

Marshfield Utilities Rules for Electric Service Installations

Table of Contents

<i>Section</i>	<i>Topic</i>	<i>Page</i>
	Table of Contents	I
	Mission and Vision Statements.....	VII
	Introduction and Purpose	VIII
	Digger Notification	VIII
1.0	SERVICE TERRITORY AND OFFICE	1-1
2.0	PROCEDURE TO OBTAIN ELECTRIC SERVICE	
2.1	Permanent Service	2-1
2.2	Temporary Service.....	2-1
2.3	Line Extension	2-1
2.4	Easements and Right-of-Way	2-1
2.5	Site Preparation.....	2-1
2.6	Inspection.....	2-2
2.7	Scheduling of the Job.....	2-2
2.8	Service Extensions – Special Requirements	2-2
3.0	SERVICE ENTRANCE REQUIREMENTS	
3.1	Service Requirements	3-1
3.1.1	Grounding	3-2
3.1.2	200 Amp Single Phase Underground.....	3-9
3.1.3	200 Amp Single Phase Underground w/Main Breaker.....	3-10
3.1.4	100-200 Amp Single Phase Overhead Entrance.....	3-11
3.1.5	Temporary Service.....	3-13
3.1.6	Permanent/Temporary Underground Service	3-17
3.1.7	Mobile Home Services.....	3-19
3.2	Single Phase 120/208 Network (0 to 200 Ampere)	3-22
3.3	Single Phase Service Installations for 2-4 Meters	3-23
3.4	400 Ampere Single Phase Residential Service	3-24
3.5	Underground Electric Service guidelines	3-25
3.6	Voltage or Phase Conversion (Load Balance)	3-29
3.7	Pad-mounted Transformers.....	3-29
3.8	Concrete Pads for Padmount Transformers	3-31
3.9	Conductor Identification for Three Phase Wiring	3-38
3.10	Vertical Space to Terminate in Switchgear and Entrances.....	3-38
3.11	Farm Services.....	3-39
3.12	Termination Enclosures	3-40
3.13	Cable Television Power Supplies	3-41
MARSHFIELD UTILITIES - ELECTRIC SERVICE MANUAL		
<i>Table of Contents</i>		
I		

Marshfield Utilities
Rules for Electric Service Installations

Table of Contents
(Continued)

<i>Section</i>	<i>Topic</i>	<i>Page</i>
4.0	METERING REQUIREMENTS	
4.0	Multiple Meters.....	4-2
4.1	Meter Heights.....	4-4
4.2	Meter sockets	4-5
4.3	Instrument Transformer Metering - General.....	4-9
4.4	Current Transformer in Padmounted Transformers.....	4-10
4.5	Current Transformer Cabinets for 400-2000 Ampere Services.....	4-11
4.6	Metering in Switchgear 1600 through 3000 Amperes.....	4-15
4.7	Primary Metering.....	4-18
4.8	Meter Ice and Snow Shield.....	4-20
5.0	CLEARANCES	
5.1	Clearances for Electric Overhead Services.....	5-1
5.2	Padmounted Transformer Clearances	5-2
5.3	Gas Lines	5-6
5.4	Clearance of Lines Near Wells	5-7
5.5	Clearance to Sewers.....	5-7
5.6	Stored Materials	5-7
5.7	Clearance of Lines Near Fuel Storage Tanks	5-7
5.8	Antennas	5-8
5.9	Buildings.....	5-8
5.10	Swimming Pools.....	5-8
5.11	Grain Bins	5-9
5.12	Alternate Sources of power.....	5-9
6.0	MU - POLICIES AND RULES	
6.1	Code Compliance and Inspection	6-1
6.2	Continuity and Quality of Service	6-1
6.3	Service Outages	6-2
6.4	Service Utilization	6-2
6.5	Resale of Energy	6-3
6.6	Diversion (Theft) of Electricity	6-3
6.7	Meter Socket Access.....	6-3
6.8	Utility Equipment on Customers Premises.....	6-4
6.9	Cable Locates.....	6-4
6.10	Line Extensions on Other Than Private Property	6-4
6.11	Line Extensions on Private Property.....	6-4
MARSHFIELD UTILITIES - ELECTRIC SERVICE MANUAL		
<i>Table of Contents</i>		
II		

Marshfield Utilities
Rules for Electric Service Installations

Table of Contents
(Continued)

<i>Section</i>	<i>Topic</i>	<i>Page</i>
6.12	Attachments on MU Poles	6-5
6.13	Service Days	6-6
6.14	Service Location	6-6
6.15	Address Posted.....	6-7
6.16	Cut-off Time	6-7
6.17	Service Entrance Wiring.....	6-7
6.18	Meter on Utility Poles.....	6-7
6.19	Temporary Services	6-8
6.20	Motors and Associated Equipment.....	6-8
6.21	Electric Water Heating.....	6-10
6.22	Electric Space Heating.....	6-10
6.23	Lighting.....	6-10
6.24	Electric Welders and Furnaces.....	6-11
6.25	Harmonics and High Frequency Equipment.....	6-11
6.26	Air Conditioners.....	6-11
6.27	Standby Generators.....	6-12
6.28	Parallel Generation.....	6-12
6.29	Marker Balls.....	6-12
6.30	Rebates.....	6-12
7.0	CODE INFORMATION	
7.1	State of Wisconsin Codes	7-1
7.2	NEC 230.2 Number of Services.....	7-1
7.3	Wisconsin Administrative Code Modifications to the NEC	7-2
7.4	Grounding Electrode System Addition to NEC 250.53 (SPS 316.250)	7-3
7.5	Wisconsin Administrative Code PSC 113	7-5
7.6	Harmonics of 60 Hertz Voltage Waves PSC 113.0704	7-5
7.7	Radio and Television Interference PSC 113.0707	7-6
7.8	Measuring Customer Service PSC 113.0802.....	7-6
TABLES		
3-1	Service Entrance Size Requirements for a 120/240 3-wire (single phase) Residential Dwelling Unit	3-1
3-2	Grounding Electrode Conductor for Alternating Current Systems.....	3-4
3-3	Service Drop Clearance Requirements	3-13
3-4	Acceptable Underground/Overhead Service Lateral Configurations .	3-28
3-5	Three Phase Load Balance Requirements.....	3-29
3-6	Three Phase Transformer Pad Construction Notes.....	3-37
MARSHFIELD UTILITIES-ELECTRIC SERVICE MANUAL		
<i>Table of Contents</i>		
III		

**Marshfield Utilities
Rules for Electric Service Installations**

**Table of Contents
(Continued)**

(Tables Cont'd)

3-7	Color Coding for Three Phase Conductors.....	3-38
3-8	Minimum Required “Vertical” Spacing to Terminate Utility Service Conductors in Switchgear.....	3-38
3-9	Pre-approved Termination Enclosures.....	3-40
4-1	Multiple Metering Requirements.....	4-3
4-2	Meter Height Clearance Requirements.....	4-4
4-3	Example 200 Amp Overhead Meter Sockets Without Main Breaker.....	4-5
4-4	Approved 200 Amp Overhead Meter Sockets with Main Breaker.....	4-5
4-5	Approved 200 Amp Service Pedestals without Main Breaker.....	4-5
4-6	Approved 200 Amp Service Pedestals with Main Breaker.....	4-5
4-7	Approved Mobile Home Pedestals.....	4-6
4-8	Approved Multi-Meter Socket Arrangements without Main Breaker 200 Amp Rated.....	4-6
4-9	Approved Multi-Meter Socket Arrangements with Main Breaker 200 Amp Rated.....	4-7
4-10	Approved 320/400 Amp Service Pedestals Without Main Breaker.....	4-7
4-11	Approved 320/400 Amp Service Pedestals With Main Breaker.....	4-7
4-12	Approved 320/400 Amp Overhead Meter Sockets.....	4-8
4-13	Approved 320/400 Amp Overhead Meter Sockets with Main Breaker.....	4-8
4-14	Approved Single Phase Instrument Rated Meter Socket for 400 and 600 Amp Services.....	4-8
4-15	Approved Meter Sockets for Self-Contained 200 Amp Three Phase Four Wire Services.....	4-8
4-16	Approved Three Phase Transformer Rated Meter Socket with Test Switch and Pre-Wired.....	4-9
4-17	Approved Current / Potential Transformer Cabinets.....	4-14
5-1	Clearances for Electrical Overhead Services.....	5-1
6-1	Motor Starting Table.....	6-9
6-2	Air Conditioner Locked Rotor Current Limits.....	6-11

FIGURES

1-1	Marshfield Electric Service Territory.....	1-1
-----	--	-----

Marshfield Utilities
Rules for Electric Service Installations

Table of Contents
(Continued)

1-2	MU Local Office Location.....	1-2
-----	-------------------------------	-----

(Figures – Cont’d)

3-1	Overhead Service	3-5
3-2	Underground Single-Family without Service Disconnect in Meter Pedestal.....	3-6
3-3	Underground-Single Family With Service Disconnect in Meter Pedestal.....	3-7
3-4	Underground-Two Family Residential	3-8
3-5	200 Amp Single Phase Underground Service.....	3-9
3-6	200 Amp Single Phase Underground Service with Main Breaker	3-10
3-7 (a)	100-200 Amp Single Phase Overhead Service	3-11
3-7 (b)	100-200 Amp Single Phase Overhead Service	3-12
3-8 (a)	Temporary Overhead Service Options.....	3-15
3-8 (b)	Temporary Overhead Service Options	3-16
3-8 (c)	Temporary Overhead Service Options	3-16
3-8 (d)	Temporary Underground Service Options	3-17
3-9	Temporary/Permanent Underground Service Option	3-18
3-10	Typical Overhead Mobile Home Service Arrangement	3-20
3-11	Free Standing Pedestal Options	3-21
3-12	Single Phase 120/208 Network Meter Socket	3-22
3-13	Typical Two Meter Pedestal Installation	3-23
3-14(a)	400 Amp Single Phase Underground Service With Main Breaker	3-24
3-14(b)	400 Amp Single Phase Underground Service Conduit Location at Utility Pole	3-25
3-15	Protective Posts for Padmounted Transformer	3-30
3-16	Protective Posts for Current Transformer Cabinets and Meter Sockets.....	3-30
3-17	Three Phase Transformer Pad (75 - 750 kVA) Without Metering	3-31
3-18	Three Phase Transformer Pad (75 - 750 kVA) with Metering on Secondary Side.....	3-32
3-19	Three Phase Transformer Pad (75 – 750 kVA with Metering on Primary Side.....	3-33
3-20	Three Phase Transformer Pad (1000 – 2500 KVA) Without Metering.....	3-34
3-21	Three Phase Transformer Pad (1000 – 2500 KVA) With Metering on Secondary Side.....	3-35
3-22	Three Phase Transformer Pad (1000 – 2500 KVA) With Metering on Primary Side.....	3-36
3-23	Typical Termination Enclosure Arrangements.....	3-40

Marshfield Utilities
Rules for Electric Service Installations

Table of Contents
(Continued)

3-24 Typical Cable Television Power Supply Arrangement 3-42

(Figures – Cont'd)

4-1 Indoor Meter Clearance Requirements 4-4

4-2 Three Phase Four Wire Meter Socket Connections 4-9

4-3 Three Phase Transformer Metering Arrangement 4-11

4-4(a) Three Phase Current Transformer Cabinet Arrangements..... 4-12

4-4(b) Three Phase Current Transformer Cabinet Arrangements..... 4-12

4-4(c) Three Phase Current Transformer Cabinet Arrangements..... 4-13

4-4(d) Three Phase Current Transformer Cabinet Arrangements..... 4-13

4-5 Three Phase Metering in Switchgear with Bar-type
Current Transformers 4-16

4-6 Three Phase Metering in Switchgear with Window-type
Current Transformers 4-17

4-7 Primary Metering Options 4-19

4-8 Meter Ice and Snow Shield 4-20

6-1 Service Location Requirements 6-7