400kV Underground Cable Construction

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Underground Cable Components

- 150mm diameter cables, made up of copper core, cross linked polyethylene insulation, seamless corrugated aluminium sheath and PVC outer sheath

- Max. 18 cables would be needed, laid in 6 x groups of 3

- Separation required to allow heat to dissipate

- Joints required every 500 – 800m (depends on cable manufacture)

- Sealing end compounds required at either end of underground section
Access for Construction

Access, Working Areas and Ground Preparation

- Approx. 65m wide working area, protected by post and wire fencing
- Temporary trackway provide vehicle access along entire route
- Vegetation clearance across working area
- Drainage improvement works
- Temporary soil storage
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Machinery Required

- Excavators to clear working area, dig trenches and improve drainage
- Delivery of materials to site using 38 tonne lorries (cables on drums)
- Tractors and other smaller vehicles used to transport materials within cable route
- Backfill delivered to site and surplus spoil removed
Underground Cable Construction

Cable trenches and laying

- Excavation of 6 trenches within working area
- Timber reinforcement to trench sides
- Cement Bound Sand bed
- Cables laid at a depth of 1.1m on CBS bed and surrounded by an additional CBS layer
- Concrete protective tiles
- Warning tapes
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Cable trenches and laying – example of section through a working area
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Cable jointing

- Joints required every 500 – 800m depending on length of cables
- Joints are made in controlled clean conditions
- Technically demanding and labour intensive
- Copper conductors joined with a compression ferrule
- Insulation hand wrapped
- Protected by glass fibre box filled with resin or bitumen
Reinstatement

- Reinstatement of soil above cable trench and across working area
- Temporary access tracks and site fencing removed
- Care needs to be taken with replacement of hedgerows and fencing – restrictions apply
- Permanent tree loss over cable swathe
Inspection and Maintenance

- Inspection is carried out at a min. every 3 years using test equipment carried in vans
- Monitoring is carried out via fibre optic cables installed with the power cables
- Excavation required to carry out cable repairs
- Cable replacement every 40 years (approx.)
Sealing End Compounds

- SEC provides connection between overhead line and underground cables
- Area protected by 2.4m high pallisade fence with electrified fence inside
- Permanent vehicle access required
- Terminal overhead line tower with downleads
- Cable sealing ends emerge from ground
Sealing End Compounds

- Downlead from OHL tower
- Insulated post
- Surge arrestor
- 2.4m palisade fence with electrified fence above
- Cable sealing end
- Height barrier
Any Questions?