APPENDIX 1

SCHEDULE OF REQUIREMENTS
(To be completed by client)

SYSTEM DETAIL

1.0 Transformer required for: Cambridge Diesel Depot substation/location

2.0 Nominal system voltage: 0.400 kV

3.0 Number of phases: 3ph

4.0 Frequency: 50 Hz

5.0 Neutral point effectively earthed: ✓ Yes/No

TRANSFORMER DETAIL

1.0 Type of transformer: Outdoor: Yes Indoor: _____

2.0 Number of phases: Single phase: _____ Three phase: Yes

3.0 Rated power: 750 kVA

4.0 Impedance percentage %: 4.72

5.0 Primary voltage rating: 11 kV

6.0 Secondary voltage rating: 0.400 kV

7.0 Vector group: Dyn11

TANK TYPE

1.0 Free-breathing ✓ Yes/No

2.0 Sealed (Transformer main tank cover joint shall be welded) Yes/No ✓

FITTINGS REQUIRED

1.0 Conservator with oil level indication. ✓ Yes/No

2.0 Silica gel breather ✓ Yes/No

3.0 Gas and oil actuating relay with test and sample valves ✓ Yes/No

4.0 Main tank drain valve ✓ Yes/No

5.0 Indicating thermometer

5.1 Oil temperature ✓ Yes/No

5.2 Winding temperature indication ✓ Yes/No

6.0 Radiators. ✓ Yes/No

7.0 Auxiliary wiring terminal box ✓ Yes/No

8.0 Neutral current transformer required Yes/No ✓

8.1 Ratio: N/A

8.2 Class: N/A

8.3 VA Rating: N/A

9.0 Off circuit tap switch required Yes/No ✓

9.1 Number of tap positions: 5

10.0 Bushings required: Outdoor: _____ Indoor: Yes

High voltage side Yes/No ✓

Low voltage side Yes/No ✓

11.0 Cable box required Yes/No ✓

Number and types of cables per phase

High voltage side: N/A

Low voltage side: 1 x 70mm2 CU SWA

12.0 Neutral required

High voltage side Yes/No ✓

Low voltage side Yes/No ✓

Number and types of cables per neutral: 1 x 95mm2 CU SWA

13.0 Mountings

13.1 Pole mounting Yes/No ✓

13.2 Platform mounting Yes/No ✓

13.3 Flat underbase Yes/No ✓

13.4 Skid underbase Yes/No ✓

13.5 Wheels and axles Yes/No ✓

13.6 Lifting lugs Yes/No ✓

13.7 Jacking pads Yes/No ✓

14.0 Dimensions (if critical)

Length: _____mm. Breadth: _____mm. Height: _____mm

15.0 Special requirements: _____

To be Cooled By ONAN and Gross weight less than 5000 kG

Suitable for use above 1800m and drying under full vacum

END ✓

APPENDIX 2

INFORMATION TO BE PROVIDED BY TENDERERS

1.0 GENERAL

1.1 Manufacturers name: _____

2.0 TRANSFORMER DETAIL

1.0 Type of transformer: Outdoor: _____ Indoor: _____

2.0 Number of phases: Single phase: _____Three phase: _____

3.0 Rated power: _____kVA

4.0 Impedance (percentage) %: _____

5.0 Primary voltage rating: _____kV

6.0 Secondary voltage rating: _____kV

7.0 Tapping Switch.

No of positions: _____ %Steps: _____

8.0 Vector group: _____

9.0 Free Breathing Yes/No

10.0 Sealed Yes/No

11.0 Welded cover Yes/No

12.0 Method of Cooling: _____

13.0 Overall dimensions: Length_____mm. Breadth_____mm. Height_____mm

14.0 Winding material: HV_____ LV_____

15.0 Mass of core and windings: _____kg

16.0 Oil capacity: _____(Litres)

17.0 Mass of transformer complete with oil: _____kg

18.0 HV end turns insulation reinforced Yes/No

19.0 Type of breather and dehydrating agent: _____

20.0 The following information refers to the transformer when connected on the principal tapping and appropriate reference temperature for the class of insulation used.

20.1 Iron loss (Watts): _____

20.2 Copper loss at full load: _____ at_____°C

20.3 Total load losses (Watts): _____at _____°C

20.4 Impedance at full load (percentage)_____Z _____X

20.5 Regulation at full load at: 1.0 PF _____Percent, 0.8 PF _____ Percent at _____°C

20.6 Efficiency at full load at: 1.0 PF _____Percent, 0.8 PF _____Percent at _____ °C

20.7 Temperature rise at rated voltage and power of:

Windings: _____°C

Top oil: _____°C

END

APPENDIX 1

SCHEDULE OF REQUIREMENTS
(To be completed by client)

SYSTEM DETAIL

1.0 Transformer required for: Cambridge Goods substation/location

2.0 Nominal system voltage: 0.400 kV

3.0 Number of phases: 3Ph

4.0 Frequency: 50 Hz

5.0 Neutral point effectively earthed: ✓ Yes/No

TRANSFORMER DETAIL

1.0 Type of transformer: Outdoor: _____ Indoor: Yes

2.0 Number of phases: Single phase: _____ Three phase: Yes

3.0 Rated power: 500 kVA

4.0 Impedance percentage %: 4.41

5.0 Primary voltage rating: 11 kV

6.0 Secondary voltage rating: 0.400 kV

7.0 Vector group: Dyn11

TANK TYPE

1.0 Free-breathing ✓ Yes/No

2.0 Sealed (Transformer main tank cover joint shall be welded) ✓ Yes/No

FITTINGS REQUIRED

1.0 Conservator with oil level indication. ✓ Yes/No

2.0 Silica gel breather ✓ Yes/No

3.0 Gas and oil actuating relay with test and sample valves ✓ Yes/No

4.0 Main tank drain valve ✓ Yes/No

5.0 Indicating thermometer

5.1 Oil temperature ✓ Yes/No

5.2 Winding temperature indication ✓ Yes/No

6.0 Radiators. ✓ Yes/No

7.0 Auxiliary wiring terminal box ✓ Yes/No

8.0 Neutral current transformer required ✓ Yes/No

8.1 Ratio: N/A

8.2 Class: N/A

8.3 VA Rating: N/A

9.0 Off circuit tap switch required Yes/No ✓

9.1 Number of tap positions: 5

10.0 Bushings required: Outdoor: Yes Indoor: _____

High voltage side Yes/No ✓

Low voltage side Yes/No ✓

11.0 Cable box required Yes/No ✓

Number and types of cables per phase

High voltage side: N/A

Low voltage side: 1x 70mm2 CU SWA

12.0 Neutral required

High voltage side Yes/No ✓

Low voltage side Yes/No ✓

Number and types of cables per neutral: 1 x 95mm2 CU SWA

13.0 Mountings

13.1 Pole mounting Yes/No ✓

13.2 Platform mounting Yes/No ✓

13.3 Flat underbase Yes/No ✓

13.4 Skid underbase Yes/No ✓

13.5 Wheels and axles Yes/No ✓

13.6 Lifting lugs Yes/No ✓

13.7 Jacking pads Yes/No ✓

14.0 Dimensions (if critical)

Length: _____mm. Breadth: _____mm. Height: _____mm

15.0 Special requirements: _____
To be Cooled By ONAN and Gross weight less than 5000 kG

Suitable for use above 1800m and drying under full vacum

END

APPENDIX 2

INFORMATION TO BE PROVIDED BY TENDERERS

1.0 GENERAL

1.1 Manufacturers name: _____

2.0 TRANSFORMER DETAIL

1.0 Type of transformer: Outdoor: _____ Indoor: _____

2.0 Number of phases: Single phase: _____Three phase: _____

3.0 Rated power: _____kVA

4.0 Impedance (percentage) %: _____

5.0 Primary voltage rating: _____kV

6.0 Secondary voltage rating: _____kV

7.0 Tapping Switch.

No of positions: _____ %Steps: _____

8.0 Vector group: _____

9.0 Free Breathing Yes/No

10.0 Sealed Yes/No

11.0 Welded cover Yes/No

12.0 Method of Cooling: _____

13.0 Overall dimensions: Length_____mm. Breadth_____mm. Height_____mm

14.0 Winding material: HV_____ LV_____

15.0 Mass of core and windings: _____kg

16.0 Oil capacity: _____(Litres)

17.0 Mass of transformer complete with oil: _____kg

18.0 HV end turns insulation reinforced Yes/No

19.0 Type of breather and dehydrating agent: _____

20.0 The following information refers to the transformer when connected on the principal tapping and appropriate reference temperature for the class of insulation used.

20.1 Iron loss (Watts): _____

20.2 Copper loss at full load: _____ at_____°C

20.3 Total load losses (Watts): _____at _____°C

20.4 Impedance at full load (percentage)_____Z _____X

20.5 Regulation at full load at: 1.0 PF _____Percent, 0.8 PF _____ Percent at _____°C

20.6 Efficiency at full load at: 1.0 PF _____Percent, 0.8 PF _____Percent at _____ °C

20.7 Temperature rise at rated voltage and power of:

Windings: _____°C

Top oil: _____°C

END

APPENDIX 1

SCHEDULE OF REQUIREMENTS
(To be completed by client)

SYSTEM DETAIL

1.0 Transformer required for: Queenstown Station substation/location

2.0 Nominal system voltage: 0.400 kV

3.0 Number of phases: 3Ph

4.0 Frequency: 50 Hz

5.0 Neutral point effectively earthed: ✓ Yes/No

TRANSFORMER DETAIL

1.0 Type of transformer: Outdoor: Yes Indoor: _____

2.0 Number of phases: Single phase: _____ Three phase: Yes

3.0 Rated power: 300 kVA

4.0 Impedance percentage %: 4.56

5.0 Primary voltage rating: 11 kV

6.0 Secondary voltage rating: 0.400 kV

7.0 Vector group: Dyn

TANK TYPE

1.0 Free-breathing ✓ Yes/No

2.0 Sealed (Transformer main tank cover joint shall be welded) ✓ Yes/No

FITTINGS REQUIRED

1.0 Conservator with oil level indication. ✓ Yes/No

2.0 Silica gel breather ✓ Yes/No

3.0 Gas and oil actuating relay with test and sample valves ✓ Yes/No

4.0 Main tank drain valve ✓ Yes/No

5.0 Indicating thermometer

5.1 Oil temperature ✓ Yes/No

5.2 Winding temperature indication ✓ Yes/No

6.0 Radiators. ✓ Yes/No

7.0 Auxiliary wiring terminal box ✓ Yes/No

8.0 Neutral current transformer required ✓ Yes/No

8.1 Ratio: N/A

8.2 Class: N/A

8.3 VA Rating: N/A

9.0 Off circuit tap switch required Yes/No

9.1 Number of tap positions: 5

10.0 Bushings required: Outdoor: Yes Indoor: _____

High voltage side Yes/No

Low voltage side Yes/No

11.0 Cable box required Yes/No

Number and types of cables per phase

High voltage side: N/A

Low voltage side: 1 x 70mm2 CU SWA

12.0 Neutral required

High voltage side Yes/No

Low voltage side Yes/No

Number and types of cables per neutral: 1 x 95mm2 CU SWA

13.0 Mountings

13.1 Pole mounting Yes/No

13.2 Platform mounting Yes/No

13.3 Flat underbase Yes/No

13.4 Skid underbase Yes/No

13.5 Wheels and axles Yes/No

13.6 Lifting lugs Yes/No

13.7 Jacking pads Yes/No

14.0 Dimensions (if critical)

Length: _____mm. Breadth: _____mm. Height: _____mm

15.0 Special requirements: _____

To be Cooled By ONAN and Gross weight less than 5000 kG

Suitable for use above 1800m and drying under full vacum

END

APPENDIX 2

INFORMATION TO BE PROVIDED BY TENDERERS

1.0 GENERAL

1.1 Manufacturers name: _____

2.0 TRANSFORMER DETAIL

1.0 Type of transformer: Outdoor: _____ Indoor: _____

2.0 Number of phases: Single phase: _____Three phase: _____

3.0 Rated power: _____kVA

4.0 Impedance (percentage) %: _____

5.0 Primary voltage rating: _____kV

6.0 Secondary voltage rating: _____kV

7.0 Tapping Switch.

No of positions: _____ %Steps: _____

8.0 Vector group: _____

9.0 Free Breathing Yes/No

10.0 Sealed Yes/No

11.0 Welded cover Yes/No

12.0 Method of Cooling: _____

13.0 Overall dimensions: Length_____mm. Breadth_____mm. Height_____mm

14.0 Winding material: HV_____ LV_____

15.0 Mass of core and windings: _____kg

16.0 Oil capacity: _____(Litres)

17.0 Mass of transformer complete with oil: _____kg

18.0 HV end turns insulation reinforced Yes/No

19.0 Type of breather and dehydrating agent: _____

20.0 The following information refers to the transformer when connected on the principal tapping and appropriate reference temperature for the class of insulation used.

20.1 Iron loss (Watts): _____

20.2 Copper loss at full load: _____ at_____°C

20.3 Total load losses (Watts): _____at _____°C

20.4 Impedance at full load (percentage)_____Z _____X

20.5 Regulation at full load at: 1.0 PF _____Percent, 0.8 PF _____ Percent at _____°C

20.6 Efficiency at full load at: 1.0 PF _____Percent, 0.8 PF _____Percent at _____ °C

20.7 Temperature rise at rated voltage and power of:

Windings: _____°C

Top oil: _____°C

END

APPENDIX 1

SCHEDULE OF REQUIREMENTS
(To be completed by client)

SYSTEM DETAIL

1.0 Transformer required for: Queenstown Loco substation/location

2.0 Nominal system voltage: 0.400 kV

3.0 Number of phases: 3Ph

4.0 Frequency: 50 Hz

5.0 Neutral point effectively earthed: Yes/No ✓

TRANSFORMER DETAIL

1.0 Type of transformer: Outdoor: Yes Indoor: _____

2.0 Number of phases: Single phase: _____ Three phase: Yes

3.0 Rated power: 500 kVA

4.0 Impedance percentage %: 4.48

5.0 Primary voltage rating: 11 kV

6.0 Secondary voltage rating: 0.400 kV

7.0 Vector group: Dyn11

TANK TYPE

1.0 Free-breathing Yes/No ✓

2.0 Sealed (Transformer main tank cover joint shall be welded) Yes/No ✓

FITTINGS REQUIRED

1.0 Conservator with oil level indication. Yes/No ✓

2.0 Silica gel breather Yes/No ✓

3.0 Gas and oil actuating relay with test and sample valves Yes/No ✓

4.0 Main tank drain valve Yes/No ✓

5.0 Indicating thermometer

5.1 Oil temperature Yes/No ✓

5.2 Winding temperature indication Yes/No ✓

6.0 Radiators. Yes/No ✓

7.0 Auxiliary wiring terminal box Yes/No ✓

8.0 Neutral current transformer required Yes/No ✓

8.1 Ratio: N/A

8.2 Class: N/A

8.3 VA Rating: N/A

9.0 Off circuit tap switch required Yes/No ✓

9.1 Number of tap positions: 5

10.0 Bushings required: Outdoor: Yes Indoor: _____

High voltage side Yes/No ✓

Low voltage side Yes/No ✓

11.0 Cable box required Yes/No ✓

Number and types of cables per phase

High voltage side: N/A

Low voltage side: 1 x 70mm2 CU SWA

12.0 Neutral required

High voltage side Yes/No ✓

Low voltage side Yes/No ✓

Number and types of cables per neutral: 1 x 95mm2 CU SWA

13.0 Mountings

13.1 Pole mounting Yes/No ✓

13.2 Platform mounting Yes/No ✓

13.3 Flat underbase Yes/No ✓

13.4 Skid underbase Yes/No ✓

13.5 Wheels and axles Yes/No ✓

13.6 Lifting lugs Yes/No ✓

13.7 Jacking pads Yes/No ✓

14.0 Dimensions (if critical)

Length: _____mm. Breadth: _____mm. Height: _____mm

15.0 Special requirements: _____

To be Cooled By ONAN and Gross weight less than 5000 kG

Suitable for use above 1800m and drying under full vacum

END

APPENDIX 2

INFORMATION TO BE PROVIDED BY TENDERERS

1.0 GENERAL

1.1 Manufacturers name: _____

2.0 TRANSFORMER DETAIL

1.0 Type of transformer: Outdoor: _____ Indoor: _____

2.0 Number of phases: Single phase: _____Three phase: _____

3.0 Rated power: _____kVA

4.0 Impedance (percentage) %: _____

5.0 Primary voltage rating: _____kV

6.0 Secondary voltage rating: _____kV

7.0 Tapping Switch.

No of positions: _____ %Steps: _____

8.0 Vector group: _____

9.0 Free Breathing Yes/No

10.0 Sealed Yes/No

11.0 Welded cover Yes/No

12.0 Method of Cooling: _____

13.0 Overall dimensions: Length_____mm. Breadth_____mm. Height_____mm

14.0 Winding material: HV_____ LV_____

15.0 Mass of core and windings: _____kg

16.0 Oil capacity: _____(Litres)

17.0 Mass of transformer complete with oil: _____kg

18.0 HV end turns insulation reinforced Yes/No

19.0 Type of breather and dehydrating agent: _____

20.0 The following information refers to the transformer when connected on the principal tapping and appropriate reference temperature for the class of insulation used.

20.1 Iron loss (Watts): _____

20.2 Copper loss at full load: _____ at_____°C

20.3 Total load losses (Watts): _____at _____°C

20.4 Impedance at full load (percentage)_____Z _____X

20.5 Regulation at full load at: 1.0 PF _____Percent, 0.8 PF _____ Percent at _____°C

20.6 Efficiency at full load at: 1.0 PF _____Percent, 0.8 PF _____Percent at _____ °C

20.7 Temperature rise at rated voltage and power of:

Windings: _____°C

Top oil: _____°C

END