ComEd Secondary and Service Loss Study

Commonwealth Edison Company

April 29, 2013

Summary

Distribution system energy loss factors are utilized to determine the amount of energy consumed in the delivery of power to end use customers. These factors are used to formulate the values listed in the ComEd Rate RDS tariff (Retail Delivery Service). The purpose of this study is to provide the basis for estimating the peak losses in secondary and service conductors by customer category. The results of this analysis will be used to determine overall distribution energy loss factors by customer category.

Study Approach

Various configurations of secondary and service conductors are used to provide service to ComEd customers. Depending on the customer load, customer proximity to the distribution transformer and the size and proximity of nearby customers, secondary conductors may not be utilized. All customers are supplied by some, if only a nominal length of service conductor. The location of customer and company facilities; magnitude of peak load; and design standards in effect at the time of installation can result in differences in the facilities used to supply individual customers.

In order to compute losses associated with secondary and service conductors, ComEd utilized a set of randomly selected customers from the accounts used in ComEd's Load Research data that has been submitted in previous rate cases as Schedule E-7, most recently in the 2012 FR Update Case, to determine the average loss for each customer category. For the four customer categories that have the largest number of customers, a field survey of conductors that supply the selected customers was performed. The field survey analyzed the size, type and length of secondary and service conductors used to supply those customers. Losses were calculated for customers surveyed using the secondary and service conductor configuration found and those customers' most recent annual peak load. Peak loads, conductor information and calculated losses for the surveyed customers are listed in Appendix 1.

For the remaining categories, an analysis of ComEd's Geographic Information System (GIS) distribution transformer locations and aerial photography of customer premises was used to determine the configuration and length of secondary and service conductors for each of the sample customers. Based on the configurations observed from this analysis, it was determined that from one to three models of conductor configuration could be used to represent the facilities used to supply the sampled customers. Secondary and service conductor losses were calculated using these models for the typical load of customers in these categories and standard conductor sizes. Secondary and service power peak losses were determined by totaling the losses for the conductors used for secondary and service purposes separately. The losses for each model were then divided by the total customer load in the model to determine losses as a percent of the load. For customer categories that are represented by more than one model of secondary and service conductors, the losses for that category were determined by weighting the losses of the applicable models by the frequency of occurrence of the applicable model in the sample of customers by category. These percentages are used for separating secondary and service conductor

losses in Appendix C and Appendix D of the DSL Study, ComEd Ex. 4.01. Losses for these categories are listed in Appendix 2.

The maximum secondary loss and maximum service loss among all categories is used to determine the general "I2R loss%" value for secondary and service losses in Appendix D of the updated "2012 ComEd Distribution System Loss Study" (ComEd Exhibit 4.01). The secondary and service loss percentage for each category is divided by the maximum for all categories to determine the "Percent of Class Load Through Elements" listed in Appendix C of the updated "2012 ComEd Distribution System Loss Study".

Secondary and service losses were not calculated for the Railroad, High Voltage (HV) or Primary service categories since only primary conductors are used to provide service to these customers.

Random Customer Sample

The random sample of accounts was generated from those accounts used in ComEd's Load Research data. Specifically, Excel's random number function was used to assign a number to each load research account. The accounts were then ranked in order by the assigned number and a certain number of the accounts in ascending order were then chosen for each category to use in the study. For the four most populated customer categories (Single Family, Multi Family, Multi Family with Space Heat, and the Small Load nonresidential category), actual data was collected for a total of four hundred accounts.

Conductor Size, Length and Configuration

A configuration diagram for each of the loss models used for the categories that were not field surveyed is contained in Appendix 3. The results of the loss calculation for each model shows the conductor type, length, service voltage, single or three phase configuration, loading and losses by conductor section as well as the total service and secondary losses and losses in percent of the load in the file Sec_Svc_Losses_3_8_13.xls. For the customer categories of 400 kW and greater, secondary conductor was not identified as being used by the sample customers, so it is not utilized in the loss calculation models.

Loads

The load used in the loss calculation model for the categories that were not field surveyed was selected to approximate the peak load by a customer in that category that would be served using the conductor model that was used for the category. For the non-residential customer categories, a load in the middle of the category range was generally used. Based on the methods of service identified for the sample customers, three phase service conductors were used for category models at 100kW and higher. Category models above 400kW used conductors operated at 480V.

Changes to Secondary and Service Loss Study dated August 6, 2012 (ComEd Ex, 17.2, Docket No. 12-0321)

- A field survey was used to determine the size, type and length of secondary and service conductors used to serve a total four hundred customers in the four categories with the largest number of customers. These include the Single Family, Multi-Family, Multi-Family with Space heat, and the 0-100 kW categories.
- The most recent annual peak load was used for customers analyzed in the four largest categories
- The category losses for the four largest categories was determined by calculating the averages of the surveyed customers

Secondary and Service Loss Models

Category	Loss Model	Configuration Diagram
SF	N/A	Survey configuration used
MF	N/A	Survey configuration used
SF_SH	6	Single Family Overhead
	7	Single Family URD
MF_SH	N/A	Survey configuration used
WH	3	Shared Secondary
	4	Service Only
0-100 kW	N/A	Survey configuration used
100-400 kW	12	Service Only
	13	Service Only
	14	Shared Secondary
400-1000 kW	15	Service Only
1-10 MW	16	Service Only
>10 MW	17	Service Only
Lighting	3	Shared Secondary
	4	Service Only

Results

The study results are listed in the Appendix 1 and 2; and are utilized in the loss allocation by category file “Ex 4.01 2012 Dist Loss factors.xlsx”.

Calculations and Supporting Documents

File	Description
Sec_Service_Losses.mdb	CYME Power Flow simulation base file
Sec_Svc_loss_results 3_27_13.xls	Power flow results for categories not field reviewed
All Customers for Field results 4_18_13.xls	Field reviewed results

Engineering Standard Practice References

5.3.6.2 – Design of Overhead Transformer, Secondary and Service Combinations
5.3.6.4 – Transformer, Buried Secondary ad Service Combination Design
5.3.8.2 – Underground Distribution Cable Selection and Application
5.3.7.1 – Standard Conductor Sizes and Application and Installation Guidelines

Power Flow Simulation Application

Cyme 5.4 revision 7

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Appendix 1 – Average Losses for Four Largest Categories

Single Family

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss %
SF-01	OH	120/240	10.44	1	150	(3) 1/C #2 AL	2.04	65	3/C #4 AL	1.40
SF-02	UG FT	120/240	6.80	1	N/A	N/A	0.00	57	3/C 4/0 AL	0.15
SF-03	OH	120/240	5.73	1	155	3/C 2/0 AL	0.56	25	3/C #4 AL	0.28
SF-04	UG FT	120/240	5.44	1	N/A	N/A	0.00	85	3/C 1/0 AL	0.29
SF-05	UG FT	120/240	4.53	1	137	2/C 4/0 Al w/ 1/C 2/0 Neut	0.24	135	3/C 1/0 CU	0.31
SF-06	OH	120/240	5.83	1	100	1/C #4 CU	1.19	75	1/C #4 CU	0.90
SF-07	OH	120/240	5.71	1	236	3/C 2/0 AL	0.86	80	3/C 1/0 AL	0.37
SF-08	OH	120/240	3.34	1	300	3/C 266 AL	0.30	40	3/C 1/0 AL	0.09
SF-09	OH	120/240	5.75	1	111	3/C 266 AL	0.18	40	3/C #4 CU	0.42
SF-10	OH	120/240	5.24	3	N/A	N/A	0.00	50	4/C 266 AL	0.04
SF-11	OH	120/240	10.07	1	132	3/C 4/0 AL	0.53	132	3/C 4/0 AL	0.53
SF-12	OH	120/240	1.92	1	166	3/C #4 AL and 4/0 CU & 1/0 CU Neut	0.63	19	3/C #2 CU	0.05
SF-13	OH	120/240	5.91	1	120	1 - 3/C 266 AL	0.22	72	1 - 3/C 4/0 AL	0.17
SF-14	OH	120/240	8.76	1	357	1-3/C 266 AL (273') & 1 -3/C #4 AL (86')	2.29	10	1 - 3/C #2 CU	0.11
SF-15	OH	120/240	12.20	3	180	1 - 4/C 4/0 AL (80') & 1 - 4/C 266 AL (100')	0.38	80	1 - 4/C 4/0 AL	0.19
SF-16	OH	120/240	9.96	1	226	1- 3/C 266 AL	0.55	170	1 -3/C 4/0 AL	0.10
SF-17	UG	120/240	7.60	1	N/A	N/A	0.00	120	1 - 4/C 3/0 AL	0.45
SF-18	OH	120/240	5.26	1	133	1-2/C 1/0 AL	0.71	25	3/C 1/0 AL	0.67
SF-19	OH	120/240	8.90	1	284	3/C 1/0 AL & 3/C #6 CU	3.07	10	3/C 1/0 AL	0.18
SF-20	UG	120/240	10.93	1	N/A	N/A	0.00	75	2 Sets 1/C 500 CU	0.09
SF-21	UG	120/240	5.84	1	N/A	N/A	2.04	150	2 - 3/0 AL w/ 1/0 Neut	0.43
SF-22	OH	120/240	3.57	1	65	4 STR AL 3/C SDC	0.39	12	3 STR CU 3/C	0.03
SF-23	OH	120/240	6.71	1	10	1/0 CU TRANS LEAD 5' & 4 SOL CU LSM 5'	0.06	135	3/c 4 SOL AL SD	1.01
SF-24	OH	120/240	5.63	1	5	1 set 3/C 1/0 AL	0.02	12	1 3 WIRE 1/0 CU	0.04
SF-25	OH	120/240	9.51	3	126	1/0 CU TRANS LEADS 6',	0.168	20	3/0 CU 4 1/C	0.03

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss %
						266 AL QUAD 120'				
SF-26	OH	120/240	3.47	1	368	5' of 3/C 1/0 CU, then 277' 3/C 266 AL, then 86' of 3/C #4 AL	0.78	15	3/C #2 CU	0.03
SF-27	OH	120/240	11.91	1	35	1/0 STRD CU TRANS LEADS 5', 3/C 4/0 AL 30'	0.15	160	UG RACEWAY	0.94
SF-28	OH	120/240	5.68	1	3	1 3/C 1/0 STRD CU	0.01	25	2 SETS 3/C 2/0 STRD AL	0.04
SF-29	OH	120/240	7.05	1	140	1 3/C NO 4 SOL AL 134', 1 3/C 1/0 STR CU A TAPS 6'	1.63	10	1 3/C 2 STR CU	0.06
SF-30	OH	120/240	4.07	1	324	3/C 1/0 STRD CU A TAPS 4', 3/C 266 STRD AL 130', 3/C 1/0 STRD AL 80', 3/C #4 SOL AL SD 110'	1.2	10	1 3/C 2 STR CU	0.02
SF-31	UG	120/240	11.33	1	250	1 SET 3/C 250 CU	0.16	92	1 SET 3/C 250 CU	0.23
SF-32	OH	120/240	4.41	1	45	4 STR AL 3/C SDC	0.34	12	3 STR CU 3/C	0.05
SF-33	OH	120/240	4.23	1	40	1 3/C NO 4 AL SD 30', 2 2/C 250 STRD CU A TAPS 10'	0.24	30	1 3/C 2 STRD CU RANGE CABLE	0.09
SF-34	OH	120/240	7.20	1	70	1 3/C NO 4 SOL AL	0.83	15	1 3/C 2 STRD CU	0.08
SF-35	OH	120/240	0.93 & (1.97)	1	85	3/C 1/0 STRD CU A TAPS 15', 1 3/C NO 4 AL SD 70'	0.38	30	1 3/C 2 STRD CU	0.07
SF-36	OH	120/240	8.4	1	249	1 3/C 4/0 STRD AL 173', 1 3/C 1/0 STRD AL 76'	1.84	13	1 3/C 3/0 STRD CU	0.25
SF-37	OH	120/240	6.71	1	199	2/C 250 STRD CU A TAPS 10', 1 4/C 266 STRD AL 104', 1 3/C NO 4 SOL AL SD 85'	1.19	15	1 3/C 2 STRD CU	1.01
SF-38	OH	120/240	3.64	1	199	2/C 250 STRD CU A TAPS 10', 1 4/C 266 STRD AL 104', 1 3/C NO 4 SOL AL SD 85'	.63	15	1 3/C 2 STRD CU	0.03
SF-39	OH	120/240	0.5	3	45	4/C AL SDC	0.00	25	3/0 4/C CU	0
SF-40	UG	120/240	6.9	1	155	6 SETS 2-1/C 4/0 AL & 1/C 2/0 AL	0.07	130	1 SET 2 - 1/C 4/0 AL & 1/C 2/0 AL	0.35
SF-41	OH	120/240	0.97	1	236	2 STRD CU TRANS LEADS 6', 2/0 3/C AL 230'	0.103	95	#4 SOL 3/C AL 77', 2/0 3/C RISER 18'	0.1
SF-42	UG	120/240	10.83	1	N/A	N/A	0.00	145	1 SET 3 1/C #6 CU	4.57
SF-43	OH	120/240	7.43	1	240	650 SOLID CU LSM 96', 2/0 3/C AL 144'	0.087	63	1/0 3/C AL SDC 53', 3/0 3/C CU	0.32

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss %
									CUST RISER 10'	
SF-44	UG	120/240	5.85	1	10	4 SETS 2 1/C 3/0 AL	0.00	95	1 SET 2 1/C 3/0 AL	0.27
SF-45	OH	120/240	4.59	1	330	2/0 3/C AL	0.96	110	4 SOL 3/C AL 98', 2 STRD CU 3/C 12'	0.81
SF-46	OH	120/240	9.55	1	384	2/0 3/C AL LSM	2.26	115	1/0 3/C AL 100', 3/0 3C CU 15'	0.79
SF-47	UG	120/240	4.8	1	180	1 SET 3/C #4 SOL AL w 6 SOL CU neu	1.69	180	1 SET 3/C #2 STRD CU w #2 STRD CU neu	0.61
SF-48	UG	120/240	14.42	1 & 3	N/A	N/A	0.00	5	1 - 4/C 3/0 w/ 2/0 Neut AL & 1 - 2/C 3/0 AL	0.04
SF-49	OH	120/240	1.49 & (.74)	1	5	1 set 3/C 1/0 AL	0.00	75	2 str CU 1 set 3 1/C	0.13
SF-50	OH	120/240	6.39 & (.64)	1	130	1 SET 3/C 266 AL w 3/0 +/-	0.28	110	1 SET 3/C 1/0 AL w #2+/-	0.61
SF-51	OH	120/240	4.58	1	77	266 TRIPLEX AL	0.11	10	1 SET 3 STR CU	0.04
SF-52	OH	120/240	6.50	1	3	1 SET 3/C - 4/0 AL & 2/0 N	0.00	90	1 SET 3/C - 3/0 AL & 1/0 N	0.25
SF-53	OH	120/240	0.12	1	N/A	N/A	0.00	120	1 SET 3/C #4 SOL AL w 6 STRD AL neu	0
SF-54	OH	120/240	4.39 & (11.71)	3	100	4/C 266 AL w 4/0 neu	0.11	50	1/C 500 CU	0.11
SF-55	OH	120/240	10.88	1	TRANSFORMER ON SAME POLE	1 SET 3/C 266 AL w 3/0 +/-	0.00	95	1 ST 3/C 3/0 AL w 1/0 NEUT	0.44
SF-56	OH	120/240	11.08	1	160	1 SET 3/C 266 AL w 3/0 +/-	0.51	80	1 SET 3/C 4/0 AL & 2/0 Neut	0.32
SF-57	UG	120/240	7.14	1	N/A	N/A	0.00	84	5 SETS 2-1/C 3/0 & 1/0 AL	0.06
SF-58	OH	120/240	5.78	1	179	1 3/C 1/0 AL	0.74	55	1 3/C 1/0 AL	0.23
SF-59	OH	120/240	5.64	1	73	6' of 3/C 250 CU, then 3' of 3/C 266 AL, then 64' of 3/C #4 AL	0.62	12	1 set 3/C #2 CU	0.05
SF-60	OH	120/240	2.08	1	168	3/C 1/0 STRD CU A TAPS 6', 3/C 266 STRD AL 97', 3/C #4 STRD AL SD 65'	0.288	10	3/C 2 STRD CU	0

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss %
SF-61	OH	120/240	4.95	1	176	3/C 1/0 STRD CU A TAPS 6', 3/C 266 STRD AL 110', 3/C #4 STRD AL 60'	0.71	20	3/C 2 STRD CU	0.07
SF-62	OH	120/240	6.31	1	155	1/0 CU TRANS LEAD 7', 266 TRIPLEX 90'. 1/0 3/C SERVICE DROP 58'	0.48	15	1 SET 3/C 4/0 CU	0.02
SF-63	OH	120/240	4.7	1	70	1/0 3/C AL	0.23	18	4/0 3/C CU	0.02
SF-64	UG	120/240	6.36	1	75	2 SETS - 3/C - 3/0 AL & 1/0 N	0.12	63	1 SET 3/C - 3/0 AL & 1/0 N	0.2
SF-65	OH	120/240	10.63	1	N/A	N/A	0.00	240	2 SETS 3/C - 3/0 AL	0.64
SF-66	OH	120/240	5.14	1	108	3/C 1/0 STRD CU A TAPS 8', 3/C #4 SOL AL SD 100'	0.88	10	3/C 2 STRD CU	0.04
SF-67	OH	120/240	7.29	1	210	266 TRIPLEX AL	0.43	10	3 STR CU	0.02
SF-68	UG	120/240	3.18	1	N/A	N/A	0.00	90	1 SET 3 1/C #4 STRD AL w #4 neu	0.125
SF-69	UG	120/240	12.3	1	N/A	N/A	0.00	87	1 SET 3/C 4/0 AL & 2/0 Neut	0.41
SF-70	OH	120/240	4.06	1	222	5' of 3/C 1/0 CU then 127' of 3/C 266 AL, then 90' 3/C #4 AL	0.84	10	3/C #2 CU	0.02
SF-71	OH	120/240	7.34	1	192	3/C 1/0 STRD CU A TAPS 8', 3/C 266 STRD AL 60', 3/C #4 SOL AL SD 124'	1.8	11	3/C 2 STRD CU	0.06
SF-72	OH	120/240	5.27	1	71	1 SET 3 1/C 1/0 AL w #2 AL neu	0.29	50	1 SET 3 1/C #4 STRD AL w #4 AL neu	0.48
SF-73	OH	120/240	12.11	1	90	3/C 2 STRD CU A TAPS 4', 3/C 1/0 STRD AL 86'	0.78	23	3/C 3/0 STRD CU	0.08
SF-74	OH	120/240	3.94	1	60	3/C 266 AL w 3/0 NEU	0.08	60	3/C #4 AL w #6 SOL CU neu	0.38
SF-75	UG	120/240	8.83	1	3	1 SET 3/C - 4/0 AL & 2/0 N	0.01	102	1 SET 3/C - 3/0 AL & 1/0 N	0.44
SF-76	UG	120/240	8.13	1	N/A	N/A	0.00	45	1 SET 3/C - 3/0 AL & 1/0 N	0.18
SF-77	UG	120/240	5.84 & (.86)	1	N/A	N/A	0.00	134	1 SET 3/C - 3/0 AL & 1/0 N	0.44
SF-78	OH	120/240	16.38 &	1	19	1 2/0 3/C STRD AACWR w2/0 AL neu	0.28	19	1 2/0 3/C STRD AACWR w2/0 AL	0.179

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss %
			(4.29)						neu	
SF-79	OH	120/240	7.57	1	240	1 3/C 1/0 AL w 2 AL neu	1.45	68	1 3/C 1/0 AL w 2 AL neu	0.41
SF-80	OH	120/240	1.39	1	232	10' OF 3/C 500 CU THEN 202' OF 3/C 266 AL THEN 20' OF 3/C - 1/0 AL	0.07	12	1 SET 3/C 3/0 CU	0
SF-81	UG	120/240	9.13	1	N/A	N/A	0.00	137	2 SETS 3 1/C 3/0 AL w 1/0 neu	0.31
SF-82	OH	120/240	2.27	1	150	1 SET 3/C 266 AL w 3/0 +/-	0.09	120	1 SET 3/C 4/0 AL & 2/0 Neut	0.09
SF-83	OH	120/240	9.3	1	131	266 AL w 3/0 AL neu	0.37	144	1 SET 3 1/C 4/0 UNDERGROUND CABLE w 2/0 AL neu	0.52
SF-84	OH	120/240	4.29	1	N/A	N/A	0.00	300	1/0 CU LEADS FROM TRANS, 3/0 UG AL SERVOCE TO RACEWAY	0.63
SF-85	UG	120/240	10.25	1	N/A	N/A	0.00	70	2 SETS 3/C - 3/0 AL & 1/0 N	0.18
SF-86	OH	120/240	10.08	1	308	3/C 4/0 STRD CU A TAPS 8, 3/C 2/0 STRD AL 245', 3/C 1/0 STRD AL SD 55'	1.587	10	3/C 3/0 STRD CU	0.029
SF-87	OH	120/240	8.93	1	250	1 SET 3 1/C #4CU	2.49	65	1 SET 3 1/C #4 STRD AL w #$ AL neu	1.05
SF-88	OH	120/240	7.66	1	52	1/0 3/C AL	0.29	12	3 STR CU	0.07
SF-89	OH	120/240	4.12	1	93	1 SET 3/0 AL	0.17	8	1 SET 3/C #6 CU	0.1
SF-90	UG	120/240	13.78	1	2	4 SETS 3/C 3/0 AL& 2/0 AL NEUT & 1 SET 2/C #6 STREET LIGHT	0.00	125	1 SET 3/C 3/0 AL& 2/0 AL Neut	0.78
SF-91	UG	120/240	11.97	1 & 3	N/A	N/A	0.00	8	1 - 4/C 350 & 4/0 NEUT AL & 1 - 2/C 350 AL	0.03
SF-92	OH	120/240	8.04	1	TRANSFORMER ON SAME POLE	1 SET 3/C 266 AL w 3/0 +/-	0.00	63	1 SET 3/C 1/0 AL w #2+/-	0.149
SF-93	OH	120/240	5.46	1	272	3/C 1/0 STRD CU A TAPS	0.46	150	3/C 4/0 STRD AL	0.32

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss %
						6', 3/C 266 STRD AL 266'			URD	
SF-94	OH	120/240	5.38	1	5	2 SETS 3 1/C 4/0 AL w 2/0 neu	0.00	249	1 SET 3 1/C 4/0 AL w 2/0 neu	0.48
SF-95	OH	120/240	4.51	1	72	1/0 3/C SDC	0.243	112	4/0 3/C AL UG 112	0.177
SF-96	UG	120/240	5.55	1	72	1 SET 3/C 3/0 AL & 1/0 N	0.2	54	1 SET 3/C - 3/0 AL & 1/0 N	0.14
SF-97	OH	120/240	5.36	1	417	5' of 3/C 250 CU, then 302' of 3/C 266 AL, then 110' of 3/C #4 AL	1.6	10	1 set 3/C #6 CU	0.09
SF-98	UG	120/240	7.75	1	165	1 SET 3/C 4/0 AL & 2/0 N	0.5	109	1 SET 3/C 3/0 AL & 1/0 N	0.41
SF-99	OH	120/240	4.16	1	184	10' of 2 sets of 2/C 1/0 CU & 1/0 N, then 174' 3/C 266 AL	0.22	104	3/C - 4/0 AL URD	0.17
SF-100	OH	120/240	8.68	1	7	250 CU stranded to 266 AL triplex	0.02	70	4/0 1 set 3 1/c	0.22
SF-101	UG	120/240	4.05	1	N/A	N/A	0.00	65	6 SETS 2 1/C 3/0 AL w 6 SETS 1 1/C 1/0 AL neu	0.02
						Average Secondary Losses	0.50		Average Service Losses	0.31

Multi-Family

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss%
MF-01	UG FT	120/240	4.58	1	N/A	N/A	0.00	100	2/C 350 AL w/ 1/C 4/0 Neut	0.13
MF-02	Hi Rise	120/240	0.66	3	N/A	N/A	0.00	60	2-4/C 750 CU XLP	0.00
MF-03	UG FT	120/240	4.33	1	N/A	N/A	0.00	80	2 sets (2)350 ALW/ 1/0 Neut	0.05
MF-04	UG FT	120/240	3.27	1	N/A	N/A	0.00	12	2/C 3/0 AL w/ 1/C 1/0 Neut	0.00
MF-05	OH	120/240	5.37	1	96	3/C 266 AL	0.17	45	3/C 1/0 AL	0.19
MF-06	OH	120/240	7.28	1	N/A	N/A	0.00	45	3/C 1/0 AL	0.26
MF-07	UG FT	120/240 D	4.49	1	N/A	N/A	0.00	161	3-3/C 4/0 AL	0.29
MF-08	UG Rad	120/240 D	0.30	3	N/A	N/A	0.00	25	3/C 650 CU	0.00
MF-09	UG FT	120/240	3.79	1	N/A	N/A	0.00	20	3/C 4/0 AL	0.05
MF-10	OH	120/240	2.14	1	N/A	N/A	0.00	58	3/C 1/0 AL	0.09
MF-11	OH	120/240	6.64	1	356	1-3/C 1/0 AL (164') & 1 - 3/C 266 AL (192')	1.28	17	1-3/C 500 CU	0.06
MF-12	UG	120/240	5.38	1	N/A	N/A	0.00	60	2 Sets 1/C 4/0 AL	0.07
MF-13	UG	120/240	2.13	1	N/A	N/A	0.00	60	2 Sets 1/C 350 AL	0.05
MF-14	OH	120/240	4.72	1	186	3/C #4 AL & 3/C 1/0 CU	1.17	25	3/C #6 CU	0.40
MF-15	Hi-Rise	120/240	0.32	1	N/A	N/A	0.00	15	1-3/C 500 CU	0.00
MF-16	UG	120/208	4.00	3	N/A	N/A	0.00	75	2 Sets 4 - 1/C 500 CU	0.00
MF-17	OH	120/240	2.22	1	120	1 -3/C 1/0 AL	0.23	12	1-3/C 1/0 AL	0.00
MF-18	OH	120/240	2.24	1	251	1-3/C #4 AL (66') & 1-3/C 266 AL (185')	0.45	15	1-3/C 3/0 CU	0.00
MF-19	UG	120/240	4.33	1	N/A	N/A	0.00	120	2 Sets 1/C 350 AL	0.21
MF-20	UG FT	120/240	4.33	1	N/A	N/A	0.00	80	2 sets (2)350 ALW/ 1/0 Neut	0.05
MF-21	OH	120/240	0.25 & (8.04)	1	213	1 SET 3/C 266 AL w 3/0 neu	0.55	75	1 SET 3/C #4 SOL AL w 6 STRD AL neu	1.25
MF-22	UG	120/208	0.99 & (22.32)	3	N/A	N/A	0.00	250	3 sets 4 wire 500 CU 4/C, Neu is 500 CU	0.15
MF-23	UG	120/240	0.06 & (10.19)	1	N/A	N/A	0.00	7	3 SETS 3 1/C 3/0 AL, 1 SET TO ADDRESS	0.1
MF-24	UG	120/208	3.29	3	N/A	N/A	0.00	60	2 SETS 4/C 500 CU	0.11

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss%
MF-25	UG	120/240	4.11	1	111	3 SETS 3 1/C 4/0	0.05	29	1 SET 3 1/C 4/0	0.05
MF-26	OH	120/240	5.20 & (4.36)	1	352	1 3/C 1/0 STRD AL SD 65', 1 3/C 1/0 SOL CU 275', 4/C 250 STRD CU A TAPS 12'	0.7	35	1 3/C 3/0 STRD CU	0.05
MF-27	OH	120/240	4.57 & (0.0)	1	88	3 SETSS 2/C 250 STRD CU w 1/C 1/0 STRD AL A TAPS 15', 1 4/C 266 STRD AL 33', 1 3/C 1/0 STRD SD 40'	0.175	30	1 3/C 3/0 STRD CU	0.043
MF-28	OH	120/240	2.46 & (5.89)	3	198	3 1/C #2 STRD CU w1 1/C #4 SOLID CU neu	0.59	40	1 SET 3/C #4 AL w 650L CU neu	0.3
MF-29	OH	120/240	5.07 & (4.03)	1	130	1 SET 3 1/C 1/0 STRD AL w 1/0 neu	0.92	40	1 SET 3 1/C 1/0 STRD AL w 1/0 neu	0.28
MF-30	OH	120/240	0.46 & (3.07)	1	420	1 SET 3/C 266 AL w 3/0 neu	0.45	51	1 SET 3/C #4 SOL AL w 6 STRD AL neu	0.37
MF-31	UG	120/240	5.52 & (15.98)	1	N/A	N/A	0.00	85	4 SETS 3 1/C 350 AL w 4/0 neu, 2 sets going to 559 Ginger, 2sets going to 560 Ginger	0.11
MF-32	OH	120/240	1.44 & (.02 for 09 & 11, 2.65 for 01 & 60)	1	197	3/C 250 STRD CU A TAPS 6', 3/C 266 STRD AL 95', 3/C 2 STRD CU 46', 3/C 1/0 STRD AL SD 10'`	0.22	30' FRONT OF BUILDIN G, 56' REAR OF BUILDIN G	1 3/C 2 STRD CU RANGE CABLE TO METER 487, 1 3/C 2 STRD CU RANGE CABLE TO METER 301 & 260	0.27
MF-33	UG	120/240	3.48	1	N/A	N/A	0.00	25	1 SET 4/0 3/C w 2/O NEUTRAL AL	0.03
MF-34	OH	120/240	2.10 & (6.59)	1	N/A	N/A	0.00	80	1 set 3/C #4 AL w 6 strd AL neu	1.23
MF-35	OH	120/240	0.38	1	35	10' of 2/C 500 CU & 1/C 1/0 THEN 25' 3/C 266 AL	0.00	30	2 SETS 3/C 4/0 CU	0.00
MF-36	UG	120/240	4.71 & (12.78)	1	155	3 SETS 2 - 1/C 350 AL & 3 SETS 1/C 4/0 AL	0.14	140	1 SET 3 - 1/C 4/0 AL	0.96
MF-37	OH	120/240	3.16 &	1	N/A	N/A	0.00	50	1 4/C 4/0 AL w 4/0 AL	0.7

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss%
			(35.84)						neu	
MF-38	Network	120/240	1.89 & (6.90)	1	N/A	N/A	0.00	15	4 SETS 3 1/C 750 CU TO BUS BAR	0.00
MF-39	OH	120/240	1.32 & (3.88)	1	100	3 1/C 2 STRD CU w 2 STRD CU neu	0.37	100	1 SET 3/C #4 SOL AL w 6 STRD AL neu	0.94
MF-40	UG	120/240	1.12 & (15.40)	1	N/A	N/A	0.00	83	4 SETS 3 1/C 3/0, 1 SET TO ADDRESS	0.108
MF-41	OH	120/240	2.53 & (.82)	1	204	1 SET 3/C 266 AL w 3/0 neu	0.21	70	1 SET 3/C #4 SOL AL w 6 STRD AL neu	0.48
MF-42	UG	120/208	2.03 & (6.38)	3	N/A	N/A	0.00	4 east 190'	4 SETS 4 1/C 500 CU, 1 SET 3 1/C 350 CU & 1 SET 1 1/C 1/0 CU neu	0.05
MF-43	OH	120/240	0.43 & (1.59)	1	N/A	N/A	0.00	15	3 1/C #6 SOL CU w 6 SOL CU neu	0.049
MF-44	UG	120/240	3.49 & (33.51 est)	1	N/A	N/A	0.00	20	1 SET 3 1/C 500 CU	0.09
MF-45	OH	120/240	1.82 & (.89)	1	96	3 1/C #2 SOL CU w 2 SOL CU neu	0.07	60	1 3/C #4 SOL AL w 6 STRD AL neu	0.31
MF-46	UG	120/240	3.28 & (20.05)	1	N/A	N/A	0.00	85	4 SETS 3 1/C 350 AL w 4/0 neu, 2 sets going to 559 Ginger, 2sets going to 560 Ginger	0.25
MF-47	UG	120/240	3.64 & (14.88)	1	155	3 SETS 2 - 1/C 350 AL & 3 SETS 1/C 4/0 AL	0.24	140	1 SET 3 - 1/C 4/0 AL	1.04
MF-48	OH	120/240	1.00 & (4.34)	3	180	1 set 4/C 266 AL & 4/0 +/- AL	0.131	30	1 SET 3/C #4 STRD AL w #6 STRD AL neu	0.037
MF-49	OH	120/240	4.91	1	60	1 3/C 1/0 STR AL SD 50', 1 3/C 1/0 STR CU A TAPS 10'	0.2	20	1 3/C 3/0 STR CU	0.03
MF-50	OH	120/240	0.94 & (3.76 est)	1	N/A	N/A	0.00	37	1 SET 3 1/C 1/0 AL w #2 STRD AL neu	0.126
MF-51	OH	120/240	3.72 & (16.28)	1	N/A	N/A	0.00	21	1 SET 3 1/C 1/0 STRD AL w #2 neu	0.33
MF-52	OH	120/240	2.78 & (2.89)	1	96	3/C 266 AL w/ 3/0 AL+/-	0.18	75	3/C #2 STRD AL	0.49

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss%
MF-53	UG	120/240	5.39	1	N/A	N/A	0.00	70	1 SET 4/0 3/C w 2/O NEUTRAL AL	0.2
MF-54	UG	120/240	2.7 & (20.3 est)	1	N/A	N/A	0.00	60	1 SET 3/0 3/C AL	0.68
MF-55	UG	120/240	5.64 & (4.26)	1	2	6 SETS 3 1/C 3/0 AL	0.00	62	4 SETS 3 1/C 3/0 AL, 1 SET TO ADDRESS	0.07
MF-56	Network	120/240	1.78 & (6.72)	1	N/A	N/A	0.00	15	4 SETS 4 1/C 500 CU	0.00
MF-57	UG	120/240	3.06 & (12.19)	1	N/A	N/A	0.00	70	1 SET 2 1/C 4/0 AL w 1 SET 1 1/C 2/0 AL (neu)	0.38
MF-58	UG	120/208	2.78 & (15.10)	3	N/A	N/A	0.00	150	2 SETS 4/C 500 CU	0.05
MF-59	OH	120/240	5.24 & (3.08)	1	170	2/C 250 STRD CU w1/C 1/0 STRD CU neu 8', 3/C 266 STRD AL 92', 3/C 4 SOL AL SD 70'	1.43	35	3/C 2 STRD AL RANGE CABLE	0.37
MF-60	OH	120/240	2.21 & (3.05)	1	90	3 1/c 2 2strd cu w/ 1 4 sol cu neu	0.34	60	1 SET 3/C #4 STRD AL\ w 6 STRD AL neu	0.53
MF-61	OH	120/240	4.61 & (6.36)	3	80	4 1/C #2 SOL CU w 2 SOL CU neu	0.62	42	1 SET 3/C 1/0 AL w #2 STRD AL neu	0.33
MF-62	OH	120/240	1.71 & (8.92)	1	290	3/C 250 STRD CU A Taps & 1/C 1/0 STRD HIGH SIDE 10', 3/C NO 6 SOL CU OPEN WIRE PSM 40', 3/C 1/0 SOL CU OPEN WIRE LSM 40', 1 4/C 2/0 STRD AL 130', 1 3/C 1/0 STRD AL SD 70'	2.23	25	1 3/C 3/0 STRD CU	0.084
MF-63	OH	120/240	6.21 & (3.83)	1	108	3/C 250 STRD CU A TAPS 10', 3/C 1/0 STRD AL SD 13', 3/C 2 STRD CU 55', 3/C 1/0 STRD AL SD 40'`	0.85	20	3/C 3/0 STRD CU	0.06
MF-64	OH	120/240	2.13 & (2.16)	1	275	2 SETS 2/C 250 STRD CU A TAPS 15', 1 4/C 266 STRD AL 220', 1 3/C 1/0 STRD AL SD 40'	0.43	30	1 3/C 3/0 STRD CU	0.04

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss%
MF-65	UG	120/208	3.54	3	N/A	N/A	0.00	10	3 SETS 4 1/C 500 CU	0.00
MF-66	OH	120/240	3.79 & (22.57)	3	N/A	N/A	0.00	45	1 SET 3/C 266 AL w 3/0 neu	0.37
MF-67	OH	120/240	4.52 & (.59)	1	105	4/C 266 AL w 4/0 neu	0.06	84	3/C 1/0 AL w 2 STRD neu	0.12
MF-68	OH	120/240	3.47 & (7.60)	1	135	1 3/C 4/0 AL w 1/0 AL neu	0.542	45	1 3/C 4/0 AL w 1/0 AL neu	0.18
MF-69	UG	120/240	6.04	1	N/A	N/A	0.00	15	3 sets 2 1/C 350 AL	0.01
MF-70	UG	120/240	2.97 & (21.0)	1	N/A	N/A	0.00	37	2 SETS 3 1/C 350 AL	0.11
MF-71	UG	120/240	2.31 & (15.98)	1	N/A	N/A	0.00	85	4 SETS 3 1/C 350 AL w 4/0 neu, 2 sets going to 559 Ginger, 2sets going to 560 Ginger	0.092
MF-72	UG	120/240	3.80 & (40.2 est)	1	N/A	N/A	0.00	30	2 SETS 3 1/C 500 CU	0.08
MF-73	UG	120/240	2.34 & (15.98)	1	N/A	N/A	0.00	85	4 SETS 3 1/C 350 AL w 4/0 neu, 2 sets going to 559 Ginger, 2sets going to 560 Ginger	0.19
MF-74	OH	120/240	5.38 & (33.62)	3	60	60 2 SETS 3/C 266 AL w 3/0 neu	0.18	60	1 SET 3/C 266 AL w 3/0 neu	0.36
MF-75	UG	120/240	3.02 & (10.35)	1	N/A	N/A	0.00	80	4 SETS 2 - 1/C 4/0 AL & 4 SETS 1/C 2/0 AL	0.1
MF-76	OH	120/240	2.07 & (4.37)	1	240	3/C 250 STRD CU A TAPS 10', 3/C 4/0 STRD AL 170', 3/C 1/0 STRD AL SD 60'	0.71	22	3/C 3/0 STRD CU	0.05
MF-77	UG	120/240	2.86 & (7.42)	1	N/A	N/A	0.00	10	1 SET 3/C 3/0 AL	0.05
MF-78	OH	120/240	4.43 & (4.73 est)	1	181	6' of 3/C 1/0 CU THEN 70' of 3/C #6 CU THEN 105' of 266 AL	1.45	35	1 SET 3/C - 1/0 CU	0.14
MF-79	UG	120/240	2.59	1	N/A	N/A	0.00	52	3 SETS 3 1/C 4/0 AL w 2/0 AL neu	0.00
MF-80	OH	120/240	2.25 &	1	231	1 SET 3/C 266 AL w 3/0	0.18	60	1 SET 3/C 1/0 AL w	0.09

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss%
			(3.35)			neu			#2 STRD AL neu	
MF-81	OH	120/240	1.28 & (8.49)	1	114	1 SET 3/C 266 AL w 3/0 neu	0.32	35	1 SET 3/C 1/0 AL w 2 STRD NEU	0.25
MF-82	OH	120/240	5.08 & (5.59)	1	N/A	N/A	0.00	60	1 SET 3/C 266 AL w 3/0 neu	0.187
MF-83	OH	120/240	3.22 & (4.72)	1	45	3 1/c #2 sol cu W #2 sol cu NEU	0.25	70	1 SET 3/C 1/0 AL w #2 STRD AL neu	0.4
MF-84	UG	120/240	2.70 & (22.3)	1	N/A	N/A	0.00	65	8 SETS 3/0 AL w 8 SETS 1/0 AL neu	0.1
MF-85	OH	120/240	3.38 & (0.0)	1	70	1 3/C NO 4 AL SD	0.088	35	3/C 2 STRD CU	0.029
MF-86	UG	120/240	7.22 & (11.9)	1	50	1 set 1/C 350 AL w 1/C 4/0 neu	0.23	45	2 1/C 1/0 AL w 1 1/C #2 NEU	0.67
MF-87	OH	120/240	8.18 & (2.74)	1	141	3/C 250 STRD CU A TAPS 10', 3/C 4/0 STRD AL 81', 3/C 1/0 STRS AL SD 50'	0.79	25	3/C 3/0 STRD CU	0.09
MF-88	UG	120/240	3.42 & (24.72)	1	N/A	N/A	0.00	100	1 SET 350 AL w 4/0 neu 3/C AL	0.685
MF-89	OH	120/240	4.58 & (2.74)	1	141	3/C 250 STRD CU A TAPS 10', 3/C 4/0 STRD AL 81', 3/C 1/0 STRS AL SD 50'	0.57	25	3/C 3/0 STRD CU	0.05
MF-90	UG	120/240	3.88 & (15.98)	1	N/A	N/A	0.00	85	4 SETS 3 1/C 350 AL w 4/0 neu, 2 sets going to 559 Ginger, 2sets going to 560 Ginger	0.2
MF-91	UG	120/208	3.11 & (92.89)	3	N/A	N/A	0.00	210	3 SETS 350 CU w 350 CU 4/C neu	2.24
MF-92	OH	120/240	1.37 & (2.16)	1	310	3/C 250 STRD CU A TAPS 10', 3/C 1/0 SOL CU 230', 3/C NO 4 SOL AL SD 70'	0.88	12	1 3/C 2 STRD AL	0.05
MF-93	OH	120/240	1.15 & (73.05)	3	156	1 set 4/C 266 AL & 4/0 +/- AL	3.88	30	1 set 4/C 266 AL & 4/0 +/- AL	0.75
MF-94	OH	120/240	4.04 & (6.19)	1	75	1 SET 3/C 2/0 STRD AACWR w 1/0 neu AL	0.00	75	1 SET 3/C 2/0 STRD AACWR w 1/0 neu AL	0.48
MF-95	UG	120/240	0.63 &	1	N/A	N/A	0.00	40	2 SETS 2-1/C 3/0 AL	0.06

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss%
			(10.08)						& 2 SETS 1/C 1/0 AL	
MF-96	OH	120/240	4.29 & (7.48)	1	193	1 4/C 266 STRD AL 113', 2 SETS 250 STRD CU A TAPS 10', 1 3/C 3/0 STRD CU 70'	0.31	25	1 3/C 3/0 STRD CU	0.04
MF-97	OH	120/240	1.26 & (3.92)	1	162	1 set 4/C 266 AL & 4/0 +/- AL	0.23	15	1 SET 3/C 1/0 AL w #2 STRD AL neu	0.06
MF-98	OH	120/240	0.14 & (6.36)	1	203	2 SETS 2/C 250 STRD CU A TAPS 10', 3/C 4/0 STRD AL 157'. 3/C 1/0 STRD AL SD 45'	0.58	55	3/C 3/0 STRD CU	0.11
MF-99	UG	120/240	5.81 & (12.75)	1	155	3 SETS 2 - 1/C 350 AL & 3 SETS 1/C 4/0 AL	0.24	140	1 SET 3 - 1/C 4/0 AL	1.04
MF-100	OH	120/240	1.60 & (.10)	1	105	4/C 266 AL w 4/0 neu	0.058	84	3/C 1/0 AL w 2 STRD neu	0.117
MF-101	OH	120/240	1.41 & (3.37)	1	183	1 3/C NO 4 AL SD 70', 1 3/C 266 AL 103', 1 3/C 250 STRD CU ATAPS 10'	0.78	15	1 3/C 2 STRD CU	0.05
MF-102	Vault	120/208	1.09 & (14.93)	3	N/A	N/A	0.00	10	2 SETS 3 1/C 350 CU	0.068
MF-103	UG	120/240	2.97 & (20.1)	1	N/A	N/A	0.00	37	2 SETS 3 1/C 350 AL	0.1
						Average	0.26		Average	0.24

Multifamily with Space Heat

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	% Svc Loss
MFSH-01	UG FT	120/240	15.27	1	N/A	N/A	0.00	161	3/C 4/0 AL	1.05
MFSH-02	UG FT	120/240	5.98	1	N/A	N/A	0.00	15	4-4/C 500 CU	0.00
MFSH-03	UG FT	120/240	10.56	1	N/A	N/A	0.00	15	4 sets 3/C 4/0 AL	0.03
MFSH-04	UG FT	120/208	0.21	3	N/A	N/A	0.00	15	4/C 250 CU	0.00
MFSH-05	UG FT	120/240	8.60	1	N/A	N/A	0.00	25	4 sets 3/C 4/0 AL w/ 2/0 Neut	0.02
MFSH-06	UG FT	120/240	9.51	1	N/A	N/A	0.00	65	2/C 3/0 w/1/C 1/0 Neut AL	0.33
MFSH-07	UG FT	120/208	5.38	3	N/A	N/A	0.00	30	(4) 1/C 500 CU	0.02
MFSH-08	Hi Rise	120/208	11.86	3	N/A	N/A	0.00	100	4/C 500 CU	0.10
MFSH-09	OH	120/208	3.2	3	N/A	N/A	0.00	25	3 Sets 4/C 500 CU	0.03
MFSH-10	UG	120/208	5.49	3	N/A	N/A	0.00	30	3 Sets 4 - 1/C 500 CU	0.00
MFSH-11	UG	120/208	6.9	3	N/A	N/A	0.00	50	2 Sets 4 - 1/C 350 AL & 1 Set 4 - 1/C 4/0 AL	0.03
MFSH-12	UG	120/208	4.95	3	N/A	N/A	0.00	30	4 - 1/C 500 CU	0.00
MFSH-13	UG	120/208	4.21	3	N/A	N/A	0.00	20	3 - 4 1/C 250 CU	0.00
MFSH-14	Hi-Rise	120/208	6.1	3	N/A	N/A	0.00	25	8 Sets - 4 - 1/C 250 CU	0.00
MFSH-15	Hi-Rise	120/208	4.74	3	N/A	N/A	0.00	20	1 Set - 4-1/C 750 CU	0.00
MFSH-16	UG	120/208	7.46	3	N/A	N/A	0.00	25	2 Sets 4/C 500CU	0.01
MFSH-17	UG	120/240	6.08	1	N/A	N/A	0.00	115	3 Sets - 3/C 4/0 AL	0.15
MFSH-18	Hi-Rise	120/208	15.12	3	N/A	N/A	0.00	20	2 Set 4 -1/C 750 CU & 4 Sets 4 -1/C 500 CU	0.01
MFSH-19	Hi-Rise	120/208	8.14	3	N/A	N/A	0.00	20	2 Sets - 4 1/C 500 CU	0.01
MFSH-20	Network	120/240	13.65 & (280 est)	1	N/A	N/A	0.00	15	3 SETS 1 1/C 500CU TO BUS BAR	0.12
MFSH-21	Hi-Rise	120/240	4.95 & (24.75)	1	N/A	N/A	0.00	5' to bus bar	7 sets 3 1/c 500 cu connected to bus bar	0.00
MFSH-22	UG	120/208	11.97 & (32.98)	3	N/A	N/A	0.00	to basement 30', 2nd floor 45', 3rd floor	8 sets 4 1/C 500 CU, 1 SET3 1/C 1/0 CU (hot), 1 SET 1 1/C #6 CU(neut)	0.16

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	% Svc Loss
								60', 4th floor 75', 5th floor 90', 6th floor 105'		
MFSH-23	UG	120/240	7.2 & (19.21)	1	N/A	N/A	0.00	35	1 SET 2/C 4/0 AL & 1/C 2/0 AL	0.39
MFSH-24	Hi-Rise	120/240	10.36 & (5.3)	1	N/A	N/A	0.00	15	4 SETS 3 1/C 250 CU	0.01
MFSH-25	Hi-Rise	120/208	6.05 & (18.24)	3	N/A	N/A	0.00	15	4 SETS 3 1/C 250 CU	0.01
MFSH-26	UG	120/208	22.03 & (55.97 est)	3	N/A	N/A	0.00	20	2 SETS 4 - 1/C 500 CU & 1 SET 2 -1/C #6 CU	0.13
MFSH-27	UG	120/208	3.18 & (82.06)	3	N/A	N/A	0.00	240	5 SETS 4-1/C 500 CU	0.34
MFSH-28	UG	120/240	11.45 & (41.55)	1	N/A	N/A	0.00	50	2 SETS 3/C 250 CU w 250 CU neu	0.31
MFSH-29	UG	120/208	4.88	3	N/A	N/A	0.00	20	5 SETS 4-1/C 500 CU & 1 SET 1/C 3/0 CU	0.01
MFSH-30	Hi-Rise	120/240	11.95 & (86.27)	3	40	4 SETS 500 MCM CU	0.06	40	500 CU	0.06
MFSH-31	UG	120/208	5.39 & (37.35)	3	N/A	3 SETS 4/C 2-500CU, 1 SET 3/0 CU	0.00	40	1 SET 4/C 500 CU	0.14

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	% Svc Loss
MFSH-32	UG	120/240	13.43 & (16.76)	1	N/A	N/A	0.00	60	4 SETS 3 1/C 4/0 AL w 1/0 AL neu	0.19
MFSH-33	Hi-Rise	120/208	8.28 & (64.6)	3	2	500 CU BUS	0.01	20	500 CU	0.06
MFSH-34	UG	120/240	4.26	3	N/A	N/A	0.00	27	3 SETS 4 1/C 500 CU w 500 CU neu	0.00
MFSH-35	UG	120/240	5.02 & (194 est)	3	N/A	N/A	0.00	27	3 SETS 4 1/C 500 CU w 500 CU neu	0.11
MFSH-36	UG	120/240	0.88	3	N/A	N/A	0.00	27	3 SETS 4 1/C 500 CU w 500 CU neu	0.00
MFSH-37	UG	120/240	17.68 & (20.25)	1	N/A	N/A	0.00	30	1 SET 350 3/C AL W/ 4/0 NEUTRAL AL	0.29
MFSH-38	UG	120/240	1.51 & (7.66)	1	N/A	N/A	0.00	55	4 SETS 3 1/C 250 CU	0.03
MFSH-39	Hi-Rise	120/240	2.66 / 14.20 & (55.1)	3	40	4 SETS 500 MCM CU	0.09	40	500 CU	0.09
MFSH-40	UG	120/240	6.88 & (23.04)	1	N/A	N/A	0.00	44	1 SET 350 AL	0.34
MFSH-41	UG	120/208	9.18 & (170.92)	3	N/A	N/A	0.00	30	4 sets 4 1/C 500 CU, 1 set 4 1/C #2 CU	0.11
MFSH-42	UG	120/240	11.52 & (38.2	1	N/A	N/A	0.00	30	2 SETS 3 1/C 250 CU	0.16

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	% Svc Loss
			9)							
MFSH-43	UG	120/208	7.09	3	N/A	N/A	0.00	55	1 SET 4-1/C 500 CU	0.07
MFSH-44	UG	120/208	12.77 & (187.33)	3	N/A	N/A	0.00	10	4 SETS 4 1/C 500 CU	0.04
MFSH-45	UG	120/208	7.69 & (40.95)	3	N/A	N/A	0.00	60	4 SETS 4/0 4/C AL W/1/0 NEUTRAL AL	0.31
MFSH-46	UG	120/240	7.39 & (1.78)	1	N/A	N/A	0.00	55	4 SETS 3 1/C 250 CU	0.03
MFSH-47	UG	120/208	7.75 & (248.25)	3	N/A	N/A	0.00	20	5 SETS 4-1/C 500 CU & 1 SET 1/C 3/0 CU	0.08
MFSH-48	Hi-Rise	120/208	22.55 & (103.77)	3	N/A	N/A	0.00	40	4 SETS 750 MCM	0.01
MFSH-49	Hi-Rise	120/240	5.91 & (55.1)	3	40	4 SETS 500 MCM CU	0.01	40	500 CU	0.01
MFSH-50	UG	120/208	6.71 & (62.31)	3	N/A	N/A	0.00	65	4 SETS 4 1/C 500 CU	0.09
MFSH-51	Network	120/240	6.18	1	N/A	N/A	0.00	5' to bus bar	7 sets 3 1/c 500 cu connected to bus bar	0.00
MFSH-52	UG	120/208	6.38	3	N/A	N/A	0.00	50	2 SETS 4 1/C 500 CU	0.01
MFSH-53	Hi-Rise	120/240	8.88 & (44.44)	1	N/A	N/A	0.00	18	2 3/C 500 CU	0.01
MFSH-54	OH	120/240	6.44 &	1	110	1 SET 3/C 266 AL w 3/0 STRD AL	0.73	180	1 SET 3/C 350 AL w 4/0 AL neu	1.18

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	% Svc Loss
			(14.32)			neu				
MFSH-55	UG	120/240	9.36 & (3.91)	1	N/A	N/A	0.00	83	2 sets 3/C - 3/0 AL & 1/0 N	0.29
MFSH-56	OH	120/240	4.35	1	125	1 3/C 4/0 STRD AL	0.21	10	1 3/C500 mcm strd cu	0.00
MFSH-57	UG	120/240	9.22 & (105.78)	1	N/A	N/A	0.00	55	2 SETS 350 w 4/0 neu	0.81
MFSH-58	Hi-Rise	120/240	13.45 & (62.07)	3	40	4 SETS 500 MCM CU	0.05	40	500 CU	0.05
MFSH-59	UG	120/240	19.83 & (14.53)	1	N/A	N/A	0.00	65	6 SETS 2 - 1/C 3/0 AL & 6 SETS 1/C 1/0 AL N	0.20
MFSH-60	Hi-Rise	120/208	8.69 & (64.6)	3	2	500 CU BUS	0.01	20	500 CU	0.06
MFSH-61	Hi-Rise	120/208	6.81 & (64.6)	3	2	500 CU BUS	0.01	20	500 CU	0.06
MFSH-62	UG	120/240	10.28 & (25.98)	1	N/A	N/A	0.00	30	1- 3/0 3/C AL w 1/0 neu AL	0.57
MFSH-63	UG	120/240	5.12 & (194 est)	3	N/A	N/A	0.00	27	3 SETS 4 1/C 500 CU w 500 CU neu	0.11
MFSH-64	UG	120/240	9.93	1	N/A	N/A	0.00	37	2 SETS (1 SET TO EACH METER) 3/C 3/0 AL & 1/0 N	0.10
MFSH-65	UG	120/208	4.41 &	3	N/A	N/A	0.00	60	6 sets 4 1/C 500 CU	0.02

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	% Svc Loss
			(22.08)							
MFSH-66	UG	120/208	5.78 & (34.22)	3	N/A	N/A	0.00	30	1 SET 4-1/C 500 CU	0.02
MFSH-67	Hi-Rise	120/240	15.19 & (137.74)	3	40	4 SETS 500 MCM CU	0.19	40	500 CU	0.19
MFSH-68	UG	120/240	8.35 & (54.53)	1	N/A	N/A	0.00	110	3 SETS 350 3/C AL w 4/0 neu	0.60
MFSH-69	UG	120/240	16.46 & (27.00)	1	N/A	N/A	0.00	3	1 SET 250 CU 250 CU NEUTRAL 3/C	0.03
MFSH-70	UG	120/240	15.46 & (20.03)	1	N/A	N/A	0.00	60	1 set 3/C 250 CU w 250 CU neu	0.50
MFSH-71	UG	120/208	5.4 & (35.1)	3	N/A	N/A	0.00	25	4 SETS 4-1/C 500 CU	0.02
MFSH-72	UG	120/208	9.77	3	N/A	N/A	0.00	25	4 SETS 4 1/C 500 CU & 1 SET 3 1/C 3/0 CU & 1 1/C #2 CU	0.01
MFSH-73	UG	120/240	4.29 & (194 est)	3	N/A	N/A	0.00	27	3 SETS 4 1/C 500 CU w 500 CU neu	0.11
MFSH-74	Hi-Rise	120/240	12.04	1	N/A	N/A	0.00	18	2 3/C 500 CU	0.01
MFSH-75	UG	120/240	5.46 & (194 est)	3	N/A	N/A	0.00	27	3 SETS 4 1/C 500 CU w 500 CU neu	0.11
MFSH-76	UG	120/208	9.17	3	N/A	N/A	0.00	15	6 SETS 4 1/C 500 CU & 1	0.01

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	% Svc Loss
			& (50.70)						SET 4 1/C 1/0 CU & 3 SETS 4 1/C 350 CU	
MFSH-77	UG	120/208	7.72 & (108.28 est)	3	N/A	N/A	0.00	25	3 SETS 4 - 1/C 500 CU	0.21
MFSH-78	UG	120/240	12.85 & (27.00)	1	N/A	N/A	0.00	35	6 SETS 2 - 1/C 350 AL & 1/C 4/0 AL	0.06
MFSH-79	UG	120/208	4.41 & (21.41)	3	N/A	N/A	0.00	60	6 sets 4 1/C 500 CU	0.02
MFSH-80	OH	120/240	7.74	1	109	1 SET 3 1/C 1/0 AL w 1/0 neu	0.70	137	1 SET 3 1/C 350 AL w 4/0 AL neu	0.27
MFSH-81	UG	120/240	17.08 & (20.35)	1	M	M	0.00	75	1 SET 2 1/C 3/0 AL	1.48
MFSH-82	UG	120/240	5.17 & (42.83 est)	1	N/A	N/A	0.00	40	1 SET 500 CU 3/C w/ 500 CU NEUTRAL	0.04
MFSH-83	UG	120/208	2.85 & (29.94)	3	N/A	N/A	0.00	7	8 4/C 600 CU	0.00
MFSH-84	UG	120/240	10.2 & (5.46)	1	N/A	N/A	0.00	100	1 SET 2 1/C 350 AL 1 SET 1 1/C 4/0 AL	0.10
MFSH-85	UG	120/240	11.69 & (12.20)	1	N/A	N/A	0.00	20	2 SETS 500 CU w 1 500 CU 3/C neu	0.06

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	% Svc Loss
MFSH-86	OH	120/240	8.25	1	113	4' of 2 sets 2/C 250 CU & 1/0 CU N, then 97' 3/C 266 AL, then 100' of 3/C 4/0 AL	0.00	2	CU Buss	0.63
MFSH-87	UG	120/208	9.39 & (17.61)	3	N/A	N/A	0.00	50	1 SET 4-1/C 500 CU	0.22
MFSH-88	UG	120/208	5.01 & (39.47)	3	N/A	N/A	0.00	200	3 SETS 500 CU 4/C w 500 CU neu	0.25
MFSH-89	UG	120/240	11.01 & (9.00)	1	N/A	N/A	0.00	11	1 SET 4/0 AL 1 SET 2/0 NEUTRAL AL 3/C	0.09
MFSH-90	UG	120/208	3.03 & (90.97 est)	3	N/A	N/A	0.00	40	2 SETS 4 - 1/C 500 CU	0.31
MFSH-91	Hi-Rise	120/240	16.8 & (55.1)	3	40	4 SETS 500 MCM CU	0.09	40	500 CU	0.09
MFSH-92	Hi-Rise	120/240	14.01 & (30.99)	1	N/A	N/A	0.00	10	2 set 3 1/c 500 cu to bus bar	0.03
MFSH-93	UG	120/208	5.3 & (82.81)	3	N/A	N/A	0.00	340	5 SETS 4-1/C 500 CU	0.44
MFSH-94	UG	120/208	4.69 & (63.78)	3	N/A	N/A	0.00	340	5 SETS 4-1/C 500 CU	0.34
MFSH-95	UG	120/240	7.97 & (5.7)	1	N/A	N/A	0.00	55	4 SETS 3 1/C 250 CU & 1 SET 3 1/C #2 CU	0.04

Cust ID	Location Type	Voltage	Peak Load (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	% Svc Loss
						Average	0.02		Average	0.16

0-100 kW

Cust ID	Location Type	Voltage	Peak (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss %
100-01	UG FT	120/208	24.28	3	N/A	N/A	0.00	10	6 sets (4) 1/C 500 CU	0.00
100-02	OH	120/240	43.90	3	N/A	N/A	0.00	10	4/C 266 AL	0.07
100-03	UG	120/208	49.72	3	N/A	N/A	0.00	60	4/C 500 CU	0.25
100-04	OH	120/240	27.90	3	N/A	N/A	0.00	100	4 sets 4/C 266 AL	0.11
100-05	OH	120/240	4.64	3	80	2 sets 4/C 266 AL	0.02	70	4 sets 4/C 266 AL & 4/C #4	0.09
100-06	OH	120/240	3.12	1 and 3	N/A	N/A	0.00	75	3/C #4 AL and 4/C #4 AL	0.26
100-07	OH	120/240	14.32	3	N/A	N/A	0.00	105	4/C 2/0 AL	0.17
100-08	OH	120/240	1.00	3	N/A	N/A	0.00	42	3/C 1/0 AL	0.00
100-09	OH	120/240	33.55	3	N/A	N/A	0.00	40	2 sets of 4/C 500 CU	0.19
100-10	UG Rad	120/240	99.60	3	N/A	N/A	0.00	10	6 sets (4) 1/C 500 CU	0.01
100-11	OH	120/240	57.20	3	50	4/C 266 AL	0.48	15	2 sets of 4/C 266 AL	0.07
100-12	OH	120/240	10.48	3	125	4/C 266 AL	0.22	15	4/C 266 AL	0.03
100-13	OH	120/240	58.64	3	N/A	N/A	0.00	15	3/C 266 AL	0.14
100-14	OH	120/240	23.88	1 and 3	323	4/C 266 AL	1.32	66 220	3/C 4/0 AL 4/C 4/0 AL	1.13
100-15	Hi Rise	480/277	6.97	3	20	2-2/C 500 CU XLP	0.00	35	3-3/C 400 CU THW	0.01
100-16	OH	120/240	4.51	3	35	4/C 250 CU	0.02	14	4/C 4/0 AL	0.02
100-17	UG	120/208	6.54	3	N/A	N/A	0.00	85	4 Sets 4 1/C 350 AL	0.03
100-18	OH	120/240	9.82	3	55	4/C 2/0 AL	0.18	65	4/C 3/0 CU	0.15
100-19	OH	120/240	18.96	1	256	3/C #4 AL, 3/C 266 AL, 3/C 266 AL	1.79	20	3/C 3/0 CU	0.19
100-20	OH	120/240	14.00	3	78	2 - 4/C 266 AL	0.09	60	3 - 4/C 500 CU	0.08
100-21	OH	120/240	13.25	1 and 3	30	3/C 1/0 AL & 4/C 1/0 AL	0.17	30	3/C 3/0 CU & 4/C 1/0 CU	0.10
100-22	OH	120/240	16.02	3	20	4/C 500 CU & 4/C 1/0 CU	0.09	30	4 - 2/C 500 CU & 1 - 4/C 1/0 CU	0.14
100-23	UG	120/240	2.68	1	N/A	N/A	0.00	120	4 Sets - 1/C 3/0 AL	0.19
100-24	UG	120/208	1.44	3	N/A	N/A	0.00	50	2 Sets 4 - 1/C 350 AL	0.00
100-25	OH	120/240	25.42	3	220 & 30	4/C 266 AL & 4/C 2/0 AL	1.20	15	4/C 4/0 CU	0.08

Cust ID	Location Type	Voltage	Peak (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss %
100-26	UG	120/208	33.90	3	N/A	N/A	0.00	20	1 - 4/C 500 CU	0.06
100-27	OH	120/240	27.20	3	117	3/C #2 CU	2.19	20	3/C #4 CU	0.60
100-28	OH	120/240	7.31	1 and 3	64	1-4/C 266 AL	0.08	15	3/C 3/0 CU & 4/C 3/0 CU	0.03
100-29	UG	120/208	31.83	3	N/A	N/A	0.00	57	2 Sets 4/C 3/0 CU	0.32
100-30	OH	120/208	14.32	3	105	1 - 4/C 2/0 AL	0.67	17	1-4/C 500CU	0.02
100-31	UG	120/240	43.88	1	N/A	N/A	0.00	65 & 35	2 - 1/C 500 CU & 2 - 1/C 3/0 AL	0.44
100-32	UG	120/208	0.85	3	N/A	N/A	0.00	65	6 SETS - 4 1/C 500 CU	0.00
100-33	UG	120/240	54.45	3	N/A	N/A	0.00	10 & 15	2 - Sets 1/C 250 CU & 1/C #2 CU AND 2 -Sets 1/C 350 AL	0.10
100-34	OH	120/240	4.31	3	35	1 - 4/C 2/0 AL	0.05	20	1 - 4/C 500 CU	0.00
100-35	UG	120/240	6.57	1	10	2 Sets 4/C 4/0 AL	0.02	130	1 - 4/C #2 CU	0.56
100-36	UG	120/208	5.98	3	N/A	N/A	0.00	30	4 Sets 4-1/C 750 AL	0.00
100-37	UG	120/208	37.00	3	N/A	N/A	0.00	80	2 SETS 500 CU 4/C NEUTRAL CU	0.12
100-38	OH	120/240	2.16 / 16.89	1&3	55 & 95	3/C 1/0 STRD CU A TAPS 6' and 3/C 1/0 STRD AL SD 49' &4/C 1/0 STRD CU A TAPS10' and 4/C 2/0 STRD AL SD 85'	0.47	10' &15'	3/C 1/0 STRD CU TO METER 875, 4/C 4/0 STRD CU TO METER 105	0.03
100-39	UG	120/208	17.75	3	N/A	N/A	0.00	100	3 SETS 4 1/C 350 AL	0.101
100-40	UG	120/208	0.0 / 7.94 & (22.06)	3	N/A	N/A	0.00	5	1 SET 4 1/C 500 CU	0.01
100-41	OH	120/208	2.95 / .13 & (37.28)	3	190	3 SETS 4/C 4/0 STRD CU URD	0.00	3	OFF BUS BAR	0.42
100-42	OH	120/240	10.27	1	95	1 3/C NO 4 STRD AL	1.89	11	1 3/C 1/0 STRD CU TO METER 305, 1 3/C STRD CU TO METER 920	0.06
100-43	OH	120/208 & 120/240	11.18 / 5.92	3	N/A	N/A	0.00	125' & 117'	1 3/C 1/0 STRD AACWR w1/0 neu &1 3/C #2 STRD AL w	1.03

Cust ID	Location Type	Voltage	Peak (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss %
									1/0 neu	
100-44	UG	120/240	20.41	1	N/A	N/A	0.00	300	4 1/c 500 CU & 4 1/C QUADRUPLEX 4/0 AL & 4 1/C QUADRUPLEX 1/0	0.54
100-45	OH	120/240	33.15	3	135	266 QUAD AL	0.68	90	266 QUAD AL	0.45
100-46	OH	120/208	14.09	3	252	250 MCM CU STRD LEADS 12', 266 QUAD AL 240'	0.77	62	1/0 QUAD AL 40', 500 MCM CU CUST RISER 22'	0.31
100-47	OH	120/208	4.14 / 29.99 / .03	3	30	1 4/C 500 MCM	0.38	15 & 115	1 4/C 3/0 STRD CU TO METER 398, 1 4/C 500 MCM TO METER 874	0.11
100-48	OH	120/208	30.47 / 0.0	3	30	1 4/C 266 STRD AL	0.4	20	2 SETS 4/C 4/0 STRD CU	0.17
100-49	OH	120/240	3.46	1	210	1 3/C 266 STRD AL 140', 1 3/C 1/0 STRD AL SD 70'	0.32	15	1 3/C NO 6 STRD CU	0.09
100-50	UG	120/208	31.1	3	N/A	N/A	0.00	35	2 SETS 4 1/C 300 CU	0.04
100-51	UG	277/480	16.12 & (55.77)	3	N/A	N/A	0.00	65	1 SET 600 KCMIL CU 3 1/C	0.07
100-52	UG	120/208	0.0 / 1.27 & (91.27)	3	N/A	N/A	0.00	30	6 SETS 4 1/C 750 CU	0.007
100-53	OH	120/208	0.19	3	N/A	N/A	0.00	75	1 SET 4 1/C 500 CU	0.00
100-54	OH	120/208	27.82 & (134.18)	3	N/A	N/A	0.00	36	4 SETS 4/C 266 AL w 4/0 AL neu	0.32
100-55	OH	120/240	26.53	3	80	1 4/C 266 STRD AL	0.32	15	1 4/C 4/0 STRD CU	0.05
100-56	UG	120/240	19.86	3	12	8 SETS 4/C 500 CU	0.00	40	8 SETS 4/C 500 CU	0.01
100-57	OH	120/240	4.85 & (.01)	3	35	1 4/C 250 STRD CU A TAPS 10', 1 4/C 1/0 STRD AL SD 25'	0.061	25	1 4/C 1/0 STRD CU & 1 3/C 2 STRD CU	0.02
100-58	UG	120/208	17.42 & (70.28 est)	3	N/A	N/A	0.00	20	3 SETS 3 - 1/C 40 AL & 4 SETS 1/C 2/0 AL (1 SET ABANDONED)	0.1
100-59	OH	120/240	11.62	3	30	1 SET 266 QUAD	0.06	10	250 MCM CU 4 1/C	0.04

Cust ID	Location Type	Voltage	Peak (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss %
						AL				
100-60	UG	480/277	32.43	3	N/A	N/A	0.00	17	3 1/C 1/0 CU	0.01
100-61	OH	120/240	2.12	1	70	1-3/C #4 AL	0.24	13	1 - 3/C #6 CU	0.05
100-62	UG	120/208	112.1	3	N/A	N/A	0.00	20	2 SETS 4 1/C 500 CU	0.09
100-63	OH	120/240	10.55	1	163	10' of 4/C 250 CU THEN 73' of 4/C 266 AL THEN 80' 3/C #4 AL	1.89	30	1 SET 3/C - 3/0 CU	0.1
100-64	OH	120/240	54.46	3	75	250 MCM CU	1.61	20	1 SET 4/0 4/C CU	0.14
100-65	UG	120/208	7.65 & (26.46)	3	N/A	N/A	0.00	104	1 SET 350 CU 4/C	0.668
100-66	UG	120/240	0.46 & (3.20)	1	N/A	N/A	0.00	75	INSIDE TRANSFORMER D3: 3 SETS 3 1/C 4/0 AL w 2/0 AL neu	0.04
100-67	UG	120/240	6.13	1 & 3	N/A	N/A		23	3 SETS 3 1/C 500 CU	
100-68	UG	120/208	84.55 / 60.48	3	N/A	N/A	0.00	68	2 SETS 4 1/C 500 CU	0.41
100-69	UG	120/208	40.87 / 28.13 / 2.39	3	N/A	N/A	0.00	30	2 SETS 4 -1/C 500 CU	0.09
100-70	UG	120/208	67.39	3	N/A	N/A	0.00	80	5 SETS 4 1/C 500 CU	0.18
100-71	OH	120/240	1.58 & (32.87)	1	30	1 3/C 2 STRD CU & 1 4/C 250 STRD A TAPS	0.31	20	3/C 1/0 STRD CU	0.14
100-72	OH	120/240	70.29 / 8.37	3	152	1 4/C 266 STRD CU 140', 2 SPT 250 STRD CU A TAPS, 1/C 250 STRD CU 12'	2.159	15' TO METER 083, 30 ' TO METER 765	1 4/C 500 MCM STRD CU TO METER 083, 1 4/C 2 STRD CU TO METER 795	0.526
100-73	UG	120/208	37.28	3	N/A	N/A	0.00	150	5 SETS 500 CU 4/C and 2 SETS 250 CU 4/C AT	0.16

Cust ID	Location Type	Voltage	Peak (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss %
									TRANSFORMER	
100-74	OH	120/240	57.18	3	227	1 4/C 250 STRD CU A TAPS 12', 1 4/C 2/0 STRD AL 140', 1 4/C 266 STRD AL SD 75'	3.62	15	2 SETS 4/C 500 MCM STRD CU, 1 3/C 2 STRD CU	0.11
100-75	OH	120/208	24.88	3	95	1/0 AL QUAD	1.34	12	4/0 CU 4 1/C	0.05
100-76	OH	120/240	52.65 / .83	3	50	1 4/C 2/0 STRD AL	0.65	15	1 4/C 3/0 STRD CU	0.18
100-77	OH	120/240	2.25	1	681	266 TRIPLEX AL	0.47	15	3/C 3 STR CU	0.01
100-78	OH	120/240	27.47	1	110	266 QUAD AL	0.94	10	4/0 CU 3/C	0.07
100-79	OH	120/240	17.17 / 19.65	1	20' 3/C 1/0 AL SDC & 75' 3/C 1/0 AL SDC	FOR METER 0388 20' 3/C 1/0 AL SDC, FOR METER 3626 75' 3/C 1/0 AL SDC	0.67	14	FOR METER 0388 4/0 3/C CU, FOR METER 3626 4/0 3/C CU	0.17
100-80	OH	120/240	14.78 / 26.74	1 & 3	130	#4 SOL AL 3/C 90', 266 QUAD AL 60'	0.98	25 & 10	1 SERT 3 1/C 1/0 CU STRD &, 1 SET 4 1/C 4/0 STRD CU	0.19
100-81	OH	120/208	64.67 / 7.34 & (15.99)	3	N/A	N/A	0.00	60	2 - 4/C 1/0 AL w 1/0 neu	1.34
100-82	OH	120/208 & 120/240	12.72 / 10.58 & (38.59 for 4526)	1 & 3	60 & 100 & 40	2 3/C 2/0 AL FROM TRANSFORMER K7, 1 4/C 266 STRD AACWR FROM TRANS E7	0.00	60 & 100 & 40	2 3/C 2/0 AL FROM TRANSFORMER K7, 1 4/C 266 STRD AACWR FROM TRANS E7	0.3
100-83	OH	120/240	53.74	3	N/A	N/A	0.00	52	1 SET 3/C 2/0 w 1/0 neu	0.92
100-84	OH	120/240	1.23 / 4.85 & (4.05)	1 & 3	217	2/C 250 STRD CU A TAPS 12', 1 3/C 266 STRD AL 185', 1 4/C 4 STRD CU 20'	0.48	10 SINGLE, 15 THREE	1 3/C 2 STRD CU SINGLE, 1 3/C NO 6 STRD CU THREE	0.11
100-85	UG	480/277	39.13 & (36.87)	3	N/A	N/A	0.00	10	1 SET 3-1/C 600 CU	0.01
100-86	OH	120/208	31.15 & (45.39)	3	8	3 sets 266 quad	0.04	110	2 SETS 4 -1/C 500 CU	1.57
100-87	UG	120/208	64.99 &	3	N/A	N/A	0.00	15	3 SETS 3 1/C 350 AL	0.06

Cust ID	Location Type	Voltage	Peak (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss %
			(0.0)							
100-88	OH	120/240 & 120/208	16.47 / 64.03	3	311' for meter 5563	Meter 5563 - 6' of 4/C 1/0 CU then 305' of 4/C 266 AL. Meter 1708 - 10' of 4/C 500 CU	0.49	Meter 5563 - 14' Meter 1708 - 20'	Meter 5563 - 1 set 4/C 4/0 CU Meter 1708 - 2 sets 4/C 500 CU	0.15
100-89	UG	120/208	75.51	3	N/A	N/A	0.00	40	4 SETS 4 1/C 500 CU	0.28
100-90	OH	120/240	24.18 & (0.0)	1	N/A	N/A	0.00	60	2 SETS 3/C 1/0 AL w #2 STRD AL neu	1.07
100-91	UG	120/208	67.16 / 0.02	3	N/A	N/A		75 & 60	5 SETS 500 CU TO METER G197195271 and 1 SET 1/0 CU TO METER W141535674	
100-92	OH	120/240	25.68	3	N/A	N/A	0.00	40	1 4/C 266 STRD AACWR	0.17
100-93	OH	120/240	5.83	3	10	1 4/C 266 STRD AL	0.02	30	2 4/C 3/0 STRD CU	0.00
100-94	OH	277/480	18.65	3	80	4/C 1/0 AL	0.14	15	2 SETS 4/C 500 MCM CU	0.00
100-95	OH	120/240	8.68	1	133	1 3/C 2/0 STR AL 101', 1 3/C 2 STR AL A TAPS 6', 1 3/C 1/0 STR AL SD 26'	0.63	10	1 3/C 3/0 STR CU	0.03
100-96	OH	120/208	35.35	3	80' TO METER 846, 30' TO METER 747	4 1/C 250 MCM CU TO METER 846, 4 1/C AL QUAD TO METER 747	0.52	14' TO METER 846, 18' TO ,METER 747	4 1/C 4/0 TO BOTH 747 & 846	0.449
100-97	Network	120/240	3.25 & (6.89)	1	N/A	3 SETS 4 1/C 500 CU TO CONDUIT	0.00	25	2 SETS 4 1/C 500 CU	0.01
100-98	OH	120/240	45.02	3	143	266 AL QUAD	1.06	18	250 MCM CU 4 1/C	0.31
100-99	OH	120/240	.54 / .31	3	55	10' of 4/C - 250 CU then 45' of 4/C 1/0 AL	0.00	14	Meter 631 - 3/C 500 CU & 1/C #2 CU N Meter 958 - 3/C #4 CU	0.00

Cust ID	Location Type	Voltage	Peak (kW)	Phases	Secondary Distance (Ft)	Secondary Conductor Size and Type (# of sets, wire/cable size and material)	Sec Loss %	Service Distance (Ft)	Service Conductor Size and Type (# of sets, wire/cable size and material)	Svc Loss %
100-100	UG	120/208	53.35	3	N/A	N/A	0.00	55	1 SET 4 - 1/C 500 CU	0.18
100-101	UG	120/208	45.54 / 5.85	3	N/A	N/A	0.00	90	4 SETS 4-1/C 500 CU & 4 - 1/C 250 CU	0.19
						Average	0.33		Average	0.20

Appendix 2 – Weighted Average results per category

Category Name	Model #	# Customers on Transformer	kW Load/ Customer	# of Customers on each Secondary	Sec Size (# sets)	Sec Length (ft)	Sec Loss %	# of Customers on each Service	Svc Size (# sets)	Svc Length (ft)	Svc Loss %	Sec_Svc Voltage (V)	% Weight by Category
SF_SH	6	12	10	4	1-4/0 AA	140	1.65	1	1-#4 AL	50	1.03	120/240	60%
SF_SH	7	12	10	4	1-4/0 AL	140	1.57	1	1-2/0 AL	70	0.44	120/240	40%

Category Weighted Average Percent (%): Sec – 1.618 Svc – 0.794

Category Name	Model #	# Customers on Transformer	kW Load/ Customer	# of Customers on each Secondary	Sec Size (# sets)	Sec Length (ft)	Sec Loss %	# of Customers on each Service	Svc Size (# sets)	Svc Length (ft)	Svc Loss %	Sec_Svc Voltage (V)	% Weight by Category
WH	3	40-50	3.7	28	2-4/0 AA	90	2.33	4	1-#4 AL	40	1.31	120/240	50%
WH	4	16	3.7	0	-	-	-	16	1-350 AL	40	0.61	120/240	50%

Category Weighted Average Percent (%): Sec – 1.165 Svc – 0.960

Category Name	Model #	# Customers on Transformer	kW Load/ Customer	# of Customers on each	Sec Size (#	Sec Length (ft)	Sec Loss %	# of Customers on each	Svc Size (# sets)	Svc Length (ft)	Svc Loss %	Sec_Svc Voltage (V)	% Weight by

				Secondary	sets)			Service					Categor y
Lighting	3	4	3.7	2	1-4/0 AL	90	0.55	1	1-#6 AL	40	0.51	120/240	40%
Lighting	4	16	3.7	0	-	-	-	1	1-#6 AL	40	0.51	120/240	60%

Category Weighted Average Percent (%): Sec – 0.222 Svc – 0.510

Appendix 2 – Weighted Average results per category (Con't)

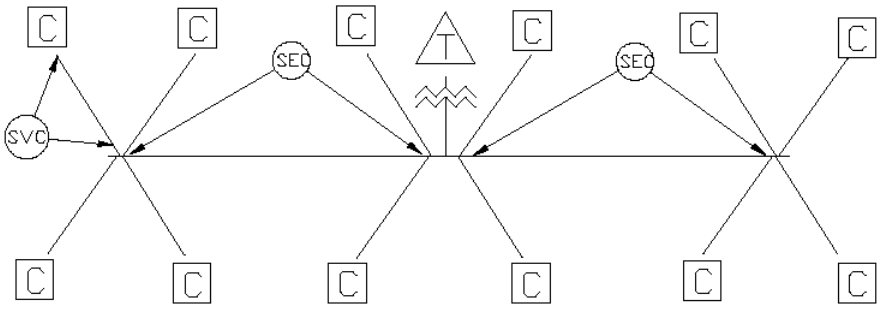
Category Name	Model #	# Customers on Transformer	kW Load/ Customer	# of Customers on each Secondary	Sec Size (# 3 Ø sets)	Sec Length (ft)	Sec Loss %	# of Customers on each Service	Svc Size (# 3 Ø sets)	Svc Length (ft)	Svc Loss %	Sec_Svc Voltage (V)	% Weight by Category
100-400 kW	12	1	154	0	-	-	-	1	2-4/0 AA	45	0.73	120/240	34%
100-400 kW	13	1	154	0	-	-	-	1	1-500 CU	45	0.43	120/208	44%
100-400 kW	14	37	154	2-3	2-4/0 AA	45	1.02	1	2-4/0 AA	45	0.74	120/240	22%

Category Weighted Average Percent (%): Sec – 0.224 Svc – 0.600

Category Name	Model #	# Customers on Transformer	kW Load/ Customer	# of Customers on each Secondary	Sec Size (# 3 Ø sets)	Sec Length (ft)	Sec Loss %	# of Customers on each Service	Svc Size (# 3 Ø sets)	Svc Length (ft)	Svc Loss %	Sec_Svc Voltage (V)	% Weight by Category
400-1000 kW	15	1	465	0	-	-	-	1	2-500CU	25	0.09	277/480	100
1-10 MW	16	1	5,500	0	-	-	-	1	15-500CU	20	0.12	277/480	100
>10 MW	17	1	11,682	0	-	-	-	1	31-500CU	30	0.18	277/480	100

Appendix 3 – Configuration Diagrams

Single Family Overhead (SH) - Suburban

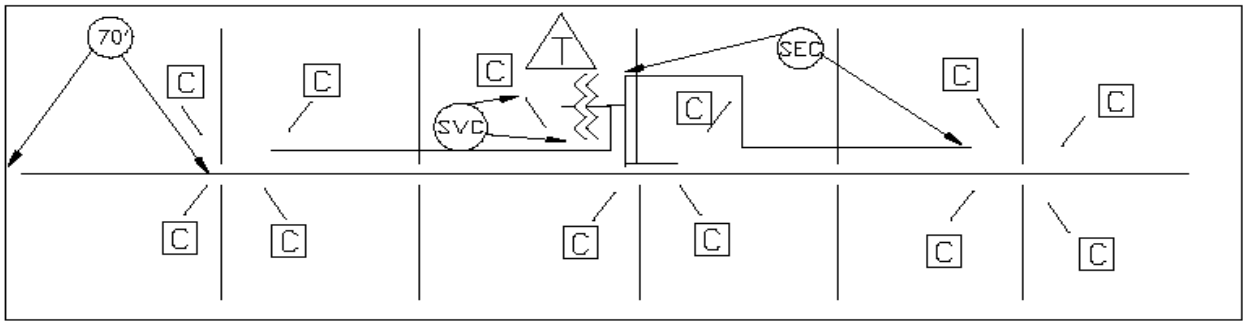


Legend
T – Transformer
C – Customer
SEC – Secondary
SVC - Service

Used in Model 6

Appendix 3 – Configuration Diagrams (continued)

Single Family URD (SH)

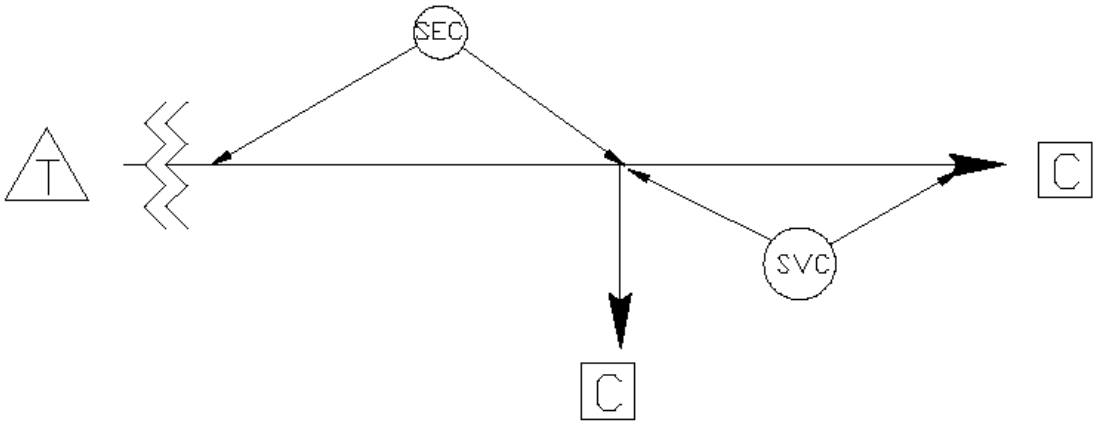


Legend
T – Transformer
C – Customer
SEC – Secondary
SVC - Service

Used in Model 7

Appendix 3 – Configuration Diagrams (continued)

Shared Secondary

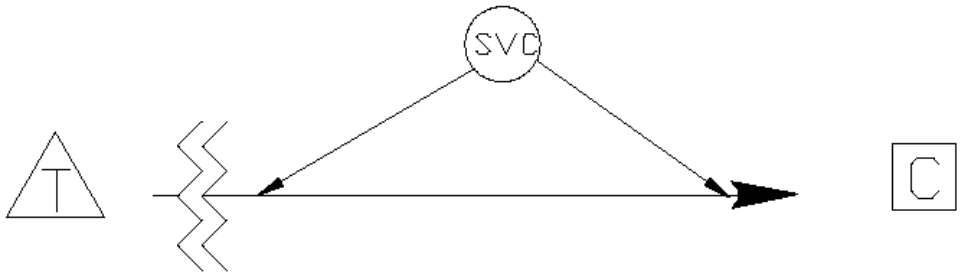


Legend
T – Transformer
C – Customer
SEC – Secondary
SVC - Service

Used in Models 14 and 18

Appendix 3 – Configuration Diagrams (continued)

Service Only



Legend
T – Transformer
C – Customer
SVC - Service

Used in Models 12-13 and 15-17