EVERSOURCE

Project Approval Form

Project Title: [redacted]Highland Dr UG Replacement	**Project Number: CD02291**
Date Prepared: 04/17/2024	**Company:** Eversource CT
Organization: Electric System Operations	**Project Category:** UG CABLE & EQUIPMNT REPLACEMNT
Project Initiator: [redacted]	**Project Type:** Specific
Initiating Organization: Distribution	**Capital Investment part of original Op Plan:** No
Project Manager: [redacted]	**Emergency Related Request?** Yes
Project Sponsor: [redacted]	**Facility Type** (check all that apply)**:** ☐ PTF ☐ non-PTF ☒ Distribution ☐ N/A (General Plant)
Required in service date: 12/31/2023	
Total Capital Request: $1,281.4K	**Authorization Type:** Full Funding

1. Executive Summary

Full funding based on actuals is being requested for this project for $1,281K which is 147% of the ENG estimate of $872K. The work done has been completed as designed with no scope change. The variance between the full funding request and the ENG estimate is due to underestimated labor charges resulting from the project being designed without the 30% adder for contractor labor. Had this adder been accounted for then the original ENG estimate would have been approximately $1,113.4K, which is only 13% less than the full funding request amount. The 13% variance is within the threshold, however the extra cost is due to additional switching being required.

The High Meadow Condos has [redacted]. This project is to address the ongoing Yellow Tag on Highland Dr, Monroe, CT that has been in place since August 2022. The initial scope of the work is ongoing under WO 10638899. Throughout the work on WO 10638899 it was determined that additional work and a project is required to complete repairs to the system. Additionally, to improve the reliability of the area it is recommended to upgrade all the DB cable in the area to prevent similar outages from occurring.

[redacted]. WO 10638899 was created to assess, locate, and address the cable fault. After extensive testing of the DB lateral connecting the facility to the BB, the fault could not be accurately located due to the bad concentric neutral in the cable, attributed mainly to the cables age and acidity of the soil in the area. To properly restore the area, it was recommended to replace the DB cable with underground conduit.

2. Project Cost Summary

Financial Evaluation

Capital Costs	2024	Total
Internal Labor and Construction Equipment	7.1	7.1
Outside Services	393.4	393.4
Materials	102.8	102.8
Removals	112.1	112.1
Risk and Contingency	89.4	89.4
Other	0.4	0.4
Subtotal	**705.3**	**705.3**

Indirect Capital Costs	2024	Total
Indirects/Overheads (including benefits)	562.3	562.3
Capitalized interest or AFUDC, if any	13.9	13.9
Subtotal	**576.1**	**576.1**
Total Capital Costs (Gross)	**1,281.4**	**1,281.4**
Less Total Customer Contribution	**0.0**	**0.0**
Project Costs (Net of Reimbursement)	**1,281.4**	**1,281.4**

3. Technical Justification

Background, Project Need/Justification, and Project Scope

a. Background

This project is to address the ongoing Yellow Tag on Highland Dr, Monroe, CT that has been in place since August 2022.
The High Meadow Condos were installed in 1991.
The High Meadow Condos is a 55+ housing community.
[redacted]

b. Project Need

The High Meadow Condos has [redacted] as per DSEM 07.221 for developments with electric heat. This project is to address the ongoing Yellow Tag on Highland Dr, Monroe, CT that has been in place since August 2022. The initial scope of the work is ongoing under WO 10638899. Throughout the work on WO 10638899 it was determined that additional work and a project is required to complete repairs to the system. Additionally, to improve the reliability of the area it is recommended to upgrade all the DB cable in the area to prevent similar outages from occurring. Concentric neutral can degrade with acidic soil causing a loss of neutral path and making fault locating difficult in addition to potentially causing stray voltage. The neutral is deteriorated and is causing significant difficulties with cable testing in this development.

[redacted]

c. Project Scope

This project will replace the existing failing DB cable with underground in conduit. The main areas that will be addressed with this project are as follows.

WO 10638899: **Cost $153,132 Work in progress**

- [redacted]

- [redacted]

Major Material:

- 3110’ of 1PH #1 AL 25KV EPR
- 3080’ of 3PH #1 AL 25KV EPR
- 2 Splice Boxes

4. Alternatives Considered

Option 1: Partial Reconductoring $677.4k*

[redacted].

Option 2: Full Reconductoring – Preferred Option $1281.4k*

[redacted]

[redacted]

	Option	
[redacted]		
Capital Cost*	$677.4k	$1,281.4k
Expense Cost*	$21.2k	$40.2k
Total Cost*	$698.6k	$1,321.6k
Preferred option		X

*Numbers adjusted based on actuals

5. Project Schedule

Add any additional milestones that are pertinent to the project

Milestone/Phase Name	Estimated Date
100% Engineering Completion	9/30/23
Construction Start	In progress
In Service Date	12/31/23

6. Regulatory Decisions

N/A

7. Codes and Standards

N/A

8. Risk and Contingencies

Risk Event	Risk Horizon	Likelihood of Occurrence	Risk Mitigation
Actual cost higher than estimated due to scope changes.	2023	Medium	Included contingency costs in the funding request. Perform detailed Field Analysis and walk down in project development to avoid potential issues.
Customer Permission / Siting Council / Municipal approvals	2023	Low	Design to minimize customer impact. Project Preplanning and customer/community outreach.
Internal construction resources not available to perform the work.	2023	Low	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Materials Shortage or long lead times	2023	Medium	Pre-order long lead time material; minimize the use of non-standard and non-stocked material.

9.

References
1. There are 141 Customers at 23KV fed in this devlopment DSEM 7.221

Underground/DB Design
Section 07.22

UG/DB Design Selections **07.221**

GENERAL – Use this abbreviated table for groups of dwellings with similar heating systems only.

[redacted]

10. Attachments (One Line Diagrams, Images, etc.)

Attachment	Included in Submittal?
A. Geographic Map	*YES*
B. WO 10638899	*YES*
C. Project Needs Statement	*YES*
D. Load Sheet	*YES*
E. Original Full Funding PAF	*YES*



Attachment A: Preferred Option Geo Map



Attachment B: WO 10638899



Attachment C: Project Needs Statement: Summary

Budget Summary - Preferred Option — Full Reconductoring

2023

ID	Title	Status	Rev #	Contingency	Expenditure Amount	Net Estimate
4	Reconductoring West Condos	Draft	0	20%	$76,200	$76,200
3	Reconductoring South Condos	Draft	0	20%	$347,633	$347,633
2	Reconductoring North Condos	Draft	0	20%	$322,281	$322,281
1	WO 10638899 Completed UG Work	Draft	0	0%	$153,132	$153,132
				2023 Total:	**$899,246**	**$899,246**
				Total Project:	**$899,246**	**$899,246**

Attachment C: Project Needs Statement Continued: Segment 1 WO 10638899 Completed UG Work

Design Alternative — CD02291-01

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	0.00%
SubTotal:	$153,132
Contingency Amount:	$0
Estimate:	$153,132
Reimbursement:	$0
Net Amount:	**$153,132**
Description:	

Item Description	CU	[redacted]	Amount
OTHER OTHER E-J Electric T&D LLC 2018 Buried Cable Replacment	23-ALL14		$38,541.00
OTHER OTHER H.I. Stone & Son, Inc. for ESE FWO# 80328086	23-ALL14		$2,093.00
OTHER OTHER H.I. Stone & Son, Inc. for WO 10638899	23-ALL14		$102,540.00
OTHER OTHER Sunbelt Rentals Generator rental	23-ALL14		$9,958.00

Attachment C: Project Needs Statement Continued: Segment 2 Reconductoring North Condos

Design Alternative CD02291-02

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	20.00%
SubTotal:	$268,568
Contingency Amount:	$53,714
Estimate:	$322,281
Reimbursement:	$0
Net Amount:	**$322,281**
Description:	

Item Description	CU	[redacted]	Amount
DB CABLE Contractor Labor - install 3PH Cable	23-DB001		$20,000.00
UG CABLE DB - Splice Box	23-UG154		$4,567.68
DB CABLE DB - HDD - 3ph	23-UG159		$110,500.00
GENERATOR DB - Generator Cost/Day	23-UG161		$12,000.00
DB CABLE DB - Contractor Lineman $ for Cutting Over CIC	23-UG162		$12,500.00
DB CABLE DB - CIC - 1ph	23-UG158		$106,500.00
OTHER OTHER Add for actual splice box price $7000	23-ALL14		$2,500.00

Attachment C: Project Needs Statement Continued: Segment 3 Reconductoring South Condos

Design Alternative CD02291-03

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	20.00%
SubTotal:	$289,694
Contingency Amount:	$57,939
Estimate:	$347,633
Reimbursement:	$0
Net Amount:	**$347,633**
Description:	

Item Description	CU	[redacted]	Amount
DB CABLE Contractor Labor - install 3PH Cable	23-DB001		$20,000 00
UG CABLE DB - Splice Box	23-UG154		$4,567 68
DB CABLE DB - CIC - 1ph	23-UG158		$78,750 00
DB CABLE DB - HDD - 3ph	23-UG159		$151,300 00
GENERATOR DB - Generator Cost/Day	23-UG161		$12,000 00
DB CABLE DB - Contractor Lineman $ for Cutting Over CIC	23-UG162		$12,500 00
OTHER OTHER Add for actual splice box price $7000	23-ALL14		$2,500 00
ENCLOSURE DB - Fiberglass Enclosure - 3ph - Doghouse Switch 1011	23-UG148		$8,076 64

Attachment C: Project Needs Statement Continued: Segment 4 Reconductoring West Condos

Design Alternative CD02291-04

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	20.00%
SubTotal:	$63,500
Contingency Amount:	$12,700
Estimate:	$76,200
Reimbursement:	$0
Net Amount:	**$76,200**
Description:	

Item Description	CU	[redacted]	Amount
DB CABLE Contractor Labor - install 3PH Cable	23-DB001		$8,000.00
DB CABLE DB - CIC - 1ph	23-UG158		$48,000.00
GENERATOR DB - Generator Cost/Day	23-UG161		$4,000.00
DB CABLE DB - Contractor Lineman $ for Cutting Over CIC	23-UG162		$7,500.00

Attachment D: Load Sheet

[redacted]

Original Full Funding PAF

Operations Project Authorization Form

Project Title: [redacted] Highland Dr UG Replacement	**Project Number: CD02291**
Date Prepared: 07/13/2023	**Company:** Eversource CT
Organization: Electric System Operations	**Class(es) of Plant:** D Line
Project Initiator: [redacted]	**Project Category:** UG CABLE & EQUIPMNT REPLACEMNT
Project Manager: [redacted]	**Project Type:** Specific
Project Sponsor: [redacted]	**Capital Investment part of original Operating Plan:** No
Estimated in service date: 12/31/23	**Emergency Related Request?** Yes
Eng./Constr. Resources Budgeted? No	**Facility Type** (check all that apply): ☐ PTF ☐ non-PTF ☒ Distribution
Total Gross Capital Request: $871.9K	**Authorization Type:** Full Funding

Executive Summary

The High Meadow Condos has [redacted] as per DSEM 07.221. This project is to address the ongoing Yellow Tag on Highland Dr, Monroe, CT that has been in place since August 2022. The initial scope of the work is ongoing under WO 10638899. Throughout the work on WO 10638899 it was determined that additional work and a project is

required to complete repairs to the system. Additionally, to improve the reliability of the area it is recommended to upgrade all the DB cable in the area to prevent similar outages from occurring.

[redacted]. WO 10638899 was created to assess, locate, and address the cable fault. After extensive testing of the DB lateral connecting the facility to the BB, the fault could not be accurately located due to the bad concentric neutral in the cable, attributed mainly to the cables age and acidity of the soil in the area. To properly restore the area, it was recommended to replace the DB cable with underground in conduit.

Project Costs Summary

Note: Dollar values are in thousands

Capital Costs	Prior Spent (WO 10638899)	Year 2023	Year 2024	Total
Direct Capital Costs				
Internal Labor and Construction Equipment	7.7	37.4	0.0	45.1
Outside Services	36.4	177.3	0.0	213.7
Materials	34.6	168.4	0.0	202.9
Removals	25.0	121.7	0.0	146.7
Other	0.7	3.2	0.0	3.8
Risk and Contingency	0.0	0.0	0.0	0.0
Subtotal – Direct Costs	**104.3**	**508.0**	0.0	**612.3**
Indirect Capital Costs				
Indirect/Overheads (including benefits)	39.6	193.0	0.0	232.6
Capitalized interest or AFUDC, if any	4.6	22.4	0.0	27.0
Subtotal – Indirect Costs	**44.2**	**215.4**	0.0	**259.6**
Total Gross Capital Costs	**148.5**	**723.4**	0.0	**871.9**
Less Total Customer Contribution	0.0	0.0	0.0	0.0
Total Net Capital Project Costs	**148.5**	**723.4**	0.0	**871.9**

Technical Justification:

Project Need, Objective and Justification:

The High Meadow Condos has [redacted] as per DSEM 07.221 for developments with electric heat. This project is to address the ongoing Yellow Tag on Highland Dr, Monroe, CT that has been in place since August 2022. The initial scope of the work is ongoing under WO 10638899. Throughout the work on WO 10638899 it was determined that additional work and a project is required to complete repairs to the system. Additionally, to improve the reliability of the area it is recommended to upgrade all the DB cable in the area to prevent similar outages from occurring. Concentric neutral can degrade with acidic soil causing a loss of neutral path and making fault locating difficult in addition to potentially causing stray voltage. The neutral is deteriorated and is causing significant difficulties with cable testing in this development.

[redacted]

Project Scope:

This project will replace the existing failing DB cable with underground in conduit. The main areas that will be addressed with this project are as follows.

WO 10638899: **Cost $153,132 Work in progress**

- [redacted]

Segment 1: **Cost $322,281**

- [redacted]

Segment 2: **Cost $347,633**

- [redacted]

[redacted]

Segment 3: **Cost $76,200**

[redacted]

Major Material:

- 3110’ of 1PH #1 AL 25KV EPR
- 3080’ of 3PH #1 AL 25KV EPR
- 2 Splice Boxes

Background:

- This project is to address the ongoing Yellow Tag on Highland Dr, Monroe, CT that has been in place since August 2022.
- The High Meadow Condos were installed in 1991
- The High Meadow Condos is a 55+ housing community
- The development has DB singe and three phase #1 AL XLP cables with concentric neutral

Outage History:

[redacted]

[redacted]										
[redacted]										

Alternatives Considered:

Were alternative solutions considered/applicable? Include any cost/benefit analysis.

Project is a compliance obligation with alternatives considered (please describe below)

Option 1: Partial Reconductoring $475,413

[redacted]

This option will only reconductor the area that is affected by the current Yellow Tag. Decreasing the outage durations and reliability for this area.

This option was not selected because it does not address the remaining DB cable in the area. This development was built in 1991, any issues occurring on one part are very likely to also be affecting the remaining DB cable in the area. In this case the degeneration of the neutral cable can lead to a loss of neutral path and making fault locating difficult in addition to potentially causing stray voltage. If not addressed now a similar outage may take place soon.

Option 2: Full Reconductoring – Preferred Option $899,246

[redacted]

This option will reconductor all the DB cable in the development. [redacted]

[redacted]

[redacted]		
Cost	$475,413	$899,246
Preferred option		X

Regulatory Approvals:

Are Regulatory body approvals needed for the project?

No

If yes, provide detailed regulatory approvals

Project Schedule

Milestone/Phase Name	Estimated Date
100% Engineering Completion	9/30/23
Construction Start	In progress
In Service Date	12/31/23

Risks and Risk Mitigation Plans

Risk Event	Risk Horizon	Likelihood of Occurrence	Risk Mitigation
Actual cost higher than estimated due to scope changes.	2023	Medium	Included contingency costs in the funding request. Perform detailed Field Analysis and walk down in project development to avoid potential issues.
Customer Permission / Siting Council / Municipal approvals	2023	Low	Design to minimize customer impact. Project Preplanning and customer/community outreach.
Internal construction resources not available to perform the work.	2023	Low	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Materials Shortage or long lead times	2023	Medium	Pre-order long lead time material; minimize the use of non-standard and non-stocked material.

References

There are 141 Customers at 23KV fed in this devlopment

Underground/DB Design
Section 07.22

UG/DB Design Selections

07.221

GENERAL – Use this abbreviated table for groups of dwellings with similar heating systems only.

Ultimate System Voltage (kV)	Customer's Heating Source	Number of Customers		Recommended Design
		New Systems	Rebuilt Systems	
13.2/13.8	Electric (Including Heat Pump)	1–30	1–40	Single–phase radial*
		—	41–80	Three–phase radial
		31–40	—	Single–phase loop*
		41–120	81–120	Three–phase loop
		121+	121+	Divide into two or more smaller systems
	Oil/Gas	1–30	1–60	Single–phase radial*
		31–110	61–110	Single–phase loop*
		111–320	111–320	Three–phase loop
		321+	321+	Divide into two or more smaller systems
23	Electric (Including Heat Pump)	1–30	1–40	Single–phase radial*
		31–70	41–70	Single–phase loop*
		71–200	71–200	Three–phase loop
		201+	201+	Divide into two or more smaller systems
	Oil/Gas	1–30	1–60	Single–phase radial*
		31–200	61–200	Single–phase loop*
		201–320	201–320	Three–phase loop
		321–560	321–560	Three–phase loop with fused subloops**
		561+	561+	Divide into two or more smaller systems

* The system may be three–phase if needed to supply a three–phase load.

** Develop a system of main loop with fused subloops and fused radial spurs so that no more than 320 customers will be interrupted by any failure in the DB system

Appendices (One-Line Diagrams, Images, etc.)