



## **APPROVED MATERIAL SPECIFICATIONS FOR UNDERGROUND CONSTRUCTION**

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REVISED: March 13, 2019

The following are Halton Hills Hydro's Approved Materials Specifications to be used in conjunction with this utility's Underground Distribution Specifications (UD-Specs) and were developed by Halton Hills Hydro Inc. to be used solely in this utility's service area.

Halton Hills Hydro has and will continue to determine the application for approved materials. Halton Hills Hydro will not be held responsible/ liable for any misuse of these materials by others (inside or outside the limits of this utility's service area).

These specifications are not recommended for use outside of Halton Hills Hydro's distribution service area as other standards/ codes may apply in other areas. As such, Standards/ Codes/ other applicable documentation should be obtained from the utility responsible for power distribution in the area you are working, if not within the limits of this utility's service area.

Please note that these materials are subject to change without notification and as such it is recommended that the user confirm latest revision of the materials specification if in doubt. Halton Hills Hydro shall not be held liable for equipment purchased that does not meet with these specifications and for any malfunction of equipment used. Halton Hills Hydro reserves the right to reject materials used if the equipment does not conform to these specifications or if another valid reason exists not to allow the use of the material. It is the responsibility of the user to ensure they are purchasing only approved materials and are using the correct materials for the intended use.

3.1 Cable and Cable Supports

**WIR52**                    **CABLE, UNDERGROUND SECONDARY SERVICE, TRIPLEX, 3-#4/0 MCM, COMPACT AL., XLPEI-PVCJ, 600V TO CEA WCWG-04 USC90 OR USEI90 OR CSA-C22.2 No.52-96 (R2000)**

MANUFACTURER:            PRYSMIAN                    GENERAL CABLE                    NEXANS  
MFG. CAT#  
MANUFACTURER:  
MFG. CAT#

**WIR53**                    **CABLE, UNDERGROUND SECONDARY SERVICE, TRIPLEX, 3-250 MCM, COMPACT AL., XLPEI-PVCJ, 600V TO CEA WCWG-04 USC90 OR USEI90 OR CSA-C22.2 No.52-96 (R2000)**

MANUFACTURER:            PRYSMIAN                    GENERAL CABLE                    NEXANS  
MFG. CAT#  
MANUFACTURER:  
MFG. CAT#

**WIR56**                    **CABLE, UNDERGROUND PRIMARY, #1/0 AWG, COMPACT CU., STRAND BLOCKED, TR-XLPEI, LLDPEJ, 28 KV TO CSA C68.5-07, 100% INSULATION, FULL CONCENTRIC NEUTRAL.**

MANUFACTURER:            PRYSMIAN                    GENERAL CABLE                    NEXANS  
MFG. CAT#

**WIRxx**                    **CABLE, UNDERGROUND PRIMARY, #1/0 AWG, COMPRESSED CU., STRAND BLOCKED, TR-XLPEI, LLDPEJ, 28 KV TO CSA C68.3 (until retired by CSA)/ C68.5-07 preferred, 100% INSULATION, FULL CONCENTRIC NEUTRAL.**

MANUFACTURER:            PRYSMIAN                    GENERAL CABLE                    SOUTHWIRE  
MFG. CAT#                    203003C                    T-264352                    61-61-00

**WIR57**                    **CABLE, UNDERGROUND PRIMARY, #2/0 AWG, COMPACT AL., STRAND BLOCKED, TR-XLPEI, LLDPEJ, 28 KV TO CSA C68.5-07, 100% INSULATION, FULL CONCENTRIC NEUTRAL. **\*\*NOT FOR USE IN RESIDENTIAL/ COMMERCIAL/ INDUSTRIAL SUBDIVISIONS AND/ OR DEVELOPMENTS\*\*****

MANUFACTURER:            PRYSMIAN                    GENERAL CABLE                    NEXANS  
MFG. CAT#

**WIR66**                    **CABLE, UNDERGROUND PRIMARY, 1000 MCM, COMPACT AL., STRAND BLOCKED, TR-XLPEI, LLDPEJ, 28 KV TO CSA C68.5-07, 100% INSULATION, 1/3 CONCENTRIC NEUTRAL.**

MANUFACTURER:            PRYSMIAN                    GENERAL CABLE                    NEXANS                    SOUTHWIRE  
MFG. CAT#                                                                                                62-92-10

3.1 Cable and Cable Supports

**WIR69**                    **CABLE, UNDERGROUND PRIMARY, 1000 MCM, COMPACT CU., STRAND BLOCKED, TR-XLPEI, LLDPEJ, 28 KV TO CSA C68.5-07, 100% INSULATION, 1/3 CONCENTRIC NEUTRAL. (FEEDER EGRESS OLNLY OR IF SPECIFIED BY HALTON HILLS HYDRO)**

**MANUFACTURER:**            **PRYSMIAN**                    **GENERAL CABLE**                    **NEXANS**  
**MFG. CAT#**

**WIR66**                    **CABLE, UNDERGROUND PRIMARY, 500 MCM, COMPACT Cu., STRAND BLOCKED, TR-XLPEI, PVCJ, 28 KV TO CSA C68.5-07, 100% INSULATION, 1/3 CONCENTRIC NEUTRAL. \*\*FOR MAINTENANCE USE ONLY, NOT FOR NEW INSTALLATIONS\*\***

**MANUFACTURER:**            **PRYSMIAN**                    **GENERAL CABLE**                    **NEXANS**  
**MFG. CAT#**

**CAB01**                    **CABLE SUPPORT, UNDERGROUND IN CONCRETE FOUNDATION, V-CUSHION WITH CLAMPING BRACKET AND HOT DIP GALVANIZED CHANNEL FOR MOUNTING SUPPORTS (TYPICALLY FITS 1000MCM, 28kV CABLE WITH DIAMETER OF 2-1/4" BUT CONTRACTOR SHALL ENSURE SNUG FIT AROUND CABLE).**

**MANUFACTURER:**            **SASCO STRUT**  
**MFG. CAT#**                    **S214VC-EH**

**CAB02**                    **CABLE SUPPORT, UNDERGROUND IN CONCRETE FOUNDATION, V-CUSHION WITH CLAMPING BRACKET AND HOT DIP GALVANIZED CHANNEL FOR MOUNTING SUPPORTS (TYPICALLY FITS 500MCM, 28kV CABLE WITH DIAMETER OF 1-7/8" BUT CONTRACTOR SHALL ENSURE SNUG FIT AROUND CABLE).**

**MANUFACTURER:**            **SASCO STRUT**  
**MFG. CAT#**                    **S178VC-EH**

NOTE: ALL PRIMARY CABLE SHALL BE MANUFACTURED PER GRIDSMART CITY PRIMARY CABLE PURCHASING SPECIFICATION "GSC U/G CABLE" AND CSA REQUIREMENTS.

NOTE: CONDUCTORS AND CABLES MANUFACTURED BY COMPANIES LISTED ABOVE ARE APPROVED BY HALTON HILLS HYDRO, HAVING RECEIVED CSA CERTIFICATION RECORDS OR TYPE TEST DATA FOR CONDUCTORS OR CABLES AS PER O.REG 22/04. ADDITIONAL MANUFACTURER'S MAY BE ADDED PROVIDED TYPE TEST DATA IS PROVIDED TO HALTON HILLS HYDRO PRIOR TO PURCHASING.

### 3.2 Single Phase Transformers

**PM TRANSFORMER, SINGLE PHASE, DUAL VOLTAGE PRIMARY, LOW PROFILE, PADMOUNTED, 50 kVA, 16000/4800V-240/120V TO BE USED WITH VAULT FOUNDATION AS PER GRIDSMART CITY SPECIFICATION GSC DT-1PAD.**

MANUFACTURER: MOLONEY CAM-TRAN CES  
MFG. CAT#  
MANUFACTURER:  
MFG. CAT#

**PM022 TRANSFORMER, SINGLE PHASE, DUAL VOLTAGE PRIMARY, LOW PROFILE, PADMOUNTED, 50 kVA, 16000/4800V-240/120V TO BE USED WITH VAULT FOUNDATION AS PER GRIDSMART CITY SPECIFICATION GSC DT-1PAD.**

MANUFACTURER: MOLONEY CAM-TRAN CES  
MFG. CAT#  
MANUFACTURER: ABB  
MFG. CAT#

**PM TRANSFORMER, SINGLE PHASE, LOW PROFILE, PADMOUNTED, 50 kVA, 2400V-240/120V TO BE USED WITH VAULT FOUNDATION AS PER GRIDSMART CITY SPECIFICATION GSC DT-1PAD.**

MANUFACTURER: MOLONEY CAM-TRAN CES  
MFG. CAT#  
MANUFACTURER: ABB  
MFG. CAT#

**PM TRANSFORMER, SINGLE PHASE, LOW PROFILE, PADMOUNTED, 75 kVA, 16000V-240/120V TO BE USED WITH VAULT FOUNDATION AS PER GRIDSMART CITY SPECIFICATION GSC DT-1PAD.**

MANUFACTURER: MOLONEY CAM-TRAN ABB  
MFG. CAT#  
MANUFACTURER: ABB  
MFG. CAT#

**PM TRANSFORMER, SINGLE PHASE, DUAL VOLTAGE PRIMARY, LOW PROFILE, PADMOUNTED, 75 kVA, 16000/4800V-240/120V TO BE USED WITH VAULT FOUNDATION AS PER GRIDSMART CITY SPECIFICATION GSC DT-1PAD.**

MANUFACTURER: MOLONEY CAM-TRAN CES  
MFG. CAT#  
MANUFACTURER: ABB  
MFG. CAT#

### 3.2 Single Phase Transformers

**PM TRANSFORMER, SINGLE PHASE, LOW PROFILE, PADMOUNTED, 75 kVA, 2400V-240/120V TO BE USED WITH VAULT FOUNDATION AS PER GRIDSMART CITY SPECIFICATION GSC DT-1PAD.**

MANUFACTURER: MOLONEY CAM-TRAN CES  
MFG. CAT#  
MANUFACTURER:  
MFG. CAT#

**PM TRANSFORMER, SINGLE PHASE, LOW PROFILE, PADMOUNTED, 100 kVA, 16000V-240/120V TO BE USED WITH VAULT FOUNDATION AS PER GRIDSMART CITY SPECIFICATION GSC DT-1PAD.**

MANUFACTURER: MOLONEY CAM-TRAN CES  
MFG. CAT#  
MANUFACTURER: ABB  
MFG. CAT#

**PM TRANSFORMER, SINGLE PHASE, DUAL VOLTAGE PRIMARY, LOW PROFILE, PADMOUNTED, 100 kVA, 16000/4800V-240/120V TO BE USED WITH VAULT FOUNDATION AS PER GRIDSMART CITY SPECIFICATION GSC DT-1PAD.**

MANUFACTURER: MOLONEY CAM-TRAN CES  
MFG. CAT#  
MANUFACTURER: ABB  
MFG. CAT#

**PM TRANSFORMER, SINGLE PHASE, DUAL VOLTAGE PRIMARY, LOW PROFILE, PADMOUNTED, 100 kVA, 2400V-240/120V TO BE USED WITH VAULT FOUNDATION AS PER GRIDSMART CITY SPECIFICATION GSC DT-1PAD.**

MANUFACTURER: MOLONEY CAM-TRAN CES  
MFG. CAT#  
MANUFACTURER: ABB  
MFG. CAT#

NOTE: TRANSFORMERS MANUFACTURED BY COMPANIES LISTED ABOVE ARE APPROVED BY HALTON HILLS HYDRO. THOSE PURCHASING TRANSFORMERS FROM THESE COMPANIES SHALL SUBMIT TYPE TEST DATA AND GUARANTEED LOSSES FOR TRANSFORMERS AS PER O.REG 22/04 OR HAVE BEEN CSA/ ESA/ UL CERTIFIED AND HHHI REQUIREMENTS. ADDITIONAL MANUFACTURER'S MAY BE ADDED PROVIDED TYPE TEST DATA IS PROVIDED TO HALTON HILLS HYDRO PRIOR TO PURCHASING. ALL TRANSFORMER MUST BE BUILT TO CSA SPECIFICATIONS CAN/ CSA C227.3 (LATEST REVISION) AND IN ACCORDANCE WITH GRIDSMART CITY SPECIFICATION GSC DT-1PAD (LATEST REVISION). PLEASE CONTACT ENGINEERING DEPARTMENT FOR GUIDELINES.

3.3 Connectors and Terminators

**TER03**                        **TERMINATION, COLD SHRINK, SILICONE POLYMER, #2 - #4/0 AWG, 28kV, 200 KV BIL, ANSI/IEEE 48-1990 , CLASS 1**

MANUFACTURER:      3M  
MFG. CAT#             7654-S-4

**TER01**                        **TERMINATION, COLD SHRINK, SILICONE POLYMER, 250 - 800 KCMIL, 28kV, 200 KV, ANSI/IEEE 48-1990 , CLASS 1**

MANUFACTURER:      3M  
MFG. CAT#             7655-S-4

**TER02**                        **TERMINATION, COLD SHRINK, SILICONE POLYMER, 900 - 1750 KCMIL, 28kV, 200 KV, ANSI/IEEE 48-1990 , CLASS 1**

MANUFACTURER:      3M  
MFG. CAT#             7666-S-8

**UGM021**                    **ELBOW, LOADBREAK, 200 AMP, 28KV, C/W TEST POINT, FOR #1/0 AWG CU COMPACT 28KV CABLE, (28kV CLASS) ANSI/IEEE 386-1995**

MANUFACTURER:      ELASTIMOLD  
MFG. CAT#             274LR-H5230A-CS854

Cooper - RTE  
PLE228CC06TCSA  
PLE228DD06TCSA  
PLE228CC07TCSA  
PLE228DD07TCSA

Purchaser of elbow is responsible for verifying the elbow will mate with the primary cable. Typically use code "06" for #1/0 cable or use code "07" for #2/0 cable. See HHH cable specifications and design for appropriate size cable.

**UGM022**                    **INSERT, BUSHING, LOADBREAK, 200 AMP, 28 KV, ANSI/IEEE 386-1995**

MANUFACTURER:      RTE                                  ELASTIMOLD  
MFG. CAT#             LBI228                              2701A4-CS854

**UGM23**                    **CAP, INSULATING, 28 KV, FOR 200 AMP, 28 KV INSERT, BUSHING, LOADBREAK, C/W GROUND WIRE, ANSI/IEEE 386-1995**

MANUFACTURER:      ELASTIMOLD                      RTE  
MFG. CAT#             273DRGA-CS854                 PLPC-228

**UGM30**                    **ELBOW ARRESTER, 28kV, 200A RATED, "METAL OXIDE VARISTOR ELBOW" C/W GROUND LEAD AND DRAIN WIRE TAB TO BE INSTALLED ON OPEN POINTS AND UGM48, ANSI/IEEE 386-1995**

MANUFACTURER:      COOPER/ RTE  
MFG. CAT#             3238019C21M

**UGM47**                    **ELBOW, T-OP 2 (RTE)/ T-BODY (ELASTIMOLD), 600 AMP, 28KV, C/W TEST POINT, SIZED TO FIT CABLE BEING INSTALLED, ANSI/IEEE 386-1995**

MANUFACTURER:      RTE                                  ELASTIMOLD

### 3.3 Connectors and Terminators

MFG. CAT#	DT628T	K656BLR	
<b>UGM48</b>	<b>INSERT, BUSHING, LOADBREAK REDUCING TAP PLUG, 28kV, 600A/200A, TO BE INSTALLED ON BACK OF T-OP 2/ T-BODY AND CAPPED WITH UGME23, ANSI/IEEE 386-1995</b>		
MANUFACTURER: MFG. CAT#	RTE LRTP628	ELASTIMOLD K650ETP	
<b>UGM51</b>	<b>INSULATED PROTECTIVE CAP, 600A, 28kV FOR T-OP 2 ELBOW, STANDARD SIZE, COMPLETE WITH DRAIN WIRE, ANSI/IEEE 386-1995</b>		
MANUFACTURER: MFG. CAT#	COOPER/ RTE DPC628		
<b>UGM52</b>	<b>INSULATED PROTECTIVE CAP, 600A, 28kV FOR T-OP 2 ELBOW, EXTENDED SIZE, COMPLETE WITH DRAIN WIRE, ANSI/IEEE 386-1995</b>		
MANUFACTURER: MFG. CAT#	COOPER/ RTE DPC628UT		
<b>UGM55</b>	<b>CABLE ADAPTER FOR 500MCM (CABLE DIAMETERS 1.36" - 1.56") TO BE ORDERED IN ADDITION TO COOPER/ RTE T-OP 2. **PURCHASER TO VERIFY ADAPTER WILL FIT CABLE.</b>		
MANUFACTURER: MFG. CAT#	COOPER/ RTE CA628H		
<b>UGM56</b>	<b>CABLE ADAPTER FOR 1000MCM (CABLE DIAMETERS 1.64" - 1.84") TO BE ORDERED IN ADDITION TO COOPER/ RTE T-OP 2. **PURCHASER TO VERIFY ADAPTER WILL FIT CABLE.</b>		
MANUFACTURER:	CA628K		
<b>UGM</b>	<b>CONNECTOR, 500MCM</b>		
MANUFACTURER: MFG. CAT#	COOPER/ RTE CC6C22TCSA30		
<b>UGM</b>	<b>CONNECTOR, 1000MCM</b>		
MANUFACTURER: MFG. CAT#	COOPER/ RTE CC6C27TCSA32		
<b>UGM</b>	<b>PARKING STAND BUSHING, 28kV, 600A.</b>		
MANUFACTURER: MFG. CAT#	COOPER/ RTE ISB628CSC		
<b>UGM</b>	<b>CONNECTOR, STEM, COMPRESSION Al/Cu, #1 AWG - #1/0 AWG COMPACT STRANDED</b>		
MANUFACTURER: MFG. CAT#	3M SC0001		
<b>CON</b>	<b>CONNECTOR, COMPRESSION SLEEVE, FOR #4/0 - #4/0 AWG, AL/AL COMPACT STRANDED</b>		
MANUFACTURER: MFG. CAT#	ILSCO ASC4/0	LAPRAIRIE KSN40P	BURNDY YJS28A

### 3.3 Connectors and Terminators

**CON CONNECTOR, COMPRESSION SLEEVE, FOR #250 - #250 MCM, CU/CU or AL/AL COMPACT STRANDED**

MANUFACTURER: ILSCO LAPRAIRIE BURNDY  
MFG. CAT# ASC250 KSN025P YJS29A

**CON03 CONNECTOR, LUG, 1 HOLE, COMPRESSION, #1/0 AWG, CU COMPACT STRANDED (For Primary Cables)**

MANUFACTURER: BURNDY TRIDEM LAPRAIRIE  
MFG. CAT# YJA1/0T12 01-210:1 CKLL10-NTN

**CON006 CONNECTOR, LUG, 1 HOLE, COMPRESSION, #4/0 AWG, AL COMPACT STRANDED (For Secondaries to Meter Base)**

MANUFACTURER: ILSCO SPECTAL LAPRAIRIE  
MFG. CAT# ACC4/0 HT4/0-1T KL40-TN  
MANUFACTURER: BURNDY  
MFG. CAT# YJA4/0AT12TN

**CON CONNECTOR, LUG, 1 HOLE, COMPRESSION, 250 MCM, AL COMPACT STRANDED (For Secondaries to Meter Base)**

MANUFACTURER: ILSCO SPECTAL LAPRAIRIE  
MFG. CAT# ACC-250 HT25-1T KL025-TN  
MANUFACTURER: BURNDY  
MFG. CAT# YJA343AT12TN

**CON CONNECTOR, LUG, 1 HOLE, COMPRESSION, #2/0 AWG, CU STRANDED (For Grounding Wire)**

MANUFACTURER: BURNDY TRIDEM LAPRAIRIE  
MFG. CAT# YJA2/0T12 01-212:1 CKLL20-NTN

**CON CONNECTOR, TAP, WEDGE, COPPER, WHITE CARTRIDGE FOR #2/0 AWG STR. TO #2/0 AWG Str.**

MANUFACTURER: AMPACT  
MFG. CAT# 1-275187-5

**CON CONNECTOR, TAP, WEDGE, COPPER, WHITE CARTRIDGE FOR #1/0 AWG STR. TO #2/0 AWG Str.**

MANUFACTURER: AMPACT  
MFG. CAT# 1-275187-6



3.4 Underground Duct Conduit

UGM	DUCT, PVC, 3" (75 MM), 3M LENGTH, TYPE DB2/ES2, C/W BELL END, CSA C22.2 NO. 211.1	
MANUFACTURER: MFG. CAT#	ROYAL DB1003 Q0TKT0C	IPEX 08230
UGM040	DUCT, PVC, 4" (100 MM), 3M LENGTH, TYPE DB2/ES2, C/W BELL END, CSA C22.2 NO. 211.1	
MANUFACTURER: MFG. CAT#	ROYAL DB1004	IPEX 08240
UGM	DUCT, PVC, 3" (75 MM), 6M LENGTH, TYPE DB2/ES2, C/W BELL END, CSA C22.2 NO. 211.1	
MANUFACTURER: MFG. CAT#	ROYAL DB2003	IPEX 08231
UGM041	DUCT, PVC, 4" (100 MM), 6M LENGTH, TYPE DB2/ES2, C/W BELL END, CSA C22.2 NO. 211.1	
MANUFACTURER: MFG. CAT#	ROYAL DB2004	IPEX 08241
UGM	COUPLING, POLYETHYLENE, 3" (75 MM), PUSH FIT, CSA C22.2 NO. 211.1 FOR CONCRETE ENCASED DUCTWORK ONLY	
MANUFACTURER: MFG. CAT#	ROYAL PFC03	IPEX PFC030
UGM	COUPLING, POLYETHYLENE, 4" (100 MM), PUSH FIT, CSA C22.2 NO. 211.1 FOR CONCRETE ENCASED DUCTWORK ONLY	
MANUFACTURER: MFG. CAT#	ROYAL PFC04	IPEX PFC040
UGM	COUPLING, POLYETHYLENE, 5°, 3" (75 MM), PUSH FIT, CSA C22.2 NO. 211.1 FOR CONCRETE ENCASED DUCTWORK ONLY	
MANUFACTURER: MFG. CAT#	ROYAL PFC5 03	IPEX 5APF30
UGM	COUPLING, POLYETHYLENE, 5°, 4" (100 MM), PUSH FIT, CSA C22.2 NO. 211.1 FOR CONCRETE ENCASED DUCTWORK ONLY	
MANUFACTURER: MFG. CAT#	ROYAL PFC5 04	IPEX 5APF40
UGM	COUPLING, PVC SOLVENT WELD, 3" (75 MM), CSA C22.2 NO. 211.1	
MANUFACTURER: MFG. CAT#	ROYAL SWC 03	IPEX SWC030
UGM	COUPLING, PVC SOLVENT WELD, 4" (100 MM), CSA C22.2 NO. 211.1	
MANUFACTURER: MFG. CAT#	ROYAL SWC 04	IPEX SWC040
UGM	COUPLING, PVC SOLVENT WELD, 5°, 3" (75 MM), CSA C22.2 NO. 211.1	
MANUFACTURER: MFG. CAT#	ROYAL SWC5 03	IPEX 5ACS30

3.4 Underground Duct Conduit

**UGM COUPLING, PVC SOLVENT WELD, 5°, 4" (100 MM), CSA C22.2 NO. 211.1**

MANUFACTURER: ROYAL IPEX  
MFG. CAT# SWC5 04 5ACS40

**DUCT PLUG, TAPERED, PVC, 3" (75 MM), CSA C22.2 NO. 211.1**

MANUFACTURER: ROYAL IPEX  
MFG. CAT# PLUG03 PLUG30

**UGM DUCT PLUG, TAPERED, PVC, 4" (100 MM), CSA C22.2 NO. 211.1**

MANUFACTURER: ROYAL IPEX  
MFG. CAT# PLUG04 PLUG40

**UGM DUCT SPACER, INTERMEDIATE, 4" X 1-1/2", FOR 4" DUCT, PVC, CSA C22.2 NO. 211.1**

MANUFACTURER: ROYAL IPEX  
MFG. CAT# RIS4015 IS5530

**UGM DUCT SPACER, BASE, 4" X 1-1/2", FOR 4" DUCT, PVC, CSA C22.2 NO. 211.1**

MANUFACTURER: ROYAL IPEX  
MFG. CAT# RBS4015 BS5530

**UGM DUCT SPACER, INTERMEDIATE, 3" X 1-1/2", FOR 3" DUCT, PVC, CSA C22.2 NO. 211.1**

MANUFACTURER: ROYAL IPEX  
MFG. CAT# IS3015 IS4530

**UGM DUCT SPACER, BASE, 3" X 1-1/2", FOR 3" DUCT, PVC, CSA C22.2 NO. 211.1**

MANUFACTURER: ROYAL IPEX  
MFG. CAT# BS3015 BS4530

**UGM BELL END, PVC, 3", TYPE DB2/ES2, CSA C22.2 NO. 211.1**

MANUFACTURER: ROYAL IPEX  
MFG. CAT# BEL03 BELL30

**UGM BELL END, PVC, 4", TYPE DB2/ES2, CSA C22.2 NO. 211.1**

MANUFACTURER: ROYAL IPEX  
MFG. CAT# BEL04 BELL40

**UGM DUCT BEND, PVC, 3" X 36"(R), 45°, TYPE DB2/ES2, CSA C22.2 NO. 211.1**

MANUFACTURER: ROYAL IPEX  
MFG. CAT# 45B3X36 453036

**UGM DUCT BEND, PVC, 4" X 36"(R), 45°, TYPE DB2/ES2, CSA C22.2 NO. 211.1**

MANUFACTURER: ROYAL IPEX  
MFG. CAT# 45B4X36 454036

**UGM DUCT BEND, PVC, 3" X 60"(R), 45°, TYPE DB2/ES2, CSA C22.2 NO. 211.1**

MANUFACTURER: ROYAL IPEX  
MFG. CAT# 45B3X60 453060

3.4 Underground Duct Conduit

UGM DUCT BEND, PVC, 4" X 60"(R), 45°, TYPE DB2/ES2, CSA C22.2 NO. 211.1

MANUFACTURER: ROYAL IPEX  
MFG. CAT# 45B4X60 454060

UGM DUCT BEND, PVC, 3" X 36"(R), 90°, TYPE DB2/ES2, CSA C22.2 NO. 211.1

MANUFACTURER: ROYAL IPEX  
MFG. CAT# 90B3X36 903036

UGM DUCT BEND, PVC, 4" X 36"(R), 90°, TYPE DB2/ES2, CSA C22.2 NO. 211.1

MANUFACTURER: ROYAL IPEX  
MFG. CAT# 90B4X36 904036

UGM DUCT BEND, PVC, 3" X 60"(R), 90°, TYPE DB2/ES2, CSA C22.2 NO. 211.1

MANUFACTURER: ROYAL IPEX  
MFG. CAT# 90B3X60 903060

UGM DUCT BEND, PVC, 4" X 60"(R), 90°, TYPE DB2/ES2, CSA C22.2 NO. 211.1

MANUFACTURER: ROYAL IPEX  
MFG. CAT# 90B4X60 904060

UGM DUCT, RIGID PVC, 2" (50 MM), C/W BELL END, CSA C22.2 NO. 211.2

MANUFACTURER: ROYAL IPEX  
MFG. CAT# RC0200 32120

UGM DUCT, RIGID PVC, 2.5" (50 MM), C/W BELL END, CSA C22.2 NO. 211.2

MANUFACTURER: ROYAL IPEX  
MFG. CAT# RC0250 32125

UGM BELL END, 2" RIGID PVC, PART OF METER BASE ENTRANCE, SEE DUCT INSTALLATION SPEC UD-09

MANUFACTURER: ROYAL IPEX CARLON  
MFG. CAT# N/A IB35 E997J-CAR

UGM BELL END, 2.5" RIGID PVC, PART OF METER BASE ENTRANCE, SEE DUCT INSTALLATION SPEC UD-09

MANUFACTURER: ROYAL IPEX CARLON  
MFG. CAT# N/A IB4C E997K

UGM OFFSET TERMINAL ADAPTORS, 2" RIGID PVC, PART OF METER BASE ENTRANCE

MANUFACTURER: ROYAL IPEX CARLON  
MFG. CAT# CM035 M035 E995J

UGM TERMINAL ADAPTER, 2" RIGID PVC, PART OF METER BASE ENTRANCE

MANUFACTURER: ROYAL IPEX CARLON  
MFG. CAT# CTA35 TA35 E943J

### 3.4 Underground Duct Conduit

<b>UGM</b>	<b>TERMINAL ADAPTER, 2.5" RIGID PVC, PART OF METER BASE ENTRANCE</b>		
MANUFACTURER: MFG. CAT#	ROYAL N/A	IPEX TA4C	CARLON E943K
<b>UGM</b>	<b>GENTLE 90 DEGREE ELBOW, CSA APPROVED, WITH BELL END FOR COULPING LARGER SERVICE DUCT TO SMALLER SERVICE DUCT. TO BE USED IN RECESSED METER BASE INSTALLATIONS ONLY. BELL END SHALL FIT UNDERGROUND DUCT FROM ROAD</b>		
MANUFACTURER: MFG. CAT#	IPEX EE3590 (METER END) & 68427 (BELL END) OR LARGER AS REQUIRED		
<b>UGM</b>	<b>U-Guard Riser, PVC, Power Mold, 2" x 8', Flanged, Heavy Duty. Used in conjunction with HHH Specification UD-15 (most recent revision)</b>		
	MANUFACTURER: Holm Industries Inc. Distributor: Lakeport Power Ltd. MFG. CAT# 400PM2-408		
<b>UGM</b>	<b>U-Guard Riser, PVC, Power Mold, 4" x 8', Flanged, Heavy Duty. Used in conjunction with HHH Specification UD-15 (most recent revision)</b>		
	MANUFACTURER: Holm Industries Inc. Distributor: Lakeport Power Ltd. MFG. CAT# 400PM4-408		
<b>UGM</b>	<b>Adapter Boot, PVC, 2" or 3", Vented. Used in conjunction with HHH Specification UD-15 (most recent revision).</b>		
	MANUFACTURER: Holm Industries Inc. Distributor: Lakeport Power Ltd. MFG. CAT# 400PMA-23		

### 3.5 Switchgear Sectionalizing

- SWG SWITCHGEAR, 28 KV, PADMOUNTED, SF6 SWITCH/ RFI, 3 PHASE, 5 WAY, 2 SWITCHED WAYS, AND 3 FAULT INTERRUPTING WAY c/w MOTOR OPERATION PROVISIONS.**
- MANUFACTURER: CANADA POWER  
MFG. CAT# PRG6-55-29.3  
MODEL (& PART #): 6TTT6/ 898 (801C1801)
- SWG SWITCHGEAR, 28 KV, PADMOUNTED, SF6 SWITCH/ RFI, 3 PHASE, 4 WAY, 3 SWITCHED WAYS, AND 1 FAULT INTERRUPTING WAY c/w MOTOR OPERATION PROVISIONS.**
- MANUFACTURER: CANADA POWER
- MFG. CAT# PRG6-44-29.3  
MODEL (& PART #): 66T6/ 898 (801C1806)
- SWG SWITCHGEAR, 28 KV, PADMOUNTED, SF6 SWITCH/ RFI, 3 PHASE, 4 WAY, 2 SWITCHED WAYS, AND 2 FAULT INTERRUPTING WAYS c/w MOTOR OPERATION PROVISIONS.**
- MANUFACTURER: CANADA POWER  
MFG. CAT# PRG6-44-29.3  
MODEL (& PART #): 6TT6/ 898 (801C1781)
- SWG SWITCHGEAR, 28 KV, PADMOUNTED, SF6 SWITCH/ RFI, 4 WAY WITH TWO (2) - 3 PHASE SWITCHED WAYS, AND TWO (2) 3-SINGLE PHASE FAULT INTERRUPTING WAYS c/w MOTOR OPERATION PROVISIONS.**
- MANUFACTURER: CANADA POWER  
MFG. CAT# PRG61/3 - 44 - 29.3  
MODEL (& PART #): 6TT6/ 898B (801C1810)
- SWG SWITCHGEAR, 28 KV, PADMOUNTED, SF6 SWITCH/ RFI, 4 WAY WITH TWO (2) - 3 PHASE SWITCHED WAYS, ONE (1) 3-PHASE FAULT INTERRUPTING WAY, AND ONE (1) 3-SINGLE PHASE FAULT INTERRUPTING WAY c/w MOTOR OPERATION PROVISIONS.**
- MANUFACTURER: CANADA POWER  
MFG. CAT# PRG61/3 - 44 - 29.3  
MODEL (& PART #): 6TT6/ 898C (801C1809)
- SWG SWITCHGEAR, 28 KV, PADMOUNTED, SF6 SWITCH/ RFI, 3 PHASE, 4 WAY WITH 1 SWITCHED WAY, AND 3 FAULT INTERRUPTING WAYS c/w MOTOR OPERATION PROVISIONS.**
- MANUFACTURER: CANADA POWER  
MFG. CAT# PRG6 - 44 - 29.3  
MODEL (& PART #): 6TTT/ 898 (801C1767)
- SWG SWITCHGEAR, 28 KV, PADMOUNTED, SF6 SWITCH/ RFI, 3 PHASE, 5 WAY, (2) 3-PHASE SWITCHED WAYS, (2) 3-PHASE FAULT-INTERRUPTING WAYS, AND (1) 3-SINGLE PHASE FAULT-INTERRUPTING WAYS c/w MOTOR OPERATION PROVISIONS.**
- MANUFACTURER: CANADA POWER  
MFG. CAT# PRG61/3-55-29.3  
MODEL (& PART #): 6TTT6/ 898 (801C1928)

### 3.5 Switchgear Sectionalizing

**KAB SECTIONALIZING UNIT, THREE PHASE, THREE WAY, 200A, 25 KV, 74"(D)X 60"(W)X 30"(H), PROVISION FOR TWO WAY - FOUR WAY MODULES, MUNSELL GREEN FINISH, 14 GAUGE STEEL, ENCLOSURE ONLY, APPROX. 400 LBS.**

<b>MANUFACTURER:</b>	<b>DURHAM COMPANY</b>	<b>KABAR</b>
<b>MFG. CAT#</b>	<b>AMSPR-12423-200A-28KV</b>	<b>K503</b>

3.6 Metering

**MET METER SOCKET, S BASE, 200A, UNDERGROUND, 4 JAW, 2 - 1/2" "STUD" - LINE CONNECTIONS, 2 TERMINAL LOAD CONNECTIONS FOR 6 - 250MCM CABLE, CU/AL, RATED 600V, TYPE 3R ENCLOSURE (CSA APPROVED) \*\*FOR USE ON NEW/ UPGRADED UNDERGROUND SERVICES INCLUDING SUBDIVISIONS.\*\***

MANUFACTURER: CUTLER-HAMMER MICROELECTRIC HYDEL  
MFG. CAT# CLX M02-V; M02-V0 MSC400T

**MET METER SOCKET, 400A, 120/240V, SINGLE PHASE, UNDERGROUND, 5 JAW, 2 - 1/2" "STUD" - LINE CONNECTIONS, 2 TERMINAL LOAD CONNECTIONS FOR 6 - 500MCM CABLE, CU/AL, EQUIPPED WITH AUTOMATIC CIRCUIT CLOSING DEVICE, TYPE 3R ENCLOSURE (CSA APPROVED)**

MANUFACTURER: EATON HYDEL  
MFG. CAT# TCC5-4 CT4-4

**MET METER SOCKET, 2 POSITION, 200A MAIN, 2-100A POSITIONS, OVERHEAD, 4 JAW, SCREW TERMINALS - LINE CONNECTIONS FOR 6-250MCM CABLE CU/AL, 2 TERMINAL LOAD CONNECTIONS FOR 6 - 1/0 CABLE, CU/AL, RATED 600V, TYPE 3R ENCLOSURE (CSA APPROVED)**

MANUFACTURER: MICROELECTRIC HYDEL  
MFG. CAT# BE2-V SD220PW

**MET METER SOCKET, 2 POSITION, S BASE, 200A MAIN, 200A POSITION, UNDERGROUND, 4 JAW, 2 - 1/2" "STUD" - LINE CONNECTIONS, 2 TERMINAL LOAD CONNECTIONS FOR 6 - 250MCM CABLE, CU/AL, RATED 600V, TYPE 3R ENCLOSURE (CSA APPROVED)**

MANUFACTURER: CUTLER-HAMMER MICROELECTRIC HYDEL  
MFG. CAT# 2KU2CLX BDC2-V MSC23R

**MET METER SOCKET, 3 POSITION, S BASE, 200A MAIN, 200A POSITION, UNDERGROUND, 4 JAW, 2 - 1/2" "STUD" - LINE CONNECTIONS, 2 TERMINAL LOAD CONNECTIONS FOR 6 - 250MCM CABLE, CU/AL, RATED 600V, TYPE 3R ENCLOSURE (CSA APPROVED)**

MANUFACTURER: CUTLER-HAMMER MICROELECTRIC  
MFG. CAT# 3KU2CLX BDC3-V

### 3.6 Metering

**MET METER SOCKET, 4 POSITION, S BASE, 200A MAIN, 200A POSITION, UNDERGROUND, 4 JAW, 2 - 1/2" "STUD" - LINE CONNECTIONS, 2 TERMINAL LOAD CONNECTIONS FOR 6 - 250MCM CABLE, CU/AL, RATED 600V, TYPE 3R ENCLOSURE (CSA APPROVED)**

MANUFACTURER: CUTLER-HAMMER MICROELECTRIC  
MFG. CAT# 4KU2CLX BDC4-V

**MET METER SOCKET, 2 POSITION, 200A PER POSITION, UNDERGROUND, 4 JAW, 2 TERMINAL LOAD CONNECTIONS FOR 6 - 250MCM CABLE, CU/AL, RATED 600V, TYPE 3R ENCLOSURE (CSA APPROVED)**

MANUFACTURER: MICROELECTRIC  
MFG. CAT# BD2-V (LEFT-HAND ENTRY) or BD2-VH (RIGHT-HAND ENTRY)

**MET METER SOCKET, 3 PHASE , S BASE, 200A , UNDERGROUND/OVERHEAD, 7JAW, 3 - 1/2" "STUD" - LINE CONNECTIONS, 3 TERMINAL LOAD CONNECTIONS FOR 6 - 250MCM CABLE, CU/AL, RATED 600V, TYPE 3 ENCLOSURE (CSA APPROVED)**

MANUFACTURER: CUTLER-HAMMER MICROELECTRIC  
MFG. CAT# P27 PL27-TCV

**MET METER SOCKET, 5 JAW, TRANSFORMER RATED, 20 AMP, 600V MAX. CONDUCTOR RANGE 14 - 10 AWG. CIRCUIT CLOSING FEATURE TO SHORT OUT CURRENT TRANSFORMER UPON REMOVAL OF METER. WEATHERPROOF TYPE 3R ENCLOSURE (CSA APPROVED).**

MANUFACTURER: CUTLER-HAMMER MICROELECTRIC  
MFG. CAT# TCC5-0 CL5-V

**MET COMBINATION OVERHEAD/ UNDERGROUND METER SOCKET, 4 JAW, 200 AMP, 600V MAX. CONDUCTOR RANGE #6 - 250MCM AWG. ALUMINUM TUNNEL TYPE CONNECTORS, SUPPLIED WITH SCREW TYPE RING . WEATHERPROOF TYPE 3R ENCLOSURE (CSA APPROVED). **\*\*USED PRIMARILY FOR OVERHEAD SERVICES, NOT NEW SUBDIVISIONS/ UNDERGROUND SERVICES UNLESS OTHERWISE SPECIFIED BY HHH ENGINEERING.\*\*****

MANUFACTURER: CUTLER-HAMMER MICROELECTRIC HYDEL  
MFG. CAT# LM2 BS2-TCV SLC400R

**MET METER ENCLOSURE (CABINET), WOODEN BACKPANEL FOR MOUNTING METER BASE, DOORLESS FOR USE IN INSTALLATIONS WHERE METER IS RECESSED.**

MANUFACTURER: HYDEL  
MFG. CAT# ST301812SC (DOORLESS)

NOTE: ALL METER BASES INSTALLED IN HALTON HILLS MUST BE CSA APPROVED FOR USE IN CANADA.



3.7 Concrete Foundations

**CON FOUNDATION, PRECAST CONCRETE BASE, FOR SINGLE PHASE PADMOUNTED TRANSFORMERS, UP TO 100 KVA, TOTAL WEIGHT APPROX. 1818 KG (4000 LBS), 32 - POLY SEAL CABLE ENTRY**

<b>MANUFACTURER:</b>	ACTON PRECAST	BROOKLIN CONCRETE	ICS
<b>MFG. CAT#</b>	LP58P	BCP-110PC	ICS-189
<b>OUTER DIMENSION</b>	58"X40"X42" (D)	58"X40"X42" (D)	58"X40"X42" (D)
<b>OPENING</b>	34"X28"	34"X28"	34"X28"

**CON FOUNDATION, PRECAST CONCRETE BASE, FOR SINGLE PHASE PADMOUNTED TRANSFORMERS, UP TO 100 KVA, TOTAL WEIGHT APPROX. 1818 KG (4000 LBS), 32 - POLY SEAL CABLE ENTRY**

<b>MANUFACTURER:</b>	ACTON PRECAST	BROOKLIN CONCRETE	ICS	UTILICON
<b>MFG. CAT#</b>	LPC48	BCP-110PC	ICS-189	UW4058C
<b>OUTER DIMENSION</b>	48"X48"X46" (D)	40"X58"X42" (D)	40"X58"X42" (D)	40"X58"X48" (D)
<b>OPENING</b>	26"X33"	28"X34"	28"X34"	28"X34"

**CON FOUNDATION, PRECAST CONCRETE BASE, FOR THREE PHASE PADMOUNTED TRANSFORMERS, UP TO 2000 KVA, TOTAL WEIGHT APPROX. 3629 KG (8000 LBS), 32 - POLY SEAL CABLE ENTRY (FOR TRANSFORMERS LARGER THAN 2000KVA, IT REMAINS THE DEVELOPERS RESPONSIBILITY TO ENSURE TRANSFORMER WILL PROPERLY SIT ON THE FOUNDATION AND BE SUPPORTED BY THE FOUNDATION)**

<b>MANUFACTURER:</b>	ACTON PRECAST
<b>MFG. CAT#</b>	LPC80
<b>OUTER DIMENSION</b>	80"X72"X48" (D)
<b>OPENING</b>	18"X44"

**CON FOUNDATION, PRECAST CONCRETE BASE, FOR PADMOUNTED SECTIONALIZING UNITS, TOTAL WEIGHT APPROX.1320 KGS (2900 LBS), POLY SEAL CABLE ENTRY**

<b>MANUFACTURER:</b>	ACTON PRECAST	BROOKLIN CONCRETE	ICS
<b>MFG. CAT#</b>	K-BAR SWITCH	BCP-109	ICS-150
<b>OUTER DIMENSION</b>	48"X34"X42" (D)	49"X38"X42" (D)	45"X24"X42" (D)
<b>OPENING</b>	12"X36"	26"X37"	42"X12"

**CON FOUNDATION, PRECAST CONCRETE BASE, CANADA POWER SWITCHGEAR, 28 KV, PADMOUNTED, SF6, 3 PHASE, 4 WAY, TOTAL WEIGHT APPROX. 2650 KG (5800 LBS), POLYSEAL CABLE ENTRY. (REF: HHH UD-27 LATEST REVISION).**

<b>MANUFACTURER:</b>	ACTON PRECAST	BROOKLIN CONCRETE	ICS
<b>MFG. CAT#</b>	B9660 & P9660		
<b>OUTER DIMENSION</b>	96"X60"X48" (D)		
<b>OPENING</b>	71"X24"		

**CON FOUNDATION, CONCRETE BASE, 78"X85"X48"D FOR 28KV S&C PADMOUNT SWITCHGEAR, TOTAL WEIGHT APPROX. 3500 KG (7650 LBS), POLY SEAL CABLE ENTRY**

<b>MANUFACTURER:</b>	ACTON PRECAST	BROOKLIN CONCRETE	ICS
<b>MFG. CAT#</b>	SPECIAL ORDER	BCP 330-P	ICS-191
<b>OUTER DIMENSION</b>	78"X85"X48" (D)	78"X85"X48" (D)	78"X85"X48" (D)
<b>OPENING</b>	77"X36"	77"X36"	77"X36"

**CON LID, CONCRETE, 96"X78"X6"(H) FOR RETROFITTING 28KV CANADA POWER SWITCHGEAR ONTO EXISTING S&C PADMOUNT SWITCHGEAR CONCRETE FOUNDATIONS, CONCRETE 32 Mpa, AIR 5-7%, APPROX. WEIGHT 3000 LBS, DESIGN LOAD 2,200 LBS. \*\*USED ONLY IN CONJUNCTION WITH HHH UD-29 UPON APPROVAL FROM HHH ENGINEERING.**

<b>MANUFACTURER:</b>	ACTON PRECAST
<b>MFG. CAT#</b>	P9678
<b>OUTER DIMENSION</b>	96"X78"X6" (H)
<b>OPENING</b>	71" (W) X24" (D)

**Note:** It is the developers responsibility to ensure that their equipment will sit properly on above listed concrete foundations. All equipment must be securely fastened to concrete lid/ foundation as applicable.

### 3.8 Fault Indicators

#### **FAU**

UNDERGROUND FAULT INDICATOR, SINGLE PHASE, PULSE - PAUSE - ZERO (PPZ), LOAD LEVELING, AUTOMATIC/ MANUAL RESET, 200A TRIP, 4 HOUR TIME RESET, WITH FIBER OPTIC CABLE ASSEMBLY (6FT CABLE).

MANUFACTURER:	HORSTMANN
MFG. CAT#	29-6028-000
CABLE O.D.	22mm - 50mm
FIBER OPTIC CABLE	49-6007-106
ASSEMBLY CAT#:	

#### **NOTES:**

APPROVED BY HALTON HILLS HYDRO - AUGUST 28, 2012

### 3.9 Grounding

**GRD** GROUND PLATES, COPPER, 7" X 7-5/8" SIZE, 0.025" PURE COPPER (MUST BE APPROVED ON A CASE-BY-CASE BASIS)

MANUFACTURER: BLACKBURN  
MFG. CAT# PBGW

**GRD001** ROD, GROUND, 3.0M (10') X 19 MM (3/4"), TYPE 2 STEEL, GALVANIZED, CSA C83.41

MANUFACTURER: HYDEL KABAR CHANCE  
MFG. CAT# 3410G K61-5 8620  
MANUFACTURER: BLACKBURN GRAFTON  
MFG. CAT# GR7510 GR3410

**GRD002** CONNECTOR, GROUND ROD, 1 - BOLT CLAMP, COPPER, FOR 3/4" GROUND ROD TO #8 - #2/0 AWG STRANDED BARE COPPER

MANUFACTURER: BURNDY CHANCE BLACKBURN GRAFTON  
MFG. CAT# GRC3426 C203-0345 JAB1H GRG34B

**GRD** CONNECTOR, GROUND ROD, U - BOLT CLAMP, COPPER, FOR 3/4" GROUND ROD TO #8 - #2/0 AWG STRANDED BARE COPPER

MANUFACTURER: BLACKBURN BURNDY CHANCE  
MFG. CAT# GUV5821 GAR6426 GC-111-3B

**WIR042** WIRE, COPPER, FOR GROUND BUS, #2/0 AWG, BARE, 19 STRAND, SOFT DRAWN

MANUFACTURER: PRYSMIAN (formerly PIRELLI) BICC ALCATEL  
MFG. CAT#  
MANUFACTURER: ALCAN  
MFG. CAT#

HHH CAT #	JACKET, COLD SHRINK, FOR 28" OPENING, 1.15 - 3.3" O.D. FOR #1/0 AWG, 28 kV SPLICES 3M CAT# 5451		
UGM	CABLE END CAP, HEAT SHRINK, FOR SEALING 1.77" to 3.15" O.D. CABLE		
MANUFACTURER: MFG. CAT#	SKE-45/100	ESC-6/A	23210-B2
UGM	JACKET, COLD SHRINK, FOR 28" OPENING, 1.15 - 3.3" O.D. FOR #1/0 AWG, 28 kV SPLICES 3M CAT# 5451		
MANUFACTURER: MFG. CAT#	3M 5J-2A		
UGM	JACKET, TUBE, INSULATED, HEAT SHRINK, 15.5" LONG, 0.35 - 1.20" DIA, FOR #2-#4/0 AWG, 600V CABLE, RATED 1000V, CSA CERTIFIED		
MANUFACTURER: MFG. CAT#	3M ITCSN-1100-48	RAYCHEM WCSM-33/8-1200-5	ILSCO 21412-B2
UGM	JACKET, TUBE, INSULATED, HEAT SHRINK, 15.5" LONG, 0.70 - 1.75" DIA, FOR 250-500 kCMIL, 600V CABLE, RATED 1000V, CSA CERTIFIED		
MANUFACTURER: MFG. CAT#	3M ITCSN-1500-48	RAYCHEM WCSM-51/16-1200-5	ILSCO 21712-B
UGM	TAPE, RUBBER, SILICONE, SELF-FUSING, 1"x30"x20 MILS		
MANUFACTURER: MFG. CAT#	3M SCOTCH 70	PLYMOUTH 3455	ARMET AR386
UGM	TAPE, SEMI-CON, RUBBER BUTYL - 3/4"x15"x30 MILS		
MANUFACTURER: MFG. CAT#	3M 13	ROTUNDA 2525	PLYMOUTH 2104
UGM	TAPE, SELF AMALGAMATING, POLYETHYLENE - SAPT - 2"x30"x20 MILS, RATED UP TO 69 KV, MOISTURE AND OZONE RESISTANT		
MANUFACTURER: MFG. CAT#	3M 130C	ROTUNDA 2501	PLYMOUTH 2211
UGM	TAPE, BLACK, PVC - 3/4" x 66' x 8.5 MILS, ASTM-D-3005 & CSA 22.2		
MANUFACTURER: MFG. CAT#	3M SCOTCH SUPER 88	PLYMOUTH 4240-PREMIUM-85CW	ROTUNDA 6408B
UGM	TAPE, BLACK, PVC - 2" x 66' x 8.5 MILS, ASTM-D-3005 & CSA 22.2		
MANUFACTURER: MFG. CAT#	3M SCOTCH SUPER 88	PLYMOUTH 4311-PREMIUM-85CW	ROTUNDA 6408B
UGM	TAPE, COLOR CODING, RED, PVC - 3/4"x 66' X 7mils, ASTM-D-3005 & CSA 22.2		
MANUFACTURER: MFG. CAT#	3M SCOTCH 35-RED	PLYMOUTH 3704-PREMIUM 37-RED	ROTUNDA 2702-RED
UGM	TAPE, COLOR CODING, WHITE, PVC- 3/4" x 66' X 7mils, ASTM-D-3005 & CSA 22.2		
MANUFACTURER: MFG. CAT#	3M SCOTCH 35-WHITE	PLYMOUTH 3706-PREMIUM 37-WHITE	ROTUNDA 2702-WHITE
UGM	TAPE, COLOR CODING, BLUE, PVC - 3/4" x 66' X 7mils, ASTM-D-3005 & CSA 22.2		
MFG. CAT#	3M SCOTCH 35-BLUE	PLYMOUTH 3705-PREMIUM 37-BLUE	ROTUNDA 2702-BLUE
UGM	LUBRICANT, CABLE PULLING, HEAVY DUTY, NON-TOXIC, PE & PVC COMPATIBLE, 5 GALLON CONTAINER		
MANUFACTURER: MFG. CAT#	3M WL-5	IDEAL YELLOW 77	BLACKBURN 15-632UT
UGM	OXIDE INHIBITOR COMPOUND, NON-PETROLEUM BASED, NON-TOXIC, 8 OZ SQUEEZE BOTTLE		
MANUFACTURER: MFG. CAT#	BLACKBURN CTB8	BURNDY PENETROX13	ELASTIMOLD 2201-8
MANUFACTURER: MFG. CAT#	ILSCO DE-0X (8 OZ)		
UGM	MARKER, BALL, "RED", ELECTRONIC, 4' DEPTH FOR THE LOCATING OF SPLICES / DUCT BANKS / SUBSURFACE EQUIPMENT		
MANUFACTURER: MFG. CAT#	3M 1402		
UGM	MARKER, BALL, "ORANGE", ELECTRONIC, 4' DEPTH FOR THE LOCATING OF FIBRE OPTIC PLANT		

MANUFACTURER: MFG. CAT#	3M 1401			
UGM	MARKER, DISC, "BLACK", ELECTRONIC, MID RANGE 6' DEPTH FOR THE LOCATING OF SPLICES / DUCT BANKS / SUBSURFACE EQUIPMENT			
MANUFACTURER: MFG. CAT#	3M 1256			
UGM	MARKER, DISC, "BLACK", ELECTRONIC, FULL RANGE, 8' DEPTH FOR THE LOCATING OF SPLICES / DUCT BANKS / SUBSURFACE EQUIPMENT			
MANUFACTURER: MFG. CAT#	3M 1251			
UGM035	GUARD, CABLE, STRAIGHT, 3-1/4" X 8", GALVANIZED STEEL, 14 GAUGE STEEL, CSA C83.53 SPECIFICATION			
MANUFACTURER: MFG. CAT#	HYDEL AG3148	MICROELECTRIC UG8314	SLACAN 7535	
MANUFACTURER: MFG. CAT#	KABAR K48-9A	CHANCE 6535		
UGM036	GUARD, CABLE, FLARED BOTTOM, 3-1/4" X 8", GALVANIZED STEEL, CSA C83.54 SPECIFICATION			
MANUFACTURER: MFG. CAT#	HYDEL AG3148F	MICROELECTRIC UGF8314	KABAR K48-9F	SLACAN 61813
UGM37	THROAT CLIP, FOR 3-1/4" GUARD, CABLE, ALUMINUM ALLOY			
MANUFACTURER: MFG. CAT#	HYDEL ATC314	KABAR K48-32	JOSLYN 10881	
UGM038	STRAP, FOR 3-1/4" GUARD, CABLE, GALVANIZED STEEL, CSA C83.55			
MANUFACTURER: MFG. CAT#	HYDEL 3145UC	MICROELECTRIC SUG314	SLACAN 22266	
MANUFACTURER: MFG. CAT#	KABAR K48-23	CHANCE 6540		
UGM	PUTTY, ELECTRICAL INSULATING, 1-1/2" X 5', "SCOTCHFIL", RATED 600V			
MANUFACTURER: MFG. CAT#	3M SCOTCHFIL			
LOC001	PADLOCK, SOLID BRASS SHACKLE AND BODY, KEYED A LIKE			
MANUFACTURER: MFG. CAT#	CISA	ABUS		
UGM	CLEANER, CABLE, FOR CLEANING CABLE INSULATION, (NON-TRACKING)			
MANUFACTURER: MFG. CAT#	BELCO SAFETY SUPPLY 51561	3M CC4		
UGM	CEMENT, CONDUIT, FOR PVC TYPE DB2/ES2 DUCT, 500 ML C/W SCREW TOP AND DAUBER			
MANUFACTURER: MFG. CAT#	ROYAL CC500	IPEX S100PT	SMC 1QTCEM	
BOL	BOLT, SILICON BRONZE, HEX HEAD, 1/2" X 1", ASTM B99			
MANUFACTURER: MFG. CAT#	H. PAULIN 5400-579	BURNDY HEB50X100	BLACKBURN 501008B	
BOL	BOLT, SILICON BRONZE, HEX HEAD, 1/2" X 2", ASTM B99			
MANUFACTURER: MFG. CAT#	H. PAULIN 5400-586	BURNDY HEB50X200	BLACKBURN 502008B	
NUT	NUT, SILICON BRONZE, FOR 1/2" BOLT, ASTM B99			
MANUFACTURER: MFG. CAT#	H. PAULIN 5426-022	BURNDY HENS0	BLACKBURN 50010HN	
WAS	WASHER, SILICON BRONZE, FLAT, FOR 1/2" BOLT, ASTM B99			
MANUFACTURER: MFG. CAT#	H. PAULIN 5455-822	BURNDY FW50	BLACKBURN 50040FW	
WAS	WASHER, SILICON BRONZE, SPLIT, FOR 1/2" BOLT, ASTM B99			
MANUFACTURER: MFG. CAT#	H. PAULIN 5458-022	BURNDY SW50	BLACKBURN 50030SW	
WAS	WASHER, "BELLEVILLE", STAINLESS STEEL, FOR 1/2" BOLT, FOR 4000 LBS FLAT LOAD, 55 FT-LBS TORQUE, .018" DISH, .125" THICKNESS, .531 ID.			
MANUFACTURER:	SPECIALTY STEELS	BLACKBURN		

MFG. CAT#	30155	50050BW	
	<b>CAUTION TAPE, RUGGED POLYETHYLENE, 6" WIDE, 1000' LENGTH, RED</b>		
MANUFACTURER: MFG. CAT#	BLACKBURN RT6	KLEIN 88003	IDEAL RT6
	<b>DUCT SEALANT, ASBESTOS FREE, FORM FITTING, IN 1 LBS. SLUGS</b>		
MANUFACTURER: MFG. CAT#	BLACKBURN DX-5	IBF DUCT1	
<b>ROP</b>	<b>POLY ROPE, 3/8", 1500' METAL SPOOL, 2440 LBS TENSILE STRENGTH</b>		
MANUFACTURER: MFG. CAT#	CHANCE C417-0324	CANADA CORDAGE PRHG-1500	POLYTWINE 38-1500
	<b>MARKERS, LETTERS, INDUSTRIAL REFLECTIVE YELLOW, 1-3/4" X 2-7/8" H</b>		
MANUFACTURER: MFG. CAT#	ALMETEK PS2.5BY		
	<b>MARKERS, NUMBERS, INDUSTRIAL REFLECTIVE YELLOW, 1-3/4" X 2-7/8" H</b>		
MANUFACTURER: MFG. CAT#	ALMETEK PS2.5RY		
	<b>SEALANT, FOUNDATION, TO BE USED BETWEEN COLLAR AND CONCRETE BASE, 1" WIDE</b>		
MANUFACTURER: MFG. CAT#	HAMILTON KENT G-KENT SEALER #2		
	<b>WRAP, TIE FOR 3" BUNDLE, 50 LBS UNLOCKING STRENGTH</b>		
MANUFACTURER: MFG. CAT#	BURNDY TF60	THOMAS & BETTS TY26MX	IDEAL 15-630
<b>SAND</b>	<b>SANDFILL, UNIFORMLY GRADED CLEAN SAND WITH MAXIMUM AGGREGATE SIZE OF 2.0MM</b>		
<b>C. SLAB</b>	<b>CONCRETE SLAB, 24"X24"</b>		
<b>C. STONE</b>	<b>3/4" (20MM) CLEAR CRUSH STONE</b>		
<b>CONCRETE</b>	<b>CONCRETE, 28 DAY COMPRESSIVE STRENGTH OF 20MPa, MAXIMUM AGGREGATES WITH 10MM PEA GRAVEL, IN ACCORDANCE WITH CSA-A23.1-M90</b>		
<b>TAG</b>	<b>SECONDARY CABLE TAGS, TECH. PRODUCTS FASTTAG, MINIATURE MARKERS, 0-9, LETTERS AS APPLICABLE.</b>		
MANUFACTURER: MFG. CAT#	TECH. PRODUCTS INC. 3DFYxx		
<b>TAG</b>	<b>SECONDARY CABLE TAG HOLDERS, 2 LINES, FOR FASTTAG NUMBERS/ LETTERS (LENGTH TO FIT AN EXTRA TWO CHARACTERS)</b>		
MANUFACTURER: MFG. CAT#	TECH. PRODUCTS INC. PHF2xx		
<b>TAG</b>	<b>PRIMARY CABLE TAGS, 1" LETTER SIZE, VERTICAL, BLACK ON YELLOW, EVERLAST, NUMBERS 0-9.</b>		
MANUFACTURER: MFG. CAT#	TECH. PRODUCTS INC. ELVKY001, ELVKY002, ELVKY003, ELVKY004, ELVKY005, ELVKY006, ELVKY007, ELVKY008, ELVKY009, ELVKY010		
<b>TAG</b>	<b>PRIMARY CABLE TAGS, 1" LETTER SIZE, VERTICAL, BLACK ON YELLOW, EVERLAST, LETTERS P, F S, K, G.</b>		
MANUFACTURER: MFG. CAT#	TECH. PRODUCTS INC. ELVKYP, ELVKYF, ELVKYS, ELVKYK, ELVKYG		
<b>TAG</b>	<b>PRIMARY CABLE TAGS, 1" LETTER SIZE, VERTICAL, BLACK ON YELLOW, EVERLAST, WORDS - RISER, SWITCH, SWITCHGEAR, TRANS., BLUE, RED, YELLOW.</b>		
MANUFACTURER: MFG. CAT#	TECH. PRODUCTS INC. ELVKY102 (RISER), ELVKY116 (SWITCH), ELVKY234 (SWITCHGEAR), ELVKY089 (TRANS.), ELVKY120 (BLUE), ELVKY119 (RED), ELVKY123 (YELLOW)		
<b>TAG</b>	<b>PRIMARY TAG HOLDER, FOR 1" NUMBERS/ LETTES ABOVE, 7 TAG CAPACITY,</b>		
MANUFACTURER: MFG. CAT#	TECH. PRODUCTS INC. PH107		

<b>WIR</b>	<b>CABLE, COPPER, UNDERGROUND STREET LIGHTING, 2-#8 AWG, STRANDED, C/W GROUND SOLID WIRE, NMWU, PVCJ, 300V</b>		
MANUFACTURER:	PIRELLI	BICC	ALCATEL
MFG. CAT#			
MANUFACTURER:	ALCAN		
MFG. CAT#			
<b>WIR</b>	<b>CABLE, COPPER, 2 CONDUCTORS, #12 AWG, TWU, SOLID OR STRANDED PVCJ, BLACK STREET LIGHT CABLE, 600V</b>		
MANUFACTURER:	PIRELLI	BICC	ALCATEL
MFG. CAT#			
MANUFACTURER:	ALCAN		
MFG. CAT#			
<b>CON</b>	<b>CONNECTOR, LUG, 1 HOLE, COMPRESSION, #8 AWG, CU STRANDED (For Street Lighting Cable)</b>		
MANUFACTURER:	HOMAC		
MFG. CAT#	L8-38		
<b>CON</b>	<b>CONNECTOR, SPLIT BOLT, COPPER, TIN PLATED FOR #10 - #2 AWG, SOLID (For Street Lighting Connections in Hand Hole)</b>		
MANUFACTURER:	BURNDY	BLACKBURN	
MFG. CAT#	KSU22	2HPS	
<b>CON</b>	<b>CONNECTOR, SPLIT BOLT, COPPER, TIN PLATED FOR #8 - #2 AWG, STRANDED (For Street Lighting Connections in Hand Hole)</b>		
MANUFACTURER:	BURNDY	BLACKBURN	
MFG. CAT#	KSU23	1HPS	
<b>FUSE</b>	<b>FUSE, CARTRIDGE, 10 AMP, 600V (For Street Lighting / Hand Hole Side)</b>		
MANUFACTURER:	BUSSMAN	BRUSH	
MFG. CAT#	KTK10	MCT 10	
<b>FUSE</b>	<b>FUSE, CARTRIDGE, 30 AMP, 600V (For Street Lighting / Transformer Side)</b>		
MANUFACTURER:	BUSSMAN	BRUSH	
MFG. CAT#	KTK30	MCT 30	
<b>FUSE</b>	<b>FUSE HOLDER, 30 AMP, 600V C/W 2L TYPE INSULATED BOOTS (1A0512) (For Street Lighting / Hand Hole Side)</b>		
MANUFACTURER:	BUSSMAN		
MFG. CAT#	HEB-AA		
<b>FUSE</b>	<b>FUSE HOLDER, 30 AMP, 600V, C/W BRK TERMINALS, C/W 2L TYPE INSULATED BOOTS (1A0512)(For Street Lighting / Transformer Side)</b>		
MANUFACTURER:	BUSSMAN		
MFG. CAT#	TRON HEB-AW-RLC-A		
<b>POLE</b>	<b>CONVENTIONAL POLE - DIRECT EMBEDDED ROUND, STRAIGHT-TAPERED, SPUN REINFORCED CONCRETE, CLASS "B" DESIGN STRENGTH, C/W STANDARD GREY FINISH, 27.5'(8.38M)</b>		
MANUFACTURER:	STRESS CRETE	UTILITY STRUCTURS	SKY CAST INC.
MFG. CAT#	E275-BPR-G-M00	HA-275-B-1-PG-10	SC-275-B-R0-CON-D-C-G-P
<b>POLE</b>	<b>CONVENTIONAL POLE - DIRECT EMBEDDED ROUND, STRAIGHT-TAPERED, SPUN REINFORCED CONCRETE, CLASS "B" DESIGN STRENGTH, C/W STANDARD GREY FINISH, 32.5'(9.91M)</b>		

MANUFACTURER:	STRESS CRETE	UTILITY STRUCTURS	SKY CAST INC.
MFG. CAT#	E325-BPR-G-M00	HA-325-B-1-PG-10	SC-325-B-R0-CON-D-C-G-P

**POLE**                    **CONVENTIONAL POLE - DIRECT EMBEDDED ROUND, STRAIGHT-TAPERED, SPUN REINFORCED CONCRETE, CLASS "B" DESIGN STRENGTH, C/W STANDARD GREY FINISH, 37.5'(11.43M)**

MANUFACTURER:	STRESS CRETE	UTILITY STRUCTURS	SKY CAST INC.
MFG. CAT#	E375-BPR-G-M00	HA-375-B-1-PG-10	SC-375-B-R0-CON-D-C-G-P

**POLE**                    **DECORATIVE POLE - DIRECT EMBEDDED OCTAGONAL, STRAIGHT-TAPERED, SPUN REINFORCED CONCRETE, CLASS "B" DESIGN STRENGTH, C/W POLISHED "MIDNIGHT LACE" FINISH, 25'(7.62M)**

MANUFACTURER:	STRESS CRETE	UTILITY STRUCTURS	SKY CAST INC.
MFG. CAT#	E250-BP0-G-S11	MA-250-B-2-ML-10	SC-250-B0C-TSP-D-C-G-P

**BRACKET**                **CONVENTIONAL S/L ARM FOR "COBRA HEAD" LUMINAIRES, TAPERED ELLIPTICAL BRACKET, 6FT(1.8M)**

MANUFACTURER:	POWERLITE INC.	STRESSCRETE	USS MANUFACTURING INC.
MFG. CAT#	SC-TB-6AL	126	TER6MA

**BRACKET**                **CONVENTIONAL S/L ARM FOR "COBRA HEAD" LUMINAIRES, TAPERED ELLIPTICAL BRACKET, 8FT(2.4M)**

MANUFACTURER:	POWERLITE INC.	STRESSCRETE	USS MANUFACTURING INC.
MFG. CAT#	SC-TB-8AL	128	TER8MA

**BRACKET**                **CONVENTIONAL S/L ARM FOR "COBRA HEAD" LUMINAIRES, TAPERED ELLIPTICAL BRACKET, 10FT(3.0M)**

MANUFACTURER:	POWERLITE INC.	STRESSCRETE	USS MANUFACTURING INC.
MFG. CAT#	N/A	1910S-10	N/A

**BRACKET**                **DECORATIVE S/L ARM, "SPRINGDALE" VICTORIAN STYLE, ALUMINUM BRACKET, 6FT(1.8M)**

MANUFACTURER:	POWERLITE INC.	STRESSCRETE	USS MANUFACTURING INC.
MFG. CAT#	N/A	176-S-6	N/A

**LUM**                        **LUMINAIRE, 120V, 70W, HPS, COBRA HEAD, C/W INTEGRAL BALAST, RECEPTACLE FOR PHOTO CONTROL, FACTORY SET LAMP SOCKET TO PROVIDE IES TYPE 2 MEDIUM SEMI-CUTOFF PHOTOMETRIC DISTRIBUTION**

MANUFACTURER:	POWERLITE	COOPER LIGHTING	LANDMARK LIGHTING
MFG. CAT#	R47G70S4Y2MSR	OVZ70SC22E4	113-H67E2-0M

**LUM**                        **LUMINAIRE, 120V, 100W,HPS, COBRA HEAD, C/W INTEGRAL BALAST, RECEPTACLE FOR PHOTO CONTROL, FACTORY SET LAMP SOCKET TO PROVIDE IES TYPE 2 MEDIUM SEMI-CUTOFF PHOTOMETRIC DISTRIBUTION**

MANUFACTURER:	POWERLITE	COOPER LIGHTING	LANDMARK LIGHTING
MFG. CAT#	R47G10S4Y2MSR	OVZ10SC22E4	113-H6712-0M

**LUM**                        **LUMINAIRE, 120V, 150W, HPS, COBRA HEAD, C/W INTEGRAL BALAST, RECEPTACLE FOR PHOTO CONTROL, FACTORY SET LAMP SOCKET TO PROVIDE IES TYPE 2 MEDIUM SEMI-CUTOFF PHOTOMETRIC DISTRIBUTION**

MANUFACTURER:	POWERLITE	COOPER LIGHTING	LANDMARK LIGHTING
MFG. CAT#	R47G15S4Y2MSR	OVZ15SC22E4	113-H6762-0M



<b>LUM</b>	<b>LUMINAIRE, 120V, 250W, HPS, COBRA HEAD, C/W INTEGRAL BALAST, RECEPTACLE FOR PHOTO CONTROL, FACTORY SET LAMP SOCKET TO PROVIDE IES TYPE 2 MEDIUM SEMI-CUTOFF PHOTOMETRIC DISTRIBUTION</b>		
MANUFACTURER:	POWERLITE	COOPER LIGHTING	LANDMARK LIGHTING
MFG. CAT#	R47G2554Y2MSR	OVZ255C22E4	113-G6733-0M
<b>LUM</b>	<b>LUMINAIRE, 120V, 100W, HPS, LANTERN STYLE, BLACK LUMINAIRE SIDE MOUNTED ON SCROLL ARM, C/W INTEGRAL BALAST, RECEPTACLE FOR PHOTO CONTROL, FACTORY SET LAMP SOCKET TO PROVIDE IES TYPE 2 MEDIUM SEMI-CUTOFF PHOTOMETRIC DISTRIBUTION</b>		
MANUFACTURER:	POWERLITE	COOPER LIGHTING	LANDMARK LIGHTING
MFG. CAT#	GR10S4YP2MSGIR	SDL1015S12RH2BK	TDRS10H122R0A00M
<b>LUM</b>	<b>LUMINAIRE, 120V, 150W, HPS, LANTERN STYLE, BLACK LUMINAIRE SIDE MOUNTED ON SCROLL ARM, C/W INTEGRAL BALAST, RECEPTACLE FOR PHOTO CONTROL, FACTORY SET LAMP SOCKET TO PROVIDE IES TYPE 2 MEDIUM SEMI-CUTOFF PHOTOMETRIC DISTRIBUTION</b>		
MANUFACTURER:	POWERLITE	COOPER LIGHTING	LANDMARK LIGHTING
MFG. CAT#	GR15S4YP2MSGIR	SDL15S12RH2BK	TDRS15H122R0A00M
<b>LUM</b>	<b>LUMINAIRE, 120V, 70W, HPS, SQUARE "SOEBOX" (WALKWAY / PATHWAY) LUMINAIRE, DARK BROWN (BRONZE), C/W INTEGRAL BALAST, RECEPTACLE FOR PHOTO CONTROL, FACTORY SET LAMP SOCKET TO PROVIDE IES TYPE 1 OR TYPE 2 MEDIUM CUTOFF PHOTOMETRIC DISTRIBUTION</b>		
MANUFACTURER:	POWERLITE	COOPER LIGHTING	HOLOPHANE
MFG. CAT#	LSSRXXX5MFSX LS507S12R	CS72121 CA40BZ	PARK070HP12ASHABZPR PARKBA4BZ
<b>PHOTOCELL</b>	<b>PHOTOCELL, 120V, HERMETICALLY SEALED</b>		
MANUFACTURER:	DTL	FISHER PIERCE	PRECISION
MFG. CAT#	D120-1.5-SM	7760-ESS	8660 MOV
<b>LAMP</b>	<b>LAMP, H.P.S., 70W/55V, MOGUL SCREW BASE, CLEAR LEAD</b>		
MANUFACTURER:	PHILIPS	GE	OSRAM SYLVANIA
MFG. CAT#	C70S62	LU70	LU70
<b>LAMP</b>	<b>LAMP, H.P.S., 100W/55V, MOGUL SCREW BASE, CLEAR LEAD</b>		
MANUFACTURER:	PHILIPS	GE	OSRAM SYLVANIA
MFG. CAT#	C100S54	LU100	LU100
<b>LAMP</b>	<b>LAMP, H.P.S., 150W/55V, MOGUL SCREW BASE, CLEAR LEAD</b>		
MANUFACTURER:	PHILIPS	GE	OSRAM SYLVANIA
MFG. CAT#	C150S55	LU150/55	LU150/55
<b>LAMP</b>	<b>LAMP, H.P.S., 250W/100V, MOGUL SCREW BASE, CLEAR LEAD</b>		
MANUFACTURER:	PHILIPS	GE	OSRAM SYLVANIA
MFG. CAT#	C250S50	LU250	LU250
<b>LAMP</b>	<b>LAMP, H.P.S., 400W/100V, MOGUL SCREW BASE, CLEAR LEAD</b>		
MANUFACTURER:	PHILIPS	GE	OSRAM SYLVANIA
MFG. CAT#	C400S51	LU400	LU400