

Technical Bulletin

TB 0315A - Introduction of Composite Crossarms

Purpose

This technical bulletin has been issued to communicate the change in Endeavor Energy's crossarm Strategy.

Background

Endeavour Energy's crossarm strategy has been recently reviewed as part of the periodic crossarm contract renewal process. With the advancement in composite material technology, it was identified that new composite materials possess superior properties (high strength, low weight, superior fire resistance and longer service life) when compared to traditional timber crossarms. These properties lead to better performance and longer and more consistent asset life.

Furthermore, a comprehensive manual handling study of composite crossarms was completed demonstrating a significant health and safety benefit for our workers. The safety benefits fundamentally being derived from composite cross arms being much lighter than timber cross arms. 12kgs vs 25kgs for timber. The installation and manoeuvring of crossarms are categorised as Hazardous Manual Tasks (HMT's) due to the heavy weight of timber crossarms and this risk of manual handling injuries will be substantially reduced with lighter composite crossarms. At the end of life of composite crossarms they can be repurposed for other applications such as fence posts and retaining material as the strength of composite material at end of life remains quite high. This improves the sustainability of Endeavour Energy's operations.

Considering the above engineering, health & safety and environmental sustainability benefits, Endeavour Energy will be introducing composite crossarms into its Network.



Actions

Following is a list of current timber crossarms that will be phased out by the corresponding composite crossarms. Higher strength steel crossarms currently used in Transmission constructions will remain as steel crossarms. Composite crossarms are stenciled (top face) with crossarm construction type for easy identification (Eg: XA010) *refer to appendix A*

Timber Crossarm vs New Composite Crossarms and Material Numbers					
Crossarm Type	Description	Current Timber crossarm Dimensions	Drawing	New composite crossarm Dimensions	New composite crossarm material number
XA010	LV	2100 x 100 x 100	332003 Sh 1	2100X100X100	1000008681
XA020	HV	2100 x 100 x 100	332003 Sh 1	2100X100X100	1000008727
XA030	HV	2100 x 150 x 100	332003 Sh 1	2100X125X125	1000008790
XA040	HV, Recloser	2700 x 100 x 100	332003 Sh 1	2700X100X100	1000008786
XA040A	HV for SMR projects	2700 x 100 x 100	332003 Sh 1	2700X125X125	1000008794
XA050	LV Sub Box	1465 x 150 x 100	332003 Sh 2	1465X125X125	1000008789
XA055	HV Sub Platform	1800 x 200 x 100	332003 Sh 2	1800X125x125	1000008801
XA060	HV Sub standoff	1800 x 100 x 100	332003 Sh 2	1800X100X100	1000008803
XA065	LV Sub Urban	2700 x 100 x 100	332003 Sh 2	2700X100X100	1000008799
XA070	LV Sub Coastal	3000 x 125 x 100	332003 Sh 2	3000X100X100	1000008810
XA075	Crossarm regulator	4000 x 150 x 100	332003 Sh 2	4000X100X100	1000008806
Type 3	Transmission Type 3	3300 x 150 x 125	79043	3300x125X125	1000008812
Type 4	Transmission Type 4	2700 x 125 x 100	79044	2700X100X100	1000008814
Type 6	Transmission Type 6	6300 x 200 x 125	79046	6300X125X125	1000008808
Type 7	Transmission Type 7	3300 x 100 x 125	79047	3300X100X100	1000008809
Type 9	Transmission Type 9	2400 x 100 x 125	79049	2400X100X100	1000008820

Note: There are separate material numbers for timber and composite crossarms

Table 1 – Composite Crossarm

Installation of crossarms

During the trial of composite cross arms, staff from across Distribution and Transmission workgroups installed over 30 composite crossarms. It was identified through the trial that drilling of the crossarms presented issues, so in response a universal bracket was developed and then trialled to overcome the need to drill the composite crossarms.

Supporting brackets to overcome the need to drill

All composite crossarms are delivered with predrilled patterns to suit standard construction types however, it is noted that occasionally onsite drilling is required, either to make installation more efficient or to avoid complete replacement of an existing crossarm. Based on trials and consultation with other energy providers, a consensus was reached to use an easy to install universal bracket as a substitute for the need to drill crossarms. (Below link will provide the quick byte video of installation of these brackets).

<https://youtu.be/HkkmEpNHVpU>



Type B Bracket



Type A Bracket

Type	Description	Material Number
Type A	Support Bracket for 100X100 crossarm	1000008816
Type B	Support Bracket for 125X125 crossarm	1000008815

Installation and Removal of crossarms

Due to the light weight of composite crossarms (~12kg), the installation and removal of composite crossarms presents a significantly lower musculoskeletal risk to workers, as identified through a DorsaVi Health study (sensor technology attached to workers muscles). This was also consistent in feedback received from staff involved in field trials.

As a result of the significant reduction in weight and manual handling risks involved with composite crossarms, it is no longer a requirement for a two person lift. Therefore, these crossarms can be installed by a single person from an EWP or pole platform for most installations.

All existing hardware is compatible with the new composite crossarms with the exceptions of the below:

- Rollers- Universal Roller with Ratchet strap base plate to be used as a substitute of crossarm mounted standard rollers -*Pls refer WPR 0151 for material number updates*
- LV links and LV fuses with Spikes only to be installed on the support brackets outlined above.

Self-tapping screws can be used to attach wiring to composite crossarms with standard saddles. New stock code for 25mm self-tapping screws (Pack size 50) can book through the stock system under Material



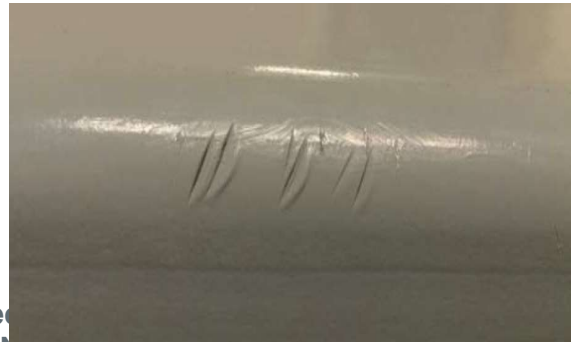
Number- 1000008869

Below picture shows the approved and recommended method of attaching the small wires.



Defects

Composite crossarms are very durable, however if one is found heavily damaged during transportation it will be replaced one-to-one by the supplier. Small scratches and dents as shown below are not considered as defects and will not affect the products integrity, therefore not requiring the crossarm to be replaced. When the crossarm coating is heavily damaged until the fiber is visible then it is categorized as defective. Missing end caps are not considered as a defect to replace the crossarm and any end cap that is damaged or missed can be easily replaced using issued end caps.



Defective crossarm
Non defective crossarm

Disposal

Composite cross arms are to be disposed of in general waste bins. Burnt composite cross arms and composite cross arms that are heavily damaged to the extent where fibres are exposed are to be bagged and placed in the general waste bin. It is important to note that even when composite cross arms are burnt, they are still inert and non-toxic.

Composite cross arms removed from service that are still in good condition are to be returned to the depot for reuse. More details on this process will be communicated in the near future.

Contacts

For further information contact:

- Amali Wickramasinghe, Lead Engineer- Mains, Engineering Delivery
- Tim Juhasz – Manager Distribution South
- Lee Karipidis – Health and Safety Business Partner

Implementation

The contents of this technical bulletin will be implemented immediately for all crossarm installations however the current stock of timber crossarms to be utilised until the current stock depletes.

Timber cross arms to be used for the jobs associated with pole changes where they can be dressed at ground level. For crossarm replacements in the air composite crossarms can be used immediately and composite crossarm bulk stocks will be available from 7 March 2022.

Impacted Standards

The contents of this technical bulletin will be included in the next update of MCI0005– Overhead construction Manual

Annexure A - composite crossarm trials in our network

