Supplement Request Form

Approved at May 15, 2019 EPAC

Link to Meeting Minutes

Date Prepared: 04/15/2019	**Project Title: [redacted] Replace Culvert**
Company/Companies: Eversource CT	**Project ID Number: CS00034**
Organization: Asset Management	**Plant Class /(F.P. Type): Distribution Substations**
Project Initiator: [redacted]	**Project Type: Specific**
Project Manager: [redacted]	**Capital Investment Part of Original Operating Plan? Y**
Project Sponsor: [redacted]	**O&M Expenses Part of the Original Operating Plan? N**
Current Authorized Amount: $730K	**Estimated in service date(s): 12/31/2018**
Supplement Request: $497K	**PAC: No**
Total Request: $1,227K	**TCA: No**

Supplement Justification

Background

The culvert at the base of the [redacted] entrance was undersized and required enlargement. After discussions with the nearby upstream neighbor who had experienced extensive flooding on their property and the City of Danbury, it was determined to have a study performed on the capacity of the existing culvert. The engineering study identified the culvert capacity required to resolve the flooding issue. This project included the replacement of the previously existing culvert with a larger capacity culvert to address the flooding.

This project was a high priority for the City of Danbury. Eversource worked with the City Engineering Department to develop a solution to address the flooding condition.

Northeast Professional Engineering (NPE) Consultants, LLC was retained by Eversource to assess drainage conditions at the [redacted] and the associated Kohanza Brook, which flows through the substation property. Due to the watershed size (>200 acres), the U.S. Army Corps of Engineers (USACE) Hydrologic Engineering Center – Hydrologic Modeling System (HEC-HMS) software was used in lieu of the Rational Method to determine storm water runoff rates.

This project started in 2014 with an estimated cost of $372K and was approved in PowerPlan on November 6, 2014. The scope of work involved the replacement of the existing steel culvert with a larger steel culvert. Field excavation revealed that an electrical duct system was present over the existing culvert. This field condition resulted in the need to design a cast in place culvert. As a result, the project would require additional funding to complete the work. Engineering requested an additional $358K to design a precast concrete culvert and install support structures to address field conditions. A supplement request form was approved by EPAC November 9, 2017. The total project budget was increased to $730K and approved in PowerPlan on January 20, 2017. During installation activities, there were numerous flooding events that delayed work and increased costs. Additionally, a second electrical duct bank was discovered underneath the existing culvert which, further complicating the design and installation of the pre-cast culvert. As a result, a supplemental request for an additional $497K is required to complete the project.

Justification for Additional Resources

The following activities account for the $497K supplemental request:

The $730,000 approved for construction assumed the concrete precast culvert would be installed over the existing duct bank. The crew mobilized for construction and during construction, an additional duct bank was discovered beneath the culvert that was not shown on Eversource drawings. More design work determined that the precast concrete culvert required modification to allow installation. The changes to the precast culverts also required additional design changes to the footings resulting in additional costs.

During installation activities, there were numerous flooding events that delayed work and increased costs.

> One event was caused by the City of Danbury releasing water from a reservoir that flooded the construction site. This event required crews to work around the clock through the weekend to maintain pumps to maintain substation access.
>
> There were several heavy rain events that caused flooding of the construction site due to an already full reservoir overflowing to flood the construction site.

The above charges total $311,332. The additional direct spending was due to in-house labor to oversee the contractor work as well as expenses and vehicle charges. The overall overage on the budget dollars was $497K. The project is now completed and in-service as of December 31, 2018.

TOTAL SUPPLEMENT REQUEST: $497K

The table below provides an overview of the line item categories from the original project estimates and the updated project costs:

Supplement Cost Breakdown

Note: Dollar values are in thousands:

Category	Original Estimate	New Estimate/Actual	Variance
Eng.& Design	$17	$19	$2
In House Labor/expenses	$4	$27	$23
Materials	$82	$74	($8)
Construction/Env Contracts	$461	$781	$320
Total Direct	$564	$901	$337
Indirects	$152	$226	$74
AFUDC	$14	$100	$86
Total	**$730**	**$1,227**	**$497**

Please see the original approved document attached. Original funding approval was prior to the PAF authorization process.

Supplement Cost Summary

Note: Dollar values are in thousands:

	Prior Authorized	Supplement Request	Total
Capital Additions - Direct	$525	$313	$838
Less Customer Contribution	$0	$0	$0
Removals net of Salvage ____%	$39	$24	$63
Total Direct Spending	$564	$337	$901
Capital Additions - Indirect	$152	$74	$226
AFUDC	$14	$86	$100
Total Capital Request	$730	$497	$1,227
O&M	$0	$0	$0
Total Request	**$730**	**$497**	**$1,227**

Note: Dollar values are in thousands:

Total Supplement Request by year view:

Request by Year	Prior Years	Year 2019	Total
Capital Additions - Direct	$313	$0	$313
Less Customer Contribution	$0	$0	$0
Removals net of Salvage ____%	$24	$0	$24
Total Direct Spending	$337	$0	$337
Capital Additions - Indirect	$74	$0	$74
AFUDC	$73	$13	$86
Total Capital Request	$484	$13	$497
O&M	$0	$0	$0
Total Request	**$484**	**$13**	**$497**

Connecticut Light & Power
A Northeast Utilities Company

Specific Project Proposal - Project #: CS00034

Dnbry - [redacted] - Repl Culvert

Work Classification

Category: Substation
Type: REL7
Type Desc: GENERAL MODERNIZATION
Work Type: Repair/Replace Failed Equipment

Ownership / Management

AWC: Newtown
Statewide: No
Owner: [redacted]
Manager: [redacted]

Project Information

Status: Prelim Design Approved
SPS #:
AIS Score:
Associated Projects:
Assignment ID:
Patrol Find ID:

Budget Summary - Preferred Option

Replacement of failed culvert

2015

ID	Title	Status	Rev #	Contingency	Expenditure Amount	Net Estimate
2	Culvert replacement	Prelim	0	24 %	$372,000	$372,000
				2015 Total:	**$372,000**	**$372,000**
				Total Project:	**$372,000**	**$372,000**

Specific Project Proposal - Project #: CS00034

Dnbry - [redacted] - Repl Culvert

Project Option Summary

ID	Description	Segments	Preliminary Estimate	Construction Estimate	Variance	IEEE $/CMS	All (w/Storm)	Prfrd
O2	Replacement of failed culvert	2	$372,000	$0	100 %	$0.00	$0.00	☑

Segments

ID	Title	Preliminary Estimate	Construction Estimate	Variance	IEEE $/CMS	All (w/Storm)
1	Culvert Replacement	$500,000			$0.00	$0.00
2	Culvert replacement	$372,000			$0.00	$0.00

Background / Scope

Issue:

The existing culvert located at the base of the [redacted] entrance is undersized and is required to be enlarged. After discussions with the nearby upstream neighbor who has experienced extensive flooding on his property and the city of Danbury, it was determined to have a study performed on the capacity of the existing culvert. The engineering study revealed our existing culvert was designed and installed undersized. This project is being presented to cover the cost of replacing the existing culvert with a larger capacity one and the cost to relocate any of our facilities that may be in the way.

Project Description:

The project will cover

- pre-construction site surveying and ground testing.
- Discussions with the city on the projects progress and time schedules
- Switching and load swapping
- Temporary means of entering the [redacted] while construction is in progress
- excavation of the existing culvert and exposing of any facilities that are in the way of construction
- Installation of the new culvert

At this point it is unsure who will be performing the required installation, the company or an outside vendor.

Other Considerations:

There are some implications that need to be worked out by the lawyers. Engineering concerns are if we as a company will need to compensate the insurance companies for any claims from flooding events that resulted from the undersized culvert. This issue came up as a result of omitting the culvert deficiencies.

Let it be known that the culvert owned by a resident directly upstream from our culvert is undersized as well. With this fact, it is unclear as to what the city of Danbury will require of us as well as the upstream resident. Discussions with the city are ongoing.

Revision / ACT Comments:

If we don't do this project, what will happen?

This project and flooding issue is currently a hot topic with the city of Danbury. We (company) are working with the city engineering department
to come up with a solution that benefits everyone.

Northeast Professional Engineering (NPE) Consultants, LLC was retained by Connecticut Light & Power (CL&P) to assess current drainage
conditions at the [redacted] Substation, specifically the Kohanza Brook which flows through the substation property. Due to the
watershed size (>200Acres), the U.S. Army Corps of Engineers (USACE) Hydrologic Engineering Center - Hydrologic Modeling System
(HEC-HMS) software was used in lieu of the Rational Method to determine stormwater runoff rates.

In the past five to ten years the Danbury area has experienced severe weather events with rainfall amounts equivalent to a 100year storm.
A "100 year" storm event is defined as having a one in one hundred or 1% chance of happening in any given year. It had been reported
by the City of Danbury Engineering Department personnel that during certain storm/rain events, the CL&P [redacted]
culvert may not have sufficient flow capacity, causing increased headwater and subsequent localized flooding of neighbor's property.

Environmental

Water Pollution: Decrease **Soil Contamination:** No Change **Natural Habitats:** No Change

Alternatives considered based on Environmental Impact or Description of Aspects **Oil Spill Risks Considered?** ☐

Safety Concerns With This Project? ☐

Explain:

External Stakeholders

Customer Impact / Involvement

Cust. Impacted:
Crit. Cust. Impacted:
Adjoining Property Owner Consent Required: ☐
Other Utility Pole Custodian Area: ☐
State Highway Permit Required: ☐

Approx. Pole Count (NU):
Approx. Pole Count (Other):
Town Hearing Required: ☐
Easement Required: ☐

Relocation / New Service

New Srvc. Contact:
Customer Type:
Request Number:

Requestor Type:
State Highway Project #:
Route #:

Specific Project Proposal - Project #: CS00034

Dnbry - [redacted] - Repl Culvert

Design Alternative

CS00034-01

General Information

Segment: 1 - Culvert Replacement
Status: Revision Prelim Design
Segment Type: ENVIRONMENTAL
Town: DANBURY
Budget Year: 2015
Work Type: Other
Trimming Required: ☐
In Service Date: 12/31/2015

Description: This segment was originaly setup to fund this project for preliminary testing and site visits. Since the field visits, contractors cost have come in under $100K without loaders and a limited scope.

Replacement of the undersized culvert with one that has the proper capacity for the water flow in that area. Also relocate any of CL&P's facilities to allow for the construction of the new culvert.

Itemized Work List

ID	Major Grid	Minor Grid	Description of Work to be Performed

Specific Project Proposal - Project #: CS00034

Dnbry - [redacted] - Repl Culvert

Design Alternative CS00034-01

Estimate

	Preliminary Estimate Summary
Revision Number:	1
Contingency:	0.00 %
SubTotal:	$500,000
Contingency Amount:	$0
Estimate:	$500,000
Reimbursement:	$0
Net Amount:	**$500,000**
Description:	The cost to replace the existing culvert and relocate any facilities in the way of construction.

Item Description	CU	$ / Per	Qty	Amount
OTHER	13-ALL14	[redacted]		$500,000.00
OTHER A revised estimate to follow				

Associated / Impacted Devices

Status	Type / SysID	Street / Cross St	Structure / Town	Circuit	Map	Cust	Notes
Existing	[redacted]	[redacted]	DANBURY	[redacted]		[redacted]	

Design Alternative

CS00034-01

Reliability Projection

Title:

Outage Start Date: 01/01/2007 Outage End Date: 04/29/2014 Years History: 7.33

[redacted]

Segment CS00034-02

General Information

Segment: 2 - Culvert replacement
Status: Prelim Design Approved
Segment Type: S/S - EQFSUBST
Town: DANBURY
Budget Year: 2015
Work Type: Other
Trimming Required: ☐
In Service Date: 12/31/2015

Description: Culvert Structure(s): replace the existing CMP culvert with three precast box culverts to increase the flow capacity. Several T&D duct banks are buried in the gravel driveway and will have to be temporarily supported to allow insertion of precast concrete box culverts.
Contractor is to provide precast concrete structures and installation of devices.

The company (NU) will need to provide support on the temporary new entrance to the station, any tree and brush clearing and support on supporting the concrete encapsulated duct banks.

Site Improvement: Re-grading portions of the Kohanza Brook channel to increase the flow rate.

Itemized Work List

ID	Major Grid	Minor Grid	Description of Work to be Performed

Specific Project Proposal - Project #: CS00034

Dnbry - [redacted] - Repl Culvert

Segment CS00034-02

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	24.00 %
SubTotal:	$300,000
Contingency Amount:	$72,000
Estimate:	$372,000
Reimbursement:	$0
Net Amount:	**$372,000**
Description:	Replacement of a failed driveway culvert

Item Description	CU	$ / Per	Qty	Amount
OTHER OTHER	14-ALL14	[redacted]		$300,000.00

Associated / Impacted Devices

Status	Type / SysID	Street / Cross St	Structure / Town	Circuit	Map	Cust	Notes