

## Checklist

### Existing Circuits Information

- Contact the owners of the existing circuits for design documentation
- Review cable and installation
  - Cable datasheet (conductor size, material, type, configuration, bonding)
  - Installation (burial depth, number of circuits, spacing, arrangement)
  - GIS / as-built locational data
- Confirm environmental conditions assumed
  - Soil thermal resistivity ①
  - Ambient soil temperature
- Confirm operational constraints
  - Operating current (A) ②
  - Maximum conductor temperature limit (°C)

### New Circuit Design

- Determine operational constraints
  - Operating current (A) ②
  - Maximum conductor temperature limit (°C)
- Determine environmental conditions
  - Soil thermal resistivity ①
  - Ambient soil temperature
- Select new cables and design installation
  - Cable datasheet (conductor size, material, type, configuration)
  - Route geometry, installation arrangements and bonding

### Parallel Section - if applicable

- Identify the closest horizontal separation between existing & new circuits
- Set up the simulation model at this worst-case location
  - Model the cable type and construction (existing and new circuits)
  - Set burial depth and spacing per owner documentation
  - Model new circuits at planned depth with minimum horizontal separation
- Run ampacity simulation and check against constraints
  - Ampacity of existing and new circuits
  - Conductor temperature

### Crossing Points - if applicable

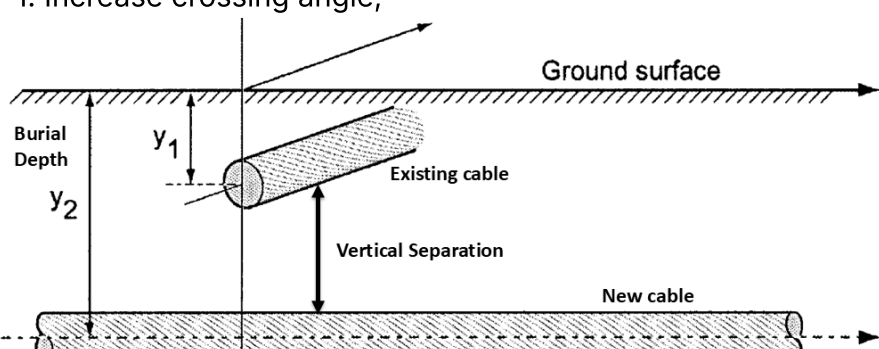
- Identify crossing location(s) where new circuits cross existing circuits
- Set up the simulation model and determine crossing geometry
  - Model the cable type and construction (existing and new circuits)
  - Crossing angle ④
  - Vertical separation ⑤
- Run simulation at the crossing point and check against constraints
  - Ampacity of existing and new circuits
  - Conductor temperature

### Overall Current Rating

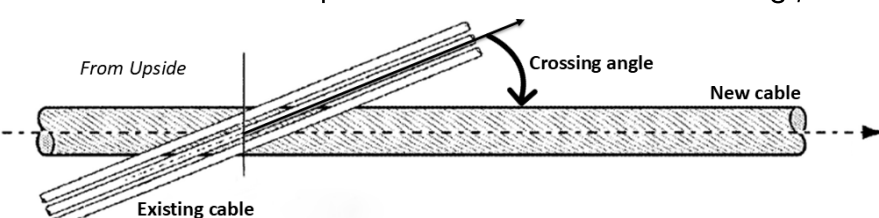
- Compare ampacity results from all hotspot analyses for new system
  - Parallel section ampacity
  - Crossing points ampacity
- Identify the minimum ampacity value as the overall current rating

### Notes

- ① Measuring soil thermal resistivity is preferred over assuming.
- ② Indicator of safe cable crossing, derived from power rating and operational voltage.
- ③ If ampacity is insufficient: Increase separation.
- ④ Maximise crossing angle as much as possible.
- ⑤ Minimum vertical separation is specified by utility owners to limit derating of existing circuits.
- ⑥ Ampacities of both existing and new circuits should be higher than their own required operational currents.
- ⑦ If ampacity is insufficient (existing or new circuits):
  1. Increase crossing angle;



2. Increase vertical separation to reduce mutual heating ;



- ⑧ Review cable configuration, choose another cable with higher ampacity