ICM Project: 2014 Update | Underground Infrastructure Segment

SUMMARY OF CHANGES FOR 2014 UPDATE

- 2014 ICM work program was revised to reflect the work accomplished to date in 2013 and the continuing priority needs of the system.[1]
- 2014 ICM jobs: Relative to the May 2012 filing, 19 new jobs have been added, two jobs removed, and four jobs revised into two jobs.
- The total cost of the 2014 ICM work program (not including spending related to approved Phase 1 jobs) is $91.06 million. Relative to the May 2012 filing, forecast 2014 capital expenditures have increased by approximately $16 million.

[1] Please see discussion of 2014 work program in Manager's Summary Update, "Overview of Projects and Segments."

I OVERVIEW OF 2014 UPDATE

1. The 2014 Work Program

This segment includes 36 discrete jobs to replace approximately $91.06 million of direct-buried cable with cable in concrete-encased ducts, and air-insulated switchgear units with SF_6-insulated switchgear units in 2014. Also, where cost-effective and prudent, THESL proposes that non-standard submersible transformers will be replaced with new standard submersible transformers as a part of these jobs. The May 2012 filing indicated that there would be 21 jobs in 2014 with a total cost of $74.92 million.

Table 1 below lists the proposed jobs for 2014.

Table 1: List of 2014 jobs

Job Title	Year	Estimated Cost ($M)
Underground Rehabilitation of Feeder SCNAH9M30	2014	**$1.92**
Underground Rehabilitation of Feeder SCNA47M13	2014	**$1.39**
Underground Rehabilitation of Feeder NYSS55F1	2014	**$0.28**
Underground Rehabilitation of Feeder NY55M23	2014	**$2.38**
Underground Rehabilitation of Feeder SCNT47M3	2014	**$2.56**
Underground Rehabilitation of Feeders NY51M8, NY51M6	2014	**$0.34**
Underground Rehabilitation of Feeder NY55M21	2014	**$1.62**
Underground Rehabilitation of Feeder SCNT63M8	2014	**$1.35**
Underground Rehabilitation of Feeder NY51M7	2014	**$0.29**
Underground Rehabilitation of Feeder NY53M27	2014	**$0.37**
Underground Rehabilitation of Feeders NY51M24, NY51M25	2014	**$1.45**
Underground Rehabilitation of Feeder NY53M25	2014	**$1.13**
Underground Rehabilitation of Feeders NY80M30, NY80M29	2014	**$8.84**
Underground Rehabilitation of Feeder NY80M8	2014	**$7.98**
Underground Rehabilitation of Feeder SCNAE5-1M25	2014	**$0.65**

Job Title	Year	Estimated Cost ($M)
Underground Rehabilitation of Feeder NY51M29	2014	**$3.80**
Underground Rehabilitation of Feeders NY85M4, NY85M24	2014	**$3.01**
Underground Rehabilitation of Feeder NY85M7	2014	**$6.64**
Underground Rehabilitation of Feeder SCNA502M23	2014	**$0.36**
Underground Rehabilitation of Feeders SCNAH9M23, SCNAH9M32	2014	**$2.14**
Underground Rehabilitation of Feeder SCNA47M17	2014	**$6.57**
Underground Rehabilitation of Feeder SCXJF1	2014	**$0.16**
Underground Rehabilitation of Feeder SCNT63M12	2014	**$1.72**
Underground Rehabilitation of Feeders NY51M3, NY51M27	2014	**$4.15**
Underground Rehabilitation of Feeder SCNAR26M31	2014	**$6.85**
Underground Rehabilitation of Feeder SCNAR26M34	2014	**$1.06**
Underground Rehabilitation of Feeder SCNT63M4	2014	**$1.90**
Underground Rehabilitation of Feeders NY51M21, NYSS27F1, NYSS27F2, NYSS27F3	2014	**$4.46**
Underground Rehabilitation of Feeder NY51M30	2014	**$1.12**
Underground Rehabilitation of Feeders SCNA502M21, SCNA502M22, SCNA502M28	2014	**$2.21**
Underground Rehabilitation of Feeder SCNAR26M32	2014	**$0.99**
Underground Rehabilitation of Feeder SCNT47M1	2014	**$7.76**
Underground Rehabilitation of Feeder NY53M1	2014	**$1.24**
Underground Rehabilitation of Feeder NY53M9	2014	**$0.73**
Underground Rehabilitation of Feeder SCFJF1	2014	**$0.25**
Underground Rehabilitation of Feeder SCNAR26M22	2014	**$1.39**
	Jobs Total	**$91.06**

2. Detailed Description of Changes

2.1. Jobs Added and Removed

Relative to May 2012 filing, 19 new jobs have been added to the segment and two jobs have been removed. Added jobs are listed below in Table 2. Removed jobs are listed in Table 3.

Table 2: List of Jobs added to the 2014 Job List

Underground Rehabilitation of Feeders NY51M21, NYSS27F1, NYSS27F2, NYSS27F3
Underground Rehabilitation of Feeder NY51M29
Underground Rehabilitation of Feeder NY51M30
Underground Rehabilitation of Feeder NY51M7
Underground Rehabilitation of Feeder NY53M1
Underground Rehabilitation of Feeder NY53M25
Underground Rehabilitation of Feeder NY53M27
Underground Rehabilitation of Feeder NY53M9
Underground Rehabilitation of Feeder NY55M21
Underground Rehabilitation of Feeders NY80M30, NY80M29
Underground Rehabilitation of Feeder NYSS55F1
Underground Rehabilitation of Feeders SCFJF1
Underground Rehabilitation of Feeder SCNA47M17
Underground Rehabilitation of Feeder SCNA502M23
Underground Rehabilitation of Feeder SCNAE5-1M25
Underground Rehabilitation of Feeder SCNAR26M22
Underground Rehabilitation of Feeder SCNAR26M31
Underground Rehabilitation of Feeder SCNAR26M32
Underground Rehabilitation of Feeder SCXJF1

Table 3: List of Jobs removed from the 2014 Job List

Underground Rehabilitation of Feeder NY80M9
Underground Rehabilitation of Feeder NY85M6

2.2. Changes to Job Cost and/or Scope

Cost and/or scope changes have occurred for some of the 2014 ICM jobs originally presented in the May 2012 filing. Changes are listed in Table 4 below.

Table 4: List of Job Changes

Original 2014 Job List		Revised 2014 Job List		
Underground Rehabilitation of Feeder	**Job Cost ($M)**	**Underground Rehabilitation of Feeder(s)**	**Job Cost ($M)**	**Details of Changes**
NY51M24	$0.67	NY51M24, NY51M25	$1.45	2 sub-jobs added
NY51M3	$2.56	NY51M3, NY51M27	$4.15	2 sub-jobs added
NY51M8	$0.32	NY51M8, NY51M6	$0.34	Correction to job title to include all feeders addressed
NY55M23	$2.24	NY55M23	$2.38	Cost revision
NY80M8	$9.51	NY80M8	$7.98	2 sub-jobs removed, 3 sub-jobs added
NY85M24	$2.03	NY85M4, NY85M24	$3.01	6 sub-jobs removed, 2 sub-jobs added; jobs combined to reflect work common to both feeders
NY85M4	$3.31			
NY85M7	$13.83	NY85M7	$6.64	5 sub-jobs removed
SCNA47M13	$0.96	SCNA47M13	$1.39	1 sub-Job added
SCNA502M21	$2.56	SCNA502M21, SCNA502M22, SCNA502M28	$2.21	2 sub-jobs removed; jobs combined to reflect work common to both feeders
SCNA502M22	$0.25			
SCNAH9M23	$2.71	SCNAH9M23, SCNAH9M32	$2.14	2 sub-jobs removed, 1 Sub-Job added
SCNAH9M30	$2.75	SCNAH9M30	$1.92	1 sub-Job removed

Original 2014 Job List		Revised 2014 Job List		
Underground Rehabilitation of Feeder	Job Cost ($M)	Underground Rehabilitation of Feeder(s)	Job Cost ($M)	Details of Changes
SCNAR26M34	$1.60	SCNAR26M34	$1.06	1 sub-Job removed
SCNT47M1	$6.58	SCNT47M1	$7.76	1 sub-Job removed, 1 sub-Job added
SCNT47M3	$0.79	SCNT47M3	$2.56	1 sub-Job removed, 4 sub-jobs added
SCNT63M12	$2.62	SCNT63M12	$1.72	1 sub-Job removed
SCNT63M4	$3.16	SCNT63M4	$1.90	1 sub-Job removed
SCNT63M8	$2.25	SCNT63M8	$1.35	1 sub-Job removed

A total of 24 sub-jobs were removed and 16 sub-jobs added to the 2014 work described in the May 2012 filing.

Detailed descriptions of jobs are provided in Section II, Job Level Updates.

2.3. Updates to specific figures and statements in previously filed schedule

As required, THESL has updated specific figures and statements in the previously filed evidence. Such updates are listed below.

(a) Figure update for (I) Executive Summary, Part 2, “Why the Work is Needed Now”, Page 4, Figure 1: *Updated Figure 1 for 2012 data (Note: Figure 1 is the same as Figure 43a)*

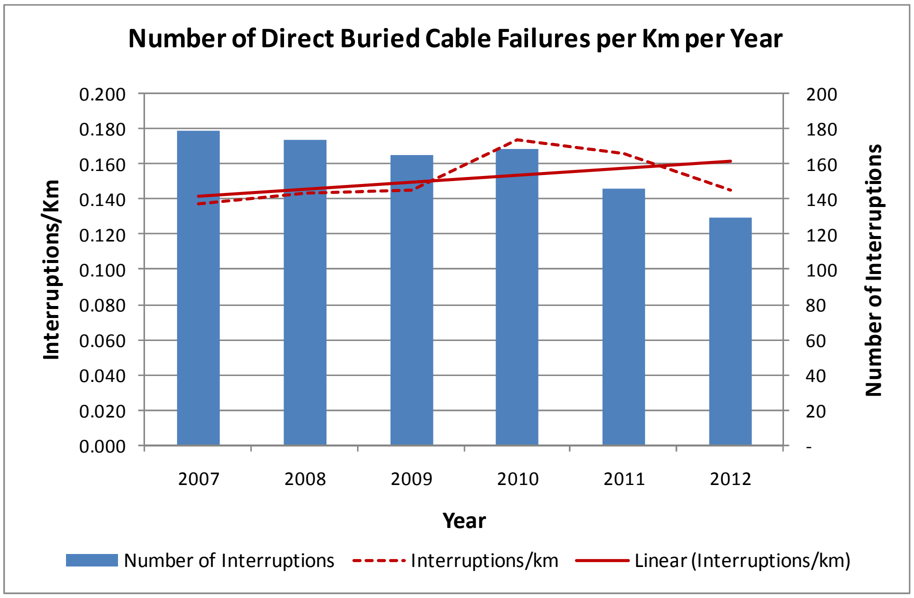


Figure 1: Number of sustained interruptions, attributed to direct-buried cable failures, per kilometre of direct-buried cable remaining in the system

(b) Figure update for (I) Executive Summary, Part 2, "Why the Work is Needed Now", Page 5, Figure 2: Updated Figure 2 to include 2012 Air Insulated Pad-Mounted Switch Failures. (Note: Figure 2 is the same as Figure 47).

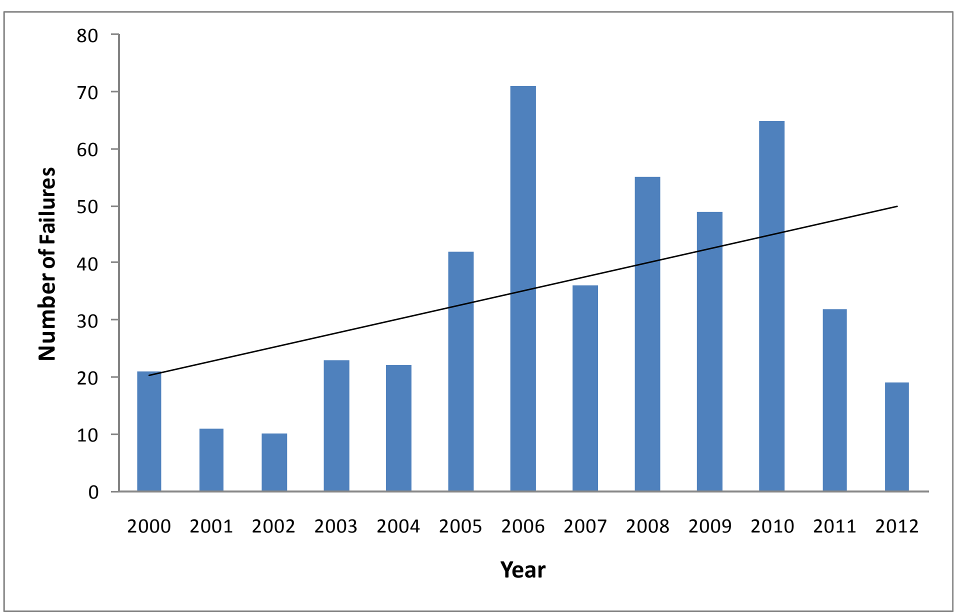


Figure 2: Air-Insulated Pad-Mounted Switch Failure Rate

(c) Figure updates for (III) Need, Part 1.5, Reliability, Pages 116 to 117, Figure 42, Figure 43, Figure 43a, Figure 44 and Figure 45: The figures originally included as Figure 42, Figure 43, Figure 43a, Figure 44 and Figure 45 in the originally filed evidence, have been updated to include 2012 direct-buried cable failures. (Note: Figure 43a is the same as Figure 1)

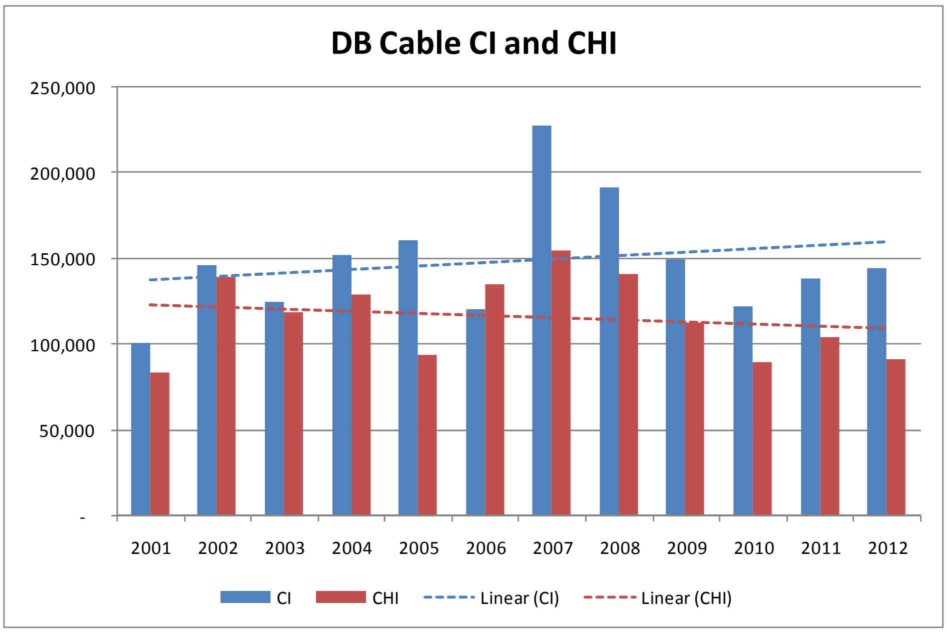


Figure 42: Customer Interruptions (CI) and Customer Hours Interrupted (CHI) due to outages attributed to direct-buried cable failures.

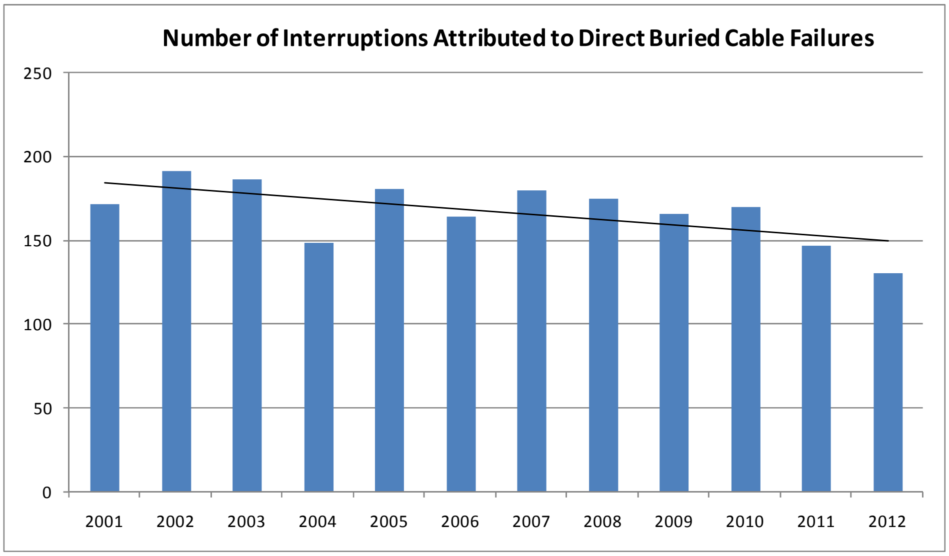


Figure 43: Number of interruptions attributed to direct-buried cable failures. Each interruption increases the Feeders Experiencing Sustained Interruptions (FESI) count.

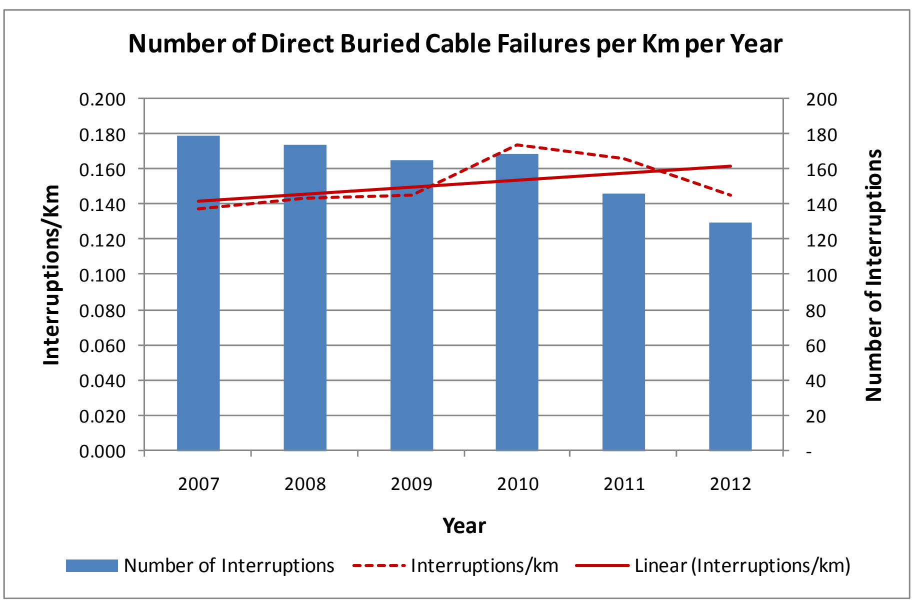


Figure 43a: Number of sustained interruptions, attributed to direct-buried cable failures, per kilometre of direct-buried cable remaining in the system.

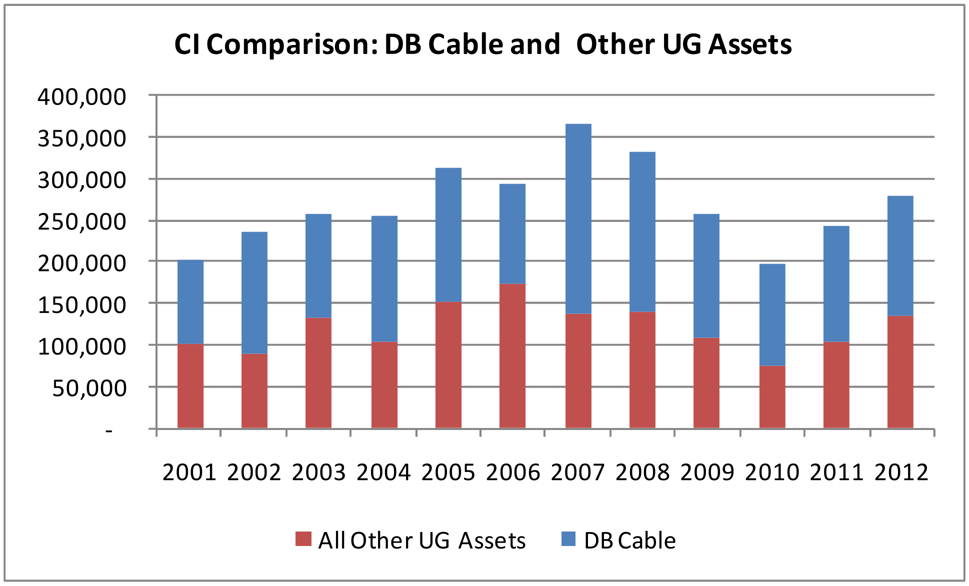


Figure 44: Customer Interruptions (CI) due to direct-buried cable versus all other underground assets.

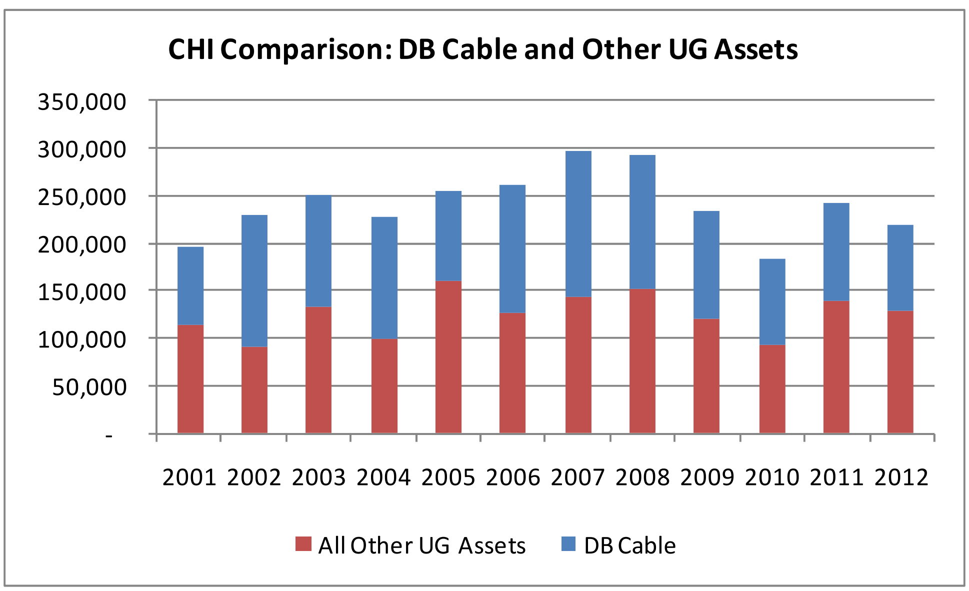


Figure 45: Customer Hours Interrupted (CHI) due to direct-buried cable versus all other underground assets.

(d) Figure update for (III) Need, Section 2, "Air Insulated Pad-Mounted Switchgear", Part 2.1 Overview, Page 120, Figure 47: Updated Figure 47 to include 2012 Air-Insulated Pad-Mounted Switch Failures.

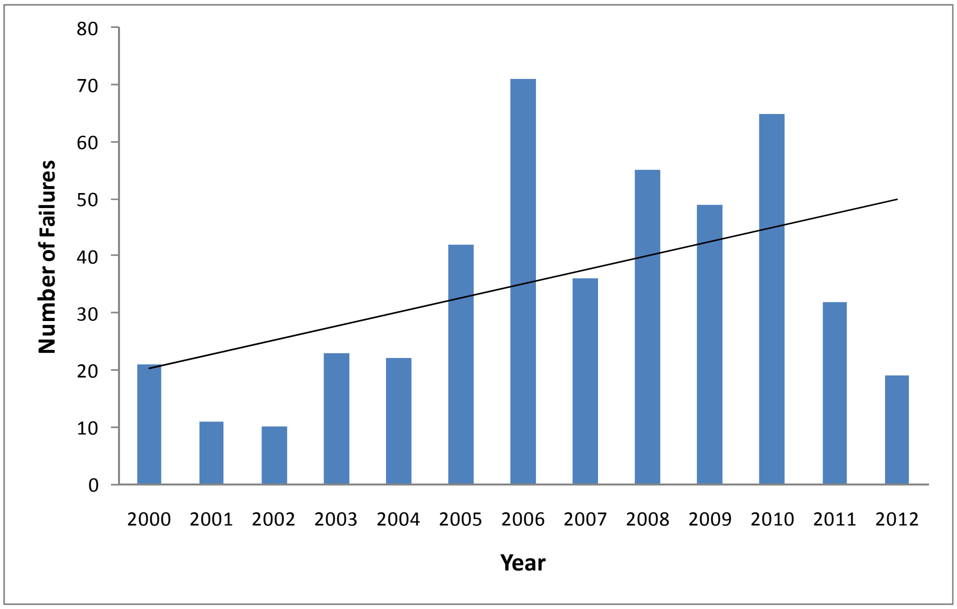


Figure 47: Air-insulated Pad-Mounted Switch Failure Rate

(e) Statement update in (III) Need, Section 2, "Air-Insulated Pad-Mounted Switchgear", Part 2.5 The Solution, Page 124, Lines 20 to 21.

Original statement is: "Over the past five-year period, an average of 55.2 air-insulated pad-mounted switch failures have taken place per year".

Revised statement to cover a time period from 2008 to 2012: "Over the past five-year period, an average of 44.0 air-insulated pad-mounted switch failures have taken place per year. This reduction reflects the reduced number of air-insulated pad-mounted switchgear units in the system."

II JOB-LEVEL UPDATES

1. Underground Rehabilitation of Feeder SCNAH9M30 (E13011 and E14190)

1.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder SCNAH9M30 in order to improve reliability of service and mitigate potential safety risks.

1.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 14

This feeder experienced a very high number of sustained outages in 2012. Also, as evident from Table 5, this feeder has been experiencing high levels of CI and CHI over the past four years. The poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds areas that have experienced underground asset failures.

Table 5: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCNAH9M30				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	8,147	6,796	2,461	6,276
Feeder CHI ***(Cumulative)***	8,175	9,441	3,239	11,378

1.3. Scope of Work

This job replaces both civil and electrical assets. Direct-buried cable, air-insulated switchgear, and non-standard submersible transformers are being replaced in this job with 28kV Aluminum TR-XLPE cable in concrete-encased ducts, SF_6-insulated switchgear, and new submersible transformers.

Table 6: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	1,380m	Primary Cable	1,380m
Submersible Transformers	15	Submersible Transformers	15
Air-insulated Pad-mounted Switchgear	4	SF_6-insulated Pad-mounted Switchgear	4
Air-insulated Vault-installed Switchgear	1	SF_6-insulated Vault-installed Switchgear	1

1.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Markham Road to the east, Brimley Road to the west, Eglinton Avenue East to the north, and Kingston Road to the south. A map of the job area appears in Figure 9 below.

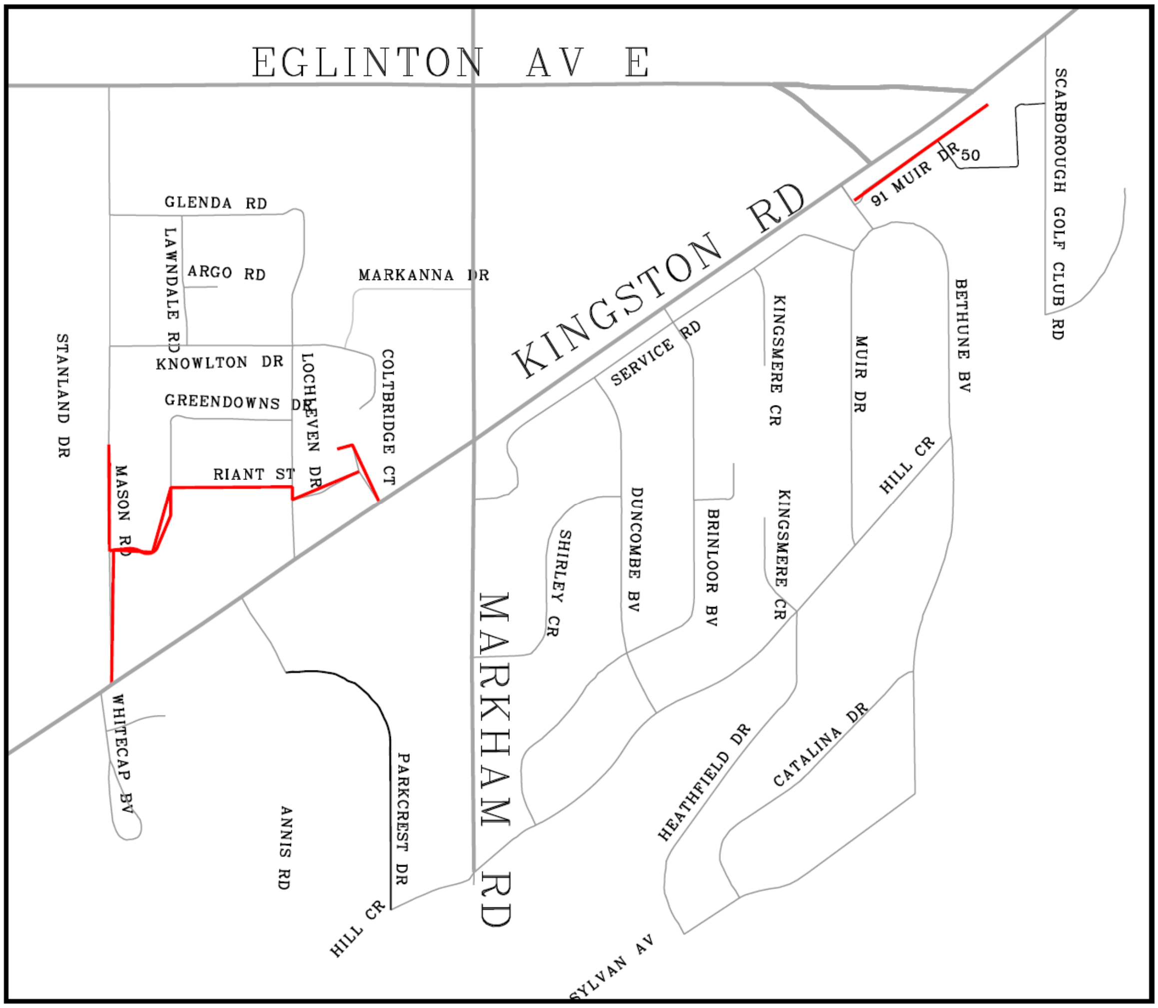


Figure 9: Map of Underground Rehabilitation of Feeder SCNAH9M30

1.5. Required Capital Costs

There are two phases to this job with a total estimated cost of $1.92M.

Table 7: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
20525	E13011 UG Rebuild Muir Dr – Golf Club SCAH9M30 (Electrical)	$0.38
23297	E14190 UG Rebuild Kingston Mason H9M30 (Civil)	$1.54
	Total:	**$1.92**

2. Underground Rehabilitation of Feeder SCNA47M13 (E12228, E12276 and E13015)

2.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder SCNA47M13 in order to improve reliability of service and mitigate potential safety risks.

2.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 11

As evident from Table 8, this feeder has been experiencing increasingly poor reliability over the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds areas that have experienced underground asset failures.

Table 8: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCNA47M13				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	4,889	10,328	17,600	8,846
Feeder CHI ***(Cumulative)***	2,653	11,821	12,499	6,931

2.3. Scope of Work

This job replaces direct-buried cable and non-standard submersible transformers with 28kV Aluminum TR-XLPE cable in concrete-encased ducts and new submersible transformers.

Table 9: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	10,847m	Primary Cable	10,847m
Submersible Transformers	70	Submersible Transformers	70

2.4. Map and Locations

This job replaces direct buried cable and associated transformers in the area bordered by Port Union Road to the east, Meadowvale Road to the west, Sheppard Avenue East to the north, and Lawrence Avenue East to the south. A map of the job area appears in Figure 10 below.

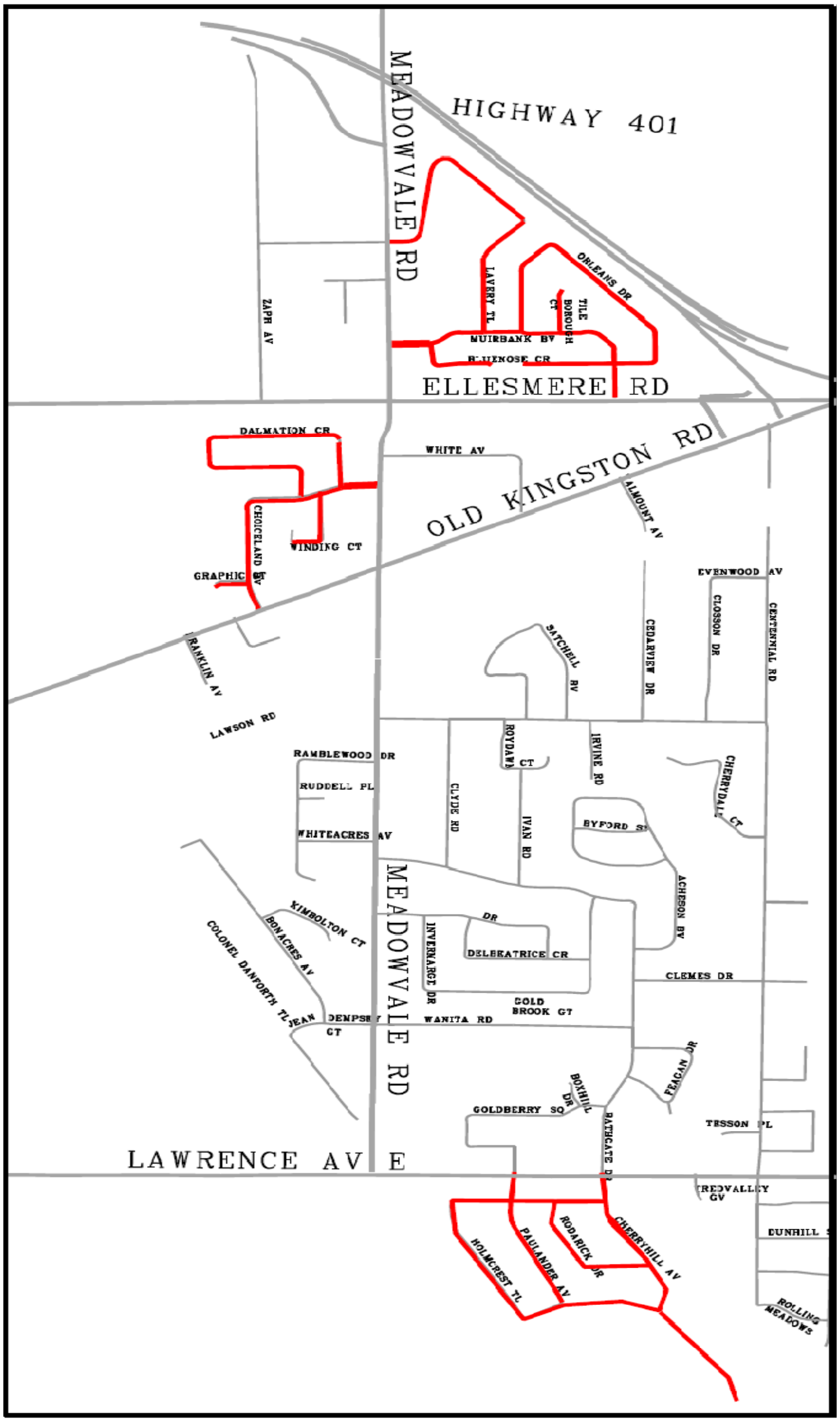


Figure 10: Map of Underground Rehabilitation of Feeder SCNA47M13

2.5. Required Capital Costs

There are three phases to this job with a total estimated cost of $1.39M.

Table 10: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
20067	E12228 SC47M13 Dalmatian/Choiceland Rebuild (Electrical)	$0.69
24636	E12276 Muirbank 47M13 UG Rebuild (Electrical)	$0.23
20638	E13015 Holmcrest 47M13 UG Rebuild (Electrical)	$0.47
	Total:	**$1.39**

3. Underground Rehabilitation of Feeder NYSS55F1 (W14667)

3.1. Objective

The objective of this job is to proactively replace underground assets on 13.8 kV feeder NYSS55F1 in order to improve reliability of service and mitigate potential safety risks.

3.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 10

As evident from Table 11, this feeder has been experiencing poor reliability over the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds areas that have experienced underground asset failures.

Table 11: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NYSS55F1				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	22	90	816	4,798
Feeder CHI ***(Cumulative)***	267	327	1,151	2,921

3.3. Scope of Work

This job replaces direct-buried cable and non-standard submersible transformers with 28kV Aluminum TR-XLPE cable in concrete-encased ducts and new submersible transformers.

Table 12: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	242m	Primary Cable	242m
Submersible Transformers	2	Submersible Transformers	2

3.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Jane Street to the east, Weston Road to the west, Steeles Avenue West to the north, and Finch Avenue West to the south. A map of the job area appears in Figure 11 below.

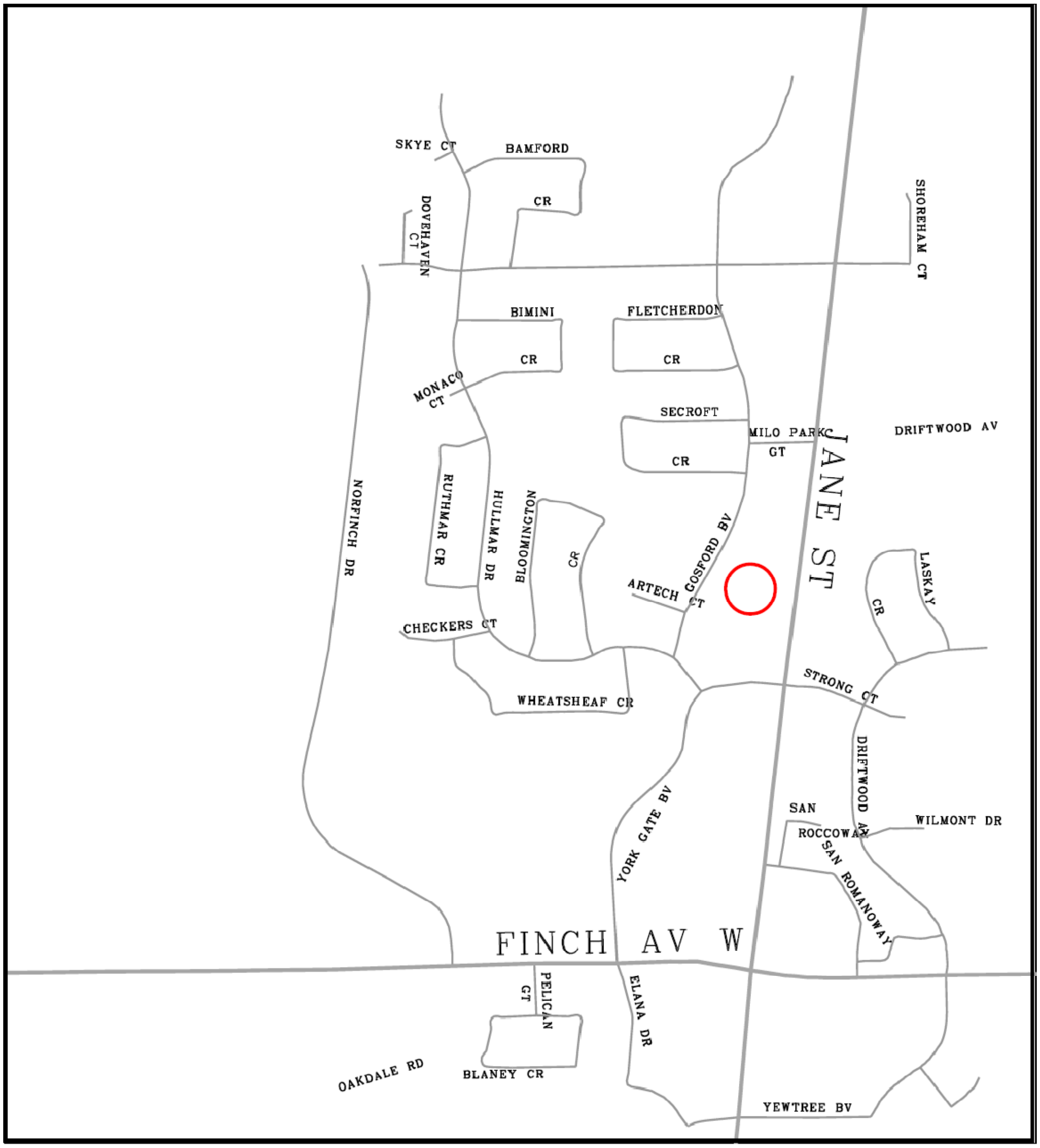


Figure 11: Map of Underground Rehabilitation of Feeder NYSS55F1

3.5. Required Capital Costs

There is a single phase to this job with a total estimated cost of $0.28M.

Table 13: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
28599	W14667 P01- Jane/Gosford UG Rebuild NYSS55F1	$0.28
	Total:	**$0.28**

4. Underground Rehabilitation of Feeder NY55M23 (W14284 and W14350)

4.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY55M23 in order to improve reliability of service and mitigate potential safety risks.

4.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 9

As evident from Table 14, this feeder has experienced poor reliability over the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds areas that have experienced underground asset failures.

Table 14: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NY55M23				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	115	6,533	3,170	1,679
Feeder CHI ***(Cumulative)***	455	1,367	915	2,181

4.3. Scope of Work

This job replaces direct-buried cable and non-standard submersible transformers with 28kV Aluminum TR-XLPE cable in concrete-encased ducts and new submersible transformers.

Table 15: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	1,667m	Primary Cable	1,667m
Submersible Transformers	4	Submersible Transformers	4

4.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Jane Street to the east, Weston Road to the west, Highway 401 to the north, and Lawrence Avenue West to the south. A map of the job area appears in Figure 12 below.

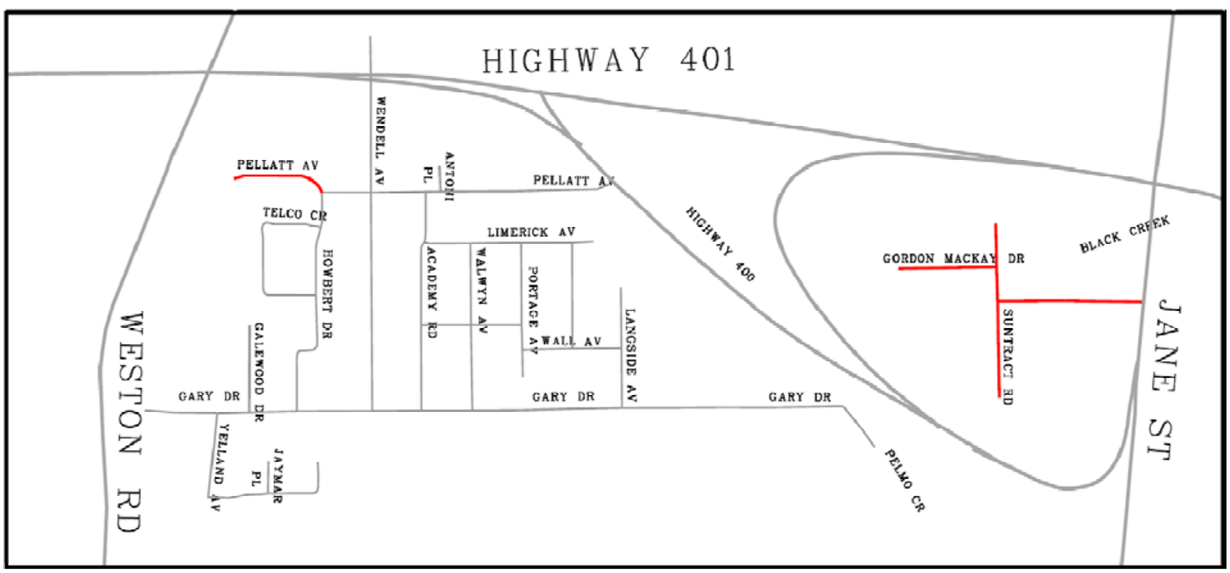


Figure 12: Map of Underground Rehabilitation of Feeder NY55M23

4.5. Required Capital Costs

There are two phases to this job with a total estimated cost of $2.38M.

1 **Table 16: Required Capital Costs**

Job Estimate Number	Job Phase	Estimated Cost ($M)
23947	W14284 Pellatt Ave UG Direct-buried Rebuild NY55M23 Phase 1	$1.13
24386	W14350 P01 Gordon Mackay UG Rebuild and OH Rehab Finch TS (Civil/Electrical)	$1.25
	Total:	**$2.38**

5. Underground Rehabilitation of Feeder SCNT47M3 (E11628, E11629, E12234 and E12235)

5.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder SCNT47M3 in order to improve reliability of service and mitigate potential safety risks.

5.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 9

As evident from Table 17, this feeder has been experiencing very poor reliability over the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds areas that have experienced underground asset failures.

Table 17: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCNT47M3				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	47,262	102,883	12,750	41,718
Feeder CHI ***(Cumulative)***	21,607	45,729	8,963	24,262

5.3. Scope of Work

This job replaces direct-buried cable, air-insulated switchgear, and non-standard submersible transformers with 28kV Aluminum TR-XLPE cable in concrete-encased ducts, SF_6-insulated switchgear, and new submersible transformers.

Table 18: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	14,516m	Primary Cable	14,516m
Submersible Transformers	70	Submersible Transformers	70
Air-insulated Pad-mounted Switchgear	4	SF_6-insulated Pad-mounted Switchgear	4
Air-insulated Vault-installed Switchgear	16	SF_6-insulated Vault-installed Switchgear	16

5.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Swells Road to the east, Neilson Road to the west, Finch Avenue East to the north, and Sheppard Avenue East to the south. A map of the job area appears in Figure 13 below.

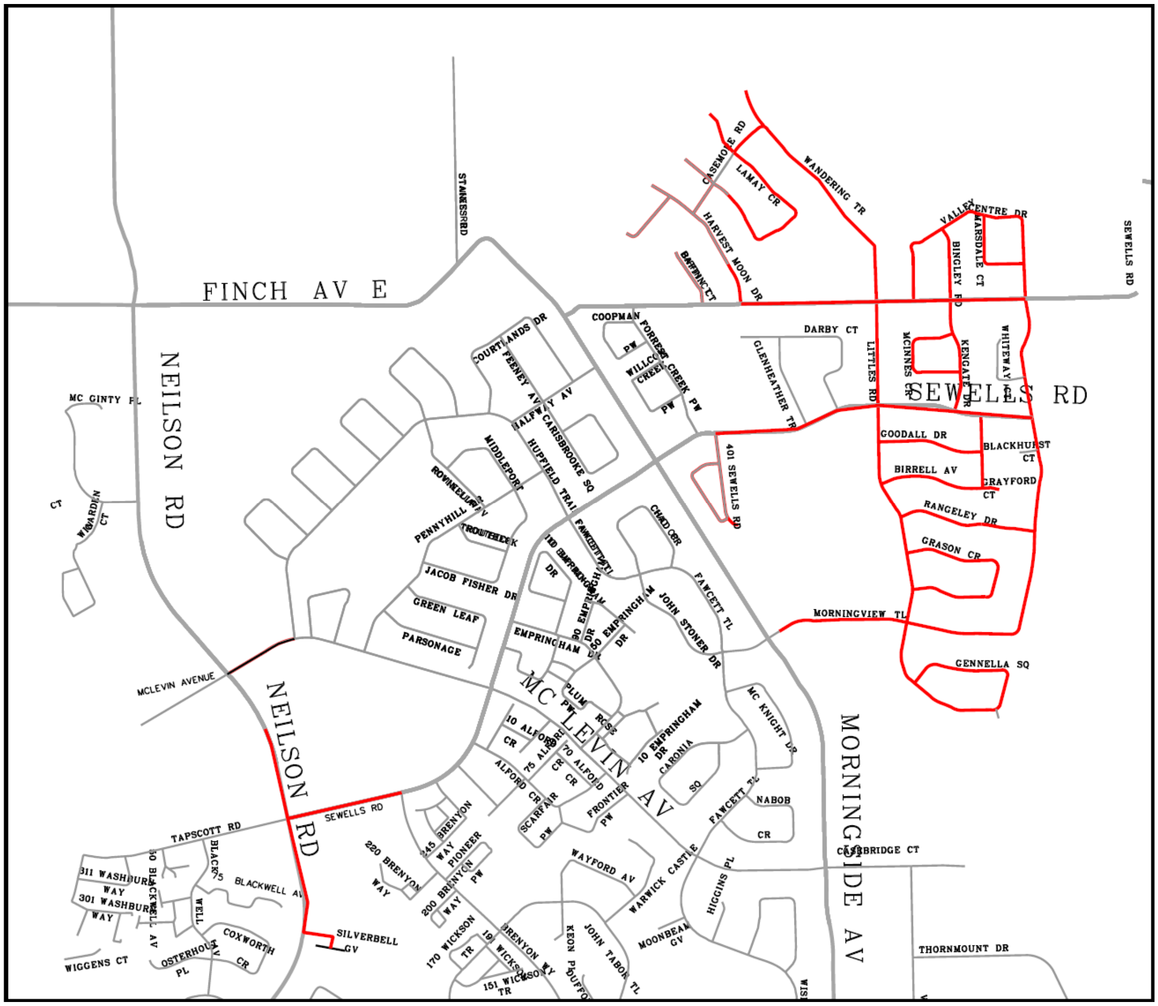


Figure 13: Map of Underground Rehabilitation of Feeder SCNT47M3

5.5. Required Capital Costs

There are four phases to this job with a total estimated cost of $2.56M.

Table 19: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost($M)
19623	E11628 Morningview SCNT47M3 UG Rebuild Phase 1 (Electrical)	$0.68
19627	E11629 Morningview SCNT47M3 UG Rebuild Phase 2 (Electrical)	$0.84
20169	E12234 Rebuild Neilson Industrial NT47M3 Phase 3 (Civil)	$0.74
20170	E12235 Rebuild Neilson Industrial NT47M3 Phase 3 (Electrical)	$0.30
	Total:	**$2.56**

6. Underground Rehabilitation of Feeders NY51M8 and NY51M6 (E13077)

6.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeders NY51M8 and NY51M6 in order to improve reliability of service and mitigate potential safety risks.

6.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 16

As evident from Table 20, feeders NY51M8 and NY51M6 have been experiencing poor reliability over the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds areas that have experienced underground asset failures.

Table 20: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NY51M8 and NY51M6				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	13,223	7,408	7,888	4,573
Feeder CHI ***(Cumulative)***	9,779	5,571	9,218	2,925

6.3. Scope of Work

This job replaces direct-buried cable with 28kV Aluminum TR-XLPE cable in concrete-encased ducts.

Table 21: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	1,983m	Primary Cable	1,983m

6.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Burbank Dr to the east, Bayview Avenue to the west, Finch Avenue to the north, and Sheppard Avenue East to the south. A map of the job area appears in Figure 14 below.

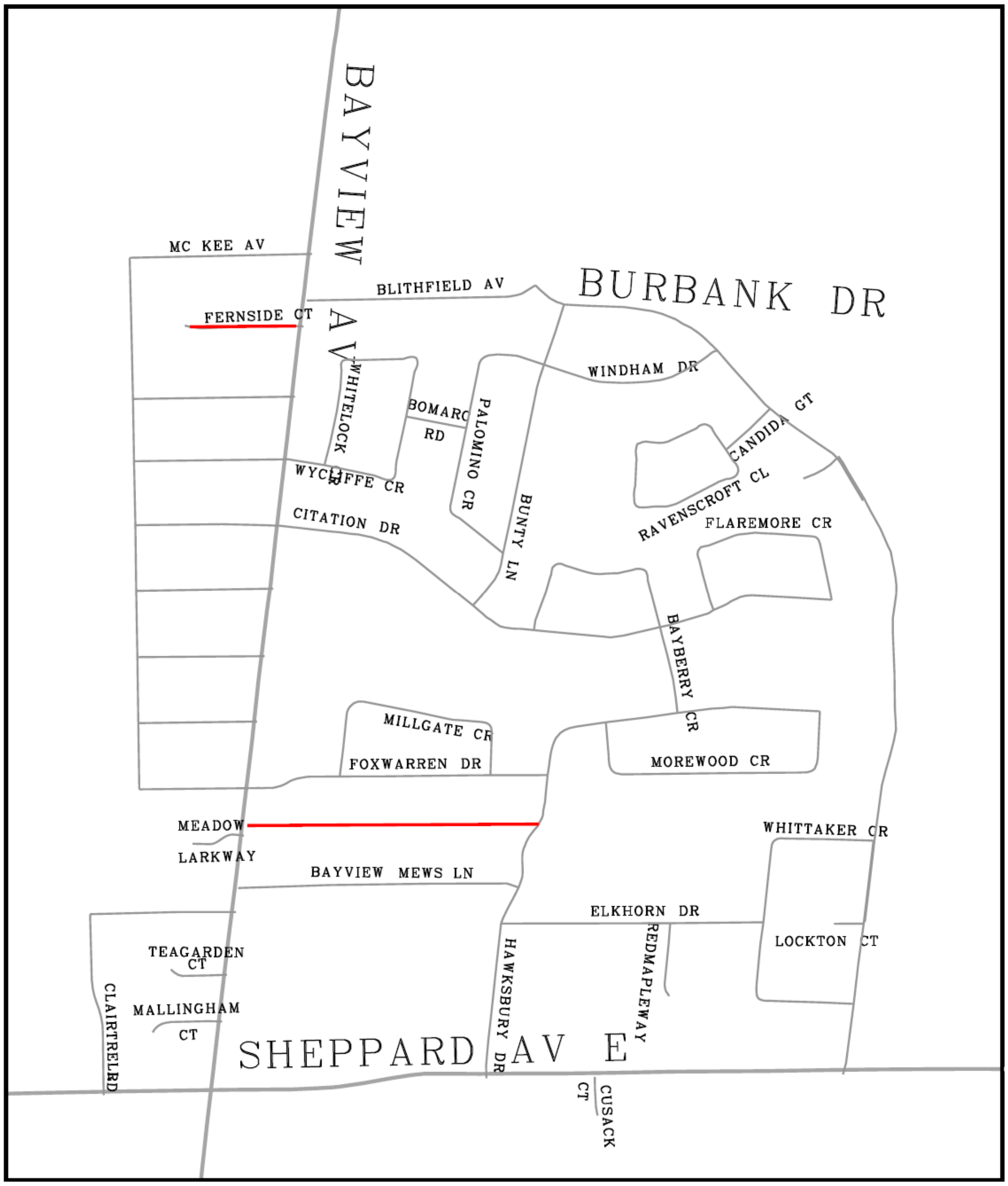


Figure 14: Map of Underground Rehabilitation of Feeders NY51M8 and NY51M6

6.5. Required Capital Costs

There is a single phase to this job with a total estimated cost of $0.34M.

Table 22: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
21297	E13077 NY51M8, NY51M6 Direct-buried cable replacement between Leslie & Bayview (Electrical)	$0.34
	Total:	**$0.34**

7. Underground Rehabilitation of Feeder NY55M21 (W13162)

7.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY55M21 in order to improve reliability of service and mitigate potential safety risks.

7.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 7

While the CI and CHI levels for this feeder are not very high, this feeder experienced a high number of sustained outages in 2012. This poor reliability is mostly due to failures of underground assets, primarily direct-buried cable. This job rebuilds an area that has experienced underground asset failures.

Table 23: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NY55M21				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	844	1,254	189	233
Feeder CHI ***(Cumulative)***	753	716	381	860

7.3. Scope of Work

This job replaces direct-buried cable and non-standard submersible transformers with 28kV Aluminum TR-XLPE cable in concrete-encased ducts and new submersible transformers.

Table 24: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	29m	Primary Cable	29m
Submersible Transformers	6	Submersible Transformers	6

7.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Bartor Road to the east, Weston Road to the west, Sheppard Avenue West to the north, and Wilson Avenue to the south. A map of the job area appears in Figure 15 below.

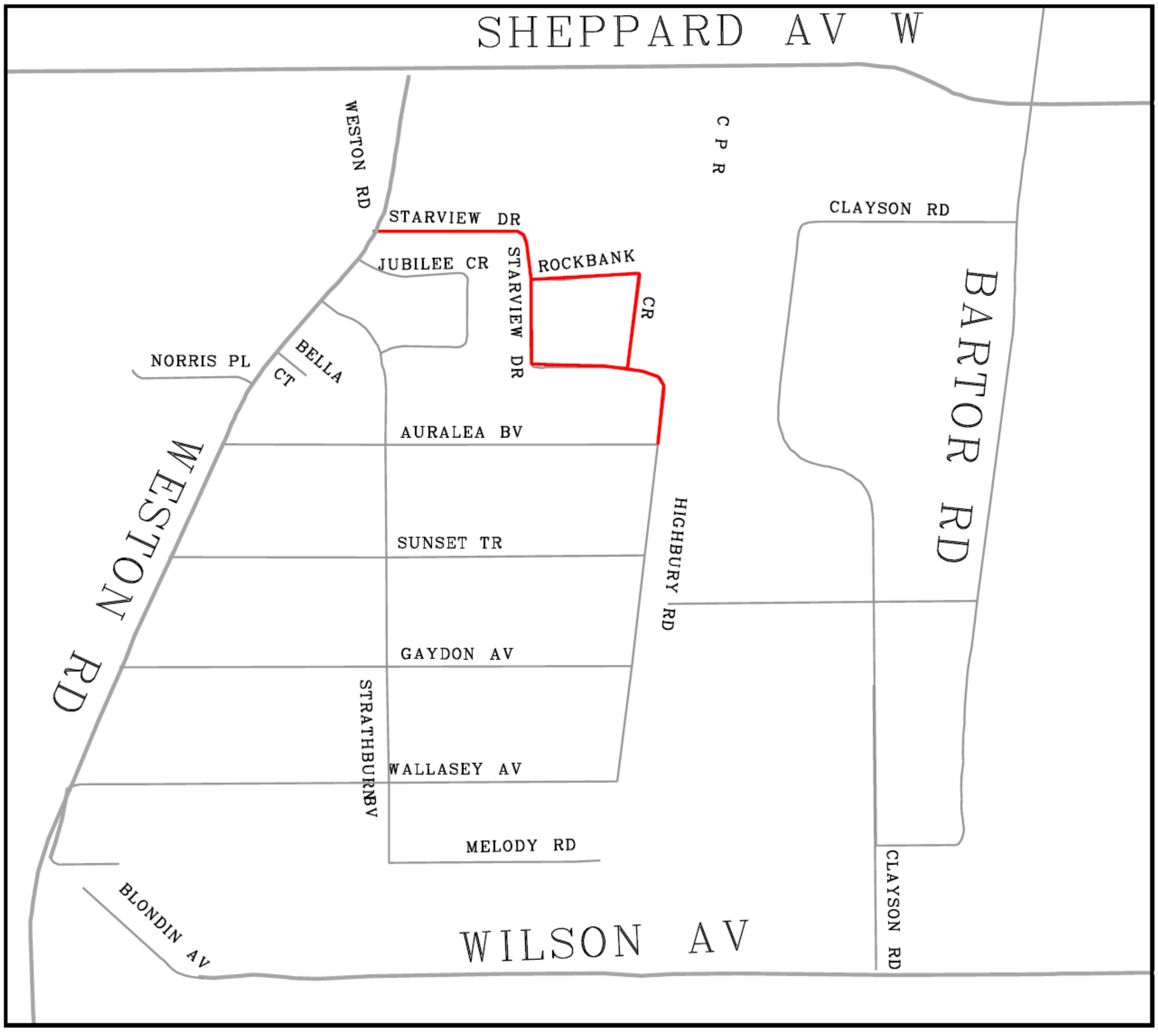


Figure 15: Map of Underground Rehabilitation of Feeder NY55M21

7.5. Required Capital Costs

There is a single phase to this job with a total estimated cost of $1.62M.

Table 25: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
21731	W13162 Starview/Rockbank UG Rehab NY55M21	$1.62
	Total:	**$1.62**

8. Underground Rehabilitation of Feeders SCNT63M8 (E13042, E13043, E14010)

8.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder SCNT63M8 in order to improve reliability of service and mitigate potential safety risks.

8.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 7

As evident from Table 26, this feeder has been experiencing poor reliability in the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds remaining areas that have experienced underground asset failures.

Table 26: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCNT63M8				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	11,495	227	5,313	846
Feeder CHI ***(Cumulative)***	5,276	659	5,879	3,230

8.3. Scope of Work

This job replaces direct-buried cable, air-insulated switchgear, and non-standard submersible transformers with 28kV Aluminum TR-XLPE cable in concrete-encased ducts, SF_6-insulated switchgear, and submersible transformers.

Table 27: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	4,838 m	Primary Cable	4,838 m
Submersible Transformers	25	Submersible Transformers	25
Air-insulated Pad-mounted Switchgear	5	SF_6-insulated Pad-mounted Switchgear	5

8.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Middlefield Road to the east, Brimley Road to the west, Steeles Avenue East to the north, and Finch Avenue East to the south. A map of the job area appears in Figure 16 below.

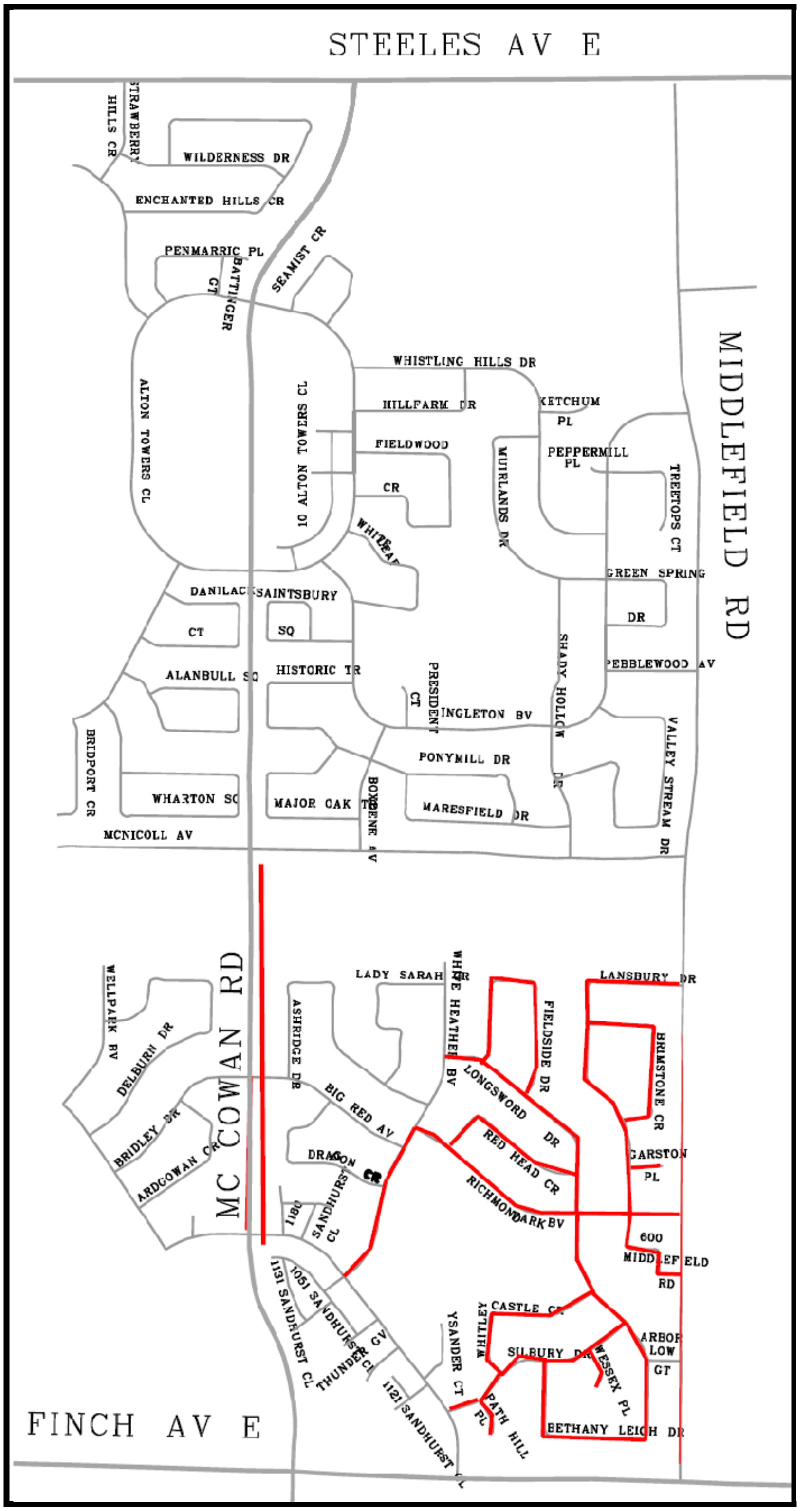


Figure 16: Map of Underground Rehabilitation of Feeders SCNT63M8

8.5. Required Capital Costs

There are three phases to this job with a total estimated cost of $1.35M.

Table 28: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
21356	E13042 FESI UG Rebuild NT63M8 Revlis Sub Part 1- Electrical SCNT63M8	$0.55
21357	E13043 FESI UG Rebuild NT63M8 Revlis Sub Part 2-Electrical SCNT63M8	$0.43
21865	E14010 Rebuild UG Trunk NT63M8 M11 McCowan-Electrical	$0.37
	Total:	**$ 1.35**

9. Underground Rehabilitation of Feeder NY51M7 (E13074)

9.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY51M7 in order to improve reliability of service and mitigate potential safety risks.

9.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 6

As evident from Table 29, this feeder has been experiencing increasingly poor reliability over the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds areas that have experienced underground asset failures.

Table 29: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NY51M7				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	5,466	9,764	3,126	7,916
Feeder CHI ***(Cumulative)***	1,783	3,676	1,728	4,921

9.3. Scope of Work

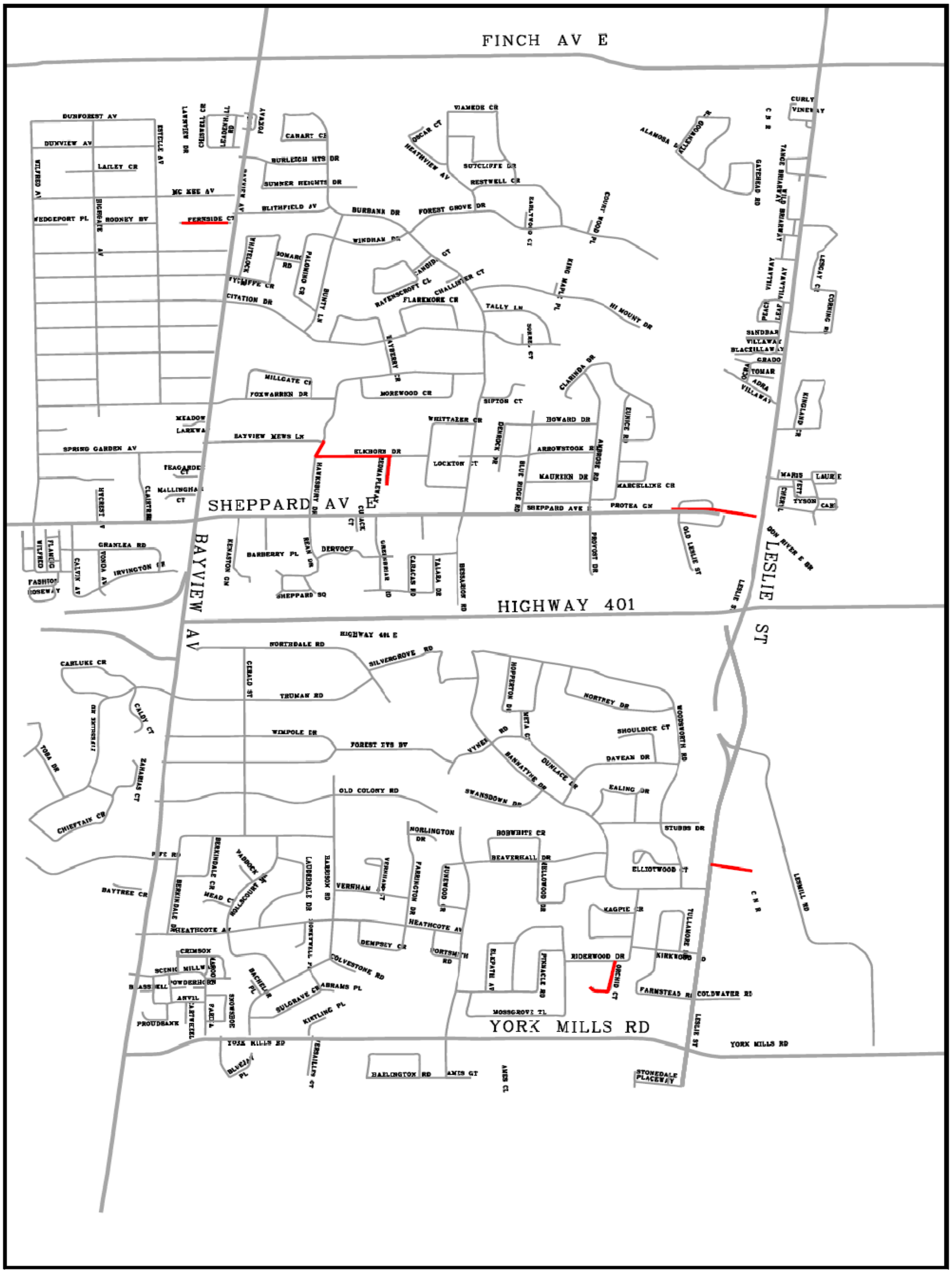
This job replaces direct-buried cable with 28kV Aluminum TR-XLPE cable in concrete-encased ducts.

Table 30: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	2,366m	Primary Cable	2,366m

9.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Leslie Street to the east, Bayview Avenue to the west, Finch Avenue to the north, and York Mills Road to the south. A map of the job area appears in Figure 17 below.



1 **Figure 17: Map of Underground Rehabilitation of Feeder NY51M7**

9.5. Required Capital Costs

There is a single phase to this job with a total estimated cost of $0.29M.

Table 31: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
21290	E13074 NY51M7 Replacement of Direct-buried cables between Leslie & Bayview (Electrical)	$0.29
	Total:	**$0.29**

10. Underground Rehabilitation of Feeder NY53M27 (E13616)

10.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY53M27 in order to improve reliability of service and mitigate potential safety risks.

10.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 6

As evident from Table 32, this feeder has been experiencing increasingly poor reliability over the past two years. This poor reliability is mostly due to failures of underground assets, primarily direct-buried cable. This job rebuilds an area of the feeder that has experienced underground asset failures.

Table 32: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NY53M27				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	2,008	155	3,474	3,782
Feeder CHI ***(Cumulative)***	770	346	864	8,047

10.3. Scope of Work

This job replaces direct-buried cable and air-insulated switchgear with 28kV Aluminum TR-XLPE cable in concrete-encased ducts and SF_6-insulated switchgear.

Table 33: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	911 m	Primary Cable	911 m
Air-insulated Pad-mounted Switchgear	1	SF_6-insulated Pad-mounted Switchgear	2

10.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Don Mills Road to the east, Leslie Street to the west, Lawrence Avenue East to the north, and Eglinton Avenue East to the south. A map of the job area appears in Figure 18 below.

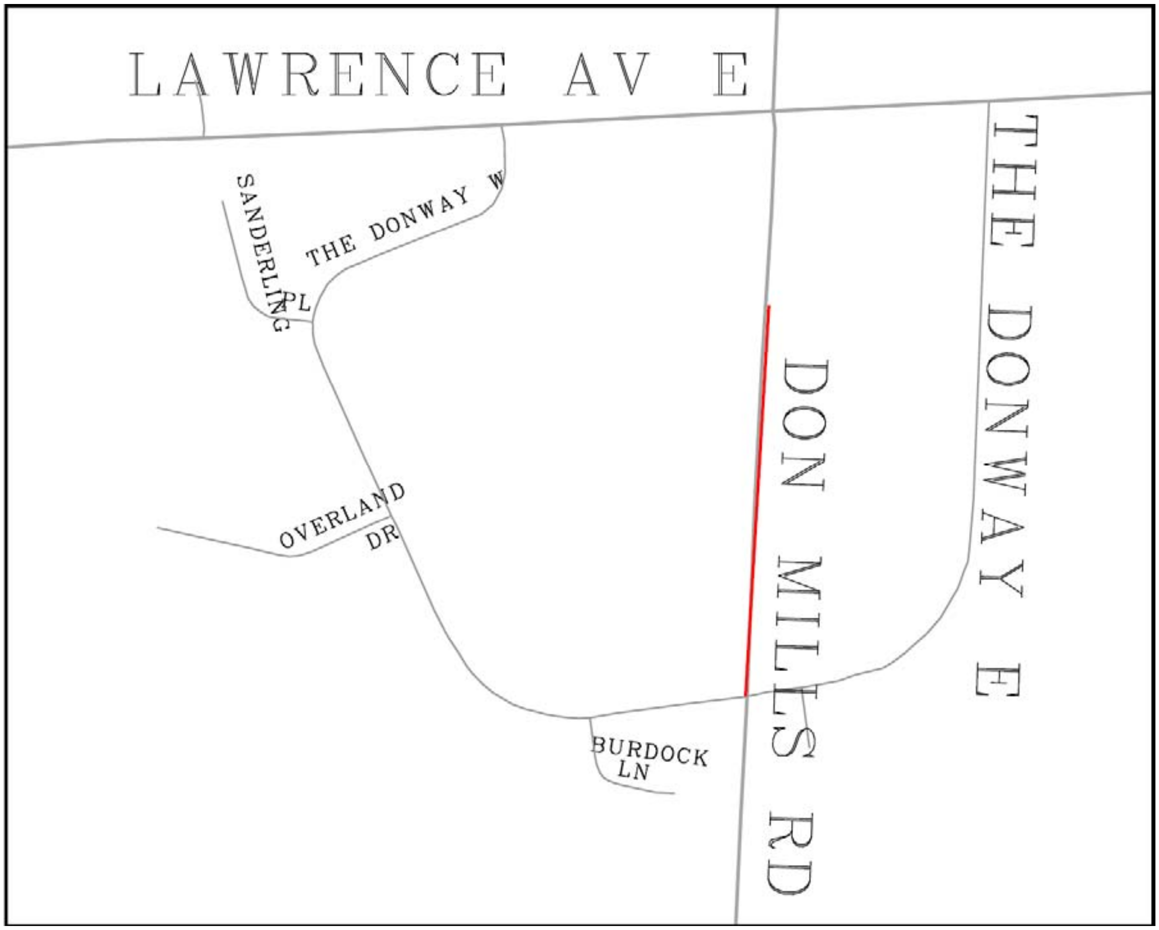


Figure 18: Map of Underground Rehabilitation of Feeder NY53M27

10.5. Required Capital Costs

There is a single phase to this job with a total estimated cost of $0.37M.

Table 34: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
27358	E13616 1090 Don Mills Load Balancing (Civil/Elec)	$0.37
	Total:	**$0.37**

11. Underground Rehabilitation of Feeders NY51M24 and NY51M25 (E11582, E13058, E13069, and E13103)

11.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeders NY51M24 and NY51M25 in order to improve reliability of service and mitigate potential safety risks.

11.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 11

As evident from Table 35, feeders NY521M24 and NY51M25 have been experiencing poor reliability over the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds areas that have experienced underground asset failures.

Table 35: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NY51M24 and NY51M25				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	8,926	8,998	1,606	10,356
Feeder CHI ***(Cumulative)***	5,779	6,213	7,781	4,432

11.3. Scope of Work

This job replaces direct-buried cable and air-insulated switchgear with 28kV Aluminum TR-XLPE cable in concrete-encased ducts and SF_6-insulated switchgear.

Table 36: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	1,245m	Primary Cable	1,245m
Air-insulated Pad-mounted Switchgear	6	SF_6-insulated Pad-mounted Switchgear	6

11.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Highway 404 to the east, Leslie Street to the west, Steeles Avenue to the north, and Sheppard Avenue East to the south. A map of the job area appears in Figure 19 below.

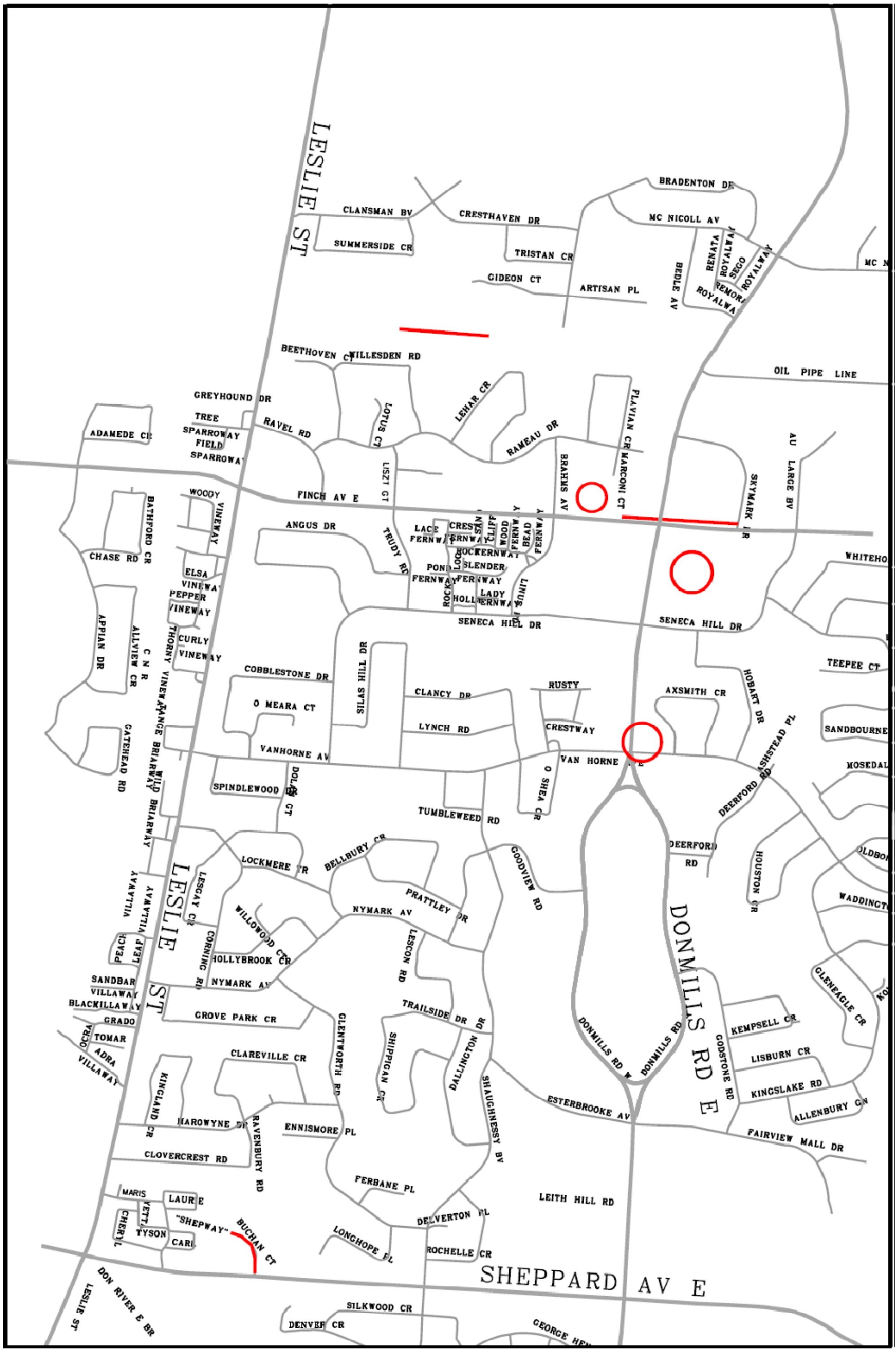


Figure 19: Map of Underground Rehabilitation of Feeders NY51M24 and NY51M25

11.5. Required Capital Costs

There are four phases to this job with a total estimated cost of $1.45M.

Table 37: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
19788	E11582 NY51M24 PMH SCADA Installation – 2011 DC	$0.42
21110	E13058 NY51M24, NY51M25 UG Rebuild by Finch and Don Mills (Electrical)	$0.18
21202	E13069 NY51M24, NY51M25 UG Rebuild by Finch and Don Mills (Civil)	$0.53
21446	E13103 UG Rebuild of NY51M24 Buchan Crt by Sheppard Ave (Electrical)	$0.32
	Total:	**$1.45**

12. Underground Rehabilitation of Feeder NY53M25 (E12237)

12.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY53M25 in order to improve reliability of service and mitigate potential safety risks.

12.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 5

As evident from Table 38, this feeder has been experiencing poor reliability over the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds an area that has experienced underground asset failures.

Table 38: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NY53M25				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	19,054	563	1,393	29,240
Feeder CHI ***(Cumulative)***	10,648	1,167	920	7,191

12.3. Scope of Work

This job replaces direct-buried cable with 28kV Aluminum TR-XLPE cable in concrete-encased ducts.

Table 39: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	13,367m	Primary Cable	13,367m

12.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Victoria Park Avenue to the east, Don Valley Parkway to the west, York Mills Road to the north, and Lawrence Avenue East to the south. A map of the job area appears in Figure 20 below.

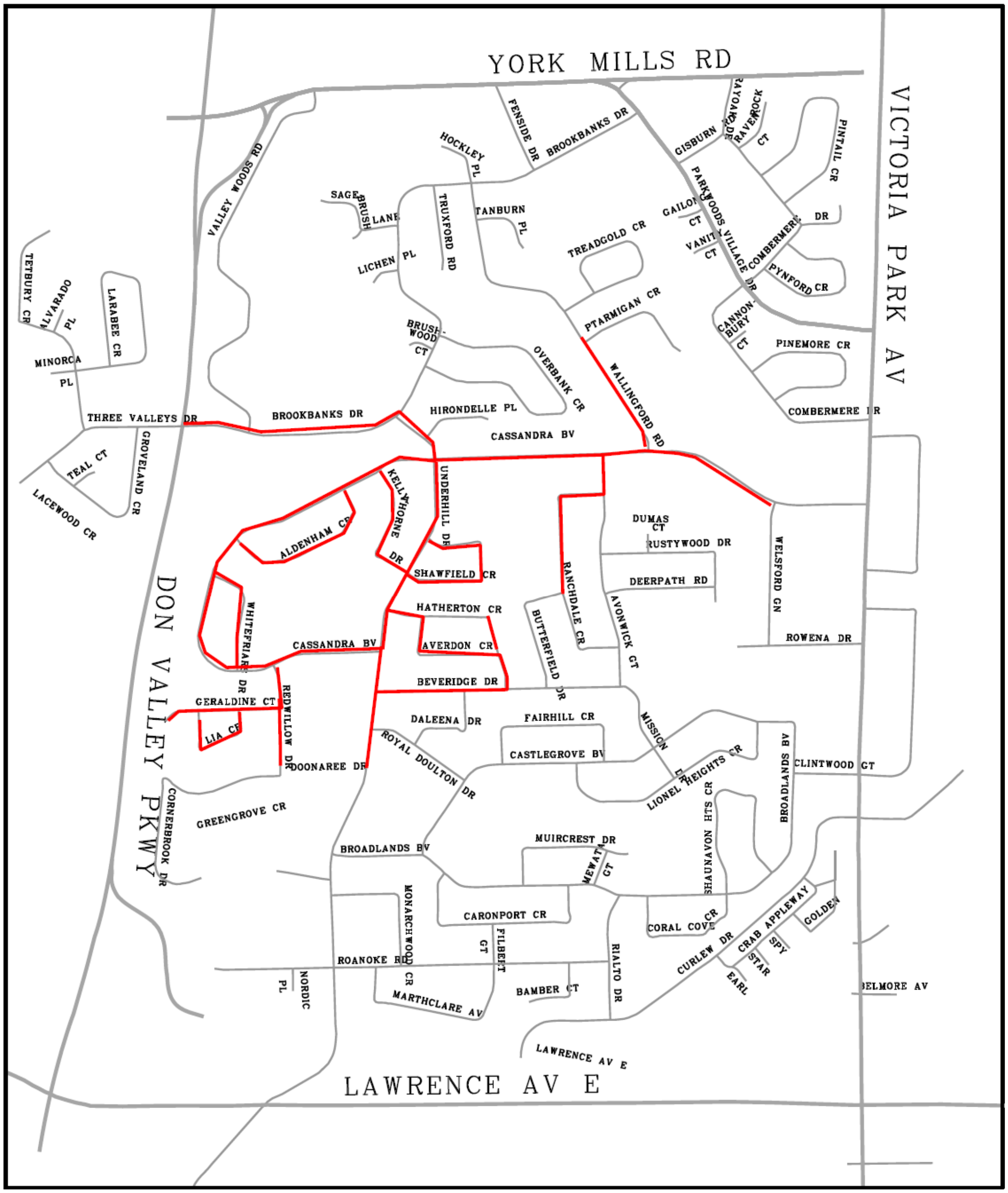


Figure20: Map of Underground Rehabilitation of Feeder NY53M25

12.5. Required Capital Costs

There is a single phase to this job with a total estimated cost of $1.13M.

Table 40: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
20179	E12237 Cassandra NY53M25 UG Cable Rebuild (Electrical)	$1.13
	Total:	**$1.13**

13. Underground Rehabilitation of Feeders NY80M30 and NY80M29 (W12077)

13.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeders NY80M30 and NY80M29 in order to improve reliability of service and mitigate potential safety risks.

13.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 10

As evident from Table 41, these feeders have been experiencing increasingly poor reliability over the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job is required in this area to improve reliability to customers through replacing aged assets and improving operational flexibility.

Table 41: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NY80M30 and NY80M29				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	17,892	11,800	8,697	29,739
Feeder CHI ***(Cumulative)***	9,514	6,593	2,550	11,952

13.3. Scope of Work

This job replaces direct-buried cable, air-insulated switchgear, and non-standard submersible transformers with 28kV Aluminum TR-XLPE cable in concrete-encased ducts, SF_6-insulated switchgear, and new submersible transformers.

Table 42: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	18,453m	Primary Cable	18,453m
Submersible Transformers	2	Submersible Transformers	2
Air-insulated Pad-mounted Switchgear	1	SF_6-insulated Pad-mounted Switchgear	5

13.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Bayview Avenue to the east, Yonge Street to the west, York Mills Road to the north, and Lawrence Avenue East to the south. A map of the job area appears in Figure 21 below.

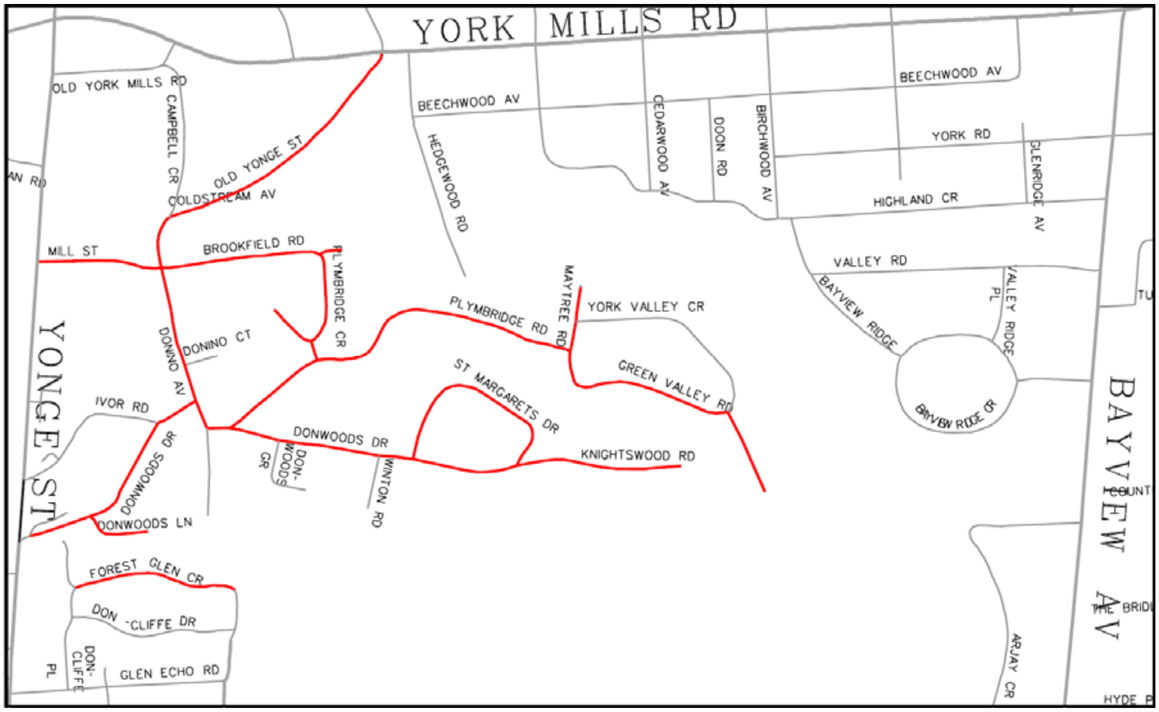


Figure 21: Map of Underground Rehabilitation of Feeders NY80M30 and NY80M29

13.5. Required Capital Costs

There is a single phase to this job with a total estimated cost of $8.84M.

Table 43: Required Capital Costs

Job Estimate Number	Job Phase		Estimated Cost ($M)
28590, 28591	W12077 Hoggs Hollow		$8.84
		Total:	**$8.84**

14. Underground Rehabilitation of Feeder NY80M8 (W12464, W14540, W14541 and W14542)

14.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY80M8 in order to improve reliability of service and mitigate potential safety risks.

14.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 5

As evident from Table 44, this feeder has been experiencing poor reliability over the past four years. This poor reliability is partially due to failures of underground assets, primarily direct-buried cable. This job rebuilds an area that has experienced underground asset failures.

Table 44: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NY80M8				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	4,622	4,616	3,004	1,457
Feeder CHI ***(Cumulative)***	5,144	3,768	2,975	415

14.3. Scope of Work

This job replaces direct-buried cable, air-insulated switchgear, and non-standard submersible transformers with 28kV Aluminum TR-XLPE cable in concrete-encased ducts, SF_6-insulated switchgear, and new submersible transformers.

Table 45: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	3,158m	Primary Cable	3,158m
Submersible Transformers	8	Submersible Transformers	8
Air-insulated Pad-mounted Switchgear	1	SF_6-insulated Pad-mounted Switchgear	1

14.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Bathurst Street to the east, Dufferin Street to the west, Steeles Avenue West to the north, and Finch Ave West to the south. A map of the job area appears in Figure 22 below.

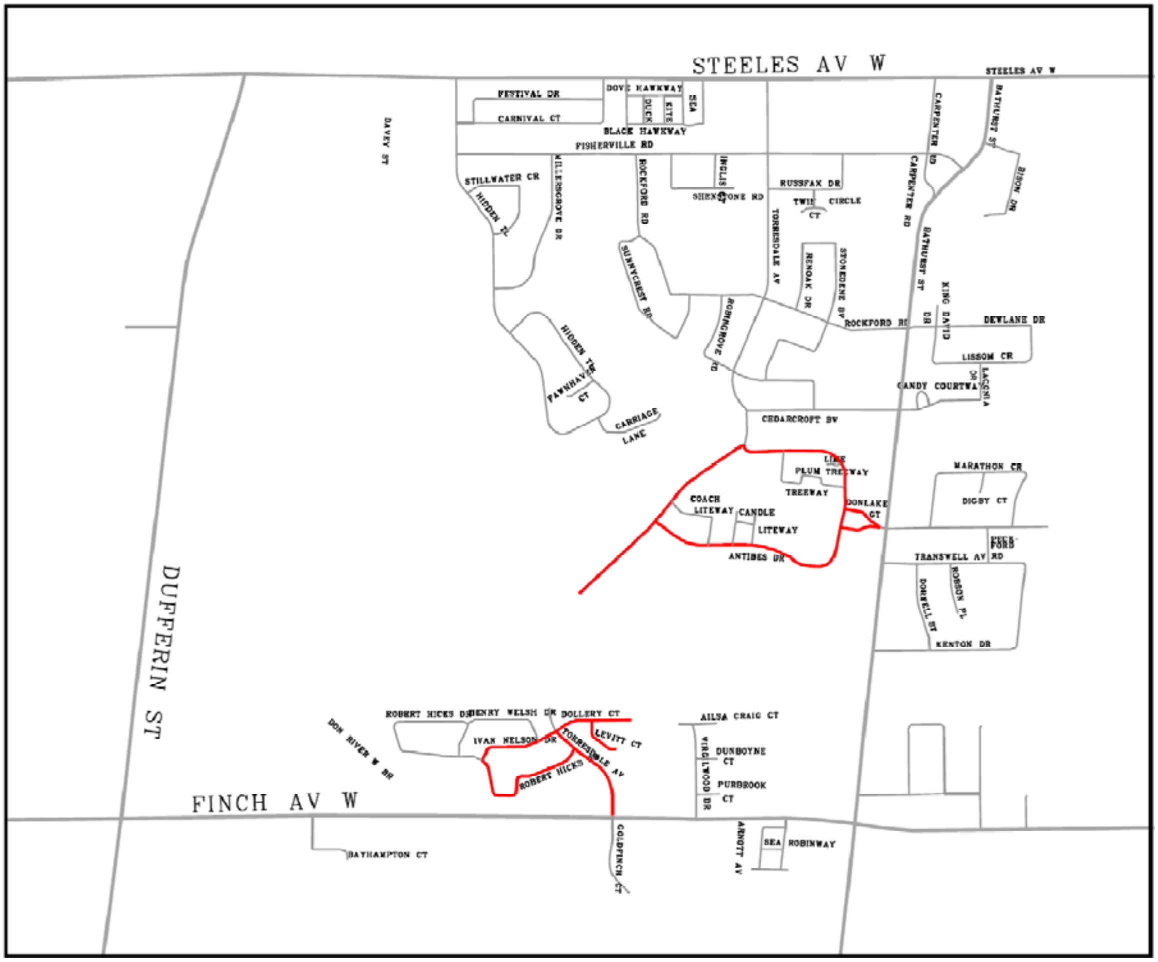


Figure22: Map of Underground Rehabilitation of Feeder NY80M8

14.5. Required Capital Costs

There are four phases to this job with a total estimated cost of $7.98M.

Table 46: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
21262	W12464 FESI - UG Cable Rehab on Antibes/Torresdale	$1.32
27941	W14540 Robert Hicks and Torresdale Subdivision Phase 1 (Civil)	$2.06
27942	W14541 Robert Hicks and Torresdale Subdivision Phase 2 (Civil)	$2.18
27943	W14542 Robert Hicks and Torresdale Subdivision Phase 3 (Civil)	$2.42
	Total:	**$7.98**

15. Underground Rehabilitation of Feeder SCNAE5-1M25 (E13066)

15.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder SCNAE5-1M25 in order to improve reliability of service and mitigate potential safety risks.

15.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 5

As evident from Table 47, reliability on this feeder has been deteriorating over the past four years. This poor reliability is mostly due to failures of underground assets, primarily direct-buried cable. This job rebuilds an area that has experienced underground asset failures.

Table 47: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCNAE5-1M25				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	10	86	880	589
Feeder CHI ***(Cumulative)***	3	216	135	356

15.3. Scope of Work

This job installs civil assets only. Future phases will replace electrical assets.

15.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Mc Cowan Road to the east, Brimley Road to the west, Eglinton Avenue East to the north, and Kingston Road to the south. A map of the job area appears in Figure 23 below.

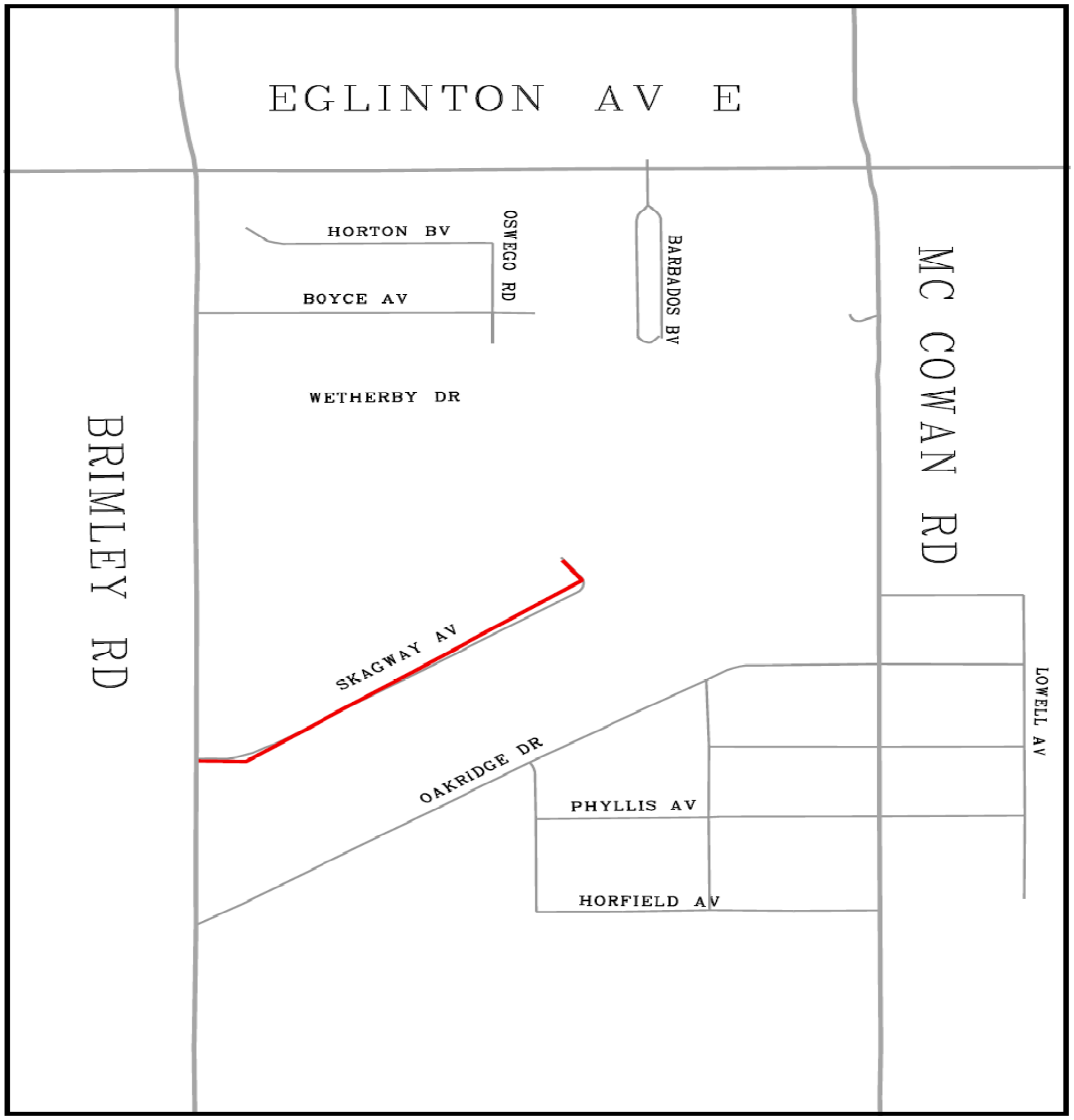


Figure 23: Map of Underground Rehabilitation of Feeder SCNAE5-1M25

15.5. Required Capital Costs

There is a single phase to this job with a total estimated cost of $0.65M.

Table 48: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
21188	E13066 Rebuild of SCNAE5-1M25 by Brimley Rd and Skagway Avenue (Civil)	$0.65
	Total:	**$0.65**

16. Underground Rehabilitation of Feeder NY51M29 (E13194)

16.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY51M29 in order to improve reliability of service and mitigate potential safety risks.

16.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 4

As evident from Table 49, this feeder has been experiencing increasingly poor reliability over the past four years. This poor reliability is partially due to failures of old and unreliable underground assets, including direct-buried cable and transformers.

Table 49: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NY51M29				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	633	4,998	455	2,593
Feeder CHI ***(Cumulative)***	767	2,074	6,054	1,120

16.3. Scope of Work

This job replaces direct-buried cable, air-insulated switchgear, and non-standard submersible transformers with 28kV Aluminum TR-XLPE cable in concrete-encased ducts, SF_6-insulated switchgear, and new submersible transformers.

Table 50: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	4,315m	Primary Cable	4,315m
Submersible Transformers	5	Submersible Transformers	5
Air-insulated Pad-mounted Switchgear	1	SF_6-insulated Pad-mounted Switchgear	1
Air-insulated Vault-installed Switchgear	14	SF_6-insulated Vault-installed Switchgear	14

16.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Don Valley Parkway to the east, Leslie Street to the west, Highway 401 to the north, and York Mills Road to the south. A map of the job area appears in Figure 24 below.

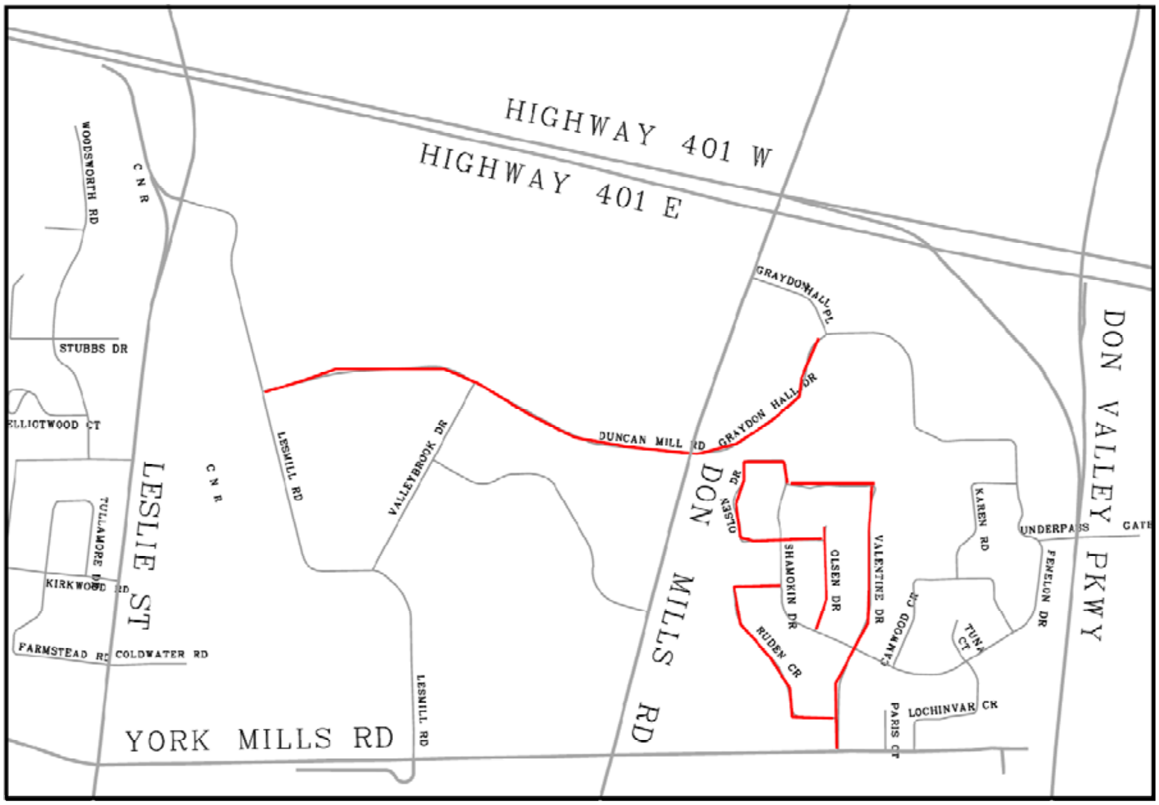


Figure 24: Map of Underground Rehabilitation of Feeder NY51M29

16.5. Required Capital Costs

There is a single phase to this job with a total estimated cost of $3.80M.

Table 51: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
22049	E13194 UG Rehab off Don Mills and Graydon Hall Drive NY51M29	$3.80
	Total:	**$3.80**

17. Underground Rehabilitation of Feeders NY85M4 and NY85M24 (W13239 and W13709)

17.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeders NY85M4 and NY85M24 in order to improve reliability of service and mitigate potential safety risks.

17.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 8

As evident from Table 52, these feeders have been experiencing increasingly poor reliability over the past two years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds areas that have experienced underground asset failures.

Table 52: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NY85M4 and NY85M24				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	3,250	88	7,655	6,631
Feeder CHI ***(Cumulative)***	1,451	136	9,259	5,035

17.3. Scope of Work

This job replaces direct-buried cable, air-insulated switchgear, and non-standard submersible transformers with 28kV Aluminum TR-XLPE cable in concrete-encased ducts, SF_6-insulated switchgear, and new submersible transformers.

Table 53: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	5,659m	Primary Cable	5,659m
Submersible Transformers	33	Submersible Transformers	33
Air-insulated Vault-installed Switchgear	3	SF_6-insulated Vault-installed Switchgear	3

17.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Keele Street to the east, Jane Street to the west, Finch Avenue West to the north, and Sheppard Avenue West to the south. A map of the job area appears in Figure 25 below.

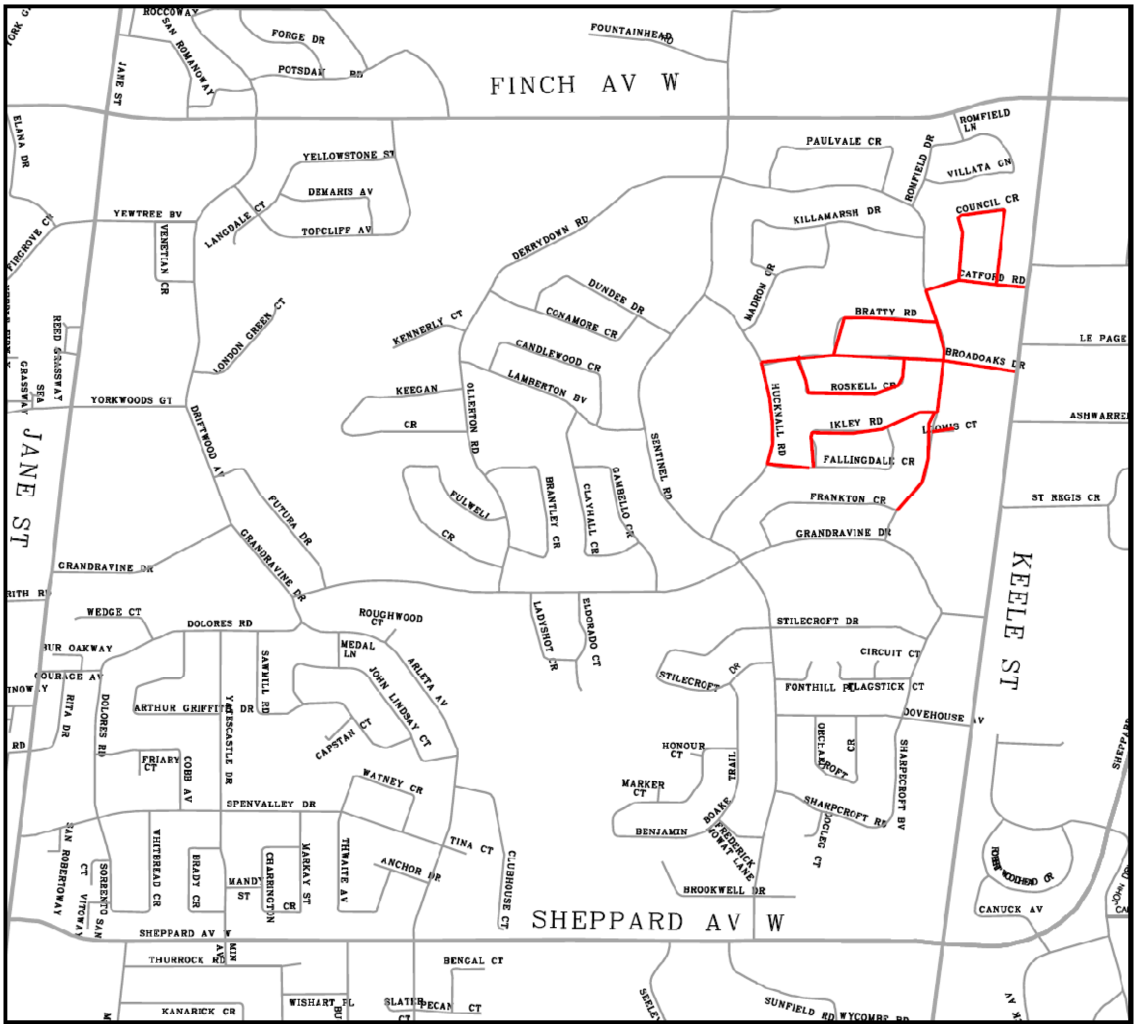


Figure 25: Map of Underground Rehabilitation of Feeders NY85M4 and NY85M24

17.5. Required Capital Costs

There are two phases to this job with a total estimated cost of $3.01M.

Table 54: Required Capital Costs

Job Estimate Number	Job Phase		Estimated Cost ($M)
22716	W13239 Northview Heights Rebuild (Electrical)		$2.20
28318	W13709 Northview Heights Phase 4 (Civil)		$0.81
		Total:	**$3.01**

18. Underground Rehabilitation of Feeder NY85M7 (W14133 and W14134)

18.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY85M7 in order to improve reliability of service and mitigate potential safety risks.

18.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 4

As evident from Table 55, these feeders have been experiencing poor reliability over the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds areas that have experienced underground asset failures.

Table 55: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NY85M7				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	1,228	3,414	85	980
Feeder CHI ***(Cumulative)***	1,415	773	36	400

18.3. Scope of Work

This job replaces direct-buried cable and non-standard submersible transformers with 28kV Aluminum TR-XLPE cable in concrete-encased ducts, and new submersible transformers.

Table 56: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	2,689m	Primary Cable	2,689m
Submersible Transformers	25	Submersible Transformers	25

18.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Bathurst Street to the east, Dufferin Street to the west, Steeles Avenue West to the north, and Finch Avenue West to the south. A map of the job area appears in Figure 26 below.

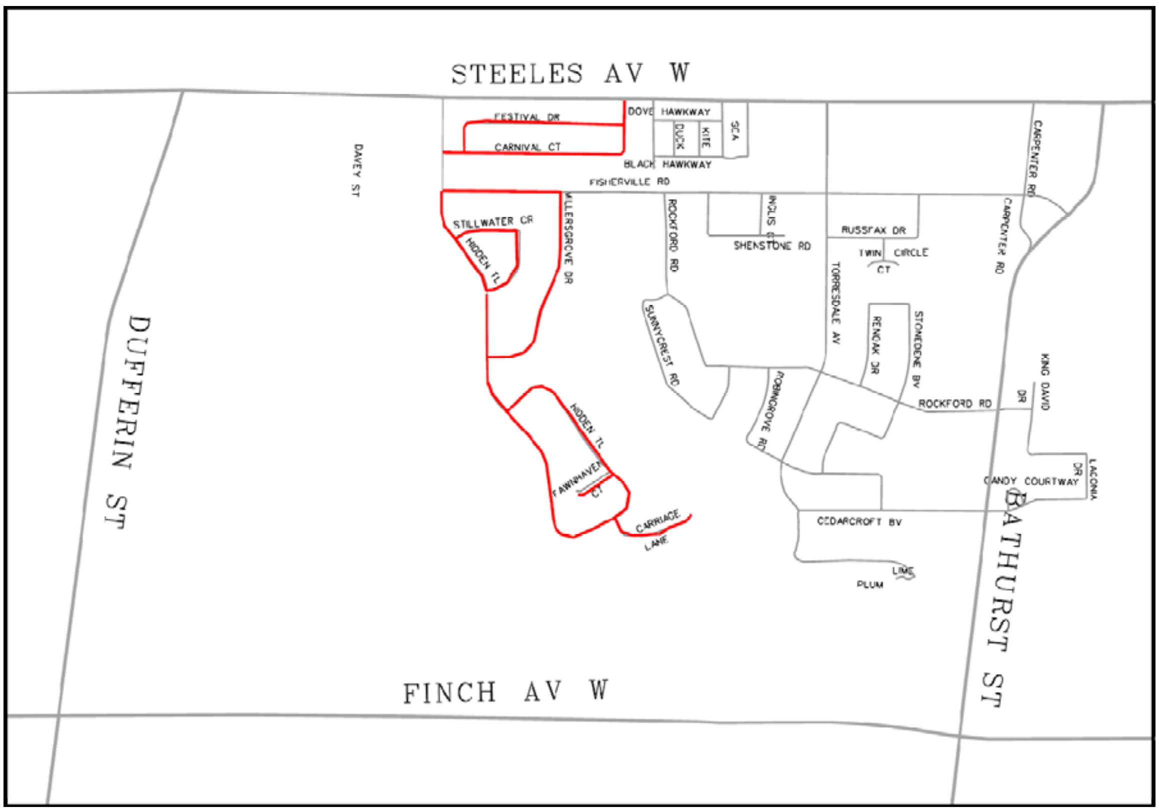


Figure 26: Map of Underground Rehabilitation of Feeder NY85M7

18.5. Required Capital Costs

There are two phases to this job with a total estimated cost of $6.64M.

Table 57: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
23043	W14133 NY85M7 Direct-buried Rebuild on Festival & Carnival	$2.69
22984	W14134 NY85M7 UG Direct-buried Rebuild Hidden Trail and surrounding area (Civil)	$3.95
	Total:	**$6.64**

19. Underground Rehabilitation of Feeder SCNA502M23 (E13605)

19.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder SCNA502M23 in order to improve reliability of service and mitigate potential safety risks.

19.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 4

Table 58 provides CI and CHI figures for this feeder. This job rebuilds areas that have experienced underground asset failures, including a section of direct-buried cable that has failed three times in the last two years.

Table 58: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCNA502M23				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	2,304	768	342	2,520
Feeder CHI ***(Cumulative)***	1,447	128	712	113

19.3. Scope of Work

This job installs new 28 kV Aluminium TR-XLPE cable in new concrete-encased ducts to replace old direct-buried cable.

Table 59: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	387 m	Primary Cable	387 m

19.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Steeles Avenue East to the east, Victoria Park Avenue to the west, Finch Avenue to the north, and BridleTown Circle to the south. A map of the job area appears in Figure 27 below.

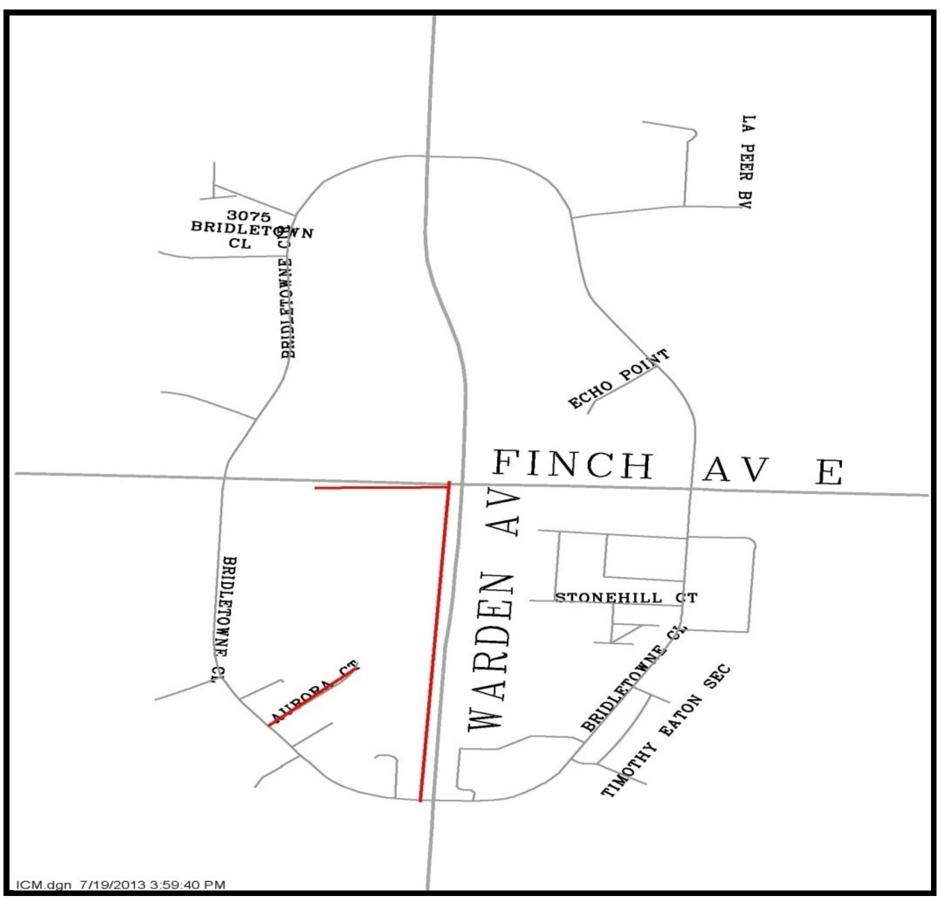


Figure 27: Map of Underground Rehabilitation of Feeder SCNA502M23

19.5. Required Capital Costs

There is one phase to this job with a total estimated cost of $0.36 M.

Table 60: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
27210	E13605 P02 50 Aurora Court Civil/Electrical Rebuild Cavanagh TS 502M23	$0.36
	Total:	$0.36

20. Underground Rehabilitation of Feeders SCNAH9M23 and SCNAH9M32 (E13121, E13147, E15023)

20.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeders SCNAH9M23 and SCNAH9M32 in order to improve reliability of service and mitigate potential safety risks.

20.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 7

As evident from Table 61, these feeders have been experiencing increasingly poor reliability over the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds areas that have experienced underground asset failures.

Table 61: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCNAH9M23, SCNAH9M32				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	2,198	1,426	10,649	1,359
Feeder CHI ***(Cumulative)***	444	152	7,884	221

20.3. Scope of Work

This job installs civil assets only. Electrical assets will be replaced in future phases.

20.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Markham Road to the east, McCowan Road to the west, Finch Avenue East to the north, and Sheppard Avenue to the south. A map of the job area appears in Figure 28 below.

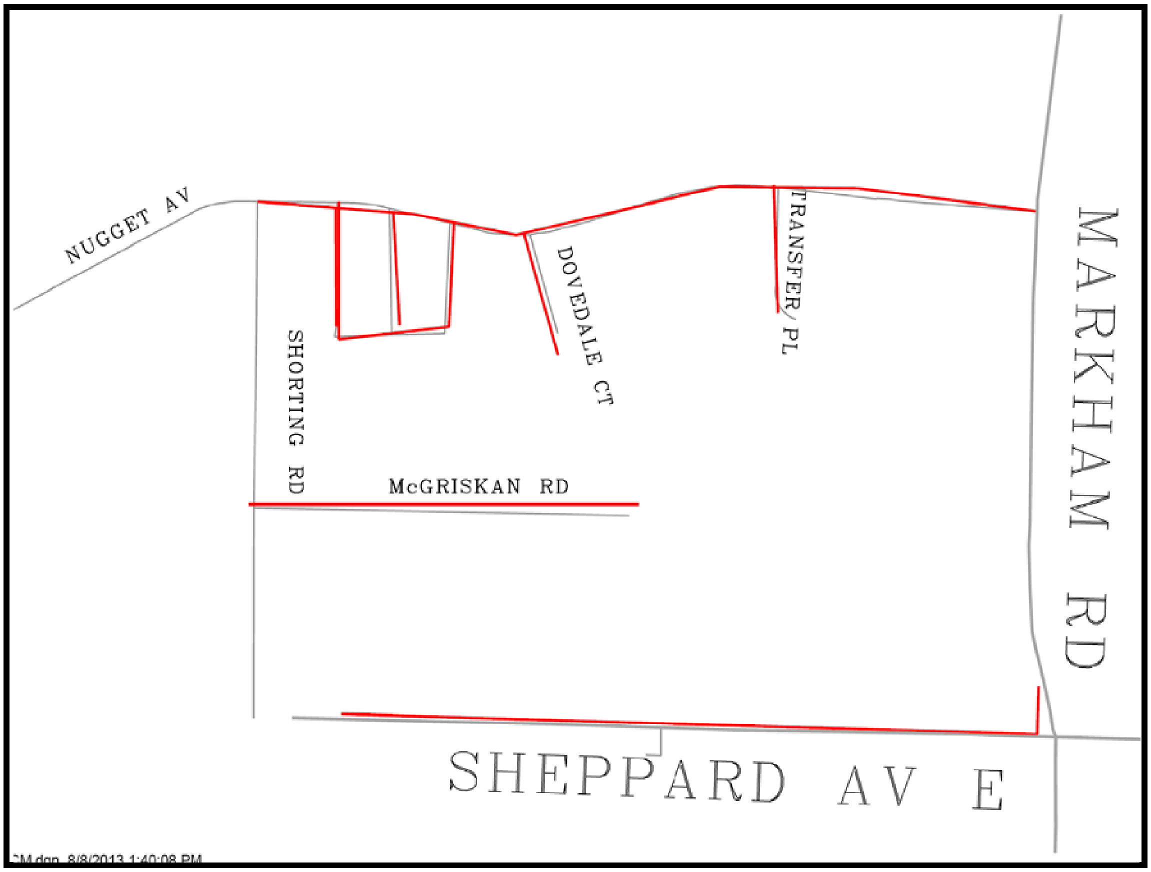


Figure 28: Map of Underground Rehabilitation of Feeders SCNAH9M23 and SCNAH9M32

20.5. Required Capital Costs

There are three phases to this job with a total estimated cost of $2.14M.

Table 62: Required Capital Costs

Job Estimate Number	Job Phase		Estimated Cost ($M)
21565	E13121 McGriskin Road UG Rebuild- Civil SCNAH9M23		$0.28
21663	E13147 Nugget Avenue UG Rebuild (Civil)		$0.89
27221	E15023 P01 Sheppard Underground DB Cable Rebuild Ellesmere TS (Civil)		$0.96
		Total:	**$2.14**

21. Underground Rehabilitation of Feeder SCNA47M17 (E11223, E11616, E12239, E12241, E12242, E12243, E12244, E12267, E12281, E12335, E12336)

21.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder SCNA47M17 in order to improve reliability of service and mitigate potential safety risks.

21.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 3

Table 63 shows CI and CHI for the past four years. Outages on this feeder have been due to failures of underground assets, including direct-buried cable. While reliability improved in 2012, this job rebuilds areas containing aged underground assets, which have experienced multiple failures. These failures and the resulting repairs have caused additional stress on these assets.

Table 63: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCNA47M17				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	7,260	7,740	3,303	76
Feeder CHI ***(Cumulative)***	1,916	3,305	665	571

21.3. Scope of Work

This job replaces direct-buried cable submersible transformers and air insulated switchgear with 28kV Aluminum TR-XLPE cable in new concrete-encased ducts submersible transformers and air insulated switchgear.

Table 64: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	13,721 m	Primary Cable	13,721 m
Submersible Transformers	7	Submersible Transformers	7
Air-insulated Pad-mounted Switchgear	3	SF_6-insulated Pad-mounted Switchgear	3

21.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Kingston Road to the east, Meadowvale Road to the west, Sheppard Avenue East to the north, and Lawrence Avenue East to the south. A map of the job area appears in Figure 29 below.

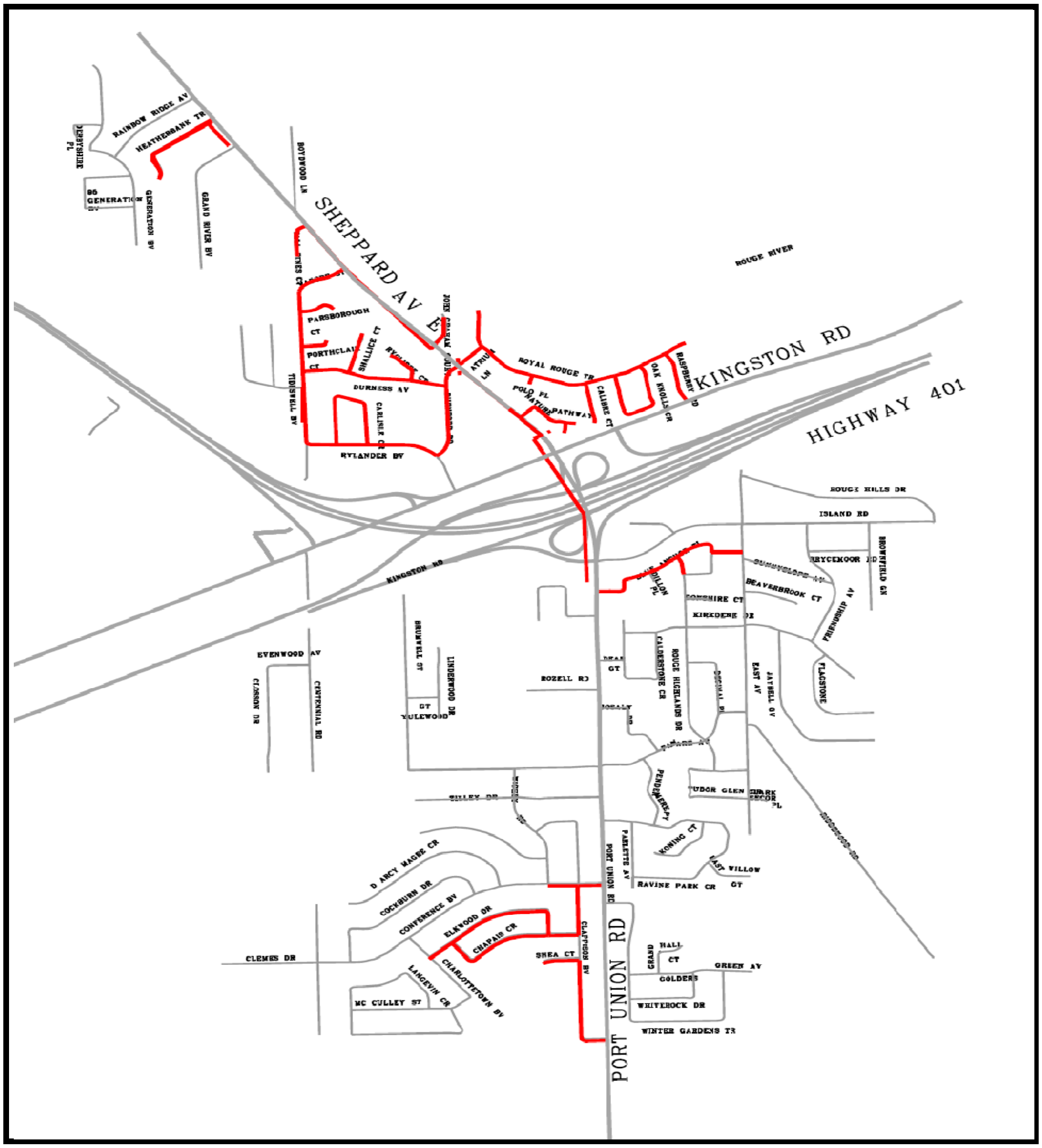


Figure 29: Map of Underground Rehabilitation of Feeder SCNA47M17

21.5. Required Capital Costs

There are 11 phases to this job with a total estimated cost of $6.57M.

Table 65: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
18320	E11223 Clappison 47M17 UG Rebuild-Civil	$1.28
20345	E11616 Meadowvale/Heatherbank Cabling Civil (47M17)	$0.42
20207	E12239 Rouge Trail Rebuild -Civil (47M17)	$1.11
20209	E12241 Tallpine Rebuild Phase Civil (47M17)	$1.48
20208	E12242 Rouge Trail Rebuild Electrical (47M17)	$0.21
20206	E12243 Durnford-Rylander-Tideswell Rebuild ph2 Electrical (47M17)	$0.30
20210	E12244 Tallpine Rebuild Phase Electrical (47M17)	$0.35
18319	E12267 Clappison 47M17 UG Rebuild-Electrical	$0.38
20313	E12281 Meadowvale/Heatherbank Cabling Electrical (47M17)	$0.51
20477	E12335 Blue Anchor Trail UG Rebuild - Elec (47M17)	$0.14
20478	E12336 Blue Anchor Trail UG Rebuild - Civil (47M17)	$0.39
	Total:	**$6.57**

22. Underground Rehabilitation of Feeder SCXJF1 (E13203, E14031)

22.1. Objective

The objective of this job is to proactively replace underground assets on 13.8 kV feeder SCXJF1 in order to improve reliability of service and mitigate potential safety risks.

22.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 3

As evident from Table 66, the reliability of this feeder has recently deteriorated. This job rebuilds a small area that has old direct-buried cable that is vulnerable to failure.

Table 66: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCXJF1				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	12	0	0	130
Feeder CHI ***(Cumulative)***	22	0	0	238

22.3. Scope of Work

This job replaces direct-buried cable and submersible transformers with 28kV Aluminum TR-XLPE cable in new concrete-encased ducts and new submersible transformers.

Table 67: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	315 m	Primary Cable	315 m
Submersible Transformers	4	Submersible Transformers	4

22.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Old Kingston Road to the east, Morning Side Avenue to the west, Ellesmere Road to the north, and Lawrence Avenueto the south. A map of the job area appears in Figure 30 below.

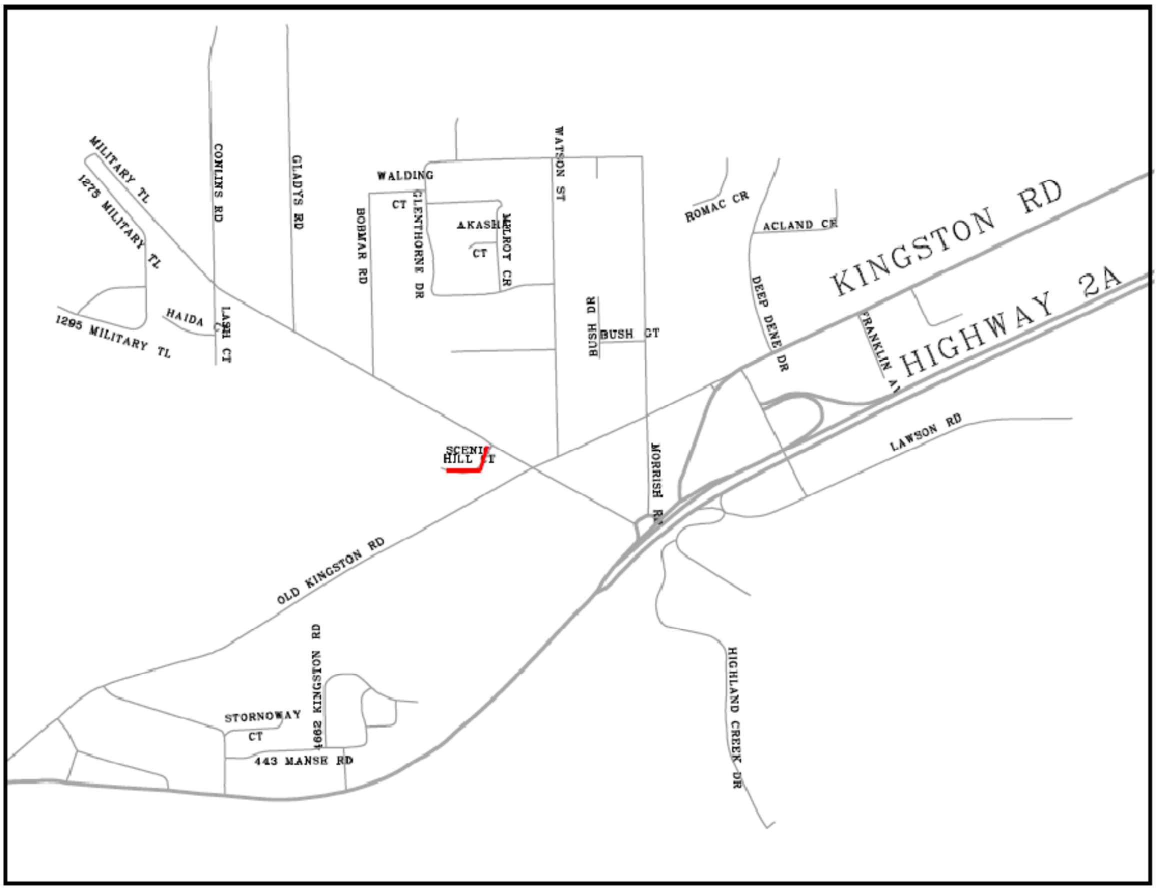


Figure 30: Map of Underground Rehabilitation of Feeder SCXJF1

22.5. Required Capital Costs

There are two phases to this job with a total estimated cost of $0.16M.

Table 68: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
22135	E13203 Scenic Hill UG Rebuild SD XJF1- Civil SCXJF1	$0.08
22137	E14031 UG Rebuild Scenic Hill SD XJF1- Electrical SCXJF1	$0.08
	Total:	**$0.16**

23. Underground Rehabilitation of Feeder SCNT63M12 (E13152)

23.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeders SCNT63M12 in order to improve reliability of service and mitigate potential safety risks.

23.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 3

As evident from Table 69, this feeder has been experiencing poor reliability in the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job replaces old and undersized direct-buried cable, vulnerable for failure, on a section of the feeder trunk.

Table 69: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCNT63M12				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	4,968	1,459	18,772	37
Feeder CHI ***(Cumulative)***	6,925	5,414	31,570	29

23.3. Scope of Work

This job installs civil assets only. Future phases will replace electrical assets.

23.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Middlefield Road to the east, Brimley Road to the west, Steeles Avenue East to the north, and Finch Avenue East to the south. A map of the job area appears in Figure 31 below.

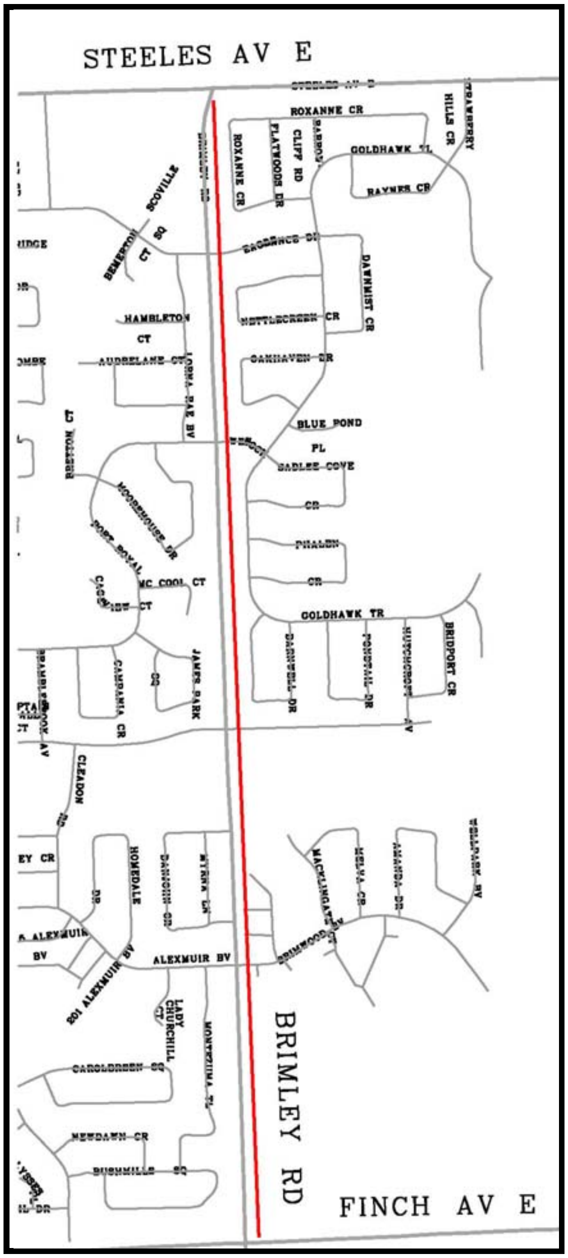


Figure 31: Map of Underground Rehabilitation of Feeders SCNT63M12

23.5. Required Capital Costs

There is one phase to this job with a total estimated cost of $1.72M.

Table 70: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
21868	E13152 Rebuild UG Trunk NT63M12 M8 Brimley-Civil	$1.72
	Total:	**$1.72**

24. Underground Rehabilitation of Feeders NY51M3 and NY51M27 (E12418, E12419, E12425, E12426, E12429, E12430, E12393, E12394, E12341, E12377, E12379, E12408)

24.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeders NY51M3 and NY51M27 in order to improve reliability of service and mitigate potential safety risks.

24.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 5

As evident from Table 71, feeders NY51M3 and NY51M27 have been experiencing poor reliability over the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds areas that have experienced underground asset failures.

Table 71: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NY51M3, NY51M27				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	253	7,041	3,680	1,847
Feeder CHI ***(Cumulative)***	748	6,498	4,720	1,001

24.3. Scope of Work

This job replaces direct-buried cable and submersible transformers with 28kV Aluminum TR-XLPE cable in new concrete-encased ducts and new submersible transformers.

Table 72: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	5264	Primary Cable	5264
Submersible Transformers	60	Submersible Transformers	60

24.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Highway 404 to the east, Bayview Ave to the west, Steeles Avenue East to the north, and Finch Avenue East to the south. A map of the job area appears in Figure 32 below.

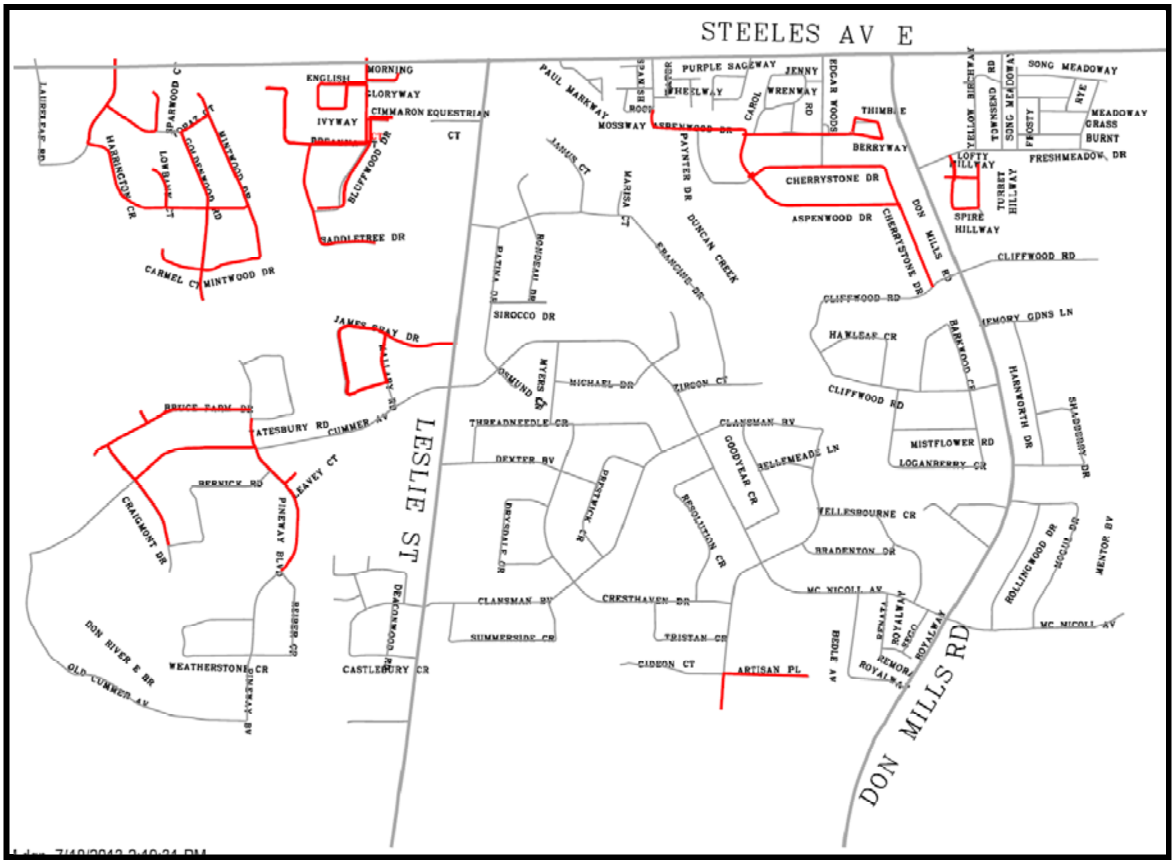


Figure 32: Map of Underground Rehabilitation of Feeders NY51M3 and NY51M27

24.5. Required Capital Costs

There are 12 phases to this job with a total estimated cost of $4.15M

Table 73: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
20722	E12418 Artisan Place UG Rebuild - Civil (51M27)	$0.10
20725	E12419 Artisan Place UG Rebuild - Electrical (51M27)	$0.08
20737	E12425 Spire Hillway UG Rebuild - Civil (51M27)	$0.19
20738	E12426 Spire Hillway UG Rebuild - Electrical (51M27)	$0.13
20744	E12429 Cherrystone Aspenwood - Civil (51M27)	$0.51

Job Estimate Number	Job Phase	Estimated Cost ($M)
20746	E12430 Cherrystone Aspenwood - Electrical (51M27)	$0.20
20672	E12393 James Gray Dr Rebuild - Electrical (51M3)	$0.19
20674	E12394 James Gray Dr Rebuild - Civil (51M3)	$0.40
24578	E12341 Bluffwood Saddletree Civil NY51M3	$1.39
20645	E12377 Goldenwood Road UG Rehab NY51M3	$0.34
20648	E12379 Pineway Craigmont Bruce Farm UG Rehab NY51M3	$0.14
20697	E12408 Thimble Berryway Aspenwood - Civil (51M3)	$0.48
	Total:	**$4.15**

25. Underground Rehabilitation of Feeder SCNAR26M31 (E11401)

25.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder SCNAR26M31 in order to improve reliability of service and mitigate potential safety risks.

25.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 2

As evident from Table 74, the reliability of this feeder has been deteriorating over the past four years. This is partially due to failures of underground assets, including direct-buried cable. This job rebuilds areas that have experienced underground asset failures.

Table 74: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCNAR26M31				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	0	730	22	1,065
Feeder CHI ***(Cumulative)***	0	61	100	683

25.3. Scope of Work

This job replaces direct-buried cable and Air insulated switchgear with new 28 kV Aluminum TR-XLPE cable in new concrete-encased ducts and SF_6 insulated switchgear.

Table 75: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	7,194 m	Primary Cable	7,194 m
Air-insulated Pad-mounted Switchgear	1	SF_6-insulated Pad-mounted Switchgear	2

25.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Neilson Road to the east, Tapscott Road to the west, Steeles Avenue to the north, and Finch Avenue East to the south. A map of the job area appears in Figure 33 below.

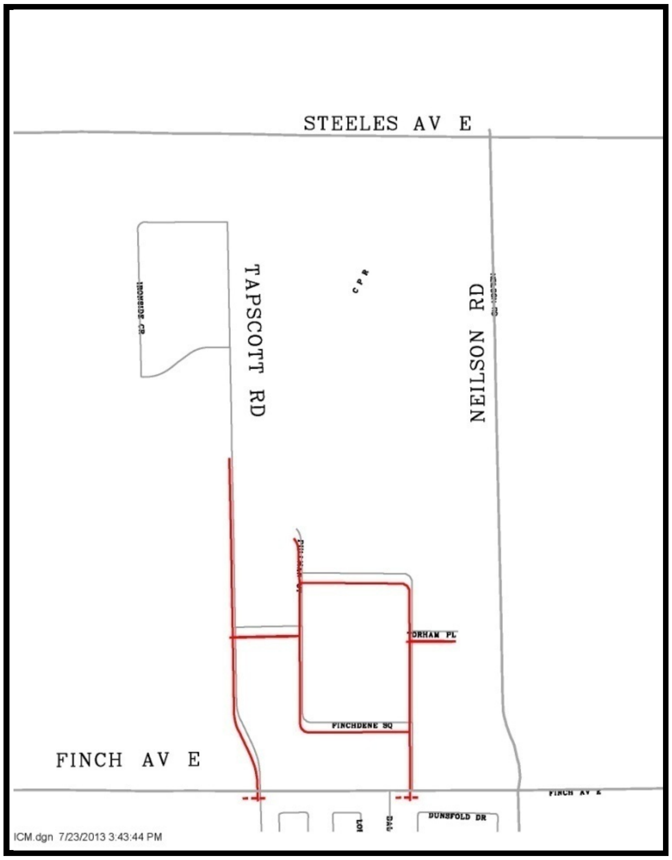


Figure 33: Map of Underground Rehabilitation of Feeder SCNAR26M31

25.5. Required Capital Costs

There is one phase to this job with a total estimated cost of $6.85M.

Table 76: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
18628	E11401 & E11426 Finchdene UG Electrical Ph1/2 (SC26M31)	$6.85
	Total:	**$6.85**

26. Underground Rehabilitation of Feeder SCNAR26M34 (E14321)

26.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder SCNAR26M34 in order to improve reliability of service and mitigate potential safety risks.

26.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 2

The high levels of CI and CHI in Table 77 indicate that this feeder has been experiencing poor reliability over the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds remaining areas that have experienced underground asset failures.

Table 77: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCNAR26M34				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	1,183	9,101	7,560	357
Feeder CHI ***(Cumulative)***	7,221	5,567	14,615	1672

26.3. Scope of Work

This job installs civil assets. Electrical assets will be installed in future years.

26.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Neilson Road to the east, Markham Road to the west, Finch Avenue East to the north, and Sheppard Avenue East to the south. A map of the job area appears in Figure 34 below.

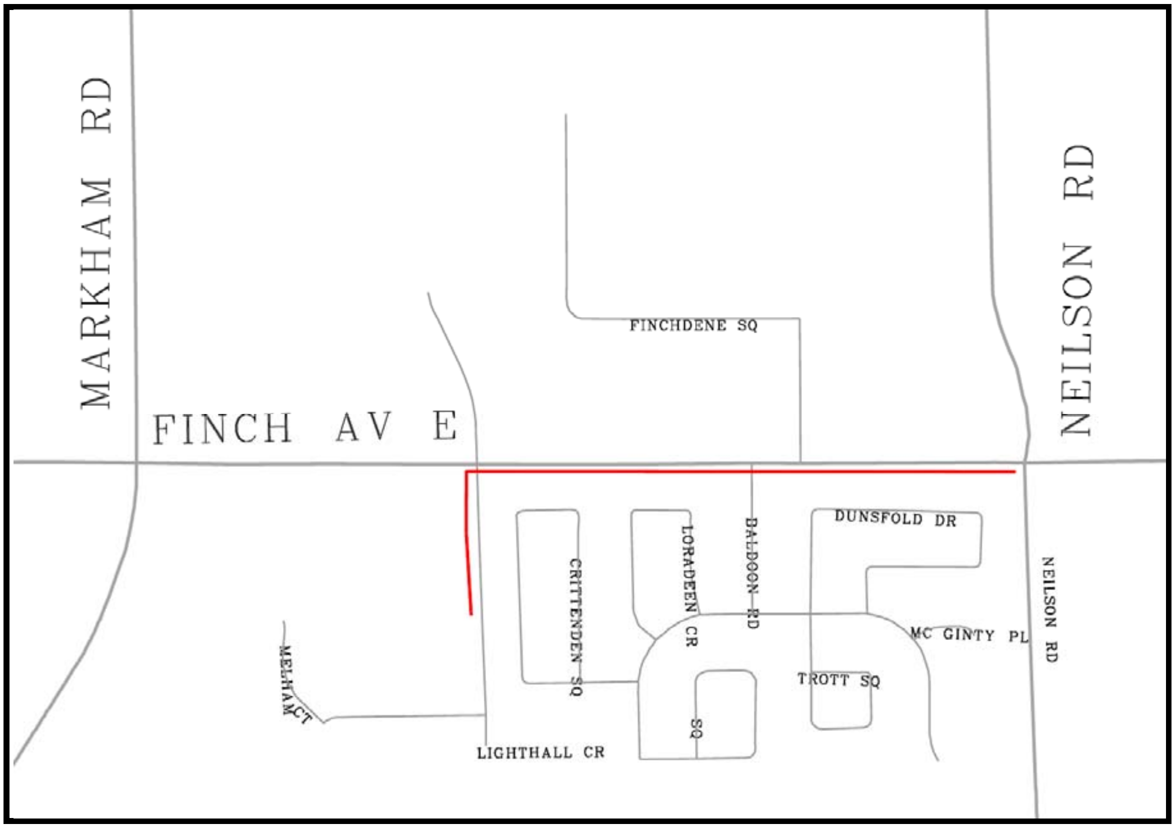


Figure 34: Map of Underground Rehabilitation of Feeder SCNAR26M34

26.5. Required Capital Costs

There is one phase to this job with a total estimated cost of $1.06M.

Table 78: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
24149	E14321 Establish Finch Neilson to Tapscott R26M34 Main – Civil	$1.06
	Total:	**$1.06**

27. Underground Rehabilitation of Feeder SCNT63M4 (E14327)

27.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder SCNT63M4 in order to improve reliability of service and mitigate potential safety risks.

27.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 2

As evident from Table 79, this feeder has been experiencing poor reliability over the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds areas that have experienced underground asset failures, including failures that contributed to the high CI and CHI in 2011.

Table 79: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCNT63M4				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	397	230	28,124	270
Feeder CHI ***(Cumulative)***	131	649	22,101	1,319

27.3. Scope of Work

This job installs civil assets. Electrical assets will be installed in future years.

27.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Brimley Road to the east, Midland Avenue to the west, Steeles Avenue East to the north, and McNicoll Avenue to the south. A map of the job area appears in Figure 35 below.

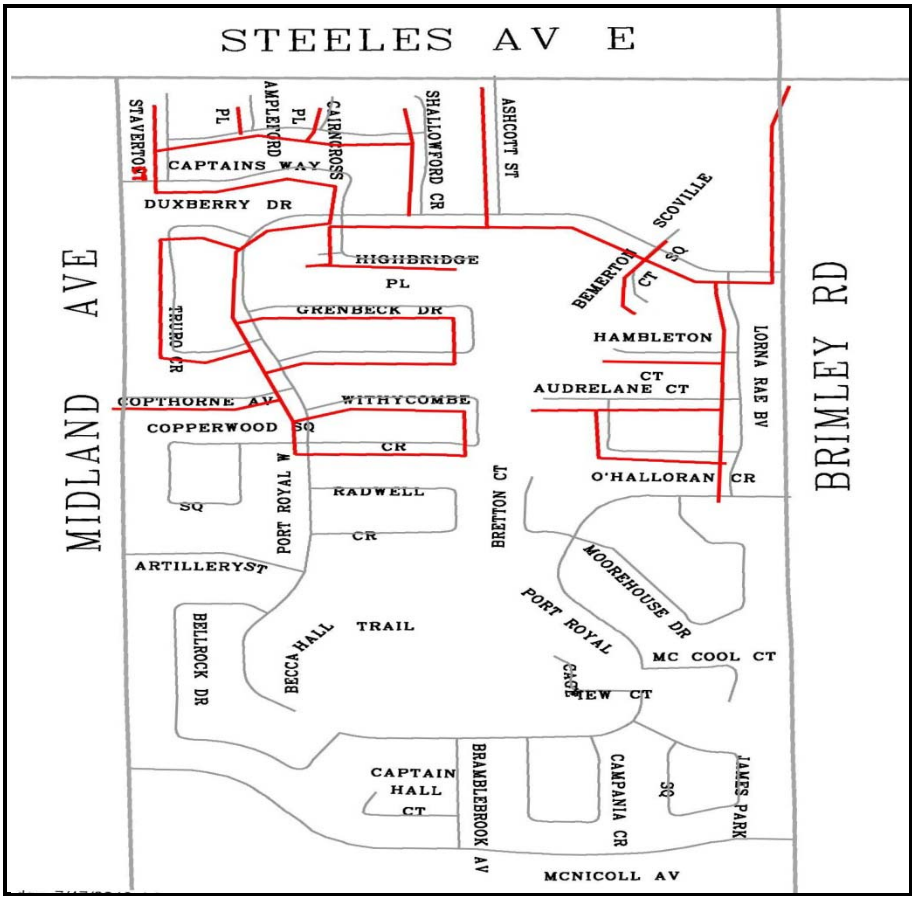


Figure 35: Map of Underground Rehabilitation of Feeder SCNT63M4

27.5. Required Capital Costs

There is one phase to this job with a total estimated cost of $1.90M.

Table 80: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
24224	E14327-P01 Port Royal N UG Reconfigure Main Civil Agincourt TS SCNT63M4	$1.90
	Total:	**$1.90**

28. Underground Rehabilitation of Feeders NY51M21, NYSS27F1, NYSS27F2, NYSS27F3 (E12217, E12250, E12251, E12266, E12268)

28.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeders NY51M21, NYSS27F1, NYSS27F2 and NYSS27F3 in order to improve reliability of service and mitigate potential safety risks.

28.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 5

As evident from Table 81, these feeders have experienced poor reliability over the past four years. This job is aimed at improving reliability by replacing direct-buried cable that is approximately 40 years old.

Table 81: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NY51M21, NYSS27F1, NYSS27F2, NYSS27F3				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	12,900	10,454	498	411
Feeder CHI ***(Cumulative)***	36,552	6,927	1,721	400

28.3. Scope of Work

This job replaces direct-buried cable and submersible transformers with 28kV Aluminum TR-XLPE cable in new concrete-encased ducts and new submersible transformers.

Table 82: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	4644 m	Primary Cable	4644 m
Submersible Transformers	33	Submersible Transformers	33

28.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Banbury Road to the east, Bayview Ave to the west, Heathcote Avenue to the north, and Lawrence to the south. A map of the job area appears in Figure 36 below.

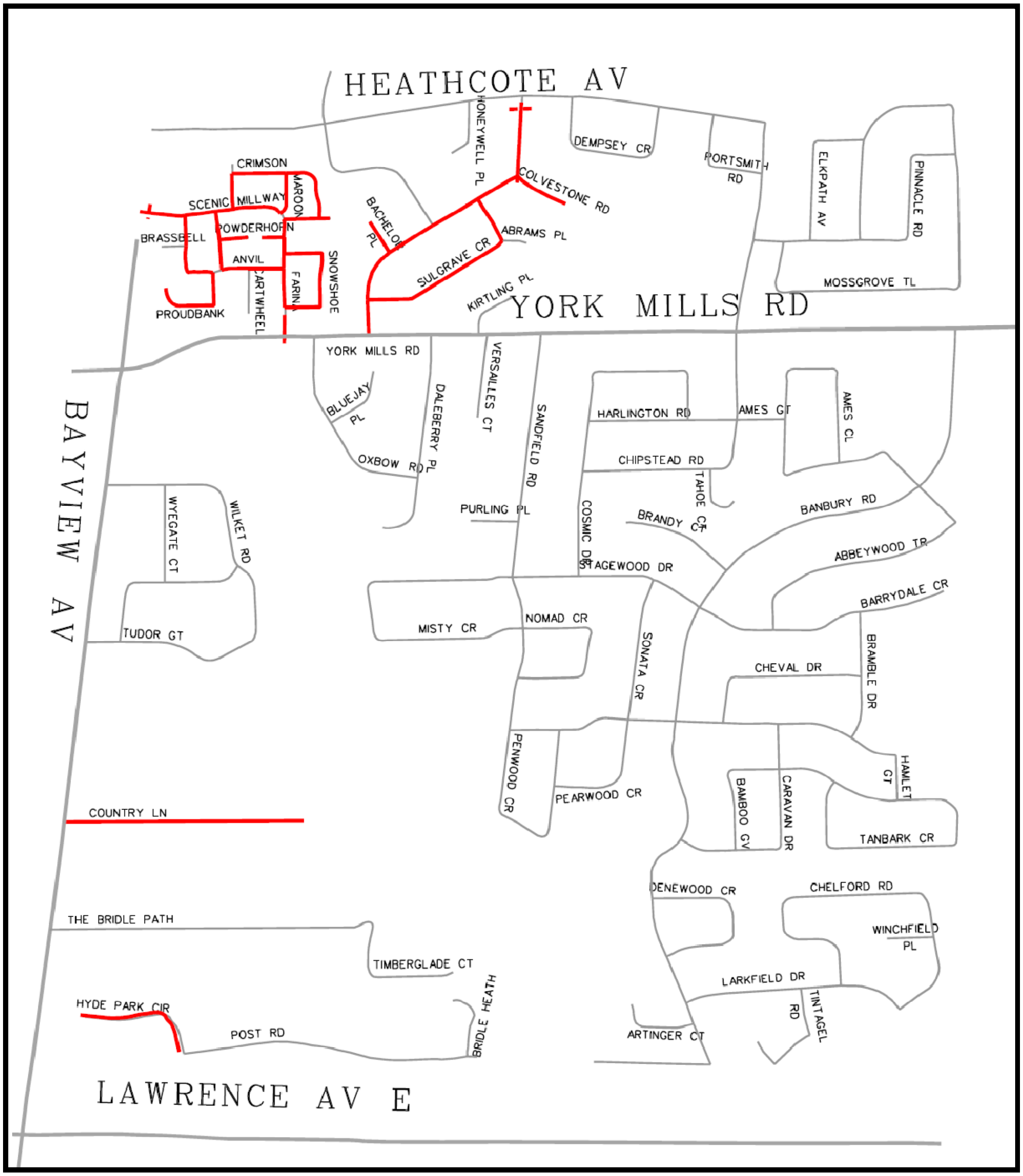


Figure 36: Map of Underground Rehabilitation of Feeders NY51M21, NYSS27F1, NYSS27F2, NYSS27F3

28.5. Required Capital Costs

There are five phase to this job with a total estimated cost of $4.46M.

Table 83: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
20260	E12217 Windfield Bayview Area Rebuild (51M21, NYSS27F1)	$0.84
20233	E12250 Scenic Millway Rebuild SS27 - Civil	$2.21
20239	E12251 Scenic Millway Rebuild SS27 - Electrical	$0.83
20298	E12266 Country Lane UG Rebuild NY61M21 - Civil	$0.43
20300	E12268 Country Lane UG Rebuild Electrical (NY61M21)	$0.14
	Total:	**$4.46**

29. Underground Rehabilitation of Feeder NY51M30 (E13093)

29.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY51M30 in order to improve reliability of service and mitigate potential safety risks.

29.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 1

As evident from Table 84, this feeder has experienced poor reliability over the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds areas that have experienced underground asset failures.

Table 84: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NY51M30				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	6,888	16,440	5,065	2,409
Feeder CHI ***(Cumulative)***	3,135	14,032	3,233	2,678

29.3. Scope of Work

This job replaces direct-buried cable and air insulated switchgear with new 28 kV Aluminum TR-XLPE cable in new concrete-encased ducts and SF_6 insulated switchgear.

Table 85: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	1,645 m	Primary Cable	1,645 m
Air-insulated Vault-installed Switchgear	6	SF_6-insulated Vault-installed Switchgear	6

29.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Don Mills Road to the east, Bayview Avenue to the west, Leslie Street to the north, and Lawrence Avenue East to the south. A map of the job area appears in Figure 37 below.

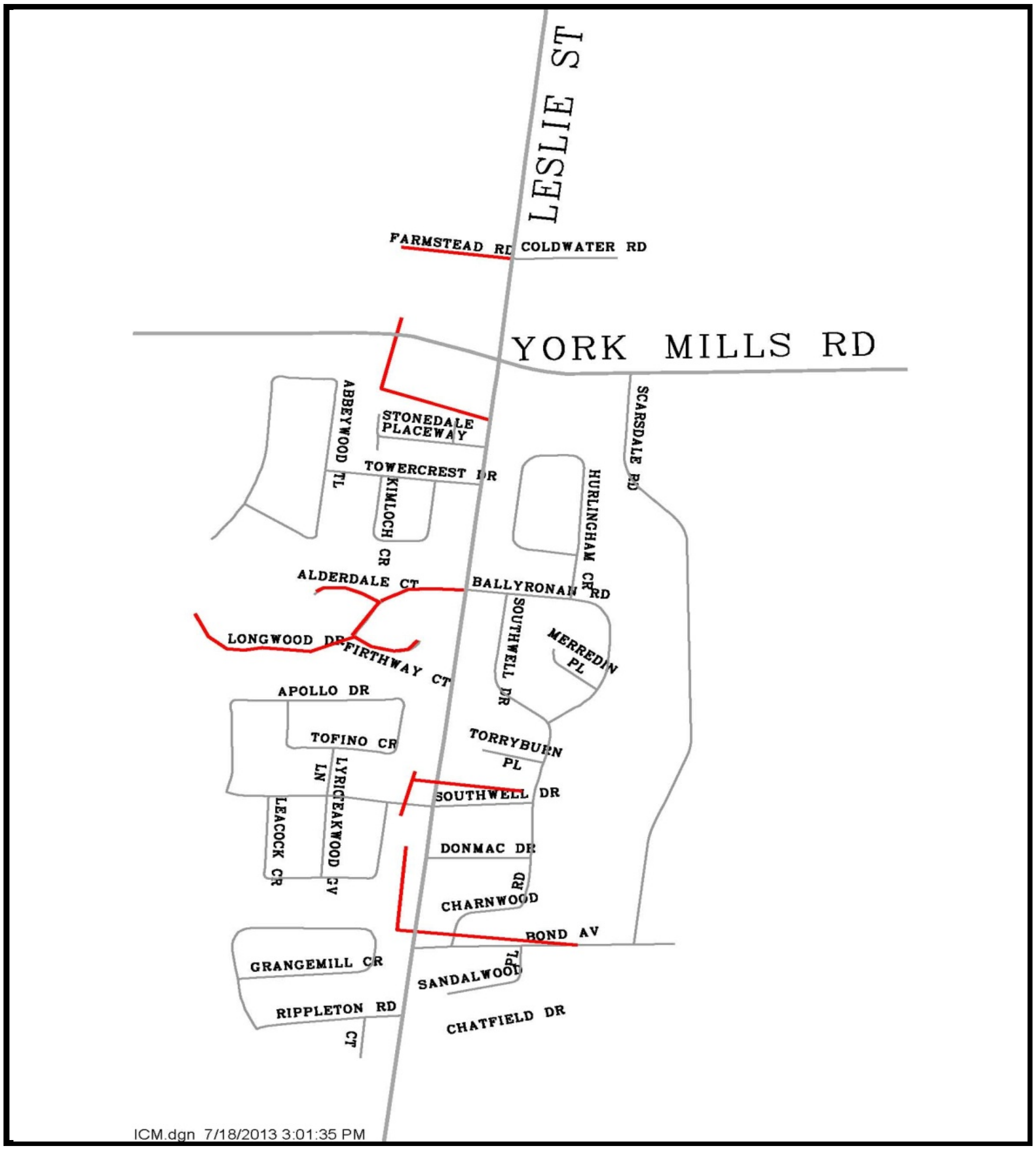


Figure 37: Map of Underground Rehabilitation of Feeder NY51M30

29.5. Required Capital Costs

There is one phase to this job with a total estimated cost of $1.12M.

Table 86: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
21334	E13093 along Leslie/north of Bond UG Rehab Electrical (NY51M30)	$1.12
	Total:	**$1.12**

30. Underground Rehabilitation of Feeders SCNA502M21, SCNA502M22 and SCNA502M28 (E13123, E13184)

30.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeders SCNA502M21, SCNA502M22 and SCNA502M28 in order to improve reliability of service and mitigate potential safety risks.

30.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 3

As evident from Table 87, these feeders have been experiencing poor reliability over the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. This job rebuilds remaining areas that have experienced underground asset failures.

Table 87: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCNA502M21,SCNA502M22,SCNA502M28				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	32,850	16,596	29,118	4,341
Feeder CHI ***(Cumulative)***	17,915	10,877	13,756	1,981

30.3. Scope of Work

This job installs civil assets. Electrical assets will be installed in future years.

30.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Birchmount Road to the east, Warden Avenue to the west, Steeles Avenue to the north, and Mcnicoll Avenue to the south. A map of the job area appears in Figure 38 below.

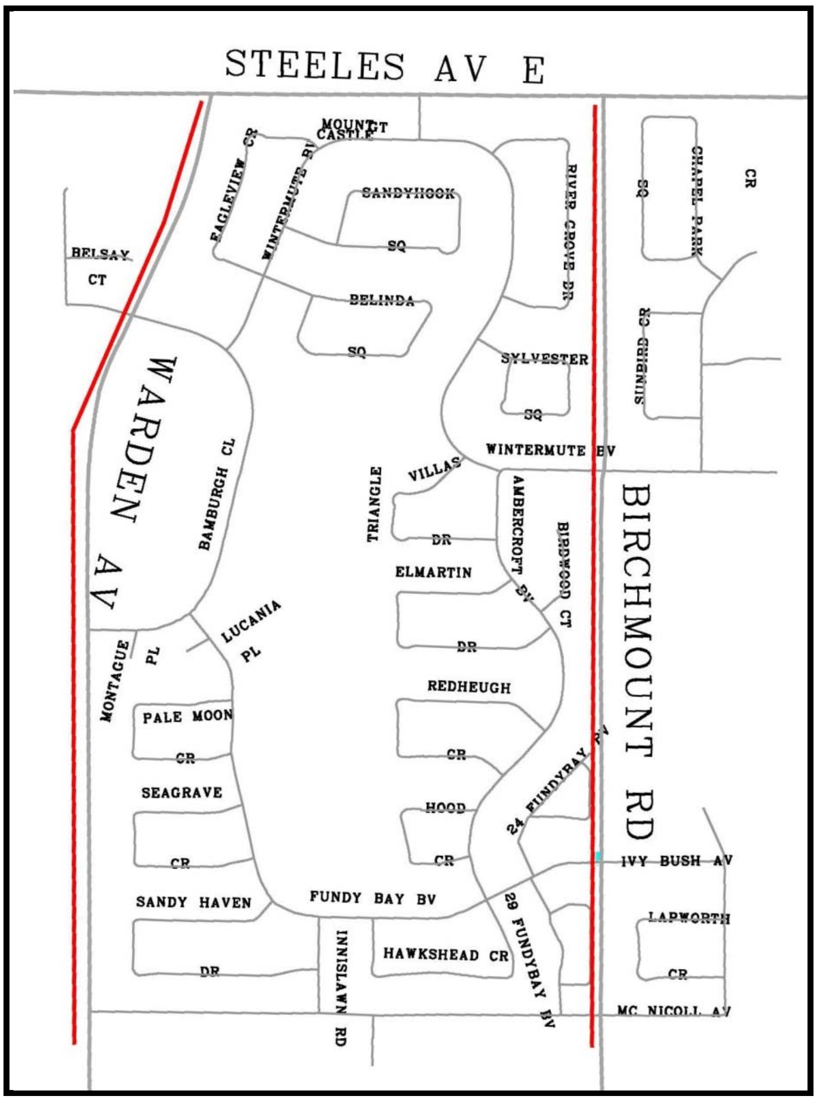


Figure 38: Map of Underground Rehabilitation of Feeders SCNA502M21, SCNA502M22 and SCNA502M28

30.5. Required Capital Costs

There are two phases to this job with a total estimated cost of $2.21M.

Table 88: Required Capital Costs

Job Estimate Number	Job Phase		Estimated Cost ($M)
21585	E13123 Rebuild Trunk 502M1 M22 Birchmount-Civil		$0.91
21933	E13184 Rebuild UG Trunk 502M21-28 Warden -Civil		$1.30
		Total:	**$2.21**

31. Underground Rehabilitation of Feeder SCNAR26M32 (E12323)

31.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder SCNAR26M32 in order to improve reliability of service and mitigate potential safety risks.

31.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 1

As evident from Table 89, this feeder has been experiencing a trend of deteriorating reliability over the past four years. This reliability trend is partially due to failures of underground assets, including direct-buried cable. This job rebuilds areas that have experienced underground asset failures.

Table 89: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCNAR26M32				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	5	850	305	145
Feeder CHI ***(Cumulative)***	4	73	1,061	457

31.3. Scope of Work

This job installs civil assets. Electrical assets will be installed in future years.

31.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Markham Road to the east, McCowan Road to the west, Steeles Avenue East to the north, and McNicoll Avenue to the south. A map of the job area appears in Figure 39 below.

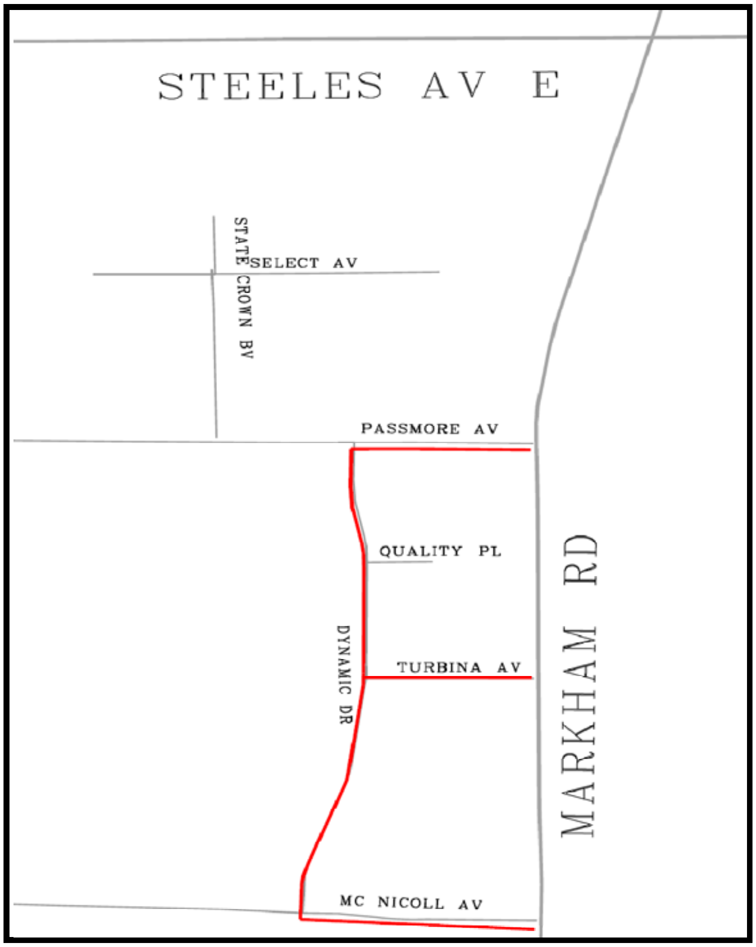


Figure 40: Map of Underground Rehabilitation of Feeder SCNAR26M32

31.5. Required Capital Costs

There is one to this job with a total estimated cost of $0.99M.

Table 90: Required Capital Costs

Job Estimate Number	Job Phase		Estimated Cost ($M)
20447	E12323 Dynamic Dr/McNicoll - Civil (NAR26M32)		$0.99
		Total:	**$0.99**

32. Underground Rehabilitation of Feeder SCNT47M1 (E12210, E12213, E12225, E12288, E12300, E12316, E13079)

32.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder SCNT47M1 in order to improve reliability of service and mitigate potential safety risks.

32.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 1

As evident from Table 91, this feeder has been experiencing poor reliability in the past four years. This poor reliability is partially due to failures of underground assets, including direct-buried cable. Reliability has improved following rebuild jobs that were completed on poor areas of the feeder. This job is intended to rebuild remaining areas of the feeder that have experienced underground asset failures.

Table 91: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCNT47M1				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	6,436	11,039	2,151	2,141
Feeder CHI ***(Cumulative)***	3,493	7,163	143	178

32.3. Scope of Work

This job replaces direct-buried cable, air-insulated switchgear, and non-standard submersible transformers with 28kV Aluminum TR-XLPE cable in concrete-encased ducts, SF_6-insulated switchgear, and submersible transformers.

Table 92: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	14,588 m	Primary Cable	14,588 m
Submersible Transformers	14	Submersible Transformers	14
Air-insulated Pad-mounted Switchgear	4	SF_6-insulated Pad-mounted Switchgear	4
Air-insulated Vault-installed Switchgear	3	SF_6-insulated Vault-installed Switchgear	3

32.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Conlins Road to the east, Markham Road to the west, Finch Avenue East to the north, and Highway 401 to the south. A map of the job area appears in Figure 41 below.

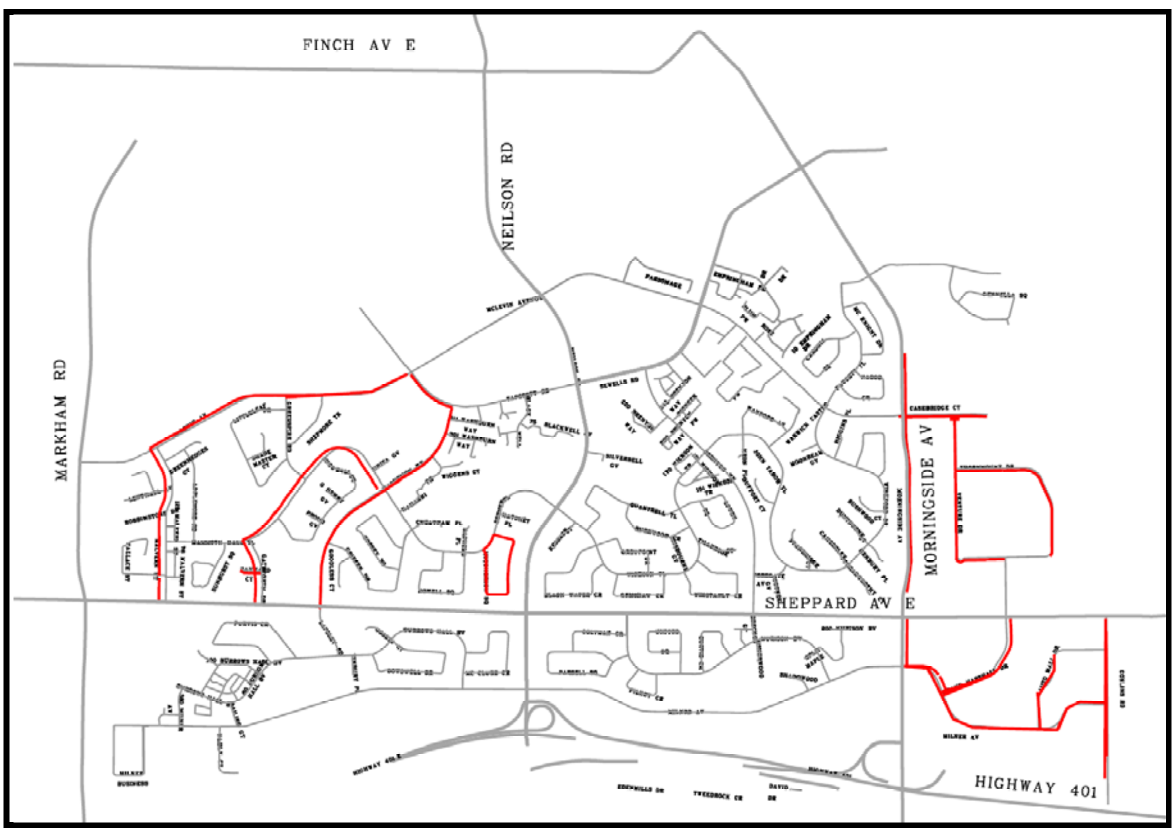


Figure 41: Map of Underground Rehabilitation of Feeder SCNT47M1

32.5. Required Capital Costs

There are seven phases to this job with a total estimated cost of $7.76M.

Table 93: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
20059	E12210- Venture Drive UG SCNT47M1 Civil/Electrical	$2.37
20051	E12213 - Morningside Casebridge SCNT47M1 - Electrical	$2.13
27565	E12225 Mammoth Hall 47M1UG Rebuild Ph2 (Electrical) SCNT47M1	$1.42
20383	E12288 Hutcherson Square UG Rebuild -Electrical (NT47M1)	$0.22
20388	E12300 Hutcherson Square UG Rebuild - Civil (NT47M1)	$0.18
20424	E12316 Mammoth Hall UG Rebuild (Electrical) SCNT47M1 Ph.1	$0.39
21288	E13079 FESI Conlins Milner NT47M1 - Electrical	$1.04
	Total:	**$7.76**

33. Underground Rehabilitation of Feeder NY53M1 (E12385, E12386)

33.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY53M1 in order to improve reliability of service and mitigate potential safety risks.

33.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 0

Table 94 provides CI and CHI figures for this feeder for the past four years. This job rebuilds an area that experienced three direct-buried cable failures in 2010, indicating degradation of assets and reflecting the need to replace assets that are at the end of their useful life.

Table 94: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NY53M1				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	232	554	20	0
Feeder CHI ***(Cumulative)***	638	264	1	0

33.3. Scope of Work

This job installs new 28 kV Aluminum TR-XLPE cable in new concrete-encased ducts to replace old direct-buried cable.

Table 95: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	2,023 m	Primary Cable	2,023 m

33.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Don Mills Road to the east, Laird to the west, Eglinton Avenue to the north, and Overlea Boulevard to the south. A map of the job area appears in Figure 42 below.

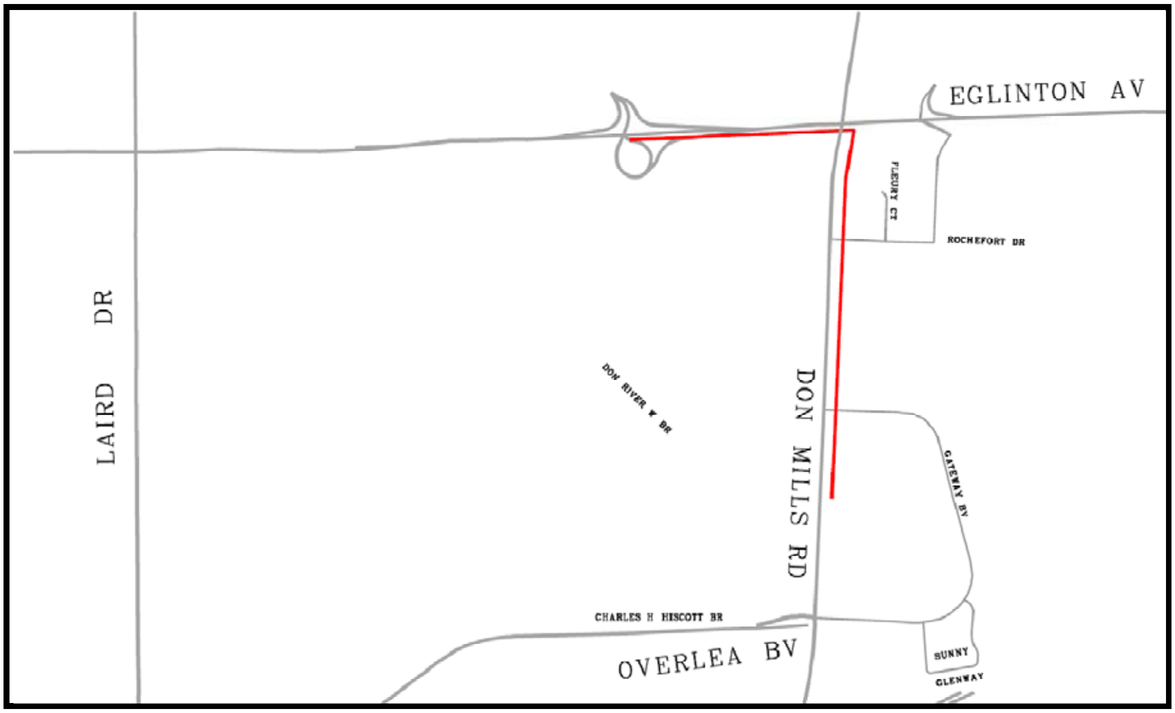


Figure 42: Map of Underground Rehabilitation of Feeder NY53M1

33.5. Required Capital Costs

There are two phases to this job with a total estimated cost of $1.24M.

Table 96: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
20664	E12385 Don Mills/Eglington UG Rebuild -Civil (53M1)	$0.80
20665	E12386 Don Mills / Eglinton UG Rebuild - Electrical (53M1)	$0.44
	Total:	**$1.24**

34. Underground Rehabilitation of Feeder NY53M9 (E08220)

34.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder NY53M9 in order to improve reliability of service and mitigate potential safety risks.

34.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 0

As evident from Table 97, the reliability of this feeder has been stable over the past four years. However, the direct-buried cables being rebuilt in this job area are over 40 years old and well past their expected useful life. In addition, catastrophic equipment failure has occurred in one of the vaults in the job area; this job is intended to reduce the risk of such failures in the future.

Table 97: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – NY53M9				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	4	31	0	0
Feeder CHI ***(Cumulative)***	0	1	0	0

34.3. Scope of Work

This job replaces direct-buried cable and air-insulated switchgear with 28kV Aluminum TR-XLPE cable in new concrete-encased ducts andSF_6-insulated switchgear.

Table 98: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	1,050 m	Primary Cable	1,050 m
Air-insulated Vault-installed Switchgear	4	SF_6-insulated Vault-installed Switchgear	4

34.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Don Valley Parkway to the east, Don Mills Road to the west, Eglinton Avenue East to the north, and Don Valley Parkway to the south. A map of the job area appears in Figure 43 below.

Figure 43: Map of Underground Rehabilitation of Feeder NY53M9

34.5. Required Capital Costs

There is one phase to this job with a total estimated cost of $0.73M.

Table 99: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
11197	E08220 Leeward 53M9 UG Rehab	$0.73
	Total:	**$0.73**

35. Underground Rehabilitation of Feeder SCFJF1 (E11116)

35.1. Objective

The objective of this job is to proactively replace underground assets on 4.16 kV feeder SCFJF1 in order to improve reliability of service and mitigate potential safety risks.

35.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 0

While in recent years the reliability of this feeder has been relatively good (Table 100), this job replaces 45 year-old direct-buried cable that has had two failures, indicating degradation of assets and reflecting the need to replace assets that are at the end of their useful life.

Table 100: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCFJF1				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	0	47	0	0
Feeder CHI ***(Cumulative)***	0	12	0	0

35.3. Scope of Work

This job replaces direct-buried cable and air insulated switchgear with new 28 kV Aluminum TR-XLPE cable in new concrete-encased ducts and SF_6 insulated switchgear.

Table 101: Asset Replacement

Assets to be Replaced		New Assets to be Installed	
Primary Cable	1,308 m	Primary Cable	1,308 m
Air-insulated Vault-installed Switchgear	8	SF_6-insulated Vault-installed Switchgear	8

35.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Kingston Road to the east, Markham Road to the west, Lawrence Avenue East to the north, and Eglinton Avenue East to the south. A map of the job area appears in Figure 44 below.

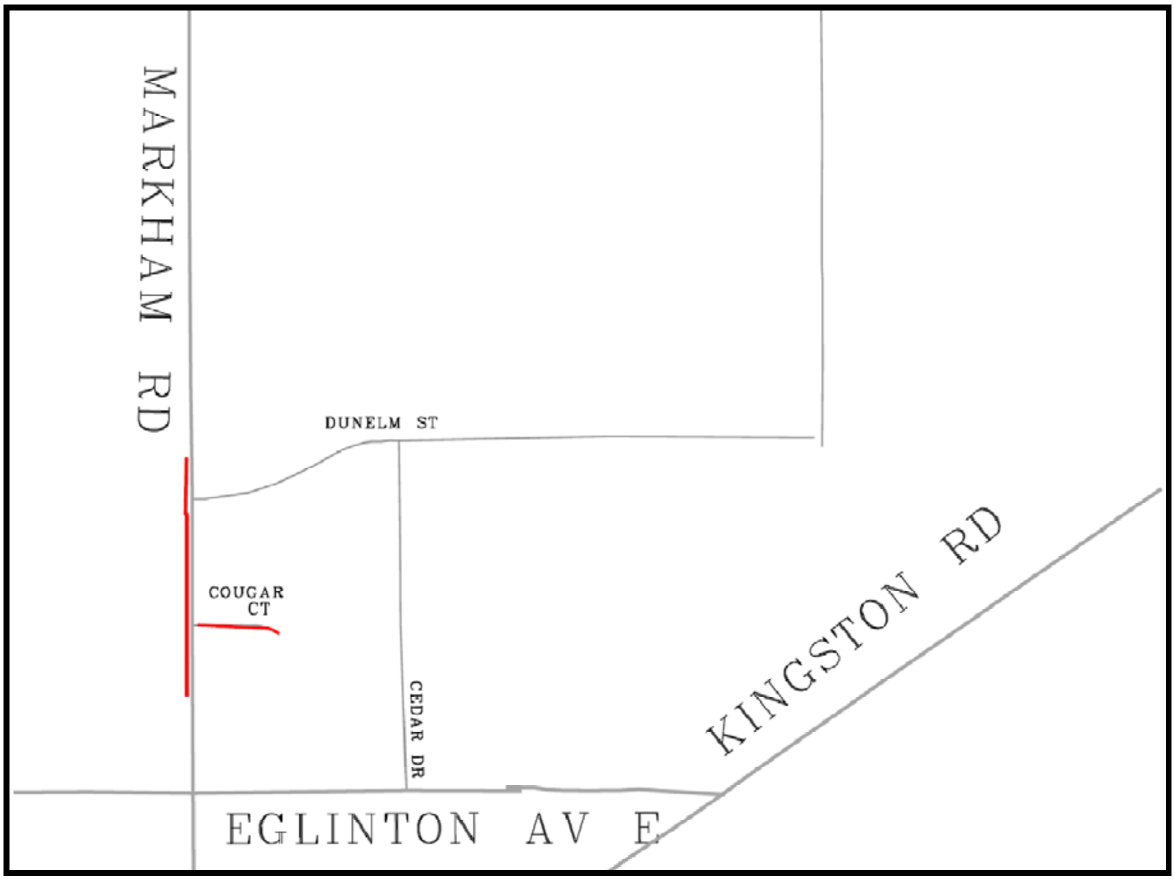


Figure 44: Map of Underground Rehabilitation of Feeder SCFJF1

35.5. Required Capital Costs

There is one phase to this job with a total estimated cost of $0.25M.

Table 102: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
20333	E11116 Cougar Court UG VC SCFJF1	$0.25
	Total:	**$0.25**

36. Underground Rehabilitation of Feeder SCNAR26M22 (E12277)

36.1. Objective

The objective of this job is to proactively replace underground assets on 27.6 kV feeder SCNAR26M22 in order to improve reliability of service and mitigate potential safety risks.

36.2. Historical Reliability Performance

Number of Unplanned Sustained Outages in 2012: 0

As evident from Table 103, the reliability of this feeder has been relatively stable in recent years. However, there was one failure of aged direct buried cable in 2011 that impacted a number of large industrial customers. This job rebuilds the area that experienced the underground cable failure in 2011 with the aim of reducing the risk of such failures in the future.

Table 103: Historical Reliability Performance

HISTORICAL RELIABILITY PERFORMANCE – SCNAR26M22				
Reliability Metric	**2009**	**2010**	**2011**	**2012**
Feeder CI ***(Cumulative)***	0	0	10	0
Feeder CHI ***(Cumulative)***	0	0	21	0

36.3. Scope of Work

This job installs civil assets only. Electrical assets will be installed in future years.

36.4. Map and Locations

The assets being replaced by this job are located in the area bordered by Markham Road to the east, McCowan Road to the west, Steeles Avenue to the north, and Finch Avenue East to the south. A map of the job area appears in Figure 45 below.

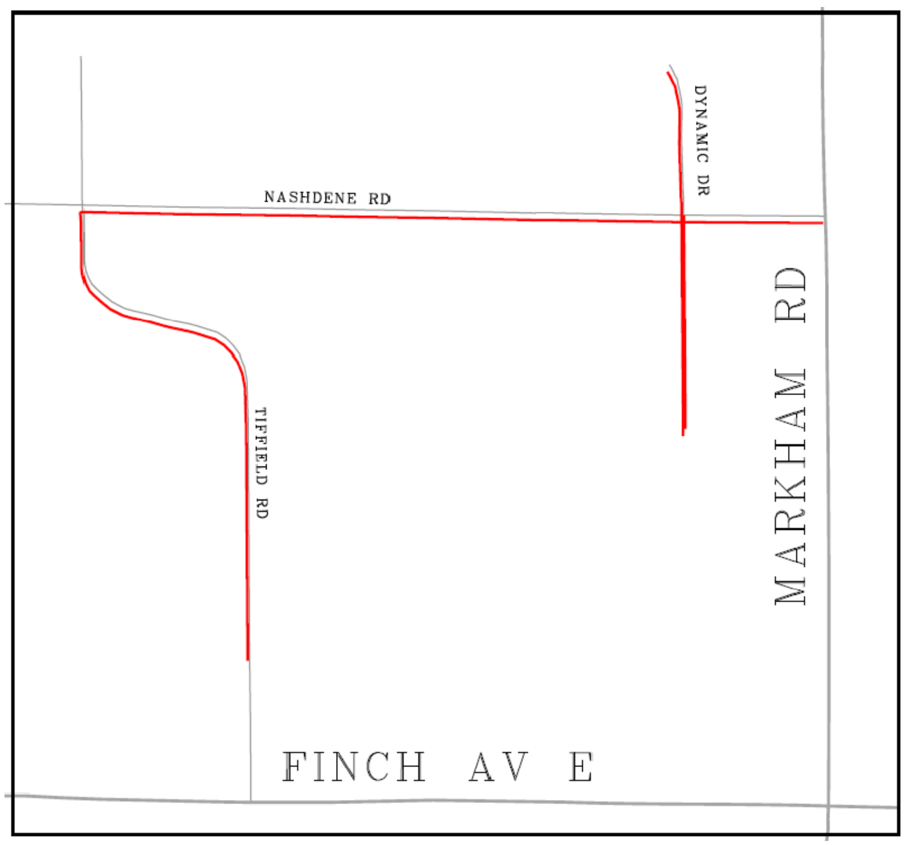


Figure 45: Map of Underground Rehabilitation of Feeder SCNAR26M22

36.5. Required Capital Costs

There is one phase to this job with a total estimated cost of $1.39M.

Table 104: Required Capital Costs

Job Estimate Number	Job Phase	Estimated Cost ($M)
20335	E12277 Nashdene-Tiffield UG Rebuild - Civil	$1.39
	Total:	**$1.39**

III Business Case Evaluation Update

The avoided risk cost estimate has been revised to only include 2014 activities (Table 105). Carrying out work on this asset class in 2014 instead of deferring to 2015 will result in an estimated avoided risk cost of $45.9 million. This demonstrates that there are substantial economic benefits from executing this work in 2014. It is also expected that approximately 35,500 CI and 31,500 CHI will be mitigated.

Table 105: Avoided Estimated Risk Cost for Underground Infrastructure Segment

Business Case Element	Cost (in Millions)
Present Value of Project Net Cost in 2015 (PV($PROJECT_{NET\_COST}$(2015))	-130.4
Project Net Cost in 2014 ($PROJECT_{NET\_COST}$(2014))	-176.3
Avoided Estimated Risk Cost = **(PV($PROJECT_{NET\_COST}$(2015)) – $PROJECT_{NET\_COST}$(2014))**	**$45.9**

ICM Project: 2014 Update | PILC Piece-Outs and Leakers Segment

SUMMARY OF CHANGES FOR 2014 UPDATE

- One piece out and leakers job was removed as its scope was combined with another job.
- Relative to the May 2012 filing, the 2014 budget in this segment increased by $1.86M.
- THESL has included capital expenditures in respect of capital work that was approved by the OEB in Phase 1, but for which THESL inadvertently requested no ICM rate riders. This work ("Bridgman to High Level PILC Feeder Replacement") is scheduled for completion in 2014. The jobs in the 2014 ICM work program reflect only the portion of this work that is coming into service in 2014. Any amounts coming into service in 2013 will be addressed at true-up.

I OVERVIEW OF 2014 UPDATE

1. The 2014 Work Program

There are three piece-out and leakers jobs included in the ICM work program for 2014, which is one less than was originally filed in this application in May 2012. The total cost of these three jobs is $1.22M. Relative to the May 2012 filing, 2014 capital expenditures on piece-out and leakers jobs have been reduced by $0.25M (not including spending related to approved Phase 1 jobs).[1]

As in Phase 1, this project segment consists of two types of work:

1. Discrete jobs to replace to repair and replace Paper Insulated Lead Covered (PILC) cable that is either leaking or requiring piecing out. 2014 capital spending on this work is presented in Table 1.

2. The replacement of feeders that run between Bridgman and High Level Station, following a near miss incident that occurred on one feeder on December 15, 2011. 2014 capital spending on this work is presented in Table 2. As described below, this work was already approved by the OEB in Phase 1.

[1] Please see discussion of 2014 work program in Manager's Summary Update, "Overview of Projects and Segments".

Table 1: Piece-Out and Leaker Jobs*

Job Estimate Number	Job Title	Units	Job Year	Total Estimated Cost ($M)
28037	Bridgman Station Piece-Out and Leakers	17	2014	0.39
24703	Gerrard & Basin (South) Station Piece-Out and Leakers	15	2014	0.11
24682	Downtown Stations Piece-Out and Leakers	49	2014	0.72
			2014 Total	**1.22M**

**Note: This was Table 3 in the previous filing*

Table 2: Bridgman to High Level PILC Feeder Replacement**

Job Estimate Number	Job Title	Job Year	Total Estimated Cost ($M)
28460	Bridgman to High Level PILC Feeder Replacement Phase 2 (Civil Work at Bridgman Egress)	2014	1.34
28461	Bridgman to High Level PILC Feeder Replacement Phase 3 (Civil Work at HL-City Park)	2014	1.34
		2014 Total	**2.68M**

**Note: Bridgman to High Level PILC work was presented in Table 2 in the previous filing*

The two jobs in Table 2 relate to the replacement of the Bridgman to High Level tie feeders. This work was approved by the OEB in Phase 1. However, due to an administrative error, the cost of this approved work ($3.9M) was not included in the ICM rate riders established in the Phase 1

Decisions.[2] The Bridgman to High Level Feeder Replacement is currently scheduled for completion in 2014. The jobs listed in Table 2 represent only the portion of the approved work coming into service in 2014. Any capital spending on this work coming into service in 2013 will be addressed at true-up.

2. Detailed Description of Changes

THESL has combined two jobs from the May 2012 filing: (i) Basin Station Piece-Out and Leakers and (ii) Gerrard Station Piece-Out and Leakers. These were combined due to the close proximity of the stations and the small number of units (3) associated with the Basin Station job.

2.1. Specific material changes in budget estimates and/or job scopes:

(a) Job 24682 (Downtown Piece-Outs and Leakers): The May 2012 filing included a job for 4 kV Stations Piece-Outs and Leakers. This job scope has been changed to Downtown Piece-Outs and Leakers, which addresses priority piece-outs and leakers in the downtown area. The original scope for 4 kV stations included 103 units, the revised scope, now for downtown stations, only includes 49 units. This results in a cost decrease of $0.43M for this job.

(b) Bridgman to High Level PILC Feeder Replacement: As noted above, this work was approved by the OEB in Phase 1. The amounts listed in Table 2 reflect only those expenditures coming into service in 2014.

THESL has split the civil work (filed as job number 27177 in the original evidence) into three jobs. Civil work along the main road, Cottingham Rd, is scheduled for 2013 under this original job number. The two additional jobs, 28460 and 28461 are in coming into service in 2014. The scope of the work for 2014 is the civil work required in the Hydro One station

[2] While the cost of this job was approved by the OEB in the PILC segment in Phase 1, the financial summary upon which the ICM rate riders were determined did not include this amount. In Phase 1, the OEB approved all of the work in this segment. In the evidence presented to the OEB (Tab 4, Schedule B2), the total 2013 capital spending on approved work was $9.32M. However, in the capital summary presented to the OEB for the determination of ICM rate riders, only $5.42M was presented for 2013 capital spending. This omission was an error. As a result, THESL receives no ICM funding for this approved work in 2013 ICM rate riders.

yard to replace the cables up to Hydro One's transformers and the civil work required through the city park adjacent to High Level Station to enable cable replacement up to the station switchgear.

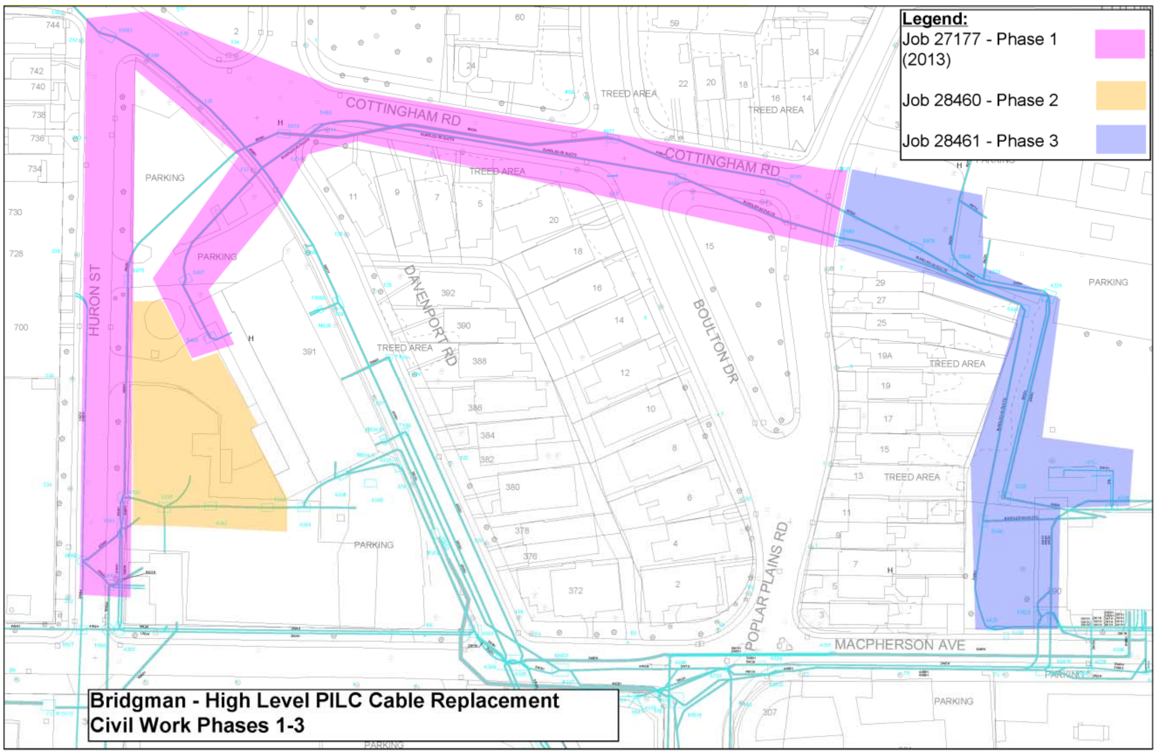


Figure 1: Location of civil work planned for Bridgman High Level tie feeder replacement

The civil work is being executed as separate jobs since both projects require extensive coordination with third parties (Hydro One and the City of Toronto respectively). In particular, the work in the Hydro One station yard is complicated by Hydro One's on-going work at this location and the need to incorporate Hydro One's future asset replacement plans into THESL's civil design. The work at the city park adjacent to High Level is complicated due to the large amount of pumping station infrastructure in the area.

2.2. Specific updates to particular sections of the originally filed narrative:

(a) In part II, sections 1.2 and 1.3 of the Phase 1 evidence for this segment (Tab 4, Schedule B), THESL stated that the existing 1500 kcmil PILC cables will be replaced with 1500 kcmil

TRXLPE cables. The existing PILC cables are now being replaced with 1000 kcmil TRXLPE cables. This change reflects current THESL standards which no longer include 1500 kcmil sized cable because their stiffness makes them too difficult for the crews to work with in the cable chambers.

(b) Sections 1.2 and 1.3 of the Phase 1 evidence for this segment (Tab 4, Schedule B) state that civil work was required due to the diameter of the new 1500 kcmil TRXLPE cable exceeding the existing duct diameter. In addition, THESL notes that this civil work is also necessary because the duct structure and cable chambers are at capacity. This means that cables must be pulled out and then replaced under contingency with the remaining tie feeders live. This is not a feasible option due to safety concerns. Additionally, the 1000 kcmil TRXLPE cable being used to replace the existing 1500 kcmil PILC cable has a lower ampacity. As a result, in some cases three feeders will be required to replace the existing pair of PILC cable tie feeders. The requirement for three replacement feeders depends on the specific feeder pair's peak load and the capacity of the High Level bus they service. The required additional cables also render the existing duct structure insufficient since there is no space to accommodate extra cables in the existing civil run.

II BUSINESS CASE EVALUATION UPDATE

Table 2, below, updates the Present Value of Options analysis presented in Phase 1 of the filing (Tab 4, Schedule B, page 28, Table 4). The data used in Table 2 was updated to reflect the assets addressed by the work program as filed in this update for the 2014 ICM year. Results confirm that proactive replacement (Option 4) is the most cost effective option for these assets.

Table 2: Present Value of Options

Business Case Element	PV (in Millions)
Option 1 — Deferral of Repair and Replacement Activities Cost of Ownership **[CO1]**	**$10.79**
➢ Environmental Cost	$5.06
➢ Emergency Repairs—Additional Tool Time	$5.73
Option 2 – De-energize Feeders within Cable Chamber during work activities—Cost of Ownership **[CO2]**	**$557.79**
➢ Cost of Customer Interruptions	$552.73
➢ Environmental Cost	$5.06
Option 3— Repair Leakers and Cables Requiring Piece Outs When Performing Emergency Work –Preset Value **[CO3]**	**$4.83**
➢ 2014 Project Cost	$5.12
Option 4 — Proactively Repair or Replace the Affected Cables – Present Value **[CO4]**	**$3.68**
➢ 2014 Project Cost	$3.99
Option 1 versus Option 2 PV [CO1-CO2]	**-$547.00**
Option 1 versus Option 3 PV [CO1-CO3]	**$5.97**
Option 1 versus Option 4 PV [CO1-CO4]	**$7.12**

ICM Project: 2014 Update | Handwell Replacement Segment

SUMMARY OF CHANGES FOR 2014 UPDATE

- Relative to May 2012 filing, forecast 2014 capital expenditures increased from $7.17M to $18.1M, an increase of $10.93M
- Increased number of handwells to be replaced from 1,031 to 2,500, a unit increase of 1,469

OVERVIEW OF 2014 UPDATE

1. The 2014 Work Program

The work proposed in this update is a continuation of THESL's Handwell Replacement Program from previous years. The 2014 ICM work program targets replacement of the remaining handwells located outside the downtown core in the surrounding areas of North York, East York, York, Etobicoke, and Scarborough, additional units identified in the field and handwells located in areas where City moratoriums have previously prevented THESL from excavating the sidewalks or other pavement. By the end of 2014, some 90 percent of handwells in the City of Toronto are expected to have been replaced.

Table 1: Summary of Segment Costs

Job Estimate Number	Job Title	Year	Cost Estimate ($M)
25011	Handwell Standardization and Remediation	2014	$18.1
Total:			**$18.1**

2. Detailed Description of Changes

THESL has added 1,469 handwell units to the 2014 ICM work program. Approximately 819 of these are additional units identified in the field, while 650 units are located in areas where City moratoriums have prevented THESL from excavating the sidewalks or other pavement.

An estimated 633 handwells will remain to be replaced upon completion of 2014 ICM jobs. THESL plans to replace these units in subsequent years.

ICM Project: 2014 Update | Overhead Infrastructure Segment

SUMMARY OF CHANGES FOR 2014 UPDATE

- 2014 ICM work program was revised to reflect the work accomplished to date in 2013 and the continuing priority needs of the system.[1]
- The overhead segment now consists of 37 jobs. This represents a net total of nine jobs that have been added to the originally filed evidence (22 jobs have been added while 13 jobs have been deferred).
- The overhead segment total project cost is $33.04M. This represents $12.93M more than the originally filed 2014 evidence. This cost increase is primarily due to the net addition of jobs.
- The jobs added are required in order to address feeders with poor reliability, end of life assets, loading and capacity constraints, and non-standard assets.
- The deferral of previously proposed jobs is due to improved reliability within those job area boundaries.

[1] Please see discussion of 2014 work program in Manager's Summary Update, "Overview of Projects and Segments."

I OVERVIEW OF 2014 UPDATE

A. The 2014 Work Program

The total funding requirement for the 2014 overhead segment has increased by $12.93 million compared to the originally filed evidence. There has been a net addition of nine projects added to the updated evidence; 22 new jobs have been added while 13 jobs have been deferred.

Table 1: Project Cost

	Project Year	Cost Estimate ($ M)
Overhead Infrastructure	2014	$33.04

B. Detailed Description of Changes

THESL has added a total of 22 new jobs to the overhead segment:

- The feeders within the scope of these jobs continue to experience poor reliability, are overloaded, or are in 4 kV areas supplied by station assets that are in poor condition.
- Three jobs were added due to overloaded feeders and capacity constraints in the southwest portion of the city.
- Three jobs were added in order to replace and convert the 4kV distribution assets that are currently being supplied by station assets in poor condition. In this case the replacement of the station assets will eventually no longer be required.
- One job was added in order to replace the end-of-life poor condition assets related to a poor reliability feeder. The addition of this job is expected to improve the reliability of this feeder and in turn improve the reliability of a key customer (Sunnybrook Hospital) supplied by this feeder.

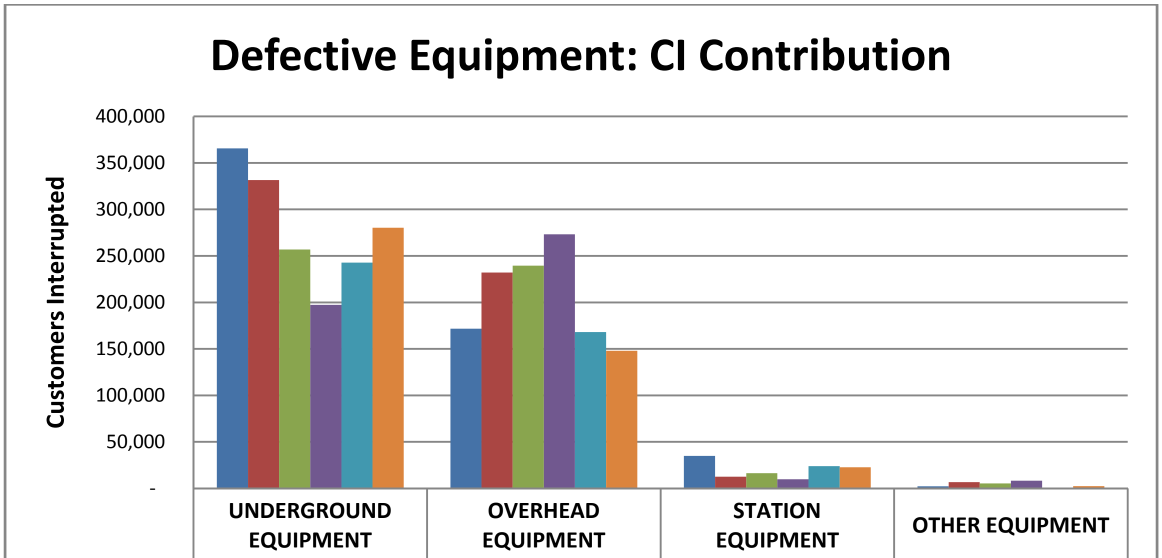
The following are specific detailed updates to the originally filed narrative (Tab 4, Schedule B4):

a) The number of poles to be replaced during 2014 has been updated to 1446 on line 6 of page 2 (previously filed as 6,315 poles during 2012-2014).

b) The number of CSP transformer to be replaced during 2014 has been updated to 156 (previously filed as 35 CSP transformers during 2012-2014).

c) The number of porcelain insulators to be replaced during 2014 has been updated to 2603 (previously filed as 400 during 2012-2014).

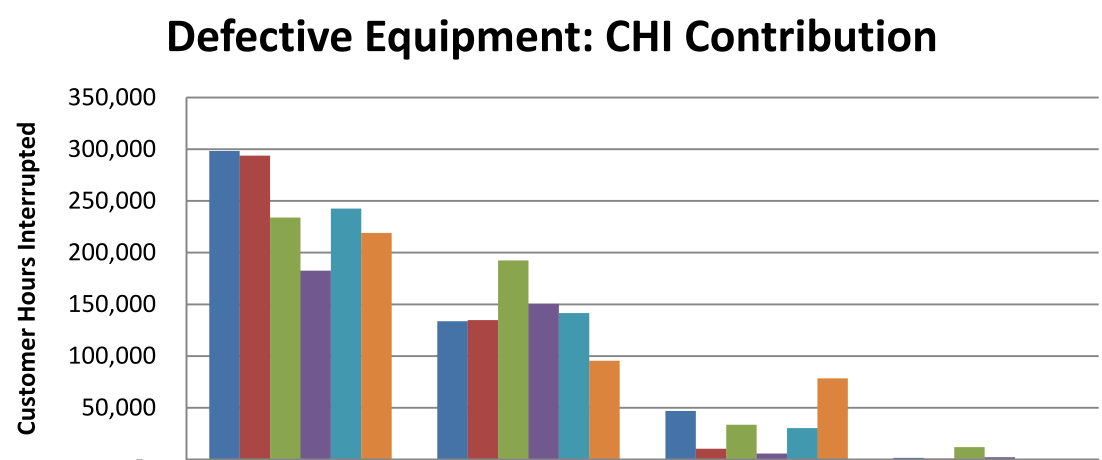
d) Figure G originally included on page 12 has been updated for 2014 and presented below:



	UNDERGROUND EQUIPMENT	OVERHEAD EQUIPMENT	STATION EQUIPMENT	OTHER EQUIPMENT
2007	365,677	171,736	34,905	2,287
2008	331,518	232,167	12,633	6,681
2009	256,934	239,523	16,275	5,248
2010	197,314	273,173	9,774	8,305
2011	242,697	168,023	23,852	6
2012	280,194	147,901	22,680	2,443

Figure 1: Defective Equipment Breakdown (CI Contribution)

e) Figure H originally included on page 12 has been updated for 2014 and presented below:



	UNDERGROUND EQUIPMENT	OVERHEAD EQUIPMENT	STATION EQUIPMENT	OTHER EQUIPMENT
2007	298,330	133,632	46,958	1,598
2008	293,849	134,758	10,367	1,047
2009	233,955	192,458	33,608	11,946
2010	182,550	150,597	5,685	2,116
2011	242,694	141,600	30,341	3
2012	219,118	95,413	78,397	814

Figure 2: Defective Equipment Breakdown (CHI Contribution)

f) The percent contribution to SAIFI for defective overhead equipment has been updated to 15% for 2012 on line 5 of page 12 (previously filed as 15 per cent for 2011).

g) The percent contribution to SAIDI for defective overhead equipment has been updated to 13% for 2012 on line 6 of page 12 (previously filed as 14 per cent for 2011).

h) The quantity of poles to be replaced during 2014 has been updated to 1,446 on line 14 of page 31 (previously filed as 6,315 poles during 2012-2014)

i) The number of CSP transformers to be replaced during 2014 has been updated to 156 on line 1 of page 42 (previously filed as 35 CSP transformers during 2012-2014)

j) The number of porcelain in-line disconnect switches and porcelain manual air-break gang-operated switches to be replaced during 2014 has been updated to 40 on line 3 of page 77 (previously filed as 114).

k) The quantity of yearly porcelain insulator replacement during 2012-2014 has been updated to 2,603 in 2014 on line 27 of page 81(previously filed as 400.

l) The quantity of yearly porcelain pothead replacement during 2012-2014 has been updated to two in 2014 on line 13 of page 82 (previously filed as 50).

II JOB-LEVEL UPDATES

1. New List of Jobs for 2014

Table 2: Listing of All 2014 Jobs

Job Estimate Number	Job Title	Year	Cost Estimate ($M)	Section Reference
27668	W13634 - P05 Extension of R30M12 Eastwards Along Evans Avenue And Royal York Rd South Of Evans into R30M1 and R30M8	2014	$1.13	2
28603	W14605 - P05-Manby - Richview Load Cascades Part1	2014	$0.29	3
28605	W14677 - P05- Manby - Richview Load Cascades Part2	2014	$1.42	3
23354	W12253 11M7 SWITCH REPLACEMENT JANE/WOOLNER	2014	$0.14	4
24169	E14319-New SCADA Switch on 43M24	2014	$0.26	4
24139	E14318-New SCADA Switches on NY51M3	2014	$0.24	4
23878	W14276 OH Feeder Rehab –Signet, Weston, Fenmar (NY55M1)	2014	$2.51	5
18523	W11289 – FESI Rowntree Contingency 55M22	2014	$0.67	5
23979	W14285 - Pellat OH & UG lateral Rebuild	2014	$0.30	6
24007	W14289 - OH Rebuild off Gary Avenue	2014	$1.03	6
25898	W13454 Voltage Conversion of Hollywood Feeders BD-F1, and BD-F2	2014	$0.44	7
27810	W13364 – Kingsway MS – OH Voltage Conversion of B1KY	2014	$0.56	7
23323	W14181 - Kingsway MS – OH Voltage Conversion (ETEF1)	2014	$0.73	7
24052	W14306 - 85M5 - McAllister Rd. Overhead Rebuild	2014	$0.33	8
24089	W14315 - 85M5 – Carmichael Ave. OH rebuild and conductor upgrade	2014	$0.81	8

Job Estimate Number	Job Title	Year	Cost Estimate ($M)	Section Reference
23089	W14150 – OH Feeder Rehab – Milvan / Penn	2014	$1.13	9
23093	W14149 - OH Feeder Rehab – Finch / Weston / Toryork	2014	$0.73	9
25263	E11333 - Brimley Anson MS Voltage Conversion	2014	$0.69	10
24698	E11333-BRIMLEY/ANSON VC PHASE 2	2014	$1.06	10
23928	E13359 - Remove YH feeders and assets after Voltage Conversion	2014	$0.35	11
23978	E14286 OH Rebuild and Voltage Conversion of NYSS64F2 from Ruddington MS	2014	$1.21	12
22211	W13206 – Refurbish Feeder Laterals Phase 2 of 2	2014	$1.82	13
28075	38M27 North Queen conductor Upgrade	2014	$0.40	14
24320	W14343-Voltage Conversion RB-F3 Phase 1	2014	$0.49	15
24333	W14345-Voltage Conversion-Westmount MS RB-F2	2014	$0.52	15
22205	E11765 Pole Replacement Deanvar Ave CE-F1	2014	$0.37	16
28560	W14658 - P05-OH Voltage Conversion of West Islington feeder AF1	2014	$0.75	17
28571	W14659 - P05- OH Voltage Conversion of West Islington feeder AF2	2014	$0.68	17
28570	W14661 - P05- OH Voltage Conversion of West Islington feeder AF6	2014	$0.51	17
19861	X12172 Replacement of non-standard/CSP transformer	2014	$1.16	18
19862	X12173 Replacement of non-standard/CSP transformer	2014	$1.10	18
19970	X12196 Rebuild primary and replace CSP transformers	2014	$2.80	18

Job Estimate Number	Job Title	Year	Cost Estimate ($M)	Section Reference
19886	X12179 Replacement of CSP transformers	2014	$1.64	18
21025	X12501 O/H Rebuild – Keele St and Milford Ave NY35M12	2014	$1.14	19
1973 5	X12148 ParkLane Repl nonStd Txf/CSP (34M7)	201 4	$0.65	20
27813	W10487 Downsview Airport Supply Rebuild 85-M3	2014	$1.90	21
26151	Install/Redesign Guying Phase 3	2014	$1.11	22
Adjustment to correct for rounding			**($0.03)**	
2014 Overhead ICM Total			**$33.04**	

2. Extension of R30M12 Eastwards Along Evans Avenue And Royal York Rd South Of Evans

2.1. Objectives

The main objective of this project is to relieve feeders R30M1 and R30M8 from the Horner TS east of Kipling Avenue by extending the new feeder R30M12 powered out of the Horner TS and slightly modifying the configuration of the existing Horner TS feeders south of The Queensway.

2.2. Scope of Work

The scope of work of this job is to construct a new overhead line at the intersection of Evans Avenue and Kipling Avenue, eastwards to Royal York Road. The new arrangement will result in 20A load from Horner TS feeder 30M1 and 240A load from Horner TS feeder R30M8 transferred to the new feeder R30M12 off bus pair B-Y of the Horner TS.

Table 3 shows an overview of the new customer connection feeder requests that had not been accounted for in the 2012 load forecast. Table 4 illustrates an analysis of the current status of Horner TS bus pair B-Y after the inclusion of the new load requests shown in Table 3. Figure 3 illustrates the changing profile of the surplus bus capacity at Horner TS.

The new project W13634 will enable Horner TS feeders close to Lakeshore Boulevard and are currently loaded to their maximum limits, increase their capacities for contingencies and allow them accommodate the anticipated load requests.

Table 3: Overview of Loading with the inclusion of new (2013) Feeder Requests

							YEAR						
Request #	Date	Bus	Feeder	Add Winter Load	Add Summer Load	In-Service Date	2013	2014	2015	2016	2017	2018	2019
2012-283	11/09/2012	Y	R30M10	937	937	20-Sep-13		0.5	0.2				
2012-317[1]	12/13/2012	Y	R30M6	11418	11418	02-Sep-13		4.9		1.0		0.8	0.4
2012-76	3/14/2012	Y	R30M4	280	280	19-Jun-12	0.2						
2012-99	04/05/2012	B	R30M5	360	360	15-Sep-12		0.3					
2013-25[2]	1/30/2013	B	R30M3	6388	6388	01-Jun-13		2.7	0.9	0.9			
2013-30	02/06/2013	Y	R30M10	2800	2800	01-Jan-16	0.9	0.7	0.4				
2013-48	2/27/2013	Y	R30M10	300	300	27-Mar-13	0.2						
2013-50[3]	2/28/2013			4100	2000	01-Jun-14		1.0	0.4				
Add Sherway load transfer (Already part of ICM filed evidence)[4]								5.0					
Remove Planned Manby Transfer (Already filed ICM evidence required to be revised)								-19.7					
Data Center ?								10.5					
1. 2014 load reduced due y 0.937 MVA already connected to Horner TS					Total Yearly Additional Load		2013	2014	2015	2016	2017	2018	2019
2. Due to construction delays, load profile revised to affect 2014-2016 (not 2013-2015)					Cummulative Yearly Additional Load		1.3160	5.8641	1.8660	1.8760	0.0000	0.8400	0.3500
3. Due to construction delays, load profile revised to affect 2014-2016 (not 2013-2015)					Bus Load As per Current Forecast		1	7	9	11	11	12	12
4. Sherway load transferred from Manby to Horner - Expected to impact starting 2014					Bus Load As per Revised Forecast		160	183	187	190	193	196	199
					Rated Bus Capacity		161	190	196	201	204	208	211
					Revised Surplus Bus Capacity		192	192	192	192	192	192	192
					Total Yearly Additional Load		31	2	-4	-9	-12	-16	-19

Table 4: Analysis of the current loading status at Horner TS

ANALYSIS	2013	2014	2015	2016	2017	2018	2019
Total Yearly Additional Load	1	6	2	2	0	1	0
Cumulative Yearly Additional Load	1	7	9	11	11	12	12
Bus Load As per Current Forecast	160	183	187	190	193	196	199
Bus Load As per Additional Forecast	161	190	196	201	204	208	211
Rated Bus Capacity	192	192	192	192	192	192	192
Surplus Bus Capacity	31	2	-4	-9	-12	-16	-19

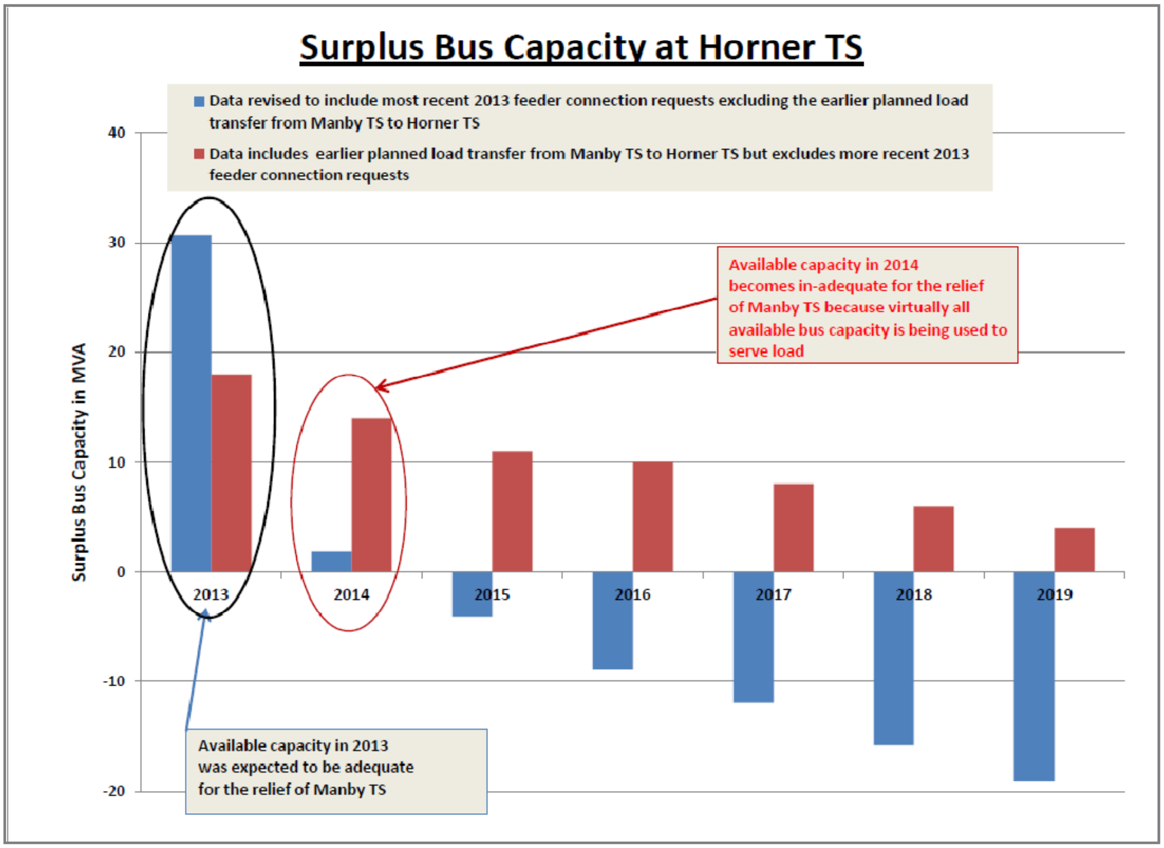


Figure 3: Illustrating the Changing profile of Surplus Bus Capacity at Horner TS

2.3. Required Capital Costs

Table 5: Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost ($M)
27688	W13634 - P05 Extension of R30M12 Eastwards Along Evans Avenue And Royal York Rd South Of Evans into R30M1 and R30M8	2014	$1.13
		Total:	**$1.13**

3. Reconfiguration of Manby TS distribution feeders

3.1. Objectives

The object of this job is to relieve Manby TS bus pairs Q-Z and B-Y of overload and provide capacity for system expansion.

3.2. Scope of Work

Load relief is required in the Manby distribution area as illustrated in Table 6 below.

Table 6: THESL 2013 10 YEARS SUMMER LOAD FORECAST (SYSTEM COINCIDENT PEAKS - MVA)

STATION / BUS	FIRM CAPACITY (MVA)				YEAR										
	PRESENT		FUTURE												
	100%	95%	100%	95%	2012*	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
MANBY (230KV/27.6KV) TS															
B & Y	63	60	63	60	68	68	54	55	56	56	57	58	59	60	61
Q & Z (see note 2)	63	60	63	60	64	65	60	61	62	63	64	64	65	66	67
V & F	112	106	112	16	101	103	104	106	108	109	111	113	114	116	118
Total of all Buses	238	226	238	226	233	236	218	222	226	228	232	235	238	242	246
Surplus MVA					5	2	20	16	12	10	6	3	0	-4	-8
% Loading (Load/2012 Firm Cap)					98	99	92	53	95	96	57	99	100	102	103

The drop in loading forecasted from 2013 to 2014 was due to savings expected from transfer projects that had been scheduled for completion before the 2014 summer peak. That forecasted drop in loading was as follows:

Table 7: Forecasted drop in loading

Year / Bus	2013	2014	Difference (MVA)
Q-Z	65	60	5
B-Y	68	54	14
Total			19

Job W13437 was expected to transfer 5MVA from Manby TS to Horner TS. Job W13329 was expected to transfer 14MVA from Manby to Horner but the project has been cancelled due to the unavailability of capacity at Horner TS. Projects W14605 and W14677 aim to make up the difference. Project W14605 transfers 3MVA from Manby bus QZ to Richview TS. Project W14677 transfers 17MVA from Manby bus BY to Richview TS. Both W14605 and W14677 need to be completed before the end of Q2 2014 to be available for the summer peak.

3.3. Required Capital Costs

Table 8: Required Capital Costs

Job Estimate Number	Project Phase	Year	Estimated Cost ($M)
28603	W14605 - P05-Manby - Richview Load Cascades Part1	2014	$0.29
28605	W14677 - P05- Manby - Richview Load Cascades Part2	2014	$1.42
		Total:	**$1.71**

4. Installation of SCADA Switches

4.1. Objectives

The purpose of this job is to replace existing manual switches with SCADA-Mate R2 switches as well as installing SCADA-MATE R2 switches in new locations in order to improve restoration time as part of the ongoing investment strategy for reducing Customers Hours Interrupted (CHI). These switches are always installed on the main trunk portion of the feeder. Outages on this portion of the feeder impact many customers. Typically, on residential feeders approximately 3,000 customers will experience a sustained outage from a fault on the feeder trunk. In addition to the switch installation, fault circuit indicators will also be installed in strategic locations along the feeder in order to further aid in improving restoration time.

With the installation of remote fault sensing switches, typically three quarters of the customers will have their power restored within a few minutes. Thus, this provides an effective means of restoring customers quickly. Without remote fault sensing switches, crews will need to patrol the feeder until the root cause of the outage is found. Furthermore, a crew will need to operate the manual switches at multiple locations in order to isolate the faulted section of the feeder and re-supply non-affected portions of the feeder from neighbouring tie feeders. The presence of a remote fault sensing switch is expected to provide two major benefits; namely the ability to provide Power System Controllers with fault location information as well as the ability to remotely open and close various switches quickly.

In some cases, THESL does not have control of opening or closing station circuit breakers because this function is controlled by Hydro One Networks. The installation of a remote fault sensing switch close to the egress of the station would allow THESL Power System Controllers to effectively control power supply to the vast majority of the feeder. This shortens the outage duration since co-ordination with Hydro One Network personnel is no longer required.

4.2. Scope of Work

The scope of work for this job is to replace existing manual switches with SCADA as well as installing SCADA-MATE R2 switches in new locations. These switches are in multiple locations across the THESL grid. In addition to the switch installation, fault circuit indicators will also be installed in strategic locations along the feeder in order to further aid in faster restoration of outages.

4.3. Required Capital Costs

Table 9: Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost ($M)
23354	W12253 11M7 SWITCH REPLACEMENT JANE/WOOLNER	2014	$0.14
24169	E14319-New SCADA Switch on 43M24	2014	$0.26
24139	E14318-New SCADA Switches on NY51M3	2014	$0.24
		Total:	**$0.64**

5. Overhead rebuild on feeder NY55M1 and NY55M22

5.1. Objectives

The purpose of these jobs is to refurbish and reconfigure the overhead distribution system by replacing defective poles and non-standard equipment on feeders 55M1 and 55M22 in the area of Steeles Avenue and Weston Road as well as in the area of Islington Avenue, Rowntree Mill Road and Apted Avenue.

5.2. Scope of Work

As shown in Figure 4, 55M1 had a consistent poor reliability trend of sustained interruptions with nine outages in 2011. For feeder 55M22, the job aims to reconfigure and extend the overhead primary line for operational flexibility. It is expected to allow for more efficient restoration of feeders adjacent to 55M22.

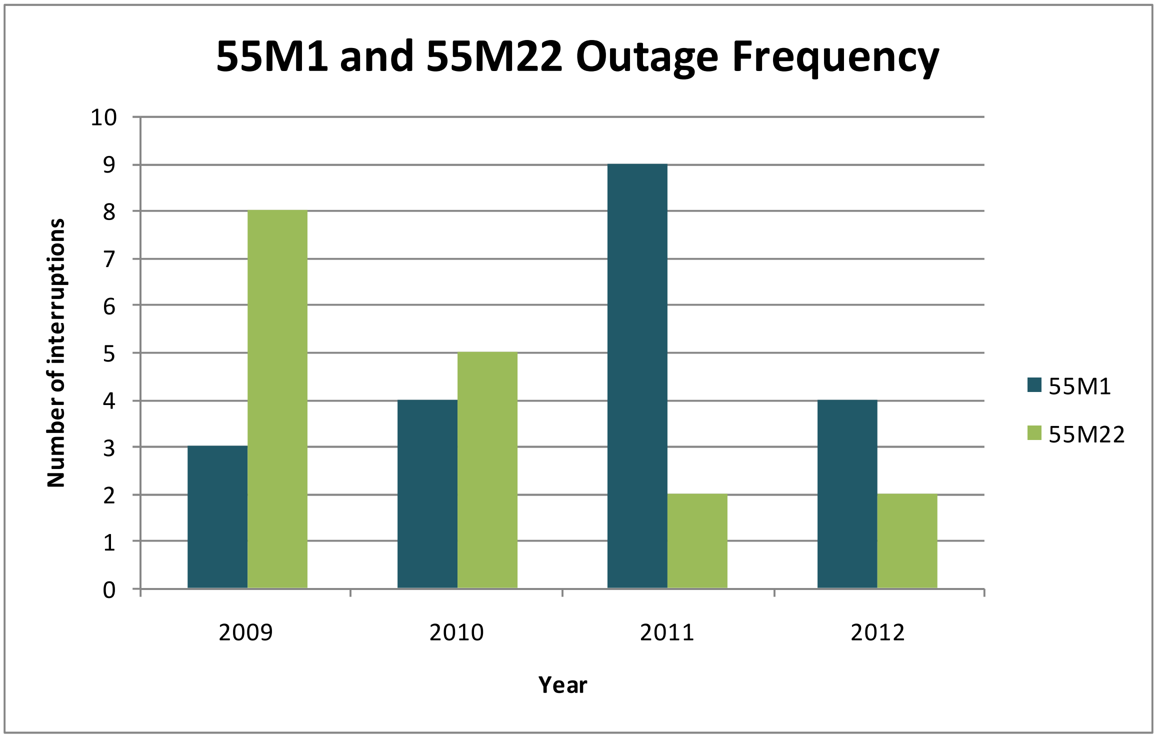


Figure 4: Outage Frequency on 55M1 and 55M22

These jobs replace defective poles, poor performing CSP transformers and under-sized conductor, as well as install tree poof conductor in treed areas. This feeder rehabilitation of the overhead infrastructure is intended to mitigate the continuing deterioration of this feeder. In addition, the job on NY55M22 will be providing a backup for the overhead loop on the area of Rowntree Mill Road west of Islington Avenue.

5.3. Required Capital Costs

Table 10: Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost ($M)
23878	W14276 OH Feeder Rehab –Signet, Weston, Fenmar (NY55M1)	2014	$2.51
18523	W11289 – FESI Rowntree Contingency 55M22	2014	$0.67
		Total	**$3.18**

6. Overhead rebuild on feeder NY55M23

6.1. Objectives

The purpose of these jobs is to refurbish and rehabilitate the overhead distribution system on feeder NY55M23 from Finch TS by replacing defective poles and non-standard equipment.

6.2. Scope of Work

As shown in Figure 5, Feeder NY55M23 has shown evidence of deteriorating reliability in the past four years. The feeder has experienced at least six failures per year over the last four years and has increased the number of outages in 2012. The major failure mode for this feeder is due to overhead equipment.

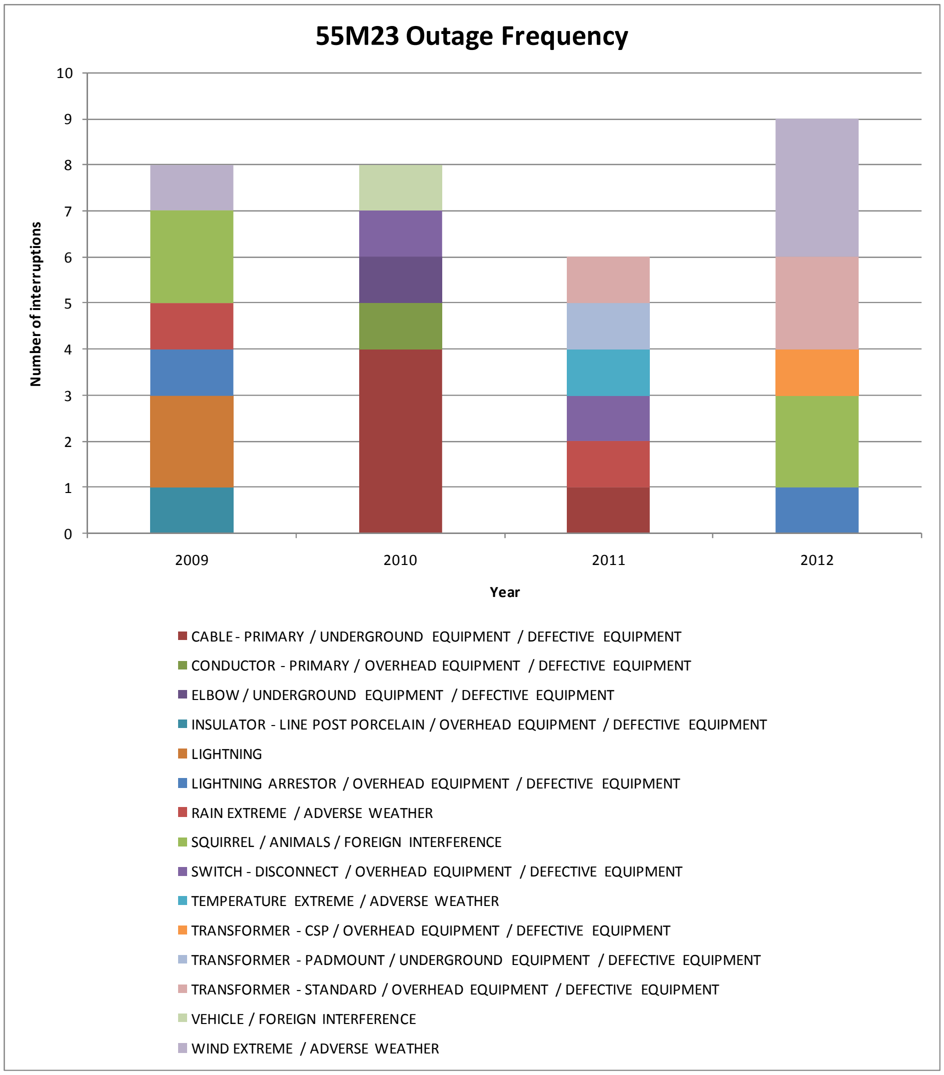


Figure 5: Outage Frequency on 55M23

These areas are primarily comprised of poorly performing, non-standard assets including CSP transformers, porcelain insulators and arrestors. The scope of work requires the replacement of end-of-life and non-standard assets. Within the boundaries of this job, all overhead primary conductors, end-of-life poles and CSP transformers will be replaced with current standard equipment as well as replacing underground cable in concrete encased ducts.

More specifically, the jobs on the primary overhead distribution system focuses on the areas bounded by Pellat Avenue, Atoni Plaza, Wendell Avenue, Langside Avenue, Meadow Oak Place and Gary Drive.

6.3. Required Capital Costs

Table 11: Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost ($M)
23979	W14285 - Pellat OH & UG lateral Rebuild	2014	$0.30
24007	W14289 - OH Rebuild off Gary Avenue	2014	$1.03
		Total	**$1.33**

7. Voltage Conversion on Etobicoke feeders

7.1. Objectives

The objective of this job is to convert obsolete and non-standard equipment on the 4kV distribution system to the standard 27.6kV service in the Etobicoke area.

7.2. Scope of Work

The 4 kV feeders, BDF1, BDF2, B1KY, EBF1, EF1, EHF1, and KKF2 in the area of Kingsway MS and the 4kV feeders BDF1 and BDF2 from Hollywood MS were selected based on outages (as shown in Figure 6 below) and condition of equipment as observed by field crew. The majority of the equipment on this aging system has reached or is approaching end of life and the substation equipment should be replaced or decommissioned. Furthermore, some of the equipment is becoming difficult to purchase due to obsolescence. These jobs will convert all the 4 kV loads to the 27.6kV system and remove any unnecessary equipment. The long term goal is to convert all the customers supplied from these 4kV station feeders and decommission the station.

The scope of work is to convert all customer loads on the 4kV system to the 27.6kV system usually by a line transfer to an adjacent 27.6kV feeder. In some cases these jobs require additional feeder configuration to accommodate customers that are currently beyond the 27.6kV system. Some trunk lines may be maintained to provide contingency options to 4kV feeders that still serve customers. These lines are planned to be removed when they are no longer necessary and the substation has been decommissioned.

The voltage conversion of Hollywood MS feeders is particularly urgent as the provincial ministry of transportation needs to appropriate the land the substation is currently situated on for the 2014 widening of the adjacent highway ramp.

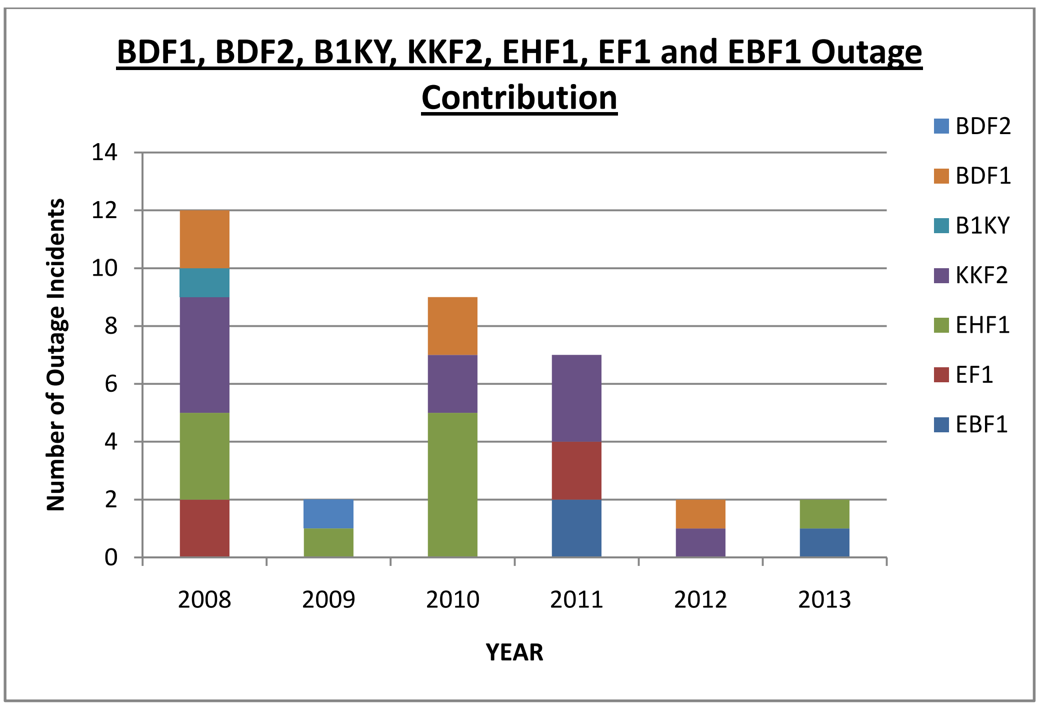


Figure 6: Outage contribution on BDF1, BDF2, B1KY, KKF2, EHF1, EF1 and EBF1

7.3. Required Capital Costs

Table 12: Required Capital Costs

Job Estimate Number	Project Phase	Year	Estimated Cost ($M)
23323	W14181 - Kingsway MS – OH Voltage Conversion (ETEF1)	2014	$0.73
27810	W13364 – Kingsway MS – OH Voltage Conversion of B1KY	2014	$0.56
25898	W13454 Voltage Conversion of Hollywood Feeders BD-F1, and BD-F2	2014	$0.44
		Total:	**$1.73**

8. Overhead Rebuild on NY85M5

8.1. Objectives

The purpose of these jobs is to replace old, poorly performing non-standard overhead distribution equipment and poles in poor condition on feeder NY85M5.

8.2. Scope of Work

As shown in Figure 7, NY85M5 has shown evidence of deteriorating reliability in the past three years. NY85M5 had 15, 16, and ten outages in 2010, 2011, and 2012 respectively, or an average of more than one outage every month.

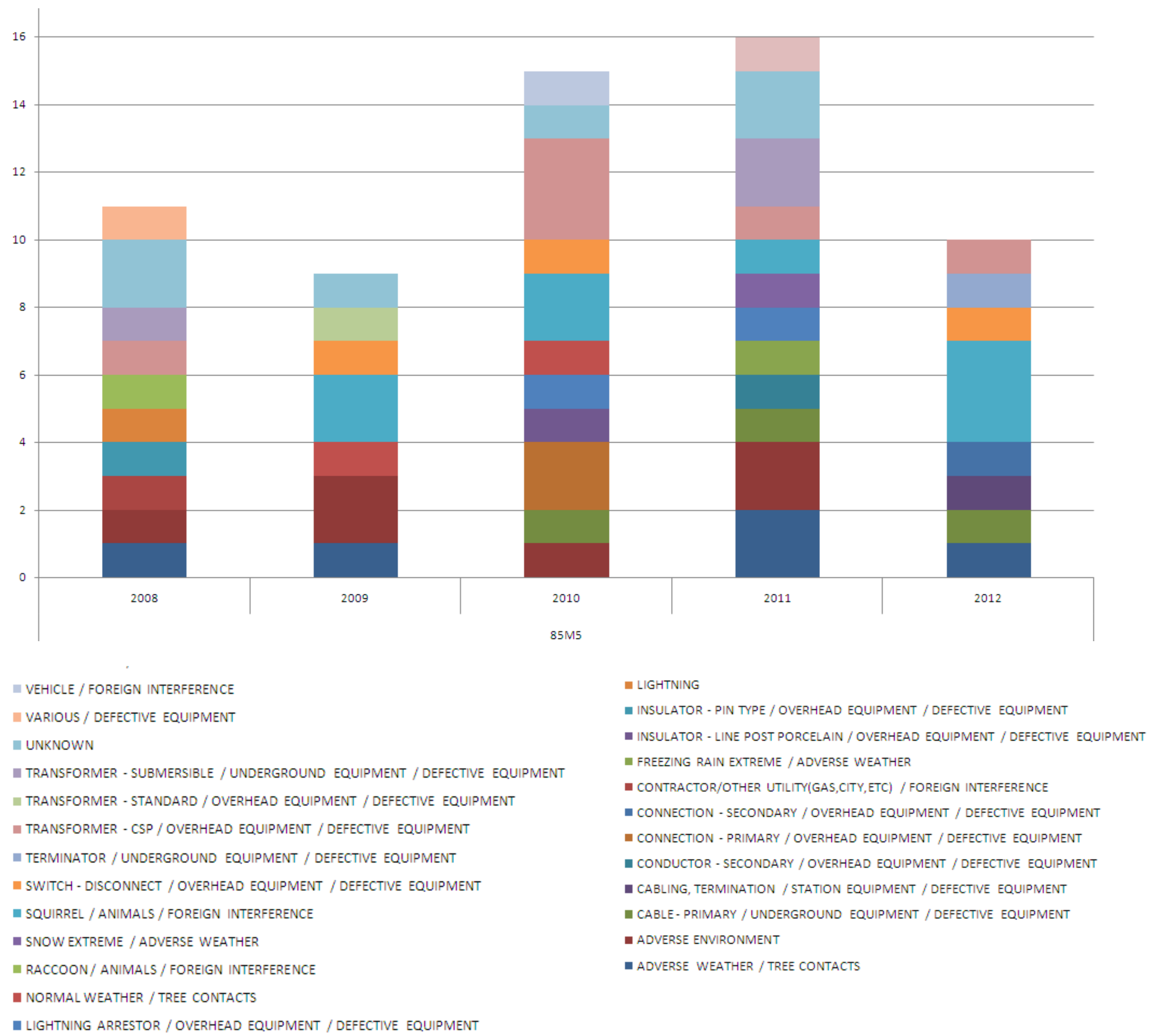


Figure 7: 85M5 Outage Frequency

These areas are primarily comprised of poorly performing, non-standard assets including CSP transformers, porcelain insulators and arrestors. The scope of work requires the replacement of end-of-life and non-standard assets. Within the boundaries of this job, all overhead primary conductors, end-of-life poles and CSP transformers will be replaced with current standard equipment. This job replaces poles, switches, insulators, pole-mounted transformers and upgrades the overhead primary conductor to 556.5 kcmil and the replacement of underground XLPE #1 Solid Cable in concrete encased ducts.

The scope of work will encompass Carmichael, Allard, Falkirk, McGillivray, Burncrest, Clyde, Joicey, Dunblaine, Mcallister, and Harlock.

8.3. Required Capital Costs

Table 13: Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost ($M)
24052	W14306 - 85M5 - McAllister Rd. Overhead Rebuild	2014	$0.33
24089	W14315 - 85M5 – Carmichael Ave. OH rebuild and conductor upgrade	2014	$0.81
		Total	**$1.14**

9. Overhead Feeder Rehabilitation on NY55M9

9.1. Objectives

The purpose of this job is to replace defective poles and non-standard equipment along Milvan Drive, Penn Drive, Finch Avenue West, Toryork Drive and Weston Road on feeder NY55M9.

As shown in Figure 8, NY55M9 experienced four outages in 2011. Approximately 80% of the outages over the last four years were due to overhead related faults and recent feeder patrol reports have shown that most of the poles in the job area are aged, feathered at the top and are at the risk of cracking, breaking and toppling over. Non-standard equipment on the overhead distribution was also identified by feeder patrols.

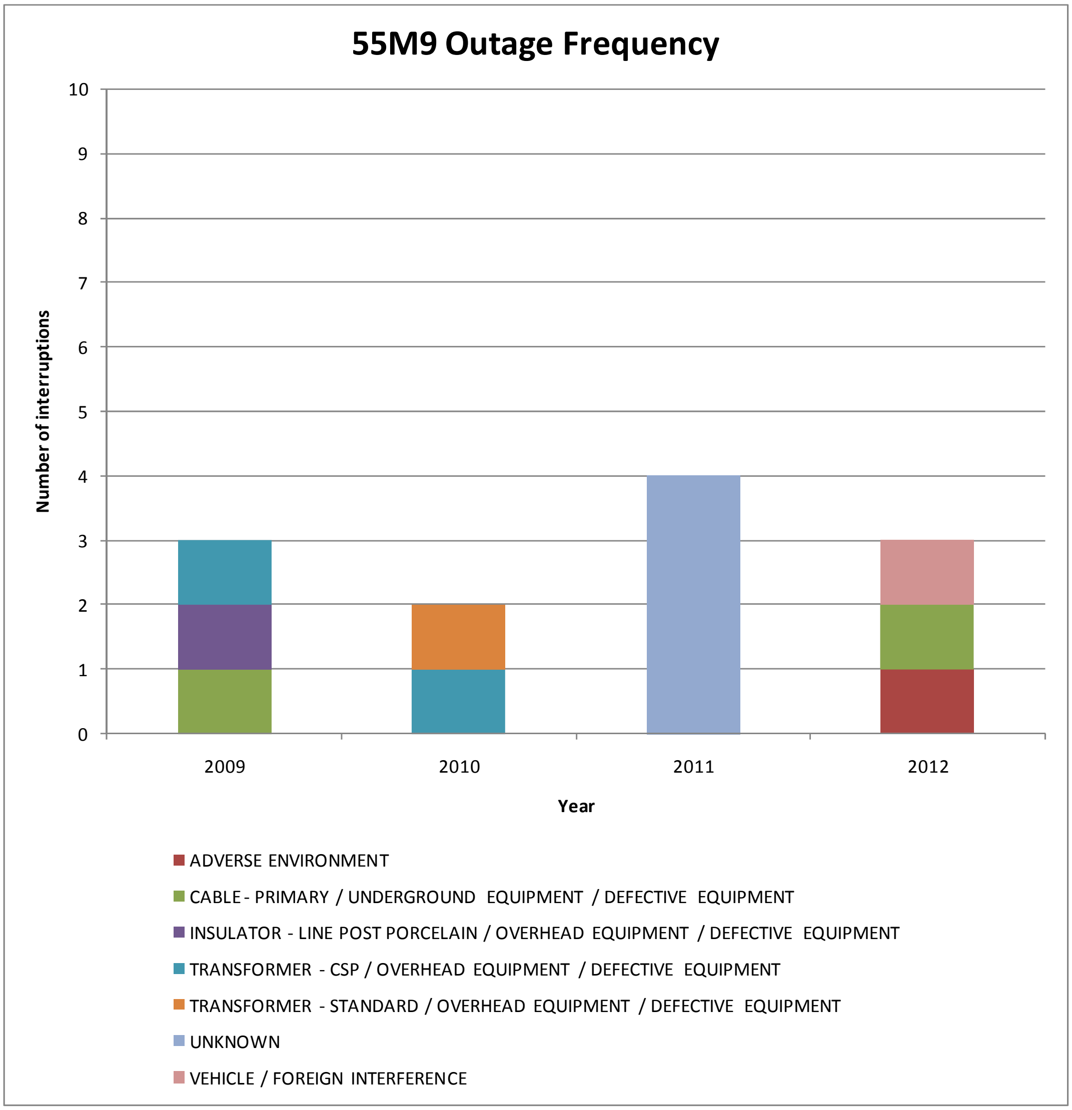


Figure 8: Outage frequency on 55M9

9.2. Scope of Work

The scope of work is to refurbish the overhead lateral distribution system on feeder NY55M9 by replacing defective poles and non-standard equipment (including insulators, brackets, arrestors), replacing CSP transformers with appropriately sized equivalents and upgrading spans of undersized primary lines (predominantly single-phase) including “open bus” secondary lines identified on the NY55M9.

9.3. Required Capital Costs

Table 14: Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost ($M)
23089	W14150 – OH Feeder Rehab – Milvan / Penn	2014	$1.13
23093	W14149 - OH Feeder Rehab – Finch / Weston / Toryork	2014	$0.73
		Total	**$1.86**

10. Voltage conversion Brimley/Anson

10.1. Objectives

The objective of this project is to rebuild the 4.16kV distribution plant that was installed in the early 1960s. This system supplied from MS station Brimley Anson (PE) is to be converted to a 27.6kV system.

10.2. Scope of Work

The scope of work is to convert all customer loads on the 4kV system of Brimley Anson MS feeders PEF1 and PEF3 to the 27.6kV system of Warden TS feeder 43M29 and Scarborough feeders NAE51M3 AND NAE52M25 by replacing the overhead conductors and underground cabling as well as the pole-top and the pad-mount distribution transformers with appropriately rated units in the project area. Some system reconfiguration will be done to align with the existing 27.6kV system. Civil structures such as ducts, pads and cable chambers will be upgraded where necessary. Some trunk lines may be maintained to provide contingency options to customers on adjacent 4kV feeders. These lines are planned to be removed when they are no longer necessary and the substation has been decommissioned.

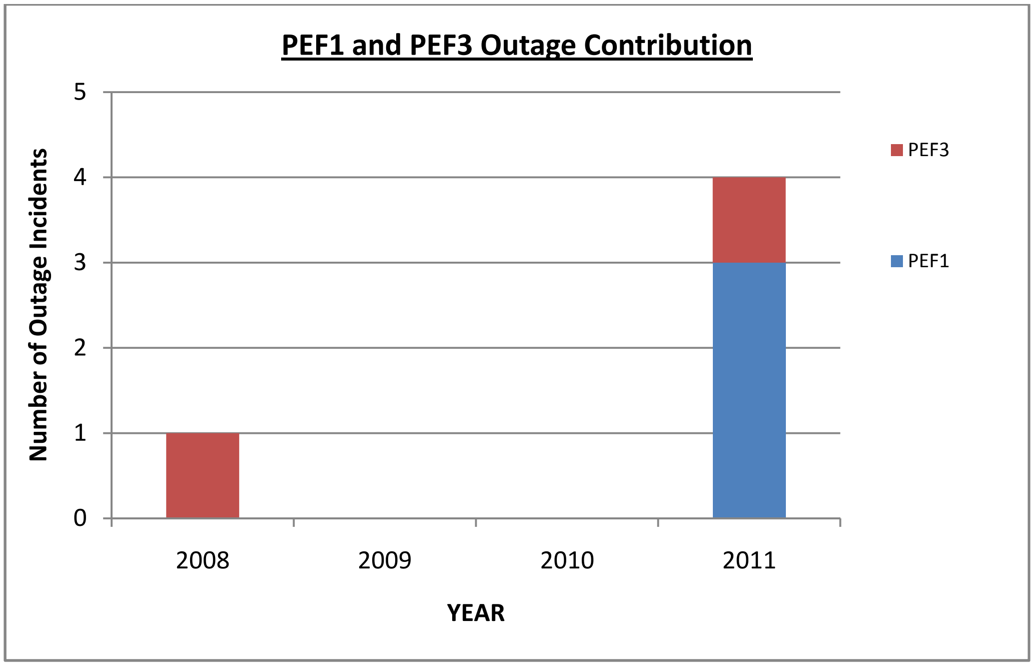


Figure 9: Outage contribution on feeders PEF1 and PEF3

10.3. Required Capital Costs

Table 15: Required Capital Costs

Job Estimate Number	Project Phase	Year	Estimated Cost ($M)
25263	E11333 - Brimley Anson MS Voltage Conversion	2014	$0.69
24698	E11333-BRIMLEY/ANSON VC PHASE 2	2014	$1.06
		Total:	**$1.75**

11. Remove Military Trail Morningside MS feeders and assets after Voltage Conversion

11.1. Objectives

The objective of this project is to convert all remaining load of Military Trail- Morningside MS for the decommissioning of an old MS station with its obsolete assets. The station switchgear had flashed over late 2011 because of an insulator breakdown. Additionally, this job aims to establish a second supply feed to the radial loads on Military Trail and also to the Pan-Am Aquatic Centre.

11.2. Scope of Work

The scope of work is to convert all customer loads on the 4kV system of Military Trail-Morningside MS feeders SCYHF1 and SCYHF3 to the 27.6kV system of Sheppard East TS feeders 47M14 and 47M15 by replacing the overhead conductors and underground cabling as well as fused disconnect switches, the pole-top and the pad-mount distribution transformers with appropriate rated units in the project area. Some system reconfiguration will be done to align with the existing 27.6kV system. Remote controlled switches installed will be commissioned to the SCADA master control. Civil structures such as ducts, pads and cable chambers will be upgraded where necessary. Some trunk lines may be maintained to provide contingency options to customers on adjacent 4kV feeders. These lines are planned to be removed when they are no longer necessary and the substation has been decommissioned.

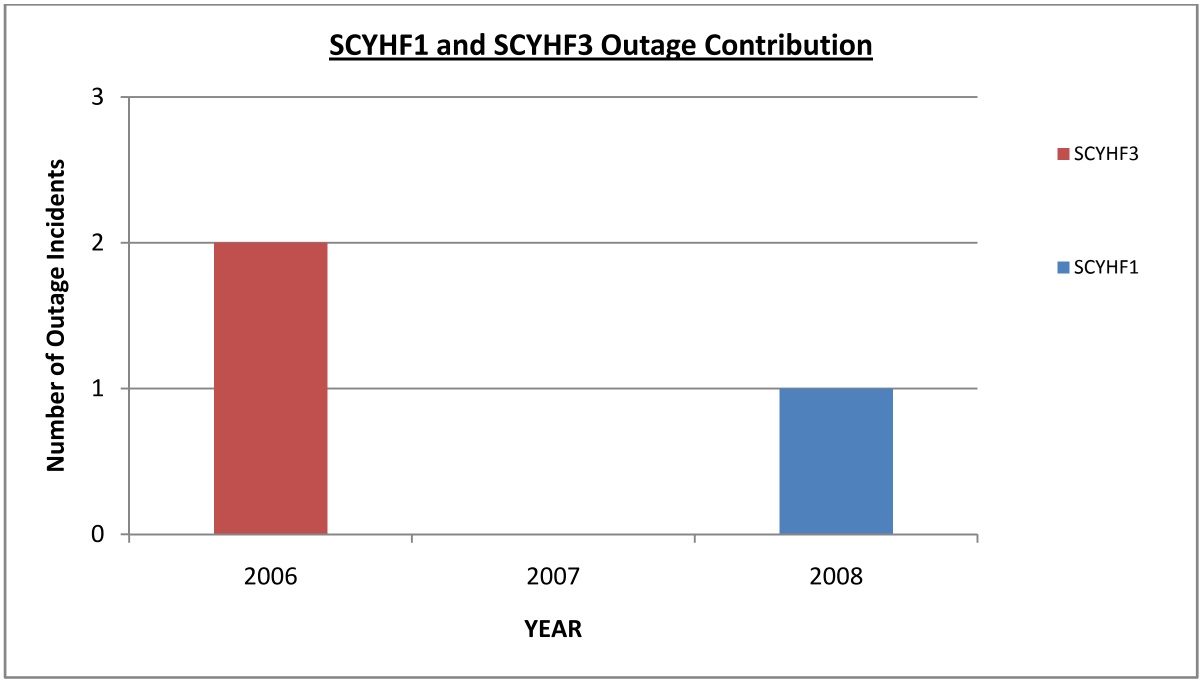


Figure 10: Outage contribution on feeders SCYHF1 and SCYHF3

11.3. Required Capital Costs

Table 16: Required Capital Costs

Job Estimate Number	Project Phase	Year	Estimated Cost ($M)
23928 v1	E13359 - Remove YH feeders and assets after Voltage Conversion	2014	$0.35
		Total:	**$0.35**

12. Overhead Rebuild and Voltage Conversion on Ruddington MS

12.1. Objectives

The purpose of this work is to convert a 4kV primary distribution system that was built in the early sixties to 27.6kV. These lines are fed by Ruddington MS (SS64), which contains transformers and circuit breakers that are past their useful life. There is a high risk of damage to other equipment if the oil circuit breakers were to fail catastrophically. These jobs will enable conversion of Ruddington MS. In addition, they are expected to lower the potential of outages with the replacement of the aged assets and reduce system losses.

12.2. Scope of Work

The scope of work for this job is to convert the primary distribution of all overhead feeders from Ruddington MS. The job will involve replacing overhead transformers along Bayview Avenue and the installation of overhead conductor on Manorcrest Drive, Winlock Park and Feldbbar Court.

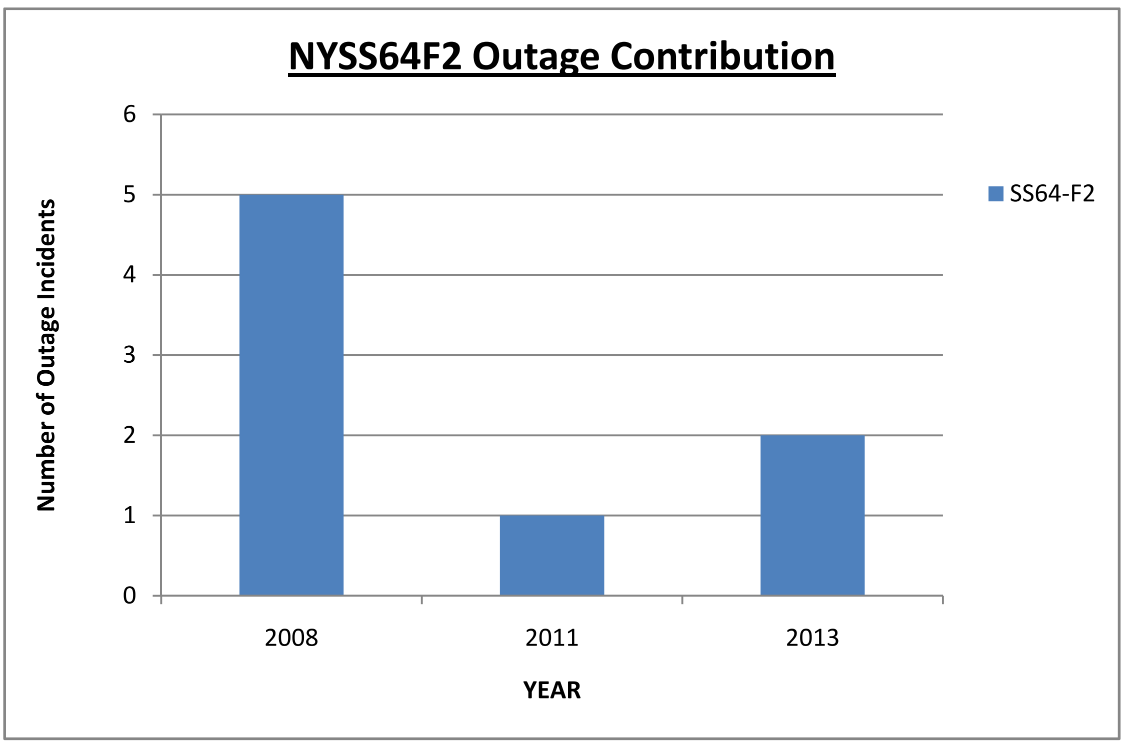


Figure 11: Outage Incidents on NYSS64F2

12.3. Required Capital Costs

Table 17: Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost ($M)
23978	E14286 OH Rebuild and Voltage Conversion of NYSS64F2 from Ruddington MS	2014	$1.21
		Total:	**$1.21**

13. Refurbishment of trunk feeder and laterals on NY85M10

13.1. Objectives

The objective of this job is to rebuild and replace the aging and non-standard primary overhead distribution equipment on feeder NY85M10 in order to improve reliability. This job also will replace XLPE lateral services with tree retardant cable to improve reliability.

13.2. Scope of Work

As illustrated in Figure 12, there have been a consistent number of outages every year on this feeder including overhead transformer failures.

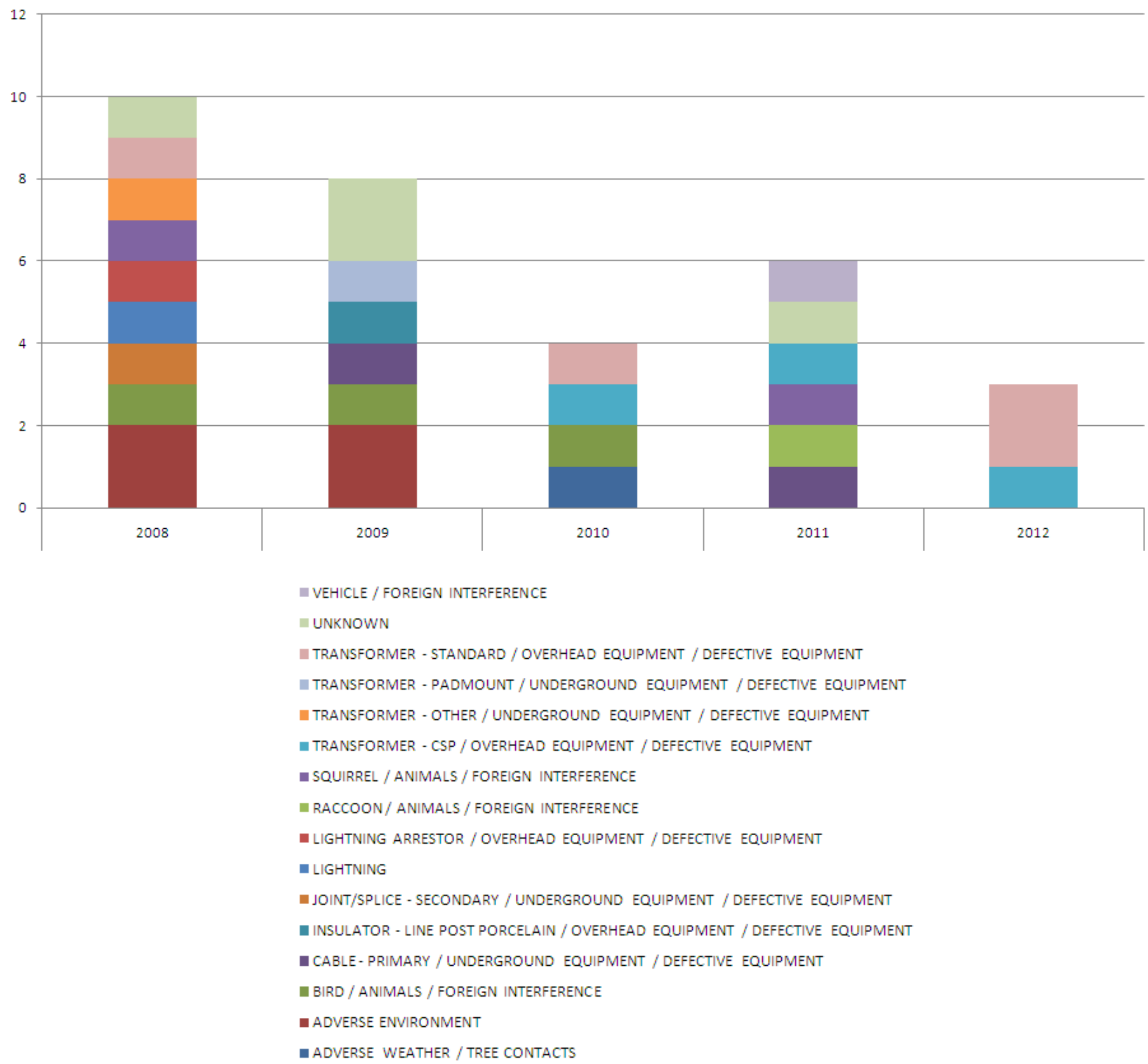


Figure 12: NY85M10 Outage Frequency

The scope of this work is to replace poles and non-standard CSP transformers. Poorly performing assets such as non-standard porcelain insulators and arrestors will be replaced as well. In addition, undersized primary overhead conductor will be replaced to standard size. In areas where underground laterals are serviced with early vintage XLPE cable, it will be replaced with standard tree retardant cable. The assets being replaced by this job are bounded by Dufferin, Whitley, Keele and Powell.

13.3. Required Capital Costs

Table 18: Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost ($M)
22211	W13206 – Refurbish Feeder Laterals Phase 2 of 2	2014	$1.82
		Total	**$1.82**

14. North Queen conductor upgrade

14.1. Objectives

The objective of this job is to upgrade the undersized conductor to a standard conductor for the feeder trunk circuit. An undersized conductor limits transfer capacity and can become a potential safety risk if overloaded for sustained periods of time.

14.2. Scope of Work

The scope of this work is to replace the undersized 3/0 OH primary located on the feeder trunk with 556.5 kcmil ASC. Non-standard and aging equipment such as porcelain insulators and poor condition poles will also be replaced.

14.3. Required Capital Costs

Table 19: Required Capital Costs

Job Estimate Number	Project Phase	Year	Estimated Cost ($M)
28075	W14125 38M27 North Queen conductor Upgrade	2014	$0.40
		Total:	**$0.40**

15. Voltage Conversion – Westmount MS

15.1. Objectives

The objective of these jobs is to convert the 4.16kV distribution infrastructure from Westmount MS to 27.6kV. The distribution and station equipment is old and approaching end-of-life and the switchgear must be replaced. This voltage conversion job will upgrade the system by removing obsolete and aging equipment and thereby allow for the eventual decommissioning of the Westmount MS station once all three feeders that it serves have been converted to 27.6kV.

15.2. Scope of Work

The scope of work consists of replacing all the 4.16KV equipment with standard 27.6KV equipment. All equipment will be transferred to adjacent 27.6kV primary feeders wherever they exist and 27.6kV feeders in the area will be extended to customers as required. There are three jobs each dedicated to converting a feeder from Westmount MS: RB-F1, RB-F2, and RB-F3. At the completion of these jobs Westmount MS is planned to be decommissioned. By completing the 4.16kV conversion of the distribution plant, THESL expects to avoid the need to replace obsolete station equipment in the near future while upgrading the distribution equipment.

15.3. Required Capital Costs

Table 20: Required Capital Costs

Job Estimate Number	Project Phase	Year	Estimated Cost ($M)
24320	W14343-Voltage Conversion RB-F3 Phase 1	2014	$0.49
24333	W14345-Voltage Conversion-Westmount MS RB-F2	2014	$0.52
		Total:	**$1.01**

16. Overhead Rebuild Deanvar Avenue

16.1. Objectives

The objective of this job is to rebuild the overhead distribution system in the area of Victoria Park and Deanvar Avenue due to the deteriorating condition of the assets that are past their useful lives. This job will replace non-standard and deteriorating equipment that pose a potential safety risk to the public and THESL personnel.

16.2. Scope of Work

The scope of this job is to replace aging and poor condition poles. Additionally, this job will target upgrading the primary conductors, and upgrading non-standard transformers. In addition, animal guards will be installed to reduce any faults that may occur from animal interference.

16.3. Required Capital Costs

Table 21: Required Capital Costs

Job Estimate Number	Project Phase	Year	Estimated Cost ($M)
22205	E11765 Pole Replacement Deanvar Ave CE-F1	2014	$0.37
		Total:	**$0.37**

17. Voltage Conversion of West Islington MS

17.1. Objectives

The objective of this job is to convert obsolete and non-standard equipment on the 4kV distribution system to the standard 27.6kV service in the Etobicoke area bounded by Shaver and Prennan Avenues at the west and east extremes, and between the south of Burnhamthorpe Road and north of Dundas Avenue West.

17.2. Scope of Work

The 4 kV feeders, AF1, AF2 and AF6 in the area of West Islington MS, were selected based on outages (as shown in Figure 13 below) and condition of equipment as observed by field crew. The majority of the equipment on this aging system has reached or is approaching end of life and the substation equipment should be replaced or decommissioned.

All six circuit breakers at the West Islington substation have been in service for over 50years. Five of the circuit breakers are either in poor or very poor operating condition. The switchgear at West Islington MS is in poor condition having been in service for 61 and 57 years respectively. The aged switchgear has been getting more difficult to maintain and the maintenance has been increasingly more expensive due to obsolescence of the parts, technology and operating skills. As such, conversion of this area is intended avoid the need for expensive station asset replacement costs.

These jobs convert all the 4 kV loads to the 27.6kV system and remove any unnecessary equipment. The long term goal is to convert all the customers on the 4kV station feeders and decommission the station.

The scope of work is to convert all customer loads on the 4kV system to the 27.6kV system usually by a line transfer to an adjacent 27.6kV feeder. In some cases these jobs require additional feeder configuration to accommodate customers that are currently beyond the 27.6kV system. Some trunk lines may be maintained to provide contingency options to 4kV feeders that still serve customers. These lines are planned to be removed when they are no longer necessary and the substation has been decommissioned.

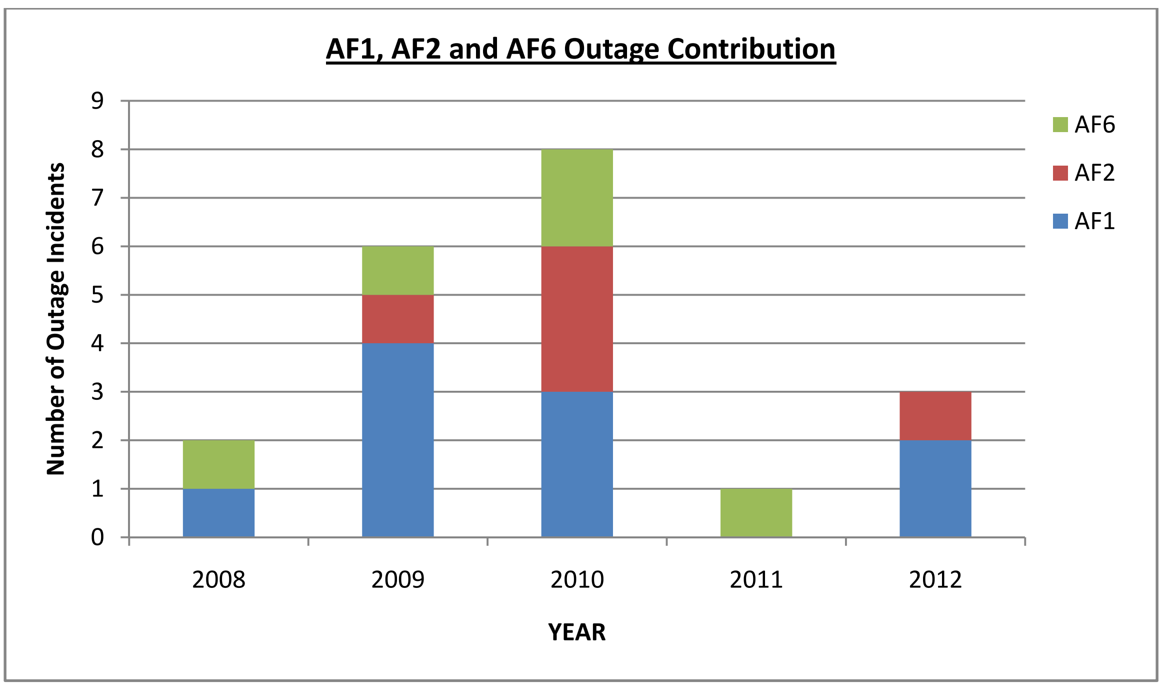


Figure 13: Outage contribution on AF1, AF2 and AF6

17.3. Required Capital Costs

Table 22: Required Capital Costs

Job Estimate Number	Project Phase	Year	Estimated Cost ($M)
28560	W14658 - P05-OH Voltage Conversion of West Islington feeder AF1	2014	$0.75
28571	W14659 - P05- OH Voltage Conversion of West Islington feeder AF2, Electrical	2014	$0.68
28570	W14661 - P05- OH Voltage Conversion of West Islington feeder AF6	2014	$0.51
		Total:	**$1.94**

18. Replacement of CSP transformers

18.1. Objectives

The purpose of this job is to upgrade non-standard CSP transformers, undersized transformers, and any other non-standard distribution assets in the area to improve the reliability of feeder 35M10.

18.2. Scope of Work

The scope of this project is to replace the existing non standard, CSP, and undersized transformers with standard transformers of appropriate capacity, replace all glass fuse cut-outs and switches with standard polymer, L/T/Steel brackets with fibreglass brackets, as well as install animal guards on all transformer high voltage bushings, and tree proof conductors in tree area.

18.3. Required Capital Costs

Table 23: Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost ($M)
19886	X12179 Replacement of CSP transformers	2014	$1.64
19861	X12172 Replacement of non-standard/CSP transformer	2014	$1.16
19862	X12173 Replacement of non-standard/CSP transformer	2014	$1.10
19970	X12196 Rebuild primary and replace CSP transformers	2014	$2.80
		Total:	**$6.70**

19. Overhead Rebuild on Keele St and Milford Ave 35M12

19.1. Objectives

The purpose of this job is to refurbish and rehabilitate the overhead distribution system on feeder 35M12 from Fairbanks TS by replacing CSP transformers, non-standard poles, and installing tree-proof conductors and animal guards.

19.2. Scope of Work

The majority of the outages on 35M12 are caused by equipment failure and foreign interference on the overhead plant. This job will target and rebuild the areas of Milford, Densley, and Keele Streets where most of these issues can be addressed. This job will focus on reducing foreign interference by replacing CSP transformers with standard transformers equipped with animal guards and by upgrading conductor with tree proof conductor in heavily-treed areas.

Table 24: Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost ($M)
21025	X12501 O/H Rebuild – Keele St and Milford Ave NY35M12	2014	$1.14
		Total:	**$1.14**

20. Park Lane non-standard equipment replacement 34M7

20.1. Objectives

The purpose of this job is to upgrade non-standard CSP transformers, undersized transformers, and any other non-standard distribution assets in the area of Bayview Avenue and Post Road in order to improve reliability of feeder 34M7. In addition, this feeder supplies Sunnybrook Hospital. This project is intended to improve reliability for this key customer.

20.2. Scope of Work

The scope of this project is to replace the existing non-standard, CSP, and undersized transformers with standard transformers of appropriate capacity, replace all glass fuse cut-outs and switches with standard polymer, L/T/Steel brackets with fibreglass brackets, as well as install animal guards on all transformer high voltage bushings, and tree proof conductors in tree area.

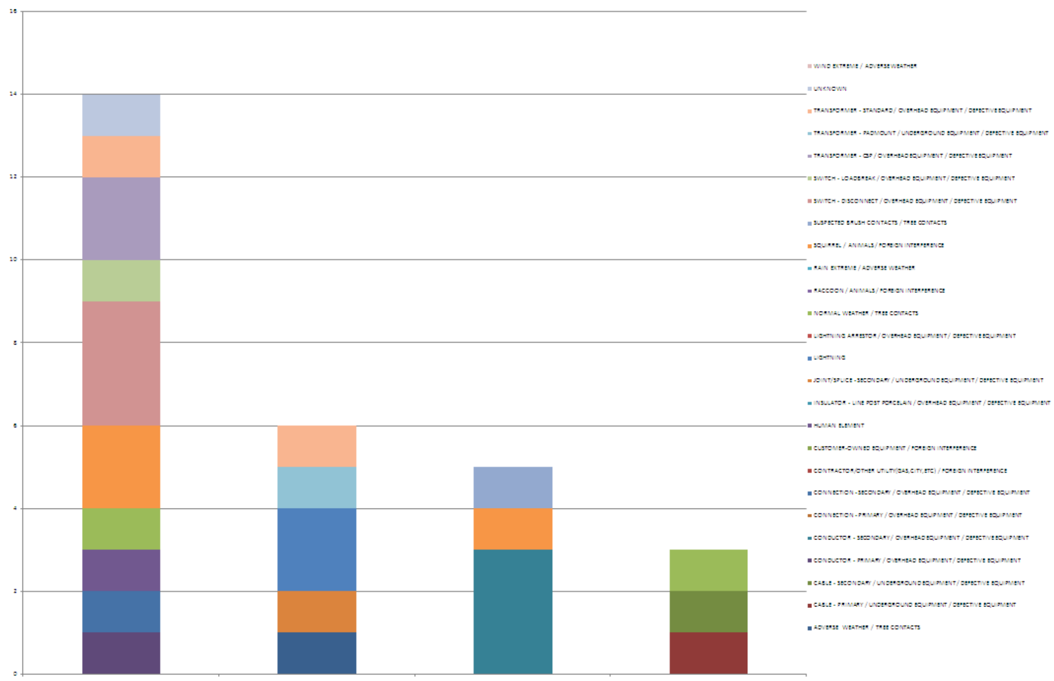


Figure 14: Outage Frequency on 34M7

20.3. Required Capital Costs

Table 25: Required Capital Costs

Job Estimate Number	Job Title	Year	Estimated Cost ($M)
19735	X12148 ParkLane Repl nonStd Txf/CSP (34M7)	2014	$0.65
		Total:	**$0.65**

21. Downsview Airport Supply Rebuild NY85M3

21.1. Objectives

The primary objective for this job will be to reconfigure primary feeder NY85M25 and NY85M3 to eliminate the existing portion of the deteriorated and failing direct buried PILC cables located within the Downsview Airport property. In addition, the proposed padmount SCADA switches on Carl Hall Rd will be required for a substantial load shift from 85M3 to 85M25 (in conjunction with other load transfers) to accommodate 9 MVA TTC Wilson Yard Expansion that is anticipated in Q1 2014. The project also avoids the installation of trunk feeders through private property.

21.2. Scope of Work

Downsview Airport, a former military base (CFB Downsview) that is currently administrated by Parc Downsview Park (PDP) and co-managed by both PDP and Bombardier Aerospace, contains a total rated load of 10 MVA, which is currently being supplied by two direct buried (DB) 350 MCM PILC cables running in parallel. These cables were installed in about 1953 and travel from Switch S2313 (attached to Pole 1127-11 – Sheppard Ave) to Switch OS7346 (attached to Pole 17 – Carhall Road). There have been numerous outages since 2005 on these two cables, which run below the airport runway, making accessibility difficult when a failure occurs. Ideally, supply to the customer of this type should be fully accessible to THESL crew members when any failure occurs.

The scope of this job will be to reconfigure 85M25/85M3 and eliminate the direct-buried PILC cables by re-routing 85M3, via overhead infrastructure, along Sheppard Ave. More specifically, the overhead circuit of 85M3 will be extended from Pole 1124 Sheppard and continue along the north side of Sheppard Avenue to existing streetlight pole, P1286 Sheppard. The overhead infrastructure will be transitioned to underground cable, from P1286 to P1290 Sheppard, to bypass underneath CN/CP railway tracks. The trunk will also be extended overhead from P3 to P15 Bakersfield to establish an overhead SCADA tie between 85M3 and 85M24, which will aid in necessary load transfers.

The extension will then continue overhead to Pole 1381 Sheppard and transition underground to P1127-30 Sheppard Ave., via two new padmount SCADA switches. These proposed padmount SCADA switches on Carl Hall Rd will be required for a substantial load shift from 85M3 to 85M25 (in conjunction with other load transfers) to accommodate the 9 MVA TTC Wilson Yard Expansion and requires completion for early 2014 prior to the load’s in-service date.

21.3. Required Capital Costs

Table 26: Required Capital Costs

Job Estimate Number	Project Phase	Year	Estimated Cost ($M)
27813	W10487 Downsview Airport Supply Rebuild 85-M3	2014	$1.90
		Total:	**$1.90**

22. Install / Redesign Pole Guying

22.1. Objectives

The objective of this job is to help ensure selected poles in the system have adequate guying installed. These poles were part of a detailed study performed by a third party and identified as needing more guying to help ensure that the mechanical stresses are within the working limits of the poles.

22.2. Scope of Work

The scope of this job is to address guying issues at 30 wood pole locations to help ensure that mechanical stresses on the pole are within limits.

22.3. Required Capital Costs

Table 27: Required Capital Costs

Job Estimate Number	Project Phase	Year	Estimated Cost ($M)
26151	Install/Redesign Guying Phase 3	2014	$1.11
		Total:	**$1.11**

III Business Case Evaluation Update

Carrying out immediate work on this asset class results in an avoided estimated risk cost of $15.5 million, which represents the avoided cost of executing the work in 2014 as opposed to deferring until 2015. This figure shows that there are substantial economic benefits from executing this work in 2014. In addition to the avoided risk cost, by the time the Overhead Infrastructure segment is completed in 2014, approximately 5,500 CI and 3,500 CHI can be mitigated when compared to a run-to-fail approach. These results have been revised to only include 2014 activities.

Table 28: Avoided Estimated Risk Cost for Overhead Infrastructure Segment

Business Case Element	Cost (in Millions)
Present Value of Project Net Cost in 2015 (PV(PROJECT$_{NET_COST}$(2015))	76.8
Project Net Cost in 2014 (PROJECT$_{NET_COST}$(2014))	61.3
Avoided Estimated Risk Cost = **(PV(PROJECT$_{NET_COST}$(2015)) – PROJECT$_{NET_COST}$(2014))**	**$15.5**

ICM Project: 2014 Update | Box Construction Segment

SUMMARY OF CHANGES FOR 2014 UPDATE

- 2014 ICM work program was revised to reflect the work accomplished to date in 2013 and the continuing priority needs of the system.[1]
- The number of proposed jobs in this segment has been reduced from ten to seven (including three originally filed 2014 jobs, and four new jobs).
- Relative to May 2012 filing, forecast 2014 capital expenditures have been reduced by $6.14M. This does not include spending related to approved Phase 1 jobs for 2012-2013.
- Added evidence on the significant effect that storms related to Hurricane Sandy had on customers served by box construction feeders.

[1] Please see discussion of 2014 work program in Manager's Summary Update, "Overview of Projects and Segments."

I OVERVIEW OF 2014 UPDATE

1. The 2014 Work Program

The proposed updated 2014 ICM work program includes three jobs originally identified as 2014 work in THESL's May 2012 filing, with a budget of $9.37M , as well as four jobs that were not included in the original filing with a budget of $9.02M. The total proposed 2014 capital expenditures for this segment are $18.39M (not including spending related to approved Phase 1 jobs).

Table 1: 2014 Proposed Job List *

Job Estimate Number	Job Title	Job Year	Cost Estimate ($M)
X12129	Millwood MS: B3MD, Merton MS B2MR Voltage Conversion Millwood(4.16 kV)	2014	$5.30
X12143	Convert 4kV Merton Feeder B1MR, B2MR to 13.8kV System	2014	$2.31
X13176	Convert Dupont 4kV B4DU to 13.8kV	2014	$1.76
X13158	B1E and B13E conversion	2014	$3.57
X13159	B5E conversion	2014	$2.08
X12097	B6W conversion to 27.6kV	2014	$3.33
S11488	S11488 Wiltshire TS 2 new feeders conversion of Keele/St. Clair	2014	$0.04
TOTAL			**$18.39**

**Table 2 in the original filing*

2. Detailed Description of Changes

During detailed design work for the 2014 ICM work program, THESL designers identified a more cost-effective solution to job X13176. This job, which was originally estimated to cost $3.67M, has been revised downwards to $1.76M.

THESL has added four new jobs to this segment:

- X13158 and X13159: Carlaw TS's A4-5E bus is an obsolete 'brick style' switchgear, and presents potentially hazardous conditions to THESL field crews who operate it. THESL plans to replace this bus in 2016, but in order to accomplish this task, all load must be transferred off this bus, and a significant portion of it comes from Carlaw MS. These jobs convert three 4kV box construction feeders from Carlaw MS to 13.8kV to help accommodate the A4-5E switchgear replacement plans.
- X12097: This job was added to improve supply reliability to customers in the Wiltshire MS area of the city.
- S11488: This Stations job directly impacts future box construction jobs, as it is a prerequisite for several box construction conversion jobs in the Keele/St Clair and Wiltshire areas.

THESL has postponed seven projects that were originally forecast for 2014 in the May 2012 filing:

- Four jobs[2] have been deferred beyond 2014 as a result of a change in the execution schedule for a prerequisite job (X11452). The four deferred jobs are phases 4 through 7 of a plan to convert Merton and Millwood MS 4kV load to 13.8kV. The prerequisite job was planned for construction in 2012, but has since been rescheduled for 2014.
- Three jobs[3] were removed for the reasons described in the Manager's Summary Update, "Overview of Projects and Segments.

[2] Jobs X12142, X12145, X12174, and X13362.
[3] Jobs X12161, X12194, and X14202.

3. Updated information

3.1. Impact of Hurricane Sandy on Box Construction Feeders

On the 29th and 30th of October, 2012, Toronto endured a powerful storm related to Hurricane Sandy, causing several extended outages across the city. Figure 1 below summarizes total customer hours interrupted and # customers out on overhead feeders by voltage class:

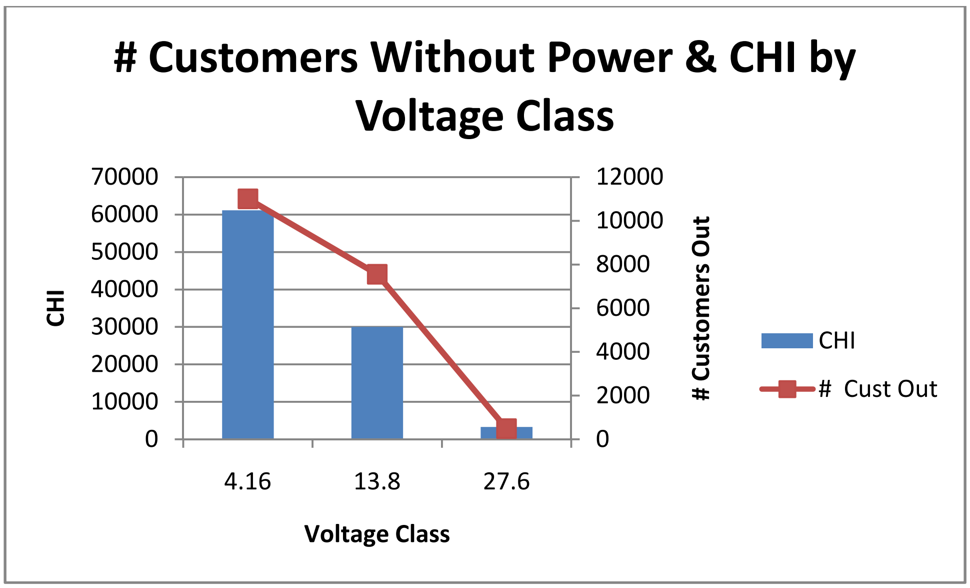


Figure 1: Number of Customers Without Power & CHI by Voltage Class

Though outages occurred on overhead feeders from all three voltage classes, customers supplied by 4kV box construction feeders were those most affected in terms of both total customer hours out, as well as total number of customers out. As stated in the evidence, the main causes of the outages and the length of time required for restoration are:

i) 4kV box construction assets are generally old and in poor condition, and were not able to withstand the strong winds and contact from trees from the storm, when compared to 13.8kV and 27.6kV overhead feeders

ii) Limited number of field crews familiar with 4kV box construction feeders contributed to delays in restoring power on those feeders

Figure 2 breaks down the areas impacted by the storm (sorted by station):

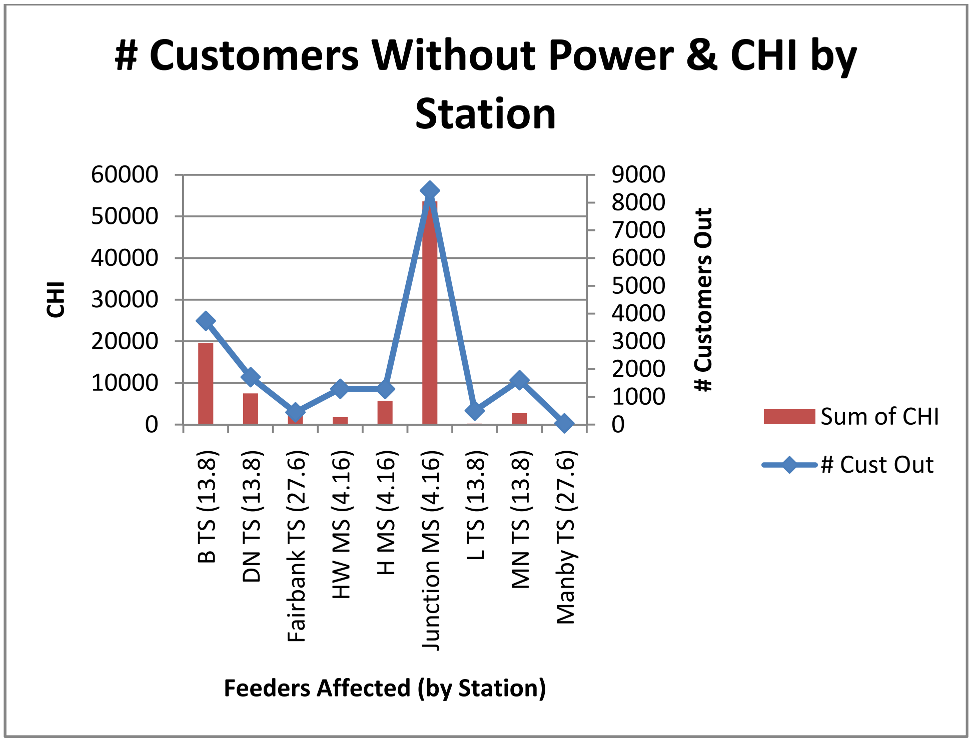


Figure 2: Number of Customers Without Power & CHI by Station

Figure 2 shows that Junction MS, a 4kV station that supplies box construction feeders, had the most customers and total feeder outage time of all the stations affected by the storm.

A list of feeders that will be addressed under this program, along with the job costs and number of assets past their useful life per circuit kilometre is provided in Table 2.

Table-2: Assets Past their Useful Lives Per Circuit Kilometre on 4kV Feeders to be Converted to 13.8kV

Feeder	Estimated Project Cost ($M)	Assets Past Useful Life	Circuit Length (km)	Quantity/ km	Projected Year of Execution
B3MD, B2MR (X12129)	$5,295,709	336**	3.18146	105.61	2014
B1MR, B2MR (X12143)	$2,314,263	304**	3.72	81.72	2014
B4DU (X13176)	$1,760,167	195	4.55508	42.81	2014
B1E, B13E (X13158)	$3,566,618	212	5.56273	38.11	2014
B5E (X13159)	$2,081,917	162	2.58396	62.69	2014
B6W (X12097)	$3,328,190	97	2.22	42.09	2014
(S11488)	$39,144	N/A (stations work)	N/A (stations work)	N/A (stations work)	2014
TOTAL	**$18,386,008**	**1,098*** **	**21.82**		

**Table 5 in the original filing*

***Asset count is by job. Since jobs X12129 and X12143 convert different portions of the same feeder, some assets past useful life are double-counted. This is corrected in the total number of assets past useful life*

****Total count is lower than the sum of the individual assets due to shared poles between feeders*

Table 3 shows the number of assets per feeder that are projected to fail by their respective planned year of conversion. In addition, it shows the quantity of assets past their useful lives per feeder, along with associated estimated 'like-for-like' replacement costs and quantified risk cost.

Table-3: Failure Projections, Assets past their useful lives and Associated Anticipated 'Like-for-Like' Replacement Costs per Feeder

Feeder	Proposed Year of Conversion	Station	Assets Presently Projected to Fail by Year of Conversion (in counts)	Risk Cost of Feeder up to Year of Conversion ($M)	Assets Past Useful Life (in counts)	Estimated Cost of Replacement for Assets Past Useful Life ($M)
B3MD, B2MR	2014	Merton MS, Millwood MS**	20	$0.34	336	$4.52
B1MR, B2MR	2014	Merton MS**	14	$0.20	304	$3.74
B4DU	2014	Dupont MS	9	$0.22	195	$2.52
B1E, B13E	2014	Carlaw MS	12	$0.15	212	$2.63
B5E	2014	Carlaw MS	7	$0.07	162	$2.02
B6W (X12097)	2014	Wiltshire MS	4	$0.04	97	$1.21
(S11488)	2014	Wiltshire TS	N/A (stations work)	N/A (stations work)	N/A (stations work)	N/A (stations work)
TOTAL			**56*** **	**$0.86*** **	**1098*** **	**13.75*** **

**Table 6 in the original filing*

***Asset count is by job. Since jobs X12129 and X12143 convert different portions of the same feeder, some assets past useful life are double-counted. This is corrected in the 'total' row*

****Total counts are lower than the sum of the individual assets/$ amounts due to shared poles between feeders*

II JOB-LEVEL UPDATES

2014 Job Descriptions

1. Partial Conversion of Millwood MS Feeders (X12129)

1.1. Objectives

The objective of this job is to prepare Millwood MS feeder B3MD for conversion from 4.16kV to 13.8kV for eventual decommissioning of Millwood MS. The main objective is to mitigate the safety concerns from working around energized box construction, which is found on feeders from Millwood MS. The benefits of completing this work are the mitigation of potential safety risks, maintained reliability and, when conversion is complete, reduced line losses. The equipment that is being replaced is overhead 4kV distribution plant which includes conductor, poles, transformers and switches.

1.2. Historical Reliability Performance

Table 4: Historical Reliability – Millwood MS

HISTORICAL RELIABILITY PERFORMANCE – B3MD			
Reliability Metric	2010	2011	2012
Feeder CI	0	0	0
Feeder CHI	0	0	0

‘CI’ stands for ‘Customers Interrupted’ and ‘CHI’ stands for ‘Customer Hours Interrupted’

1.3. Scope of Work

The scope of work of job X12129 includes the conversion of B3MD from 4.16kV to 13.8kV. X12129 also involves one or more feeders from Merton station, as discussed below.

Table 5: Assets to be Replaced - Millwood MS

Assets to be upgraded from 4.16kV to 13.8kV (B3MD)	
Poles	157
Switches	19
Transformers	34
Conductor	3184m

1.4. Locations

Boundaries for this work are outlined in Table-6.

Table 6: Project Boundaries for Millwood MS Conversion

Project	Feeders	North Boundary	South Boundary	East Boundary	West Boundary
X12129	B2MR	Millwood Road	Merton Road	Bayview Avenue	Mt. Pleasant Road

1.5. Required Capital Costs

Table 7: Capital Costs

Job Estimate Number	Job	Cost ($)	Projected Year of Execution
19632	X12129 Millwood MS: B3MD, Merton MS B2MR Voltage Conversion*	$5,295,709	2014
Total		**$5,295,709**	

**Job converts feeders in both Merton MS and Millwood MS. Job cost included in Merton MS*

1.6. Preferred Option for Feeders Supplied by Millwood MS (B3MD)

The information on the preferred option for Millwood MS is discussed in section 2.6 below in association with the work on feeders from Merton MS.

2. Partial Conversion of Merton MS feeders (X12129, X12143)

2.1. Objectives

The objective of these jobs is to prepare Merton MS feeders for conversion from 4.16kV to 13.8kV for eventual decommissioning of Merton MS. The main objective is to mitigate the potential safety risks from working around energized box construction, which is found on feeders from Merton MS. X12129 also involves one or more feeders from Millwood station. The benefits of completing this work are mitigation of potential safety risks, improved reliability and, when conversion is complete, reduced line losses. The equipment that is being replaced is overhead 4kV distribution plant which includes conductor, poles, transformers and switches.

2.2. Historical Reliability Performance

Table 8: Historical Reliability - Merton MS

HISTORICAL RELIABILITY PERFORMANCE – B1MR, B2MR			
Reliability Metric	**2010**	**2011**	**2012**
Feeder CI	0	724	1588
Feeder CHI	0	2584	1505

2.3. Scope of Work

The scope of work for the jobs listed in Table 10 is to convert feeders B1MR and B2MR-from 4.16kV to 13.8kV.

Table 9: Assets to be Replaced - Merton MS

Assets to be upgraded from 4.16kV to 13.8kV (B1MR, B2MR)	
Poles	226
Switches	37
Transformers	67
Conductor	6190

2.4. Locations

The boundaries for this work are outlined in Table 10.

Table 10: Project Boundaries for Merton MS Conversion

Project	Feeders	North Boundary	South Boundary	East Boundary	West Boundary
X12129	B2MR	Millwood Road	Merton Road	Bayview Avenue	Mt.Pleasant Road
X12143	B1MR,B2MR	Manor Road	Davisville Avenue	Mt.Pleasant Road	Yonge Street

2.5. Required Capital Costs

Table 11: Capital Costs

Job Estimate Number	Job	Cost ($, millions)	Projected Year of Execution
19632	X12129 Millwood MS: B3MD, Merton MS B2MR Voltage Conversion*	$5,295,709	2014
19706	X12143 Convert 4kV Merton Feeder B1MR, B2MR to 13.8kV System	$2,314,263	2014
Total		**$7,609,972**	

*Jobs convert feeders in both Merton MS and Millwood MS. Job costs included in Millwood MS as well.

2.6. Preferred Option for Feeders Supplied by Millwood MS (B3MD) and Merton MS (B1MR, B2MR)

Maintenance reports suggest that station assets in Merton MS are deteriorating, as shown in Table 12.

Table 12: Merton MS Transformer TR1 DGA results

TR1	March 5, 2010
CO(PPM)	361*

'*' indicates 'condition 2' status, meaning overheated cellulose insulation (transformer insulation degradation, and eventual transformer failure)

The significant number of assets past useful life, along with the potential safety concerns and increased complexity of box construction when compared to 13.8kV overhead construction warrants executing these jobs.

3. Partial Conversion of Carlaw MS feeders (X13158, X13159)

3.1. Objectives

The objective of these projects is to prepare Carlaw MS feeders for conversion from 4.16kV to 13.8kV for eventual decommissioning of Carlaw MS. The main objective is to mitigate the potential safety risks from working around energized box construction, which is found on feeders from Carlaw MS. Furthermore, Carlaw MS is fed from Carlaw TS A4-5E bus; this bus is an obsolete 'brick style' switchgear, and presents potentially hazardous conditions to THESL field crews when being operated. THESL is planning to replace this bus in 2016, but in order to accomplish this task, all load must be transferred off this bus, and a significant portion of it comes from Carlaw MS. Projects X13158 and X13159 aim to convert three 4kV box construction feeders from Carlaw MS to 13.8kV to help accommodate the A4-5E switchgear replacement plans.

The benefits of completing this work are mitigation of potential safety risks, maintained reliability and, when conversion is complete, reduced line losses. The equipment that is being replaced is overhead 4kV distribution plant which includes conductor, poles, transformers and switches.

3.2. Historical Reliability Performance

Table 13: Historical Reliability – Carlaw MS

HISTORICAL RELIABILITY PERFORMANCE – B1E, B13E, B5E			
Reliability Metric	**2010**	**2011**	**2012**
Feeder CI	0	0	0
Feeder CHI	0	0	0

3.3. Scope of Work

The scope of work for the jobs listed in Table 15 is to convert feeders B1E,B13E, and B5E from 4.16kV to 13.8kV.

Table 14: Assets to be Replaced - Carlaw MS

Assets to be upgraded from 4.16kV to 13.8kV	
Poles	220
Switches	43
Transformers	68
Conductor	8147m

3.4. Locations

The boundaries for this work are outlined in Table 15.

Table 15: Project Boundaries for Carlaw MS Conversion

Project	Feeders	North Boundary	South Boundary	East Boundary	West Boundary
X13158	B1E, B13E	Riverdale Ave	Dundas St E	Prust Ave	Carlaw Ave
X13159	B5E	Gerrard St	Queen St E	Leslie St	Carlaw Ave

3.5. Required Capital Costs

Table 16: Capital Costs

Job Estimate Number	Job	Cost ($, millions)	Projected Year of Execution
22022	Carlaw 4kV conversion B1E & B13E	$3,566,618	2014
22151	Carlaw 4kV conversion B5E	$2,081,917	2014
Total		**$5,648,535**	

3.6. Preferred Option for Feeders Supplied by Carlaw MS (B1E, B13E, B5E)

There are several station assets at Carlaw TS and Carlaw MS that are in poor condition. Station bus A4-5E is 63 years old and has a health index of 43, indicating that it is in poor condition. This bus is obsolete 'brick style' switchgear, and presents potentially hazardous conditions to THESL field crews when being operated. THESL is planning to replace this bus in 2016, but in order to accomplish this task, all load must be transferred off this bus, and jobs X13158 and X13159 will transfer converted 4kV load from this bus to a another.

In addition, 4kV bus B3-4E is 73 years old and also has a health index of 43, indicating that it is in poor condition.

The significant number of assets past useful life, along with the potential safety risks and increased complexity of box construction when compared to 13.8kV overhead construction warrants executing these jobs.

4. Partial Conversion of Wiltshire MS feeders (X12097)

4.1. Objectives

The objective of these projects is to prepare Wiltshire MS feeder B6W for conversion from 4.16kV to 27.6kV for eventual decommissioning of Wiltshire MS. The main objective is to mitigate the potential safety risks from working around energized box construction, which is found on feeders from Wiltshire MS.

The benefits of completing this work are mitigation of potential safety risks, maintained reliability and, when conversion is complete, reduced line losses. The equipment that is being replaced is overhead 4kV distribution plant which includes conductor, poles, transformers and switches.

4.2. Historical Reliability Performance

Table 17: Historical Reliability – Wiltshire MS

HISTORICAL RELIABILITY PERFORMANCE – B6W			
Reliability Metric	**2010**	**2011**	**2012**
Feeder CI	0	0	0
Feeder CHI	0	0	0

4.3. Scope of Work

The scope of work for the job listed in Table 19 is to convert feeder B6W from 4.16kV to 27.6kV.

Table 18: Assets to be Replaced - Wiltshire MS

Assets to be upgraded from 4.16kV to 27.6kV	
Poles	80
Switches	11
Transformers	28
Conductor	1000m (underground), 2200m (overhead)

4.4. Locations

The boundaries for this work are outlined in Table 19.

Table 19: Project Boundaries for Wilshire MS Conversion

Project	Feeders	North Boundary	South Boundary	East Boundary	West Boundary
X12097	B6W	Rogers Rd	St Clair Ave W	McRoberts	Gilbert

4.5. Required Capital Costs

Table 20: Capital Costs

Job Estimate Number	Job	Cost ($, millions)	Projected Year of Execution
19736	Convert 4kV Wilshire MS B6W feeder to 27.6kV	$3,328,190	2014
Total		**$3,328,190**	

4.6. Preferred Option for Feeders Supplied by Wiltshire MS (B6W)

The significant number of assets past useful life, along with the potential safety risks and increased complexity of box construction when compared to 13.8kV overhead construction warrants executing these jobs.

5. Partial Conversion of Dupont MS Feeders (X13176)

5.1. Project Objectives

The objective of these jobs is to prepare Dupont MS feeders for conversion from 4.16kV to 13.8kV system for eventual decommissioning of Dupont MS. The main objective is to mitigate potential safety risks from working around energized box construction. The benefits of completing this work are the mitigation of safety risks, improved reliability and, when conversion is complete, reduced line losses.

5.2. Historical Reliability Performance

Table 21: Historical Reliability - Dupont MS

HISTORICAL RELIABILITY PERFORMANCE –B4DU			
Reliability Metric	**2010**	**2011**	**2012**
Feeder CI	0	971	0
Feeder CHI	0	307	0

5.3. Scope of Work

The scope of work described in X13176 is to convert the Dupont MS feeder B-4-DU from 4.16kV to 13.8kV system.

Table 22: Assets to be Replaced - Dupont MS

Assets to be upgraded from 4.16kV to 13.8kV system	
X13176	
Poles	228
Switches	28
Transformers	46
Conductor	5.12 km

5.4. Locations

The assets being replaced belong to feeder B-4-DU, and are located around the intersection of Davenport Rd and Ossington Avenue.

5.5. Required Capital Costs

Table-23: Capital Costs

Job Estimate Number	Job Phase	Cost ($, millions)	Projected Year of Execution
19966	X13176 – Voltage Conversion from 4kV to 13.8kV (B4DU)	$1,760,167	2014
	Total:	**$1,760,167**	

5.6. Preferred Option for Feeders Supplied by Dupont MS (B-4-DU)

The significant number of assets are past useful life, along with the potential safety risks and increased complexity of box construction when compared to 13.8kV overhead construction warrants the undertaking of this conversion. Stations supplying feeder B-4-DU (Dupont MS) are planned to be decommissioned going forward.

6. Wiltshire TS 2 new feeders conversion of Keele/St. Clair (S11488)

6.1. Project Objectives

The objective of these jobs is to prepare two cell positions at Wiltshire TS A5-6W bus for two new 13.8kV feeders.

6.2. Historical Reliability Performance

Table 24: Historical Reliability - Dupont MS

HISTORICAL RELIABILITY PERFORMANCE –B4DU			
Reliability Metric	**2010**	**2011**	**2012**
Feeder CI	N/A*	N/A*	N/A*
Feeder CHI	N/A*	N/A*	N/A*

*No feeders are being converted from 4kV to 13.8kV in this scope. Rather, it is a job to support future box construction conversion jobs. As a result, historical reliability data does not apply to this section

6.3. Scope of Work

The objective of these jobs is to prepare two cell positions at Wiltshire TS A5-6W bus for two new 13.8kV feeders. These two feeder positions will be used for the conversion of several 4kV box construction feeders in the Keele & St Clair MS and Wiltshire MS areas. Note that those conversion jobs cannot proceed until job S11488 is completed.

Table 25: Assets to be Replaced - Dupont MS

Assets to be upgraded from 4.16kV to 13.8kV system	
S11488	
Poles	N/A*
Switches	N/A*
Transformers	N/A*
Conductor	N/A*

*No feeders are being converted from 4kV to 13.8kV in this scope. Rather, it is a job to support future box construction conversion jobs. As a result, historical reliability data does not apply to this section.

6.4. Locations

The feeder positions being prepared are located at Wiltshire TS. This station is located at the intersection of Wiltshire Ave and Davenport Ave.

6.5. Required Capital Costs

Table-26: Capital Costs

Job Estimate Number	Job Phase	Cost ($, millions)	Projected Year of Execution
26567	S11488 - Wiltshire TS 2 new feeders conversion of Keele/St. Clair	$39,144	2014
	Total:	**$39,144**	

6.6. Preferred Option for 'Wiltshire TS 2 new feeders conversion of Keele/St. Clair'

This job prepares two 13.8kV feeder positions that will be used for the conversion of several 4kV box construction feeders in the Keele & St Clair MS and Wiltshire MS areas. These conversion jobs cannot proceed until job S11488 is completed.

III BUSINESS CASE EVALUATION UPDATE

The business case evaluation results have been revised to include only 2014 projects (Table 27). Carrying out immediate work to replace the Box Construction 4kV feeders with 13.8kV feeders as proposed in this segment will result in an estimated net present value for the project of $1.6 million.

Table-27: Business Case Evaluation (BCE) for Box Construction Projects (2014)

Business Case Element	Cost($, millions)	
Cost of Ownership of Existing Box Construction (COOE)		
Projected risk cost of existing box construction feeders (PV)	$	11.7
Projected risk cost of existing Stations (PV)	$	3.2
Projected non-asset risk cost of existing 4kV overhead (PV)	$	24.0
Stations Maintenance for existing system (PV)	$	1.4
4kV line losses relative to 13.8kV feeders (PV)	$	3.0
TOTAL (COO,Existing)	$	43
Cost of Ownership of New Box Construction (COON)		
Projected risk cost of converted feeders (PV)	-$	2.2
Projected non-asset risk cost of new 13.8kV overhead (PV)	-$	21.2
TOTAL (COO,New)	-$	23.4
PROJECT COST	-$	18.4
PROJECT NPV	$	1.6

ICM Project: 2014 Update | Rear Lot Segment

SUMMARY OF CHANGES FOR 2014 UPDATE

- 2014 ICM work program was revised to reflect the work accomplished to date in 2013 and the continuing priority needs of the system.[1]
- The number of jobs increased by three for the 2014 program; two to complete the electrical distribution in Thorncrest and a Civil expansion to mitigate road moratoriums and convert the next at risk location of Markland Wood
- Relative to May 2012 filing, forecast 2014 capital expenditures have increased by $3.65M, from $11.03M to $14.69M, due to the two electrical jobs at Thorncrest and one new civil job at Markland Wood

[1] Please see discussion of 2014 work program in Manager's Summary Update, "Overview of Projects and Segments."

I OVERVIEW OF 2014 UPDATE

1. The 2014 Work Program

The rear lot work program for 2014 will focus on two neighbourhoods, Thorncrest and Markland Wood. The Thorncrest rear lot conversion project will focus on installing the Electrical infrastructure utilizing the civil infrastructure installed in 2013, thus completing the conversion for this section of the neighbourhood. The second neighbourhood, Markland Wood, will expand a feeder through the neighbourhood creating a supply point for expansion into the neighbourhood. Areas of the neighbourhood that are slated for roadwork will have civil completed to avoid road moratoriums.

Table 1: Listing of Rear Lot Jobs

Job Estimate Number	Job Title	Year	Cost Estimate ($M)
21484	W11726-Markland Woods Rear Lot VC Phase 1 (Civil)	2014	$5.85
25424	W11726-Markland Woods Rear Lot VC Phase 1 (Electrical)	2014	$3.13
28608	W14674-P07-Markland Woods Rearlot Conversion Ph4 (Civil)	2014	$3.00
20701	W13017-Rear Lot #011 Ph#1 Electrical VC	2014	$1.44
24944	W13020-Thorncrest (#011) RL VC Ph#5 Electrical	2014	$1.26
2014 Total			**$14.69**

2. Detailed Description of Changes

In 2014, THESL plans to complete $14.69M of civil and infrastructure work related to rear lot conversion. This is a $3.65M increase from the originally proposed 2014 rear lot segment budget of $11.03M, caused by the deferral of two projects from 2013 in the October 2012 evidentiary update and a new project for 2014. The 2014 ICM rear lot program will focus on two neighbourhoods consisting of five jobs. Four of these jobs were included in the original filing and a new one was added in relation to the Markland Wood neighbourhood. None of the jobs proposed for 2014 were included in the work program approved by the OEB for 2012 and 2013.

Two jobs in the neighbourhood of Thorncrest include the installation of the electrical distribution (W13017 and W13020) within the neighbourhood utilizing the civil infrastructure that was previously installed.

In the neighbourhood of Markland Wood, THESL plans to conduct three jobs in two phases. In the first phase, THESL will carry out two jobs to install civil and electrical infrastructure. THESL will install other civil infrastructure in a new job comprising the second phase. The new conversion phase will address an area that has had a number of long duration outages affecting the neighbourhood's customers and is scheduled for road and water work by the city. In order to mitigate any long deferrals that would be imposed by a road moratorium, THESL plans to complete the civil infrastructure work in 2014.

II JOB-LEVEL UPDATES

2014 Job Descriptions

1. Thorncrest Area Rear Lot (W12381, W13020)

1.1. Objectives

The purpose of this job is to improve reliability in the Thorncrest area by replacing and converting the rear lot electrical equipment from the following 4.16kV feeders to front lot underground: ETSB-F1, ETBH-F2, and ETRA-F2. It is necessary that THESL carry out this work in 2014 since the area residents in the Thorncrest area have experienced long duration outages and remain susceptible to them. During 2009, area residents experienced two sustained outages: one lasting over 25 hours, and the other lasting over 40 hours. During 2011, area residents experienced two sustained outages, which lasted between 12 and 15 hours. During 2012, area residents experienced one sustained outage, which lasted over 6.5 hours.

1.2. Scope of Work

This job will replace both overhead and underground rear lot facilities by installing new 27.6kV aluminum TRXLPE-insulated cable in new concrete-encased front lot ducts and associated equipment. Poles are required to be installed along Rathburn Rd and Kipling Ave in order to accommodate the proposed 27.6kV conductors supplying this area. The job will utilize the civil infrastructure installed in 2013 and will complete the rear lot conversion in this area.

Table 2:

Asset Type		Assets Installed	
		Non-Linear Asset Count	Linear Asset Count (m)
Pole		2	
Switch		1	
Transformer	Dry		
	Network		
	Padmount	36	
	Polemount		
	Submersible		
	Vault		
Conductor			
Cable			17,220
Underground-Civil work			

1.3. Locations

The assets being replaced by this job are located in the vicinity of the intersection of Rathburn Road and Islington Avenue.

1.4. Required Capital Costs

Table 3: Required Capital Costs

Project Estimate Number	Project Title	Year	Cost Estimate ($M)
20701	W13017 Rear Lot #011 Ph#1 Electrical VC	2014	$1.44
24944	W13020-Thorncrest (#011) RL VC Ph#5 Electrical	2014	$1.26
		Total	**$2.70**

2. Markland Woods Rear Lot (W11726, W11726, W14674)

2.1. Objectives

The purpose of this job is to improve the reliability in the neighbourhood of Markland Wood by converting the 4.16kV rear lot electrical service with a 27.6kV underground front lot service. This job will convert the following ETLF-F1, ETLF-F3, and ETLF-F4 from Mill MS. In addition, feeder ET88-M46 will extend down Mill Rd and tie with ET38-M25 providing a new tie-point and relieving some of the load off of ET38-M25 which is heavily loaded. It is necessary that THESL carry out this work in 2014 since the customers in this neighbourhood have experienced a number of long duration outages. In 2010, residents experienced a sustained outage of over seven hours and another of over 28 hours. In 2011, residents experienced a sustained outage of over ten hours. All these outages occurred in the rear lot area of the distribution system. Furthermore, the civil work should be undertaken in 2014 as there is road work scheduled by the city in this area. When this work is finished, there will be a five-year moratorium, which would delay any future civil work for these customers.

2.2. Scope of Work

This job will replace both overhead and underground equipment served from the 4.16kV system with new underground front lot served from the 27.6kV system. The new front lot will use new concrete encased ducts and underground service connections.

Table 4:

Asset Type		Assets Installed	
		Non-Liniar Assets Count	Linear Asset Count (m)
Pole		2	
Switch		7	
Transformer	Dry		
	Network		
	Padmount	5	
	Polemount		
	Submersible		
	Vault		
Conductor			
Cable		12,000	
Underground Civil Work			11,479

2.3. Locations

The target locations for these jobs are in the vicinity of the intersection of Mill Road between Bloor Street West and Burnhamthorpe Rd.

2.4. Required Capital Costs

Table 5: Required Capital Costs

Job Estimate Number	Job Title	Year	Cost Estimate ($M)
21484	W11726 Markland Woods Rear Lot VC Phase 1 (Civil)	2014	$5.85
25424	W11726 Markland Woods Rear Lot VC Phase 1 (Electrical)	2014	$3.13
28608	W14674-P07-Markland Woods Rearlot Conversion Ph4 (Civil)	2014	$3.00
		Total	**$11.98**

III BUSINESS CASE EVALUATION UPDATE

Carrying out immediate work on this asset class will result in a net present value of approximately $3.24M, which represents the difference between the current and future costs of ownership values reduced by the total segment cost of $14.69M. Thus, there are quantifiable social and economic benefits expected from executing this work immediately. These results have been revised to only include 2014 projects.

Table 6: Cost of Ownership of Existing Rear Lot Infrastructure

Business Case Element	Estimated Cost ($, millions)
OPTION 1 – Status Quo (Remediation on an as-needed basis)	
Cost of Ownership of Existing Rear Lot Construction (COO_E)	
Projected risk cost of existing rear lot (NPV)	$0.86
Projected non-asset risk cost of existing rear lot (NPV)	$17.62
Maintenance cost of existing rear lot	$0.22
TOTAL (COO_E)	**$18.71**

1 **Table 7: Cost of Ownership of New U/G Front Lot Replacement and Business Case Evaluation**

Business Case Element	Estimated Cost ($, millions)
OPTION 4 – Replacement of Existing O/H Rear Lot with New U/G Front Lot	
Cost of Ownership of New Standardized Underground Front Lot Construction (COO_N)	
Projected risk cost of underground front lot (NPV)	$0.64
Projected non-asset risk cost of underground front lot (NPV)	$0
Maintenance cost of underground front lot	$0.14
TOTAL (COO_N)	**$0.78**
Option 4 Project Net Benefit	
TOTAL (COO_E)	**$18.71**
TOTAL (COO_N)	**$0.78**
PROJECT COST	**$14.69**
PROJECT NPV: ((COO_E – COO_N) – PROJECT COST)	**$3.24**

2

3

ICM Project: 2014 Update | Polymer SMD-20 Switches Segment

SUMMARY OF CHANGES FOR 2014 UPDATE

- Relative to May 2012 filing, 2014 forecast capital expenditures increased by $0.18M

OVERVIEW OF 2014 UPDATE

The 2014 jobs in this segment target the SMD-20 switches located in the areas of North York, East York, Etobicoke, and Scarborough. When the work described in this segment is complete, approximately 36 percent of the defective SMD-20 switches in the THESL's distribution system will have been replaced.

Table 1 summarizes the forecast 2014 cost of the segment.

Table 1: Cost of SMD-20 Switches to be replaced

Job Estimate Number	**Job Title**	**Year**	**Cost Estimate ($M)**
26802	SMD-20 Replacement PH4-Fairchild TS	2014	$0.37
26803	SMD-20 Replacement PH5-Manby, Rexdale, Horner TS	2014	$0.41
26804	SMD-20 Replacement PH6-Runnymede, Fairbanks, Finch TS	2014	$0.37
26805	SMD-20 Replacement PH7-Bathurst TS, Fairchild TS	2014	$0.35
26806	SMD-20 Replacement PH8-Rexdale, Richview, Manby TS	2014	$0.65
26807	SMD-20 Replacement PH9-Horner TS	2014	$0.77
26808	SMD-20 Replacement PH10-Jane MS, Sentinel MS, Leaside TS	2014	$0.08
28474	SMD-20 Replacement NY North York part 1 - Bermondsey TS, Leslie MS	2014	$0.69
28479	SMD-20 Replacement NY North York part 2 – Leaside TS, Leslie TS	2014	$0.28
Total:			**$3.97**

The estimates in Table 1 have been created based on the replacement of switches on specific groups of feeders from corresponding stations. This approach is intended to maximize the efficiency of the replacements by concentrating operational activity on identified feeder groups.

The forecast 2014 costs of this segment have marginally increased relative to the estimates originally filed in May 2012. This reflects the in-field costs experienced in implementing the 2012 and 2013 jobs in this segment.

Business Case Evaluation Update

The business case evaluation results were updated to include 2014 jobs only. Carrying out immediate work on this asset class will result in a present value of $0.4M, which represents the difference between the current and future costs of ownership values reduced by the total segment cost, shown in Table 2. Thus, there are distinct economic benefits to executing this work immediately.

Table 2: Business Case Evaluation (BCE) Results for SMD-20 Projects (2014)

Business Case Element	Cost ($, Millions)
BCE Results – Replacement of Defective SMD-20 switches	
Cost of Ownership between Existing State & New State, or Incremental Risks Introduced by Defective SMD-20 Switches (COON-E)	
Asset-related differences in cost of ownership, derived by examining incremental asset-related risks due to defective SMD-20 switches (PV_{N-E})	$2.9
Non-Asset-related differences in cost of ownership, derived by examining incremental non-asset-related risks due to defective SMD-20 switches (NAR_{N-E})	$1.4
TOTAL (COO_{N-E})	**$4.4**
Project Cost	$4.0
PROJECT PV: ((COO_{N-E}) – PROJECT COST)	**$0.4**

ICM Project: 2014 Update | SCADA-Mate R1 Switches Segment

SUMMARY OF CHANGES FOR 2014 UPDATE

- Relative to May 2012 filing, 2014 forecast capital expenditures increased by $1.07M
- Increased the number of SCADA-MATE R1 switches to be replaced from 49 to 64, a unit increase of 15

OVERVIEW OF 2014 UPDATE

The jobs proposed in this update replace SCADA-Mate R1 switches not included in the ICM work program approved by the OEB for 2012 and 2013. The 2014 work in this segment targets SCADA-Mate R1 switches located in the areas of North York, Etobicoke and York. When the work described in this segment is complete, approximately 28 percent of SCADA-Mate R1 switches in the Toronto Hydro system will have been replaced.

Table 1 summarizes the cost of the segment.

Table 1: Cost of SCADA-Mate R1 Switches to be replaced

Job Estimate Number	Job Title	Year	Cost Estimate ($M)
28466	R1 Replacement Manby Ph1, Manby TS, 38M1	2014	$0.73
28467	R1 SCADA Replacement Manby/Horner Ph2, Manby TS, Horner TS	2014	$0.73
28504	R1 SCADA Replacement North York Ph2, Richview TS, Leslie MS	2014	$0.31
28502	R1 Replacement North York Ph1, Runnymede TS, Finch TS	2014	$0.36
28468	R1 SCADA Replacement Richview PH1, Richview TS	2014	$0.65
28464	R1 SCADA Replacement Richview PH2, Richview TS	2014	$0.57
28463	R1 SCADA Replacement Rexdale PH1, Rexdale TS	2014	$0.65
28465	R1 SCADA Replacement Rexdale PH2, Rexdale TS	2014	$0.73
Total:			**$4.73**

The jobs in Table 1 have been created based on the replacement of switches on specific groups of feeders from corresponding stations. This approach is intended to maximize the efficiency of the replacements by concentrating operational activity on identified feeder groups.

Business Case Evaluation Update

The business case evaluation results have been revised to only include 2014 projects. Carrying out immediate work on this asset class will result in an avoided estimated risk cost of $11.5 million, which represents the avoided cost of executing the work in 2014 as opposed to deferring until 2015. This shows that there are substantial economic benefits from executing this work in 2014.

Table 2: Business Evaluation Update for SCADA-Mate 2014 Projects

Business Case Element	Cost (in millions)
Present Value of Project Net Cost in 2015 (PV(PROJECT$_{NET_COST}$(2015))	$ 36.1
Project Net Cost in 2014 (PROJECT$_{NET_COST}$(2014))	$ 24.6
Avoided Estimated Risk Cost	**$ 11.5**

ICM Project: 2014 Update | Network Vaults and Roofs Segment

SUMMARY OF CHANGES FOR 2014 UPDATE

- 2014 ICM work program was revised to reflect the work accomplished to date in 2013 and the continuing priority needs of the system.[1]
- The number of vault locations to be addressed in 2014 has been reduced by 12.
- Relative to May 2012 filing, forecast 2014 capital expenditures have been reduced by $13.3M (not including spending related to approved Phase 1 jobs).

[1] Please see discussion of 2014 work program in Manager's Summary Update, "Overview of Projects and Segments."

I OVERVIEW OF 2014 UPDATE

1. The 2014 Work Program

There are three roof rebuild jobs and two vault rebuild jobs scheduled for the 2014 ICM work program. This differs from the two vault decommissionings, six roof rebuilds and nine vault rebuilds in the evidence for 2014 originally filed in May 2012. The total cost of the proposed 2014 vault jobs is $2.26M, which represents a reduction of $13.3M from the estimated 2014 costs originally filed in May 2012.

Table 1: 2014 Network Vault Roof Rebuild Program

Job Number	Job Title	Job Year	Estimated Cost ($M)
X12263	Vault Loc#Z0005, Rebuild Vault Roof Danforth/Coxwell	2014	$0.20
X13692	Vault 4731 - Rebuild Roof	2014	$0.20
X14591	Vault Roof Rebuild - LOC 4830	2014	$0.18
Total 2014:			**$0.58**

**Note: This was Table 2 in the previous filing*

Table 2: 2014 Network Vault Rebuild Program

Job Number	Job Title	Job Year	Estimated Cost ($M)
X14592	Vault Rebuild Loc 4210 - Adelaide & Yonge	2014	$0.55
X14597	Vault Rebuild - LOC 4258 - Yonge St & Isabella St	2014	$1.13
		Total 2014:	**$ 1.68**

***Note: This was Table 3 in the previous filing*

2. Detailed Description of Changes

THESL proposes no new vault decommissioning jobs in the 2014 ICM work program, three fewer roof rebuilds, and seven fewer vault rebuilds.

In the originally filed evidence for 2014, there was one job for all vault rebuilds, one for all roof rebuilds and one for all vault decommissioning work. These jobs have been broken out into individual jobs corresponding to each location that requires work in 2014. Having one job for each location is preferable for the tracking, design and execution of the work.

The maps of locations of planned vault and roof rebuilds originally included as Figures 2 and 3 in the originally filed evidence, have been updated for the revised 2014 program and are presented below (Figure 1, previously on page 7 [Originally Figure 2], Figure 2, previously on page 9 [Originally Figure 3]).

Figure 1: Locations of Network Vault Roof Rebuild Jobs - 2014

Figure 2: Locations of Network Vault Rebuild Jobs - 2014

ICM Project: 2014 Update | Fibertop Network Units Segment

SUMMARY OF CHANGES FOR 2014 UPDATE

- 2014 ICM work program was revised to reflect the work accomplished to date in 2013 and the continuing priority needs of the system.[1]
- Relative to May 2012 filing, forecast 2014 capital expenditures reduced by $2.27M (not including spending related to approved Phase 1 jobs).
- The number of Fibertop Network Units to be addressed in 2014 has declined by 22.

[1] Please see discussion of 2014 work program in Manager's Summary Update, "Overview of Projects and Segments."

I OVERVIEW OF 2014 UPDATE

1. The 2014 Work Program

The 2014 work program for Fibertop Network Unit replacements is $7.09M and it covers the replacement of 43 network units.

Table 1: Project Budget Details

Project Title	Project Year	Estimated Cost ($M)
Fibertop Changeouts	2014	$7.09

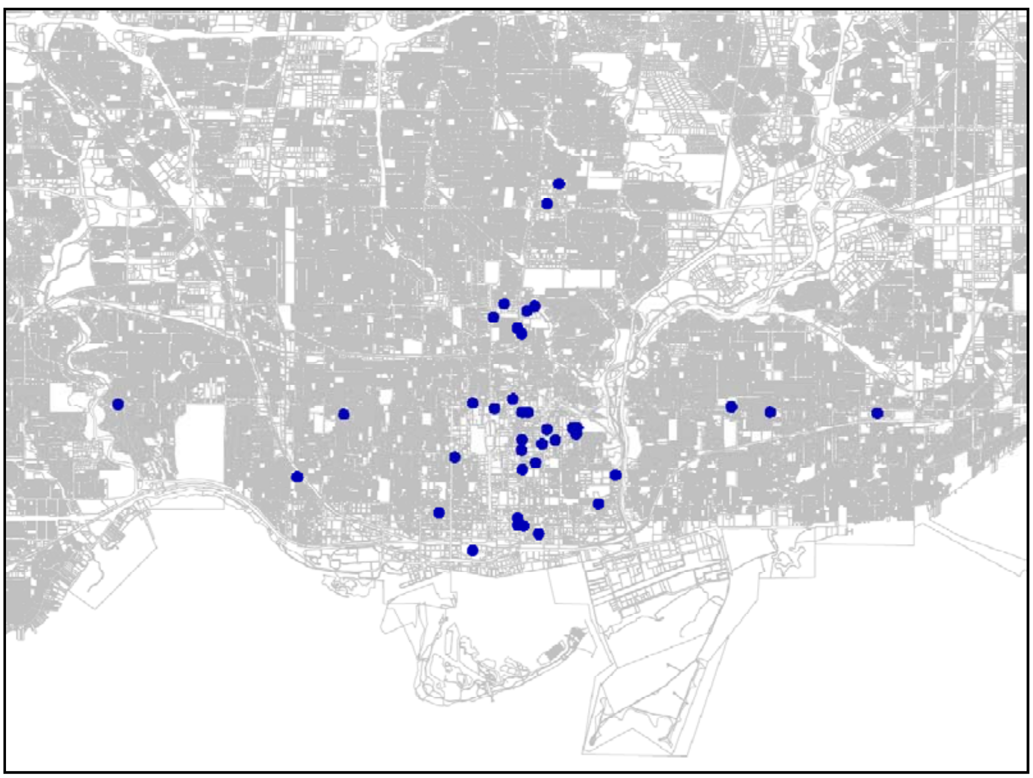


Figure 1: 2014 Fibertop Replacement Locations

2. Detailed Description of Changes

The 2014 ICM work program of $7.09M represents a reduction of $2.27M and 22 fibertop network units relative to the work previously proposed for 2014 in the May 2012 filing. This reduction is due in part to the implementation of new standard submersible equipment and the limited availability of contractors with the required skill-set.

During 2013, THESL conducted a field trial to test new submersible equipment that would replace the existing ventilated standard. The field trial was successful but due to the time it took to test the new equipment, existing projects that required the new equipment were delayed. (See below for photos comparing the two standards.)

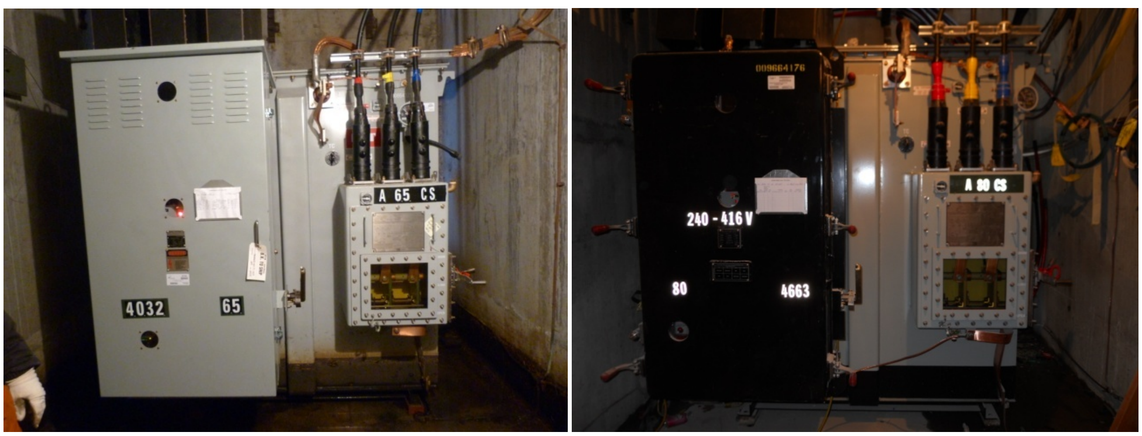


Figure 2: The photo on the left shows an older protector case that is ventilated for cooling. The protector on the right is a submersible protector that is water tight.

Fibertop Network Unit changeouts remain an essential program for THESL. THESL intends to continue with planned replacements beyond 2014.

3. Updated Information

In addition to the incidents outlined in section 2 of the Phase 1 evidence (Tab 4, Schedule B10), another fibertop network unit failed on Monday, January 28, 2013. A network vault fire occurred at 95 St Clair Ave W. The location of the fire was vault 4651, a two unit spot vault fed by A54H and A53H. The building at 95 St Clair Ave West was without power for 49 hours. A53H and A54H were dropped during the outage and both feeds were out until the affected vault could be isolated affecting over 16 highrise buildings. The civil infrastructure in the vault experienced severe damage from the fire and required a full rebuild.

Figure 3: Images of the fire at vault location 4651

This network location was a part of the planned 2012-2013 work program, but the fire occurred prior to the scheduled replacement. The photos below show how the vault fire compromised the structural integrity of the vault. The vault at this location needed to be rebuilt before new equipment could be installed.

Figure 4: Images of the damaged civil structure caused by the fire.

As demonstrated by this incident, fibertop protectors continue to pose a potential risk to public safety and the reliability of the distribution system. THESL expects to continue the replacement program until the risks to safety and reliability have been mitigated.

II JOB-LEVEL UPDATES

Table of Jobs for 2014

Table 2: Detailed List of Jobs for 2014

Estimate Number	Project Title	Year	Cost Estimate ($M)
28194	4476_A16L	2014	$0.16
28289	46667_A30DN	2014	$0.22
28204	4653NV_4654EV_4696SV_A63CS	2014	$0.58
28195	4317_A91A	2014	$0.14
28200	N1115_A94CS	2014	$0.16
28208	4654WV_N1109_A65CS	2014	$0.35
28351	4917SV_N1114_A69WR	2014	$0.29
28420	4035_A78CS	2014	$0.14
28201	4760_A10MN	2014	$0.14
28205	4885_A11E	2014	$0.14
28207	4885_A12E	2014	$0.14
28272	4564_A18T	2014	$0.14
28366	4210_A34A_A36A	2014	$0.28
28232	N1196_A36MN	2014	$0.16
28280	N1090_A37X	2014	$0.16
28233	N1196_A38MN	2014	$0.16
28399	4826_A3K	2014	$0.14
28291	4230EV_A40GD	2014	$0.22
28238	4753_A48H	2014	$0.22
28239	4753_A49H	2014	$0.22
28419	4542_A4K	2014	$0.14
28219	4539_A55CS	2014	$0.14
28217	4770_4553_A56H	2014	$0.28

Estimate Number	Project Title	Year	Cost Estimate ($M)
28501	4851_A5GL	2014	$0.14
28432	4176_A5K	2014	$0.19
28221	4696NV_A62CS	2014	$0.22
28220	4774_A63H	2014	$0.16
28222	4499EV_A65H	2014	$0.16
28359	4114_A65WR	2014	$0.14
28363	N1102_A72CE	2014	$0.14
28275	4400NV_A72CS	2014	$0.16
28422	4254W_4752_A75CS	2014	$0.30
28505	4543EV_A7GL	2014	$0.31
28277	4769_A92B	2014	$0.19
28426	4005_4637_A57H	2014	$0.27
2014 Total (adjusted for rounding)			**$7.09**

The jobs in the 2014 ICM work program have been structured based on the supply feeder for the network unit where possible so that several units are replaced on the same feeder at the same time to take advantage of switching required to take the feeder out of service. For example 4917SV_A69WR and N1114_A69WR both have A69WR as the supply feeder and have been grouped to be executed at the same time.

III BUSINESS CASE EVALUATION UPDATE

Carrying out immediate work on this asset class will result in an avoided estimated risk cost of $1.8 million, which represents the avoided cost of executing the work in 2014 as opposed to deferring until 2015. This figure shows that there are substantial economic benefits from executing this work in 2014. These results have been revised to only include 2014 projects. Detailed clarifications are further explained within the Appendix B of the original filing.

Table 3: Business Case Evaluation (BCE) for Fibertop Network Units (2014)

Business Case Element	Cost (in Millions)
Present Value of Project Net Cost in 2015 (PV($PROJECT_{NET\_COST}$(2015))	$3.5
Project Net Cost in 2014 ($PROJECT_{NET\_COST}$(2014))	$1.7
Avoided Estimated Risk Cost = **(PV($PROJECT_{NET\_COST}$(2015)) – $PROJECT_{NET\_COST}$(2014))**	**$1.8**

ICM Project: 2014 Update | ATS and RPB Segment

SUMMARY OF CHANGES FOR 2014 UPDATE

- 2014 ICM work program was revised to reflect the work accomplished to date in 2013 and the continuing priority needs of the system.[1]
- Eight ATS Jobs and two RPB jobs were removed from the 2014 ICM work program.
- Relative to the May 2012 filing, forecast 2014 capital expenditures decreased by $2.98M (not including spending related to approved Phase 1 jobs).

[1] Please see discussion of 2014 work program in Manager's Summary Update, "Overview of Projects and Segments."

I. OVERVIEW OF 2014 UPDATE

A. The 2014 Work Program

The 2014 ICM work program for the ATS and RPB segment is $0.25M which reflects replacement of two ATS switches and no RPB protectors. This differs from the originally filed 2014 evidence where ten ATS and two RPBs were to be replaced at a cost of $3.23M. The result is a $2.98M reduction.

Table 1: ATS and RPB Segment Capital Cost

Description	Year	Estimated Total Cost ($M)
Replace two ATS Locations	2014	$0.25M

B. Detailed Description of Changes

The ATS changeout program has been reduced by eight jobs and the RPB changeout program has been reduced by two jobs. The ATS and RPB replacement program remains important to mitigating the risk of failure on THESL's distribution system. THESL expects to continue executing planned jobs beyond 2014.

1 **Figure 1: Map of 2014 ATS Replacements**

II. JOB-LEVEL UPDATES

A. New Jobs for 2014

Table 2: 2014 ATS Replacement Jobs

Job Estimate Number	Job Title	Job Year	Cost Estimate ($M)
28500	D3008 - 281 Front St E, Toronto	2014	0.19
28478	D9016 – Richmond St W, Toronto	2014	0.06

Job 28500 replaces the ATS and the distribution transformers in the vault. A recent inspection identified that the ATS was rusting and the transformers in the vault were heavily rusted. In addition, D3008 is a sidewalk vault that multiple inspections have shown is prone to moisture and dirt accumulation.

Figure 2: Photo of ATS and Transformer in Location D3008

Job 28478 replaces the ATS in the vault. Recent inspections show heavy rust on the base of the ATS. The vault is an underground location that is prone to moisture accumulation.

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SUMMARY OF CHANGES FOR 2014 UPDATE

- Two jobs were removed from this segment based on the criteria set out by the OEB in its Partial Decision and Order regarding this segment.
- One job was added back that was originally included in the 2012/2013 ICM work program, but deferred during the October 2012 evidentiary update.
- Relative to the May 2012 filing, forecast 2014 capital expenditures were reduced from \$3.93M to \$3.54M (not including spending related to approved Phase 1 jobs), a difference of \$0.39M.[1]

[1] Please see discussion of 2014 work program in Manager's Summary Update, "Overview of Projects and Segments."

I OVERVIEW OF 2014 UPDATE

1. The 2014 Work Program

Two jobs were removed from this segment by applying THESL's interpretation of the criteria used by the OEB to approve certain 2012/13 jobs in this segment, as outlined in the 2013 decision (Refer to section II, Job Level Updates, for a discussion of the criteria). One job (Phase 2 of a previously approved job) has been added. In total the budget of this segment was reduced by $0.39M, relative to the May 2012 filing. A summary of the 2014 program is outlined below.

Table 1: Job Cost Estimate

Job Estimate Number	Job Title	Year Installed	Job Year	Cost Estimate ($M)
22804	S14068 Islington MS Replace Switchgear	1955	2014	1.58
22805	S14070 Thornton MS Replace switchgear	1955	2014	0.90
21581	S13126 Neilson Dr MS Replace Switchgear (Phase 2)	1954	2014	1.06
TOTAL				**3.54**

2. Detailed Description of Changes

THESL reviewed the OEB's criteria for approving certain switchgear replacement jobs in the 2012/2013 rate filing and applied a consistent interpretation of these criteria to the 2014 switchgear replacement program. The following jobs were **removed**:

- Removed S14044 Midland Lawrence MS Replace switchgear ($0.62M) as it did not meet the criteria the OEB used to approve jobs under this segment.
- Removed S14048 Pharmacy CPR MS Replace switchgear ($0.94M) as it did not meet the criteria the OEB used to approve jobs under this segment.

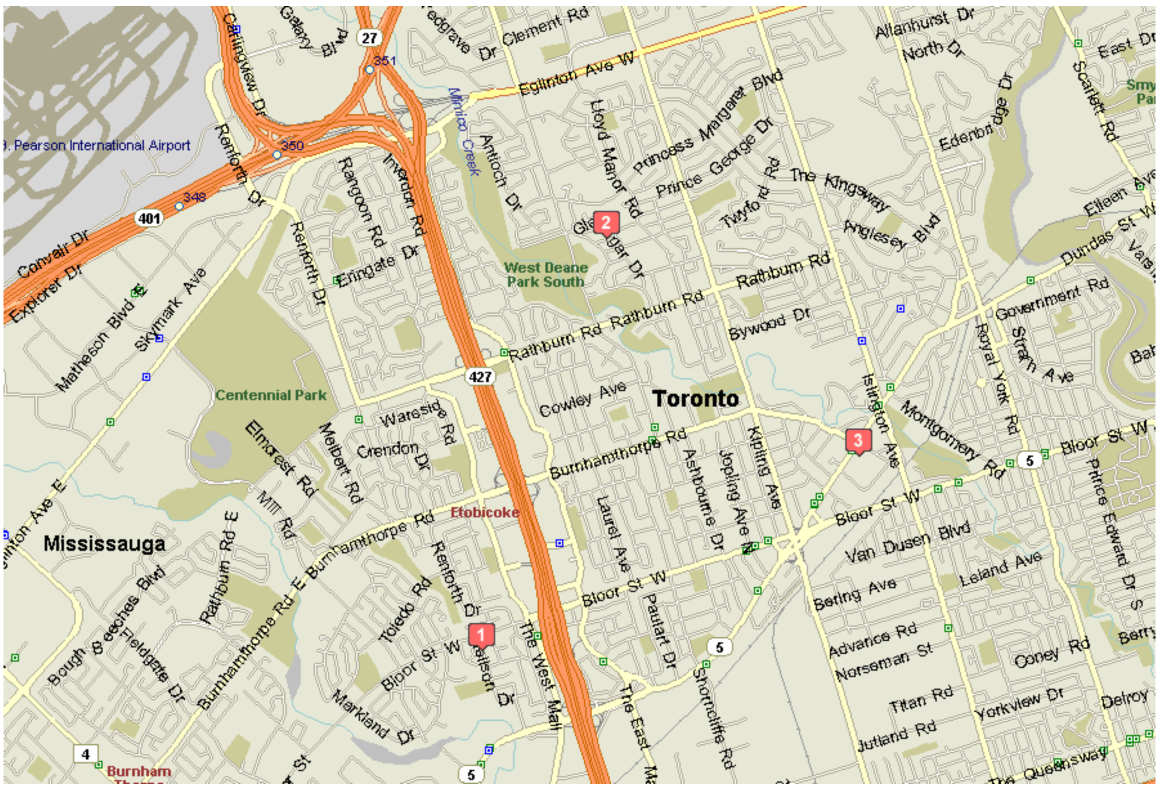
THESL has filed a job reflecting the 2014 phase of a work that was approved by the OEB in the 2012/2013 ICM work program:

- S13126 Neilson Dr MS Replace Switchgear ($1.06M): This job reflects the second phase of a project (replacement of egress cables) that was approved in the Phase 1 Decisions. In the originally filed evidence, both phases of this work were presented as a single job. During the October 2012 evidentiary update, a severable portion of this job was deferred to 2014 and thus removed from costs of the approved in Phase 1 and funded via ICM rate riders. The work presented in this evidentiary update is incremental to the work approved in Phase 1.

JOB LEVEL UPDATES

1. 2014 Job Descriptions

Three switchgears are to be replaced in this segment as part of the 2014 ICM work program. These switchgears are located at Islington MS, Thornton MS and Neilson MS in the west end of Toronto, as illustrated in Figure 1 below.



Marker ID	Station Name	Address
1	Islington MS	Cordova Avenue, Toronto, ON M9A
2	Thornton MS	59 Glen Agar Dr, Toronto, ON M9B 5L9
3	Neilson Dr MS	4237 Bloor St W Toronto, ON M9C 1Z6

Figure 1: Job Locations

The switchgears selected for replacement in this segment were chosen based on equipment age, equipment obsolescence, lack of arc-resistant design and safety related operational issues.

2. Job Description

The objective of this job is to replace the existing non-arc resistant switchgears at Islington MS, Thornton MS and Neilson MS with new arc-flash resistant switchgear. All three of these switchgears have auto-reclosure issues as described in detail below. In its Partial Decision and Order, the OEB approved 2012/13 switchgear replacement projects that were affected by this issue. THESL has applied the same criteria to identify the 2014 MS switchgear replacement jobs proposed in this evidentiary update.

The existing switchgear at Islington MS, Thornton MS and Neilson MS are 58, 58, and 59 years old, respectively. The switchgears employ obsolete designs, such as non arc-resistance design, obsolete oil circuit breakers and mechanical relays.

The switchgear in this segment:

- are well past of their useful life, the estimated remaining lifetime of the switchgears is limited and proactive intervention is necessary;
- employ obsolete equipment built to legacy standards, such as non-arc flash resistant enclosures; and
- rely on parts that are no longer readily available, resulting in challenges to repair and maintain them.

The switchgears at Islington MS, Thornton MS and Neilson MS have additional operational constraints that pose potential safety risks to operating personnel. The circuit breakers in these switchgears have auto re-closure problems, i.e., when a circuit breaker is taken out of service for maintenance and is put back after it is maintained, it auto re-closes instead of locking even though the circuit breaker is in the open position and the auto re-closure is blocked by the control authority. The auto re-closuring poses a potential safety risk to the operating personnel. To correct the auto re-closure problem, re-engineering and rewiring of the circuit breakers is required. However, rewiring or re-engineering circuit breakers that are at the end of their life is not cost effective; therefore, it is prudent to replace the whole switchgear. To mitigate the potential safety risk temporarily, the circuit breakers are tagged with warning labels to flag the safety concern.

II Business Case Evaluation Update

Carrying out immediate work on this asset class will result in an avoided estimated risk cost of 0.055 million, which represents the avoided cost of executing the work in 2014 as opposed to deferring until 2015. These results have been revised to only include 2014 projects.

Table 2: Business Case Evaluation Update for Switchgear (2014)

Business Case Element	Estimated Cost (in Millions)
Present Value of Project Net Cost in 2015 (PV($PROJECT_{NET\_COST}$(2015))	\$0.655
Project Net Cost in 2014 ($PROJECT_{NET\_COST}$(2014))	\$0.600
Avoided Estimated Risk Cost = (PV($PROJECT_{NET\_COST}$(2015)) – $PROJECT_{NET\_COST}$(2014))	**\$ 0.055**

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ICM Project: 2014 Update | Stations Circuit Breakers Segment

SUMMARY OF CHANGES FOR 2014 UPDATE

- The 2014 ICM work program was increased from six to eight jobs.
- Relative to May 2012 filing, forecast 2014 capital expenditures increased by $1.27M (not including spending related to approved Phase 1 jobs)[1], from $1.37M to $2.64M, due to the addition of two jobs.

[1] Please see discussion of 2014 work program in Manager's Summary Update, "Overview of Projects and Segments".

I OVERVIEW OF 2014 UPDATE

1. The 2014 Work Program

The number of jobs included in the 2014 work program has increased from six to eight. The two additional jobs, S13125 Leslie TS and S13146 Bermondsey TS, were originally filed as part of the 2013 work program, but were deferred to 2014 during the October 31, 2012 evidentiary update. Due to the addition of these two jobs, the 2014 ICM work program has increased by $1.27M to $2.64M from $1.37M, relative to that original filing in May 2012.

Table 1: Job Cost Estimates

Job Estimate Number	Job Title	Job Year	Cost Estimate ($M)
21657	S13125 Leslie TS: Repl. KSO CBs (51M7 and 51M8)	2014	0.47
21656	S13146 Bermondsey TS: Repl. KSO CBs (53M1, 53M9, & 53M11)	2014	0.71
22694	S14054 Finch TS: Replace KSO CB (55M25 and 55M8)	2014	0.420
22693	S14052 Finch TS: Replace KSO CB (55M24)	2014	0.20
22695	S14055 Bathurst TS: Replace 85M1 KSO CB	2014	0.21
22698	S14056 Bathurst TS: Replace 85M4 KSO CB	2014	0.21
22699	S14057 Bathurst TS: Replace 85M2 KSO CB	2014	0.21
22700	S14059 Bathurst TS: Replace 85M25 KSO CB	2014	0.21
Jobs Total 2014:			**2.64**

2. Detailed Description of Changes

Two jobs have been added to this segment, the details of which are provided below:

- S13125 Leslie TS: Repl. KSO CBs (51M7 and 51M8), which involves replacement of two KSO circuit breakers at Leslie TS.

- S13146 Bermondsey TS: Repl. KSO CBs (53M1, 53M9, & 53M11), which involves the replacement of three KSO circuit breakers at Bermondsey TS.

II JOB-LEVEL UPDATES

1. 2014 Job Descriptions

The scope of each job in this portfolio is to replace the existing KSO oil circuit breaker with a modern vacuum circuit breaker. A map of project locations is shown in Figure 1 below:

Reference Number	Station Name	Address
1	Bathurst TS	165 Goddard St, Toronto
2	Finch TS	1 Signet Dr, Toronto
3	Leslie TS	5733 Leslie St, Toronto
5	Bermondsey TS	178 Bermondsey Rd, Toronto

Figure 1: Map showing all proposed CB locations

An overview of each circuit breaker planned for replacement in 2014 is provided below.

1.1. Station Name: Leslie TS

Station Circuit Breaker ID: 51M7

Age of the Circuit Breaker: 50

Justification:

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.

Figure 2: Circuit Breaker at Leslie TS 51M7 (February 3, 2012)

1.2. Station Name: Leslie TS

Station Circuit Breaker ID: 51M8

Age of the Circuit Breaker: 50

Justification:

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.

Figure 3: Circuit Breaker at Leslie TS 51M8 (February 3, 2012)

1.3. Station Name: Bermondsey TS

Station Circuit Breaker ID: 53M1

Age of the Circuit Breaker: 52

Justification:

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.

Figure 4: Circuit Breaker at Bermondsey TS 53M1 (February 3, 2012)

1.4. Station Name: Bermondsey TS

Station Circuit Breaker ID: 53M9

Age of the Circuit Breaker: 52

Justification:

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.

Figure 5: Circuit Breaker at Bermondsey TS 53M9 (February 3, 2012)

1.5. Station Name: Bermondsey TS

Station Circuit Breaker ID: 53M11

Age of the Circuit Breaker: 52

Justification:

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.

Figure 6: Circuit Breaker at Bermondsey TS 53M11 (February 3, 2012)

1.6. Station Name: Finch TS

Station Circuit Breaker ID: 55M24

Age of the Circuit Breaker: 53

Justification:

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.

Figure 7: Circuit Breaker at Finch TS 55M24 (February 2, 2012)

1.7. Station Name: Finch TS

Station Circuit Breaker ID: 55M25

Age of the Circuit Breaker: 53

Justification:

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.

Figure 8: Circuit Breaker at Finch TS 55M25 (February 2, 2012)

1.8. Station Name: Finch TS

Station Circuit Breaker ID: 55M8

Age of the Circuit Breaker: 53

Justification:

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.

Figure 9: Circuit Breaker at Finch TS 55M8 (March 14, 2012)

1.9. Station Name: Bathurst TS

Station Circuit Breaker ID: 85M1

Age of the Circuit Breaker: 51

Justification:

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.

Figure 10: Circuit Breaker at Bathurst TS 85M1 (February 2, 2012)

1.10. Station Name: Bathurst TS

Station Circuit Breaker ID: 85M4

Age of the Circuit Breaker: 51

Justification:

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.

Figure 11: Circuit Breaker at Bathurst TS 85M4 (February 2, 2012)

1.11. Station Name: Bathurst TS

Station Circuit Breaker ID: 85M2

Age of the Circuit Breaker: 51

Justification:

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.

Figure 12: Circuit Breaker at Bathurst TS 85M2 (February 2, 2012)

1.12. Station Name: Bathurst TS

Station Circuit Breaker ID: 85M25

Age of the Circuit Breaker: 51

Justification:

This circuit breaker is past end of life. Replacement is required due to obsolescence, high maintenance requirements and risk of collateral damage in the event of a catastrophic failure.

Figure 13: Circuit Breaker at Bathurst TS 85M25 (February 2, 2012)

III Business Case Evaluation Update

Carrying out immediate work on this asset class will result in an avoided estimated risk cost of $0.7 million, which represents the avoided cost of executing the work in 2014 as opposed to deferring until 2015. This figure shows that there are substantial economic benefits from executing this work in 2014. The results have been revised to only include 2014 projects.

Table 2: Business Case Evaluation (BCE) update of Circuit Breaker Projects (2014)

Business Case Element	Estimated Cost (in Millions)
Present Value of Project Net Cost in 2015 ($PV(PROJECT_{NET\_COST}(2015))$	$ 1.2
Project Net Cost in 2014 ($PROJECT_{NET\_COST}(2014)$)	$ 0.5
Avoided Estimated Risk Cost = ($PV(PROJECT_{NET\_COST}(2015)) – PROJECT_{NET\_COST}(2014)$)	**$ 0.7**

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ICM Project | Copeland TS (formerly Bremner TS)

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ICM Project: 2014 Update | HONI Capital Contributions

SUMMARY OF CHANGES FOR 2014 UPDATE

- Capital contributions related to projects not scheduled to be in service in 2014 have been removed, and one new job has been added.
- The number of jobs included in this portfolio for 2014 has been reduced from four to one.
- Relative to May 2012 filing, 2014 capital expenditures reduced from $9.00M to $2.64M[1], not including spending related to Copeland TS (formerly Bremner TS).
- Pursuant to the OEB's Partial Decision and Order, April 2, 2013, capital contributions related to Copeland TS have not been included in this segment of the evidentiary update. Pursuant to the Phase 1 Decisions, these amounts are accounted for in the proposed 2014 rate riders.

[1] Please see discussion of 2014 work program in Manager's Summary Update, "Overview of Projects and Segments"

I OVERVIEW OF 2014 UPDATE

1. The 2014 Work Program

THESL has one non-discretionary capital contribution payment due to Hydro One for which the underlying project is scheduled to come in service in 2014.

Table 1: Summary of Capital Contribution to HONI in 2014

Job Title	**2014 Job Estimated Cost ($ millions)**
Carlaw A6-7E Switchgear Replacement Capital Contribution	$2.64
Total Capital Contribution to HONI in 2014:	$2.64

2. Detailed Description of Changes

This segment has been updated as follows:

- Removed capital contributions in relation to projects which will not be in service in 2014
- Capital contributions related to Copeland TS (formerly Bremner TS) are not addressed within this segment
- Added “Carlaw A6-7E Switchgear Replacement Capital Contribution”

II JOB-LEVEL UPDATES

2014 Job Descriptions

The "Carlaw A6-7E Switchgear Replacement Capital Contribution" job covers a capital contribution to replace Hydro One's incoming breakers, which is required to energize the new switchgear that is replacing A6-7E at Carlaw TS, as approved by the OEB.

The OEB approved the capital job replacing THESL's A6-7E switchgear at Carlaw TS (Tab 4, Schedule B13.2, pages 10-11) in its Partial Decision and Order on April 2, 2013. Payment of this capital contribution is a non-discretionary component of the switchgear replacement job. When the application for THESL A6-7 switchgear was originally filed in May 2012, it was not clear to THESL that a capital contribution to HONI would be required for this work and as a result it was not included. At the time of the previous filing, THESL believed HONI would replace the four incoming breakers (to Carlaw A6-7 switchgear) that were at end-of-life at their cost, without capital contribution from THESL. HONI later argued that THESL was responsible for the cost of two of the four incoming breakers because HONI considered the additional two incoming breakers redundant equipment that would improve THESL reliability. Since then, THESL has entered into a Customer Cost Recovery Agreement (CCRA) with Hydro One which requires payment of $2.64M in total.

ICM Project: 2014 Update | Feeder Automation

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ICM Project: 2014 Update | Metering

SUMMARY OF CHANGES FOR 2014 UPDATE

- The Metering budget for 2014 decreased by $0.56M, to a new total of $9.54M (as compared to $10.10M in the original May 2014 filing)
- The original estimate for the Seal Expiring Meters category in 2014 has been reduced from $1.00M to $0.50M. The number of QuadLogic meters with seals expiring in 2014 has been reduced from 4,703 to 970. This was a result of certain QuadLogic meters receiving a longer than previous approved re-verification period from Measurement Canada.
- The original estimate for Wholesale Meter Market Settlement Compliance in 2014 has been reduced from $9.10M to $6.13M. The category's cost was reduced for 2014 in part because Terauley station transformers were certified as compliant and did not require replacement as anticipated. THESL also realized lower communication infrastructure costs by using a secure wide area network instead of a dedicated fibre network.
- A new category, of work has been added to address critical issues that impact performance of the residential AMR network that serves over 650,000 residential and small commercial accounts. The Wireless Collector Upgrade is forecast to cost $2.91M. This work safeguards THESL's ability to collect meter readings from customers who collectively account for over $800M in annual revenue.

I OVERVIEW OF 2014 UPDATE

1. The 2014 Work Program

The updated 2014 Metering segment costs are presented in Table 1 below.

Table 1: 2014 Program Costs

Item	2014 ($M)
Wholesale Metering Market Settlement Compliance	$6.13M
Seal Expiring Meters	$0.50M
Wireless Collector Upgrade	$2.91M
Total	**$9.54M**

2. Detailed Description of Changes

2.1. Wholesale Meter Market Settlement Compliance

THESL's 2014 costs for Wholesale Metering Market Settlement Compliance work have been reduced to $6.13M. This reduction is the result of the Terauley Station work being completed in 2012 with existing current transformers that meet the required specifications. This eliminated the metering replacement cost and greatly reduced HONI involvement in the project. In addition, THESL also realized lower communication infrastructure costs by utilizing a secure wireless Wide Area Network rather than providing fibre communication to each site. This reduced infrastructure costs by $2.4M across the wholesale metering jobs in this segment category.

2.2. Seal Expiring Meters

THESL has reduced the number of QuadLogic Meters due for re-verification in 2014 from 4,703 to 970, and correspondingly lowered its Seal Expiring Meters category costs from $1.0M to $0.50M. This was as a result of Measurement Canada having recently approved an extended initial re-verification period for all installed QuadLogic S20MC5 meters (refer to Appendix A and B). The re-verification period has been extended from a six-year period to a ten-year period.

2.3. Wireless Collector Upgrade

This job involves the replacement of failing first generation phone line-based collectors with wireless second generation collectors. This change is required due to the manufacturer discontinuing production of modem based collectors (refer to Appendix C). Given the failure rate and the lack of spares, replacement is urgently needed to maintain the collection of interval data for the purposes of billing THESL customers on TOU rates.

II JOB-LEVEL UPDATES

Table 1: Wholesale Metering Upgrades by Location

Job Estimate Number	Job Title	Job Year	Cost Estimate ($M)
TH7021	IESO Compliant Metering at Gerrard TS (T1A4A5, T2A2A2, T3A1A2 & T4A4A5)	2014	$0.83
TH7017	IESO Compliant Metering at Warden TS (J Bus & Q Bus)	2014	$0.33
TH7008	IESO Compliant Metering at Basin TS (T3A5A6, T3A7A8, T5A5A6, T5A7A8)	2014	$0.83
TH7013	IESO Compliant Metering at Main TS (T3 & T4)	2014	$0.82
TH7005	IESO Compliant Metering at Manby TS (T13 & T14)	2014	$0.39
TH7016	IESO Compliant Metering at Runnymede TS (T3 & T4)	2014	$0.44
TH7011	IESO Compliant Metering at Bridgman TS (T5 & T11)	2014	$0.74
TH7014	IESO Compliant Metering at Leaside TS (M1, M2, M3, M4, M8, T19, T20, T21)	2014	$0.77
TH7018	IESO Compliant Metering at Esplanade TS (M11, M12, M13)	2014	$0.47
TBD	IESO Compliant Metering at Strachan TS (T13, T15)	2014	$0.50

1 **Table 2: Meter Replacement Requirements by Meter Type**

Meter Type	2014
RIMS	304
Quadlogic	970
Smart and Other	292
Total	**1,566**

2 **Table 3: Listing of all Jobs**

Project Estimate Number	Job Title	Job Year	Cost Estimate ($M)
TH7021	IESO Compliant Metering at Gerrard TS (T1A4A5, T2A2A2, T3A1A2 & T4A4A5)	2014	$0.83
TH7017	IESO Compliant Metering at Warden TS (J Bus & Q Bus)	2014	$0.33
TH7008	IESO Compliant Metering at Basin TS (T3A5A6, T3A7A8, T5A5A6, T5A7A8)	2014	$0.83
TH7013	IESO Compliant Metering at Main TS (T3 & T4)	2014	$0.82
TH7005	IESO Compliant Metering at Manby TS (T13 & T14)	2014	$0.39
TH7016	IESO Compliant Metering at Runnymede TS (T3 & T4)	2014	$0.44
TH7011	IESO Compliant Metering at Bridgman TS (T5 & T11)	2014	$0.74
TH7014	IESO Compliant Metering at Leaside TS (M1, M2, M3, M4, M8, T19, T20, T21)	2014	$0.77
TH7018	IESO Compliant Metering at Esplanade TS (M11, M12, M13)	2014	$0.47

ICM Project: 2014 Update | Metering

Project Estimate Number	Job Title	Job Year	Cost Estimate ($M)
	IESO Compliant Metering at Strachan TS (T13, T15)	2014	$0.50
24985	2014 RC4250 Re-verification Meter Replacement	2014	$0.50
	Wireless Collector Upgrade	2014	$2.91
2014 Total:		**$9.54**	

A 2014 Job Descriptions

1. Proposal for Gerrard TS (NT33) – Replace T1A4A5, T2A1A2, T3A1A2, and T4A4A5 Wholesale Revenue Metering

1.1. Job Objectives

With the completion of this work, THESL will become the Meter Service Provider (MSP) and is assuming ownership of these meters. To allow THESL access to the meters for ongoing maintenance, the meters must be physically moved from HONI accessible areas to areas accessible to THESL's crews. THESL intends to abandon the above mentioned metering installations and build new low voltage installations inside Gerrard TS. This proposal is for the work associated with de-registering the existing four wholesale revenue metering points and with making ready four new fully-compliant IESO wholesale metering installations.

1.2. Job Scope of Work

The switchyard site is a 115/13.8 kV, 60 Hz TS supplying local loads. There are four power transformers (T1, T2, T3 and T4) providing step down transformation from the 115 kV system to 13.8 kV system. All are within the scope of this revenue metering upgrade.

1.3. Location

The assets being replaced are located at Gerrard Terminal Station (TS).

1.4. Required Capital Costs

Table 4: Required Capital Costs

Estimate Number	Job Phase	Cost ($M)
TH7021	Gerrard TS (NT33) – Replace T1A4A5, T2A1A2, T3A1A2, and T4A4A5 Wholesale Revenue Metering	$0.83
	Total:	$0.83

2. Proposal for Warden TS – Replace J Bus and Q Bus Wholesale Revenue Metering

2.1. Job Objectives

With the completion of this work, THESL will become the Meter Service Provider (MSP) and is assuming ownership of these meters. To allow THESL access to the meters for ongoing maintenance, the meters must be physically moved from HONI accessible areas to areas accessible to THESL's crews. THESL expects to abandon the above mentioned metering installations and build new low voltage installations inside Warden TS. This proposal is for the work associated with de-registering the existing four wholesale revenue metering points and with making ready four new fully-compliant IESO wholesale metering installations.

2.2. Job Scope of Work

The switchyard site is a 230/27.6 kV, 60 Hz transformer station supplying local loads. There are two power transformers (T3 and T4) providing step down transformation from the 230 kV system to 27.6 kV system. Both transformers are within the scope of this revenue metering upgrade.

2.3. Location

The assets being replaced are located at Warden TS.

2.4. Required Capital Costs

Table 5: Required Capital Costs

Estimate Number	Job Phase	Estimated Cost ($M)
TH7017	Warden TS – Replace J Bus and Q Bus Wholesale Revenue Metering	$0.33
	Total:	**$0.33**

3. Proposal for Basin TS (NT4) – Replace T3A5A6, T3A7A8, T5A5A6, and T5A7A8 Wholesale Revenue Metering

3.1. Job Objectives

With the completion of this work, THESL will become the Meter Service Provider (MSP) and is assuming ownership of these meters. To allow THESL access to the meters for ongoing maintenance, the meters must be physically moved from HONI accessible areas to areas accessible to THESL's crews. THESL expects to abandon the above mentioned metering installations and build new low voltage installations inside Basin TS. This proposal is for the work associated with de-registering the existing four wholesale revenue metering points and with making ready four new fully-compliant IESO wholesale metering installations.

3.2. Job Scope of Work

The switchyard site is a 115/13.8 kV, 60 Hz TS supplying local loads. There are two power transformers (T3 and T5) providing step down transformation from the 115 kV system to the THESL owned 13.8 kV system. Both transformers are within the scope of this revenue metering upgrade.

3.3. Location

The assets being replaced are located at Basin TS.

3.4. Required Capital Costs

Table 6: Required Capital Costs

Estimate Number	Job Phase	Estimated Cost ($M)
TH7008	Proposal for IESO Compliant Metering at Basin TS (T3A5A6, T3A7A8, T5A5A6, T5A7A8) Wholesale Revenue Metering	$0.83
	Total:	**$0.83**

4. Proposal for Main TS – Replace T3 and T4 Wholesale Revenue Metering

4.1. Job Objectives

With the completion of this work, THESL will become the Meter Service Provider (MSP) and is assuming ownership of these meters. To allow THESL access to the meters for ongoing maintenance, the meters must be physically moved from HONI accessible areas to areas accessible to THESL's crews. THESL expects to abandon the above mentioned metering installations and build new low voltage installations inside Main TS. This proposal is for the work associated with de-registering the existing four wholesale revenue metering points and with making ready four new fully-compliant IESO wholesale metering installations.

4.2. Job Scope of Work

The switchyard site is a 115/13.8 kV transformer station supplying local loads. There are two transformers, designated as T3 and T4, connected via 115 kV, 60 Hz lines. They are both subject of this revenue metering upgrade.

4.3. Location

The assets being replaced are located at Main TS.

4.4. Required Capital Costs

Table 7: Required Capital Costs

Estimate Number	Job Phase	Estimated Cost ($M)
TH7013	Proposal for Main TS – Replace T3 and T4 Wholesale Revenue Metering	$0.82
	Total:	**$0.82**

5. Proposal for Manby TS (NA38) – Replace T13 and T14 Wholesale Revenue Metering

5.1. Job Objectives

With the completion of this work, THESL will become the Meter Service Provider (MSP) and is assuming ownership of these meters. To allow THESL access to the meters for ongoing maintenance, the meters must be physically moved from HONI accessible areas to areas accessible to THESL's crews. THESL expects to abandon the above mentioned metering installations and build new low voltage installations inside Manby TS. This proposal is for the work associated with de-registering the existing four wholesale revenue metering points and with making ready four new fully-compliant IESO wholesale metering installations.

5.2. Job Scope of Work

Manby TS (T13/T14) consists of two 220/28 kV, 50/67/93 MVA power transformers, each with a winter ten-day Limited Time Rating (LTR) of 120.6 MVA. A meter only upgrade of the T13/T14 2EL metering installation was done in 2008 but a full metering upgrade is now needed to satisfy the requirements of Market Rules. Before beginning work Hydro One will complete a detailed design of two new IESO compliant metering installations; one to meter the energy being delivered by transformer T13 and the other to meter that of transformer T14.

5.3. Location

The assets being replaced are located at Manby TS.

5.4. Required Capital Costs

Table 8: Required Capital Costs

Estimate Number	Job Phase	Estimated Cost ($M)
TH7005	Manby TS (NA38) – Replace T13 and T14 Wholesale Revenue Metering	$0.39
	Total:	**$0.39**

6. Proposal for Runnymede (NT11) – Replace T3 and T4 Wholesale Revenue Metering

6.1. Job Objectives

With the completion of this work, THESL will become the Meter Service Provider (MSP) and is assuming ownership of these meters. To allow THESL access to the meters for ongoing maintenance, the meters must be physically moved from HONI accessible areas to areas accessible to THESL's crews. THESL expects to abandon the above mentioned metering installations and build new low voltage installations inside Runnymede TS. This proposal is for the work associated with de-registering the existing four wholesale revenue metering points and with making ready four new fully-compliant IESO wholesale metering installations.

6.2. Job Scope of Work

Runnymede TS is a 115/27.6 kV transformer station supplying local loads. There are two transformers, designated as T3 and T4, connected via 115kV, 60 Hz lines K11W and K12W. Both transformers are the subject of this revenue metering upgrade.

6.3. Location

The assets being replaced are located at Runnymede (TS).

6.4. Required Capital Costs

Table 9: Required Capital Costs

Estimate Number	Job Phase	Estimated Cost ($M)
TH7016	Runnymede (NT11) – Replace T3 and T4 Wholesale Revenue Metering	$0.44
	Total:	**$0.44**

7. Proposal for Bridgman TS – Replace T5A4A6HL and T11A5A6HL Wholesale Revenue Metering

7.1. Job Objectives

With the completion of this work, THESL will become the Meter Service Provider (MSP) and is assuming ownership of these meters. To allow THESL access to the meters for ongoing maintenance, the meters must be physically moved from HONI accessible areas to areas accessible to THESL's crews. THESL expects to abandon the above mentioned metering installations and build new low voltage installations inside Bridgman TS. This proposal is for the work associated with de-registering the existing four wholesale revenue metering points and with making ready four new fully-compliant IESO wholesale metering installations.

7.2. Job Scope of Work

The switchyard site is a 115/13.8 kV, 60 Hz TS supplying local loads. There are two power transformers (T5 and T11) providing step down transformation from the 115 kV system to 13.8 kV system. Both are within the scope of this revenue metering upgrade.

7.3. Location

The assets being replaced are located at Bridgman TS.

7.4. Required Capital Costs

Table 10: Required Capital Costs

Estimate Number	Job Phase		Estimated Cost ($M)
TH7011	Bridgman TS – Replace T5A4A6HL and T11A5A6HL Wholesale Revenue		$0.74
		Total:	**$0.74**

8. Proposal for Leaside TS – Replace M1, M2, M3, M4, M8, T19, T20 and T21 Wholesale Revenue Metering

8.1. Job Objectives

With the completion of this work, THESL will become the Meter Service Provider (MSP) and is assuming ownership of these meters. To allow THESL access to the meters for ongoing maintenance, the meters must be physically moved from HONI accessible areas to areas accessible to THESL's crews. THESL expects to abandon the above mentioned metering installations and build new low voltage installations inside Leaside TS. This proposal is for the work associated with de-registering the existing four wholesale revenue metering points and with making ready four new fully-compliant IESO wholesale metering installations.

8.2. Job Scope of Work

The switchyard site is a 230/13.8 kV and 230/27.6 kV, 60 Hz TS supplying local loads. There are three (3) power transformers (T19, T20 and T21) providing step down transformation from the 230 kV system to 13.8 kV and 27.6 kV system. All are within the scope of this revenue metering upgrade.

8.3. Location

The assets being replaced are located at Leaside (TS).

8.4. Required Capital Costs

Table 11: Required Capital Costs

Estimate Number	Job Phase	Estimated Cost ($M)
TH7014	Leaside TS – Replace M1, M2, M3, M4, M8, T19, T20 and T21 Wholesale Revenue Metering	$0.77
	Total:	**$0.77**

9. Proposal for Esplanade TS – Replace T11, T12 and T13 Wholesale Revenue Metering

9.1. Job Objectives

With the completion of this work, THESL will become the Meter Service Provider (MSP) and is assuming ownership of these meters To allow THESL access to the meters for ongoing maintenance, the meters must be physically moved from HONI accessible areas to areas accessible to THESL's crews. THESL expects to abandon the above mentioned metering installations and build new low voltage installations inside Esplanade TS. This proposal is for the work associated with de-registering the existing four wholesale revenue metering points and with making ready four new fully-compliant IESO wholesale metering installations.

9.2. Job Scope of Work

The switchyard site is a 115/13.8 kV, 60 Hz TS supplying local loads. There are three power transformers (T11, T12 and T13) providing step down transformation from the 115 kV system to the 13.8 kV system. All are within the scope of this revenue metering upgrade.

9.3. Location

The assets being replaced are located at Esplanade (TS).

9.4. Required Capital Costs

Table 12: Required Capital Costs

Estimate Number	Job Phase	Estimated Cost ($M)
TH7018	Esplanade TS – Replace T11, T12 and T13 Wholesale Revenue Metering	$0.47
	Total:	**$0.47**

10. Proposal for Strachan TS – Replace T13 and T15 Wholesale Revenue Metering

10.1. Job Objectives

With the completion of this work, THESL will become the Meter Service Provider (MSP) and is assuming ownership of these meters. To allow THESL access to the meters for ongoing maintenance, the meters must be physically moved from HONI accessible areas to areas accessible to THESL's crews. THESL expects to abandon the above mentioned metering installations and build new low voltage installations inside Strachan TS. This proposal is for the work associated with de-registering the existing four wholesale revenue metering points and with making ready four new fully-compliant IESO wholesale metering installations.

10.2. Job Scope of Work

The switchyard site is a 115/13.8 kV, 60 Hz TS supplying local loads. There are two power transformers (T13 and T15) providing step down transformation from the 115 kV system to the 13.8 kV system. All are within the scope of this revenue metering upgrade.

10.3. Location

The assets being replaced by this project are located at Strachan TS.

10.4. Required Capital Costs

Table 13: Required Capital Costs

Estimate Number	Job Phase		Estimated Cost ($M)
TBD	Strachan TS – Replace T13 and T15 Wholesale Revenue Metering		$0.50
		Total:	**$0.50**

11. Measurement Canada Compliance– Mandatory Replacement Program in 2014

11.1. Job Objectives

To maintain THESL compliance with Measurement Canada requirements for seal expired meters in 2014.

11.2. Job Scope of Work

To replace the 1,566 meters that have expired seals.

Table 14:

Type of Work	2014
Seal Expired Meters	1,566

11.3. Job Locations

These assets are located throughout THESL's service area.

11.4. Required Capital Costs

Table 15: Required Capital Costs

Job Number	Job Phase		Estimated Cost ($M)
24985	Seal Expired Meters		$0.50
		Total:	**$0.50**

11.5. Conclusions

This work must be completed for THESL to remain in compliance with Measurement Canada requirements.

12. Data Collector Project – Mandatory Replacement Program in 2014

12.1. Job Objectives

To maintain the functionality of the existing unsupportable phone line based data collector network that daily retrieves data from over 650,000 customers. These customers account for over $800M in annual revenue.

12.2. Job Scope of Work

To replace the existing phone based data collector network that serves the residential and small commercial meter network. The replacement consists of upgrading the existing EA_MAS software to be able to support new wireless collectors and physically replacing the 1,395, first generation obsolete data collectors with 1,000 newer wireless data collectors (higher memory capability requires fewer collectors). The existing collectors are no longer supported by the manufacturer.

Table 16:

Type of Work	2014
Data Collector Replacement	1,200

12.3. Job Locations

These assets are located throughout THESL's service area.

12.4. Required Capital Costs

Table 17: Required Capital Costs

Estimate Number	Job Phase		Estimated Cost ($M)
TBD	Data Collector Replacement		$2.91
		Total:	**$2.91**

12.5. Conclusions

This work must be completed in order for THESL to maintain its AMR. The upgrade will provide support for new wireless collectors, and allow THESL to physically replace failing and obsolete first generation data collectors.

From: Thomas George <tgeorge@quadlogic.com>
Date: 07-22-2013 16:33 (GMT-05:00)
To: Phil Fram <pfram@quadlogic.com>
Subject: 10 Year Initial re-verification period for MC5/c

You probably already know that we are now approved for 10 year re-verification period for our MiniCloset meters. You can find a notification to that effect on our website:

www.quadlogic.com

Quadlogic is pleased to announce that Measurement Canada has approved Quadlogic MC5 and MC5c high-density meters for a 10 year Initial Reverification Period. This is a major achievement and confirms the long term accuracy of Quadlogic meters. Previously QLC meters were approved for a six year Initial Reverification Period. This revised Reverification Period to 10 years is effective immediately for any meters sealed after January 1, 2007. The Measurement Canada bulletin E-28 will be revised sometime this fall to reflect the change.

Manufacture	Model(s)	Approval No.	Rating/Configuration
Quadlogic Controls Corp.	MC-5 & MC-5c	AE-1148	1 element, 2 wire, 2 element, 3 wire, 3 element, 4 wire, Wye

Please let me know if you have any questions.

Regards

-Tom

--
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Bulletin

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	Supersedes: **E-28 (rev. 7)**	

Qualification of Electricity Meters for Lengthened Initial Reverification Period of 10 years

1.0 Purpose & Scope

The purpose of this bulletin is to officially communicate the electronic electricity meters that have been conditionally and unconditionally qualified for a 10-year initial reverification period pursuant to Measurement Canada specifications S-EG-01and S-S-05, and to communicate those meters that no longer qualify for a lengthened initial reverification period.

2.0 References

2.1 *Electricity and Gas Inspection Act* [link 1] (R.S. 1985, c. E-4), s. 12.

2.2 *Electricity and Gas Inspection Regulations* [link 2] (SOR/86-131), ss. 3(1), s. 19.

2.3 Specification S-EG-01 [link3] – Electricity and Gas Meter Pattern Approval Applications - Quality and Measurement Reliability Information Requirements in Support of a Lengthened Initial Reverification Period

2.4 Specification S-S-05 [link4] – Performance Requirements Applicable to Meters Granted a Conditionally Lengthened Initial Reverification Period under S-EG-01

Canada

3.0 Initial Reverification Period Tables

Table 1 – Electricity Meters Qualified for an Unconditional 10 year Initial Reverification Period

Manufacturer	Model(s)	Approval No.	Rating/Configuration	Applicability
Itron	C1S (D, T, L and R model designations) CN1S (D, T, L and R model designations) CN1SX C1SX	AE-0920	1 element, 2 wire, single phase, 120 volts, 240 volt, 0.2-20, 0.25-100, 1.0-100 amperes, 60 Hz 1.5 element, 3 wire, single phase, 240 volts, 0.5-200, 2.0-200 amperes, 60 Hz 2 element, 3 wire, network, 120 volts, 0.5-200, 2.0-200 amperes, 60 Hz	Unconditional 10 year initial reverification period for all meters.
Itron	Sentinel	AE-1132	1 element, 2 wire, single phase, 120 to 480 volts, 0.2-20 amperes, 60 Hz 1.5 element, 3 wire, single phase, 120 to 480 volts, 0.5-200 amperes, 60 Hz 2 element, 3 wire, network and single phase, 120 to 480 volts, 0.5-200 amperes, 60 Hz 2 element, 3 wire, delta, 120 to 480 volts, 0.05-20, 0.5-200 amperes, 60 Hz 2.5 element, 4 wire, Wye or delta, 120 to 480 volts, 0.2-20, 0.5-200 amperes, 60 Hz 3.0 element, 4 wire, Wye or delta, 120 to 480 volts, 0.2-20, 0.375-150, 0.5-200 amperes, 60 Hz	Unconditional 10 year initial reverification period for all meters.

Manufacturer	Model(s)	Approval No.	Rating/Configuration	Applicability
Itron	CP1S (D, T, L and R model designations)	AE-1466	3 element, 4 wire, Wye or delta, 120 to 480 volts, 0.02-20, 0.5 -200, 0.5-320 amperes, 60 Hz 2 element, network, 3 wire, delta, 120 to 480 volts, 0.02-20, 0.5-200, 0.5-320 amperes, 60 Hz 2.5 element, 4 wire, Wye, 120 to 480 volts, 0.02-20 amperes, 60 Hz	Unconditional 10 year initial reverification period for all meters.

Manufacturer	Model(s)	Approval No.	Rating/Configuration	Applicability
General Electric Co.	KV2c KV2c+ KV2e KV2n	AE-1059	1 element, 2 wire, single phase, 120 to 480 volts, 0.2-20, 2.0-200 amperes, 60 Hz 1.5 element, 3 wire, single phase, 120 to 480 volts, 0.2-20, 2.0-200 amperes, 60 Hz 2 element, 3 wire, single phase, 120 to 480 volts, 0.2-20, 2.0-200 amperes, 60 Hz 2 elements, 3 wire, network, 120 to 480 volts, 0.2-20, 2.0-200 amperes, 60 Hz 2 elements, 3 wire, 120 to 480, 600 volts, 0.2-20, 2.0-200 amperes, 60 Hz 2 elements, 3 wire, delta, 120 to 480, 600 volts, 0.2-20, 2.0-200 amperes, 60 Hz 2.5 elements, 4 wire, Wye, 120 to 480 volts, 0.2-20 amperes, 60 Hz 3 elements, 4 wire, Wye or delta, 120 to 480 volts, 0.2-20, 2.0-200 amperes, 60 Hz	Unconditional 10 year initial reverification period for all meters.
General Electric Co.	I-210	AE-1342	2 wire, single phase, 120, 240 volts, 0.2-20, 1.0-100 amperes, 60 Hz 3 wire, single phase , 240 volts, 0.2-20, 1.0-100, 2.0-200 amperes, 60 Hz	Unconditional 10 year initial reverification period for all meters.

Manufacturer	Model(s)	Approval No.	Rating/Configuration	Applicability
Elster Metering	ALPHA 1 A1* A1D* A1T* *(L, A, Q, +) /(P, M, Z, S, A) Only model designations with '+' in the type designation.	AE-0541	2 elements, 3 wire, network. 96 to 528 volts, 0.1-20, 1.0-200 amperes, 60 Hz 2 elements, 3 wire, delta, 96 to 528 volts, 0.1-20, 1.0-200 amperes, 60 Hz 2.5 elements, 4 wire, Wye, 96 to 528 volts, 0.1-20, 1.0 -200 amperes, 60 Hz 3 elements, 4 wire, Wye or delta, 96 to 528 volts, 0.1-20, 1.0-200 amperes, 60 Hz	Unconditional 10 year initial reverification period for all meters.
Elster Metering	ALPHA 1 A1K* A1R* *(L, A, Q, +) /(P, M, Z, S, A) Only model designations with '+' in the type designation.	AE-0580	2 elements, 3 wire, network, 96 to 528 volts, 0.1-10, 0.1-20, 1.0-100, 1.0-200 amperes, 60 Hz 2 elements, 3 wire, delta, 96 to 528 volts 0.1-10, 0.1-20, 1.0-100, 1.0-200 amperes, 60 Hz 2 5 elements, 4 wire, Wye, 96 to 528 volts, 0.1-10, 0.1-20, 1.0-100, 1.0-200 amperes, 60 Hz 3 elements, 4 wire, Wye or delta, 96 to 528 volts, 0.1-10, 0.1-20, 1.0-100, 1.0-200 amperes, 60 Hz	Unconditional 10 year initial reverification period for all meters.
Elster Metering	ALPHA 1 A1* A1D* A1T* A1K* A1R* *(L, A, Q, +) /(P, M, Z, S, A) Only model designations with '+' in the type designation.	AE-0601	1 element, 2 wire, single phase, 120 to 480, 240 volts, 0.1-20, 1.0-200 amperes, 60 Hz 1.5 element, 3 wire, single phase, 120 to 480, 240 volts, 0.1-20, 1.0-200 amperes, 60 Hz	Unconditional 10 year initial reverification period for all meters.

Manufacturer	Model(s)	Approval No.	Rating/Configuration	Applicability
Elster Metering	ALPHA 3 A3K A3D A3T A3R /(Q, L, N, C, A) Model designations	AE-1168	1 elements, 2 wire, single phase, 96 to 528 volts, 0.1-10, 0.1-20, 1.0-200 amperes, 60 Hz 1.5 elements, 3 wire, single phase, 96 to 528 volts, 0.1-20, 1.0-200 amperes, 60 Hz 2 elements, 3 wire, network, 96 to 528 volts, 0.1-10, 0.1-20, 1.0-200 amperes, 60 Hz 2 elements, 3 wire, delta, 96 to 528 volts, 0.1-10, 0.1-20, 1.0-200 amperes, 60 Hz 2.5 elements, 4 wire, Wye, 96 to 528 volts, 0.1-10, 0.1-20, amperes, 60 Hz 3 elements, 4 wire, Wye, 96 to 528 volts, 0.1-10, 0.1-20, 1.0-200 amperes, 60 Hz	Unconditional 10 year initial reverification period for all meters.
Elster Metering	REX R1 RS R1SD	AE-1320	1 element, 2 wire, single phase, 120 to 240 volts, 0.1-20, 1.0-200 amperes, 60 Hz 1.5 elements, 3 wire, single phase, 120 to 240 volts, 0.1-20, 1.0-200 amperes, 60 Hz 2 elements, 3 wire, network, 120 to 240 volts, 0.1-20, 1.0-200 amperes, 60 Hz	Unconditional 10 year initial reverification period for all meters.
Landis + Gyr Inc.	Focus ALF	AE-1356	1 element, 2 wire, single phase, 120, 240 volts, 0.1-10, 2.0-200 amperes, 60 Hz 1.5 element, 3 wire, single phase, 120, 240 volts, 0.1-10, 2.0-200 amperes, 60 Hz 2 elements, 3 wire, network, 120 volts, 2.0-200 amperes, 60 Hz	Unconditional 10 year initial reverification period for all meters.

Manufacturer	Model(s)	Approval No.	Rating/Configuration	Applicability
TRIACTA Power Technologies	POWERHAWK 6320	AE-1434	2 elements, 3 wire, single phase, network, 120 volts, 0.05 to 5 amperes, 2 to 200 amperes, 60 Hz 3 elements, 4 wires Wye, 120 volts, 0.05 to 5 amperes, 2 to 200 amperes, 60 Hz	Unconditional 10 year initial reverification period for all meters.
Sensus Metering Systems Inc.	iCon iCon Flexnet 530-X iCon RadioRead 530-E MXU	AE-1145	Single phase, 3 wire, 120, 240 volts, 1-200 amperes, 60 Hz 2 element, 3 wire, network, 120, 240 volts, 1-200 amperes, 60 Hz	Unconditional 10 year initial reverification period for all meters.

Table 2 – Electricity Meters Qualified for a Conditional 10 year Initial Reverification Period

(Electronic electricity meters qualified for a conditional 10 year initial reverification period which are subject to additional testing prior to the end of the six year initial reverification period)

Manufacturer	Model(s)	Approval No.	Rating/Configuration	Applicability
Landis + Gyr Inc.	RXS4e RXRS4e AXS4e AXLS4e AXRS4e	AE-0764	1 element, 2 wire, single phase, 120 to 480 volts, 0.1-10, 0.2-20, 2.0-200 amperes, 60 Hz 1.5 element, 3 wire, single phase, 120 to 480 volts, 0.1-10, 0.2-20, 2.0-200 amperes, 60 Hz 2 elements, 3 wire, network or delta, 120 to 480 volts, 0.2-20, 2.0-200 amperes, 60 Hz 2.5 elements, 4 wire, Wye or delta, 120 to 480 volts, 0.2-20 amperes, 60 Hz 3 element, 4 wire, Wye or delta, 120 to 480 volts, 0.2-20, 2.0-200 amperes, 60 Hz	Conditional 10 year initial reverification period applicable to meters verified on or after January 1st, 2008. Sampling in accordance to S-S-05 required prior to June 2014.

Manufacturer	Model(s)	Approval No.	Rating/Configuration	Applicability
Landis + Gyr Inc.	Focus II ALF	AE-1559	1 element, 2 wire, single phase, 120, 240 volts, 0.1-10, 0.2-20, 2.0-200 amperes, 60 Hz 1.5 element, 3 wire, single phase, 120, 240 volts, 0.1-10, 2.0-200 amperes, 60 Hz 2 elements, 3 wire, network, 120 volts, 2.0-200 amperes, 60 Hz	Conditional 10 year initial reverification period applicable to meters verified on or after January 1st, 2008. Sampling in accordance to S-S-05 required prior to June 2014.
Elster Metering	REX2 R2S R2SD gREX	AE-1579	1 element, 2 wire, single phase, 120, 240 volts, 0.1-10, 0.1-20, 1.0-100, 1.0-200 amperes, 60 Hz 1.5 elements, 3 wire, single phase, 120, 240 volts, 0.1-10, 0.1-20, 1.0-100, 1.0-200 amperes, 60 Hz 2 elements, 3 wire, network, 120 volts, 1.0-200 amperes, 60 Hz 2 element, 3 wire, delta, 600 volts, 1.0-200 amperes, 60 Hz gREX: 1 element, 2 wire, single phase, 120, 240 volts, 1.0-100 amperes, 60 Hz 1.5 elements, 3 wire, single phase, 240 volts, 1.0-100 amperes, 60 Hz	Conditional 10 year initial reverification period applicable to meters verified on or after January 1st, 2008. Sampling in accordance to S-S-05 required prior to June 2014.

Manufacturer	Model(s)	Approval No.	Rating/Configuration	Applicability
Itron	CVSO (D and R model designations)	AE-1498	1.5 element, 3 wire, single phase, 240 volts, 0.5-200 amperes, 60 Hz	Conditional 10 year initial reverification period applicable to meters verified on or after January 1st, 2007. Sampling in accordance to S-S-05 required prior to June 2013.
General Electric Co.	I-210+ I-210+n	AE-1517	2 wire, single phase, 120 volts, 0.2-20, 1.0-100 amperes, 60 Hz 3 wire, single phase, 240 volts, 0.2-20, 2.0-200 amperes, 60 Hz 2 element, 3 wire, network, 120 volts, 2.0-200 amperes, 60 Hz	Conditional 10 year initial reverification period applicable to meters verified on or after January 1st, 2007. Sampling in accordance to S-S-05 required prior to June 2013.
Sensus Metering Systems Inc	iSA2 with Flexnet 530-X	AE-1611	2 wire, single phase, 120, 240 volts, 0.2-20, 1.0-200 amperes, 60 Hz 1.5 element, 3 wire, single phase, 120, 240 volts, 0.2-20, 1-200 amperes, 60 Hz 2 element, 3 wire, network, 120, 240 volts, 1-200 amperes, 60 Hz	Conditional 10 year initial reverification period applicable to meters verified on or after January 1st, 2009. Sampling in accordance to S-S-05 required prior to June 2015.

Manufacturer	Model(s)	Approval No.	Rating/Configuration	Applicability
Itron	C2SO C2SOD CN2SO CN2SOD	AE-1631	1 element, 2 wire, single phase, 120 volts, 0.25-100, 0.5-200 amperes, 60 Hz 1.5 elements, 3 wire, single phase, 240 volts, 0.5-200 amperes, 60 Hz 2.0 elements, 3 wire, network, 120 volts, 0.5-200 amperes, 60 Hz	Conditional 10 year initial reverification period applicable to meters verified on or after January 1st, 2011. Sampling in accordance to S-S-05 required prior to June 2017.
Itron	CP2SO CP2SOA	AE-1822	1 element, 2 wire, single phase, 120-480 volts, 0.2-20 amperes, 60 Hz 1.5 elements, 3 wire, single phase, 120-480 volts, 0.5-200 amperes, 60 Hz 2.0 elements, 3 wire, network and delta, 120-480 volts, 0.2-20, 0.5-200 amperes, 60 Hz 3.0 elements, 4 wire Wye and delta, 120-480 volts, 0.2-20, 0.5-200 amperes, 60 Hz	Conditional 10 year initial reverification period applicable to meters verified on or after January 1st, 2011. Sampling in accordance to S-S-05 required prior to June 2017.
Quadlogic Controls Corp.	MC-5	AE-1148	1 element, 2 wire, 2 element, 3 wire, 3 element, 4 wire, Wye 120 to 600 Volts, 0.1-10 amperes, External Sensors 1-100, 2-200 amperes 60 Hz	Conditional 10 year initial reverification period applicable to meters verified on or after January 1st, 2007. Sampling in accordance to S-S-05 required prior to June 2013.

Manufacturer	Model(s)	Approval No.	Rating/Configuration	Applicability
General Electric Co.	I-210+c I-210+ce I-210+cn	AE-1652	1 element, 2 wire, single phase, 120, 240 volts, 0.2-20, 1.0-100 amperes, 60 Hz 1.5 element, 3 wire, single phase, 240 volts, 2.0-200 amperes, 60 Hz 2 element, 3 wire, network, 120 volts, 2.0-200 amperes, 60 Hz	Conditional 10 year initial reverification period applicable to meters verified on or after January 1st, 2011. Sampling in accordance to S-S-05 required prior to June 2017.

Table 3 – Electronic Electricity Meters that no longer Qualify for the Conditional 10 Year Initial Reverification Period

(Electronic electricity meters that no longer qualify for the conditional 10 year initial reverification period or have not completed the sampling as required in accordance with S-S-05)

Manufacturer	Model(s)	Approval No.	Rating/Configuration	Applicability
Itron	Q1000	AE-0828	2 element, 3 wire, delta, 69, 120 volts, 0.05 -20 amperes, 60 Hz 2.5 element, 4 wire, Wye or delta, 69, 120 volts, 0.05 -20 amperes, 60 Hz 3 element, 4 wire, Wye or delta, 69, 120 volts, 0.05 -20 amperes, 60 Hz	Conditional 10 year initial reverification period qualification **suspended**. Initial reverification period **amended to 6 years**, applicable to all meters verified on or after January 1st, 2003.
Power Measurement Ltd.	ION 8300 8400 8500 8600	AE-0924	2 element, 3 wire, delta, 120 to 480 volts (L-L), 0.1-20, 0.05-20 amperes, 60 Hz 2.5 element, 4 wire, Wye, 69 to 277 volts (L-N), 0.1-20, 0.05-20 amperes, 60 Hz 3 element, 4 wire, Wye, 69 to 277 volts (L-N), 0.1-20, 0.05-20 amperes, 60 Hz	Conditional 10 year initial reverification period qualification **suspended**. Initial reverification period **amended to 6 years**, applicable to all meters verified on or after January 1st, 2003.

Manufacturer	Model(s)	Approval No.	Rating/Configuration	Applicability
Power Measurement Ltd.	ION 6200 Siemens 9200	AE-1143	2 element, 3 wire, single phase, 69 to 347 volts (L-N), 0.1-10 amperes, 60 Hz 2 element, 3 wire, delta, 120 to 600 volts (L-L), 0.1-10 amperes, 60 Hz 3 element, 4 wire, Wye, 69 to 347 volts (L-N), 0.1-10 amperes, 60 Hz	Conditional 10 year initial reverification period qualification **suspended**. Initial reverification period **amended to 6 years**, applicable to all meters verified on or after January 1st, 2003.
Power Measurement Ltd.	ION 7550 7650 Siemens 9510 9610	AE-1484	3 element, 4 wire, Wye, 57 to 347 volts (L-N), 0.05-20 amperes, 60Hz 2 element, 3 wire, delta, 120 to 600 volts (L-L), 0.05-20 amperes, 60Hz	Conditional 10 year initial reverification period qualification **suspended**. Initial reverification period **amended to 6 years**, applicable to all meters verified on or after January 1st, 2003.
Power Measurement Ltd.	ION 8600	AE-1535	2 element, 3 wire, delta, 120 volts (L-L), 0.2-20 amperes, 25Hz 3 element, 4 wire, Wye, 120 volts (L-L), 0.2-20 amperes, 25Hz	Conditional 10 year initial reverification period qualification **suspended**. Initial reverification period **amended to 6 years**, applicable to all meters verified on or after January 1st, 2003.

4.0 Revision

4.1 The purpose of revision 2 was to clarify and reflect the change in references from Measurement Canada provisional specification PS-E-11 to specification S-EG-01. Revision 2 amends the scope to include meters that have been conditionally and unconditionally qualified to receive a 10 year initial reverification period, and meters that no longer qualify for a lengthened initial reverification period.

4.2 The purpose of revision 3 was to add AE-1320 to table 1 and include additional configurations for AE-1611 in table 2.

4.3 The purpose of revision 4 was to add additional ratings and or configurations for AE-1611 and AE-0764 in table 2.

4.4 The purpose of revision 5 was to add additional ratings and or configurations for the meters under AE-1517 and AE-1579 in table 2. Also, meters under AE-1145 are included in table 3 to indicate a suspension of the lengthened initial reverification period until sampling pursuant to S-S-05 is completed.

4.5 The purpose of revision 6 was to add AE-1356 to table 1.

4.6 The purpose of revision 7 is to add AE-1434 to table 1.

4.7 The purpose of revision 8 is to add additional ratings and configuration for AE 1466 and AE-1168. Revision 8 has also been revised to add the following to table 1 and 2:

- Table 1: AE-1466 and AE 1145

- Table 2: AE-1148, AE-1652, AE-1631 and AE-1822

5.0 Additional Information

For additional information regarding this bulletin, please contact the Senior Program Officer responsible for electricity measurement. For more information regarding Measurement Canada and its programs, visit our website[link 5].

David Flieler
Senior Program Officer

[Link 1] http://laws-lois.justice.gc.ca/eng/acts/E-4/index.html
[Link 2] http://laws-lois.justice.gc.ca/eng/regulations/SOR-86-131/index.html
[Link 3] http://strategis.ic.gc.ca/eic/site/mc-mc.nsf/eng/lm00587.html
[Link 4] http://strategis.ic.gc.ca/eic/site/mc-mc.nsf/eng/lm03954.html
[Link 5] http://www.ic.gc.ca/eic/site/mc-mc.nsf/eng/Home

Customer Satisfaction Bulletin

Date: 03 May 2012 CSB number: CSB1205-01

Subject: Internal telephone modem (ITM3) end-of-life status

Announcement

Since 2003, Elster Solutions (Elster) has offered the ITM3 option board, a public switch telephone network (PSTN) modem, for use in the ALPHA Plus® meter, A3 ALPHA® meter, and A1800 ALPHA meter. The ITM3 option board is also used in the A3 ALPHA meter with EA_Gatekeeper module.

A parts supplier has notified us that a key component for the ITM3 option board is at end-of-life and will no longer be supplied. Our supplies of the ITM3 option board are limited.

For those who may still be using the ITM3 option board, we wish to remind you that a variety of communication solutions are available.

Customer action

Please review the additional WAN solutions offered by Elster. Contact your Elster Account Executive to help you determine which solution will best meet your requirements. If you still require an internal PSTN modem, please inform your account executive of your quantity and schedule requirements.

Additional WAN solutions

Elster offers a variety of WAN solutions for use in our meters.

ALPHA Plus meters

- Utilities can deploy a range of both wired and wireless third party communications solutions using Elster's RS-232 or RS-485 communications options.

A3 ALPHA meters (including meters with the EA_Gatekeeper module):

- Elster's Ethernet WAN interface card (E-WIC) is a solution that connects to a variety of communication solutions such as fiber, DSL, or cable. The Elster' E-WIC supports either ANSI C12.21 or ANSI C12.22.
- Elster's internal wireless WIC (W-WIC) supports C12.22 communication over Verizon's public cellular CDMA network.
- Utilities can deploy a range of both wired and wireless third party communications solutions using Elster's RS-232 or RS-485 communications options.

A1800 ALPHA meter

- Elster's Ethernet WAN interface card (E-WIC) is a solution that connects to a variety of communication solutions such as fiber, DSL, or cable. The Elster' E-WIC supports either ANSI C12.21 or ANSI C12.22.
- Utilities can deploy a range of both wired and wireless third party communications solutions using the RS-232 or RS-485 communications options offered by Elster's A1800 ALPHA meter.

Contact Elster for more information.

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ICM Project: 2014 Update | Externally-Initiated Plant Relocations and Expansions

SUMMARY OF CHANGES FOR 2014 UPDATE

- The 2014 ICM work program removes three projects that were included in THESL's original filing and adds five projects that were not contained in the original filing. This results in a net increase of two jobs. All five changes are in response to actions by external agencies.
- Relative to the May 2012 filing, forecast 2014 capital expenditures are reduced by $8.82M (not including spending related to approved Phase 1 jobs).

I OVERVIEW OF 2014 UPDATE

A. The 2014 Work Program

Table 1 lists both relocation jobs that THESL must undertake and expansion jobs that would be prudent for THESL to complete in coordination with infrastructure activities of external agencies. It also presents the costs that THESL will incur for these jobs and any external funding that is expected to be provided for them pursuant to statutory provisions or applicable commercial terms.

Table 1: Summary of Externally-Initiated Plant Relocation and Expansion Jobs and Cost Estimates

Job Estimate Number	Job Title	Year	THESL Cost Estimate ($M)	Agency	Estimated Agency Cost ($M)
Projects Removed from 2014 Filing (Relative to May 2012 filing)					
24731	Queens Quay Phase 5	2014	($6.98)	Waterfront Toronto	($1.0)
23497	Black Creek and Weston Underground Reinstatement	2014	($0.09)	GO Transit	$0
25277	Dundas Street Overhead to Underground Phase 3	2014	($6.27)	City of Toronto	($1.74)
Jobs Removed Total			**($13.34)**		**($2.74)**

Job Estimate Number	Job Title	Year	THESL Cost Estimate ($M)	Agency	Estimated Agency Cost ($M)
Projects Added to the 2014 Filing					
28882	Strachan Relocation Phase 2	2014	$1.30	GO Transit	$0
28007	Redlea Road Expansion	2014	$0.67	City of Toronto	$0
25927	Lower Sherbourne Works	2014	$0.31	City of Toronto	$0.37
28187	Chine Drive Pole Relocation	2014	$0.02	City of Toronto	$0.01
28962	Leslie Expansion Works	2014	$2.23	TTC	$0
Adjustment to correct for rounding			**($0.01)**		
Jobs Added Total			**$4.52**		**$0.38**

B. Detailed Description of Changes

1. Projects Removed

1.1 Queens Quay Phase 5

For the section of work on Queens Quay between York Street and Yonge Street, THESL expected additional design and construction complexities due to the underground streetcar tunnel access to Union Station that exists along Queens Quay Boulevard between York Street and Bay Street. Based on changes from the TTC, however, the scope of work was incorporated into Phases 1 through 4 of the Queens Quay project.

1.2 Black Creek and Weston UG Reinstatement

GO Transit is upgrading the bridge crossing at Black Creek Drive, and THESL had infrastructure crossing under the existing bridge north of Weston Road and east of Black Creek Drive. GO Transit requested that THESL remove the duct bank temporarily while they are constructing the foundation of the new rail bridge. Upon completion of the GO Transit bridge work, THESL intends to rebuild the duct bank crossing the rail right of way. This allows the distribution system to return to a normal state, as various feeder loading routes are being altered to allow the duct bank to be removed. As GO Transit is currently unable to commit to a completion date, the project is expected to be deferred to 2015.

1.3 Dundas Street Overheard to Underground Phase 3

This job is on Dundas Street West from Bathurst Street to University Avenue and it is part of the City of Toronto revitalization capital program. The City deferred their project until 2016, after the PanAm Games, thus the related THESL project will be deferred until at least 2015.

2. Projects Added

2.1 Strachan Relocation Phase 2

The first phase of this job was approved by the OEB in Phase 1 of this application. This project addresses the civil capacity crossing the rails by returning capacity to its 2012 state. This civil capacity, which existed prior to the relocation, is crucial to allow for future growth. The electrical infrastructure transfer completed in 2012 removed the civil capacity for future growth.

THESL had an arterial crossing on Strachan Avenue which it was required to relocate in 2012 in order to allow GO Metrolinx to construct track improvements in the area. In 2012, THESL was able to relocate all required electrical infrastructure, but the civil capacity crossing the rail tracks was reduced temporarily.

2.2 Redlea Road Expansion

The City of Toronto is expanding Redlea Avenue from Passmore Avenue to Milliken Boulevard. THESL must coordinate with the City to install all necessary civil and electrical infrastructure prior to the five-year moratorium which will be effective once the road is completed and open for public use in the summer of 2014.

2.3 Lower Sherbourne Works

The City of Toronto is planning a road re-alignment and streetscape project along Lower Sherbourne Street between Front Street and Lakeshore Boulevard. THESL is required to relocate a number of poles as well as underground infrastructure in the area to accommodate the road re-alignment. During the relocation of underground infrastructure THESL is increasing the capacity of the civil infrastructure in order to allow the egress at Sherbourne station to be reconfigured to current standards.

2.4 Chine Drive Pole Relocation

The City is constructing a new cul-de-sac on Chine Drive, south of Kingston Road. THESL is required to relocate infrastructure that conflicts with the proposed road alignment.

2.5 Leslie Queen/Leslie Lakeshore Works

A connection track that links the Queen Street streetcar tracks to the Ashbridges Bay TTC Facility on Leslie Street from Queen Street to Commissioners Street is currently under construction. Based on proposed future THESL projects and projected growth potential in the area, it is prudent to proceed with the expansion work of installing new underground civil infrastructure from the south side of Queen Street to the north and from the south side of Lakeshore Blvd to the north along Leslie Street while the TTC is completing construction in the area. Significant savings will be realized by constructing this expansion work in conjunction with the TTC's project when compared to executing the two projects separately (e.g., single-cut permit/ excavation/restoration/landscaping).

I OPERATIONS PORTFOLIO CAPITAL SEGMENT - OVERVIEW

Background

In Phase 1, THESL organized the Operations Portfolio Capital segment[1] into five components: (1) Engineering Capital, (2) Worst Performing Feeder Capital, (3) Customer Connections Capital, (4) Reactive Capital, and (5) Continuing Project and Emerging Issues ("Emerging Issues"). THESL provided a description of the work comprised the Emerging Issues budget, but it did not provide an itemized list of jobs.

In its Partial Decision and Order, the OEB found that – in respect of Emerging Issues – THESL had presented "insufficient evidence on the nature of those projects for the OEB to determine whether they are non-discretionary."[2] THESL seeks to be responsive to the OEB's finding and to satisfy it that all proposed work is non-discretionary. As requested by the OEB and as described in the Manager's Summary update[3], THESL has broken-out non-discretionary work that would otherwise have been contained within Emerging Issues in 2014. THESL has presented this work in components number 5-8, listed below.

In Phase 2, THESL has organized the Operations Portfolio Capital Segment as follows:

1. Engineering Capital
2. Worst Performing Feeder Capital
3. Customer Connections Capital
4. Reactive Capital

Approved in Phase 1

5. **Mitigating System Operating Constraints**
6. **Critical Stations Work**
7. **Essential Tools and Equipment**
8. **Historic Road Cut Repairs**

Formerly within "Continuing Projects and Emerging Issues"

Approval Pending

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[1] Tab 4, Schedule C1.
[2] Partial Decision and Order, Page 63.
[3] Tab 9, Schedule 1.

Table 1:

#	COMPONENT NAME	2014 Capital Expenditures ($ millions)
1	**Engineering Capital** *[Phase 1 work approved]*	**10.62**
2	**Worst Performing Feeder Capital** *[Phase 1 work approved]]*	**1.80**
3	**Customer Connections (net of Customer Contributions) Capital** *[Phase 1 work approved]*	**48.10**
4	**Reactive Capital** *[Phase 1 work approved]*	**32.58**
5	**Mitigating System Operating Constraints**	**4.28**
6	**Critical Stations Work**	**7.63**
	6.1 Station Batteries and Chargers	0.69
	6.2 Station Critical Spares Inventory	1.50
	6.3 Station Fire Prevention/Mitigation Systems	0.51
	6.4 Building Integrity and Security	0.20
	6.5 Station Sump Pump Systems	0.26
	6.6 Station Contingency Service	1.29
	6.7 Station Civil Egress	3.20
7	**Essential Tools and Equipment**	**1.07**
	7.1 Station Tools & Test Equipment	0.17
	7.2 Major Tools	0.90
8	**Historic Road Cut Repairs**	**3.22**
	TOTAL	**109.30**

II PROJECT DESCRIPTIONS

1. Engineering Capital

The OEB approved the Phase 1 work in this component.

Engineering capital represents labour costs that are capitalized although they are not directly attributable to specific distribution system assets or projects. These consist of the labour costs of engineers, technologists, design technicians and power system controllers ("PSCs") for engineering, design and planning work that they perform on distribution assets that are put in service. Such planning and design work is non-discretionary and is critical to THESL's ability to complete capital work in 2014 as it continues its focus on the following key areas: the capital investment program to address aging equipment and legacy infrastructure, development and implementation of new approaches for engineering decision support for creation and optimization of capital programs, and modernization through new technologies and systems.

THESL's planned 2014 spending for Engineering Capital for is $10.62M. This amount is solely for projects within THESL's Normal Capital Budget (other than the portion of Copeland TS falling below the materiality Threshold). THESL's proposed ICM projects all have their associated engineering capital funding included within their proposed budgets.

2. Worst Performing Feeder Capital

The OEB approved the Phase 1 work in this component.

The Worst Performing Feeder ("WPF") program is part of the effort to improve THESL's overall service reliability by improving service for customers supplied from poorly performing feeders. The WPF budget varies year-to-year, depending on the type of work required on the worst performing feeders. The majority of capital work on worst performing feeders in 2014 is scheduled to be performed through various ICM Segments. As a result, the dedicated WPF budget has been reduced to $1.80M for 2014.

Figures 1 and 2 below (updated to include the 2012) demonstrate the trend in the contribution of FESI-7 feeders to system CI and CHI, respectively.

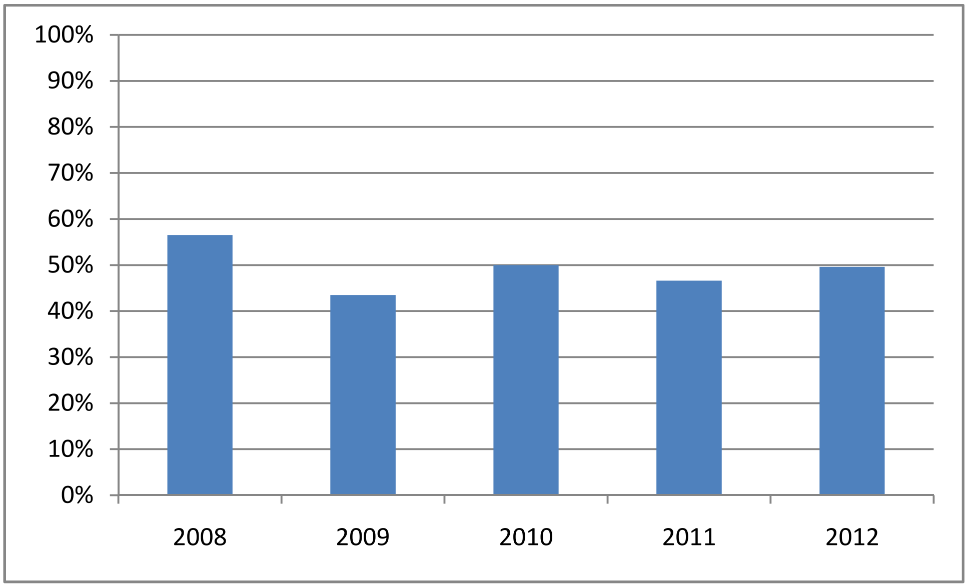

Figure 1: Contribution of FESI-7 Feeders to System CI

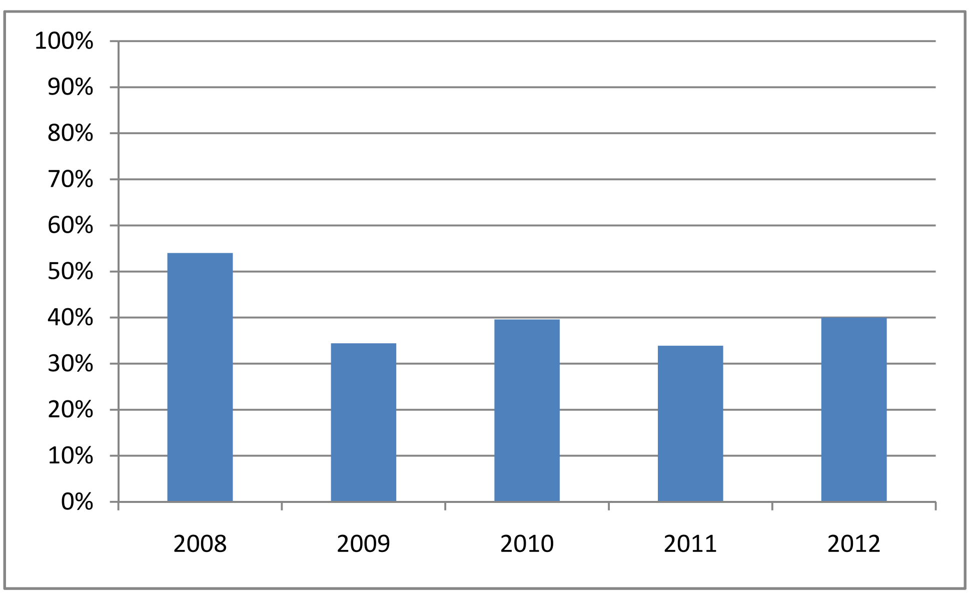

Figure 2: Contribution of FESI-7 Feeders to System CHI

3. Customer Connections (net of Customer Contributions) Capital

The OEB approved the Phase 1 work in this component.

The costs for customer connections, including new services and upgrades to existing services, are based on the capital expenditures for the different types of services and the number of each type of customer connection per year. The 2014 budgeted forecast largely follows the same trends as in the originally submitted evidence.

Table 3: Customer Connections Capital Summary ($ millions)

Customer Connections Capital	**Costs ($ millions)**
Customer Connections Capital (Gross)	$62.21
Customer Contributions	$(14.11)
Customer Connections Capital (Net)	**$48.10**

4. Reactive Capital

The OEB approved the Phase 1 work in this component.

Reactive Capital is comprised of capital expenditures necessary to repair defective and failed equipment. This work is non-discretionary in nature and required to restore power to customers in the case of outages, to mitigate potential safety risks to the public, to maintain system integrity, to maintain accurate billing, to perform corrective work to address failed and defective equipment and/or to address other unexpected events that require immediate action.

Such work and the related capital expenditures are unplanned, but THESL allocates funds for reactive work based on historical system performance, analyses of failure trends, and the trends of the number of work requests for reactive capital work over the past five years. The 2014 budget presented below is largely in line with the originally filed forecast.

Table 4: Reactive Capital Summary ($ millions)

Reactive Capital	**Costs ($ millions)**
Underground Assets	$19.83
Overhead Assets	$10.80
Stations and	$1.11
Metering Assets	$0.84
Total	**$32.58**

5. Mitigating System Operating Constraints

The work budgeted in this component is designed to facilitate the transfer of existing customers from THESL's current Transformer Station ("TS") supply to an adjacent TS supply in order to provide load relief, operational flexibility, and maintain good operating practices by preventing assets overloading and premature asset failures. THESL proposes to achieve this through several different approaches, including transferring entire feeders, transferring only specific customers, moving normal open switching points, or other options.

The failure to complete this work could potentially result in a reduction to the life of the existing assets, a failure of assets, and/or loss of supply to customers. If THESL does not completed the load transfer jobs outlined here, the identified assets are at material risk of becoming overloaded under normal operating conditions.

Operating assets above their rated capacity over extended periods of time under normal operating condition (i.e., overloading) exposes customers to various compounding reliability risks. These risks, such as the failure of a major station asset (like switchgear), or the loss of transmission supply, may lead to prolonged outages affecting a large number of customers. Due to the complicated nature of station assets, these outages could last several days while repairs are being performed or replacement assets are being delivered.

THESL has identified the jobs in Table 7 as the minimum work required to maintain existing reliability and operational flexibility in these areas which are experiencing natural load growth.

Table 7:

Job	Cost ($ millions)	Description
X14562 Civil Work for Load Transfer from Bridgman to High Level Phase 1	$0.89	Bridgman A1-2B switchgear has reached its rated capacity. In order to relieve load, seven customer locations will be transferred to High Level feeders. This job is to execute the civil work required for the electrical transfer for the identified locations.
X14440 Bridgman (A1-2B) Load Transfer Electrical Work Phase 2	$0.90	Bridgman A1-2B switchgear has reached its rated capacity. In order to relieve load, seven customer locations will be transferred to High Level feeders. This job is to execute the electrical work involved for the transfer of four of the seven identified locations.
X14585 Bridgman (A1-2B) Load Transfer Electrical Work Phase 3	$0.17	Bridgman A1-2B switchgear has reached its rated capacity. In order to relieve load, seven customer locations will be transferred to High Level feeders. This job is to execute the electrical work involved for the transfer of three of the seven identified locations.
X13718 Transfer A273DN/A310DN TO A5-6W Phase 2 Civil	$1.00	Dufferin A7-8DN switchgear has reached its rated capacity. In order to relieve load, two feeders will be transferred to Wiltshire A5-6W switchgear. This job is to execute the civil work required for the electrical transfer of the two feeders.

Job	Cost ($ millions)	Description
X14683 Transfer A273DN/A310DN TO A5-6W Electrical	$0.59	Dufferin A7-8DN switchgear has reached its rated capacity. In order to relieve load, two feeders will be transferred to Wiltshire A5-6W switchgear. This job is to execute the electrical work involved to transfer two feeders.
S13462 Dufferin A7-8 load tranf to A5-6W WiltshireTS	$0.07	This job is to prep the Wiltshire A5-6W switchgear for the above job X14683.
S13498 Junction MS proj support	$0.04	This job is to prep the Wiltshire A5-6W switchgear for the above job X14683.
X13470 Transfer A256DN From A5-6DN To A5-6W Dufferin Phase I - Civil & UG Cable	$0.52	Dufferin A7-8DN switchgear has reached its rated capacity. This job is to execute the civil and electrical work required for the transfer of a single feeder to Wiltshire A5-6W switchgear to relieve load.
S13464 Dufferin A5-6 load tranf to A5-6W WiltshireTS	$0.04	This job is to prep the Wiltshire A5-6W switchgear for the above job X13470.
S13387 Dupont MS support X13470	$0.06	This job is to prep the Wiltshire A5-6W switchgear for the above job X13470.
TOTAL	**$4.28**	

6. Stations Refurbishment And Maintenance

6.1. Station Batteries and Chargers

This sub-component involves jobs to replace aged battery and charger systems at various municipal and terminal stations. Batteries and chargers are an essential asset for THESL's stations infrastructure: they provide reliable DC power to protection and control systems at the station. These critical systems enable operation of circuit breakers for both routine switching and for fault isolation in the event of a failure. Without functional batteries and chargers, THESL would not be able to effectively isolate feeder faults and perform efficient switching to restore power supply to affected customers, leading to much longer outages to customers due to a laborious process of manual switching. As a result, reliable and properly functioning batteries and chargers are non-discretionary critical assets for maintaining system reliability and the safety of both THESL employees and the public.

THESL has undertaken a program to replace approximately eight to twelve battery and charger sets per year (although THESL has completed up to 25 in any given year). This program has been ongoing since the late 1990s. Recently, THESL has begun to experience several battery failures in its system with ages less than ten years. On this basis, THESL conservatively plans to replace batteries as soon as they are over ten years of age, with the intent of preventing unnecessary failures. A list of battery/charger failures that have occurred in the last three years where equipment was less than ten years old is shown in Table 1 below. When a failure occurs, the equipment must be replaced on a more costly reactive basis and the system is put at risk.

Table 8: Summary of battery failures that occurred in last three years

Battery location	Age when failure occurred	Year failed
Meteor MS	7	2011
Belfield MS	9	2011
Neilson MS	7	2011
Walney MS	8	2010
Reid Manor MS	8	2010
Ravensbourne MS	8	2010

The jobs planned for 2014 involve the replacement of 12 battery and charger systems which are at end-of-life, and installation of a redundant battery and charger set at Wiltshire TS, one of THESL's large terminal stations.

Table 9: Summary of battery and charger replacement jobs

Job Number	Job Title/Description	Age (in 2014)	Cost ($ millions)
S14568	Brimley Lawrence MS Replace Battery and Charger	12	$0.04
S14569	Redcliff MS Replace Battery and Charger	10	$0.04
S14570	Island MS Replace Battery and Charger	12	$0.04
S14572	Thornton MS Replace Battery and Charger	12	$0.04
S14573	Orton Park Merkley SQ MS - Replace Battery and Charger	12	$0.03
S14574	Centennial MS Replace Battery and Charger	13	$0.04
S14575	Sheppard Kennedy MS - Replace Battery and Charger	13	$0.03
S14576	Hammersmith MS - Replace Battery and Charger	11	$0.04
S14577	Longfield MS - Replace Battery and Charger	14	$0.04
S14578	Porterfield MS Replace Battery and Charger	12	$0.04
S14581	Cecil TS - Replace Battery and Charger	12	$0.12
S14583	Terauley TS - Replace Battery and Charger	12	$0.17
S14612	Wiltshire A TS - Install Second Set of Battery and Charger	N/A	$0.06
TOTAL			**$0.69**

This program is non-discretionary for the following reasons:

- Functioning batteries and chargers are necessary for reliable and continued operation of circuit breakers and other station protection functions.

- All protective relays and their control circuits are powered by a DC supply from station batteries charged by station rectifiers. This source of control voltage is essential for indicator lights, alarms and actuating equipment such as circuit breakers and relays, SCADA control system, fire protection, and emergency lighting. Failure to maintain proper battery voltage could compromise operation of the protective system and breakers, potentially leading to longer customer outages and increased risk personnel safety. Field crews rely on station batteries to power essential devices which enable communication with outside crew members, and interactions with controllers used during an emergency load transfer. In this way, the condition of station battery systems directly impact system reliability and operational flexibility.
- The batteries and chargers being replaced have reached their end-of-life, except for S14612, which involves installation of a redundant battery/charger set at Wiltshire TS to reduce failure risk.
- The redundant set at the Wiltshire TS is proposed because Wiltshire TS has three large switchgears with a total load of 89 MVA (as of 2013), serving an approximate total of 19,300 customers, through 34 of 13.8kV feeders. Failure of the battery system at Wiltshire TS will require manual labour resources to perform several switching operations, and prolonging customer outages during cable failures. Given the cost of a battery/charger set, and the relative magnitude of the consequences above, the installation of a redundant battery/charger is non-discretionary and prudent.

6.2. Station Critical Spares Inventory

THESL has a large population of power transformers designed to operate at various voltage classes and sizes. Approximately 31% of the power transformers population are in-service beyond the maximum typical useful life of 55 years. In order to manage failure risk, THESL has developed a critical spares strategy for power transformers which will involve the purchase of eight additional power transformers of varying voltage classes and sizes. Refer to Table 10 below for more details.

Table 10: Proposed Spare unit acquisition against transformer population

Voltage Class (kV/kV)	TX Size (MVA)	Population (unit)	Proposed Spare Acquisition (unit)
13.8/4.16	2.7, 5, 5/6.7	73	2
27.6/13.8	7.5/10	13	1
27.6/13.8	10, 12	17	1
27.6/4.16	3.4, 3/4	22	1
27.6/4.16	5, 5/6.7	119	2
27.6/4.16	6, 6/7.8, 7.5/10	3	1
		TOTAL	**8**

Availability of spares for critical station equipment is crucial for THESL to manage failure risk of critical assets in a prudent and cost effective manner. Due to the long lead time required to purchase new units (which is typically around 12 months), a failure has the potential to have a major impact on customer service and system reliability. Premature failure of equipment could occur at any time, and when a failure involves critical station equipment such as a power transformer, it could trigger long power outages to a large number of customers due to the lead time required to procure a large power transformer. THESL proactively mitigates this risk by purchasing spare power transformer units to help ensure it can provide customers with reliable service and maintain system reliability.

Table 11: Station Critical Spare Equipment job Summary

Job Number	**Job Title/Description**	**Cost ($ millions)**
S14607	Purchase of Station Critical Spare Equipment	$1.5

This program is non-discretionary for the following reasons:

- Approximately 31% of power transformers currently in service are 55 years of age or older (this represents 86 out of a total of 277 transformers system wide). The maximum typical useful life of a power transformer is 55 years.
- Available spares for critical station equipment are required to replace unexpectedly failed equipment to reduce power outage duration and to allow for expedient customer power restoration.
- Due to the long lead time typically associated with power transformer orders (approximately 12 months), spare equipment needs to be purchased ahead of time and made readily available in stock for emergency replacement. The spare equipment will significantly reduce the length of outage duration that customers would experience when station equipment failure occurs.
- A lack of spare critical station equipment available for emergency installation will likely result in a lengthy outage to a large number of customers, and therefore in a significant adverse impact to the reliability of THESL's service for affected customers.
- Available critical spare equipment will improve overall reliability by reducing the duration of outages due to critical equipment failure.
- Available spare equipment can be used (borrowed) for planned transformer replacements to improve execution efficiency. For example, a spare stock transformer can be installed at a planned location without having to coordinate with equipment delivery. This may allow THESL to perform a replacement prior to the peak summer season. When the new unit is delivered it would then be returned to the critical spares stock.

6.3. Station Fire Prevention/Mitigation Systems

This sub-component includes work associated with non-discretionary upgrades to station structures and auxiliary systems aimed at maintaining station safety and reliability. This work is required to address deficiencies in the design and/or the current state of the substations to prevent or mitigate the risk of fire.

The majority of this work was identified as part of a physical station risk assessment program THESL undertook in 2011 and 2012. THESL engineers and field staff physically visited each site and inspected critical indoor downtown stations to proactively identify physical risks and subsequently identify required work to mitigate these risks. This sub-category of work aims to mitigate the impact in the event of a fire, and in particular a fire that occurs due to catastrophic substation equipment failure.

This work is non-discretionary as a substation fire can severely impact the supply of power to customers and damage associated THESL substation equipment. Substation fires can also create a safety hazard to THESL personnel, emergency personnel, and the general public if appropriate fire protection or mitigation measures are not put in place. Therefore, it is essential that fire events in substation facilities are prevented or mitigated so that operational disruptions are avoided and the employee and public safety hazard is mitigated. This work will also prevent fire caused by catastrophic equipment failure from causing collateral damage to adjacent equipment or buildings.

All this work is scheduled in critical downtown terminal stations which supply a large number of customers, lack the ability to transfer a significant amount of load to a back up station, and are located in close proximity to residential and/or commercial areas.

A detailed description of each job is provided below.

6.3.1. S14617 Strachan B MS install fire barriers

There are three transformers at Strachan MS. These transformers are close to each other and they are approximately 1.5 metres away from the general building of the CNE, as shown in Figure 3. The transformers are oil filled and have a potential of failing catastrophically. If any of the transformers fails catastrophically, the collateral damage may be significant.

According to the IEEE standard 979-1994, if large oil filled transformers are located between 20 feet (6.1 metres) and 50 feet (15.2 metres) of a building, the exposed walls of the building should constitute, or be protected by at least a two-hour rated barrier. In order to meet the IEEE standard and to mitigate the risk of collateral damage, THESL intends to install a two-hour rated fire resistant barrier between the transformers and between the transformers and the general building of the CNE.

Figure 3: 1 Strachan B Power Transformers

6.3.2. S11491 Jane MS install firewall barriers

The power transformers at Jane MS are oil filled transformers and are located approximately 12 metres away from the residential houses as shown in Figure 4. Catastrophic failure of any of the transformers could pose a safety risk or cause collateral damage to the residential properties.

As per the IEEE standard 979-1994, the exposed walls of any building which are 20 feet (6.1 metres) to 50 feet (15.2 metres) away from a large oil filled transformers should constitute or be protected by at least a two-hour rated barrier. Therefore, to protect the safety and property of the residents, and to meet the IEEE standard, THESL intends to install two-hour rated firewall barriers along the northern perimeter of Jane MS.

Figure 4: Jane MS Transformers

6.3.3. S13463 Jane MS install oil containment

The two power transformers at Jane MS are oil filled and contain a significant amount of oil. The transformers have no oil containment system as shown in Figure 4 and it is possible that oil from these transformers could leak into the ground. Leaking transformers can pose a significant potential risk to the ground water and watercourses. In the event of a catastrophic failure a significant amount of oil could potentially be released. Therefore, to avoid spillage of oil into the ground and into the water system, it is necessary to install an oil containment system for both transformers.

6.3.4. S12038 Glengrove TS relocate station service transformer

The two station service transformers at Glengrove TS are very close to each other as shown in Figure 5. They are both oil filled transformers. If any of the station service transformers fails catastrophically, the second one will also be impacted and in such an event the operational capability of Glengrove TS will be severely impacted due to loss of service power at the station. Therefore, it is necessary for THESL that station service TR2 is relocated to an appropriate safer location. There is not enough space between the two transformers to install a fire barrier.

Figure 5: Glengrove TS station service transformers

Table 12: Station Fire Prevention/Mitigation Jobs Summary

Job Number	Job Title/Description	Cost ($ millions)
S14617	Strachan B MS install firewall barrier	$0.20
S11491	Jane MS install firewall barrier	$0.14
S13463	Jane MS Install Oil Containment	$0.14
DC_S12038	Glengrove TS relocate station service Transformer	$0.03
	Total	**$0.51**

6.4. Building Integrity and Security

This sub-component includes work associated with non-discretionary upgrades to station structures and auxiliary systems aimed at maintaining station safety and reliability. This sub-category includes work required to maintain the security and integrity of station buildings.

The work in this sub-category is intended to prevent water from damaging high voltage electrical equipment in the station (and possibly starting a fire), and to address potential safety risks associated with station roofs that are in poor condition, and to detect abnormal conditions within High Level MS.

Roofs at Merton MS, Thistledown MS and Danforth MS are currently in poor condition (sample pictures are shown in Figures 6 to 9) and must be repaired. A damaged roof can result in water ingress, and when water comes in contact with energized electrical equipment there is a significant risk of catastrophic equipment failure and/or fire.

Figure 6: Cracked roof of Merton MS

Figure 7: Cracked roof of Merton MS

Figure 8: Roof leak at Danforth MS Floor

Figure 9: Leaking roof of Danforth MS

High Level MS requires a motion detection camera system to monitor equipment status to detect unauthorized entry and to proactively identify abnormal conditions. This station houses multiple power transformers and switchgear line-ups on different floors, and thus abnormal conditions can have a significant impact on system reliability. This system will allow for expedient identification of reliability and safety risks, such as flooding of the basement (which houses a 13.8kV switchgear line-up). It will also enable personnel safety to be assessed remotely from the control center using the camera before any substation personnel is dispatched to the substation to identify any safety and risk prior to substation entry. High Level TS is one of few critical downtown stations that have energized equipment at a below grade level without such a system already installed. This job will bring it up to the same standard as similar stations.

The cost breakdown of each job is provided below.

Table 13: Building Integrity and Security Jobs Summary

Scope Number	Scope Title/Description	Cost ($ millions)
S14623	Various station roof rebuild	$0.15
S14641	High Level MS install motion detection Camera	$0.05
	Total	**$0.20**

6.5. Station Sump Pump Systems

Jobs in this sub-component are required to address the absence of sump pump systems and inadequacies of existing sump pump systems in critical stations. Sump pumps are installed to prevent water from accumulating in areas that house high voltage electrical equipment by pumping accumulated water to the drainage system. In each of these stations, THESL identified those which either a lack of sump pumps or those that have inadequate sump pump systems.

These jobs are necessary to address the significant potential risk associated with water flooding of a downtown station. Such flooding has occurred in recent years for a number of different reasons, including failure of a water main pipe in the vicinity of a station, leaking roofs, water ingress through underground cable ducts, and extreme heavy rainfall, among others. It is also possible that excessive rainfall similar to the storm that occurred on July 8, 2013 in Toronto could flood stations and result in long outages to customers. Hydro One experienced severe flooding at its Richview and Manby stations on July 8, 2013 and part of some of the energized electrical equipment was under water (as shown in Figures 9 to 11) due to the excessive rain fall. This flooding impacted numerous 230 KV circuits of these stations which resulted in a power interruption to approximately 300,000 customers of THESL. Without these non-discretionary installations, THESL equipment could be at similar risk.

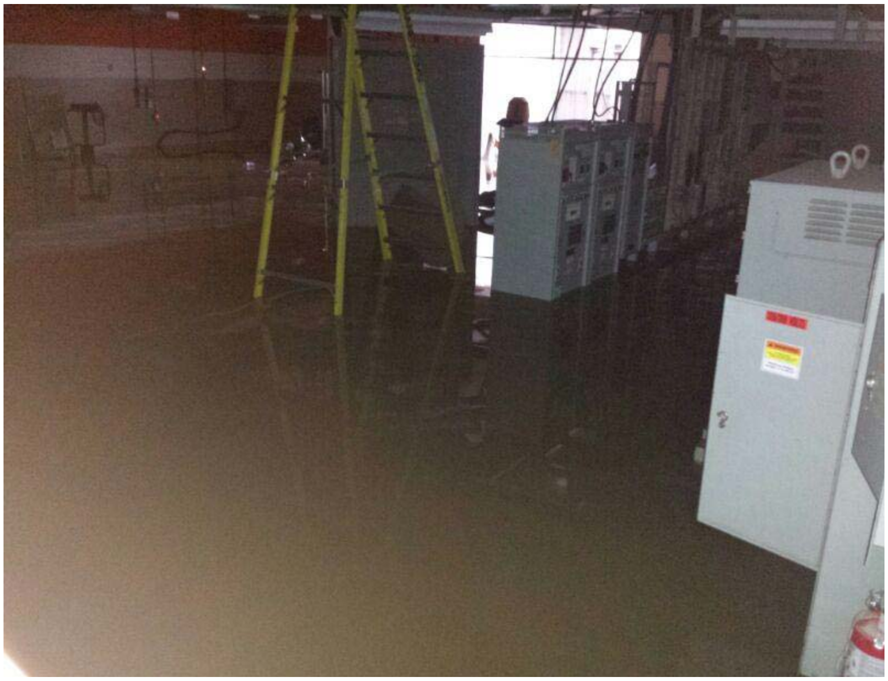

Figure 9: Flooded substation equipment at HONI's Manby TS - July 8-10, 2013

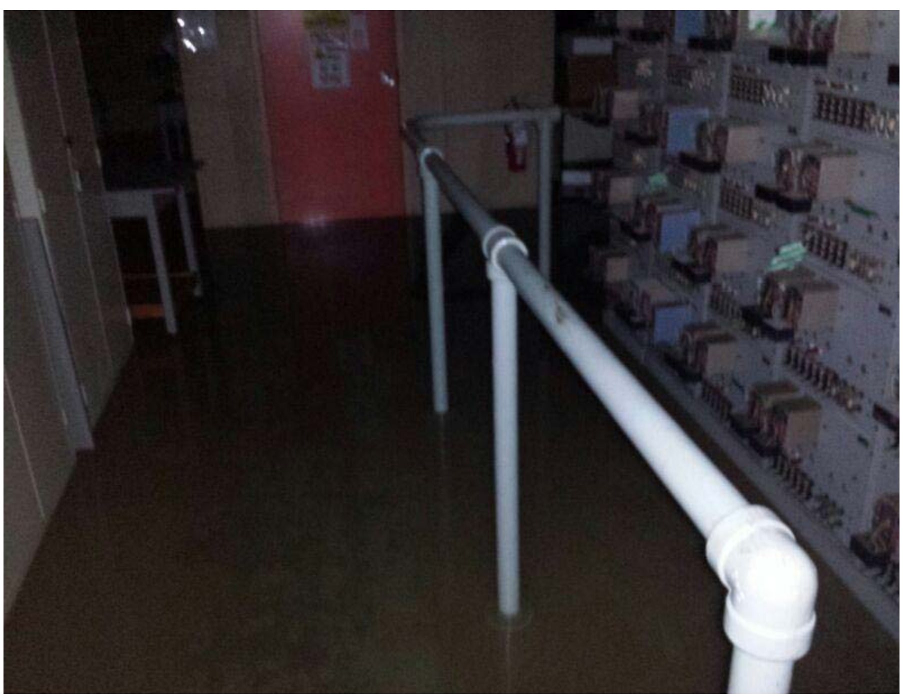

Figure 10: Flooded substation equipment at HONI's Manby TS - July 8-10, 2013

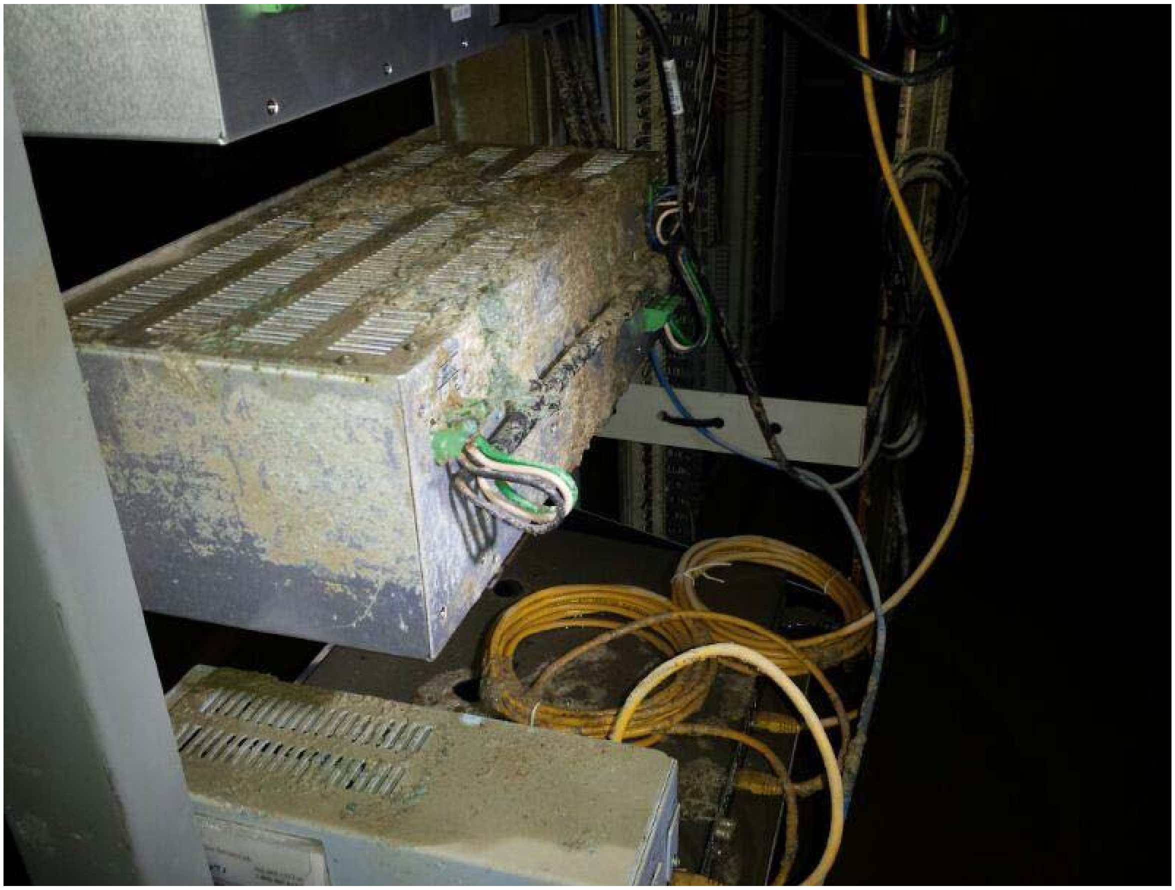

Figure 11: Flood damaged substation equipment at HONI's Manby TS - July 8-10, 2013

Table 14: Station Sump Pump Jobs Summary

Job Number	**Job Title/Description**	**Cost ($ millions)**
S14609	Wiltshire A TS Install Water Pump	$0.05
S14610	Wiltshire B TS: Install Water Pump	$0.05
S14611	Cecil TS: Install Water Pump	$0.05
S12771	Carlaw TS: Install Water Pump	$0.05
S13088	Esplanade TS Install Water Pump	$0.05
	TOTAL	**$0.26**

6.6. Station Contingency Service

Work under this sub-component is associated with THESL's station service contingency plan, which affects system reliability. Station service transformers are required to provide supply to the station auxiliary, such as battery rectifiers, building heating and cooling, process cooling systems, lighting, and various other support systems needed for station operation. A failure of station service transformers impacts the battery power supply system which in turn impacts the proper functioning of the protective relays and their control circuits such as circuit breakers and SCADA control systems. The consequence of this may cause damage electrical assets including the potential loss of an entire station. As a result, THESL views contingency planning as both a prudent and non-discretionary means of mitigating such risk.

This work involves using a feeder from the Esplanade TS A1-2X bus to supply one of three station service transformers at Copeland TS. The other two station service transformers will be fed from new Copeland TS buses. This Copeland TS service plan utilizes an external supply from a neighbouring Esplanade TS A1-2X bus.

The costs details of this job are shown below in Table 15.

Table 15: Station Contingency Service Job summary

Scope Number	Scope Title/Description	Cost ($ millions)
X13389	Provide Copeland station Stand-by Service From Esplanade TS A1-2X Bus	$1.29

6.7. Station Civil Egress

Work under this sub-category is designed to construct and build new egress points for Transformer Stations ("TS") in order to replace existing deteriorating or congested civil infrastructure. Several egress points at existing THESL TSs are over 50 years old and have collapsed ducts, potentially unsafe cable chambers, or no longer have the capacity for new cables to be installed. Such cases pose potential safety risks to THESL employees and reliability risks to THESL's customers.

This work is required and is non-discretionary in nature because, without it, THESL employees may be put in unsafe conditions. The sites identified for work include civil infrastructure that may be in a dangerous condition where cable chambers are deteriorating. Chambers can also be congested due to the number of cables installed in them. Both issues may pose a safety risk to THESL employees entering the chamber for reactive emergency work when required.

In addition, this work is also required and non-discretionary from a reliability perspective. Due to the age and condition of the civil egress for certain TSs, the ducts are collapsed and cable can no longer be removed or installed in the duct banks. In the event of a cable fault or contingency scenario, THESL customers are currently at risk of a long sustained outage as in certain scenarios the faulted cable cannot be removed for repairs and new cables cannot be pulled to re-energize customers.

Table 16: Station Civil Egress jobs Summary

Job	**Description**	**Cost ($ millions)**
X13156 Strachan Civil Egress Phase 1	Ducts in the existing civil egress at Strachan TS have collapsed and THESL has identified cable chambers outside the station as a potential safety hazard. The three jobs in this table aim to rectify the situation by constructing a new civil egress to the west. This phase is to execute the civil work immediately outside the station to the west.	$1.79

Job	Description	Cost ($ millions)
X12638 Pirandello St Rail Crossing Tunnel	This job is necessary to address the same civil egress issue at Strachan TS described in the preceding job. This phase is to construct a tunnel crossing below the rail corridor north of Strachan TS.	$1.08
X12639 Pirandello Road Alignment Civil Installation	This job is necessary to address the same civil egress issue at Strachan TS described in the preceding jobs. This phase is to execute the civil work required to tie the new egress into the existing civil infrastructure.	$0.33
TOTAL		**$3.20**

7. Essential Tools and Equipment

7.1. Station Tools and Test Equipment

This sub-component addresses the need to purchase station tools and test equipment to support station field activities such as maintenance, construction, protection commissioning and management of SF_6 gas (refilling and disposing). THESL purchases tools on an ongoing basis to replace worn or broken tools, and as required to install, commission and maintain new technologies. As THESL undertakes capital projects to modernize its aging and obsolete station equipment, it is essential to purchase compatible tools and test equipment for the maintenance of station assets. Moreover, station crews require different types of tools and test equipment to perform planned, preventive, predictive, corrective and emergency maintenance work on existing station assets to increase system reliability, extend asset life and maintain employee and public safety.

One significant example of a tool to which THESL currently has insufficient access is the test sets required to test and commission modern microprocessor-based pilot wire relays installed within new switchgear panels and for many large new customer connections. In addition, in 2014 THESL plans to purchase equipment and tools required to manage SF_6 gas in accordance with Canadian Electricity Association requirements. This includes top-up equipment and SF_6 weight scales. Without this and similar testing equipment, THESL is unable to perform essential diagnostic and maintenance work on these and other crucial assets.

The work in this component is an ongoing and non-discretionary utility expense because failure to perform maintenance, repair or commissioning work due to lack of appropriate tools and test equipments will result in inefficiencies, increased costs for both maintenance and capital work, and possibly reduce system reliability and increase outage duration. Moreover, leaking SF_6 gas may result in various potential safety risks.

Table 18: Station Tools and Test Equipment Jobs Summary

Scope Number	**Scope Title/Description**	**Cost ($ millions)**
S14123	Station Tools and Equipment	$0.15
S14622	SF_6 Tools and Equipment (weight scales, SF_6 top-up fitting, etc.)	$0.02
	TOTAL	**$0.17**

7.2. Major Tools

This sub-component addresses THESL's need for investment in major tools and test equipment to allow employees to continue to complete needed work effectively and efficiently. THESL invests in major tools on an ongoing basis to replace worn or broken tools, and as required to install, commission and maintain new technologies. These are regular utility expenses that are essential to being able to perform necessary capital and maintenance work. As THESL undertakes capital projects to modernize its aging and obsolete station equipment, it is essential that it continue to reinvest in Major Tools. Tools in this category include mechanical and powered tools, hydraulic wrenches, Phasing Meters, Portable Generators, Phasing Sticks, Cable Cutters, among many others. In addition, the lack of necessary tools and test equipment may result in potential safety risks to THESL personnel.

Table 19:

Scope Title/Description	Cost ($ millions)
Major Tools	$0.9

8. Historic Road Cut Repairs

This sub-component relates to road cut repairs. When THESL installs equipment in the ground it generally must disturb the environment around the job site (such as sidewalks and roadways). Temporary repairs to the property are done when THESL's required construction is completed. This is required to make the area safe for the public and provide continuity of the surface with the surrounding area. Permanent repairs are made later by contractors engaged by the City of Toronto, usually anywhere from one to four years after THESL's construction has been completed. THESL is invoiced at that time for the cost of this restoration work, often several years after THESL's work is complete. The timing of these repairs is generally out of THESL's control. Most jobs tend to get tendered by the City anywhere from 18 to 30 months after job completion.

Starting in 2012, cut restoration costs were charged to actual projects in the constructing department at the time the road cut is made. Prior to 2012, however, the cut restoration costs were charged into a pooled common expense (at the time invoices were received from the City) and individual projects would not have included cut restoration costs in their cost estimates.

As a result of the outstanding costs for road cut repairs related to THESL jobs performed prior to 2012, THESL continues to receive and be legally obligated to pay invoices for repairs for road cuts dating back as far as 2008. THESL has a backlog of cut repair costs for historic projects that it needs to fund in 2014. The costs are non-discretionary as they are a contractual obligation to the City of Toronto.

Table 17:

Scope Title/Description	**Cost ($ millions)**
Historic Road Cut Costs 2014	$3.22

II INFORMATION TECHNOLOGY CAPITAL: 2014 EVIDENTIARY UPDATE

SUMMARY OF CHANGES FOR 2014

- The total IT capital budget for 2014 is unchanged at $15M.
- Spending within the budget has been shifted toward *Corporate Applications Upgrades* in order to reflect the continuing priority needs of THESL's IT systems.

Table 1: Information Technology Budget 2014

Project Name	Estimated Cost ($M)
Corporate Applications Upgrade	4.00
Billing and Regulatory Compliance Systems Upgrade	2.14
Geospatial Information System & Outage Management System Upgrade	0.50
Information Technology Hardware Asset Replacement	8.36
TOTAL	**15.00**

1. Detailed Description of Changes

THESL has identified *Corporate Applications Upgrade* requirements resulting from critical assets, such as Windows XP, reaching end-of-support/end-of-life status. THESL has allocated 2014 spending in this category to address this need. The aggregate 2014 budget for IT capital spending remains the same as was originally filed in May 2012.

III FLEET CAPITAL: 2014 EVIDENTIARY UPDATE

SUMMARY OF CHANGES FOR 2014

- No change. Relative to the May 2012 filing, the forecast 2014 capital expenditures remain unchanged.

Table 1: Fleet Budget 2014

Vehicle Description	Number	Cost Estimate ($M)
Car/Light Truck	-	-
Derrick	-	-
Forklift	-	-
Bucket Truck (Various Designs)	6	1.69
Cube Van	3	0.31
Total	9	**2.00**

IV BUILDINGS AND FACILITIES CAPITAL: 2014 ICM UPDATE

SUMMARY OF CHANGES FOR 2014

- No change. Relative to the May 2012 filing, the forecast 2014 capital expenditures remain unchanged.

Table 1: Buildings and Facilities Budget 2014

Project Name	Cost Estimate ($M)
14 Carlton Street	1.62
500 Commissioners Street	0.97
6 Monogram Place	0.11
60 Eglinton Ave W	-
601 Milner Avenue	0.40
Card Access Security System	1.90
Installation of Backflow Preventer	-
TOTAL	**5.00**

Ontario Energy Board

Incremental Capital Workform

Legend: DROP-DOWN MENU | INPUT FIELD | CALCULATION

Applicant Name	**Toronto Hydro-Electric System Limited**
Application Type	**IRM3**
LDC Licence Number	**ED-2002-0497**
Applied for Effective Date	**May 1, 2012**
Stretch Factor Group	**III**
Stretch Factor Value	**0.6%**
Last COS Re-based Year	**2011**
Last COS OEB Application Number	**EB-2010-0142**
ICM Billing Determinants for Growth - Numerator	**2011 Re-Based Forecast**
ICM Billing Determinants for Growth - Denominator	**2010 Audited RRR**

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Rate Class and Re-Based Billing Determinants & Rates

Select the appropriate Rate Groups and Rate Classes from the drop-down menus in Columns C and D respectively. Following your selection, all appropriate input cells will be shaded green.

Last COS Re-based Year	**2011**
Last COS OEB Application Number	**EB-2010-0142**

Rate Group	Rate Class	Fixed Metric	Vol Metric	Re-based Billed Customers or Connections A	Re-based Billed kWh B	Re-based Billed kW C	Re-based Tariff Service Charge D	Re-based Tariff Distribution Volumetric Rate kWh E	Re-based Tariff Distribution Volumetric Rate kW F
RES	Residential	Customer	kWh	598,508	4,886,977,489		18.25	0.0151	
RES	Residential Urban	Customer	kWh	24,898	99,791,184		17.00	0.0257	
GSLT50	General Service Less Than 50 kW	Customer	kWh	65,792	2,139,318,076	0	24.30	0.0225	
GSGT50	General Service 50 to 999 kW	Customer	kW	13,067	10,116,374,153	26,935,191	35.56		5.5956
GSGT50	General Service 1,000 to 4,999 kW	Customer	kW	514	4,626,928,262	10,587,119	686.46		4.4497
LU	Large Use	Customer	kW	47	2,376,778,323	4,993,733	3,009.11		4.7406
SL	Street Lighting	Connection	kW	162,777	110,165,016	322,023	1.30		28.7248
USL	Unmetered Scattered Load	Connection	kWh	1,130	56,231,585		4.84	0.0607	
USL	Unmetered Scattered Load	Connection	kWh	21,729	0		0.49		
NA	Rate Class 10	NA	NA						
NA	Rate Class 11	NA	NA						
NA	Rate Class 12	NA	NA						
NA	Rate Class 13	NA	NA						
NA	Rate Class 14	NA	NA						
NA	Rate Class 15	NA	NA						
NA	Rate Class 16	NA	NA						
NA	Rate Class 17	NA	NA						
NA	Rate Class 18	NA	NA						
NA	Rate Class 19	NA	NA						
NA	Rate Class 20	NA	NA						
NA	Rate Class 21	NA	NA						
NA	Rate Class 22	NA	NA						
NA	Rate Class 23	NA	NA						
NA	Rate Class 24	NA	NA						
NA	Rate Class 25	NA	NA						

Removal of Rate Adders

Last COS Re-based Year 2011

Last COS OEB Application Number EB-2010-0142

Rate Class	Re-based Tariff Service Charge	Re-based Tariff Distribution Volumetric Rate kWh	Re-based Tariff Distribution Volumetric Rate kW	Service Charge Rate Adders	Distribution Volumetric kWh Rate Adders	Distribution Volumetric kW Rate Adders	Re-based Base Service Charge	Re-based Base Distribution Volumetric Rate kWh	Re-based Base Distribution Volumetric Rate kW
	A	B	C	D	E	F	H = A - D	I = B - E	J = C - F
Residential	18.25	0.0151	0.0000	0.00	0.0000	0.0000	18.25	0.0151	0.0000
Residential Urban	17.00	0.0257	0.0000	0.00	0.0000	0.0000	17.00	0.0257	0.0000
General Service Less Than 50 kW	24.30	0.0225	0.0000	0.00	0.0000	0.0000	24.30	0.0225	0.0000
General Service 50 to 999 kW	35.56	0.0000	5.5956	0.00	0.0000	0.0000	35.56	0.0000	5.5956
General Service 1,000 to 4,999 kW	686.46	0.0000	4.4497	0.00	0.0000	0.0000	686.46	0.0000	4.4497
Large Use	3,009.11	0.0000	4.7406	0.00	0.0000	0.0000	3,009.11	0.0000	4.7406
Street Lighting	1.30	0.0000	28.7248	0.00	0.0000	0.0000	1.30	0.0000	28.7248
Unmetered Scattered Load	4.84	0.0607	0.0000	0.00	0.0000	0.0000	4.84	0.0607	0.0000
Unmetered Scattered Load	0.49	0.0000	0.0000	0.00	0.0000	0.0000	0.49	0.0000	0.0000

Calculated Re-Based Revenue From Rates

Last COS Re-based Year 2011

Last COS OEB Application Number EB-2010-0142

Rate Class	Re-based Billed Customers or Connections A	Re-based Billed kWh B	Re-based Billed kW C	Re-based Base Service Charge D	Re-based Base Distribution Volumetric Rate kWh E	Re-based Base Distribution Volumetric Rate kW F	Service Charge Revenue G = A * D *12	Distribution Volumetric Rate Revenue kWh H = B * E	Distribution Volumetric Rate Revenue kW I = C * F	Revenue Requirement from Rates J = G + H + I	Service Charge % Revenue K = G / J	Distribution Volumetric Rate % Revenue kWh L = H / J	Distribution Volumetric Rate % Revenue kW M = I / J	Total % Revenue N = J / R
Residential	598,508	4,886,977,489	0	18.25	0.0151	0.0000	131,073,252	73,646,751	0	204,720,003	64.0%	36.0%	0.0%	38.8%
Residential Urban	24,898	99,791,184	0	17.00	0.0257	0.0000	5,079,192	2,559,644	0	7,638,836	66.5%	33.5%	0.0%	1.4%
General Service Less Than 50 kW	65,792	2,139,318,076	0	24.30	0.0225	0.0000	19,184,993	48,070,477	0	67,255,470	28.5%	71.5%	0.0%	12.7%
General Service 50 to 999 kW	13,067	10,116,374,153	26,935,191	35.56	0.0000	5.5956	5,575,758	0	150,718,556	156,294,314	3.6%	0.0%	96.4%	29.6%
General Service 1,000 to 4,999 kW	514	4,626,928,262	10,587,119	686.46	0.0000	4.4497	4,234,085	0	47,109,505	51,343,590	8.2%	0.0%	91.8%	9.7%
Large Use	47	2,376,778,323	4,993,733	3,009.11	0.0000	4.7406	1,697,138	0	23,673,292	25,370,430	6.7%	0.0%	93.3%	4.8%
Street Lighting	162,777	110,165,016	322,023	1.30	0.0000	28.7248	2,539,322	0	9,250,042	11,789,364	21.5%	0.0%	78.5%	2.2%
Unmetered Scattered Load	1,130	56,231,585	0	4.84	0.0607	0.0000	65,611	3,413,257	0	3,478,868	1.9%	98.1%	0.0%	0.7%
Unmetered Scattered Load	21,729	0	0	0.49	0.0000	0.0000	127,767	0	0	127,767	100.0%	0.0%	0.0%	0.0%
							169,577,117	127,690,129	230,751,395	528,018,642				100.0%

Detailed Re-Based Revenue From Rates

Last COS Re-based Year	**2011**
Last COS OEB Application Number	**EB-2010-0142**

Applicants Rate Base					**Last Rate Re-based Amount**	
Average Net Fixed Assets						
Gross Fixed Assets - Re-based Opening	$	4,183,572,075	A			
Add: CWIP Re-based Opening	$	204,719,106	B			
Re-based Capital Additions	$	376,263,596	C			
Re-based Capital Disposals			D			
Re-based Capital Retirements			E			
Deduct: CWIP Re-based Closing	-$	232,060,508	F			
Gross Fixed Assets - Re-based Closing	$	4,532,494,269	G			
Average Gross Fixed Assets				$	4,358,033,172	H = (A + G) / 2
Accumulated Depreciation - Re-based Opening	$	2,285,733,698	I			
Re-based Depreciation Expense	$	138,815,781	J			
Re-based Disposals	$	2,807,234	K			
Re-based Retirements			L			
Accumulated Depreciation - Re-based Closing	$	2,427,356,713	M			
Average Accumulated Depreciation				$	2,356,545,206	N = (I + M) / 2
Average Net Fixed Assets				**$**	**2,001,487,967**	O = H - N
Working Capital Allowance						
Working Capital Allowance Base	$	2,479,952,766	P			
Working Capital Allowance Rate		12.0%	Q			
Working Capital Allowance				**$**	**296,739,314**	R = P * Q
Rate Base				**$**	**2,298,227,281**	S = O + R
Return on Rate Base						
Deemed ShortTerm Debt %		4.00%	T	$	91,929,091	W = S * T
Deemed Long Term Debt %		56.00%	U	$	1,287,007,277	X = S * U
Deemed Equity %		40.00%	V	$	919,290,912	Y = S * V
Short Term Interest		2.46%	Z	$	2,261,456	AC = W * Z
Long Term Interest		5.37%	AA	$	69,112,291	AD = X * AA
Return on Equity		9.58%	AB	$	88,068,069	AE = Y * AB
Return on Rate Base				**$**	**159,441,816**	AF = AC + AD + AE

Distribution Expenses

OM&A Expenses	$	231,014,224	AG			
Amortization	$	138,815,781	AH			
Ontario Capital Tax (F1.1 Z-Factor Tax Changes)	$	6,802,382	AI			
Grossed Up PILs (F1.1 Z-Factor Tax Changes)	$	11,791,223	AJ			
Low Voltage			AK			
Transformer Allowance	$	11,479,842	AL			
	$	-	AM			
			AN			
			AO			
				$	**399,903,452**	AP = SUM (AG : AO)

Revenue Offsets

Specific Service Charges	-$	7,580,526	AQ			
Late Payment Charges	-$	4,900,000	AR			
Other Distribution Income	-$	7,240,556	AS			
Other Income and Deductions	-$	6,300,000	AT	**-$**	**26,021,082**	AU = SUM (AQ : AT)

Revenue Requirement from Distribution Rates	**$**	**533,324,186**	AV = AF + AP + AU

Rate Classes Revenue

Rate Classes Revenue - Total (B1.1 Re-based Revenue - Gen)	$	528,018,642	AW
Difference	$	5,305,544	AZ = AV - AW
Difference (Percentage - should be less than 1%)		1.00%	BA = AZ / AW

Load Actual - Most Recent Year

Rate Class	Fixed Metric	Vol Metric	Billed Customers or Connections	Billed kWh	Billed kW	Base Service Charge	Base Distribution Volumetric Rate kWh	Base Distribution Volumetric Rate kW	Service Charge Revenue	Distribution Volumetric Rate Revenue kWh	Distribution Volumetric Rate Revenue kW	Total Revenue by Rate Class
			A	B	C	D	E	F	G = A * D * 12	H = B * E	I = C * F	J = G + H + I
Residential	Customer	kWh	591,496	5,105,974,275	0	$18.25	$0.0151	$0.0000	$129,537,624	$76,947,032	$0	$206,484,656
Residential Urban	Customer	kWh	24,898	99,791,184	0	$17.00	$0.0257	$0.0000	$5,079,192	$2,559,644	$0	$7,638,836
General Service Less Than 50 kW	Customer	kWh	65,799	2,095,343,918	0	$24.30	$0.0225	$0.0000	$19,186,988	$47,082,378	$0	$66,269,366
General Service 50 to 999 kW	Customer	kW	12,873	10,189,051,346	26,712,248	$35.56	$0.0000	$5.5956	$5,493,167	$0	$149,471,055	$154,964,221
General Service 1,000 to 4,999 kW	Customer	kW	509	4,828,382,733	10,972,419	$686.46	$0.0000	$4.4497	$4,192,898	$0	$48,823,974	$53,016,871
Large Use	Customer	kW	47	2,263,227,585	5,267,224	$3,009.11	$0.0000	$4.7406	$1,697,138	$0	$24,969,801	$26,666,940
Street Lighting	Connection	kW	162,964	112,727,603	321,995	$1.30	$0.0000	$28.7248	$2,542,238	$0	$9,249,232	$11,791,471
Unmetered Scattered Load	Connection	kWh	1,107	52,097,299	0	$4.84	$0.0607	$0.0000	$64,295	$3,162,306	$0	$3,226,601
Unmetered Scattered Load	Connection	kWh	12,159	0	0	$0.49	$0.0000	$0.0000	$71,495	$0	$0	$71,495
									$167,865,035	**$129,751,360**	**$232,514,062**	**$530,130,457**

This sheet is used to determine the applicants most current allocation of revenues (after the most recent revenue cost ratio adjustment, if applicable) to be used to calculate the incremental capital rate riders.

Current Revenue from Rates

Rate Class	Fixed Metric	Vol Metric	Current Base Service Charge A	Current Base Distribution Volumetric Rate kWh B	Current Base Distribution Volumetric Rate kW C	Re-based Billed Customers or Connections D	Re-based Billed kWh E	Re-based Billed kW F	Current Base Service Charge Revenue G = A * D *12	Current Base Distribution Volumetric Rate kWh Revenue H = B * E	Current Base Distribution Volumetric Rate kW Revenue I = C * F	Total Current Base Revenue J = G + H + I	Service Charge % Total Revenue L = G / $K	Distribution Volumetric Rate % Total Revenue M = H / $K	Distribution Volumetric Rate % Total Revenue N = I / $K	Total % Revenue O = J / $K
Residential	Customer	kWh	18.43	0.0151		598,508	4,886,977,489	0	132,366,029	73,646,751	0	206,012,780	25.0%	13.9%	0.0%	38.9%
Residential Urban	Customer	kWh	17.16	0.0257		24,898	99,791,184	0	5,126,996	2,559,644	0	7,686,640	1.0%	0.5%	0.0%	1.5%
General Service Less Than 50 kW	Customer	kWh	24.53	0.0225		65,792	2,139,318,076	0	19,366,579	48,070,477	0	67,437,056	3.7%	9.1%	0.0%	12.7%
General Service 50 to 999 kW	Customer	kW	35.90		5.5956	13,067	10,116,374,153	26,935,191	5,629,069	0	150,718,556	156,347,626	1.1%	0.0%	28.5%	29.5%
General Service 1,000 to 4,999 kW	Customer	kW	693.06		4.4497	514	4,626,928,262	10,587,119	4,274,794	0	47,109,505	51,384,299	0.8%	0.0%	8.9%	9.7%
Large Use	Customer	kW	3,038.05		4.7406	47	2,376,778,323	4,993,733	1,713,460	0	23,673,292	25,386,752	0.3%	0.0%	4.5%	4.8%
Street Lighting	Connection	kW	1.31		28.7248	162,777	110,165,016	322,023	2,556,589	0	9,250,042	11,806,631	0.5%	0.0%	1.7%	2.2%
Unmetered Scattered Load	Connection	kWh	4.89	0.0607		1,130	56,231,585	0	66,289	3,413,257	0	3,479,546	0.0%	0.6%	0.0%	0.7%
Unmetered Scattered Load	Connection	kWh	0.49			21,729	0	0	127,767	0	0	127,767	0.0%	0.0%	0.0%	0.0%
									171,227,573	127,690,129	230,751,395	529,669,097	32.3%	24.1%	43.6%	100.0%

Threshold Parameters

Price Cap Index

Price Escalator (GDP-IPI)	1.60%	
Less Productivity Factor	-0.72%	
Less Stretch Factor	-0.60%	
Price Cap Index		**0.28%**

Growth

ICM Billing Determinants for Growth - Numerator : 2011 Re-Based Forecast	$ 528,018,642	A
ICM Billing Determinants for Growth - Denominator : 2010 Audited RRR	$ 530,130,457	B
Growth	**-0.40%**	C = A / B

Threshold Test

Year			**2011**	
Price Cap Index			**0.28%**	**A**
Growth			**-0.40%**	**B**
Dead Band			**20%**	**C**
Average Net Fixed Assets				
Gross Fixed Assets Opening		$	4,183,572,075	
Add: CWIP Opening		$	204,719,106	
Capital Additions		$	376,263,596	
Capital Disposals		$	-	
Capital Retirements		$	-	
Deduct: CWIP Closing		-$	232,060,508	
Gross Fixed Assets - Closing		$	4,532,494,269	
Average Gross Fixed Assets		$	4,358,033,172	
Accumulated Depreciation - Opening		$	2,285,733,698	
Depreciation Expense		$	138,815,781	**D**
Disposals		$	2,807,234	
Retirements				
Accumulated Depreciation - Closing		$	2,427,356,713	
Average Accumulated Depreciation		$	2,356,545,206	
Average Net Fixed Assets		$	2,001,487,967	**E**
Working Capital Allowance				
Working Capital Allowance Base		$	2,479,952,766	
Working Capital Allowance Rate			12%	
Working Capital Allowance		$	296,739,314	**F**
Rate Base		**$**	**2,298,227,281**	**G = E + F**
Depreciation	**D**	**$**	**138,815,781**	**H**
Threshold Test			**118.02%**	**I = 1 + (G / H) * (B + A * (1 + B)) + (**
Threshold CAPEX		$	163,833,177	**J = H *I**

Summary of Incremental Capital Projects (ICPs)

Number of ICPs
1

Project ID #	Incremental Capital Non-Discretionary Project Description	Incremental Capital CAPEX	Amortization Expense	CCA
ICP 1	Copeland	88,822,884	2,755,428	3,618,671
		88,822,884	2,755,428	3,618,671

Incremental Capital Adjustment

Current Revenue Requirement

Current Revenue Requirement - Total			$ 533,324,186	A

Return on Rate Base

Incremental Capital CAPEX			$ 88,822,884	B
Depreciation Expense			$ 2,755,428	C
Incremental Capital CAPEX to be included in Rate Base			$ 86,067,456	D = B - C
Deemed ShortTerm Debt %	4.0%	E	$ 3,442,698	G = D * E
Deemed Long Term Debt %	56.0%	F	$ 48,197,775	H = D * F
Short Term Interest	2.46%	I	$ 84,690	K = G * I
Long Term Interest	5.37%	J	$ 2,588,221	L = H * J
Return on Rate Base - Interest			$ 2,672,911	M = K + L
Deemed Equity %	40.0%	N	$ 34,426,982	P = D * N
Return on Rate Base -Equity	9.58%	O	$ 3,298,105	Q = P * O
Return on Rate Base - Total			$ 5,971,016	R = M + Q

Amortization Expense

Amortization Expense - Incremental		C	$ 2,755,428	S

Grossed up PIL's

Regulatory Taxable Income		O	$ 3,298,105	T
Add Back Amortization Expense		S	$ 2,755,428	U
Deduct CCA			$ 3,618,671	V
Incremental Taxable Income			$ 2,434,862	W = T + U - V
Current Tax Rate (F1.1 Z-Factor Tax Changes)	26.4%	X		
PIL's Before Gross Up			$ 642,804	Y = W * X
Incremental Grossed Up PIL's			$ 873,374	Z = Y / (1 - X)

Ontario Capital Tax

Incremental Capital CAPEX			$ 88,822,884	AA
Less : Available Capital Exemption (if any)			$ -	AB
Incremental Capital CAPEX subject to OCT			$ 88,822,884	AC = AA - AB
Ontario Capital Tax Rate (F1.1 Z-Factor Tax Changes)	0.000%	AD		
Incremental Ontario Capital Tax			$ -	AE = AC * AD

Incremental Revenue Requirement

Return on Rate Base - Total	Q	$ 5,971,016	AF
Amortization Expense - Total	S	$ 2,755,428	AG
Incremental Grossed Up PIL's	Z	$ 873,374	AH
Incremental Ontario Capital Tax	AE	$ -	AI
Incremental Revenue Requirement		$ 9,599,818	AJ = AF + AG + AH + AI

Calculation of Incremental Capital Rate Rider - Option A Fixed and Variable

Rate Class	Service Charge % Revenue A	Distribution Volumetric Rate % Revenue kWh B	Distribution Volumetric Rate % Revenue kW C	Service Charge Revenue D = $N * A	Distribution Volumetric Rate Revenue kWh E = $N * B	Distribution Volumetric Rate Revenue kW F = $N * C	Total Revenue by Rate Class G = D + E + F	Billed Customers or Connections H	Billed kWh I	Billed kW J	Service Charge Rate Rider K = D / H / 12	Distribution Volumetric Rate kWh Rate Rider L = E / I	Distribution Volumetric Rate kW Rate Rider M = F / J
Residential	25.0%	13.9%	0.0%	$ 2,399,025.81	$ 1,334,787.01	$ -	$ 3,733,812.82	598,508	4,886,977,489	0	$0.334029	$0.000273	
Residential Urban	1.0%	0.5%	0.0%	$ 92,922.60	$ 46,391.45	$ -	$ 139,314.05	24,898	99,791,184	0	$0.311011	$0.000465	
General Service Less Than 50 kW	3.7%	9.1%	0.0%	$ 351,003.37	$ 871,238.01	$ -	$ 1,222,241.38	65,792	2,139,318,076	0	$0.444586	$0.000407	
General Service 50 to 999 kW	1.1%	0.0%	28.5%	$ 102,022.27	$ -	$ 2,731,650.32	$ 2,833,672.59	13,067	###########	26,935,191	$0.650658	$0.000000	$0.101416
General Service 1,000 to 4,999 kW	0.8%	0.0%	8.9%	$ 77,477.14	$ -	$ 853,821.17	$ 931,298.31	514	4,626,928,262	10,587,119	$12.561145	$0.000000	$0.080647
Large Use	0.3%	0.0%	4.5%	$ 31,055.06	$ -	$ 429,059.02	$ 460,114.08	47	2,376,778,323	4,993,733	$55.062167	$0.000000	$0.085919
Street Lighting	0.5%	0.0%	1.7%	$ 46,336.08	$ -	$ 167,649.44	$ 213,985.52	162,777	110,165,016	322,023	$0.023722	$0.000000	$0.520613
Unmetered Scattered Load	0.0%	0.6%	0.0%	$ 1,201.43	$ 61,862.49	$ -	$ 63,063.92	1,130	56,231,585	0	$0.088627	$0.001100	
Unmetered Scattered Load	0.0%	0.0%	0.0%	$ 2,315.67	$ -	$ -	$ 2,315.67	21,729	0	0	$0.008881		
				$ 3,103,359.44	$ 2,314,278.95	$ 4,182,179.94	$ 9,599,818.33						
							-						

Enter the above rate riders onto "Sheet 14. Proposed Rate_Riders" in the 2012 OEB IRM3 Rate Generator as an "Rate Rider for Incremental Capital"

Calculation of Incremental Capital Rate Rider - Option B Variable

Rate Class	Total Revenue $ by Rate Class A	Total Revenue % by Rate Class B = A / $H	Total Incremental Capital $ by Rate Class C = $I * B	Billed kWh D	Billed kW E	Distribution Volumetric Rate kWh Rate Rider F = C / D	Distribution Volumetric Rate kW Rate Rider G = C / E
Residential	$206,012,780	38.89%	$3,733,813	4,886,977,489	0	$0.0008	
Residential Urban	$7,686,640	1.45%	$139,314	99,791,184	0	$0.0014	
General Service Less Than 50 kW	$67,437,056	12.73%	$1,222,241	2,139,318,076	0	$0.0006	
General Service 50 to 999 kW	$156,347,626	29.52%	$2,833,673	10,116,374,153	26,935,191		$0.1052
General Service 1,000 to 4,999 kW	$51,384,299	9.70%	$931,298	4,626,928,262	10,587,119		$0.0880
Large Use	$25,386,752	4.79%	$460,114	2,376,778,323	4,993,733		$0.0921
Street Lighting	$11,806,631	2.23%	$213,986	110,165,016	322,023		$0.6645
Unmetered Scattered Load	$3,479,546	0.66%	$63,064	56,231,585	0	$0.0011	
Unmetered Scattered Load	$127,767	0.02%	$2,316	0	0		
	$529,669,097	100.00%	$9,599,818				
	H		I				

Enter the above rate riders onto "Sheet 14. Proposed Rate_Riders" in the 2012 OEB IRM3 Rate Generator as an "Rate Rider for Incremental Capital"

Ontario Energy Board

Incremental Capital Workform

Legend: DROP-DOWN MENU | INPUT FIELD | CALCULATION

Applicant Name	**Toronto Hydro-Electric System Limited**
Application Type	**IRM3**
LDC Licence Number	**ED-2002-0497**
Applied for Effective Date	**May 1, 2012**
Stretch Factor Group	**III**
Stretch Factor Value	**0.6%**
Last COS Re-based Year	**2011**
Last COS OEB Application Number	**EB-2010-0142**
ICM Billing Determinants for Growth - Numerator	**2011 Re-Based Forecast**
ICM Billing Determinants for Growth - Denominator	**2010 Audited RRR**

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Rate Class and Re-Based Billing Determinants & Rates

Select the appropriate Rate Groups and Rate Classes from the drop-down menus in Columns C and D respectively. Following your selection, all appropriate input cells will be shaded green.

Last COS Re-based Year	**2011**
Last COS OEB Application Number	**EB-2010-0142**

Rate Group	Rate Class	Fixed Metric	Vol Metric	Re-based Billed Customers or Connections A	Re-based Billed kWh B	Re-based Billed kW C	Re-based Tariff Service Charge D	Re-based Tariff Distribution Volumetric Rate kWh E	Re-based Tariff Distribution Volumetric Rate kW F
RES	Residential	Customer	kWh	598,508	4,886,977,489		18.25	0.0151	
RES	Residential Urban	Customer	kWh	24,898	99,791,184		17.00	0.0257	
GSLT50	General Service Less Than 50 kW	Customer	kWh	65,792	2,139,318,076	0	24.30	0.0225	
GSGT50	General Service 50 to 999 kW	Customer	kW	13,067	############	26,935,191	35.56		5.5956
GSGT50	General Service 1,000 to 4,999 kW	Customer	kW	514	4,626,928,262	10,587,119	686.46		4.4497
LU	Large Use	Customer	kW	47	2,376,778,323	4,993,733	3,009.11		4.7406
SL	Street Lighting	Connection	kW	162,777	110,165,016	322,023	1.30		28.7248
USL	Unmetered Scattered Load	Connection	kWh	1,130	56,231,585		4.84	0.0607	
USL	Unmetered Scattered Load	Connection	kWh	21,729	0		0.49		
NA	Rate Class 10	NA	NA						
NA	Rate Class 11	NA	NA						
NA	Rate Class 12	NA	NA						
NA	Rate Class 13	NA	NA						
NA	Rate Class 14	NA	NA						
NA	Rate Class 15	NA	NA						
NA	Rate Class 16	NA	NA						
NA	Rate Class 17	NA	NA						
NA	Rate Class 18	NA	NA						
NA	Rate Class 19	NA	NA						
NA	Rate Class 20	NA	NA						
NA	Rate Class 21	NA	NA						
NA	Rate Class 22	NA	NA						
NA	Rate Class 23	NA	NA						
NA	Rate Class 24	NA	NA						
NA	Rate Class 25	NA	NA						

Removal of Rate Adders

Last COS Re-based Year 2011

Last COS OEB Application Number EB-2010-0142

Rate Class	Re-based Tariff Service Charge A	Re-based Tariff Distribution Volumetric Rate kWh B	Re-based Tariff Distribution Volumetric Rate kW C	Service Charge Rate Adders D	Distribution Volumetric kWh Rate Adders E	Distribution Volumetric kW Rate Adders F	Re-based Base Service Charge H = A - D	Re-based Base Distribution Volumetric Rate kWh I = B - E	Re-based Base Distribution Volumetric Rate kW J = C - F
Residential	18.25	0.0151	0.0000	0.00	0.0000	0.0000	18.25	0.0151	0.0000
Residential Urban	17.00	0.0257	0.0000	0.00	0.0000	0.0000	17.00	0.0257	0.0000
General Service Less Than 50 kW	24.30	0.0225	0.0000	0.00	0.0000	0.0000	24.30	0.0225	0.0000
General Service 50 to 999 kW	35.56	0.0000	5.5956	0.00	0.0000	0.0000	35.56	0.0000	5.5956
General Service 1,000 to 4,999 kW	686.46	0.0000	4.4497	0.00	0.0000	0.0000	686.46	0.0000	4.4497
Large Use	3,009.11	0.0000	4.7406	0.00	0.0000	0.0000	3,009.11	0.0000	4.7406
Street Lighting	1.30	0.0000	28.7248	0.00	0.0000	0.0000	1.30	0.0000	28.7248
Unmetered Scattered Load	4.84	0.0607	0.0000	0.00	0.0000	0.0000	4.84	0.0607	0.0000
Unmetered Scattered Load	0.49	0.0000	0.0000	0.00	0.0000	0.0000	0.49	0.0000	0.0000

Calculated Re-Based Revenue From Rates

Last COS Re-based Year 2011

Last COS OEB Application Number EB-2010-0142

Rate Class	Re-based Billed Customers or Connections A	Re-based Billed kWh B	Re-based Billed kW C	Re-based Base Service Charge D	Re-based Base Distribution Volumetric Rate kWh E	Re-based Base Distribution Volumetric Rate kW F	Service Charge Revenue G = A * D *12	Distribution Volumetric Rate Revenue kWh H = B * E	Distribution Volumetric Rate Revenue kW I = C * F	Revenue Requirement from Rates J = G + H + I	Service Charge % Revenue K = G / J	Distribution Volumetric Rate % Revenue kWh L = H / J	Distribution Volumetric Rate % Revenue kW M = I / J	Total % Revenue N = J / R
Residential	598,508	4,886,977,489	0	18.25	0.0151	0.0000	131,073,252	73,646,751	0	204,720,003	64.0%	36.0%	0.0%	38.8%
Residential Urban	24,898	99,791,184	0	17.00	0.0257	0.0000	5,079,192	2,559,644	0	7,638,836	66.5%	33.5%	0.0%	1.4%
General Service Less Than 50 kW	65,792	2,139,318,076	0	24.30	0.0225	0.0000	19,184,993	48,070,477	0	67,255,470	28.5%	71.5%	0.0%	12.7%
General Service 50 to 999 kW	13,067	10,116,374,153	26,935,191	35.56	0.0000	5.5956	5,575,758	0	150,718,556	156,294,314	3.6%	0.0%	96.4%	29.6%
General Service 1,000 to 4,999 kW	514	4,626,928,262	10,587,119	686.46	0.0000	4.4497	4,234,085	0	47,109,505	51,343,590	8.2%	0.0%	91.8%	9.7%
Large Use	47	2,376,778,323	4,993,733	3,009.11	0.0000	4.7406	1,697,138	0	23,673,292	25,370,430	6.7%	0.0%	93.3%	4.8%
Street Lighting	162,777	110,165,016	322,023	1.30	0.0000	28.7248	2,539,322	0	9,250,042	11,789,364	21.5%	0.0%	78.5%	2.2%
Unmetered Scattered Load	1,130	56,231,585	0	4.84	0.0607	0.0000	65,611	3,413,257	0	3,478,868	1.9%	98.1%	0.0%	0.7%
Unmetered Scattered Load	21,729	0	0	0.49	0.0000	0.0000	127,767	0	0	127,767	100.0%	0.0%	0.0%	0.0%
							169,577,117	127,690,129	230,751,395	528,018,642				100.0%

Detailed Re-Based Revenue From Rates

Last COS Re-based Year	**2011**
Last COS OEB Application Number	**EB-2010-0142**

Applicants Rate Base

					Last Rate Re-based Amount	
Average Net Fixed Assets						
Gross Fixed Assets - Re-based Opening	$	4,183,572,075	A			
Add: CWIP Re-based Opening	$	204,719,106	B			
Re-based Capital Additions	$	376,263,596	C			
Re-based Capital Disposals			D			
Re-based Capital Retirements			E			
Deduct: CWIP Re-based Closing	-$	232,060,508	F			
Gross Fixed Assets - Re-based Closing	$	4,532,494,269	G			
Average Gross Fixed Assets				$	4,358,033,172	H = (A + G) / 2
Accumulated Depreciation - Re-based Opening	$	2,285,733,698	I			
Re-based Depreciation Expense	$	138,815,781	J			
Re-based Disposals	$	2,807,234	K			
Re-based Retirements			L			
Accumulated Depreciation - Re-based Closing	$	2,427,356,713	M			
Average Accumulated Depreciation				$	2,356,545,206	N = (I + M) / 2
Average Net Fixed Assets				**$**	**2,001,487,967**	O = H - N
Working Capital Allowance						
Working Capital Allowance Base	$	2,479,952,766	P			
Working Capital Allowance Rate		12.0%	Q			
Working Capital Allowance				**$**	**296,739,314**	R = P * Q
Rate Base				**$**	**2,298,227,281**	S = O + R

Return on Rate Base

Deemed ShortTerm Debt %	4.00%	T	$	91,929,091	W = S * T
Deemed Long Term Debt %	56.00%	U	$	1,287,007,277	X = S * U
Deemed Equity %	40.00%	V	$	919,290,912	Y = S * V
Short Term Interest	2.46%	Z	$	2,261,456	AC = W * Z
Long Term Interest	5.37%	AA	$	69,112,291	AD = X * AA
Return on Equity	9.58%	AB	$	88,068,069	AE = Y * AB
Return on Rate Base			**$**	**159,441,816**	AF = AC + AD + AE

Distribution Expenses						
OM&A Expenses	$	231,014,224	AG			
Amortization	$	138,815,781	AH			
Ontario Capital Tax (F1.1 Z-Factor Tax Changes)	$	6,802,382	AI			
Grossed Up PILs (F1.1 Z-Factor Tax Changes)	$	11,791,223	AJ			
Low Voltage			AK			
Transformer Allowance	$	11,479,842	AL			
	$	-	AM			
			AN			
			AO			
				$	**399,903,452**	AP = SUM (AG : AO)
Revenue Offsets						
Specific Service Charges	-$	7,580,526	AQ			
Late Payment Charges	-$	4,900,000	AR			
Other Distribution Income	-$	7,240,556	AS			
Other Income and Deductions	-$	6,300,000	AT	**-$**	**26,021,082**	AU = SUM (AQ : AT)
Revenue Requirement from Distribution Rates				**$**	**533,324,186**	AV = AF + AP + AU
Rate Classes Revenue						
Rate Classes Revenue - Total (B1.1 Re-based Revenue - Gen)				$	528,018,642	AW
Difference				$	5,305,544	AZ = AV - AW
Difference (Percentage - should be less than 1%)					1.00%	BA = AZ / AW

Load Actual - Most Recent Year

Rate Class	Fixed Metric	Vol Metric	Billed Customers or Connections A	Billed kWh B	Billed kW C	Base Service Charge D	Base Distribution Volumetric Rate kWh E	Base Distribution Volumetric Rate kW F	Service Charge Revenue G = A * D * 12	Distribution Volumetric Rate Revenue kWh H = B * E	Distribution Volumetric Rate Revenue kW I = C * F	Total Revenue by Rate Class J = G + H + I
Residential	Customer	kWh	591,496	5,105,974,275	0	$18.25	$0.0151	$0.0000	$129,537,624	$76,947,032	$0	$206,484,656
Residential Urban	Customer	kWh	24,898	99,791,184	0	$17.00	$0.0257	$0.0000	$5,079,192	$2,559,644	$0	$7,638,836
General Service Less Than 50 kW	Customer	kWh	65,799	2,095,343,918	0	$24.30	$0.0225	$0.0000	$19,186,988	$47,082,378	$0	$66,269,366
General Service 50 to 999 kW	Customer	kW	12,873	10,189,051,346	26,712,248	$35.56	$0.0000	$5.5956	$5,493,167	$0	$149,471,055	$154,964,221
General Service 1,000 to 4,999 kW	Customer	kW	509	4,828,382,733	10,972,419	$686.46	$0.0000	$4.4497	$4,192,898	$0	$48,823,974	$53,016,871
Large Use	Customer	kW	47	2,263,227,585	5,267,224	$3,009.11	$0.0000	$4.7406	$1,697,138	$0	$24,969,801	$26,666,940
Street Lighting	Connection	kW	162,964	112,727,603	321,995	$1.30	$0.0000	$28.7248	$2,542,238	$0	$9,249,232	$11,791,471
Unmetered Scattered Load	Connection	kWh	1,107	52,097,299	0	$4.84	$0.0607	$0.0000	$64,295	$3,162,306	$0	$3,226,601
Unmetered Scattered Load	Connection	kWh	12,159	0	0	$0.49	$0.0000	$0.0000	$71,495	$0	$0	$71,495
									$167,865,035	**$129,751,360**	**$232,514,062**	**$530,130,457**

This sheet is used to determine the applicants most current allocation of revenues (after the most recent revenue cost ratio adjustment, if applicable) to be used to calculate the incremental capital rate riders.

Current Revenue from Rates

Rate Class	Fixed Metric	Vol Metric	Current Base Service Charge A	Current Base Distribution Volumetric Rate kWh B	Current Base Distribution Volumetric Rate kW C	Re-based Billed Customers or Connections D	Re-based Billed kWh E	Re-based Billed kW F	Current Base Service Charge Revenue G = A * D *12	Current Base Distribution Volumetric Rate kWh Revenue H = B * E	Current Base Distribution Volumetric Rate kW Revenue I = C * F	Total Current Base Revenue J = G + H + I	Service Charge % Total Revenue L = G / $K	Distribution Volumetric Rate % Total Revenue M = H / $K	Distribution Volumetric Rate % Total Revenue N = I / $K	Total % Revenue O = J / $K
Residential	Customer	kWh	18.43	0.0151		598,508	4,886,977,489	0	132,366,029	73,646,751	0	206,012,780	25.0%	13.9%	0.0%	38.9%
Residential Urban	Customer	kWh	17.16	0.0257		24,898	99,791,184	0	5,126,996	2,559,644	0	7,686,640	1.0%	0.5%	0.0%	1.5%
General Service Less Than 50 kW	Customer	kWh	24.53	0.0225		65,792	2,139,318,076	0	19,366,579	48,070,477	0	67,437,056	3.7%	9.1%	0.0%	12.7%
General Service 50 to 999 kW	Customer	kW	35.90		5.5956	13,067	10,116,374,153	26,935,191	5,629,069	0	150,718,556	156,347,626	1.1%	0.0%	28.5%	29.5%
General Service 1,000 to 4,999 kW	Customer	kW	693.06		4.4497	514	4,626,928,262	10,587,119	4,274,794	0	47,109,505	51,384,299	0.8%	0.0%	8.9%	9.7%
Large Use	Customer	kW	3,038.05		4.7406	47	2,376,778,323	4,993,733	1,713,460	0	23,673,292	25,386,752	0.3%	0.0%	4.5%	4.8%
Street Lighting	Connection	kW	1.31		28.7248	162,777	110,165,016	322,023	2,556,589	0	9,250,042	11,806,631	0.5%	0.0%	1.7%	2.2%
Unmetered Scattered Load	Connection	kWh	4.89	0.0607		1,130	56,231,585	0	66,289	3,413,257	0	3,479,546	0.0%	0.6%	0.0%	0.7%
Unmetered Scattered Load	Connection	kWh	0.49			21,729	0	0	127,767	0	0	127,767	0.0%	0.0%	0.0%	0.0%
									171,227,573	127,690,129	230,751,395	529,669,097	32.3%	24.1%	43.6%	100.0%

Ontario Energy Board

Incremental Capital Workform

Threshold Parameters

Price Cap Index

Price Escalator (GDP-IPI)	1.60%	
Less Productivity Factor	-0.72%	
Less Stretch Factor	-0.60%	
Price Cap Index		**0.28%**

Growth

ICM Billing Determinants for Growth - Numerator : 2011 Re-Based Forecast	$ 528,018,642	A
ICM Billing Determinants for Growth - Denominator : 2010 Audited RRR	$ 530,130,457	B
Growth	**-0.40%**	C = A / B

Ontario Energy Board

Incremental Capital Workform

Threshold Test

Year			**2011**	
Price Cap Index			**0.28%**	**A**
Growth			**-0.40%**	**B**
Dead Band			**20%**	**C**
Average Net Fixed Assets				
Gross Fixed Assets Opening		$	4,183,572,075	
Add: CWIP Opening		$	204,719,106	
Capital Additions		$	376,263,596	
Capital Disposals		$	-	
Capital Retirements		$	-	
Deduct: CWIP Closing		-$	232,060,508	
Gross Fixed Assets - Closing		$	4,532,494,269	
Average Gross Fixed Assets		$	4,358,033,172	
Accumulated Depreciation - Opening		$	2,285,733,698	
Depreciation Expense		$	138,815,781	**D**
Disposals		$	2,807,234	
Retirements				
Accumulated Depreciation - Closing		$	2,427,356,713	
Average Accumulated Depreciation		$	2,356,545,206	
Average Net Fixed Assets		$	2,001,487,967	**E**
Working Capital Allowance				
Working Capital Allowance Base		$	2,479,952,766	
Working Capital Allowance Rate			12%	
Working Capital Allowance		$	296,739,314	**F**
Rate Base		**$**	**2,298,227,281**	**G = E + F**
Depreciation	**D**	**$**	**138,815,781**	**H**
Threshold Test			**118.02%**	**I = 1 + (G / H) * (B + A * (1 + B)) + (**
Threshold CAPEX		$	163,833,177	**J = H *I**

Summary of Incremental Capital Projects (ICPs)

Number of ICPs
1

Project ID #	Incremental Capital Non-Discretionary Project Description	Incremental Capital CAPEX	Amortization Expense	CCA
ICP 1	Summary of Projects (please see Table XXX)	93,635,278	2,955,884	7,492,130
		93,635,278	2,955,884	7,492,130

Incremental Capital Adjustment

Current Revenue Requirement				
Current Revenue Requirement - Total			$533,324,186	A

Return on Rate Base				
Incremental Capital CAPEX			$ 93,635,278	B
Depreciation Expense			$ 2,955,884	C
Incremental Capital CAPEX to be included in Rate Base			$ 90,679,394	D = B - C
Deemed ShortTerm Debt %	4.0%	E	$ 3,627,176	G = D * E
Deemed Long Term Debt %	56.0%	F	$ 50,780,460	H = D * F
Short Term Interest	2.46%	I	$ 89,229	K = G * I
Long Term Interest	5.37%	J	$ 2,726,911	L = H * J
Return on Rate Base - Interest			$ 2,816,139	M = K + L
Deemed Equity %	40.0%	N	$ 36,271,757	P = D * N
Return on Rate Base -Equity	9.58%	O	$ 3,474,834	Q = P * O
Return on Rate Base - Total			$ 6,290,974	R = M + Q

Amortization Expense

Amortization Expense - Incremental		C	$ 2,955,884	S

Grossed up PIL's

Regulatory Taxable Income		O	$ 3,474,834	T
Add Back Amortization Expense		S	$ 2,955,884	U
Deduct CCA			$ 7,492,130	V
Incremental Taxable Income			-$ 1,061,412	W = T + U - V
Current Tax Rate (F1.1 Z-Factor Tax Changes)	26.4%	X		
PIL's Before Gross Up			-$ 280,213	Y = W * X
Incremental Grossed Up PIL's			-$ 380,724	Z = Y / (1 - X)

Ontario Capital Tax

Incremental Capital CAPEX			$ 93,635,278	AA
Less : Available Capital Exemption (if any)			$ -	AB
Incremental Capital CAPEX subject to OCT			$ 93,635,278	AC = AA - AB
Ontario Capital Tax Rate (F1.1 Z-Factor Tax Changes)	0.000%	AD		
Incremental Ontario Capital Tax			$ -	AE = AC * AD

Incremental Revenue Requirement

Return on Rate Base - Total	Q	$ 6,290,974	AF
Amortization Expense - Total	S	$ 2,955,884	AG
Incremental Grossed Up PIL's	Z	-$ 380,724	AH
Incremental Ontario Capital Tax	AE	$ -	AI
Incremental Revenue Requirement		$ 8,866,134	AJ = AF + AG + AH + AI

Calculation of Incremental Capital Rate Rider - Option A Fixed and Variable

Rate Class	Service Charge % Revenue A	Distribution Volumetric Rate % Revenue kWh B	Distribution Volumetric Rate % Revenue kW C	Service Charge Revenue D = $N * A	Distribution Volumetric Rate Revenue kWh E = $N * B	Distribution Volumetric Rate Revenue kW F = $N * C	Total Revenue by Rate Class G = D + E + F	Billed Customers or Connections H	Billed kWh I	Billed kW J	Service Charge Rate Rider K = D / H / 12	Distribution Volumetric Rate kWh Rate Rider L = E / I	Distribution Volumetric Rate kW Rate Rider M = F / J
Residential	25.0%	13.9%	0.0%	$ 2,215,675.69	$ 1,232,773.36	$ -	$ 3,448,449.05	598,508	4,886,977,489	0	$0.308500	$0.000252	
Residential Urban	1.0%	0.5%	0.0%	$ 85,820.82	$ 42,845.89	$ -	$ 128,666.71	24,898	99,791,184	0	$0.287241	$0.000429	
General Service Less Than 50 kW	3.7%	9.1%	0.0%	$ 324,177.27	$ 804,651.98	$ -	$ 1,128,829.25	65,792	2,139,318,076	0	$0.410608	$0.000376	
General Service 50 to 999 kW	1.1%	0.0%	28.5%	$ 94,225.02	$ -	$ 2,522,878.74	$ 2,617,103.76	13,067	###########	26,935,191	$0.600930	$0.000000	$0.093665
General Service 1,000 to 4,999 kW	0.8%	0.0%	8.9%	$ 71,555.80	$ -	$ 788,566.26	$ 860,122.06	514	4,626,928,262	10,587,119	$11.601135	$0.000000	$0.074484
Large Use	0.3%	0.0%	4.5%	$ 28,681.62	$ -	$ 396,267.37	$ 424,948.99	47	2,376,778,323	4,993,733	$50.853936	$0.000000	$0.079353
Street Lighting	0.5%	0.0%	1.7%	$ 42,794.76	$ -	$ 154,836.51	$ 197,631.27	162,777	110,165,016	322,023	$0.021909	$0.000000	$0.480825
Unmetered Scattered Load	0.0%	0.6%	0.0%	$ 1,109.61	$ 57,134.53	$ -	$ 58,244.14	1,130	56,231,585	0	$0.081854	$0.001016	
Unmetered Scattered Load	0.0%	0.0%	0.0%	$ 2,138.69	$ -	$ -	$ 2,138.69	21,729	0	0	$0.008202		
				$ 2,866,179.28	$ 2,137,405.77	$ 3,862,548.87	$ 8,866,133.92						
							-						

Enter the above rate riders onto "Sheet 14. Proposed Rate_Riders" in the 2012 OEB IRM3 Rate Generator as an "Rate Rider for Incremental Capital"

Calculation of Incremental Capital Rate Rider - Option B Variable

Rate Class	Total Revenue $ by Rate Class A	Total Revenue % by Rate Class B = A / $H	Total Incremental Capital $ by Rate Class C = $I * B	Billed kWh D	Billed kW E	Distribution Volumetric Rate kWh Rate Rider F = C / D	Distribution Volumetric Rate kW Rate Rider G = C / E
Residential	$206,012,780	38.89%	$3,448,449	4,886,977,489	0	$0.0007	
Residential Urban	$7,686,640	1.45%	$128,667	99,791,184	0	$0.0013	
General Service Less Than 50 kW	$67,437,056	12.73%	$1,128,829	2,139,318,076	0	$0.0005	
General Service 50 to 999 kW	$156,347,626	29.52%	$2,617,104	10,116,374,153	26,935,191		$0.0972
General Service 1,000 to 4,999 kW	$51,384,299	9.70%	$860,122	4,626,928,262	10,587,119		$0.0812
Large Use	$25,386,752	4.79%	$424,949	2,376,778,323	4,993,733		$0.0851
Street Lighting	$11,806,631	2.23%	$197,631	110,165,016	322,023		$0.6137
Unmetered Scattered Load	$3,479,546	0.66%	$58,244	56,231,585	0	$0.0010	
Unmetered Scattered Load	$127,767	0.02%	$2,139	0	0		
	$529,669,097	100.00%	$8,866,134				
	H		I				

Enter the above rate riders onto "Sheet 14. Proposed Rate_Riders" in the 2012 OEB IRM3 Rate Generator as an "Rate Rider for Incremental Capital"

Rate Class	2011 Approved Load Forecast: Billed Customers or Connections	2011 Approved Load Forecast: Billed kWh	2011 Approved Load Forecast: Billed kVA	Service Charge Revenue Requirement	Distribution Volumetric Rate Revenue Requirement kWh	Distribution Volumetric Rate Revenue Requirement kVA	Total Revenue Requirement	Service Charge (per 30 Days)	Distribution Volumetric Rate kWh	Distribution Volumetric Rate kVA (per 30 days)
2014 ICM Rate Rider (Excluding Copeland)								**12 months Recovery**		
Residential	598,508	4,886,977,489	-	2,215,676	1,232,773	-	$ 3,448,449	$ 0.30	$ 0.00025	
Residential Urban	24,898	99,791,184	-	85,821	42,846	-	$ 128,667	$ 0.28	$ 0.00043	
General Service Less Than 50 kW	65,792	2,139,318,076	-	324,177	804,652	-	$ 1,128,829	$ 0.40	$ 0.00038	
General Service 50 to 999 kW	13,067	10,116,374,153	26,935,191	94,225	-	2,522,879	$ 2,617,104	$ 0.59		$ 0.0924
General Service 1,000 to 4,999 kW	514	4,626,928,262	10,587,119	71,556	-	788,566	$ 860,122	$ 11.44		$ 0.0735
Large Use - Regular	47	2,376,778,323	4,993,733	28,682	-	396,267	$ 424,949	$ 50.16		$ 0.0783
Street Lighting	162,777	110,165,016	322,023	42,795	-	154,837	$ 197,631	$ 0.02		$ 0.4742
Unmetered Scattered Load	1,130	56,231,585	-	1,110	57,135	-	$ 58,244	$ 0.08	$ 0.00102	
Unmetered Scattered Load	21,729	-	-	2,139	-	-	$ 2,139	$ 0.01		
				$ 2,866,179	$ 2,137,406	$ 3,862,549	**$ 8,866,134**			
2014 ICM Copeland Rate Rider								**12 months Recovery**		
Residential	598,508	4,886,977,489	-	2,399,026	1,334,787	-	$ 3,733,813	$ 0.33	$ 0.00027	
Residential Urban	24,898	99,791,184	-	92,923	46,391	-	$ 139,314	$ 0.31	$ 0.00046	
General Service Less Than 50 kW	65,792	2,139,318,076	-	351,003	871,238	-	$ 1,222,241	$ 0.44	$ 0.00041	
General Service 50 to 999 kW	13,067	10,116,374,153	26,935,191	102,022	-	2,731,650	$ 2,833,673	$ 0.64		$ 0.1000
General Service 1,000 to 4,999 kW	514	4,626,928,262	10,587,119	77,477	-	853,821	$ 931,298	$ 12.39		$ 0.0795
Large Use - Regular	47	2,376,778,323	4,993,733	31,055	-	429,059	$ 460,114	$ 54.31		$ 0.0847
Street Lighting	162,777	110,165,016	322,023	46,336	-	167,649	$ 213,986	$ 0.02		$ 0.5135
Unmetered Scattered Load	1,130	56,231,585	-	1,201	61,862	-	$ 63,064	$ 0.09	$ 0.00110	
Unmetered Scattered Load	21,729	-	-	2,316	-	-	$ 2,316	$ 0.01		
				$ 3,103,359	$ 2,314,279	$ 4,182,180	**$ 9,599,818**			

	2014 Net Fixed Asset (Full Year)
Projects above Threshold CAPEX	
B1 Underground Infrastructure	59,767,546
B2 Paper Insulated Lead Covered Cable - Piece Outs and Leakers	3,539,380
B3 Handwell Replacement	13,740,341
B4 Overhead Infrastructure	36,648,425
B5 Box Construction	14,738,418
B6 Rear Lot Construction	16,521,650
B9 Network Vault & Roofs	8,244,019
B10 Fibertop Network Units	5,854,178
B11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)	1,377,204
B12 Stations Power Transformers	1,362,952
B13.1 & 13.2 Stations Switchgear - Muncipal and Transformer Stations	6,782,921
B15 Stations Control & Communicaton Systems	-
B18.2 Copeland (Formerly Bremner) Hydro One Capital Contributions	60,000,000
B19 Feeder Automation	-
B20 Metering	7,105,239
B21 Externally-Initiated Plant Relocations and Expansions	11,588,282
B17 Copeland (Formerly Bremner) Transformer Station (above threshold portion)	**117,645,768**

Projects spanning THRESHOLD CAPEX	
B17 Copeland (Formerly Bremner) Transformer Station	124,100,000

Projects below THRESHOLD CAPEX	
B17 Copeland (Formerly Bremner) Transformer Station (below threshold portion)	6,454,232
B7 Polymer SMD-20 Switches	2,188,256
B8 SCADA-Mate R1 Switches	2,452,184
B14 Stations Circuit Breakers	1,267,422
B16 Downtown Station Load Transfers	836,436
B18.1 Hydro One Capital Contributions	2,637,024
2014 Normal Capital	**115,719,419**
Pre-2012 CWIP	**32,278,204**

Total	**528,749,501**
	-
2013 Threshold CAPEX (from ICM model)	**163,833,177**

	Net Fixed Asset (Full Year)
Values Above Threshold for ICM Model	**364,916,324**
Threshold CAPEX	**163,833,177**
Total For Checking	**528,749,501**

	2014 Net Fixed Asset (Full Year)	2014 Net Fixed Asset (Half Year Rule)	Amort. Exp	CCA
Projects above Threshold CAPEX				
B1 Underground Infrastructure	59,767,546	29,883,773	1,020,272	2,390,702
B2 Paper Insulated Lead Covered Cable - Piece Outs and Leakers	3,539,380	1,769,690	46,556	141,575
B3 Handwell Replacement	13,740,341	6,870,171	171,754	549,614
B4 Overhead Infrastructure	36,648,425	18,324,213	496,052	1,465,937
B5 Box Construction	14,738,418	7,369,209	192,684	589,537
B6 Rear Lot Construction	16,521,650	8,260,825	259,977	660,866
B9 Network Vault & Roofs	8,244,019	4,122,010	137,408	329,761
B10 Fibertop Network Units	5,854,178	2,927,089	141,259	234,167
B11 Automatic Transfer Switches (ATS) & Reverse Power Breakers (RPB)	1,377,204	688,602	30,635	55,088
B12 Stations Power Transformers	1,362,952	681,476	21,316	54,461
B13.1 & 13.2 Stations Switchgear - Muncipal and Transformer Stations	6,782,921	3,391,460	87,173	272,682
B15 Stations Control & Communicaton Systems	-	-	-	-
B19 Feeder Automation	-	-	-	-
B20 Metering	7,105,239	3,552,620	171,307	284,210
B21 Externally-Initiated Plant Relocations and Expansions	11,588,282	5,794,141	179,491	463,531

	Net Fixed Asset (Full Year)	Net Fixed Asset (Half Year)	Amort. Exp	CCA
Values Above Threshold for ICM Model Without Copeland	**364,916,324**	**93,635,278**	**2,955,884**	**7,492,130**

	2014 Net Fixed Asset (Full Year)	2014 Net Fixed Asset (Half Year Rule)	Amort. Exp	CCA
Projects above Threshold CAPEX				
B18.2 Copeland (Formerly Bremner) Hydro One Capital Contributions	60,000,000	30,000,000	1,200,000	-
B17 Copeland (Formerly Bremner) Transformer Station	**117,645,768**	58,822,884	1,555,428	3,618,671

	Net Fixed Asset (Full Year)	Net Fixed Asset (Half Year)	Amort. Exp	CCA
Values Above Threshold for ICM Model (Copeland Rate Rider)	**364,916,324**	**88,822,884**	**2,755,428**	**3,618,671**