Operations Project Authorization Form

Project Title: [redacted] TDRP_2020	**Project Number: CD01634**
Date Prepared: 06/07/2023	**Company: Eversource CT**
Organization: Electric Field Operations	**Class(es) of Plant: D Line**
Project Initiator: [redacted]	**Project Category: TRMSN DISTR RELIABILTY PERFRM**
Project Manager: [redacted]	**Project Type: Specific**
Project Sponsor: [redacted]	**Capital Investment part of original Operating Plan: Yes**
Estimated in service date: 10/2023	**Emergency Related Request? No**
Eng./Constr. Resources Budgeted? Yes	**Facility Type** (check all that apply): ☐ PTF ☐ non-PTF ☒ Distribution
Total Gross Capital Request: $738,500	**Authorization Type: Full Funding**

Financial Requirements:

Project Authorization
ERM: _____

FP&A: _____

Executive Summary

[redacted] circuit was analyzed for reliability improvements because it ranked 61 on the Transmission-Distribution Reliability Performance (TDRP) list based on the 4-year outage history. Therefore, the driver for this project is twofold: (1) Regulatory Commitments and (2) System upgrades for reliability improvements.

[redacted]

The initial engineering estimate for this project was approved for $422K on April 29, 2021. However, the initial estimate did not include a revised increase per unit cost for material, labor, additional tree trimming, and the unplanned replacement of the [redacted] that needed to be

reconfigured to a Smart Switch as part of the loop scheme changes. The [redacted] is an obsolete Siemens Centurion recloser that cannot be re-configured as a Smart Switch [redacted]

Therefore, the full funding request for this project is $738,5k and includes an additional capital cost of $245,4k for (labor, outside services, material, removals, contingency) and additional indirect cost of $71,1K (indirect/overhead, benefits, capitalized interest)

Project Costs Summary

Note: Dollar values are in thousands

Financial Evaluation ($000's)

Capital Costs	2022	2023	Year 3+	Total
Internal Labor and Construction Equipment	0.5	0.8	0.0	1.3
Outside Services	132.4	190.9	0.0	323.3
Materials	32.7	47.2	0.0	79.9
Removals	21.0	30.3	0.0	51.2
Risk and Contingency	0.0	51.5	0.0	51.5
Other	0.0	0.0	0.0	0.0
Subtotal	**186.7**	**320.7**	**0.0**	**507.4**

Indirect Capital Costs	2022	2023	Year 3+	Total
Indirects/Overheads (including benefits)	92.9	134.0	0.0	226.9
Capitalized interest or AFUDC, if any	1.7	2.5	0.0	4.3
Subtotal	**94.7**	**136.5**	**0.0**	**231.1**
Total Capital Costs (Gross)	**281.3**	**457.2**	**0.0**	**738.5**
Less Total Customer Contribution	**0.0**	**0.0**	**0.0**	**0.0**
Project Costs (Net of Reimbursement)	**281.3**	**457.2**	**0.0**	**738.5**

Technical Justification:

Project Need, Objective and Justification:

Project CD01634 identifies the locations and causes of outages that have a significant impact on our systems performance. The [redacted]

The project will also address reconductoring small wire segments where there's an outcrop of trees and a history of outages and splices.

Project Objectives

Resolve high concentration of tree caused outages on the backbone by reconductoring poor performing sections. [redacted] ROW. [redacted].

Project Scope

Selected Option ($738.5K)

The project will perform the following work:

[redacted]

It consists of two (2) separate segments as follows:

[redacted]

[redacted]

Major Material:

- (12) Ampact Wedge Connectors,
- (930') 556 TW,
- (6) 1254 kVA 23 kV-13.8 kV Auto's

[redacted]

[redacted]

Major Material:

- (3) In-Line Switches
- (12) Ampact Wedge Connectors
- (2,430 ft.) 556 Tree Wire 3 phase
- (6) 1254 kVA Auto Transformers

Background:

[redacted]

On a yearly basis, storms contribute between 70% - 99% of customer minutes and trees between 76% - 99%.

Table 1 below shows the various segments reviewed to address the reliability issues on the [redacted]uit. This is a cost / benefit evaluation. Segments were selected that provide the lowest cost per customer minute. For this project the approved segments include #1 and #2. Note, #8 will be performed under an annual workorder to get the work on the schedule and performed quickly.

Table 2 shows [redacted].

Table 3 shows the devices chosen for this project based their contribution to the customer minutes.

Table 1: Cost Effectiveness Summary



Table 2: [redacted] and [redacted] Outage History

[redacted]

Table 3: 20Y1 Top 7 Worst Performing Devices

Device Name	Count of Device	Sum of Customer Affected	Sum of Customer Minutes	% CMI	% Customers	Comments
[redacted]	6	[redacted]	1259527	26.59%	21.78%	
	2		710487	15.00%	6.03%	
	4		688940	14.54%	7.34%	[redacted]
	6		641800	13.55%	17.64%	
	2		197964	4.18%	3.06%	
	5		137618	2.91%	12.26%	
	2		128786	2.72%	1.72%	
	27		**3,765,122**	**79%**	**70%**	

Business Process and / or Technical Improvements:

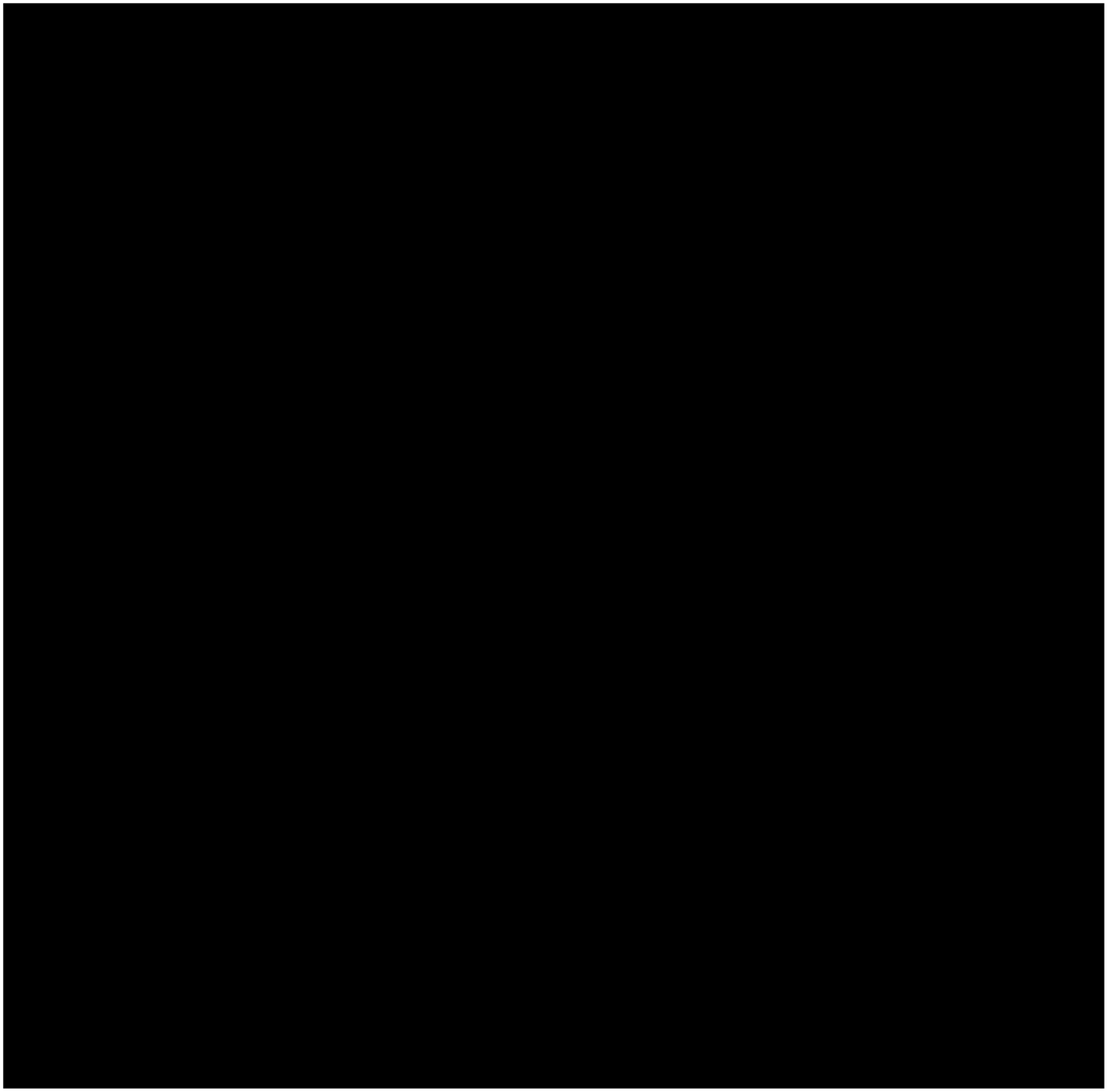
The reliability improvements on the [redacted] will mitigate the events that led to this circuit being on the TDRP list. The areas that were determined to be problematic have been addressed with electrical and structural improvements.

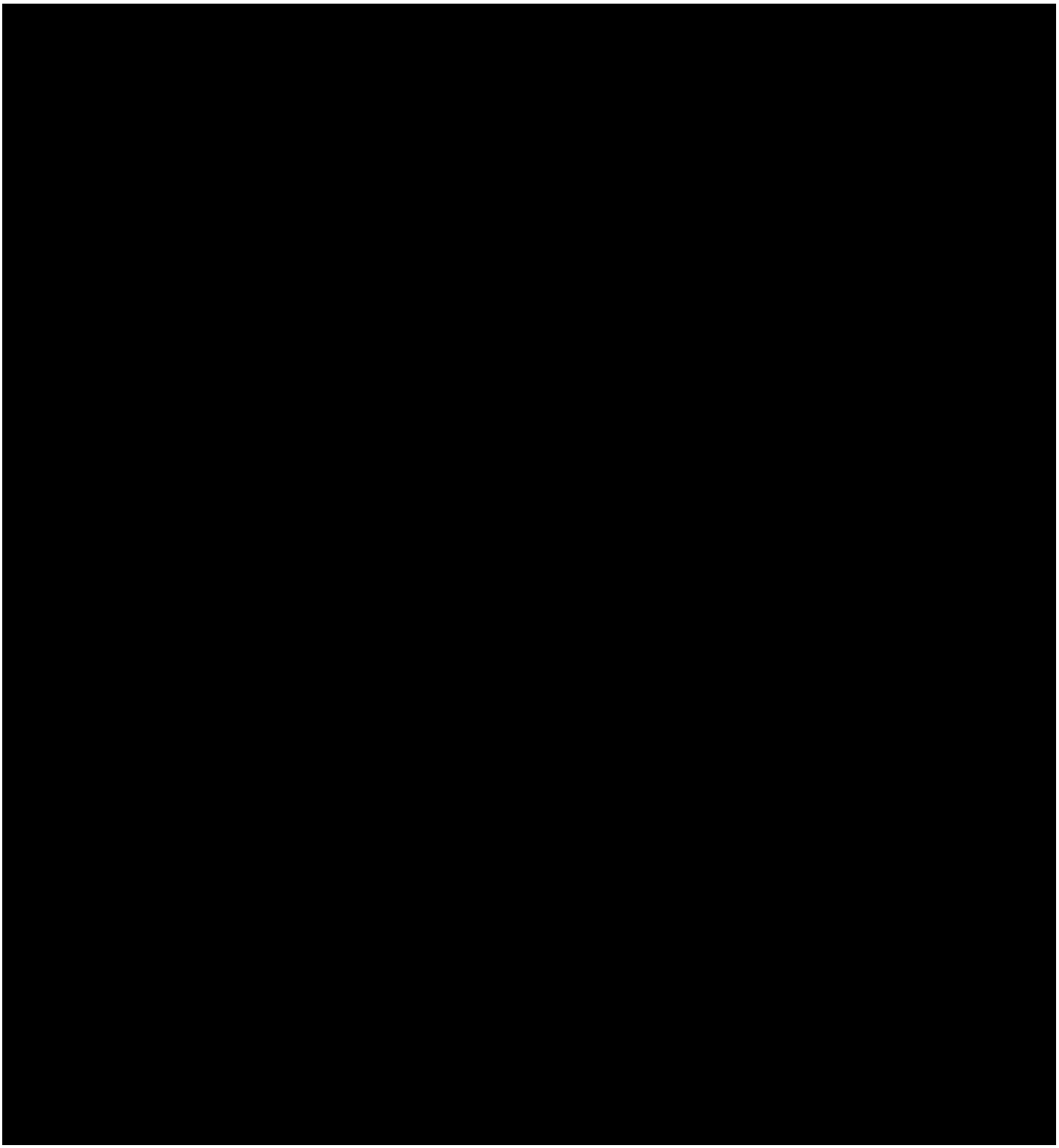
Alternatives Considered with Cost Estimates:

Alternatives include an additional 30% due to a revise increase unit cost and (30%) for outside contractor service.

The following options (proposals) were considered as alternatives but they were not selected.

Proposal #3: Cost $1.1M_ Columbia_TDRP 2020_Alt_[redacted]





Regulatory Approvals:

Are Regulatory body approvals needed for the project?

No

Project Schedule

Milestone/Phase Name	Estimated Completion Date
Preliminary Approval	04/2021
Detail Design Approval	05/2022
Start Construction	01/2023
End Construction	10/2023

References

DSEM 02.501 – System Resiliency
DSEM 02.411 – Circuit Performance Ranking
DSEM 10.553 – Fuse Selection Tables (Table 4)
DSEM 03.301 – Reliability Project Cost Effectiveness

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

Need Statement

CD01634_project_needs_statement.pdf

Analysis

[redacted]_TDRP_2020_Mod_rev1.4.xlsx

Detail Maps

[redacted] TDRP_Detail Map_rev0.7.pdf

One-Line Map

[redacted]_2020 TDRP_rev0.6.pdf

Load Sheet

[redacted]1%20TDRP%202020_Load%20Sheet_F

Full Circuit Map

[redacted] TDRP_Full Circuit Primary Map_r

Storm Isias Restoration Timeline Map

[redacted] TDRP 2020 Timeline.pdf

Approved Annual Work_Proposal #8_Replace HL Clamps

Proposal 8_Replace HL Clamps[redacted] Back

---------- ORIGINAL PAF ----------

Operations Project Authorization Form

Date Prepared: December 2, 2021	**Project Title:** [redacted] TDRP_2020
Company/ies: Eversource CT	**Project ID Number:** CD01634
Organization: Distribution Electric	**Class(es) of Plant:** Distribution
Project Initiator: [redacted]	**Project Category:** Line
Project Manager: [redacted]	**Project Type:** TDRP
Project Sponsor: [redacted]	**Project Purpose:** Improve Reliability
Estimated in service date: December 31, 2022	**If Transmission Project: PTF?** N/A
Eng. /Constr. Resources Budgeted? Yes	**Capital Investment Part of Original Operating Plan?**
Authorization Type: Preliminary	**O&M Expenses Part of the Original Operating Plan?**
Total Request: $422,000	

Financial Requirements

Project Authorization

ERM: _____

FP&A: _____

Executive Summary

[redacted] circuit was analyzed for reliability improvements because it ranked 61 on the Transmission-Distribution Reliability Performance (TDRP) list based on the 4-year outage history.

[redacted]

These changes address devices that contributed to 42% of the customer minutes (CM) and 28% of customer interruptions (CI).

Project Costs Summary

Note: Dollar values are in thousands

Capital Costs	Prior Authorized	Supplemental Request	Total
Direct Capital Costs			
Internal Labor	**$10**	**$6**	**$16**
Outside Services	**$115**	**$15**	**$130**
Materials	**$76**	**$15**	**$91**
Removals	$19	$3	$22
Risk and Contingency	$3	$0	$3
Other	$0	$0	$0
Subtotal	$223	$39	$262
Indirect Capital Costs			
Indirect/Overheads (including benefits)	**$130**	**$26**	**$156**
Capitalized interest or AFUDC, if any	**$3**	**$1**	**$4**
Subtotal	$133	$27	$160
Total Customer Contribution	$0	$0	$0
Total Capital Project Costs	**$356**	**$66**	**$422**

Note: Explain unique payment provisions, if applicable

Technical Justification

Project Need Statement

The project identifies locations and causes of outages that have a significant impact on our systems performance. [redacted] Typically, a fault on one circuit will interfere with the other and when maintenance is required both circuits must be switched out to ensure the crews safety.

The project will also address reconductoring small wire segments where there's an outcrop of trees and a history of outages and splices.

Project Objectives

Resolve high concentration of tree caused outages on the backbone by reconductoring poor performing sections. [redacted]

Project Scope

Selected Option

The project will perform the following work:

[redacted]

It consists of two (2) separate segments as follows:

Segment #1_$422K: [redacted] Connectors and Load

[redacted]

Project Scope (cont'd)
Segment #1 (Cont'd)



Major Material

- (3) In-Line Switches
- (12) Ampact Wedge Connectors
- (2,430 ft.) 556 Tree Wire 3 phase
- (6) 1254 kVA Auto Transformers
- Replace Recloser ([redacted]) for Smart Switch ([redacted]), which add $56K to project. Replacement was due to obsolete Recloser that cannot be program as smart switch.

Background / Justification

[redacted]

On a yearly basis, storms contribute between 70% - 99% of customer minutes and trees between 76% - 99%.

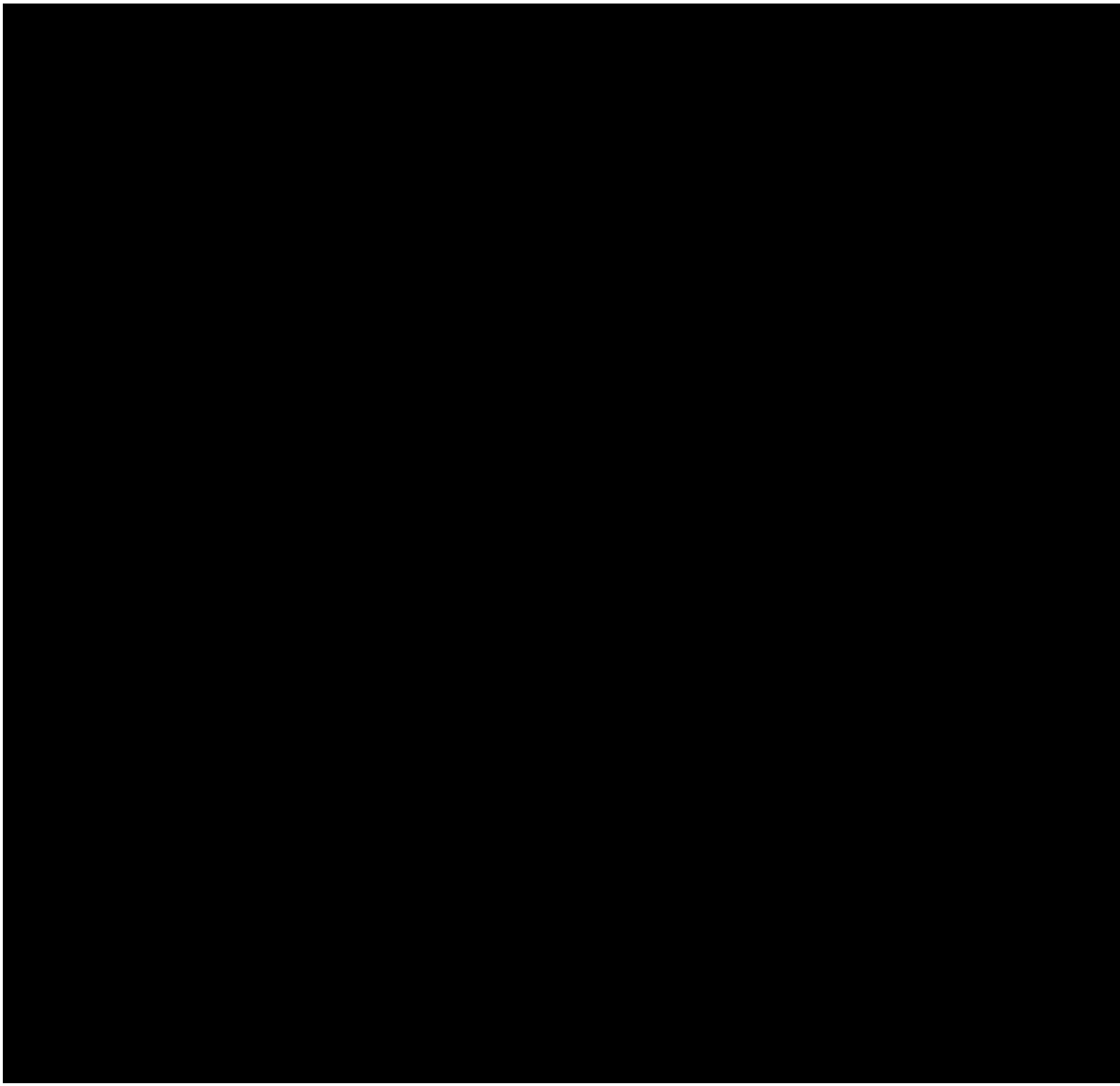
Table 1 below shows the various segments reviewed to address the reliability issues on the [redacted] circuit. This is a cost / benefit evaluation. Segments were selected that provide the lowest cost per customer minute. For this project the approved segments include #1 and #2. Note, #8 will be performed under an annual workorder to get the work on the schedule and performed quickly.

Table 2 shows [redacted]

Table 3 shows the devices chosen for this project based their contribution to the customer minutes.

Table 1: Cost Effectiveness Summary

[redacted]



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	2		128786	2.72%	1.72%	
	27		**3,765,122**	**79%**	**70%**	

Business Process and / or Technical Improvements:

The reliability improvements on the [redacted] will mitigate the events that led to this circuit being on the TDRP list. The areas that were determined to be problematic have been addressed with electrical and structural improvements.

Alternatives Considered with Cost Estimates

The following options were also reviewed. These were not selected.

Proposal #3: [redacted]_TDRP 2020_Alt_[redacted]

Description: Almost 40% of the spans, 41 spans total, have a splice presumably to repair the wire. A total of 15 spans contain splices totaling 22 splices all together. Propose to [redacted]

Distribution Project Cost: $710K
Outage Summary: (5) Tree, (1) Employee Error (1/1/2016 -1/1/2020)
Impacted Customer: [redacted]
Customer Zone: [redacted]
Impacted Critical Customer(s): [redacted]
Major Material: (5,526 ft) 556 TW

- [redacted] **P. 1135 ([redacted]) to P. 107 ([redacted]):** [redacted]

This option was not selected due to the high cost associated with reconductoring the entire line. The segment selected will reconductor the areas of concern.

Alternatives Considered with Cost Estimates **(Cont'd)**

The following proposals were not selected because these zones were not the driver for the TDRP ranking. Addressing the ROW zone as proposed by the selected segments will address the root cause. The high cost and fact these were not a driver for the circuit performance was the reason these proposals were not selected.

[redacted]

[redacted]

[redacted]

[redacted]

Project Schedule

Milestone/Phase Name	Estimated Completion Date
Preliminary Approval	4/2021
Detail Design Approval	2/2022
Start Construction	3/2022
End Construction	6/2022

Risks and Risk Mitigation Plans

Risk Event	Risk Horizon	Likelihood of Occurrence	Risk Mitigation
Actual cost higher than estimated due to scope changes.	2022	Low	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	2022	Low	Design to minimize customer impact. Project Preplanning and customer/community outreach.
Internal construction 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.
Internal engineering resources not available to perform the work.	2022	Low	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Materials Shortage or long lead times	2022	Low	Pre-order long lead time material; minimize the use of non-standard and non-stocked material.

Storm delays	2022	Low	If storm activity delays work, we may be forced to use external resources.
System abnormal configuration	2022	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	2022	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	2022	Low	Use of mats and specialty equipment, only work during certain times of the year.

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One-Line Map

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Load Sheet

[redacted]%20TDRP%202020_Load%20Sheet_F

Full Circuit Map

[redacted] TDRP_Full Circuit Primary Map_r

Storm Isias Restoration Timeline Map

[redacted].pdf

Approved Annual Work_Proposal #8_Replace HL Clamps



Proposal 8_Replace HL Clamps[redacted]Back