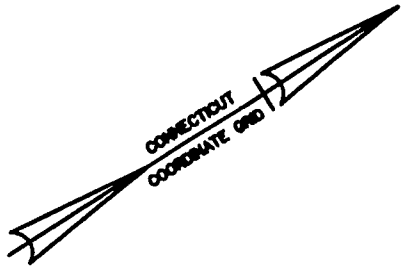
- 29 -



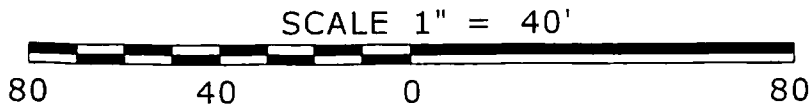
MPT STAGE 4 CONSTRUCTION
WETHERSFIELD APPROACH



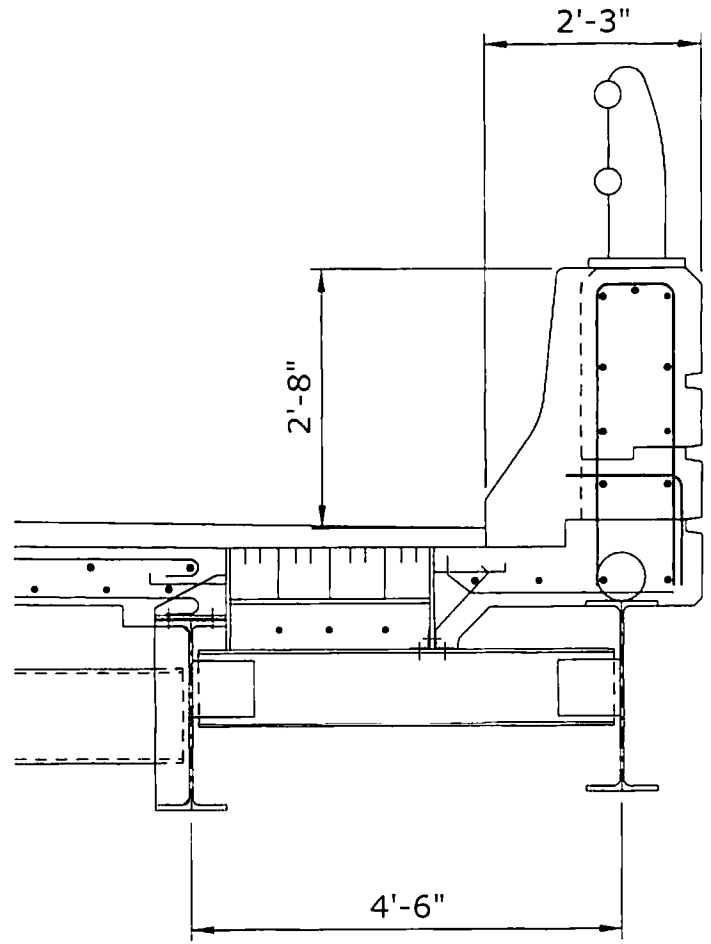
ROUTE 3 OVER THE CONNECTICUT RIVER	
MAINTENANCE AND PROTECTION OF TRAFFIC	
TOWN: GLASTONBURY/WETHERSFIELD	BRIDGE NO. 00417
STATE PROJECT NO.: 053-175	DATE: 3/3/2011



MPT STAGE 4 CONSTRUCTION
GLASTONBURY APPROACH



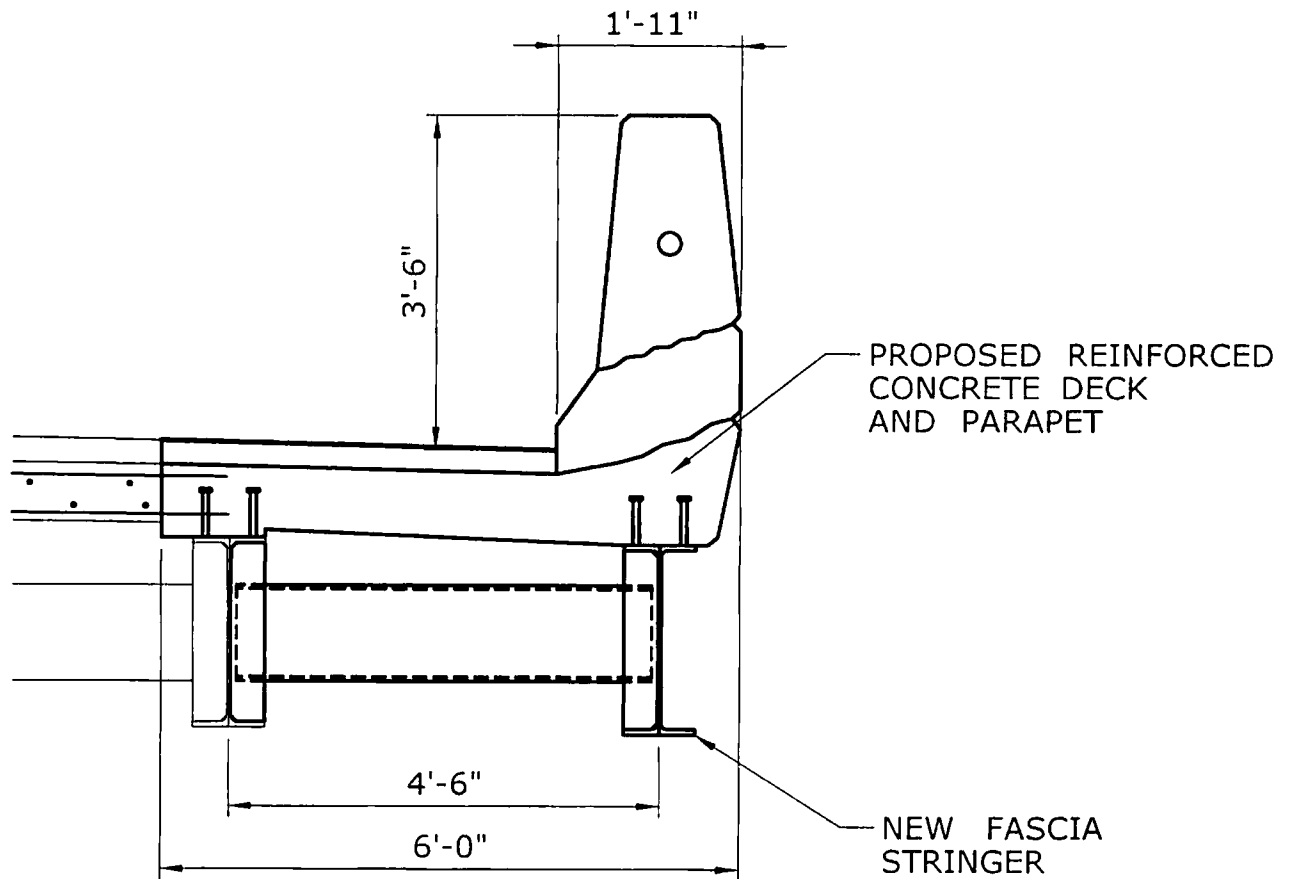
ROUTE 3 OVER THE CONNECTICUT RIVER	
MAINTENANCE AND PROTECTION OF TRAFFIC	
TOWN: GLASTONBURY/WETHERSFIELD	BRIDGE NO. 00417
STATE PROJECT NO.: 053-175	DATE: 3/3/2011



EXISTING DECK AND PARAPET

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

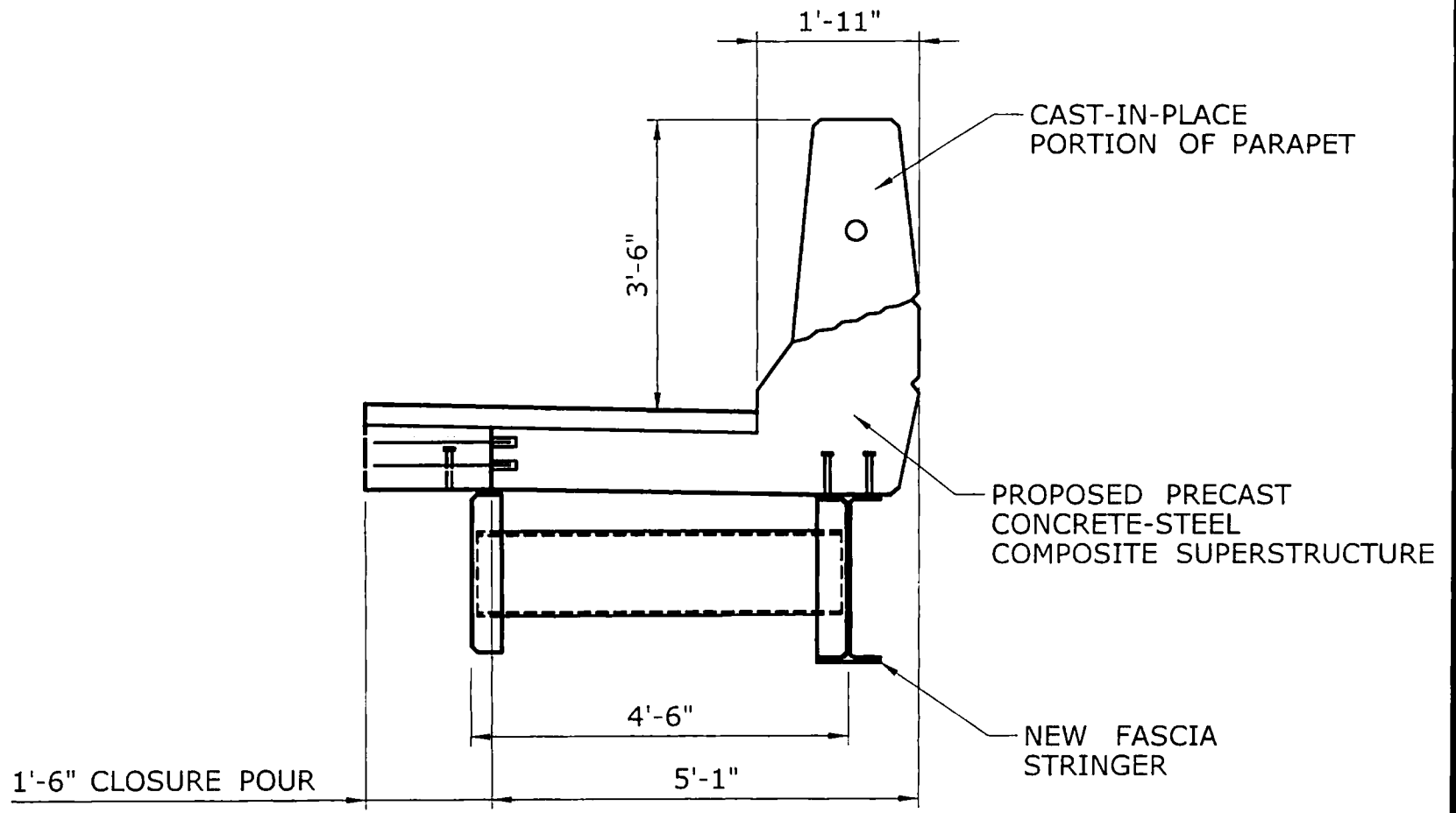
ROUTE 3 OVER THE CONNECTICUT RIVER	
DECK AND PARAPET REPLACEMENT	
TOWN: GLASTONBURY/WETHERSFIELD	BRIDGE NO. 00417
STATE PROJECT NO.: 053-175	DATE: 3/4/2011



CAST-IN-PLACE DECK AND PARAPET
 SCALE: 1/2" = 1'-0"

ROUTE 3 OVER THE CONNECTICUT RIVER	
DECK AND PARAPET REPLACEMENT	
TOWN:	BRIDGE NO.
GLASTONBURY/WETHERSFIELD	00417
STATE PROJECT NO.:	DATE:
053-175	3/4/2011

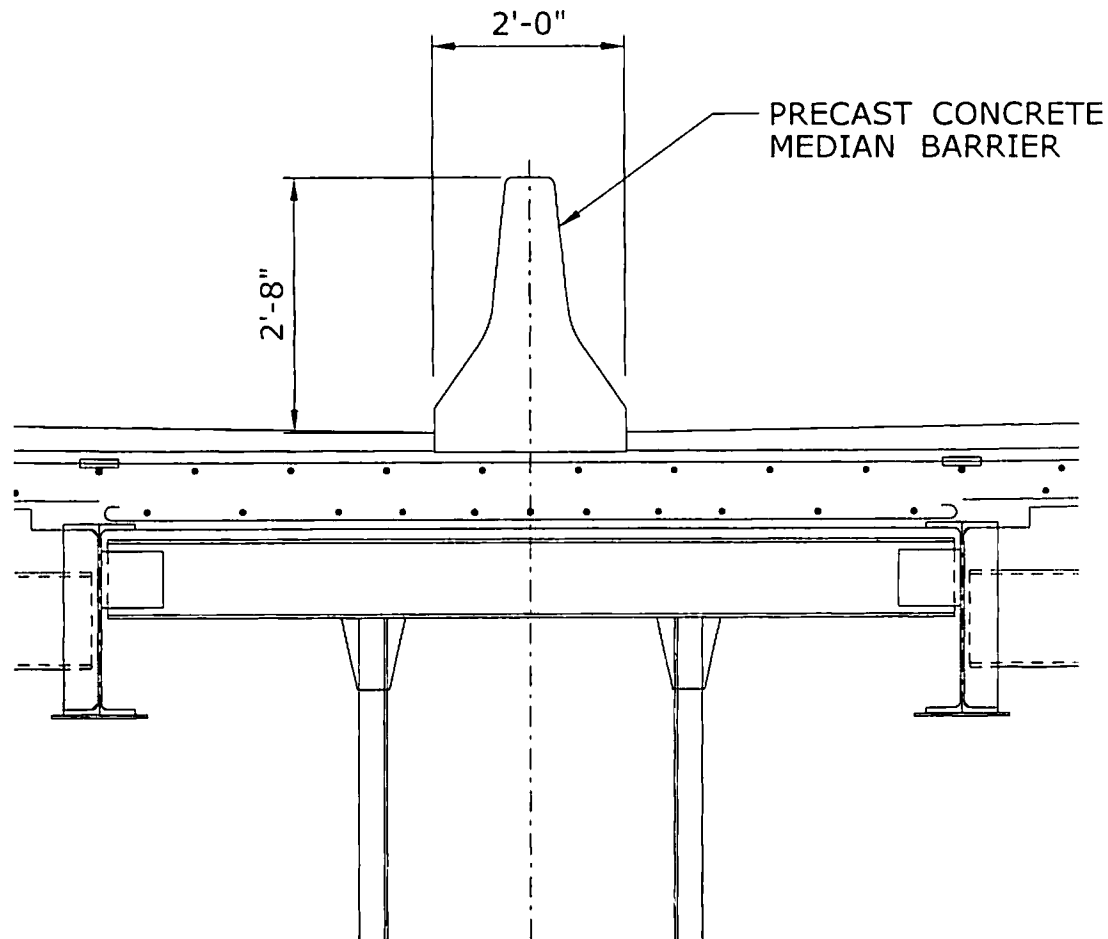
- 33 -



PRECAST CONCRETE/STEEL COMPOSITE SUPERSTRUCTURE

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

ROUTE 3 OVER THE CONNECTICUT RIVER	
DECK AND PARAPET REPLACEMENT	
TOWN: GLASTONBURY/WETHERSFIELD	BRIDGE NO. 00417
STATE PROJECT NO.: 053-175	DATE: 3/4/2011



EXISTING MEDIAN SECTION

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

ROUTE 3 OVER THE CONNECTICUT RIVER

MEDIAN RECONSTRUCTION

TOWN:

GLASTONBURY/WETHERSFIELD

BRIDGE NO.

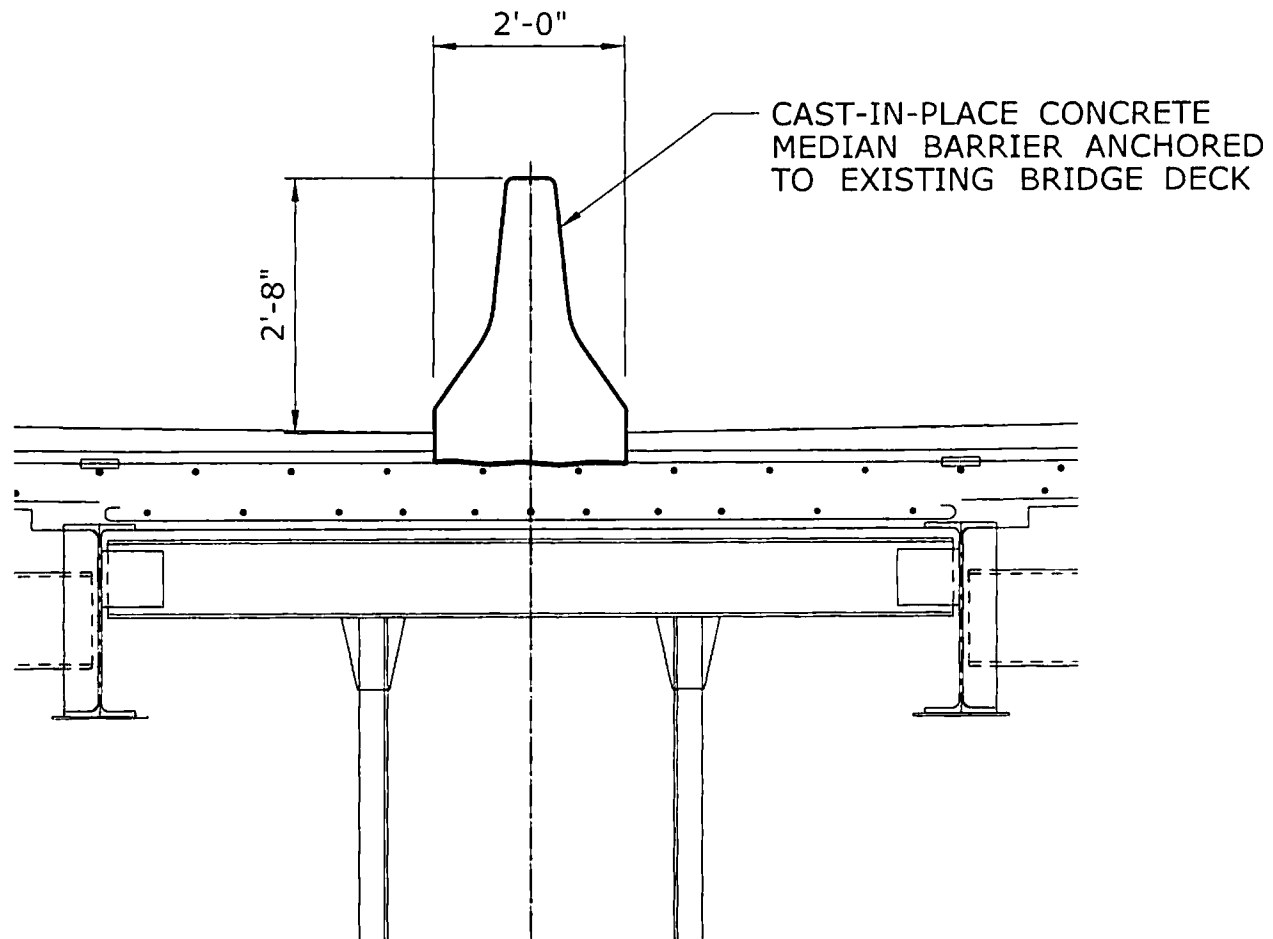
00417

STATE PROJECT NO.:

053-175

DATE:

3/4/2011



PROPOSED MEDIAN SECTION

SCALE: $\frac{1}{2}$ " = 1'-0"

ROUTE 3 OVER THE CONNECTICUT RIVER

MEDIAN RECONSTRUCTION

TOWN:

GLASTONBURY/WETHERSFIELD

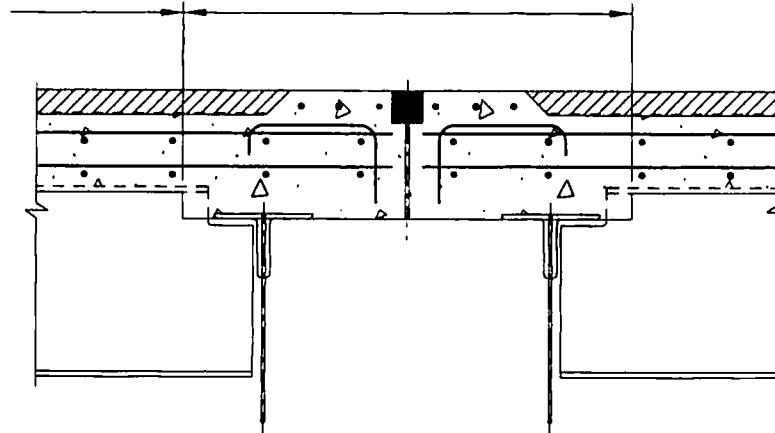
BRIDGE NO.

00417

STATE PROJECT NO.: 053-175

DATE: 3/11/2011

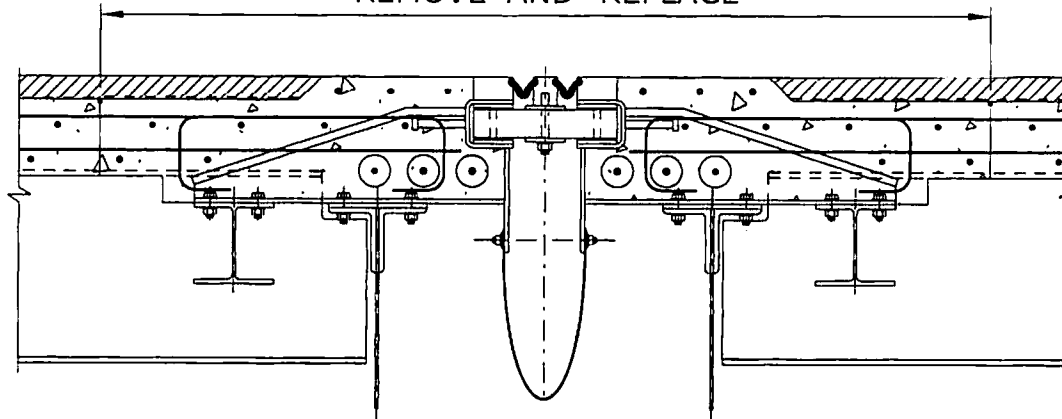
REMOVE AND REPLACE
CONCRETE HEADERS WITH
ASPHALTIC PLUG OR SILICONE
EXPANSION JOINT SYSTEM



EXISTING JOINT AT FIXED BEARING LOCATIONS

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

REMOVE AND REPLACE



EXISTING MODULAR EXPANSION JOINT SYSTEM

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

ROUTE 3 OVER THE CONNECTICUT RIVER

DECK JOINT REPLACEMENT

TOWN:

GLASTONBURY/WETHERSFIELD

BRIDGE NO.

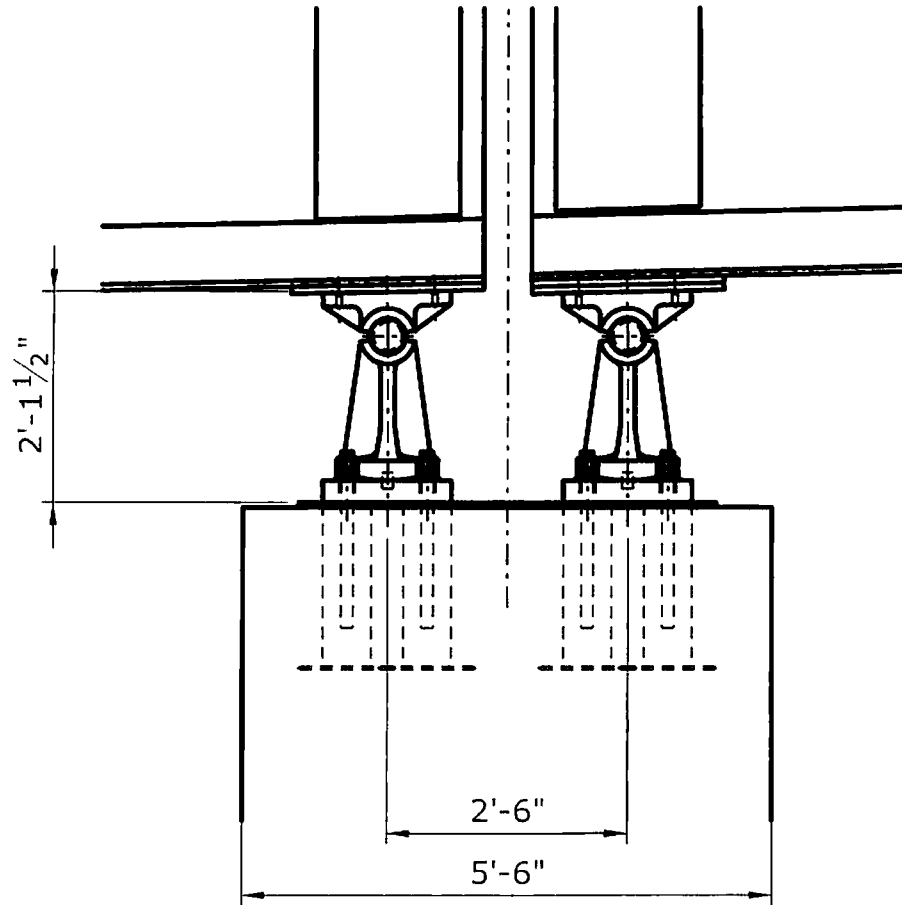
00417

STATE PROJECT NO.:

053-175

DATE:

3/11/2011



EXISTING APPROACH SPAN EXPANSION BEARINGS

SCALE: $\frac{1}{2}$ " = 1'-0"

ROUTE 3 OVER THE CONNECTICUT RIVER

BEARING REPLACEMENT

TOWN:

GLASTONBURY/WETHERSFIELD

BRIDGE NO.

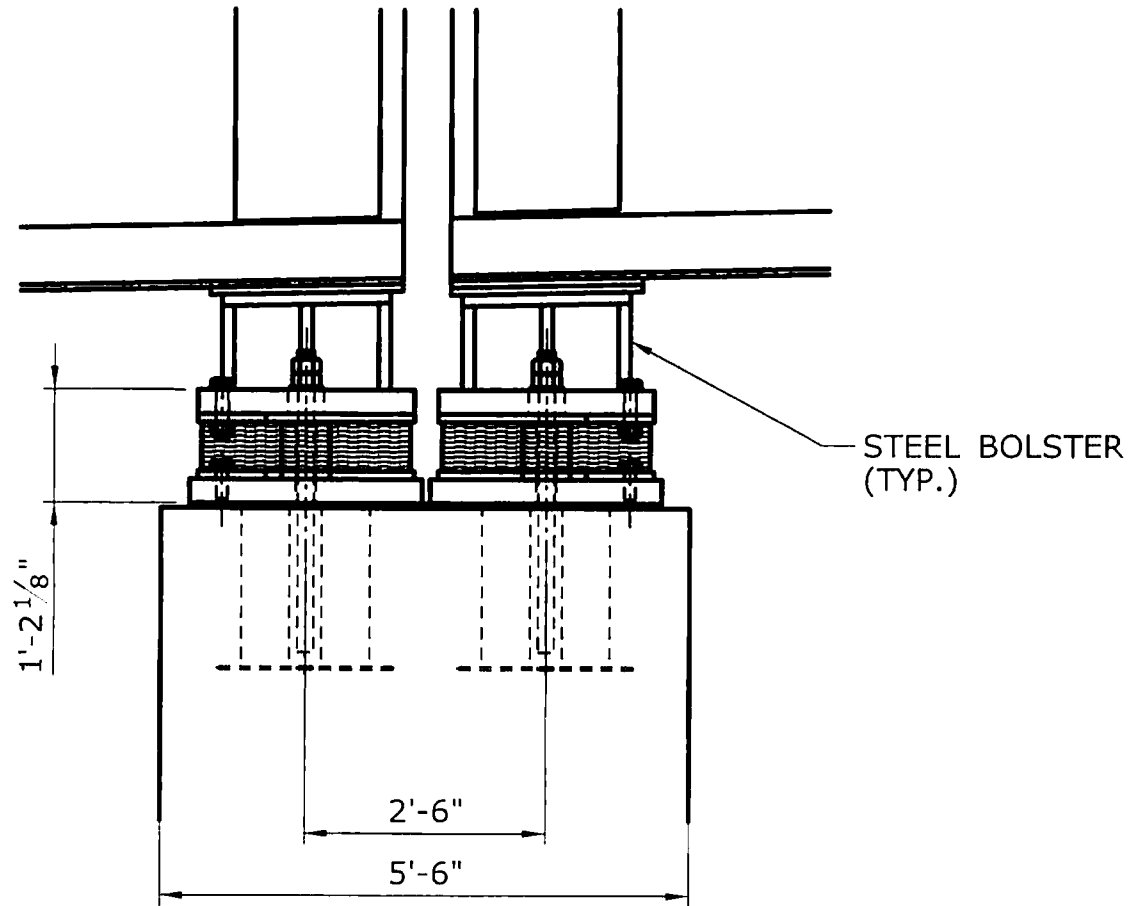
00417

STATE PROJECT NO.:

053-175

DATE:

3/4/2011



PROPOSED APPROACH SPAN EXPANSION BEARINGS

SCALE: $\frac{1}{2}$ " = 1'-0"

ROUTE 3 OVER THE CONNECTICUT RIVER

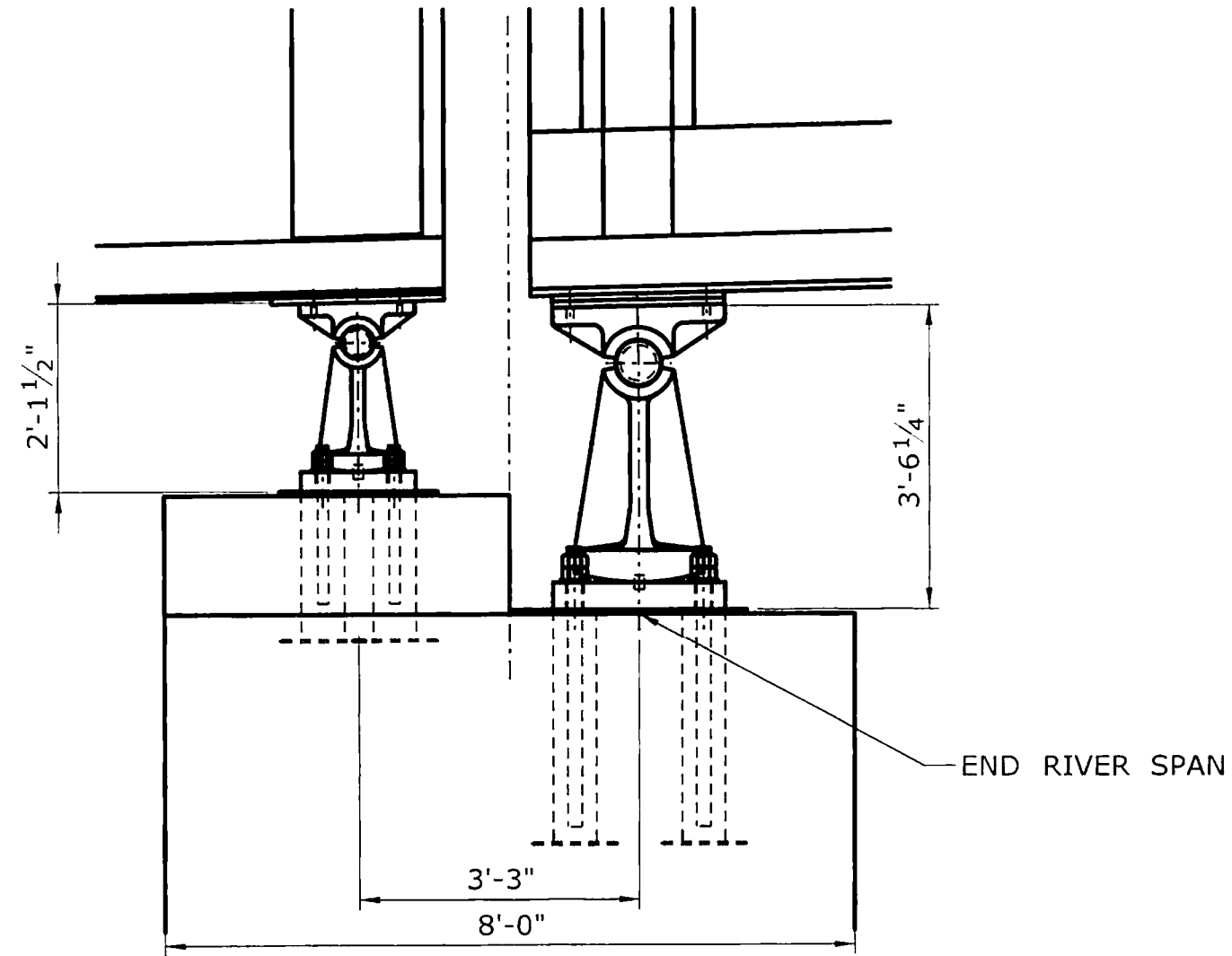
BEARING REPLACEMENT

TOWN:
GLASTONBURY/WETHERSFIELD

BRIDGE NO.
00417

STATE PROJECT NO.: 053-175

DATE: 3/4/2011



EXISTING END RIVER SPAN EXPANSION BEARING

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

ROUTE 3 OVER THE CONNECTICUT RIVER	
BEARING REPLACEMENT	
TOWN: GLASTONBURY/WETHERSFIELD	BRIDGE NO. 00417
STATE PROJECT NO.: 053-175	DATE: 3/4/2011

STEEL BOLSTER
(TYP.)

1'-2³/₄"

1'-4"

END RIVER SPAN

3'-3"

8'-0"

PROPOSED END RIVER SPAN EXPANSION BEARING

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

ROUTE 3 OVER THE CONNECTICUT RIVER

BEARING REPLACEMENT

TOWN:

GLASTONBURY/WETHERSFIELD

BRIDGE NO.

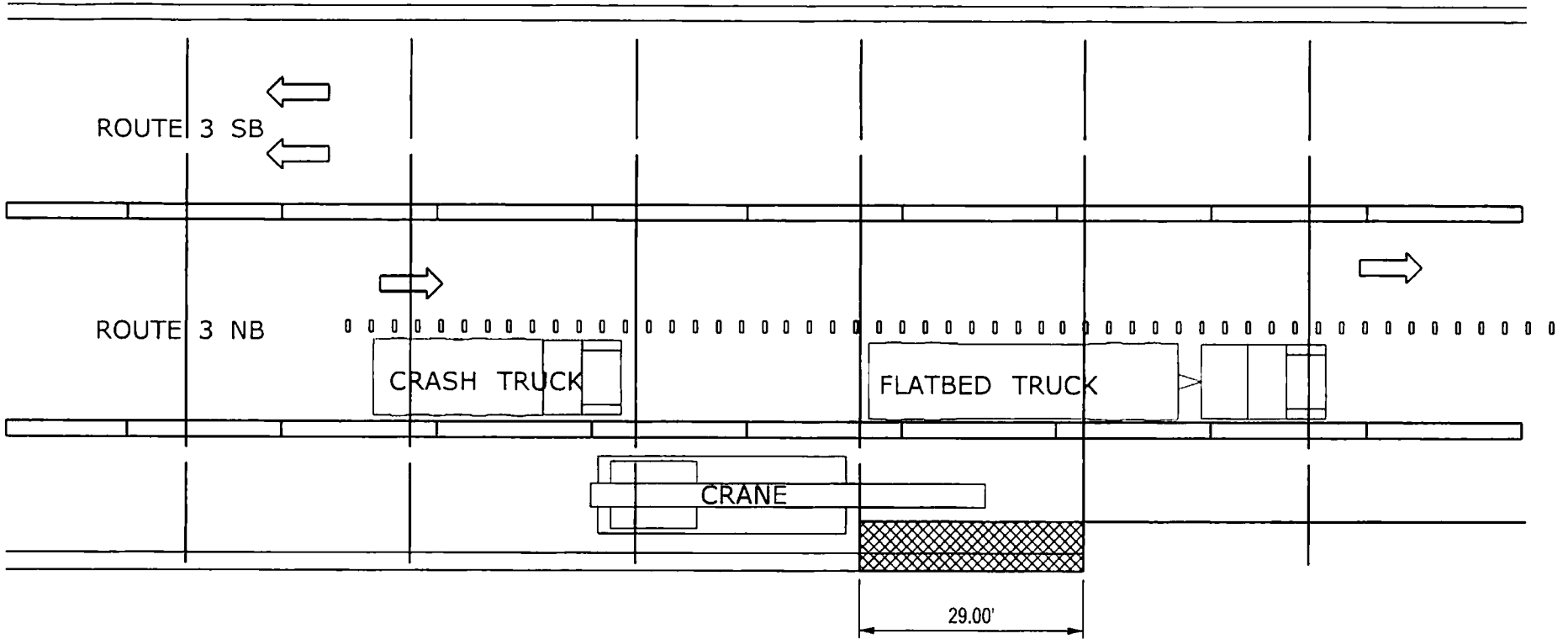
00417

STATE PROJECT NO.:

053-175

DATE:

3/4/2011

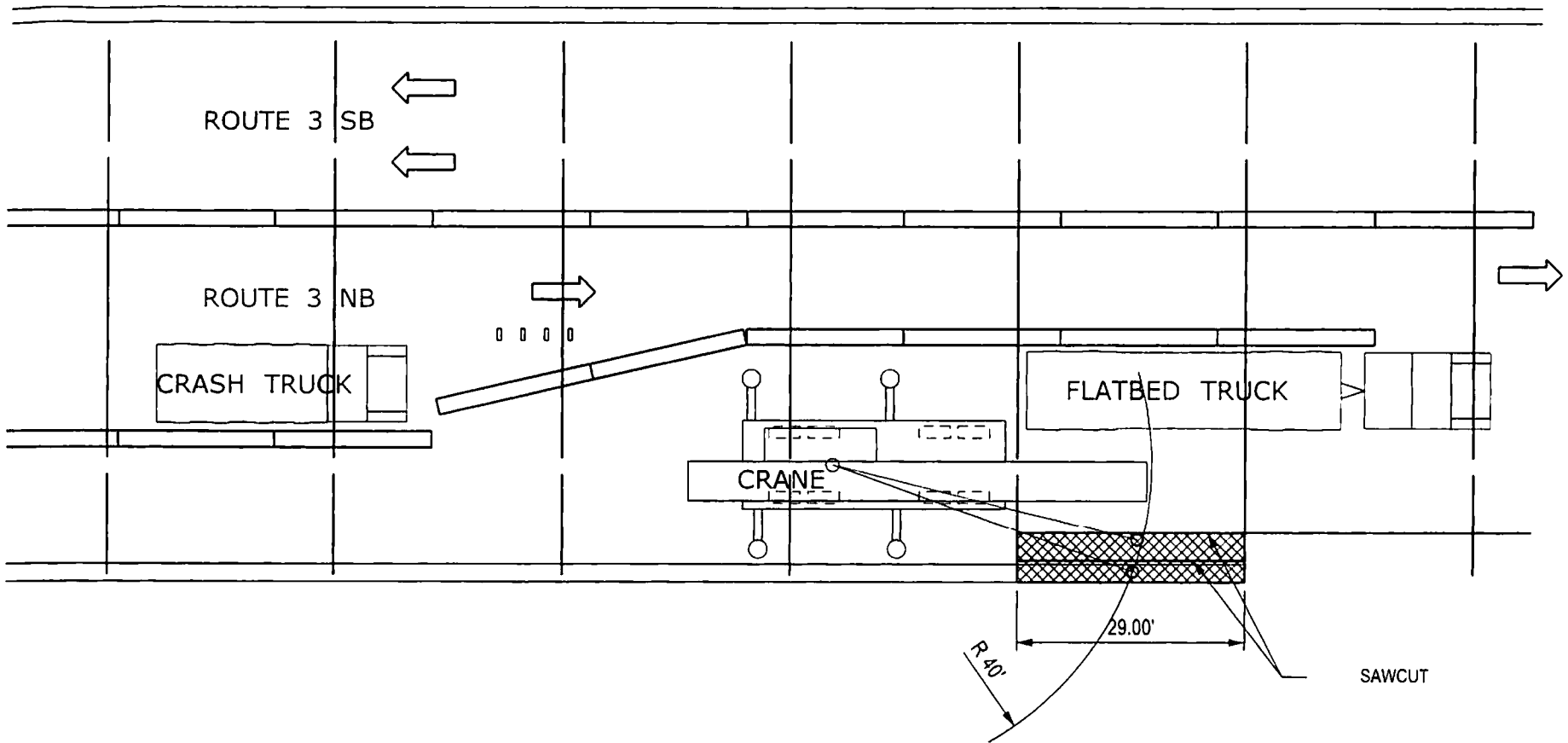


RUBBER TIRE CRANE
SCALE: 1" = 20'



SAWCUT PIECES TO BE REMOVED
AND SET ON FLATBED
MAX. APPROX. PICK WGT. = 2 TON
OFF PEAK LANE CLOSURE REQUIRED

ROUTE 3 OVER THE CONNECTICUT RIVER	
CONSTRUCTION ACCESS	
TOWN: GLASTONBURY/WETHERSFIELD	BRIDGE NO. 00417
STATE PROJECT NO.: 053-175	DATE: 3/4/2011



OUTRIGGER EXTENDED CRANE
SCALE: 1" = 20'



SAWCUT PIECES TO BE REMOVED
AND SET ON FLATBED
MAX. APPROX. PICK WGT. = 25 TON
OFF PEAK LANE CLOSURE REQUIRED

ROUTE 3 OVER THE CONNECTICUT RIVER	
CONSTRUCTION ACCESS	
TOWN: GLASTONBURY/WETHERSFIELD	BRIDGE NO. 00417
STATE PROJECT NO.: 053-175	DATE: 3/4/2011

APPENDIX A
REPORTS OF MEETING
(February 22, 2011 & February 24, 2011)

REPORT OF MEETING

PROJECT: 53-175

DATE OF MEETING: February 22, 2011

LOCATION OF MEETING: ConnDOT Conference Room 3130

SUBJECT OF MEETING: Putnam Bridge Rehabilitation

IN ATTENDANCE:

Department of Transportation (ConnDOT)

Close, Jensen and Miller (CJM)

Julie F. Georges
Charles Harlow
Nick Ozkan
Stephen Curley
Kimberly Lesay
Michael LaLone
Robert Brown
Timothy Fields
Paul Corrente
Mohammed Bishtawi

Thomas M. Ryan
John H. Miller II

TRANSACTIONS AND DETERMINATIONS

Purpose:

To discuss the nature of the work and initial ideas with respect to construction access and maintaining traffic.

Transactions and Determinations:

Robert Brown gave an overview of the project including; parapet replacement, deck replacement up to the first interior stringer, drainage replacement, median replacement, deck joint replacement, steel repairs and bearing work.

John Miller distributed Maintenance and Protection of Traffic (MP&T) schemes.

Charles Harlow noted that the Arrigoni Bridge construction project is scheduled for construction in 2011 and 2012 and asked when construction is scheduled on the Putnam project. Traffic impacts between these two projects over the Connecticut River will be considered further as the project advances into final design.

Mike LaLone commented the work areas on the M&PT are too small and suggested reducing the travel lane widths to 11 ft. *Subsequent to the meeting CJM revised the lane widths.*

A movable barrier M&PT scheme was discussed and it was determined this would require closing direct access from I-91 Northbound to Route 3 Northbound. The impacted traffic will be detoured "around the block", onto Great Meadow Road and I-91 Southbound. This option will be considered further, with District Construction.

A meeting regarding bearing working is scheduled for February 24, 2011. If bearing replacement is necessary, the work will require access from the land area below the bridge. Permit impacts were discussed. It was determined some of the heavy deck and stringer replacement may be feasible from below, and that this work should be considered in the permit if it will reduce the traffic impacts during construction.

Prepared by: John H. Miller II
John H. Miller II, P.E., L.S.

Date: 3/4/11

Reviewed by: Robert Brown
Robert Brown

Date: 3/2/11

Approved by: Julie F. Georges
Julie F. Georges, P.E.

Date: 3/9/11

c: Attendees

REPORT OF MEETING

PROJECT: 53-175

DATE OF MEETING: February 24, 2011

LOCATION OF MEETING: ConnDOT, Room 1341
Newington, CT

SUBJECT OF MEETING: Putnam Bridge Interim Deck Patch

IN ATTENDANCE:

Department of Transportation (ConnDOT)

Julie Georges
James Bedard
Timothy Fields
Robert Brown
Sandra A. Dumas

Rosemary Rodriguez
Paul Carl
David Hiscox
Mark St. Germain

Close, Jensen and Miller (CJM)

Thomas M. Ryan
John H. Miller II

Pennoni Associates, Inc.

Nathan W. Buttorff
Jennifer C. Laning

TRANSACTIONS AND DETERMINATIONS

Purpose:

- A. To determine the extent of the bearing repairs.
- B. To determine the preferred Maintenance and Protection of Traffic (M&PT) scheme.

Transactions and Determinations:

Pennoni representatives gave a summary of their findings regarding the condition of the existing bridge. Approximately 60% of the expansion bearings on the approach spans are at an advanced stage of deterioration and are not functioning properly. The bridge deck joints are leaking heavily and this is causing the condition of the bearings to deteriorate at a rapid pace. It was determined that all of the approach span expansion bearings will be replaced.

There was a discussion of the river span bearings. Pending further review, a determination will be made how to address deficiencies with these bearings. In general, the deterioration of these bearings is not as severe as the approach spans. *Subsequent to the meeting it was determined to replace the end expansion bearings on the river spans (Pier Nos. 5 and 9). The river span bearings at Pier Nos. 6, 7, and 8 will be cleaned and painted. If the results of the fix-fix modelling validate this.* Pennoni did not have any other major areas of concern, and noted that the deck overlay is in great condition. ✓

There was a discussion of the M&PT options that were presented to Traffic on 2/22/11. District Construction felt that the M&PT scheme which maximizes the work area by removing the existing median barrier and shifting traffic to one side of the bridge is the best choice to facilitate the proposed construction. It was determined to proceed with this M&PT scheme which maintains two 24-ft. barrels of traffic separated by a temporary barrier curb. This M&PT scheme will require temporary reconstruction of the approach roadways to accommodate the proposed shift in traffic.

Prepared by: John H. Miller II
John H. Miller II, P.E., L.S.

Date: 3/4/11

Reviewed by: Robert Brown
Robert Brown

Date: 3/9/11

Approved by: Timothy D. Fields
Timothy D. Fields

Date: 3/8/11