EVERSOURCE

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Operations Project Authorization Form

Approved at October 13, 2021 EPAC

Link to Meeting Minutes

Non-redacted PAF link

Date Prepared: 09/27/2021	**Project Title:** [redacted]
Company: Eversource CT	**Project Number:** CS00466, CD01854
Organization: Asset Management	**Class(es) of Plant:** D SS, D Line
Project Initiator: [redacted]	**Project Category:** Stations - CIP/Security
Project Manager: [redacted]	**Project Type:** Specific
Project Sponsor: [redacted]	**Project Purpose: Security Enhancements**
Estimated in service date: April 2022	**Capital Investment part of original Oper. Plan:** Yes
Eng./Constr. Resources Budgeted? Yes	**O&M Expenses part of original Oper. Plan:** Yes
Authorization Type: Full Funding	**Facility Type** (check all that apply)**:** ☐ PTF ☒ non-PTF ☒ Distribution
Total Request: $2.899M D SS $2.657M; D L $242K	

Financial Requirements:

Project Authorization

ERM: _____

FP&A: _____

Executive Summary

This project is requesting full funding in the amount of $2.899M (D SS - $2.657M, D Line - $242K) to implement [redacted]

[redacted]

[redacted]

[redacted]

The total cost for this D Line work is estimated at $242K.

Initial funding of $150K was approved for this project in PowerPlan on 3/1/2021. As of 8/31/2021, $65K has been spent to complete the preliminary engineering design, to investigate preliminary environmental permitting needs and impacts, to conduct constructability reviews, and to prepare full funding request documentation including the cost estimate, P6 schedule, and full funding PAF.

Project Costs Summary - Totals

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2021 to Go	2022	2023	2024	2025	2026	Total
1. ROW / Easements / Land Acquisition									
2. Environmental Approvals / Permits									
3. Outreach			$0	$3					$3
4. Siting Approvals / Permits			$0	$9					$9
5. Engineering / Design		$8	$65	$2					$76
6. Materials (Eversource purchased)				$81					$81
7. Construction (incl matl's by contractors)		$35		$1,451					$1,486
8. Testing / Commissioning									
9. Project Mgmt Team			$28	$35					$64
10. Removals				$102					$102
11. Other									
12. Risks				$226					$226
SUBTOTAL DIRECTS W/ RISKS	**$150**	**$43**	**$94**	**$1,910**					**$2,047**
13. Indirects/Overhead		$22	$77	$634					$733
14. AFUDC		$1	$5	$30					$36
PROJECT TOTAL – BASELINE BUDGET	**$150**	**$65**	**$177**	**$2,575**					**$2,816**
15. Contingency			$3	$80					$83
TOTAL CAPITAL REQUEST	**$150**	**$65**	**$180**	**$2,655**					**$2,899**
16. Reimbursables/Customer Contribution									
PROJECT TOTAL (LESS REIMBURSABLES)	**$150**	**$65**	**$180**	**$2,655**					**$2,899**
O&M									
TOTAL REQUEST	**$150**	**$65**	**$180**	**$2,655**					**$2,899**

Note: Explain unique payment provisions, if applicable: *Provide a detailed breakdown of Other costs here.*

Risk Breakdown ($226K)

D SS	
Potential UG Obstructions (Security Conduits)	$ 20K
Severe Weather, Delays, OT	$ 10K
Design development	$ 15K
Blakeslee items A1 thru A5 (total):	$ 126K
• Foundation changes at IFC above 15CY	$ 24K
• Demo of existing foundations above 40CY	$ 29K
• Below grade rock excavation above 2CY	$ 3K
• Snow removal above 80Hrs	$ 36K
• Fabrication/Installation of Hand Crank above three (3) total	$ 35K
Rock above 2CY	$ 15K
Contaminated Soil	$ 10K
Overhead Clearances	$ 10K
D Line	
Exist Conduit not reuseable	$ 10K
Severe Weather, Delays, OT	$ 5K
Design development	$ 5K

Breakout Costs

Line item Category	Prior Authorized	Actuals to Date	2021 to Go	2022	2023	2024	2025	2026	Total
ST Labor		$2	$9	$35					$47
OT Labor									
Outside Services Labor		$40	$85	$737					$861
Materials*				$809					$809
Removals				$102					$102
Other			$4	$308					$312
Indirects		$22	$77	$634					$733
AFUDC		$1	$5	$30					$36
TOTAL CAPITAL REQUEST - W/O REIMBURSABLES	**$150**	**$65**	**$180**	**$2,655**					**$2,899**

*All materials including Eversource purchased and outside service purchased. Note that outside service purchased material included in construction in project cost summary above.

Project Costs Summary (D SS)

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2021 to Go	2022	2023	2024	2025	2026	Total
1. ROW / Easements / Land Acquisition									
2. Environmental Approvals / Permits									
3. Outreach			$0	$3					$3
4. Siting Approvals / Permits			$0	$8					$9
5. Engineering / Design		$8	$64	$1					$73
6. Materials (Eversource purchased)				$35					$35
7. Construction (incl matl's by contractors)		$35		$1,422					$1,456
8. Testing / Commissioning									
9. Project Mgmt Team			$25	$34					$59
10. Removals				$57					$57
11. Other									
12. Risks				$206					$206
SUBTOTAL DIRECTS W/ RISKS	**$150**	**$43**	**$90**	**$1,766**					**$1,899**
13. Indirects/Overhead		$22	$71	$557					$650
14. AFUDC		$1	$5	$27					$33
PROJECT TOTAL – BASELINE BUDGET	**$150**	**$65**	**$166**	**$2,351**					**$2,582**
15. Contingency			$3	$72					$76
TOTAL CAPITAL REQUEST	**$150**	**$65**	**$169**	**$2,423**					**$2,657**
16. Reimbursables/Customer Contribution									
PROJECT TOTAL (LESS REIMBURSABLES)	**$150**	**$65**	**$169**	**$2,423**					**$2,657**
O&M									
TOTAL REQUEST	**$150**	**$65**	**$169**	**$2,423**					**$2,657**

Note: Explain unique payment provisions, if applicable: *Provide a detailed breakdown of Other costs here.*

Risk Breakdown ($206K)

Potential UG Obstructions (Security Conduits)	$ 20K
Severe Weather, Delays, OT	$ 10K
Design development	$ 15K
Blakeslee items A1 thru A5 (total):	$ 126K
• Foundation changes at IFC above 15CY	$ 24K
• Demo of existing foundations above 40CY	$ 29K
• Below grade rock excavation above 2CY	$ 3K
• Snow removal above 80Hrs	$ 36K
• Fabrication/Installation of Hand Crank above three (3) total	$ 35K
Rock above 2CY	$ 15K
Contaminated Soil	$ 10K
Overhead Clearances	$ 10K

Breakout Costs

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2021 to Go	2022	2023	2024	2025	2026	Total
ST Labor		$2	$5	$4					$12
OT Labor									
Outside Services Labor		$40	$85	$736					$861
Materials*				$763					$763
Removals				$57					$57
Other			$3	$279					$282
Indirects		$22	$71	$557					$650
AFUDC		$1	$5	$27					$33
TOTAL CAPITAL REQUEST - W/O REIMBURSABLES	**$150**	**$65**	**$169**	**$2,423**					**$2,657**

*All materials including Eversource purchased and outside service purchased. Note that outside service purchased material included in construction in project cost summary above.

Project Costs Summary (D Line)

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2021 to Go	2022	2023	2024	2025	2026	Total
1. ROW / Easements / Land Acquisition									
2. Environmental Approvals / Permits									
3. Outreach				$0					$0
4. Siting Approvals / Permits				$1					$1
5. Engineering / Design			$1	$1					$2
6. Materials (Eversource purchased)				$46					$46
7. Construction (incl matl's by contractors)				$30					$30
8. Testing / Commissioning									
9. Project Mgmt Team			$3	$2					$5
10. Removals				$45					$45
11. Other									
12. Risks				$20					$20
SUBTOTAL DIRECTS W/ RISKS			**$4**	**$144**					**$149**
13. Indirects/Overhead			$6	$77					$83
14. AFUDC			$0	$3					$3
PROJECT TOTAL – BASELINE BUDGET			**$10**	**$224**					**$234**
15. Contingency			$0	$8					$8
TOTAL CAPITAL REQUEST			**$10**	**$232**					**$242**
16. Reimbursables/Customer Contribution									
PROJECT TOTAL (LESS REIMBURSABLES)			**$10**	**$232**					**$242**
O&M									
TOTAL REQUEST			**$10**	**$232**					**$242**

Note: Explain unique payment provisions, if applicable: *Provide a detailed breakdown of Other costs here.*

Risk Breakdown ($20K)

Exist Conduit not reuseable	$ 10K
Severe Weather, Delays, OT	$ 5K
Design development	$ 5K

Breakout Costs

Note: Dollar values are in thousands

Line item Category	Prior Authorized	Actuals to Date	2021 to Go	2022	2023	2024	2025	2026	Total
ST Labor			$4	$31					$35
OT Labor									
Outside Services Labor				$1					$1
Materials*				$46					$46
Removals				$45					$45
Other			$0	$29					$30
Indirects			$6	$77					$83
AFUDC			$0	$3					$3
TOTAL CAPITAL REQUEST - W/O REIMBURSABLES			**$10**	**$232**					**$242**

*All materials including Eversource purchased and outside service purchased. Note that outside service purchased material included in construction in project cost summary above.

Future Financial Impacts:

Provide below the estimated future costs that will result from the project:
Note: Dollar values are in thousands

Future Costs	Year 2022	Year 2023	Year 2024	Year 20__+*	Total Future Project Costs
Capital	$ -	$ -	$ -	$ -	$ -
O&M	0.98	2.29	2.29	2.29	7.83
Other	-	-	-	-	-
TOTAL	**$ 1**	**$ 2**	**$ 2**	**$ 2**	**$ 8**

*Maintenance described below will be performed annually with no defined end-date

Describe the estimated future Capital, O&M, and/or Other costs noted above: The projected O&M costs are to support regular preventative annual maintenance on the slide gates once a year. The proposed pricing was based on the gate installer/manufacturer vendor proposal that indicated each slide gate inspection is $325.00. An additional $1,310.00 was included per year starting in 2023 for any repairs that are deemed required post inspection, as any repairs needed in 2022 would be covered under the one-year warranty.

What functional area(s) will these future costs be funded in? CT Substation Operations – Wayne Gagnon
A representative from the respective functional area is required to be included as a project approver.

Provide below the estimated future financial benefits that will result from the project:
Note: Dollar values are in thousands

Future Benefits	Year 20__	Year 20__	Year 20__	Year 20__+	Total Future Project Benefits
Capital	$ -	$ -	$ -	$ -	$ -
O&M	-	-	-	-	-
Other	-	-	-	-	-
TOTAL	**$ -**	**$ -**	**$ -**	**$ -**	**$ -**

Describe the estimated future Capital, O&M, and/or Other benefits noted above:

What functional area(s) will these benefits be reflected in? N/A
A representative from the respective functional area is required to be included as a project approver.

Asset Retirement Obligation (ARO) and/ or Environmental Cleanup Costs (Environmental Liabilities):

Is there an ARO associated with this project? If yes, please provide details: No

Are there other environmental cleanup costs associated with this project? If yes, please provide details: Yes, there is potential for unanticipated contaminated soils and risk allocation has been included in the project estimate to account for this cost.

Technical Justification:

Project Need Statement

[redacted]

Project Objectives

[redacted]

Project Scope

The scope for this project consists of the following:

[redacted]

A constructability review for this project was completed on 8/25/21 and 9/14/21. The signed Constructability Review Form is provided as Attachment C.

Background / Justification

[redacted]

Business Process and / or Technical Improvements

[redacted]

Alternatives Considered with Cost Estimates

[redacted]

[redacted]

Do nothing:

[redacted]

Project Schedule

Milestone/Phase Name	Estimated Date
EPAC Full Funding Approval	10/13/2021
Detailed Engineering Completion	11/1/2021
Materials Ordered	11/4/2021
Construction Start	11/1/2021
Construction Complete and Project ISD	4/6/2022
Project Close-out	5/13/2022

See Attachment B for the full P6 schedule.

Regulatory Approvals

There are no environmental or regulatory permits and approvals required for the proposed work on this project.

Risks and Risk Mitigation Plans

Risk allocation has also been included to account for increased costs that may be realized due to potential underground obstructions including rock and contaminated soils, severe weather, delays and OT, design development delays, snow removal, and delays or increased costs associated with insufficient overhead clearances within the substation yard.

Contingency

Contingency in the amount of $83K ($76K – D SS, $8K – D Line) is included with this project request to account for any unknowns.

References

- [redacted]

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

- Attachment A - Cost Estimate Backup Files
- Attachment B - P6 Schedule
- Attachment C - Constructability Review Form
- Attachment D – [redacted] pictures

INSTRUCTIONS:
It is the responsibility of the initiator to contact the subject matter experts in the listed area disciplines to determine if the project considerations contained in this list are applicable to their project. They should fill out the checklist and determine a transition plan for the purpose of project execution. See the PAF Guide for additional instruction.

Project Checklist - Transmission & Substation Capital Project				
Project Name: [redacted]			**Project Number: CS00466, CD01854**	
Facility Type: ☒ BPS ☒ BES ☐ PTF ☒ non-PTF ☒ CIP ☒ Distribution				
PLANNING				
Is a NX-9 required?			No	
Is an ISO-NE PAC presentation required?			No	
ISO-NE Presentation Date (if completed):			Enter Date	
Cost in ISO-NE Presentation ($M) (if completed):			Enter Cost ($M)	
Is a PPA required?			No	
Is a TCA Application Required?			No	
TCA Submittal Date (if submitted):			Enter Date	
Cost in TCA Submittal ($M) (if submitted):			Enter Cost ($M)	
Enter ISO-NE RSP / Asset Condition ID, if assigned:			Enter ISO-NE ID	
PLANNING/PROTECTION & CONTROLS				
Are RAS/SPS/UVLs affected?			No	
OPERATIONS				
Outage Required?	☐ Primary Equipment (Power Transfer)	☐ Secondary Equipment (P&C only)	☒ Outage Not Required	
Do SCLL Conditions Exist?			No	
Has an outage schedule been approved?			NR	
Are Operations & Maintenance procedures/training required?			No	
STANDARDS				
Does the project include standard equipment and designs?			Yes	
SUBSTATION ENGINEERING				
Does this impact Revenue Metering			No	
Is preliminary short circuit/ breaker duty analysis required?			No	
Are there any changes to the baseline audible noise?			No	
Is there an impact to the existing ground grid?			Yes	
Is a Transient Over Voltage (TOV) analysis required?			No	

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Project Checklist - Transmission & Substation Capital Project	
Project Name: [redacted]	**Project Number: CS00466, CD01854**
P&C ENGINEERING	
OP-22 - Are PMUs and DDR required?	No
If BPS, is an NPCC Directory #4 presentation required?	No
Are ISO-NE OP-24 Appendix B updates necessary?	No
TRANSMISSION LINE ENGINEERING	
Are there any changes that affect the baseline EMF?	No
Are there any changes that affect the baseline EMI?	No
SITING	
Is a Siting filing required? *(If yes, list in regulatory approvals section)*	No
PERMITTING	
Is there any permitting required? *(If yes, list in regulatory approvals section)*	No
SITING & CONSTRUCTION SERVICES (OUTREACH)	
What is the level of outreach expected?	Low
INITIATOR	
Has a field constructability review been completed?	Yes
INVESTMENT RECOVERY	
Does the project require development of an Investment Recovery plan?	Yes
COST ESTIMATING	
What team/firm prepared the cost estimate?	Estimate was prepared by the Eversource Estimating Team
Name of the person who prepared the estimate:	[redacted]
Was the estimate reviewed by Eversource Estimating?	Yes - Full Review

Cost Estimate Backup Details

Please see Attachment A

ESTIMATE SUMMARY

Project Title: [redacted]
Project Mgr/Lead: [redacted]

Template Revision 2.0

SUMMARY OF ESTIMATES

Estimate Type: Planning

WI	Description	TOTAL	% of Directs	% of Total	Planning C-21-681L	Planning C-21-681S
1	ROW / Easements / Land purchases					
2	Environmental Approvals / Permits					
3	Outreach	$3,300	0.2%	0.1%	$200	$3,100
4	Siting Approvals / Permits	$9,200	0.4%	0.3%	$600	$8,600
5	Engineering / Design	$75,600	3.7%	2.6%	$2,200	$73,400
6	Materials (Eversource purchased)	$81,200	4.0%	2.8%	$46,300	$34,900
7	Construction (incl matl's by contractors)	$1,486,000	72.6%	51.3%	$29,800	$1,456,200
8	Testing / Commissioning					
9	PMT Project Mgmt Team	$63,700	3.1%	2.2%	$4,500	$59,200
10	Removals	$101,500	5.0%	3.5%	$44,900	$56,600
11	Other					
12	Risks	$226,400	11.1%	7.8%	$20,000	$206,400
	Project Directs Total w/Risks	**$2,046,900**	100.0%	70.6%	$148,500	$1,898,400
13	Indirects/Overhead	$733,000		25.3%	$82,900	$650,100
14	AFUDC	$35,900		1.2%	$2,700	$33,200
	Project Total - Baseline Budget	**$2,815,800**		97.1%	$234,100	$2,581,700
15	Contingency	$83,200		2.9%	$7,700	$75,500
	Project Total - Funding Approval Level	**$2,899,000**		100.0%	$241,800	$2,657,200
16	Reimbursables/Customer Contribution					
	Project Total (less reimbursables)	**$2,899,000**			$241,800	$2,657,200
	Cost per key qty (if appl)				$241,800	$885,733
	Amount of Escalation included above	$56,000			$5,200	$50,800
6	Total materials - Eversource	$81,200			$46,300	$34,900
	Total materials - Contractor	$727,600				$727,600
	Total materials	$808,800			$46,300	$762,500
	NOTE: Risk / Contingency is 12% of Project Total Costs (incl escal/indirects/AFUDC but excl reimb.)					

Estimate Range	-25%	25%
	$2,174,000	**$3,624,000**

Project Scope:

[redacted]

[redacted]

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Activity ID	Activity Name	Remaining Duration	Start	Finish	Predecessors	Successors	Total Float	Activity Flag	DEPT - DEPARTMEI	Project Lead	Activity Scheduler
80046425	[redacted]	202	02-Aug-21 A	01-Jul-22			0			[redacted]	
[redacted]	[redacted]	0	01-Jul-22	01-Jul-22			0				
[redacted]	**- Asset Protection & Physical Security (Swing Gates Replace**	0	01-Jul-22	01-Jul-22			0				
[redacted]	**- Asset Protection & Physical Security (Swing Gates Replaceme**	0	01-Jul-22	01-Jul-22			0				
STH-PF-001	Project Finish	0		01-Jul-22	STH-4030, STH-4070, CSD120, STH-9180, FINISH		0				
INITIALIZATION AND SCOPE DEVELOPMENT		102	08-Oct-21	10-Mar-22			-49				
T-Milestones (Civil)		81	01-Nov-21	20-Jan-22			-81				
T-Milestones (Civil)		81	01-Nov-21	20-Jan-22			-81				
AT00	A-T-00 - Start Construction (Civil)	0	01-Nov-21*		AT1811, AT2605, AT0805C	STH-4000, STH-0170, STH-4130	0		CONS		
AT2605	Preliminary Design / Engineering Completed (Civil)	0		01-Nov-21	STH-9060	AT00	-1	ENG-PREL	SS.ELEC		
AT1811	Detail Design / Engineering Completed (Civil)	0		16-Nov-21	STH-9080	AT00	-16	ENG-DTL	SS.ELEC		
AT0805C	CIVIL IFC w/BOM ((Civil)	0		20-Jan-22	STH-9380	AT00	-81	BG-IFC	SS.CIVL		
T-Milestones (Electrical & Gates Installs)		153	08-Oct-21	10-Mar-22			-72				
T-Milestones (Electrical & Gates Installs)		153	08-Oct-21	10-Mar-22			-72				
BT2605	Preliminary Design / Engineering Completed (Electrical)	0		08-Oct-21	STH-9020	BT00	81	ENG-PRELIM	SS.ELEC		
BT1801	T-18 All Firm TOA Applications Due to LCC (Civil & Electrical)	0		08-Nov-21*	STH-1520	BT00	-76	TOA	PROJ		
BT1811	Detail Design / Engineering Completed (Electrical)	0		16-Nov-21	STH-9040	BT00	42	ENG-DTL	SS.ELEC		
BT0203	Go / No-Go [CAN] Construction Authorization Notice Form Complete	0		22-Nov-21	STH-9270	BT00	36		PROJ		
BT00	B-T-00 - Start Construction (Electrical & Gates Installs)	0	29-Dec-21*		BT0602, BT1801, BT0203, BT0814, BT2605, BT1811, BT0805E, BT0401	STH-ISD110, STH-4040, CFM, STH-0170, STH-9340, STH-9350, STH-9370	0	SOC	CONS		
BT0805E	IFC - w/BOM ((Electrical)	0		10-Jan-22	STH-9390	BT00	-13	AG-IFC	SS.ELEC		
BT0602	Units Of Property (Items) Issued To Plant Accounting (Electrical)	0		25-Jan-22	STH-1850	BT00	-28		PROJ		
BT0401	Final Material Receipt Review Completed *ES Purchased* (Electrical)	0		10-Mar-22	A4080	BT00	-72	M-DELIV	PROJ		
EPAC Initial Funding		42	12-Oct-21	10-Dec-21			-49				
EPAC Full Funding		42	12-Oct-21	10-Dec-21			-49				
PE1600	Review Preliminary Siting & Permitting (If Required)	1	12-Oct-21	12-Oct-21	STH-9280, STH-9050, A00290	DE1700	-49				
DE1700	Conduct Initial Risk Management & SCLL Review (Project Initiator & PM)	1	13-Oct-21	13-Oct-21	STH-9050, STH-9280, PE1600	DE1600	-49		PROJ		
DE1600	Create Planning Grade Estimate (+/-25% Full Funding)	10	14-Oct-21	27-Oct-21	DE1700	PAFF2000	-49	EST-FULL	ENG.BQA.		
PAFF2000	Submit Full Funding PAF for Internal Review	5	28-Oct-21	03-Nov-21	DE1600	PAFF2100	-49	PAF Submit	ENG.AM.EN		

[redacted] 15-Sep-21 14:21

Activity ID	Activity Name	Remaining Duration	Start	Finish	Predecessors	Successors	Total Float	Activity Flag	DEPT - DEPARTMEI	Project Lead	Activity Scheduler
PAFF2100	Incorporate Internal Review Comments & Submit Full Funding PAF to EPAC for Review	5	04-Nov-21	10-Nov-21	PAFF2000	PAFF2200	-49			[redacted]	
FF1000	EPAC Full Funding Approval	0		18-Nov-21	PAFF2200	FF1010	-49	EPAC-F	ENG.AM.EN		
PAFF2200	Incorporate EPAC Full Funding PAF Review Comments	5	12-Nov-21	18-Nov-21	PAFF2100	FF1000	-49				
FF1010	Full Funding Routed in Power Plan & Approvals Received	15	19-Nov-21	10-Dec-21	FF1000	A4080	-49	PPA-FF	ENG.AM.EN		
T-06 Units Of Property (Items) Issued To Plant Accounting		15	04-Jan-22	25-Jan-22			-18				
T-06 Units Of Property (Items) Issued To Plant Accounting		15	04-Jan-22	25-Jan-22			-18				
T-06 Units Of Property (Items) Issued To Plant Accounting		15	04-Jan-22	25-Jan-22			-18				
STH-1800	UoP Preliminary 1 - Develop Prelim UOP List(s) by PM/Engr/Con Rep/Cost Analyst	5	04-Jan-22	10-Jan-22	STH-2820, CSD100, MIL-4100, STH-4080	STH-1810	-18		PM		
STH-1810	UoP Preliminary 2 - Review Units of Property by PM	5	11-Jan-22	18-Jan-22	STH-1800	STH-1850	-18		PM		
STH-1850	UoP Preliminary 3 - Complete UOP forms M6-PP-3005.1&2 ; Enter in T-Projects Workbook, Fwd to Plant Acctng	5	19-Jan-22	25-Jan-22	STH-1810	BT0602, TMP2130	-18		PM		
ENGINEERING & DESIGN		88	02-Aug-21 A	20-Jan-22			-15				
Gate - Civil Engineering		88	23-Aug-21 A	20-Jan-22			-54				
Gate - Preliminary Engineering Civil Design		35	23-Aug-21 A	01-Nov-21			-52				
STH-9050	Vendor Submit Preliminary Engineering Design (Civil)	20	23-Aug-21 A	08-Oct-21	STH-9220, STH-9290, STH-0110	STH-9060, DE1700, PE1600	-52	V-PRELIM	SS.CIVL		
STH-9060	ES Review Preliminary Engineering Design (Civil)	15	12-Oct-21	01-Nov-21	STH-9050, PI1400	STH-1520, AT2605	-52	ES-PRELIM	SS.CIVL		
Gate - Detail Engineering Civil Design		25	12-Oct-21	16-Nov-21			-54				
STH-9070	Vendor Submit Detail Engineering Design (Civil)	15	12-Oct-21	01-Nov-21	STH-9020, STH-9110	STH-9080	-54	V-DTL	SS.CIVL		
STH-9080	ES Review Detail Engineering Design (Civil)	10	02-Nov-21	16-Nov-21	STH-9070	CSD100, STH-2890, AT181	-54	ES-DTL	SS.CIVL		
Gate - 100% / IFC Civil Engineering Design		43	17-Nov-21	20-Jan-22			-54				
STH-2890	Vendor Submit 100% Design Package (Civil)	10	17-Nov-21	01-Dec-21	STH-9080	STH-2910, STH-2920	-54	V-100%	SS.CIVL		
STH-2920	ES Review 100% Design Package (Civil)	9	02-Dec-21	14-Dec-21	STH-2890	STH-2910	-54	ES-100%	SS.CIVL		
STH-2910	Vendor Issue IFC Package For Record (Civil)	12	15-Dec-21	03-Jan-22*	STH-2890, STH-2920	STH-9380	-54	V-IFC	SS.CIVL		
STH-9380	ES Reviews & Issues IFC Package(Civil)	12	04-Jan-22	20-Jan-22	STH-2910	AT0805C	-54	V-IFC	SS.CIVL		
Gate - Electrical Engineering		81	02-Aug-21 A	10-Jan-22			-8				
Gate - Preliminary Engineering Electrical Design		20	02-Aug-21 A	08-Oct-21			-38				
STH-9150	Burns & ES Review [redacted] IFR (Electrical)	5	09-Aug-21 A	17-Sep-21	STH-9140	STH-9030, STH-9160	-23		SS.ELEC		
STH-9280	Vendor Submit Preliminary Engineering Design (Electrical)	5	02-Aug-21 A	17-Sep-21	STH-9220, STH-9010	STH-9020, DE1700, PE1600, A00290	-54	V-PRELIM	SS.ELEC		
STH-9020	ES Review Preliminary Engineering Design (Electrical)	15	20-Sep-21	08-Oct-21	PI1400, STH-9280	STH-9030, BT2605, STH-1520, STH-9070	-54	ES-PRELIM	SS.ELEC		
Gate - Detail Engineering Electrical Design		40	20-Sep-21	16-Nov-21			-32				
STH-9160	[redacted] IFF (Electrical)	10	20-Sep-21	01-Oct-21	STH-9150	STH-9170	-12		SS.ELEC		
STH-9170	[redacted] IFF (Electrical)	10	04-Oct-21	18-Oct-21	STH-9160	A4080	-12		SS.ELEC		

[redacted] - Asset Protection Physical Security (Swing Gates Replacement) 15-Sep-21 14:21

Activity ID	Activity Name	Remaining Duration	Start	Finish	Predecessors	Successors	Total Float	Activity Flag	DEPT - DEPARTMEI	Project Lead	Activity Scheduler
STH-9030	Vendor Submit Detail Engineering Design (Electrical)	15	12-Oct-21	01-Nov-21	STH-9020, STH-9150	STH-9040	-38	V-DTL	SS.ELEC	[redacted]	
STH-9040	ES Review Detail Engineering Design (Electrical)	10	02-Nov-21	16-Nov-21	STH-9030	STH-2800, BT1811, CSD1(	-38	ES-DTL	SS.ELEC		
Gate - 100% / IFC Electrical		36	17-Nov-21	10-Jan-22			-8				
STH-2800	Vendor Submit 100% Engineering Design (Electrical)	10	17-Nov-21	01-Dec-21	STH-9040	STH-2810	-38	V-100%	SS.ELEC		
STH-2810	ES Review 100% Engineering Design (Electrical)	9	02-Dec-21	14-Dec-21	STH-2800	STH-2820	-38	ES-100%	SS.ELEC		
STH-2820	Vendor Issue IFC Package For Record (Electrical)	12	15-Dec-21	03-Jan-22*	STH-2810	STH-1800, CSD100, STH-9390	-38	V-IFC	SS.ELEC		
CSD100	PE Initiate CASCADE Forms (Appendix A) for Construction Package	5	27-Dec-21	03-Jan-22	STH-9040, STH-2820, STH-9080	CSD110, STH-1800	-18	CASCADE	SS.ELEC		
STH-9390	ES Reviews & Issues IFC Package (Electrical)	5	04-Jan-22	10-Jan-22	STH-2820	BT0805E	-8	V-IFC	SS.ELEC		
MATERIAL		60	13-Dec-21	10-Mar-22			-49				
Electrical Material		60	13-Dec-21	10-Mar-22			-49				
Vehicle Gates		60	13-Dec-21	10-Mar-22			-49				
A4080	Manufacture/ Fabricate/ Deliver - Vehicle Gates(3)	60	13-Dec-21	10-Mar-22	STH-9170, FF1010, STH-9130	STH-4000, STH-4040, CFM, STH-0170, BT0401, STH-9340, STH-9350, STH-9370	-49		PURC		
CONSTRUCTION		107	01-Nov-21	06-Apr-22			61				
Construction Authorization		95	02-Nov-21	22-Mar-22			72				
Construction Authorization		95	02-Nov-21	22-Mar-22			72				
STH-1520	OUTAGE REQUEST - Submit Outage request - Electrical (if needed)	5	02-Nov-21	08-Nov-21	STH-9020, STH-9060, A00290	STH-1530, BT1801	-52		CONS		
STH-9260	C A N "A" - Prepare CAN	5	15-Nov-21*	19-Nov-21	STH-0110	STH-9270	24		PM		
STH-9270	C A N "A" [go / no go] Submitted & Approved	1	22-Nov-21	22-Nov-21	STH-9260	BT0203	24		PM		
STH-1530	OUTAGE REQUEST - Review/ Approve - Electrical (standard 18 weeks)	90	09-Nov-21	22-Mar-22	STH-1520		72		CONS		
Vehicle Gate Construction		157	01-Nov-21	06-Apr-22			-6				
Vehicle Gate Construction		157	01-Nov-21	06-Apr-22			-6				
STH-4130	Civil Construction	30	01-Nov-21	30-Nov-21	STH-0110, AT00	STH-9370, STH-0190	94		CONS		
STH-9370	[redacted]	12	11-Mar-22	22-Mar-22	BT00, STH-0110, A4080, STH-4130	STH-9340	-6		CONS		
STH-9340	[redacted]	12	23-Mar-22	03-Apr-22	BT00, STH-0110, A4080, STH-9370	STH-9350	-6		CONS		
STH-9350	[redacted]	3	04-Apr-22	06-Apr-22	BT00, STH-0110, A4080, STH-9340	STH-4000, STH-4040, CFM, STH-0190	-6		CONS		
Construction Rep Support		127	01-Dec-21	06-Apr-22			0				
Construction Rep Support		127	01-Dec-21	06-Apr-22			0				
STH-0190	[redacted] (Electrical)	127	01-Dec-21	06-Apr-22	STH-ISD110, STH-9350, STH-4130	CFM	0	CRH	CONS		
TEST & COMMISSIONING		61	06-Apr-22	01-Jul-22			0				
In Service (ISD)		0	06-Apr-22	06-Apr-22			0				

[redacted] - Asset Protection Physical Security (Swing Gates Replacement) 15-Sep-21 14:21

Activity ID	Activity Name	Remaining Duration	Start	Finish	Predecessors	Successors	Total Float	Activity Flag	DEPT - DEPARTMEI	Project Lead	Activity Scheduler
In Service (ISD)		0	06-Apr-22	06-Apr-22			0			[redacted]	
STH-ISD110	Project in Service Date (ISD) Vehicle Gates	0		06-Apr-22	BT00, CFM	STH-0170, STH-0190, CSD110	0		CONS		
CFM	Construction Finish Milestone - Constr Compl (~= ISD)	0		06-Apr-22*	STH-0190, BT00, A4080, STH-9350	TMP2130, CSD110, STH-ISD110, FINISH10, FINISH10	-6	ISD	CONS		
CSC Notification		61	07-Apr-22	01-Jul-22			0				
CSC Notification		61	07-Apr-22	01-Jul-22			0				
STH-0170	Prepaare CSC Extension Notice	60	07-Apr-22	30-Jun-22	STH-ISD110, BT00, AT00, A4080	STH-9180	0		SITE		
STH-9180	Notify CSC of Construction Completion	1	01-Jul-22	01-Jul-22	STH-0170	STH-PF-001	0		SITE		
PROJECT MANAGEMENT CLOSEOUT		40	07-Apr-22	02-Jun-22			21				
PROJECT MANAGEMENT CLOSEOUT		40	07-Apr-22	02-Jun-22			21				
PROJECT MANAGEMENT CLOSEOUT		40	07-Apr-22	02-Jun-22			21				
FINISH10	Field Verifies Gate Drawings Mark-ups	5	07-Apr-22	13-Apr-22	CFM, CFM	STH-4000, STH-4040	35				
CSD110	Construction Rep Finalize CASCADE Forms (within 14 days following ISD) (ONLY ADD THIS ACTIVITY IF YOU DON'T HAVE IT)	10	07-Apr-22	20-Apr-22	CSD100, STH-ISD110, CFM	CSD120	21		CONS		
TMP2130	UoP Final - Prepare by Cost Analyst, Forward to Engineering and Plant Accounting	20	07-Apr-22	04-May-22	STH-1850, CFM	FINISH	41		PM		
CSD120	Asset Management Complete Asset Update(s) in CASCADE	30	21-Apr-22	02-Jun-22	CSD110	STH-PF-001, FINISH	21		ENG.AM.CO		
FINISH	Project Complete Milestone	0		02-Jun-22	TMP2130, CSD120, STH-4030, STH-4070	STH-PF-001	21				
Civil As-Builts		21	14-Apr-22	12-May-22			35				
Civil As-Builts		21	14-Apr-22	12-May-22			35				
STH-4000	Vendor Eng Verifies Gate Civil Mark Ups & Updates As-Built Drawing Pkg Submits Final Pkg to ES_	10	14-Apr-22	27-Apr-22	FINISH10, AT00, A4080, STH-9350	STH-4010	35	V-ASB	SS.CIVL		
STH-4010	ES Verifies Quality of Submitted Gate Civil Drawings.	5	28-Apr-22	04-May-22	STH-4000	STH-4020	35	ES-ASB	SS.CIVL		
STH-4020	ES Create Gate Civil Transmittal, Approve Final As-Built Package, EDC Files and Issues Drawings to Field.	5	05-May-22	11-May-22	STH-4010	STH-4030	35	ES-ASB	SS.CIVL		
STH-4030	PM to Document Gate Civil As-Built Drawings Complete	1	12-May-22	12-May-22	STH-4020	STH-PF-001, FINISH	35	PM	PM		
Electrical As-Builts		21	14-Apr-22	12-May-22			35				
Electrical As-Builts		21	14-Apr-22	12-May-22			35				
STH-4040	Vendor Eng Verifies Gate Electrical Mark Ups & Updates As-Built Drawing Pkg Submits Final Pkg to ES_	10	14-Apr-22	27-Apr-22	BT00, FINISH10, A4080, STH-9350	STH-4050	35	V-ASB	SS.ELEC		
STH-4050	ES Verifies Quality of Submitted Gate Electrical Drawings.	5	28-Apr-22	04-May-22	STH-4040	STH-4060	35	ES-ASB	SS.ELEC		
STH-4060	ES Create Gate Electrical Transmittal, Approve Final As-Built Package, EDC Files and Issues Drawings to Field.	5	05-May-22	11-May-22	STH-4050	STH-4070	35	ES-ASB	SS.ELEC		
STH-4070	PM to Document Gate Electrical As-Built Drawings Complete	1	12-May-22	12-May-22	STH-4060	STH-PF-001, FINISH	35	PM	PM		

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Constructability Review Form: **Substation**

Project Title: [redacted]	☒	Prior Constructability Review Performed?
	☐	Program Related Site Specific Review?
Project Numbers(s): CS000466 WO# 80046425	**Project Constructability Phase:**	
Date(s) of Constructability Review: **08/25/2021** 09/14/2021	☐ Conceptual Engineering Design ☒ Preliminary Engineering Design ☐ Detailed Engineering Design	
Project Scope Statement: [redacted]		

Department Review/Walkdown Attendees*:

Required [X]	Attended [X]	Department	Name	Required [X]	Attended [X]	Department	Name
☒	☒	Project Management	[redacted]	☐	☐	S/S Engineering	
☐	☐	Asset Management		☐	☐	P&C Engineering	
☒	☒	Constr. Management		☒	☒	Civil Engineering	[redacted]
☐	☐	S/S Technical / LCE		☐	☐	Telecom	
☒	☐	S/S Operations**		☐	☐	Environmental	
☐	☐	Field Engineering		☐	☐	Real Estate	
☐	☐	Line Engineering		☐	☐	T&D ROW	
☐	☐	Vegetation Management		☐	☐	Survey Engineering	
☐	☐	Siting		☐	☐	Cost Estimating	
☐	☒	Safety		☐	☐	Outreach (SCS)	
☐	☐	SCADA		☐	☐	Material Procurement	
			*** input on this form was provided from desktop or other field reviews then the one held on 8/25				

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Constructability Review Form: **Substation**

*** Sign-off in the table above for the Detailed Engineering Design Constructability Review indicates that all Action Items/Concerns from prior Constructability Reviews have been mitigated/resolved as documented in this form. Not every department is required to attend walkdowns for every project but should be consulted for project impact considerations**

** Internal Eversource Substation Operations must be included in the review even if external construction resources are planned

[Project Manager] certifies that this review was performed to completeness, that all applicable departments were infor[redacted]ad opportunity to provide input to this review:

[redacted] [redacted] 9/15/21

Name / Signature *Date*

Documents available for use prior to Constructability Review					
[X]	**Document**	**[X]**	**Document**	**[X]**	**Document**
☒	Initial Scope -Birdseye site plan -General Arrangement	☒	Preliminary Drawings -Civil Site Drawing -Electrical Drawing -Section Drawings	☐	Prints in hand for marking up -Panel Front/Read View -Control Enclosure Layout -Floor / Wall Plans
☒	Detailed Scope Document	☒	Proposed Schedule	☒	Construction Sequence/Timeline
☒	Previous Notes / Comments / Observations	☒	Major Material / Equipment List	☐	Replace / Reuse of equipment

Action Items and Resolutions:

Item No.	Const. Review Action Item/Concern	Design Resolution/Mitigation:
1	Confirm drive paths for construction activities do not have any clearance issues with energized equipment/bus. Confirm if any outages or NRAs are required to support construction activities.	[redacted]
2	Confirm with SS Operations that there is no issue with altered travel path at North Gate.	[redacted]
3	Underground conflicts at the North Gate	[redacted]

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Constructability Review Form: **Substation**

		[redacted]
4		
5		

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
A	**Engineering & Asset Management**		
1	**Scope of Work** - Is scope adequately developed and sufficiently detailed for intended deliverable? - Any complimentary projects or other adjacent obsolete equipment for inclusion? - Any overlapping projects that could impact work/outages? - Consider Physical Installation, P&C Scope, Civil Scope, Engineering studies, Design standard adherence - Any remote station impacts? - Engineering Estimates for Design and Technical Support? (EE and EOC) Total Project	No Concern	Scope document provided with 30% package.
2	**Materials Identified/Ordered** -Any concerns with BOM/Major Materials? Review BOM lead times and project need dates -Specialty Major Materials: Identify Specialty Equipment & Materials potentials - temporary/replacement - long lead items? -Any Materials needed to facilitate construction access?	No Concern	[redacted]

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
3	**Control House** - Review Unmapped equipment interferences, Control/Battery Enclosure Layout, HVAC System (if equipment added), space for new or modified equipment, AC / DC station breaker availability and service loading, Panel Space, Expansion, one-line and/or riser type panelboard drawings, other..	N/A	No impact to Control House.
4	**Ratings & Dimensions** for Major Equipment. Any concerns upon field review? Equipment Rating One Line (and/or equipment thermal ratings tables) - Review for any errors in field	N/A	Not Applicable.
5	**Wall, Fence, Gate, and Foundation Considerations** -Any permanent / temporary alterations or relocations required? -Pre-Project Sound Measurements Needed? Sound Walls? -Take measurements for Foundation quantities, dimensions and concrete volumes -CIP Review/Ballistic needs. Any Physical Security Requirement Consideration? -Assess condition of existing yard equipment foundations and viability for reuse (if proposed) -Review station expansion areas (if needed) for structures, old foundations, etc. -Any Steel Structural Plan Considerations? -Any impacts to construction plan?	No Concern	[redacted]
6	**Below Grade / Enclosure Raceway** - If possible, evaluate existing raceway and review spacing requirements. Review for any subsurface investigation needs or potential below grade obstructions. GPR/test pits needed? Geotechnical Investigation - is soil boring or resistivity investigation needed?	X	[redacted] This work will require an additional construction contract to be awarded (~$15K)

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
7	**Underground Obstructions** -Drawing review concerns? -Is preconstruction or test excavation needed? -Is reuse of underground control cables / Conduits /replace Non-Shielded Cable feasible (if applicable) -Are spare conduits available? Are they useable? -Review if any areas will need to be plated for increased load bearing for equipment access (i.e. large Xfmr, etc.)	No Concern	See above ^.
8	**Grounding Plan (Ground Grid)** - Will footprint impact layout or other equipment? Identify locations to improve grounding. Impacts to foundations and ground grid plans. Observations on wetlands or ability to perform tests	No Concern	[redacted]
9	Nomenclature / Switching One-Line Diagram -Any obvious deviations from diagrams provided?	N/A	Not Applicable.
10	BPS Separation Requirements - Is this BPS Substation? Y/N (part of PAF) - Changes to pre-existing BPS standards?	N/A	Not Applicable.
11	IEC 61850 Substation Automation and Communication Requirements - Any Impacts/Retrofit needed?	N/A	Not Applicable.
12	Any Upgrades to ES Standards - Is retrofit needed to bring up to ES standards? Can that be done?	N/A	Not Applicable.
B	**Construction**		
1	**Any safety hazards specific to the facility? i.e. Low Bus, Deterioration, etc.**	No Concern	North – None. East – [redacted] South - [redacted]
2	**Prior known Site Specific Conditions** -Common or Obvious station Issues -Missing scope items that could impact costs?	N/A	

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
3	**Identify/Consider Required Depts for Construction?** -Who is constructor: Internal vs External Resources -S/S Ops, GO, Test, Field Engineering, etc -Specialty Contractors Required? -Required Oversite Needed - Estimated level of CR and LCE support needed	No Concern	[redacted]
4	**Site Plan, Access, and Temporary Construction Facilities:** -Confirm maintenance access for proposed new or replaced equipment -Verify clear footprint for yard equipment / Property Plan -General access to site, can areas outside substation be utilized? -Substation Entry Plan (driveway and drive path modifications) - Identification of Unique Requirements, i.e. (access bridges, station service, etc.) -Site Development Plan (grading and drainage) with Cut/Fill -Existing Rock Conditions? Potential Impacts (rock quantity)? -Any police details needed for deliveries, restricted hours, and/or need for extended hour approvals -Any Sanitary Civil Requirements? (Septic tanks, etc) -Review turning radius for delivery trucks (if critical) -Any Substation Access and site/yard access Limitations? -Office Trailer Needs: Facilities, Utilities, Restroom, Container, Dumpster Space -Weather impacts to Site (Snow Placement) -Identify Material Laydown and Security -Where will new vs removed equipment go? -Construction permit for trailers outside substation fence?	X	[redacted]

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
5	Unique Equipment Considerations: Gas insulated substation, Gas insulated line, Gas insulated bus, Pass Breaker, Statcom, Sync Condenser	N/A	Not Applicable.
6	**Outage & Energization Plan and Construction Sequence:** *Review electrical working clearances for equipment during construction, Detailed look at protection zone changes, Locked sequence or random outages, Outage durations minimized.* ***Considerations:*** -Approach Distances – Outage Requirements to maintain electrical clearances throughout proposed installation -Distribution Clearances -Clearance Holder Assignments -Drawings vs Field Conditions -Outage boundaries and interconnections -Phased approach needs for additional mobilizations -Verify outage sequence supports the planned construction sequence and timeline. (Lead Commissioning Engineer "LCE", Substation Operations, and Outage Planner input) -Any design alterations or considerations to Eliminate SCLL Conditions, Reduce Recall Time, Reduce Outage durations, Special Conditions -Additional outage requirements: Railroad Catenaries, Fiber outage, SCADA outage, Relay permissions -Seasonal or weather conditions impacts	X	[redacted]
7	**Equipment Testing & Acceptance** -Grounding plans / Resources? Will we need grounds hung? -Hi-pot testing and where will the equipment be set up?	X	[redacted]
8	Need for mobile generator and where connected (if needed)	N/A	Not Applicable.
9	Need for mobile battery and where connected (if needed)	N/A	Not Applicable.
10	OT work required or Notable Permit Conditions (special hours)?	N/A	Not Applicable.

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
11	Coordination of boundaries/seams (Identification of point of demarcation for connection to existing equipment and/or for coordination with other municipalities)	N/A	Not Applicable.
C	**Environmental**		
1	Soil Pre-Characterization or Grab Sampling Completed/Planned	X	[redacted]
2	**Desktop investigation and EAD Review** -Required Permits -Stormwater Considerations -Dewatering requirements -Wetland and buffer review	No Concerns	[redacted]
3	Risk or presence of PCB's/Asbestos/Lead/SF6	N/A	Not Applicable.
4	Transformer Spill Containment Recommended?	N/A	Not Applicable.
5	Expanding Footprint / New Buildings or future Expansion Plans? (Enviro Impact)	N/A	Not Applicable.
6	Environmental oversight considerations? (Inspection type/Interval)	N/A	Not Required.
7	Environmental mitigations - Any matting or seasonal needs? Review D&M Plan with CR.	N/A	Not Required.
D	**Siting, S&CS, and T&D Real Estate**		
1	**Any regulatory concerns or approvals needed?** - Consider scope/design alterations to mitigate concerns - Consider Visual screening considerations (feasibility or location) -Zoning Relief and Permits required	N/A	Not Required.
2	**Neighbor/Abutter impacts:** - Any noise, visual impacts, or sensitive abutters - Any changes to lighting or additional lighting needed?	No Concern	[redacted]

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
3	Review for roadway, gate access, trailers, equip height, noise, weekend/night work, or any potential public disturbance related to work	N/A	Same ^.
4	Installation within Eversource Rights - Is Rights and Restrictions Review required?	No Concern	Rights review was completed, and all work planned to be performed is on Eversource property.
5	Expanding Footprint / New Buildings or future Expansion Plans?	N/A	Not Applicable.
6	Proposed Equipment on same property? - Any Encroachments	N/A	All on Eversource property.
F	**Protection & Controls**		
1	Panel Graphic additions and/or Modifications	N/A	Not Applicable.
2	Space on existing panels for new equipment? (front & rear of panel fronts)	N/A	Not Applicable.
3	Panel fronts conform to drawings	N/A	Not Applicable.
4	Access to bring new panels into control enclosure	N/A	Not Applicable.
5	Nameplate list and location of nameplates	N/A	Not Applicable.
6	Verifies that relays and meters that will be an interconnected project work are as shown on the drawings.	N/A	Not Applicable.
7	Temporary protection, relays, control cable needed? How long will they be required?	N/A	Not Applicable.
8	Will relay setting changes be needed? Any additional outage requirements for changes?	N/A	Not Applicable.
G	**Telecom Engineering**		
1	Review telecom equipment in existing control enclosure	N/A	Not Applicable.
2	Review path to get telecom circuits into the station and paths within the control house. Determine whether new underground duct or overhead tray work is needed.	N/A	Not Applicable.
3	Review current or proposed Telecom equipment power connections and validate with P&C any need for system 1 and system 2 separation.	N/A	Not Applicable.
4	Review current Telecom fiber diversity and validate with P&C any fiber diversity requirements.	N/A	Not Applicable.

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Constructability Review Form: **Substation**

	Key Review Item Description	N/A or No Concern	Review Notes, Concerns, or Additional Info Needed
5	Review and list any remote station impacts/updates	N/A	Not Applicable.
6	Confirm whether correct interface equipment is available (i.e.) for fiber termination or multiplexor termination	N/A	Not Applicable.
7	Confirm whether existing communications cabinets are enough to support additional telecommunications equipment installed	N/A	Not Applicable.
8	Review space for any required additional communications cabinets which may be required to support additional telecommunications equipment installed	N/A	Not Applicable.
9	Review third party Telecommunications at substation and confirm whether additional capacity or Ground Potential Rise protection is required	N/A	Not Applicable.

Photos

(Ex. Equipment control cabinet, Breakers, MODs, CCVTs, PTs, Transformers)

North Gate – Inside View



East Gate – Outside View



South Gate – East View



Additional photos can be found within the estimating attachments.

Attachment D – Existing Vehicle Swing Gate Pictures

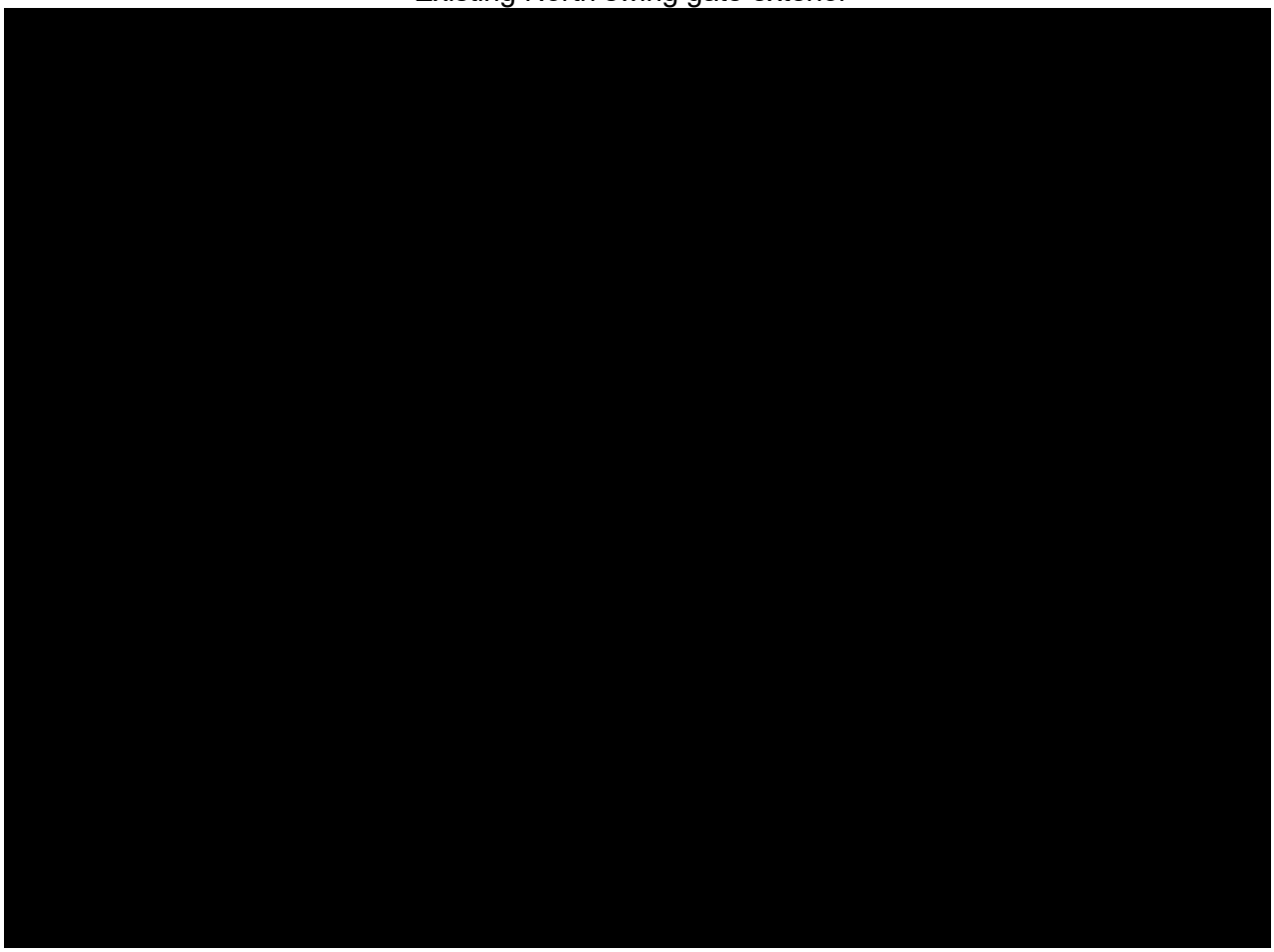
Existing East swing gate exterior



Existing North swing gate interior



Existing North swing gate exterior



Existing South swing gate exterior

