EVERSOURCE

Project Approval Form

Project Title: Eversource CT – 2023 Trip Saver Program	**Project Number:** CD02197
Date Prepared: 02/14/2024	**Company:** Eversource CT
Organization: Electric System Operations	**Project Category:** SMART SWITCHES PROGRAM
Project Initiator: [redacted]	**Project Type:** Program Release
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: 1-31-24	
Total Capital Request: $21,121,613	**Authorization Type:** Full Funding

1. Executive Summary

Project CD02197 proposes to install Trip Savers at 1969 fused lateral locations in Connecticut to reduce the number of outages caused by transient type events (Tree, Animal, Lightning, Patrolled Nothing Found).

A Trip Saver is a self–powered, electronically controlled, single–phase, cutout–mounted vacuum interrupter recloser. The Trip Saver is designed to eliminate the sustained interruption that occurs when a lateral fuse cutout operates in response to a transient fault. This device will save outages and reduce trips by troubleshooters. It also can eliminate momentary circuit interruptions that occur when a substation circuit breaker or source–side line recloser would otherwise trip to prevent a lateral fuse cutout from operating in response to a transient fault.

Based on previous year's results, it is projected that the number of permanent outage events and the Customer Minutes Interrupted (CMI) will be reduced by approximately 70% on the fused laterals that are selected. (See table in the Background / Justification section of the PAF document.)

CD02197 is requesting Full Funding of $21,122K for the Eversource CT Trip Saver Program. There are a total of 1969 locations in Connecticut for Trip Saver installations – 408 locations will be done to target the top 10 worst performing SAIDI CKTS. The remaining 1,561 locations are prioritized by customer interruption saved. The average cost per location was estimated at $10,160 and is based on program historical costs.

The installation of these 2589 Trip Savers (included in the appendix) will provide the following annual customer interruptions and SAIDI reductions:

Trip Saver Additional Locations 2023 CD02197						
State	locations	Devices	Customer Interruptions Saved	Customer Mins Saved	SADI Saved	Total $/ (Cust Mins Saved)
CT	1969	2589	41,670	11,828,084	9.15	$ 1.69

Initial Vs. Full Funding

The full funding estimate came in at $21,121K Vs. $19,573K which is an 8% increase in funding. A total of 70 locations were delayed and needed to be completed in January 2024 due to material shortages. The major material shortage was arrestors.

2. Project Cost Summary

Note: Dollar values are in thousands.

Capital Costs	2023 Actual	2024 Estimate	Total
Internal Labor and Construction Equipment	112.9	1.5	114.3
Outside Services	2,832.1	209.0	2,868.7
Materials	13,345.0	0.0	13,517.4
Removals	383.5	15.2	398.7
Risk and Contingency	0.0	434.9	434.9
Other	2.1	0.0	2.2
Subtotal	**16,675.6**	**660.6**	**17,336.2**

Indirect Capital Costs	2023 Actual	2024 Estimate	Total
Indirects/Overheads (including benefits)	3,372.2	159.8	3,532.0
Capitalized interest or AFUDC, if any	253.4	0.0	253.4
Subtotal	**3,625.6**	**159.8**	**3,785.4**
Total Capital Costs (Gross)	**20,301.2**	**820.4**	**21,121.6**
Less Total Customer Contribution	**0.0**		**0.0**

Project Costs (Net of Reimbursement)	**20,301.2**	**820.4**	**21,121.6**

Explain unique payment provisions, if applicable:

3. Technical Justification

Background, Project Need/Justification, and Project Scope

a. Background

A Trip Saver is a self−powered, electronically controlled, single−phase, cutout−mounted vacuum interrupter recloser. The Trip Saver is designed to eliminate the sustained interruption that occurs when a lateral fuse cutout operates in response to a transient fault. This device will save outages and reduce trips by troubleshooters. It also can eliminate momentary circuit interruptions that occur when a substation circuit breaker or source−side line recloser would otherwise trip to prevent a lateral fuse cutout from operating in response to a transient fault.

Based on previous year's results, it is projected that the number of permanent outage events and the Customer Minutes Interrupted (CMI) will be reduced by approximately 70% on the fused laterals that are selected.

Comparison of August YTD Data for Prior 4 Year Avg vs Post Construction (2019):

AUGUST YTD	PRIOR 4 YR PERIOD				PRIOR 4 YR AVG	POST CONSTR		
ES REPORTABLE	2015	2016	2017	2018	15-19	2019	REDUCTION	CHANGE
CUSTOMERS AFFECTED	9,914	21,331	10,989	12,269	13,626	3,626	10,000	-73%
# EVENTS	100	196	113	106	129	37	92	-71%
CMI	1,149,291	2,870,324	1,277,797	1,658,729	1,739,035	476,048	1,262,987	-73%

AUGUST YTD	PRIOR 4 YR PERIOD				PRIOR 4 YR AVG	POST CONSTR		
WITH STORMS	2015	2016	2017	2018	15-19	2019	REDUCTION	CHANGE
CUSTOMERS AFFECTED	11,293	29,067	13,776	28,010	20,537	5,795	14,742	-72%
# EVENTS	117	258	136	254	191	56	135	-71%
CMI	2,104,549	9,176,665	1,645,425	25,297,525	9,556,041	1,222,124	8,333,917	-87%

b. Project Need

Project CD02197 proposes to install Trip Savers at 1969 fused lateral locations in Connecticut to reduce the number of outages caused by transient type events (Tree, Animal, Lightning, Patrolled Nothing Found). Locations were prioritized by customer interruptions. Trip savers will save outages and reduce trips by troubleshooters. Major storm Isais was excluded from the events. Based on the standardized recloser improvement indices, 50% of customer interruption & 50% customer mins saved was utilized.

The installation of these 2,589 Trip Savers (included in the appendix) will provide the following annual customer interruptions and SAIDI reductions:

Trip Saver Additional Locations 2023 CD02197						
State	**locations**	**Devices**	**Customer Interruptions Saved**	**Customer Mins Saved**	**SADI Saved**	**Total $/ (Cust Mins Saved)**
CT	1969	2589	41,670	11,828,084	9.15	$ 1.69

c. Project Scope

Install Trip Savers at 1969 fused lateral locations in Connecticut. 1966 locations are to be done in 2023 as follows:

Division	#locations	Devices
CT CENTRAL	489	687
CT EASTERN	834	1074
CT WESTERN	646	828

Major Material:

CD02197 Trip Savers		
Fuse Size	**locations**	**Devices**
25K	360	**383**
40K	460	**495**
65K	581	**721**
80K	83	**127**
100K	377	**629**
140K	108	**234**
Total	1969	**2589**

4. Alternatives Considered

Do Nothing: 1969 fused lateral locations in Connecticut will continue to experience outages caused by transient type events (Tree, Animal, Lightning, Patrolled Nothing Found).

5. Project Schedule

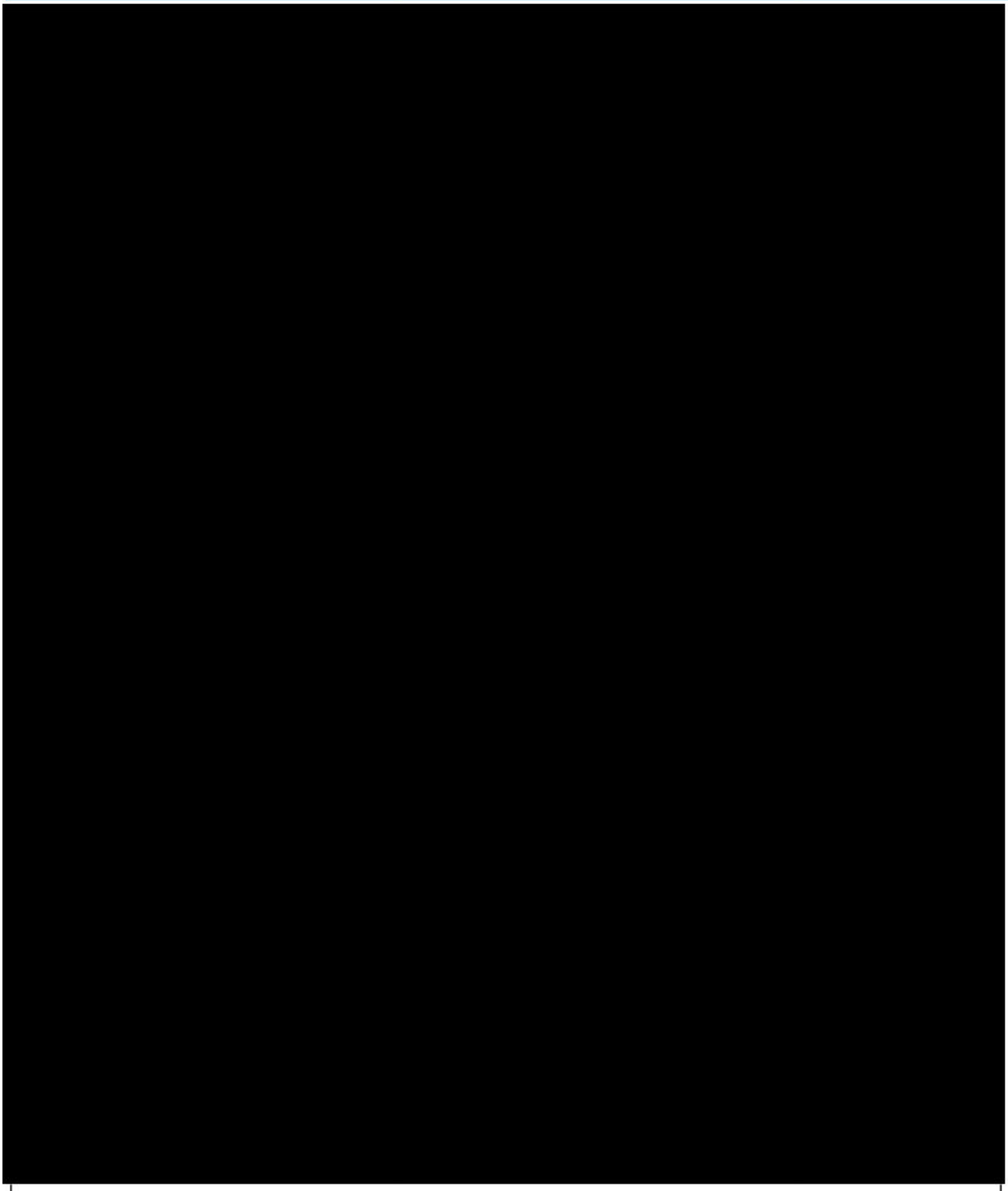
Add any additional milestones that are pertinent to the project

Milestone/Phase Name	Estimated Date
Partial Approval	3-1-23
100% Detailed Engineering Completion	5-1-23
Fully Funded	2-14-24
Construction Start	5-1-23
In Service Date	1-31-24

6. Regulatory Decisions

7. Codes and Standards

DSEM Section 10.43 Trip Saver II General



8. Risk and Contingencies

Contingencies:

Risk Mitigation:

Risk Event	Risk Horizon	Likelihood of Occurrence	Risk Mitigation
Actual cost higher than estimated due to scope changes.	2023	Low	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	Low	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.
Material Shortage	2024	Medium	Long leaded materials as soon as project approval granted. Internal contacts and updates made with manufactuer.
Storm delays	2023	Low	If storm activity delays work, we may be forced to use external resources.

System abnormal configuration	2023	Low	Schedule work to minimize system abnormal time. Most of this work will require system to be abnormal for any extended period of time.

9. References

References
1. DSEM Section 10.43 Trip Saver II General
2.
3.
4.
5.

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

Attachment	Included in Submittal?
A. Cost Estimate	*YES*
B. Locations	*YES*
C. Partial Funding PAF	*YES*

A. Cost Estimate:

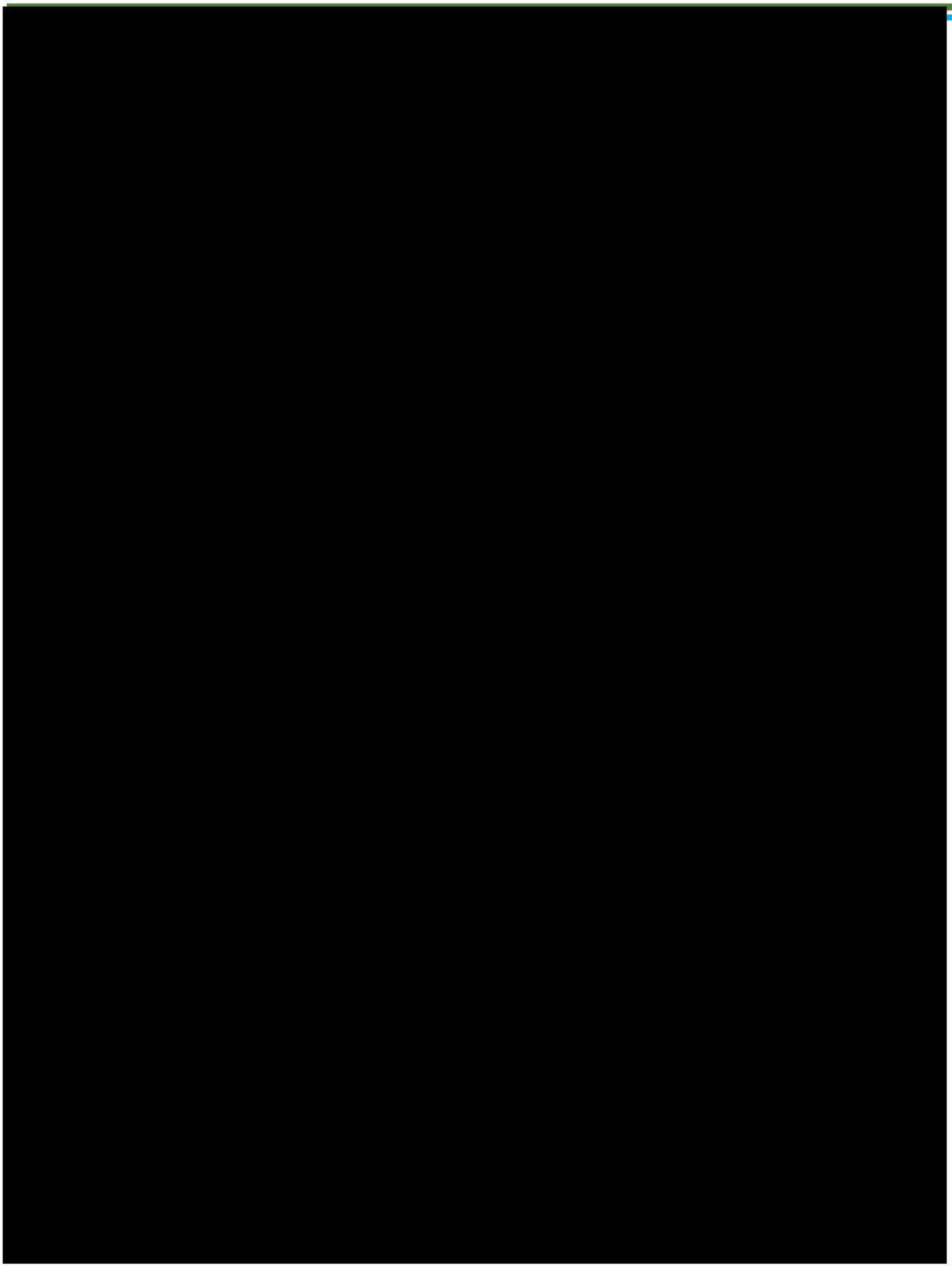
Design Alternative CD02197-01

Estimate

	Preliminary Estimate Summary
Revision Number:	0
Contingency:	0.00%
SubTotal:	$4,737,855
Contingency Amount:	$0
Estimate:	$4,737,855
Reimbursement:	$0
Net Amount:	**$4,737,855**
Description:	

Item Description	CU	[redacted]	Amount
OTHER OTHER 504 units @ $9200per location	16-ALL14		$4,737,855.00

B. Locations



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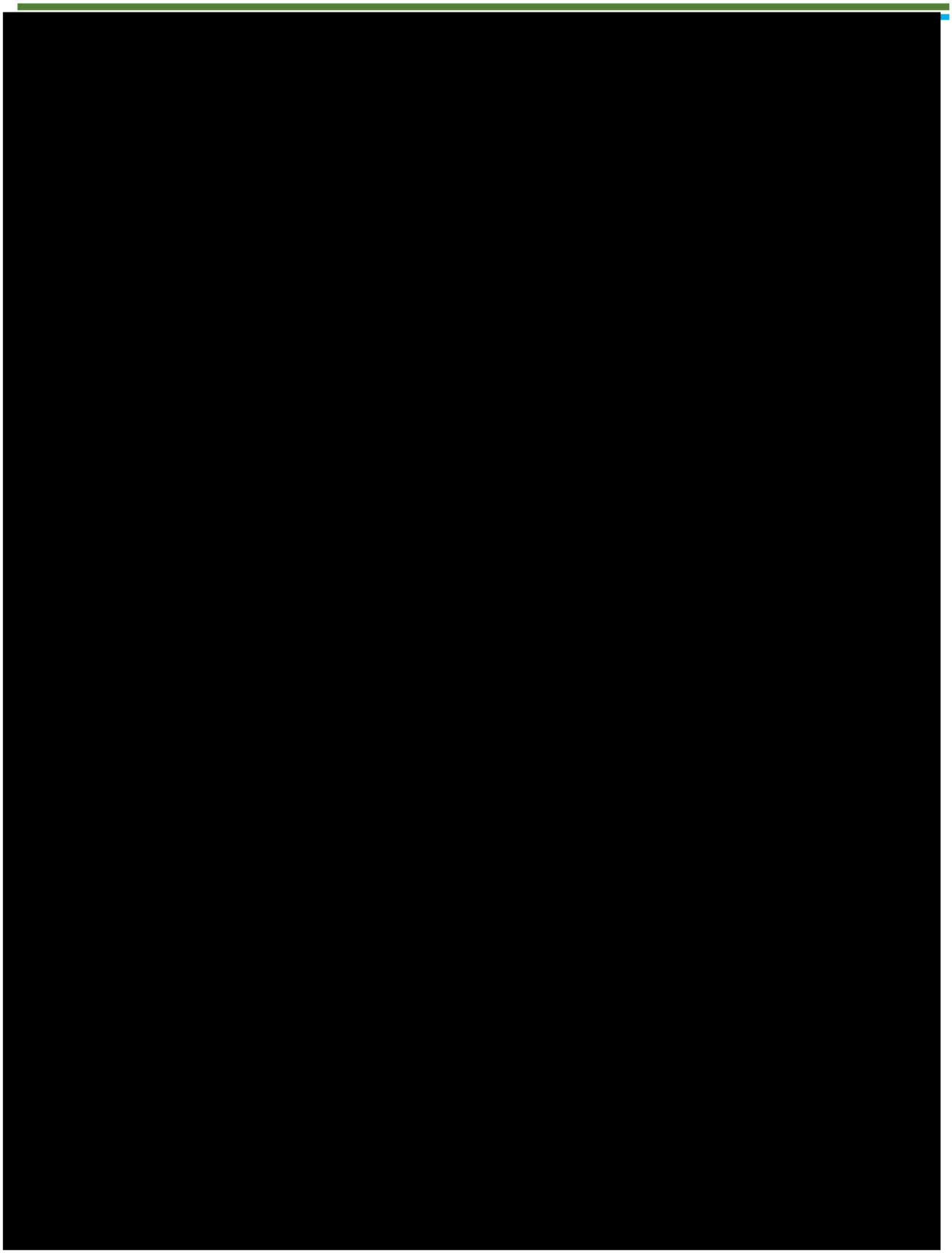

Refer to Distribution Capital Project Approval Process
JA-AM-2001-B, Rev.1

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Refer to Distribution Capital Project Approval Process
JA-AM-2001-B, Rev.1

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Project Approval Form

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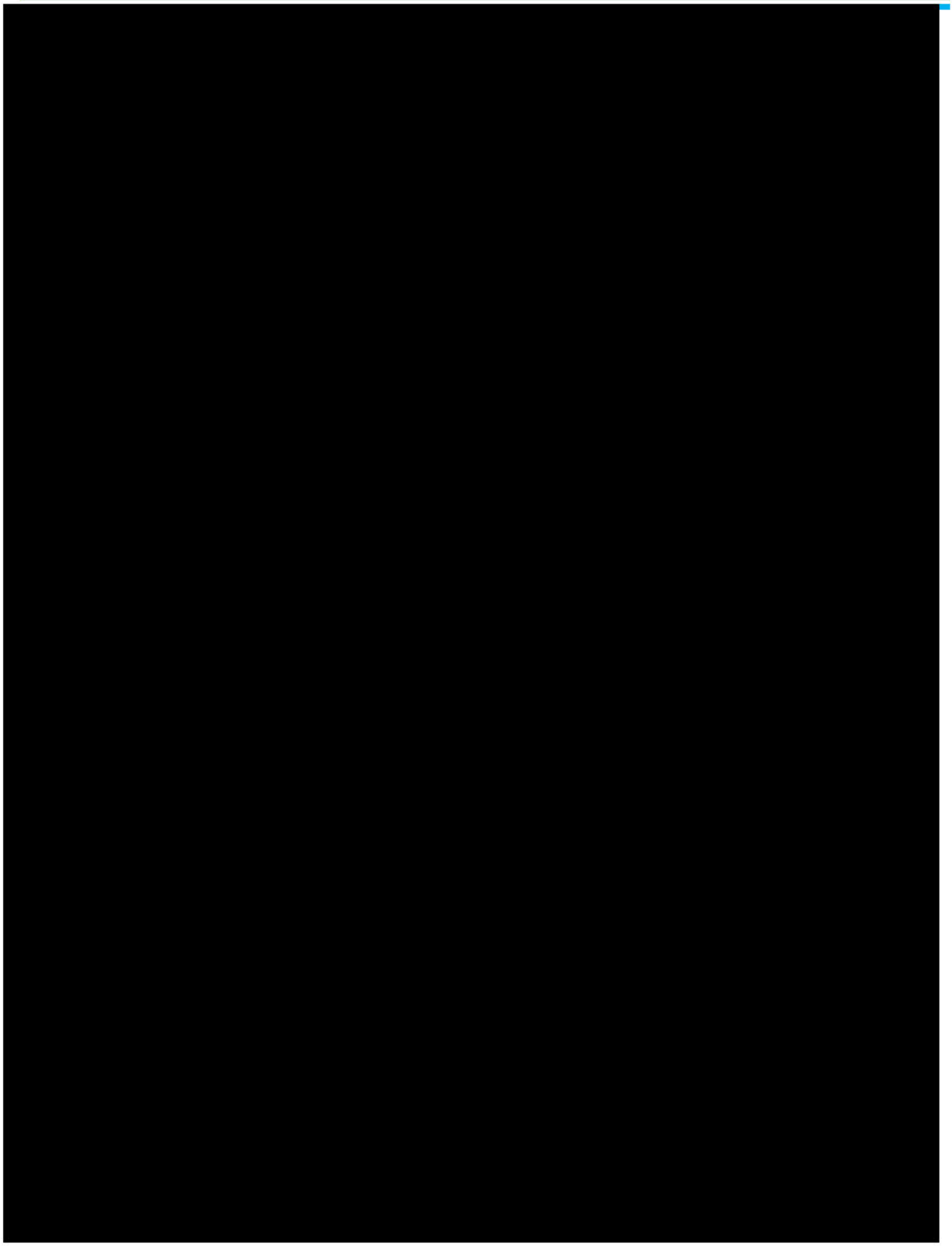

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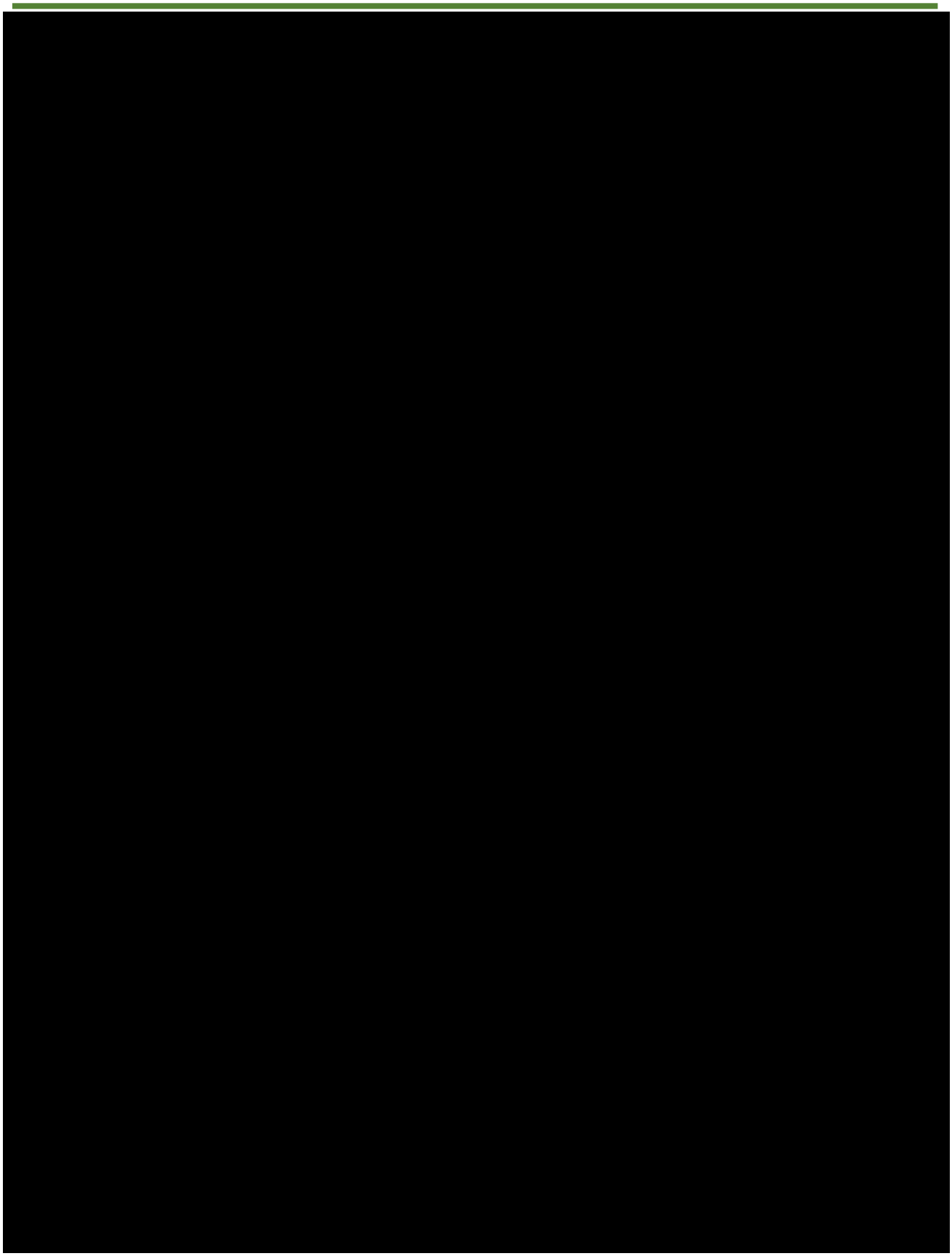

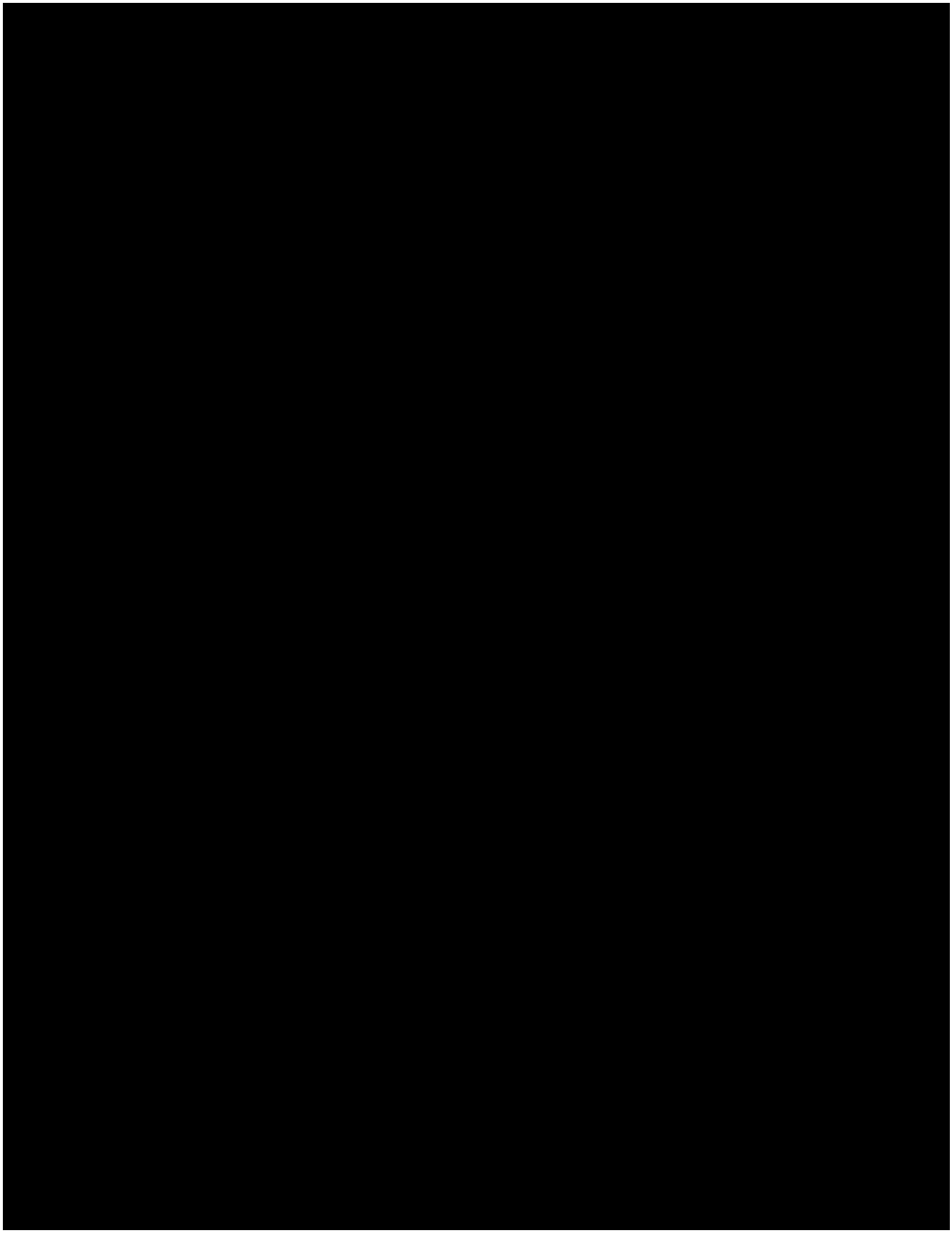

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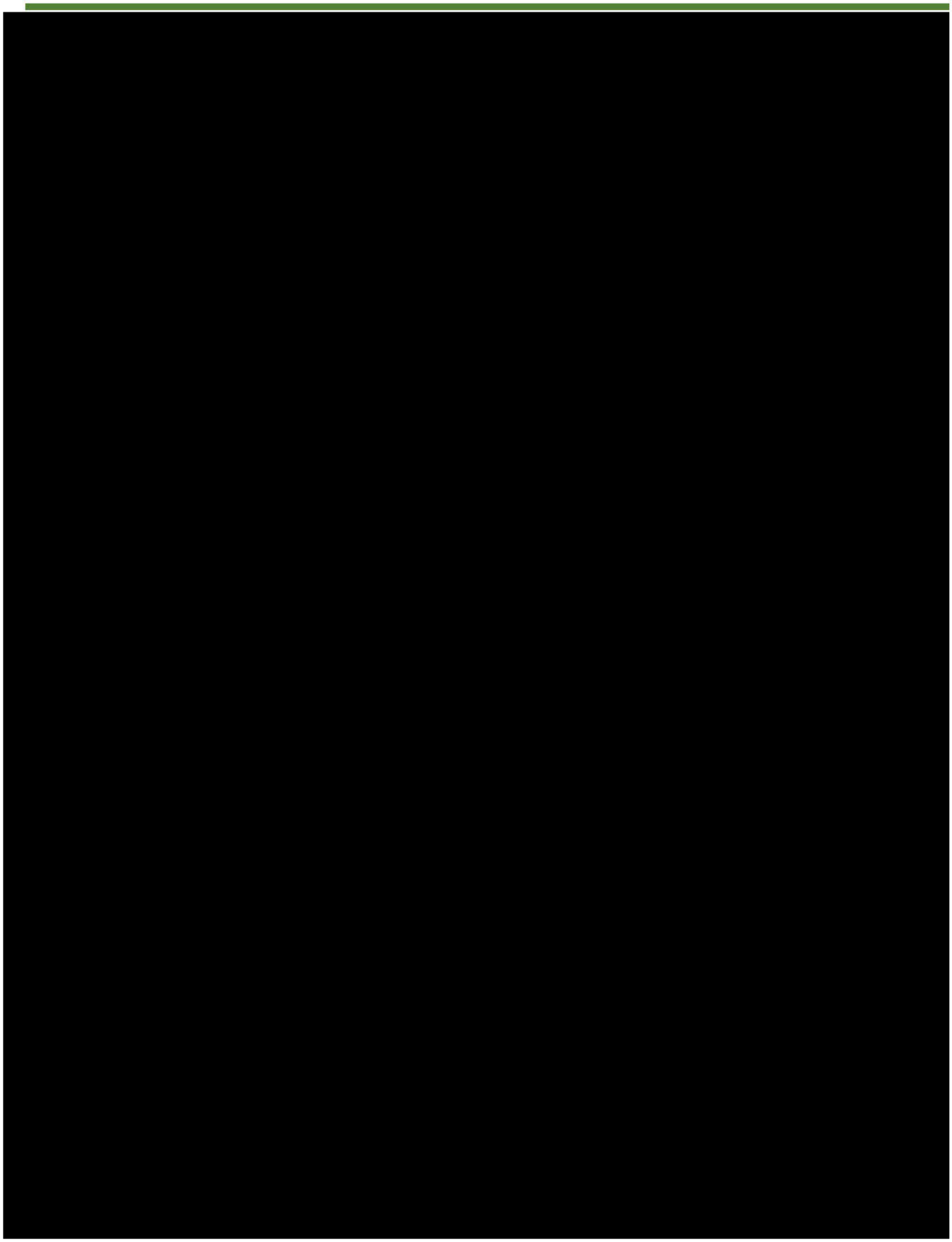

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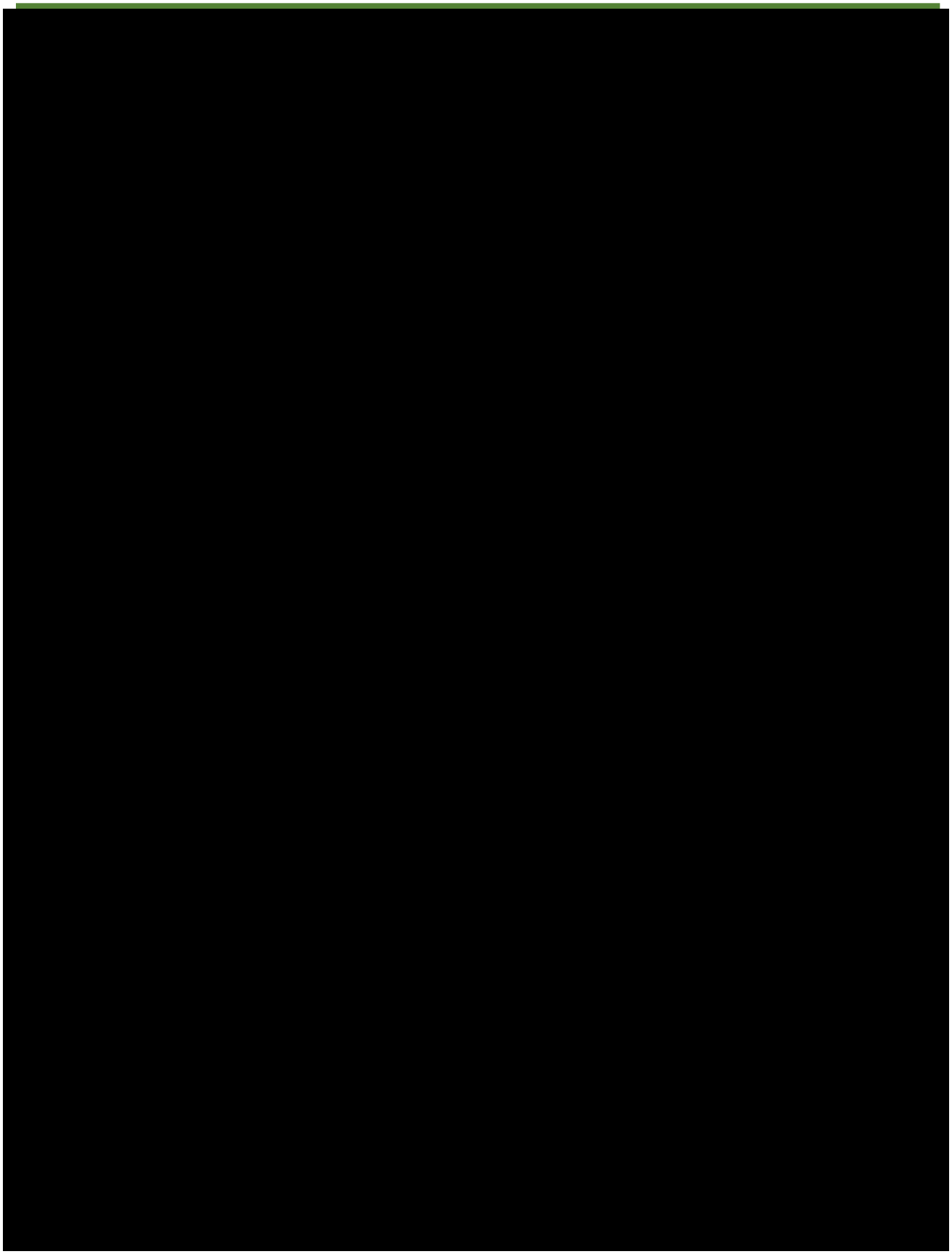
JA-AM-2001-B, Rev.1



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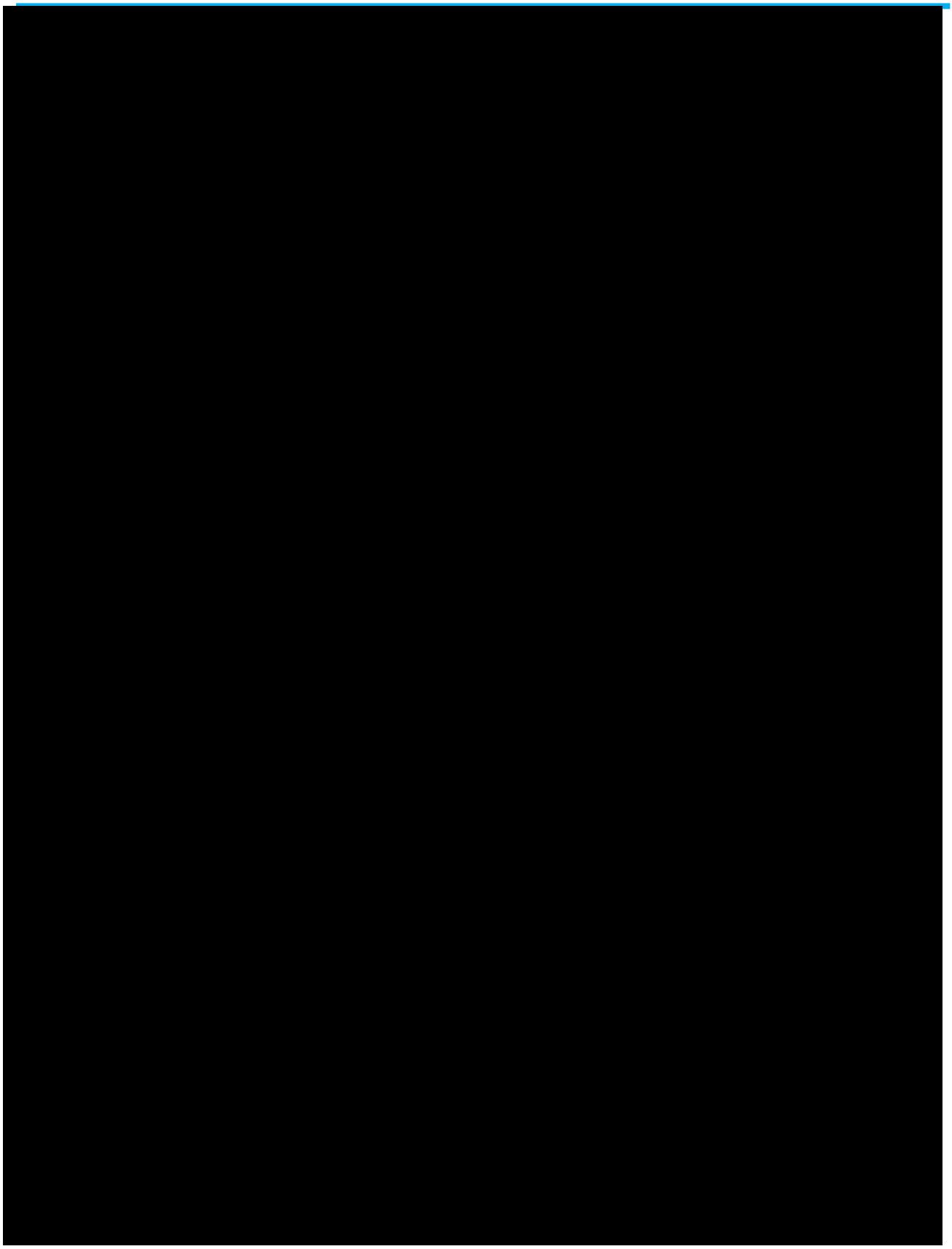

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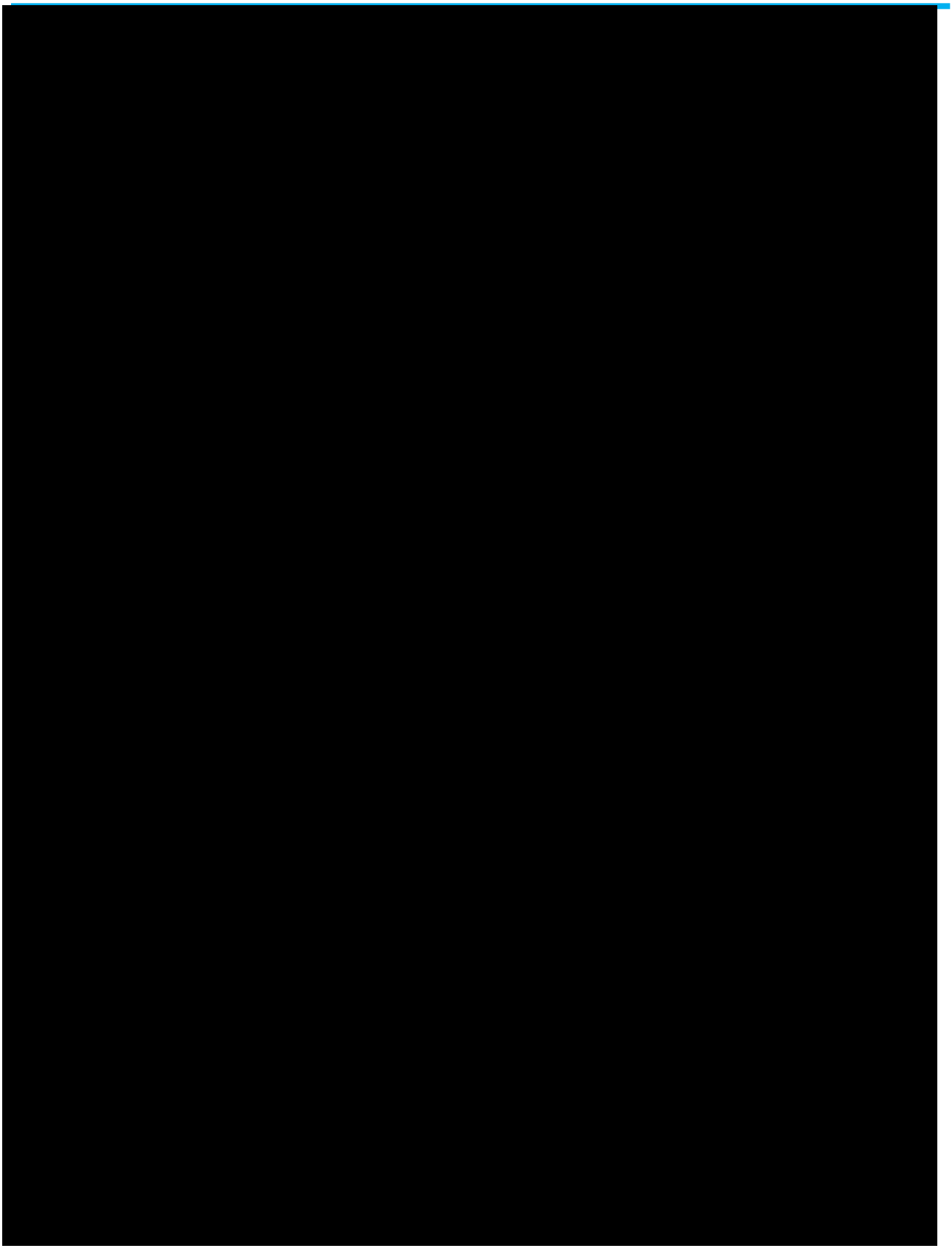

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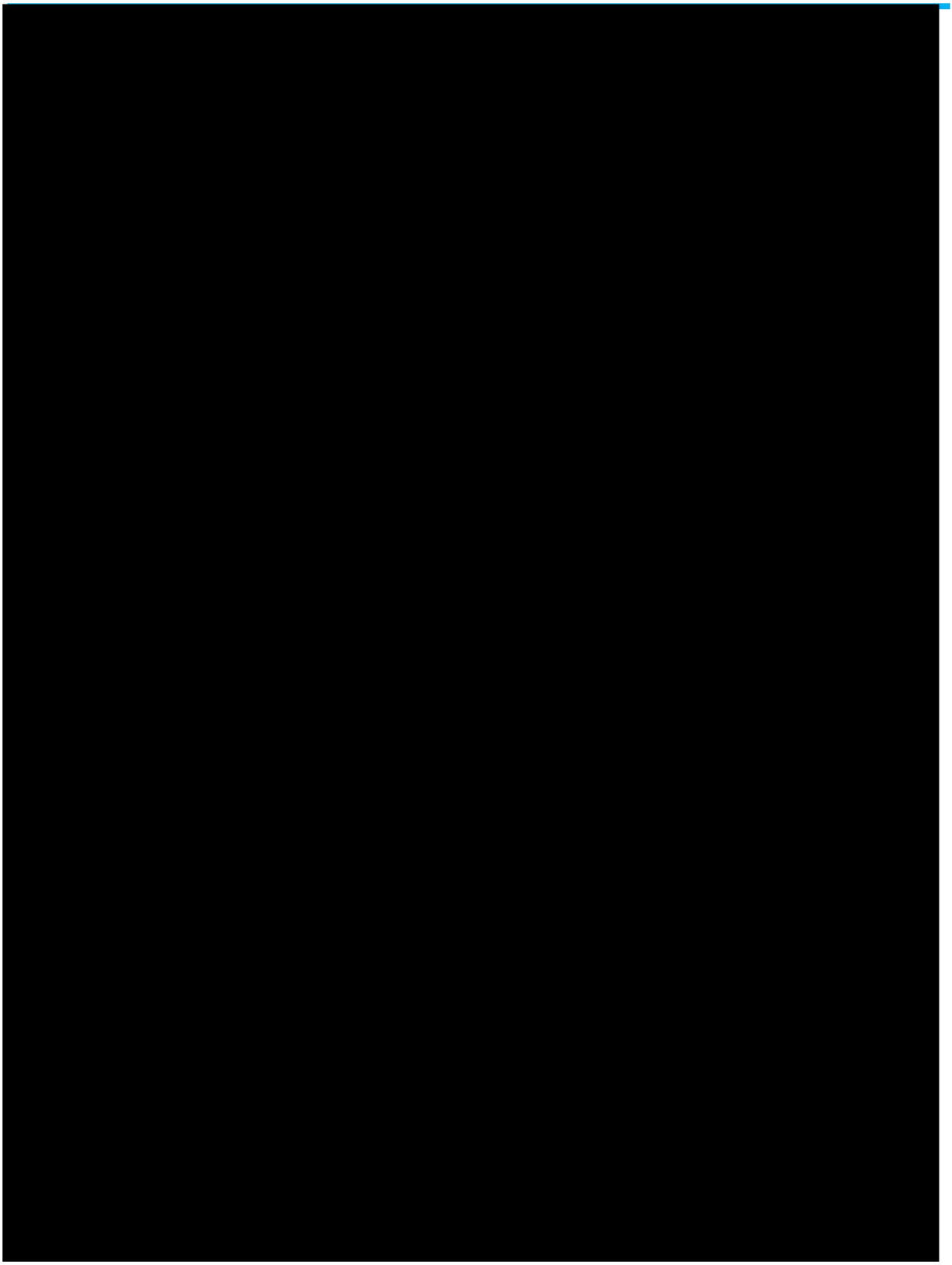

Refer to Distribution Capital Project Approval Process
JA-AM-2001-B, Rev.1



C. Partial Funding PAF:

D.

Operations Project Authorization Form

Project Title: Eversource CT – 2023 Trip Saver Program Additional locations	**Project Number:** CD02197
Date Prepared: 04/05/2023	**Company:** Eversource CT
Organization: Electric Field Operations	**Class(es) of Plant:** D Line
Project Initiator: [redacted]	**Project Category:** SMART SWITCHES PROGRAM
Project Manager: [redacted]	**Project Type:** Program
Project Sponsor: [redacted]	**Capital Investment part of original Operating Plan:** Yes
Estimated in service date: 12/31/2023	**Emergency Related Request?** No
Eng./Constr. Resources Budgeted? Yes	**Facility Type** (check all that apply): ☐ PTF ☐ non-PTF ☒ Distribution
Total Gross Capital Request: $19,573K	**Authorization Type:** Initial Funding

Executive Summary

Project CD02197 proposes to install Trip Savers at 1969 fused lateral locations in Connecticut to reduce the number of outages caused by transient type events (Tree, Animal, Lightning, Patrolled Nothing Found).

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CT	1969	2589	41,670	11,828,084	9.15	$ 1.69

Project Costs Summary

Note: Dollar values are in thousands

Capital Costs	2023	Total
Internal Labor and Construction Equipment	$737	$737
Outside Services	$6,970	$6,970
Materials	$2,159	$2,159
Removals	$1,116	$1,116
Risk and Contingency	$952	$952
Other	$0	$0
Subtotal	**$11,934**	**$11,934**

Indirect Capital Costs	Year 1	Total
Indirects/Overheads (including benefits)	$7,246	$7,246
Capitalized interest or AFUDC, if any	$394	$394
Subtotal	**$7,639**	**$7,639**
Total Capital Costs (Gross)	**$19,573**	**$19,573**
Less Total Customer Contribution	**$0**	**$0**
Project Costs (Net)	**$19,573**	**$19,573**

Technical Justification:

Project Need, Objective and Justification:

Project CD02197 proposes to install Trip Savers at 1969 fused lateral locations in Connecticut to reduce the number of outages caused by transient type events (Tree, Animal, Lightning, Patrolled Nothing Found). Locations were prioritized by customer interruptions. Trip savers will save outages and reduce trips by troubleshooters. Major storm Isais was excluded from the events. Based on the standardized recloser improvement indices, 50% of customer interruption & 50% customer mins saved was utilized.

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Major Material:

CD02197 Trip Savers		
Fuse Size	locations	Devices
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Total	1969	**2589**

Background:

Based on previous year's results, it is projected that the number of permanent outage events and the Customer Minutes Interrupted (CMI) will be reduced by approximately 70% on the fused laterals that are selected.

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CMI	1,149,291	2,870,324	1,277,797	1,658,729	1,739,035	476,048	1,262,987	-73%

AUGUST YTD	PRIOR 4 YR PERIOD				PRIOR 4 YR AVG	POST CONSTR		
WITH STORMS	2015	2016	2017	2018	15-19	2019	REDUCTION	CHANGE
CUSTOMERS AFFECTED	11,293	29,067	13,776	28,010	20,537	5,795	14,742	-72%
# EVENTS	117	258	136	254	191	56	135	-71%
CMI	2,104,549	9,176,665	1,645,425	25,297,525	9,556,041	1,222,124	8,333,917	-87%

Alternatives Considered:

Alternatives were considered (please describe below)

Do Nothing: 1969 fused lateral locations in Connecticut will continue to experience outages caused by transient type events (Tree, Animal, Lightning, Patrolled Nothing Found).

Regulatory Approvals:

Are Regulatory body approvals needed for the project?

No

Project Schedule

Milestone/Phase Name	Estimated Date
100% Engineering Completion	June 2023
Construction Start	May 2023
In Service Date	December 2023

Risks and Risk Mitigation Plans

Risk Event	Risk Horizon	Likelihood of Occurrence	Risk Mitigation
Actual cost higher than estimated due to scope changes.	2023	Low	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	Low	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.
Storm delays	2023	Low	If storm activity delays work, we may be forced to use external resources.
System abnormal configuration	2023	Low	Schedule work to minimize system abnormal time. Most of this work will require system to be abnormal for any extended period of time.

References



DSEM Section 10-43
TripSaverII General.p

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



2019-09-18 CT
TripSaver Program U

Attachment	Included in Submittal?
A. Cost Estimate	*YES / NO / N/A*
B. Locations	*YES / NO / N/A*

A. Cost Estimate:

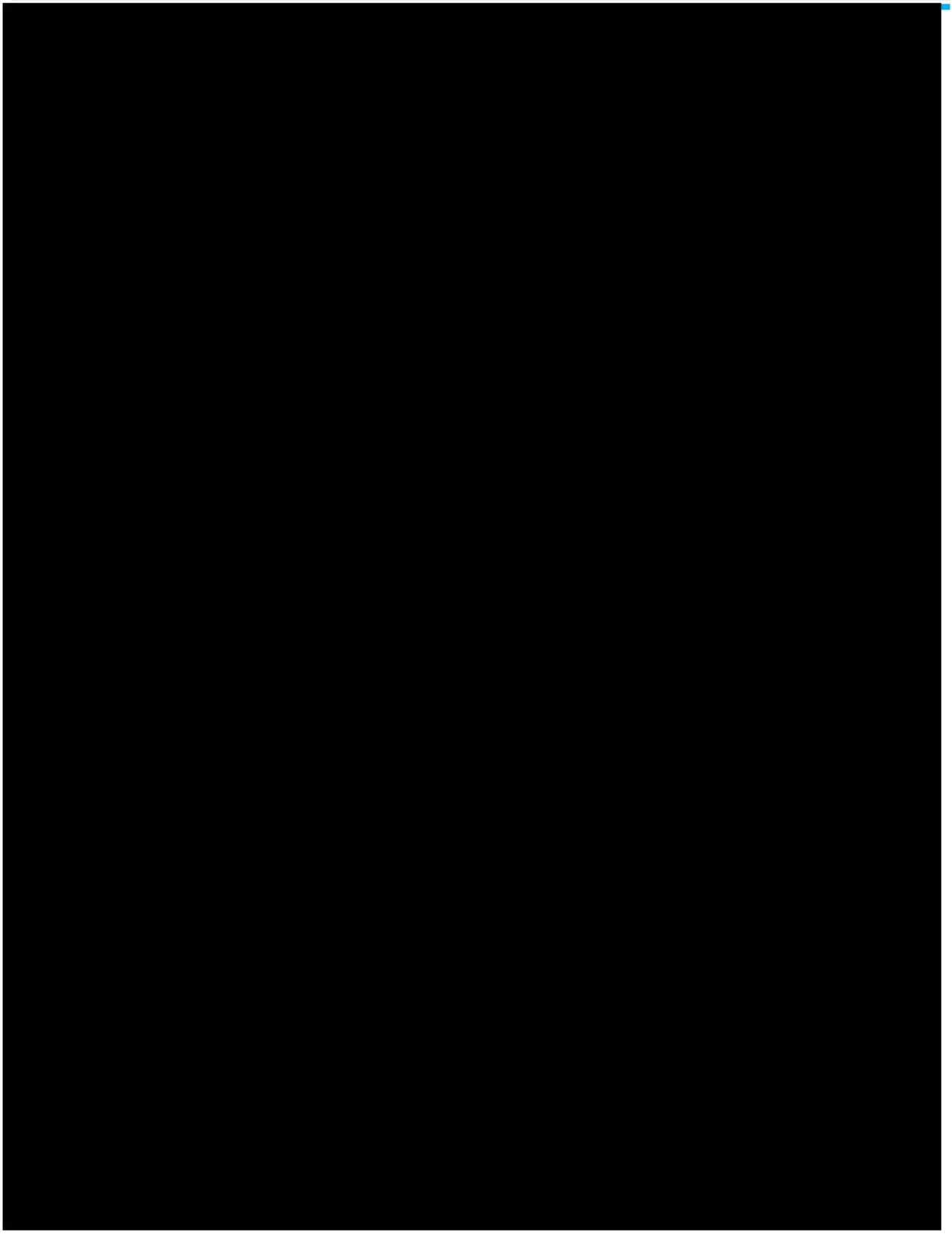
Design Alternative CD02197-01

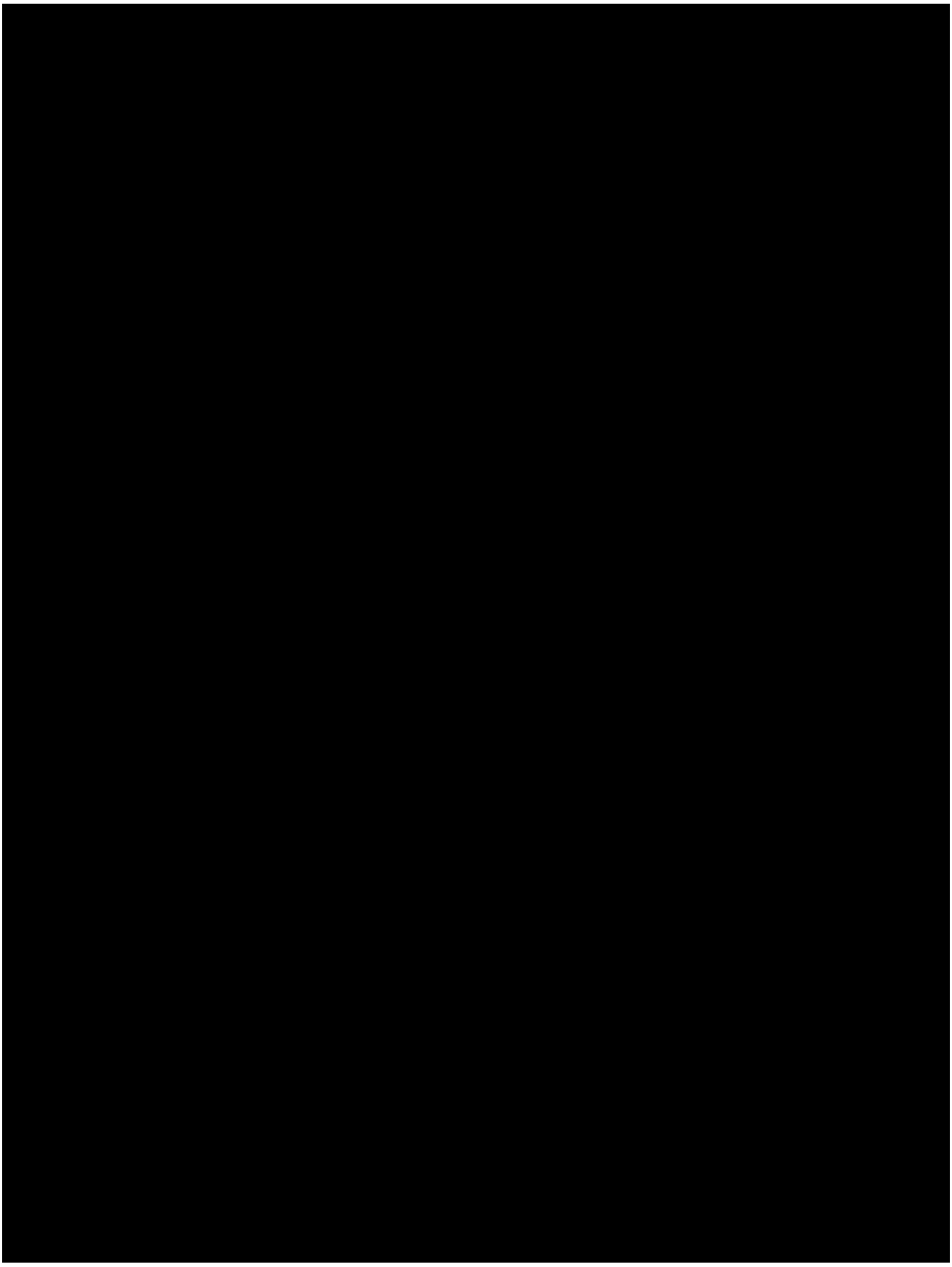
Estimate

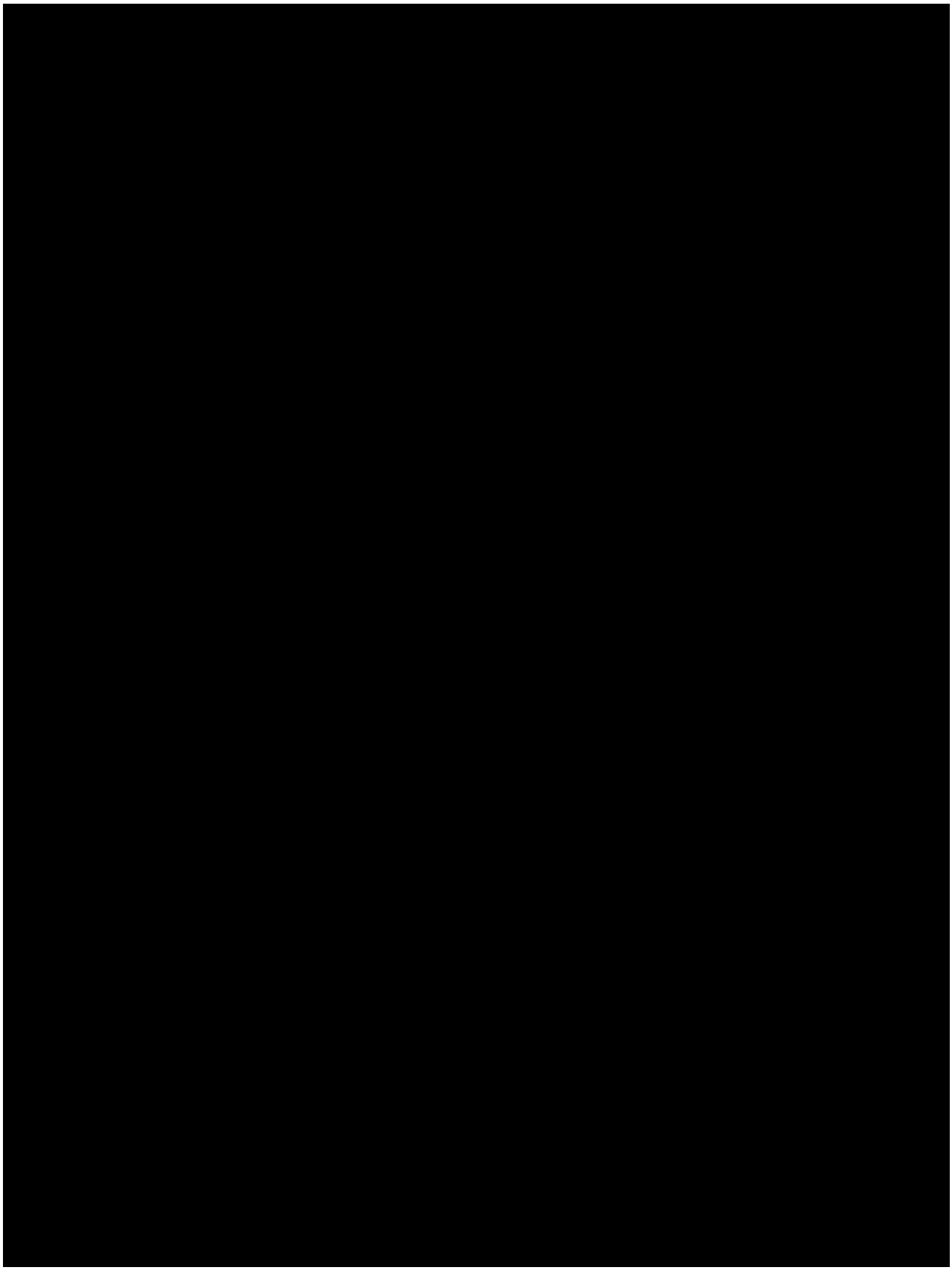
	Preliminary Estimate Summary
Revision Number:	0
Contingency:	0.00%
SubTotal:	$4,737,855
Contingency Amount:	$0
Estimate:	$4,737,855
Reimbursement:	$0
Net Amount:	**$4,737,855**
Description:	

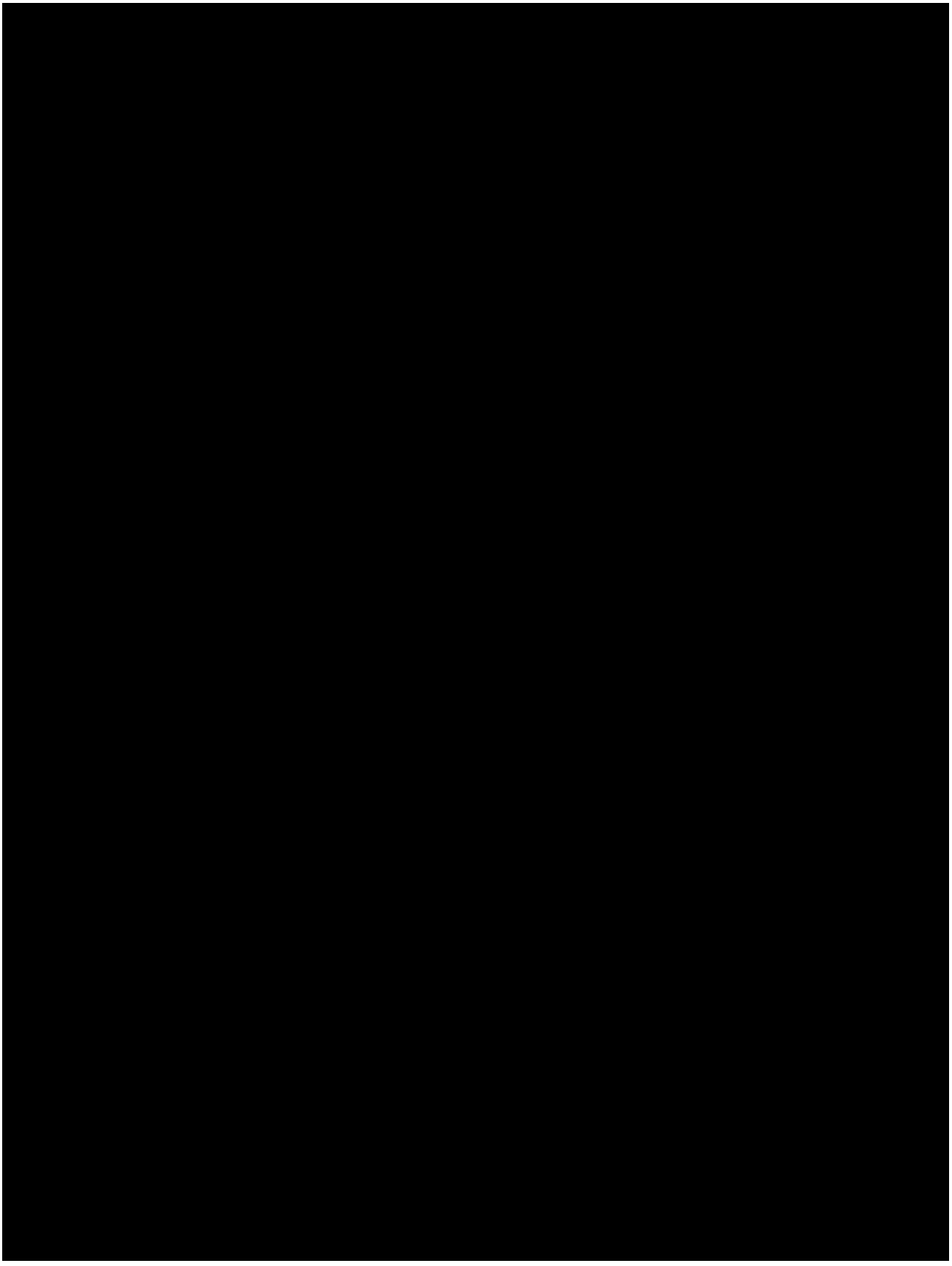
Item Description	CU	[redacted]	Amount
OTHER OTHER 504 units @ $9200per location	16-ALL14		$4,737,855.00

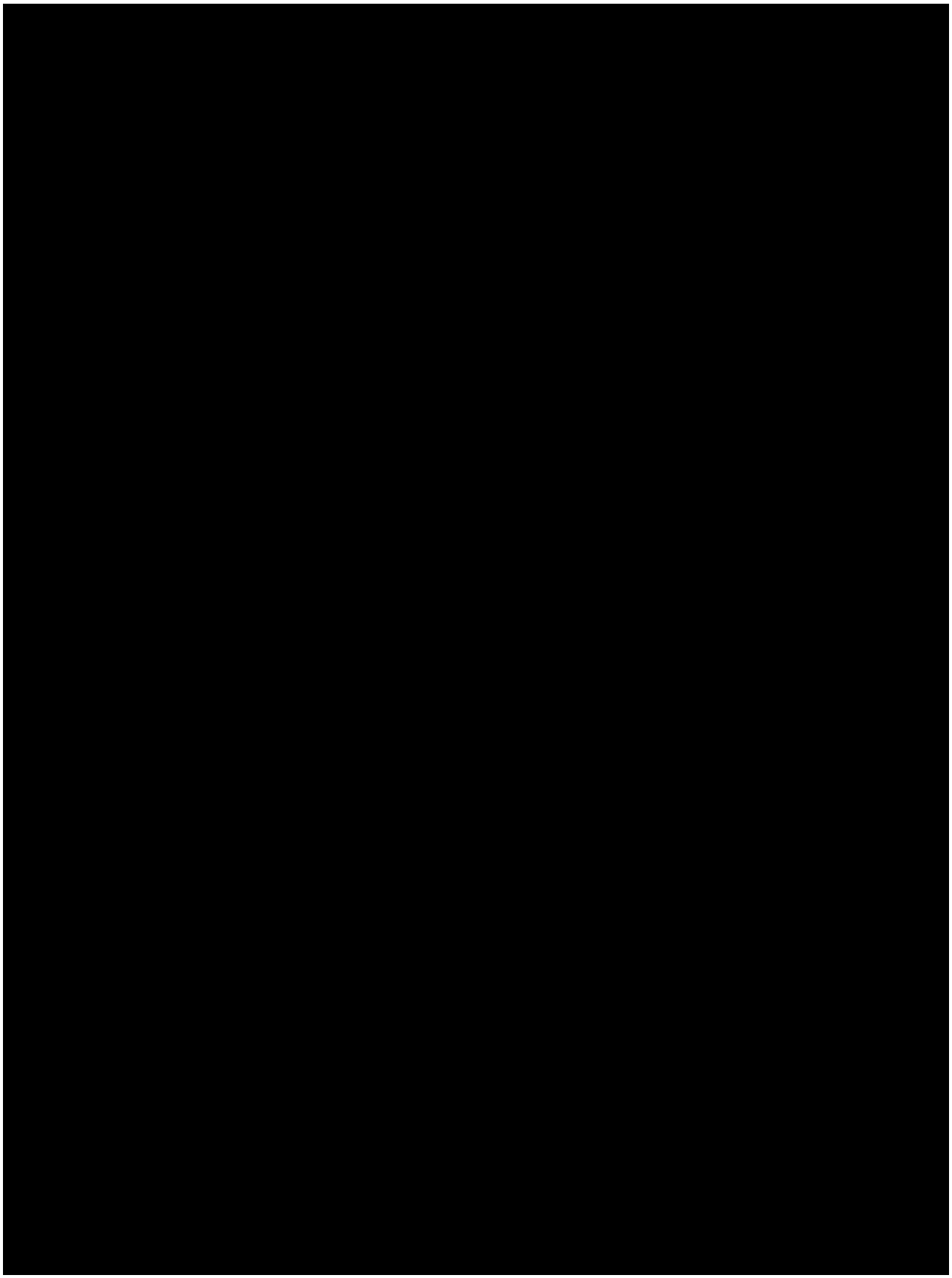
B. Locations











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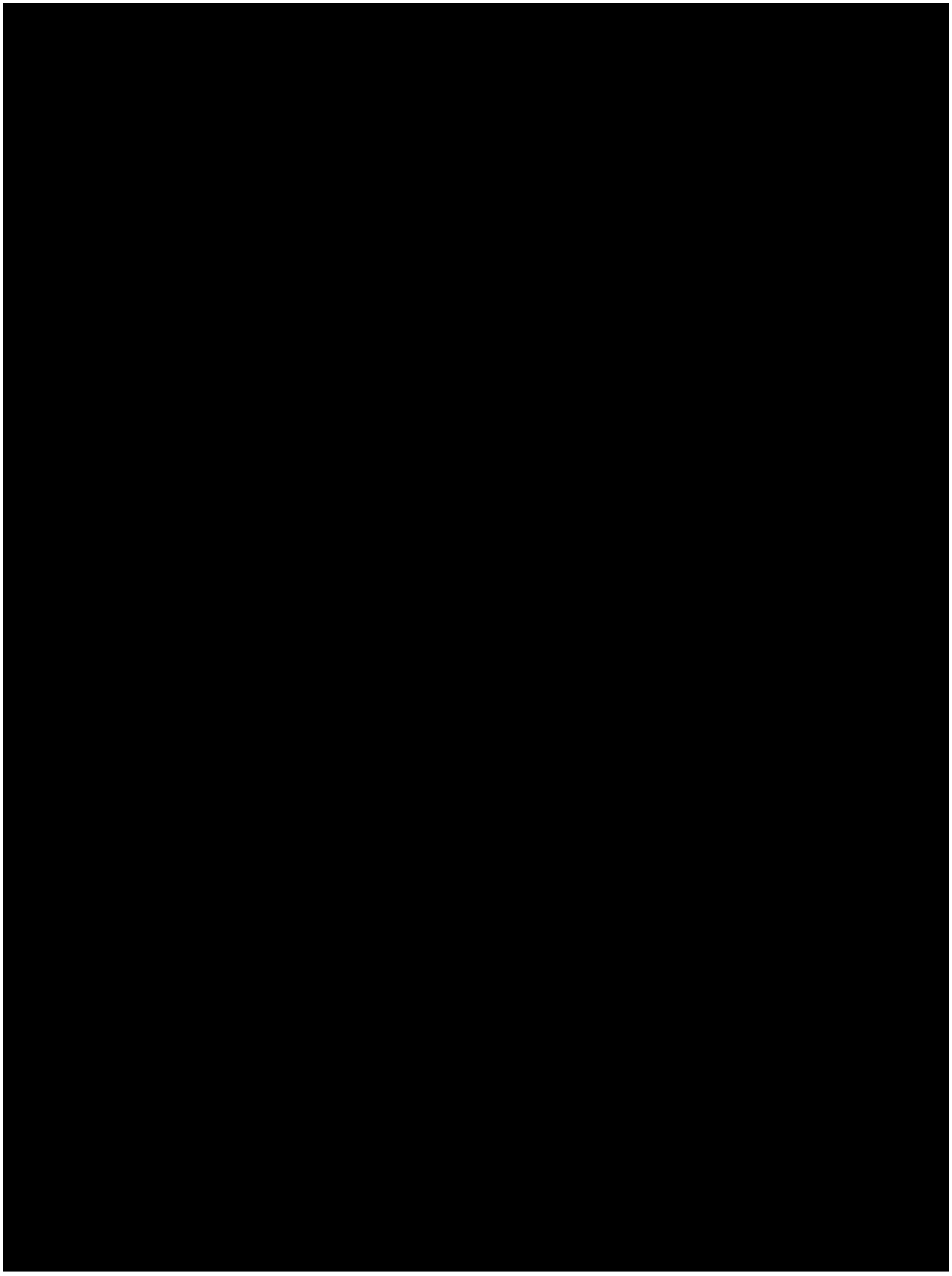

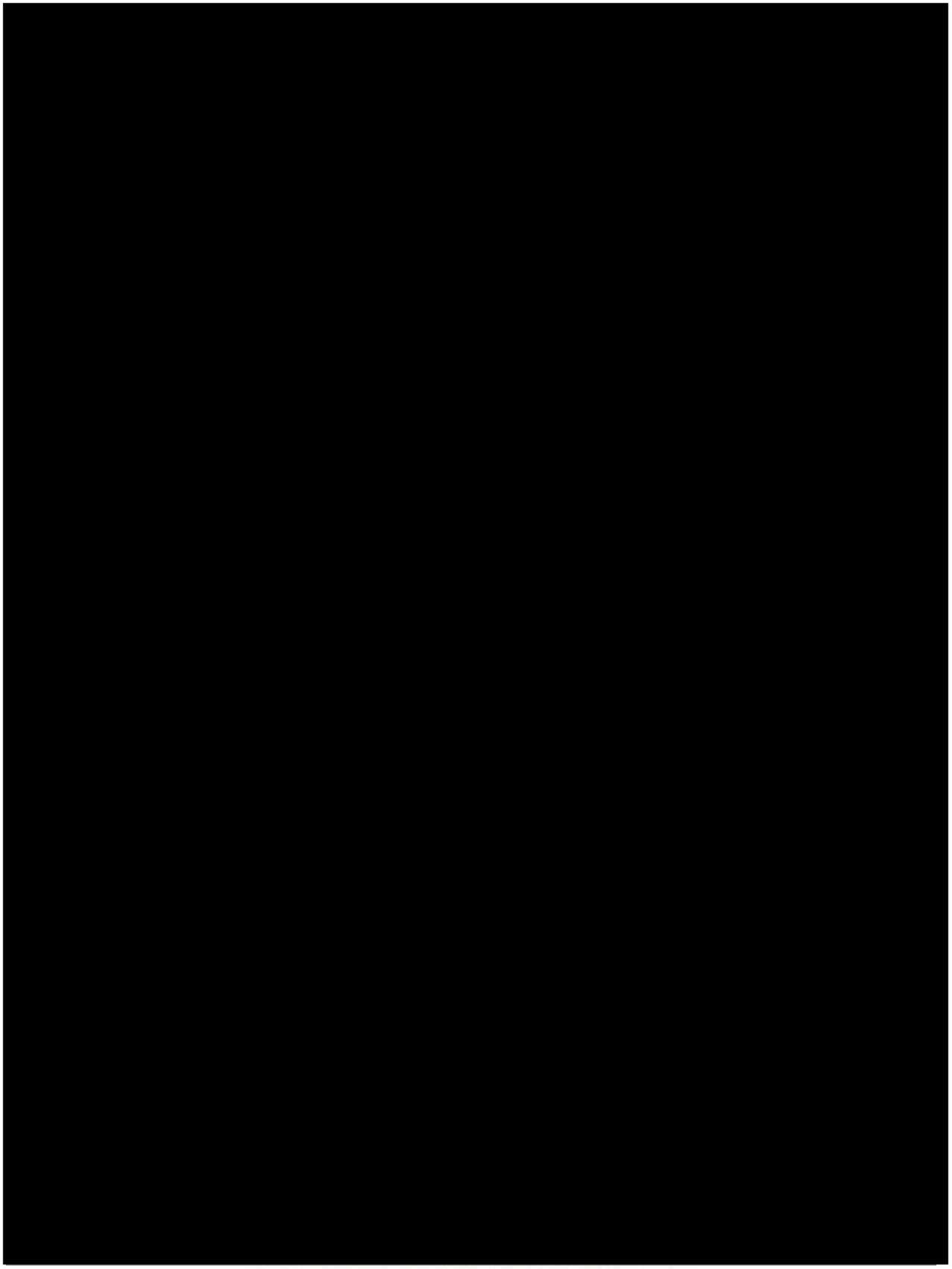

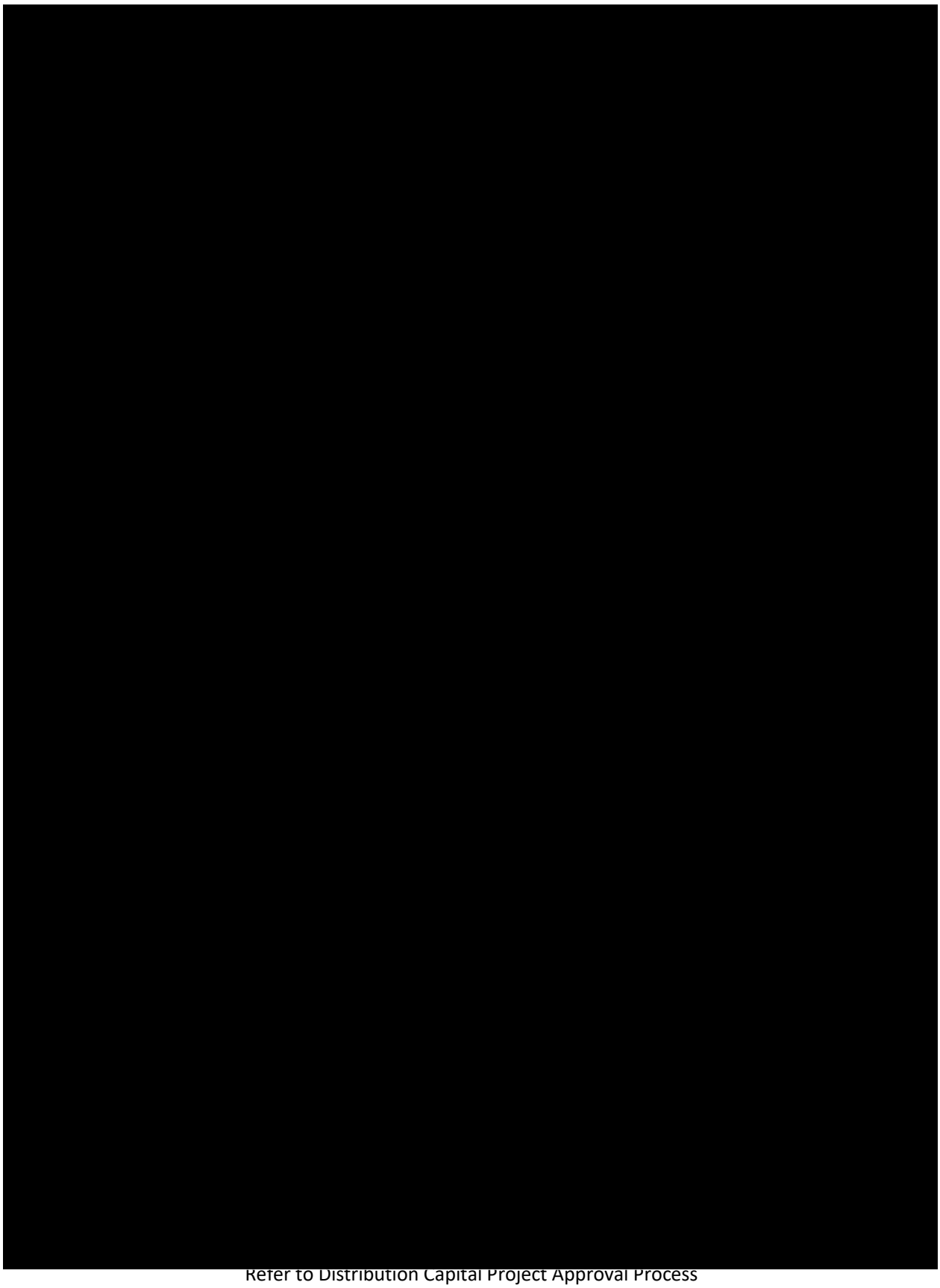

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