EVERSOURCE

Project Approval Form

Project Title: [redacted] WPC Reliability Improvement	Project Number: CD02195
Date Prepared: 05/15/2024	**Company:** Eversource CT
Organization: Electric System Operations	**Project Category:** TRMSN DISTR RELIABILTY PERFRM
Project Initiator: [redacted]	**Project Type:** Specific
Initiating Organization: Distribution	**Capital Investment part of original Op Plan:** Yes
Project Manager: [redacted]	**Emergency Related Request?** No
Project Sponsor: [redacted]	**Facility Type** (check all that apply)**:** ☐ PTF ☐ non-PTF ☒ Distribution ☐ N/A (General Plant)
Required in service date: 12/31/2025	Towns: Lebanon, Scotland, S. Windham, Willimantic_ Circuit(s): 11F13 WPC
Total Capital Request: $5,401K	**Authorization Type: Full Funding**

1. Executive Summary

Eversource identified the top ten worst performing circuits (WPC) for each operating company based on the total number of customer minutes experienced on these circuits over the last four years. The devices with the most customer minutes for each circuit were identified as high impact zones. Cross functional teams were created with members from Engineering, Operations, System Planning, Vegetation Management and Standards to review the aging infrastructure within each high impact zone where outages have occurred. CD02195 focuses on infrastructure replacement to improve the reliability of the [redacted]. There is currently another project addressing reliability issues on the [redacted]: CD02401 is scheduled for year 2024.

[redacted]

CD02195 addresses the five high impact zones on the [redacted]

The initial engineering estimate for this project was approved for $4.4M in March 2023. However, the initial estimate did not include a revised increase per unit cost for material, labor,

rock drilling, and trimming. Therefore, the full funding request for this project is $5.41M and reflects a 22.7% increase, which includes the following additional items:

- Additional 180 man-hours for internal crews from the East Hampton AWC.
- Additional 770 man-hours for internal crews from the Danielson AWC.
- Additional tree trimming at Beaumont Hwy.
- Additional travel time for internal crews from Danielson and East Hampton AWCs.
- Additional Rock Drilling by EJ-Electric to replace 120 Frontier Poles.

*Additional Labor and travel time was originally underestimated and is the result of the involvement of line crews from two Area Work Centers (AWC) completing the work

2. Project Cost Summary

Note: Dollar values are in thousands.

Financial Evaluation ($000's)

Capital Costs	Year 2024	Year 2025	Total
Internal Labor and Construction Equipment	1,293.1	124.9	1,417.9
Outside Services	122.4	11.8	134.2
Materials	314.0	30.3	344.3
Removals	232.8	22.6	255.4
Risk and Contingency	342.9	33.9	376.8
Other	0.0	0.0	0.0
Subtotal	**2,305.1**	**223.5**	**2,528.6**

Indirect Capital Costs	Year 2024	Year 2025	Total
Indirects/Overheads (including benefits)	2,610.3	262.1	2,872.4
Capitalized interest or AFUDC, if any	0.0	0.0	0.0
Subtotal	**2,610.3**	**262.1**	**2,872.4**
Total Capital Costs (Gross)	**4,915.4**	**485.5**	**5,401.0**
Less Total Customer Contribution	**0.0**	**0.0**	**0.0**
Project Costs (Net of Reimbursement)	**4,915.4**	**485.5**	**5,401.0**

Technical Justification

a. Background

[redacted]

b. Project Need

Eversource identified the top ten worst performing circuits (WPC) for each operating company based on the total number of customer minutes experienced on these circuits over the last four years. The devices with the most customer minutes for each circuit were identified as high impact zones. Cross functional teams were created with members from Engineering, Operations, System Planning, Vegetation Management and Standards to review the aging infrastructure within each high impact zone [redacted]

a. Project Scope

This project addresses the aging infrastructure and reliability performance in five high impact zones through the following proposals:

[redacted]

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- Trim/remove as much vegetation as permissible.

[redacted]

- [redacted]
- Trim to blue sky spec as permissible.

[redacted]

- [redacted]
- Trim to blue sky spec as permissible.

[redacted]

- [redacted]
- Trim to blue sky spec as permissible.

[redacted] Windham Rd

- [redacted]
- Trim to blue sky spec as permissible.

A Synergi loadflow was performed on the circuit and no overloads were identified and all voltages were within PURA guidelines.

Major Material:

2024

- Three phase 556 Tree Wire – 15,950’ ’ ~ 3.02 miles
- Single phase 336 Tree Wire – 13,350’
- 23kV Reclosers/Scada Switches – 1
- Replace 107 Frontier Poles

2025

- Three phase 556 Tree Wire – 800’

2. Alternatives Considered

1 – Do Nothing (0.00) –

This alternative was not selected because it doesn’t address the aging infrastructure and heavy vegetation on this circuit and would not improve reliability.

2 – ($1.25M) – Extensive Vegetation Trimming –

This alternative was not selected because it only addresses the heavy vegetation on the [redacted]3 but does not replace any of the aging infrastructure. This option would not address all reliability concerns on the [redacted] and would leave under class poles and smaller bare conductor on the circuit.

3 – ($36.8M) – Replace overhead facilities in the 4 high impact zones with underground facilities would cost over $30M –

This option was not selected since lower cost options to replace the aging infrastructure were possible.

4- The preferred option was selected because it provides the highest value to customers in terms of the cost of customer minutes and customer interruption saved.

3. Project Schedule

Add any additional milestones that are pertinent to the project

Milestone/Phase Name	Estimated Date
100% Engineering Completion	10/31/2023
Construction Start	2/1/2024
In Service Date	12/31/2025

4. Regulatory Decisions

5. Codes and Standards

6. Risk and Contingencies

Risk Event	Risk Horizon	Likelihood of Occurrence	Risk Mitigation
Actual cost higher than estimated due to scope changes.	2024/2025	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	2024	Medium	Design to minimize customer impact. Project Preplanning and customer/community outreach.
Internal construction resources not available to perform the work.	2024/2025	Medium	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Internal engineering resources not available to perform the work.	2023/2024	Medium	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Materials Shortage or long lead times	2024/2025	High	Pre-order long lead time material; minimize the use of non-standard and non-stocked material.
Storm delays	2024/2025	High	If storm activity delays work, we may be forced to use external resources.

System abnormal configuration	2024/2025	Medium	Schedule work to minimize system abnormal time. Install temporary bypasses/equipment if system will be abnormal for extended periods.
Technological risks involving integration of new technology	2024/2025	Low	Before use of new technology ensure support of standards and manufacturer. Schedule project to accommodate for extra time or ensure new technology is not on the critical path.
Wetlands / Environmentally sensitive area	2024	Low	Use of mats and specialty equipment, only work during certain times of the year.

7. References

References
DSEM 11.562 – Automatic Switchgear Selection Guide Diagrams
DSEM 11.511 – Standard Switchgear Units and Combinations
DSEM 11.551 – Automatic Switchgear Selection Guide
DSEM 07.223 – UG/DB Design Selections, and DSEM 05.831 – Underground System Nomenclature

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

Attachment	Included in Submittal?
A. Cost Estimate	*YES*
B. Geographical View	*YES*
C. One Line	*YES*
	YES

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

[redacted]%20PAF%20M[redacted]%20One%20Li CD02195_[redacted]_pr CD02195 One-Line
aps%20Rev2.vsdx ne.vsdx oject_needs_stateme [redacted]df

A. Cost Estimate

Connecticut Light & Power
A Northeast Utilities Company

Specific Project Proposal - Project #: CD02195

[redacted] WPC - Reliability Improvements

Work Classification

Category: Line
Type: REL1
Type Desc: RELIABILITY IMPROVE SPEC PROJ
Work Type:

Ownership / Management

AWC: East Hampton
Statewide: No
Owner: [redacted]
Manager:

Project Information

Status: Draft
SPS #:
AIS Score:
Associated Projects:
Assignment ID:
Patrol Find ID:

Budget Summary - Preferred Option

All segments

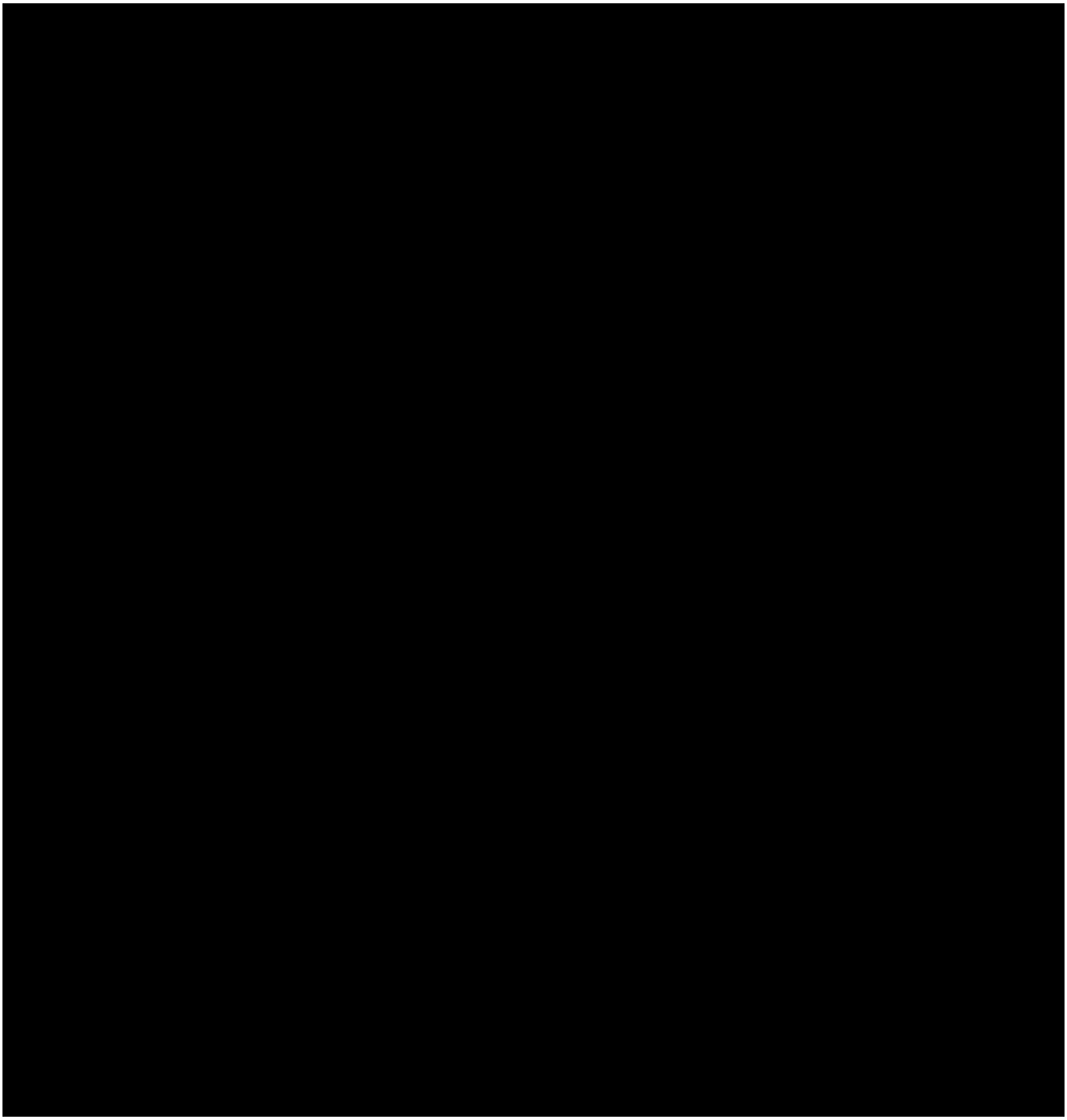
2024

ID	Title	Status	Rev #	Contingency	Expenditure Amount	Net Estimate
4	[redacted]	Draft	0	24%	$415,782	$415,782
3		Draft	0	24%	$572,225	$572,225
2		Draft	0	24%	$1,711,391	$1,711,391
1		Draft	0	24%	$1,699,944	$1,699,944
				2024 Total:	**$4,399,342**	**$4,399,342**

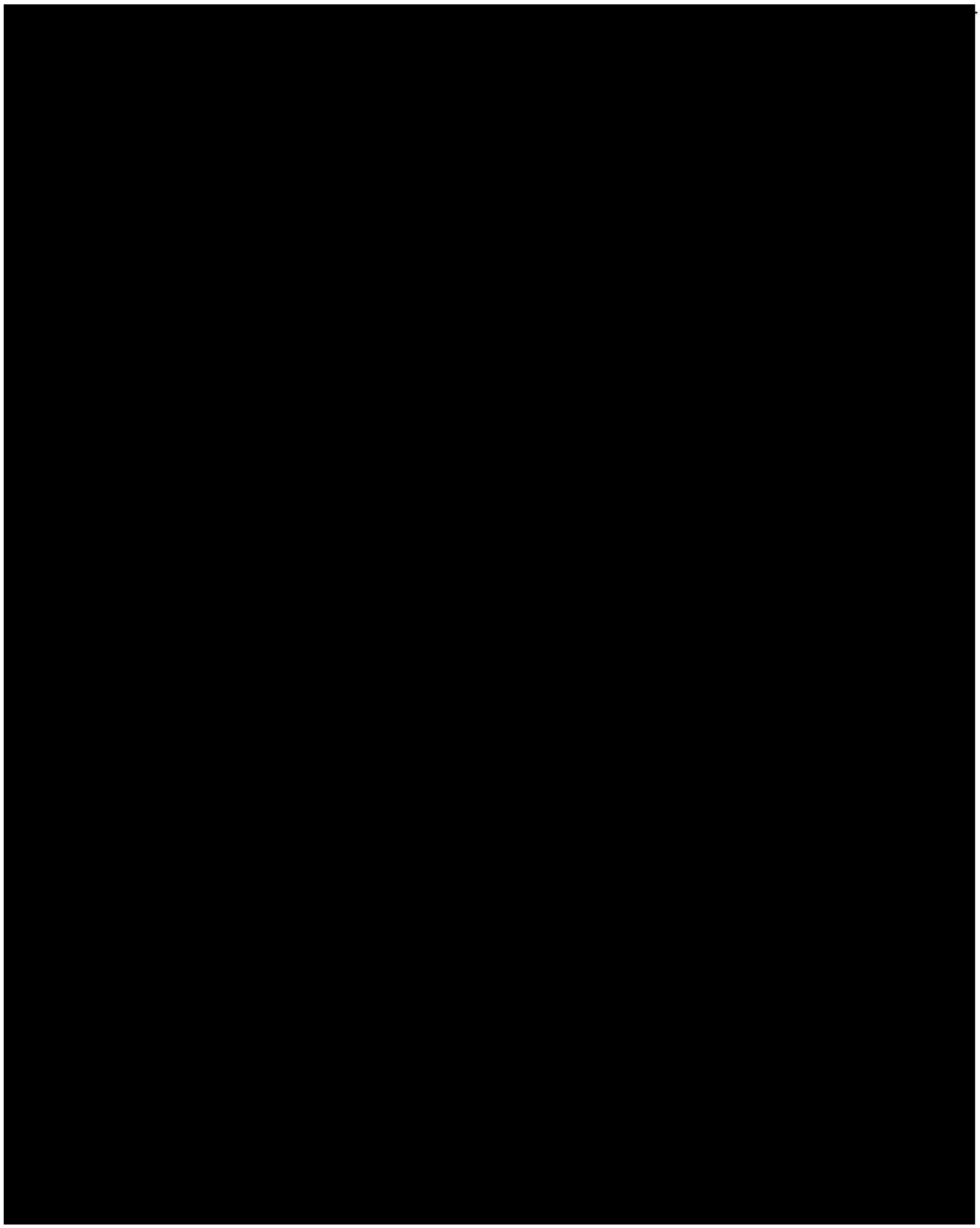
2025

ID	Title	Status	Rev #	Contingency	Expenditure Amount	Net Estimate
5	[redacted]	Draft	0	28%	$156,473	$156,473
				2025 Total:	**$156,473**	**$156,473**
				Total Project:	**$4,555,815**	**$4,555,815**

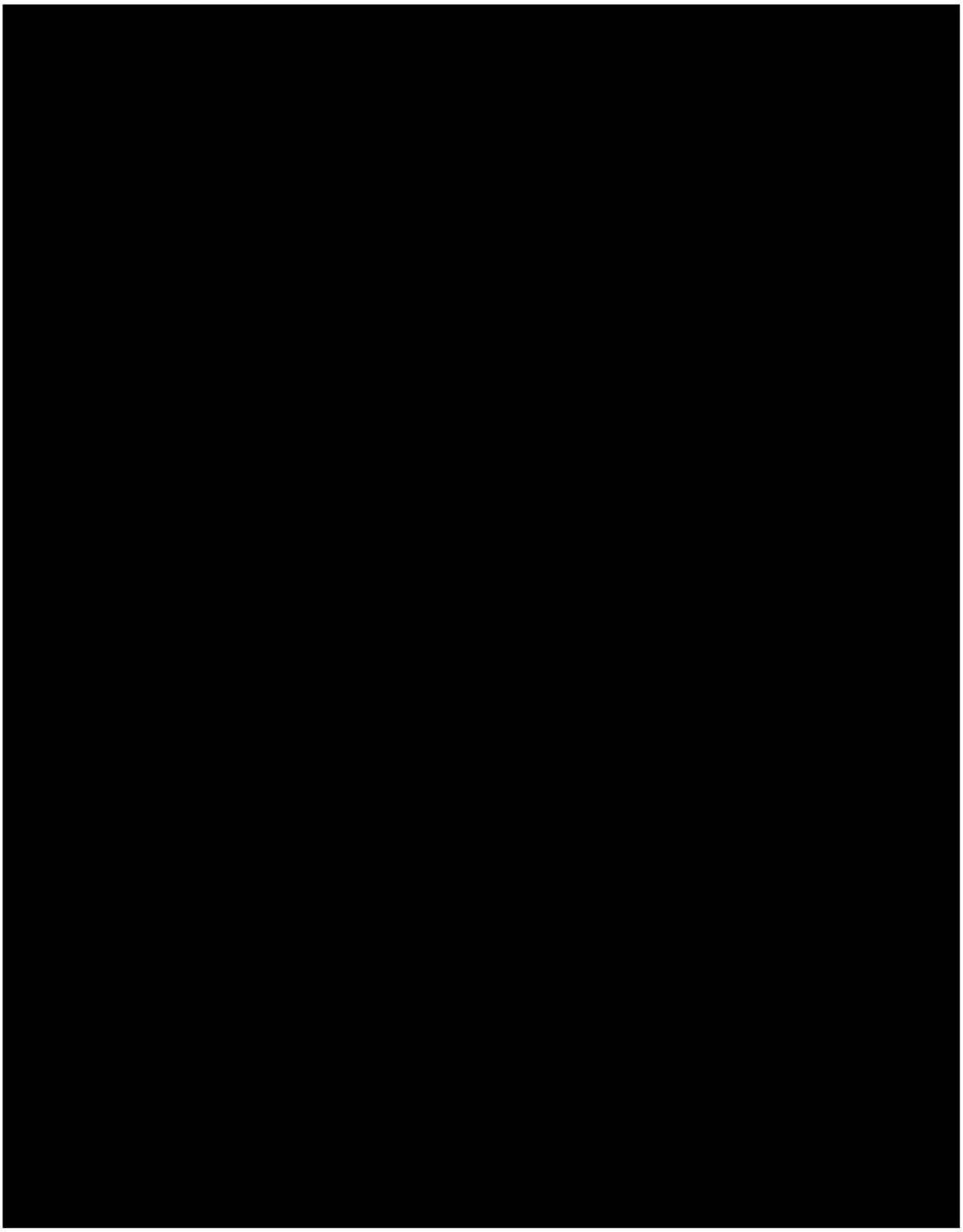
B. Geographic Map



C. One line Diagram (Before)



C. One line Diagram (After)



Operations Project Authorization Form

Project Title: [redacted] **WPC Reliability Improvement**	**Project Number: CD02195**
Date Prepared: 03/20/2023	**Company:** Eversource CT
Organization: Electric Field Operations	**Class(es) of Plant:** D Line
Project Initiator: [redacted]	**Project Category:** RELIABILITY IMPROVE SPEC PROJ
Project Manager: [redacted]	**Project Type:** Specific
Project Sponsor: [redacted]	**Capital Investment part of original Operating Plan:** Yes
Estimated in service date: 12/31/2025	**Emergency Related Request?** No
Eng./Constr. Resources Budgeted? Yes	**Facility Type** (check all that apply): ☐ PTF ☐ non-PTF ☒ Distribution
Total Gross Capital Request: $4,459K	**Authorization Type:** Initial Funding

Executive Summary

Eversource identified the top ten worst performing circuits (WPC) for each operating company based on the total number of customer minutes experienced on these circuits over the last four years. The devices with the most customer minutes for each circuit were identified as high impact zones. Cross functional teams were created with members from Engineering, Operations, System Planning, Vegetation Management and Standards to review the aging infrastructure within each high impact zone where outages have occurred. CD02195 focuses on infrastructure replacement to improve the reliability of the [redacted] circuit.

[redacted]

CD02195 addresses the four high impact zones on the [redacted] These proposals include aging infrastructure replacement, upgrading conductor sizes to increase reliability and ampacity as well as extensive vegetation trimming.

Project Costs Summary

Note: Dollar values are in thousands

Capital Costs	Year 2024	Year 2025	Year 2026+	Total
Direct Capital Costs				
Internal Labor and Construction Equipment	$162	$6	$0	$168
Outside Services	$1,533	$55	$0	$1,588
Materials	$475	$17	$0	$492
Removals	$245	$9	$0	$254
Risk and Contingency	$209	$7	$0	$217
Other	$0	$0	$0	$0
Subtotal – Direct Costs	**$2,625**	**$94**	**$0**	**$2,719**
Indirect Capital Costs				
Indirect/Overheads (including benefits)	$1,594	$57	$0	$1,651
Capitalized interest or AFUDC, if any	$87	$3	$0	$90
Subtotal – Indirect Costs	**$1,680**	**$60**	**$0**	**$1,740**
Total Gross Capital Costs	**$4,305**	**$154**	**$0**	**$4,459**
Customer Contribution				
Total Net Capital Project Costs	**$4,305**	**$154**	**$0**	**$4,459**

Technical Justification:

Project Need, Objective and Justification:

Eversource identified the top ten worst performing circuits (WPC) for each operating company based on the total number of customer minutes experienced on these circuits over the last four years. The devices with the most customer minutes for each circuit were identified as high impact zones. Cross functional teams were created with members from Engineering, Operations, System Planning, Vegetation Management and Standards to review the aging infrastructure within each high impact zone where outages have occurred. CD02195 focuses on infrastructure replacement to improve the reliability of the [redacted]

[redacted]

This project addresses the reliability in the following high impact zones, [redacted] through aging infrastructure replacement, vegetation removals and conductor replacement that will increase both reliability and ampacity.

Project Scope:

This project addresses the aging infrastructure and reliability performance in five high impact zones through the following proposals:

[redacted]

- [redacted]
- [redacted]
- [redacted]
- [redacted]
- [redacted]

[redacted]

[redacted]

A Synergi loadflow was performed on the circuit and no overloads were identified and all voltages were within PURA guidelines.

Major Material:

2024

- Three phase 556 Tree Wire – 15,950'
- Single phase 336 Tree Wire – 13,350'
- 23kV Reclosers/Scada Switches – 1

2025

- Three phase 556 Tree Wire – 800'

Background:

[redacted]

[redacted]

[redacted]

[redacted]

[redacted]

Alternatives Considered:

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

Alternatives were considered (please describe below)

1 – Do Nothing – This alternative was not selected because it doesn't address the aging infrastructure and heavy vegetation on this circuit and would not improve reliability.

2 – Extensive Vegetation Trimming - $1.02M – This alternative was not selected because it only addresses the heavy vegetation on the [redacted] but does not replace any of the aging infrastructure. This option would not address all reliability concerns on the [redacted] and would leave under classed poles and smaller bare conductor on the circuit.

3 – Replace overhead facilities in the 4 high impact zones with underground facilities would cost over $30M
This option was not selected since lower cost options to replace the aging infrastructure were possible.

Regulatory Approvals:

Are Regulatory body approvals needed for the project?

No

DOT permits may be required for this work.

Project Schedule

Milestone/Phase Name	Estimated Date
100% Engineering Completion	10/31/2023
Construction Start	3/1/2024
In Service Date	12/31/2024

Risks and Risk Mitigation Plans

Risk Event	Risk Horizon	Likelihood of Occurrence	Risk Mitigation
Actual cost higher than estimated due to scope changes.	2024/2025	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	2024	Medium	Design to minimize customer impact. Project Preplanning and customer/community outreach.
Internal construction resources not available to perform the work.	2024/2025	Medium	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Internal engineering resources not available to perform the work.	2023/2024	Medium	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Materials Shortage or long lead times	2024/2025	High	Pre-order long lead time material; minimize the use of non-standard and non-stocked material.
Storm delays	2024/2025	High	If storm activity delays work, we may be forced to use external resources.
System abnormal configuration	2024/2025	Medium	Schedule work to minimize system abnormal time. Install temporary bypasses/equipment if system will be abnormal for extended periods.
Technological risks involving integration of new technology	2024/2025	Low	Before use of new technology ensure support of standards and manufacturer. Schedule project to accommodate for extra time or ensure new technology is not on the critical path.
Wetlands / Environmentally sensitive area	2024	Low	Use of mats and specialty equipment, only work during certain times of the year.

References

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

