EVERSOURCE

Project Approval Form

Project Title: [redacted] **Replacement**	**Project Number: CD01333**
Date Prepared: 09/28/2023	**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: $2,432.0K	**Authorization Type:** Full Funding

1. Executive Summary

Project CD01333 was established to replace the remaining paper insulated lead covered (PILC) cable on the [redacted].

- Approved Initial Funding Authorization: $1,021.9K at the 7/25/2019 CT-PAC meeting.
- Requesting Full Funding authorization: $2,432.0K, a difference of $1,410.1K or 138% of the Initial Funding authorization.
- Project Location:
  - Division: Western
  - District: Waterbury AWC
  - Town: Waterbury

The variance is due to the following:

- $197.8K - Change in scope. An additional 480' of PILC cable was identified as requiring replacement that was not included in the original estimate. This was because the GIS system incorrectly indicated that the cable in question was 4/0 Cu 4CT cable instead of PILC cable. The additional cable was identified during pre-construction field visits.
- $310.6K - Increased 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.
- $901.7 – Contract Labor. The original estimate was based on construction being performed by Eversource labor, whereas the project is being constructed with contract labor. Also, additional costs were incurred due to delays in replacing the first section of the cable from the switchgear to the getaway manhole. The conduits into the existing getaway manhole from the switchgear enter the manhole very close to the floor of the manhole, making it impossible to replace the cable without damaging the new cable. A new manhole is in the process of being installed under

a separate project to facilitate replacement of the three cables affected. [redacted] which are being replaced under separate PILC cable replacement projects.

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	14.3	6.1	0.0	20.4
Outside Services	380.2	161.2	0.0	541.4
Materials	396.7	168.2	0.0	564.9
Removals	180.4	120.1	0.0	300.5
Risk and Contingency	0.0	196.0	0.0	196.0
Other	19.5	8.3	0.0	27.7
Subtotal – Direct Costs	**991.1**	**659.7**	**0.0**	**1,650.9**
Indirect Capital Costs				
Indirect/Overheads (including benefits)	403.6	356.5	0.0	760.1
Capitalized interest or AFUDC, if any	21.0	0.0	0.0	21.0
Subtotal – Indirect Costs	**424.6**	**356.5**	**0.0**	**781.1**
Total Gross Capital Costs	**1,415.8**	**1,016.2**	**0.0**	**2,432.0**
Customer Contribution	**0.0**	**0.0**	**0.0**	**0.0**
Total Net Capital Project Costs	**1,415.8**	**1,016.2**	**0.0**	**2,432.0**

Explain unique payment provisions, if applicable:

3. Technical Justification

Background, Project Need/Justification, and Project Scope

a. Background

The [redacted]

The following is a list of known [redacted] from 1/1/2007 to 6/21/2019, as documented in the OMS system.

[redacted]

b. Project Need

Project CD01333 has been established to replace the remaining paper insulated lead covered (PILC) [redacted]

Project CD01333 is part of the initiative to eliminate PILC underground cable due to demonstrated poor performance of this type of cable on our distribution system.

PILC copper cable was used extensively in the urban underground electrical systems that were built in the early/mid 1900s. This cable is now reaching the end of its useful life, and cable failures cause feeder lockouts which can impact customer reliability and satisfaction.

Beginning in 2018, Eversource - CT has established a program to proactively replace PILC cable. Targeted cable replacement is prioritized based on outage history / reliability.

c. Project Scope

This project proposes the following cable replacement:



4. Alternatives Considered



Project Option Comparison

Design Criteria	Option	
[redacted]		
Authorization Type	Partial (see note)	Full
Capital Cost	$2,091.5K	$2,432.0K
Expense Cost	$53.7K	$62.4K
Total Cost	$2,145.2K	$2,494.4K
Total Cost / MVA added	$4.29M/MVA	$4.99M/MVA
Total Cost / CM Saved	$88.35/CM	$98.26/CM
Total Cost / CI Saved	$13,241.97/CI	$15,397.53/CI
Preferred option		X

Note: Costs for option 1 were updated to reflect the added costs as stated in the Executive Summary.

5. Project Schedule

Milestone/Phase Name	Estimated Date
Partial Approval	7/25/2019
100% Detailed Engineering Completion	2/3/2023
Fully Funded	10/4/2023
Construction Start	1/1/2023
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.	2022-3	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	2022	Low	Design to minimize customer impact. Project Preplanning and customer/community outreach.
Internal construction resources not available to perform the work.	2022-3	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.	2021-3	Medium	Plan internal resources to perform the work. Use competitive bidding to ensure lowest outside labor cost.
Materials Shortage or long lead times	2022-3	Low	Pre-order long lead time material; minimize the use of non-standard and non-stocked material.
Storm delays	2022-3	Low	If storm activity delays work, we may be forced to use external resources.
System abnormal configuration	2022-3	Medium	Schedule work to minimize system abnormal time. Install temporary bypasses/equipment if system will be abnormal for extended periods.

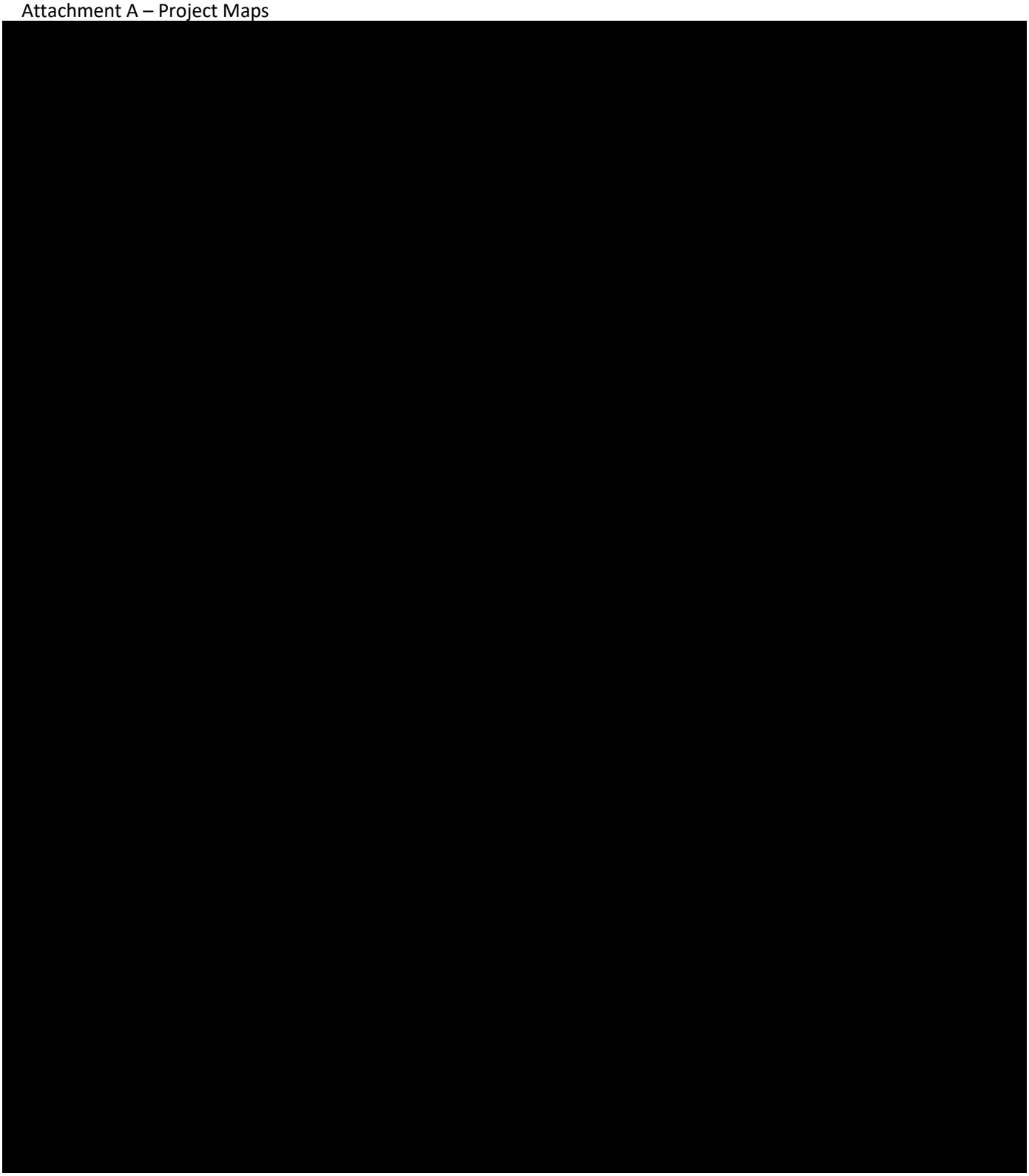
9. References

References
1. None

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 A – Project Maps





Map showing additional scope:



Attachment B – One-Line



Attachment C – Load Summary

Project Load Summary

Project Number: CD01333

Project Name: [redacted] PILC Cable Replacement

[redacted]

EVERSOURCE
Project Authorization Form

Operations Project Authorization Form

Date Prepared: June 21, 2019	Project Title: [redacted] PILC Cable Replacement
Company/ies: Eversource CT	Project ID Number: CD01333
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? Yes
Authorization Type: Initial Funding	O&M Expenses Part of the Original Operating Plan? Yes
Total Request: $1,021,932	

Financial Requirements:

Project Authorization

ERM: _____

FP&A: _____

Executive Summary

Project CD01333 is being established to replace the remaining paper insulated lead covered (PILC) cable on the [redacted]. There has been a [redacted] on 2/24/2019. This is part of an overall strategy to address poor performing PILC cable in the underground distribution system.

[redacted]

Project CD01333 is estimated at $1,022K based on Preliminary Engineering Design estimates. Initial Funding is requested at this time.

Project Costs Summary

Note: Dollar values are in thousands

	Prior Authorized	2019	2020	2021	Totals
Capital Additions - Direct	$0	$0	$0	$531	$531
Less Customer Contribution	$0	$0	$0	$0	$0
Removals net of Salvage ____%	$0	$0	$0	$60	$60
Total - Direct Spending	$0	$0	$0	$591	$591
Capital Additions - Indirect	$0	$0	$0	$403	$403
Subtotal Request	$0	$0	$0	$995	$995
AFUDC	$0	$0	$0	$8	$8
Total Capital Request	$0	$0	$0	$1,003	$1,003
O&M	$0	$0	$0	$19	$19
Total Request	**$0**	**$0**	**$0**	**$1,022**	**$1,022**

Financial Evaluation

Note: Dollar values are in thousands

Direct Capital Costs	2019	2020	2021	Total
Straight Time Labor	$0	$0	$91	$91
Overtime Labor	$0	$0	$49	$49
Outside Services	$0	$0	$202	$202
Materials	$0	$0	$241	$241
Other, including contingency amounts (describe)	$0	$0	$8	$8
Total	$0	$0	$591	$591

Indirect Capital Costs	2019	2020	2021	Total
Indirects/Overheads (including benefits)	$0	$0	$403	$403
Capitalized interest or AFUDC, if any	$0	$0	$8	$8
Total	$0	$0	$412	$412

Total Capital Costs	$0	$0	$1,003	$1,003
Less Total Customer Contribution	$0	$0	$0	$0
Total Capital Project Costs	**$0**	**$0**	**$1,003**	**$1,003**
Total O&M Project Costs	**$0**	**$0**	**$19**	**$19**

Technical Justification:

Project Need Statement

Project CD01333 has been established to replace the remaining paper insulated lead covered (PILC)

[redacted]

Project Objectives

Project CD01333 is part of the initiative to eliminate PILC underground cable due to demonstrated poor performance of this type of cable on our distribution system.

PILC copper cable was used extensively in the urban underground electrical systems that were built in the early/mid 1900s. This cable is now reaching the end of its useful life, and cable failures cause feeder lock-outs which can impact customer reliability and satisfaction.

Beginning in 2018, Eversource - CT has established a program to proactively replace PILC cable. Targeted cable replacement is prioritized based on outage history / reliability.

Project Scope

This project proposes the following cable replacement:

[redacted]

The above distances were determined using the best available data based on a review of existing underground maps, known cable replacements due to failures, as well as known cable replacements resulting from leaking splices identified during underground inspections. The actual amount of cable will be determined as part of the detail design engineering process.

Background / Justification

[redacted]

[redacted]

Business Process and / or Technical Improvements:

[redacted]

Alternatives Considered with Cost Estimates

[redacted]

Although the cost of this alternative is $876K, which is less than the preferred alternative, this

[redacted]

Project Schedule

Milestone/Phase Name	Estimated Completion Date
Initial Funding Approval	June 2019
Detail Design Engineering	June 2020
Full Funding Approval	July 2020
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

References

None

Connecticut Light & Power
A Northeast Utilities Company

Specific Project Proposal - Project #: CD01333

[redacted] PILC Cable Replacement

Work Classification

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

Ownership / Management

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

Project Information

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

Budget Summary - Preferred Option

Replace PILC Cable with 750 CU EPR

2021 ID	Title	Status	Rev #	Contingency	Expenditure Amount	Net Estimate
2	Replace PILC Cable with 750 CU EPR	Prelim	0	28%	$1,021,932	$1,021,932
				2021 Total:	$1,021,932	$1,021,932
				Total Project:	$1,021,932	$1,021,932

Project Option Summary

ID	Description	Segments	Preliminary Estimate	Construction Estimate	Variance	IEEE $/CMS	All (w/Storm)	Prfrd
O1	Replace PILC Cable with 500 CU EPR	1	$875,950	$0	100%	$36.21	$36.21	☐
O2	Replace PILC Cable with 750 CU EPR	2	$1,021,932	$0	100%	$40.28	$40.28	☑

Segments

ID	Title	Preliminary Estimate	Construction Estimate	Variance	IEEE $/CMS	All (w/Storm)
1	Replace PILC Cable with 500 CU EPR	$875,950			$36.21	$36.21
2	Replace PILC Cable with 750 CU EPR	$1,021,932			$40.27	$40.27

Design Alternative CD01333-01

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	28.00%
SubTotal:	$684,336
Contingency Amount:	$191,614
Estimate:	$875,950
Reimbursement:	$0
Net Amount:	**$875,950**
Description:	Original estimate for ENG approval

Item Description	CU	$ / Per	Qty	Amount
SWITCHING OH/DB/UG - SWITCHING Network	16-ALL15	[redacted]		$70,244.00
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18			$95,000.00
OTHER OTHER Additional cost associated with removal of PILC cable.	16-ALL14			$97,000.00
UG CABLE UG - Cable Removal - all cables [redacted]MH 55 to MH 62: Remove old PILC cable	16-UG117			$10,300.00
UG CABLE DB/UG - 4/0 - 3-1/C (3ph) Cu [redacted]H 55 to MH 62: Replace PILC cable with 250 CU EPR 3-1/C 15kV	16-UG113B			$24,720.00
UG CABLE UG - Cable Removal - all cables [redacted]o MH 15: Remove old PILC cable.	16-UG117	[redacted]		$7,400.00
UG CABLE DB/UG - 350/500 - 3-1/C (3ph) Cu [redacted]o MH 15: Replace PILC cable with 500 CU EPR 3-1/C 15kV	16-UG114			$25,752.00
UG CABLE UG - Cable Removal - all cables [redacted]MH 24 to MH 48: Remove old PILC cable.	16-UG117	[redacted]		$54,300.00
UG CABLE DB/UG - 350/500 - 3-1/C (3ph) Cu [redacted]MH 24 to MH 48: Replace PILC cable with 500 CU EPR 3-1/C 15kV	16-UG114			$188,964.00

Design Alternative CD01333-01

UG CABLE UG - Cable Removal - all cables [redacted] MH 26 to [redacted] MH 340: Remove old PILC cable	16-UG117	[redacted]	$10,700.00
UG CABLE DB/UG - 350/500 - 3-1/C (3ph) Cu [redacted] MH 26 to Sperry St MH 340: Replace PILC cable with 500 CU EPR 3-1/C 15kV	16-UG114		$37,236.00
UG CABLE UG - Cable Removal - all cables [redacted] MH 48 to [redacted] MH 411: Remove old PILC cable	16-UG117	[redacted]	$7,100.00
UG CABLE DB/UG - 350/500 - 3-1/C (3ph) Cu [redacted] MH 48 to [redacted] MH 411: Replace PILC cable with 500 CU EPR 3-1/C 15kV	16-UG114		$24,708.00
UG CABLE UG - Cable Removal - all cables [redacted] MH 49 to MH 53: Remove old PILC cable	16-UG117	[redacted]	$6,900.00
UG CABLE DB/UG - 350/500 - 3-1/C (3ph) Cu [redacted] MH 49 to MH 53: Replace PILC cable with 500 CU EPR 3-1/C 15kV	16-UG114		$24,012.00

Associated / Impacted Devices

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

Design Alternative CD01333-02

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	28.00%
SubTotal:	$798,384
Contingency Amount:	$223,548
Estimate:	$1,021,932
Reimbursement:	$0
Net Amount:	**$1,021,932**
Description:	Original estimate for ENG approval.

Item Description	CU	$ / Per	Qty	Amount
SWITCHING OH/DB/UG - SWITCHING Network	16-ALL15	[redacted]		$70,244.00
TRAFFIC OH/DB/UG - Traffic Control - Police Officer	16-ALL18			$95,000.00
OTHER OTHER Additional cost associated with removal of PILC cable.	16-ALL14			$97,000.00
UG CABLE DB/UG - 4/0 - 3-1/C (3ph) Cu Install 250 CU EPR 3-1/C 15kV cable or [redacted]	16-UG113B			$24,720.00
UG CABLE DB/UG - 750/1000 - 3-1/C (3ph) Cu Install 750 CU EPR 3-1/C 15kV cable	16-UG114B			$414,720.00
UG CABLE UG - Cable Removal - all cables Remove PILC cable	16-UG117			$96,700.00

Associated / Impacted Devices

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