EVERSOURCE

Project Approval Form

Project Title: S[redacted]-COND.6	**Project Number: CD02007**
Date Prepared: 10/11/2024	**Company:** Eversource CT
Organization: Distribution Engineering	**Project Category:** SMART SWITCHES PROGRAM
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	
Total Capital Request: $1,739.8K	**Authorization Type:** Full Funding

1. Executive Summary

Full funding is being requested for this project at a cost of $1,739.8K which is 137.8% of the partial funding capital estimate of $1,263K. CD02007 was partially approved on 10/20/2022. The variance between the full funding and partial funding estimate is due to addition of approximately [redacted] of 1/0 tree wire which was originally not part of the project scope. This addition was necessary due to existing #4 wire not being adequate to support MR 2B5-80M disconnect switches required on [redacted]. The additional material and labor increased the indirect spending necessary for the project as well. The original project was presented as follows:

- *Project CD02007 seeks to address large customer zones and increase future reliability for the 2B5 circuit in Thomaston, CT. The 2B5 currently has two zones over [redacted] customers. The first zone is the [redacted] which has [redacted] customers at risk. This zone has experienced three outages in the last four years. The second zone is the [redacted] which hosts [redacted] customers is a downstream radial zone of the [redacted] and has experienced two outages over the last four years. The 2[redacted] currently has no tie with circuits emanating from a separate bulk substation. In the event of a failure on the [redacted] there is no way to back-up the [redacted]5.*
- *This project suggests the creation of a new two-way autoloop between the [redacted] in Plymouth. The tie will improve future reliability for the [redacted] while also providing protection to 3 large industrial facilities and Terryville Highschool. The proposed loop scheme involves the installation of 6 new reclosers. One SR will be installed on the 15U1 creating a 95 customer zone and allowing for a two-way tie recloser to be installed along [redacted] A set of 1667kVA auto-XFMRs will be required to step the voltage from 13.2kV to 13.8kV and will be protected by high and low side radial reclosers. An MR & SR will be installed on P#'s 1181 & 55 respectively. This will create two new recloser zones of [redacted]. Finally, a radial recloser will be installed*

at P# 830 creating a new 366 customer zone. It is important to note that the [redacted] will be a no-live tie due to difference in phasing between the two circuits.

- *Upon completion this project would reduce all customer zones on the [redacted] while also creating a new two-way tie to improve future reliability to the [redacted], and critical facilities. The total cost for the suggested work is $1,263.294.*

2. Project Cost Summary

Note: Dollar values are in thousands.

Capital Costs	2023	2024	2025	Total
Direct Capital Costs				
Internal Labor and Construction Equipment	0.3	2.0	96.8	99.2
Outside Services	1.4	8.6	415.2	425.1
Materials	1.1	6.8	327.1	334.9
Removals	0.1	0.4	22.6	23.0
Risk and Contingency	0.0	0.0	119.4	119.4
Other	0.0	0.0	0.0	0.0
Subtotal – Direct Costs	**2.9**	**17.8**	**981.1**	**1,001.7**
Indirect Capital Costs				
Indirect/Overheads (including benefits)	1.9	15.3	720.1	737.3
Capitalized interest or AFUDC, if any	0.0	0.8	0.0	0.8
Subtotal – Indirect Costs	**2.0**	**16.1**	**720.1**	**738.1**
Total Gross Capital Costs	**4.8**	**33.8**	**1,701.1**	**1,739.8**
Customer Contribution				
Total Net Capital Project Costs	**4.8**	**33.8**	**1,701.1**	**1,739.8**

Explain unique payment provisions, if applicable:

3. Technical Justification

Background, Project Need/Justification, and Project Scope

a. Background

The [redacted] customers with two large side taps of [redacted] and [redacted] customers respectively. The [redacted] and downstream radial zones have experienced 5 outages in the last four years, four of which were tree related and one equipment failure. In addition, the [redacted] does not have any auto-loop backups with external bulk substations, meaning that in the event of failure on the 2B the entirety of the [redacted] is at risk for loss of power.

Presented below are the outages associated with this work:

[redacted]

Business Process and / or Technical Improvements:

The creation of a two-way auto-loop between the [redacted] will be the first external tie on the [redacted] circuit which would be able to pick up the [redacted] in the event of loss of source from the [redacted]. The creation of this tie along [redacted]. in Plymouth would provide backup to three large industrial parks as well as Terryville Highschool and reduce exposure to Plymouth fire department and a small waste-water treatment plant along Main St. in Plymouth. The suggested work would also reduce all zones along the [redacted].

b. Project Need

This project has been established to reduce zones along the [redacted] that exceed [redacted] customers while also offering future reliability improvements for critical customers along the [redacted]. Currently the [redacted] has two zones that meet this condition. The first is the [redacted] zone which hosts [redacted] customers and has experienced three outages in the last four years. The second zone is a large lateral emanating from the [redacted] recloser. This zone hosts [redacted] customers and has experienced two outages in the last four years. Additionally, the [redacted] has no existing tie with any external bulk substation, thus if the [redacted] source the entirety of the [redacted] circuit would be out of power. This leaves [redacted] customers at risk on the [redacted] alone. With the creation of a new [redacted] the [redacted] will have all zones reduced to less than [redacted] customer zones and

will allow for backup to Terryville Highschool and three large industrial facilities in Plymouth, CT. The two-way tie would reduce the 2035 at risk customers to 1354.

c. Project Scope

The scope of the project is as follows:

P# 55

- Settings Change (RR to SR)

P# 830

- Install RR

P# 1181

- Install MR

P# 1753

- Create [redacted]-PH line extension from P# 1753 to #2341 (Preston Rd)
- Reconductor w/ 556 Spacer, [redacted]

P# New Sets (3)

- Install Set of Auto XFMRs

P# New Set (Before Autos)

- Install RR

P# New Set (After Autos)

- Install RR

P# New Set (After RRs)

- Install New TR

P# 2340 - 6328

- Replace 6 XFMRS from 13.8kV/13.2kV
    - 25kVA OH @ P# 2340
    - 25kVA OH @ P# 527
    - 25kVA OH @ P# 2957
    - 50kVA OH @ P# 5898
    - 25kVA OH @ P# 1746
    - 25kVA UG @ PAD# 5098

P# 2507

- Remove 30k C/O
- Create new Dead End to separate [redacted]

P# 1610

- Remove 140k C/O
- Install SR

P# 1616

- Remove 100k C/O
- Install Solids

P# 1717

- Install 65k C/Os

Major Material:

- 556 Spacer Cable – [redacted]
- SCADA Reclosers – [redacted]
- Recloser Settings:
  - Radial Settings – [redacted]
  - Midpoint Settings – [redacted]
  - Sectionalizing Settings – [redacted]
  - 2-way Tie Settings – [redacted]
- 1667kVA 13.2/13.8kV Auto XFMR – [redacted]
- Eversource Poles - [redacted]

4. Alternatives Considered

Option 1: Zone Sectionalizing

This option suggests the installation of two new devices to reduce the zone sizes along the [redacted] circuit. One new radial recloser would be installed at P#830 reducing the [redacted] zone from [redacted] customers and creating a new [redacted] customer radial zone. Additionally, a new smart switch would be installed at P# 1181 on [redacted]. This would create a new [redacted] customer zone and reduce the existing [redacted] zone from [redacted] customers. The cost for this option is $132k. This alternative was not chosen because it fails to provide additional ties and improve reliability to critical customer facilities.

Option 2: [redacted] Tie along [redacted]. Plymouth

This option suggests the installation of the RR and SR at P# 830 and 1181 respectively as in option 1 but also includes work to create a new two-way tie with the [redacted]. in Plymouth. To create the tie a 3-PH line extension with 556 TW from P#785 to 793 is required. A new 2-way tie recloser will be installed at P# 796 creating a no-live tie with the 15U1. Additionally, a set of 1667kVA auto XFMRs will be installed on P#801, 802, & 803 respectively. A radial recloser will be installed on both the low side and high side of the XFMRs on P# 800 and 804 as well. Finally, a new sectionalizing recloser will be installed at P#786 completing the work for the tie. After work is complete all zones will be comprised of less than [redacted] customers and a new 2-way tie will be created helping improve reliability on both the [redacted]. The cost for this option is $698k. While this option does create an additional tie and reduce customer zones, it does not increase reliability to customers and reduce customer interruptions especially to critical facilities.

Option 3 is the preferred option because it provides the greatest benefit to critical customers and facilities while also reducing customer zone size to less than [redacted] customers throughout the [redacted] circuit. This option accomplishes the zone reduction seen in options 1 & 2 while also creating a 2-way tie between the [redacted] as in option 2 for a cost per customer minute saved of $4.39. This cost per

customers minute saved is less than that presented in option 1 and 2 and provides greater reliability improvement than either other option. Additionally, this option provided better protection of key industrial facilities near [redacted] and Terryville High School.

5. Project Option Comparison

Design Criteria	Option		
	1 – [redacted] Zone Reductions	2 – [redacted] Tie, [redacted] Plymouth	3 – [redacted] [redacted] Plymouth
Normal loads < 80% of OH rating	X	X	X
Contingent loads < 100% of rating	X	X	X
All zones < 500 customers	X	X	X
Additional ties created	0	1	1
No automatic circuit ties with circuits emanating from the same bus		X	X
# of Critical Facilities Protected	0	1	3
Total Cost	$132K	$698K	$1.74M
Cost / CM Saved	$2.84/CMS	$24.05/CMS	$4.39/CMS
Preferred option			X

6. Project Schedule

Add any additional milestones that are pertinent to the project

Milestone/Phase Name	Estimated Date
Preliminary Approval	11/30/2022
Detailed Design	5/1/2024
Settings Requested	6/1/2023

Milestone/Phase Name	Estimated Date
Construction End	12/31/2025

7. Regulatory Decisions

N/A

8. Codes and Standards

N/A

9. Risk and Contingencies

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

Storm delays	2025	Low	If storm activity delays work, we may be forced to use external resources.
System abnormal configuration	2025	Low	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	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	2025	Medium	Use of mats and specialty equipment, only work during certain times of the year.

10. References

N/A

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

Attachment	Included in Submittal?
A. Project Needs Statement	*YES*
B. Load Sheet	*YES*
C. Geographic Map	*YES*
D. System and Station One-Lines	*YES*
E. Partial Funding PAF Form	*YES*

Attachment A: Project Needs Statement

Connecticut Light & Power
A Northeast Utilities Company

Specific Project Proposal - Project #: CD02007 [redacted]

Work Classification

Category: Line
Type: SRSS
Type Desc: SMART SWITCHES PROGRAM
Work Type:

Ownership / Management

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

Project Information

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

Budget Summary - Preferred Option

Option 3: Create 2B5/15U1 Tie, Preston Rd

2024

ID	Title	Status	Rev #	Contingency	Expenditure Amount	Net Estimate
3	Option 3: Create Tie, Preston Rd	Draft	0	28%	$1,290,833	$1,290,833
				2024 Total:	$1,290,833	$1,290,833
				Total Project:	$1,290,833	$1,290,833

Connecticut Light & Power
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Specific Project Proposal - Project #: CD02007 [redacted]

Project Option Summary

ID	Description	Segments	Preliminary Estimate	Construction Estimate	Variance	IEEE $/CMS	All (w/Storm)	Prfrd
O1	Option 1: 2B5- [redacted]	1	$134,398	$0	100%	$0.00	$2.84	☐
O2	Option 2: Create [redacted]	2	$712,487	$0	100%	$0.00	$12.04	☐
O3	Option 3: Create [redacted]	3	$1,290,833	$0	100%	$0.00	$3.19	☑
O4	Option 4: Create [redacted]	4	$1,255,215	$0	100%	$0.00	$18.28	☐

Segments

ID	Title	Preliminary Estimate	Construction Estimate	Variance	IEEE $/CMS	All (w/Storm)
1	Option 1 - 2 [redacted] Reduct	$134,398			$0.00	$2.84
2	Option 2 - [redacted]	$712,487			$0.00	$24.05
3	Option 3: C [redacted]	$1,290,833			$0.00	$3.19
4	Option 4: C [redacted]	$1,255,215			$0.00	$18.26

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Specific Project Proposal - Project #: CD02007 [redacted]

Background / Scope

Issue:

Project Description:

Other Considerations:

Revision / ACT Comments:

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

Environmental

Water Pollution: No Change 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: Approx. Pole Count (NU):

Crit. Cust. Impacted: Approx. Pole Count (Other):

Adjoining Property Owner Consent Required: ☐ Town Hearing Required: ☐

Other Utility Pole Custodian Area: ☐ Easement Required: ☐

State Highway Permit Required: ☐

Relocation / New Service

New Srvc. Contact: Requestor Type:

Customer Type: State Highway Project #:

Request Number: Route #:

Connecticut Light & Power
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Specific Project Proposal - Project #: CD02007 [redacted]

Design Alternative CD02007-01

General Information

Segment: 1 - Option 1 - 2B5-70S & 2B5-60R Zone Reduct Status: Draft

Segment Type: SECTIONALIZING - OH Town: THOMASTON Budget Year: 2024

Work Type: BB-Sctnlzng-Reclosers Trimming Required: ☐ In Service Date: 12/31/2023

Description: Install 1 radial recloser @ P# 830 reducing the 511 customer [redacted] one to [redacted] customers and generating a new [redacted] zone comprised of [redacted] customers.

Install 1 smart switch @ P# 1181 reducing the [redacted] customer [redacted] zone to [redacted] customers and creating a new [redacted] zone comprised of 362 customers.

Itemized Work List

ID	Major Grid	Minor Grid	Description of Work to be Performed

Connecticut Light & Power
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Specific Project Proposal - Project #: CD02007 [redacted]

Design Alternative CD02007-01

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	28.00%
SubTotal:	$104,998
Contingency Amount:	$29,400
Estimate:	$134,398
Reimbursement:	$0
Net Amount:	**$134,398**

Description:

Item Description	CU	$ / Per	Qty	Amount
SWITCHING OH/DB/UG - SWITCHING NonNetwork - Average	16-ALL17	[redacted]		$7,019.20
TRAFFIC OH/DB/UG - Traffic Control - Police Officer $1,000/day - Assume 2 Days	16-ALL18	1.00 / $	2,000	$2,000.00
SECTIONALIZE OH - Recloser - 3ph 1 Smart Switc[redacted]@ P#1181) & 1 Radial Recloser (2[redacted]@ P#830)	16-OH38	[redacted]		$95,979.20

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Specific Project Proposal - Project #: CD02007 [redacted]

Design Alternative CD02007-01

Associated / Impacted Devices

Status	Type / SysID	Street / Cross St	Structure / Town	Circuit	Map	Cust	Notes
Existing	SCADA_RECLOSER 6695540	[redacted]	[redacted] PLYMOUTH		F7-2 K-2	1604	
Existing	SCADA_RECLOSER 6695757		[redacted] PLYMOUTH		F7-2 K-2	681	
Existing	OH_FUSE 6697676		[redacted] PLYMOUTH		F7-2 L-2	366	
Existing	LB_DISC_OH 44970495		[redacted] PLYMOUTH		F7-2 K-3	1154	
Existing	LB_DISC_OH 44970761		[redacted] PLYMOUTH		F7-2 K-2	396	
Existing	OH_FUSE 145880728		[redacted] PLYMOUTH		F7-2 M-2	117	
Existing	UG_FUSE 420496134		[redacted] PLYMOUTH		F7-2 K-3	1	
Existing	SINGLE_PHASE_RECLOSER 422715828		[redacted] PLYMOUTH		F6-4 M-8	362	

Reliability Projection

Title:

Outage Start Date: 5/1/2018 Outage End Date: 5/1/2022 Years History: 4.00

Selected Event Summary

	Non-Storm	Storm	Total
Total Customer Minutes:	0	474,000	474,000
Total Customer Interruptions:	0	474	474
Total Number of Events:	0	1	1

Improvement Factors

	Default	Override
Cust. Minutes:	30%	40%
Cust. Intrrpts:	0%	0%

Calculation Results

	DPU Non-Storm Default	DPU Non-Storm Override	IEEE Non-Storm Default	IEEE Non-Storm Override	ALL Default	ALL Override
Cust. Interruptions Saved:	0	0	0	0	0	0
Cost Per Cust. Intr. Saved:	0.00	0.00	0.00	0.00	0.00	0.00
Customer Minutes Saved:	0	0	0	0	35,550	47,400
Cost Per Cust. Min. Saved:	0.00	0.00	0.00	0.00	3.78	2.84

Connecticut Light & Power
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Specific Project Proposal - Project #: CD02007 [redacted]

Design Alternative CD02007-02

General Information

Segment: 2 - Option 2 - Create Tie, Route 6 Status: Draft

Segment Type: SECTIONALIZING - OH Town: THOMASTON Budget Year: 2024

Work Type: BB-Sctnlzng-Rclsrs+Recond Trimming Required: ☑ In Service Date: 12/31/2023

Description: P# 830
- Install RR
P# 1181
- Install SS
P# 785
- Create 3-PH line extension from P# 785 to P# 793 (Route 6)
- Install 65k C/O
- Reconductor w/ 556 AL TW
P# 793
- Replace 37.5kVA OH XFMR
P# 794
- Replace 10 UG PAD XFMRs
? 1 - 25KVA
? 3 - 50kVA
? 5 - 75KVA
? 1 - 100kVA
P# 796
- Install new TR
P# 799
- Remove 3 - 50kVA XFMRs and Shift to P# 798
P# 800
- Remove 25kVA XFMR and Shift to P# 799
P# 800
- Install RR
P# 801-803
- Install set of Auto XFMRs
P# 804
- Install RR
P# 786
- Install SR

Itemized Work List

ID	Major Grid	Minor Grid	Description of Work to be Performed

Connecticut Light & Power
A Northeast Utilities Company

Specific Project Proposal - Project #: CD02007 [redacted]

Design Alternative CD02007-02

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	28.00%
SubTotal:	$556,631
Contingency Amount:	$155,857
Estimate:	$712,487
Reimbursement:	$0
Net Amount:	**$712,487**
Description:	

Item Description	CU	$ / Per	Qty	Amount
SWITCHING OH/DB/UG - SWITCHING NonNetwork - Average	16-ALL17	[redacted]		$17,548.00
SECTIONALIZE OH - Cutouts or Arresters - 3ph 65k C/O @ P# 785	16-OH20			$2,315.20
TRAFFIC OH/DB/UG - Traffic Control - Police Officer 1 Officer, 10 Days, $1,000/Day - $10,000	16-ALL18			$10,000.00
OH WIRE OH - Line Extension - 3ph (556 kcmil) 1,000' Line extension from P# 785 to 793	16-OH34			$120,000.00
OTHER OTHER 100kVA UG XFMR (535207) // [redacted]	16-ALL14			$17,388.00
OTHER OTHER 25kVA OH XFMR (534813) // [redacted]	16-ALL14			$650.00
OTHER OTHER 25kVA UG XFMR (535205) // [redacted]	16-ALL14			$1,530.00
OTHER OTHER 50kVA OH XFMR (535012) // [redacted]	16-ALL14			$6,212.00
OTHER OTHER 50kVA UG XFMR (535206) // [redacted]	16-ALL14			$5,994.00

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Connecticut Light & Power
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Specific Project Proposal - Project #: CD02007 [redacted]

Design Alternative — CD02007-02

TREE OH - Tree Trimming Assumed [redacted]	16-OH61	$10,000.00
SECTIONALIZE OH - Recloser - 3ph Install RR @ P# 830, 800, 804 // Install SS @ P# 1181 // Install TR @	16-OH38	$287,937.60
OTHER OTHER Platform (566849) // [redacted]	16-ALL14	$6,055.00
OH WIRE OH - Remove circuit wire (1 phase) Remove existing segment of 1-PH 1/0 ACSR TW	16-OH37	$2,400.00
XF DB/UG - Padmount XF - 1ph Replace [redacted] Pad XFMRs, 1 - 25kVA, 3 - 50kVA, 5 - 75kVA, 1 - 100kV	16-UG130	$31,472.00
XF OH - OH XF - 1ph Shift XFMR @ P# 800 to P# 799	16-OH45	$2,109.60
XF OH - OH XF's - bank of 3-1ph Shift XFMRs from P# 799 to P# 798	16-OH46	$5,019.20
OTHER OTHER XFMR, DIST, OH, POLE TOP, CONV, HV: 7970/13800Y V, LV: 762[redacted] LED, 3 BUSHINGS, W/O TAP (534992), [redacted]	16-ALL14	$30,000.00

Associated / Impacted Devices

Status	Type / SysID	Street / Cross St	Structure / Town	Circuit	Map	Cust	Notes
Existing	SCADA_RECLOSER 6695540	[redacted]	29 PLYMOUTH	[redacted]	F7-2 K-2	1604	
Existing	SCADA_RECLOSER 6695757	H[redacted]	55 PLYMOUTH		F7-2 K-2	681	
Existing	SCADA_RECLOSER 548602768		3007 PLYMOUTH		F7-2 O-1	294	
Existing	SCADA_RECLOSER 548602799		5675 PLYMOUTH		F7-2 P-2	785	

Connecticut Light & Power
A Northeast Utilities Company

Specific Project Proposal - Project #: CD02007 [redacted]

Design Alternative CD02007-02

Reliability Projection

Title:

Outage Start Date: 8/1/2018 Outage End Date: 8/1/2022 Years History: 4.00

Selected Event Summary

	Non-Storm	Storm	Total
Total Customer Minutes:	0	474,000	474,000
Total Customer Interruptions:	0	474	474
Total Number of Events:	0	1	1

Improvement Factors

	Default	Override
Cust. Minutes:	50%	25%
Cust. Intrrpts:	40%	25%

Calculation Results

	DPU Non-Storm Default	DPU Non-Storm Override	IEEE Non-Storm Default	IEEE Non-Storm Override	ALL Default	ALL Override
Cust. Interruptions Saved:	0	0	0	0	47	30
Cost Per Cust. Intr. Saved:	0.00	0.00	0.00	0.00	15,031.37	24,054.26
Customer Minutes Saved:	0	0	0	0	59,250	29,625
Cost Per Cust. Min. Saved:	0.00	0.00	0.00	0.00	12.03	24.05

Connecticut Light & Power
A Northeast Utilities Company

Specific Project Proposal - Project #: CD02007 [redacted]

Design Alternative — CD02007-03

General Information

Segment: 3 - Option 3: Create Tie [redacted] — Status: Draft

Segment Type: SECTIONALIZING - OH — Town: THOMASTON — Budget Year: 2024

Work Type: BB-Sctnlzng-Rclsrs+Recond — Trimming Required: ☑ — In Service Date: 12/31/2023

Description: P# 55
- Settings Change (RR to SR)

P# 830
- Install RR

P# 1181
- Install MR

P# 1753
- Create 3-PH line extension from P# 1753 to #2341 ([redacted])
- Reconductor w/ 556 Spacer, 4500'

P# New Sets (3 or 2 w/ Rack)
- Install Set of Auto XFMRs

P# New Set (Before Autos)
- Install RR

P# New Set (After Autos)
- Install RR

P# New Set (After RRs)
- Install New TR

P# 2340 - 6328
- Replace 6 XFMRS
  ? 25kVA OH @ P# 2340
  ? 25kVA OH @ P# 527
  ? 25kVA OH @ P# 2957
  ? 50kVA OH @ P# 5898
  ? 25kVA OH @ P# 1746
  ? 25kVA UG @ PAD# 5098

P# 2507
- Remove 30k C/O
- Create new Dead End to separate 2B5 & 15U1

P# 1610
- Remove 140k C/O
- Install SR

P# 1616
- Remove 100k C/O

Install Solids

Itemized Work List

ID	Major Grid	Minor Grid	Description of Work to be Performed

Connecticut Light & Power
A Northeast Utilities Company

Specific Project Proposal - Project #: CD02007 [redacted]

Design Alternative CD02007-03

Estimate

Preliminary Estimate Summary

Revision Number:	0
Contingency:	28.00%
SubTotal:	$1,008,464
Contingency Amount:	$282,370
Estimate:	$1,290,833
Reimbursement:	$0
Net Amount:	**$1,290,833**
Description:	

Item Description	CU	$ / Per	Qty	Amount
SWITCHING OH/DB/UG - SWITCHING NonNetwork - Average	16-ALL17	[redacted]		$35,096.00
TRAFFIC OH/DB/UG - Traffic Control - Flagger	16-ALL19			$31,000.00
[redacted]				
OTHER OTHER 25kVA OH XFMR (535011) // [redacted]	16-ALL14			$5,476.00
OTHER OTHER 25kVA UG XFMR (535201) // Cost: $1,630 // Quantity: 1	16-ALL14			$1,630.00
OH WIRE OH - Line Extension - 3ph (556 kcmil) 4,500' Line extension from P# 1753 to 2341	16-OH34			$540,000.00
OTHER OTHER 50kVA OH XFMR (535013) // Cost: [redacted]	16-ALL14			$1,205.00
TREE OH - Tree Trimming Estimate from Arborist	16-OH61			$50,000.00
SECTIONALIZE OH - Cutouts or Arresters - 3ph Install 65K C/O on P# 1717	16-OH20			$2,315.20
SECTIONALIZE OH - Recloser - 3ph Install RR @ P# 830, New Sets (Before and after Autos) // Install MR [redacted] fter RRs // Install SR @ P#1610	16-OH38			$287,937.60

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Connecticut Light & Power
A Northeast Utilities Company

Specific Project Proposal - Project #: CD02007 [redacted]

Design Alternative — CD02007-03

SECTIONALIZE OH - Cutouts or Arresters - 3ph Install set of 900A Solids @ P# 1616	16-OH20	[redacted]	$2,315.20
SECTIONALIZE OH - Recloser Control - setting changes only Install SR Controls @ existing 2B5-60R on P# 55	16-OH39A		$4,885.60
OTHER OTHER Platform (566849) // Cost: $6,055 // Quantity: 1	16-ALL14		$6,055.00
XF OH - OH XF - 1ph Shift OH XFMRs on P# 2340, 527, 5898, 2957, & 1746	16-OH45		$10,548.00
OTHER OTHER XFMR, DIST, OH, POLE TOP, CONV, HV: 7970/13800Y V, LV: 7620/13200Y V, 1667 KVA, 1 PH, OIL FILLED, 3 BUSHINGS, W/O TAP (534992), [redacted]	16-ALL14		$30,000.00

Associated / Impacted Devices

Status	Type / SysID	Street / Cross St	Structure / Town	Circuit	Map	Cust	Notes
Existing	SCADA_RECLOSER 6695540	[redacted]	[redacted] PLYMOUTH		F7-2 K-2	1604	
Existing	SCADA_RECLOSER 6695757		[redacted] PLYMOUTH		F7-2 K-2	681	
Existing	SINGLE_PHASE_RECLOSER 6696069		[redacted] PLYMOUTH		F7-2 K-3	412	
Existing	SCADA_RECLOSER 542126998		[redacted] PLYMOUTH		G6-3 A-8	1140	

Connecticut Light & Power
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Specific Project Proposal - Project #: CD02007 [redacted]

Design Alternative CD02007-03

Reliability Projection

Title:

Outage Start Date: 5/1/2018 Outage End Date: 5/1/2022 Years History: 4.00

Selected Event Summary

	Non-Storm	Storm	Total
Total Customer Minutes:	0	2,698,008	2,698,008
Total Customer Interruptions:	0	1,554	1,554
Total Number of Events:	0	3	3

Improvement Factors

	Default	Override
Cust. Minutes:	50%	60%
Cust. Intrrpts:	40%	60%

Calculation Results

	DPU Non-Storm Default	DPU Non-Storm Override	IEEE Non-Storm Default	IEEE Non-Storm Override	ALL Default	ALL Override
Cust. Interruptions Saved:	0	0	0	0	155	233
Cost Per Cust. Intr. Saved:	0.00	0.00	0.00	0.00	8,306.52	5,537.68
Customer Minutes Saved:	0	0	0	0	337,251	404,701
Cost Per Cust. Min. Saved:	0.00	0.00	0.00	0.00	3.83	3.19

Connecticut Light & Power
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Specific Project Proposal - Project #: CD02007 [redacted]

Design Alternative CD02007-04

General Information

Segment: 4 - Option 4: Create Tie, [redacted] Status: Draft

Segment Type: SECTIONALIZING - OH Town: THOMASTON Budget Year: 2024

Work Type: BB-Sctnlzng-Rclsrs+Recond Trimming Required: ☑ In Service Date: 12/31/2023

Description: P# 830
- Install SR
P# 1181
- Install SS
P# 2572
- Create 3-PH line extension from P# 2755 to #804 ([redacted])
- Reconductor w/ 556 TW, 4300'
P# New Sets (3 or 2 w/ Rack)
- Install Set of Auto XFMRs
P# New Set (Before Autos)
- Install RR
P# New Set (After Autos)
- Install RR
P# New Set (After RRs)
- Install New TR
P# 2837 - 804
- Shift 4 OH XFMRs
P# 483
- Install 30k C/O
P# 1394
- Remove 65k C/O
- Install new SR

Itemized Work List

ID	Major Grid	Minor Grid	Description of Work to be Performed

Connecticut Light & Power
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Specific Project Proposal - Project #: CD02007 [redacted]

Design Alternative CD02007-04

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	28.00%
SubTotal:	$980,637
Contingency Amount:	$274,578
Estimate:	$1,255,215
Reimbursement:	$0
Net Amount:	**$1,255,215**

Description:

Item Description	CU	Amount
SWITCHING OH/DB/UG - SWITCHING NonNetwork - Average	16-ALL17	$35,096.00
TRAFFIC OH/DB/UG - Traffic Control - Flagger [redacted]	16-ALL19	$35,000.00
OH WIRE OH - Line Extension - 3ph (556 kcmil) [redacted]ine extension from P# 2572 to 804 (Washington Rd)	16-OH34	$516,000.00
TREE OH - Tree Trimming Estimate from Arborist	16-OH61	$60,000.00
SECTIONALIZE OH - Recloser - 3ph Install SR @ P# 830, New Sets (Before and after Autos) // Install SS (After RRs // Install SR @ P#1394	16-OH38	$287,937.60
OTHER OTHER Platform (566849) // [redacted]	16-ALL14	$6,055.00
XF OH - OH XF - 1ph Shift 4 OH XFMRs on P# 2755, 2836, 481, 1374, & 1369	16-OH45	$10,548.00
OTHER OTHER XFMR, DIST, OH, POLE TOP, CONV, HV: 7970/13800Y V, LV: 7620/13200Y V, 1667 KVA, 1 PH, OIL FILLED, 3 [redacted]	16-ALL14	$30,000.00

Connecticut Light & Power
A Northeast Utilities Company

Specific Project Proposal - Project #: CD02007 [redacted]

Design Alternative CD02007-04

Associated / Impacted Devices

Status	Type / SysID	Street / Cross St	Structure / Town	Circuit	Map	Cust	Notes
Existing	SCADA_RECLOSER 6695540	[redacted]	[redacted] PLYMOUTH		F7-2 K-2	1604	
Existing	SCADA_RECLOSER 6695757	[redacted]	[redacted] PLYMOUTH		F7-2 K-2	681	
Existing	SCADA_RECLOSER 16863151	[redacted]	8134 PLYMOUTH	11K45	G7-1 A-2	628	

Reliability Projection

Title:

Outage Start Date: 5/1/2018 Outage End Date: 5/1/2022 Years History: 4.00

Selected Event Summary

	Non-Storm	Storm	Total
Total Customer Minutes:	0	474,000	474,000
Total Customer Interruptions:	0	474	474
Total Number of Events:	0	1	1

Improvement Factors

	Default	Override
Cust. Minutes:	50%	58%
Cust. Intrrpts:	40%	58%

Calculation Results

	DPU Non-Storm Default	DPU Non-Storm Override	IEEE Non-Storm Default	IEEE Non-Storm Override	ALL Default	ALL Override
Cust. Interruptions Saved:	0	0	0	0	47	69
Cost Per Cust. Intr. Saved:	0.00	0.00	0.00	0.00	26,481.33	18,262.98
Customer Minutes Saved:	0	0	0	0	59,250	68,730
Cost Per Cust. Min. Saved:	0.00	0.00	0.00	0.00	21.19	18.26

Attachment B: Load Sheet



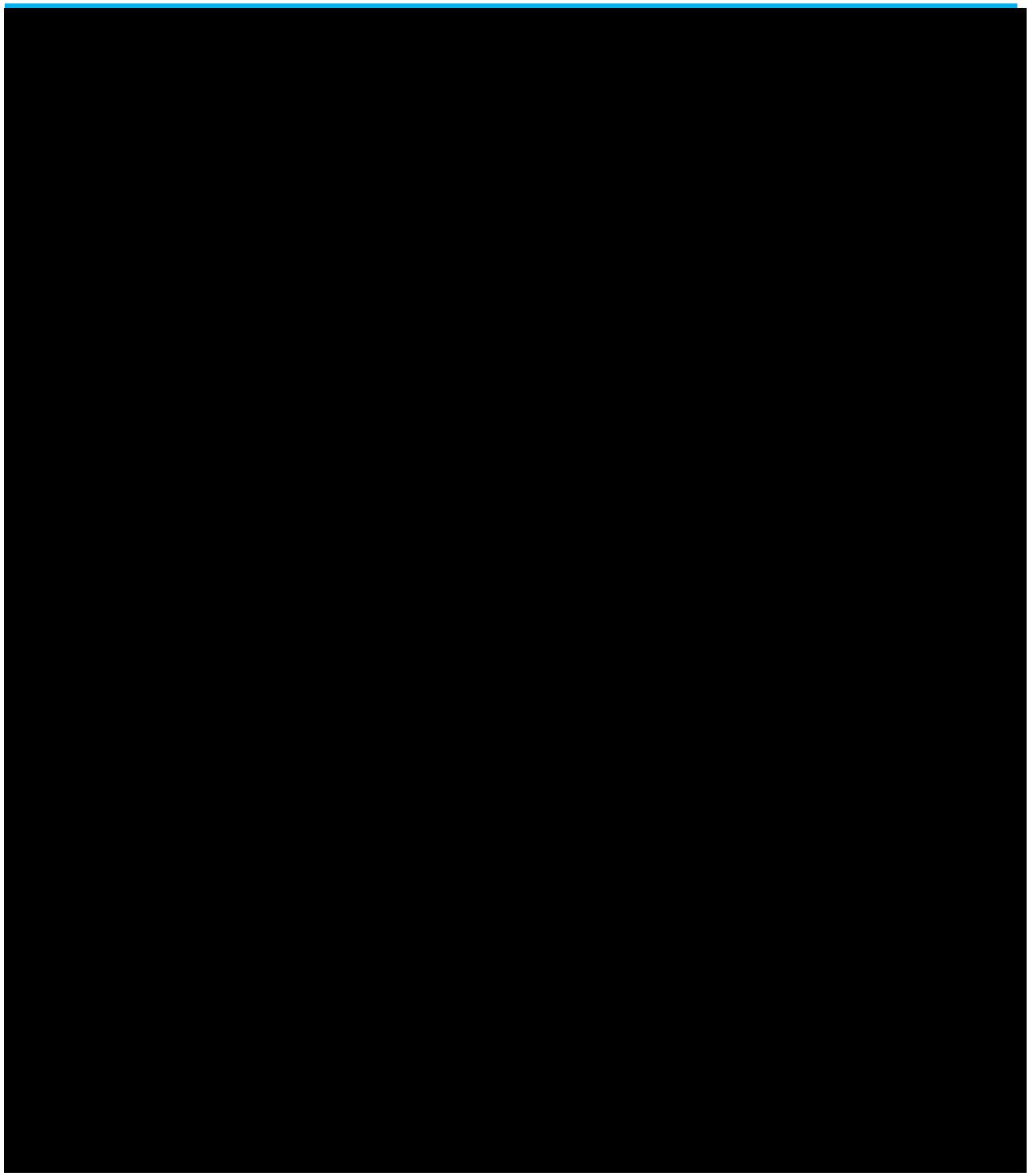


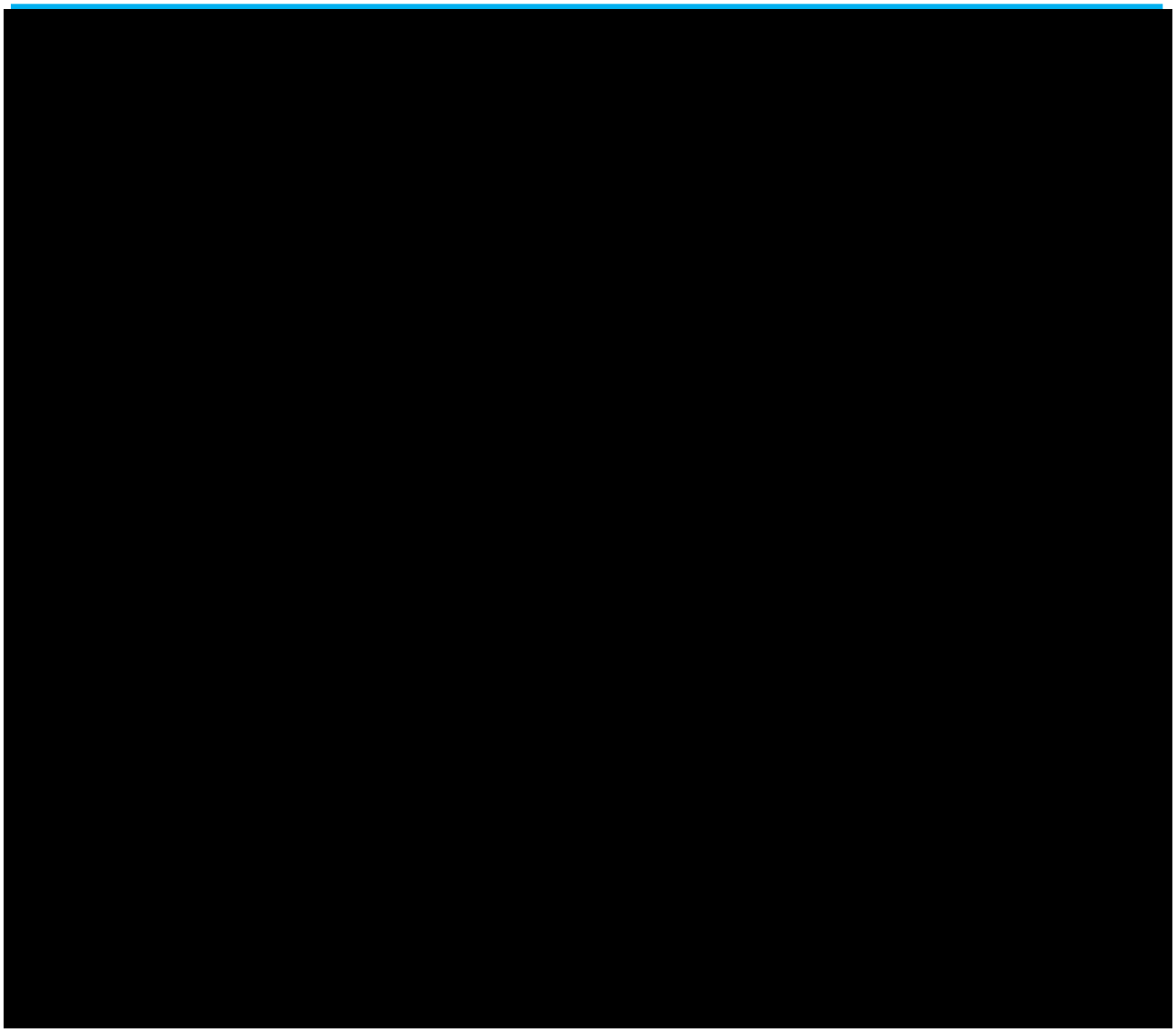




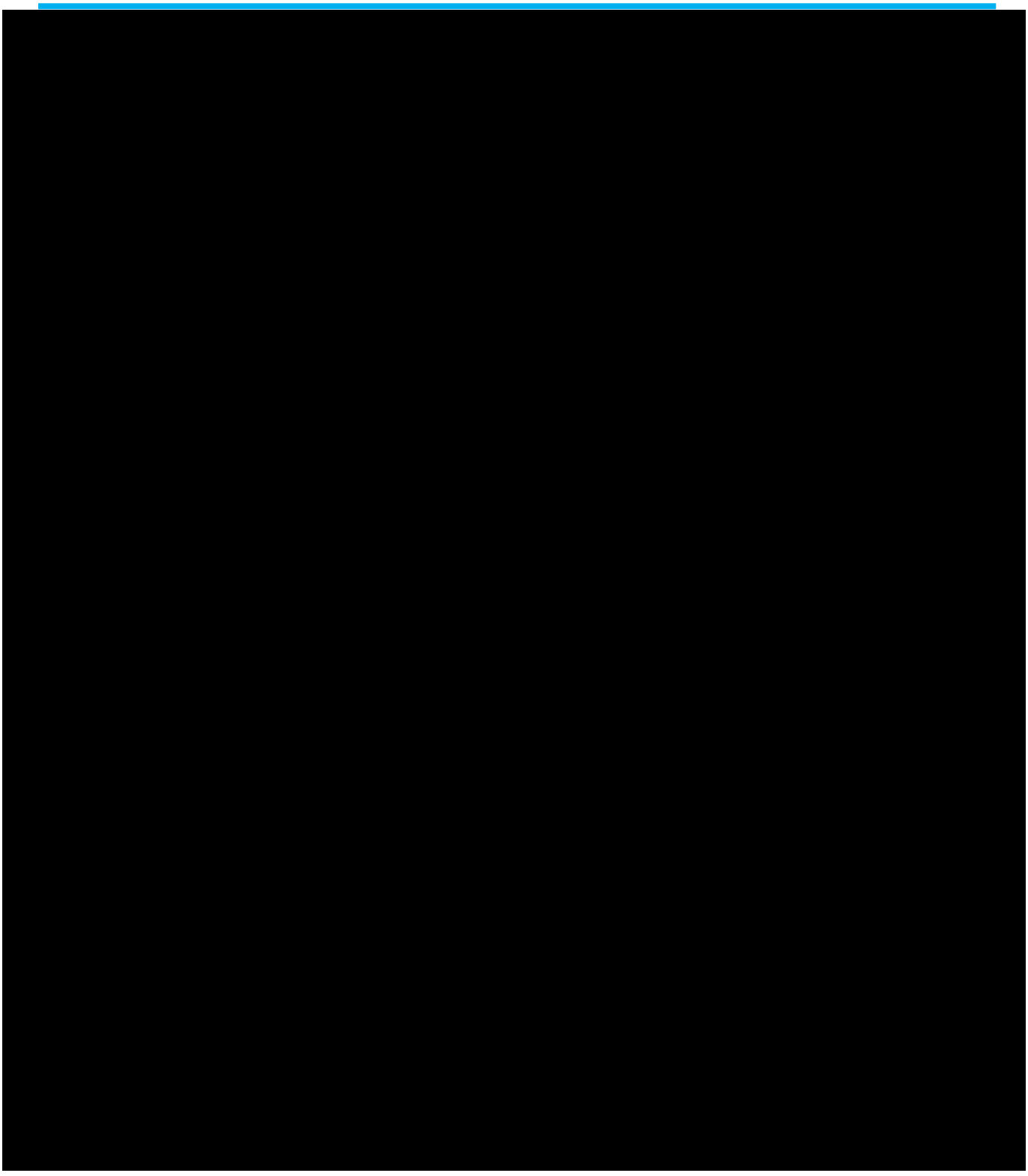
Attachment C: Geographic Map

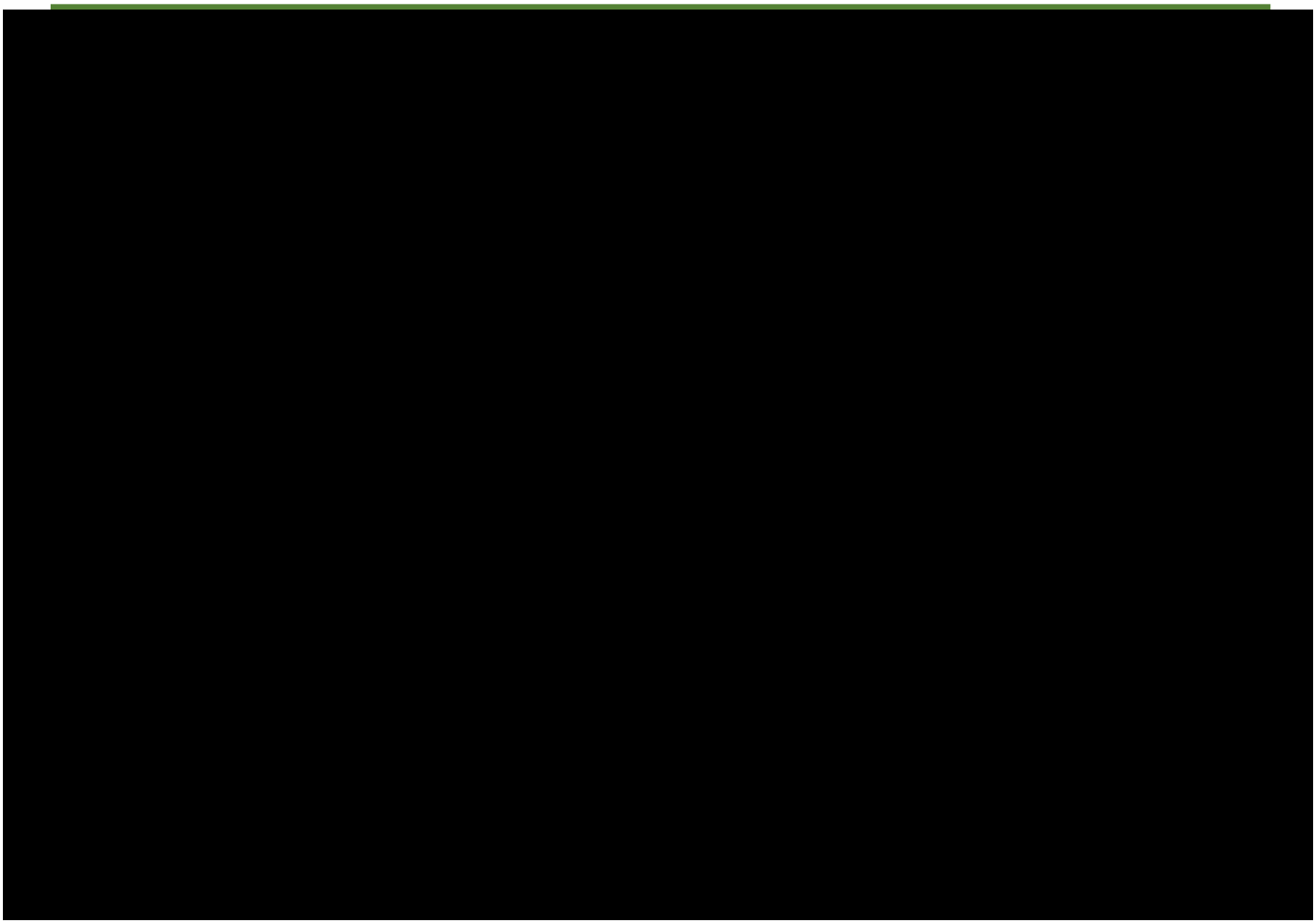












Attachment E: Partial Funding PAF Form

Operations Project Authorization Form

Project Title: [redacted]	**Project Number: CD02007**
Date Prepared: 10/12/2022	**Company:** Eversource CT
Organization: Electric Field Operations	**Class(es) of Plant:** D Line
Project Initiator: [redacted]	**Project Category:** SMART SWITCHES PROGRAM
Project Manager: [redacted]	**Project Type:** Specific
Project Sponsor: [redacted]	**Capital Investment part of original Operating Plan:** No
Estimated in service date: 12/31/2024	**Emergency Related Request?** No
Eng./Constr. Resources Budgeted? No	**Facility Type** (check all that apply): ☐ PTF ☐ non-PTF ☒ Distribution
Total Gross Capital Request: $1.263M	**Authorization Type:** Initial Funding

Executive Summary

Project CD02007 seeks to address large customer zones and increase future reliability for the [redacted] circuit in Thomaston, CT. The [redacted] currently has two zones over [redacted] customers. The first zone is the [redacted] which has [redacted] customers at risk. This zone has experienced three outages in the last four years. The second zone is the [redacted] which hosts [redacted] customers is a downstream radial zone of the [redacted] and has experienced two outages over the last four years. The [redacted] currently has no tie with circuits emanating from a separate bulk substation. In the event of a failure on the [redacted] there is no way to back-up the [redacted]

This project suggests the creation of a new two-way autoloop between the [redacted] and [redacted]. in Plymouth. The tie will improve future reliability for the [redacted] circuits while also providing protection to 3 large industrial facilities and Terryville Highschool. The proposed loop scheme involves the installation of 6 new reclosers. One SR will be installed on the [redacted] creating a [redacted] customer zone and allowing for a two-way tie recloser to be installed along [redacted]. A set of 1667kVA auto-XFMRs will be required to step the voltage from 13.2kV to 13.8kV and will be protected by high and low side radial reclosers. An MR & SR will be installed on P#'s 1181 & 55 respectively. This will create two new recloser zones of [redacted] and [redacted] customers. Finally, a radial recloser will be installed at P# 830 creating a new [redacted] customer zone. It is important to note that the [redacted] will be a no-live tie due to difference in phasing between the two circuits.

Upon completion this project would reduce all customer zones on the [redacted] to less than [redacted] customers while also creating a new two-way tie to improve future reliability to the [redacted], and critical facilities. The total cost for the suggested work is $1,263.294.

Project Costs Summary

Note: Dollar values are in thousands

Capital Costs	2024	2025	2026	Total
Internal Labor and Construction Equipment	$47	$0	$0	$47
Outside Services	$449	$0	$0	$449
Materials	$139	$0	$0	$139
Removals	$72	$0	$0	$72
Risk and Contingency	$61	$0	$0	$61
Other	$0	$0	$0	$0
Subtotal	$770	$0	$0	$770
Indirect Capital Costs	**2024**	**2025**	**2026**	**Total**
Indirects/Overheads (including benefits)	$467	$0	$0	$467
Capitalized interest or AFUDC, if any	$25	$0	$0	$25
Subtotal	$493	$0	$0	$493
Total Capital Costs (Gross)	**$1,263**	**$0**	**$0**	**$1,263**

Technical Justification:

Project Need, Objective and Justification:

This project has been established to reduce zones along the [redacted] that exceed [redacted] customers while also offering future reliability improvements for critical customers along the [redacted]. Currently the [redacted] has two zones that meet this condition. The first is the [redacted] zone which hosts [redacted] customers and has experienced three outages in the last four years. The second zone is a large lateral emanating from the [redacted] recloser. This zone hosts [redacted] customers and has experienced two outages in the last four years. Additionally, the [redacted] has no existing tie with any external bulk substation, thus if the 2B loses source the entirety of the 2B5 circuit would be out of power. This leaves [redacted] customers at risk on the [redacted] alone. With the creation of a new [redacted] loop scheme the [redacted] will have all zones reduced to less than [redacted] customer zones and will allow for

backup to Terryville Highschool and three large industrial facilities in Plymouth, CT. The two-way tie would reduce the 2035 at risk customers to [redacted].

Project Scope:

The scope of the project is as follows:

P# 55

- Settings Change (RR to SR)

P# 830

- Install RR

P# 1181

- Install MR

P# 1753

- Create 3-PH line extension from P# 1753 to #2341 [redacted]
- Reconductor w/ 556 Spacer, [redacted]

P# New Sets (3)

- Install Set of Auto XFMRs

P# New Set (Before Autos)

- Install RR

P# New Set (After Autos)

- Install RR

P# New Set (After RRs)

- Install New TR

P# 2340 - 6328

- Replace 6 XFMRS from 13.8kV/13.2kV
  - 25kVA OH @ P# 2340
  - 25kVA OH @ P# 527
  - 25kVA OH @ P# 2957
  - 50kVA OH @ P# 5898
  - 25kVA OH @ P# 1746
  - 25kVA UG @ PAD# 5098

P# 2507

- Remove 30k C/O
- Create new Dead End to separate [redacted]

P# 1610

- Remove 140k C/O
- Install SR

P# 1616

- Remove 100k C/O

- Install Solids

P# 1717

- Install 65k C/Os

Major Material:

- 556 Spacer Cable – [redacted]'
- SCADA Reclosers – [redacted]
- Recloser Settings:
  - Radial Settings – [redacted]
  - Midpoint Settings – [redacted]
  - Sectionalizing Settings – [redacted]
  - 2-way Tie Settings – [redacted]
- 1667kVA 13.2/13.8kV Auto XFMR – [redacted]
- Eversource Poles - [redacted]

Background:

The [redacted] zone hosts [redacted] customers with two large side taps of [redacted] customers respectively. The [redacted] and downstream radial zones have experienced 5 outages in the last four years, four of which were tree related and one equipment failure. In addition, the [redacted] does not have any auto-loop backups with external bulk substations, meaning that in the event of failure on the [redacted] the entirety of the [redacted] is at risk for loss of power.

Presented below are the outages associated with this work:

[redacted]

Business Process and / or Technical Improvements:

The creation of a two-way auto-loop between the [redacted] will be the first external tie on the [redacted] which would be able to pick up the [redacted] in the event of loss of source from the [redacted] The creation of this tie along [redacted]. in Plymouth would provide backup to three large industrial parks as well as Terryville Highschool and reduce exposure to Plymouth fire department and a small waste-water treatment plant along [redacted]. in Plymouth. The suggested work would also reduce all zones along the [redacted] to less than [redacted] customers.

Alternatives Considered:

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

There were three alternatives considered:

Option 1: Zone Sectionalizing

This option suggests the installation of two new devices to reduce the zone sizes along the [redacted]. One new radial recloser would be installed at P#830 reducing the [redacted] zone from [redacted] customers and creating a new [redacted] customer radial zone. Additionally, a new smart switch would be installed at P# 1181 on [redacted]. This would create a new [redacted] customer zone and reduce the existing [redacted] zone from [redacted] customers. The cost for this option is $132k. This alternative was not chosen because it fails to provide additional ties and improve reliability to critical customer facilities.

Option 2: [redacted] Tie along [redacted] Plymouth

This option suggests the installation of the RR and SR at P# 830 and 1181 respectively as in option 1 but also includes work to create a new two-way tie with the [redacted] along [redacted] in Plymouth. To create the tie a 3-PH line extension with 556 TW from P#785 to 793 is required. A new 2-way tie recloser will be installed at P# 796 creating a no-live tie with the [redacted]. Additionally, a set of 1667kVA auto XFMRs will be installed on P#801, 802, & 803 respectively. A radial recloser will be installed on both the low side and high side of the XFMRs on P# 800 and 804 as well. Finally, a new sectionalizing recloser will be installed at P#786 completing the work for the tie. After work is complete all zones will be comprised of less than [redacted] customers and a new 2-way tie will be created helping improve reliability on both the [redacted] circuits. The cost for this option is $698k. While this option does create an additional tie and reduce customer zones, it does not increase reliability to customers and reduce customer interruptions especially to critical facilities.

Option 3 is the preferred option because it provides the greatest benefit to critical customers and facilities while also reducing customer zone size to less than 500 customers throughout the [redacted] circuit. This option accomplishes the zone reduction seen in options 1 & 2 while also creating a 2-way tie between the [redacted] as in option 2 for a cost per customer minute saved of $3.19. This cost per customers minute saved is less than that presented in option 1 and 2 and provides greater reliability improvement than either other option. Additionally, this option provided better protection of key industrial facilities near Preston Drive and also Terryville High School.

PROJECT OPTION COMPARISON

DESIGN CRITERIA	Options		
	1 – [redacted] Zone Reductions	2 – [redacted] Tie, [redacted] Plymouth	3 – 2[redacted] Tie, [redacted] Plymouth
NORMAL LOADS < 80% OF OH RATING	X	X	X
CONTINGENT LOADS < 100% OF RATING	X	X	X
ALL ZONES < 500 CUSTOMERS	X	X	X

ADDITIONAL TIES CREATED	0	1	1
NO AUTOMATIC CIRCUIT TIES WITH CIRCUITS EMANATING FROM THE SAME BUS		X	X
# OF CRITICAL FACILITIES PROTECTED	0	1	3
TOTAL COST	**$132k**	**$698k**	**$1.26M**
COST / CM SAVED	$2.84/CMS	$24.05/CMS	$3.19/CMS
PREFERRED OPTION			X

Project Schedule

Milestone/Phase Name	Estimated Date
Preliminary Approval	11/30/2022
Detailed Design	5/1/2023
Settings Requested	6/1/2023
Construction Start	1/1/2024
Construction End	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	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	High	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.	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	High	Pre-order long lead time material; minimize the use of non-standard and non-stocked material.
Storm delays	2024	Low	If storm activity delays work, we may be forced to use external resources.
System abnormal configuration	2024	Low	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	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	Medium	Use of mats and specialty equipment, only work during certain times of the year.