INTRODUCTION

(Iso 9001 Certified)

By the grace of Almighty Allah **Mutahir Metal Works (Pvt) Ltd** are now acknowledged as a quality products producing company, based on customer satisfaction in quality, timely deliveries, and best services on their doorsteps.

Mutahir Metal Works (Pvt) Ltd equipped with latest plant and testing laboratory backed by a strong technical and dedicated team to ensure quality production.

Mutahir Metal Works (Pvt) Ltd are geared to inducting the latest technology and know how during its expansion program so, as to further improve the standard of its product range. This is a challenge as well as a commitment.

Mutahir Metal Works (Pvt) Ltd

LAHORE ELECTRIC SUPPLY COMPANY

MATERIAL MANAGEMENT DIRECTORATE

22-A Queens Road Lahore Ph. # 99204842, Fax: 99204843

Subject: **RENEWAL OF REGISTRATION AS MANUFACTURER**

Reference: Your letter dated 21.03.2013.

Name of your firm has been renewed for Registration up to 30.06.2014 with LESCO Limited, Lahore as manufacturer under following Categories:-

File #	Categories	Items	Description
123	M-3	Item-1	A) ACSR and All Aluminium Conductor upto 13-Strands. B) ACSR and All Aluminium Conductor exceeding 13-Strands
		Item-II	Galvanized Steel Wires Soild and Stranded
		Item-iv	Binding Wire
	M-9	Item-I	PVC LT Single, Two and four Core Aluminium Cables
		Item-II	11 KV XPLE Power Cable.

Your renewal of registration is also subject to the terms and conditions which may be assigned by the Chief Execitive LESCO Limited, Lahore/Chief Engineer (P&D) PEPCO / WAPDA, Lahore from time to time. Your renewal of registration will expire on 30.06.2014 but LESCO may cancel your registration earlier and initiate action for blacklisting of your firm if you are found deficient in manufacturing machinery, equipment, manpower or finances and if your performance regarding progress / quality of material, conduct etc; is found unsatisfactory / lacking and if any violation of purchase procedure/tender bid conditions id committed.

You will have to apply for renweal of your registration for the year 2014-2015 along-with a copy of receipt amounting to Rs.2500/- per category (non-refundable) as renewal fee at least 45 days before the expiry of registration in case you desire to continue as registered supplier.

This is issued with the approval of Competent Authority.

SECRETARY
PREQUALIFICATION COMMITTEE
SR. MANAGER (MM) LESCO LTD.

To:-

M/s. Mutahir Metal Warks, Pvt. Ltd.
79-D-1, Johar Town, Lahore.

Info:-

1. The Chief Executive Officer LESCO Ltd: Lahore.
2. The Grneral Manager (Tech) LESCO Ltd. Lahore.
3. The Chief Engineer (D&S) PEPCO / WAPDA, Block-N, M/Town, Lahore
4. The Chief Engineer (MI), NTDC / WPDA,Sunny View, Lahore
5. The Chief Engineer (P&D), WAPDA / PEPCO, WAPDA House, Lahore
6. The Finance Director, LESCO, Ltd, Lahore.
7. All DSCOs under WAPDA / PEPCO.
8. Master File.

No. 1480-95 PQ-123 Dated. 09 .07.2013

LAHORE ELECTRIC SUPPLY COMPANY

MATERIAL MANAGEMENT DIRECTORATE

22-A Queens Road Lahore Ph. # 99204842, Fax: 99204843

Subject: **RENEWAL OF PREQUALIFICATION AS MANUFACTURER**

Reference: Your letter dated 21.03.2013.

After considering your application for renewal of Prequalification of your firm, Chief Executive LESCO is pleased to renew the Prequalification of your firm as manufacturer for the period ending 30.06.2016 under the below mentioned categories:-

Categories	Items	Description
M-3	Item-1	A) ACSR and All Aluminium Conductor upto 13 (Thirteen) Strands. B) ACSR and All Aluminium Conductor exceeding 13 (Thirteen) Strands
	Item-II	Galvanized Steel Wires Soild and Stranded
	Item-iv	Binding Wire
M-9	Item-I	PVC LT Single, Two and four Core Aluminium Cables
	Item-II	11 KV XPLE Power Cable.

Your renewal of pre-qualification is subject to the terms and conditions which may be assigned by the Chief Executive LESCO Limited, Lahore/Chief Engineer (P&D) WAPDA, Lahore from time to time. Your renewal of Prequalification will expire on the date mentioned above but LESCO may cancel your Prequalification earlier and initiate action for blacklisting of your firm if you are found deficient in mansufacturiring machinety, equipment, manpower or finances and if your performance regarding progress / quality of material, conduct etc; is found unsatisfactory / lacking and if any violation of purchase procedure / tender bid conditions is committed.

Your Prequalification will expire on 30.06.2016 and you will have to apply for the renewal of your Prequalification at least 45 days before its expiry

This is issued with the approval of CEO LESCO Limited, Lahore.

SECRETARY
PREQUALIFICATION COMMITTEE
SR. MANAGER (MM) LESCO LTD.

To:-

M/s. Mutahir Metal Warks, Pvt. Ltd.
79-D-1, Johar Town, Lahore.

Info:-

1. The Chief Executive Officer LESCO Ltd: Lahore.
2. The Grneral Manager (Tech) LESCO Ltd. Lahore.
3. The Chief Engineer (D&S) PEPCO / WAPDA, Block-N, M/Town, Lahore
4. The Chief Engineer (MI), NTDC / WPDA,Sunny View, Lahore
5. The Chief Engineer (P&D), WAPDA / PEPCO, WAPDA House, Lahore
6. The Finance Director, LESCO, Ltd, Lahore.
7. All DSCOs under WAPDA / PEPCO.
8. Master File.

No. 1464-79 /MMM/LESCO/PQ-158 Dated: 09 07.2013

Grams : KRLABS

بسم اللہ الرحمن الرحیم

Tel. : 92-51-9280541
Fax : 92-51-9280542
Telex : 5584 PUFCO

GOVERNMENT OF PAKISTAN
DR. A. Q. KHAN RESEARCH LABORATORIES KAHUTA
P.O. BOX NO. 602 HAWALPINDI (PAKISTAN)

March 21, 2001

LETTER OF APPRECIATION

We have been in business with M/s Muahir Metals Works Kote Lakhpat Lahore for the past one-year. During this period we have found it a reliable firm. All items manufactured / supplied by this firm have been found up to the mark of our acceptance criteria. In addition to the metallic components, M/s Mustahir Metals has also manufactured submerged cable for us and its quality was found as good as supplied by the foreign supplier. The other factors that give M/s Mutahir Metals an edge over other manufacturers / suppliers is the in time delivery of required items, keeping i's commitments with us, and its prompt responses.

Best wishes for M/s Mutahir Metals Works.

For
Dr. A. Q. Khan Research Laboratories

CRESCENT SUGAR MILLS & DISTILLERY LTD.
(TEXTILE DIVISION)
New Lahore Road, Nishatabad, Faisalabad-Pakistan.
Head Off Tel: 041-8752111 to 8752114 Fax: 041-8750366
Telex: 43321 Sugar Pk. E-mail: csmd@brain.net.pk
Mill: 0563-721700, 0563-721622, 0563-721689

TUV CERT
DIN EN ISO 9001:2000
Certificate No. 01 100 011638
TÜV

CSM/TXTL/AC/
6TH March, 2007

LETTER OF APPRECIATION

We are in business with M/S Mutahir Metal Works Kot Lakhpat, Lahore for the past few years. During this period, we have found them reliable Manufactures and all items supplied by this firm have been found up to the mark of our referred specifications. In addition to their quality products, the timely delivery and personal follow up of firm's partners an edge over other Manufactures/Suppliers.

We are fully satisfied with their performance/quality/salesmanshio and technical know how.

For Crescent Sugar Mills & Distillery Limited,
(Textile Division)

DIRECTOR: _____

TECHNICAL DIRECTOR: _____

PLANT MANAGER: _____

COMMERCIAL MANAGER: _____

PAKISTAN RAILWAYS
HEADQUARTERS OFFICE,
LAHORE.

No. 63-S/33/10292/EC. Dated:-

M/s Mutahir, Metal Wroks,
124/1 Industrial Estate,
Kot Lakhpat Lahore.

SUB:- APPROVAL OF BRAND.

Ref:- Your letter No. Nil dated 16.11.201.

M.M. Wire and Cable brand for cable PVC of all sizes Manufactured by M/s Mutahir Metal Wroks, 127/1 Industrial Estate, Kot Lakhpat, Lahore is hereby put on the approval brand list of Pakistan Railways.

(RIZWAN SAEED KHAN)
for Chief Controller of Purchase & Procurement.

Copy for information to:-

1. The Divl: Electrical Engineer/Workshop, Pakistan Railways, Moghalpura.
2. The Chief Electrical Engineer/PBU & IBU, Pakistan Railways, Headquarters office Lahore
3. All Head Clerks (NP-1, NP-2, NP-3, NP-4, NP-5, NP-6, NP-7, NP-8, NP-9, NP-10 NP-11, NP-12, NP-13, NP-14, NP-15, NP-16, NP-17, NP-18, NP-19, NP-20, & NP-21

PUNJAB INDUSTRIAL ESTATES
DEVELOPMENT AND MANAGEMENT COMPANY

To

M/s Mutahir Metal Works
79, Baig Rd, Block D2,
Johar Town, Lahore 54000
Tel: (042) 35401662

No: PIE/CSS/3493
Dated: 5th June 2017

Subject:- **SHORT LISTING OF VENDORS/MANUFACTURERS FOR SUPPLY OF ELECTRICAL EQUIPMENT/MATERIAL FOR PIEDMC INDUSTRIAL ESTATES FOR THE PERIOD OF TWO YEARS**

Reference:

- ***Profile submitted by your good self dated 5th November 2016 against advertisement published dated 19th October 2016***

Dear Sir,

We are pleased to inform you that you have been shortlisted / registered as vendor to supply the electrical material required time to time by the PIEDMC against the following categories for two years with immediate effect.

Sr. No	Category	Description of Material
01	F	LT Cable (XLPE/PVC) etc

In this regards request for quotations will be called for the procurement of material as and when required.

Manager Contract PIEDMC

Cc.

- P S To CEO PIEDMC
- General Manager Technical PIEDMC
- Chief Engineer Electrical PIEDMC

LAHORE ELECTRIC SUPPLY COMPANY

MATERIAL MANAGEMENT DIRECTORATE

22-A Queens Road Lahore Ph. # 99204842, Fax: 99204843

Subject: **REGISTRATION AS GENERAL ORDER SUPPLIER**

Reference: Your application dated. 27.09.2013. This office memo No. 20466-68 dated. 13.01.2013. Your letter No. MMW/15/3079 dated. 19.02.2015. This office No. 36235-41 dated. 0303.2015.

Your application for registration as General Order Supplier for Supply of T&P items and Electrical Goods / Equipment has been considered and approved by the Chief Executive Officer, LESCO on has been considered and Prequalification / registration Committee.

Your registration is subject to the terms and conditions which may be assigned by the Chief Executive Officer LESCO Limited, Lahore / Chief Engineer (P&D) PEPCO, Lahore from time to time. However, LESCO may cancel your deficient in machinery/equipment, manpower or finances and if your performance regarding progress / quality of material, conduct etc; is found unsatisfactory / lacking and if any violation of purchase procedure / tender bid conditions is committed.

This is being issued with the approval of competent authority.

SECRETARY
PREQUALIFICATION COMMITTEE
SR. MANAGER (MM) LESCO

To:-

M/s. Mutahir Metal Warks, Pvt. Ltd.
127/1 Industrial Area Kot Lakhpat,
Lahore.

Info:-

1. The Chief Executive Officer LESCO Ltd: Lahore.
2. Technical Director LESCO Ltd. Lahore.
3. Chief Engineer / Sr. Manager (O&M), Dist. LESCO Ltd. Lahore.
4. Chief Engineer (MI) NTDC, Sunny View, Lahore.
5. Chief Engineer (Development) LESCO Ltd. Lahore.
6. Chief Engineer (D&S) PEPCO / WAPDA, Model Town, Lahore.
7. Chief Engineer (Operation) North LESCO Ltd. Lahore.
8. Chief Engineer (P&D) PEPCO, WAPDA House, Lahore.
9. Chief Engineer (STG) NTDC, 622-WAPDA House, Lahore
10. The Chief Financial Officer, LESCO Ltd, Lahore.
11. All Chief Executive Officers of the DISCOs.

No. 48085 /MMM/LESCO/R- Dated: 24/4/2015

PAKISTAN RAILWAYS

From:-

The Chief Controller of Purchase,
P.R., Lahore.

No. 63-S/33/10292 **(E.C.)** **Dated** _____

To:-

M/s. Mutahir Metal Works,
127/1, Industrial Estate
Kot Lakhpat, Lahore.

Sub.- Registration as approved Contractor.

Ref. Your Letter No. NIL

Dated 16-11-2001

You have been registered as an approved contractor for Weekly Stores Bullutin Enquiries and Registration No. 1222 **has been allotted to you.**

for chief Controller of Purchase.

P.R.-1988/7-1981-82-5D R.

CURRENT RATING (AC) AND VOLTAGE DROP

600 - 1000 V

CABLES INSTALLED IN AIR

UN-ARMOURED CABLES WITH COPPER CONDUCTOR

Nominal area of Conductor	Single Core						Two Core		Three and Four Core	
	Two cables spaced		Three cables trefoil touching		Laid Flat Speced					
	Current rating	Approximate volt drop per amp per metre	Current rating	Approximate volt drop per amp per metre	Current rating	Approximate volt drop per amp per metre	Current rating	Approximate volt drop per amp per metre	Current rating	Approximate volt drop per amp per metre
mm^2	amp	mV	amp	mV	amp	mV	amp	mV	amp	mV
16	-	-	-	-	-	-	91	2.8	79	2.4
25	-	-	-	-	-	-	122	1.7	103	1.5
35	-	-	-	-	-	-	149	1.3	128	1.1
50	207	0.97	173	0.82	201	0.83	182	0.94	156	0.82
70	262	0.70	219	0.58	255	0.60	229	0.66	197	0.57
95	325	0.53	273	0.43	317	0.47	284	0.49	243	0.42
120	379	0.45	318	0.35	368	0.40	330	0.40	284	0.35
150	435	0.39	365	0.30	424	0.35	379	0.34	324	0.29
185	504	0.35	423	0.25	492	0.33	436	0.29	374	0.25
240	602	0.31	505	0.22	588	0.32	519	0.24	446	0.21
300	697	0.29	583	0.19	681	0.31	598	0.21	512	0.18
400	815	0.28	679	0.18	796	0.28	695	0.19	593	0.17
500	948	0.26	782	0.16	927	0.27	-	-	-	-
630	1108	0.25	900	0.15	1083	0.25	-	-	-	-
800	1277	0.25	1080	0.15	1249	0.23	-	-	-	-
1000	1437	0.25	1134	0.14	1412	0.22				

CURRENT RATING (AC) AND VOLTAGE DROP

600 - 1000 V

CABLES INSTALLED IN AIR

UN-ARMOURED CABLES WITH STRANDED ALUMINIUM CONDUCTORS

Nominal area of Conductor	Single Core						Two Core		Three and Four Core	
	Two cables spaced		Three cables trefoil touching		Laid Flat Speced					
	Current rating	Approximate volt drop per amp per metre	Current rating	Approximate volt drop per amp per metre	Current rating	Approximate volt drop per amp per metre	Current rating	Approximate volt drop per amp per metre	Current rating	Approximate volt drop per amp per metre
mm^2	amp	mV	amp	mV	amp	mV	amp	mV	amp	mV
16	-	-	-	-	-	-	70	4.6	59	4.0
25	-	-	-	-	-	-	90	2.9	78	2.5
35	-	-	-	-	-	-	110	2.1	96	1.8
50	153	1.6	129	1.3	149	1.3	134	1.5	117	1.3
70	194	1.1	164	0.94	189	0.95	169	1.1	149	0.93
95	241	0.81	202	0.68	234	0.70	209	0.79	183	0.68
120	281	0.66	236	0.55	273	0.58	-	-	212	0.54
150	324	0.56	271	0.46	313	0.49	-	-	243	0.45
185	373	0.47	315	0.37	364	0.42	-	-	281	0.37
240	446	0.40	376	0.30	434	0.40	-	-	336	0.29
300	515	0.35	436	0.26	503	0.36	-	-	287	0.25
380	601	0.32	509	0.22	588	0.33	-	-	-	-
480	697	0.29	591	0.20	682	0.30	-	-	-	-
600	798	0.28	674	0.18	781	0.28	-	-	-	-
740	923	0.27	776	0.17	903	0.26	-	-	-	-
960	1091	0.26	910	0.15	1068	0.24	-	-	-	-
1200	1247	0.25	1028	0.15	1221	0.23	-	-	-	-

PVC INSULATED NON SHEATHED GENERAL PURPOSE CABLE 450/750 VOLTS (SINGLE CORE) ACCORDING TO BSS = 6004 - 1990

1	2	3	4	5
Area	Wire Single and # Wire	Radial Thickness of Insulation	Mean Overall diameter upper limit	
mm^2	mm	mm	mm	
1.5	**1/1.38**	**0.70**	**3.3**	
1.50	**7/0.53**	**0.70**	**3.5**	
2.5	**1/78**	**0.80**	**3.9**	
2.5	**7/0.67**	**0.80**	**4.20**	
4	**1/2.24**	**0.80**	**4.40**	
4	**7/0.84**	**0.80**	**4.8**	
6	**1/2.74**	**0.80**	**4.90**	
6	**7/1.04**	**0.80**	**5.40**	
10	**1/3.56**	**1.00**	**6.40**	
10	**7/1.35**	**1.00**	**6.80**	
16	**7/1.70**	**1.00**	**8.0**	
25	**7/2.14**	**1.20**	**9.80**	
35	**7/2.52**	**1.20**	**11.00**	
50	**19/1.78**	**1.40**	**13.00**	
70	**19/2.14**	**1.40**	**15.00**	
95	**19/2.52**	**1.60**	**17.00**	
120	**37/2.03**	**1.60**	**19.00**	
150	**37/2.25**	**1.80**	**21.00**	
185	**37/2.52**	**2.00**	**23.50**	
240	**61/2.25**	**2.20**	**26.50**	
300	**61/2.52**	**2.40**	**29.50**	
400	**61/2.85**	**2.60**	**33.50**	
500	**61/3.20**	**2.80**	**37.00**	
630	**127/2.52**	**2.80**	**41.00**	

PVC INSULATED PVC SHEATHED STRANDED COPPER CONDUCTOR
SINGLE CORE CABLE 600 / 1000V
BSS - 6346 - 1989

6	7	8	9	10
Nominal Cross Sectional Area	No. Of wire and single wire diameter in strand	Thickneess of Insulation	Thickness of Sheathe	Approximates overall diameter
mm^2	mm	mm	mm	mm
50	**19/1.78**	**1.40**	**1.40**	**19.10**
70	**19/2.14**	**1.40**	**1.40**	**21.10**
95	**19/2.52**	**1.60**	**1.50**	**23.40**
120	**37/2.03**	**1.60**	**1.50**	**26.30**
150	**37/2.25**	**1.80**	**1.60**	**28.30**
185	**37/2.25**	**2.00**	**1.60**	**30.80**
240	**61/2.25**	**2.20**	**1.80**	**34.10**
300	**61/2.52**	**2.40**	**1.90**	**37.00**
400	**61/2.85**	**2.60**	**2.0**	**42.00**
500	**61/3.20**	**2.80**	**2.10**	**45.60**
630	**127/2.52**	**2.80**	**2.20**	**49.70**
800	**127/2.85**	**2.80**	**2.30**	**55.80**
1000	**127/3.20**	**3.00**	**2.50**	**61.00**

600/1000 DIMENSIONS AND WEIGHTS OF PVC INSULATED CABLES With Stranded Copper Conductors To BS 6346 :

Unarmoured and single wire armoured, PVC oversheathed cables

		Nominal area of conductor	Thickness of insulation	Unarmoured		Armoured		
				Approximate diameter overall	Approximate cable weight	Armour wire diameter	Approximate cable diameter overall	Approximate cable weight
							Extruded bedding	Extruded bedding
		mm^2	mm	mm	kg/100m	mm	mm	kg/100mm
Single core	°	**50**	**1.4**	**15.1**	**60**	**1.25**	**19.1**	**101**
		70	**1.4**	**16.9**	**81**	**1.25**	**21.1**	**128**
		95	**1.6**	**19.4**	**110**	**1.25**	**23.4**	**162**
		120	**1.6**	**21.0**	**135**	**1.6**	**26.3**	**210**
		150	**1.8**	**23.2**	**165**	**1.6**	**28.3**	**246**
		185	**2.0**	**25.8**	**206**	**1.6**	**30.8**	**294**
		240	**2.2**	**29.0**	**267**	**1.6**	**34.1**	**366**
		300	**2.4**	**32.1**	**332**	**1.6**	**37.0**	**439**
		400	**2.6**	**35.8**	**419**	**2.0**	**42.0**	**572**
		500	**2.8**	**39.6**	**523**	**2.0**	**45.6**	**689**
		630	**2.8**	**43.8**	**663**	**2.0**	**49.7**	**844**
		800	**2.8**	**48.3**	**833**	**2.5**	**55.8**	**1088**
		1000	**3.3**	**53.7**	**1044**	**2.5**	**61.0**	**1322**
Twin core	°	**16**	**1.0**	**15.6**	**47**	**1.25**	**18.9**	**84**
	*	**25**	**1.2**	**18.4**	**69**	**1.6**	**23.0**	**128**
		35	**1.2**	**20.1**	**95**	**1.6**	**24.9**	**161**
		50	**1.4**	**22.8**	**126**	**1.6**	**27.8**	**201**
		70	**1.4**	**25.5**	**170**	**1.6**	**30.4**	**252**
		95	**1.6**	**29.3**	**231**	**2.0**	**35.5**	**352**
		120	**1.6**	**31.8**	**288**	**2.0**	**38.0**	**420**
		150	**1.8**	**35.1**	**352**	**2.0**	**41.3**	**496**
		185	**2.0**	**39.1**	**439**	**2.5**	**46.4**	**639**
		240	**2.2**	**43.9**	**576**	**2.5**	**51.2**	**802**
		300	**2.4**	**48.7**	**716**	**2.5**	**56.4**	**971**
		400	**2.6**	**54.2**	**904**	**2.5**	**61.9**	**1185**
Three core	°	**16**	**1.0**	**17.2**	**67**	**1.25**	**20.6**	**105**
	*	**25**	**1.2**	**20.4**	**100**	**1.6**	**25.0**	**167**
		35	**1.2**	**22.4**	**130**	**1.6**	**27.3**	**205**
		50	**1.4**	**25.5**	**172**	**1.6**	**30.5**	**258**
		70	**1.4**	**28.7**	**236**	**2.0**	**35.0**	**359**
		95	**1.6**	**33.3**	**333**	**2.0**	**39.3**	**471**
		120	**1.6**	**36.3**	**410**	**2.0**	**42.2**	**559**
				40.0				
		150	**1.8**	**40.0**	**502**	**2.5**	**47.5**	**711**
		185	**2.0**	**44.6**	**626**	**2.5**	**51.9**	**854**
		240	**2.2**	**50.1**	**815**	**2.5**	**57.8**	**1079**
		300	**2.4**	**55.6**	**1014**	**2.5**	**63.2**	**1304**
		400	**2.6**	**62.2**	**1286**	**2.5**	**69.6**	**1602**

600/1000 DIMENSIONS AND WEIGHTS OF PVC INSULATED CABLES With Stranded Copper Conductors To BS 6346 :

Unarmoured and single wire armoured, PVC oversheathed cables

	Nominal area of conductor mm²		Nominal area of neutral conductor mm²	Thickness of insulation mm	Unarmoured: Approximate cable diameter overall mm	Unarmoured: Approximate cable weight kg/100m	Armoured: Armour wire diameter mm	Armoured: Approximate cable diameter overall Extruded bedding mm	Approximate cable weight Extruded bedding kg/100mm
Four core	16	°	—	1.0	19.3	86	1.6	23.9	149
	25		—	1.2	22.9	129	1.6	27.8	205
	35		—	12.2	25.4	169	1.6	30.5	253
	50		—	1.4	29.2	225	2.0	35.4	348
	70		—	1.4	33.0	310	2.0	39.2	447
	95		—	1.6	38.3	436	2.0	44.3	590
	120		—	1.6	41.5	538	2.5	49.3	754
	150		—	1.8	46.3	663	2.5	53.6	897
	185		—	2.0	51.3	825	2.5	59.0	1089
	240		—	2.2	58.0	1073	2.5	65.7	1369
	300		—	2.4	64.6	1338	2.5	72.0	1661
	400		—	2.6	72.0	1693	3.15	81.3	2148
Four core* with reduced neutral conductor	25	°	16	1.2	22.9	126	1.6	27.8	2.02
	35		16	1.2	24.7	159	1.6	29.5	243
	50	*	25	1.4	28.3	212	1.6	33.1	305
	70		35	1.4	32.0	289	2.0	38.0	422
	95		50	1.6	37.5	392	2.0	43.7	546
	120		70	1.6	41.4	489	2.5	49.0	699
	150		70	1.8	44.7	590	2.5	52.0	818
	185		95	2.0	49.0	740	2.5	57.2	991
	240		120	2.2	56.0	959	2.5	63.7	1247
	300		150	2.4	62.2	1191	2.5	69.8	1508
	300		185	2.4	64.2	1219	2.5	71.8	1536
	400		185	2.6	69.6	1507	3.15	78.6	1947

° CIRCULAR CONDUCTORS

* Shaped Conductors for 25 mm and above in multicore cables.

600/1000 DIMENSIONS AND WEIGHTS OF PVC INSULATED CABLES With Stranded Aluminium Conductors To BS 6346 :

Unarmoured and single wire armoured, PVC oversheathed cables

	Nominal area of conductor	Nominal area of neutral conductor	Thickness of insulation	Unarmoured: Approximate cable diameter overall	Unarmoured: Approximate cable weight	Armoured: Armour wire diameter	Armoured: Approximate cable diameter overall	Approximate cable weight
							Extruded bedding	Extruded bedding
	mm^2	mm^2	mm	mm	kg/100m	mm	mm	kg/100mm
Single core	16 o	50	1.4	15.1	28	1.25	13.1	66
		70	1.4	16.9	36	1.25	21.1	79
	25	95	1.6	19.4	48	1.25	23.4	95
	35							
	50	120	1.6	21.0	57	1.6	26.3	125
		150	1.8	23.2	69	1.6	28.3	143
	70	185	2.0	25.8	86	1.6	30.8	166
	95							198
	120	240	2.2	29.0	109	1.6	34.1	198
		300	2.4	32.1	134	1.6	37.0	230
	150	400	2.6	35.8	167	2.0	42.0	303
	185							
	240	500	2.8	39.6	206	2.0	45.6	355
		630	2.8	43.8	244	2.0	49.7	404
	300	800	2.8	48.3	294	2.5	55.8	515
	400	1000	3.0	53.7	375	2.5	61.0	624
Twin core	25 o	16	1.0	15.6	23	1.25	18.9	65
	35	25	1.2	18.4	39	1.6	23.0	98
	50 *	35	1.2	20.1	53	1.6	24.9	119
	70	50	1.4	22.8	69	1.6	27.8	144
	95	70	1.4	25.5	87	1.6	30.4	170
	120	95	1.6	29.3	116	2.0	35.5	238
	150	120	1.6	31.8	137	2.0	38.0	241.0
	185	150	1.8	35.1	166.4	2.0	41.3	310.4
	240	185	2.0	39.1	206.2	2.5	46.4	406.2
	300	240	2.2	43.9	270.0	2.5	51.2	496.0
	300	300	2.4	48.7	332.0	2.5	56.4	587.0
	400	400	2.6	54.2	413.0	2.5	61.9	694.0

TO BE CONTINUED

600/1000 DIMENSIONS AND WEIGHTS OF PVC INSULATED CABLES With Stranded Aluminium Conductors To BS 6346 :

Unarmoured and single wire armoured, PVC oversheathed cables

	Nominal area of conductor mm2		Nominal area of neutral conductor mm2	Thickness of insulation mm	Umarmoured: Approximate cable diameter overall mm	Umarmoured: Approximate cable weight kg/100m	Armoured: Armour wire diameter mm	Armoured: Approximate cable diameter overall, Extruded bedding mm	Approximate cable weight, Extruded bedding kg/100mm
Four core		°	16	1.0	17.2	38	1.25	20.6	79
			25	1.2	20.4	54	1.6	25.0	121
			35	1.2	22.4	66	1.6	27.3	142
			50	1.4	25.2	90	1.6	30.5	176
			70	1.4	28.7	112	2.0	35.0	236
			95	1.6	33.3	160	2.0	39.3	299
			120	1.6	36.3	182	2.0	42.2	342
			150	1.8	40.0	235	2.5	47.5	446
			185	2.0	44.6	290	2.5	51.9	520
			240	2.2	50.1	344	2.5	57.8	640
			300	2.4	55.6	460	2.5	63.2	752
Twin core* with reduced neutral conductor	25	*	16	1.0	19.3	48	1.6	23.9	111
	35		25	1.2	22.9	64	1.6	27.8	144
	50		35	1.2	25.4	84	1.6	30.5	169
	70		50	1.4	29.2	113	2.0	35.4	240
	95		70	1.4	33.0	145	2.0	39.2	283
	120		95	1.6	38.3	206	2.0	44.3	361
	150		120	1.6	41.8	248	2.5	49.3	465
	185		150	1.8	46.3	306	2.5	53.6	542
	240		185	2.0	51.3	378	2.5	59.3	644
	300		240	2.2	58.0	485	2.5	65.7	783
	300		300	2.4	64.6	599	2.5	72.0	924
	400		400	2.6					

° CIRCULAR CONDUCTORS

* Shaped Conductors for 25 mm and above in multicore cables.

1900/3300 V DIMENSIONS AND WEIGHTS OF PVC INSULATED CABLES With Stranded Copper Conductors To BS 6346 :

Unarmoured and single wire armoured, PVC oversheathed cables

		Nominal area of conductor mm²	Thickness of insulation mm²	Umarmoured: Approximate cable diameter overall mm	Umarmoured: Approximate cable weight kg/100m	Armoured: Armour wire diameter mm	Armoured: Approximate cable diameter overall, Extruded bedding mm	Approximate cable weight, Extruded bedding kg/100mm
Single core	•	**50**	**2.2**	**16.8**	**66**	**1.25**	**21.0**	**113**
		70	**2.2**	**18.8**	**89**	**1.25**	**22.8**	**140**
		95	**2.2**	**20.7**	**116**	**1.6**	**26.0**	**190**
		120	**2.2**	**22.6**	**143**	**1.6**	**27.6**	**222**
		150	**2.2**	**24.1**	**171**	**1.6**	**29.4**	**255**
		185	**2.2**	**26.2**	**209**	**1.6**	**31.3**	**299**
		240	**2.2**	**29.0**	**267**	**1.6**	**34.1**	**366**
		300	**2.4**	**32.1**	**332**	**1.6**	**37.0**	**439**
		400	**2.6**	**35.8**	**419**	**2.0**	**42.0**	**572**
		500	**2.8**	**39.6**	**523**	**2.0**	**45.6**	**689**
		630	**2.8**	**43.8**	**663**	**2.0**	**49.7**	**844**
		800	**2.8**	**48.3**	**833**	**2.5**	**55.8**	**1088**
		1000	**3.0**	**53.7**	**1044**	**2.5**	**61.0**	**1322**
Three core		**16**	**2.2**	—	—	**1.6**	**27.6**	**175**
		25	**2.2**	—	—	**1.6**	**29.9**	**215**
	*	**35**	**2.2**	—	—	**1.6**	**32.1**	**257**
		50	**2.2**	—	—	**2.0**	**35.6**	**333**
		70	**2.2**	—	—	**2.0**	**38.9**	**414**
		95	**2.2**	—	—	**2.0**	**42.3**	**511**
		120	**2.2**	—	—	**2.5**	**46.6**	**645**
		150	**2.2**	—	—	**2.5**	**49.4**	**743**
		185	**2.2**	—	—	**2.5**	**52.8**	**873**
		240	**2.2**	—	—	**2.5**	**57.8**	**1083**
		300	**2.4**	—	—	**2.5**	**63.2**	**1309**
		400	**2.6**	—	—	**2.5**	**69.6**	**1609**

º CIRCULAR CONDUCTORS

*** Shaped Conductors for 25 mm and above in multicore cables.**

1900/3300 V DIMENSIONS AND WEIGHTS OF PVC INSULATED CABLES With Stranded Aluminium Copper Conductors To BS 6346 :

Unarmoured and single wire armoured, PVC oversheathed cables

		Nominal area of conductor	Thickness of insulation	Umarmoured		Armoured		
				Approximate cable diam-eter overall	Approximate cable weight	Armour wire diameter	Approximate cable diameter overall	Approximate cable weight
							Extruded bedding	Extruded bedding
		mm^2	mm^2	mm	kg/100m	mm	mm	kg/100mm
Single core	•	**50**	**2.2**	**16.8**	**34**	**1.25**	**21.0**	**77**
		70	**2.2**	**18.8**	**44**	**1.25**	**22.8**	**90**
		95	**2.2**	**20.7**	**54**	**1.6**	**26.0**	**122**
		120	**2.2**	**22.6**	**63**	**1.6**	**27.6**	**136**
		150	**2.2**	**24.1**	**74**	**1.6**	**29.4**	**151**
		185	**2.2**	**26.2**	**88**	**1.6**	**31.3**	**170**
		240	**2.2**	**29.0**	**109**	**1.6**	**34.1**	**198**
		300	**2.4**	**32.1**	**134**	**1.6**	**37.0**	**230**
		400	**2.6**	**35.8**	**167**	**2.0**	**42.0**	**303**
		500	**2.8**	**39.6**	**206**	**2.0**	**45.6**	**355**
		630	**2.8**	**43.8**	**244**	**2.0**	**49.7**	**404**
		800	**2.8**	**48.3**	**294**	**2.5**	**55.8**	**515**
		1000	**3.0**	**53.7**	**375**	**2.5**	**64.0**	**624**
Three core		**16**	**2.2**	—	—	**1.6**	**27.6**	**134**
	*	**24**	**2.2**	—	—	**1.6**	**29.9**	**154**
		35	**2.2**	—	—	**1.6**	**32.1**	**177**
		50	**2.2**	—	—	**2.0**	**35.6**	—
		70	**2.2**	—	—	**2.0**	**38.9**	**265**
		95	**2.2**	—	—	**2.0**	**42.3**	**309**
		120	**2.2**	—	—	**2.5**	**46.6**	**390**
		150	**2.2**	—	—	**2.5**	**49.4**	**434**
		185	**2.2**	—	—	**2.5**	**52.8**	**490**
		240	**2.2**	—	—	**2.5**	**57.8**	**586**
		300	**2.4**	—	—	**2.5**	**63.2**	**688**
				—	—			

º CIRCULAR CONDUCTORS

*** Shaped Conductors for 25 mm and above in multicore cables.**

SHEATHED INSULATED DISTRIBUTION CABLES WITH STRANDED ALUMINUM CONDUCTOR ACCORDING TO WAPDA SPECIFICATION DDS - 8:84

Area	10 mm^2	25 mm^2	70 mm^2	120 mm^2	300 mm^2
Conductor Stranding	7/1.35	7/2.14	19/2.14	37/2.03	61/2.52
Shaped Cond No. Of Wire	—	7	19	37	61
Weight Kg/KM	27.7	69.5	189	331	839
D.C Resistance at 20 C /KM Single core & Multicore cable	3.08	1.2	0.443	0.253	0.1
Nominal Insulation Thickness					
(A) Single Core Cable	—	1.5	1.98	2.3	2.74
(B) Multi Core Cable	1.2	1.42	1.64	1.86	2.74
Nominal Outer Sheath Thickness					
S/C (A)	—	1.4	1.6	2.05	2.74
2/C (B)	1.8	1.8	—	—	—
4/C PVC/PVC (C)	2.1	2.1	2.6	3.2	3.4
4/C (SWA) (d)	2.08	—	2.52	3.08	3.51
Nominal Thickness of Bedding	1.64	—	2.36	2.61	2.87
Dia of (SWA) four core armored cable only	1.6	—	2.1	2.64	3.175

600/1000 V CONTROL CABLES WITH SOLID COPPER CONDUCTORS

1	2	3	4	5	6	7	8
	Conductor						
Number of cores	Nominal area	Number and nominal diameter of wires	Thickness of Insulation	Thickness of extruded bedding	Nominal armour wire diameter	Thickness of oversheath	Approx. Overall diameter
	mm^2	mm	mm	mm	mm	mm	mm
5				**0.8**	**0.9**	**1.4**	**13.8**
7				**0.8**	**0.9**	**1.4**	**14.5**
10				**0.8**	**1.25**	**1.5**	**18.1**
12				**0.8**	**1.25**	**1.5**	**18.6**
19	**1.5**	**1/1.38**	**0.6**	**0.8**	**1.25**	**1.6**	**21.1**
27				**1.0**	**1.6**	**1.7**	**25.4**
37				**1.0**	**1.6**	**1.8**	**27.8**
48				**1.0**	**1.6**	**1.8**	**30.8**
5				**0.8**	**0.9**	**1.4**	**13.8**
7				**0.8**	**0.9**	**1.4**	**14.5**
10				**0.8**	**1.25**	**1.5**	**18.1**
12				**0.8**	**1.25**	**1.5**	**18.6**
19				**0.8**	**1.25**	**1.6**	**21.1**
27				**1.0**	**1.6**	**1.7**	**25.4**
37				**1.0**	**1.6**	**1.8**	**27.8**
48				**1.0**	**1.6**	**1.8**	**30.8**
5	**2.5**	**1/1.78**	**0.7**				
7							
10							
12							
19							
27							
37							
48							
5				**0.8**	**1.25**	**1.5**	**19.0**
7				**0.8**	**1.25**	**1.6**	**20.5**
10				**1.0**	**1.6**	**1.7**	**26.1**
12				**1.0**	**1.6**	**1.7**	**26.8**
19				**1.0**	**1.6**	**1.8**	**30.5**
27				**1.2**	**2.0**	**2.0**	**37.1**
5	**4**	**7/0.85**	**0.8**				
7							
10							
12							
19							
27							

The above cable shall also be supplied as per wapda Specification P:100

600/1000 V CONTROL CABLES WITH SOLID STRANDED COPPER CONDUCTORS

1	2	3	4	5	6	7	8
	Conductor						
Number of cores	Nominal area	Number and nominal diameter of wires	Thickness of Insulation	Thickness of extruded bedding	Nominal armour wire diameter	Thickness of oversheath	Approx. Overall diameter
	mm^2	mm	mm	mm	mm	mm	mm
5				**0.8**	**0.9**	**1.4**	**13.8**
7				**0.8**	**0.9**	**1.4**	**14.5**
10				**0.8**	**1.25**	**1.5**	**18.1**
12				**0.8**	**1.25**	**1.5**	**18.6**
19	**1.5**	**1/1.38**	**0.6**	**0.8**	**1.25**	**1.6**	**21.1**
27				**1.0**	**1.6**	**1.7**	**25.4**
37				**1.0**	**1.6**	**1.8**	**27.8**
48				**1.0**	**1.6**	**1.8**	**30.8**
5				**0.8**	**0.9**	**1.5**	**16.3**
7				**0.8**	**1.25**	**1.5**	**18.0**
10				**0.8**	**1.25**	**1.6**	**21.9**
12				**0.8**	**1.25**	**1.6**	**22.4**
19	**2.5**	**1/1.78**	**0.7**	**0.8**	**1.6**	**1.7**	**26.6**
27				**1.0**	**1.6**	**1.8**	**30.7**
37				**1.0**	**1.6**	**1.9**	**34.0**
48				**1.2**	**2.0**	**2.1**	**39.5**
5				**0.8**	**1.25**	**1.5**	**19.0**
7				**0.8**	**1.25**	**1.6**	**20.5**
10				**1.0**	**1.6**	**1.7**	**26.1**
12				**1.0**	**1.6**	**1.7**	**26.8**
19	**4**	**7/0.85**	**0.8**	**1.0**	**1.6**	**1.8**	**30.5**
27				**1.2**	**2.0**	**2.0**	**37.1**

ALL ALUMINUM CONDUCTOR

AND

ALUMINUM CONDUCTOR

STEEL REINFORCED

British Standard - BS 215 Part 2 : 1970

Code word	Nominal aluminum area	Stranding		Overall diameter		Sectional area		
		Aluminum	Steel	A. C. S. R.	Steel	Aluminum	Total	Aluminum
	mm^2	No./mm		mm		mm^2		
Gopher	**25**	**6/2.36**	**1/2.36**	**7.08**	**2.36**	**26.24**	**30.62**	**72.0**
Weasel	**30**	**6/2.59**	**1/2.59**	**7.77**	**2.59**	**31.61**	**36.88**	**86.7**
Ferret	**40**	**6/3.00**	**1/3.00**	**9.00**	**3.00**	**42.41**	**49.48**	**116.4**
Rabbit	**50**	**6/3.35**	**1/3.35**	**10.05**	**3.35**	**52.88**	**61.70**	**145.1**
Horse	**70**	**12/2.79**	**7/2.79**	**13.95**	**8.37**	**73.37**	**116.2**	**202.7**
Dog	**100**	**6/4.72**	**7/1.57**	**14.15**	**4.71**	**105.0**	**118.5**	**288.1**
Wolf	**150**	**30/2.59**	**7/2.59**	**18.13**	**7.77**	**158.1**	**194.9**	**436.7**
Dingo	**150**	**18/3.35**	**1/3.35**	**16.75**	**3.35**	**158.7**	**167.5**	**436.9**
Lynx	**175**	**30/2.79**	**7/2.79**	**19.53**	**8.37**	**183.4**	**226.2**	**507.0**
Caracal	**175**	**18/3.61**	**1/3.61**	**18.05**	**3.61**	**184.3**	**194.5**	**507.5**
Panther	**200**	**30/3.00**	**7/3.00**	**21.00**	**9.00**	**212.1**	**261.5**	**586.1**
Jeguar	**200**	**18/3.68**	**1/3.86**	**19.30**	**3.68**	**210.6**	**222.3**	**580.1**
Zebra	**400**	**54/3.18**	**7/3.18**	**28.62**	**9.54**	**428.9**	**484.5**	**1 185.8**
Following Sizes are semi-standard								
Fox		**6/2.79**	**1/2.79**	**8.37**	**2.79**	**36.68**	**42.80**	**42.80**
Mink		**6/3.66**	**1/3.66**	**10.98**	**3.66**	**63.12**	**73.64**	**73.64**
Skunk		**12/2.59**	**7/2.59**	**12.95**	**7.77**	**63.23**	**100.1**	**100.1**
Beaver		**6/3.99**	**1/3.99**	**11.97**	**3.99**	**75.00**	**87.50**	**87.50**
Raccoon		**6/4.09**	**1/4.09**	**12.27**	**4.09**	**78.84**	**90.98**	**90.98**
otter		**6/4.22**	**1/4.22**	**12.66**	**4.22**	**83.94**	**97.93**	**97.93**
Cat		**6/4.50**	**1/4.50**	**13.50**	**4.50**	**95.40**	**111.3**	**111.3**
Hare		**6/4.72**	**1/4.72**	**14.16**	**4.72**	**105.0**	**122.5**	**122.5**
Hyena		**7/4.39**	**7/4.93**	**14.57**	**5.79**	**106.0**	**126.5**	**126.5**
Leopard		**6/5.25**	**7/1.75**	**15.81**	**5.25**	**131.4**	**148.2**	**148.2**
Tiger		**30/2.36**	**7/2.36**	**16.52**	**7.08**	**131.2**	**161.8**	**161.8**
Coyote		**26/2.54**	**7/1.91**	**15.89**	**5.73**	**131.7**	**151.8**	**151.8**
Lion		**30/3.18**	**7/3.18**	**22.26**	**9.54**	**238.3**	**293.9**	**293.9**
Bear		**30/3.35**	**7/3.35**	**23.45**	**10.05**	**264.4**	**326.1**	**326.1**
Goat		**30/3.71**	**7/3.71**	**25.97**	**11.13**	**324.3**	**400.0**	**400.0**
Antelope		**54/2.97**	**7/3.97**	**26.73**	**8.91**	**374.1**	**422.6**	**422.6**
Sheep		**30/3.99**	**7/3.99**	**27.93**	**11.97**	**375.0**	**462.5**	**462.5**
Bison		**54/3.00**	**7/3.00**	**27.00**	**9.00**	**381.7**	**431.2**	**431.2**
Deer		**30/4.27**	**7/4.27**	**29.89**	**12.81**	**429.6**	**529.8**	**529.8**
Camel		**54/3.35**	**7/3.35**	**30.15**	**10.05**	**476.0**	**537.7**	**237.7**
Elk		**30/4.50**	**7/4.50**	**31.50**	**13.50**	**477.0**	**588.3**	**588.3**
Moose		**54/3.53**	**7/3.53**	**31.77**	**10.59**	**528.5**	**597.0**	**597.0**

*** 1 KN=100 000 000 dyne=101.972 kgf**

A.C.S.R.

Weight per km		Calculated electrical resistance	Calculated breaking load		Nominal length	Reel designation	Weight of Package		Measure-ment
Steel	A.C.S.R.						Net	Gross	
kg		/Km 20 C	KN*	kg	m		kg		cft
34.1	106	1.093	9.61	(980)	1 950x2	E 4-1	413	501	22
41.1	128	0.9077	11.45	(1 170)	3 250	E 4-1	416	504	22
55.1	172	0.6766	15.20	(1 550)	2 400x2	E 4-3	826	948	34
68.8	214	0.5426	18.35	(1 870)	1 950x2	E 4-3	835	957	34
335.4	538	0.3936	61.20	(6 240)	2 850	E 6-1	1 533	1 712	48
106.2	394	0.2733	32.70	(3 330)	2 050	E 4-3	808	930	34
288.9	726	0.1828	69.20	(7 060)	3 550	E 7-2	2 577	2 864	90
68.75	506	0.1815	35.70	(3 640)	1 950x2	E 7-2	1 973	2 260	90
335.4	842	0.1576	79.80	(8 140)	3 000	E 7-2	2 526	2 813	90
79.84	587	0.1563	41.10	(4 190)	3 350	E 7-2	1 966	2 253	90
387.7	974	0.1363	92.25	(9 410)	2 600	E 7-2	2 532	2 918	90
91.28	671	0.1367	46.55	(4 750)	2 950	E 7-2	1 979	2 266	90
435.6	1 621	0.06740	131.9	(13 450)	1 950	E 9-2	3 161	3 657	152
47.69	148	0.7822	13.15	(1 340)	2 800x2	E 4-3	823	945	34
82.06	255	0.4546	21.80	(2 220)	3 250	E 4-3	829	951	34
288.9	464	0.4568	52.90	(5 400)	3 400	E 6-1	1 578	1 757	48
97.50	303	0.3826	25.75	(2 630)	2 750	E 4-3	833	955	34
102.5	319	0.3639	27.05	(2 760)	2 600	E 4-3	829	951	34
109.1	339	0.3418	28.80	(5 940)	2 450	E 4-3	831	953	34
124.0	386	0.3008	32.65	(3 330)	2 150	E 4-3	833	952	34
136.5	425	0.2722	35.95	(3 670)	1 950	E 4-3	829	951	34
160.5	451	0.2707	41.00	(4 180)	1 950	E 4-3	879	1 001	34
131.9	492	0.2796	4.075	(4 160)	1 600	E 4-3	787	909	34
239.9	602	0.2202	58.00	(5 910)	2 100x2	E 7-2	2 528	2 815	90
157.2	521	0.219	46.35	(4 730)	3 900	E 7-1	2 032	2 296	79
435.6	1 094	0.1213	100.4	(10 240)	2 150	E 7-2	2 352	2 616	90
483.5	1 214	0.1093	111.2	(11 340)	2 150	E 8-1	2 610	2 999	107
592.9	1 489	0.08912	135.8	(13 850)	1 700	E 8-1	2 531	2 920	107
380.0	1 415	0.07728	118.5	(12 080)	2 250	E 9-2	3 184	3 680	152
685.6	1 722	0.07705	156.3	(15 940)	1 400	E 9-1	2 411	2 839	122
387.7	1 433	0.07574	120.9	(12 330)	2 200	E 9-2	3 153	3 649	152
785.5	1 973	0.06727	178.6	(16 210)	1 300	E 9-1	2 565	2 993	122
483.5	1 799	0.06074	145.9	(14 880)	1 500	E 14-7	2 699	3 286	168
872.0	2 190	0.06059	198.3	(20 220)	1 100	E 13-7	2 409	2 806	117
536.9	1 998	0.05470	161.0	(16 240)	1 450	L 14-7	2 897	3 484	168

A.A.C.

Cod word	Nominal aluminum area	Stranding	Calculated sectional area	Overall diameter	Weighy per km	Calculated electrical resistance	Calculated breaking load		Nominal reel	
									Length	Designation
	mm^2	No./ mm	$.mm^2$	.mm	kg	km 20 C	KN	kg	m	—
Midge Ant Fly	22 50 60	7/2.06 7/3.10 7/3.40	23.33 52.83 63.55	6.18 9.30 10.20	64 145 174	1.227 0.5419 0.4505	3.99 8.28 9.90	(407) (844) (1 010)	2 850x2 2 400x2 2 050x2	E 4-1 E 4-3 E 4-3
Wasp Hornet Chafer	100 150 200	7/4.39 19/3.25 19/3.78	106.0 157.6 213.2	13.17 16.25 18.90	290 434 587	0.2702 8.1825 0.1349	16.00 25.70 32.40	(1 630) (2 620) (3 300)	2 350 2 200x2 3 150	E 4-3 E 7-2 E 7-2
Cockracch Butterfly Centipede	250 300 400	19/4.22 19/4.65 37/3.78	265.7 322.7 415.2	21.10 23.25 26.46	731 868 1 145	0.1083 0.08916 0.06944	40.40. 48.75 63.10	(4 120) (4 976) (6 430)	2 550 2 150 2 900	E 7-2 E 8-2 E 9-3

Note : 1 KN=100 000 000 dyne=101.972 kgf

Canadian Standard — CSA C-49-1965

Cod word	Conductor size CM (AWG	Stranding	Calculated sectional area	Overall diameter	Rated strength	Calculated electrical resistance	Weight per km
		No./ mm	mm^2	mm	kg	km 20 C	kg
Rose Lily Iris	(4) (3) (2)	7/1.96 7/2.20 7/2.47	21.12 26.61 33.54	5.88 6.60 7.41	416 515 637	1.356 1.076 0.8535	57.83 72.82 91.83
Pansy Poppy Aster	(1) (1/0) (2/0)	7/2.78 7/3.12 7/3.50	42.49 43.52 67.35	8.34 9.36 10.50	777 938 1 180	0.6738 0.5335 0.4252	116.4 146.5 184.4
Phlox Oxlip Valerian	(3/0) (4/0) 2500 000	7/3.93 7/4.42 19/2.91	84.91 107.4 126.4	11.79 13.26 14.55	1 440 1 810 2 260	0.3372 0.2667 0.2277	232.5 294.0 347.6
Laurel Peony Tulip	266 800 300 000 336 400	19/3.01 19/3.19 19/3.38	135.2 151.2 170.5	15.05 15.95 16.90	2 430 2 660 3 000	0.2128 0.1895 0.1688	371.9 417.8 469.0
Daffodil ----- Goldentuft	350 000 400 000 450 000	19/3.45 19/3.69 19/3.91	177.6 230.1 228.2	17.25 18.45 19.55	3 120 3 500 3 860	0.1620 0.1417 0.1261	488.8 559.0 627.8
Cosmos Zinnia Dahlia	477 000 500 000 556 500	19/4.02 19/4.12 19/4.35	241.1 253.3 282.3	20.10 20.60 21.75	4 070 4 280 4 770	0.1193 0.1136 0.1019	663.4 696.9 777.0
----- Meadowseet Orchid	550 000 600 000 636 000	37/3.10 37/3.23 37/3.33	279.3 303.2 322.2	21.70 22.61 23.31	4 920 5 330 5 660	0.1032 0.09508 0.08946	769.9 835.9 888.4
Heuchera Verbena Petunia	650 000 700 000 750 000	37/3.37 37/3.49 37/3.62	330.0 353.9 380.7	23.59 24.43 25.34	5 810 6 220 6 550	0.08736 0.08146 0.07573	909.9 976.0 1 050
----- Cookscomb Hawkweed	800 000 900 900 1 000 000	37/3.73 37/3.96 37/4.18	402.2 455.8 507.6	26.11 27.72 29.26	6 960 7 700 8 550	0.07129 0.06324 0.05679	1 115 1 257 1 400
----- ----- -----	1 100 000 1 200 000 1 300 000	61/3.41 61/3.56 61/3.71	557.1 607.2 659.4	30.69 32.04 33.39	9 820 10 490 11 350	0.05185 0.04758 0.04381	1 539 1 678 1 822
----- ----- -----	1 400 000 1 500 000 1 600 000	61/3.85 61/3.98 61/4.11	710.0 758.8 809.5	34.65 35.82 36.99	11 960 12 810 13 660	0.04068 0.03807 0.03569	1 961 2 086 2 236
----- -----	1 700 000 1 800 000	61/4.24 61/3.57	861.3 910.9	38.16 39.27	14 520 15 650	0.03354 0.03175	2 380 2 519

German Standard – DIN 48201 Blatt 5-1965

Conductor size	Stranding	Calculated sectional area	Overall diameter	Reted strength	Weight per km	Calculated electrical resistance	Current capacity	Nominal length	Reel designation
mm^2	No./ mm	$.mm^2$	.mm	KP[1)]	Kg	km 20 C	A[2)]	m	—
16 25 35	7/1.7 7/2.1 7/2.5	15.89 24.25 34.36	5.1 6.3 7.5	290 425 585	44 67 94	1.798 1.177 0.831	110 145 180	2 800x3 2 750x2 1 950x2	E 4-1 E 4-1 E 4-1
50 50 70	7/3 19/1.8 19/2.1	49.48 48.35 65.82	9.0 9.0 10.5	810 860 1 150	135 133 181	0.577 0.596 0.438	225 225 270	2 600x2 3 500x2 2 450x2	E 4-3 E 6-1 E 6-1
95 120 150	19/2.5 19/2.8 37/2.25	93.27 117.0 147.1	12.5 14.0 15.7	1 595 1 910 2 570	256 322 406	0.309 0.246 0.197	340 390 455	3 450 2 850 2 400x2	E 6-1 E 6-1 E 7-2
185 240 300	37/2.5 61/2.25 61/2.5	181.6 242.5 299.4	17.5 20.2 22.5	3 105 4 015 4 850	501 670 827	0.160 0.120 0.0969	520 625 710	1 900x2 1 750x2 2 700	E 7-2 E 8-2 E 8-2
400 500 625 800 1 000	61/2.89 61/3.23 91/2.96 91/3.35 91/3.74	400.1 499.8 626.2 802.1 999.7	26.0 29.1 32.6 36.8 41.1	6 190 7 600 9 690 12 055 14 845	1 105 1 381 1 733 2 219 2766	0.0730 0.0580 0.0462 0.0361 0.0290	855 990 1 140 1 340 1 540	2 000 1 550 1 950 1 550 1 100	E 8-2 E 8-2 L 17-4 L 17-4 L 17-4

Note : 1) 1) KP=1 kg force
2) Calculated on 35 C ambient temperature, 45 Crise, 0.6 m/sec Wind velocity 60 Hz A.C.

Note :
All type of Aluminum Conductor and Aluminum Conductor Steel reinforced shall be produced and supplied as per customer requirements / refered specification.

BARE COPPER CONDUCTOR
CONVERSION TABLE OF SIZES BRITISH / AMERICAN METRIC

Norninal diameter of bare conductor		Gauge number		Norninal diameter of bare conductor		Gauge number		Norninal diameter of bare conductor		Gauge number	
inch	mm	S.W.G.	B. & S. G. (A.W.G.)	inch	mm	S.W.G.	B. & S. G. (A.W.G.)	inch	mm	S.W.G.	B. & S. G. (A.W.G.)
0.0020	0.051	47	44	0.0130	0.330			0.052	1.32		
0.0022	0.056		43	0.0136	0.345	29		0.054	1.37		
0.0024	0.061	46		0.0142	0.361		27	0.056	1.42	17	
0.0025	0.064		42	0.0148	0.0376	28		0.0571	1.45		15
0.0026	0.066			0.0156	0.396			0.058	1.473		
0.0028	0.071	45	41	0.0159	0.404		26	0.060	1.524		
0.0030	0.076			0.0164	0.417	27		0.064	1.626	16	
0.0031	0.079		40	0.0172	0.437			0.0641	1.628		14
0.0032	0.081	44		0.0179	0.455		25	0.068	1.73		
0.0035	0.090		39	0.018	0.457	26		0.072	1.83	15	13
0.0036	0.091	43		0.019	0.483			0.076	1.93		
0.0040	0.102	42	38	0.020	0.508	25		0.080	2.03	14	
0.0044	0.112	41		0.0201	0.511			0.0808	2.05		12
0.0045	0.114		37	0.021	0.533			0.084	2.13		
0.0048	0.122	40		0.022	0.559	24		0.088	2.24		
0.0050	0.127		36	0.0226	0.574		23	0.0907	2.30		11
0.0052	0.132	39		0.023	0.584			0.092	2.34	13	
0.0056	0.142		35	0.024	0.610	23		0.096	2.44		
0.0060	0.152	38		0.025	0.635			0.100	2.54		
0.0063	0.160		34	0.0253	0.643		22	0.1019	2.59		10
0.0064	0.163			0.026	0.660			0.104	2.64	12	
0.0068	0.173	37		0.027	0.689			0.108	2.74		
0.0071	0.180		33	0.028	0.711	22		0.112	2.84		
0.0072	0.183			0.0285	0.724		21	0.1144	2.91		9
0.0076	0.193	36		0.029	0.733			0.116	2.95	11	
	.		32								
0.0080	0.203			0.030	0.762			0.120	3.05		
0.0084	0.213	35		0.032	0.813	21	20	0.124	3.15		
0.0088	0.224		31	0.034	0.864			0.128	3.25	10	
0.0089	0.226			0.0359	0.912		19	0.1285	3.26		8
0.0092	0.234	34		00.36	0.914	20		0.132	3.35		
0.0096	0.244		30	0.038	0.965			0.136	3.45		
0.0100	0.254	33		0.040	1.02	19		0.140	3.66		
0.0104	0.264			0.0403	1.02		18	0.144	3.66	9	
0.0108	0.274	32		0.042	1.07			0.1443	3.66		7
0.0112	0.284			0.044	1.12			0.148	3.76		
			29								
0.0113	0.287			0.0453	1.15		17	0.152	3.86		
0.0116	0.295	31		0.046	1.17			0.160	4.06	8	
0.0120	0.305			0.048	1.22	18					
0.0124	0.315	30	28	0.050	1.27						
0.0126	0.320			0.0508	1.29		16				

CONVERSION FACTORS

TO CONVERT	MULTIPLY BY
mm. to in.	0.03937
mm^2. to in^2.	0.00155
cm^3 . to in^3.	0.06102
cm4. to in4.	0.02403
m. to ft.	3.2802
m^2 . to ft^2 .	10.7639
m^3 . to ft^3 .	35.3147
KM. To Mille.	0.6214
m. to yd.	1.0936
m^2 . to yd^2	1.1960
m^3 . to yd^3	1.3080
kg.. to lb	2.2046
kg. to cwt.	0.01968
kg. to tons.	0.0009842
lb. to tons.	0.0004464
short tons. to tons.	0.8929
tonnes (metric) to tons.	0.9852
kg./mm^2 to lb./in^2	1422.33
tons./in^2. To lb./in^2	2240
grams/cm^3 to lb./in^3	0.03613
kg./m. to lb./ft.	0.6720

TO CONVERT	MULTIPLY BY
In. to mm.	25.4
In^2. to mm^2 .	645.16
In^3. to cm^3.	16.3871
In4. to cm4.	41.6231
ft. to m.	0.3048
ft^2. to m^2	0.09290
ft^3 . to m^3 .	0.02832
Mile. to KM.	1.6093
yd. to m.	0.9144
yd^2 to m^2 .	0.8361
yd^3. to m^3	0.7646
lb. to kg.	0.4536
cwt. to kg.	50.8023
tons. to kg.	1016.0461
tone. to lb.	2240
tons. to short tons.	1.12
tons. to tonnes (metric)	1.0160
lb./in^2 . to kg./mm^2	0.0007031
ib.in^2 . to tons./in^2 .	0.0004464
lb./in^3 . to grams/cm^3 .	27.6799
lb./ft. to kg./m	1.4882

TABLES

WEIGHTS AND MEASURES

AVOIRDUPOIS WEIGHT

Dram = 1.777 grams
Ounce (16 drams) = 28.349 grams
Pound (16 ounces) = 0.453 kilograms
Quarter (28 pounds) = 12.695 kilograms
Hundredweight (112 pounds) = 50.802 kilograms
Ton (20 hundredweight) = 1016.048 kilograms

LINEAR MEASURE

Millimeter (1/1000 M.) = 0.039 inch
Centimeter (1/100 M.) = 0.393 inch
Decimeter (1/10 M.) = 3.937 inches
Meter = 39.3704 inches = 3.28089 feet
Decameter (10 M.) = 32.8089 feet
Hectometer (100 M.) = 328.089 ft at = 109.36 yaeds
Kilometer (1.000 M) = 1093.633 yards = 0.62138 mite
Myriameter (10,000 M.) = 6.213 miles
1 Inch = 2.5399 centimeters
1 Foot = 0.30479 meter
3 Feet (1 yard) = 0.9143 meter
1 Fathom (2 yards) = 1.828 meters
1 Pole (5 ½ yards) = 5.0291 meters
1 Furiong (220 yards) = 201.164 meters
1 Mile (1,760 yards) = 1609.314 meters or 1.609 Kilometers

SUPERFICIAL MEASURE

Square inch = 6.4513 square centimeters
Square fool = 0.0929 square meter
Square yard = 0.836 square meter = 00836 are
Rod = 25.291 meters
Rood (1,210 square yards) = 10.116 ares
Acre (4,840 square yards) = 40.467 ares
Square mile = 2.588 square kilorneters
1 Square Centimeter = .155 square inch
1 Square Meter = 10.7640 square feet
1 Are = 119.6033 square yards
1 Bectare = 2.47114 acres = 0.00386 square mile

SOLID MEASURE

Cubic inch = 16.386 cubic centimeters
Cubic foot = 0.0283 cubic meter
Cubic yard = 0.7645 cubic meter
1 Cubic centimeter = 0.6102 cubic inch
1 Cubic meter = 3.5316 cubic feet = 1.308 cubic yards

CAPACITY

1 Cubic inch = 16.386 milliliter
1 Gill = .14198 liter
1 Pint = 56824 liter
1 Quart = 1.13648 liters
1 Gallon = 4.54592 liters
1 Milliliter = .06102 cubic inch
1 Liter = 1.7598 pints = 0.2199 gallon

TABLES

LOCATION SYMBOLS FOR INSTALLATIONS (from B.S. 108 : 1951)

No	DESCRIPTION	
	Control Gear and Distribution Fuseboards	
19A2	Main Switch	
19A4	Switchboard, Distribution Board, of fuseboard	
19A6	Meter	
	Lighting Outlet, etc	
19B1	Celing Outlet Lighting, Filament Lamp	
19B2	Well outlet Lighting, Filament Lamp	
19B3	Ceiling Outlet Discharge Lamp	
19B6	Lighting Outlet Connected to an Emergency System	
19B7	Exit Box with Wiring for Normal and Emergency Systems	
19B9	Ceiling Outlet for Filament Lamps with wiring connected to Normal and Emergency Systems	
19B10	Ceiling Outlet with Wiring for Filament and Discharge Lamps	
19B11	Ceiling Outlet with Wining for Discharge Lamp connected to Normal System plus Wiring for Filarment Lamp connected to Emergency System	
	Switch Outlets	
19C2	1-way Switch	
19C3	2-way Switch	
19C4	intermediate Switch	
19C6	Pull Switch	
19D1	Socket Outlet (N= Current-carrying capacity)	
19D2	Switch Socket Outlet (N = Current-carrying capacity)	
	Fixed Heating Outlets	
19E1	Tubular Heater	
19E2	Fixed Radiation or Heating Panel	
19E4	Electric Unit Heater	
19E5	Immersion Heater	
19E6	Thermostat	
19E8	Self-contained Electric Water Heater	

No	DESCRIPTION	
	Bells. etc.	
19F1	Bell Bush Outlet	
19F3	Bell	
19F4	Buzzer	
19F5	Indicator (N = Number of ways)	
19F7	Bell Transformer Note May be used for any special LV. purpose	
	Telephones	
19G1	Telephone Point pubic service	
19G2	Telephone Board, public service	
19G3	Telephone Point, intermal	
19G4	Telephone Board, Internal	
	Clocks	
19H1	Synchronous Clocks Outlet	
19H2	Impulse Clock Outlet	
19H4	Master Clock	
	Fire Alams	
19J1	Fire Push	
19J2	Automatic Contact	
19J3	Bell connected to Fire Alarm	
19J4	Fire Alarm Indcator (N = Number of ways)	
	Radia Reception Outlets	
19L2	Loudspeaker Outlet	
	Luminous Signal Systems	
19M1	Luminous Signal Systems	
19M3	Pilot or Corridor Lamp Position	
19M4	Indicator Note:- Buzzer may be added if required (N = Number of ways)	
19M6	Rest Position	
	Fixed Apparatus Outlets	
19P2	Outlet for Motor to Fixed Fan	
19P3	Outlet for Motor to Ceiling Fan	
19P5	Cooker Control Unit	

CONVERSION FACTORS

TO CONVERT	MULTIPLY BY
kg / m^2 to ib / ff^2	0.2048
kg / mm^2 to tons/ in^2	0.6350
N to lbf	0.2248
N to kgf	0.1020
bar to N / m^2	10^5
bar to lbf / in^2	14.5
N / m^2 to lbf / in^2	1.450 X 10^4
kgf / cm^2 to lbf / in^2	14.223
1 (lite) to gal (UK)	0.2202
1 (lite) to gal (US)	0.2642

TO CONVERT	MULTIPLY BY
lb / ft^2 to kg / m^2	4.8824
tons / in^2 to kg / mm^2	1.5749
lbf to N	4.4482
kgf to N	9.8067
N / m^2 to bar	10^5
lbf / in^2 to bar	68.9476 X 10^3
lbf / in^2 to N / m^2	6894.76
lbf / in^2 to kgf / cm^2	0.07031
gal (UK) to 1 (litre)	4.541
gal (US) to 1 (litre)	3.785

MULTIPLE AND SUB-MULITPLE METRIC UNITS

Multiple	Prefix	Symbol
10^{12}	tera	T
10^9	giga	G
10^6	mega	M
10^3	kilo	k
10^2	hecto	h
10	deca	da

Sub-multiple	Prefix	Symbol
10^{-1}	deci	d
10^{-2}	centi	c
10^{-3}	milli	m
10^{-6}	micro	u
10^{-9}	nano	n
10^{-12}	pico	p