EVERSOURCE

Project Approval Form

Project Title: Middlebury [redacted] Reliability Improvement	Project Number: CD01912
Date Prepared: 09/21/2023	**Company:** Eversource CT
Organization: Distribution Engineering	**Project Category:** RELIABILITY IMPROVE SPEC PROJ
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: 12/31/2023	
Total Capital Request: $3.499.8K	**Authorization Type:** Full Funding

1. Executive Summary

This project has been established to cover the costs associated with the conversion of a portion of the [redacted]. The portion in question is the Artillery Road area.

[redacted]
spreadsheet, which was developed to address the worst performing laterals in Connecticut.

[redacted]

[redacted]

- Approved Initial Funding Authorization: $2,737.9K at the 1/27/2022 CT-PAC meeting.
- Requesting Full Funding authorization: $3,499.8K, a difference of $761.9K or 28% of the Initial Funding authorization.
- Project Location:
  - Division: Western
  - District: Waterbury AWC
  - Town: Middlebury

The variance is due to the following:

- $290K – [redacted]



- $472K - Increased labor and material costs: the legacy estimating units used to produce the Initial Funding estimate are about 30% lower than the estimates used today, which were updated to reflect increased labor & material costs.

2. Project Cost Summary

Note: Dollar values are in thousands.

Capital Costs	Year 2022	Year 2023	Year 2024+	Total
Direct Capital Costs				
Internal Labor and Construction Equipment	0.2	6.3	0.0	6.5
Outside Services	35.7	1,436.9	0.0	1,472.6
Materials	8.1	324.8	0.0	332.9
Removals	9.6	420.5	0.0	430.1
Risk and Contingency	0.0	160.3	0.0	160.3
Other	0.0	0.3	0.0	0.3
Subtotal – Direct Costs	**53.5**	**2,349.2**	**0.0**	**2,402.7**
Indirect Capital Costs				
Indirect/Overheads (including benefits)	42.3	1,009.9	0.0	1,052.3
Capitalized interest or AFUDC, if any	2.1	42.8	0.0	44.9
Subtotal – Indirect Costs	**44.4**	**1,052.7**	**0.0**	**1,097.1**
Total Gross Capital Costs	**98.0**	**3,401.9**	**0.0**	**3,499.8**
Customer Contribution	**0.0**	**0.0**	**0.0**	**0.0**
Total Net Capital Project Costs	**98.0**	**3,401.9**	**0.0**	**3,499.8**

3. Technical Justification

Background, Project Need/Justification, and Project Scope

a. Background

[redacted]

The following is the interruption history from 1/1/2018 to 12/31/2021 for fuse pole 17624 on Artillery Rd., which feeds Charcoal Ave:



The following is the interruption history for the [redacted], since 1/1/2007:



b. Project Need

[redacted]

c. Project Scope

The scope of this project is as follows:

[redacted]

Major Material:

8,365' - 556 AAC spacer cable & 052 messenger
4,400' - 1/0 ACSR 175 MIL HDP
15,900' - 1/0 ACSR bare neutral
1 – Cooper Nova recloser for 13.8kV & Form 6 control.
1 – 900A Group Operated Air-Break switch.
3 – 140K Trip Savers

4. Alternatives Considered

Option 1 – [redacted]

Option 2 – [redacted]

[redacted]	Option	
Authorization Type	Full	Partial*
Capital Cost	$3,499.6K	$1,733.1K
Expense Cost	$168.7K	$98.4K
Total Cost	$3,668.3K	$1,831.5K
Cost / CM Saved	$6.87/CM	$6.24/CM
Cost / CI Saved	$6,122/CI	$5,043/CI
Preferred option	X	

* Note: the estimate for option two was modified to include the 30% adjustment to account for the legacy estimating units used due to increased labor and materials costs, to make a like for like comparison of the two options.

5. Project Schedule

Milestone/Phase Name	Estimated Date
Initial Approval	1/27/2022
100% Detailed Engineering Completion	7/1/2022
Fully Funded	9/21/2023
In Service Date	12/31/2023

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	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.	2022	Medium	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Materials Shortage or long lead times	2023	Low	Pre-order long lead time material; minimize the use of non-standard and non-stocked material.
Storm delays	2023	Low	If storm activity delays work, we may be forced to use external resources.
System abnormal configuration	2023	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	2023	Low	Before use of new technology ensure support of standards and manufacturer. Schedule project to

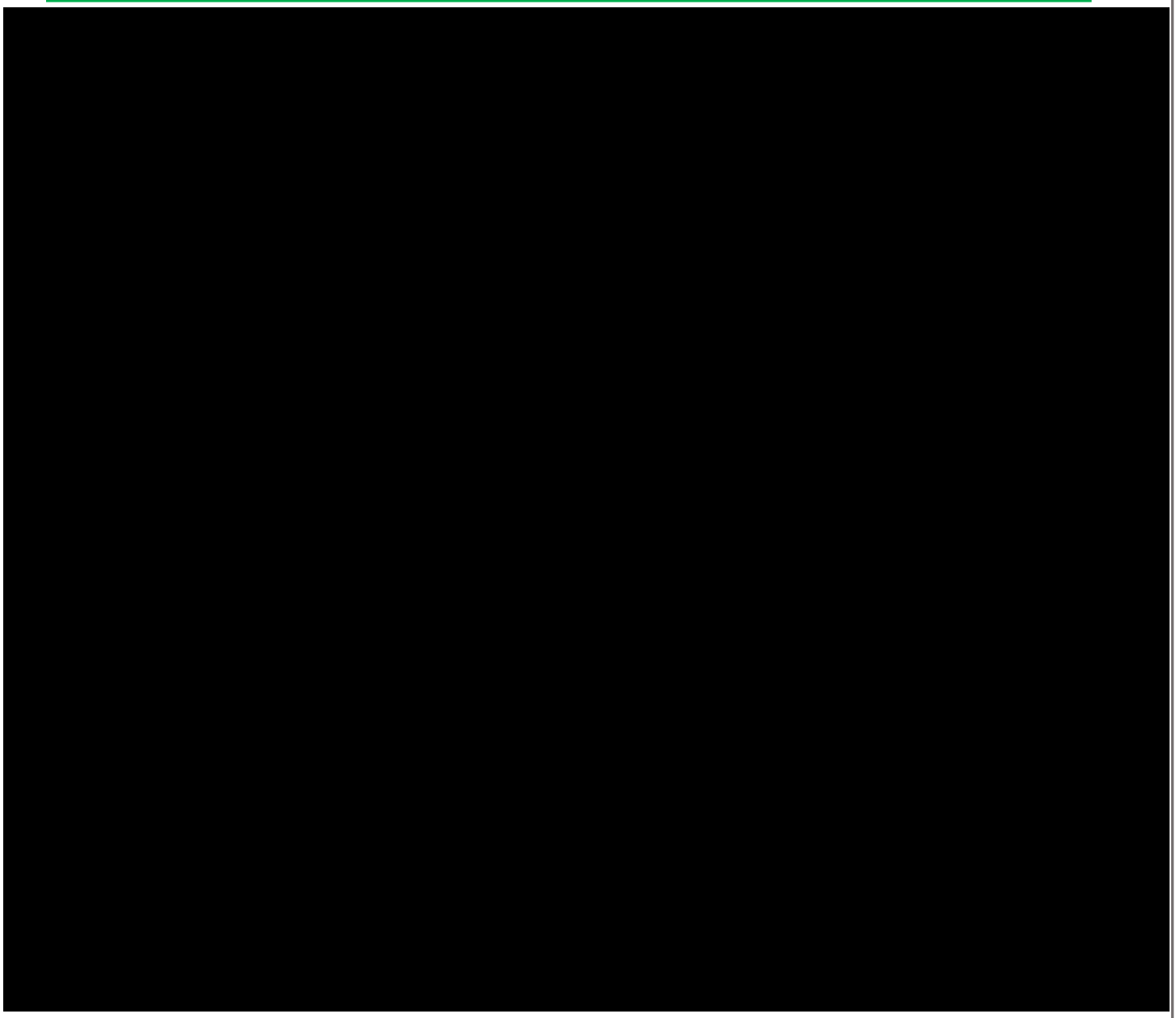
			accommodate for extra time or ensure new technology is not on the critical path.
Wetlands / Environmentally sensitive area	2023	Low	Use of mats and specialty equipment, only work during certain times of the year.

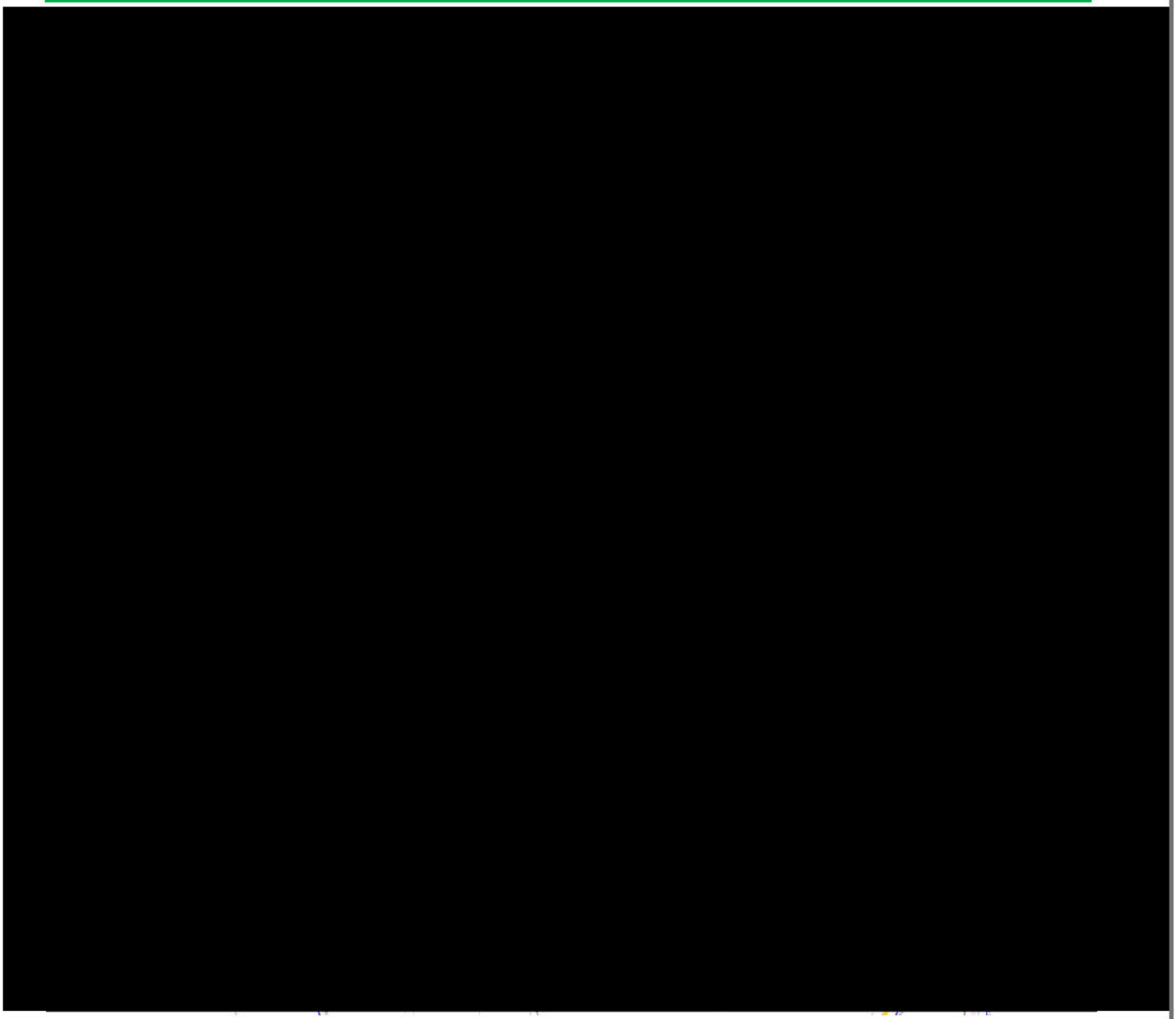
9. References

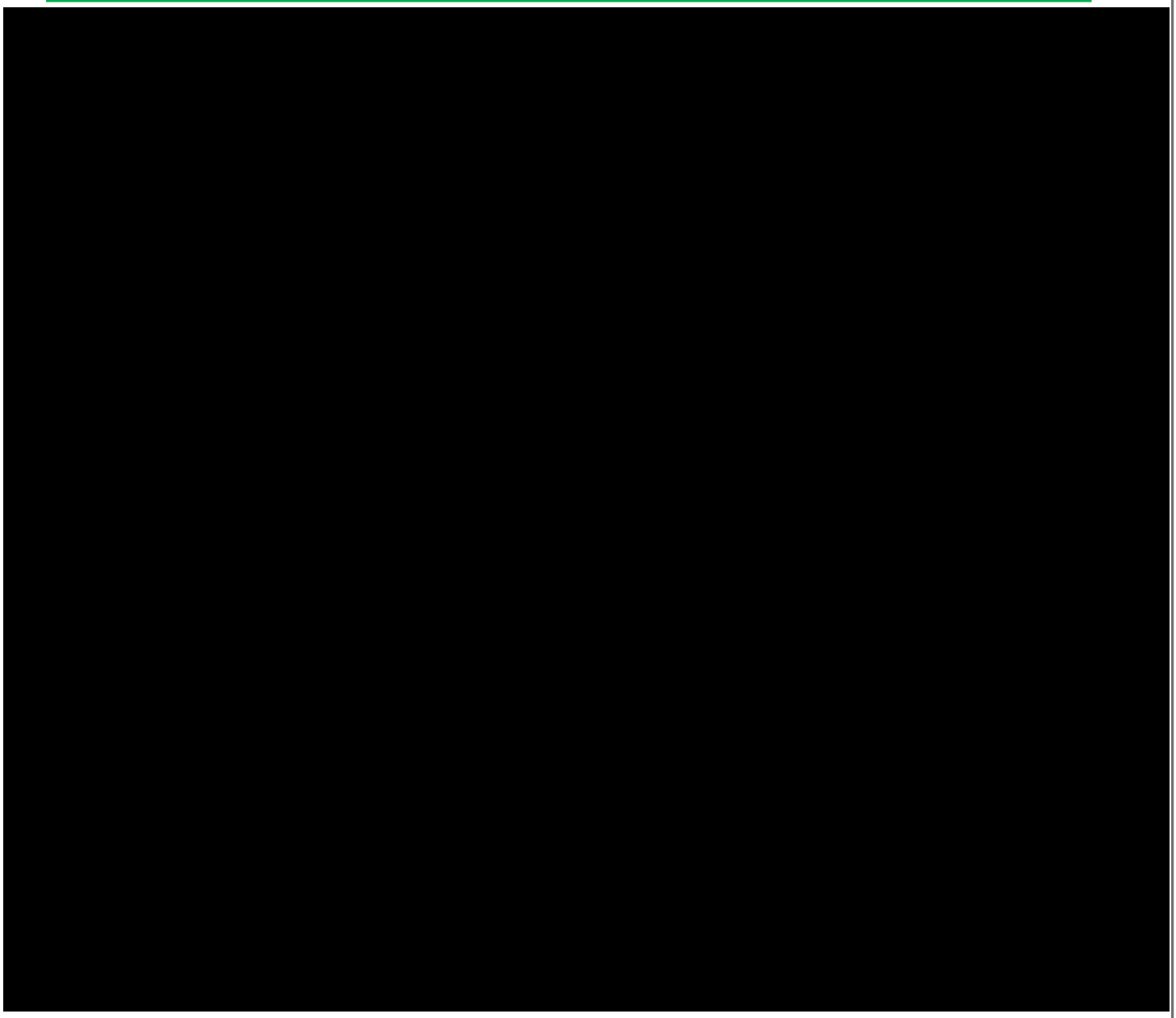
References
1. DSEM 02-301 Automatic Sectionalizing Device Guideline

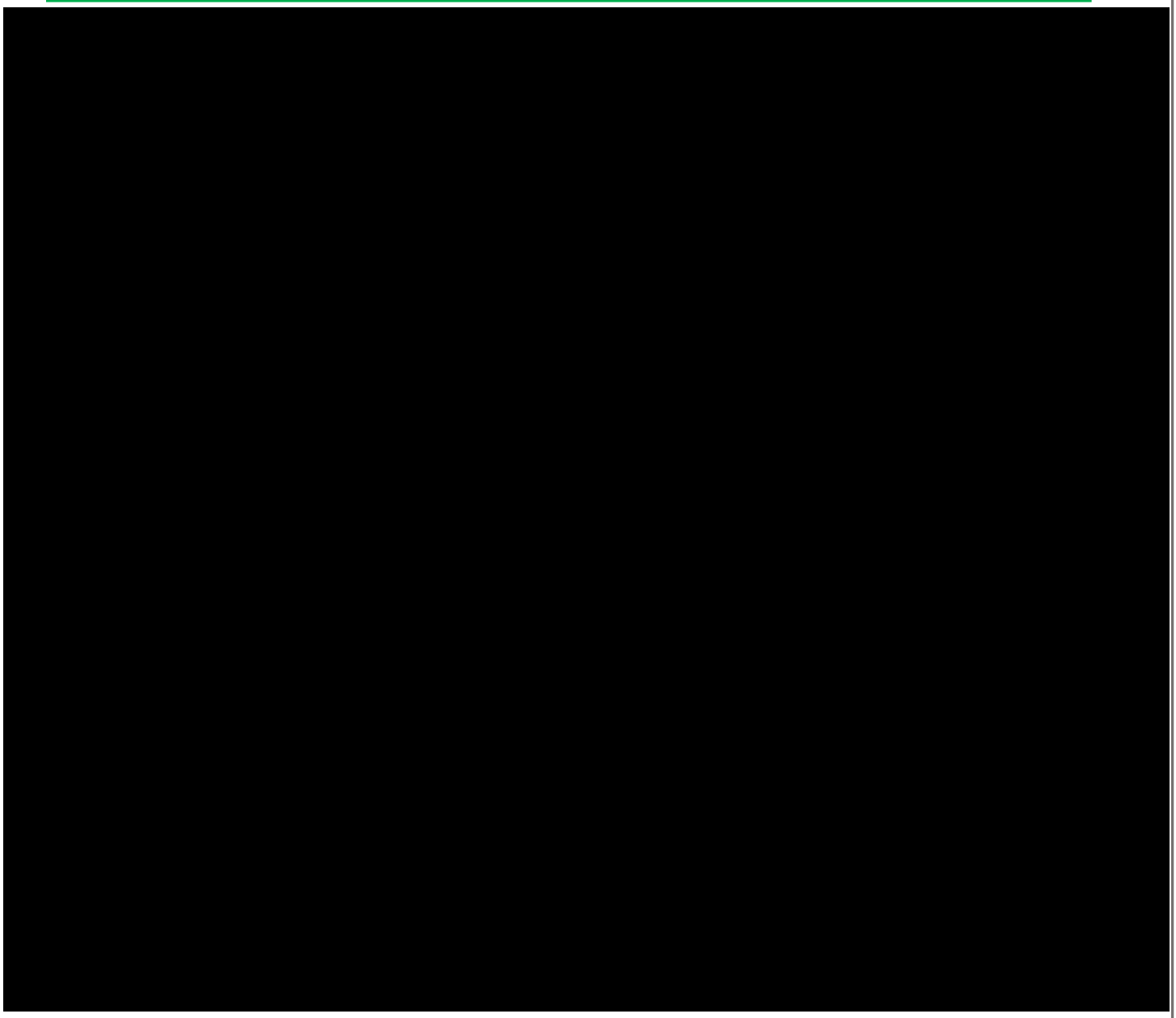
10. Attachments (One Line Diagrams, Images, etc.)

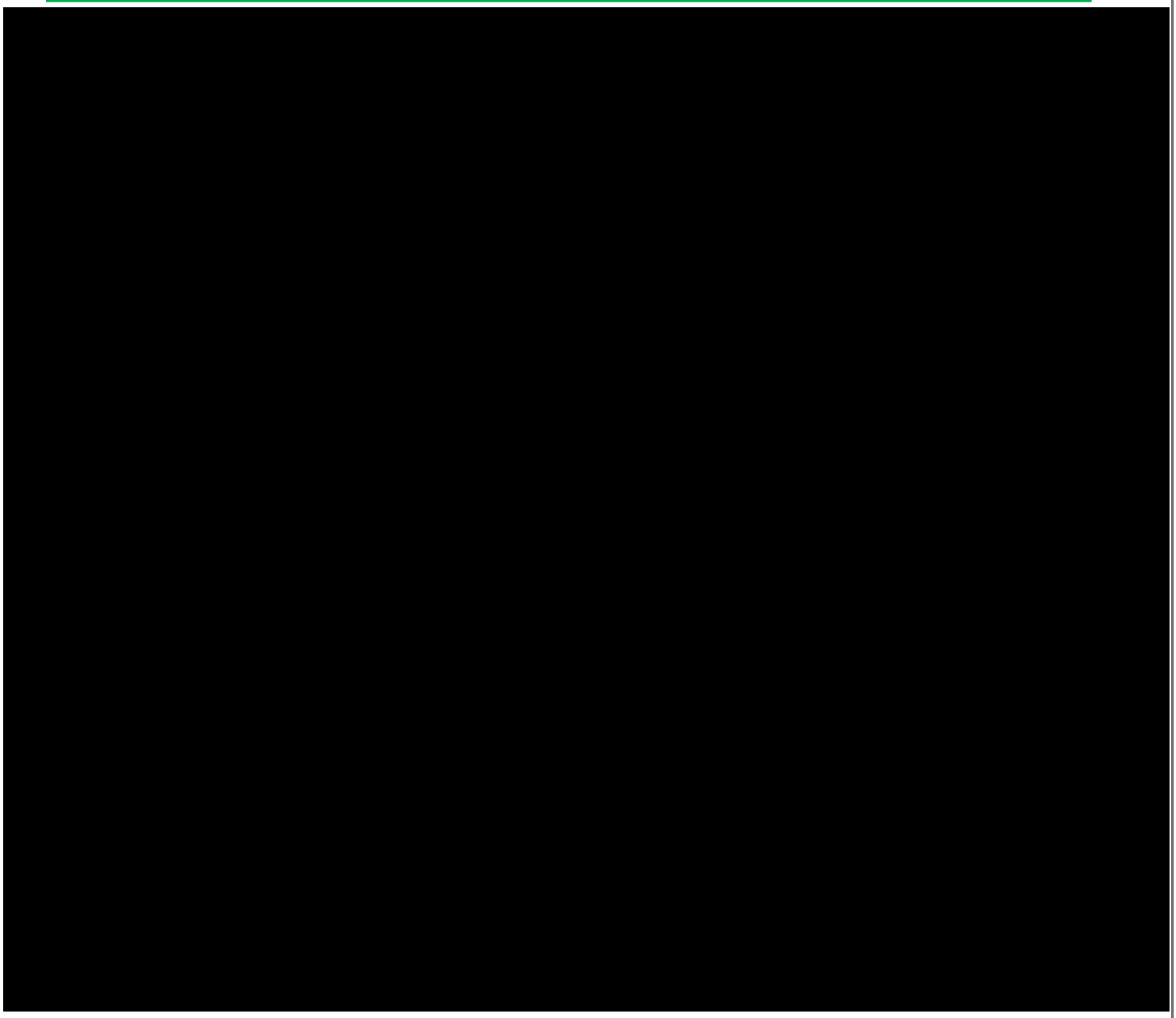
Attachment	Included in Submittal?
A. Geographic Map	*YES*
B. System and Station One-Lines	*YES*
C. Load Summary	*YES*
D. Initial Funding PAF	*YES*

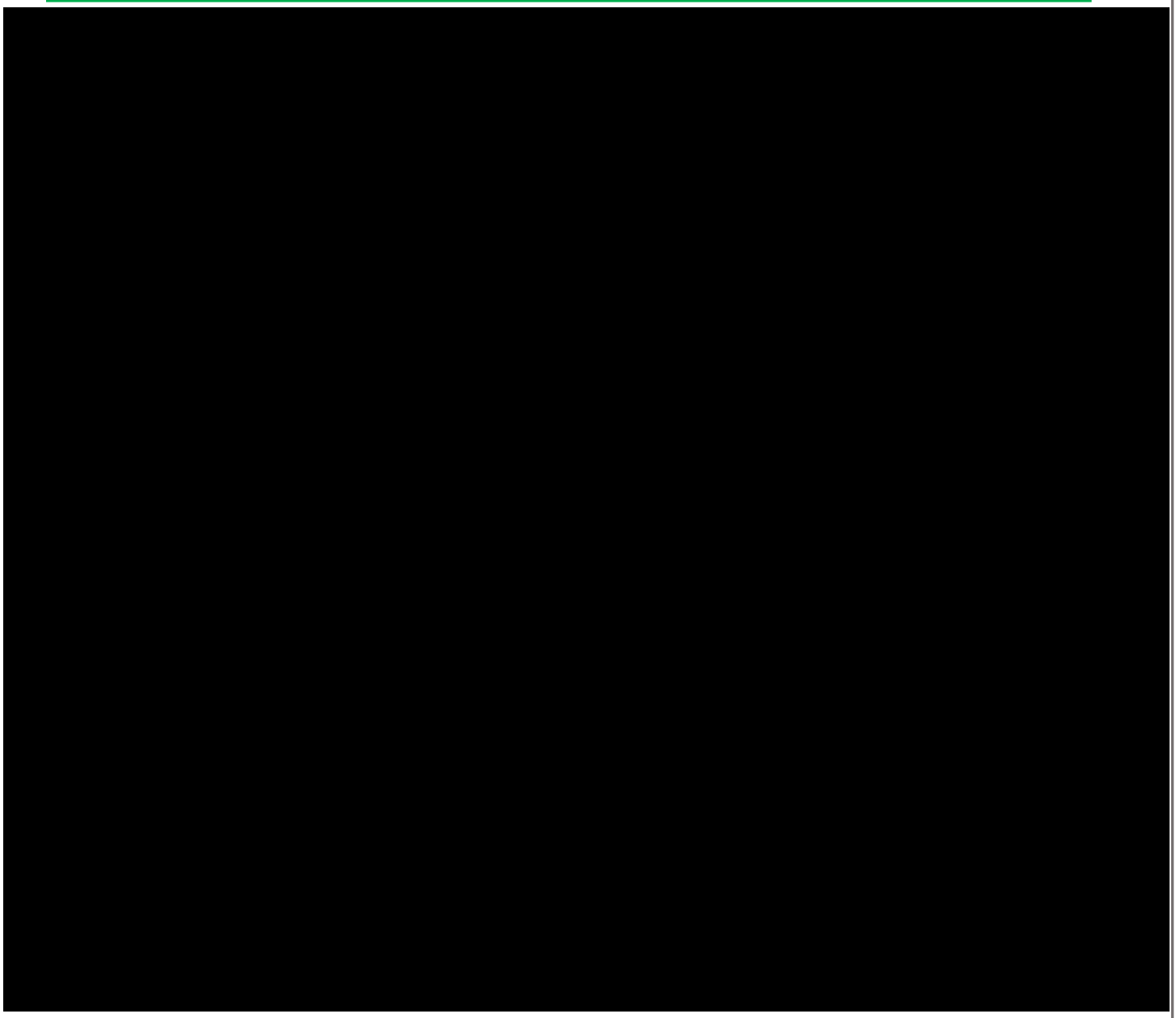












Attachment D – Initial Funding PAF

EVERSOURCE
Project Authorization Form

Operations Project Authorization Form

Date Prepared: 1/26/2022	Project Title: Middlebury [redacted] Reliability Improvement
Company/ies: Eversource CT	Project ID Number: CD01912
Organization: Distribution Electric	Class(es) of Plant: Distribution
Project Initiator: [redacted]	Project Category: Line
Project Manager: [redacted]	Project Type: Reliability Improve Spec Proj
Project Sponsor: [redacted]	Project Purpose: Eliminate Obsolete S/S Equipment
Estimated in service date: 12/31/2023	If Transmission Project: PTF? N/A
Eng. /Constr. Resources Budgeted? N	Capital Investment Part of Original Operating Plan? N
Authorization Type: Preliminary Funding	O&M Expenses Part of the Original Operating Plan? N
Total Request: $2,737,863	

Financial Requirements:

Project Authorization

ERM: _____

FP&A: _____

Executive Summary

This project has been established to cover the costs associated with the conversion of a portion of [redacted]

[redacted]

Project Costs Summary

Note: Dollar values are in thousands

	Prior Authorized	2023	2024	2025+	Totals
Capital Additions - Direct	$0	$1,561	$0	$0	$1,561
Removals net of Salvage ____%	$0	$144	$0	$0	$144
Total - Direct Spending	$0	$1,705	$0	$0	$1,705
Capital Additions - Indirect	$0	$928	$0	$0	$928
Subtotal Request	$0	$2,633	$0	$0	$2,633
AFUDC	$0	$21	$0	$0	$21
Total Capital Request	$0	$2,654	$0	$0	$2,654
O&M	$0	$84	$0	$0	$84
Total Request	**$0**	**$2,738**	**$0**	**$0**	**$2,738**

Financial Evaluation

Note: Dollar values are in thousands

Direct Capital Costs	2023	2024	2025+	Total
Straight Time Labor	$116	$0	$0	$116
Overtime Labor	$21	$0	$0	$21
Outside Services	$1,164	$0	$0	$1,164
Materials	$399	$0	$0	$399
Other, including contingency amounts (describe)	$5	$0	$0	$5
Total Direct Costs	**$1,705**	**$0**	**$0**	**$1,705**

Indirect Capital Costs	2023	2024	2025+	Total
Indirects/Overheads (including benefits)	$928	$0	$0	$928
Capitalized interest or AFUDC, if any	$20	$0	$0	$20
Total Indirect Costs	**$949**	**$0**	**$0**	**$949**
Total Capital Costs	**$2,654**	**$0**	**$0**	**$2,654**
Less Total Customer Contribution	**$0**	**$0**	**$0**	**$0**
Total Capital Project Costs	**$2,654**	**$0**	**$0**	**$2,654**
Total O&M Project Costs	**$84**	**$0**	**$0**	**$84**
Total Project Cost	**$2,738**	**$0**	**$0**	**$2,738**

Technical Justification:

Project Need Statement

[redacted]

Project Objectives

[redacted]

Project Scope

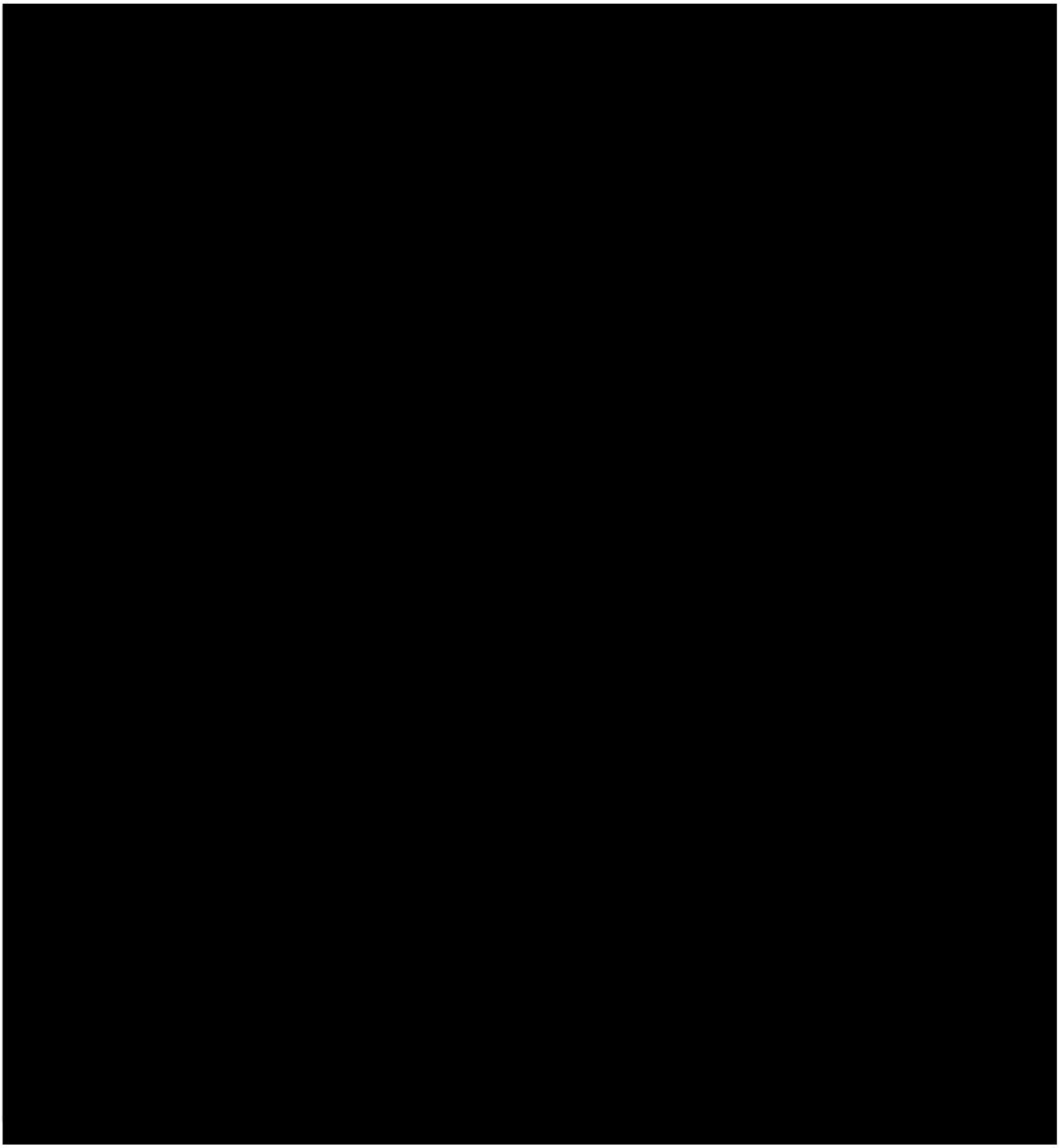
The scope of this project is as follows:

[redacted]

Major Material:

7,265' - 556 AAC spacer cable & 052 messenger
2,470' - 1/0 ACSR 175 MIL HDP
15,900' - 1/0 ACSR bare neutral
1 – Cooper Nova recloser for 13.8kV & Form 6 control.
1 – 900 Amp Group Operated Air-Break switches.
3 – 140K Trip Savers

Background / Justification



[redacted]

Business Process and / or Technical Improvements:

[redacted]

Alternatives Considered with Cost Estimates



Authorization Type		
Capital Cost		
Expense Cost		
Total Cost	$2,738K	$1,408K
Cost / CM Saved	$5.61/CM	$4.80/CM
Cost / CI Saved	$4,993/CI	$3,879/CI
Preferred option	X	

Project Schedule

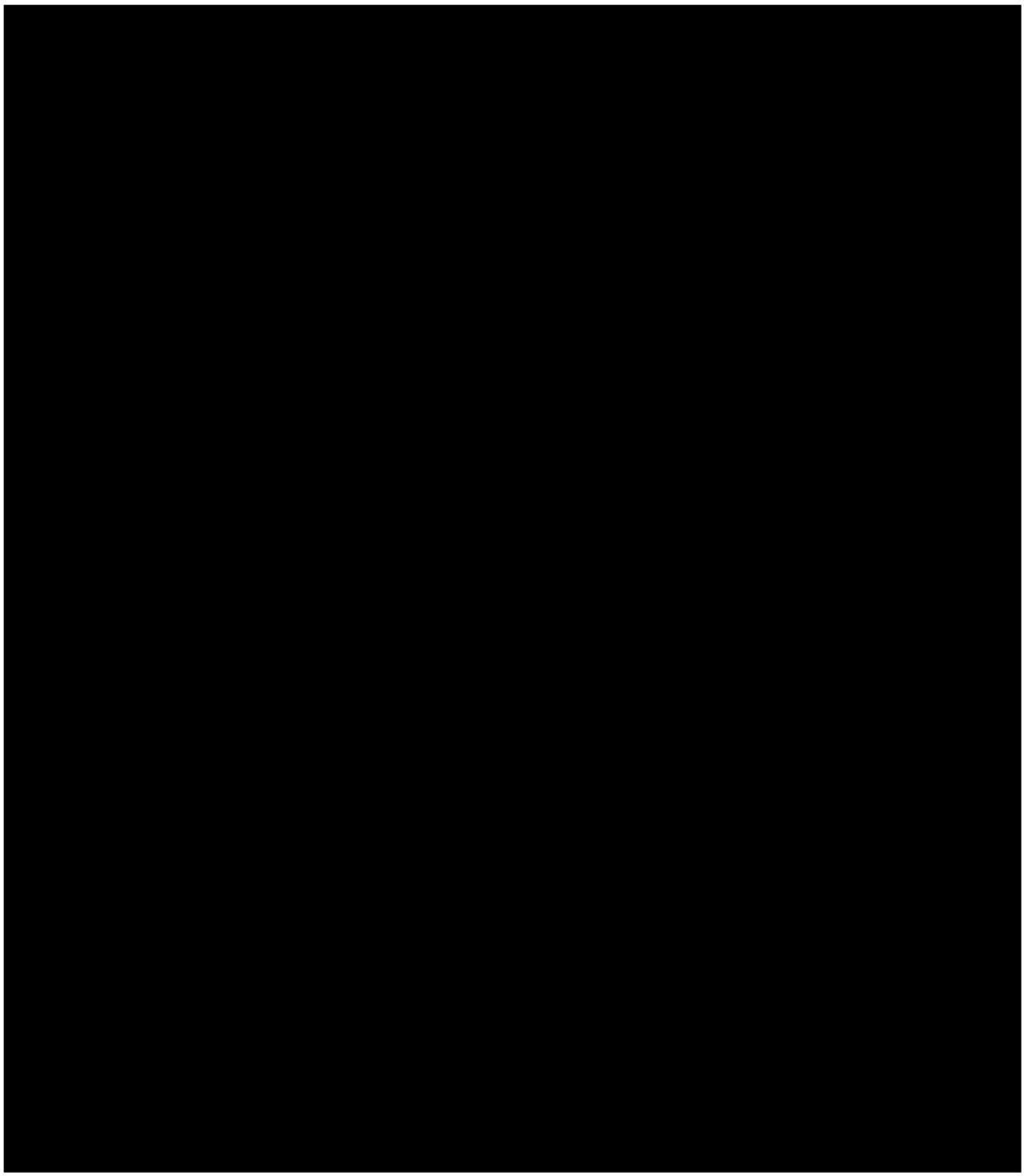
Milestone/Phase Name	Estimated Completion Date
Preliminary Approval	January 2022
Detailed Design	June 2022
Settings Requested	November 2022
Construction Start Date	January 2023
Construction End Date	December 2023

Regulatory Approvals

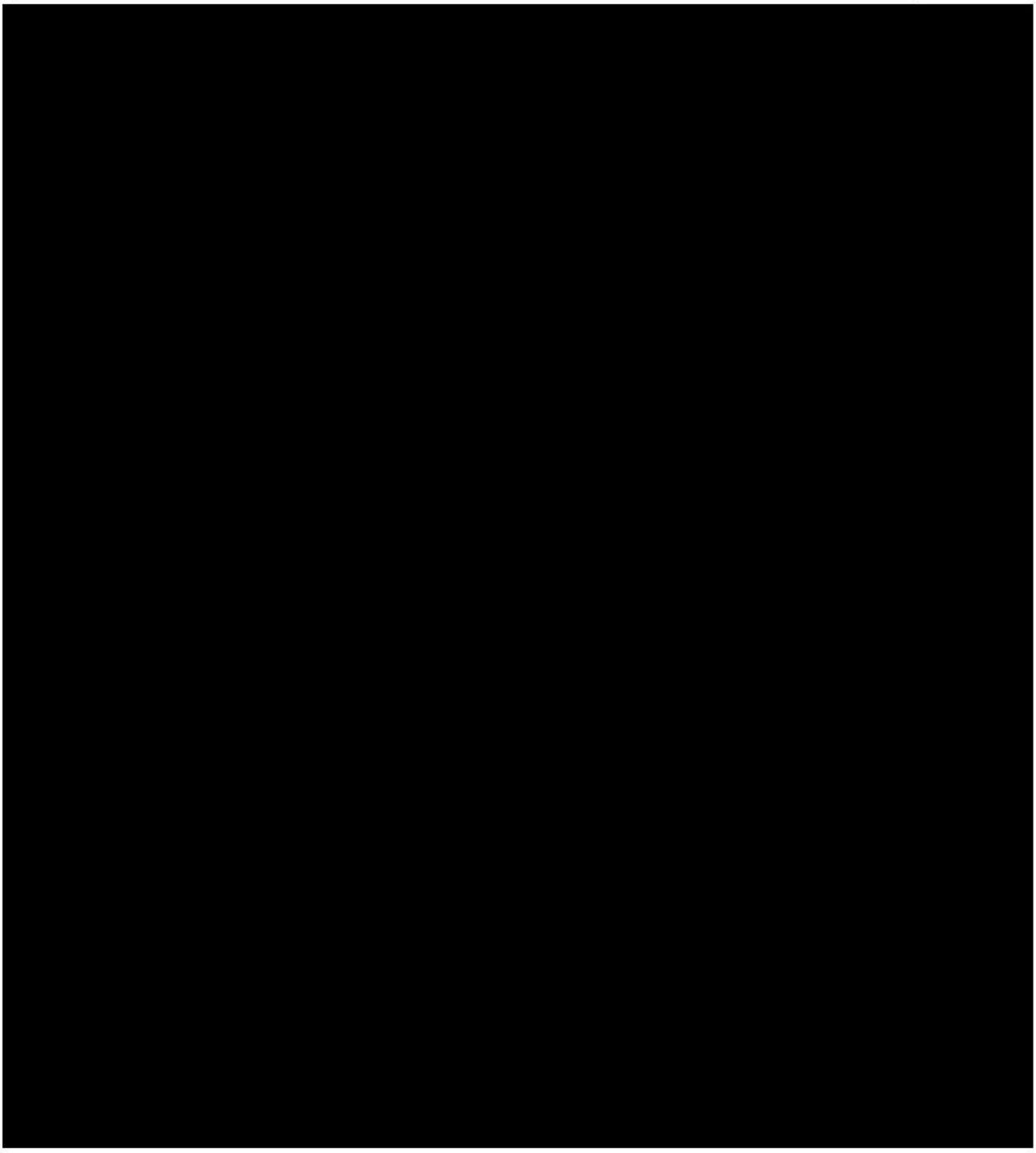
None

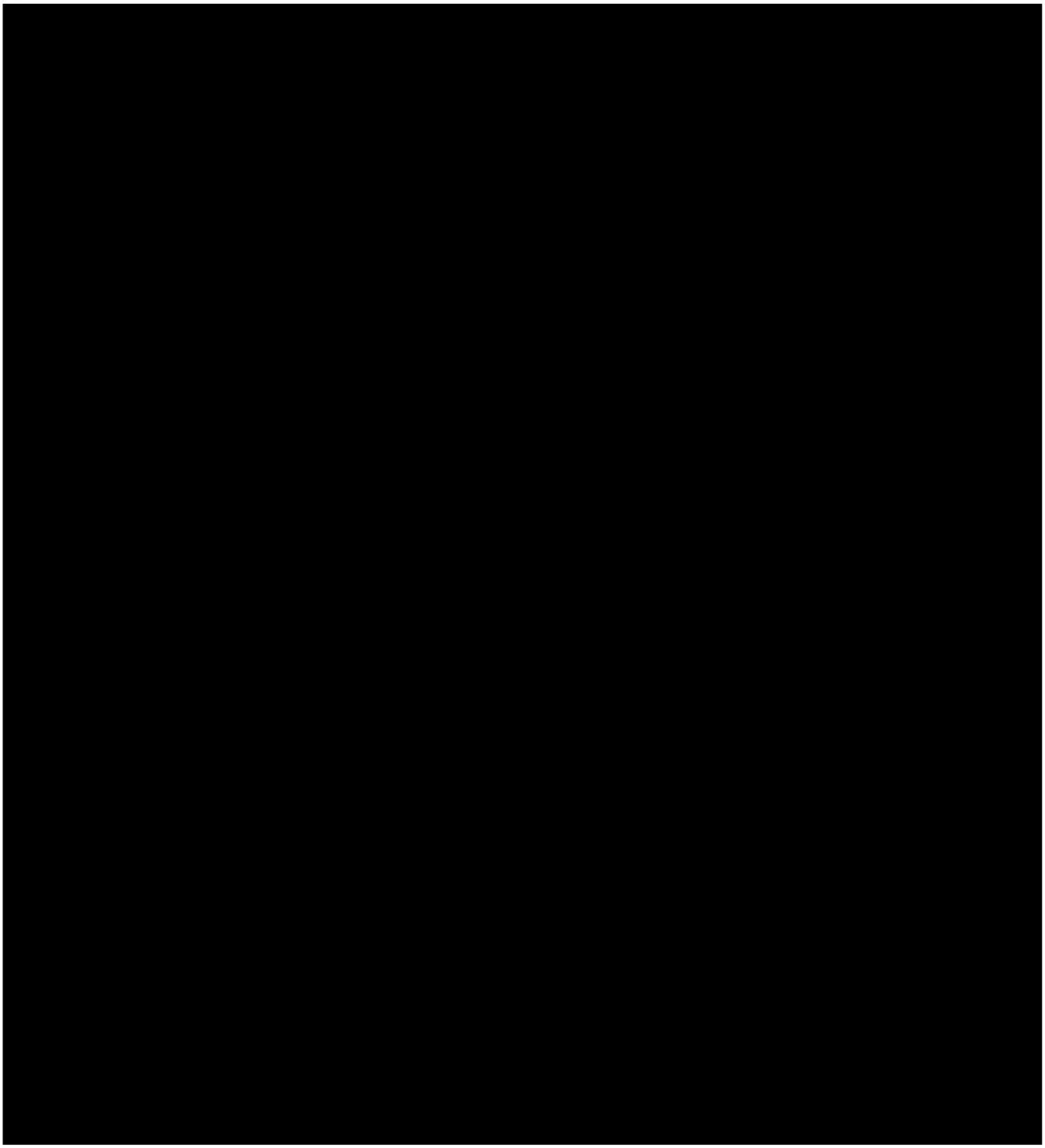
Risks and Risk Mitigation Plans

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	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.	2022	Medium	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Storm delays	2023	Low	If storm activity delays work, we may be forced to use external resources.
System abnormal configuration	2023	Low	Schedule work to minimize system abnormal time. Most of this work will require system to be abnormal for any extended period of time.



Reliability Section 02.30	Automatic Sectionalizing Device Guidelines	02.302





Reliability Section 02.30	Automatic Sectionalizing Device Guidelines	02.304

GLOSSARY

ASD: A device that automatically sectionalizes a line section (e.g. recloser, sectionalizer, or fuse).

Autoloop: A scheme where two or more distribution circuits are tied together with a normally-open-tie recloser capable of automatically restoring service to portions of feeders that were de-energized due to an outage.

Autoloop Backbone: An autoloop involves two circuits. The autoloop backbone is the three phase electrical connection that can be traced from the origin of one circuit to the origin of the other circuit. in line with this electrical connection are the reclosers and sectionalizers that make up the autoloop scheme.

Branch: A single, two or three phase portion of a circuit. The origin of a branch is a junction pole or an ASD and the termination is the end of the electrical circuit. A branch may have multiple termination points.

Circuit Backbone: The portion of the three phase overhead distribution circuit beginning at the source and ending at transitions to single or multiphase circuitry protected by single phase devices.

Load Side: The customer side of the device under normal operating conditions.

Source Side: The side of the device closest to the substation supplying the circuit under normal operating conditions.





Connecticut Light & Power
A Northeast Utilities Company

Specific Project Proposal - Project #: CD01912

Middlebury [redacted] Reliability Improve

Work Classification

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

Ownership / Management

AWC: Cheshire
Statewide: No
Owner [redacted]
Manager

Project Information

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

Budget Summary - Preferred Option

Recond & Conv Charcoal Ave

2023

ID	Title	Status	Rev #	Contingency	Expenditure Amount	Net Estimate
1	Artillery Rd Convert	Prelim	0	24%	$270,633	$270,633
2	Charcoal Ave Recond & Convert	Prelim	0	24%	$2,326,955	$2,326,955
3	[redacted] 80m Sectionalizing	Prelim	0	24%	$140,275	$140,275
				2023 Total:	**$2,737,863**	**$2,737,863**
				Total Project:	**$2,737,863**	**$2,737,863**

Project Option Summary

ID	Description	Segments	Preliminary Estimate	Construction Estimate	Variance	IEEE $/CMS	All (w/Storm)	Prfrd
O1	Recond & Conv Charcoal Ave	1,2,3	$2,737,863	$0	100%	$92.38	$5.61	☑
O2	Recond Charcoal Ave Only	4	$1,407,904	$0	100%	$58.61	$4.80	☐

Segments

ID	Title	Preliminary Estimate	Construction Estimate	Variance	IEEE $/CMS	All (w/Storm)
1	Artillery Rd Convert	$270,633			$132.13	$3.24
2	Charcoal Ave Recond & Convert	$2,326,955			$96.01	$7.92
3	[redacted] 80m Sectionalizing	$140,275			$39.40	$1.26
4	Charcoal Ave Recond Only	$1,407,904			$58.59	$4.79

Design Alternative CD01912-01

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	24.00%
SubTotal:	$218,253
Contingency Amount:	$52,381
Estimate:	$270,633
Reimbursement:	$0
Net Amount:	**$270,633**
Description:	

Item Description	CU	[redacted]	Amount
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18		$30,000.00
POLE OH - POLE - 1ph (Telephone custodian)	16-OH11		$7,504.00
OH WIRE OH - Neutral	16-OH31		$40,320.00
OH WIRE OH - Remove circuit wire (1 phase)	16-OH37		$15,768.00
OH WIRE OH - Remove circuit wire (3 phase)	16-OH37A		$1,440.00
SECTIONALIZE OH-Vertical Disconnect Switches-600/900 amp 3-1ph	16-OH43		$10,283.20
EQUIPMENT OH - Remove Capacitor, any kVAR	16-OH54		$1,800.00
EQUIPMENT OH - Conversion Prep Work - 1ph	16-OH56		$42,024.00
EQUIPMENT OH - Conversion Prep Work - 3ph	16-OH57		$16,480.00

Design Alternative			CD01912-01
EQUIPMENT OH - Conversion - CUTOVER	16-OH58	[redacted]	$9,633.60
OTHER OTHER 20% adder for contract labor	16-ALL14		$40,000.00
OTHER OTHER remove regulator	16-ALL14		$1,000.00
OTHER OTHER remove steps	16-ALL14		$2,000.00

Associated / Impacted Devices

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

Reliability Projection

Title:

Outage Start Date: 01/01/2018 Outage End Date: 12/31/2021 Years History: 4

[redacted]

Design Alternative CD01912-02

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	24.00%
SubTotal:	$1,876,577
Contingency Amount:	$450,378
Estimate:	$2,326,955
Reimbursement:	$0
Net Amount:	**$2,326,955**
Description:	

Item Description	CU	[redacted]	Amount
SWITCHING OH/DB/UG - SWITCHING NonNetwork - Average	16-ALL17		$3,509.60
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18		$246,000.00
POLE OH - POLE - 1ph (Telephone custodian)	16-OH11		$56,280.00
POLE OH - POLE - 3ph (Telephone custodian)	16-OH12		$85,440.00
OH WIRE OH-Reconductor w/175 Mil Tree Wire-1ph (any gauge)	16-OH25		$59,280.00
OH WIRE OH - Reconductor w/Spacer Cable - 556 kcmil	16-OH29		$743,936.00
OH WIRE OH - Neutral	16-OH31		$101,760.00
OH WIRE OH - Remove circuit wire (1 phase)	16-OH37		$45,381.60
OH WIRE OH - Remove circuit wire (3 phase)	16-OH37A		$23,248.00

Design Alternative			CD01912-02
EQUIPMENT OH - Conversion Prep Work - 1ph	16-OH56	[redacted]	$117,420.00
EQUIPMENT OH - Conversion - CUTOVER	16-OH58		$33,182.40
SECTIONALIZE OH - Hydraulic Reclosers - 3ph cluster 1 set of 3 - trip saveers	16-OH41		$17,139.20
OTHER OTHER 20% adder for contract labor	16-ALL14		$328,000.00
OTHER OTHER remove regulator	16-ALL14		$2,000.00
OTHER OTHER remove steps	16-ALL14		$14,000.00

Associated / Impacted Devices

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

Design Alternative CD01912-02

Reliability Projection

Title:

Outage Start Date: 01/01/2018 Outage End Date: 12/31/2021 Years History: 4

[redacted]

Design Alternative CD01912-03

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	24.00%
SubTotal:	$113,125
Contingency Amount:	$27,150
Estimate:	$140,275
Reimbursement:	$0
Net Amount:	**$140,275**
Description:	

Item Description	CU	[redacted]	Amount
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18		$8,000.00
SECTIONALIZE OH - Recloser - 3ph	16-OH38		$47,989.60
SECTIONALIZE OH - Recloser Control - setting changes only	16-OH39A		$4,885.60
SECTIONALIZE OH - GOAB Switch	16-OH44		$20,566.40
OTHER OTHER 20% adder for contract labor	16-ALL14		$21,400.00
SECTIONALIZE OH-Vertical Disconnect Switches-600/900 amp 3-1ph in-line disconnects for new recloser	16-OH43		$10,283.20

Associated / Impacted Devices

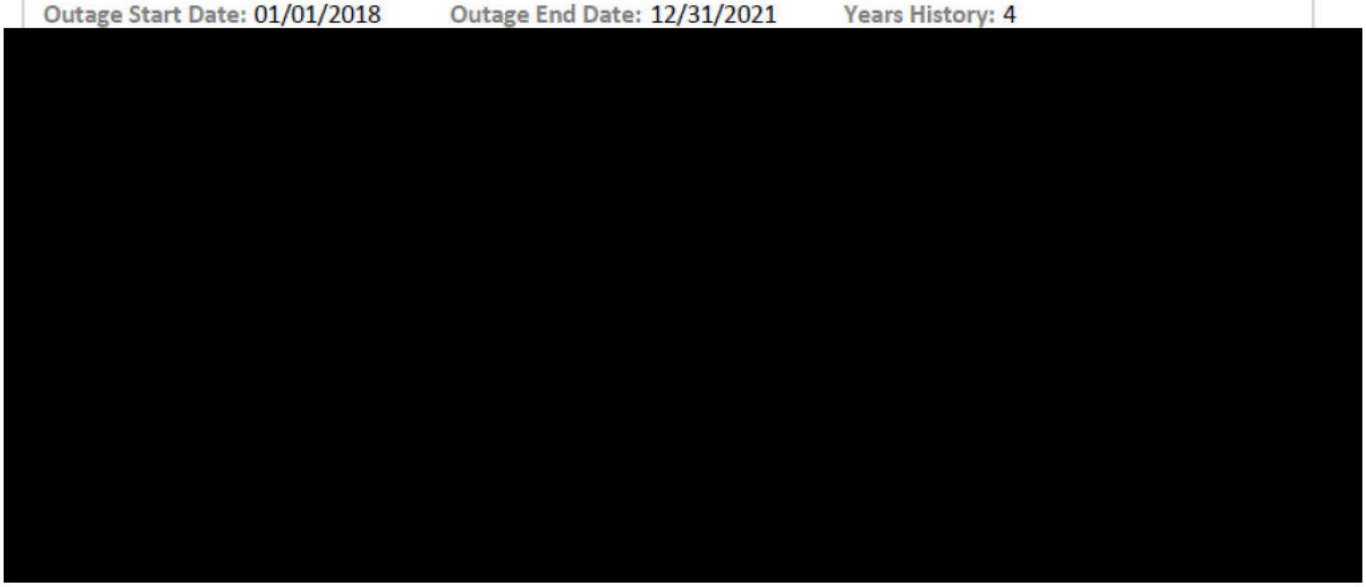
Status	Type / SysID	Street / Cross St	Structure / Town	Circuit	Map	Cust	Notes
Existing	[redacted]						

Design Alternative CD01912-03

Reliability Projection

Title:

Outage Start Date: 01/01/2018 Outage End Date: 12/31/2021 Years History: 4



Design Alternative CD01912-04

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	24.00%
SubTotal:	$1,135,406
Contingency Amount:	$272,498
Estimate:	$1,407,904
Reimbursement:	$0
Net Amount:	**$1,407,904**
Description:	

Item Description	CU	[redacted]	Amount
SWITCHING OH/DB/UG - SWITCHING NonNetwork - Average	16-ALL17		$3,509.60
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18		$150,000.00
SECTIONALIZE OH - Cutouts or Arresters - 1ph	16-OH19		$8,227.20
OH WIRE OH - Reconductor w/Spacer Cable - 556 kcmil	16-OH29		$743,936.00
OH WIRE OH - Remove circuit wire (1 phase)	16-OH37		$2,985.60
OH WIRE OH - Remove circuit wire (3 phase)	16-OH37A		$23,248.00
OTHER OTHER 20% adder for contract labor	16-ALL14		$200,000.00
OTHER OTHER create dead section	16-ALL14		$2,000.00
OTHER OTHER rem c/o's	16-ALL14		$1,500.00

Design Alternative CD01912-04

Associated / Impacted Devices

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

Reliability Projection

Title:

Outage Start Date: 01/01/2018 Outage End Date: 12/31/2021 Years History: 4

[redacted]