**OCTOBER 6, 2016**
**REHABILITATION OF MULTIPLE BRIDGES I-84 EASTBOUND & WESTBOUND**
**FEDERAL AID PROJECT NOS. 0843(236), 0843(234), 0843(235)**
**STATE PROJECT NOS. 0063-0699, 0063-0700, 0063-0701**
**CITY OF HARTFORD**

# ADDENDUM NO. 1

## SPECIAL PROVISIONS

### NEW SPECIAL PROVISION

The following Special Provision is hereby added to the Contract:

- NOTICE TO CONTRACTOR – SUPPLEMENTAL INSURANCE REQUIREMENTS
- NOTICE TO CONTRACTOR – RIGHTS OF WAY RESTRICTIONS

### REVISED SPECIAL PROVISIONS

The following Special Provisions are hereby deleted in their entirety and replaced with the attached like-named Special Provisions:

- NOTICE TO CONTRACTOR – CONTRACT DURATION
- NOTICE TO CONTRACTOR – SALVAGED MATERIAL
- NOTICE TO CONTRACTOR – PARKING AREAS
- SECTION 1.08 – PROSECUTION AND PROGRESS
- ITEM NO. 0000310A – BIRD SPIKE
- ITEM NO. 0503889A – JACKING EXISTING SUPERSTRUCTURE
- ITEM NO. 0521003A – BEARING REPLACEMENT WITH ELASTOMERIC BEARING PADS
- ITEM NO. 0601039A – MODIFY BRIDGE PARAPET
- ITEM NO. 0601044A – BRIDGE PARAPET CAP
- ITEM NO. 0601270A – FULL DEPTH PATCH (HIGH EARLY STRENGTH CONCRETE)
- ITEM NO. 0601318A – PARTIAL DEPTH PATCH
- ITEM NO. 0603352A – TEMPORARY SUPPORT ASSEMBLY

## PLAN SHEETS

### NEW PLAN SHEETS

The following new Plan Sheets are hereby added to the Contract:

- SHEET NO. 01.04.13.A1 PROPERTY TRANSFERS
- SHEET NO. 01.04.14.A1 PROPERTY TRANSFERS
- SHEET NO. 01.04.15.A1 PROPERTY TRANSFERS
- SHEET NO. 01.04.16.A1 PROPERTY TRANSFERS
- SHEET NO. 01.04.17.A1 PROPERTY TRANSFERS
- SHEET NO. 01.04.18.A1 PROPERTY TRANSFERS
- SHEET NO. 01.04.19.A1 PROPERTY TRANSFERS
- SHEET NO. 01.04.20.A1 PROPERTY TRANSFERS
- SHEET NO. 01.04.21.A1 PROPERTY TRANSFERS

**REVISED PLAN SHEETS**

The following revised Plan Sheets are hereby added to the Contract:

- SHEET NO. 01.02.01.A1 LIST OF REVISIONS
- SHEET NO. 01.04.01.A1 HIGHWAY INDEX OF DRAWINGS
- SHEET NO. 01.04.02.A1 HIGHWAY INDEX PLAN
- SHEET NO. 01.04.03.A1 HIGHWAY PLAN
- SHEET NO. 01.04.04.A1 HIGHWAY PLAN
- SHEET NO. 01.04.05.A1 HIGHWAY PLAN
- SHEET NO. 01.04.06.A1 HIGHWAY PLAN
- SHEET NO. 01.04.07.A1 HIGHWAY PLAN
- SHEET NO. 01.04.08.A1 BRIDGE NO. 3301 SITE ACCESS PLAN
- SHEET NO. 01.04.09.A1 BRIDGE NO. 3303 SITE ACCESS PLAN
- SHEET NO. 01.04.10.A1 BRIDGE NO. 3160 SITE ACCESS PLAN
- SHEET NO. 01.04.11.A1 SEDIMENTATION CONTROL PLAN
- SHEET NO. 01.04.12.A1 SEDIMENTATION CONTROL DETAILS
- SHEET NO. 01.08.059.A1 SUBSTRUCTURE REPAIR – BRIDGE 3160B PIER NO. ES3
- SHEET NO. 01.08.100.A1 EXPANSION BEARING REPLACEMENT – 2
- SHEET NO. 01.08.101.A1 EXPANSION BEARING REPLACEMENT – 3
- SHEET NO. 01.08.102.A1 TEMPORARY SUPPORT OF STRUCTURE – 1
- SHEET NO. 01.08.103.A1 TEMPORARY SUPPORT OF STRUCTURE – 2
- SHEET NO. 01.08.104.A1 TEMPORARY SUPPORT OF STRUCTURE – 3
- SHEET NO. 01.08.105.A1 DECK JOINT SEAL DETAILS - 1
- SHEET NO. 01.08.106.A1 DECK JOINT SEAL DETAILS - 2
- SHEET NO. 01.08.107.A1 DECK END REPAIR DETAILS - 1
- SHEET NO. 01.08.108.A1 DECK END REPAIR DETAILS - 2
- SHEET NO. 01.08.109.A1 DECK END REPAIR DETAILS -3
- SHEET NO. 01.08.110.A1 DECK END REPAIR DETAILS - 4
- SHEET NO. 01.08.111.A1 PARAPET RETROFIT
- SHEET NO. 01.08.112.A1 PARAPET TRANSITION - 1
- SHEET NO. 01.08.113.A1 PARAPET TRANSITION - 2

- SHEET NO. 01.08.114.A1 PARAPET TRANSITION - 3
- SHEET NO. 01.08.115.A1 MEDIAN DETAILS - 1
- SHEET NO. 01.08.116.A1 MEDIAN DETAILS - 2
- SHEET NO. 01.08.117.A1 MEDIAN DETAILS - 3
- SHEET NO. 01.08.118.A1 MEDIAN DETAILS - 4
- SHEET NO. 01.08.119.A1 MEDIAN DETAILS - 5
- SHEET NO. 01.08.120.A1 PARAPET MOUNTED SIGN SUPPORT
- SHEET NO. 01.08.121.A1 LIGHT STANDARD SUPPORT
- SHEET NO. 01.08.122.A1 MISCELLANEOUS DETAILS
- SHEET NO. 01.08.123.A1 PAINTING & CONTAINMENT
- SHEET NO. 01.08.124.A1 DRAINAGE REPAIR PLAN
- SHEET NO. 01.08.125.A1 DRAINAGE DETAILS
- SHEET NO. 02.04.03.A1 TYPICAL SECTION AND NOTES
- SHEET NO. 03.04.03.A1 TYPICAL SECTION AND NOTES

The Bid Proposal Form and Detailed Estimate Sheets are not affected by these changes.

There will be no change in the number of calendar days due to this Addendum.

The foregoing is hereby made a part of the contract.

## NOTICE TO CONTRACTOR – SUPPLEMENTAL INSURANCE REQUIREMENTS

State will require that all contractors performing work in the easement areas indemnify, defend, and hold Aetna and its affiliates, agents, employees, and contractors harmless from any and all cost, claims, liabilities, and damages associated with the contractor's work.

The State will require that Aetna is added as an additional insured through endorsement to the CGL policies required to be held by any contractor working within the easement area which policy shall include a contractual liability endorsement.

# NOTICE TO CONTRACTOR - RIGHTS OF WAY RESTRICTIONS

The Contractor is hereby advised that at the time of advertising for bids not all the property may be acquired by the State and certain residences and/or business establishments had not been vacated. A complete listing of the affected properties and the anticipated dates that they will become available is hereinafter provided. The Contractor is further advised that limitations, as enumerated herein below, are imposed which may interfere with the physical construction of the project. Following are statements which will set forth the restrictions on the right of entrance to property and conditions governing construction of the project.

1) The Contractor shall not occupy properties that are unacquired, perform any work thereon, or inhibit access thereto until the properties have been acquired and right of possession has been obtained. If the Contractor is allowed to proceed with the physical construction of the project, no action will be taken that will result in unnecessary inconvenience such as the discontinuance of utilities, the prevention of ingress and egress to the property, or will result in disproportionate injury or any action coercive in nature to occupants of residences (businesses, farms, or non-profit organization) who have not yet moved from the right-of-way.

2) It should be anticipated that each of the properties listed herein may be considered to have an effect upon construction operations.

3) The Contractor shall be aware that extensions of time will be granted, if necessary, for delays in construction operations caused by continued occupancy of residences or properties being unacquired by the anticipated date.

The following is a complete listing of properties which have not been acquired and vacated as of September 21, 2016 with the anticipated dates such properties will be acquired and/or vacated.

| Serial Number | Property Owner | Approximate Location | Anticipated Completion Date |
|---|---|---|---|
| 2 | Aetna Life Insurance Company | Sta. 914+50 to Sta. 936+90 | 04/01/2017 |
| 3 | CT-285 Broad Street, LLC | Sta. 931+00 to Sta. 936+00 | 04/01/2017 |
| 6 | The Greater Hartford Flood Commission | Sta. 919+00 to Sta. 924+00 | 04/01/2017 |
| 7 | CDECCA Property Company, LLC | Sta. 920+60 to Sta. 924+40 | 04/01/2017 |

# NOTICE TO CONTRACTOR – CONTRACT DURATION

The Contractor is hereby notified that this is not to be considered an ordinary project by any means and that due to the inconvenience to the traveling public that it causes, extra manpower, equipment and work shifts will be required to complete the work at multiple sites in accordance within the specified contract time, and in compliance with milestone dates noted herein and elsewhere within these documents.

The Contractor will be required to complete the following tasks within the allotted period for construction:

- Repair steel stringers.
- Repair steel girders.
- Repair steel pier cap girders.
- Repair concrete columns, pier caps, and abutments.
- Erect temporary supports and replace bearings.
- Abrasive Blast Clean and Paint all stringer and girder beam ends and the full length of median stringers below median deck repair areas.
- Remove and replace the bituminous wearing surface and waterproofing membrane in multiple stages at designated areas.
- Remove and patch deteriorated bridge deck concrete, including partial and full depth areas from above and below.
- Remove and/or replace bridge downspout pipes.
- Modify the curb and construct a cap on the existing parapet.
- Replace median.
- Replace bridge deck adjacent to the median.

The list above shall not be considered all inclusive of this project. Additional construction items, incidental to the work noted above are also required as part of this contract.

The above noted scope items are to be performed under the limitations noted within these contract documents, and shall be performed with the minimum impact to the highway traffic, local traffic, railroad operations, and parking operations. Coordination with the Connecticut Department of Transportation, the City of Hartford, CT*fastrak*, and Amtrak Railroad will be required of the Contractor. This coordination shall include any and all necessary approvals, workzone coordination, access, and all work to secure necessary outside agency personnel, including police officers and railroad flagmen, for protection of all assets during construction.

Milestones: The Contractor shall meet the following Milestones during Construction.

**Season 1 Milestones**

1. Site No. 1 (Bridge 3160A/C)
    a. Complete all Parapet Modifications to the Right Parapet Barriers
    b. Complete parapet modifications to the Left Parapet exiting the median region
    c. Roadway Lighting Modifications
    d. Substructure Concrete Repairs
    e. Clean & Paint Structural Steel
    f. Structural Steel Repairs
    g. Replace Deck Joints and Concrete Deck Ends

2. Site No. 1 (Bridge 3160B/D)
    a. Complete all Parapet Modifications to the Right Parapet Barriers
    b. Complete parapet modifications to the Left Parapet entering the median region
    c. Roadway Lighting Modifications
    d. Substructure Concrete Repairs
    e. Clean & Paint Structural Steel
    f. Structural Steel Repairs
    g. Replace Deck Joints and Concrete Deck Ends

3. Site No. 1 (Bridge 3301)
    a. Complete all Parapet Modifications to the Right Parapet Barriers
    b. Complete parapet modifications to the Left Parapet entering the median region
    c. Roadway Lighting Modifications
    d. Substructure Concrete Repairs
    e. Clean & Paint Structural Steel
    f. Structural Steel Repairs

4. Site No. (Bridge 3303)
    a. Complete all Parapet Modifications to the Right Parapet Barriers
    b. Complete parapet modifications to the Left Parapet entering the median region
    c. Roadway Lighting Modifications
    d. Substructure Concrete Repairs
    e. Clean & Paint Structural Steel
    f. Structural Steel Repairs

5. Site No. 2 (Bridge 1765)
    a. Complete all Top of Deck Work, Deck Patching, Membrane, Overlay, Line Striping.
    b. Complete all Parapet Modifications to the Right Parapet Barriers
    c. Complete parapet modifications to the Left Parapet entering the median region
    d. Roadway Lighting Modifications
    e. Substructure Concrete Repairs
    f. Clean & Paint Structural Steel
    g. Replace Deck Joints and Concrete Deck Ends

6. Site No. 3 (Bridge 1766)
    a. Complete all Top of Deck Work, Deck Patching, Membrane, Overlay, Line Striping.
    b. Complete all Parapet Modifications to the Right Parapet Barriers
    c. Complete parapet modifications to the Left Parapet entering the median region
    d. Roadway Lighting Modifications
    e. Substructure Concrete Repairs
    f. Clean & Paint Structural Steel
    g. Replace Deck Joints and Concrete Deck Ends

## Season 1 Parking Area Milestones

See "Notice to Contractor – Parking Areas" for Area Locations. The State will cancel parking area leases to allow the Contractor's access to complete the work according to the following schedule. See Section 1.08 of these Special Provisions for additional information.

| | |
|---|---|
| Parking Area 1: | 63 Calendar Days (45 Weekdays) |
| Parking Area 2: | 63 Calendar Days (45 Weekdays) |
| Parking Area 3(W): | 126 Calendar Days (90 Weekdays)* |
| Parking Area 3(E): | 105 Calendar Days (75 Weekdays)* |
| Parking Area 4 : | 175 Calendar Days (125 Weekdays) |
| Parking Area 5 : | 175 Calendar Days (125 Weekdays)** |
| Parking Area 6 : | 81 Calendar Days (60 Weekdays)*** |
| Parking Area 7: | 42 Calendar Days (30 Weekdays) |

* - See Section 1.08 for coordination between Parking Areas 3(W) and 3(E).
** - The Contractor is permitted to move this work period to Season 2. If the work in Parking Area 5 is performed in Season 1, it shall be done concurrently with the work in Parking Area 4.
*** - See Section 1.08 for additional limitations on the workzone in Parking Area 6.

| | |
|---|---|
| Parking Area B (11 Spaces): | 84 Calendar Days (60 Weekdays) |
| Parking Area B (14 Spaces): | 84 Calendar Days (60 Weekdays) |
| Parking Area B (3 Spaces for Gate Access): | Contract Duration |

## Season 2 Milestones

1. Site No. 1 (Bridge 3160A/C)
    a. Median & Adjacent Deck
    b. Remaining Parapet Work

2. Site No. 1 (Bridge 3160B/D)
    a. Median & Adjacent Deck
    b. Remaining Parapet Work

3. Site No. 1 (Bridge 3301)
    a. Remaining Parapet Work

4. Site No. (Bridge 3303)
    a. Remaining Parapet Work
    b. Bearing Replacement

5. Site No. 2 (Bridge 1765)
    a. Superstructure Repairs
    b. Bearing Replacement

6. Site No. 3 (Bridge 1766)
    a. Superstructure Repairs
    b. Bearing Replacement

## Season 2 Parking Area Milestones

See "Notice to Contractor – Parking Areas" for Area Locations. The State will cancel parking area leases to allow the Contractor's access to complete the work according to the following schedule. See Section 1.08 of these Special Provisions for additional information.

| | |
|---|---|
| Parking Area 1: | No Lease Cancellations |
| Parking Area 2: | No Lease Cancellations |
| Parking Area 3(W) : | 84 Calendar Days (60 Weekdays) |
| Parking Area 3(E) : | 84 Calendar Days (60 Weekdays) |
| Parking Area 4 : | 238 Calendar Days (170 Weekdays) |
| Parking Area 5 : | No Lease Cancellations* |
| Parking Area 6 : | No Access |
| Parking Area 7: | 56 Calendar Days (40 Weekdays) |

* - See note included with Season 1 Milestones.

| | |
|---|---|
| Parking Area B (11 Spaces): | 84 Calendar Days (60 Weekdays) |
| Parking Area B (14 Spaces): | 84 Calendar Days (60 Weekdays) |
| Parking Area B (3 Spaces for Gate Access): | Contract Duration |

By bidding on this project, the Contractor is certifying that sufficient manpower and resources are readily available to allow completion of this construction project within the limitations noted herein. Liquidated Damages may apply, as defined elsewhere in these specifications, in the event that milestones are not met or permitted durations are exceeded.

# NOTICE TO CONTRACTOR – SALVAGED MATERIAL

The following items shall be salvaged from the bridge during the rehabilitation:

1. Bronze Slide Plate Bearings (Anticipated Number of Assemblies = 8)
2. Aluminum Bridge Rail (Quantity as Ordered by the Engineer, Estimated Length = 1100 feet)

The Contractor shall load, transport, and unload the material. The material shall be stacked and stored according to the directions of the Materials Storage Manager. The condition of the material is to be determined by the State Inspector responsible for this project. Strict adherence to proper stores documentation, Directive 19 - "Transfer of Salvage Material from Project to Stores", is mandatory. Any material not meeting this criterion will be refused.

Bronze Slide Plate Bearings shall be delivered as units that are banded together as individual units as they existed in the field, to eliminate mix/matching of various pieces. The Engineer will designate the units to be salvaged.

The Contractor shall disassemble the system (rail and posts) without damaging the material and deliver them on a rack body or flatbed truck for unloading by DOT equipment. The posts and hardware should be gathered together and the rails in their original lengths (without cutting of the material).

Deliver Salvaged Materials to the following address:

Hartford Bridge
49 Jennings Road
Hartford, CT 06120
Contact: Eric Belanger
Phone: (860) 566-3102

A minimum of 2 days notice shall be provided prior to delivery.

All materials that the Resident Engineer deems unsuitable for salvage shall remain the property of the Contractor.

## NOTICE TO CONTRACTOR – PARKING AREAS

The following parking areas are impacted by the Projects.

| Area & Description | Location & Access |
|---|---|
| Area A<br>Hartford Financial Services Group | North End of Spruce Street |
| | Access Point: No Contractor Access |
| Area B<br>Spruce Street GHTD Lot | West of Spruce Street and bound to the South by Asylum Street, to the West by Interstate I-84 WB, to the North by Myrtle Street. |
| | Access Point: Gate to Spruce Street at the Northeast end of the lot. |
| Area 1<br>State of Connecticut<br>DAS LOT B | South of Capitol Ave. and bound to the East by Laurel Street, to the North by Capitol Avenue, to the South by private property, and to the West by Bridge Abutments |
| | Access Point: Gate to Laurel Street at the Southeast corner of the lot. |
| Area 2<br>State of Connecticut<br>DAS LOT A | South of Capitol Ave. and bound to the West by Laurel Street, to the North by Capitol Avenue, to the South by private property, and to the East by Park Place |
| | Access Point: Gate to Laurel Street at the Southwest corner of the lot. |
| Area 3(W)<br>Aetna Lot West of Sigourney Street | Specifically the portion of this parking area West of Pier ML-12, with the entire parking area defined as follows:<br>North of Capitol Ave. and bound to the West by private property, to the North by Amtrak Railroad, to the South by Capitol Avenue, and to the East by a gated fence below Pier ML20. State owned areas of this parking lot are bound by privately owned parking areas. |
| | Access Point: Gate to Capitol Avenue at the South End of the lot. |
| Area 3(E)<br>Aetna Lot East of Sigourney Street | Specifically the portion of this parking area East of Pier ML-12, with the entire parking area defined as follows:<br>North of Capitol Ave. and bound to the West by private property, to the North by Amtrak Railroad, to the South by Capitol Avenue, and to the East by a gated fence below Pier ML20. State owned areas of this parking lot are bound by privately owned parking areas. |
| | Access Point: Gate to Capitol Avenue at the South End of the lot. |
| Area 4<br>State of Connecticut<br>DAS – OPM Lot | South of Amtrak Railroad and bound to the West by a gated fence below Pier ML20, to North by a concrete wall at the Railroad ROW boundary, to the South by a fence at the South Pier Column Line, and to the East by a Fence at Pier ML29. |
| | Access Point: Gate from Area 3 adjacent to Pier ML20. Easements are in place to allow access to State Owned portions of Area 3. |
| Area 5<br>DAS - Flower Street West Lot | West of Flower Street and bound to the West by Pier ML31, to the North by a fence, to the South by a concrete wall at the Railroad ROW boundary (CT*fastrak*), and to the East by Flower Street. |
| | Access Point: Direct access from Flower Street North |
| Area 6<br>Hartford Courant | West of Flower Street, bound to the north by Railroad ROW, to the West by State Property, to the South by Greater Hartford Flood Property. |
| | Access Point: The Contractor shall remove fence at the West edge of the lot to permit access from Parking Area 4. |
| Area 7<br>Armory Lot | South of Amtrak Railroad and bound to the West by Bituminous Driveway to Hungerford Street, to the East by a brick building, and to the south by chain link fence. |
| | Access Point: Direct access from Hungerford Street Easement. |
| | |

| | |
|---|---|

The Contractor is hereby notified that, with the exception of the parking lot at the North end of Spruce Street (identified as Parking Area "A"), and the Hartford Currant Lot (identified as Parking Area 6) all parking areas directly below the viaduct structures are State owned property and are currently leased to various organizations. The leaseholders will be permitted to occupy the parking lots upon cancellation of the leases. As noted elsewhere in these special provisions, the Contractor shall be responsible for adhering to a schedule identifying impacts to the parking areas during construction. The Contractor's operations shall be performed within the limitations noted in these contract documents and shall meet the milestones within this contract.

**Protective Fencing:** At all locations where the Contractor has been granted the right to remove fencing, temporary barriers and fencing shall be provided at the locations shown on the plans to prevent unwanted access to areas of parking lots that are intended to remain in service.

Contact information for coordination with occupants of State owned lots shall be as follows:

| | Parking Area B | Parking Areas 1, 2, 3, 4 & 5, | Parking Area 3(W) & 3(E) | Parking Area 7 |
|---|---|---|---|---|
| Contact Person | DJ Gonzalez | Douglas J. Moore | Mr. John Walsh | Jon Mullen |
| Managing Organization | Greater Hartford Transit District | Department of Administrative Services (DAS) | Aetna Life Insurance Co. | Military Department Construction & Facilities Management |
| Telephone | (860) 209-9554 ext 3080 | (860) 713-5885 | (860) 273-1759 | (860) 524-4947 |

The Contractor shall refer to the Special Provision for Section 1.08.04 – Limitations of Operations, for governing specific limitations on parking areas during construction.

The Contractor will be required to coordinate operations affecting the privately owned parking lots for the Hartford Courant and for the Hartford Financial Services Group.

Parking Area 6 - Hartford Courant: Refer to the Contract plans for further information on easements obtained for Temporary Work areas within the Hartford Courant property. The property accessed by the Contractor within this parking area includes land owned by 285 Broad Street, LLC & Amtrak Railroad. All coordination within this lot shall be made through the Hartford Courant as the managing organization.

Parking Area 7 – Armory Lot: Refer to the Contract plans for further information on the Temporary Work area within the Armory Lot property. All coordination within this lot shall be made through the Military Department Construction & Facilities Management Office.

Parking Area A - The Hartford Financial Services Group, Inc.: The Contractor will be required to inform the Hartford Financial Services Group, Inc. of any construction operations that affect, or have the potential to affect access to Parking Area A, located at the North end of Spruce

Street. Refer to the Contract plans for further information in this area. Within this privately owned parking area, Contractor activities shall not be permitted. Construction operations that affect access to this parking area, such as crane picks or the erection of overhead elements, shall be limited in duration and shall only be permitted when the parking area is closed. The Contractor shall assume such impacts will be during overnight hours and the schedule for such outages will be subject to the approval of the manager of Parking Area A.

All coordination with privately owned parking lots:

| | Parking Area 7 | Parking Area A |
|---|---|---|
| Contact Person | Mr. Hans Keck<br>Mr. Fritz Pameijer | Facilities |
| Organization | The Hartford Courant | The Hartford Financial Services Group, Inc. |
| Telephone | (860) 241-3958 | (860) 547-5000 |

# SECTION 1.08 - PROSECUTION AND PROGRESS

**Article 1.08.04 - Limitation of Operations - Add the following:**

In order to provide for traffic operations as outlined in the Special Provision "Maintenance and Protection of Traffic," the Contractor will not be permitted to perform any work which will interfere with the described traffic operations on all project roadways as follows:

**Route I-84**

On the following State observed Legal Holidays:
New Year's Day
Good Friday, Easter Sunday*
Memorial Day
Independence Day
Labor Day
Columbus Day
Thanksgiving Day**
Christmas Day

The following restrictions also apply:

On the day before and the day after any of the above Legal Holidays.

On the Friday, Saturday, and Sunday immediately preceding any of the above Holidays celebrated on a Monday.

On the Saturday, Sunday, and Monday immediately following any of the above Holidays celebrated on a Friday.

* From 6:00 a.m. the Thursday before the Holiday to 8:00 p.m. the Monday after the Holiday.

** From 6:00 a.m. the Wednesday before the Holiday to 8:00 p.m. the Monday after the Holiday.

During all other times
The Contractor shall maintain and protect traffic as shown on the accompanying "Limitation of Operations" charts, which dictate the minimum number of lanes that must remain open for each day of the week, except as noted in Deviation from Limitation of Operations, below.

**Project No. 63-699, 63-700, 63-701**
**Limitation of Operations Chart**
**Minimum Number of Through Lanes to Remain Open**

| I-84 Westbound Hartford Number of Through Lanes: 3 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Hour Beginn -ing | Mon | Tue | Wed | Thu | Fri | Sat | Sun |
| Mid | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 AM | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| 6 AM | E | E | E | E | E | 2 | 1 |
| 7 AM | E | E | E | E | E | 2 | 2 |
| 8 AM | E | E | E | E | E | 3 | 2 |
| 9 AM | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 10 AM | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 11 AM | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Noon | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 1 PM | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 2 PM | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 3 PM | E | E | E | E | E | 3 | 3 |
| 4 PM | E | E | E | E | E | 3 | 3 |
| 5 PM | E | E | E | E | E | 3 | 3 |
| 6 PM | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 7 PM | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 8 PM | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 9 PM | 2 | 2 | 2 | 3 | 3 | 3 | 3 |
| 10 PM | 2 | 2 | 2 | 2 | 3 | 2 | 2 |
| 11 PM | 1 | 1 | 1 | 2 | 2 | 2 | 2 |

| I-84 Westbound Hartford Number of Through Lanes: 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Hour Beginn -ing | Mon | Tue | Wed | Thu | Fri | Sat | Sun |
| Mid | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 AM | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| 6 AM | E | E | E | E | E | 2 | 1 |
| 7 AM | E | E | E | E | E | 2 | 2 |
| 8 AM | E | E | E | E | E | 3 | 2 |
| 9 AM | 4 | 4 | 4 | 4 | 4 | 3 | 3 |
| 10 AM | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 11 AM | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Noon | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 1 PM | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 2 PM | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 3 PM | E | E | E | E | E | 4 | 4 |
| 4 PM | E | E | E | E | E | 4 | 4 |
| 5 PM | E | E | E | E | E | 4 | 4 |
| 6 PM | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 7 PM | 3 | 3 | 3 | 4 | 4 | 3 | 4 |
| 8 PM | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 9 PM | 2 | 2 | 2 | 3 | 3 | 3 | 3 |
| 10 PM | 2 | 2 | 2 | 2 | 3 | 2 | 2 |
| 11 PM | 1 | 1 | 1 | 2 | 2 | 2 | 2 |

**On Holidays and within Holiday Periods, all Hours shall be 'E.'**

**'E' = maintain existing traffic operations = all available travel lanes, including exit only lanes, climbing lanes and all available shoulder widths shall be open to traffic during this period.**

**Project No. 63-699, 63-700, 63-701**
**Limitation of Operations Chart**
**Minimum Number of Lanes to Remain Open**

| I-84 Eastbound Hartford Number of Through Lanes: 3 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Hour Beginn -ing | Mon | Tue | Wed | Thu | Fri | Sat | Sun |
| Mid | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 AM | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| 6 AM | E | E | E | E | E | 2 | 1 |
| 7 AM | E | E | E | E | E | 3 | 2 |
| 8 AM | E | E | E | E | E | 3 | 2 |
| 9 AM | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 10 AM | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 11 AM | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| Noon | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 1 PM | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 2 PM | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 3 PM | E | E | E | E | E | 3 | 3 |
| 4 PM | E | E | E | E | E | 3 | 3 |
| 5 PM | E | E | E | E | E | 3 | 3 |
| 6 PM | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 7 PM | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 8 PM | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| 9 PM | 2 | 2 | 2 | 3 | 3 | 3 | 2 |
| 10 PM | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 11 PM | 1 | 1 | 1 | 1 | 2 | 2 | 1 |

| I-84 Eastbound Hartford Number of Through Lanes: 4 | | | | | | | |
|---|---|---|---|---|---|---|---|
| Hour Beginn -ing | Mon | Tue | Wed | Thu | Fri | Sat | Sun |
| Mid | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 1 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 2 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 3 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 4 AM | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| 5 AM | 2 | 2 | 2 | 2 | 2 | 1 | 1 |
| 6 AM | E | E | E | E | E | 2 | 1 |
| 7 AM | E | E | E | E | E | 3 | 2 |
| 8 AM | E | E | E | E | E | 3 | 2 |
| 9 AM | 4 | 4 | 4 | 4 | 4 | 4 | 3 |
| 10 AM | 4 | 4 | 4 | 4 | 4 | 4 | 3 |
| 11 AM | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| Noon | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 1 PM | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 2 PM | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 3 PM | E | E | E | E | E | 4 | 4 |
| 4 PM | E | E | E | E | E | 4 | 4 |
| 5 PM | E | E | E | E | E | 4 | 4 |
| 6 PM | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| 7 PM | 3 | 3 | 3 | 4 | 4 | 3 | 3 |
| 8 PM | 3 | 3 | 3 | 3 | 4 | 3 | 3 |
| 9 PM | 2 | 2 | 2 | 3 | 3 | 3 | 2 |
| 10 PM | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| 11 PM | 1 | 1 | 1 | 1 | 2 | 2 | 1 |

**On Holidays and within Holiday Periods, all Hours shall be 'E.'**

**'E' = maintain existing traffic operations = all available travel lanes, including exit only lanes, climbing lanes and all available shoulder widths shall be open to traffic during this period**

**Ramps and Turning Roadways**

The Contractor will not be allowed to perform any work that will interfere with the existing traffic operations on all ramps, and exit only lanes on:

Monday through Friday between 6:00 a.m. and 8:00 p.m.
Saturday between 9:00 a.m. and 8:00 p.m.
Sunday between 11:00 a.m. and 8:00 p.m.

The Contractor must coordinate State Projects #63-699, 63-700, & 63-701 on all Detours and M&PT operations.

**Eastbound I-84**

The Contractor will be permitted to close the eastbound Sisson Ave. on-ramp and detour traffic as shown on the detour plan contained in the contract documents.

The Contractor shall not be permitted to close the Exit 46 (Sisson Avenue) and Exit 47 (Sigourney Street) on- ramps in the eastbound direction simultaneously.

The Contractor will be permitted to close the Exit 47 (Sigourney St.) on-ramp and Exits #48A & 48B off ramps simultaneously in the eastbound direction during the exit only lane and right lane closures and detour traffic as shown on the detour plan contained in the contract documents.

The Contractor shall not be permitted to close the Exit # 49 off ramp, concurrent with an Exit # 48 (Capitol Avenue) exit ramp closure in the eastbound direction.

The Contractor will be permitted to close the Exit # 49 off ramp in the eastbound direction during the exit only lane and right lane closures and detour traffic as shown on the detour plan contained in the contract documents.

The Contractor shall not be permitted to close the Broad Street on ramp, concurrent with a Sisson Avenue and Sigourney Street on- ramp closure in the eastbound direction.

The Contractor will be permitted to close the eastbound Broad Street on-ramp and detour traffic as shown on the detour plan contained in the contract documents.

**Westbound I-84**

The Contractor will be permitted to close the westbound on ramp from Chapel Street and detour traffic as shown on the detour plan contained in the contract documents. This closure shall note be permitted simultaneously with a closure of the westbound on ramp from Capitol Avenue.

The Contractor shall be permitted to close the westbound on ramp from Capitol Avenue & Asylum Street and detour traffic as shown on the detour plan contained in the contract documents. This closure shall not be permitted simultaneously with a closure of the westbound on ramp from Chapel Street.

The Contractor will be permitted to close the Exit # 48 off-ramp in the westbound direction during the right through lane and exit only lane closures and detour traffic as shown on the detour plan contained in the contract documents.

The Contractor shall not be permitted to close the Exit # 48 ramp, concurrent with an Exit 46 (Sisson Avenue) or Exit 47 (Sigourney Street) exit ramp closure in the westbound direction.

The Contractor will be permitted to close the Exit # 47 off-ramp in the westbound direction during the right through lane and exit only lane closures and detour traffic to Exit #46 as shown on the detour plan contained in the contract documents. This closure shall not be permitted simultaneously with an Exit #46 closure.

The Contractor shall not be permitted to close the Exit 46 (Sisson Avenue) and Exit 47 (Sigourney Street) exit ramps in the westbound direction simultaneously.

**Permissible Deviation from Limitation of Operations Chart**

The Contractor shall be permitted extended hours of two lane service on I-84 to allow replacement of bridge joints to the extents shown on the Contract Plans.

The Contractor will be permitted to reduce service as follows:

I-84 EB

| | |
|---|---|
| Friday 9 pm to Saturday 8 am | 11 hours |
| Saturday 9 pm to Sunday 10 am | 13 hours |

I-84 WB

| | |
|---|---|
| Friday 9 pm to Saturday 9 am | 12 hours |
| Saturday 9 pm to Sunday 10 am | 13 hours |

During these time periods, the Contractor will be permitted to reduce traffic to two lanes. In the event that the Limitation of Operations Charts indicate that the Contractor may further reduce traffic to a single lane, the Contractor is permitted at adjust the traffic pattern to do so, provided that two lane service is restored by the time identified in the Limitation of Operations Charts.

The Contractor shall provide a minimum 4 weeks advance notification prior to the planned extended work hours. The Department will prohibit the extended hours on weekends when special events are scheduled at the locations noted herein.

**Special Events**

The Contractor will not be allowed to perform any work that will interfere with the existing traffic operations from four hours prior to scheduled events at the XL Center, Xfinity Theatre, Convention Center, Expo Center, Yard Goat Baseball Stadium, and Rentschler Field between 8:00 p.m. and 12:00 a.m. This restriction is in addition to the restrictions noted above for I-84 and the associated ramps and exit only lanes.

A schedule of special events at these facilities shall be requested through the City of Hartford Police Department and shall form the basis of the Contractor's schedule for limited construction operations. Ongoing special events coordination throughout the construction project shall be the responsibility of the Contractor.

**All Other Roadways**

The Contractor will not be allowed to perform any work that will interfere with the existing traffic operations on all City of Hartford roadways:

Monday through Friday between 6:00 a.m. and 8:00 p.m.
Saturday between 9:00 a.m. and 8:00 p.m.
Sunday between 11:00 a.m. and 8:00 p.m.

## PARKING AREAS

In order to provide for parking lot operations as outlined in the Notice to Contractor – Parking Areas the Contractor will not be allowed to perform any work that will interfere with existing parking lot occupancy except as follows:

**Parking Area A (Private Lot)**

The Contractor will not be permitted to occupy the parking area or impede access. The Contractor shall perform work interfering with traffic on Spruce Street within the limitations noted above for "All Other Roadways". Temporary roadway closures for the purpose of erection of overhead construction shall be scheduled during times when Parking Area A is closed.

**Parking Area B (State Owned Lot, Managed by Greater Hartford Transit District - GHTD)**

The Contractor will have access to this parking lot through a gate on Spruce Street for the duration of the project.

The Contractor will be granted passage from Parking Area B to the area below the bridges through the gate at the Southwest corner of the lot. The Contractor may take 3 spaces in front of this gate for the duration of the project.

The Contractor may take up to 14 spaces at the North end of Parking Area B below and adjacent to Span 6 for 3 months. The Contractor will be limited to taking 11 spaces at the West side of Parking Area B, adjacent to the bridge structure for 3 months. The 14 spaces at the North end of the parking area and the 11 spaces at the west side of the parking area may not be taken simultaneously. Each 3 month period may be scheduled in Season 1 and/or Season 2.

The Contractor will be permitted to schedule construction work zones no less than 1 week in advance for all construction operations. The Contractor will only be permitted to occupy the areas designated. The Contractor shall not impede access to any parking spaces which remain in service.

**Parking Areas 1 & 2 ("DAS LOT B" & "DAS LOT A")**
**State Owned Lots, Managed by DAS**

The Contractor is required to perform the work in Parking Areas 1 & 2 simultaneously. This work shall be performed in advance of any work performed within Parking Areas 4 & 5 and occupancy of these lots may not be concurrent with any activities requiring the closure of Parking Areas 4 & 5.

The State will cancel parking leases as follows:

| | | |
|---|---|---|
| Season 1: | Parking Area 1 (DAS Lot B): | 63 Calendar Days (45 Weekdays) |
| Season 1: | Parking Area 2 (DAS Lot A): | 63 Calendar Days (45 Weekdays) |
| Season 2: | Parking Area 1 (DAS Lot B): | No Lease Cancellations |
| Season 2: | Parking Area 2 (DAS Lot A): | No Lease Cancellations |

**Parking Area 3 ("Aetna Lot")**
**State Owned Lot Bound by Private Lot, Managed by Aetna,**

The State will secure access easements cross privately owned property and to enable the Contractor to enter State Property freely from the existing gate on Capitol Avenue for the duration of the project. For the duration of the project, the Contractor shall be permitted access to and the right to move through and throughout State owned property within Lots 3W and 3E, provided that such occupancy and the movement of vehicles does not prohibit the use of the parking areas.

To permit Contractor operations that prohibit the use of portions of the parking areas, the State will cancel parking leases as follows:

| | | |
|---|---|---|
| Season 1: | Parking Area 3W (West of Sigourney): | 126 Calendar Days (90 Weekdays) |
| Season 1: | Parking Area 3E (East of Sigourney): | 105 Calendar Days (75 Weekdays) |
| Season 2: | Parking Area 3W (West of Sigourney): | 84 Calendar Days (60 Weekdays) |
| Season 2: | Parking Area 3E (East of Sigourney): | 84 Calendar Days (60 Weekdays) |

Occupancy that prohibits the use of parking spaces within Parking Area 3W and 3E shall not be permitted concurrently unless the parking area Managing Organization deems the total number of spaces occupied by the contractor and the means of access between areas north and south of the

bridges provided and protected by the contractor to be acceptable. Such acceptance must be secured in writing from the parking area Managing Organization identified in the "Notice to Contractor - Parking Areas".

State owned areas within Parking Area 3 (Aetna Lot) are bound by privately owned parking lots which may be occupied during construction.

Parking Area 3 shall remain active for parking occupancy use during construction activities and the Contractor's use of the Parking Area 3 will be limited to temporary work zone areas for construction activities only. Mobilization or storage will be permitted within the temporary work zone areas but not permitted within the active parking occupancy areas. The Contractor shall delineate the temporary work zone areas with temporary barricades to clearly define the impacted spaces. The temporary work areas shall be returned for use as parking spaces as repairs are completed. Access to other temporary work zone areas will be permitted as inactive temporary work areas are returned for parking space occupancy. The Contractor shall coordinate and schedule construction activities for minimal loss of parking space occupancy use.

The Contractor will be permitted to schedule multiple temporary construction work zone areas in advance for all construction activities and operations. The temporary construction work zone areas will be limited to an area not to exceed fifty (50) parking spaces each and the total number of parking spaces impacted for all parking spaces shall not exceed two-hundred (200) parking spaces. The Contractor shall not obstruct the access to or use of any parking spaces which remain in service. Where temporary supports have been erected outside of the Contractor's work zone, all parking spaces impacted by their presence shall be included in the number of parking spaces impacted.

Vehicular access between Parking Areas 3W and 3E shall be maintained at all times. Vehicular access between north side and south side of the parking areas shall be maintained at all times.

Pedestrian stair access to Sigourney Street shall be maintained at all times. Temporary shielding shall be provided as necessary to maintain the pedestrian access during construction activities at no additional cost. Parking spaces below the Sigourney Street shall remain available for use during construction.

Construction access to the parking areas will be limited to one dedicated construction entrance at Parking Area 3W. The dedicated construction entrance would be removed after the construction activities have been completed. The construction entrances shall not impact parking access or occupancy.

Cooperation of the Contractor shall be provided to the Managing Organization to ensure that there will be minimal disruption for parking occupancy and access for parking areas during the construction activities.

**Parking Areas 4 & 5 ("OPM Lot" & "Flower Street West Lot")**
**State Owned Lots, Managed by DAS**

This work shall be performed after completion of work performed within Parking Areas 1 & 2 and occupancy of these lots may not be concurrent with any activities requiring the closure of Parking Areas 1 & 2.

Portions of Parking Area 4 "OPM Lot" are owned by Amtrak Railroad. These areas are subject to an easement in favor of the Department for overhead bridge purposes, Project 63-95; Serial 333B.

The State will cancel parking leases as follows:

| | | |
|---|---|---|
| Season 1: | Parking Area 4 (OPM Lot): | 175 Calendar Days (125 Weekdays) |
| Season 1: | Parking Area 5 (Flower Street West): | 175 Calendar Days (125 Weekdays)* |
| Season 2: | Parking Area 4 (OPM Lot): | 238 Calendar Days (170 Weekdays) |
| Season 2: | Parking Area 5 (Flower Street West): | No Lease Cancellations* |

* - The Contractor is permitted to move this work period to Season 2. If the work in Parking Area 5 is performed in Season 1, it shall be done concurrently with the work in Parking Area 4.

**Parking Area 6 (Hartford Courant Parking Area) (Private Lot)**

The Contractor will only be permitted to occupy the areas designated in the Contract Plans.

The Contractor shall remove existing fence to allow access from Parking Area 4 (OPM Lot) to Parking Area 6 (Hartford Courant). The gate must provide access between adjacent State Owned Parcels of land.

This work shall be performed concurrently with the activities requiring the closure of parking Area 4 with the following exception: Contractor access to the Hartford Courant parking area will be permitted from the first Monday in June through the last Friday in August. All work which may impact this parking area must be completed within this time period, as the Contractor will not be granted access to this parking area outside of this window.

| | | |
|---|---|---|
| Season 1: | Parking Area 6 (Hartford Courant): | 81 Calendar Days (60 Weekdays) |
| Season 2: | Parking Area 6 (Hartford Courant): | No Access Easement |

**Parking Area 7 (Armory)**

The Contractor shall provide a temporary gate with locks at any location where an existing gate is removed. The Contractor shall maintain vehicular access to the remaining area of the lot and pump station throughout construction. Locks shall be configured to allow the Military or the Contractor to access through the gate without each other's presence.

The State will allow the contractor to perform work within the lot as follows:

| | | |
|---|---|---|
| Season 1: | Parking Area 7 (Armory): | 42 Calendar Days (30 Weekdays) |
| Season 2: | Parking Area 7 (Armory): | 56 Calendar Days (40 Weekdays) |

**Construction Staking**

For roadways where the existing pavement markings are to be re-established, the Contractor shall establish control points from the existing pavement markings in accordance with Section 9.80 Construction Staking. This work will be paid for under Item No. 0980001 "Construction Staking".

**Bituminous Concrete Milling and Deck Repair Requirements**

The Contractor shall schedule the operations so that pavement milling and/or re-paving operations shall be full width across the roadway section at the end of a work day/work night.

A concrete patching operation must be started the next working day after the milling operation is completed and performed on a continuous basis within the work week (minimum of five (5) working days per week, weather permitting, and only when possible within the allowable time frame as specified in the "Limitation of Operations" charts). Dedicated crews must be assigned to each work area. The Contractor shall include in the bid, provisions for sufficient crews, equipment, and material dedicated to accomplish the work for each section of roadway. The Contractor shall also provide sufficient additional equipment to function in the event of equipment malfunction or breakdown. A contingency plan, meeting the requirements of the Engineer, shall also be in place to permit mobilization of spare equipment in the event of need.

If after milling the bituminous overlay, the exposed surface of the concrete bridge deck is deemed by the Engineer to be unsafe for travel due to severe surface deterioration, the Contractor must immediately ensure a clear roadway, free from debris through sweeping, followed by patching the roadway as outlined in the Special Provision "ITEM #0601318A - PARTIAL DEPTH PATCH". In the event that the Engineer determines that insufficient time remains between the completion of the post-milling inspection and the required opening time for traffic, the Engineer may instruct the Contractor to temporarily patch the roadway as outlined in the Special Provision "ITEM # 0406137A SURFACE PATCH (TEMPORARY)". Such temporary patches shall only be permitted where sufficient deck strength remains to support traffic.

The Contractor shall perform the deck repair work, the milling of existing pavement, and the installation of the new bituminous concrete pavement in accordance with the Special Provisions that are contained elsewhere in the contract documents.

It is recommended that the Contractor utilize the various lane closures that will be required for the above work to perform the other work required, such as structural steel work, parapet work, and expansion joint work, whenever possible.

**Lane Closure Restrictions**

It is anticipated that work on adjacent City projects may be ongoing simultaneously with these projects. The Contractor shall be responsible to coordinate with those projects so that proper traffic flow is maintained at all times on all project roadways and this coordination must be acceptable to the Engineer.

It is anticipated that the Connecticut Department of Administrative Services (DAS) may have a facility construction project underway during the 2017 and 2018 construction seasons. The project includes the planned construction of a Thermal Plant at 340 Capitol Avenue, Hartford, CT.

The Contractor will not be allowed to perform any work that will interfere with existing traffic operations on an expressway when any other Contractor is restricting existing traffic operations on that expressway within one mile of a lane closure on this project unless the Contractors have coordinated the closure and this coordination is acceptable to the Engineer.

The Contractor will not be allowed to close a lane if a Contractor working on an adjacent project has the opposite lane closed unless there is at least a one mile clear area length where the entire roadway is open to traffic, measured from the end of the first work area to the beginning of the signing pattern for the next work area.

**Other Limitations**

The field installation of a signing pattern shall constitute interference with existing traffic operations and shall not be allowed except during the allowable periods.

Longitudinal dropdowns will not be allowed during those periods when the maximum number of through traffic lanes is required as shown in the Limitation of Operations charts contained herein.

The Contractor shall schedule operations so that pavement removal and deck repair shall be completed full width across the bridge section by the end of a workday (worknight). All transverse height differentials on all roadway surfaces shall be tapered to negate any “bump” to traffic as approved by the Engineer. Material for this taper shall be as approved by the Engineer. The cost of this work is included under item no. 0971001A, Maintenance and Protection of Traffic.

The Contractor will not be permitted to laterally cross any expressway with construction vehicles. Construction vehicles shall merge with the mainline traffic flow and utilize existing interchanges. All protective systems and traffic control devices as called for by the Contract or ordered by the Engineer must be on-hand and available in sufficient quantity for immediate installation prior to any stage change.

No roadway, with the exception of transition areas, shall be open to traffic unless the appropriate pavement markings have been installed. The transition areas shall have pavement markings applied immediately upon opening to traffic.

## HIGHWAY ILLUMINATION

The Contractor is required to stage the installation/removal of light poles so that continuous nighttime roadway illumination meeting current levels is maintained throughout construction. The Contract documents include provisions for five (5) new light standards to permit the Contractor to install and energize light standard brackets using a combination of night work from the top of deck and day-time from manlifts alongside or below the bridge structures. Split operations are expected to be necessary to allow pole replacement and energizing while complying with lane closure restrictions and illumination requirements since the poles can be installed at night but energized during the day. The Contractor shall only be permitted to increase the quantity of new light standards and decrease the quantity of relocated light standards at the approval of the Resident Engineer. Surplus light standards that are removed and not re-installed shall become the property of the Contractor.

## CT*fastrak* BUSWAY

The Contractor is required to receive written approval from the Busway prior to the following activities:

1. Mobilization or the start construction activities within any areas on site, where access is restricted by the CT*fastrak* infrastructure.
2. Performance of construction activities that may impact the operations of CT*fastrak*.
3. Storage of construction materials or equipment within the CT*fastrak* right-of-way.
4. Performance of construction activities that may prevent access to CT*fastrak* from currently established access points.

Any portion of the CT*fastrak* infrastructure damaged during construction activities, which prevents operation of service, will be repaired immediately to the satisfaction of the Engineer, at the Contractor's expense. Upon completion of construction, any elements of the CT*fastrak* infrastructure disturbed during construction shall be restored to their original condition prior to construction to the satisfaction of the Engineer, at the sole expense of the Contractor.

## AMTRAK RAILROAD

The Contractor is required to comply with Amtrak railroad requirements identified in Notice to Contractor elsewhere in these specifications.

# INCIDENT MANAGEMENT SYSTEM

The Contractor will not be allowed to perform any work that will disrupt the normal operation of the Incident Management System (IMS) as follows:

- On Monday through Friday from 5:00 a.m. to 9:00 p.m.
- On Saturday and Sunday.
- On the day before or after any of the Legal Holidays listed below:

  New Years Day
  Good Friday
  Memorial Day
  Independence Day
  Labor Day
  Thanksgiving Day
  Christmas Day

- On the Saturday, Sunday and Monday following Thanksgiving Day.
- On the Friday, Saturday and Sunday immediately preceding any of the above Legal holidays celebrated on a Monday.
- On the Saturday, Sunday and Monday immediately following any of the above Legal holidays celebrated on a Friday.

In order to maintain continuous operation of the Incident Management System, the Contractor shall adhere to the requirements in the special provision “Notice to Contractor – Installation Qualifications” and “Notice to Contractor – IMS Installation”.

# ITEM #0000310A – BIRD SPIKE

**Description:**

The work for this item shall consist of furnishing and installing bird spikes on the pier caps, pedestals, and beam bottom flanges within 15' of the bearings to prevent birds from landing on the horizontal surfaces.

**Materials:**

**Beam Bottom Flanges**: Bird spikes shall be five inches (5") wide by four and three-quarters inches (4¾") high. The bird spikes shall be constructed with stainless steel pins and C-Clamp base attachment. Construction shall be such that spikes will not fall out of base if bent or crushed. No gaps between bird spikes are permitted that may permit birds to roost or landing. The bird spikes shall be similar to models commonly referred to as "Girder Bird Spikes".

**Concrete Pier Caps:** Bird spikes shall be eight inches (8") wide by four and three-quarters inches (4¾") high. The Bird Spikes shall be constructed with stainless steel pins in a UV protected polycarbonate base. Construction shall be such that spikes will not fall out of base if bent or crushed. No gaps between bird spikes are permitted that may permit birds to roost or landing. The bird spikes shall similar to models commonly referred to as "Stainless Steel Pigeon Spikes".

Polyurethane sealant/adhesive shall be a premium-grade, high-performance, moisture-cured, 1-component, polyurethane-based, non-sag elastomeric sealant. The adhesive shall meet Federal specification TT-S-00230C, Type II, Class A. Meets ASTM C-920, Type S, Grade NS, Class 35, use T, NT, O, M, G, I

Drilled-in fasteners shall be 3/16" diameter AISI Type 410 Stainless Steel Concrete and Masonry Screws with hex-washer heads. Provide sealing washers to prevent damage to bird spikes as may be directed by the bird-spike manufacturer.

**Construction Methods**:

The Contractor shall prepare and submit shop drawings to the Engineer for approval in accordance with Section 1.05.02-3 prior to ordering and fabricating material. These drawings shall include, but not limited to, field measurements, installation plans, material lists and material designations. Product data shall include the manufacturer's descriptive literature and product specification.

Disinfect the area prior to installation. Due to the infectious diseases associated with bird feces, be sure to use extreme care when removing nests and bird droppings. Use a 10% bleach or ammonia solution to disinfect that area. It is important that all debris is removed and properly disposed of including overhanging branches, leaves, nests, etc. before disinfecting.

To keep birds from landing and roosting, place stainless steel bird spike rods to overhang the outer edge of beam flanges or concrete caps by 1/2". Stainless steel bird spike rods should be no more than 1 ½" from the back wall or beam webs to prevent smaller birds from landing between the bird spikes and the back wall or beam webs.

**Beam Bottom Flanges:** Secure pigeon spikes to the beam bottom flanges with factory installed C-Clamp base attachment and polyurethane sealant/adhesive. Peen fastener threads after tightening clamp bolts to prevent loosening and loss of connection. Space all clamps as directed by manufacturer. Mount bird spikes to exterior bottom flanges within 15' of pier bearings.

**Concrete Pier Caps & Pedestals:** Secure pigeon spikes to concrete pier caps with screws and polyurethane sealant/adhesive. Provide screw anchors for bird spikes in conjunction with the use of an outdoor construction sealant/adhesive. Fasten the bird spike strips at 24" o.c. using 3/16" diameter self-drilling concrete anchor screws. Fasten bird spike strip material with no less than 3 screws per individual length. Bird spikes shall be mounted along the full length along each edge of the pier caps and along the edges of pedestals deemed by the Resident Engineer to be wide enough to permit roosting.

**Method Of Measurement:**

This work will be measured for payment by the number of linear feet of bird spike installed and accepted. The bird spikes will be measured for payment along the base. C-Clamps, sealant/adhesive, fasteners, and related work are not measured.

**Basis of Payment:**

This work will be paid for at the contract unit price per linear foot, complete in place, including furnishing, fabricating and installing and all materials, equipment, tools, labor and work incidental thereto. Payment shall include mounting the bird spikes. Sealant/adhesive, drilling and installing concrete anchors, furnishing and placing C-Clamps, and all other methods of attachment approved for use by the Engineer shall be considered incidental to mounting the bird spikes. Payment shall also include all work to remove overhanging branches, leaves, nests, bird droppings, etc. and disinfecting the area.

| Pay Item | Pay Unit |
|---|---|
| Bird Spike | Linear Foot |

ITEM #0000310A

# ITEM #0503889A – JACKING EXISTING SUPERSTRUCTURE

**Description:**

The work for this item shall govern the work to design, fabricate, erect and remove a temporary means of support to relieve load during pier concrete rehabilitation. The Contractor shall determine the loads applied to the temporary support system and shall provide a means to support the lifting operation to account for such forces. Temporary means of support shall be provided as shown on the plans, and as directed by the Engineer.

Work shall also include the labor required to create a foundation or other means of support for the temporary support system to maintain stability during construction. The Contractor shall not be permitted to bear directly upon horizontal slab portions of the Park River Conduit. All loads transferred to the conduit or the adjacent soil shall be documented in the design calculations.

This work includes furnishing lifting apparatus and the work to perform the lifting operation.

This work excludes all work to modify or strengthen the existing structure, in preparation for the lifting operations, which shall instead be included in the appropriate items.

Temporary barrier, if necessary to protect the temporary support system installed under this item shall be considered incidental to the work.

Excavation, backfilling and restoration of excavated areas is incidental to the work and is included in this item.

Support of excavation is incidental to the work and is included in this item.

**Materials:** The materials used shall be of satisfactory quality, and capable of safely carrying the anticipated loads. All materials shall be approved by the Engineer before use.

Steel, timber, concrete, or any other material or combination of materials may be used for the temporary support system and supporting of the hydraulic lifting operation.

Structural steel for permanently installed jacking supports shall conform to the requirements of Article 6.03.02 of the Connecticut Department of Transportation Standard Specifications, and all applicable special provisions. Structural steel supports, which are to remain in place upon the completion of the work shall be designed by a Professional Engineer, licensed in the State of Connecticut.

Hydraulic jacks shall be dual acting hydraulic cylinders equipped with locking nuts. Jacks shall be fitted with tilt collars to provide a minimum of 5 degrees of rotational capacity. Hydraulic Jacks shall be furnished with pressure gauges to monitor jacking loads.

Jacking bolsters furnished to relieve load from the hydraulic jacks shall meet the requirements of Article 6.03.02.

Work platforms and railings shall be designed for OSHA Loads.

**Construction Methods:** Temporary supports shall be governed by Article 6.03.03-4(a) (Falsework).

Design computations shall be performed by a Professional Engineer licensed in the State of Connecticut and shall be prepared and submitted to the Engineer prior to any work on the piers for which the temporary support system is necessary. The calculations shall be signed and sealed by the Professional Engineer and submitted in paper and electronic form to the Engineer for review. The Professional Engineer shall also be available for consultation interpreting his drawings and calculations, and in the resolution of any problem that may occur during the performance of the work. Each working drawing must be sealed.

The reactions from the temporary support system on underlying materials, the structural components being supported, or any loads imparted on the existing substructure shall not exceed those allowed by the AASHTO Manual for Bridge Evaluation for the existing structural elements.

Prior to construction, the Contractor shall submit working drawings, design computations and catalog cuts for review in accordance with Article 1.05.02. The design shall conform to the AASHTO *LRFD Bridge Design Specifications* and the AASHTO *Guide Design Specifications for Bridge Temporary Works*.

The design computations shall include, but not be limited to, the following:

1. Material designations and material lists.
2. Allowable loads or capacities for all structural members and components. Appropriate reductions in allowable stresses and loads shall be used in design when other than new or undamaged materials are used in the construction of the temporary jacking system.
3. Soil or pavement bearing capacities, if applicable.
4. Anticipated lifting loads.
5. Anticipated design loads and stresses on structural members and components.
6. Anticipated design loads on adjacent structures, such as the Park River Conduit.
7. References for all design equations.

The working drawings shall include, but not be limited to, the following:

1. General Notes.
2. Details of framing system such as bents, towers, distribution beams, foundations, etc.

3. Maximum anticipated reaction from each jack supported by the temporary support system.
4. A Plan showing the layout of the bracing and supporting members. All connections shall be detailed. Provisions shall be included to ensure that all jacks may be set level.
5. Details of proposed modifications to the existing structure and the methods of restoration. All modifications to the bridge shall be removed unless otherwise permitted by the Engineer to remain. Welds are to be removed by grinding or "arc" gouging without damaging the base metal that is to remain. No holes shall be drilled into or concrete removed from the superstructure.
6. The location, length, and type of temporary barriers placed for protection of the temporary support system.

The furnishing of calculations and working drawings shall not serve to relieve the Contractor of any responsibility for the safety of the work or the successful completion of the work.

The Contractor shall field verify all working drawing dimensions before fabricating any materials.

Jacking loads shall not exceed 50% of the load capacity of the jacks.

After the load is removed from the substructure, blocking may be installed as necessary to support the superstructure while work is performed on the substructure. At all locations where jacks are installed and required to support liveload between work shifts, the Contractor shall place structural steel bolsters around or alongside the hydraulic jacks that will maintain the position of the jacked superstructure in the event that the jack or line of jacks are depressurized. This requirement is in addition to locking nuts provided at each cylinder. The details of the jacking bolsters shall be submitted for review and acceptance by the Resident Engineer.

The Contractor shall hydraulically lift the existing structure to the minimum height necessary for the rehabilitation work shown on the plans. Differential lifting height between adjacent spans shall not exceed ½" unless approved by the Resident Engineer.

The Jacking system shall be properly designed and substantially constructed and maintained for the dead and live loads which will come upon it. The Contractor shall prepare and submit to the Engineer for review, plans and computations for the hydraulic lifting system, including all materials and procedures to be utilized. Items submitted for review shall be designed by a Professional Engineer, licensed in the State of Connecticut. Review and acceptance of the Contractor's plans shall not be considered as relieving the Contractor from any responsibility.

The jacking system shall be installed as detailed on the working drawings. The jacking system, once installed, shall not prohibit the Contractor from performing any work required by the contract plans. The Engineer may require that any lifting equipment which he deems to be inadequate or faulty be removed from the project site. The Contractor shall have two spare jacks available during the jacking operation.

Jacking against the concrete counterweight or the concrete deck, or any portion of these elements, shall not be permitted.

The applied lifting force at each jacking point location shall not exceed the maximum anticipated lifting load without approval by the Engineer.

The Contractor shall carefully inspect and maintain the jacking system during its use.

When the jacking system is no longer required, the Contractor shall promptly remove and dispose of the temporary support system. Excavated areas shall be restored to their original condition and to the satisfaction of the Engineer. Seeded areas shall be re-seeded and bare areas shall be restored with select granular fill, stone, or other material approved by the Engineer. Temporary subgrade concrete elements installed for jacking operations may remain permanently in place. Steel elements shall be removed. Anchors into subgrade may remain if galvanized or if exposed surfaces are painted.

Prior to any construction, the Contractor is responsible for locating all the substructures and utilities within the working area. Place and limit construction equipment, construction loads and/or surcharges in the vicinity of the identified substructures and/or utilities such that the substructures and utilities are not damaged due to the construction activities. Monitor and control vibrations and potential movements caused by the any construction activities to avoid any damages to the adjacent substructures and utilities. Damages to any substructures and utilities shall be immediately brought to the attention of the Engineer and the Owner of the subsurface elements.

The Contractor shall be responsible for any damage caused to any part of the structure, utilities, pavement, or vehicular traffic as a result of the work required by this special provision. He shall repair and/or replace any such damage at no cost to the State, and to the satisfaction to the Engineer.

Methods of temporarily supporting the superstructure depicted on the plans represent a suggested method of support. The Contractor may submit alternative methods. Regardless of whether the suggested method or an alternate method is used, the temporary support system chosen as part of this item shall be supported by working drawings and design computations for review and approval by the Engineer. See earlier paragraphs for submission requirements.

**Method of Measurement:**

The work included in the item “Jacking Existing Superstructure” shall be measured as each system designed, fabricated, erected and removed as specified herein for which one (1) location shall be measured for bridge pier that requires hydraulic lifting for the purpose of completing the concrete pier repairs noted on the plans, identified thereon, and as directed by the Engineer, regardless of the number or type of systems provided to complete the work and regardless of the makeup of the hydraulic lifting system supported by the temporary support system.

**Basis of Payment:**

The work "Jacking Existing Superstructure" will be paid for at the Contract Unit price for each pier location, measured as noted above, which unit price shall include the cost of all material, equipment, labor, and incidental expenses required to satisfactorily complete the work in accordance with the contract documents. The unit price shall also include the cost of the calculations prepared by the licensed Profession Engineer, erection, and removal of the temporary system. All materials, labor, equipment and incidental costs associated with temporary foundations for the support system shall also be included. Excavation, temporary support of excavation, backfill, and restoration of the site, at areas disturbed during installation, use, or removal of the temporary support system is included in this item.

Apparatus and related work to perform hydraulic lifting shall be included as part of the Item "Jacking Existing Superstructure".

| Pay Item | Pay Unit |
|---|---|
| Jacking Existing Superstructure | EA |

# ITEM #0521003A – BEARING REPLACEMENT WITH ELASTOMERIC BEARING PADS

## Description:

Work under this item shall consist of removing existing expansion rocker and sliding plate bearings and furnishing & installing steel-laminated elastomeric bearings with factory vulcanized external load plates as shown on the plans, as directed by the Department, and in accordance with these specifications. Modifications to existing structural elements to allow installation of the new elastomeric bearing pads are incidental to bearing replacement and included with this item, except as noted otherwise on the plans or herein. This work includes shims between the external load plate and the structural steel bolsters as incidental to proper installation of the bearings.

Bolsters placed between the existing girder bottom flange and the top of the external load plate are not included in this item, but are included in the item for "Structural Steel Repairs (Site No. 1)".

Temporary support assemblies and hydraulic lifting of the superstructure to allow replacement of the bearings are not included as part of this item, but are paid for under their respective items.

Existing bronze slide plate bearings shall be inspected by the Engineer and the bearing units that are deemed suitable by the Engineer shall remain the property of the Department. See Notice to Contractor – Salvaged Material.

**Materials**: Elastomer, laminae, fabricated pads, pads and adhesive for bonding the pads to steel shall conform to the requirements of Article M.17.01, as amended herein.

1. **Elastomer:** The elastomer compound shall be low temperature grade 3 (as defined by the testing requirements), have a Shore "A" Durometer hardness as shown on the plans and meet the requirements of the AASHTO LRFD Bridge Construction Specifications, 3rd edition, 2010, up to and including 2015 interim revisions..

2. **Laminae**: The internal steel laminates, used for reinforcement, shall be a mild rolled steel conforming to ASTM A709 (AASHTO M270), Grade 36 or 40, ASTM A611, Grade C or D, or an approved equal. The laminae shall be sandblasted and cleaned of all surface coatings; rust and mill scale before bonding and shall be free of sharp edges and burrs.

3. **Fabricated Pads:** The fabrication and fabrication tolerances of elastomeric bearings shall conform to the requirements of the AASHTO LRFD Bridge Construction Specifications and Article M.17.01-3(a)(2) .

   Every bearing shall be visually inspected for compliance with dimensional tolerance and for overall quality of manufacture. Buffing, cutting, or other attempt to alter the

size of the bearings, for the purpose of meeting the tolerances stated herein will not be permitted.

(f) Each steel-laminated elastomeric bearing shall have embossed on it, the following: the word "CONN," project number, the manufacturer's identification code or symbol, and the month and year of manufacture. The bearing shall also have stenciled on it, with indelible ink, the orientation, order number, lot number, bridge number, bearing identification number, and elastomer type and grade (Neoprene, Grade3). The markings should be placed on a side of the bearing that is visible after installation

(g) If guide pins or other devices are used to control the side cover over the steel laminates, any exposed portions of the steel laminates shall be sealed by vulcanized patching.

4. **Adhesive for Bonding:** Adhesive bonding of the elastomer portion of the bearings to the external load plates is not permitted.

5. **External Load Plates**: The external load plates shall be fabricated from structural steel meeting the requirements of ASTM A709 Grade 50. External load plates shall be hot-dip galvanized in accordance with ASTM A123. Holes in external load plates shall be drilled prior to galvanizing.

   The surface of the bonding region of the external load plates shall be prepared by abrasive blasting to remove galvanizing prior to vulcanization of the bearing to the plate. Vulcanization shall be performed by the bearing manufacturer.

6. **Shim Plates:** The individual shims shall be placed between the bolster and the external load plate and shall be pre-drilled to suit the bolt pattern. Shims shall be cut to the dimensions of the assembled parts and drilled for all bolts that pass through the shims. Shims less than ¼-inch thick shall be Stainless Steel ASTM A240 Type 304. Shims ¼-inch or greater in thickness shall be Carbon Steel ASTM A709 Grade 50. Carbon steel shims shall be prime coated.

**Construction Methods:**

Submit a removal procedure to the Resident Engineer for review and acceptance prior to removal of existing bearings. Existing rocker bearings shall be restrained from rotation prior to initiating the hydraulic lifting operation in a manner that prevents the rockers from falling from the pier top.

Prior to removing existing bearings, sole plates, and associated bolted and welded connections, the Contractor shall locally remove the existing lead paint. The Contractor shall be responsible for repair of any damage done to existing structural members to remain during removal of bearing components. Grind smooth the underside of the girder bottom flange after removal of existing sole plate welds. The faying surface between the existing girder and the bolster shall be prime coated

prior to bolster installation. Care shall be taken during removal of the existing bearing assemblies so as not to damage any components which are to remain in service or are to be salvaged.

Anchor bolts that remain after removal of the existing bearings shall be removed to ½" below the top of the pedestal and the recess filled with a non-shrink grout conforming to the requirements of Article M.03.05.

Before fabricating any materials, the Contractor shall submit shop drawings to the Department, for review and approval. These drawings shall include, but not be limited to, the following information: manufacturers name, complete details of the bearings, material designations, nominal hardness of the elastomer, the quantity of bearings required, including test bearings, material designations, nominal hardness of the elastomer, the quantity of bearings required, including test bearings, and the location of the bearing identification.

Bearing areas, upon which the elastomeric bearings will be set, shall be cleaned of all debris. Bearing areas, shall be carefully finished, by grinding, in necessary, to a smooth, even, level surface of the required elevation, and shall show no variations from a true plane greater than 1/16" over the entire area upon which the elastomeric bearings are to rest.

The elastomeric bearings shall be installed as shown on the plans. The elastomeric bearings shall be installed when the temperature of the ambient air and the bearings is between $41^{o}$ F to $86^{o}$ F and has been within this range for at least 2 hours. The Contractor shall jack the superstructure and reset all bearings erected outside of this range once conditions permit.

Adhesive bonding of the elastomeric bearings to steel and concrete surfaces is not permitted. Welding, with the elastomeric bearings in place, is permitted at locations where there is more than 1 ½ inches between the weld and the elastomer. In no case shall the elastomer be exposed to temperatures greater than 400 F. Welding shall conform to the requirements of Sub article 6.03.03. Existing coatings shall be removed and the prime coat of the new steel shall be masked in the weld areas.

Assembly with high strength bolts shall conform to the requirements of Article 6.03.03.

The elastomeric bearings shall bear uniformly on all surfaces under full dead load. If uniform bearing is not present, the gaps beneath the bearing shall be filled with elastomeric shims. The Contractor, in the presence of the Department, shall measure the gaps to determine the limits of the areas requiring shims.

The Contractor shall raise the superstructure and install steel shims between the bolster and the external load plate as required to provide uniform bearing at all surfaces. Shims shall be shown and fully dimensioned as details on the shop drawings. Shims with open side or U-shaped holes for bolts will not be permitted. No shims shall have less than two holes for bolts. Bolt holes shall not be punched at the Fabricator's shop to prevent distortion of the shims.

In general, sufficient thickness shall be furnished to secure 1/64-inch variations of the shim allowance plus one shim equal to the full allowance. For example, a ½ inch nominal shim pack shall consist of the following thickness variations: one ½-inch, one ¼-inch, one 1/8-inch, one 1/16-inch, one 1/32-inch, and two-1/64-inch.

**Method of Measurement:**

This work shall be measured by each existing bearing assembly removed and replaced with an elastomeric bearing assembly, furnished, installed, and accepted. No allowance shall be made for test bearings. Furnishing, fabricating, and placing shims is incidental to this work. Shims shall not be measured.

The work to furnish and fabricate the galvanized external load plates and vulcanize the plates to the bearings, shall not be measured separately.

Removal of the existing expansion bearing assemblies and salvage of the bearing units selected by the Engineer shall not be measured separately.

**Basis of Payment:**

This work will be paid for at the contract unit price for each existing bearing assembly that has been removed and replaced with an elastomeric bearing assembly, complete in place, which price shall include all external steel load plates, primer, internal steel laminates, test bearings, shims, materials, testing, equipment, tools and labor incidental thereto.

The contract price shall include local paint removal, removal and salvage of existing bearing assemblies identified by the Engineer as salvageable, removal and disposal of all other existing expansion bearing assemblies, sole plates, and keeper angles, cutting of existing anchor bolts, and preparation of bearing surfaces.

| Pay Item | Pay Unit |
|---|---|
| Bearing Replacement with Elastomeric Bearing Pads | Each |

# ITEM #0601039A – MODIFY BRIDGE PARAPET

# ITEM #0601044A – BRIDGE PARAPET CAP

**Description:** Work under this item shall consist of the complete modification of bridge and wingwall parapets from a safety walk shape to a sloped curb along with parapet and wingwall end treatments as shown on the plans, as directed by the Engineer and in accordance with these specifications.

At locations where a Bridge Parapet Cap is proposed, this work includes the removal of existing steel and aluminum bridge rail components, mounted on the top of the existing concrete parapet.

This work includes the removal of precast barrier elements presently mounted on the safety walk and anchored to the parapet face.

Aluminum bridge rail components deemed suitable for salvage by the Engineer shall remain the property of the Department. See Notice to Contractor – Salvaged Material.

**Materials**:

Concrete: The concrete shall be a Contractor designed portland cement concrete, air entrained, with a maximum size coarse aggregate of 3/8" and a minimum 28 day compressive strength (f'c) of 4000 psi.

The Contractor shall submit to the Engineer a concrete mix design for approval. The Contractor shall further provide a certificate stating that the mix submitted shall meet the requirements.

Coarse aggregate shall consist of broken stone, having a maximum size of 3/8", conforming to the requirements of Article M.03.01.

Fine aggregate, Water, Air Entraining Admixture and Retarder Admixture shall conform to the requirements of Article M.03.01.

The air entraining feature may be obtained by the use of either air entraining portland cement or an approved air entraining admixture. The entrained air content shall not be less than four (4) percent or more than six (6) percent.

Portland Cement shall conform to the requirements of M.03.01, except that Type III or Type IIIA portland cement may be used at no additional cost to the State.

The Contractor may submit, for the approval of the Engineer, a water reducing admixture for the purpose of increasing workability and reducing the water requirement for the concrete.

When the Engineer has previously approved the use of a high range water reducer in the concrete mix, the entrained air content shall be not less than five (5) percent nor more than eight (8) percent.

The addition to the mix of calcium chloride or an admixture containing calcium chloride will not be permitted.

Adhesive Bonding Material: The adhesive bonding material shall be a resin compound specially formulated to anchor steel bars in holes drilled into concrete for the purpose of resisting tension pull out. The materials shall be from the Department's approved product list.

A Materials Certificate will be required in accordance with Article 1.06.07, certifying the conformance of the adhesive bonding material to the requirements set forth in the Manufacturer's specifications.

Junction Box Covers: Replacement junction box covers shall be fabricated from ASTM A709 Grade 36 structural steel to meet existing mounting details. Covers shall comply with the requirements of Section M.06.02. Covers shall be galvanized in accordance with Section M.06.03.

Reinforcing: The reinforcing shall be uncoated and conform to ASTM A615, Grade 60.

Non-Shrink Grout: Non-shrink, non-staining grout shall conform to Subarticle M.03.05.

Joint Seal: Joint seal shall conform to the requirements of Subarticle M.03.08.

**Construction Methods**: Existing precast barrier curb, anchor bolts, and wood shims shall be removed from the existing safety walk. The existing safety walk portion of the parapet, steel curb plates, and stone curb shall be removed to the limits shown on the plans.

Anchor bolts between the precast barrier curb and the vertical face of parapet shall be removed to a depth not less than ½" below the surface of concrete and the recess shall be filled with non-shrink, non-staining grout.

If, after removal of precast barrier elements, the covers of the existing cast iron junction boxes are missing, the Contractor shall replace the covers with new galvanized steel covers.

The existing steel bridge rail components shall be removed and properly disposed of. The existing aluminum bridge rail components shall be removed and salvaged as directed by the Engineer. Care shall be taken during removal of the existing bridge rail systems so as not to damage any components which are to remain in service or are to be salvaged.

The parapet and wingwall end treatments that require modifications shall be reconstructed as shown on the plans. Care shall be taken not to damage the portion of the parapet that is to remain in place.

Removal of the concrete shall be accomplished by pneumatic hammers approved by the Engineer. The weight of the pneumatic hammers shall not exceed 30 lb. Existing reinforcing, designated to remain in place, shall be cleaned of loose rust, concrete, and other foreign matter, and if required, cut and bent as shown on the plans.

Holes for the additional reinforcing shall be drilled into the concrete as shown on the plans. Drilling methods shall not cause spalling, cracking, or other damage to the existing concrete. The weight of the drill shall not exceed 20 lb. Those areas damaged by the Contractor shall be repaired by him, in a manner suitable to the Engineer, at no expense to the State. The hole diameter shall be as recommended by the Manufacturer of the chemical anchoring material for the specific diameter of the reinforcing steel bar.

A pachometer shall be used to locate existing steel. If existing reinforcing bars are encountered during the drilling operation, the hole shall be relocated to clear the existing reinforcing as directed by the Engineer. Uncompleted holes shall be filled with grout and finished smooth to the contour of the surrounding concrete surface.

Fabrication and placement of reinforcing steel shall conform to the requirements of Article 6.02.03. The reinforcing steel and the chemical anchoring material shall be installed in the holes prepared in accordance with the chemical anchoring material Manufacturer's recommendations.

Mixing, placing, curing, and finishing of the concrete shall be in accordance with Article 6.01.03.

Any newly placed concrete having a hollow sound when sounded with a hammer shall be replaced by the Contractor at his expense by a method acceptable to the Engineer.

Non-shrink grout shall be placed to finish the roughened deck areas, adjacent to the gutterline, smooth and flush with the surrounding deck.

The existing vertical faces of the parapet shall be protected during the pouring and finishing of the modified section to prevent concrete staining. Any staining or discoloration of existing concrete caused by the Contractor shall be cleaned at the Contractor's expense by a method acceptable to the Engineer.

**Method of Measurement**: This work to modify the bridge parapet, which includes the removal of the concrete safety curb and granite stone curbing, drilling and grouting of dowels into deck concrete for reconstructed curbs, furnishing and placing reinforcement, and placing and finishing concrete for the reconstructed curbs, will be measured for payment as the number of linear feet of modified bridge parapet, measured along the new gutterline, constructed in accordance with the contract plans. Barrier transition length shall not be included in this measurement. Removal and disposal of precast barrier segments, anchor bolts, and wood shims is included but shall not be measured. The work to furnish and install new steel junction box covers is included but shall not be measured.

The work to construct the bridge parapet cap, which includes drilling and grouting dowels into the top of the concrete parapets, furnishing and placing of reinforcement and placing of concrete for the reconstructed cap,will be measured in linear feet along the top of the parapet cap from the start and end points identified on the plans. Removal of existing steel and aluminum bridge railing components, and salvage of aluminum bridge railing components is incidental to the item "Bridge Parapet Cap" and is not measured. Barrier transition length shall not be included in this measurement.

**Basis of Payment:** This work will be paid for at the contract unit price, per linear foot, for "Modify Bridge Parapet" or "Bridge Parapet Cap" complete in place, which price shall include all materials, equipment, tools and labor incidental thereto.

| **Pay Item** | **Pay Unit** |
|---|---|
| Modify Bridge Parapet | L.F. |
| Bridge Parapet Cap | L.F. |

# ITEM # 0601270A - FULL DEPTH PATCH (HIGH EARLY STRENGTH CONCRETE)

**Description:** This item shall consist of the saw cutting concrete, removal of all deteriorated concrete for the full depth of the deck slab, furnishing and installing deformed steel bars, and reconstructing the slab with new concrete, where directed by the Engineer and as hereinafter specified. Locating areas of concrete in need of repair shall be performed during a hands-on inspection of the existing structure. Labor, materials, and equipment necessary to complete the hands-on inspection, and to provide access for the Resident Engineer to perform a hands-on inspection to verify the extent of repairs is incidental to this work. The Contractor's schedule shall include adequate time for the Resident Engineer to verify and approve the proposed work.

This item includes work above local roads, parking areas, sidewalks, the railroad right-of-way, etc. and the protection of these areas is included in this item.

**Materials:** The materials shall conform to the following requirements:

1. High Early Strength Concrete – The high early strength concrete shall conform to one of the following:

   A. The Contractor shall design and submit to the Engineer for approval a high early strength concrete mix. This mix shall be air-entrained, and shall be composed of Portland cement, fine and coarse aggregates, approved admixtures and additives, and water. The mix shall contain between 4 and 7 percent-entrained air, and shall attain a 1-hour compressive strength of 2,500 psi. Additionally, the mix shall contain shrinkage compensating additives such that there will be no separation of the patched area from the parent concrete. This shrinkage-compensating additive shall be utilized so as to produce expansion in the high early strength concrete of no more than 3 percent. Additional requirements for the mix are as follows:
      - A minimum 24 hour compressive strength of 3,500 psi and a 28-day compressive strength of 5,000 psi (ASTM C109)
      - A minimum bond strength of 220 psi after 24 hours (ASTM C882)
      - A minimum initial setting time of 20 minutes at $75^{o}$ +/-$5^{o}$ F (ASTM C266)
      - The ability to withstand 50 cycles of freeze-thaw (10% NaCl solution) with a maximum loss of 6% (ASTM C666)
      - A workable mixture when extended with a minimum 60% No. 8 aggregate by weight of dry concrete component.

   B. In lieu of the above high early strength concrete mix, the Contractor may propose the use of a proprietary type mix that will meet the same physical requirements as those stated above. A mix design shall be submitted for this material, stating the percentage of each

component to be utilized. Unless otherwise approved by the Engineer, one of the following proprietary materials may be used:

Rapid Set DOT Cement
CTS Cement Manufacturing
1023 Dogwood Lane
West Chester, PA 19382
215-429-4956

HD-50
Dayton Superior Corporation
PO Box 355
Oregon, IL 61061
800-745-3707

Speed Crete Green Line
Tamms Industries
730 Casey Ave.
Wilkes-Barre, PA 18702
800-218-2667

2. Regardless of the type of high early strength concrete proposed by the Contractor, substantive data that demonstrates the ability of the material to meet the specification requirements shall be submitted with the proposed mix design at least two weeks prior to its use.

3. Deformed Steel Bars: Section 6.02.

**Construction Methods:** Construction methods shall conform to the following requirements:

1. Inspection of the Structural Slab: Before any existing concrete is removed from the structural slab, the Contractor will provide the Engineer clear access to the bridge deck. During this time, the Engineer will perform an inspection of the structural slab and designate areas where concrete removal will be required. Due to the nature of the operations, the inspection can be performed only after some existing materials, notably overlays and waterproofing systems, have first been removed from the structural slab. It shall be the responsibility of the Contractor to arrange the construction schedule so that the required operations may be performed without causing delay to the work.

   No operations will be performed by the Engineer until after the following construction work has been completed:

   a) The existing bituminous overlay or concrete wearing course, if present, has been removed.

   b) The existing waterproofing system, if present, has been removed.

   The removal of this material will be paid for under other applicable items.

   It shall be the responsibility of the Contractor to inform the Engineer, in writing, of the date that a structure will be available for inspection operations. Notification shall be given to the

Engineer at least seven (7) days prior to the date that the area in question will be in a condition acceptable to the Engineer.

The Contractor is hereby informed that the following time period will be necessary to perform the required inspection operations:

One working day with suitable weather conditions per each six thousand square feet, or portion thereof, of structural slab area.

The Contractor will not be allowed to do any further work to the structural slab, until all necessary inspection operations have been performed, unless given permission by the Engineer. The Contractor will include any costs related to the allowance for this inspection in the general cost of the work.

2. Removal of Deteriorated Concrete: All deteriorated concrete shall be removed within the limits shown on the plans and where ordered by the Engineer. The lateral limits of each area to be repaired will be delineated by the Engineer and suitably marked. Where several areas to be repaired are very close together, the Engineer may combine these individual patches into a large area. The outlines of each such area shall first be cut to a depth of one-half (1/2) inch with an approved power-saw capable of making straight cuts. In the event that reinforcing steel is encountered within the upper 1/2 inch depth during sawing operations, the depth of saw-cut shall immediately be adjusted to a shallower depth so as not to damage the steel bars. If so directed by the Engineer, saw cutting shall again be carried down to the 1/2 inch depth at other locations of repair provided reinforcing steel is not again encountered. Where over-breakage occurs resulting in a featheredge, the featheredge shall be squared up to a vertical edge in an approved manner. Where sawing is impractical, the areas shall be outlined by chisel or other approved means.

   The removal of concrete shall be by pneumatic hammer methods and shall be governed by the requirements set forth in the special provision Item “Partial Depth Patch” and as directed by the Engineer.

   The Contractor shall take adequate measures to prevent concrete debris from falling to any area below the structure and onto adjacent roadway lanes. All debris shall be promptly cleaned up and removed from the site. All material removed shall be satisfactorily disposed of by the Contractor.

   Where existing reinforcing steel is damaged or has insufficient cover as determined by the Engineer, it shall be cut out and replaced with new reinforcing steel the same size, with a minimum length for lap splices as indicated on the plans or as directed by the Engineer.

3. Surface Preparation: Sound reinforcing steel which is in the proper position in the slab shall be left in place and cleaned of all concrete. The smaller fragments shall be removed with hand tools or by water blast cleaning.

The newly exposed reinforcing steel and concrete faces shall be cleaned of loose or powder-like rust, oil solvent, grease, dirt, dust, bitumen, loose particles, and foreign matter just prior to patching.

Existing concrete surfaces against which the new patch will be placed shall be dampened. All free water shall be removed from the surface.

Forms shall conform to the pertinent requirements of Article 6.01.03.

The cleaned concrete surface area to receive patching material shall be wetted for a one hour period immediately prior to placement of the concrete patch. Any standing water shall be blown out with compressed air prior to application of binding grout and patch material.

After wetting of the deck patch area to receive patching, and removal of the standing water, cement binding grout shall be scrubbed into the concrete patch bonding surface with stiff bristled brushes. All bonding surfaces in the patch area shall receive a coating of bonding grout within a time period not to exceed five (5) minutes prior to placement of the concrete patch material.

4. Mixing, Placing, and Finishing: Mixing and placing concrete shall be done in accordance with the applicable portions of Article 6.01.03. Mixing and placing shall not be executed unless the ambient temperature is above 40 degrees F. and rising.

   The concrete mix shall be properly placed to insure complete contact around all reinforcing steel and against existing concrete at patch edges and compacted to a level slightly above the surrounding deck surface. Vibrators of the appropriate size shall be used for all consolidation of the concrete, regardless of the size of the patch area, with no hand tamping or rodding allowed. Concrete may be moved horizontally with the aid of hand tools, but not with the use of vibrators (excessive vibration shall be avoided).

   Vibrating plates or vibrating screed shall be used on the surface of all patches for strike off and consolidation. After the concrete has been spread evenly and compacted to a level slightly above the adjacent concrete surface, the vibrating plate or screed shall be drawn over the surface at a uniform speed without stopping, in order to finish the surface smooth and even with adjacent concrete. The surface shall be float finished. Finishing operations shall be completed before initial set takes place.

5. Curing: Immediately after finishing of the patch area, a sheet of 4 mil polyethylene shall be placed over the repair area, in conjunction with insulating curing material. This material shall be a minimum of 2-inch thick closed cell extruded polystyrene insulation board that conforms with the requirements of ASTM C578. It shall have a minimum certified R-value of ten (10). The insulating material shall extend a minimum of 12 inches beyond the limits of the patch area, and shall be kept in intimate contact with the surrounding payment surface to prevent lifting of the material. It shall be weighted down with sandbags that weight at

least 15 pounds each. The sandbags shall be placed a minimum of two (2) feet on center around the patch area.

Cured patches, having a hollow sound when chain dragged or tapped (indicating delamination), shall be replaced by the Contractor at his expense until a patch acceptable to the Engineer is in place.

6. Tolerances in Finished Patch Surfaces: The surface profile of the patched area shall not vary more than one-eighth inch in a distance of 10 feet, when a 10 foot long straightedge is placed on the surface at any angle relative to the centerline of the bridge. Humps in the patch that exceed the one-eighth inch tolerance shall be ground down by approved machinery. Sags or depressions in the surface of the patch area that exceed one-eighth inch tolerance as determined by the Engineer shall be repaired by removal of the concrete in the depression to a depth of one inch and repaired in the previously described manner.

7. Testing: The Contractor shall form, cure and test all concrete test cylinders under supervision of a representative of the Department. The dimensions, type of cylinder mold, number of cylinders, and method of curing shall be as directed by the Engineer.

   The Contractor shall provide a portable compressive testing machine, on site, for the purpose of testing all compressive strength cylinders. All testing shall be in accordance with the requirements of ASTM C39. NOTE: This compressive testing machine must be calibrated in accordance with the provisions of Section 5, ASTM C39.

8. Time Schedule: Traffic will not be allowed on any areas where the Contractor has placed and finished concrete until the material has properly cured as specified, and has developed the required strength of 2,500 psi as determined by the compressive strength test, or until the Engineer authorizes its opening to traffic.

   All work shall proceed as required by the "Maintenance and Protection of Traffic" and "Prosecution and Progress" specifications elsewhere within the contract documents.

**Method of Measurement**: This work will be measured for payment by the actual volume in cubic yards of replacement concrete, complete and accepted. No deduction will be made for the volume of reinforcing steel. Removal of concrete will not be measured for payment. Protection of areas below the bridge structure during performance of this work is incidental and shall be measured.

**Basis of Payment**: This work will be paid for at the contract unit price per cubic yard for "Full Depth Patch (High Early Strength Concrete)" complete in place, which price shall include performing hands-on inspection, providing access to the Engineer for hands-on inspection, sawcutting and removal of concrete, surface preparation, furnishing and installing deformed steel bars, formwork, concrete replacement, all equipment, tools, labor and work incidental thereto.

| Pay Item | Pay Unit |
|---|---|
| Full Depth Patch (High Early Strength Concrete) | C.Y. |

# ITEM # 0601318A – PARTIAL DEPTH PATCH

**Description:** Work under this item shall consist of the removal of spalled, delaminated or otherwise deteriorated concrete from existing bridge decks and/or approach slabs using hand-held concrete breakers, such as jack hammers, and replacement with fast setting patching material as shown on the plans, as directed by the Engineer, and hereinafter specified. The Contractor's schedule shall include adequate time for the Resident Engineer to verify and approve the proposed work.

Work under this item shall also include the furnishing and installation of reinforcing bar wire ties and vertical supports on inadequately supported and/or vibrating reinforcing steel within deck patch areas, as ordered by the Engineer.

Locating areas of concrete in need of repair shall be performed during a hands-on inspection of the existing structure. Labor, materials, and equipment necessary to complete the hands-on inspection, and to provide access for the Resident Engineer to perform a hands-on inspection to verify the extent of repairs is incidental to this work.

**Materials:** The materials shall conform to the following requirements:

1) Patching Material: The patching material shall be a concrete composed of a quick setting cement, fine aggregate, coarse aggregate and water. This concrete shall harden within 40 minutes, and develop minimum compressive strengths of 1,000 psi within one hour after set and 3,000 psi within three days.

The Contractor shall design and submit a quick setting mix to the engineer for approval. The mix proportions and method of application shall be in accordance with the manufacturer's recommendations. Sources of supply of all the materials shall be clearly indicated.

Fine aggregate shall conform to the requirements of Subarticle M.03.01-2.

The coarse aggregate shall conform to the requirements of Subarticle M.03.01-1. The required grading shall be obtained by using 100 percent of No. 67 size coarse aggregate. Grading of the aggregate shall conform to the gradation table of Article M.01.01.

Water shall conform to the requirements of Subarticle M.03.01-4.

Unless otherwise approved by the Engineer, the quick setting cement shall be one of the following materials:

Cementitous Based Materials:

Emaco T-415
Master Builders, Inc.
23700 Chagrin Blvd.
Cleveland, OH 44122
800-628-7378

Perma Patch FP
Dayton Superior Corporation
PO Box 355
Oregon, IL 61061
800-745-3707

Rapid Set DOT Cement
CTS Cement Manufacturing
1023 Dogwood Lane
West Chester, PA 19382
215-429-4956

Speed Crete Green Line
Tamms Industries
730 Casey Ave.
Wilkes-Barre, PA 18702
800-218-2667

Fastcrete
Silpro Corporation
2 New England Way
Ayer, MA 01432
508-772-4444

Other patching products not currently approved by the Department may also be substituted provided that the Contractor submits to the Department the manufacturer's literature and a sufficient quantity of the proposed patching materials for field testing and evaluation. Further information regarding approval procedures may be obtained by contacting the Department's Research and Materials Testing Laboratory at 280 West Street, Rocky Hill, CT 06067. No substituted patching material shall be used until it has been approved in writing by the Department.

2) Epoxy Resin: The epoxy resin shall be a two component system. The base polymer shall be a thermosetting resin of the epoxy type. The epoxy resin shall be composed of 100% reactive constituents, which are a condensation product of the reaction of epichlorohydrin with bisphenol ether of bisphenol A, containing no more than trace amounts of hydrolyzable chloride. The epoxy resin shall have an epoxide equivalent between 465 and 530.

The reacting system shall consist of a blend of condensation polymers of dimerized and trimerized unsaturated fatty acids and an aliphatic polyamine.

Unless otherwise specified, pigmentation shall be required in the system so that the cured coating shall conform to the Federal Color Standard 595, No. 16357.

a) Physical Requirements of (Mixed) Epoxy Resin System:

A mixture of both components in the proportions recommended by the manufacturer shall conform to the following requirements:

Viscosity - 500 to 800 centipoises at 77°F
Pot life - 7 hours minimum at 75°F
Minimum solids content - 48%

The cured system shall not exhibit amine blushing or sweating.

When testing for abrasion by ASTM Designation D968, the pigmented finish coats shall require a minimum of 50 liters of sand to abrade a one mil thickness of coating.

A 2 ½ mil dry film thickness of the coating tested according to ASTM Designation D522 shall pass a 1/8 inch diameter mandrel test without splitting the film or causing loss of bond.

b) Sampling:

A representative sample of each component sufficient for the test specified shall be taken by a Department representative either from a well-blended bulk lot prior to packaging or by withdrawing 3 fluid ounce samples from no less than 5 percent by random selection of the containers comprising the lot or shipment. Unless the samples of the same component taken from containers show evidence of variability, they may be blended into a single composite sample to represent that component. The entire lot of both components may be rejected if samples submitted for test fail to meet any requirements of this specification.

c) Packaging and Marking:

The two components of the epoxy resin system furnished under these specifications shall be supplied in separate containers, which are non-reactive with the materials contained therein. The size of the container shall be such that the recommended proportions of the final mixture can be obtained by combining one container of one component with one or more whole containers of the other component.

Containers shall be identified as base polymer and reacting system, and shall show the mixing directions and usable temperature range as defined by these specifications. Each container shall be marked with the name of the manufacturer, the lot or batch number, the date of packaging, pigmentation if any, and the quantity contained therein in pounds and gallons.

Printed instructions from the manufacturer for mixing and applying the material shall be included.

Potential hazards shall be so stated on the package in accordance with the Federal Hazardous Products Labeling Act.

d) Control of Materials:

A Materials Certificate will be required in accordance with Article 1.06.07, certifying the conformance of the epoxy resin to the requirements set forth in this specification.

**Construction Methods:**

1) Inspection of the Structural Slab: Before any existing concrete is removed from the structural slab, the Contractor will provide the Engineer clear access to the bridge deck. During this time, the Engineer will perform an inspection of the structural slab and designate areas where concrete removal will be required. Due to the nature of the operations, the inspection can be performed only after some existing materials, notably overlays and waterproofing systems, have first been removed from the structural slab. It shall be the responsibility of the Contractor to arrange the construction schedule so that the required operations may be performed without causing delay to the work.

No operations will be performed by the Engineer until after the following construction work has been completed:

a) The existing bituminous overlay or concrete wearing course, if present, has been removed.

b) The existing waterproofing system, if present, has been removed.

Note: The removal of this material will be paid for under other applicable items.

It shall be the responsibility of the Contractor to inform the Engineer, in writing, of the date that a structure will be available for inspection operations. Notification shall be given to the Engineer at least seven (7) days prior to the date that the area in question will be in a condition acceptable to the Engineer.

The Contractor is hereby informed that the following time period will be necessary to perform the required inspection operations:

One working day with suitable weather conditions per each six thousand square feet, or portion thereof, of structural slab area.

The Contractor will not be allowed to do any further work to the structural slab, until all necessary inspection operations have been performed, unless given permission by the Engineer.

The Contractor will include any costs related to the allowance for this inspection in the general cost of the work.

2) Removal of Deteriorated Concrete: All deteriorated concrete designated for removal under this construction item shall be removed within the limits shown on the plans and where

ordered by the Engineer. The lateral limits of each area to be repaired will be delineated by the Engineer and suitably marked. Where several areas to be repaired are very close together, the Engineer may combine these individual patches into a large area. The outlines of each such area shall first be cut to a depth of one-half (1/2) inch with an approved powersaw capable of making straight cuts. In the event that reinforcing steel is encountered within the upper 1/2 inch depth during sawing operations, the depth of saw-cut shall immediately be adjusted to a shallower depth so as not to damage the steel bars. If so directed by the Engineer, saw cutting shall again be carried down to the 1/2 inch depth at other locations of repair provided reinforcing steel is not again encountered. Where over-breakage occurs resulting in a featheredge, the featheredge shall be squared up to a vertical edge in an approved manner. Where sawing is impractical, the area shall be outlined by chisel or other approved means.

All deteriorated concrete shall be removed by hand-held concrete breakers, such as jack hammers. Hydro-demolition methods will not be permitted

The weight of pneumatic hammers when used shall not exceed 25 pounds for concrete removal above the top reinforcing steel nor 15 pounds for concrete removal below the top reinforcing steel.

The depth of concrete removal shall be as shown on the plans, but shall be such as to include all spalled, delaminated, or otherwise deteriorated concrete. The Engineer will be sole determiner of what constitutes deteriorated concrete, using sounding methods or other evaluation measures at his discretion.

Where the existing reinforcing steel is damaged or corroded, it shall be cut out and replaced with new reinforcing steel of the same size. Any sound reinforcing steel damaged during the concrete removal operations, shall be repaired or replaced by the Contractor at his expense as directed by the Engineer. New steel shall be attached beneath or beside existing steel with a minimum splice length as indicated on the plans, or as directed by the Engineer. The concrete shall be removed to a minimum depth of 1 inch below the new steel.

The Engineer shall examine the underside of the bridge deck for pop-outs caused by the removal of the deteriorated concrete. When pop-outs that expose the bottom mat of reinforcing steel are encountered on the underside of the deck due to removal of concrete, the area shall be repaired in accordance with the procedure shown on the contract plans.

3) Surface Preparation: Sound reinforcing steel which is in the proper position in the slab shall be left in place and cleaned of all concrete, the smaller fragments to be removed with hand tools in patch areas where pneumatic hammers were used.

Reinforcing bar wire ties and vertical supports shall be installed on inadequately supported and/or vibrating reinforcing steel, as directed by the Engineer.

The concrete surface and reinforcing steel to receive patching material shall be either sandblasted or water blasted, followed by air blasting in order to remove all loose particles and

dust. All blasting operations shall be performed using techniques approved by the Engineer, taking care to protect all pedestrians, traffic, and adjacent property. All compressed air sources shall have properly sized and designed oil separators, attached and functional, to allow delivered air at the nozzle to be oil-free. The patch area shall be cleaned of all additional loose or powder-like rust, oil, solvent, grease, dirt, dust, bitumen, loose particles, and foreign matter just prior to patching.

The entire concrete surface to be patched shall be dampened. All free water shall be removed from the patch area.

4) Mixing, Placing, and Finishing: Mixing and placing concrete should not be done unless the ambient temperature is above 35°F. All mixing shall be accomplished by means of a standard drum-type portable mixer. A continuous type mobile mixer may be used if permitted by the Engineer. The Contractor shall calibrate the mobile mixer under supervision of the Engineer. Calibration shall be in accordance with the applicable sections of ASTM method C685. The total mix shall be limited to the quantity that can be mixed and placed in 15 minutes. The concrete mix shall be spread evenly and compacted to a level slightly above the pavement surface. Vibration, spading or rodding shall be used to thoroughly compact concrete and fill the entire patch area. Where practical, internal vibration shall be used in cases where concrete has been removed below the reinforcing steel. Hand tamping shall be used to consolidate concrete in smaller patches, including popouts.

Vibrating plates or vibrating screeds shall be used on the surface of all patches for strike off and consolidation. After the concrete has been spread evenly and compacted to a level slightly above the pavement surface, the vibrating plate or screed shall be drawn over the surface at a uniform speed without stopping, in order to finish the surface smooth and even with adjacent concrete.

The surface shall be float finished.

Finishing operations shall be completed before initial set takes place.

Cured patches, having a hollow sound when chain dragged or tapped (indicating delamination), shall be replaced by the Contractor at his expense until a patch acceptable to the Engineer is in place.

5) Tolerances in Finished Patched Surfaces: The surface profile of the patched area shall not vary more than one-eighth inch in a distance of 10 feet, when a 10 foot long straightedge is placed on the surface at any angle relative to the centerline of the bridge. Humps in the patch that exceed the one-eighth inch tolerance shall be ground down by approved machinery. Sags or depressions in the surface of the patch area that exceed one-eighth inch tolerance shall be repaired by removal of the concrete in the depression over an area determined by the Engineer to a depth of one inch and repaired in the previously described manner.

6) Test Cylinders: The Contractor shall make and perform compressive strength tests on representative cylinders under the supervision of the Engineer. The dimensions, type of cylinder mold and number of cylinders shall be specified by the Engineer. Traffic shall not be permitted on patched surfaces until the patch material attains a strength of 1800 psi, as determined by breaks of the test cylinders.

A portable compression testing machine shall be provided by the Contractor and available on site for cylinder testing. All testing and equipment shall conform to ASTM C39.

Note: This compression machine must be calibrated in accordance with the provisions of Section 5, ASTM C39.

7) Time Schedule: Work under this item begun on any specific bridge during a construction season shall be completed, at least, to include this item, membrane waterproofing and placing of first course of wearing surface as soon as possible and specifically before the beginning of the construction season's winter shutdown.

All work shall proceed as required by the "Maintenance and Protection of Traffic" and "Prosecution and Progress" specifications elsewhere within the contract documents. Traffic will not be allowed on any areas where the Contractor has removed deteriorated concrete until a minimum of 1.5 hours after the placing and finishing operations on the areas are complete as required by this specification.

**Method of Measurement:** This work will be measured for payment by the actual number of cubic feet of patching material used in acceptable concrete deck patches, except where the Engineer determines that the Contractor has unnecessarily removed sound concrete. Where sound concrete has been unnecessarily removed, the replacement concrete will not be measured for payment.

The actual number of cubic feet of patching material will be determined by the actual product yield per bag based upon the Contractor's mix design as determined by the Department's Material Testing Lab.

The Contractor shall provide the Engineer with a statement certifying the number of bags of patching material incorporated into the work.

**Basis of Payment:** This work will be paid for at the contract unit price per cubic foot of deck concrete repaired for "Partial Depth Patch", complete in place and accepted, which price shall include performing hands-on inspection, providing access to the Engineer for hands-on inspection, removal of deteriorated concrete, surface preparation of patch areas, concrete replacement, the furnishing and installation of reinforcing bar wire ties and vertical supports for inadequately supported existing reinforcing steel, all materials, equipment, including the portable compression testing machine required for the testing of the repair material, tools, labor and work incidental thereto.

No additional compensation shall be made for the removal of temporary patches previously placed at the direction of the Engineer.

Replacement of deteriorated rebar, if required, will be paid for under the item "Deformed Steel Bars."

Epoxy resin coating of exposed rebar at the underside of the deck, if required, will be paid for under the item "Clean and Coat Exposed Reinforcing Steel."

| Pay Item | Pay Unit |
|---|---|
| Partial Depth Patch | C.F. |

# ITEM #0603352A – TEMPORARY SUPPORT ASSEMBLY

**Description:**

The work for this item shall govern the work to design, fabricate, erect and remove a temporary means of support to allow hydraulic lifting of existing girders to allow bearing replacement. The Contractor shall determine the loads applied to the temporary support assembly and shall provide a means to support the lifting operation to account for such forces. Temporary means of support shall be provided as shown on the plans, and as directed by the Engineer.

Work shall also include the labor required to create a foundation or other means of support for the temporary support assembly to maintain stability during construction. . The Contractor shall not be permitted to bear directly upon horizontal slab portions of the Park River Conduit. All loads transferred to the conduit or the adjacent soil shall be documented in the design calculations.

This work excludes furnishing lifting apparatus and the work to perform the lifting operation, which shall instead by governed by the Special Provision for "Jacking for Bearing Replacement". This work also excludes all work to modify or strengthen the existing structure, in preparation for the lifting operations, which shall instead be included in the appropriate items, as identified in the Special Provision for "Jacking for Bearing Replacement".

Temporary barrier, to protect the temporary support assembly shall be considered incidental to the work.

Excavation, backfilling and restoration of excavated areas is incidental to the work and is included in this item.

Support of excavation is incidental to the work and is included in this item.

**Materials:** The materials used shall be of satisfactory quality, and capable of safely carrying the anticipated loads. All materials shall be approved by the Engineer before use.

Steel, timber, concrete, or any other material or combination of materials may be used for the temporary support assembly and supporting of the hydraulic lifting operation.

**Construction Methods:** Temporary supports shall be governed by Article 6.03.03-4(a) (Falsework).

Design computations shall be performed by a Professional Engineer licensed in the State of Connecticut and shall be prepared and submitted to the Engineer prior to any work on the girders for which the temporary support assembly is necessary. The calculations shall be signed and sealed by the Professional Engineer and submitted in paper and electronic form to the Engineer

for review. The Professional Engineer shall also be available for consultation interpreting his drawings and calculations, and in the resolution of any problem that may occur during the performance of the work. Each working drawing must be sealed.

The reactions from the temporary support assembly on underlying materials, the girder being supported, or any loads imparted on the existing substructure shall not exceed those allowed by the AASHTO Manual for Bridge Evaluation for the existing structural elements.

Prior to construction, the Contractor shall submit working drawings, design computations and catalog cuts for review in accordance with Article 1.05.02. The design shall conform to the AASHTO *LRFD Bridge Design Specifications* and the AASHTO *Guide Design Specifications for Bridge Temporary Works*.

The design computations shall include, but not be limited to, the following:

1. Material designations and material lists.
2. Allowable loads or capacities for all structural members and components. Appropriate reductions in allowable stresses and loads shall be used in design when other than new or undamaged materials are used in the construction of the temporary jacking system.
3. Soil or pavement bearing capacities, if applicable.
4. Anticipated lifting loads.
5. Anticipated design loads and stresses on structural members and components.
6. Anticipated design loads on adjacent structures, such as the Park River Conduit.
7. References for all design equations.

The working drawings shall include, but not be limited to, the following:

1. General Notes.
2. Details of framing assembly such as bents, towers, distribution beams, foundations, etc.
3. Maximum anticipated reaction from each jack supported by the temporary support assembly.
4. A Plan showing the layout of the bracing and supporting members. All connections shall be detailed. Provisions shall be included to ensure that all jacks may be set level.
5. Details of proposed modifications to the existing structure and the methods of restoration. All modifications to the bridge shall be removed unless otherwise permitted by the Engineer to remain. Welds are to be removed by grinding or “arc” gouging without damaging the base metal that is to remain. No holes shall be drilled into or concrete removed from the superstructure.
6. The location, length, and type of temporary barriers placed for protection of the temporary support assembly.

The furnishing of calculations and working drawings shall not serve to relieve the Contractor of any responsibility for the safety of the work or the successful completion of the work.

The Contractor shall field verify all working drawing dimensions before fabricating any materials.

When the jacking system is no longer required, the Contractor shall promptly remove and dispose of the temporary support assembly. Excavated areas shall be restored to their original condition and to the satisfaction of the Engineer. Seeded areas shall be re-seeded and bare areas shall be restored with select granular fill, stone, or other material approved by the Engineer. Temporary subgrade concrete elements installed for jacking operations may remain permanently in place. Steel elements shall be removed. Anchors into subgrade may remain if galvanized or if exposed surfaces are painted.

Prior to any construction, the Contractor is responsible for locating all the substructures and utilities within the working area. Place and limit construction equipment, construction loads and/or surcharges in the vicinity of the identified substructures and/or utilities such that the substructures and utilities are not damaged due to the construction activities. Monitor and control vibrations and potential movements caused by the any construction activities to avoid any damages to the adjacent substructures and utilities. Damages to any substructures and utilities shall be immediately brought to the attention of the Engineer and the Owner of the subsurface elements.

The Contractor shall be responsible for any damage caused to any part of the structure, utilities, pavement, or vehicular traffic as a result of the work required by this special provision. He shall repair and/or replace any such damage at no cost to the State, and to the satisfaction to the Engineer.

Methods of temporarily supporting the superstructure depicted on the plans represent a suggested method of support. The Contractor may submit alternative methods. Regardless of whether the suggested method or an alternate method is used, the Temporary Support Assembly chosen shall be supported by working drawings and design computations for review and approval by the Engineer. See earlier paragraphs for submission requirements.

**Method of Measurement:**

The work included in the item “Temporary Support Assembly” shall be measured as each assembly designed, fabricated, erected and removed as specified herein for which one (1) temporary support assembly shall be measured for each bridge bearing that requires hydraulic lifting for the purpose of completing the bearing replacement noted on the plans, identified thereon, and as directed by the Engineer, regardless of the number or type of assemblies provided to complete the work and regardless of the makeup of the hydraulic lifting system supported by the temporary support assembly.

**Basis of Payment:**

The work "Temporary Support Assembly" will be paid for at the Contract Unit price for each assembly, measured as noted above, which unit price shall include the cost of all material, equipment, labor, and incidental expenses required to satisfactorily complete the work in accordance with the contract documents. The unit price shall also include the cost of the calculations prepared by the licensed Profession Engineer, erection, and removal of the temporary assembly. All materials, labor, equipment and incidental costs associated with temporary foundations for the support assembly shall also be included. Excavation, temporary support of excavation, backfill, and restoration of the site, at areas disturbed during installation, use, or removal of the temporary support assembly is included in this item.

Apparatus and related work to perform hydraulic lifting shall not be included, but shall instead be included in the item for "Jacking Existing Girders".

| Pay Item | Pay Unit |
|---|---|
| Temporary Support Assembly | EA |