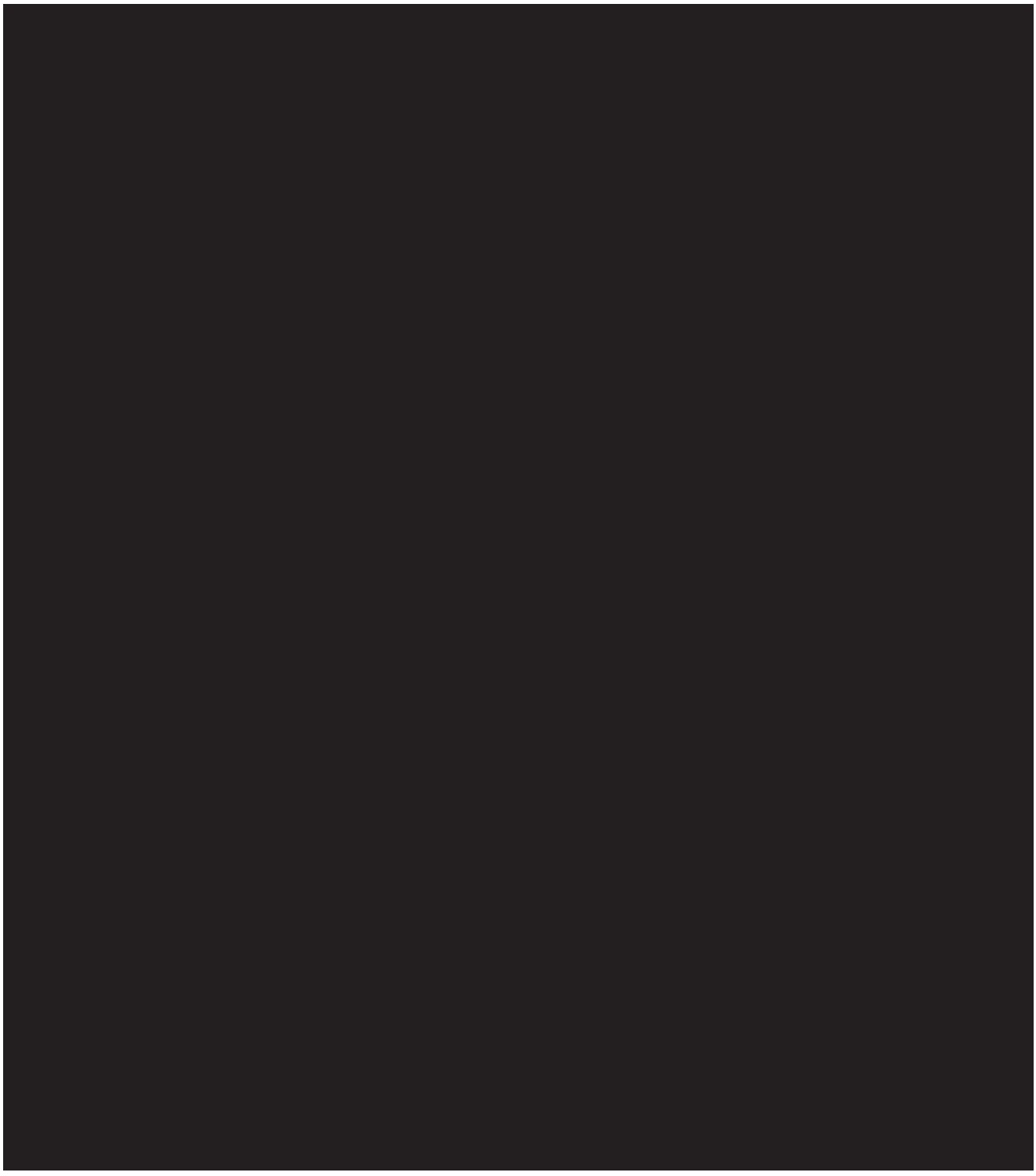
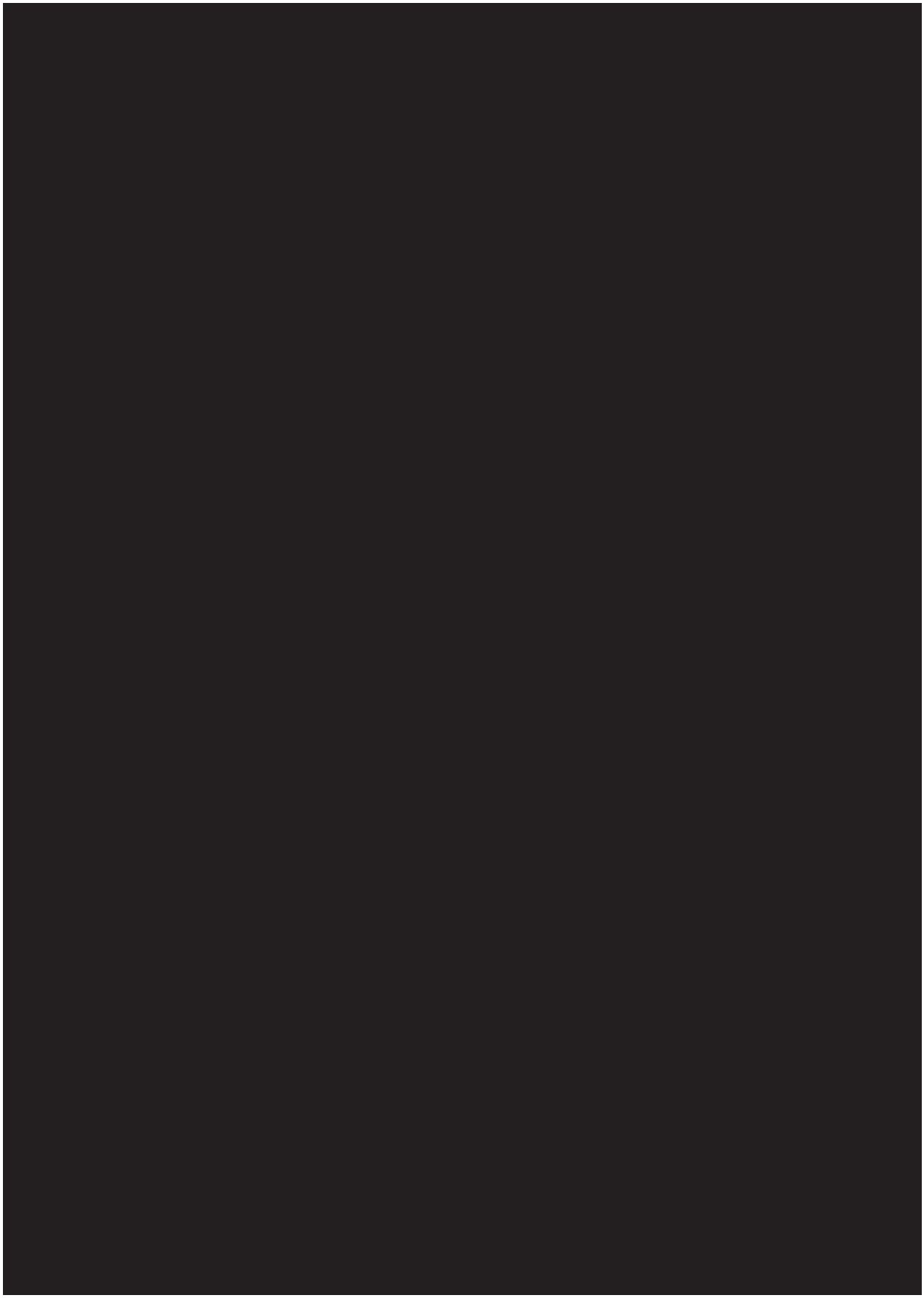
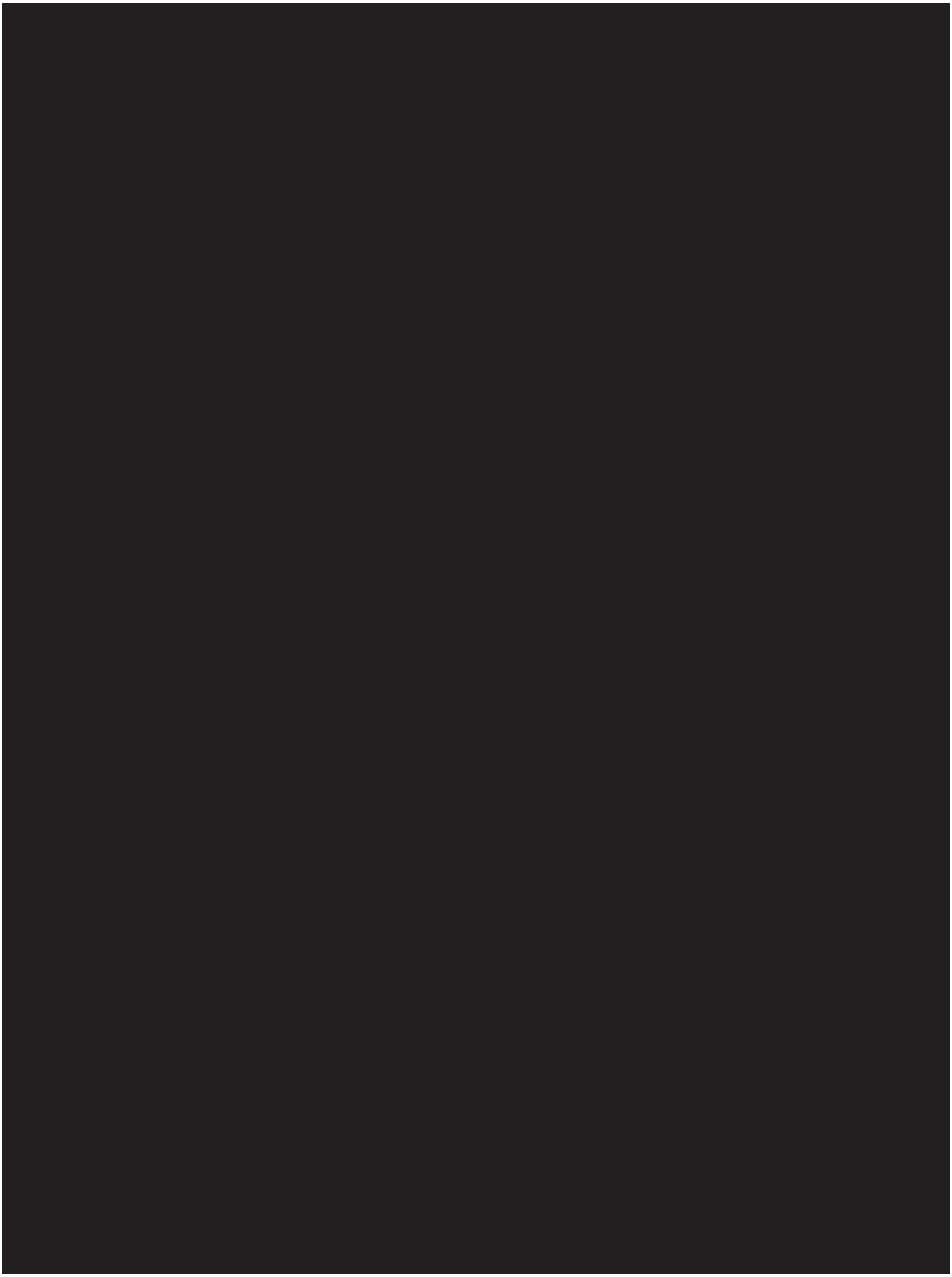
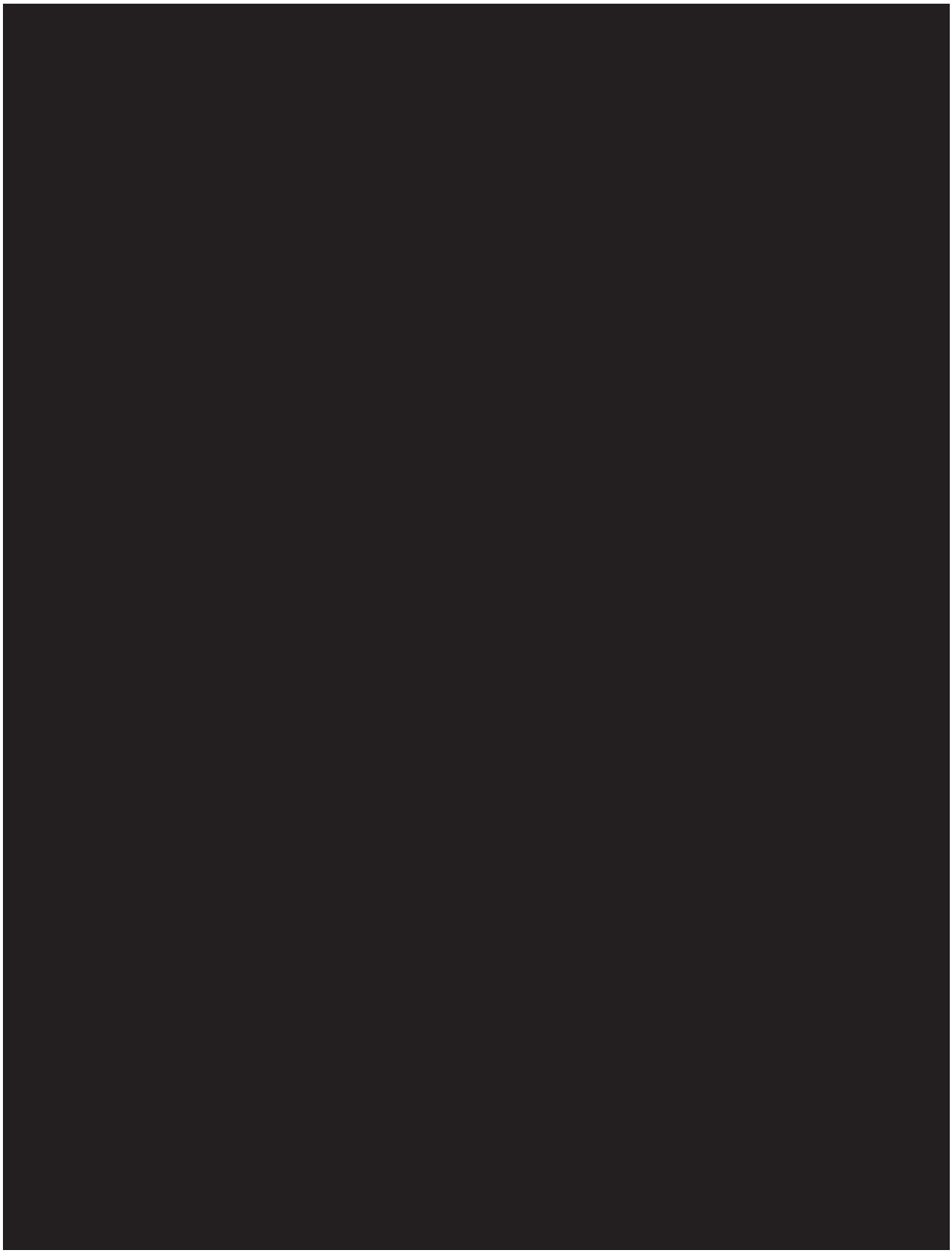
I. Use of Railroad Customers' Electric Traction Power Facilities









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II. Study Methodology

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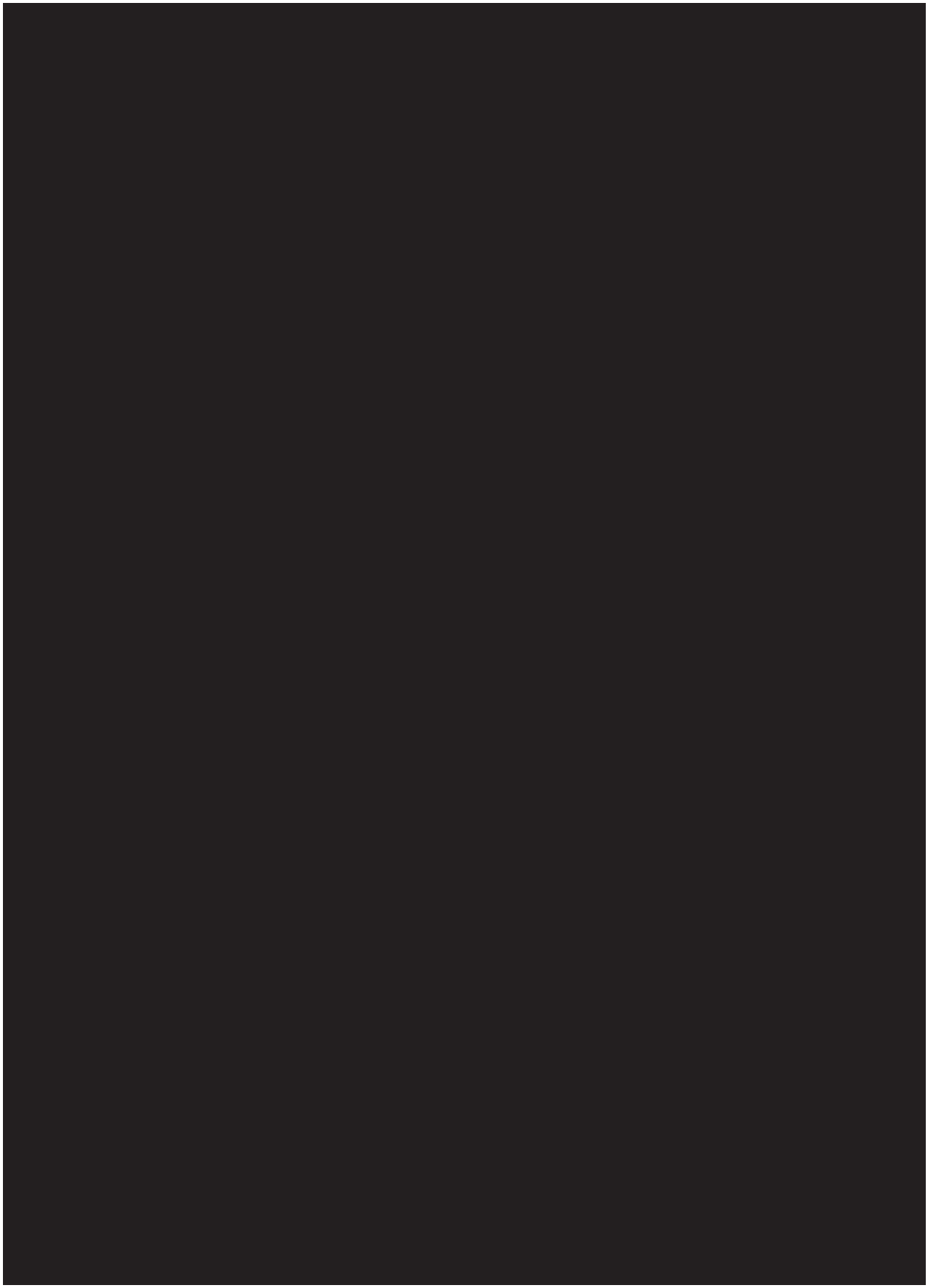
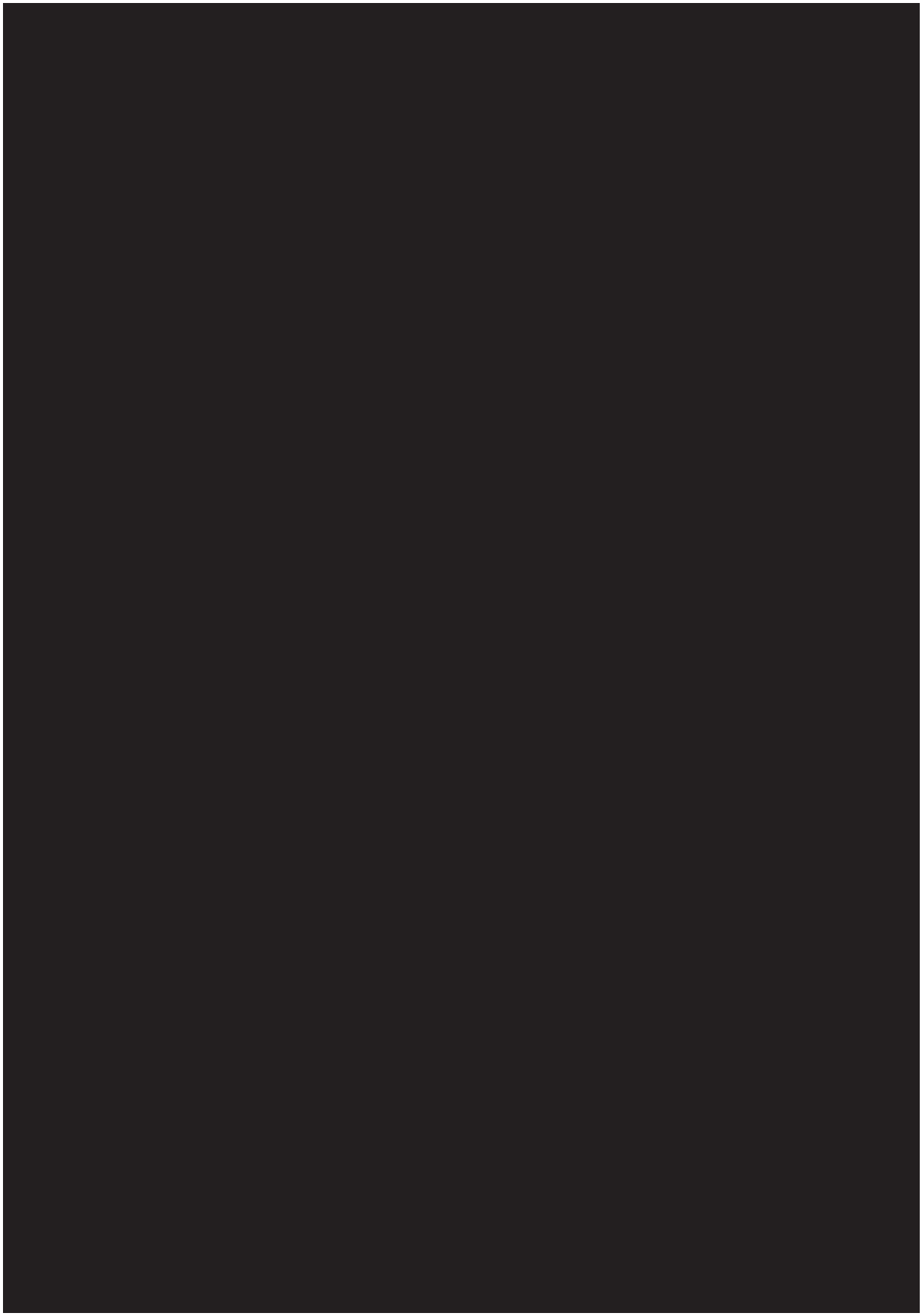
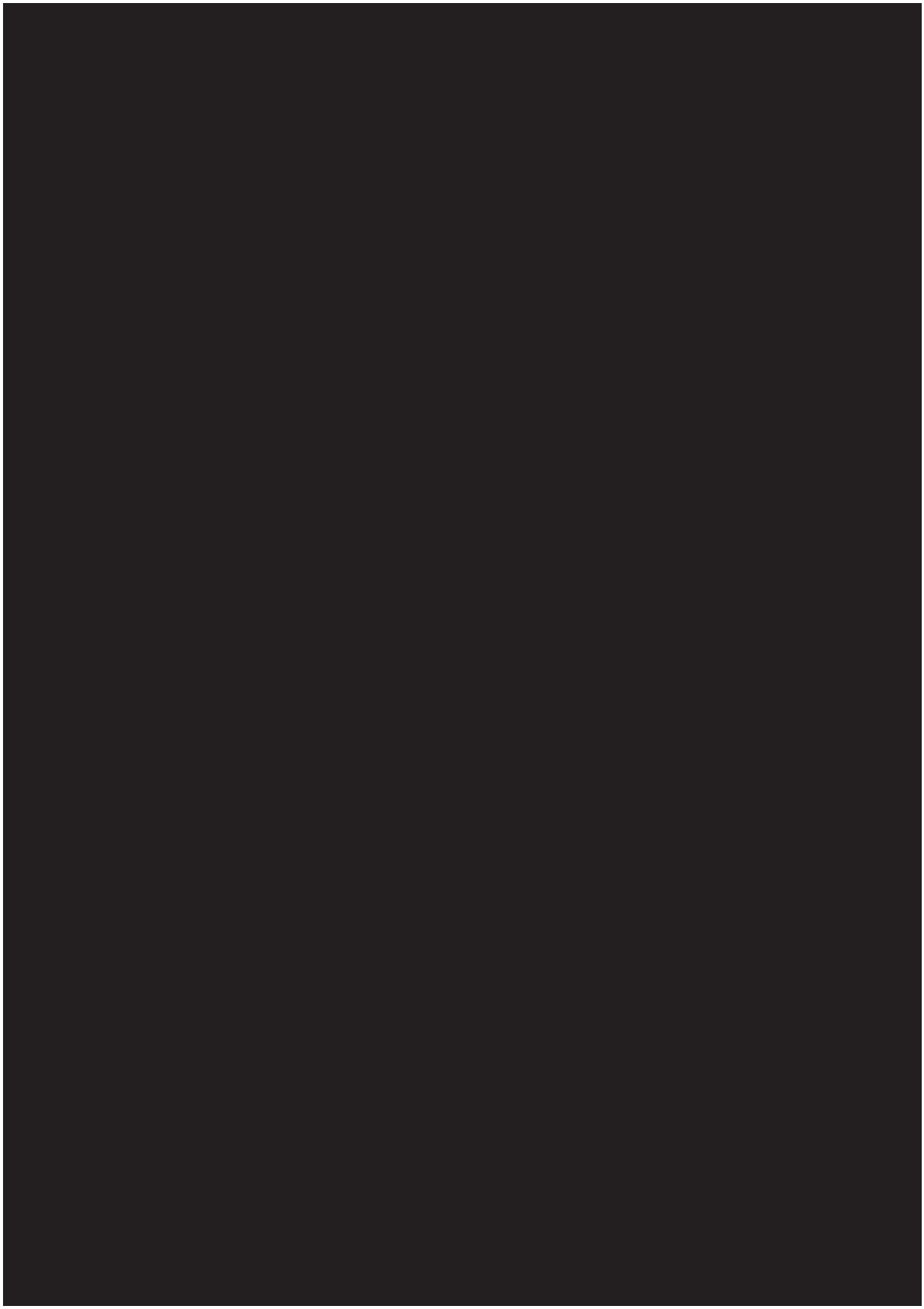
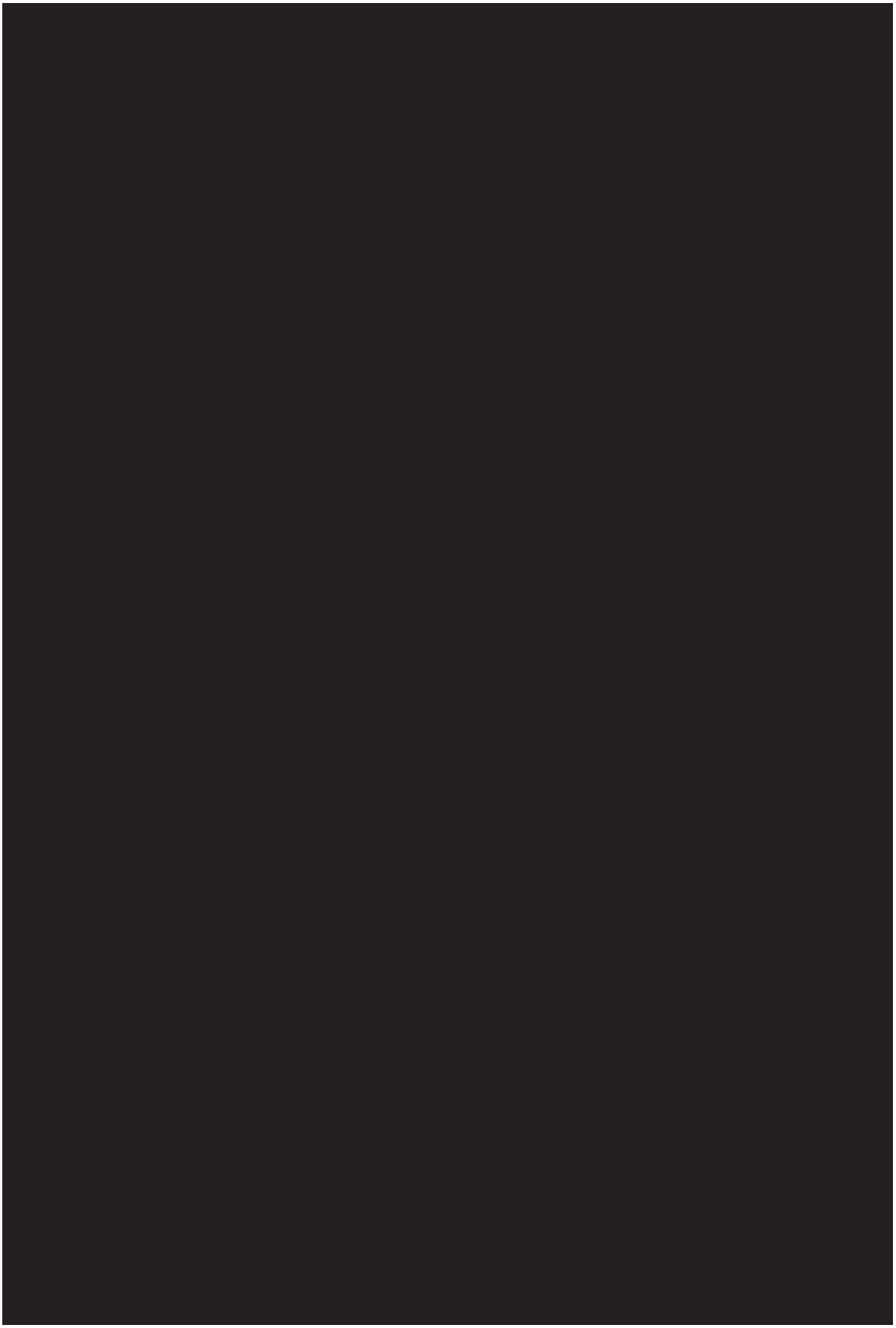
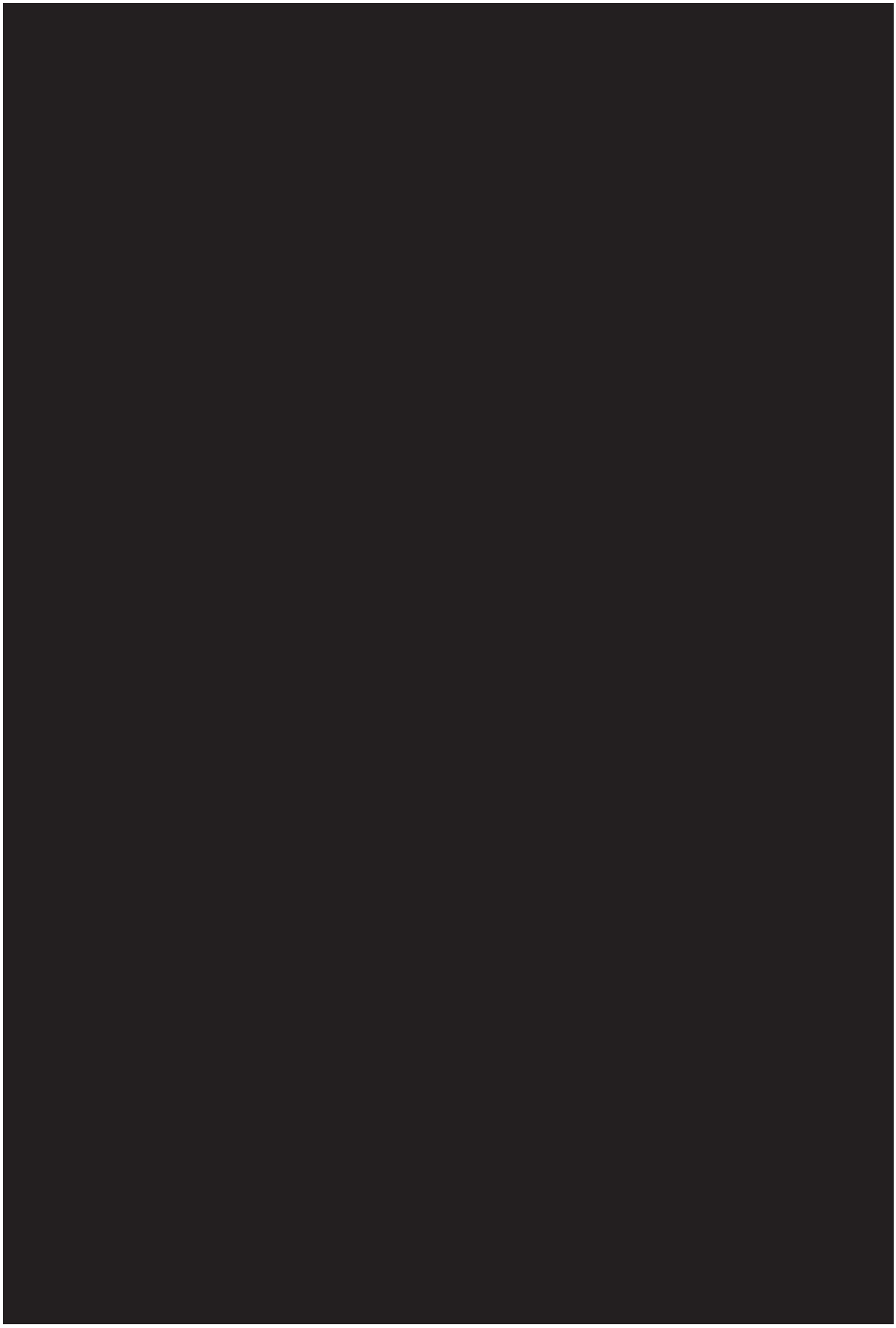
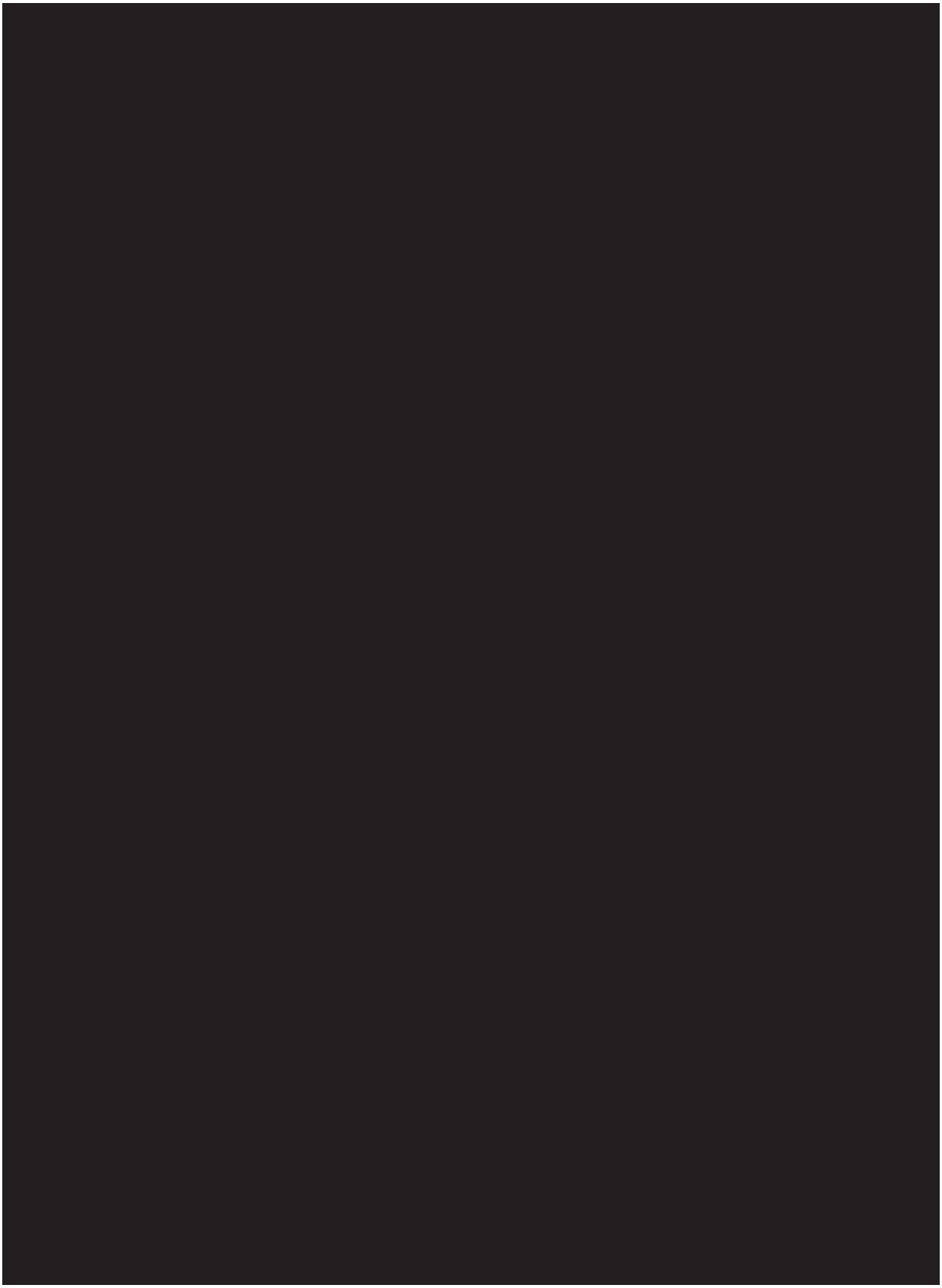


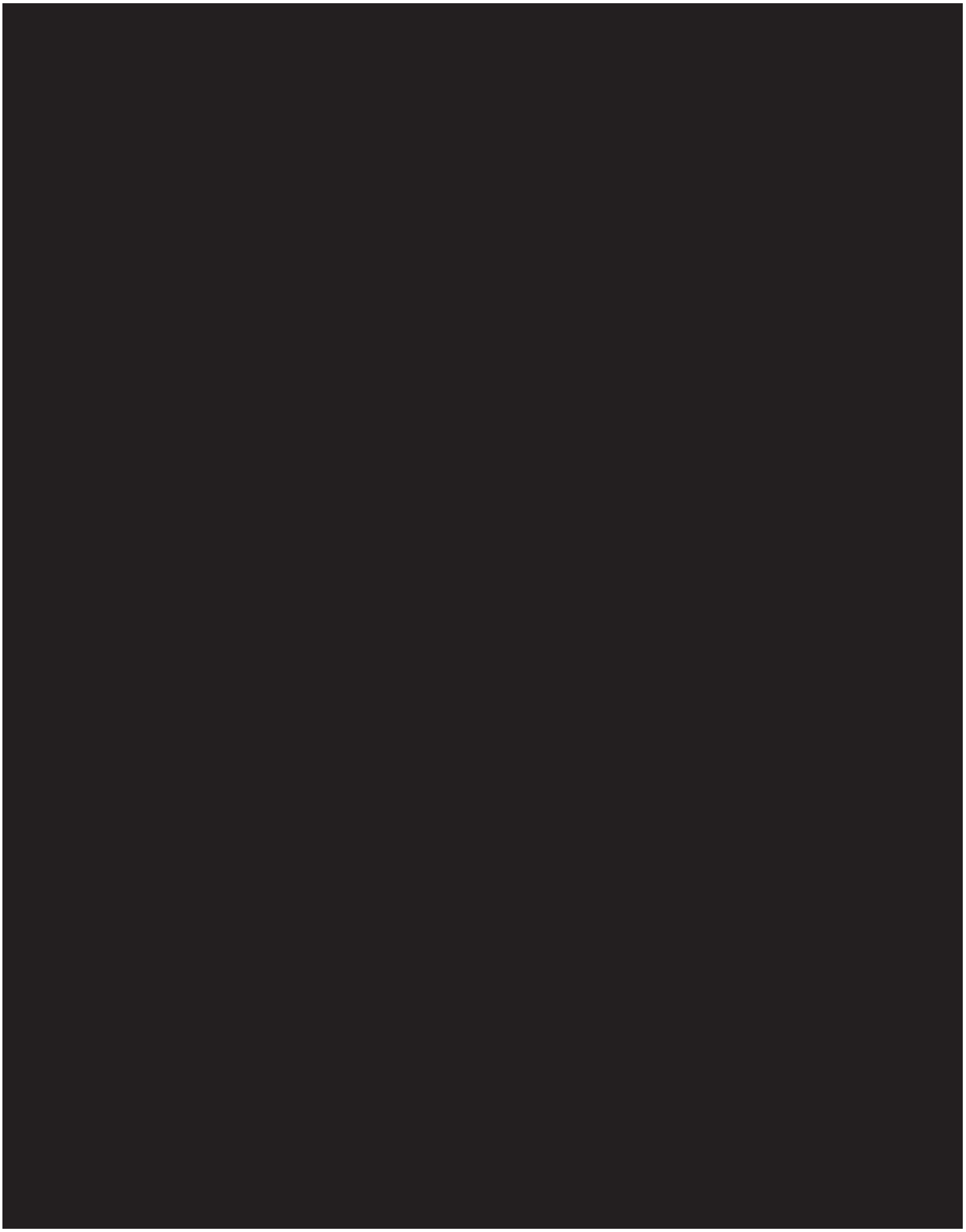




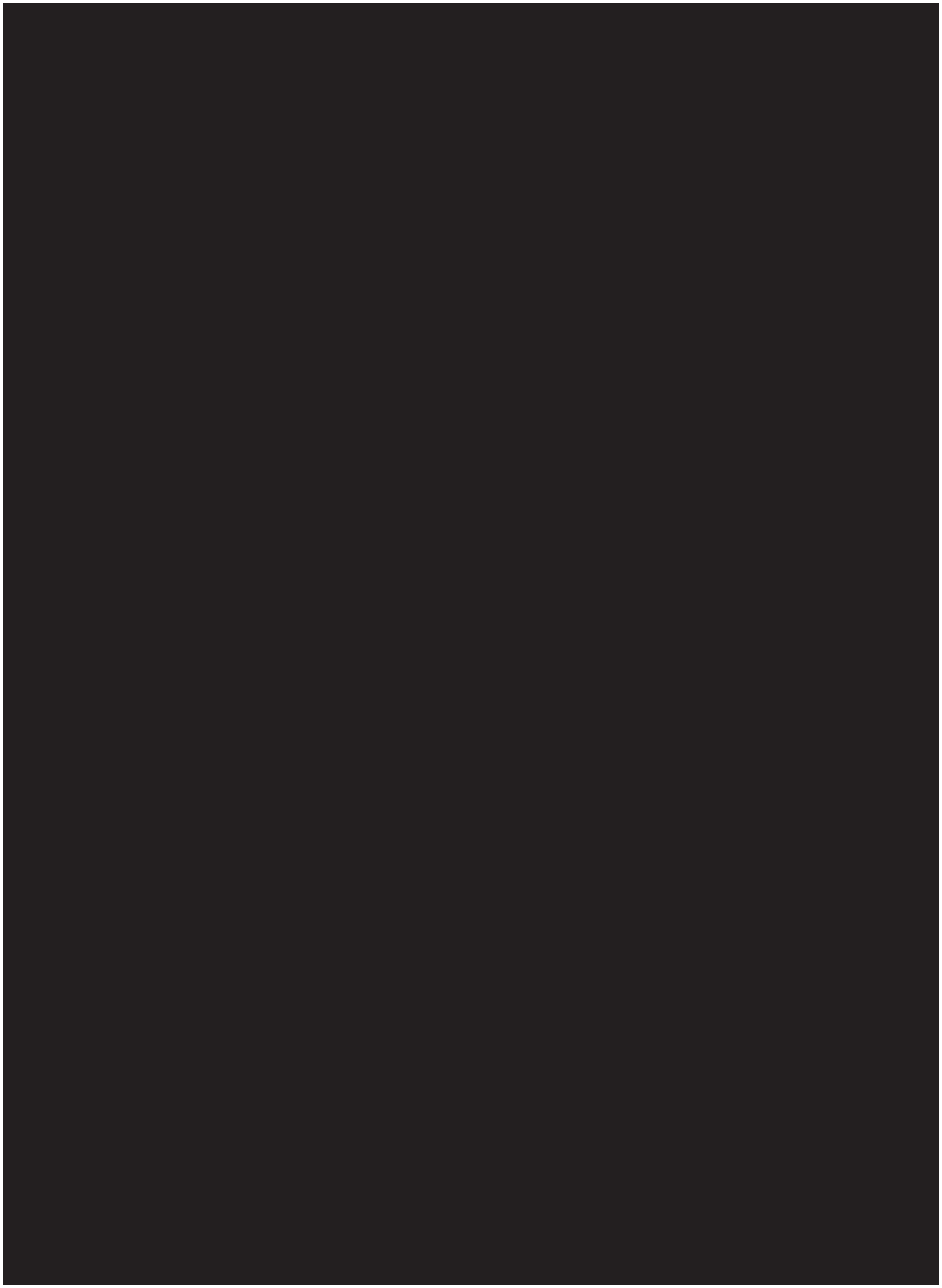


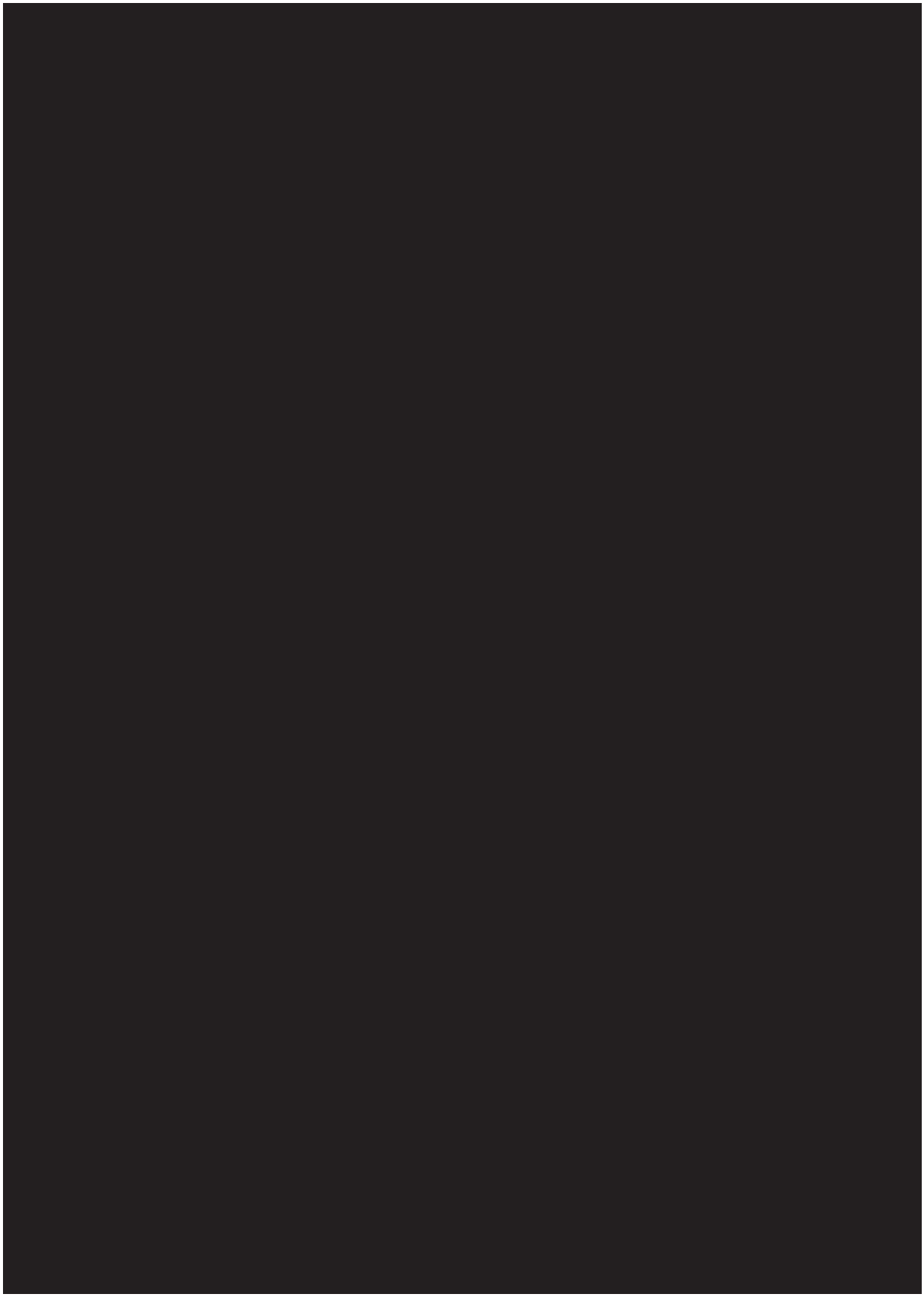






III. **Results**





Substation	Substation	Railroad	Address	ESS#	ComEd System Reconfiguration Required?	Estimated Cost	# of ComEd Lines Requiring Relay Replacements	Estimated Cost of Relay Work	Total ComEd Cost	Comments
[redacted]	FFF	[redacted]	[redacted]	[redacted]	N	$0	2	$136,000	$136,000	
	GG				N	$0	2	$136,000	$136,000	
	A				N	$0	2	$136,000	$136,000	
	GGG				N	$0	2	$136,000	$136,000	
	HH				Y	$33,000	0	$0	$33,000	
	B				N	$0	2	$136,000	$136,000	
	II				N	$0	2	$136,000	$136,000	
	HHH				N	$0	2	$136,000	$136,000	
	III				Y	$89,000	1	$68,000	$157,000	Combined study with AAA. Same line group.
	JJ				N	$0	2	$136,000	$136,000	
	C				N	$0	2	$136,000	$136,000	
	D				N	$0	1	$68,000	$68,000	
	KK				N	$0	2	$136,000	$136,000	
	Z				N	$0	2	$136,000	$136,000	
	LL				N	$0	0	$0	$0	Combined study with XX. Same line group.
	AA				N	$0	2	$136,000	$136,000	
	MM				N	$0	2	$136,000	$136,000	
	E				N	$0	2	$136,000	$136,000	
	NN				N	$0	2	$136,000	$136,000	
	JJJ				Y	$25,000	0	$0	$25,000	
	OO				N	$0	2	$136,000	$136,000	
	PP				N	$0	3	$204,000	$204,000	Combined study with TT. Same line group.
	F				N	$0	2	$136,000	$136,000	
	G				Y	$63,000	2	$136,000	$199,000	Combined study with R. Same line group.
	BB				N	$0	3	$204,000	$204,000	Combined study with DDD. Same line group.
	QQ				N	$0	2	$136,000	$136,000	
	CC				Y	$23,000	2	$136,000	$159,000	Combined study with LLL. Same line group.
	RR				N	$0	2	$136,000	$136,000	
	SS				N	$0	2	$136,000	$136,000	
	KKK				N	$0	2	$136,000	$136,000	
	H				Y	$91,000	2	$136,000	$227,000	
	TT				N	$0	0	$0	$0	Combined study with PP. Same line group.
	LLL				Y	$0	0	$0	$0	Combined study with CC. Same line group.
	I				N	$0	2	$136,000	$136,000	
	J				Y	$3,000	2	$136,000	$139,000	
	K				N	$0	2	$136,000	$136,000	
	UU				N	$0	2	$136,000	$136,000	
	L				N	$0	2	$136,000	$136,000	
	M				N	$0	2	$136,000	$136,000	
	DD				N	$0	2	$136,000	$136,000	
	MMM				N	$0	0	$0	$0	Presently operated radially
	NNN				N	$0	1	$68,000	$68,000	
	VV				N	$0	2	$136,000	$136,000	
	WW				N	$0	2	$136,000	$136,000	

Substation	Substation	Railroad	Address	ESS#	ComEd System Reconfiguration Required?	Estimated Cost	# of ComEd Lines Requiring Relay Replacements	Estimated Cost of Relay Work	Total ComEd Cost	Comments
[redacted]	N	[redacted]			N	$0	2	$136,000	$136,000	
	XX				N	$0	1	$68,000	$68,000	Combined study with LL. Same line group.
	YY				N	$0	0	$0	$0	Presently operated radially
	ZZ				N	$0	2	$136,000	$136,000	
	OOO				N	$0	1	$68,000	$68,000	
	AAA				Y	$0	0	$0	$0	Combined study with III. Same line group.
	BBB				N	$0	1	$68,000	$68,000	
	PPP				N	$0	2	$136,000	$136,000	
	O				N	$0	2	$136,000	$136,000	
	CCC				N	$0	2	$136,000	$136,000	
	EE				N	$0	2	$136,000	$136,000	
	FF				N	$0	2	$136,000	$136,000	
	QQQ				N	$0	0	$0	$0	Presently operated radially
	P				N	$0	1	$68,000	$68,000	
	DDD				N	$0	0	$0	$0	Combined study with BB. Same line group.
	RRR				N	$0	2	$136,000	$136,000	
	EEE				N	$0	1	$68,000	$68,000	
						$0	2	$136,000	$136,000	
	Q				N	$0	3	$204,000	$204,000	Combined study with U. Same line group.
	R				Y	$0	0	$0	$0	Combined study with G. Same line group.
	S				N	$0	1	$68,000	$68,000	
	U				N	$0	0	$0	$0	Combined study with Q. Same line group.
	T				N	$0	2	$136,000	$136,000	
	Y				N	$0	0	$0	$0	Railroad source lines serve no other customers
	V				Y	$43,000	2	$136,000	$179,000	
	W				N	$0	2	$136,000	$136,000	
	X				N	$0	2	$136,000	$136,000	
	SSS				N	$0	0	$0	$0	Railroad source lines serve no other customers
					TOTAL	$370,000		$7,480,000	$7,850,000	

Relay Change Est $68,000

Substation	Substation	Railroad	Address	ESS#	ComEd System Reconfiguration Required?	Estimated Cost	Comments
[redacted]	FFF	[redacted]	[redacted]	[redacted]	N	$0	
	GG				N	$0	
	A				N	$0	
	GGG				N	$0	
	HH				Y	$33,000	
	B				N	$0	
	II				N	$0	
	HHH				N	$0	
	III				Y	$89,000	Combined study with AAA. Same line group.
	JJ				N	$0	
	C				N	$0	
	D				N	$0	
	KK				N	$0	
	Z				N	$0	
	LL				N	$0	Combined study with XX. Same line group.
	AA				N	$0	
	MM				N	$0	
	E				N	$0	
	NN				N	$0	
	JJJ				Y	$25,000	
	OO				N	$0	
	PP				N	$0	Combined study with TT. Same line group.
	F				N	$0	
	G				Y	$63,000	Combined study with R. Same line group.
	BB				N	$0	Combined study with DDD. Same line group.
	QQ				N	$0	
	CC				Y	$23,000	Combined study with LLL. Same line group.
	RR				N	$0	
	SS				N	$0	
	KKK				N	$0	
	H				Y	$91,000	
	TT				N	$0	Combined study with PP. Same line group.
	LLL				Y	$0	Combined study with CC. Same line group.
	I				N	$0	
	J				Y	$3,000	
	K				N	$0	
	UU				N	$0	
	L				N	$0	
	M				N	$0	
	DD				N	$0	
	MMM				N	$0	Presently operated radially
	NNN				N	$0	
	VV				N	$0	
	WW				N	$0	

Substation	Substation	Railroad	Address	ESS#	ComEd System Reconfiguration Required?	Estimated Cost	Comments
[redacted]	N	[redacted]			N	$0	
	XX				N	$0	Combined study with LL. Same line group.
	YY				N	$0	Presently operated radially
	ZZ				N	$0	
	OOO				N	$0	
	AAA				Y	$0	Combined study with III. Same line group.
	BBB				N	$0	
	PPP				N	$0	
	O				N	$0	
	CCC				N	$0	
	EE				N	$0	
	FF				N	$0	
	QQQ				N	$0	Presently operated radially
	P				N	$0	
	DDD				N	$0	Combined study with BB. Same line group.
	RRR				N	$0	
	EEE				N	$0	
						$0	
	Q				N	$0	Combined study with U. Same line group.
	R				Y	$0	Combined study with G. Same line group.
	S				N	$0	
	U				N	$0	Combined study with Q. Same line group.
	T				N	$0	
	Y				N	$0	Railroad source lines serve no other customers
	V				Y	$43,000	
	W				N	$0	
	X				N	$0	
	SSS				N	$0	Railroad source lines serve no other customers
					TOTAL	$370,000	

Key for Acronyms and Device Names in various figures:

351S:	Overcurrent relay made by Schweitzer
52a:	A contact that follows the actual position (open or closed) of the circuit breaker
52b:	A contact that follows the opposite position (open or closed) of the circuit breaker
86b2:	A bus differential relay on bus 2
Auto:	Automatic
Aux:	Auxiliary
BT:	Bus-Tie Breaker
CB:	Circuit Breaker
CC:	Close Command from relay or Circuit Breaker Close Coil
CO6:	A definite time overcurrent relay manufactured by Westinghouse
CT:	Current Transformer (used for protective relaying)
CTR:	Current Transformer Ratio
IRD	An electromechanical directional relay manufactured by Westinghouse
LOR:	Lock Out Relay
PT:	Potential Transformer (used for protective relaying)
SCADA:	Supervisory Control And Data Acquisition (used for remote system control and monitoring)
SEL:	Schweitzer Relay Company
TC:	Trip Command from Relay