EVERSOURCE

Supplement Authorization Form

Project Title: New Canaan Network Conversion	**Project Number:** CD01915
Date Prepared: 12/18/2024	**Company:** Eversource CT
Organization: Distribution Engineering	**Project Category:** NTWRK 500KCMIL CBL RPL PRG
Initiating Organization: Distribution	**Project Type:** Specific
Project DDE: [redacted]	**Capital Investment part of 5-year 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)
Current Authorized Amount: $7,085.1K	**Approved In-Service Date:** 12/31/2024
Supplement Request: $1,866.8K	**Estimated In-Service Date:** 12/31/2024
Total Capital Request ($): $8,951.9K	**Authorization Type:** Supplement Request
	Reason: Scope Change

1. Project Background

Supplemental funding of $1,866.8K is being requested for this project. The project is currently authorized for $7,085.1K, which brings this total funding request to $8,951.9K or 126% of a previously full funding authorized amount.

[redacted]

The design and condition of network secondary bus can have a significant impact on reliability, safety, restorability, and the demand on maintenance resources. The open secondary bus work in some underground network locations have been judged as unreliable, unsafe, and consequently in demand of inordinate maintenance expense. A PURA docket 06-10-21 was issued to address type B networks following the cable fault on 10/6/2006 in the Waterbury underground secondary network system.

This project is being constructed as part of a PURA commitment to remove type B (500cu) secondaries from networks by converting the system to a conventional UG system or reconductoring the secondaries with type A (4/0 7CT). The New Canaan network system is fed by feeders that also feed OH loads. This project mitigates the problematic scenario of a faulted feeder along with a network protector being stuck in the closed position causing severe overvoltage to equipment on the OH portion of the feeder.

[redacted]

[redacted]

2. Supplement Justification Overview

The project's variance of $1,866.8K is mainly due to issues that arose while the project was under construction – specifically during the cut-over sequence – resulting in slight scope changes, significant labor costs and additional material.

3. Supplement Justification Detail

The primary drivers of this additional supplemental funding request are issues that arose during the cut-over sequence of the project resulting in added costs for outside services (Contractor costs) ($549K), internal labor ($50K), materials ($28K) and associated loaders ($971.1K).

Some issues that arose during the cut-over sequence were as follows:

[redacted]

4. Supplement Cost Summary (Project Total)

Capital Costs	To Date Spend	Prior Authorized	Supplemental Request	Total Request
Internal Labor and Construction Equipment	152.0	107.7	50.0	157.7
Outside Services	2,863.4	2,422.6	549.0	2,971.7
Materials	980.1	989.3	27.9	1,017.2
Removals	779.0	884.1	-37.1	846.9
Risk and Contingency	0.0	0.0	197.6	197.6
Other	4.6	4.6	0.2	4.8
Subtotal	**4,779.0**	**4,408.3**	**787.5**	**5,195.9**

Indirect Capital Costs	To Date Spend	Prior Authorized	Supplemental Request	Total Request
Indirects/Overheads (including benefits)	3,356.1	2,574.3	971.1	3,545.4
Capitalized interest or AFUDC, if any	210.6	102.5	108.1	210.6
Subtotal	**3,566.8**	**2,676.8**	**1,079.2**	**3,756.0**
Total Capital Costs (Gross)	**8,345.8**	**7,085.1**	**1,866.7**	**8,951.9**
Less Total Customer Contribution	**0.0**	**0.0**	**0.0**	**0.0**
Project Costs (Net of Reimbursement)	**8,345.8**	**7,085.1**	**1,866.7**	**8,951.9**

5. New Total Request by Year (if applicable)

Capital Costs	2023 Actual	2024 Actual	2024 Estimate	TOTAL
Internal Labor & Equipment	49.6	102.4	5.8	157.7
Outside Services	934.3	1,929.1	108.3	2,971.7
Materials	319.8	660.3	37.1	1,017.2
Removals	254.2	524.8	67.9	846.9
Risk and Contingency	0.0	0.0	197.6	197.6
Other	1.5	3.1	0.2	4.8
SUBTOTAL Direct Cost	**1,559.3**	**3,219.7**	**416.8**	**5,195.9**
Indirects / Overheads	974.6	2,381.5	189.2	3,545.4
AFUDC	43.6	167.0	0.0	210.6
SUBTOTAL Indirect Cost	**1,018.3**	**2,548.5**	**189.2**	**3,756.0**
TOTAL Capital Request	**2,577.6**	**5,768.2**	**606.1**	**8,951.9**
Less Total Customer Contribution	0.0	0.0	0.0	**0.0**
TOTAL Project Cost	**2,577.6**	**5,768.2**	**606.1**	**8,951.9**

Attachments:

Project Title: New Canaan Network Conversion	**Project Number:** CD01915
Date Prepared: 05/21/2024	**Company:** Eversource CT
Organization: Distribution Engineering	**Project Category:** NTWRK 500KCMIL CBL RPL PRG
Initiating Organization: Distribution	**Project Type:** Specific
Project DDE: [redacted]	**Capital Investment part of 5-year 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)
Current Authorized Amount: $4,319.9K	**Approved In-Service Date:** 12/31/2024
Supplement Request: $2,765.2K	**Estimated In-Service Date:** 12/31/2024
Total Capital Request ($): $7,085.1K	**Authorization Type:** Supplement Request
	Reason: Scope Change

1. Project Background

Supplemental funding of $2,765.2K is being requested for this project. The project is currently authorized for $4,319.9K, which brings this total funding request to $7,085.1K or 164% of the full funding authorized amount.

[redacted]. Presently, the network secondary network is composed of the old type B configuration which consists of 500 CU secondary cables.

The design and condition of network secondary bus can have a significant impact on reliability, safety, restorability, and the demand on maintenance resources. The open secondary bus work in some underground network locations have been judged as unreliable, unsafe, and consequently in demand of inordinate maintenance expense. A PURA docket 06-10-21 was issued to address type B networks following the cable fault on 10/6/2006 in the Waterbury underground secondary network system.

This project is being constructed as part of a PURA commitment to remove type B (500cu) secondaries from networks by converting the system to a conventional UG system or reconductoring the secondaries with type A (4/0 7CT). [redacted]

[redacted]

[redacted]

2. Supplement Justification Overview

The project's variance of $2,765K is mainly due to issues that arose while the project was under construction resulting in slight scope changes, significant labor costs and additional material.

3. Supplement Justification Detail

The primary drivers of this supplemental funding request are issues that arose during construction of the project resulting in added costs for outside services (Contractor costs) ($1.1M), materials ($0.6M) and associated loaders ($1M).

Some issues that arose during construction are as follows:

[redacted]

4. Supplement Cost Summary (Project Total)

Capital Costs	To Date Spend	Prior Authorized	Supplemental Request	Total Request
Internal Labor and Construction Equipment	92.7	275.6	-167.9	107.7
Outside Services	2,085.8	1,276.4	1,146.2	2,422.6
Materials	851.8	415.1	574.2	989.3
Removals	590.9	743.2	-56.9	686.3
Risk and Contingency	0.0	0.0	197.7	197.7
Other	4.0	0.0	4.6	4.6
Subtotal	**3,625.2**	**2,710.3**	**1,698.0**	**4,408.3**

Indirect Capital Costs	To Date Spend	Prior Authorized	Supplemental Request	Total Request
Indirects/Overheads (including benefits)	2,069.1	1,609.6	964.7	2,574.3
Capitalized interest or AFUDC, if any	102.5	0.0	102.5	102.5
Subtotal	**2,171.6**	**1,609.6**	**1,067.2**	**2,676.8**
Total Capital Costs (Gross)	**5,796.8**	**4,319.9**	**2,765.2**	**7,085.1**
Less Total Customer Contribution	**0.0**	**0.0**	**0.0**	**0.0**
Project Costs (Net of Reimbursement)	**5,796.8**	**4,319.9**	**2,765.2**	**7,085.1**

5. New Total Request by Year (if applicable)

Capital Costs	2023 Actual	2024 Actual	2024 Estimate	TOTAL
Internal Labor & Equipment	39.9	52.8	15.0	107.7
Outside Services	897.2	1,188.7	336.8	2,422.6
Materials	366.4	485.4	137.5	989.3
Removals	254.2	336.7	95.4	686.3
Risk and Contingency	0.0	0.0	197.7	197.7
Other	1.7	2.3	0.6	4.6
SUBTOTAL Direct Cost	**1,559.3**	**2,065.9**	**783.1**	**4,408.3**
Indirects / Overheads	974.6	1,094.4	505.2	2,574.3
AFUDC	43.6	58.9	0.0	102.5
SUBTOTAL Indirect Cost	**1,018.3**	**1,153.3**	**505.2**	**2,676.8**
TOTAL Capital Request	**2,577.6**	**3,219.2**	**1,288.3**	**7,085.1**
Less Total Customer Contribution	0.0	0.0	0.0	**0.0**
TOTAL Project Cost	**2,577.6**	**3,219.2**	**1,288.3**	**7,085.1**

6. Lessons Learned

Project Title: New Canaan Network Conversion	**Project Number:** CD01915
Date Prepared: 10/10/2023	**Company:** Eversource CT
Organization: Distribution Engineering	**Project Category:** NTWRK 500KCMIL CBL RPL PRG
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: 12/31/2024	
Total Capital Request: $4,319.9K	**Authorization Type:** Full Funding

7. Executive Summary

This project is being constructed as part of a PURA commitment to remove type B (500cu) secondaries from networks by converting the system to a conventional UG system or reconductoring the secondaries with type A (4/0 7CT). [redacted]. This project mitigates the problematic scenario of a faulted feeder along with a network protector being stuck in the closed position causing severe overvoltage to equipment on the OH portion of the feeder.

[redacted]

The project is expected to be completed over 2 years with civil work, line extensions and recloser work scheduled for 2023 and UG transformer and cable work scheduled for 2024.

10/11/2023 – Full Funding Request

Full funding is being sought for this project at a cost of $4,319.9K which is 115% of the Partial funding estimate of $3,753K. The variance was due to a slight scope change with 2 vaults being relocated. [redacted]

8. Project Cost Summary

Note: Dollar values are in thousands.

Capital Costs	2023	2024	2025+	Total
Internal Labor and Construction Equipment	140.5	135.1	0.0	275.6
Outside Services	650.9	625.6	0.0	1,276.4
Materials	211.7	203.4	0.0	415.1
Removals	225.3	216.5	0.0	441.8
Risk and Contingency	153.7	147.7	0.0	301.4
Other	0.0	0.0	0.0	0.0
Subtotal	**1,382.0**	**1,328.3**	**0.0**	**2,710.3**

Indirect Capital Costs	2023	2024	2025+	Total
Indirects/Overheads (including benefits)	820.7	788.9	0.0	1,609.6
Capitalized interest or AFUDC, if any	0.0	0.0	0.0	0.0
Subtotal	**820.7**	**788.9**	**0.0**	**1,609.6**
Total Capital Costs (Gross)	**2,202.7**	**2,117.2**	**0.0**	**4,319.9**
Less Total Customer Contribution	**0.0**	**0.0**	**0.0**	**0.0**
Project Costs (Net of Reimbursement)	**2,202.7**	**2,117.2**	**0.0**	**4,319.9**

9. Technical Justification

Background, Project Need/Justification, and Project Scope

a. Background

[redacted] Presently, the network secondary network is composed of the old type B configuration which consists of 500 CU secondary cables. This project is being established because of a state mandate to eliminate underground secondary type B construction.

The design and condition of network secondary bus can have a significant impact on reliability, safety, restorability, and the demand on maintenance resources. The open secondary bus work in some underground network locations have been judged as unreliable, unsafe, and consequently in demand of inordinate

maintenance expense. A PURA docket 06-10-21 was issued to address type B networks following the cable fault on 10/6/2006 in the Waterbury underground secondary network system.

b. Project Need

The purpose of this project is to mitigate the secondary network Type B construction by converting the network into a conventional underground system with a loop. The New Canaan network system is fed by feeders that also feed OH loads. This configuration is problematic in that a faulted feeder along with a network protector being stuck in the closed position could cause severe overvoltage to equipment on the OH portion of the feeder. Converting the Network Secondary system to conventional UG system will mitigate this issue.

c. Project Scope



10. Alternatives Considered

Several loop designs were considered as shown on the Geographic Maps in Attachment B. Their pros and cons are as follows:

Option 1 - OPEN LOOP WITH 2 SOURCES AND EXPRESS (Preferred)

Pros

[redacted]

This option was chosen because it created additional loops to backup customers in the event of an outage and limited the exposure due to an UG outage. Option 1 created the most reliable alternative to the network.

Option 2 - OPEN UG LOOP WITH 2 SOURCES

Pros

[redacted]

Option 3 - RISER TO UCT

Pros

[redacted]

Option 4 - AUTO TRANSFER [redacted]

Pros

[redacted]

Con

[redacted]

Option 5 – RECONDUCTOR EXISTING NETWORK SECONDARIES

A fifth option considered was to keep the [redacted]

Project Option Comparison

Design Criteria	Options				
[redacted]					
Authorization Type	Full	Partial	Partial	Partial	Partial
Capital Cost	$4,319.9K	$3,427K	$2,951K	$2,974K	$4,659K
Expense Cost	$77.1K	$61K	$52K	$53K	$83K
Total Cost	$4,397K	$3,488K	$3,003K	$3,027K	$4,742K
Preferred option	X				

11. Project Schedule

Add any additional milestones that are pertinent to the project

Milestone/Phase Name	Estimated Date
Partial Approval	October, 2022
100% Detailed Engineering Completion	June 2023
Fully Funded	October 2023
Construction Start	October 2023
In Service Date	December 2024

12. Regulatory Decisions

N/A

13. Codes and Standards

N/A

14. 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.	2023	Low	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Materials Shortage or long lead times	2023	Medium	Pre-order long lead time material; minimize the use of non-standard and non-stocked material.
Storm delays	2023	Low	If storm activity delays work, we may be forced to use external resources.
System abnormal configuration	2024	Medium	Schedule work to minimize system abnormal time. Install temporary bypasses/equipment if system will be abnormal for extended periods.

15. References

References
1. N/A

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

Attachment	Included in Submittal?
A. Cost Estimate	*YES*
B. Geographic Maps	*YES*
C. One-Line Diagram	*YES*
D. Load Sheet	*YES*
E. Partial Funding PAF	*YES*

Attachment A: Cost Estimates

Option 1 – OPEN UG LOOP AND EXPRESS CABLE FOR BACK_UP

Xfmrs and Cables

Segment CD01915-01

Estimate

Preliminary Estimate Summary	
Revision Number:	0
Contingency:	28.00%
SubTotal:	$1,467,768
Contingency Amount:	$410,975
Estimate:	$1,878,743
Reimbursement:	$0
Net Amount:	$1,878,743
Description:	

Item Description	CU	[redacted]	Amount
SWITCHING OH/DB/UG - SWITCHING Network	16-ALL15		$42,146.40
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18		$20,000.00
DB CABLE DB/UG - 4/0 - 3-1/C (3ph) Al	16-UG113		$53,760.00
UG CABLE DB/UG - 350/500 - 3-1/C (3ph) Cu	16-UG114		$125,280.00
UG CABLE UG - Cable Removal - all cables	16-UG117		$50,000.00
UG CABLE UG - Network Secondary Ring Bus	16-UG118		$184,000.00
XF UG - Submersible XF, 3-1ph - in manhole/vault	16-UG133		$296,932.80
OTHER OTHER 30% contractor adder	16-ALL14		$338,716.00
OTHER OTHER MH cleaning	16-ALL14		$40,000.00

Segment			CD01915-01
XF UG - Submersible XF, 3-1ph - in manhole/vault remove network transformers	16-UG133	[redacted]	$296,932.80
OTHER OTHER separate network secondaries	16-ALL14		$20,000.00

Civil Work

Design Alternative — CD01915-05

Estimate

	Preliminary Estimate Summary
Revision Number:	1
Contingency:	24.00%
SubTotal:	$1,666,668
Contingency Amount:	$400,000
Estimate:	$2,066,668
Reimbursement:	$0
Net Amount:	**$2,066,668**
Description:	

Item Description	CU		Amount
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18	[redacted]	$20,000.00
CONDUIT UG-Ductline-up to 12 duct - Traveled Way / Paved	16-UG137		$125,120.00
ENCLOSURE UG - MANHOLE - Rebuild, enlarge or re-roof	16-UG141		$593,870.40
ENCLOSURE UG - HEXHOLE	16-UG142		$183,566.40
ENCLOSURE UG - Network Vault or Switch Vault	16-UG144		$296,936.00
OTHER OTHER 30% contractor adder	16-ALL14		$384,615.00
CONDUIT UG-Ductline-up to 12 duct - Traveled Way / Paved extra conduits for 2 new vaults	16-UG137		$62,560.00

Line Extension and Reclosers

Segment CD01915-06

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	24.00%
SubTotal:	$369,474
Contingency Amount:	$88,674
Estimate:	$458,148
Reimbursement:	$0
Net Amount:	**$458,148**

Description:

Item Description	CU	[redacted]	Amount
SWITCHING OH/DB/UG - SWITCHING Network	16-ALL15		$28,097.60
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18		$10,000.00
OH WIRE OH - Line Extension - 3ph (556 kcmil)	16-OH34		$12,000.00
SECTIONALIZE OH - Recloser - 3ph	16-OH38		$191,958.40
SECTIONALIZE OH-Vertical Disconnect Switches-600/900 amp 3-1ph	16-OH43		$20,566.40
POLE DB/UG - Riser - 3ph	16-UG146		$21,588.80
OTHER OTHER 30% contractor adder	16-ALL14		$85,263.00

Option 2 – OPEN UG LOOP WITH 2 SOURCES

Design Alternative CD01915-02

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	28.00%
SubTotal:	$2,724,942
Contingency Amount:	$762,984
Estimate:	$3,487,926
Reimbursement:	$0
Net Amount:	**$3,487,926**
Description:	

Item Description	CU	[redacted]	Amount
SWITCHING OH/DB/UG - SWITCHING Network	16-ALL15		$42,146.40
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18		$40,000.00
DB CABLE DB/UG - 4/0 - 3-1/C (3ph) Al	16-UG113		$53,760.00
UG CABLE UG - Cable Removal - all cables	16-UG117		$50,000.00
UG CABLE UG - Network Secondary Ring Bus	16-UG118		$184,000.00
XF UG - Submersible XF, 3-1ph - in manhole/vault	16-UG133		$296,932.80
CONDUIT UG-Ductline-up to 12 duct - Traveled Way / Paved	16-UG137		$187,680.00
ENCLOSURE UG - MANHOLE - Rebuild, enlarge or re-roof	16-UG141		$593,870.40
ENCLOSURE UG - HEXHOLE	16-UG142		$183,566.40

Design Alternative		[redacted]	CD01915-02
OTHER OTHER CONTRACTOR ADDER	16-ALL14		$756,053.00
OTHER OTHER MH cleaning	16-ALL14		$40,000.00
XF UG - Submersible XF, 3-1ph - in manhole/vault remove network transformers	16-UG133		$296,932.80

Option 3 – RISER TO UCT

Design Alternative CD01915-03

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	28.00%
SubTotal:	$2,346,321
Contingency Amount:	$656,970
Estimate:	$3,003,291
Reimbursement:	$0
Net Amount:	**$3,003,291**
Description:	

Item Description	CU	[redacted]	Amount
SWITCHING OH/DB/UG - SWITCHING Network	16-ALL15		$42,146.40
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18		$40,000.00
SECTIONALIZE OH - Cutouts or Arresters - 3ph	16-OH20		$13,891.20
XF OH - OH XF's - bank of 3-1ph	16-OH46		$5,019.20
DB CABLE DB/UG - 4/0 - 3-1/C (3ph) Al	16-UG113		$40,320.00
UG CABLE UG - Cable Removal - all cables	16-UG117		$40,000.00
UG CABLE UG - Network Secondary Ring Bus	16-UG118		$184,000.00
XF UG - Submersible XF, 3-1ph - in manhole/vault	16-UG133		$296,932.80
CONDUIT UG-Ductline-up to 12 duct - Traveled Way / Paved	16-UG137		$37,536.00

Design Alternative			CD01915-03
ENCLOSURE UG - MANHOLE - Rebuild, enlarge or re-roof	16-UG141	[redacted]	$593,870.40
ENCLOSURE UG - HEXHOLE	16-UG142		$61,188.80
POLE DB/UG - Riser - 3ph	16-UG146		$32,383.20
OTHER OTHER 30% CONTRACTOR ADDER	16-ALL14		$622,100.00
OTHER OTHER MH CLEANING	16-ALL14		$40,000.00
XF UG - Submersible XF, 3-1ph - in manhole/vault remove network transformers	16-UG133		$296,932.80

Option 4 – AUTO TRANSFER 31A15 TO 31A6

Design Alternative CD01915-04

Estimate

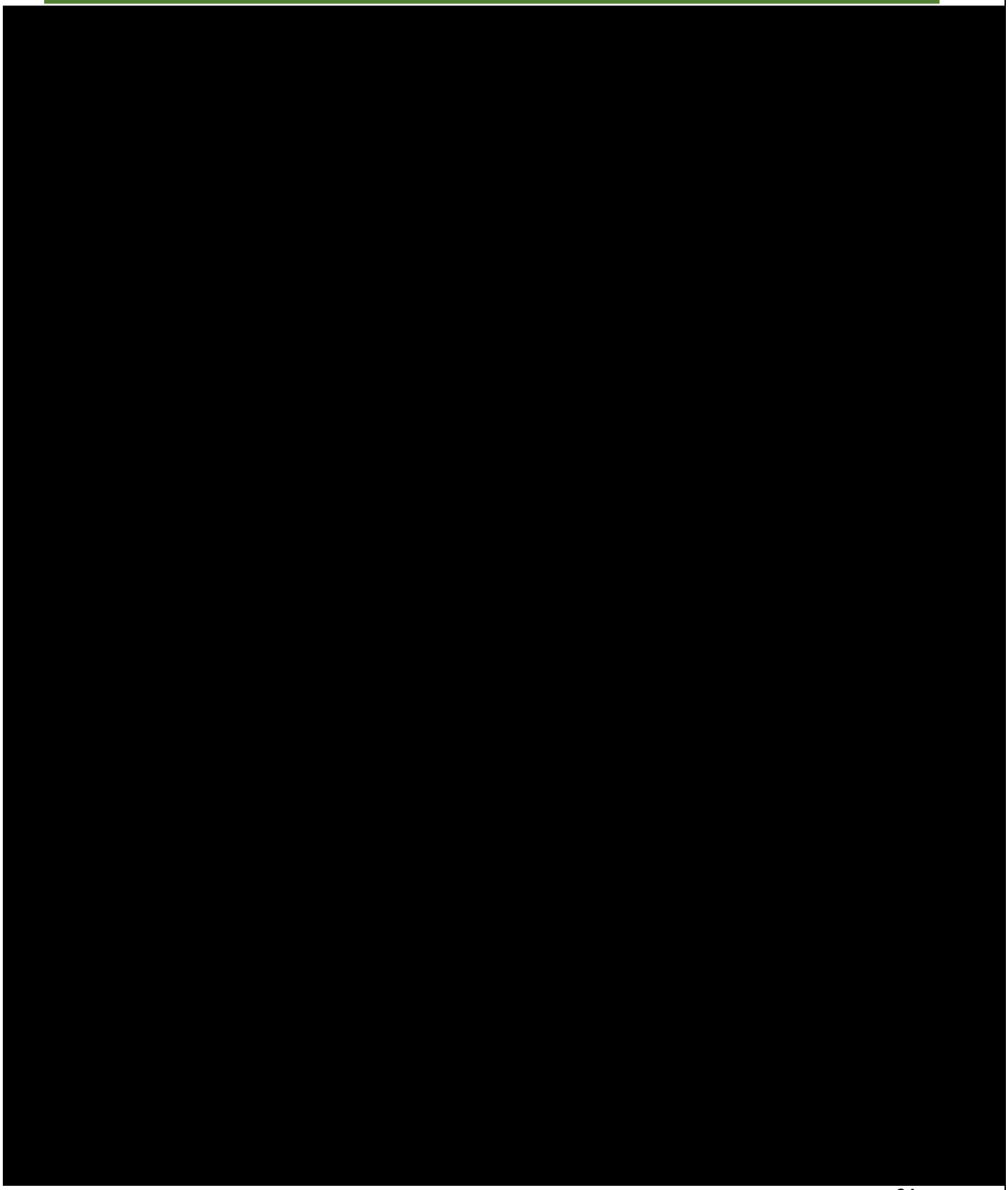
	Preliminary Estimate Summary
Revision Number:	0
Contingency:	24.00%
SubTotal:	$2,441,127
Contingency Amount:	$585,871
Estimate:	$3,026,998
Reimbursement:	$0
Net Amount:	**$3,026,998**
Description:	

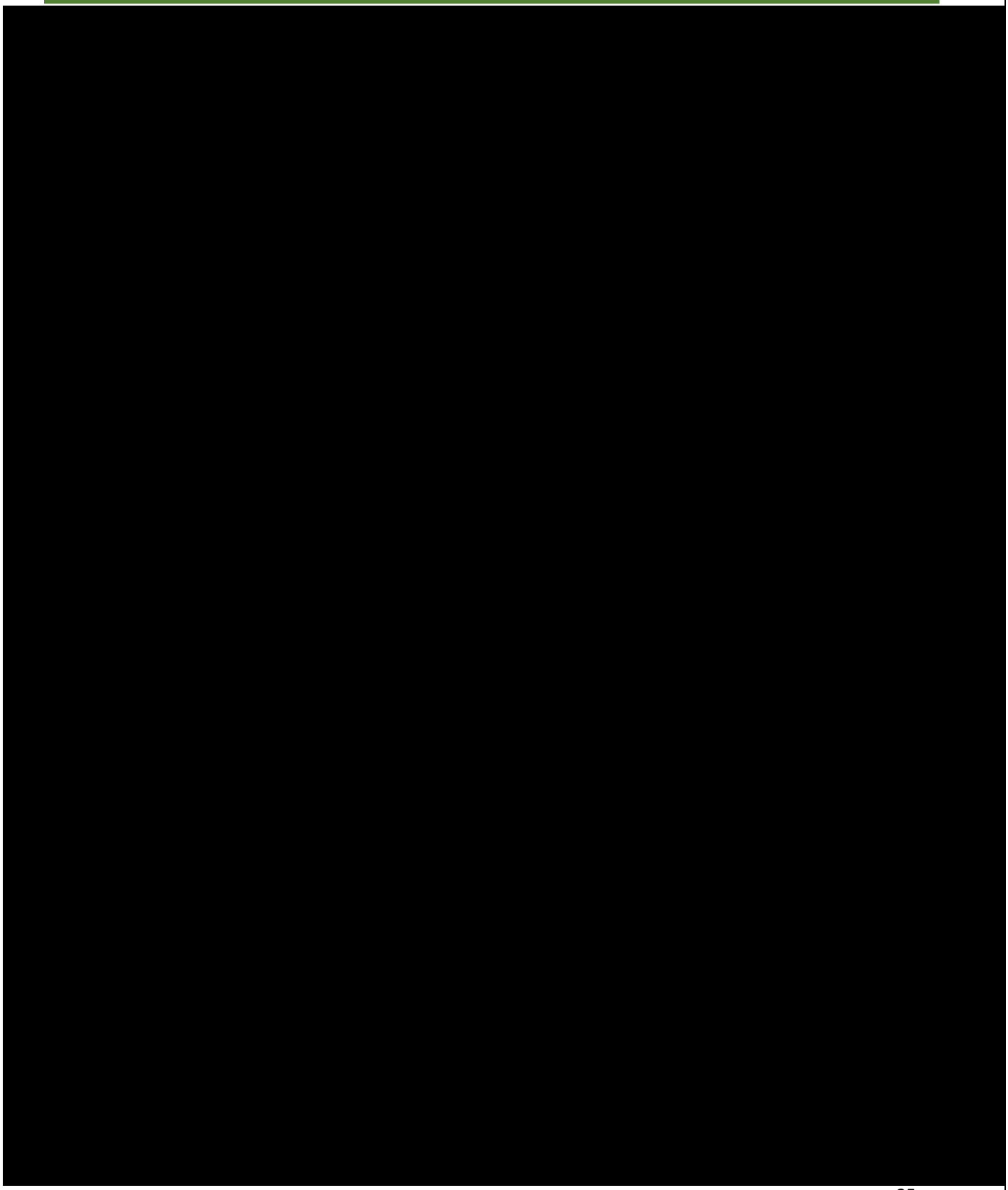
Item Description	CU	Amount
SWITCHING OH/DB/UG - SWITCHING Network	16-ALL15	$42,146.40
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18	$40,000.00
SECTIONALIZE OH - Recloser - 3ph	16-OH38	$95,979.20
SECTIONALIZE OH - Remove Recloser (any)	16-OH42	$11,312.00
DB CABLE DB/UG - 4/0 - 3-1/C (3ph) Al	16-UG113	$53,760.00
UG CABLE UG - Cable Removal - all cables	16-UG117	$50,000.00
UG CABLE UG - Network Secondary Ring Bus	16-UG118	$184,000.00
XF UG - Submersible XF, 3-1ph - in manhole/vault	16-UG133	$296,932.80
CONDUIT UG-Ductline-up to 12 duct - Traveled Way / Paved	16-UG137	$187,680.00

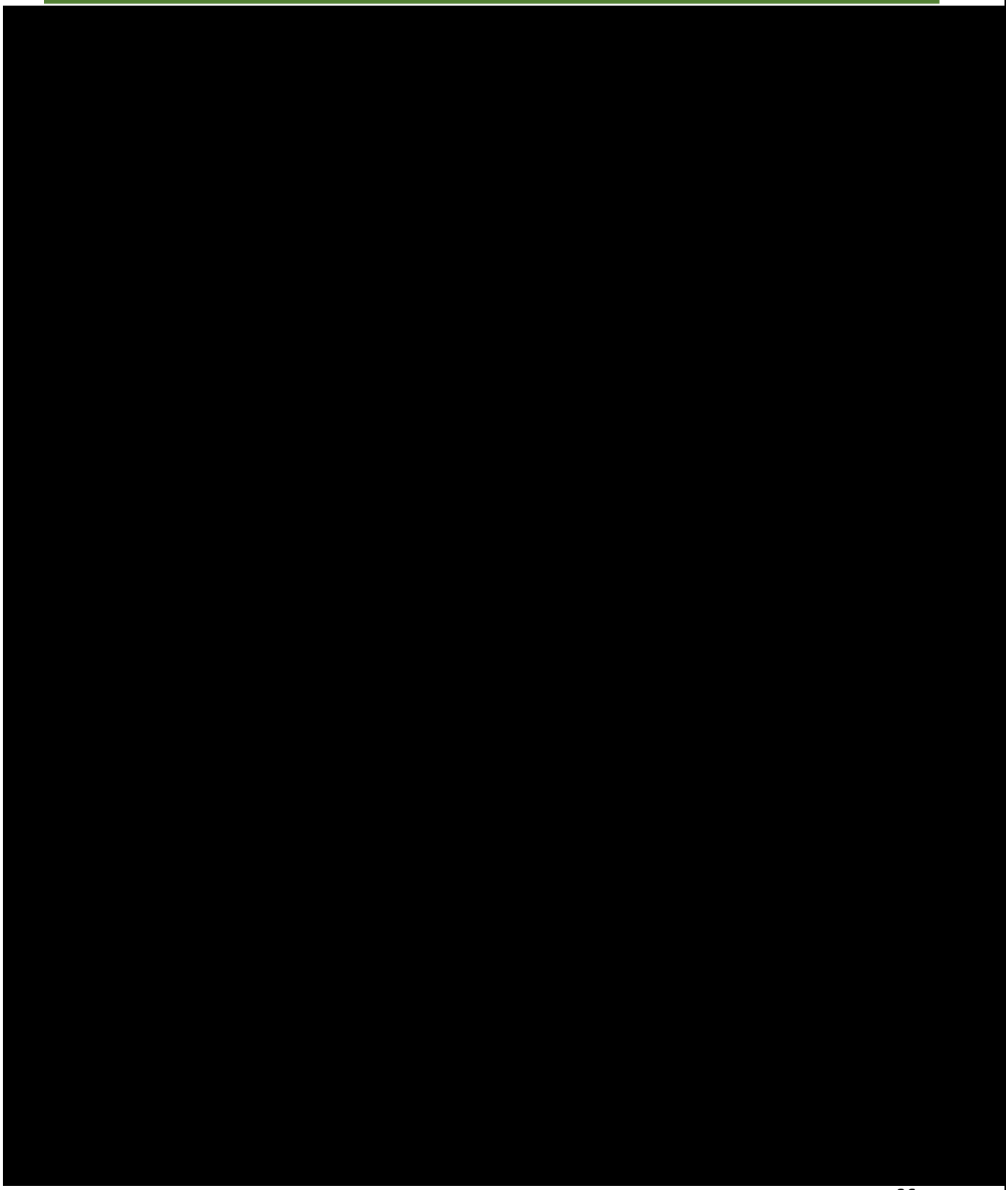
Design Alternative		[redacted]	CD01915-04
ENCLOSURE UG - MANHOLE - Rebuild, enlarge or re-roof	16-UG141		$593,870.40
ENCLOSURE UG - HEXHOLE	16-UG142		$183,566.40
OTHER OTHER 30% CONTRACTOR ADDER	16-ALL14		$661,880.00
OTHER OTHER MH CLEANING	16-ALL14		$40,000.00

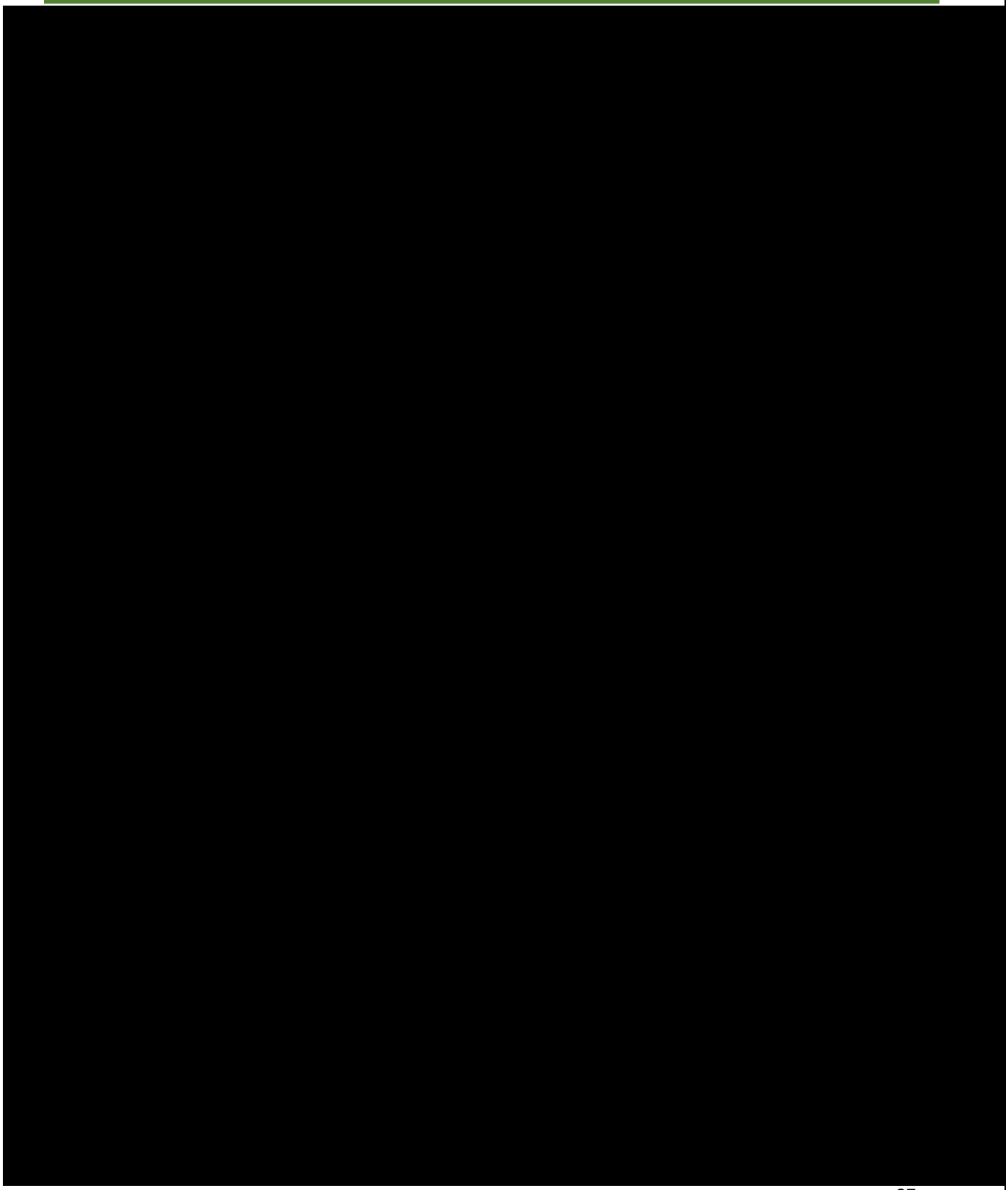
Attachment B – Geographic Maps

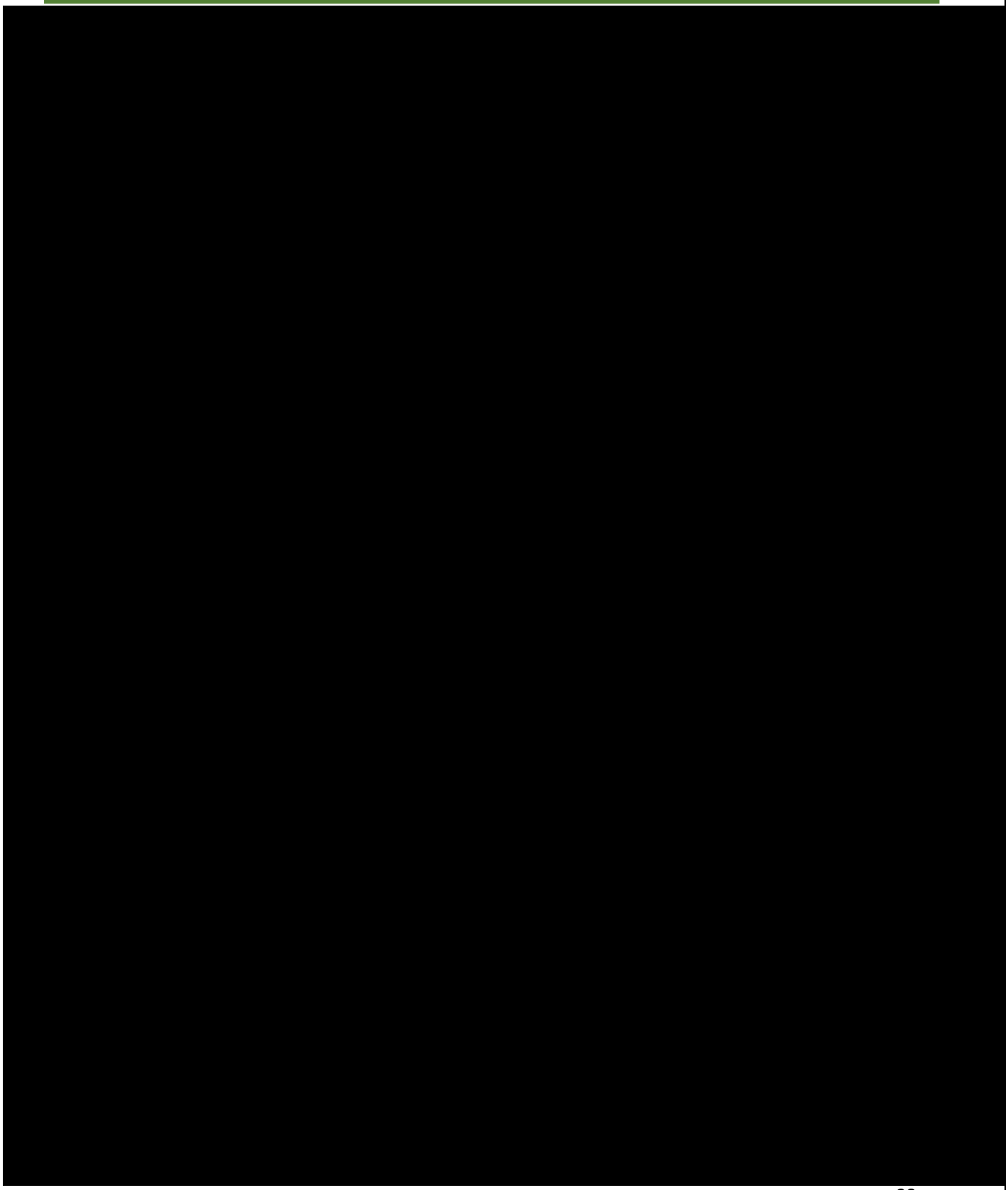
[redacted]

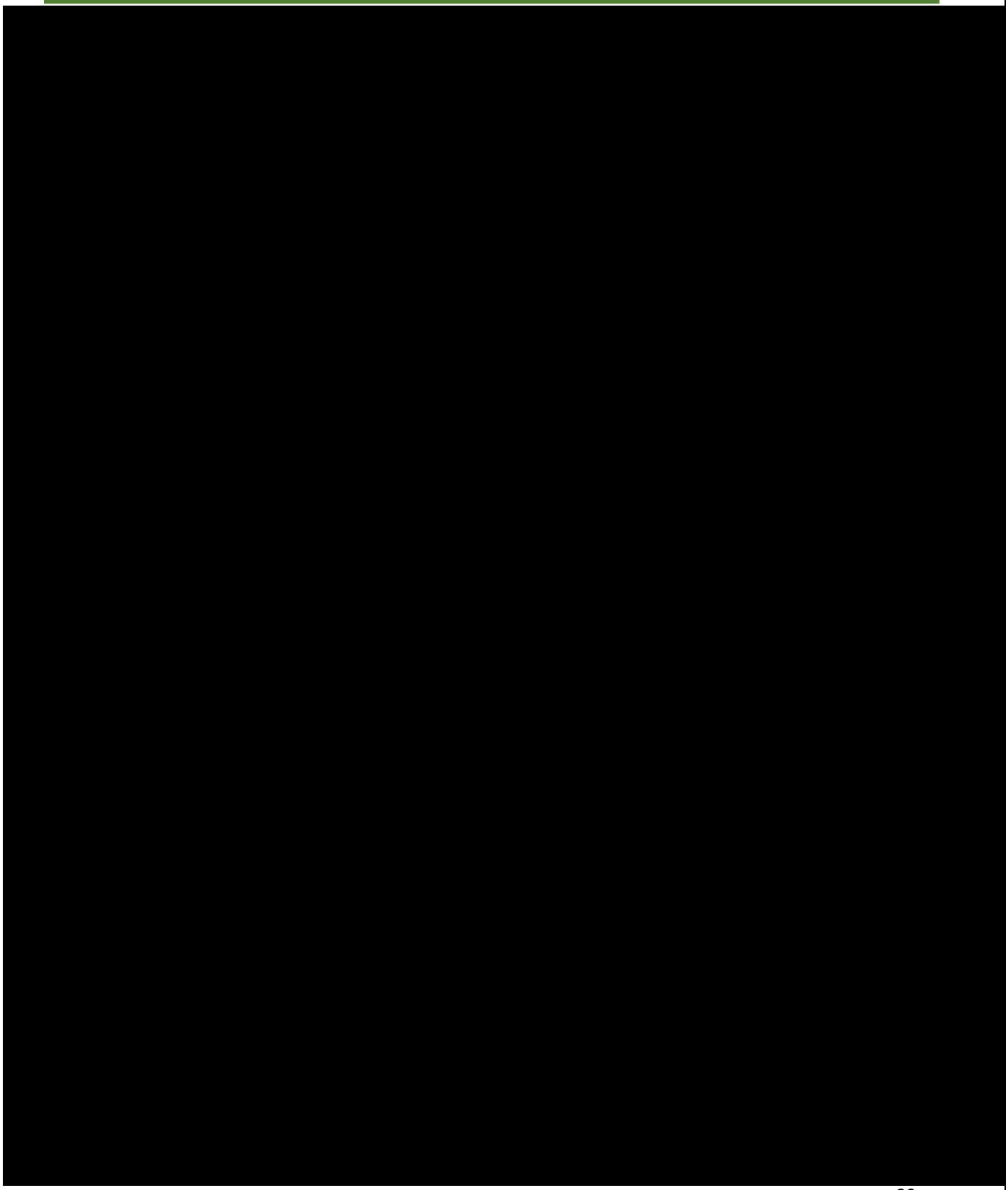


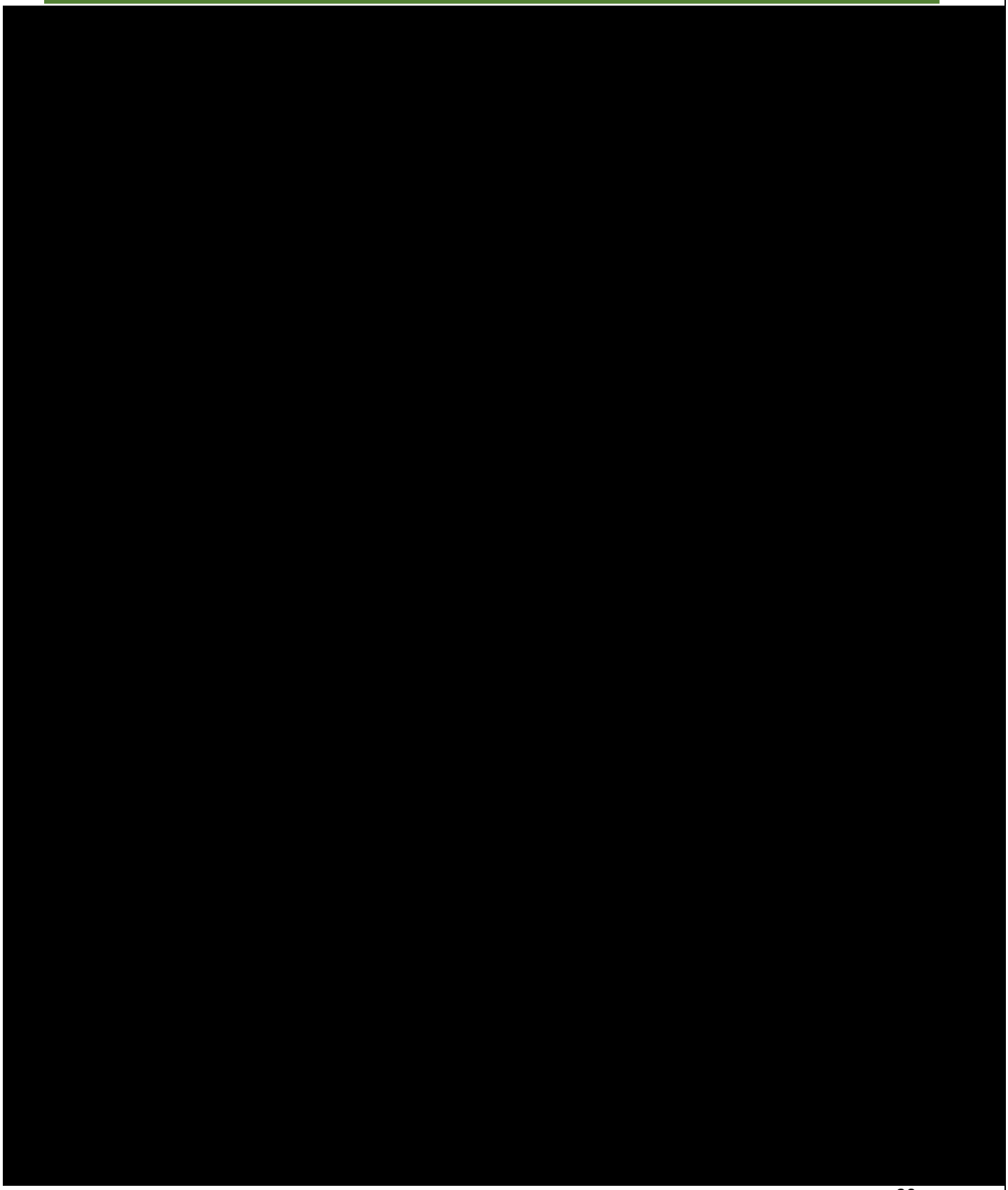












Attachment E: Partial Funding PAF

Operations Project Authorization Form

Project Title: New Canaan Network Conversion	**Project Number: CD01915**
Date Prepared: 10/20/2022	**Company:** Eversource CT
Organization: Electric Field Operations	**Class(es) of Plant:** D Line
Project Initiator: [redacted]	**Project Category:** NTWRK 500KCMIL CBL RPL PRG
Project Manager: [redacted]	**Project Type:** Program
Project Sponsor: [redacted]	**Capital Investment part of original Operating Plan:** No
Estimated in service date: 12/31/2024	**Emergency Related Request?** Choose an item
Eng./Constr. Resources Budgeted? No	**Facility Type** (check all that apply)**:**
Total Gross Capital Request: $3,753K	**Authorization Type:** Partial Funding

Executive Summary

This project was originally granted initial funding approval for 3.8 million dollars to convert the New Canaan Network from a network system to a conventional underground system. There has been a slight scope change with the addition of 2 transformer vaults causing the total cost to increase by $574K or 15% of the original initial approved funding. Some work that was scheduled to be performed in 2024 will also need to be completed in 2023. This project is being constructed as part of a PURA commitment to remove type B (500cu) secondaries from networks by converting the system to a conventional UG system or reconductoring the secondaries with type A (4/0 7CT). [redacted]

The project is expected to be completed over 2 years with civil work, line extensions and recloser work scheduled for 2023 and UG transformer and cable work scheduled for 2024.

Project Costs Summary

Note: Dollar values are in thousands

Capital Costs	2023	2024	2025+	Total
Internal Labor and Construction Equipment	$101	$97	$0	$198
Outside Services	$641	$616	$0	$1,257
Materials	$280	$269	$0	$548
Removals	$158	$152	$0	$310
Risk and Contingency	($6)	($6)	$0	($12)
Other	$0	$0	$0	$0
Subtotal	**$1,174**	**$1,128**	**$0**	**$2,302**

Indirect Capital Costs	2023	2024	2025+	Total
Indirects/Overheads (including benefits)	$699	$671	$0	$1,370
Capitalized interest or AFUDC, if any	$42	$40	$0	$82
Subtotal	**$740**	**$711**	**$0**	**$1,452**
Total Capital Costs (Gross)	**$1,914**	**$1,839**	**$0**	**$3,753**
Less Total Customer Contribution	**$0**	**$0**	**$0**	**$0**
Project Costs (Net)	**$1,914**	**$1,839**	**$0**	**$3,753**

Technical Justification:

Project Need, Objective and Justification:

The New Canaan Secondary Network is presently comprised of the old Type B configuration which has 500 CU secondary cables and open bus secondary connections. This project is being established because of a PURA commitment to remove underground secondary type B construction.

The purpose of this project is to mitigate the secondary network Type B construction by converting the network into a conventional underground system with a loop. [redacted]

Project Scope:

[redacted]

Major Material:

- 6 wye-wye UCT's
- 6 Hex holes
- 2 Transformer vaults
- 4 Reclosers
- 4000' of 4/0 Al cable
- 2 Network Secondary Ring Bus

Background:

[redacted]

Alternatives Considered:

Alternatives were considered (please describe below)

Loop Options.docx

The alternatives were not selected because they do not provide the same reliability as the preferred option. The goal is to provide a reliable service that is like the existing network service.

Below are the costs for the different options explored in this project:

Option 1 (Preferred) -- $3,820K

- [redacted]

Option 2 – 3,427K

- [redacted]

Option 3 – 2,952K

- [redacted]

Option 4 – 2,974K

- [redacted]

Option 5 – 4,659K

- [redacted]

Project Option Comparison

	Options				
[redacted]					
Cost	$3.81M	$3.43M	$2.96M	$2.98M	4.7M
Preferred option	X				

Regulatory Approvals:

Are Regulatory body approvals needed for the project?

No

Project Schedule

Milestone/Phase Name	Estimated Date
100% Engineering Completion	06/30/2023
Construction Start	09/01/2023
Testing/Commissioning	10/30/2024
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.	2023	Medium	Included contingency costs in the funding request. Perform detailed Field Analysis and walk down in project development to avoid potential issues.
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.	2023	Low	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Materials Shortage or long lead times	2023	Medium	Pre-order long lead time material; minimize the use of non-standard and non-stocked material.
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.

References

CD01915_project_needs_statement revi

load Projections.xlsx

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

New Canaan map-Before.pdf

New Canaan map FINAL.pdf

Project Title: New Canaan Network Conversion	**Project Number:** CD01915
Date Prepared: 10/10/2023	**Company:** Eversource CT
Organization: Distribution Engineering	**Project Category:** NTWRK 500KCMIL CBL RPL PRG
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: 12/31/2024	
Total Capital Request: $4,319.9K	**Authorization Type:** Full Funding

1. Executive Summary

This project is being constructed as part of a PURA commitment to remove type B (500cu) secondaries from networks by converting the system to a conventional UG system or reconductoring the secondaries with type A (4/0 7CT). [redacted]

The project is expected to be completed over 2 years with civil work, line extensions and recloser work scheduled for 2023 and UG transformer and cable work scheduled for 2024.

10/11/2023 – Full Funding Request

Full funding is being sought for this project at a cost of $4,319.9K which is 115% of the Partial funding estimate of $3,753K. The variance was due to a slight scope change with 2 vaults being relocated. [redacted] It was also not a good location since it was in the sidewalk directly in front of a restaurant. [redacted] At this location the curb was being bumped out and would've ended up going through the existing

vault grating. These issues require new vaults and new duct bank between the existing vaults and new vault locations – the existing vaults were converted to manholes.

2. Project Cost Summary

Note: Dollar values are in thousands.

Capital Costs	2023	2024	2025+	Total
Internal Labor and Construction Equipment	140.5	135.1	0.0	275.6
Outside Services	650.9	625.6	0.0	1,276.4
Materials	211.7	203.4	0.0	415.1
Removals	225.3	216.5	0.0	441.8
Risk and Contingency	153.7	147.7	0.0	301.4
Other	0.0	0.0	0.0	0.0
Subtotal	**1,382.0**	**1,328.3**	**0.0**	**2,710.3**

Indirect Capital Costs	2023	2024	2025+	Total
Indirects/Overheads (including benefits)	820.7	788.9	0.0	1,609.6
Capitalized interest or AFUDC, if any	0.0	0.0	0.0	0.0
Subtotal	**820.7**	**788.9**	**0.0**	**1,609.6**
Total Capital Costs (Gross)	**2,202.7**	**2,117.2**	**0.0**	**4,319.9**
Less Total Customer Contribution	**0.0**	**0.0**	**0.0**	**0.0**
Project Costs (Net of Reimbursement)	**2,202.7**	**2,117.2**	**0.0**	**4,319.9**

3. Technical Justification

Background, Project Need/Justification, and Project Scope

a. Background

[redacted]

The design and condition of network secondary bus can have a significant impact on reliability, safety, restorability, and the demand on maintenance resources. The open secondary bus work in some underground network locations have been judged as unreliable, unsafe, and consequently in demand of inordinate maintenance expense. A PURA docket 06-10-21 was issued to address type B networks following the cable fault on 10/6/2006 in the Waterbury underground secondary network system.

b. Project Need

The purpose of this project is to mitigate the secondary network Type B construction by converting the network into a conventional underground system with a loop. The New Canaan network system is fed by feeders that also feed OH loads. This configuration is problematic in that a faulted feeder along with a network protector being stuck in the closed position could cause severe overvoltage to equipment on the OH portion of the feeder. Converting the Network Secondary system to conventional UG system will mitigate this issue.

c. Project Scope

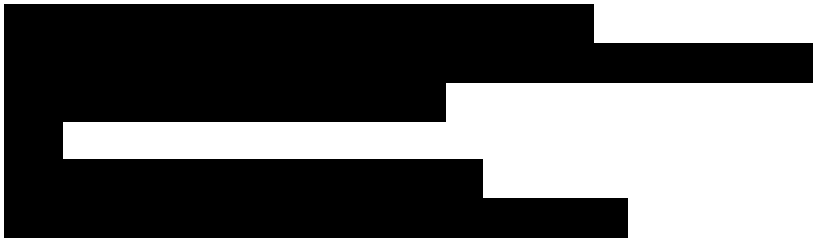


4. Alternatives Considered

Several loop designs were considered as shown on the Geographic Maps in Attachment B. Their pros and cons are as follows:

Option 1 - OPEN LOOP WITH 2 SOURCES AND EXPRESS (Preferred)

Pros



This option was chosen because it created additional loops to backup customers in the event of an outage and limited the exposure due to an UG outage. Option 1 created the most reliable alternative to the network.

Option 2 - OPEN UG LOOP WITH 2 SOURCES

Pros



Option 3 - RISER TO UCT

Pros



Option 4 - AUTO TRANSFER 31A15 TO 31A6

Pros



[redacted]

Con

[redacted]

Option 5 – RECONDUCTOR EXISTING NETWORK SECONDARIES

A fifth option considered was to [redacted]

Project Option Comparison

Design Criteria	Options				
[redacted]					
Authorization Type	Full	Partial	Partial	Partial	Partial
Capital Cost	$4,319.9K	$3,427K	$2,951K	$2,974K	$4,659K
Expense Cost	$77.1K	$61K	$52K	$53K	$83K
Total Cost	$4,397K	$3,488K	$3,003K	$3,027K	$4,742K
Preferred option	X				

5. Project Schedule

Add any additional milestones that are pertinent to the project

Milestone/Phase Name	Estimated Date
Partial Approval	October, 2022
100% Detailed Engineering Completion	June 2023
Fully Funded	October 2023
Construction Start	October 2023
In Service Date	December 2024

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

System abnormal configuration	2024	Medium	Schedule work to minimize system abnormal time. Install temporary bypasses/equipment if system will be abnormal for extended periods.

9. References

References
1. N/A

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

Attachment	Included in Submittal?
A. Cost Estimate	*YES*
B. Geographic Maps	*YES*
C. One-Line Diagram	*YES*
D. Load Sheet	*YES*
E. Partial Funding PAF	*YES*

Attachment A: Cost Estimates

Option 1 – OPEN UG LOOP AND EXPRESS CABLE FOR BACK_UP

Xfmrs and Cables

EVERSOURCE

Supplement Authorization Form

Segment CD01915-01

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	28.00%
SubTotal:	$1,467,768
Contingency Amount:	$410,975
Estimate:	$1,878,743
Reimbursement:	$0
Net Amount:	**$1,878,743**
Description:	

Item Description	CU	Amount
SWITCHING OH/DB/UG - SWITCHING Network	16-ALL15	$42,146.40
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18	$20,000.00
DB CABLE DB/UG - 4/0 - 3-1/C (3ph) Al	16-UG113	$53,760.00
UG CABLE DB/UG - 350/500 - 3-1/C (3ph) Cu	16-UG114	$125,280.00
UG CABLE UG - Cable Removal - all cables	16-UG117	$50,000.00
UG CABLE UG - Network Secondary Ring Bus	16-UG118	$184,000.00
XF UG - Submersible XF, 3-1ph - in manhole/vault	16-UG133	$296,932.80
OTHER OTHER 30% contractor adder	16-ALL14	$338,716.00
OTHER OTHER MH cleaning	16-ALL14	$40,000.00

[redacted]

Segment			CD01915-01
XF UG - Submersible XF, 3-1ph - in manhole/vault remove network transformers	16-UG133	[redacted]	$296,932.80
OTHER OTHER separate network secondaries	16-ALL14		$20,000.00

Civil Work

EVERSOURCE

Supplement Authorization Form

Design Alternative CD01915-05

Estimate

	Preliminary Estimate Summary
Revision Number:	1
Contingency:	24.00%
SubTotal:	$1,666,668
Contingency Amount:	$400,000
Estimate:	$2,066,668
Reimbursement:	$0
Net Amount:	**$2,066,668**

Description:

Item Description	CU	Amount
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18	$20,000.00
CONDUIT UG-Ductline-up to 12 duct - Traveled Way / Paved	16-UG137	$125,120.00
ENCLOSURE UG - MANHOLE - Rebuild, enlarge or re-roof	16-UG141	$593,870.40
ENCLOSURE UG - HEXHOLE	16-UG142	$183,566.40
ENCLOSURE UG - Network Vault or Switch Vault	16-UG144	$296,936.00
OTHER OTHER 30% contractor adder	16-ALL14	$384,615.00
CONDUIT UG-Ductline-up to 12 duct - Traveled Way / Paved extra conduits for 2 new vaults	16-UG137	$62,560.00

[redacted]

Line Extension and Reclosers

Supplement Authorization Form

Segment CD01915-06

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	24.00%
SubTotal:	$369,474
Contingency Amount:	$88,674
Estimate:	$458,148
Reimbursement:	$0
Net Amount:	**$458,148**
Description:	

Item Description	CU	[redacted]	Amount
SWITCHING OH/DB/UG - SWITCHING Network	16-ALL15		$28,097.60
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18		$10,000.00
OH WIRE OH - Line Extension - 3ph (556 kcmil)	16-OH34		$12,000.00
SECTIONALIZE OH - Recloser - 3ph	16-OH38		$191,958.40
SECTIONALIZE OH-Vertical Disconnect Switches-600/900 amp 3-1ph	16-OH43		$20,566.40
POLE DB/UG - Riser - 3ph	16-UG146		$21,588.80
OTHER OTHER 30% contractor adder	16-ALL14		$85,263.00

Option 2 – OPEN UG LOOP WITH 2 SOURCES

EVERSOURCE

Supplement Authorization Form

Design Alternative CD01915-02

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	28.00%
SubTotal:	$2,724,942
Contingency Amount:	$762,984
Estimate:	$3,487,926
Reimbursement:	$0
Net Amount:	**$3,487,926**
Description:	

Item Description	CU	[redacted]	Amount
SWITCHING OH/DB/UG - SWITCHING Network	16-ALL15		$42,146.40
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18		$40,000.00
DB CABLE DB/UG - 4/0 - 3-1/C (3ph) Al	16-UG113		$53,760.00
UG CABLE UG - Cable Removal - all cables	16-UG117		$50,000.00
UG CABLE UG - Network Secondary Ring Bus	16-UG118		$184,000.00
XF UG - Submersible XF, 3-1ph - in manhole/vault	16-UG133		$296,932.80
CONDUIT UG-Ductline-up to 12 duct - Traveled Way / Paved	16-UG137		$187,680.00
ENCLOSURE UG - MANHOLE - Rebuild, enlarge or re-roof	16-UG141		$593,870.40
ENCLOSURE UG - HEXHOLE	16-UG142		$183,566.40

EVERSOURCE

Supplement Authorization Form

Design Alternative			CD01915-02
OTHER OTHER CONTRACTOR ADDER	16-ALL14	[redacted]	$756,053.00
OTHER OTHER MH cleaning	16-ALL14		$40,000.00
XF UG - Submersible XF, 3-1ph - in manhole/vault remove network transformers	16-UG133		$296,932.80

Option 3 – RISER TO UCT

Design Alternative CD01915-03

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	28.00%
SubTotal:	$2,346,321
Contingency Amount:	$656,970
Estimate:	$3,003,291
Reimbursement:	$0
Net Amount:	**$3,003,291**
Description:	

Item Description	CU	[redacted]	Amount
SWITCHING OH/DB/UG - SWITCHING Network	16-ALL15		$42,146.40
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18		$40,000.00
SECTIONALIZE OH - Cutouts or Arresters - 3ph	16-OH20		$13,891.20
XF OH - OH XF's - bank of 3-1ph	16-OH46		$5,019.20
DB CABLE DB/UG - 4/0 - 3-1/C (3ph) Al	16-UG113		$40,320.00
UG CABLE UG - Cable Removal - all cables	16-UG117		$40,000.00
UG CABLE UG - Network Secondary Ring Bus	16-UG118		$184,000.00
XF UG - Submersible XF, 3-1ph - in manhole/vault	16-UG133		$296,932.80
CONDUIT UG-Ductline-up to 12 duct - Traveled Way / Paved	16-UG137		$37,536.00

EVERSOURCE

Supplement Authorization Form

Design Alternative		[redacted]	CD01915-03
ENCLOSURE UG - MANHOLE - Rebuild, enlarge or re-roof	16-UG141		$593,870.40
ENCLOSURE UG - HEXHOLE	16-UG142		$61,188.80
POLE DB/UG - Riser - 3ph	16-UG146		$32,383.20
OTHER OTHER 30% CONTRACTOR ADDER	16-ALL14		$622,100.00
OTHER OTHER MH CLEANING	16-ALL14		$40,000.00
XF UG - Submersible XF, 3-1ph - in manhole/vault remove network transformers	16-UG133		$296,932.80

Option 4 – AUTO TRANSFER 31A15 TO 31A6

Design Alternative CD01915-04

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	24.00%
SubTotal:	$2,441,127
Contingency Amount:	$585,871
Estimate:	$3,026,998
Reimbursement:	$0
Net Amount:	**$3,026,998**
Description:	

Item Description	CU	[redacted]	Amount
SWITCHING OH/DB/UG - SWITCHING Network	16-ALL15		$42,146.40
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18		$40,000.00
SECTIONALIZE OH - Recloser - 3ph	16-OH38		$95,979.20
SECTIONALIZE OH - Remove Recloser (any)	16-OH42		$11,312.00
DB CABLE DB/UG - 4/0 - 3-1/C (3ph) Al	16-UG113		$53,760.00
UG CABLE UG - Cable Removal - all cables	16-UG117		$50,000.00
UG CABLE UG - Network Secondary Ring Bus	16-UG118		$184,000.00
XF UG - Submersible XF, 3-1ph - in manhole/vault	16-UG133		$296,932.80
CONDUIT UG-Ductline-up to 12 duct - Traveled Way / Paved	16-UG137		$187,680.00

Design Alternative			CD01915-04
ENCLOSURE UG - MANHOLE - Rebuild, enlarge or re-roof	16-UG141	[redacted]	$593,870.40
ENCLOSURE UG - HEXHOLE	16-UG142		$183,566.40
OTHER OTHER 30% CONTRACTOR ADDER	16-ALL14		$661,880.00
OTHER OTHER MH CLEANING	16-ALL14		$40,000.00

Attachment B – Geographic Maps

