

Cable Jointing Manual

Jointing Procedures

Module 11

Preparing & Working on LV Waveform Cable

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Revision Log

Version: 1.1	Prepared by: R. Summers	Date: April 2009
Changes made	Manual reference added to the headers and footers The use of a knife to make the circumfrenclal cut on ALPEX / WaveconAl removed. New photos showing complete shrouding added The use of caps to temporary insulate cut conductors added Remove the use of the metal knife to remove the inner rubber bedding for Alpex cables	
Version: 1.0	Prepared by: Terry Dutton	Date: June 2008
Changes made	New Combined Module. Replaces Central Networks East COP15 MODULE 11. Replaces Cable Jointing Procedures in Central Networks West Underground Cable Jointing Manual:- CJP310; CJP372; CJP373; CJP374; CJP375; CJP376; CJP501.	

1. GENERAL

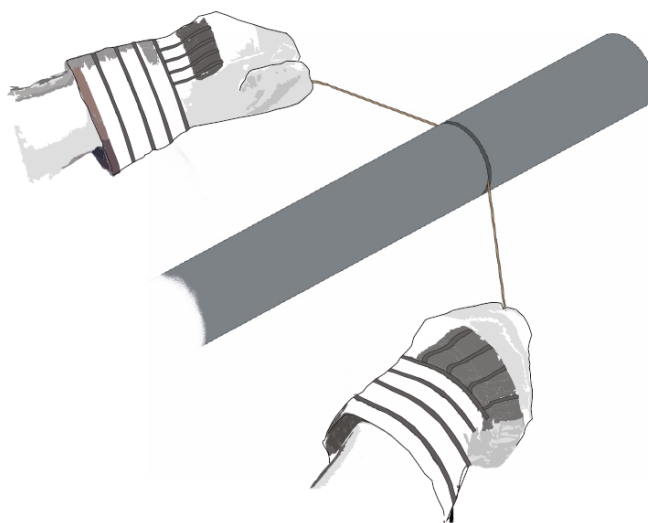
Two types of waveform cable are in use; Aluminium waveform, which was installed from the late 1960's until the late 90's and Copper waveform, which came into use subsequently. Waveform is sheathed with PVC, a tough, abrasion resistant material with good fire retardant properties. Also, Aluminium waveform cable has layers of rubber bedding above and below the combined neutral/earth (CNE) wires; Copper waveform cable has only one layer of rubber, below the wires.

In both cases, care must be taken when removing the sheath that the underlying CNE wires are not damaged. The different sheaths must be removed using different methods as described in the procedures; do not attempt to use a metal knife.

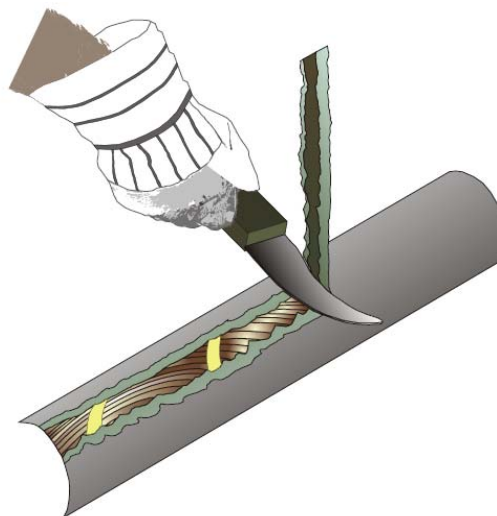
2. PROCEDURE FOR SHEATH AND RUBBER BEDDING REMOVAL, COPPER WAVEFORM CABLE

2.1 For Service and Breech Joints it is necessary to locate the 'crest' of the neutral wires. To do this cut a 150mm long window in the sheath. The 'crest' is the centre line of the joint.

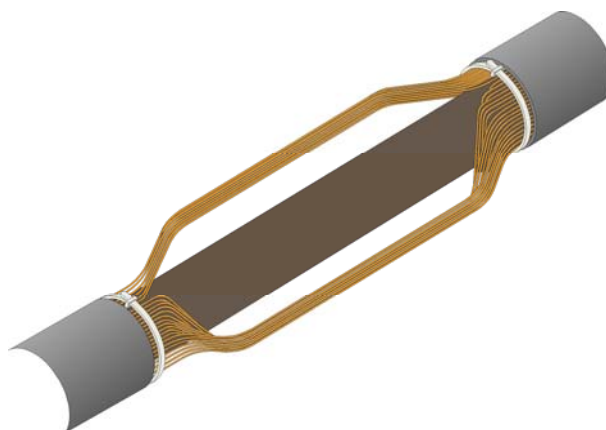
Measure and mark the cable sheaths at the location or locations where the sheath is to be terminated, according to the particular cable jointing procedure. Cut a length of twine approximately 0.7 metre long and use it to cut through the sheath at the marked positions, over the whole circumference, by rapid to and fro movement. This will generate sufficient heat by friction to melt through the material.



2.2 Connect the two circumferential cuts using the flat of a cable knife after warming the sheath with the gas torch

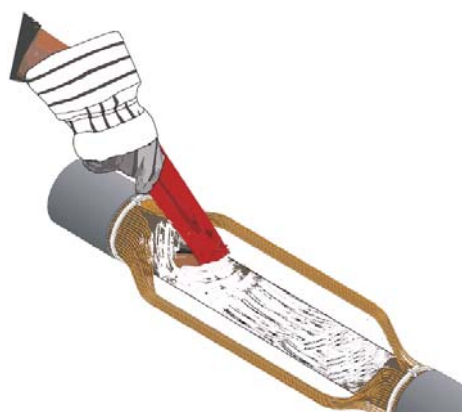


2.3 Fit two turns of 18 SWG wire or cable tie binders over the CNE wires at the oversheath off positions and pull out the Copper CNE waveform conductors.



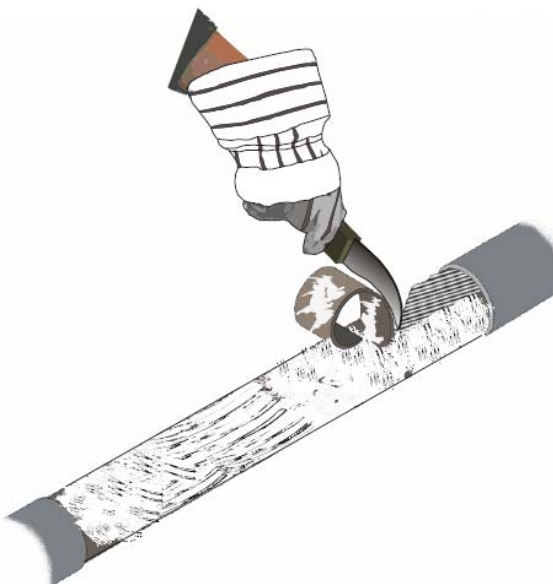
2.4 Fit a temporary **single turn** of 18 SWG binders at the points where the rubber layer is to be terminated. Remove the inner bedding rubber layer bedding using a plastic wedge at a tangent, up to the binder positions. There may be a clear Melinex tape layer over the phase conductors, if there is, remove it.

Finally, ensure that the Copper wires are completely free of adhering rubber and remove the temporary binders.

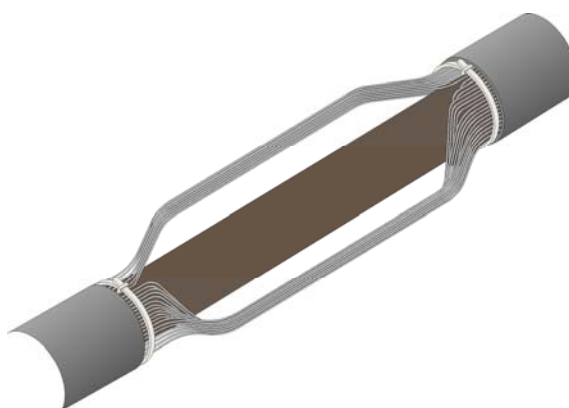


3. PROCEDURE FOR RUBBER BEDDING REMOVAL, ALUMINIUM WAVEFORM (ALPEX/WAVECONAL) CABLE

3.1 With the PVC sheath removed, the Aluminium conductors can now be cleaned free of the butyl bedding rubber. Remove the outer layer of butyl bedding rubber using a metal knife, applied flat lengthways along the cable with a shaving action.

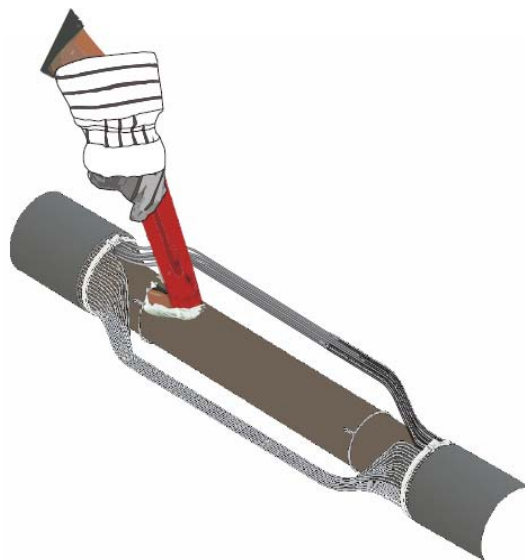


3.2 With the outer layer of butyl rubber removed, fit wire or cable tie binders over the CNE wires at the oversheath off positions and pull out the Aluminium CNE waveform conductors. Wipe each strand completely free of adhering butyl rubber, using clean dry rag.



3.3 Fit temporary turn of 18 SWG single wire binders at the points where the rubber layer is to be terminated. Remove the inner bedding rubber layer using a plastic wedge at a tangent, up to the binder positions. There may be a Melinex tape layer over the phase conductors, if there is, remove it with a plastic wedge.

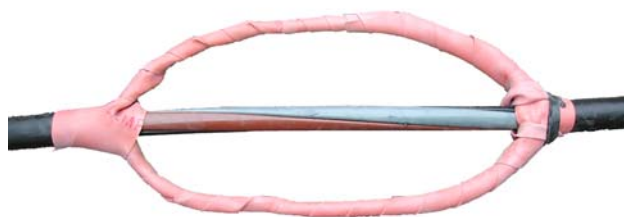
Finally, ensure that the Aluminium wires are completely free of adhering rubber



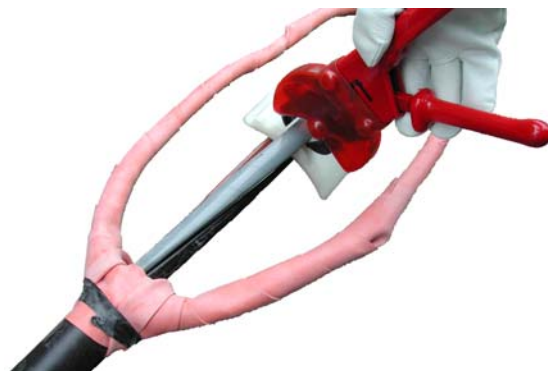
4. FURTHER PRECAUTIONS WHEN WORKING ON WAVEFORM CABLES

This section describes the particular safety precautions that need to be observed when working on cables, focussing on temporary shrouding and cutting cores.

4.1 Split conductors 50-50, bunch together and position on either side of the cable joint. Cover them with an Approved shrouding material. All neutral earth conductors must be shrouded.



4.2 Lift and separate the cores with the Approved cutting wedge (shown in the photo) and cut through the phase cores one at a time, using either an **insulated hacksaw** or **insulated core croppers**.



4.3 As each core is cut, apply temporary insulation to both core ends before starting on the next phase core. This temporary insulation consists of either a minimum of 6 layers of adhesive tape or an Approved tapered cap (secured in place with adhesive tape)



4.4 Remove the temporary insulation and cut the CNE conductors only when all three cores have been cut and insulated.

