APPLICATION FORM
CULVERT REPLACEMENT MUNICIPAL ASSISTANCE GRANT APPLICATION FORM

FY22 RFR ID: DER 2021-01

(See Section 3.3.1 in the RFR for instructions on how to fill out the Application Form)

1) APPLICANT INFORMATION

i. **Funding Request:** $ 200,000	ii. **Town:** Plymouth
iii. Applicant's Name: Town of Plymouth	Email/Phone: ssgarzi@plymouth-ma.gov

2) CULVERT INFORMATION

i. Road: Bartlett Road	ii. Stream: unnamed tributary to Beaver Dam Brook	
iii. Location: Bounded by Mass Audubon Conservation Property (137 Bartlett Road) to the West, 146 Bartlett Road to the Southeast and 3 Earl Road to the Northeast		
iv. Does this crossing have multiple culverts?	☐ Yes (*Please provide more details under (4)(i) Project Background*)	☑ No
v. Culvert Type: Dam with box culvert. Superstructure consists of concrete deck supported on encased steel girders. Substructure consists of abutments and wingwalls		
vi. Length: 19'-0" out to out	Width: 7'-8" inside abutment face to inside abutment face	

vii. Utilities within Right of Way and/or close proximity to the Culvert (check all that apply):

☐ Gas ☑ Electric ☑ Water ☐ Sewer ☑ Telecommunications ☑ Stormwater Infastructure ☐ Other

3) PROJECT SUMMARY

i. **Brief Summary:** Provide a brief descriptive summary for the project (e.g. 4 sentences), including existing conditions, project benefits, and goals of the project.

This project includes removal of a box culvert dam in poor condition on Bartlett Road, a public way, that has limited ecological function and is limiting flow of the tributary from Fresh Pond to Beaver Dam Brook, the site of DERs ecological stream restoration project at Tidmarsh Farms. The goal of the project is to remove the failing dam and replace with an open box culvert designed to Mass Stream Crossing Standards that will enhance river function, ecological function, fish passage of river herring, American Eel passage, wildlife passage and eliminate public safety hazards. This project complements DER's ecological stream restoration project and the adjacent Tidmarsh Farms by improving river herring passage up to Fresh Pond.

4) DEMONSTRATED NEED

PLEASE USE AS MUCH SPACE AS NEEDED. THE BOXES WILL EXPAND AS YOU FILL THEM.

i. **Project Background:** Describe the condition of the culvert and stream and any background information about the culvert. Consider the physical condition of the culvert, current risk of failure, maintenance and flooding history, erosion, environmental concerns such as impacts to fish and wildlife, and hazards to the community. If you have multiple culverts, please include the length and width of each structure. *Please use as much space as needed.*

In 2015, prior to DER's restoration at Tidmarsh Farms which is adjacent to Fresh Pond Dam, the Town removed one side of boards in Fresh Pond Dam to allow flow from Fresh Pond, down the unnamed tributary to DER's restoration site for fish passage. Previous to 2015, Fresh Pond Dam impounded water and was considered a significant jurisdictional dam in poor condition. This dam is unique as it is downstream of Fresh Pond and was used to dam the unnamed tributary for agricultural water use at Tidmarsh Farms. Due to the current height of the dam with the weir boards removed it is no longer considered jurisdictional, however, it is still in poor condition with limited ecological function.

Fresh Pond Dam is located on Bartlett Road, a public way, in Plymouth, south of Route 3A. The dam is in poor condition and has a structural height of 5 feet with a 7.5 ft wide by 6ft tall concrete box culvert with stop logs on one side of the dam. Fresh Pond is a freshwater pond that feeds via an unnamed tributary into Beaver Dam Brook, site of DER's Restoration Project. Mass Department of Fish and Game have documented American Eels on multiple survey's in Fresh Pond. Following the removal of one side of the boards in the dam, river herring were documented entering Fresh Pond even given the limited river function. The existing dam does not provide adequate ecological function for proper fish passage nor does it provide any wildlife habitat passage.

In 2005 the Town of Plymouth placed a weight restriction on the crossing the Bartlett Road/Fresh Pond Dam due to the poor condition of the structure. Since then, the Town of Plymouth has had this project on capital list of projects, however it had not been prioritized or funded by the Town Meeting process. On August 28,2012 Tighe and Bond conducted an Inspection and Evaluation Report for Fresh Pond Dam and the dam was classified in poor condition. Due to the boards on one side of the structure being removed, the dam is no longer considered a jurisdictional dam with ongoing inspections. On February 18,2021, SLR Consulting conducted a visual inspection with recommendations of complete replacement. Some of the visual findings included the superstructure with spalling of the concrete encasement of the grinders/ stringers revealed surface oxidation on the exposed surfaces. Sounding of the remaining encasement yielded hollow spots along the bottom of the flanges where concentrated cracking was observed. The substructure was found to be in fair to poor condition. Scaling within three feet of the waterline was observed at both the east and west abutments. Both abutments had minor hairline cracking and honeycombing. The approaches to the bridge were considered in poor to critical condition. Roadway alignment of both approaches is located along a curve with a bridge width of 18 feet for two lanes of traffic. The east and west approach pavement exhibited minor alligator cracking and roadway settlement of 1-2 feet at the east abutment. The bridge railing consists of steel guard rail section unsupported along the approximate 8 foot length of the structure. The current support condition of the bridge rail is not considered to provide adequate protection for vehicular traffic. Approach guardrails and end treatments are present although the guard rail posts appear misaligned and hence they are not in compliance with current standards nor do they provide adequate protection to vehicular traffic on the bridge.

The Town could perform short term maintenance to alleviate some of the deficiencies of the dam, however, the Town is committed to a long-term solution that will eliminate public safety hazards and improve ecological function. The Town of Plymouth Department of Public Works is working in collaboration with the Town of Plymouth's Marine & Environmental Affairs office on this project.

Should the dam fail, the downstream impacts would be on DERs restoration project. The impact to public safety would include failure of passage through Bartlett Road. Residents would not be landlocked due to other roads available; however, the Town would be responsible for maintaining road closure and proper blockage at the site. In addition, upon a failure the Town would be pushed to perform short-term measures to allow for public passage verses performing long-term measures that would include ecological function and habitat improvements.

ii. **Project Status**: If work has already begun on the proposed culvert replacement, please explain the scope of what has already been initiated and/or completed. List and briefly explain any plans, reports, or documents that have been created as part of the culvert replacement. Consider any field data collection, analyses, design, permitting, utility coordination, and/or construction. If work has not started please state that below. *For projects underway, all supporting documentation should be submitted with this application (e.g., reports, design plans, permits, opinion of probable costs, etc.).*

Plymouth Department of Public Works has consulted with SLR Consulting (merged with Milone and MacBroom) to conduct an assessment and cost estimate for design and permitting to meet Massachusetts Stream Crossing Standards. The Town of Plymouth has already coordinated with Mass Audubon, whom owns the property at Tidmarsh Farms, to ensure the Town has the appropriate easements in the Conservation Restriction for improvements to the bridge and to allow for sidewalk passage as well. This approval of easements are recorded at the Plymouth Registry of Deeds with allowing this project to be conducted.

The Town of Plymouth Department of Public Works and the Town's Marine and Environmental Affairs are working on this project collaboratively. The Town has received a scope of work from SLR consulting to conduct design, permitting and construction bidding services for this project. The Town of Plymouth Department of Public Works will be completing the required topographic survey for the project with Survey Crew. To date, SLR has completed the visual inspection to provide a scope of work to move forward with data collection, geotechnical engineering, wetland delineation, watershed evaluation, hydrologic assessment, hydraulic modeling, sediment assessment, conceptual design, preliminary design, permitting, final design and bidding phase services.

iii. **Financial Need:** Explain why your municipality needs funding from this grant opportunity to advance the proposed project. Describe other anticipated or secured funding sources such as Town funds or Chapter 90 funds that will support any portion of this project.

The Town of Plymouth Department of Public Works has had the replacement of Fresh Pond Dam on the capital requests list since 2005, for over 15 YEARS and has been unable to secure funding. Another attempt was made when DER was conducting the wetland restoration project at Tidmarsh Farms but was not funded by the Town. However, the newly hired Town Engineer has placed this project as #1 on the list of projects for construction in FY23 (June 2022-July 2023). The Town Engineer will be placing the construction funding portion of the project on the Spring 2022 Town Meeting which will be held in April of 2022 and funds available by July 1, 2022 for construction. SLR consulting is anticipating a construction cost of 2.5-2.7 million dollars. The grant funding for this project to complete the design and permitting will greatly enhance the Town's ability to secure the funding for construction at Town Meeting. It will also allow the project to keep a continual flow as once the design, permitting and bidding phases are completed as part of this project the Town will be able to move into the construction phase next summer.

This project would be fully supported by Town Meeting with grant funding by DERs Culvert Replacement Municipal Assistance Program. This funding would allow the Department of Public Works to proposition the project at Town Meeting and emphasize the grant funding support to have approval by Town Meeting members for construction phase services. The Town of Plymouth Department of Public Works will be matching this grant proposal with in-kind services for the topographic survey needed for the project.

5) PROJECT DESCRIPTION

PLEASE USE AS MUCH SPACE AS NEEDED. THE BOXES WILL EXPAND AS YOU FILL THEM.

i. **Project Scope:** Please describe the proposed culvert replacement and the specific work to be covered by this funding (end date 6/30/22). Consider project tasks, personnel, deliverables, etc. As guidance, you may use, but are not limited to using, the topics listed on the *Proposed Work Checklist* with the purple header.

Task 1.0 – Kickoff and Coordination Meetings

Throughout the course of this project, the project manager will coordinate project tasks; perform project- related managerial tasks; receive and execute directions from the Town and project partners; schedule work; maintain project records, technical data, drawings, reports, and financial records; and coordinate with the Town and project partners. The following specific tasks are proposed:

1.1 Kickoff Meeting – Project team members will attend an initial kickoff meeting with the Town and project partners.

1.2 Coordination Meetings – Project team members will attend project coordination meetings with the Town, project partners, and other interested parties during this phase of work.

1.3 Conference Calls – Project team members will participate in conference calls throughout this phase of work as needed and/or requested by Town staff.

Task 2.0 – Data Collection and Subsurface Exploration

The Town of Plymouth Department of Public Works will be completed the topographic survey as part of the data collection.

2.1 Existing Data Collection and Review – Collect and review available data and resource information on file with project stakeholders, the Town, state agencies, and other sources. This information may include bridge and dam inspection reports, past studies, watershed history, information regarding abutting property owners, information on historical anadromous fish runs and/or fisheries, threatened or endangered species, existing archaeological or historical reports, mapping of the project area, aerial photographs, natural resource information, geologic data and mapping, hydrologic data and analysis, fisheries data, United States Geological Survey (USGS) gauging station data, and sediment data.

2.2 Geomorphic Assessment – Perform a geomorphic assessment of the Beaver Dam Brook immediately upstream and downstream of the bridge site wherever natural segments of channel can be located. Bankfull width and depth will be field measured, verified, and compared to regional hydraulic geometry curves. The streambed and banks, riparian floodplain area, and channel structure will be noted. Up to two pebble counts will be conducted to characterize the sediment in the free-flowing channel. A representative sample of the native substrate below the channel bed armoring layer will be taken and submitted to a materials testing laboratory for grain-size analysis in support of a proposed bridge footings scour analysis.

2.3 Sediment Probing – Conduct sediment observations and probes to characterize the nature, distribution, and volume of sediment in the impoundment of the dam. Identify extent of sediments likely to be mobilized by partial removal of the dam, potential downstream deposition areas, and potential for upstream head cuts.

2.4 Geotechnical Engineering – Conduct a subsurface exploration program at the bridge crossing to establish subgrade conditions. The principal objective is to provide soils data necessary for bridge foundation and pavement design, including soil type and consistency, frost susceptibility characteristics, and ledge and/or groundwater depth. The program will include the following:

- 2.4.1 A boring program to undertake two Type B drilled borings at the bridge
- 2.4.2 Coordination of the services of the boring contractor to execute the program
- 2.4.3 Collection of continuous split-spoon samples from the borings extending to bedrock or firm grade
- 2.4.4 Laboratory testing of the samples for grain size in order to establish frost susceptibility
- 2.4.5 If bedrock is encountered, coring to a depth of 10 feet and establish rock quality designation (RQD)
- 2.4.6 Geotechnical analyses and recommendations for bridge support, pavements, and subgrade drainage
- 2.4.7 Preparation of a geotechnical report summarizing the results of the subsurface exploration, lab testing, and design recommendations

2.5 Contact local utility providers and request available mapping of existing facilities in the

vicinity of the structure. Utilities will be depicted on the survey base map based on best available information.

2.6 Sensitive Species Review – A review of the Massachusetts Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program (NHESP) mapping indicates that the project site is not located within mapped Estimated and Priority Habitat for state-listed species. This mapping is updated annually, and SLR will review the mapping during the permitting process to reconfirm our initial findings. This scope of services assumes that the proposed project will not require any Massachusetts Endangered Species Act (MESA) filings and will have no impact to listed species or their habitat. If this is not the case, and additional level of effort is required (e.g., MESA applications, surveys, mitigation), an amendment will be provided for these services.

2.7 Sensitive Historical/Archaeological Resources (Section 106) – As the project will require state and federal permits, coordination with the Massachusetts Historical Commission (MHC) and the Tribal Historic Preservation Officer (THPO) will be undertaken to determine potential project impacts to sensitive historical or archaeological sites. A Project Notification Form (PNF) will be submitted to the MHC along with the required accompanying materials, and notification letters will be submitted to the THPOs. It is assumed that each entity will issue a finding of no significant impact to historical/archaeological resources and that no additional coordination, surveys, or mitigation will be required. If review by any of these entities determines that an additional level of effort is required, an amendment will be provided for these services.

Task 3 – Preliminary Design

3.1 Delineation of Wetland Resources – A wetland scientist will identify, characterize, and flag resource areas subject to the provisions of the Rules and Regulations for Plymouth Wetlands Protection Bylaw, Massachusetts Wetlands Protection Act, and Section 404 of the Clean Water Act. Wetlands will be delineated using the methodology provided in the U.S. Army Corps of Engineers (USACE) *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region.* Resource area boundary flags will be surveyed using a handheld Global Positioning System (GPS) with submeter accuracy, and the resource flags will be incorporated into the design plans.

3.2 Wetland Delineation Technical Memorandum – Following wetland delineation, our wetland scientists will prepare a technical memorandum describing the identified wetland resource areas within the project site. This memorandum will include a detailed description of the characteristics of each identified resource area, a brief qualitative assessment of wetland functions, and representative photographs. The purpose of this report is to support the project permitting process.

3.3 Ecological Characterization – A wildlife biologist will conduct a field-based assessment of the area surrounding the bridge to identify important physical and biological habitat

characteristics. Prior to the field investigation, existing project materials provided by the Town and publicly available data sources will be reviewed to develop a preliminary assessment of the site's ecological communities. This landscape analysis will be used to guide a ground-based ecological characterization consisting of a single field visit to evaluate the project site's physical and biological habitat characteristics. The field survey will consist of a meander survey throughout the project area with an emphasis on areas identified during the landscape analysis with the greatest potential to support wildlife habitat and will consider guidance in the *Massachusetts Wildlife Habitat Protection Guidance for Inland Wetlands* and include the completion of Appendix A: Simplified Wildlife Habitat Evaluation (Appendix A).

Detailed field notes and photographs of the site's habitats will be taken as appropriate. Vegetation communities will be characterized according to the *Classification of Natural Communities of Massachusetts* (Swain and Kearsley, 2001). Following the completion of the field survey, we will prepare a brief technical memorandum presenting the results of the landscape analysis and ecological characterization. The report will include an introduction, brief descriptions of the methodology and results, and a discussion.

3.4 Watershed Evaluation – Under this task, the contributing watershed boundary will be compiled using available MassGIS drainage basin data, USGS *StreamStats* watershed data, and USGS quadrangle maps and assessed for general characteristics such as land use, surficial geology, urbanization and impervious area, presence of dams and other flow control structures and otherfactors. A field visit will be necessary to confirm watershed boundary.

3.5 Hydrologic Assessment – Develop a United States Department of Agriculture TR-20 model of watershed that flows to the proposed bridge, including Fresh Pond and the surrounding residential area, to establish existing conditions flows. This will involve assessment of the watershed relative to land use, the hydrologic properties of the soils, the development of flow paths, the development of time of concentration (Tc) values, and the procurement of localized and current rainfall data. The effects of climate change on hydrology will be considered as part of this effort by assessing current regional guidance documents and adjusting estimated peak flows to extrapolate the expected flows throughout the design life of the structure.

3.6 Existing Conditions Hydraulic Modeling – Utilize base mapping and light detection and ranging (LIDAR) topography to develop an existing conditions hydraulic model using the USACE's *Hydraulic Engineering Center River Analysis System* (HEC-RAS) software. Input the peak flows computed from the TR-20 analysis and calibrate the model's roughness coefficients based upon the field investigation.

3.7 Proposed Conditions Hydraulic Modeling – Develop a bridge replacement alternative to the extent necessary to model proposed conditions and evaluate potential changes

in velocity and water surface elevation. Modeling will assess predicted water depths, velocities, shear, and water surface elevations.

3.8 Sediment, Bed, and Bank Stability Assessment – Following characterization of channel bed material through grain-size analysis and pebble counts, utilize the results of proposed conditions HEC-RAS output to evaluate shear stress and develop a comparison table to compare against the resistance and competency of the existing and anticipated postconstruction bed material.

3.9 Bridge Scour Analysis – The proposed bridge footings will be evaluated for their susceptibility to scour and countermeasures will be designed, if necessary. Scour will be evaluated using the proposed hydraulic modeling and will be performed following the guidelines set forth in the current Federal Highway Administration (FHWA) Document HEC-18 "Evaluating Scour at Bridges."

3.10 Preliminary Engineering Report – The findings of the previous assessments (geomorphic, hydrologic, and hydraulic) will be documented in a report for submittal and review by the Massachusetts Department of Transportation (MassDOT).

Task 4 – Conceptual Design

Under this task, existing and new data will be summarized, and conceptual alternatives will be developed for the bridge replacement and roadway realignment.

4.1 Prepare a Bridge Type Study memorandum that will evaluate two cost-effective bridge structure alternatives with options for parapets and railing systems.

4.1.1 Prepare a brief memorandum summarizing the project alternatives, impacts, and costs. Embedded within the report will be a structure type study evaluating the design alternatives. The memorandum shall include the following:

4.1.1.1 Schematic plan, elevation, and typical section for each alternative, including railing and parapet treatments
4.1.1.2 Construction cost opinions for each alternative studied
4.1.1.3 Summary of project requirements and impacts for each alternative to address construction cost, constructability, impacts to utilities/necessary relocations, rights-of-way needs, maintenance requirements, regulatory permit requirements, and public concerns
4.1.1.4 Recommendation for a preferred alternative

4.2 Conceptual Alternative Development – Develop schematic design alternatives for the

roadway realignment, including design sketches. Provide a technical memorandum that presents the concept alternatives and the advantages and disadvantages of each as well as planning level cost opinions.

4.3 Submittal – Provide conceptual design alternatives to the Town and project partners for review and comment.

4.4 Recommendations – Recommend a preferred alternative based on considerations of existing conditions, hydraulic assessment, construction feasibility, benefits and impacts, and input from project stakeholders.

4.5 Submit memorandum to the Town for review and comment. Meet with Town staff to discuss the report and recommendations and solicit design direction.

Task 5 - Preliminary Design

5.1

Prepare preliminary design plans of the preferred alternative to approximate 60% completion, including bridge replacement and roadway realignment, channel work, area regrading, and landscaping. The plans will depict the site location; plan view of existing conditions showing elevations, physical features, and the extents of regulated areas (i.e., onsite wetlands, ordinary high water, etc.); plan view of proposed conditions in areas to be altered; preliminary planting plan; profile of proposed conditions in the channel; section views of the channel; and typical details. The bridge design will include preliminary horizontal and vertical roadway geometry, storm drainage improvements, utility relocations, and treatment of properties along Bartlett Road. A typical roadway cross section and sections at critical locations will be provided. SLR will evaluate project interface with existing site facilities and operations and conformance to Town, MassDOT, and American Association of State Highway and Transportation Officials guidelines. Develop preliminary design plans to include the following:

5.1.1 Title sheet
5.1.2 Beginning and end of project and project limit lines
5.1.3 Existing conditions, including titles of adjacent roadways and watercourses; location of utilities, drainage facilities, and associated appurtenances; designated wetlands; and property lines and related information compiled from existing maps and records
5.1.4 Plan view and longitudinal profile of existing channel and crossings in the project area
5.1.5 Proposed improvements, including plan view and longitudinal profile of proposed channel in the project area as well as construction control points
5.1.6 Proposed grading
5.1.7 Proposed plan, cross section, and elevation of the bridge
5.1.8 Proposed staging and maintenance and protection of traffic plan or detour plan
5.1.9 Utility relocations
5.1.10 Typical cross sections
5.1.11 Proposed planting/restoration plans

5.1.12 Proposed water control during construction
5.1.13 Standard design details
5.1.14 Special design details
5.1.15 Proposed soil erosion and sedimentation controls
5.1.16 Sequence of construction

5.2 Preliminary Estimated Quantities and Cost Opinion – Prepare a preliminary opinion of probable construction cost.

5.3 Submittal – Submit eight copies of the preliminary design plans, preliminary cost opinion, and engineering report to the Town and project partners for their review and comment.

5.4 Submit the above information to the Town for review and comment.

5.5 Prepare written responses to design review comments prior to proceeding with final design.

Task 6- Regulatory Permitting Assistance

6.1 Permit Application Preparation – Assist the Town in preparing application forms and supporting documentation. The following permits are anticipated:

- Wetlands Protection Act (WPA) Notice of Intent (NOI) – Massachusetts Department of Environmental Protection and Plymouth Conservation Commission – Prepare and submit a WPA NOI (including necessary accompanying materials) to the Plymouth Conservation Commission and Massachusetts Department of Environmental Protection (MA DEP). This task includes abutter notification, production and distribution of the required number of copies of the NOI to the Plymouth Conservation Commission and MA DEP, attendance at the Conservation Commission site visit, and attendance at the public hearing (including up to two public meetings).

- Chapter 91 Waterways License – MA DEP – Prepare and submit a Chapter 91 Permit (for bridge), including all required supporting materials, to MA DEP Waterways Southeast Regional Office. This task includes submitting the legal notice and providing direct notification to all required entities per Chapter 91 regulations. For this permit application, the design plan format will be modified as required to meet MA DEP's Chapter 91 application requirements for bridge replacement projects. This scope of work assumes that the licensing status of the structures will be confirmed by MA DEP during the permitting process, and thus, no license/permit history research will be required under this scope of work. This scope of work also assumes that no public hearing will be requested by the municipality or MA DEP.

- Section 404 Permit – USACOE – Prepare and submit a Self-Verification Notification Form General Permit No. 10 Linear Transportation Projects and Stream Crossings. For this permit application, the design plan format will be modified as required to meet USACE plan submittal guidelines.

Filing fees and local advertising fee will be required for multiple permit applications, and these fees will be billed directly to the Town. If during design development it is determined by the regulatory agencies that additional permitting other than listed above is required these permit applications will be prepared under a separate contract amendment.

This scope of services assumes that the contractor will prepare and submit a National Pollutant Discharge Elimination System Stormwater Pollution Prevention Plan, Construction Dewatering Permit, and any other construction-related permits that may be required.

6.2 Application Review – Provide application review assistance as necessary based on comments and questions from the regulatory review agencies.

Task 7 -Final Design

7.1 Based upon the approved Preliminary Design and agreed revisions, incorporate the review comments and prepare final design (90% Completion) plans and specifications to include the following:

7.1.1 Roadway plan and profile indicating storm drainage improvements and roadside barriers and utility plans indicating municipal relocation, construction details, and details for treatment of affected properties within the work areas. Incorporate utility relocation plans prepared by private utilities
7.1.2 Pavement marking and signage plans
7.1.3 Maintenance and protection of traffic plans or detour plan
7.1.4 Sedimentation and erosion control plans
7.1.5 Structure plans for the bridge, including structure layout plan, elevation, typical cross section, foundation plans, and structure details
7.1.6 Boring logs
7.1.7 Details for stream bank/channel restoration and scour countermeasure
7.1.8 Title Sheet and Miscellaneous Details

7.2 Perform structural calculations.

7.3 Prepare technical specifications suitable for public bidding purposes. The Town will provide front end.

7.4 Prepare final quantity estimate, cost opinion, and calendar day chart.

7.5 Submit 90% Completion plans, special provisions, estimate, and calculations for review by the Town.

7.6 Meet with the Town to discuss the final design. Respond to review comments in writing.

7.7 Submit plans and supporting documents to the MassDOT District 5 Bridge Engineer for review. (Allow 2 months for receipt of comments.)

7.8 Incorporate final review comments and prepare final plans and specifications for bidding.

7.9 Submit final plans and specifications for review by the Town.

7.10 Respond to review comments on the 100% submissions and incorporate changes to the final plans and specifications.

7.11 Provide ongoing utility coordination throughout final design. This shall include forwarding design submissions, conducting a utility field meeting, and requesting design reviews. Should utility design for relocations or attachments be necessary, the work will be designed by the utility companies or may be negotiated as extra work.

7.12 Provide hard copies and an electronic copy (PDF) of Final Bid documents to the Town for bidding. Prepare a CD for the Town containing applicable CAD files.

Task 8- Stakeholder Engagement

8.1 Participate in one public informational meeting to solicit general input from area residents and businesses. SLR will provide assistance for the public informational meeting and with conveying the technical aspects of the design to the public.

8.2 Attend and present plans to Town representatives at up to two meetings as requested.

8.3 Contact affected utility companies to keep them apprised of the project requirements and schedule. Proposed design plans shall be provided to utility companies at each milestone submission to allow them to initiate necessary relocations.

8.4 Meet with affected property owners to review impacts and encroachments. Prepare up to two right-of-way maps for temporary easements and/or permanent acquisitions. Assist the Town in communicating the impacts to the affected property owners. Prepare one filing mylar for each of the two right-of-way maps, if requested.

Task 9- Bidding Phase Services

9.1 Assist the Town in preparing final contract documents and bid advertisement. Assist the Town in the process of advertising and answering questions during the bid phase. Prepare addenda to the contract documents upon request during bidding. Provide paper copies for bidders if required.

9.2 Review, tabulate, and summarize bids. Assist the Town in its determination as to the award of a construction contract and provide a summary letter of the bid results and recommendation as to suggested Town action for award of a construction contract.

ii. **Project Budget:** To the best of your ability, complete the table below, which incorporates project cost and funding needs by project activity. In the box at the bottom, provide a short but descriptive budget narrative. Refer to *RFR Section 3. Instructions for Application Submission, Evaluation Criteria, Project Budget* for additional guidance.

Budget Overview:

Project Phase	**Funding Requested from DER**	**Secured Funding** *(list source in Budget Narrative)*	**Pending / Remaining Funds Needed**	**Total Cost Estimate**
Task 1 – Kickoff and Project Coordination Meetings	$16,500	$0	$0	$16,500
Task 2 – Data Collection and Subsurface Exploration	$20,000	$0	$0	$20,000
Task 2 – Town In-Kind Match for Topographic Survey	$0	$24,000 (in-kind match)		$24,000
Task 3 – Preliminary Engineering	$52,000	$0	$0	$52,000
Task 4 – Conceptual Design	$19,000	$0	$0	$19,000
Task 5 – Preliminary Design	$30,000	$0	$0	$30,000
Task 6 – Regulatory Permitting Assistance	$28,000	$0	$0	$28,000
Task 7 – Final Design	$14,500	$22,500	$0	$37,000
Task 8 – Stakeholder Engagement	$15,000	$0	$0	$15,000
Task 9 – Bidding Phase Services	$5,000	$0	$0	$5,000
Totals	$200,000	$46,500		$246,500

Budget Narrative: Briefly explain the project budget and how cost estimates were determined. Be sure to describe how DER funds will be used. Where possible, provide supporting documentation. List any additional sources of known funding for the culvert replacement and the amount. This includes anticipated sources/amount and funding in-hand.

The Town of Plymouth Department of Public Works will be providing in-kind match for the topographic survey needed for this project. In addition, $22,500 is secured from the Town's Roads Preservation Account. The in-kind and cash match represents 19% of the cost of this project. SLR Consulting completed a visual inspection in February of 2021 to complete an accurate scope of work for this project. The Scope of Work is attached for review and the Town is currently requesting funding through the bidding phase of the project. The Town of Plymouth Department of Marine and Environmental Affairs has worked successfully with the crew at SLR Consulting (Milone and MacBroom merged with SLR Consulting) on several dam removal and bridge replacement projects. The Town Engineer will be placing the Construction portion of the project on the Spring 2022 Town Meeting Warrant which will be held in April of 2022. SLR Consulting is anticipating a construction cost of 2.5-2.7 million dollars. Funding by DER for the design and permitting portion of the project will greatly enhance the ability to secure the construction funding and also allow for continual flow from design straight into construction next year.

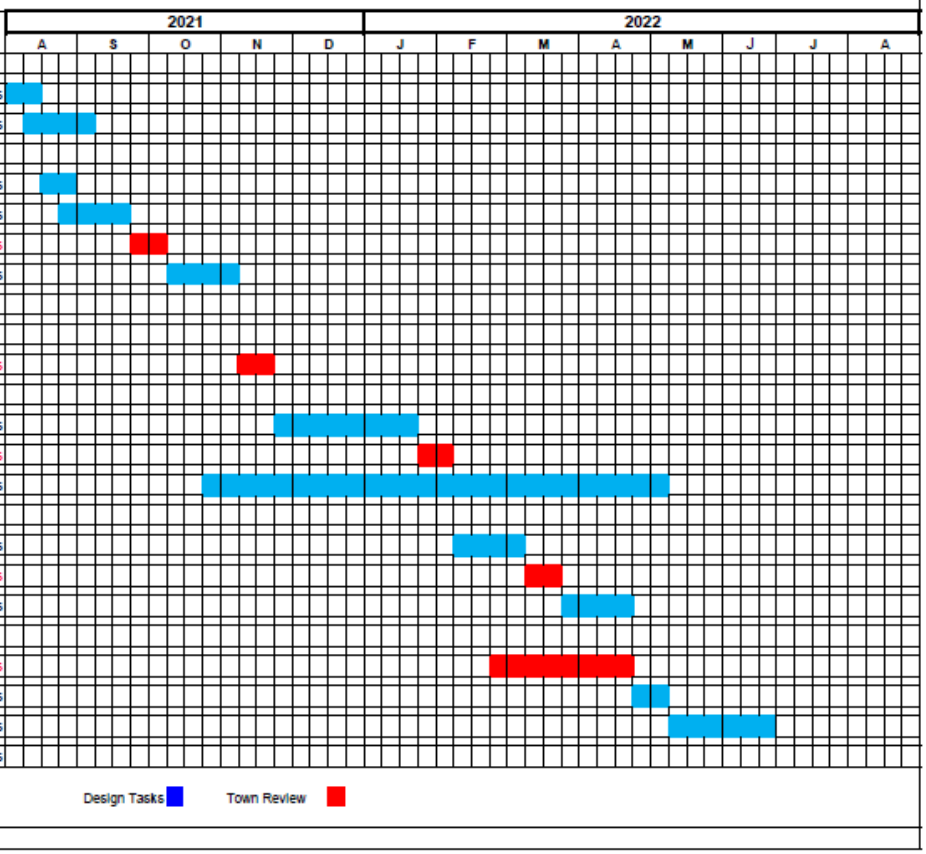
☑ *Please check if Supporting Documentation is attached (e.g., budget details, Opinion of Probable Costs, design or construction bids, etc.)*

iii. **Project Timeline:** Describe the estimated timeline for the overall culvert replacement project *and* the timeline for proposed work to be covered by this funding (end date 6/30/22). Topics listed on the *Proposed Work Checklist* with the purple header may provide direction for the type of milestones or goals to be included in a timeline.

The Town of Plymouth is working with SLR Consulting with anticipation of receiving this grant by August of 2021 with completion by June 30,2022. A detailed design schedule is attached for your review for clearer viewing and also pasted below.

Design Schedule
Roadway Realignment of Bartlett Road and Bridge Replacement (Bridge No. P13011-9KM-MUN-BRI)
Town of Plymouth, MA

Task Name	Duration
Notice to Proceed (01/01/19)	
A. Survey	2 Weeks
B. Data Collection & Subsurface Exploration	4 Weeks
C. Preliminary Engineering	
Wetland Delineation & Memo	2 Weeks
Preliminary Engineering Report	4 Weeks
Town Review	2 Weeks
D. Conceptual Design	4 Weeks
Bridge Type Study	
Roadway Conceptual Design	
Town Review	2 Weeks
E. Preliminary Design	
60% Roadway & Bridge Design	8 Weeks
Town Review	2 Weeks
F. Regulatory Permitting & Review	26 Weeks
G. Final Design	
90% Roadway & Bridge Design	4 Weeks
Town Review	2 Weeks
Roadway & Bridge Design Complete	4 Weeks
Submit Plans of Chapter 85 Review to District 5	
District 5 Review	8 Weeks
Final Contract Documents	2 Weeks
H. Advertising/Award of Contract	6 Weeks
Start Construction (04/01/23)	0 days



6) PROJECT BENEFITS

PLEASE USE AS MUCH SPACE AS NEEDED. THE BOXES WILL EXPAND AS YOU FILL THEM.

i. Benefits to the Environment: Briefly explain any known environmental information about the culvert site or possible environmental benefits for its replacement. Consider critical habitat, bank erosion, water quality, fish and wildlife species that inhabit the site/area, and problems for these organisms to pass through the culvert.

Fresh Pond outlets into an un-named tributary connecting with Beaver Dam Brook and ultimately flows into coastal waters at White Horse Beach. The proposed project site is at Fresh Pond Dam on Bartlett Road which is adjacent to Tidmarsh Farms, DERs Wetland Restoration Site. The Town removed weir boards at the dam site in 2015, this allowed for minimal fish passage from the Wetland Restoration Site to Fresh Pond. Herring were documented as entering Fresh Pond in the Spring of 2016 after these boards were removed, even with the limited river function the dam currently supports. Mass Department of Fish and Game have conducted several surveys in Fresh Pond and have documented the existence of American Eels. There is significant sediment backup over the decades of the dam being in place. This project includes removing a dam in poor structural condition with limited ecological function and replacing with an open box culvert that will meet Massachusetts Stream Crossing Standards. Replacement of this culvert would include restoring the river channel to Fresh Pond to restore the ecological functions for fish passage to Fresh Pond, spawning habitat for river herring. An additional environmental benefit of the project would be for wildlife passage through a new culvert as limited passage currently exists with the dam or crossing over the vehicular road. This project will compliment DERs Wetland Restoration project at Tidmarsh Farms by restoring the river channel from DERs project site up to Fresh Pond which is spawning habitat for river herring.

ii. **Public Safety Benefits:** Describe how the culvert replacement will improve public safety and reduce vulnerability to changing climatic conditions, such as flooding and damage caused by more frequent, high intensity storms. Consider road closures, culvert failure, road washout, and access to municipal and emergency services. If available, include supporting documentation (e.g., photos, recent inspection reports, news stories, etc.) of the hazard and/or anticipated public safety benefits.

This project will reduce vulnerability to changing climatic conditions by removing a failing dam in poor condition and replacing with an open box culvert which will meet stream crossing standards and flow capacity. The failure of this dam would cause closure of the public way, Bartlett Road, as well as a cost for the town to maintain closures to ensure public are not crossing the failed structure. The current support condition of the bridge rail is not considered to provide adequate protection for vehicular traffic. Approach guardrails and end treatments are present although the guard rail posts appear misaligned and hence they are not in compliance with current standards nor do they provide adequate protection to vehicular traffic on the bridge. Currently there is not an ability for pedestrians to cross the structure safely with vehicular traffic. The proposed project includes proposing sidewalks for pedestrian crossing which will allow for the public to walk from neighborhoods to access Tidmarsh Farms Conservation Area.

iii. **Economic and Community Benefits:** Describe expected economic benefits to the community for the culvert replacement. Consider increased economic activity, enhanced recreation, cost savings through improved infrastructure resilience, and/or reduced maintenance cost.

This project includes enhanced economic and community recreational benefits. Currently, the crossing at Bartlett Road does not provide adequate space nor a sidewalk for walking. The proposed project includes designing a new culvert with enough space on the crossing for a sidewalk. This will allow for safe pedestrian passage from Mass Audubon property at Tidmarsh Farms to Bartlett Road. Currently Bartlett Road does not have sidewalks, however, this is planned for future use. Economic benefits with receiving funding from DERs Culvert Replacement Program will allow for a cost savings to the tax payers for a long-term solution verses utilizing tax payer dollars for short-term solutions over decades. This project also eliminates continued maintenance costs with the dam. The 2012 Inspection Report indicated a short term solution cost estimate of over $150,000 was needed. There is value in initiating a long-term solution that benefits both economic and ecological functions.

SIGNATURES

I HEREBY DECLARE THAT THE ABOVE INFORMATION IS TRUE TO THE BEST OF MY KNOWLEDGE AND BELIEF. BY SIGNING THIS APPLICATION, I CONFIRM MY INTENT FOR THE PROPOSED CULVERT REPLACEMENT TO MEET THE GOALS OF THE MA RIVER AND STREAM CROSSING STANDARDS.

Applicant Signature: Shia J. Sgro	Position: Town Engineer	Date: 3/17/2021

☑ By checking this box, you confirm that all supporting materials such as project plans, reports and/or documents are included with this application.

PROPOSED WORK CHECKLIST
CULVERT REPLACEMENT MUNICIPAL ASSISTANCE GRANT APPLICATION

FY22 RFR ID: DER 2021-01

(See Section 3.3.2 in the RFR for instructions on how to fill out the Application Checklist)

PROJECT INFORMATION

Road Name: **Bartlett Road**	Town: **Plymouth**

FIELD DATA COLLECTION

PROJECT STATUS					TASK
Proposed	In Progress	Complete	Not Started	Not Applicable	Please indicate under Project Status if the Tasks listed below are **"Proposed"** to be completed under this grant application, currently **"In Progress"**, **"Complete"**, **"Not Started"** or if you have determined the Task **"Not Applicable"** to the project. Mark the appropriate column with an "**X**".
X					***Wetland Resources Delineation:*** *A wetland resource area delineated and flagged by a qualified person, including data plots.*
X					***River Substrate Analysis:*** *An analysis of stream characteristics and substrate to be used as a reference for the replacement crossing design.*
X					***Geotechnical Evaluation:*** *Geotechnical borings and substrate analysis for structural properties.*
X					***Radial Site Survey:*** *A detailed survey of the crossing area, including elevations of the crossing inverts, road surface, road edge, site utilities, approximately 50-100ft radius around crossing location.*
X					***Longitudinal Profile Survey:*** *A detailed survey of the stream profile several hundred feet upstream and downstream of the crossing locating stream features and elevations.*
X					***Hydrologic Study:*** *A calculation of existing storm events using standard methods and watershed characteristics to determine runoff volumes, time of concentration, and peak discharge.*
X					***Hydraulic Analysis:*** *Modeling of the existing crossing for water surface elevation, scour, and velocity to understand the hydraulic forces.*
X					***Recommended Replacement Summary:*** *A detailed summary of structure types evaluated and recommended structure type for the project location. Considerations include site constraints, ease of construction, structure lifespan, potential for erosion and head-cutting, stream stability and risk of stream channel adjustment, benefits to stream habitat, storm flow conveyance, potential to affect property or infrastructure, and cost of replacement.*

Enter additional tasks or notes here. Box will expand:

- **Kick off and Coordination Meetings. Project Team will attend initial meeting and coordinate meetings throughout the project phase via conference calls or in-person meetings.**
- **Existing Data Collection Review. Collect and review existing and available data including prior dam inspections, watershed history, information from abutting properties, historical information on fish runs, threatened or endangered species, mapping of the project area, aerial photographs, existing hydrologic data, data from USGS staging station and sediment data.**
- **Ecological Characterization. – A wildlife biologist will conduct a field-based assessment of the area surrounding the bridge to identify important physical and biological habitat characteristics**

- **Sensitive Species Review. A review of the Massachusetts Division of Fisheries and Wildlife Natural Heritage and Endangered Species Program (NHESP) mapping indicates that the project site is not located within mapped Estimated and Priority Habitat for state-listed species. This mapping is updated annually, and SLR will review the mapping during the permitting process to reconfirm our initial findings**
  Sensitive Historical and Archeological Resource Review. As the project will require state and federal permits, coordination with the Massachusetts Historical Commission (MHC) and the Tribal Historic Preservation Officer (THPO) will be undertaken to determine potential project impacts to sensitive historical or archaeological sites. A Project Notification Form (PNF) will be submitted to the MHC along with the required accompanying materials, and notification letters will be submitted to the THPOs.

PROPOSED WORK CHECKLIST
CULVERT REPLACEMENT MUNICIPAL ASSISTANCE GRANT APPLICATION

FY22 RFR ID: DER 2021-01

(See Section 3.3.2 in the RFR for instructions on how to fill out the Application Checklist)

DESIGN & ENGINEERING

PROJECT STATUS					TASK
Proposed	In Progress	Complete	Not Started	Not Applicable	Please indicate under Project Status if the Tasks listed below are **"Proposed"** to be completed under this grant application, currently **"In Progress"**, **"Complete"**, **"Not Started"** or if you have determined the Task **"Not Applicable"** to the project. Mark the appropriate column with an "**X**".
X					***Preliminary Design Plans:*** *Design regarding footprint, dimensions, site constraint considerations, and resource area impacts.*
X					***Hydraulic Design:*** *Model the proposed structure for water surface elevation, scour, sediment transport, and velocity to understand the hydraulic forces and design the stream bed so that flow conditions and hydraulic dynamics in the culvert are comparable to the upstream and downstream stream channel and meet MassDOT standards when applicable.*
X					***Geotechnical Design:*** *Design the crossing within the limitations of the substrate characteristics and meet MassDOT standards when applicable.*
X					***Structural Design:*** *Design the crossing to meet the structural needs of the road type and meet MassDOT standards when applicable.*
X					***Construction Details:*** *Design the crossing with sufficient details for a contractor to construct the crossing and meet MassDOT standards when applicable.*
X					***Final Design Plans:*** *Complete all other design requirements for a P.E. to stamp the plans.*

Enter additional tasks or notes here. Box will expand:

- **Conceptual Design prior to Preliminary Design**
- **Alternatives Analysis**
- **Bridge Scour Analysis**
- **Stakeholder Engagement**
- **Bidding Phase Services**

PERMITTING					
PROJECT STATUS					TASK
Proposed	In Progress	Complete	Not Started	Not Applicable	Please indicate under Project Status if the Tasks listed below are **"Proposed"** to be completed under this grant application, currently **"In Progress"**, **"Complete"**, **"Not Started"** or if you have determined the Task **"Not Applicable"** to the project. Mark the appropriate column with an "**X**".
x					***Permitting:*** *Including required local, state and federal environmental and permit reviews.*
x					***Chapter 85, Section 35 MassDOT Review:*** *Replacement structure spans over 10ft are subject to MassDOT design requirements and review in accordance with MGL Chapter 85, Section 35. For more information about the MassDOT requirements see:* Municipal Small Bridge Program design requirements for new and full bridge replacement projects (PDF 98 KB)

PROPOSED WORK CHECKLIST
CULVERT REPLACEMENT MUNICIPAL ASSISTANCE GRANT APPLICATION

FY22RFR ID: DER 2021-01

(See Section 3.3.2 in the RFR for instructions on how to fill out the Application Checklist)

PERMITTING (CONT.)	
To the best of your ability list all of the permits needed as part of your proposed work.	
1) **Wetlands Projection Act Notice of Intent – Mass DEP and Local Conservation Commission**	5)
2) **Chapter 91 Waterways License – Mass DEP**	6)
3) **Section 404 Permit - USACOE**	7)
4) **Mass DOT Review**	8)

CONSTRUCTION					
PROJECT STATUS					TASK
Proposed	In Progress	Complete	Not Started	Not Applicable	Please indicate under Project Status if the Tasks listed below are **"Proposed"** to be completed under this grant application, currently **"In Progress"**, **"Complete"**, **"Not Started"** or if you have determined the Task **"Not Applicable"** to the project. Mark the appropriate column with an "**X**".
					Construction Bidding: *Final construction specifications and project plans have been stamped and construction*
					Construction: *Explain the scope of construction in Section 5) i. on the Application Form.*

Project Meets the Massachusetts Stream Crossing Standards:

☐ Projects requesting construction funds must meet the MA Stream Crossing Standards. If the project design is final but does not meet these criteria, or if the applicant is unsure, check this box to update and/or redesign the crossing to meet the MA Stream Crossing Standards before construction.