

PART B

PROJECT TECHNICAL REQUIREMENTS

1.0 DESIGN-BUILDER’S SCOPE OF WORK

The Scope of Work at the 027601 bridge consists of completely replacing the existing structure in its entirety. RIDOT is proposing to replace this structure with a new two-span steel girder bridge supported on full height reinforced concrete abutments and one mid-span pier, both founded on spread footings as shown in the Base Technical Concept (BTC) Plans. Accelerated Bridge Construction Methods are encouraged to the extent possible. The proposed final roadway widths for the new bridge shall be ~~54’-1 ½”~~49’-0” curb to curb Southbound and 35’-0” curb to curb Northbound.

~~The approach roadway work to each bridge will consist of repaving to the limits shown in the BTC Plans. Only minor adjustments to the Route 146 profile are proposed. No widening of Route 146 or the local roads is proposed. Other highway work required will include, but not be limited to: replacement of existing guardrail, repair of stormwater treatments, placement of new pavement markings and maintenance and protection of traffic. The approach roadway work to each bridge will consist of repaving to the limits shown in the BTC Plans. Only minor adjustments to the Route 146 profile are proposed. No widening of Route 146 or the local roads is proposed. Two existing ramps are to be realigned, one ramp closed, and a permanent traffic signal is to be installed on Rt. 116 to improve the traffic safety of the interchange. Other highway work required will include, but not be limited to: replacement of existing guardrail, repair of stormwater treatments, placement of new pavement markings and maintenance and protection of traffic.~~

The Design-Build Team (D/B Team) shall have full responsibility to complete the final design of all Project elements, regardless of the fact that RIDOT has supplied certain preliminary design work for certain portions of the project to the D/B Team. All plans, specifications, reports and other information provided by RIDOT are for reference only. The BTC was developed to represent RIDOT’s minimum baseline requirements that shall be equaled or exceeded by the D/B Team. In the event that the D/B Team, through its final design development, proposes changes to their Technical Proposal or the BTC requirements, the D/B Team shall include written justification for RIDOT’s review and concurrence before incorporating such a change into a Design Submission. Any proposed changes to the BTC that are not demonstrated to be equal or better than the BTC, as determined by RIDOT, will be rejected by RIDOT. The D/B Team shall be required to provide a final, complete Project design that is stamped, sealed and certified by their own Professional Engineer of Record for review and approval by RIDOT and possibly third parties. The Professional Engineer shall be licensed to practice Engineering in the State of Rhode Island.

The D/B Team is responsible for diligently reviewing and verifying the BTC design for errors, omissions, inconsistencies or other defects and shall incorporate into their Cost Proposal all costs associated with correction of such errors, omissions, inconsistencies or other defects. RIDOT shall have no liability for errors, omissions or defects in the RIDOT supplied BTC design documentation.

PART B – PROJECT TECHNICAL REQUIREMENTS

The following requirements shall apply during construction:

- No long term reduction of travel lanes on RI-146 will be allowed. Refer to Section 2.11 below for more detailed temporary traffic control requirements.

shall be metalized in accordance with section 827 and painted in accordance with Section 825 of the RIDOT Standard Specifications for Road and Bridge Construction. The Finish Coat Color shall be blue (semi-gloss) to match Munsell Color 2.5PB 5/10.

- b. Aesthetics** – The proposed bridge aesthetic details (parapets, end posts, abutment stems, wingwalls, pilasters, concrete form liners, etc.) shall match those of the existing Ramp NE-A bridge (027621) to the maximum extent as practical. Details of the existing Ramp NE-A bridge are included in Part D of this RFP.
- c. Historic Bridge Identification Plaques** – The existing bridge no 276 contains four (4) ceramic tile bridge identification plaques at the end of each existing end post at the four corners of the bridge wingwalls. These plaques shall be carefully removed and reinstalled on the replacement bridge. The proposed location of the bridge identification plaques shall be coordinated with and approved by RIDOT’s Office of Historic and Cultural Review (OHCR). Please note that the year built plaques (i.e. do not contain the bridge number) shall ~~not~~ be preserved and delivered to RIDOT for disposition.
- d. Concrete Protective Sealer** – The entire exposed surface area of the completed abutments, pier and wingwalls shall receive a protective coating conforming to Section 820 of the RIDOT Standard Specifications.
- e. Bridge Deck Membrane** – Membrane waterproofing (Cold Spray-applied Liquid Membrane) is required for all bridge decks conforming to Section 813 of the RIDOT Standard Specifications for Road and Bridge Construction.
- f. Materials** – Any RIDOT required materials shall conform to RIDOT Standards and any specific requirements outlined in this RFP.
- g. Buy America Provision** – The D/B Team agrees to comply with 23 CFR 635.410 which provides that Federal funds may not be obligated unless all steel, iron and manufactured products used in FHWA funded projects are produced in the United States, unless a waiver has been granted by FHWA or the product is subject to a general waiver.

2.4.2 Scope of Work and Guidelines

The Scope of the Improvements to the bridge structures for this Project includes all components identified in accordance with the RFP documents provided. The D/B Team shall determine the full scope of the Project by a thorough examination of the entire RFP, BTC Plans and visits to the Project site.

The D/B Team shall be responsible for designing, furnishing, constructing, and installing all components of the Project, as stipulated herein. All bridge components shall be designed in accordance with AASHTO’s Load and Resistance Factor Design (LRFD) method. All work performed on this Project shall be completed using English units.

The D/B Team is solely responsible for assessing existing conditions, presenting design and/or engineering solutions, and defining the means and methods for complying with the requirements outlined in this RFP.

A geotechnical data report (GDR) has been prepared which defines the existing conditions at the site. Geotechnical reports are for informational purposes only. The D/B Team will be responsible for preparing a Final Geotechnical Interpretation Report for this bridge location based upon their final design. The D/B Team will also be responsible for identifying and performing any supplemental subsurface investigation, testing, analysis, etc., as required by their proposed design. Existing information and the GDR may be used as reference material.

The D/B Team shall furnish all Design and Construction Services, Quality Management, Quality Control (QC) program, materials, equipment, labor, transportation, and incidentals required to complete the design and construction work according to the terms of the Contract.

The BTC does not require obtaining additional Right-of-Way or easements to construct this Project. However, the D/B Team will be responsible for securing any right-of-way modifications resulting from either design modifications or construction issues.

The D/B Team’s obligations shall include, without limitation, the following:

1. Proposed Bridge Structure Requirements

- a. **General** – Complete replacement of the bridge structure carrying Route 146 over Route 116 (George Washington Highway) as described herein and as shown on the BTC Plans. The existing bridge is a concrete rigid frame structure that will be removed in stages. The proposed bridge will be constructed in stages and will consist of two separate superstructures, one each for Southbound and Northbound, separated by a small gap. The pier and abutments will also be built in stages.

The bridge shall be designed and constructed for a minimum 75-year service life.

Prestressed concrete butted box beams will not be allowed.

- b. **Geometry** – The existing horizontal alignment and roadway cross slopes shall match the existing bridge to the extent practical.

~~The proposed Southbound structure shall maintain the two travel lanes and the merge lane carried by the existing structure, and shall be widened to introduce a new 12'-0" future lane. The proposed Northbound structure shall maintain the two travel lanes and shoulder carried by the existing structure. Sidewalks and safety walks will not be included in the proposed structure. The proposed Southbound structure shall maintain the two travel lanes, the existing merge lane shall become a 12'-0" acceleration lane, and the structure~~

PART B – PROJECT TECHNICAL REQUIREMENTS

shall be widened to introduce a new 12'-0" shoulder. The proposed Northbound structure shall maintain the two travel lanes and shoulder carried by the existing structure. 1'-0" shoulders adjacent to the median barriers on each structure shall also be provided. Sidewalks and safety walks will not be included in the proposed structure.

PART B – PROJECT TECHNICAL REQUIREMENTS

For all design plan review submissions, the D/B Team shall coordinate with RIDOT regarding the number of copies required for review at least seven (7) days prior to submission. All design plan review submissions, shop drawing review submissions, and all permit application review submissions, shall be made simultaneously to the Resident Engineer’s field office, and to RIDOT headquarters at the following address:

Attention: **Dario Quintana**
~~Kristen Capaldi~~, Project Manager 1
Two Capitol Hill, 2nd Floor
Division of Project Management
Providence, RI 02903

Design reviews by RIDOT will consist of an oversight review to ensure that the design plans, calculations, specifications or other data have been developed in accordance with the requirements and design criteria presented in the RFP. The reviews will also consist of checking that the Quality Control procedures established in the Quality Control Plan are being followed. “Over the Shoulder” reviews may be used to facilitate the resolution of comments on the design submission. This type of review is a joint examination of the design documents by RIDOT and the D/B Team.

The RIDOT review time for design submission reviews and permit application reviews shall be twenty-one (21) calendar days from the date of receipt.

For scheduling purposes, the D/B Team shall assume a six week review period for the Rhode Island Department of Environmental Management (RIDEM) to review all permit applications submitted by RIDOT.

Three (3) full size copies of the final approved plans (Stamped and signed) shall be delivered to the Resident Engineer and five (5) copies to RIDOT headquarters (same attention as above.)

In addition, the D/B Team shall provide PDF copies of all submissions and shall provide CADD and WORD files of the final, Issued for Construction, submission.

The following Design Submittals are required:

1. **75% Highway/90% Bridge Design Submission** – As part of the project requirements, the D/B Team must provide a complete submittal package for the new bridge to RIDOT for review and approval. This submission shall include the following:
 - 75% Highway Plans/90% Bridge Plans
 - Utility Plan Submittal (for utility companies)
 - Job Specific Construction Specifications
 - Bridge Design Calculations
 - Environmental Permit Applications

PART B – PROJECT TECHNICAL REQUIREMENTS

2. **PS&E Design Submission** – After receiving all comments made on the 75%/90% Submission, the D/B Team shall prepare responses to the comments, revise all plans, specifications and calculations as required and submit a final design submission of all Plans, Calculations and Specifications for final review and approval.
3. **IFC (Issued for Construction) Submission**– Upon resolution of all comments, the D/B Team shall submit a stamped and signed set of final construction plans to RIDOT labeled as “Issued for Construction.” The final plans shall conform to the requirements for PS&E level plans for all elements in accordance with the RIDOT DPM requirements.

2.5 Lump Sum Breakdown/Major Items List

The following is a list of major work items for this project to be used as a starting point for developing a breakdown of the Lump Sum for payment purposes. This list is by no means exhaustive, and is based upon the Base Technical Concept.

Design:

- Final Bridge Design
- Final Highway/MP&T Design
- Stormwater Design & Environmental Coordination
- Utility Coordination
- Traffic Safety Improvements

Construction:

- Mobilization
- Field Office
- Demolition of Bridge Br. 027601
- Temporary Roadway Construction
- Bridge Substructure – Br. 027601
- Bridge Superstructure – Br. 027601
- Roadway approaches Bridge 027601
- Roadway approaches and local road work at Route 116 (George Washington Highway)
- Maintenance and Protection of Traffic on Route 146 and Route 116.
- Median & drainage restoration
- Stormwater BMPs (drainage repair and cleaning)
- Traffic Safety Improvements

2.6 Environmental

2.6.1 NEPA Compliance/Environmental Documentation

RIDOT has prepared and submitted a Categorical Exclusion (CE) Checklist to FHWA for this project to satisfy NEPA requirements. The CE will be issued prior to the issuance of the Notice to Proceed

PART B – PROJECT TECHNICAL REQUIREMENTS

will be completed prior to the start of construction. The careful removal of four (4) ceramic bridge identification tiles from the existing historic bridge, and reinstallation of those tiles on the new bridge, will be performed by the D-B Contractor as part of Section 2.4.1 of this document, and is not considered part of the RIHRA or MOA process.

In addition to addressing the NRHP-Eligible Louisquisset Pike Bridge, RIDOT has performed due diligence surveys in order to identify other historic architectural properties as well as archaeological sites. A Historic Architectural Due Diligence Review report was submitted to RIDOT with information on previously documented architectural properties, as well as newly identified structures over 50 years in age. The results of the Due Diligence Review recommended that no potentially significant historic properties would be affected by the proposed project.

RIDOT has also undertaken a Phase I archaeological study, due to the presence of documented archaeological sites within the APE, and the potential to uncover additional sites. Fieldwork was conducted in December 2017, and final recommendations are currently being reviewed by RIDOT and RIHPHC for comment. It is anticipated that no further archaeological studies will be required – if additional work is needed, this work will occur separately from the Design-Builder’s scope and schedule.

The archaeological studies have confirmed that intact portions of one NRHP eligible historic archaeological site are present within the APE. This historic property is the Great Road (RI-544), the only remaining unpaved portion of a stonewall-lined Colonial roadway. Road surface and stone walls are intact within the northeast cloverleaf of the existing interchange, as well as areas east of the existing interchange south of Amica Center Boulevard. Additionally two historic features have been identified within the APE. These include the stonewall-lined Chestnut Tree Lane roadway (no site number) and the Old Louisquisset Pike (RI-545). Intact portions of the NRHP eligible historic property and two extant historic resources may need to be avoided during all stages of work.

Additionally, a documented archaeological site located within the southwest cloverleaf (RI-551) was found to have been destroyed during previous activities. The site is no longer present, and there is no need to avoid the former location of the site.

~~The D-B Contractor is responsible for avoiding any and all identified landscape features recommended for avoidance, and maintaining the locations of these features on all construction drawings. The DB Contractor will inspect the locations of the landscape features to ensure that all site activities are in compliance with avoidance instructions. D-B Contractor is also responsible for working within the LOD defined in the BTC. Ground disturbance outside of the current LOD and/or failure to avoid the identified resources may jeopardize the Section 106 and NEPA compliance of the project and require supplemental permit applications and/or work to examine cultural resources. “Ground disturbance” includes any permanent and temporary impacts to the ground, including equipment storage, staging, traffic/parking (vehicle and heavy machinery), or hand/machinery excavation. Any such additional work resulting from non-compliance with avoidance instructions or ground disturbance outside of the BTC LOD will be the sole responsibility of the D-B Contractor. In addition, D-B Contractor will be responsible for the following during construction:~~
The D-B Contractor is responsible for avoiding any and all identified archaeological and/or historical features recommended for avoidance, and maintaining the locations of these features on all

PART B – PROJECT TECHNICAL REQUIREMENTS

construction drawings. Avoidance will include installation of temporary fencing and signage identifying each area as protected and historically sensitive. The D-B Contractor should assume that all remaining stone walls identified on the BTC drawings will require fencing and signage. The DB-Contractor will inspect the locations of the landscape features to ensure that all site activities are in compliance with avoidance instructions. Fencing and signage shall be removed at the conclusion of all construction activities. D-B Contractor is also responsible for working within the LOD defined in the BTC. Ground disturbance outside of the current LOD and/or failure to avoid the identified resources may jeopardize the Section 106 and NEPA compliance of the project and require supplemental permit applications and/or work to examine cultural resources. “Ground disturbance” includes any permanent and temporary impacts to the ground, including equipment storage, staging, traffic/parking (vehicle and heavy machinery), or hand/machinery excavation. Any such additional work resulting from non-compliance with avoidance instructions or ground-disturbance outside of the BTC LOD will be the sole responsibility of the D-B Contractor. In addition, D-B Contractor will be responsible for the following during construction:

Temporary anchored barrier on bridge decks shall conform to TAC 0296 and Section 926 of the RIDOT Standard Specifications for Road and Bridge Construction and the following: The barrier system used shall be crash tested and approved for use on the National Highway System by FHWA. The designer shall determine the appropriate Test Level for the required application and ensure it satisfies the required dynamic deflection limits needed at the locations installed. Installation of the system shall be in accordance with the manufacturer's requirements. When anchoring barrier to the new bridge decks, the D/B Team shall position the barrier anchorage locations to avoid deck reinforcement.

2.10.1 Signs

The Project scope of work shall include all required modifications to existing signs and sign structures and all required new signs and structures. Any signs on adjacent roadways that require relocation/ replacement due to construction activities shall be the responsibility of the D/B Team. The D/B Team shall prepare an existing sign inventory that shall be completed prior to starting work on site. This existing information shall be submitted at the same time as the first plan submittal for proposed signing. The D/B Team shall design all proposed sign panels in accordance with the latest edition of the MUTCD.

The permanent elimination of Route 146 southbound Off-ramp to Route 116 eastbound requires modifications to/replacement of several existing overhead signs, as shown in the BTC Plans, Advanced Guide Signs. Although, the sign assemblies shall remain intact at their existing locations, the legends and panels will require modifications and replacements, as shown on the plans. The D/B Team shall be responsible for the required modifications and replacements. All proposed overhead sign panels shall be designed in accordance with the latest MUTCD and RIDOT Standards.

2.10.2 Pavement Markings

The D/B Team shall provide, install and remove all required pavement markings. All temporary pavement markings shall be waterborne pavement markings. All permanent edge lines, lane lines and centerlines shall be Epoxy Resin. The D/B Team shall furnish, apply, and maintain temporary pavement markings within the project limits and approaches to work zones. All pavement markings (temporary and permanent) are to be eradicated by the D/B Team when they conflict with other pavement markings or are no longer applicable.

2.11 Maintenance and Protection of Traffic Plan

The BTC Plans provide preliminary Maintenance and Protection of Traffic (M&PT) concepts for the proposed stage construction at both bridge locations. The D/B Team shall design, develop and incorporate a final design M&PT in accordance with RIDOT requirements. The M&PT documents shall clearly show how traffic will be managed during the various phases of construction of the Project and will include Temporary Traffic Control (TTC) plans and TTC strategies. The D/B Team shall coordinate all work in accordance with the M&PT. The M&PT shall incorporate and address all of the requirements of DPM 450.05 – Work Zone Safety and Mobility including the following:

PART B – PROJECT TECHNICAL REQUIREMENTS

The D/B Team shall design the TTC Plans in accordance with RIDOT, the MUTCD, and AASHTO design standards and in accordance with guidelines specified in this RFP and shown on the BTC Plans. These plans shall be in accordance with current RIDOT policies including, but not limited to, DPM 450.05 – Work Zone Safety and Mobility and the RIDOT Traffic Design Manual. The D/B Team will be responsible for any changes to the M&PT resulting from any D/B Team changes to the

sequence of construction or scope of work and shall coordinate with RIDOT to ensure that the changes are acceptable.

The D/B Team shall be responsible for coordinating, cooperating and scheduling this work and all segments thereof with RIDOT, other contractors on adjacent construction projects, utility owners, and applicable local authorities, so as to minimize impacts to the construction schedule.

Throughout construction, RIDOT will review the traffic control setups in the field. RIDOT reserves the right to require the D/B Team to modify the traffic control setups in the field and/or mandate additional traffic control devices or strategies (including, but not limited to additional signs, barriers, drums, and public outreach) to improve traffic conditions. The D/B Team will also be responsible for adjusting the M&PT accordingly. The D/B Team shall be prepared to furnish and install additional traffic control devices as may be requested by RIDOT after the setup is implemented in the field. A 15% contingency shall be included when determining the quantity of temporary traffic control devices required.

The D/B Team will also be required to implement and maintain the proposed detour plans for ramp closures, by providing proper public notices, maintaining all required traffic control devices, and informing RIDOT of any issues or conflicts resulting from implementing the proposed detours.

Construction signs shall be installed, maintained, adjusted, and removed by the D/B Team throughout the duration of the project. Existing signs that conflict with construction signs or permanent signs shall be covered and/or removed. Guardrail within the limits of the TTC plans shall also be maintained, adjusted, and/or removed and replaced by the D/B Team throughout the duration of the Project.

2.11.1 Temporary Traffic Control

The bridges shall be replaced while providing two lanes of traffic in each direction on Route 146 at all times except for short term lane closures during off peak periods. All Route 146 on/off ramps and acceleration lanes shall be maintained except for short term closures during off peak periods, and except as noted in the BTC plans. The BTC Plans depict implementation of Route 146 southbound crossover to the northbound corridor in order to maintain two (2) lanes of traffic in each direction. The existing lane configuration on Route 116 shall also be maintained throughout construction except for short term closures during off peak periods.

The Design Speed used for the TTC Plans shall be a minimum of 55 mph for Route 146 and 30 mph for Route 116, unless otherwise noted on the BTC drawings.

Below are restrictions for traffic control used in the Traffic Management Plan:

Route 146 Northbound and Southbound, & Route 116 Eastbound and Westbound:

PART B – PROJECT TECHNICAL REQUIREMENTS

- Maintain a minimum of two travel lanes in each direction 6:00AM – 9:00PM, 7 days per week (Monday through Sunday);
- Maintain a minimum of two travel lanes in each direction from 9:00PM Friday through 9:00PM Sunday;
- Maintain a minimum of one travel lane in each direction 9:00PM – 6:00AM, Sunday through Thursday.
- Full roadway closures will only be allowed between 10:00 PM and 5:00 AM Sunday through Thursday, and only upon approval of RIDOT a minimum of three weeks in advance.

More extensive lane restrictions may be allowed in combination with alternate ABC methods that occur over a shorter duration. RIDOT approval will be required.

The BTC construction staging would require crossing Route 146 southbound traffic to the northbound corridor. This crossover causes Route 146 southbound Off-ramp to Route 116 westbound, and Route 116 westbound On-ramp to Route 146 southbound to be closed to traffic during Stage 1 construction. A temporary signalized intersection along Route 116 is proposed to facilitate both ramps' traffic during this stage. The Temporary Detour Plan Stage 1 depicts the location of the temporary signal.

The temporary signalized intersection is proposed to be a four-legged intersection. The southbound leg, which is an extension of Route 146 southbound Off-ramp to Route 116 westbound, would include an exclusive right-turn lane and a shared thru/left lane. The eastbound approach – Route 116 eastbound – will remain unchanged and include a thru and a shared thru/right lane. The westbound approach, which currently carries two thru lanes, will include a thru lane and an exclusive left-turn lane. The southern leg, Route 116 eastbound ramp to Route 146 southbound, will remain unchanged with one receiving lane, only. The preliminary capacity analysis at this intersection indicates that the proposed number of lanes and configuration at this location would result in acceptable operating conditions (LOS C), during both morning and evening peak hours.

It should be noted that the Route 146 southbound Off-ramp Extension and the temporary signalized intersection shall be constructed according to their final conditions. Upon completion of the staged construction the following modifications to the intersection will be required to create the final conditions:

- Convert the shared thru/left lane along the southbound approach to an exclusive left-turn lane.
- Remove the temporary exclusive left-turn lane along the westbound approach and restore the median to the final condition.
- Restoration of the Rt. 116 WB roadway to two thru lanes

The D/B Team shall provide timing plans and any additional information required for the signal operation and maintenance for both temporary and permanent conditions. The D/B Team will coordinate with RIDOT on approved equipment and signal location and shall notify RIDOT of any issues or conflicts due to installation and operation of the temporary traffic signal.

The D/B Team shall provide timing plans and any additional information required for the signal operation and maintenance for both temporary and permanent conditions. The D/B Team will coordinate with RIDOT on approved equipment and signal location and shall notify RIDOT of any issues or conflicts due to installation and operation of the temporary traffic signal.

Also refer to the Job Specific Specifications for Maintenance and Movement of Traffic Protective Devices, Maintenance of Travel Lanes and Shoulders and Holiday Restrictions.

2.12 Right-of-Way

The BTC does not require any land or easements outside the existing State Right-of-Way. If the D/B Team's design requires additional land rights such as temporary easements, permanent easements, and permanent takings, the D/B Team will be responsible for preparing all necessary plans and documentation needed for RIDOT to acquire the additional land rights. All right-of-way activities must be completed in compliance with RIDOT and FHWA standard procedures.

DPM 320.11; Access to Private Property does not apply to this project. The D/B Team shall be responsible for assuming all risks associated with the acquisition of additional right-of-way (to accommodate their unique solution), including any public hearings that may be required, and no modifications to the Contract Price or Contract Time will be granted or considered.

2.13 Planting

All areas adjacent to the bridge and roadways disturbed by any activities necessitated by the Project shall be completely restored to pre-construction conditions, and shall be re-seeded for grass. All grass seeding shall be done in accordance with Part L of the RIDOT Standard Specifications.