Needham-Newton Bridge No. N-04-002 = N-12-002 (362) over the Charles River

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Agenda

1. Project Scope
2. Bridge Rehabilitation Scope
3. Bridge Rehabilitation Design
4. Questions
Project Scope
Project Location
Scope of Work

Along the Highland Avenue/ Needham Street corridor and several side streets, roadway and safety improvements included:

- Widened roadways
- Addition of bike lanes
- Addition of sidewalks
- Traffic signal upgrades
- Drainage modifications
- Utility relocations
- Stormwater BMP installation
Bridge Rehabilitation Scope
Scope of Work

- Preserve a historic masonry bridge which has undergone no significant modifications since being originally constructed in 1875
- Widen the bridge at deck level to provide two 11 ft travel lanes, a 10 ft turning lane, two 2 ft shoulders, and two 8.5 ft wide shared use paths (SUPs, one on each side of the roadway)
- Provide crash-worthy bridge-railings between the roadway and SUPs
- Maintain a lane of traffic in each direction
- Maintain access during construction for small recreational vessels traveling along the Charles River through the center arch of the three-span structure
- Minimize environmental impacts to the riverbed, banks, and adjacent vegetated wetlands, and improving drainage runoff conditions
Details of Widening for Shared Use Paths

NOTE B:
FIELD INSTALLED SPRAY APPLIED MEMBRANE
WATERPROOFING WITH AN AGGREGATE WEARING
SURFACE. FULL WIDTH OF SLAB INCLUDING 14"
LEVEL PORTION. SEE SPECIAL PROVISIONS, ITEM
992.1, FOR DETAILS.
Details of Widening for Shared Use Paths

CROSS SECTION AT PIERS
(LOOKING UPSTATION)
SCALE: 3/16" = 1'-0"

EXIST. FILL MATERIAL
RELOCATED 9" - 9.5" ELEC.
NON-SHRINK LEVELING COURSE (TYP.)
LEAN CONCRETE FILL (TYP.)
DHW EL. 86.0 ±
TEMPORARY EARTH SUPPORT, LEFT-IN-PLACE (TYP.)
Staged Construction – 2 Lanes Maintained
Details of Precast Concrete Pier Caps
Details of Precast Concrete Pier Caps

PLAN

ELEVATION
Construction Sequence

A. Precast Pier Caps

1. Installation of 3 Tie-Down Anchors per Pier Cap, and Load-Testing of Tie-Down Anchors

2. Installation of Precast Pier Caps and Pre-Tensioning Anchors to Specified Load

3. Backfilling to Grade of CIP Moment Slabs with Gravel between Pier Caps

4. Placing Reinforced Concrete Moment Slabs on Grade between Pier Caps
Construction Sequence

B. Moment Slabs, BR-2 Railing, and SUP Slabs

5. Placing Reinforced Concrete Base of BR-2 Bridge Railing Atop Moment Slabs

6. Placing Steel Posts and Rail of BR-2 Bridge Railing

7. Placing Precast Shared Use Path (SUP) Slabs

8. SUP Slabs in Place with Temporary Wood Guard Rail at Edge (as of 2/16/2024)
Details of Various Stone Veneers – Salvaged From Pieces Removed from Spandrels

- 3 in. Thick Veneer at Wingwalls
- 6 in. Thick Veneer at Pier Caps
- 4 in. Thick Veneer at Face of Type 3 Moment Slabs
Details of Various Stone Veneers – Salvaged From Pieces Removed from Spandrels

3 in. Thick Veneer at Wingwalls

NOTE A:
RANDOM PATTERN. DOVETAIL SLOTS WITH ADJUSTABLE ANCHORS. ANCHORS SHALL BE STAINLESS STEEL, TYPE 302 OR 304.

STONE VENEER DETAIL
NOT TO SCALE

DOVETAIL SLOT DETAIL
NOT TO SCALE

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

Southeast Wingwall

Northeast Wingwall
Highland Ave. / Needham St. over Charles River

Photo of bridge before, and photo-realistic rendering of same view after construction.

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Highland Ave. / Needham St. over Charles River

Photo of bridge before, and photo-realistic rendering of same view after construction.
Highland Ave. / Needham St. over Charles River

Before and after photos of bridge from similar viewing points.
Before and after photos of bridge from similar viewing points.

Highland Ave. / Needham St. over Charles River
Before and after photos of bridge from similar viewing points.

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Thank You