



KINGDOM OF CAMBODIA  
Nation, Religion, King



**ELECTRICITE DU CAMBODGE**

**TECHNICAL SPECIFICATION**

**EDC-DTS-MV014**

**Pole Cross Arms**

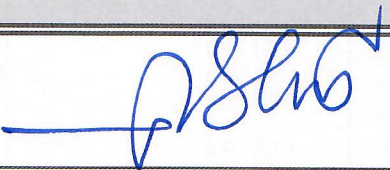
**April 2021**

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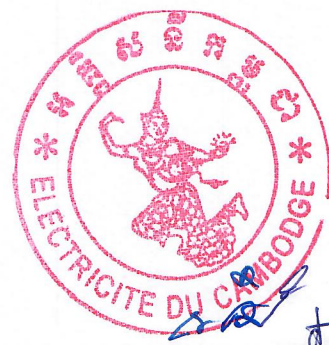


**ELECTRICITE DU CAMBODGE**

Version	Date	Technical Specification Name	Authorized by : (name and signature)
1.0	January, 2022	Pole Cross Arms ✓	
<b>Dr. Praing Chulasa</b>			







EDC-DTS-MV014- POLE CROSS ARMS

Version	Drafted/reviewed by	Verified by	Approved by	Date
Draft 1	AD			
Draft 2	EDC/AD			
Final	EDC/AD			Jan 2018
Final 2	EDC/AD			March 2021
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# Pole cross arms

## 1 Scope

This specification covers the design, manufacturing, testing, supply, delivery and performance requirements of Pole's cross arms, to be used on MV Overhead lines of Electricité du Cambodge with an expected lifespan of at least 25 years.

## 2 Standards

### EN: European Standards

EN 10024:	Hot rolled taper flange I sections - Tolerances on shape and dimensions
EN 10025:	Hot rolled products of structural steels
EN10058:	Hot rolled flat steel bars for general purposes
EN 10060:	Hot rolled round steel bars for general purposes
EN 10113:	Metallic materials - Sheets and strip

### ISO: International Standard Organisation

ISO 1460:	Metallic coatings - Hot dip galvanized coatings on ferrous materials Gravimetric determination of the mass per unit area
ISO 1461:	Hot dip galvanized coatings on fabricated iron and steel articles
ISO 4016:	Hexagon head bolts — Products grade C
ISO 7091:	Plain washers — Normal series — Product grade C
ISO 10684:	Fasteners — Hot dip galvanized coatings

The supplier may propose alternative standards, provided it is demonstrated that they give an equivalent degree of quality as the referenced standard. Acceptability of any alternative standard is at the discretion of the Employer.

## 3 Inspection/acceptance

The cross arms shall be inspected at the manufacturer's plant by EDC Representatives.

Copies of previous test reports issued by the National Testing Standards Authority of the country of manufacture or its accredited testing laboratory shall be submitted with the tender for the purpose of technical evaluation, all in the English Language.

A minimum of two weeks before any inspection commences, the Contractor shall send a notice to EDC in order EDC Representatives can observe the tests. All testing shall be carried out by the Contractor.

Copies of steel manufacturers test certificates for the steel products used for manufacturing the cross arms showing quality and characteristics of steel shall be handed over by the pole cross arms manufacturer to EDC representatives.

*Le 00/11/18*





The zinc thickness measurement shall be carried out on cross arms selected at random by EDC at the rate of 3 % for each type of cross arm to be delivered. For those measures, a deviation exceeding - 5 % on only one cross arm selected at random will result in the rejection of the complete cross arm type delivery.

The manufacturer shall made available a specific device for measuring zinc thickness and all measurement shall be recorded.

Additionally, all holes of the previously selected cross arms and members shall be verified in order to verify if they can accept the foreseen bolts or insulator fixing pin. For that purpose steel pins of the required bolts diameter shall be used and inserted in the arms holes. The pin shall be inserted freely without any difficulty and the diameter difference shall not be more than 2 mm. If 10% of the holes of the selected cross arms or members show pin insertion difficulties (zing damaging) and/or more than 2 mm diameters difference, the whole cross arm type lot shall be rejected.

The inspection report done by the manufacturer and handed over to EDC representatives shall include as a minimum type and quantities of cross arms to be delivered, number and type of cross arms tested as well as all records of measurements and pin insertion tests. It shall comprise also all copies of steel manufacturer test certificate and written cross arms manufacturer confirmation/engagement that the steel used for manufacturing is the steel batch mentioned in the test certificate of the steel manufacturer.

The inspection certificate shall be signed by both parties.

#### 4 Cross Arms for conductors

Cross arms shall be manufactured from angle section steel, hot dip galvanized after fabrication, particular care shall be taken so as to reduce embrittling the steel during the galvanizing process. All holes for the mounting of line post insulators, string insulators and cross arm assembly shall be drilled to suit the components to be attached before galvanising.

Angle section cross arm shall in general be used for single and double pin and line post insulator positions. The angle section shall have welded cleats at the pin positions to allow the fitting of standard insulator pins and studs.

Strain (dead end) cross arm shall be also constructed from angle section steel, with suitable provision for pin and line post insulators for jumpers.

The steel used for cross arms shall be of S275 (Elasticity limit of 275 Mpa) and S375 (Elasticity limit of 375 Mpa) classes as per EN 10025 and EN 10113 or equivalent. The choice of the steel shall be determined by the manufacturer according the mechanical requirement of the cross arm component and according the conductor working loads requested here in after.

Copies of steel manufacturers test certificates for the steel products used for manufacturing the cross arms showing quality and characteristics of steel shall be made available by the pole cross arms manufacturer on EDC request.

All cross arm shall be fitted with flat section hot dip galvanized steel cross arm braces.

The centre phase conductor shall be supported independently of the cross arm on purposed designed brackets that attach directly to the pole. All bolts associated with cross arm shall be M16 hot dip galvanized. The conductor loads to be used for designing the cross arm and the insulator brackets (in





the case of the centre phase) shall be a factor of safety (F.O.S.) of 2.5 times the appropriate standard design working load scheduled below:

The following minimum characteristics shall apply to all cross arm:

Per Conductor Design Working Load (kN)

Cross arm Type	Vertical (kN)	Transverse (kN)	Longitudinal (kN)
Single Pin or Line post insulator	2.0	5.0	3.0
Double Pin or Line post insulator	4.0	8.0	5.0
Tension insulator	4.0	16.0	20.0

## 5 Cross Members for distribution substations

Structural steel cross members hot dip galvanized after fabrication, are required for pole mounted MV/0.4 kV distribution transformers. These cross members are required to support the surge arresters, the drop out fuses, and the distribution transformers.

The cross-members shall be designed to adequately support the static load of the equipment plus the live load of maintenance personnel.

The Contractor shall submit detailed design drawings to the Employer's Representative for approval prior to manufacture.

The steel used for cross members shall be of S275 (Elasticity limit of 275 Mpa) and S375 (Elasticity limit of 375 Mpa) classes as per EN 10025 and EN 10113 or equivalent. The choice of the steel shall be determined by the manufacturer according the mechanical requirement of the cross member component.

Copies of steel manufacturers test certificates for the steel products used for manufacturing the cross arms showing quality and characteristics of steel shall be made available by the pole cross arms manufacturer on EDC request.

Bidders shall note that all components/sub-items and bolts required to complete the assemblies are included in this scope.

## 6 Galvanizing

All iron and steel used in the Contract shall be protected against corrosion effects, after the whole fabrication is completed.

All iron and steel wires shall be hot dip galvanized by an approved process before straining. The galvanization shall be smooth, clean, of uniform thickness and free from defects and shall withstand the tests set out in ISO 1460 or equivalent.

The preparation for surface coating and the coating itself shall not distort or adversely affect the mechanical properties of the materials.

The minimum weight of zinc deposited generally shall be 610g/m<sup>2</sup>, which is equivalent to a minimum average thickness of coating of 85 microns (μm). Any cross arm that are not in accordance with this requirement shall be rejected.

Any coated part found to be imperfect must be replaced. The whole of the expense involved in the replacement of the imperfect part shall be supported by the Contractor.

All steel shall be fully fabricated before galvanizing, no machine or shop work, boring, punching, etc., will be allowed after galvanizing.

## 7 Nuts and Bolts

Nuts and bolts shall conform to ISO recommendations, as applicable, for metric threads and spring washers to ISO 630 "Structural Steels" strength 41 kg/mm<sup>2</sup> or more.

Nuts and heads of all bolts shall be of the metric hexagonal type and of uniform outline dimension. All washers are to be included under this Contract, including locking devices and anti-vibration arrangements, which are to be subject to the approval of EDC representative.

On outdoor equipment and structures all steel bolts and screwed rods shall be **hot dip galvanized including the threaded portions**. All associated nuts shall be hot dip galvanized with the exception of the threaded part that shall be mineral oiled.

The washers shall be of adequate thickness to abridge the projection of the shaft and the commencement of the threaded portion. Nuts shall be finger tight on the bolt and will be rejected if they are, in the opinion of EDC Representative, considered to have an excessively loose or tight fit. Bolts with re-cut threads after galvanizing will be rejected.

## 8 Marking

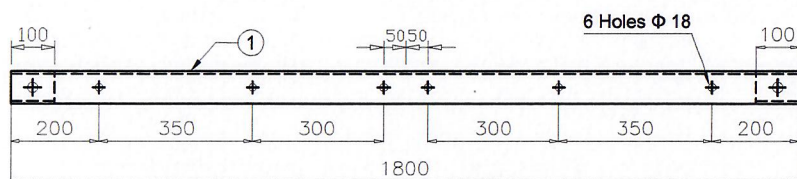
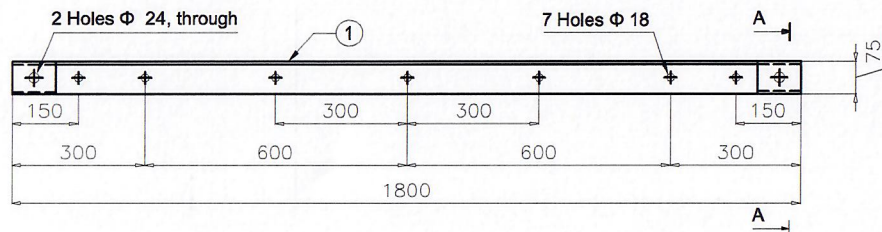
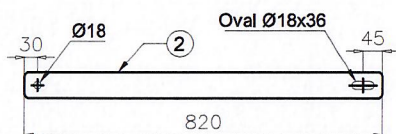
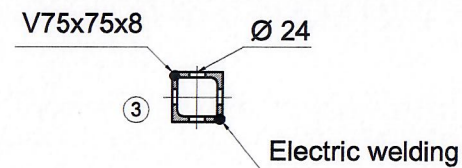
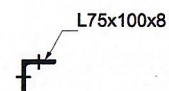
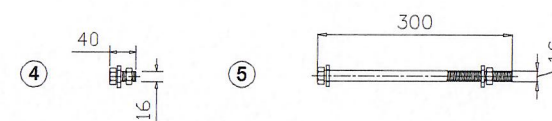
All cross arms and members shall be marked as follow:

- Manufacturer name or logo.
- Month and year of manufacturing.

The marking shall be done by engraving before galvanizing and shall be clearly visible after galvanizing.

## 9 Drawings



**CROSSARM V75x75x8x1800****ARM TIE PL 60x6x820****Section: A-A****Galvanized Bolts and Nuts**

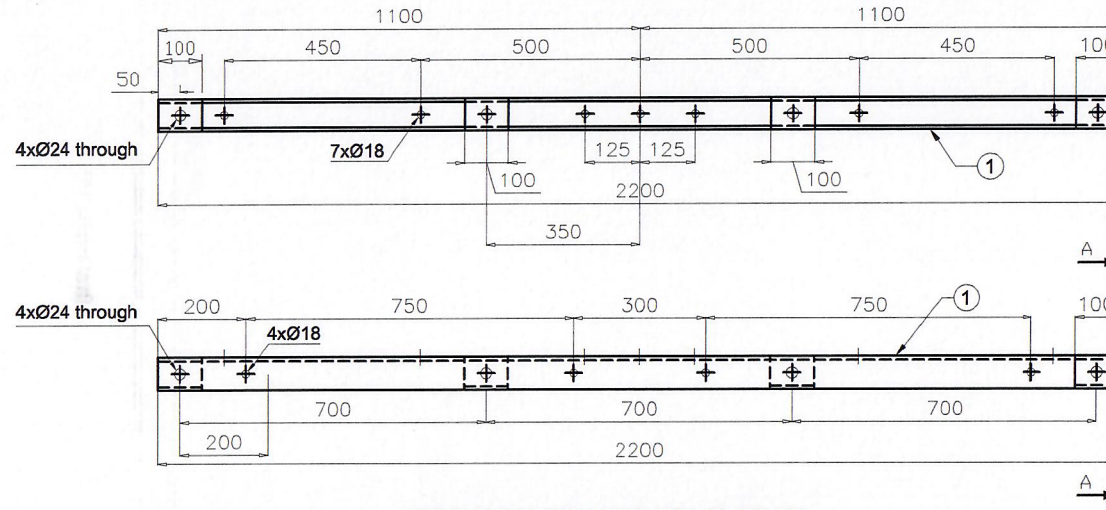
Item No.	Materials Description	Material	Unit	Qty	Requirement
1	Cross arm V75x75x8x1800 mm	Hot-Dip Gal.Steel	Pcs	01	
2	Arm tie PL 60x6x820 mm	Hot-Dip Gal.Steel	Pcs	02	
3	Link bar V75x100x8 mm	Hot-Dip Gal.Steel	Pcs	02	
4	Bolt M16x40 (Nut+ washer and Spring washer)	Hot-Dip Gal.Steel	Set	02	
5	Bolt M16x300 (Nut+ 2 square washer)	Hot-Dip Gal.Steel	Set	02	

Rev	Description	Rev'd by	App'd by	Signature	Date	Position	Name	Signature	Date	Drawing Title:	DWG No.	Scale
01						Drawn by				<b>Cross Arm V75x75x8x1800mm (2 Cores)</b>	EDC02-CA-001	N.T.S
02						Prepared by					Rev. 01	
03						Checked by					Date :	
04						Approved by						

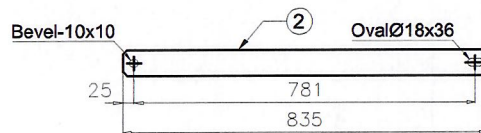
  
**ELECTRICITE DU CAMBODGE**  
 STREET 19, WATT PHNOM DAUN PENH DISTRICT  
 PHNOM PENH, CAMBODIA



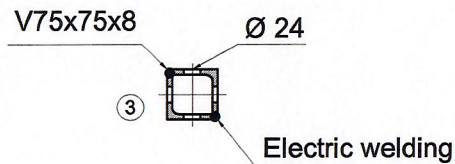
# EDC-DTS-MV014 POLE CROSS ARMS



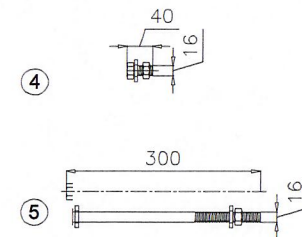
**CROSSARM V75x75x8x2200**



**ARM TIE PL 60x6x835**



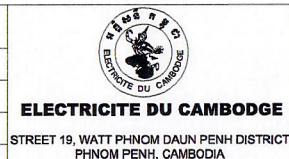
**Section: A-A**



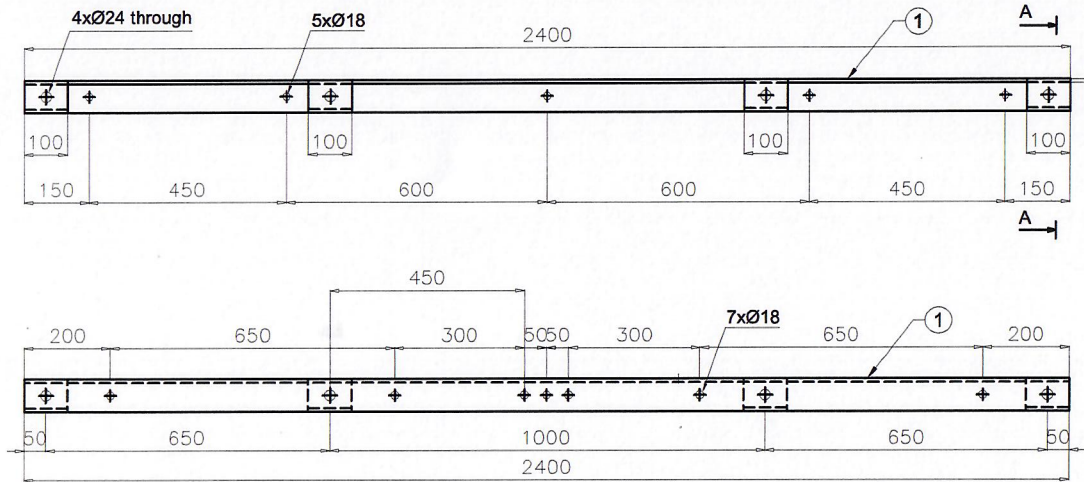
**Galvanized Bolts and Nuts**

Item No.	Materials Description	Material	Unit	Qty	Requirement
1	Cross arm V75x75x8x2200 mm	Hot-Dip Gal.Steel	Pcs	01	
2	Arm tie PL 60x6x835 mm	Hot-Dip Gal.Steel	Pcs	02	
3	Link bar V75x100x8 mm	Hot-Dip Gal.Steel	Pcs	04	
4	Bolt M16x40 (Nut+ washer and Spring washer)	Hot-Dip Gal.Steel	Set	02	
5	Bolt M16x300 (Nut+ 2 square washers)	Hot-Dip Gal.Steel	Set	02	

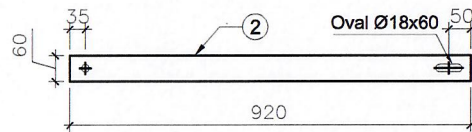
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02						Prepared by					Rev. 01	
03						Checked by					Date :	
04						Approved by						



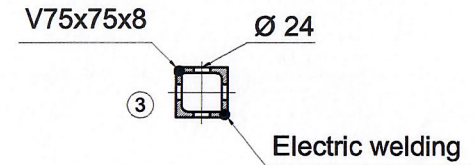
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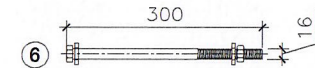
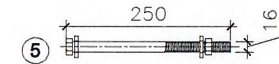
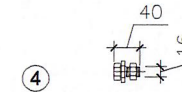
**CROSSARM V75x75x8x2400**



**ARM TIE PL 60x6x920**



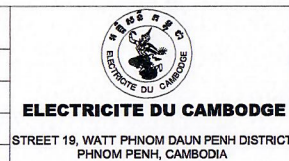
**Section: A-A**



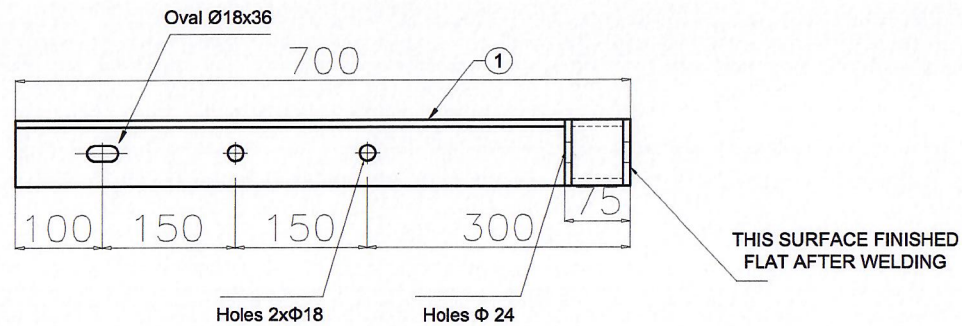
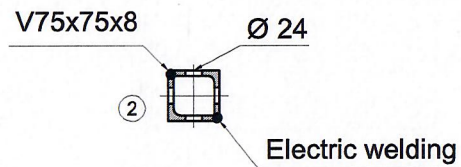
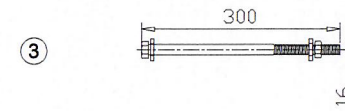
**Galvanized Bolts and Nuts**

Item No.	Materials Description	Material	Unit	Qty	Requirement
1	Cross arm V75x75x8x2400 mm	Hot-Dip Gal.Steel	Pcs	01	
2	Arm tie PL 60x6x920 mm	Hot-Dip Gal.Steel	Pcs	02	
3	Link bar V75x75x8 mm	Hot-Dip Gal.Steel	Pcs	04	
4	Bolt M16x40 (Nut+ washer and Spring washer)	Hot-Dip Gal.Steel	Set	02	
5	Bolt M16x250 (Nut+ 2 square washers)	Hot-Dip Gal.Steel	Set	02	
6	Bolt M16x300 (Nut+ 2 square washers)	Hot-Dip Gal.Steel	Set	02	

Rev.	Description	Rev'd by	App'd by	Signature	Date	Position	Name	Signature	Date	Drawing Title:	DWG No.	Scale
01						Drawn by				<b>Cross Arm V75x75x8x2400mm (4 Cores)</b>	EDC02-CA-001	N.T.S
02						Prepared by					Rev. 01	
03						Checked by					Date :	
04						Approved by						






**TOP CROSSARM V75x75x8x700****Section: A-A****Galvanized Bolts and Nuts**

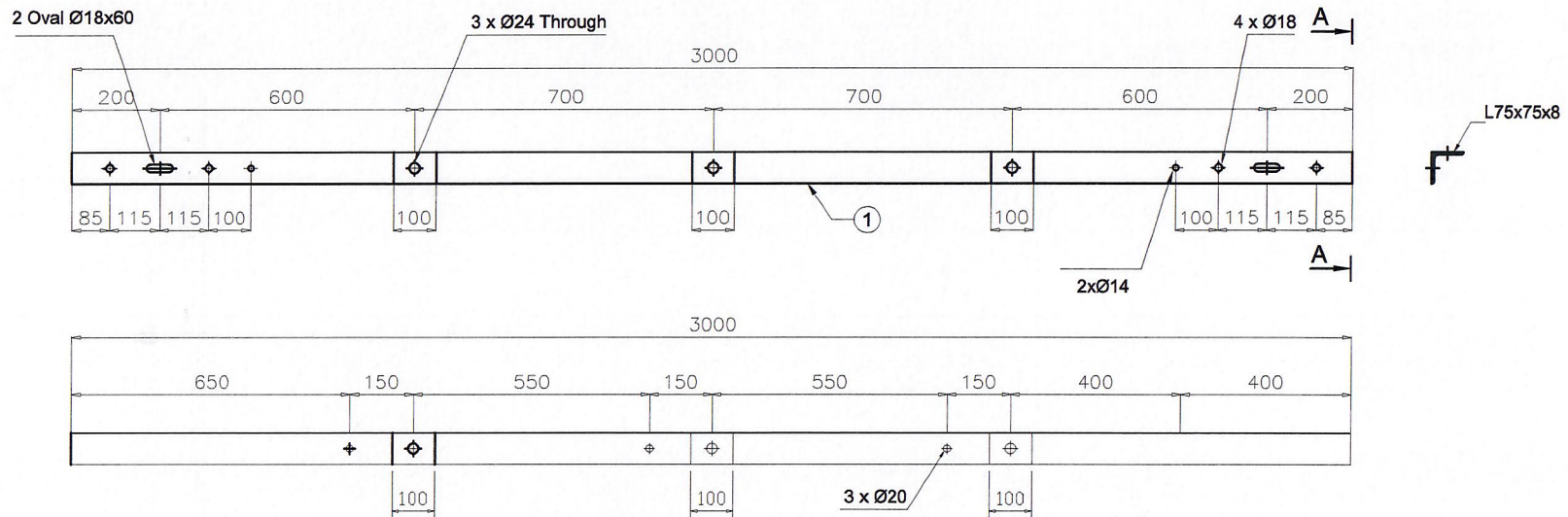
Item No.	Materials Description	Material	Unit	Qty	Requirement
1	Top Cross arm V75x75x8x700 mm	Hot-Dip Gal.Steel	Pcs	01	
2	Link bar V75x75x8 mm	Hot-Dip Gal.Steel	Pcs	01	
3	Bolt M16x300 (Nut+ 2 square washer)	Hot-Dip Gal.Steel	Set	02	

Rev.	Description	Rev'd by	App'd by	Signature	Date	Position	Name	Signature	Date	Drawing Title:	DWG No.	Scale
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02						Prepared by					Rev. 01	
03						Checked by					Date :	
04						Approved by						

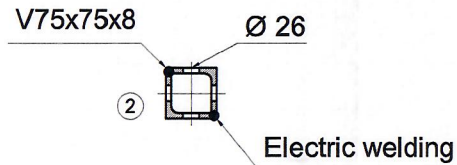
  
**ELECTRICITE DU CAMBODGE**  
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 PHNOM PENH, CAMBODIA



# EDC-DTS-MV014 POLE CROSS ARMS

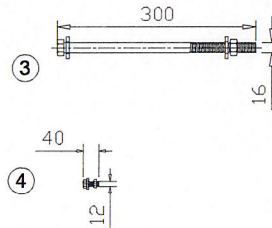


**CROSSARM V75x75x8x3000**



**Section: A-A**

**Galvanized Bolts and Nuts**

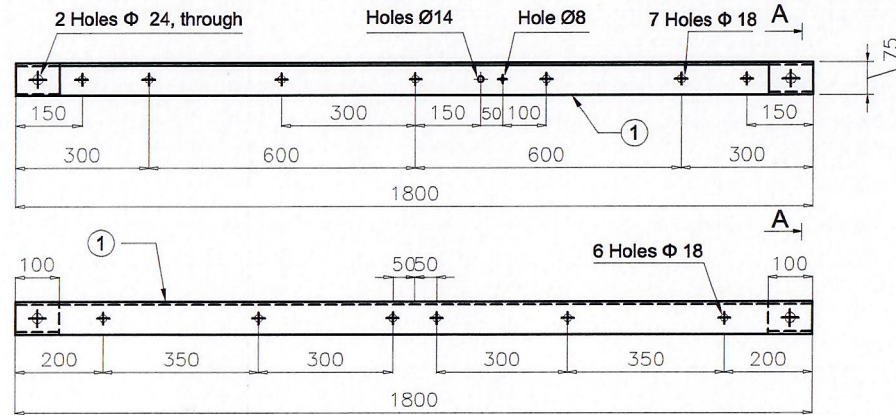


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1	Cross arm V75x75x8x3000 mm	Hot-Dip Gal.Steel	Pcs	02	
2	Bolt M12x35 (full thread + washer and 1Nut)	Hot-Dip Gal.Steel	Pcs	02	
3	Bolt M16x300 (Nut+ 2 square washers)	Hot-Dip Gal.Steel	Pcs	06	
4	Bolt M12x40 (Nut+ round washer)	Gal. or St. Steel	Set	01	

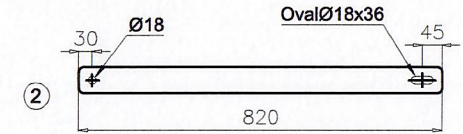
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02						Prepared by					Rev. 01	
03						Checked by					Date :	
04						Approved by						

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PHNOM PENH, CAMBODIA

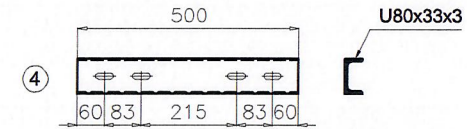
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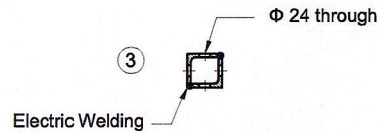
**CROSSARM V75x75x8x1800**



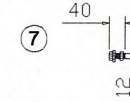
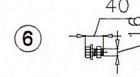
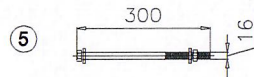
**ARM TIE PL 60x6x820**



**LINK BAR U80x33x6x500**



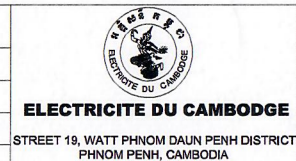
**Section: A-A**



## Galvanized Bolts and Nuts

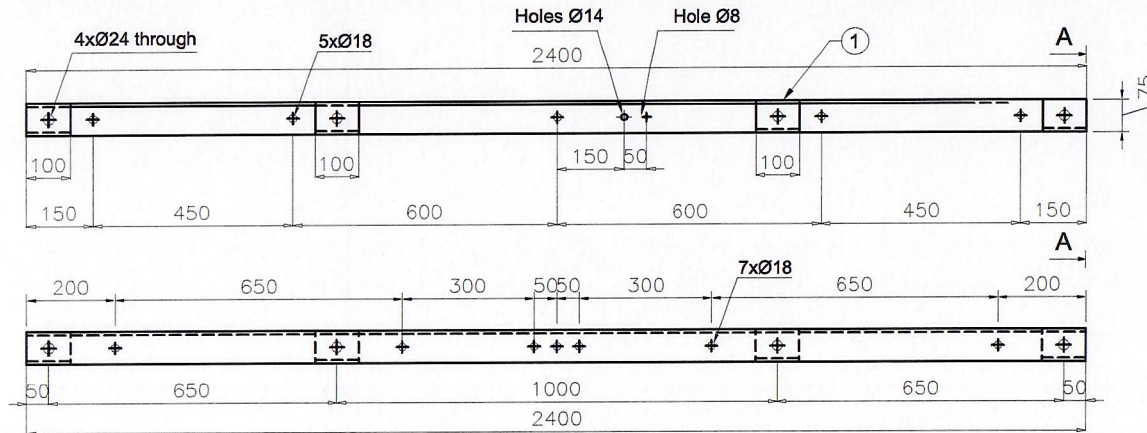
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1	Cross arm V75x75x8x1800	Hot-Dip Gal. Steel	Each	02	
2	Arm tie PL 60x6x820	Hot-Dip Gal. Steel	Each	04	
3	Link bar cores U80x8x100	Hot-Dip Gal. Steel	Each	08	
4	Link bar U80x33x3x500	Hot-Dip Gal. Steel	Each	08	
5	Bolt M16x300 (Nut+ 2 square washer)	Hot-Dip Gal. Steel	Set	02	
6	Bolt M16x40 (Nut+ washer and Spring washer)	Hot-Dip Gal. Steel	Set	04	
7	Bolt M12x40 (Nut+ round washer)	Gal. or St. Steel	Set	01	
8	Bolt M6x40 (Nut+ round washer)	Gal. or St. Steel	Set	01	

Rev.	Description	Rev'd by	App'd by	Signature	Date	Position	Name	Signature	Date	Drawing Title:	DWG No.	Scale
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02						Prepared by					Rev. 01	
03						Checked by					Date :	
04						Approved by						

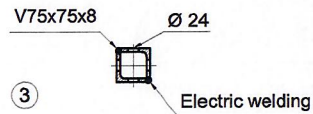




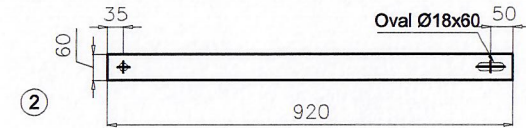
# EDC-DTS-MV014 POLE CROSS ARMS



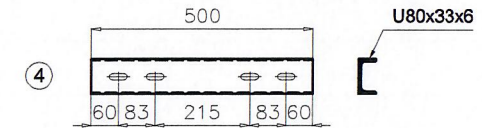
**CROSS ARM V75x75x8x2400**



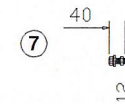
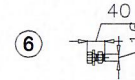
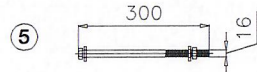
**Section: A-A**



**ARM TIE 60x6x920**



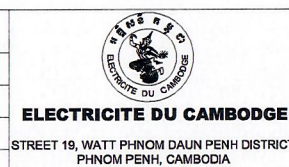
**LINK BAR U80x33x3x500**



**Galvanized Bolts and Nuts**

Item	Description	Material	Unit	Quantity	Requirement
1	Cross arm V75x75x8x2400	Hot-Dip Gal. Steel	Each	02	
2	Arm tie PL 60x6x920	Hot-Dip Gal. Steel	Each	04	
3	Link bar cores V75x8x100	Hot-Dip Gal. Steel	Each	08	
4	Link bar U80x33x3x500	Hot-Dip Gal. Steel	Each	08	
5	Bolt M16x300 (Nut+ 2 square washer)	Hot-Dip Gal. Steel	Set	02	
6	Bolt M16x40 (Nut+ washer and Spring washer)	Hot-Dip Gal. Steel	Set	04	
7	Bolt M12x40 (Nut+ square washer)	Gal. or St. Steel	Set	01	
8	Bolt M6x40 (Nut+round washer)	Gal. or St. Steel	Set	01	

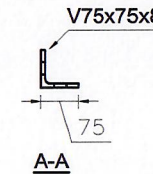
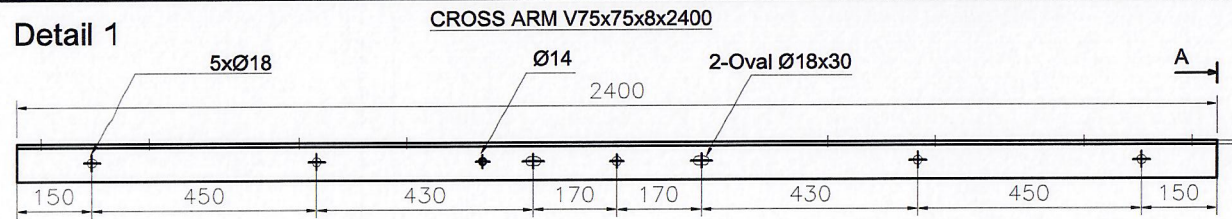
Rev.	Description	Rev'd by	App'd by	Signature	Date	Position	Name	Signature	Date	Drawing Title:	DWG No.	Scale
01						Drawn by				<b>Cross Arm V75x75x8x2400mm (Support CT &amp; VT)</b>	EDC02-CA-001	N.T.S
02						Prepared by					Rev. 01	
03						Checked by					Date :	
04						Approved by						



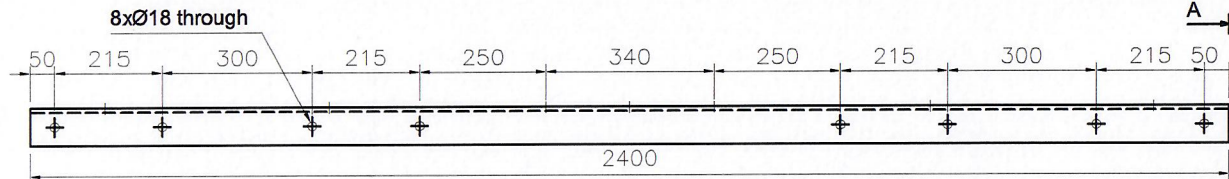


# EDC-DTS-MV014 POLE CROSS ARMS

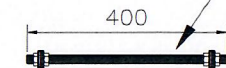
Detail 1



Detail 7



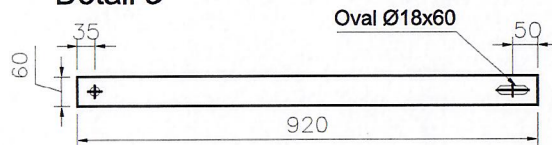
Detail 6



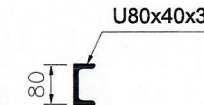
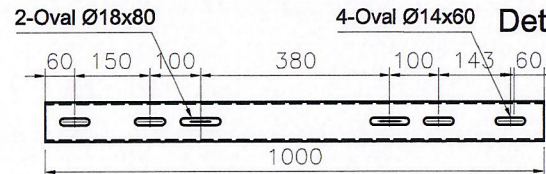
ARM TIE 60x6x920

LINK BAR U80x40x3x1000

Detail 3



Detail 2




Detail 4

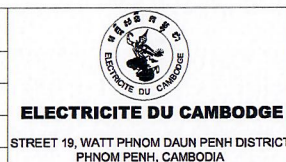


Galvanized Bolts and Nuts

Item	Description	Material	Quantity	Unit	Requirement
1	Cross arm V75x75x8x2400	Hot-Dip Gal. Steel	02	Each	
2	Link bar U80x40x3x1000	Hot-Dip Gal. Steel	06	Each	
3	Arm tie PL 60x6x920	Hot-Dip Gal. Steel	04	Each	
4	Bolt M16x400 (Nut+ washer and Spring washer)	Hot-Dip Gal. Steel	02	Set	
5	Bolt M16x80 (Nut+ washer and Spring washer)	Hot-Dip Gal. Steel	16	Set	
6	THROUGH Bolt M16x400 (Nut+ washer)	Hot-Dip Gal. Steel	02	Set	
7	Bolt M12x40 (Nut+ 2 square washer)	Hot-Dip Gal. Steel	26	Set	

Note: Dimension are in Millimeter

Rev.	Description	Rev'd by	App'd by	Signature	Date	 <b>ELECTRICITE DU CAMBODGE</b> STREET 19, WATT PHNOM DAUN PENH DISTRICT PHNOM PENH, CAMBODIA	Position	Name	Signature	Date	<b>CROSS ARM FOR SUPPORT CT&amp;VT METER FOR POLE</b>	DWG No.	Scale
01							Drawn by					EDC02-CA-006-5	N.T.S
02							Prepared by				Project Name:	REV.  01 Date : 20-02-2021	
03							Checked by						
04							Approved by						





Item No.	Materials Description	Unit	Qty
1	Cross arm V 75x75x8x3000 mm	Pcs	02
2	Cross arm U 80x33x3x1000 mm	Pcs	06
3	Bolt M12x60 (Nut+ washer and Spring washer)	Set	12
4	Bolt M16x350 (Nut+ 2 square washers)	Set	06
5	Thought bolt M16x350 + 04 nuts + 02 square washers	Set	06
6	Bolt M12x40 (Nut+ round washer)	Set	01
7	Bolt M6x40 (Nut+ round washer)	Set	01

**Cross Arm L 75x75x8x3000**

Rev.	Description	Rev'd by	App'd by	Signature	Date
01					
02					
03					
04					

Position	Name	Signature	Date
Drawn by			
Prepared by			
Checked by			
Approved by			

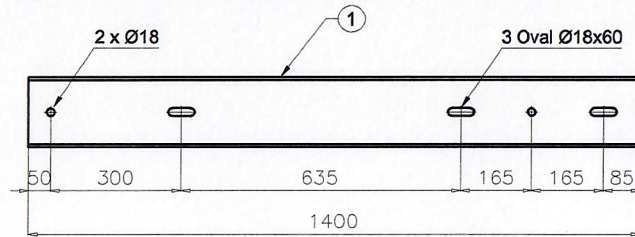
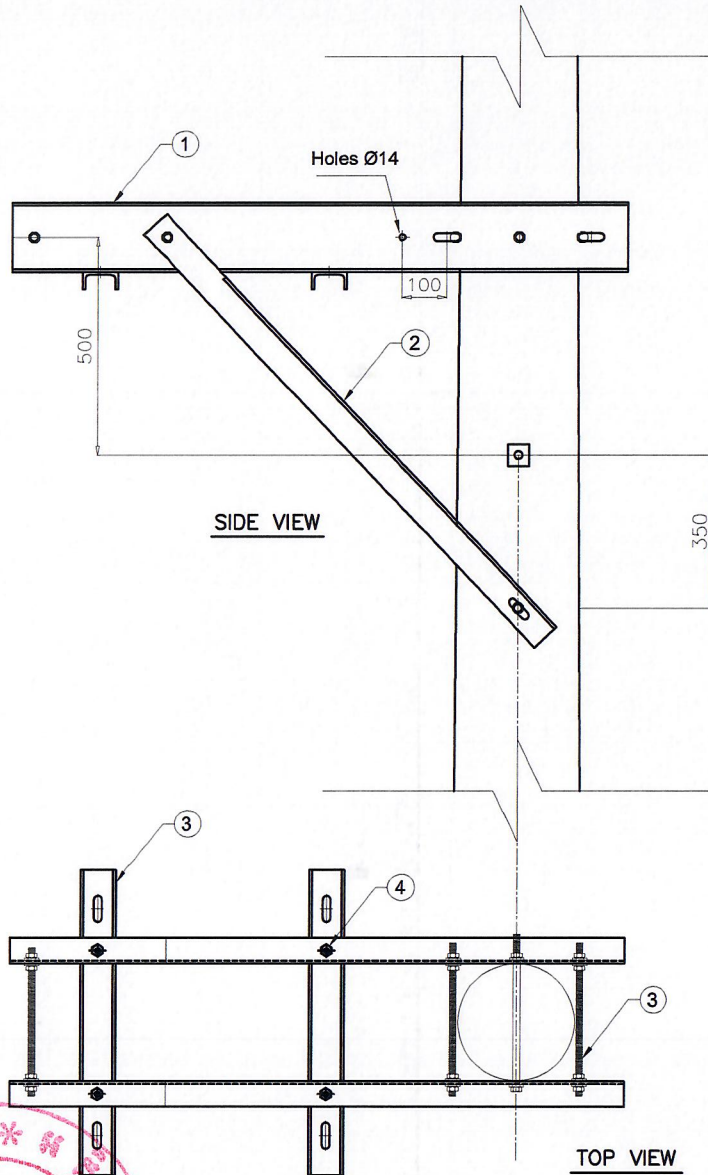
Drawing Title: **Cross Arm L75x75x8x3000mm (Support CT, VT for double pole)**

DWG No.	Scale
EDC02-CA-001	N.T.S

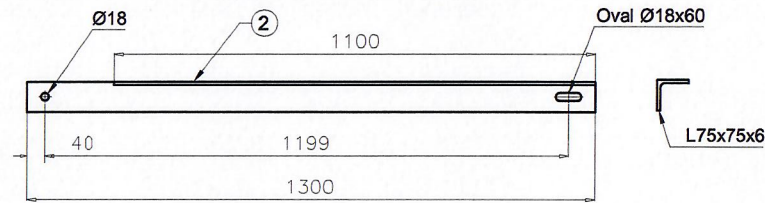
Rev. 01  
Date :



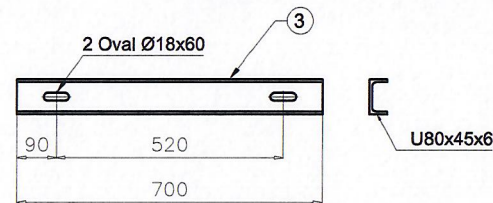
# EDC-DTS-MV014 POLE CROSS ARMS



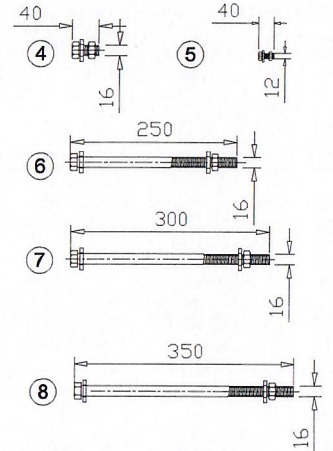
**Cross Arm U 75x75x8x1400**



**Cross Arm 75x75x8x1300**



**Cross Arm U 75x75x8x700**



**Galvanized Bolts and Nuts**

Item	Description	Material	Unit	Quantity	Requirement
1	Cross arm U160x59x8x1400 mm	Hot-Dip Gal. Steel	Each	02	
2	Cross arm U75x75x8x1300 mm	Hot-Dip Gal. Steel	Each	02	
3	Cross arm U80x45x8x700 mm	Hot-Dip Gal. Steel	Each	02	
4	Bolt M16x40 (Nut+ washer and Spring washer)	Hot-Dip Gal. Steel	Each	02	
5	Bolt M12x40 (Nut+ round washer)	Gal. or St. Steel	Set	01	
6	Bolt M16x250 (Nut+ 2 square washers)	Hot-Dip Gal. Steel	Set	02	
7	Bolt M16x350 (Nut+ 2 square washers)	Hot-Dip Gal. Steel	Set	04	
8	Through Bolt M16x350 (4Nut+ 4 square washers)	Hot-Dip Gal. Steel	Set	01	

Rev.	Description	Rev'd by	App'd by	Signature	Date
01					
02					
03					
04					



**ELECTRICITE DU CAMBODGE**  
STREET 19, WATT PHNOM DAUN PENH DISTRICT  
PHNOM PENH, CAMBODIA

Position	Name	Signature	Date
Drawn by			
Prepared by			
Checked by			
Approved by			

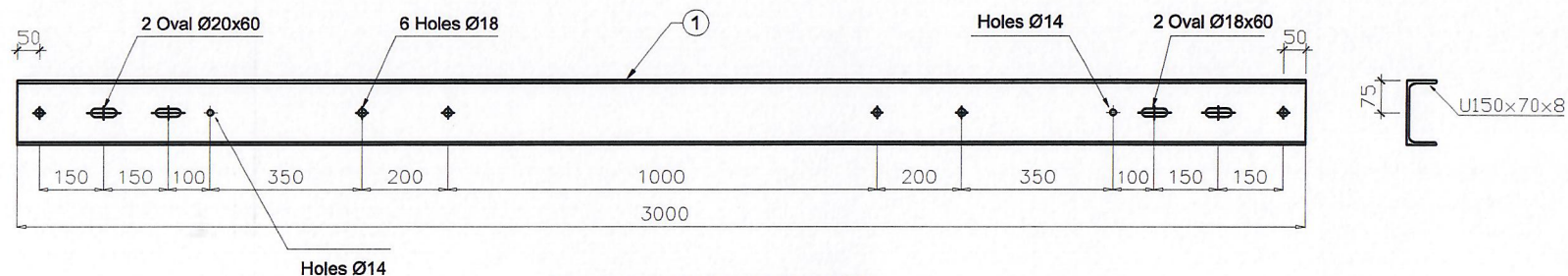
Drawing Title:

**Cross Arm Support PMT  
on Single Pole**

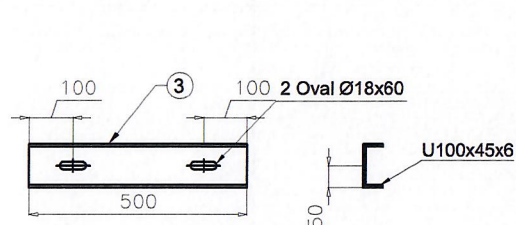
DWG No.	Scale
EDC02-CA-001	N.T.S
Rev. 01	
Date :	



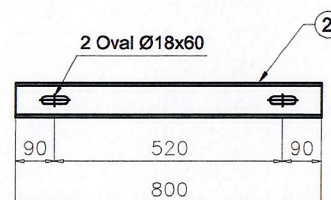
# EDC-DTS-MV014 POLE CROSS ARMS



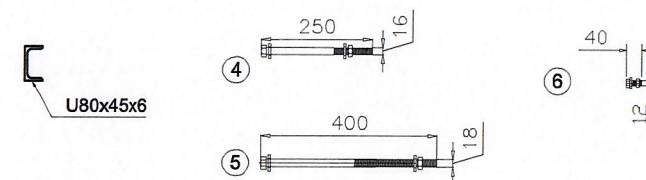
**Cross Arm U150x70x8x3000**



**Cross Arm U100x45x500**



**Cross Arm U80x45x8x700**



**Galvanized Bolts and Nuts**

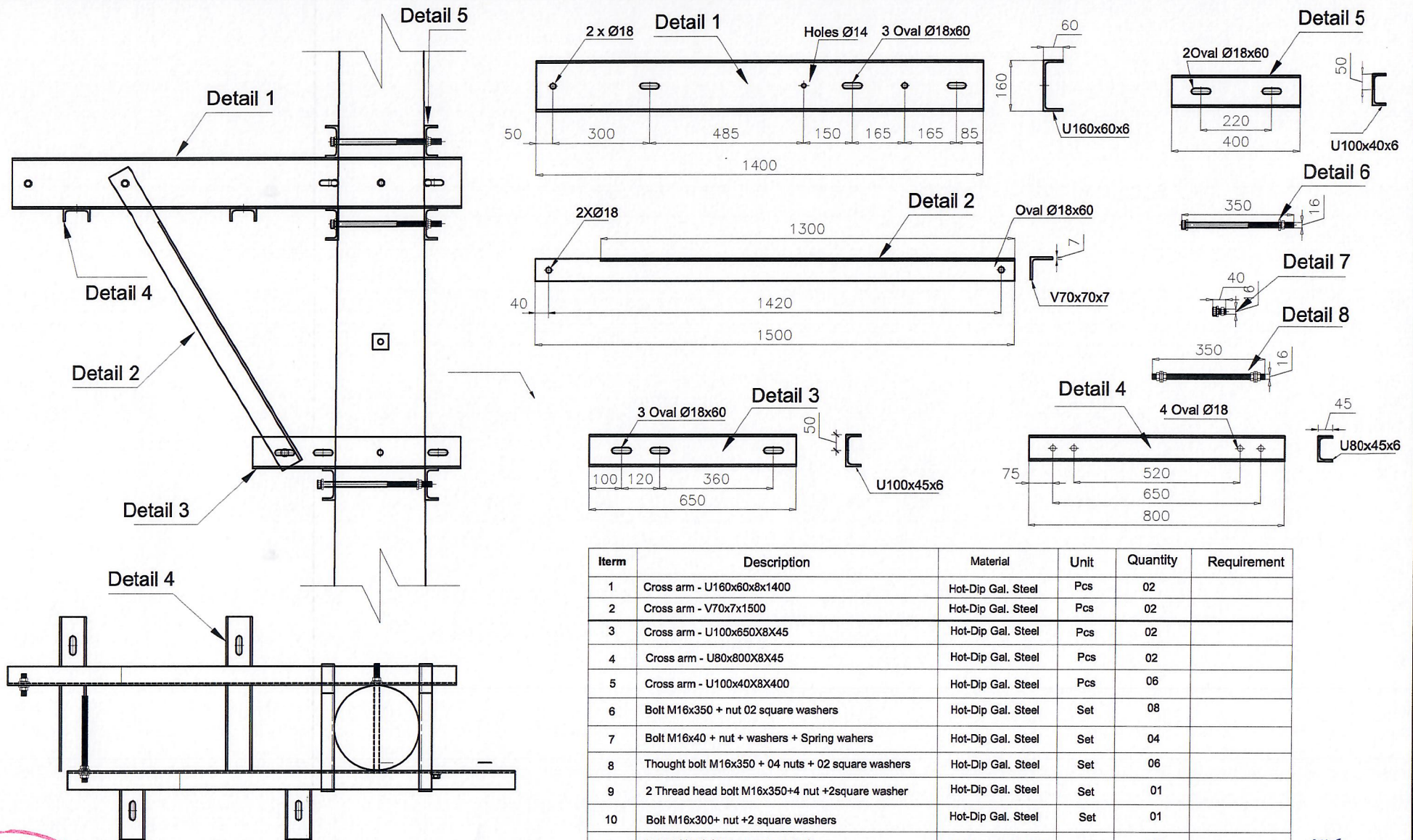
Item	Description	Material	Unit	Quantity	Requirement
1	Cross arm U150x70x8x3000 mm	Hot-Dip Gal. Steel	Each	02	
2	Cross arm U80x45x8x700 mm	Hot-Dip Gal. Steel	Each	02	
3	Cross arm U100x45x8x500 mm	Hot-Dip Gal. Steel	Each	04	
4	Bolt M16x250 (2Nut+ 2 square washers)	Hot-Dip Gal. Steel	Set	04	
5	Bolt M16x400 (2Nut+ 2 square washers)	Hot-Dip Gal. Steel	Set	10	
6	Bolt M12x40 (Nut+ round washer)	Gal. or St. Steel	Set	01	

Rev.	Description	Rev'd by	App'd by	Signature	Date	Position	Name	Signature	Date	Drawing Title:	DWG No.	Scale
01						Drawn by				<b>Cross Arm Support PMT on Double Pole</b>	EDC02-CA-001	N.T.S
02						Prepared by					Rev. 01	
03						Checked by					Date :	
04						Approved by						

**ELECTRICITE DU CAMBODGE**  
STREET 19, WATT PHNOM DAUN PENH DISTRICT  
PHNOM PENH, CAMBODIA




# EDC-DTS-MV014 POLE CROSS ARMS



Item	Description	Material	Unit	Quantity	Requirement
1	Cross arm - U160x60x8x1400	Hot-Dip Gal. Steel	Pcs	02	
2	Cross arm - V70x7x1500	Hot-Dip Gal. Steel	Pcs	02	
3	Cross arm - U100x650X8X45	Hot-Dip Gal. Steel	Pcs	02	
4	Cross arm - U80x800X8X45	Hot-Dip Gal. Steel	Pcs	02	
5	Cross arm - U100x40X8X400	Hot-Dip Gal. Steel	Pcs	06	
6	Bolt M16x350 + nut 02 square washers	Hot-Dip Gal. Steel	Set	08	
7	Bolt M16x40 + nut + washers + Spring wahers	Hot-Dip Gal. Steel	Set	04	
8	Thought bolt M16x350 + 04 nuts + 02 square washers	Hot-Dip Gal. Steel	Set	06	
9	2 Thread head bolt M16x350+4 nut +2square washer	Hot-Dip Gal. Steel	Set	01	
10	Bolt M16x300+ nut +2 square washers	Hot-Dip Gal. Steel	Set	01	
11	Bolt M12x40 (Nut+ round washer)	Steel or Hot-Dip Gal.	Set	01	

Rev.	Description	Rev'd by	App'd by	Signature	Date
01					
02					
03					
04					

  
**ELECTRICITE DU CAMBODGE**  
 STREET 19, WATT PHNOM DAUN PENH DISTRICT  
 PHNOM PENH, CAMBODIA

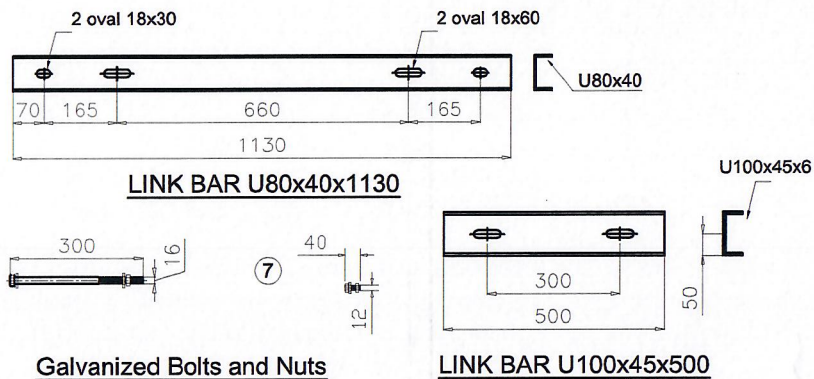
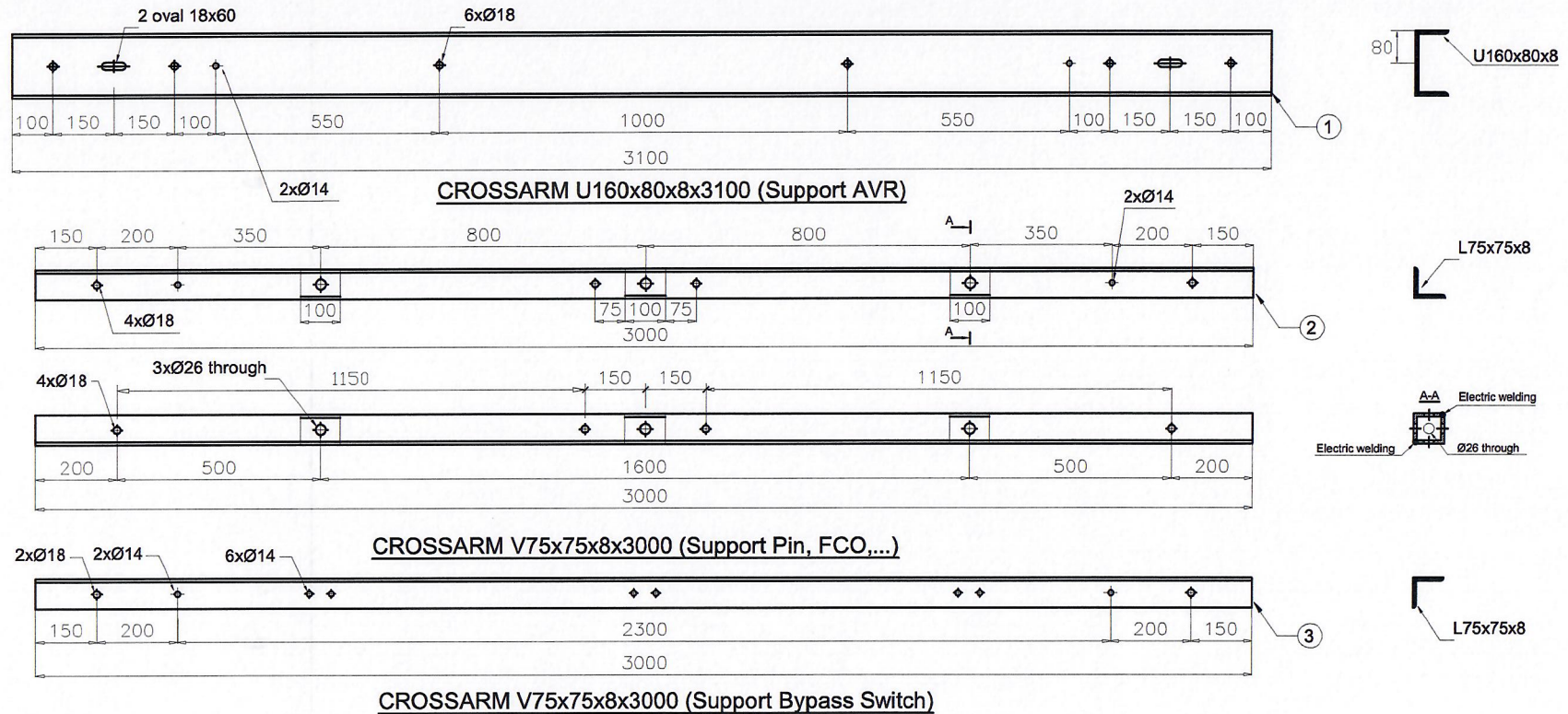
Position	Name	Signature	Date
Drawn by			
Prepared by			
Checked by			
Approved by			

Drawing Title:  
**CROSS ARM SUPPORT TRANSFORMER**  
**3P-100kVA & 160kVA**

DWG No. EDC02-CA-001  
 Scale N.T.S.  
 Rev. 01  
 Date :



# EDC-DTS-MV014 POLE CROSS ARMS



Item	Description	Material	Unit	Quantity	Requirement
1	Cross arm U160x80x8x3100 (Support AVR)	Hot-Dip Gal. Steel	Each	06	
2	Cross arm V75x75x8x3000 (Support Pin, FCO,...)	Hot-Dip Gal. Steel	Each	05	
3	Cross arm V75x75x8x3000 (Support Bypass Switch)	Hot-Dip Gal. Steel	Each	02	
4	Link bar U80x40x1130	Hot-Dip Gal. Steel	Each	06	
5	Link bar U100x45x500	Hot-Dip Gal. Steel	Set	10	
6	Bolt M16x300 (Nut+ washer+ Spring washer)	Hot-Dip Gal. Steel	Set	54	
7	Bolt M12x40 (Nut+ round washer)	Gal. or St. Steel	Set	10	

Rev.	Description	Rev'd by	App'd by	Signature	Date
01					
02					
03					
04					

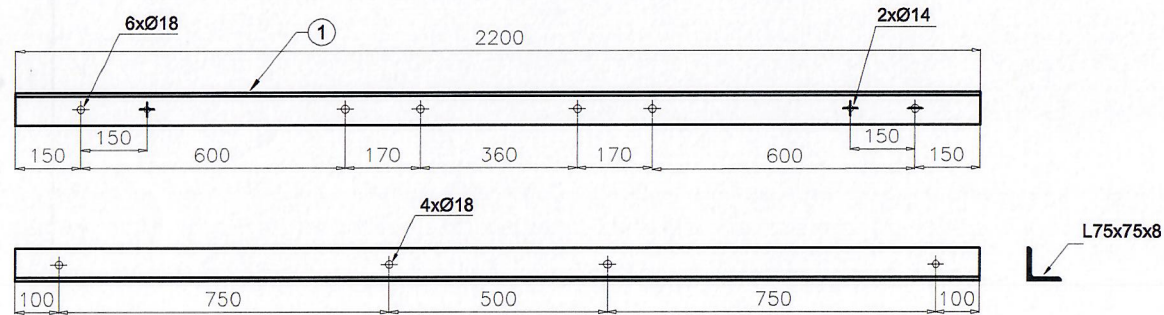


Position	Name	Signature	Date
Drawn by			
Prepared by			
Checked by			
Approved by			

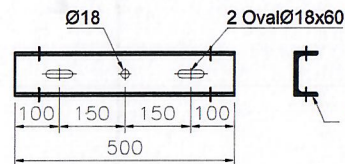
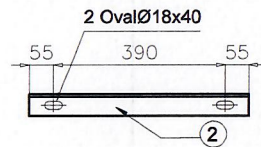
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<b>Cross Arm Support AVR</b>	EDC02-CA-001	N.T.S
	Rev. 01	
	Date :	



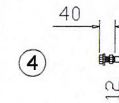
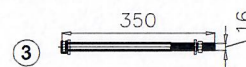
# EDC-DTS-MV014 POLE CROSS ARMS



**CROSSARM V75x75x8x2200**



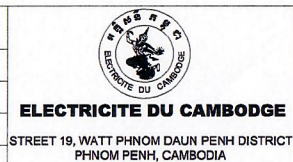
**LINK BAR U100x50x500**



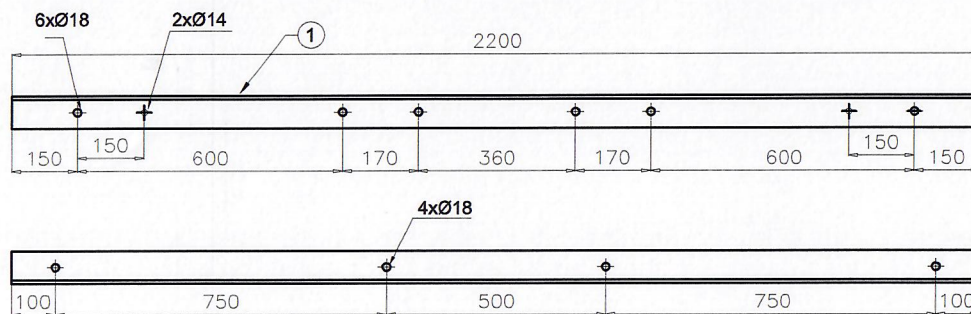
**Galvanized Bolts and Nuts**

Item No.	Materials Description	Material	Unit	Qty	Requirement
1	Cross arm V75x75x8x2200	Hot-Dip Gal.Steel	Pcs	02	
2	Link bar U100x50x500	Hot-Dip Gal.Steel	Pcs	02	
3	Bolt M16x350 (Nut+ 2 square washer)	Hot-Dip Gal.Steel	Pcs	03	
4	Bolt M12x40 (Nut+ round washer)	Gal. or St. Steel	Set	01	

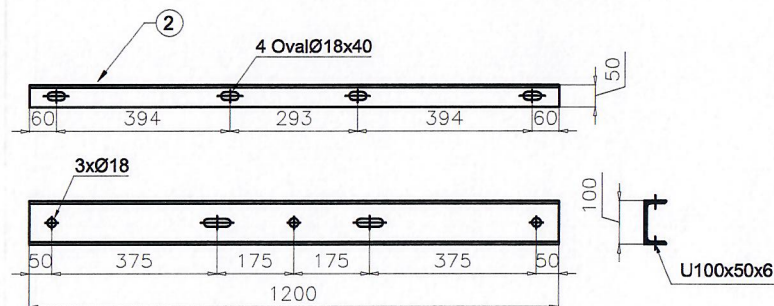
Rev.	Description	Rev'd by	App'd by	Signature	Date	Position	Name	Signature	Date	Drawing Title:	DWG No.	Scale
01						Drawn by				<b>Cross Arm V75x75x8x2200mm (Support MV Fix Cap Bank)</b>	EDC02-CA-001	N.T.S
02						Prepared by					Rev. 01	
03						Checked by					Date :	
04						Approved by						



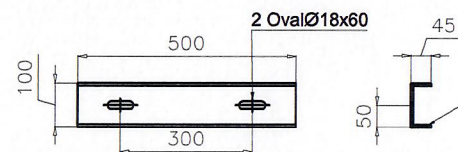
# EDC-DTS-MV014 POLE CROSS ARMS



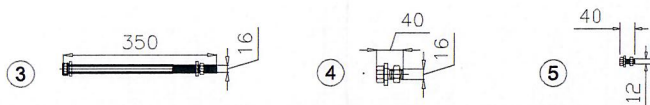
**CROSSARM V75x75x8x2200**



**LINK BAR U100x50x1200**



**LINK BAR U100x45x500**



**Galvanized Bolts and Nuts**

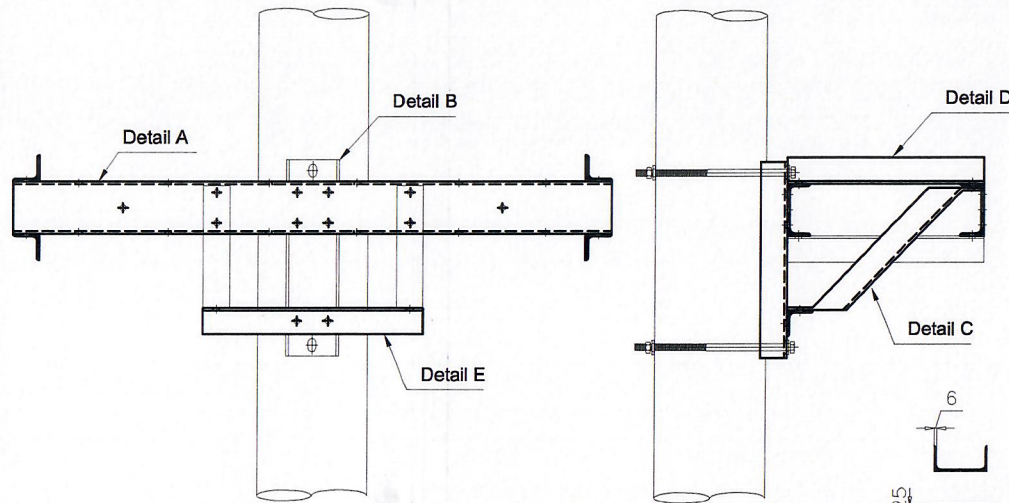
Item No.	Materials Description	Material	Unit	Qty	Requirement
1	Cross arm V75x75x8x2200	Hot-Dip Gal.Steel	Pcs	03	
2	Link bar U100x50x6x1200	Hot-Dip Gal.Steel	Pcs	02	
3	Link bar U100x45x6x500	Hot-Dip Gal.Steel	Pcs	02	
4	Bolt M16x350 (Nut+ 2 square washer)	Hot-Dip Gal.Steel	Set	05	
5	Bolt M12x40 (Nut+ round washer)	Gal. or St. Steel	Set	01	

Rev.	Description	Rev'd by	App'd by	Signature	Date	Position	Name	Signature	Date	Drawing Title:	DWG No.	Scale
01						Drawn by				<b>Cross Arm V75x75x8x2200mm (Support MV Auto Cap Bank)</b>	EDC02-CA-001	N.T.S
02						Prepared by					Rev. 01	
03						Checked by					Date :	
04						Approved by						

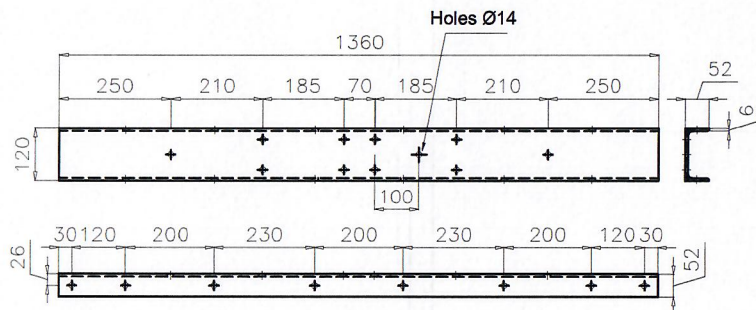
**ELECTRICITE DU CAMBODGE**  
STREET 19, WATT PHNOM DAUN PENH DISTRICT  
PHNOM PENH, CAMBODIA



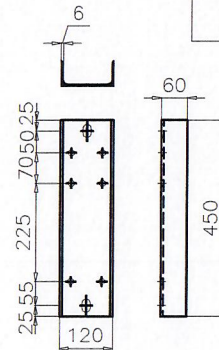
# EDC-DTS-MV014 POLE CROSS ARMS



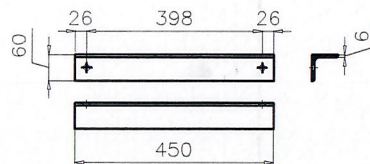
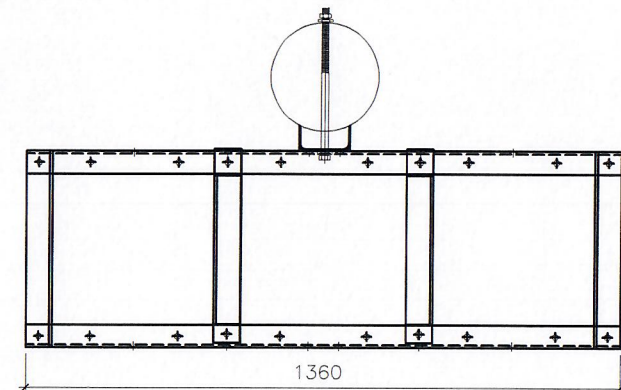
Item	Description	Material	Quantity	Unit
1	Cross arm U120x52x6x1360 (Detail A)	Hot-Dip. Steel	02	Each
2	Cross arm U120x60x6x450 (Detail B)	Hot-Dip. Steel	01	Each
3	Cross arm V 60x60x6x562 (Detail C)	Hot-Dip. Steel	02	Each
4	Cross arm V 60x60x6x500 (Detail E)	Hot-Dip. Steel	01	Each
5	Cross arm V 60x60x6x450 (Detail D)	Hot-Dip. Steel	04	Each
6	Bolt M16x350 (Nut+ 2 square washer)	Hot-Dip. Steel	02	Set
7	Bolt M16x40 (Nut+ washer and Spring washer)	Hot-Dip. Steel	18	Set
8	Bolt M12x40 (Nut+ round washer)	Gal. or St. Steel	01	Set



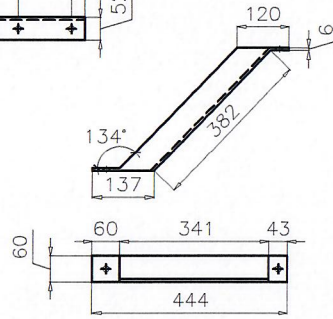
Detail A



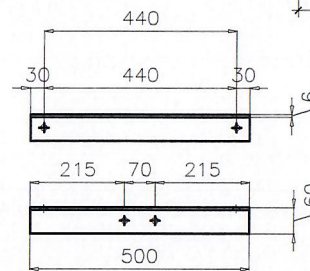
Detail B



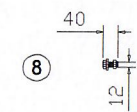
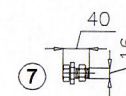
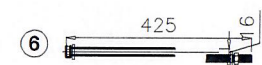
Detail D



Detail C



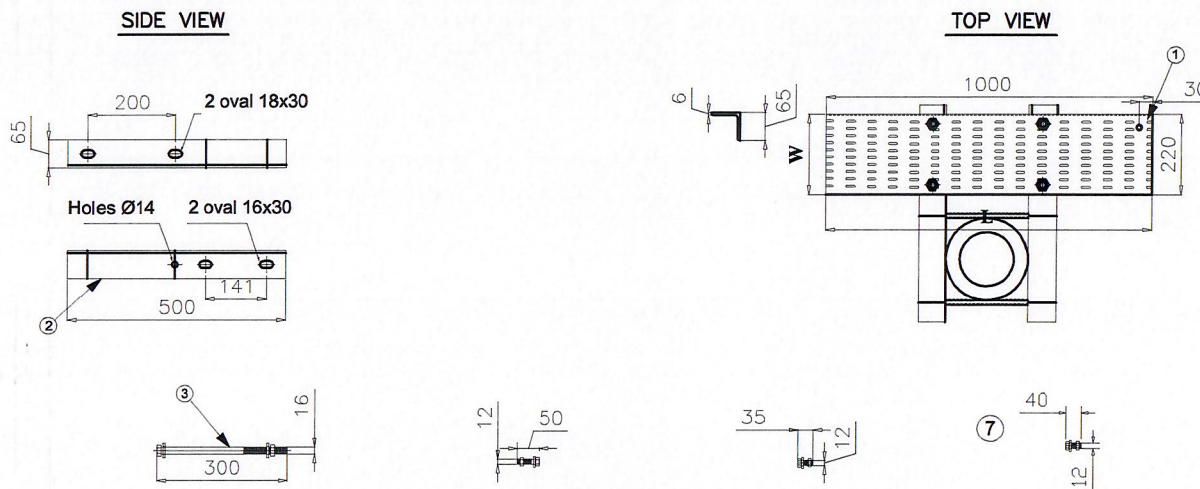
Detail E



Rev.	Description	Rev'd by	App'd by	Signature	Date	Position	Name	Signature	Date	Drawing Title:	DWG No.	Scale
01						Drawn by				<b>Cross Arm Support Capacitor Bank</b>	EDC02-CA-001	N.T.S
02						Prepared by					Rev. 01	
03						Checked by					Date :	
04						Approved by						

**ELECTRICITE DU CAMBODGE**  
STREET 19, WATT PHNOM DAUN PENH DISTRICT  
PHNOM PENH, CAMBODIA

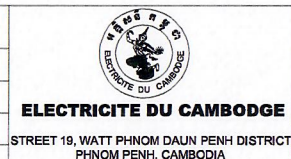
# EDC-DTS-MV014 POLE CROSS ARMS



## Galvanized Bolts and Nuts

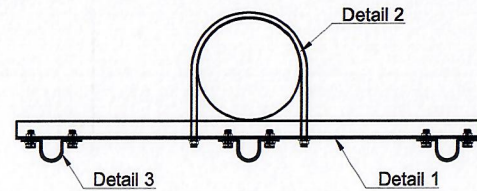
Item	Description	Material	Unit	Quantity	Requirement
1	Cable Tray 185 x 750 x 4 for ABC	Steel	Each	01	
2	Cable Tray Support 65x65x6 , 500mm	Steel	Each	02	
3	Bolt M16x300 (Nut + 2 Square washer)	Steel	Each	02	
4	Bolt M12x50 (Nut+ 2 square washer)	Steel	Set	04	
5	Bolt M12x40 (Nut+ round washer)	Gal. or St. Steel	Set	01	

Rev.	Description	Rev'd by	App'd by	Signature	Date	Position	Name	Signature	Date	Drawing Title:	DWG No.	Scale
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02						Prepared by					Rev. 01	
03						Checked by					Date :	
04						Approved by						

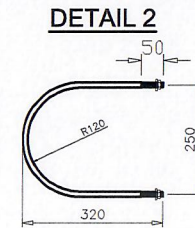




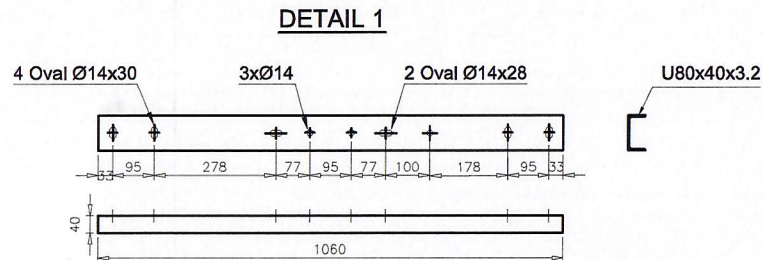
# EDC-DTS-MV014 POLE CROSS ARMS



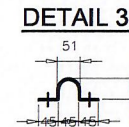
**RAISING CALBE SUPPORT**



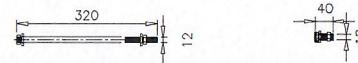
**U Shape Bolt M12**



**Cross arm U80x40x3.2x1060**



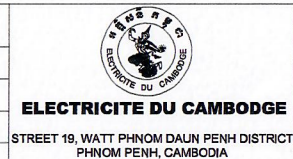
**Support 75x3.2x135**

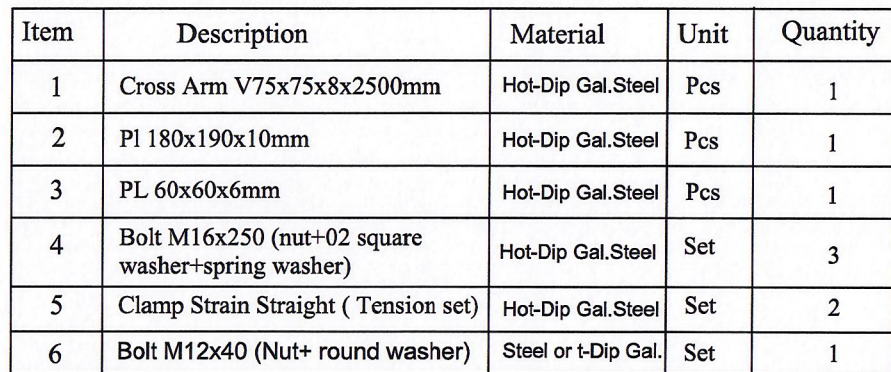



**Galvanized Bolts and Nuts**

Item	Description	Material	Unit	Quantity	Requirement
1	Cross arm U80x40x3.2x1060 mm	Hot-Dip Gal. Steel	Each	01	
2	U Shape Bolt M12x320 ( 2Nuts and 2 Washers)	Hot-Dip Gal. Steel	Each	01	
3	Support 75x3.2x135	Aluminum	Set	03	
4	Bolt M12x40 (Nut+ 2 square washers+ spring washer)	Hot-Dip Gal. Steel	Set	06	

Rev.	Description	Rev'd by	App'd by	Signature	Date	Position	Name	Signature	Date	Drawing Title:	DWG No.	Scale
01						Drawn by				<b>Cross Arm for Cable Rising Underground-Overhead</b>	EDC02-CA-001	N.T.S
02						Prepared by					Rev. 01	
03						Checked by					Date :	
04						Approved by						



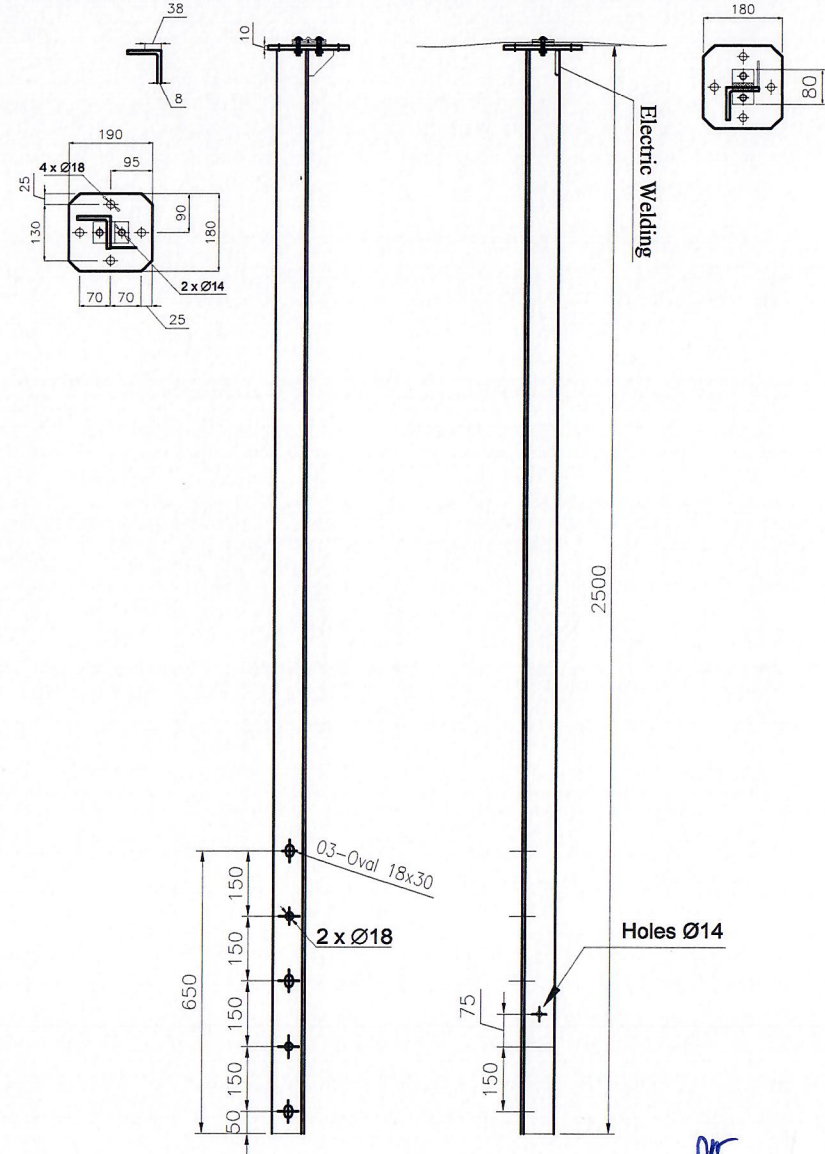
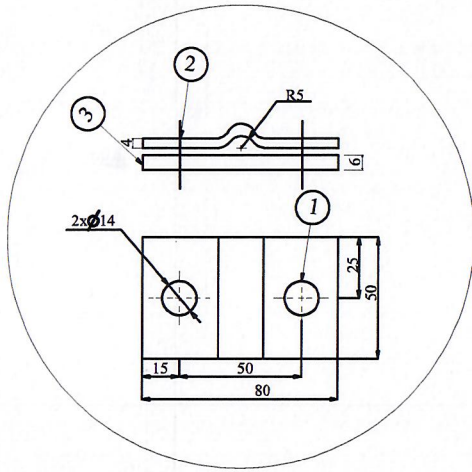



Rev.	Description	Rev'd by	App'd by	Signature	Date	<div><p><b>ELECTRICITE DU CAMBODGE</b> STREET 19, WATT PHNOM DAUN PENH DISTRICT PHNOM PENH, CAMBODIA</p></div>	Position	Name	Signature	Date	<b>Extension Cross Arm for Tension</b>	DWG No.	Scale	
01							Drawn by						EDC02-ASY-012	N.T.S
02							Prepared by					Project Name:	REV. 01 Date :	
03							Checked by							
04							Approved by							



# PG CLAMP

ITEM	DESCRIPTION	Unit	QUANTITY
1	Bolt M12x40	Steel	3
2	PL 80x50x6	Steel	4
3	Pl 80x50x4	Steel	1



Rev	Description	Rev'd by	App'd by	Signature	Date	<div><p><b>ELECTRICITE DU CAMBODGE</b> STREET 19, WATT PHNOM DALU PENH DISTRICT PHNOM PENH, CAMBODIA</p></div>	Position	Name	Signature	Date	Drawing Title:	DWG No.	Scale
01							Drawn by					EDC02-CA-001	N.T.S
02							Prepared by					<b>Extension Cross Arm for Suspension</b>  Rev. 01  Date :	
03							Checked by						
04							Approved by						

**10 Technical data sheets**

	Description	Unit	Requirements	Supplier's Offer
	<b>Cross arms</b>			
	Type:	<b>Fill one technical data sheet for each cross arm required</b>		
	V75x75x8X1800mm 2 cores		<input type="checkbox"/>	<input type="checkbox"/>
	V75x75x8X2200mm 4 cores		<input type="checkbox"/>	<input type="checkbox"/>
	V75x75x8X2400mm 4 cores		<input type="checkbox"/>	<input type="checkbox"/>
	Top cross arm 75x75x8x700mm 1 core		<input type="checkbox"/>	<input type="checkbox"/>
	V75x75x8x3000mm Support FCO and LA		<input type="checkbox"/>	<input type="checkbox"/>
	V75x75x8x1800mm Support VT & CT		<input type="checkbox"/>	<input type="checkbox"/>
	V75x75x8x2400mm Support VT & CT		<input type="checkbox"/>	<input type="checkbox"/>
	Cross arm for support CT & VT meter for pole		<input type="checkbox"/>	<input type="checkbox"/>
	Cross arm for support CT & VT for double pole		<input type="checkbox"/>	<input type="checkbox"/>
	Cross arm support transformer single pole		<input type="checkbox"/>	<input type="checkbox"/>
	Cross arm support transformer 100 and 160 kVA		<input type="checkbox"/>	<input type="checkbox"/>
	Cross arm support transformer double pole		<input type="checkbox"/>	<input type="checkbox"/>
	Cross arm for support AVR		<input type="checkbox"/>	<input type="checkbox"/>
	Cross arm for support fix MV capacitor bank		<input type="checkbox"/>	<input type="checkbox"/>
	Cross arm for support auto MV capacitor bank		<input type="checkbox"/>	<input type="checkbox"/>
	Cross arm support MV capacitor bank		<input type="checkbox"/>	<input type="checkbox"/>
	Cable tray & bolt support		<input type="checkbox"/>	<input type="checkbox"/>





EDC-DTS-MV014- POLE CROSS ARMS

	Cross arm for MV UGC and OHL interface		<input type="checkbox"/>	<input type="checkbox"/>
	Extension cross arm for tension		<input type="checkbox"/>	<input type="checkbox"/>
	Extension cross arm for suspension		<input type="checkbox"/>	<input type="checkbox"/>
1	Country of origin		to be specified	
2	Manufacturer		to be specified	
3	Manufacturer's Reference		to be specified	
4	Steel Applicable Standards		EN 10024 EN 10025 EN10058 EN 10060 EN 10113 ISO 1460 ISO 1461 ISO 4016 ISO 7091 ISO 10684	
5	Kind of steel		S275 Or/and S375	<input type="checkbox"/>  <input type="checkbox"/>
6	Copies of steel manufacturers test certificates for the raw steel products		Yes Sample to be provided attached to the technical data sheet	
7	Manufacturer drawing signed and stamped		Yes To be provided attached to the technical data sheet	
8	Manufacturer authorisation		Yes To be provided attached to the technical data sheet	



## EDC-DTS-MV014- POLE CROSS ARMS

9	Strictly in accordance with EDC drawing		Yes	
10	Hot dip galvanized		Yes	
11	Minimum weight of zinc deposited is	g/m <sup>2</sup>	610	
12	Fully fabricated before hot dip galvanizing		Yes	
13	withstand the tests set out in ISO 1460		Yes	
14	Nuts and bolts conform to ISO recommendations for metric threads		Yes	
15	Spring washers conform to ISO 630 "Structural Steels" strength 41 kg/mm <sup>2</sup> or more.		Yes	
16	Nuts and heads of all bolts are of the metric hexagonal type		Yes	
17	Steel bolts and screwed rods are hot dip galvanized including the threaded portions.		Yes	
18	Bolts are not re-cut threads after galvanizing		Yes	
19	All nuts are hot dip galvanized with the exception of the threaded part that is mineral oiled.		Yes	
20	All cross arms and members are marked as follow: <ul style="list-style-type: none"> <li>• Manufacturer name or logo.</li> <li>• Month and year of manufacturing.</li> </ul>		Yes Yes	
21	Marking done by engraving before galvanizing and clearly visible after galvanizing.		Yes	
22	Delivered complete with all components attached together		Yes	





EDC-DTS-MV014- POLE CROSS ARMS

23	Delivered with a plate mentioning the EDC cross arm reference		Yes	
Supplier's offer column must be properly filled with the right figures. "Compliant, Yes, ", V , etc..." are not accepted.				
<p style="text-align: center;">Deviation from the technical specification:</p> <p>The bidder shall list point after point and explain here in after all deviation from the requested technical specification.</p> <p>1/</p> <p>2/</p> <p>3/</p> <p style="text-align: center;"><b>Full technical information shall be supplied within the bid. If not, the offer shall not be considered</b></p> <p style="text-align: center;">Bidder signature:</p>				

