EVERSOURCE

Project Approval Form

Project Title: [redacted] PILC Cable Replacement	Project Number: CD01559
Date Prepared: 12/07/2023	**Company:** Eversource CT
Organization: Distribution Engineering	**Project Category:** UG CABLE & EQUIPMNT REPLACEMNT
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: $1,807.4K	**Authorization Type:** Full Funding

1. Executive Summary

Project CD01559 was established to replace the paper insulated lead covered (PILC) cable on the [redacted]. This project is part of an overall strategy to address poor performing PILC cable in the underground distribution system.

- Approved Initial Funding Authorization: $1,852K at the 6/12/2020 CT-PAC meeting.
- Requesting Full Funding authorization: $1,807.4K or 98% of the Initial Funding authorization.
- Project Location:
  - Division: Western
  - District: Waterbury AWC
  - Town: Waterbury

The variance is due to the following:

- [redacted] This accounts for a cost increase of about $260K. This includes $150K for the actual work plus about $100K for environmental clean-up due to contamination found.
- Labor and material charges. 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. However, this was offset by the fact that the project was originally estimated for contract labor, whereas the project is actually being done using local district crews. This resulted in a decrease in the overall cost of the project.

2. Project Cost Summary

Note: Dollar values are in thousands.

Capital Costs	Prior Actuals	Year 2023	Year 2024+	Total
Direct Capital Costs				
Internal Labor and Construction Equipment	106.4	56.3	0.0	162.7
Outside Services	103.1	54.5	0.0	157.6
Materials	431.8	228.3	0.0	660.1
Removals	125.1	79.2	0.0	204.2
Risk and Contingency	0.0	67.0	0.0	67.0
Other	0.9	0.5	0.0	1.3
Subtotal – Direct Costs	**767.2**	**485.8**	**0.0**	**1,253.0**
Indirect Capital Costs				
Indirect/Overheads (including benefits)	265.1	250.9	0.0	516.1
Capitalized interest or AFUDC, if any	38.4	0.0	0.0	38.4
Subtotal – Indirect Costs	**303.6**	**250.9**	**0.0**	**554.5**
Total Gross Capital Costs	**1,070.8**	**736.7**	**0.0**	**1,807.4**
Customer Contribution	**0.0**	**0.0**	**0.0**	**0.0**
Total Net Capital Project Costs	**1,070.8**	**736.7**	**0.0**	**1,807.4**

3. Technical Justification

Background, Project Need/Justification, and Project Scope

a. Background

[redacted]

The following is a list of known cable faults on the [redacted] circuit from 1/1/2007 to present:

- 01/19/2007
- 10/09/2008
- 09/08/2015
- 06/20/2016

The above dates are based on work requests that were established for the replacement of the faulted cables in the STORMS system. The events are not found in the OMS system since no customers were interrupted as a result of these failures.

b. Project Need

[redacted]

c. Project Scope

[redacted]

4. Alternatives Considered

[redacted]

Project Option Comparison

[redacted]

Authorization Type	Partial	Partial	Partial	Full
Capital Cost	$1,184.0K	$1,306.1K	$1,412.5K	$1,807.4K
Expense Cost	$30.4K	$33.5K	$36.2K	$46,3K
Total Cost	$1,214.4K	$1,339.6K	$1,448.7K	$1,853.7K
Cost / MVA Added	$4.2M/MVA	$1.2M/MVA	$0.71M/MVA	$0.67M/MVA
Preferred option				X

Note: the partial cost estimates for options 1, 2 & 3 were adjusted to reflect the revised project costs as mentioned in the Executive Summary.

5. Project Schedule

Milestone/Phase Name	Estimated Date
Partial Approval	6/12/2020
100% Detailed Engineering Completion	9/16/2022
Fully Funded	11/9/2023
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	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.	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	2023	Low	Before use of new technology ensure support of standards and manufacturer. Schedule project to

integration of new technology			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.

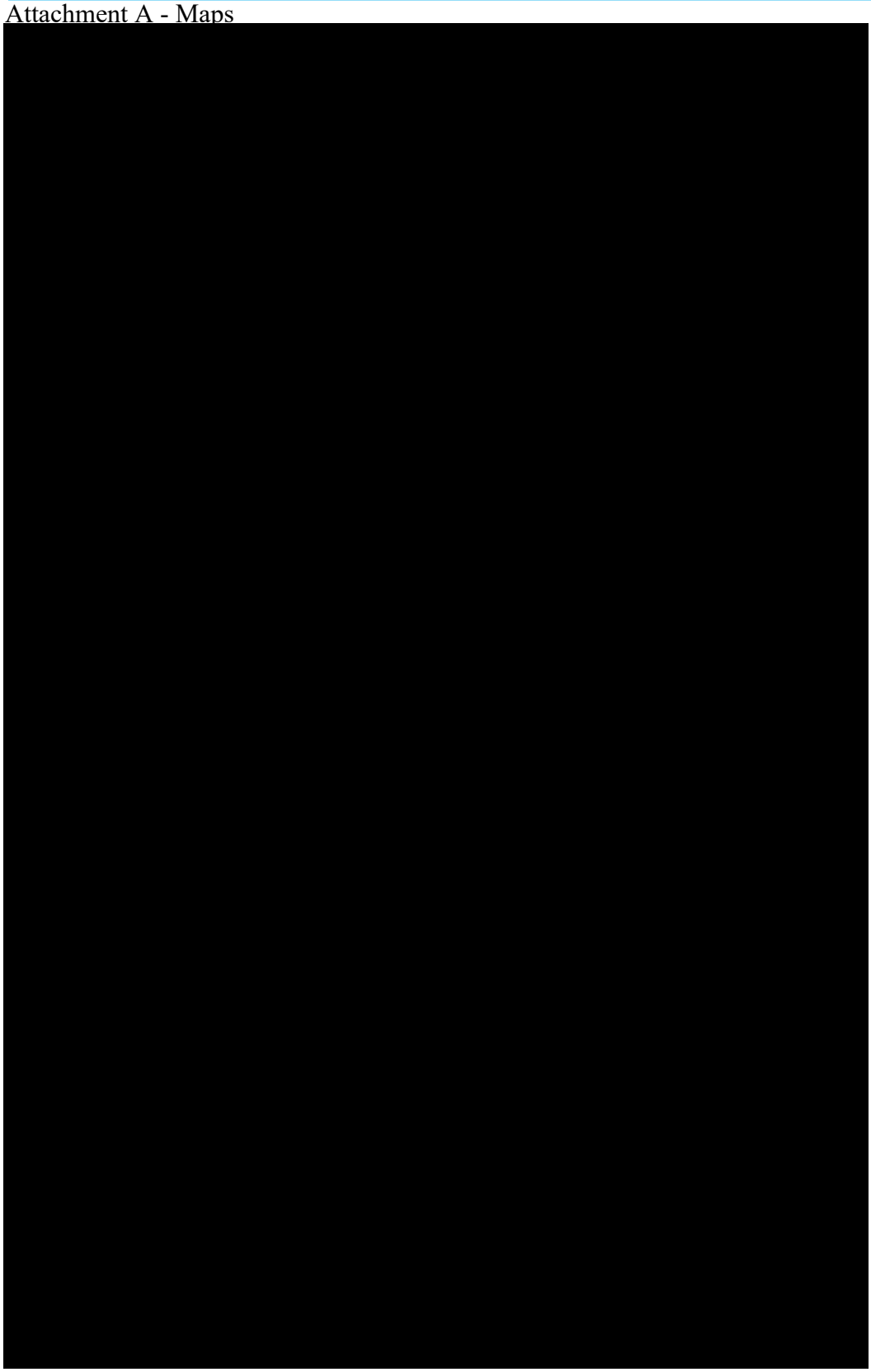
9. References

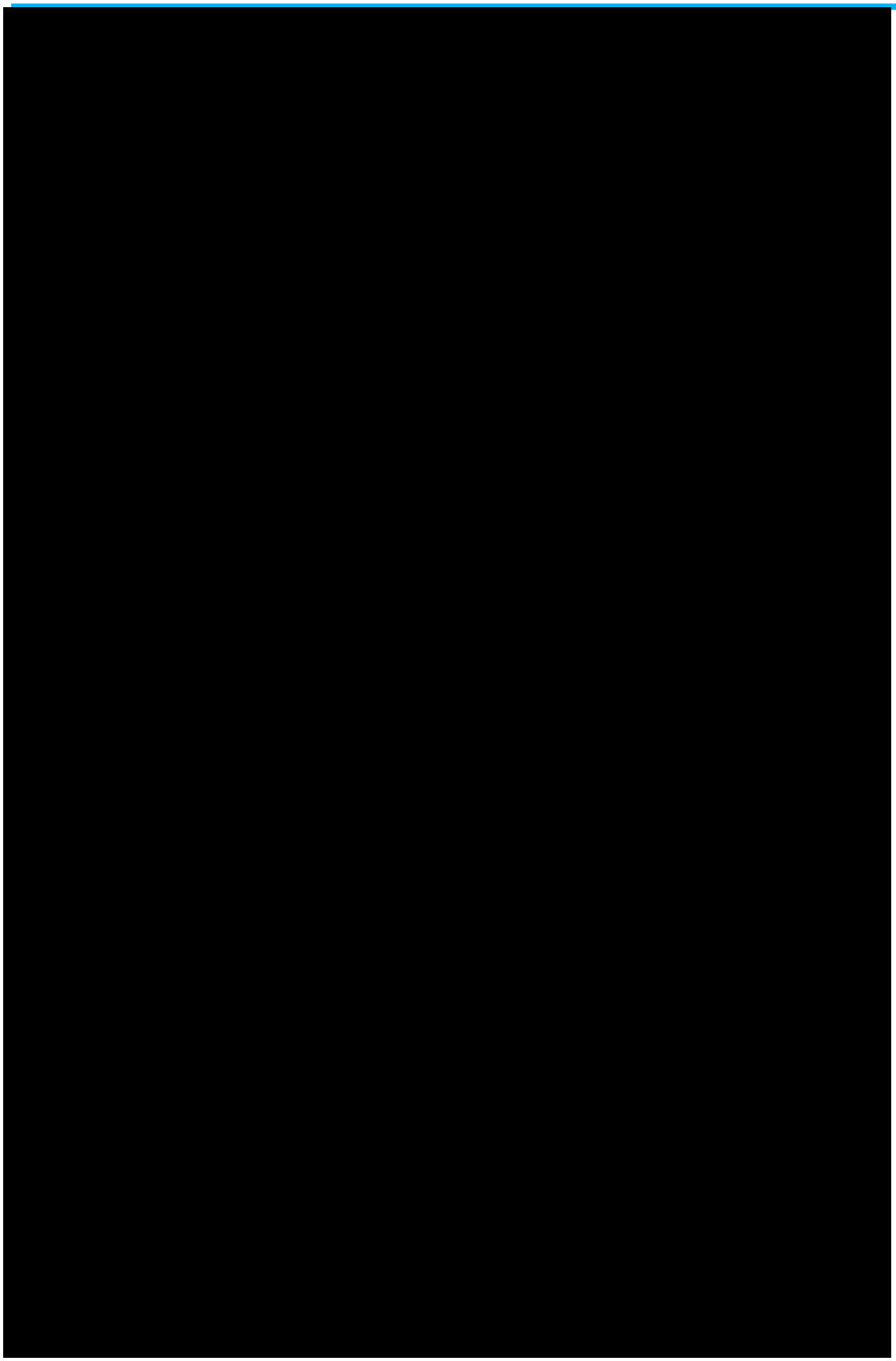
References
1. None

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

Attachment	Included in Submittal?
A. Project Maps	*YES*
B. One-Lines	*YES*
C. Load Summary	*YES*
D. Initial Funding PAF	*YES*

Attachment A - Maps



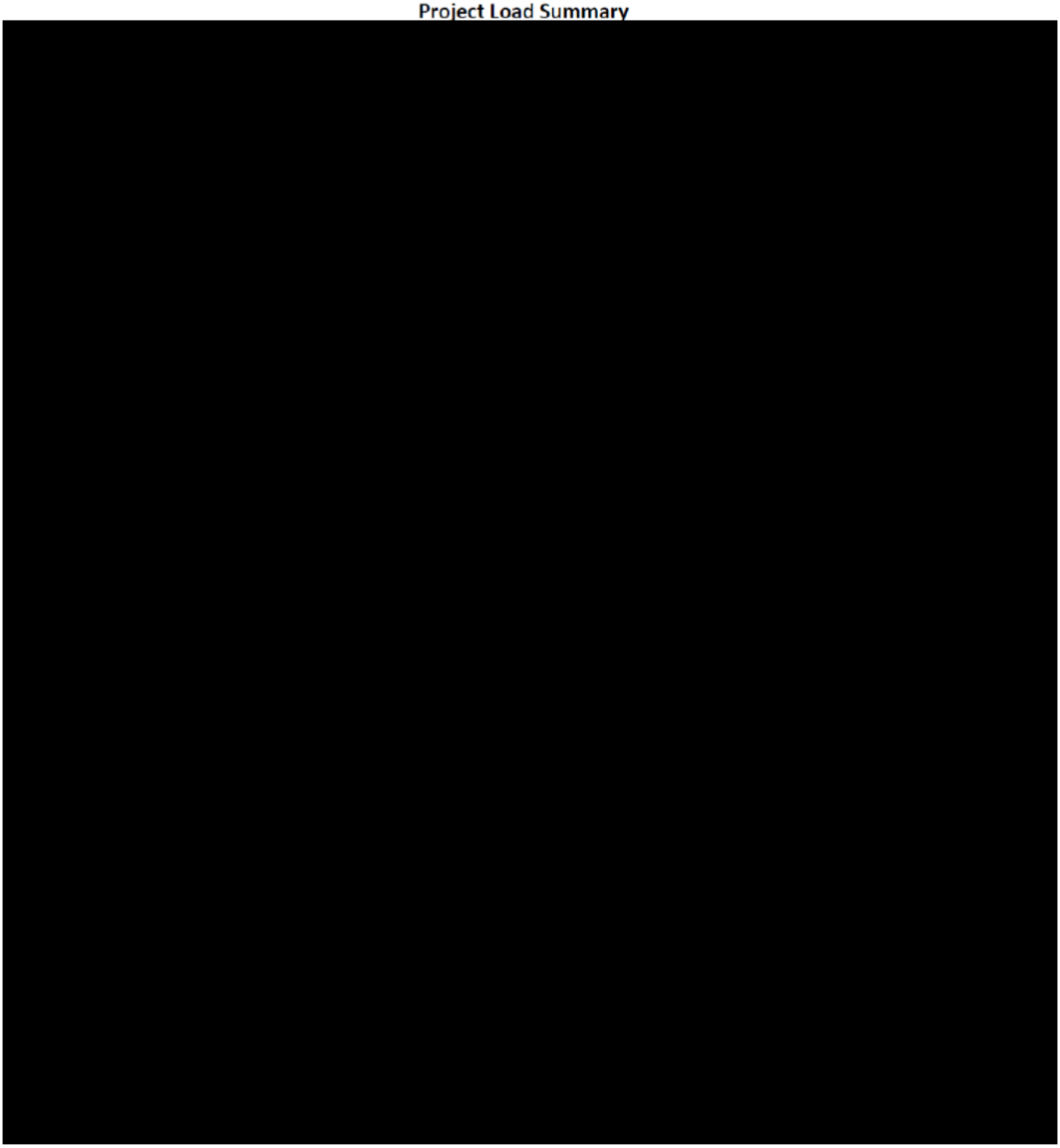


Attachment B – One-Line



Attachment C – Load Summary

Project Load Summary



Attachment D – Initial Funding PAF

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Project Authorization Form

Operations Project Authorization Form

Date Prepared: May 26, 2020	Project Title [redacted] ILC Cable Replacement
Company/ies: Eversource CT	Project ID Number: CD01559
Organization: Distribution	Class(es) of Plant: Underground
Project Initiator: [redacted]	Project Category: UG Cable & Equipment Replacement
Project Manager: [redacted]	Project Type: Specific
Project Sponsor: [redacted]	Project Purpose: PILC Cable Replacement
Estimated in service date: 12/31/2021	If Transmission Project: PTF? N/A
Eng. / Constr. Resources Budgeted? Yes	Capital Investment Part of Original Operating Plan? N
Authorization Type: Initial Funding	O&M Expenses Part of the Original Operating Plan? N
Total Request: $1,853k	

Financial Requirements:

Project Authorization

ERM: _____

FP&A: _____

Executive Summary

[redacted]

Project Costs Summary

Note: Dollar values are in thousands

	Prior Authorized	2021	2022	2023+	Totals
Capital Additions - Direct	$0	$1,090	$0	$0	$1,090
Less Customer Contribution	$0	$0	$0	$0	$0
Removals net of Salvage ____%	$0	$120	$0	$0	$120
Total - Direct Spending	$0	$1,210	$0	$0	$1,210
Capital Additions - Indirect	$0	$629	$0	$0	$629
Subtotal Request	$0	$1,839	$0	$0	$1,839
AFUDC	$0	$13	$0	$0	$13
Total Capital Request	$0	$1,852	$0	$0	$1,852
O&M	$0	$1	$0	$0	$1
Total Request	**$0**	**$1,853**	**$0**	**$0**	**$1,853**

Financial Evaluation

Note: Dollar values are in thousands

Direct Capital Costs	2021	2022	2023+	Total
Straight Time Labor	$154	$0	$0	$154
Overtime Labor	$56	$0	$0	$56
Outside Services	$356	$0	$0	$356
Materials	$622	$0	$0	$622
Other, including contingency amounts (describe)	$22	$0	$0	$22
Total Direct Costs	**$1,210**	**$0**	**$0**	**$1,210**

Indirect Capital Costs	2021	2022	2023+	Total
Indirects/Overheads (including benefits)	$629	$0	$0	$629
Capitalized interest or AFUDC, if any	$13	$0	$0	$13
Total Indirect Costs	**$641**	**$0**	**$0**	**$641**
Total Capital Costs	**$1,852**	**$0**	**$0**	**$1,852**
Less Total Customer Contribution	**$0**	**$0**	**$0**	**$0**
Total Capital Project Costs	**$1,852**	**$0**	**$0**	**$1,852**
Total O&M Project Costs	**$1**	**$0**	**$0**	**$1**
Total Project Cost	**$1,853**	**$0**	**$0**	**$1,853**

Technical Justification:

Project Need Statement

[redacted]

Project Objectives

[redacted]

Background / Justification

[redacted]

[redacted]

The following is a list of known cable faults on the [redacted] circuit from 1/1/2007 to present:

- 01/19/2007
- 10/09/2008
- 09/08/2015
- 06/20/2016

The above dates are based on work requests established for the replacement of the faulted cables in the STORMS system. The events are not found in the OMS system, since no customers were interrupted as a result of these failures.

Business Process and / or Technical Improvements:

[redacted]

Alternatives Considered with Cost Estimates

[redacted]

Project Option Comparison

[redacted]

Cost	$1,239k	$1,367k	$1,478k	$1,853k
Cost / MVA Added	$4,320k/MVA	$1,192k/MVA	$728k/MVA	$692k/MVA
Preferred option				X

Project Schedule

Milestone/Phase Name	Estimated Completion Date
Initial Funding Approval	June 2020
Detail Design Engineering & Full Funding Authorization	October 2020
Construction Start	January 2021
Construction Complete	December 2021

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.	2021	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	2020	Low	Design to minimize customer impact. Project Preplanning and customer/community outreach
Internal construction resources not available to perform the work.	2021	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.	2020	Medium	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Materials Shortage or long lead times	2021	Low	Pre-order long lead time material; minimize the use of non-standard and non-stocked material.
Storm delays	2021	Low	If storm activity delays work, we may be forced to use external resources.
System abnormal configuration	2021	Medium	Schedule work to minimize system abnormal time. Install temporary bypasses/equipment if system will be abnormal for extended periods

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Project Approval Form

Work Classification

Category: Line
Type: REL1
Type Desc: UG CABLE & EQUIPMNT REPLACEMNT
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

Repl 500 PILC & EPR with 750 CU EPR

2021

ID	Title	Status	Rev #	Contingency	Expenditure Amount	Net Estimate
1	[redacted]o MH 19	Prelim	0	24%	$362,755	$362,755
2	MH 19 to MH 21	Prelim	0	24%	$127,824	$127,824
3	MH 21 to MH 399	Prelim	0	24%	$358,315	$358,315
4	MH 399 to MH 322	Prelim	0	24%	$111,233	$111,233
5	MH 322 to MH 324	Prelim	0	24%	$224,123	$224,123
6	MH 324 to MH 325	Prelim	0	24%	$86,210	$86,210
7	MH 325 to MH 328	Prelim	0	24%	$293,959	$293,959
8	MH 328 to Riser Pole 23294	Prelim	0	24%	$288,645	$288,645
				2021 Total:	**$1,853,064**	**$1,853,064**
				Total Project:	**$1,853,064**	**$1,853,064**

Project Option Summary

ID	Description	Segments	Preliminary Estimate	Construction Estimate	Variance	IEEE $/CMS	All (w/Storm)	Prfrd
O1	Repl 500 PILC Only	1,3,5,7	$1,239,152	$0	100%	$0.00	$0.00	☐
O2	Repl 500 PILC & 4 Fdr EPR sections	1,2,3,5,7	$1,366,976	$0	100%	$0.00	$0.00	☐
O3	Repl 500 PILC & 3+ Fdr EPR sections	1,2,3,4,5,7	$1,478,209	$0	100%	$0.00	$0.00	☐
O4	Repl 500 PILC & EPR with 750 CU EPR	1,2,3,4,5,6,7,8	$1,853,064	$0	100%	$0.00	$0.00	☑

Project Approval Form

Design Alternative CD01559-01

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	24.00%
SubTotal:	$292,544
Contingency Amount:	$70,211
Estimate:	$362,755
Reimbursement:	$0
Net Amount:	**$362,755**
Description:	

Item Description	CU	$ / Per	Qty	Amount
SWITCHING OH/DB/UG - SWITCHING NonNetwork - Complex	16-ALL16	[redacted]	[redacted]	$7,024.00
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18			$8,000.00
UG CABLE DB/UG - 750/1000 - 3-1/C (3ph) Cu	16-UG114B			$141,120.00
UG CABLE UG - Cable Removal - all cables	16-UG117			$29,400.00
OTHER OTHER additional costs associated with removal of PILC cable	16-ALL14			$30,000.00
OTHER OTHER Additional costs due to contract labor.	16-ALL14			$77,000.00

Project Approval Form

Design Alternative CD01559-02

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	24.00%
SubTotal:	$103,084
Contingency Amount:	$24,740
Estimate:	$127,824
Reimbursement:	$0
Net Amount:	**$127,824**
Description:	

Item Description	CU	$ / Per	[redacted]	Amount
SWITCHING OH/DB/UG - SWITCHING NonNetwork - Complex	16-ALL16	[redacted]	[redacted]	$7,024.00
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18			$8,000.00
UG CABLE DB/UG - 750/1000 - 3-1/C (3ph) Cu	16-UG114B			$51,360.00
UG CABLE UG - Cable Removal - all cables	16-UG117			$10,700.00
OTHER OTHER Additional costs due to contract labor.	16-ALL14			$26,000.00

Project Approval Form

Design Alternative CD01559-03

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	24.00%
SubTotal:	$288,964
Contingency Amount:	$69,351
Estimate:	$358,315
Reimbursement:	$0
Net Amount:	**$358,315**

Description:

Item Description	CU	$ / Per	Qty	Amount
SWITCHING OH/DB/UG - SWITCHING NonNetwork - Complex	16-ALL16	[redacted]	[redacted]	$7,024.00
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18			$16,000.00
UG CABLE DB/UG - 750/1000 - 3-1/C (3ph) Cu	16-UG114B			$140,640.00
UG CABLE UG - Cable Removal - all cables	16-UG117			$29,300.00
OTHER OTHER additional costs associated with pilc cable removal	16-ALL14			$30,000.00
OTHER OTHER Additional costs due to contract labor.	16-ALL14			$66,000.00

Project Approval Form

Design Alternative CD01559-04

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	24.00%
SubTotal:	$89,704
Contingency Amount:	$21,529
Estimate:	$111,233
Reimbursement:	$0
Net Amount:	**$111,233**
Description:	

Item Description	CU	$ / Per		Amount
SWITCHING OH/DB/UG - SWITCHING NonNetwork - Complex	16-ALL16	[redacted]		$7,024.00
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18			$4,000.00
UG CABLE DB/UG - 750/1000 - 3-1/C (3ph) Cu	16-UG114B			$46,080.00
UG CABLE UG - Cable Removal - all cables	16-UG117			$9,600.00
OTHER OTHER Additional costs due to contract labor.	16-ALL14		2	$23,000.00

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Design Alternative CD01559-05

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	24.00%
SubTotal:	$180,744
Contingency Amount:	$43,379
Estimate:	$224,123
Reimbursement:	$0
Net Amount:	**$224,123**
Description:	

Item Description	CU	$ / Per	Qty	Amount
SWITCHING OH/DB/UG - SWITCHING NonNetwork - Complex	16-ALL16	[redacted]	[redacted]	$7,024.00
UG CABLE DB/UG - 750/1000 - 3-1/C (3ph) Cu	16-UG114B			$88,320.00
UG CABLE UG - Cable Removal - all cables	16-UG117			$18,400.00
OTHER OTHER Additional cost due to removal of PILC Cable	16-ALL14			$18,000.00
OTHER OTHER Additional costs due to contract labor.	16-ALL14			$49,000.00

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Project Approval Form

Design Alternative CD01559-06

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	24.00%
SubTotal:	$69,524
Contingency Amount:	$16,686
Estimate:	$86,210
Reimbursement:	$0
Net Amount:	**$86,210**

Description:

Item Description	CU	$ / Per	Qty	Amount
SWITCHING OH/DB/UG - SWITCHING NonNetwork - Complex	16-ALL16	[redacted]	[redacted]	$7,024.00
UG CABLE DB/UG - 750/1000 - 3-1/C (3ph) Cu	16-UG114B			$36,000.00
UG CABLE UG - Cable Removal - all cables	16-UG117			$7,500.00
OTHER OTHER Additional costs due to contract labor.	16-ALL14			$19,000.00

Project Approval Form

Design Alternative CD01559-07

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	24.00%
SubTotal:	$237,064
Contingency Amount:	$56,895
Estimate:	$293,959
Reimbursement:	$0
Net Amount:	**$293,959**

Description:

Item Description	CU	$ / Per	Qty	Amount
SWITCHING OH/DB/UG - SWITCHING NonNetwork - Complex	16-ALL16	[redacted]	[redacted]	$7,024.00
UG CABLE DB/UG - 750/1000 - 3-1/C (3ph) Cu	16-UG114B			$162,240.00
UG CABLE UG - Cable Removal - all cables	16-UG117			$33,800.00
OTHER OTHER Additional cost due to removal of PILC Cable	16-ALL14			$34,000.00

Project Approval Form

Design Alternative CD01559-08

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	24.00%
SubTotal:	$232,778
Contingency Amount:	$55,867
Estimate:	$288,645
Reimbursement:	$0
Net Amount:	**$288,645**
Description:	

Item Description	CU	$ / Per	Qty	Amount
SWITCHING OH/DB/UG - SWITCHING NonNetwork - Complex	16-ALL16	[redacted]	[redacted]	$7,024.00
UG CABLE DB/UG - 750/1000 - 3-1/C (3ph) Cu	16-UG114B			$125,760.00
UG CABLE UG - Cable Removal - all cables	16-UG117			$26,200.00
OTHER OTHER Additional cost due to removal of PILC Cable	16-ALL14			$63,000.00
POLE DB/UG - Riser - 3ph Rebuild riser pole for 750 CU EPR cable replacement	16-UG146			$10,794.40