CONDUCTOR DATA

DRAWING NUMBER	SHT.	DRAWING TITLE	DWG REV.	BOM REV.
C-26-04.06	**1 – 2**	**PRIMARY XLPE CABLE AMPACITIES**	**C / 0**	**-**
C-26-04.06	**3**	**PRIMARY XLPE CABLE AMPACITIES OBSOLETE AND LEGACY CABLES**	**A**	**-**
C-26-04.09	**1 – 1**	**JACKETED PRIMARY CABLES-PHYSICAL AND ELECTRICAL PROPERTIES**	**C**	**-**
C-26-04.10	**1 – 3**	**PRIMARY CABLES-PHYSICAL AND ELECTRICAL PROPERTIES**	**C/C/C**	**-**
C-26-04.11	**1 – 2**	**SECONDARY CABLE DATA**	**B/0**	**-**
C-26-04.12	**1 – 3**	**SECONDARY CABLES-PHYSCIAL AND ELECTRICAL PROPERTIES**	**0/0/0**	**-**
C-26-04.13	**1 – 1**	**SECONDARY USC-75 CABLE AMPACITIES**	**0**	**-**
C-26-04.14	**1 – 4**	**CABLE PULLING TENSIONS AND MAX PULL LENGTHS**	**0/0/0/0**	

*Sask***Power** - DISTRIBUTION STANDARDS

APPROVAL	DESIGN CHK	DRN. **ARU**	**INDEX**
L. MOEN	**A. UHREN**	CHKD.	
		2017-08-14	

DATE OF ISSUE: 2017/08/31 | DRAWING NO: **C-26-04-INDEX** | **SHEET 1 of 1** | REV. **K**

PRIMARY XLPE CABLE AMPACITIES

CONDUCTOR CODE	DESCRIPTION	STANDARD USES	CONFIG	DIRECT BURIED	DUCT BURIED (5" FIBRE)	DUCT BURIED (5" PVC)
2 94 22	#2 Solid Al cnJ (See Note 3)	RUD / PIPELINE CROSS	1Ø	199 (181)	151 (146)	160 (154)
			3Ø	164 (147)	135 (128)	138 (130)
2 94 32	#1 Compact Al cnJ	URBAN 1Ø & 3Ø	1Ø	228 (207)	173 (167)	183 (176)
			3Ø	186 (166)	154 (145)	156 (147)
2 94 33	#1 Solid Al cnJ	URBAN 1Ø & 3Ø	1Ø	225 (206)	173 (167)	183 (175)
			3Ø	186 (166)	155 (146)	156 (147)
2 94 36	4/0 Compact Al cnJ	URBAN 3Ø	3Ø	306 (272)	256 (240)	257 (241)
2 94 37	500 Compact Al cnJ	URBAN 3Ø	3Ø	479 (424)	404 (376)	404 (376)
2 94 38	500 Compact Cu cnJ	URBAN 3Ø	3Ø	588 (520)	495 (460)	495 (459)

TABLE VALUES ARE CALCULATED IN CYMCAP 7.0 REV 1, BASED ON THE FOLLOWING INFORMATION:

- 90°C CONDUCTOR TEMPERATURE
- 10°C AMBIENT TEMPERATURE
- 100% LOAD FACTOR
- 1.2m BURIED DEPTH
- 0.9 °C-m/W SOIL RESITIVITY
- 4.8 °C-m/W FIBRE DUCT RESITIVITY
- 7.0 °C-m/W PVC DUCT RESITIVITY
- CABLES BONDED AT BOTH ENDS FOR 3-PHASE, NO BONDING FOR 1-PHASE
- NEUTRAL CURRENT IS 75% FOR 1-PHASE AND 0% FOR 3-PHASE
- 5" SCHEDULE 40 DUCTS
- DUCTS ARE BURIED WITH NO CONCRETE
- 3 PHASE IN TREFOIL FORMATION

NOTES:

1. cn = CONCENTRIC NEUTRAL, J = JACKET
2. ALL CABLES RATED 25KV UNLESS OTHERWISE SPECIFIED
3. CODE 2 94 22 HAS PREVIOUSLY BEEN SUPPLIED BOTH JACKETED AND UNJACKETED. FOR THESE SIMULATIONS THE AMPACITY IS THE SAME WITH OR WITHOUT JACKET. ALL NEW CABLES COME WITH A JACKET.
4. VALUES IN BRACKETS REPRESENT ALLOWABLE AMPACITY WHEN INSTALLED IN DRY SAND, 1.2 °C-m/W RESITIVITY. ALL OTHER CRITERIA REMAINS THE SAME AS LISTED ABOVE.

PRIMARY XLPE CABLE AMPACITIES

CONDUCTOR CODE	DESCRIPTION	STANDARD USES	CONFIG	DUCT BURIED (5" HDPE)	DUCT BURIED (2" HDPE)
2 94 22	#2 Solid Al cnJ (See Note 3)	RUD / PIPELINE CROSS	1Ø	163 (156)	158 (150)
			3Ø	141 (132)	151 (140)
2 94 32	#1 Compact Al cnJ	URBAN 1Ø & 3Ø	1Ø	186 (178)	180 (171)
			3Ø	160 (150)	171 (157)
2 94 33	#1 Solid Al cnJ	URBAN 1Ø & 3Ø	1Ø	185 (178)	180 (171)
			3Ø	160 (150)	171 (157)
2 94 36	4/0 Compact Al cnJ	URBAN 3Ø	3Ø	264 (246)	279 (255)
2 94 37	500 Compact Al cnJ	URBAN 3Ø	3Ø	415 (385)	N/A
2 94 38	500 Compact Cu cnJ	URBAN 3Ø	3Ø	508 (471)	N/A

TABLE VALUES ARE CALCULATED IN CYMCAP 7.0 REV 1, BASED ON THE FOLLOWING INFORMATION:

- 90°C CONDUCTOR TEMPERATURE
- 10°C AMBIENT TEMPERATURE
- 100% LOAD FACTOR
- 1.2m BURIED DEPTH
- 0.9 °C-m/W SOIL RESITIVITY
- 2.0 °C-m/W HDPE DUCT RESITIVITY
- CABLES BONDED AT BOTH ENDS FOR 3-PHASE, NO BONDING FOR 1-PHASE
- NEUTRAL CURRENT IS 75% FOR 1-PHASE AND 0% FOR 3-PHASE
- DUCTS ARE BURIED WITH NO CONCRETE
- HDPE SDR13.5 DUCTS AS PER ASTM F2160
- 3 PHASE IN TREFOIL FORMATION
- 3 PHASE USING 3 x 2" DUCTS ASSUME DUCTS ARE TOUCHING IN TREFOIL FORMATION, WITH EVEN SPACING OF CONDUCTORS

NOTES:

1. cn = CONCENTRIC NEUTRAL, J = JACKET
2. ALL CABLES RATED 25KV UNLESS OTHERWISE SPECIFIED
3. CODE 2 94 22 HAS PREVIOUSLY BEEN SUPPLIED BOTH JACKETED AND UNJACKETED. FOR THESE SIMULATIONS THE AMPACITY IS THE SAME WITH OR WITHOUT JACKET. ALL NEW CABLES COME WITH A JACKET.
4. VALUES IN BRACKETS REPRESENT ALLOWABLE AMPACITY WHEN INSTALLED IN DRY SAND, 1.2 °C-m/W RESITIVITY. ALL OTHER CRITERIA REMAINS THE SAME AS LISTED ABOVE.
5. 2" HDPE DUCT COLUMN ASSUMES ONLY ONE CONDUCTOR INSIDE DUCT. FOR 3 PHASE CALCULATIONS, THREE SEPARATE 2" DUCTS ARE USED WITH ONE CONDUCTOR IN EACH.

PRIMARY XLPE CABLE AMPACITIES
OBSOLETE AND LEGACY CABLES

CONDUCTOR CODE	DESCRIPTION	CONFIG	DIRECT BURIED	DUCT BURIED
2 92 21	#1 Compact Cu cn	1Ø	292	211
		3Ø	238	195
2 92 22	#1 Stranded Al cn	1Ø	229	166
		3Ø	185	152
2 92 24	4/0 Compact Al cn	3Ø	306	255
2 92 25	#2 Solid Al cn	1Ø	202	145
2 92 34 (See Note 4)	4/0 Al	3Ø	289	249
2 92 50 (See Note 5)	3 x 500 Compressed Cu cnJ	3Ø	566	443
2 94 10	15kV 4/0 Stranded Cu cn	3Ø	395	323
2 94 15	15kV 500 Stranded Cu cn	3Ø	608	506
2 94 25	500 Stranded Cu cn	3Ø	601	504

TABLE VALUES ARE CALCULATED IN CYMCAP 6.0 REV 5, BASED ON THE FOLLOWING INFORMATION:

- 90°C CONDUCTOR TEMPERATURE
- 10°C AMBIENT TEMPERATURE
- 100% LOAD FACTOR
- 1.2m BURIED DEPTH
- 0.9 °C-m/W SOIL RESITIVITY
- 4.8 °C-m/W FIBRE DUCT RESITIVITY
- CABLES BONDED AT BOTH ENDS FOR 3-PHASE, NO BONDING FOR 1-PHASE
- NEUTRAL CURRENT IS 75% FOR 1-PHASE AND 0% FOR 3-PHASE
- 5” FIBRE DUCTS
- DUCTS ARE BURIED WITH NO CONCRETE
- 3 PHASE IN TREFOIL FORMATION

NOTE:

1. cn = CONCENTRIC NEUTRAL, J = JACKET
2. ALL CABLES RATED 25KV UNLESS OTHERWISE SPECIFIED.
3. THIS TABLE IS FOR REFERENCE PURPOSES ONLY. NEW INSTALLATIONS SHOULD NOT USE THESE CONDUCTORS.
4. CODE 2 92 34 IS CALCULATED ON A PREVIOUS VERSION OF CYMCAP USING 20°C AMBIENT TEMPERATURE AND 4” FIBRE DUCTS.
5. CODE 2 92 50 IS CALCULATED ON A PREVIOUS VERSION OF CYMCAP USING 20°C AMBIENT TEMPERATURE.

PRIMARY CABLES–PHYSICAL PROPERTIES

CODE	2–94–22	2–94–33	2–94–36	2–94–37	2–94–38
DESCRIPTION	#2 Al SOLID 25 kV XLPE, FULL c.n. PE JACKET	#1 Al SOLID, 25 kV XLPE, FULL c.n. PE JACKET	4/0 Al COMPACT, 25 kV XLPE, REDUCED (1/3) c.n. PE JACKET	500 Al COMPACT, 25 kV XLPE, REDUCED (1/3) c.n. PE JACKET	500 Cu COMPACT, 25 kV XLPE, REDUCED (1/3) c.n. PE JACKET
DIA. OF COND. mm	6.55 (0.258")	7.35 (0.289")	12.07 (0.475")	18.80 (0.740")	18.69 (0.736")
AREA OF COND. sq mm	33.6	42.4	107.0	253.4	253.4
DIA. OVER COND. SHIELD mm	7.62 (0.300")	8.11 (0.319")	12.83 (0.505")	19.90 (0.780")	19.86 (0.782")
DIA. OVER INSUL. mm	20.83 (0.820")	22.10 (0.870")	26.85 (1.057")	33.60 (1.320")	33.45 (1.317")
DIA. OVER INSUL. SHIELD mm	22.61 (0.890")	24.70 (0.972")	29.41 (1.158")	36.30 (1.430")	35.55 (1.400")
C/N MAKE UP DIA. 1 C/N mm	10x#14Cu 1.63(0.064")	13x#14Cu 1.63(0.064")	11x#14Cu 1.63(0.064")	25x#14Cu 1.63(0.064")	26x#12Cu 2.05(0.081")
DIA. OVER C/N ASSY mm	25.91 (1.020")	27.96 (1.101")	32.66 (1.286")	39.56 (1.560")	39.66 (1.561")
DIA. OVER JKT. mm	27.79 (1.094")	30.56 (1.203")	35.31 (1.392")	42.36 (1.668")	43.76 (1.723")
OUTSIDE CBL DIA. mm	27.79 (1.094")	30.56 (1.203")	35.31 (1.392")	42.36 (1.668")	43.76 (1.723")
CABLE WEIGHT kg/m	0.400	0.998	1.34	2.330	4.222
GMR mm	2.551 (0.100")	2.956 (0.116")	4.699 (0.185")	7.280 (0.287")	7.217 (0.284")
Rdc @ 20° C OHMS/km	0.8573	0.6798	0.2690	0.114	0.0693
Rac @ 90° C OHMS/km	1.0990	0.8714	0.3452	0.149	
Rac–n @ 80° C OHMS/km	1.0623	0.8170	0.979	0.431	0.261

SaskPower – DISTRIBUTION STANDARDS

APPROVAL	DESIGN CHK.	DRN. S.D. CHKD.	JACKETED PRIMARY CABLES–PHYSICAL AND ELECTRICIAL PROPERTIES	
DATE OF ISSUE 2010–04–21		DRAWING NO. C–26–04.09	SHEET 1 of 1	REV. C

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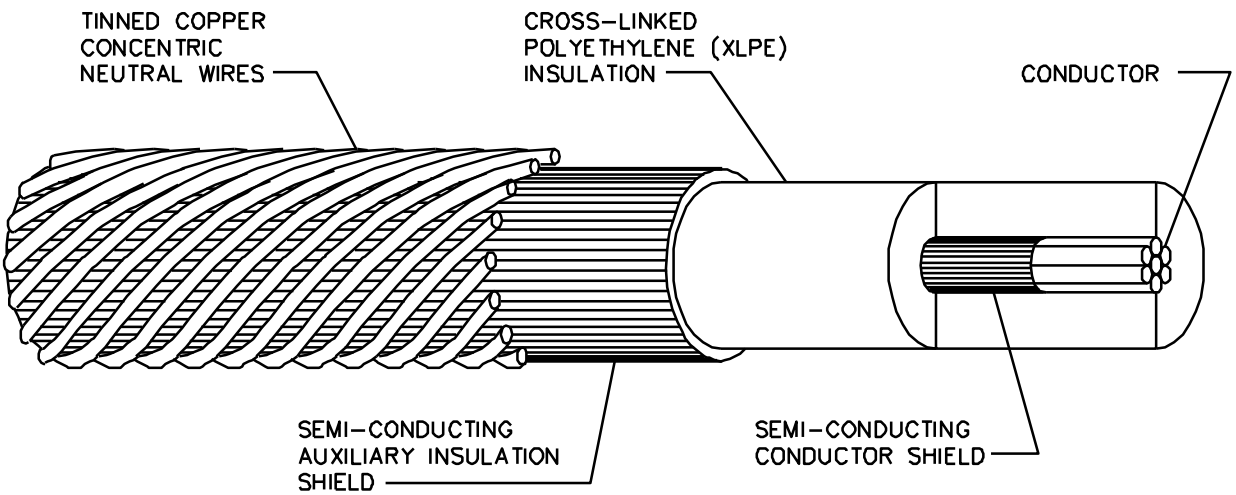
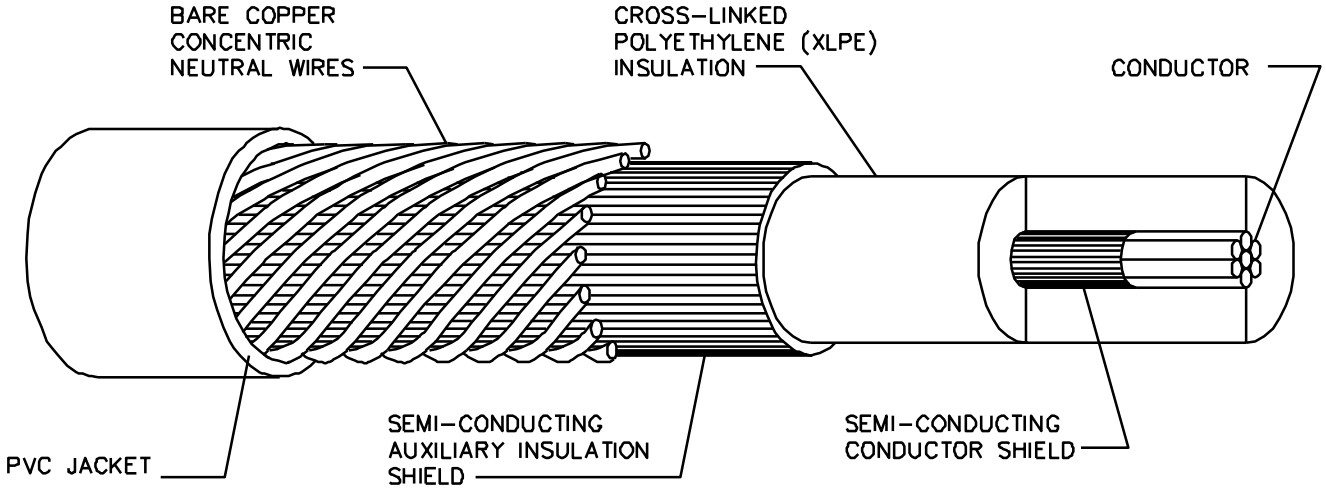
SINGLE PRIMARY CABLE (SINGLE & THREE PHASE APPLICATION)



UNJACKETED PRIMARY CABLE



JACKETED PRIMARY CABLE

SCALE: N.T.S. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED

Sask Power – DISTRIBUTION STANDARDS				
DRN.	DESIGN CHK.	SAFETY APP.	APPROVAL	PRIMARY CABLES, PHYSICAL & ELECTRICAL PROPERTIES
CHKD.				
DATE	DATE	DATE	DATE	
DATE OF ISSUE: 2009-06-29		DRAWING NO. C-26-04.10	SHEET 1 of 3	REV. C

	# 2 AL 2 92 25	# 2 AL 2 94 22	#1 AL 2 92 22	#1 AL (19 WIRE) 2 94 32
DIA. OF COND. DC	**6.553 (0.258")**	**6.54 (0.257")**	**7.595 (0.299")**	**8.179 (0.322")**
DIA. OVER COND. SHIELD DCS	**7.620 (0.300")**	**7.53 (0.296")**	**--**	**8.941 (0.352")**
DIA. OVER INSULATION DI	**20.828 (0.820")**	**21.14 (0.832")**	**22.403 (0.882")**	**21.996 (0.866")**
DIA. OVER INSULATION SHIELD DIS	**22.606 (0.890")**	**22.96 (0.904")**	**24.079 (0.948")**	**23.393 (0.921")**
CONC. NEUT. MAKE UP DIA OF 1 C/N WIRE	**10 x #14CU 1.626 (0.0641")**	**10 x #14CU 1.626 (0.0641")**	**13 x #14CU 1.626 (0.0641")**	**13 x #14CU 1.626 (0.0641")**
DIA. OVER C/N ASSEMBLY DMS	**25.908 (1.020")**	**28.91 (1.138")**	**27.381 (1.078")**	**25.197 (0.992")**
MEAN SHIELD C/N DIA. DMS	**24.232 (0.954")**	**24.59 (0.968")**	**25.705 (1.012")**	**25.197 (0.992")**
OUTSIDE CABLE DIA. DO	**25.908 (1.020")**	**28.91 (1.138")**	**27.381 (1.078")**	**29.185 (1.149")**
GMR	**2.540 (0.100")**	**2.548 (0.100")**	**2.9591 (0.1165")**	**1.0414 (0.0410")**
RDC @ 20°C OHMS/KM	**0.8573**	**0.839**	**0.6798**	**0.6798**
RAC @ 90°C OHMS/KM	**1.0990**	**1.076**	**0.8714**	**0.8714**
RAC-N @ 80°C OHMS/KM	**1.0623**	**1.047**	**0.829**	**--**

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED

	#1 CU 2 92 21	# 4/0 AL 2 92 24	500 KCMIL CU 2 94 25	3 X 500 KCMIL CU 2 92 50
DIA. OF COND. DC	7.595 (0.299”)	12.065 (0.475”)	18.796 (0.740”)	18.796 (0.740”)
DIA. OVER COND. SHIELD DCS	--	--	20.066 (0.790”)	20.066 (0.790”)
DIA. OVER INSULATION DI	22.301 (0.878”)	26.797 (1.055”)	34.595 (1.362”)	33.782 (1.330”)
DIA. OVER INSULATION SHIELD DIS	24.079 (0.948”)	29.693 (1.169”)	37.490 (1.476”)	36.322 (1.430”)
CONC. NEUT. MAKE UP DIA OF 1 C/N WIRE	20 x #14CU 1.626 (0.064”)	20 x #12 CU 2.052 (0.0808”)	26 x #12 CU 2.052 (0.0808”)	3 x 3/0 CU
DIA. OVER C/N ASSEMBLY DMS	27.381 (1.078”)	33.807 (1.331”)	41.605 (1.638”)	35.560 (1.400”)
MEAN SHIELD C/N DIA. DMS	25.705 (1.012”)	31.725 (1.249”)	39.548 (1.557”)	35.560 (1.400”)
OUTSIDE CABLE DIA. DO	27.381 (1.078”)	33.807 (1.331”)	41.605 (1.638”)	86.868 (3.420”)
GMR	2.959 (0.1165”)	4.699 (0.185”)	7.2796 (0.2866”)	7.2796 (0.2866”)
RDC @ 20°C OHMS/KM	0.4147	0.2690	0.0696	0.0696
RAC @ 90°C OHMS/KM	0.5289	0.3452	0.0902	0.0902
RAC-N @ 80°C OHMS/KM	--	0.3340	--	--

ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED

SERVICE ENTRANCE CABLE
USEB-90

	2 x #2 CU 2 92 86	**2 x 1/0 AL 2 92 87**	**2 x 1/0 CU 2 92 93**
DIA. OF CONDUCTOR DC	0.270”	0.338”	0.338”
THICKNESS INSULATION TI	0.045”	0.055”	0.055”
DIA. OVER INSULATION DI	0.370”	0.468”	0.468”
NEUTRAL CONDUCTOR NC	17 x #16 CU	15 x #16 CU	16 x #14 CU
DIA. NEUTRAL CONDUCTOR DNC	0.0508”	0.0508”	0.0641”
THICKNESS JACKET TJ	0.080”	0.080”	0.080”
AMPACITY AMPS	221	197	281

NOTE:

1. AMPACITY IS FOR NATURAL EARTH BACKFILL AT 100% LOAD FACTOR.

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TRIPLEX SECONDARY CONDUCTORS

USEI–90

	2 x 4/0 AL 2–96–44	2 x 350 kcmil AL 2–96–46	2 x 500 kcmil AL 2–96–48
DIA. OF COND. dc	.480"	.622"	.820"
THICKNESS INSUL. ti	.055"	.065"	.065"
DIA. OVER INSULATION di	.640"	.812"	.970"
NEUTRAL COND. nc	2/0	3/0	4/0
DIA. NEUT. COND. dnc	.378"	.425"	.480"
THICKNESS JACKET tj	.045"	.045"	.045"
AMPACITY amps	313	393	469

NOTE:

1. AMPACITY IS FOR NATURAL EARTH BACKFILL AT 100% LOAD FACTOR.

SaskPower – DISTRIBUTION STANDARDS				
DRN. *DK*	DESIGN CHK.	SAFETY APP.	APPROVAL	SECONDARY CABLE DATA
CHKD.				
DATE	DATE	DATE	DATE	
DATE OF ISSUE		DRAWING NO. C–26–04.11	SHEET 2 of 2	REV. 0

SPC/AUTODRAFT

SECONDARY USC–75 CABLES–PHYSICAL PROPERTIESL

CODE	2–94–51 2 x #4 Al	2–94–62 3 x #2 Al	2–94–64 3 x 1/0 Al	2–94–66 3 x 4/0 Al
DESCRIPTION	#4 Al COMPACT, 600 V, PE INSUL., PVC JACKET, (STREET LIGHT CABLE)	#2 Al COMPACT, 600 V, PE INSUL., PVC JACKET	1/0 Al COMPACT, 600 V, PE INSUL., PVC JACKET	4/0 Al COMPACT, 600 V, PE INSUL., PVC JACKET
DIA. OF COND. mm	5.40 (0.213")	7.30 (0.287")	9.20 (0.362")	12.10 (0.476")
AREA OF COND. sq mm	21.2	33.6	53.5	107.2
INSULATION THICKNESS MM	1.10 (0.043")	1.10 (0.043")	1.40 (0.055")	1.40 (0.055")
DIA. OVER INSUL. mm	7.60 (0.299")	9.50 (0.374")	12.00 (0.472")	14.90 (.587")
JACKET THICKNESS MM	0.76 (0.030")	1.10 (0.043")	1.10 (0.043")	1.14 (0.045")
DIA. OVER JKT. mm	9.12 (0.359")	11.70 (0.461")	14.20 (0.559")	17.18 (0.676")
DIA. OVER ASSY. mm	18.8 (0.740")	25.3 (0.996")	30.2 (1.189")	38.0 (1.496")
ASSEMBLY WT. mm	0.232	0.533	0.794	1.360

CODE	2–94–67 3 x 350 Al	2–94–68 3 x 500 Al	2–94–82 4 x #2 Al	2–94–84 4 x 1/0 Al
DESCRIPTION	350 Al COMPACT, 600 V, PE INSUL., PVC JACKET	500 Al COMPACT, 600 V PE INSUL., PVC JACKET	#2 Al COMPACT, 600 V PE INSUL., PVC JACKET	1/0 Al COMPACT, 600 V PE INSUL., PVC JACKET
DIA. OF COND. mm	16.32 (0.643")	18.69 (0.736")	7.30 (0.287")	9.20 (0.362")
AREA OF COND. sq mm	177.3	253.4	33.6	53.5
INSULATION THICKNESS MM	1.65 (0.065")	1.65 (0.065")	1.10 (0.043")	1.40 (0.055")
DIAMETER OVER INSULATION mm	19.62 (0.772")	21.99 (0.866")	9.50 (0.374")	12.00 (0.472")
JACKET THICKNESS mm	1.14 (0.045")	1.14 (0.045")	1.10 (0.043")	1.10 (0.043")
DIAMETER OVER JACKET mm	21.90 (0.862")	24.27 (0.956")	11.70 (0.461")	14.20 (0.559")
DIAMETER OVER ASSEMBLY mm	47.2 (1.858")	54.1 (2.130)	28.3 (1.114")	33.8 (1.331")
ASSEMBLY WT. kg/m	2.120	2.880	0.710	1.060

SaskPower – DISTRIBUTION STANDARDS

DRN. S.D.	DESIGN CHK.	SAFETY APP.	APPROVAL	SECONDARY CABLES–PHYSICAL AND ELECTRICAL PROPERTIES
CHKD.				
DATE	DATE	DATE	DATE	
DATE OF ISSUE		DRAWING NO. C–26–04.12	SHEET 1 OF 3	REV. 0

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SECONDARY USC–75 CABLES–PHYSICAL PROPERTIESL

CODE	2–94–86 4 x 4/0 Al	2–94–87 4 x 350 Al	2–94–88 4 x 500 Al
DESCRIPTION	4/0 Al COMPACT, 600V, PE INSUL., PVC JACKET	350 Al COMPACT, 600V, PE INSUL., PVC JACKET	500 Al COMPACT, 600V, PE INSUL., PVC JACKET
DIA. OF COND. mm	12.10 (0.476")	16.32 (0.643")	18.69 (0.736")
AREA OF COND. sq mm	107.2	177.3	253.4
INSULATION THICKNESS mm	1.40 (0.055")	1.65 (0.065")	1.65 (0.065")
DIA. OVER INSUL. mm	14.90 (0.587")	19.62 (0.772")	21.99 (0.866")
JACKET THICKNESS mm	1.14 (0.045")	1.14 (0.045")	1.14 (0.045")
DIA. OVER JKT mm	17.18 (0.676")	21.90 (0.862")	24.27 (0.956")
DIA. OVER ASSY. mm	42.5 (1.673")	55.0 (2.165")	62.5 (2.461")
ASSEMBLY Wt. kg/m	1.810	2.900	3.900

NOTE: DIAMETER AND WEIGHT OF ASSEMBLY ARE APPROXIMATE

SaskPower – DISTRIBUTION STANDARDS

DRN. S.D.	DESIGN CHK.	SAFETY APP.	APPROVAL	SECONDARY CABLES–PHYSICALL AND ELECTRICIAL PROPERTIESL
CHKD.				
DATE	DATE	DATE	DATE	
DATE OF ISSUE		DRAWING NO. C–26–04.12	SHEET 2 OF 3	REV. 0

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SECONDARY USC–75 CABLES–ELECTRICAL PROPERTIESL

CABLE	MAX. CONDUCTOR TEMP. DEG. C	R ac @ MAX. TEMP. OHMS/KM	X ac OHMS/KM	GMR mm
2–94–51 2 x #4 Al	75	1.7473	0.1356	1.959 (0.077")
2–94–62 3 x #2 Al	75	1.0483	0.1120	2.648 (0.104")
2–94–64 3 x 1/0 Al	75	0.6590	0.1059	3.485 (0.137")
2–94–66 3 x 4/0 Al	75	0.3292	0.0996	4.584 (0.180")
2–94–67 3 x 350 Al	75	0.1996	0.0943	6.265 (0.247")
2–94–68 3 x 500 Al	75	0.1402	0.0919	7.175 (0.282")
2–94–82 4 x #2 Al	75	1.0483	0.1207	2.648 (0.104")
2–94–84 4 x 1/0 Al	75	0.6590	0.1146	3.485 (0.137")
2–94–86 4 x 4/0 Al	75	0.3292	0.1083	4.584 (0.180")
2–94–87 4 x 350 Al	75	0.1996	0.1041	6.265 (0.247")
2–94–88 4 x 500 Al	75	0.1402	0.1006	7.175 (0.282")

NOTE: Rac AND Xac ARE PER PHASE.
Xac IS CALCULATED WITH CONDUCTORS TOUCHING AND IN THE FOLLOWING CONFIGURATIONS:

2 CONDUCTORS

3 CONDUCTORS

4 CONDUCTORS

SaskPower – DISTRIBUTION STANDARDS

DRN. M.T.S.	DESIGN CHK.	SAFETY APP.	APPROVAL	SECONDARY CABLES–PHYSICAL AND ELECTRICIAL PROPERTIES	
CHKD.					
DATE	DATE	DATE	DATE		
DATE OF ISSUE			DRAWING NO. C–26–04.12	SHEET 3 OF 3	REV. 0

AUTO DRAFT

SECONDARY USC–75 CABLE AMPACITIES

CONDUCTOR CODE	DESC	DIRECT BURIED ** 10 DEG. C AMBIENT		DUCT BURIED ** 10 DEG. C AMBIENT	
		RESIDENTIAL 75% LF AMPS	COMMERCIAL 100% LF AMPS	RESIDENTIAL 75% LF AMPS	COMMERCIAL 100% LF AMPS
2–94–51	2 x #4	---	145	---	---
2–94–62	3 x #2	175	150	140	130
2–94–64	3 x 1/0	235	200	185	175
2–94–66	3 x 4/0	360	305	285	270
2–94–67	3 x 350	510	420	415	380
2–94–68	3 X 500	640	520	500	435
2–94–82	4 x #2	160	135	110	105
2–94–84	4 x 1/0	210	180	150	145
2–94–86	4 x 4/0	320	265	230	220
2–94–87	4 x 350	450	365	335	315
2–94–88	4 x 500	555	445	440	410

CONDUCTOR CODE	DESC	DUCT IN AIR 30 DEG. C AMBIENT		DUCT IN AIR *** 40 DEG. C AMBIENT	
			COMMERCIAL 100% LF AMPS		COMMERCIAL 100% LF AMPS
2–94–51	2 x #4		---		---
2–94–62	3 x #2		110		95
2–94–64	3 x 1/0		145		130
2–94–66	3 x 4/0		225		200
2–94–67	3 x 350		320		280
2–94–68	3 X 500		405		355
2–94–82	4 x #2		85		75
2–94–84	4 x 1/0		115		100
2–94–86	4 x 4/0		175		155
2–94–87	4 x 350		255		225
2–94–88	4 x 500		320		280

BASED ON: 75 DEG. C MAXIMUM CONDUCTOR TEMPERATURE, CABLES TOUCHING, BALANCED LOAD; ONE CONDUCTOR PER PHASE; DEPTH OF BURIAL 0.6m; SOIL THERMAL RESISTIVITY 90 C–cm/w; FRE DUCTS 5" DIA.; 75% LF(LOAD FACTOR) BASED ON TYPICAL RESIDENTIAL LOAD; 100% LF(LOAD FACTOR) BASED ON 8 TO 24 HOUR CONTINOUS LOAD.

NOTE: * THESE AMPACITIES ARE BASED ON 1 CONDUCTOR PER PHASE, FOR 2 CONDUCTORS PER PHASE REDUCE AMPACITY TO 80%, AND FOR 3 CONDUCTORS PER PHASE REDUCE AMPACITY TO 70%. MAXIMUM NUMBER OF CABLES FOR 5" DUCT IS 2 CONDUCTORS PER PHASE FOR 500 kcmil AND 3 CONDUCTORS PER PHASE FOR 350 kcmil.

NOTE: ** FOR RESIDENTIAL SERVICES, THE PORTION OF SERVICE LOCATED IN DUCT IN AIR ON THE RISER POLE AND AT THE SERVICE ENTRANCE CAN BE IGNORED BECAUSE;
a) THE ACTUAL AIR TEMPERATURE DURING WINTER PEAK WILL BE MUCH LESS THAN +10 DEG. C (ABOUT –20 DEG C), WHICH WILL COOL THE CABLES IN AIR MORE THAN CABLES UNDERGROUND.
b) THE SUMMER PEAK LOADS IS TYPICALLY ONLY 70% OF WINTER PEAK, AND THE RATINGS FOR CABLES IN DUCT IN AIR ARE NORMALLY 70–75% OF THE DIRECT BURIED RATING.

NOTE: *** THE 40 DEG. C AMBIENT SHOULD ONLY BE USED FOR INSTALLATIONS WHERE IT IS EXPECTED THAT THE AMBIENT TEMPERATURE WILL EXCEED 30 DEG. C FOR EXTENDED PERIODS OF TIME.

SCALE: N.T.S. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE INDICATED

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DRN. M.T.S.	DESIGN CHK.	SAFETY APP.	APPROVAL	SECONDARY USC–75 CABLE AMPACITIES
CHKD.				
DATE	DATE	DATE	DATE	
DATE OF ISSUE		DRAWING NO. C–26–04.13	SHEET 1 OF 1	REV. 0

Cable Type	Stock Code	Max Tension (N [lbf])	1Ø or 3Ø	Duct Type	Number of 90° Bends	Max Pull Length (m)	Min Lube Required* (L/m)
#2 Solid Al cnJ Typical reel length 1700m	29422	1,849 [416]	1Ø	2" HDPE	0	1800	0.05
					1	1610	0.05
					2	1420	0.06
					3	1230	0.06
		3,661 [824]	3Ø	4" PVC	0	1060	0.09
					1	930	0.09
					2	810	0.10
					3	690	0.10
				5" PVC	0	1130	0.11
					1	1010	0.11
					2	880	0.13
					3	770	0.13
				5" HDPE	0	1220	0.11
					1	1100	0.11
					2	980	0.13
					3	860	0.13
#1 Compact Al cnJ Typical reel length 900m	29432	2,975 [669]	1Ø	2" HDPE	0	1270	0.05
					1	1150	0.05
					2	1040	0.06
					3	920	0.06
		5,891 [1,325]	3Ø	4" PVC	0	710	0.09
					1	630	0.09
					2	560	0.10
					3	480	0.10
				5" PVC	0	760	0.11
					1	680	0.11
					2	610	0.13
					3	530	0.13
				5" HDPE	0	820	0.11
					1	740	0.11
					2	670	0.13
					3	590	0.13
#1 Solid Al cnJ Typical reel length 1000m	29433	2,332 [524]	1Ø	2" HDPE	0	950	0.05
					1	860	0.05
					2	760	0.06
					3	670	0.06
		4,617 [1,038]	3Ø	4" PVC	0	530	0.09
					1	470	0.09
					2	410	0.10
					3	350	0.10
				5" PVC	0	570	0.11
					1	510	0.11
					2	450	0.13
					3	400	0.13
				5" HDPE	0	620	0.11
					1	560	0.11
					2	500	0.13
					3	440	0.13

* LUBRICANT IS REQUIRED DURING CABLE PULLS. SEE NOTE 5 ON SHEET 3 FOR MORE DETAILS.

Cable Type	Stock Code	Max Tension (N [lbf])	1Ø or 3Ø	Duct Type	Number of 90° Bends	Max Pull Length (m)	Min Lube Required* (L/m)
4/0 Compact Al cnJ Typical reel length 650m	29436	11,676 [2,625]	3Ø	3-7/8" Fiber	0	790	0.08
					1	680	0.08
					2	560	0.09
					3	460	0.09
				4" PVC	0	960	0.09
					1	840	0.09
					2	730	0.10
					3	620	0.10
				5" PVC	0	1070	0.11
					1	960	0.11
					2	850	0.13
					3	740	0.13
				5" HDPE	0	1160	0.11
					1	1040	0.11
					2	940	0.13
					3	830	0.13
500 kcmil Compact Al cnJ Typical reel length 450m	29437	27,589 [6,201]	3Ø	5" PVC	0	1360	0.11
					1	1200	0.11
					2	1050	0.13
					3	900	0.13
				5" HDPE	0	1470	0.11
					1	1310	0.11
					2	1160	0.13
					3	1020	0.13
500 kcmil Compact Cu cnJ Typical reel length 450m	29438	34,589 [7,775]	3Ø	5" PVC	0	910	0.11
					1	800	0.11
					2	700	0.13
					3	600	0.13
				5" HDPE	0	990	0.11
					1	880	0.11
					2	780	0.13
					3	680	0.13
500 kcmil Compact Cu cnJ Reduced Wall Typical reel length 450m	29440	35,230 [7,920]	3Ø	3-7/8" Fiber	0	780	0.08
					1	660	0.08
					2	550	0.09
					3	440	0.09
				5" PVC	0	1280	0.11
					1	1170	0.11
					2	1060	0.13
					3	950	0.13
3 x 500 kcmil Compact Cu cnJ Reduced Wall Typical reel length 450m	29442	48,441 [10,890]	3Ø	3-7/8" Fiber	0	1360	0.08
					1	1190	0.08
					2	1020	0.09
					3	870	0.09
				5" PVC	0	1840	0.11
					1	1680	0.11
					2	1520	0.13
					3	1370	0.13

* LUBRICANT IS REQUIRED DURING CABLE PULLS. SEE NOTE 5 ON SHEET 3 FOR MORE DETAILS.

NOTE:

1. cn = CONCENTRIC NEUTRAL, J = JACKET
2. ALL CABLES RATED 25kV UNLESS OTHERWISE INDICATED.
3. MAX PULL LENGTH VALUES ARE ROUNDED TO NEAREST 10m THAT IS AT OR BELOW THE MAX TENSION ALLOWED.
4. CABLES SHOULD BE FED FROM THE SIDE WITH THE MAJORITY OF THE BENDS, IF POSSIBLE, TO LOWER TENSION.
5. LUBRICATING OF CABLES DURING PULL IS REQUIRED TO ACHIEVE THESE LENGTHS OF PULLS. MINIMUM AMOUNT OF LUBRICANT REQUIRED AS PER PULL PLANNER 3000 SOFTWARE IS GIVEN IN THE TABLE. MULTIPLY THE TABLE VALUES BY THE LENGTH OF PULL IN METRES TO GET THE REQUIRED AMOUNT OF LUBE IN LITRES. MULTIPLY THE TOTAL LITRES BY THE FOLLOWING FACTORS WHEN CERTAIN LENGTHS ARE EXCEEDED:
    a. >150m X 1.2
    b. >300m X 1.3
    c. >450m X 1.4
    d. >600m X 1.5

    ADDITIONAL LUBRICANT IS ALSO REQUIRED FOR OLD OR WORN DUCTS, AS THE TABLE VALUES ASSUME GOOD CONDITION DUCTS.
6. THESE TABLE VALUES ARE GIVEN FOR REFERENCE PURPOSE ONLY AND ARE NOT MEANT TO COVER ALL SITUATIONS. **UNDER NO CIRCUMSTANCE DURING A CABLE PULL SHALL THE MAX TENSION OF THE CABLE BE EXCEEDED.** IF MAX TENSION FROM CABLE MANUFACTURER DOESN'T MATCH WITH THE VALUE IN THE TABLES, USE THE TENSION FROM THE MANUFACTURER.
7. ALL CABLE PULLS ASSUME THE USE OF A PULLING EYE.
8. 3 PHASE CABLE TENSIONS ARE CALCULATED BY MULTIPLYING THE INDIVIDUAL CABLE TENSION BY 3 AND DERATING IT BY 66%. THIS ASSUMES NO SINGLE CABLE WILL TAKE MORE THAN 66% OF TOTAL TENSION DURING THE PULL, AND IS RECOMMENDED BY PULL PLANNER 3000 SOFTWARE.
9. 3-7/8" FIBER DUCT PULL LENGTHS CAN ALSO BE USED FOR ANY 4" FIBER DUCT. IF USING 4" FIBER DUCT THEN USE THE SAME LUBRICANT QUANTITIES AS FOR 4" PVC DUCT.
10. ALL TABLE VALUES FOR PULL LENGTHS ARE THEORECTICAL AND IN MANY CASES, WILL BE LIMITED BY THE LENGTH OF CABLE REEL. TYPICAL REEL LENGTHS ARE SHOWN IN THE TABLE FOR REFERENCE.

TABLE VALUES ARE CALCULATED IN PULL PLANNER 3000 USING THE FOLLOWING CRITERIA:

- 90 DEGREE BENDS WITH 36” RADIUS ASSUMED AT THE BEGINNING AND END OF EVERY PULL TO SIMULATE COMING IN AND OUT OF A VAULT, MANHOLE, ETC. THE NUMBER OF BENDS LISTED IN THE TABLE IN ARE ADDITION TO THESE 2 BENDS.
- INCOMING OR BACK TENSION SET AT 225 N (50 LBF).
- BENDS ARE PLACED IN THE MIDDLE OF THE PULL AND ARE CONSIDERED HORIZONTAL BENDS.
- BEND RADIUS USED FOR VARIOUS DUCTS:
    - 2” HDPE: 0.31m (12”)
    - 3-7/8” FIBER: 0.92m (36”)
    - 4” PVC AND FIBER: 0.92m (36”)
    - 5” PVC: 0.92m (36”)
    - 5” HDPE: 0.81 (32”)
- COEFFICIENT OF FRICTION VALUES ARE TAKEN FROM PULL PLANNER 3000 DATABASE AND ALL ASSUME GOOD CONDITION DUCT WITH POLYWATER J LUBRICANT AND LLDPE CABLE JACKET, WITH THE EXCEPTION OF REDUCED WALL CABLES. COEFFICIENT OF FRICTION USED FOR CERTAIN DUCT TYPES:
    - PVC DUCT: 0.11
    - HDPE DUCT: 0.10
- REDUCED WALL CABLES ARE AN EXCEPTION TO COEFFICIENT OF FRICTION VALUES ABOVE. CODE 29440 USES POLYPROPYLENE JACKET AND CODE 29442 USES PVC JACKET. COEFFICIENT OF FRICTION VALUES USED FOR CERTAIN DUCT TYPES:
    - CODE 29440
        - FIBER: 0.13
        - PVC: 0.09
    - CODE 29442
        - FIBER: 0.16
        - PVC: 0.11
- 3 PHASE CABLES ARE ASSUMED TO NOT BE TRIPLEXED (BRAIDED TOGETHER).
- ALL PULL SIMULATIONS ASSUME A 5° INCLINE.