

Example 8C: Connection of housing development with remote network Reinforcement

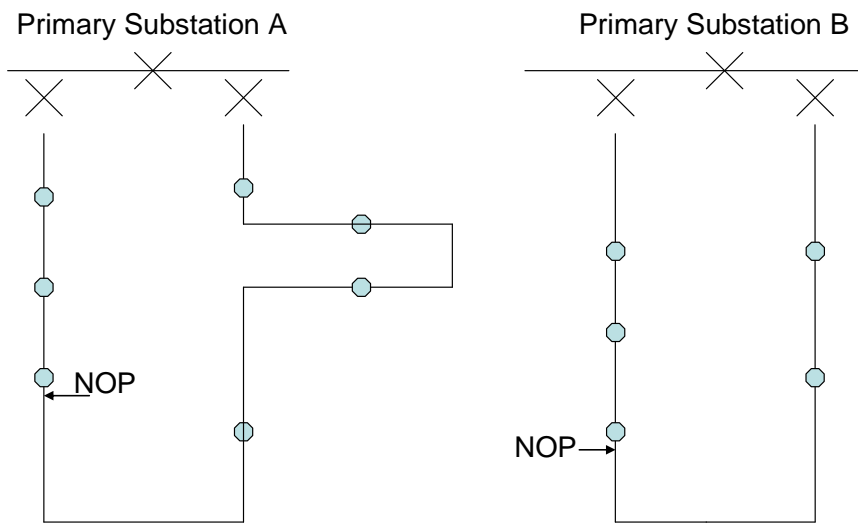
This further variation shows the arrangements that will apply where it is necessary to reinforce a different part of the Distribution System so that existing demand may be transferred in order to release capacity for the new connection.

A new housing development has a Required Capacity of 2MVA to serve 900 plots. The local 11kV feeder has a network capacity of 7.7MVA based upon the limitation of the existing 400 Amp circuit breakers at Primary Substation A. The existing load on the circuit is 7.6MVA. It is therefore not possible to connect the new load to this circuit without Reinforcement works.

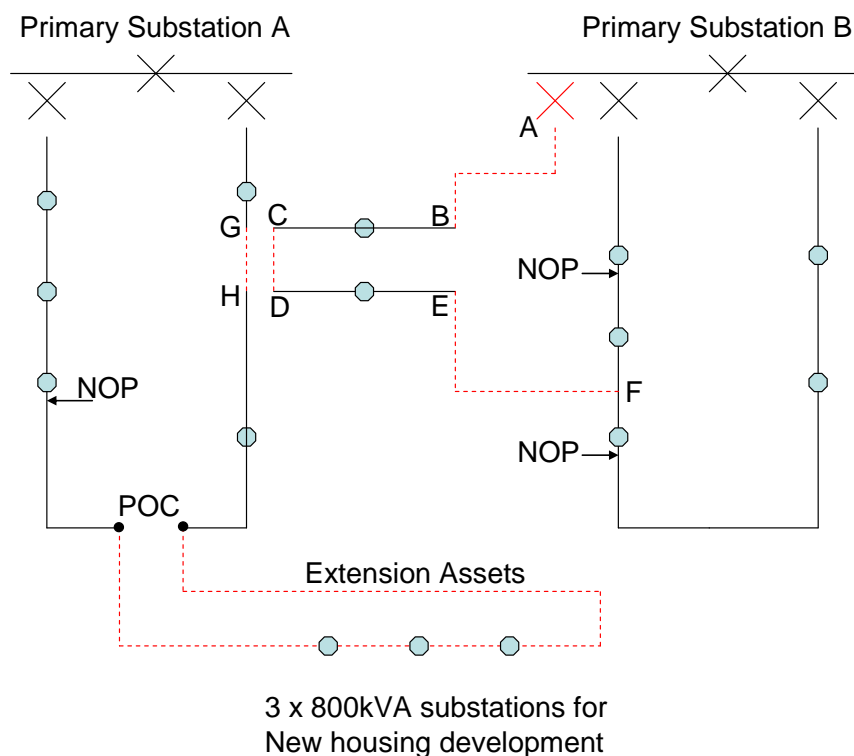
It is proposed to reinforce an adjacent network so that two existing substations may be transferred on to it, in order to release capacity so that the new connections can be made. Primary Substation B has sufficient spare capacity to accommodate the two existing substations. A new circuit breaker is to be installed at Primary Substation B and a new 11kV feeder (also rated at 7.7MVA) is to be installed between points A – B, and points E – F for connection to the local 11kV circuit at point F. The existing circuit will be cut at point BE so that the new joints can be made. This will convert the Primary Substation B network from a two feeder to a three feeder network. The new cable between points A – B, and E - F is 500m long in total. The network will be reconfigured by installation of two short straps C – D and G - H in order to maintain connectivity.

This Reinforcement will allow a POC to be taken from the local 11kV circuit to supply the new development. The newly installed cable to connect the development from the POC is 1200m long. Three 800kVA distribution substations are to be established onsite. The above work represents the Minimum Scheme to provide connections to the new site.

Original network:



Proposed network:



Reinforcement:

The RSN for the Reinforcement

For the Reinforcement CAF the RSN is considered to be the three feeder 11kV network comprising the two original feeders from Primary Substation B and the new feeder from Primary Substation B, as this new feeder is capable of feeding either of the existing circuits. The numerator in the CAF calculation is based upon the Required Capacity of the new development, i.e. 2MVA. In this case, the New Network Capacity (under N -1 conditions) following the Reinforcement works is equal to $(3 - 1) \times 7.7\text{MVA} = 15.4\text{MVA}$

Fault Level CAF calculation: This Scheme does not have any significant Fault Level contribution to the existing shared use distribution network and Fault Level CAF is therefore not applicable here.

The Connection Charge for this Scheme is calculated as follows:

Reinforcement

| | Cost | Apportionment | Customer Contribution |
|----------------------|---------|-------------------------|-----------------------|
| Non Contestable Work | | | |
| 500m of 11kV | £50,000 | $2/15.4 \times 100\% =$ | £6,500 |

| | | | |
|----------------------------------------------|----------|----------|---------|
| cable: A-B, C-D, E-F | | 13% | |
| 11kV Circuit Breaker at Primary Substation B | £45,000 | As above | £5,844 |
| 11kV jointing at Points A,B,C,D,E,F | £10,000 | As above | £1,300 |
| | | | |
| Total reinforcement cost | £105,000 | | £13,644 |

Extension assets

| | Cost | Apportionment | Customer Contribution |
|---------------------------------------------------|----------|---------------|-----------------------|
| Contestable Work | | | |
| 1200m of 11kV cable inc. strap at G - H | £120,000 | n/a | £120,000 |
| 3 by 800kVA distribution substations | £150,000 | n/a | £150,000 |
| On site LV mains and services | £330,000 | n/a | £330,000 |
| | | | |
| Non Contestable Work | | | |
| 4 by 11kV closing joints at POC and at points G,H | £10,000 | n/a | £10,000 |
| | | | |
| Total extension asset cost | £610,000 | | £610,000 |
| CiC charges | | | £3,500 |