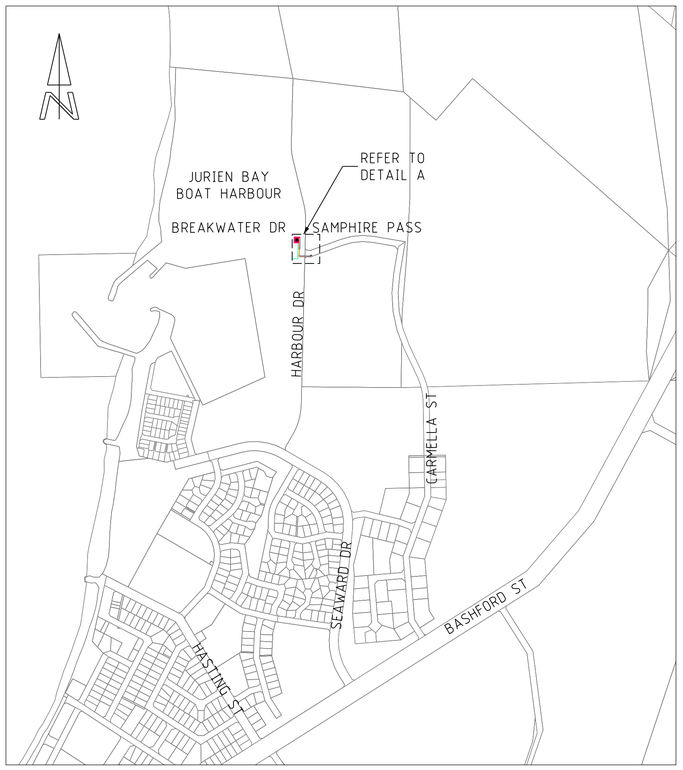
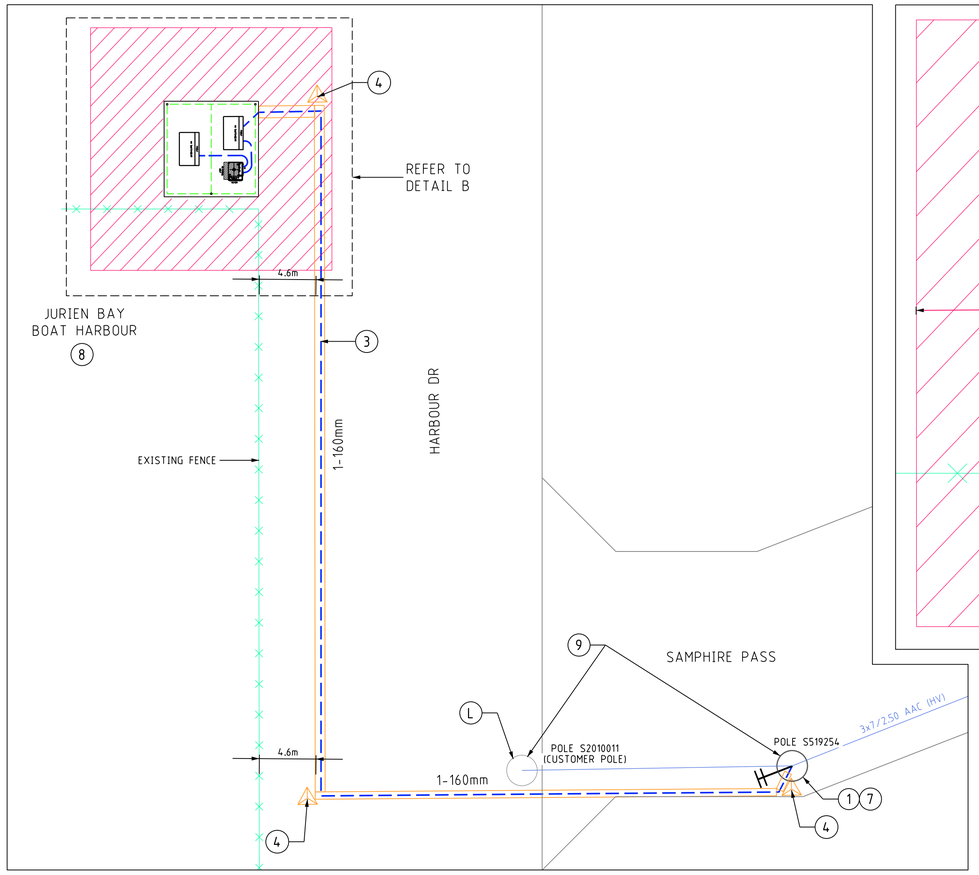
SAFETY - MAKE IT YOUR PRIMARY VALUE

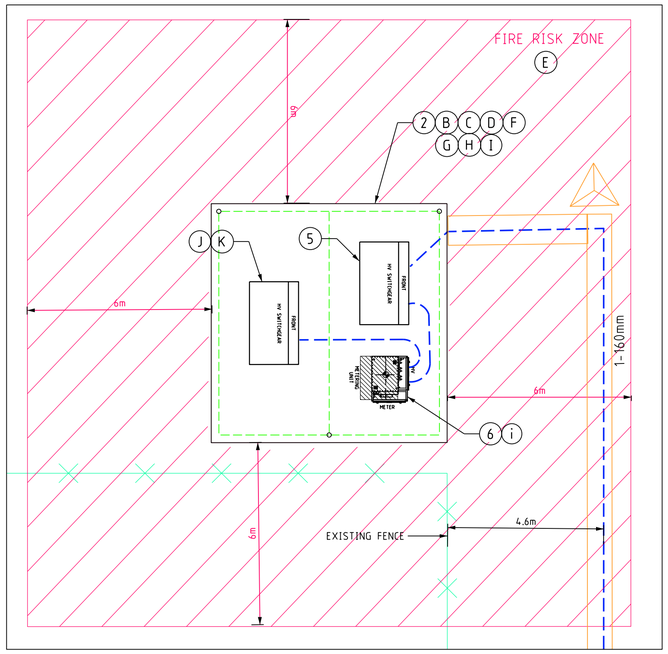



1:10,000 (200 100 0 200 400 600 800)

LOCATION PLAN




1:250 (5 2.5 0 5 10 15 20) DETAIL 'A'



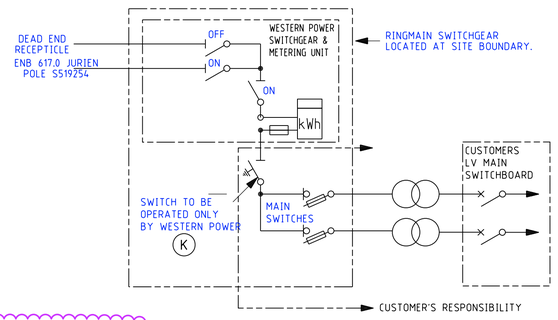

1:100 (2 1 0 2 4 6 8) DETAIL 'B'

## LEGEND

HV CABLES
- CN53 - 400mm2 (3X1c)
- CN49 - 240mm2 (3X1c)
- CN48 - 185mm2 (3X1c)
- CN50 - 95mm2 (3X1c)
- CN51 - 50mm2 (3X1c)
- CN51 - 50mm2 (1c)
- CN46 - 35mm2 (3X1c)
- CN47 - 35mm2 (1c)
- EXISTING HV CABLES (SIZE AND TYPE INDICATED)

OH EQUIPMENT
- INTERMEDIATE
- PTS
- DOF
- HV ISOLATOR (150L)
- INLINE STRAIN
- LV DISCONNECTOR
- PTT
- ISOL TX
- AERIAL STAY
- OUTRIGGER STAY
- RECLOSER
- GROUND STAY
- LOAD BREAK SWITCH
- SECTIONALISER
- CAPACITOR
- LV ABC KRONE
- LBPTS
- STREETLIGHT BOX (SLB)

HV - AERIAL CONDUCTORS
- 19/3.25 AAC/AAAC
- 7/4.75 AAC/AAAC
- 7/2.5 AAC/AAAC
- 3/2.75 SCAC
- 6/1/3.00 AACSR/AC
- 150 HENDRIX
- EXISTING HV CONDUCTORS (SIZE AND TYPE INDICATED)




SIMPLIFIED SINGLE LINE DIAGRAM

3-PHASE SHORT CIRCUIT

| | FAULT CURRENT (A) | R (PU) | X (PU) |
|---|---|---|---|
| MAXIMUM | 588.064 | 1.802 | 2.368 |
| MINIMUM | 575.981 | 1.809 | 2.440 |

B

1-PHASE EARTH FAULT

| | FAULT CURRENT (A) | R1 (PU) | X1 (PU) | R0 (PU) | X0 (PU) | TOTAL R (PU) | TOTAL X (PU) |
|---|---|---|---|---|---|---|---|
| MAXIMUM | 358.630 | 1.802 | 2.368 | 2.678 | 8.484 | 6.281 | 13.219 |
| MINIMUM | 356.167 | 1.809 | 2.440 | 2.680 | 8.443 | 6.298 | 13.232 |

UPSTREAM PROTECTION SETTINGS (ENB 617 CB)

| IDMT OVER CURRENT | | | | | IDMT EARTH FAULT | | | |
|---|---|---|---|---|---|---|---|---|
| CIRCUIT | PICKUP (A) | TMS | HIGH-SET | CURVE | PICKUP (A) | TMS | CURVE | TRIPS TO LOCKOUT |
| ENB 617 | 100 | 0.32 | N/A | SI | 25 | 0.3 | SI | 1 |

THERE SHALL BE A MIN. MARGIN OF 0.3 SECONDS BETWEEN THE CURVES AT THE MAX. FAULT LEVEL FOR THESE SETTINGS, & THE CURVES BEING PROPOSED FOR THE CUSTOMER SETTINGS

## WESTERN POWER SCOPE OF WORKS

1. REPLACE POLE S519254 WITH NEW 12.5m SSP2 POLE.
   INSTALL HV TERMINATION XARM.
   INSTALL RUNNING EARTH TERMINATION.
   INSTALL 19/2.75 OUTRIGGER STAY.
   CU: PO18 x 1, HV5 x 1, CN1 x 3, RE3 x 1, ST4 x 1
   DCSH: H09-1, R14-2
2. INSTALL WESTERN POWER'S OUTDOOR HV 3+0 SWITCHGEAR, INCLUDING NON STANDARD METERING UNIT, TO NON STANDARD DSM-3-23V AS NOTED ON THE DRAWING (SHEET 2 & EDM#58696421).
   INSTALL 33kV 185HV CABLE FROM SWITCHGEAR TO HV METERING UNIT.
   INSTALL 33kV 185HV FROM HV METERING UNIT TO CUSTOMER CMS.
   INSTALL DEAD END RECEPTICAL TO SWITCHGEAR SPARE SWITCH.
   CU: HU100 x 1, HU76 x 1, HM1 x 1, CN48 x 25m, CN73 x 6, HU67 x 3
   NCU: XA2500 x 1
   DCSH: DSM-3-23V
3. INSTALL 33kV 185HV CABLE FROM POLE S519254 CABLE TO NEW 3+0 RMU.
   CU: CN48 x 125m, CN73 x 3
4. ⚠ IDENTIFIES POSITION WHERE CABLE MARKERS ARE TO BE INSTALLED. EACH MARKER IS TO BE VISIBLE FROM THE NEXT WITH A MAXIMUM SPACING BETWEEN MARKERS OF 150m.
   CU: CN64 x 3
5. TERMINATE 2 x 33kV 185HV CABLE TO NEW 3+0 RMU.
6. TERMINATE 2 x 33kV 185HV CABLE TO HV METERING UNIT.
7. TERMINATE 33kV 185HV CABLE TO POLE S519254.
   CU: HU18 x 1, CN9 x 3, CN70 x 3
   DCSH: H09-1
8. REMOVE EXISTING LV METER NO: 0413002327 FROM THE CUSTOMER'S SWITCHBOARD.
9. REMOVE EXISTING AERIAL CONDUCTORS BETWEEN POLE S2010011 AND S519254 IN CONJUCTION WITH CUSTOMER ELECTRICAL CONTRACTOR.
10. ENVIRONMENTAL FILTER CHECKED
    THE FOLLOWING ENVIRONMENTAL ISSUES HAVE BEEN IDENTIFIED FOR THIS PROJECT:
    - CONDITIONS OF NATIVE VEGETATION CLEARING PERMIT
      THE CUSTOMER IS RESPONSIBLE FOR OBTAINING A CLEARING PERMIT AND PROVIDE A COPY OF PERMIT TO WESTERN POWER.
    - A NOTIFICATION OF WORKS (EDM 34174076) SHALL BE SUBMITTED TO THE RELEVANT LOCAL GOVERNMENT AUTHORITY AT LEAST 10 DAYS BEFORE WORKS COMMENCE IN A LOCAL ROAD RESERVE (EXCLUDING INSPECTIONS).

B

## NOTE TO CONSTRUCTION MANAGER

(i) NON-STANDARD METERING UNIT TO BE INSTALLED.
ITEM CODE: XA2500

## CUSTOMER SCOPE OF WORKS

(A) THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE WESTERN AUSTRALIAN SERVICE AND INSTALLATION REQUIREMENTS.

(B) SUBSTATION TO BE DESIGNED TO MINIMUM DIMENSIONS SHOWN ON THE DRAWING AND IN-CONJUNCTION WITH WESTERN POWER'S DRAWING DSM-3-23V EDM58696421.

(C) SUBSTATION SITE WILL BE PREPARED AS PER THE WESTERN AUSTRALIAN SERVICE AND INSTALLATION REQUIREMENTS CLAUSE 14.4.6. THIS INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING:

1. PEGGING. COMPACTION AND LEVELLING. A COMPACTION CERTIFICATE IS REQUIRED.

2. LOCATED 500mm ABOVE 100 YEAR FLOOD LEVEL AND NOT IN A PRECARIOUS POSITION.

3. CLEAR OF ALL SERVICES INCLUDING ENCROACHMENT.

4. CLEAN SAND FILL TO A DEPTH OF 1.2m. EXCAVATIONS GREATER THAN 1.5m TO BE IN ACCORDANCE WITH THE EXCAVATION CODE OF PRACTICE.

(D) IF THE CUSTOMER PROPOSES TO INSTALL SCREENING, APPROVAL SHALL BE OBTAINED FROM WESTERN POWER PRIOR TO ITS INSTALLATION. THE SCREENING SHALL BE INSTALLED ONLY AFTER WESTERN POWER HAS COMPLETED ALL OF THE WORK ON THE SUBSTATION SITE. REFER TO THE WESTERN AUSTRALIAN SERVICE AND INSTALLATION REQUIREMENTS CLAUSES 14.4.10.3.2, 14.4.11 AND 14.5.4 FOR DETAILS.

(E) NO BUILDINGS ALLOWED WITHIN 6m OF THE SUBSTATION UNLESS 2 HOUR FIRE RATED. SEE WESTERN POWER DRAWING DSM-5-01 FOR DETAILS.

(F) CUSTOMER MUST COMPLY WITH POWER QUALITY LIMITS AS PER AS/NZS TS IEC 61000.3.5 AND WESTERN POWER TECHNICAL REQUIREMENTS.

(G) WESTERN POWER MUST RECEIVE A HV SUBMISSION FROM THE CUSTOMER AND APPROVE THE NETWORK CONNECTION PRIOR TO INSTALLATION OF THE CUSTOMER'S EQUIPMENT, AS PER WAER CLAUSE 7 AND THE WESTERN AUSTRALIAN SERVICE AND INSTALLATION REQUIREMENTS CLAUSE 13.7.2.

(H) THE CUSTOMER'S EQUIPMENT MUST BE RATED FOR 33,000 VOLTS, WHICH IS THE HV DISTRIBUTION VOLTAGE IN THIS AREA. THE CUSTOMER'S INSTALLATION MUST BE DESIGNED TO WITHSTAND WITHOUT DAMAGE THE MAXIMUM CURRENTS WHICH MAY FLOW THROUGH IT UNDER FAULT CONDITIONS AS PER THE WESTERN AUSTRALIAN SERVICE AND INSTALLATION REQUIREMENTS CLAUSE 10.6.2.

(I) THE CUSTOMER MUST MEET THE REQUIREMENTS OF THE WESTERN AUSTRALIAN SERVICE AND INSTALLATION REQUIREMENTS CLAUSE 11.6.4.6 - ADDITIONAL REQUIREMENTS FOR HIGH VOLTAGE CONNECTIONS.

(J) CUSTOMER ELECTRICAL CONTRACTOR IS TO SUPPLY SUITABLE TERMINATION MATERIALS AND MAKE CONNECTION TO THE CUSTOMER'S HV SWITCHGEAR.

(K) CUSTOMER MAIN SWITCH (CMS) SWITCHGEAR IS REQUIRED TO BE A CIRCUIT BREAKER WITH AN INTEGRATED EARTH SWITCH.

B

(L) CUSTOMER TO REMOVE POLE S2010011 AND ALL ASSOCIATED EQUIPMENT AFTER THE DE-ENERGIZATION OF THE POLE S2010011 RECLOSER AND REMOVAL OF AERIAL CONDUCTOR BETWEEN POLE S2010011 AND POLE S519254.

(M) CUSTOMER IS RESPONSIBLE FOR OBTAINING A NATIVE VEGETATION CLEARING PERMIT AND REMOVING VEGETATION PRIOR TO THE COMMENCEMENT OF WORKS. REFER TO THE ENVIRONMENTAL DRAWING (SHEET 3) FOR MORE DETAILS.

CUSTOMER CONTACT DETAILS
COMPANY NAME: DEPARTMENT OF TRANSPORT
CONTACT: WILLIAM HAYES TEL: 0467 900 648

| Rev. | REVISIONS | DRN | DATE | REFERENCE FILE DETAILS |
|---|---|---|---|---|
| | | | | DESIGN DRAWING EDM: 59073549 |
| B | CHANGE IN FAULT LEVELS AND SCOPE OF WORKS NOTES | A.B | 04/22 | ENVIRONMENT ADVICE EDM: 59062348 |
| A | APPROVED FOR CONSTRUCTION | A.B | 03/22 | HAZARD MANGEMENT REGISTER DM: 59063975 |

# 33kV SUPPLY RELOCATION

## NETWORK VOLTAGES 33kV

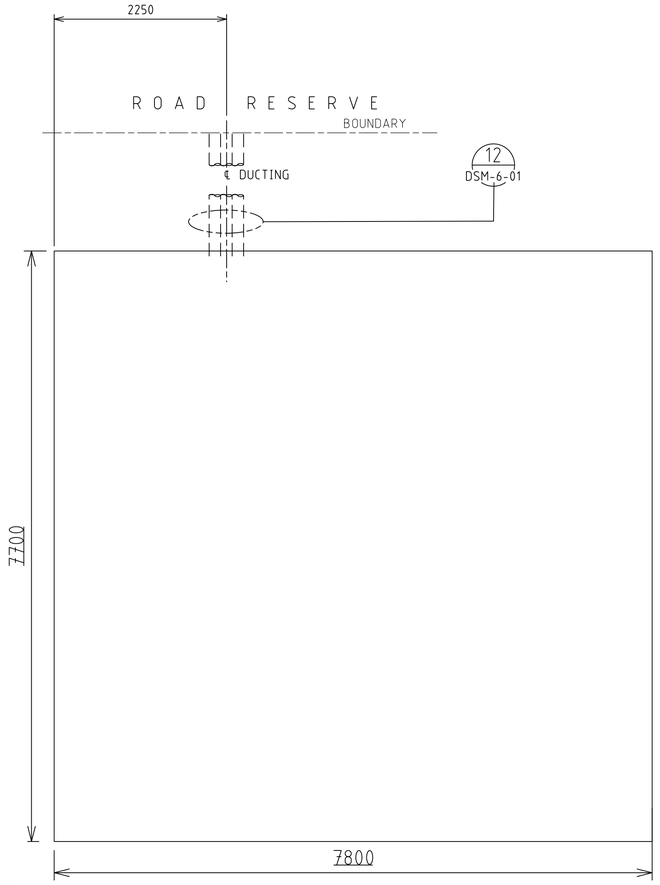
HARBOUR DRIVE, JURIEN BAY WA

DESIGN DRAWING

westernpower

DESIGNER: CUSTOMER CONNECTION DESIGN
TEL: 13 10 87
DATE: 04/22 SCALE: @ A1
GEO REF: Lat. - 30°17'12" S
Long. - 115°02'49" E

DRAWING NUMBER
NP030721
SHEET 01 OF 03
REV: B ORIGINAL SIZE - A1



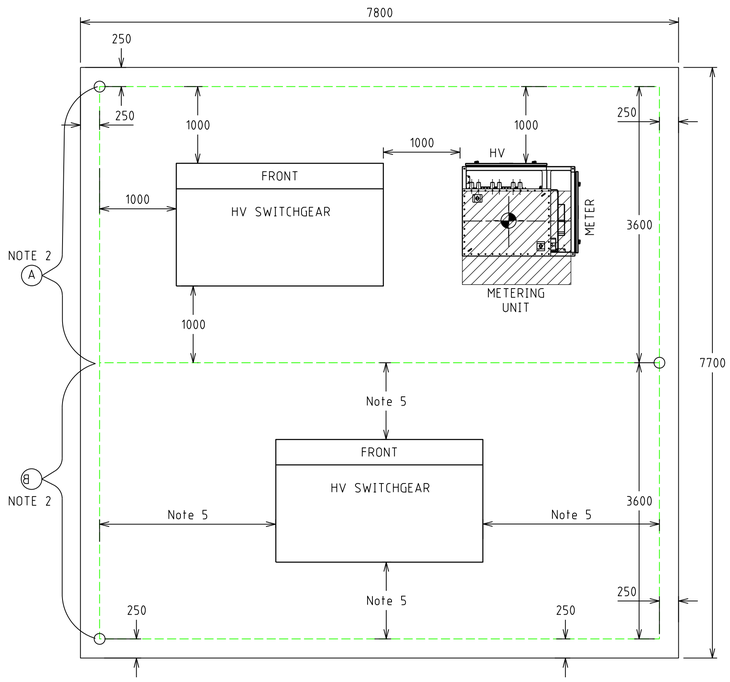

NOTES:-
1. DUCTING REQUIRED IF LAND REQUIREMENT IS SET BACK FROM ROAD RESERVE BOUNDARY.
2. 4 - 150 ID HEAVY DUTY DUCTING. SEE DSM SECTION 6 FOR DETAILS

APPROVED DESIGN VARIATION JOB No: NP030721
SIGNED BY: DATE:
SIGNED BY: DATE:

| REV | DATE | DESCRIPTION | DRGD | CHKD | CHKD |
|---|---|---|---|---|---|
| A | 11/21 | ORIGINAL ISSUE | AB | CK | MM |

TITLE: 33kV CUSTOMER OWNED SUBSTATION HV OUT DOOR GROUND MOUNTED SWGR CIVIL AND LAND REQUIREMENTS

DISTRIBUTION SUBSTATION MANUAL — westernpower
DRAWN AB DATE 11/21 | ORIGINATED | SCALE NTS | CHECKED | APPROVED –
DRG No DSM-3-23V
REV A SHT 1/3



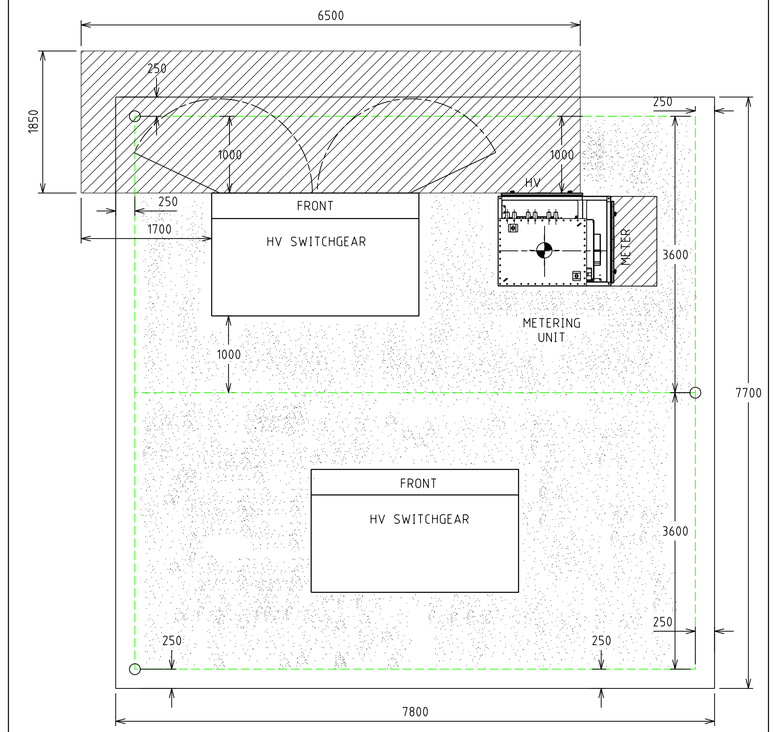

NOTES:-
1. THIS INSTALLATION IS ONLY SUITABLE FOR LOADS UP TO AND INCLUDING 4 MVA
2. SECTION A EARTHING IS TO BE INSTALLED BY WPC, SECTION B EARTHING TO BE INSTALLED BY CUSTOMER AND CONNECTED TO WPC EARTH GRID
3. IF WPC AND THE CUSTOMER HV EQUIPMENT IS BEING INSTALLED SIMULTANEOUSLY, THE CUSTOMER IS RESPONSIBLE FOR INSTALLING ALL OF THE EARTH GRID.
4. CUSTOMERS MAIN SWITCH TO HAVE INTEGRAL EARTH SWITCH THAT IS USED UNDER A CUSTOMER AND WESTERN POWER OPERATING AGREEMENT
5. CUSTOMER TO DESIGN TO ENSURE COMPLIANCE WITH AS2067.

APPROVED DESIGN VARIATION JOB No: NP030721
SIGNED BY: DATE:
SIGNED BY: DATE:

| REV | DATE | DESCRIPTION | DRGD | CHKD | CHKD |
|---|---|---|---|---|---|
| A | 11/21 | ORIGINAL ISSUE | AB | CK | MM |

TITLE: 33kV CUSTOMER SUBSTATION HV OUTDOOR GROUND MOUNTED SWGR EQUIPMENT & INSTALLATION DETAILS

DISTRIBUTION SUBSTATION MANUAL — westernpower
DRAWN AB DATE 11/21 | ORIGINATED | SCALE NTS | CHECKED | APPROVED –
DRG No DSM-3-23V
REV A SHT 2/3




MINIMUM CLEARANCE REQUIRED FOR EARTHING PURPOSES.

CLEARANCE REQUIRED FOR OPERATIONAL PURPOSES

NOTES:-
1. DESIGNER TO ENSURE SAFE ACCESS AND EGRESS ROUTES ARE PROVIDED
2. WHERE THE SITE IS SET BACK FROM THE STREET CRANE ACCESS IS REQUIRED OPERATIONAL AND EARTHING CLEARANCES AROUND CUSTOMER EQUIPMENT IS NOT SHOWN. DESIGNER TO WORK WITH CUSTOMER TO DETERMINE CLEARANCES BASED ON TYPE OF EQUIPMENT SELECTED.
3. CLEARANCES TO BE USED FOR EARTHING STUDY / CALCULATION OF TOUCH VOLTAGES (WITH DOORS CLOSED)

APPROVED DESIGN VARIATION JOB No: NP030721
SIGNED BY: DATE:
SIGNED BY: DATE:

| REV | DATE | DESCRIPTION | DRGD | CHKD | CHKD |
|---|---|---|---|---|---|
| A | 11/21 | ORIGINAL ISSUE | AB | CK | MM |

TITLE: 33kV CUSTOMER OWNED SUBSTATION HV OUTDOOR GROUND MOUNTED SWGR OPERATIONAL CLEARANCES

DISTRIBUTION SUBSTATION MANUAL — westernpower
DRAWN AB DATE 11/21 | ORIGINATED | SCALE NTS | CHECKED | APPROVED –
DRG No DSM-3-23V
REV A SHT 3/3

CUSTOMER CONTACT DETAILS
COMPANY NAME: DEPARTMENT OF TRANSPORT
CONTACT: WILLIAM HAYES TEL: 0467 900 648

| Rev. | REVISIONS | DRN | DATE |
|---|---|---|---|
| B | CHANGE IN FAULT LEVELS AND SCOPE OF WORKS NOTES | A.B | 04/22 |
| A | APPROVED FOR CONSTRUCTION | A.B | 02/22 |

REFERENCE FILE DETAILS
DESIGN DRAWING EDM: 59073549
ENVIRONMENT ADVICE EDM: 59062348
HAZARD MANGEMENT REGISTER DM: 59063975

# 33kV SUPPLY RELOCATION

## NETWORK VOLTAGES 33kV

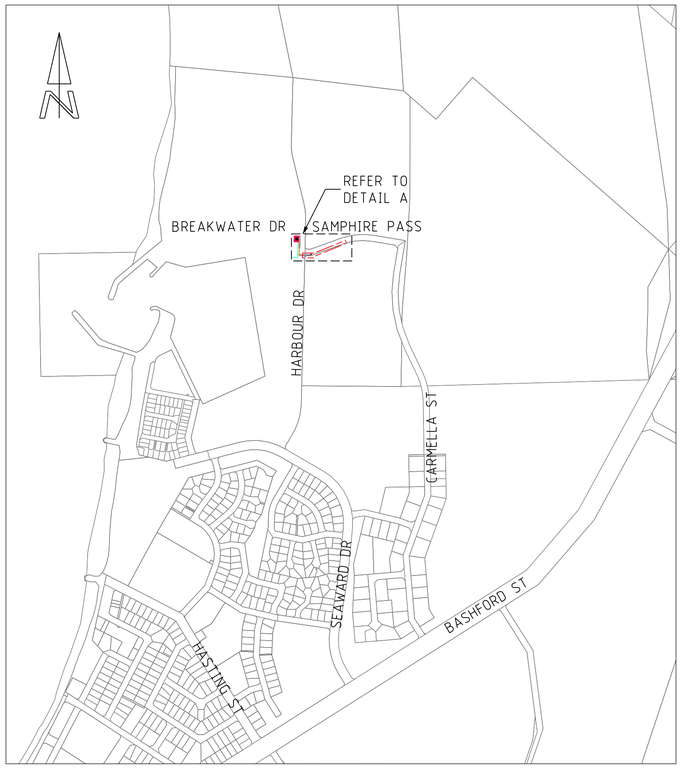
HARBOUR DRIVE, JURIEN BAY WA

DESIGN DRAWING

westernpower
DESIGNER: CUSTOMER CONNECTION DESIGN
TEL: 13 10 87
DATE: 02/22 | SCALE: A1
GEO REF: Lat. - 30°17'12" S Long. - 115°02'49" E

DRAWING NUMBER
NP030721
SHEET 02 OF 03
REV: B | ORIGINAL SIZE - A1

DRAFT DESIGN DRAWING




200 100 0 200 400 600 800

1:10,000

LOCATION PLAN

5 2.5 0 5 10 15 20

1:250

DETAIL 'A'

CLEARING PERMIT AREA

NO NATIVE VEGETATION MAY BE DISTURBED WITHOUT A PERMIT OR OUTSIDE OF THE PERMIT AREA. IF IN DOUBT, PLEASE CONTACT THE RELEVANT MANAGER WHO WILL CONTACT WESTERN POWER ENVIRONMENTAL TEAM.

PLEASE NOTE: HEAVY PENALTIES MAY APPLY TO INDIVIDUALS AND BUSINESSES FOR DAMAGE TO NATIVE VEGETATION WITHOUT A PERMIT.

## LEGEND

**HV CABLES**

- CN53 - 400mm2 (3X1c)
- CN49 - 240mm2 (3X1c)
- CN48 - 185mm2 (3X1c)
- CN50 - 95mm2 (3X1c)
- CN51 - 50mm2 (3X1c)
- CN51 - 50mm2 (1c)
- CN46 - 35mm2 (3X1c)
- CN47 - 35mm2 (1c)
- EXISTING HV CABLES (SIZE AND TYPE INDICATED)

**OH EQUIPMENT**

- INTERMEDIATE
- PTS
- DOF
- HV ISOLATOR
- INLINE STRAIN
- LV DISCONNECTOR
- PTT
- ISOL TX
- AERIAL STAY
- OUTRIGGER STAY
- RECLOSER
- GROUND STAY
- LOAD BREAK SWITCH
- SECTIONALISER
- CAPACITOR
- LV ABC KRONE
- LBPTS
- STREETLIGHT BOX

**HV - AERIAL CONDUCTORS**

- 19/3.25 AAC/AAAC
- 7/4.75 AAC/AAAC
- 7/2.5 AAC/AAAC
- 3/2.75 SCAC
- 6/1/3.00 AACSR/AC
- 150 HENDRIX
- EXISTING HV CONDUCTORS (SIZE AND TYPE INDICATED)

## VEGETATION INSTRUCTION

With regard to your requested works, it has been identified by Western Power that clearing or potential clearing is required to facilitate the connection.

The Department of Water and Environmental Regulation (DWER) administers the clearing provisions of the Environmental Protection Act 1986 (EP Act). Clearing of Native vegetation is an offence unless it is done under the authority of a clearing permit of an exemption applies. Note there are some circumstances where exemptions are granted. Advice on relevant exemptions can be obtained via DWER's Guide 1- Exemptions and Regulations for Clearing Native Vegetation and clarification can be sought via emailing DWER directly via info@DWER.wa.gov.au.

Detail A shows the area of 330m2, which a clearing permit is required to allow the work to proceed. The area is defined as the operational potential impact in performing the works. The permit allows for inadvertent destruction of vegetation but is not required to be cleared by the customer prior to works commencing.

To assist in the above task, when the clearing is to be across multiple properties, which are third party to yourself, including road reserve, Western Power recommends that a Purpose Permit (Form C2) be submitted to DWER (found via www.dwer.wa.gov.au under the clearing permit tab). Please attach this sheet which should contain the relevant information to fill out the form. The application cost for a Purpose Permit starts from $2400 subject to the permit area required. You will also be required to obtain approval from the relevant land owners/LGA. Typically a response may take up to 60 working days dependant on the environmental impact.

Please note that DWER may identify that the clearing has significant impacts and there may be additional requirements before or after DWER issue a clearing permit that may impact the delivery date. These may include flora or fauna survey requirements and hygiene management plans.

Please ensure you provide Western Power with a copy of the signed clearing permit to the construction manager as soon as practicable for review and suitability confirmation. Further relevant and supporting information is available via DWER's website. If you have any questions, please contact your allocated designer.

CUSTOMER CONTACT DETAILS
COMPANY NAME: DEPARTMENT OF TRANSPORT
CONTACT: WILLIAM HAYES TEL: 0467 900 648

| Rev. | REVISIONS | DRN | DATE | REFERENCE FILE DETAILS |
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| | | | | DESIGN DRAWING EDM: 59073549 |
| B | CHANGE IN FAULT LEVELS AND SCOPE OF WORKS NOTES | | | ENVIRONMENT ADVICE EDM: 59062348 |
| A | APPROVED FOR CONSTRUCTION | A.B | 02/22 | HAZARD MANGEMENT REGISTER DM: 59063975 |

# 33kV SUPPLY RELOCATION

NETWORK VOLTAGES 33kV

HARBOUR DRIVE, JURIEN BAY WA

ENVIRONMENTAL DRAWING

westernpower

DESIGNER: CUSTOMER CONNECTION DESIGN
TEL: 13 10 87
DATE: 04/22 SCALE: @ A1
GEO REF: Lat. - 30°17'12" S Long. - 115°02'49" E

DRAWING NUMBER
NP030721
SHEET 03 OF 03
REV: B ORIGINAL SIZE - A1