Western Power's Asset Management System

Distribution Construction Standard Handbook High Voltage Overhead Part 04 (H)

Stakeholder Requirements				
Organisational Objectives				
Asset Management Policy				
ASSET MANAGEMENT FRAMEW	ORK			и
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Performance Management	Risk	Know Asset	Supl	Gov

Original Issue: August 2008 Content Owner/Custodian: Distribution Design and Standards This Revision: 9 – May 2025 Date for Next Review: May 2028

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Document control

Endorsement approvals

	Name	Title	Signature and Date
Compiled by	Nory Cerrado	Distribution Draftsperson	Signature on file
Checked by	Chris Omodei	Principal Engineer	Signature on file
Endorsed by	Ken Tiong	Team Leader	Signature on file
Approved by	Pep Ngwenya	Distribution Design & Standards Manager	Signature on file

Record of revisions

Revision No.	Date	EDM Version	Compiled by	Description
1	09/05/2025	51	Nory Cerrado	First Revision with new Format and 3 yearly review

This document gives direction to and influences the following documents.

Doc	Title of document
ALL CHAPTERS	DDC - DISTRIBUTION DESIGN CATALOGUE
ALL CHAPTERS	DCSH - DISTRIBUTION CONSTRUCTION STANDARD HANDBOOK
ALL CHAPTERS	DSPM - DISTRIBUTION SUBSTATION PLANT MANUAL

Stakeholders (people that were consulted when document was updated)

Business Unit / Function

Asset Management - Asset Performance

Asset Management - Safety Environment Quality and Training

Asset Management - Grid Transformation

Asset Operations – Network Operations

Asset Operations – Operational Services

Asset Operations - Customer Connection Services

Business and Customer Service - Customer Service

Notification list (people to be notified when document is updated)

Business Unit / Function

Asset Management - Asset Performance

Asset Management – Safety Environment Quality and Training

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Business and Customer Service - Customer Service

This document must not be made available to personnel outside Western Power without the prior written approval of Western Power.



Document classification and hierarchy

A key requirement of the Western Power Asset Management Policy (AMP) is to develop and maintain an Asset Management System (AMS). This Distribution Substation Plant Manual is defined as a technical document within the AMS document classification and structure and sits within the planning and Program Delivery components of the AMS.

The AMS and the interrelationships between the collection of documents, tools and systems that are used for asset management are described in the AMS document EDM# <u>40304923</u>.

Stakeholder Requirements				
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Asset Management Policy				
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Performance Management	Ri	A		



General Notes

Clearances of conductors from ground, other structures and other conductors shall be undertaken in accordance with Western Power's Overhead Line Design Standard.

HV Insulated Taps are to be used where wildlife protection against contact with earth or another phase is required, using either –

- 1) LVABC may be used for connection to for mounted transformers and cable heads supplying ground mounted transformers,
- 2) For all other applications, use a conductor to match the conductors being joined, and fit this conductor with grey flexible hose with drain holes cut at the bottom of the drip loops to drain moisture.

Pole strength and height selections for poles <u>without</u> pole top plant shall be determined as per Poles 'n' Wires assessments, unless stated otherwise under the specific DCSH reference.

In general, the following rules apply when selecting pole strengths <u>with</u> pole top plant, unless stated otherwise under the specific DCSH references:

- For 315kVA Pole Top Transformers: use 8kN poles
- For single phase Pole Top Transformers: use 4kN poles as minimum
- For all other pole top plant and pole top switches: use 6kN poles as a minimum

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Drawing Register

Number	Revision	DESCRIPTION
H01-1	Ι	3 PHASE INTERMEDIATE WITH RUNNING EARTH
H01-3	L	3 PHASE INTERMEDIATE ANTI-SWAN CROSSARM GUIDE
H01-4	С	3 PHASE INTERMEDIATE DOUBLE CROSS-ARM
H02-1	Е	3 PH INTERMEDIATE 1 PH TEE-OFF WITH/WITHOUT DOF
H02-2	А	3 PH INTERMEDIATE 1 PH TEE-OFF WITH/WITHOUT DOF ALT. MAIN RE
H03	F	4 WAY INTERMEDIATE
H04-1	Ι	HORIZONTAL TERMINATION
H04-2	С	HORIZONTAL TERMINATION – ANTI-SWAN CROSS-ARM
H04-3	В	DOUBLE TERMINATION AND 1 PH T-OFF WITH DOF
H05-1	Е	STRAIN ANGLE WITH OR WITHOUT DROPOUT FUSE
H05-2	С	STRAIN ANGLE UPTO 30° DEVIATION - DOUBLE ANTI-SWAN CROSS-ARM
H05-3	В	STRAIN ANGLE ANTI SWAN CROSS-ARM – LONG BAY
H05-4	А	3Φ x 3 POLE LONG BAY SOLUTION FOR ANGLE DEVIATION UPTO 45°
H05-5	А	3Φ IN-LINE STRAIN WITH TEE OFF
H06	L	RUNNING DISC ANGLE OR VERTICAL TERMINATION (900mm SPACING)
H07	Н	RUNNING DISC ANGLE OR VERTICAL TERMINATION (1200mm SPACING)
H08-1	С	INTERMEDIATE CABLE WITH DROPOUT FUSES
H08-2	D	INTERMEDIATE CABLE WITH DROPOUT FUSES (ALTERNATE CROSSARM)
H08-3	А	INTERMEDIATE CABLE WITHOUT DROPOUT FUSES
H09-1	G	TERMINATION CABLE WITH DROPOUT FUSES UPSTREAM
H09-2	Ε	TERMINATION & CABLE WITH DROPOUT FUSES
H09-3	С	3 PHASE TERMINATION & CABLE WITH FUSED SINGLE-PHASE TEE-OFF
H09-4	А	Termination Cable Single Phase Tx. And DOF
H10-1	К	INTERMEDIATE TRANSFORMER HV TO OPEN AERIAL
H10-2	М	INTERMEDIATE TRANSFORMER HV TO ABC
H11-1	J	IN-LINE TERMINATION TRANSFORMER
H11-2	Н	SIDE MOUNTED TERMINATION TRANSFORMER WITH DROPOUT FUSES
H11-3	С	REMOTE DATA ACQUISITION FOR TX TERMINATION TRANSFORMER STOCK NO.
H12	Е	POLE TOP SWITCH INCLUDING EARTH
H13-1	Е	TEE-OFF WITH DROPOUT FUSES
H13-2	В	TEE-OFF WITHOUT DROPOUT FUSES
H14-1	С	COMBINATION SWITCH & FUSE WITH RAISER (11KV & 22KV) (FLY-OVER SWITCH)
H14-2	В	COMBINATION SWITCH & FUSE
H14-3	D	PTS & FUSES/ISOLATORS LAYOUT FOR 2 CABLES
H17-4	С	TRANSFORMER CABLE SUPPLIED
H18	Ε	TERMINATION POLE TOP SWITCH WITH CABLE AND DROPOUT FUSE
H19	Ε	TERMINATION POLE TOP SWITCH WITH CABLE ARRANGEMENT
H20-1	Ε	ISOLATION TRANSFORMER
H20-2	Е	ISOLATION TRANSFORMER 3PH TERMINATION 1PH IN-LINE WITHOUT 1PH DROPOUT FUSE
H20-3	D	ISOLATION TRANSFORMER 3PH TERMINATION 1PH IN-LINE WITH DROPOUT FUSE
H20-4	D	ISOLATION TRANSFORMER 3PH TERMINATION 1PH IN-LINE WITH/WITHOUT DROPOUT FUSE

Number	Revision	DESCRIPTION
H20-5	F	ISOLATION TRANSFORMER 3PH CABLE/1PH TEE-OFF WITH/WITHOUT DROPOUT FUSE
H20-6	D	ISOLATION TRANSFORMER 3PH IN-LINE/1PH TEE-OFF WITHOUT DROPOUT FUSE
H20-7	D	ISOLATION TRANSFORMER 3PH TERMINATION/1PH CABLE WITH DROP OUT FUSE
H20-8	В	TERMINATION TRANSFORMER 2 PHASE LINE/ 1 PHASE SPUR
H21	D	METERING TRANSFORMER
H22	С	INTERMEDIATE WISHBONE WITH OVERHEAD EARTHWIRE
H23	С	INTERMEDIATE FLAT CONSTRUCTION WITH OVERHEAD EARTHWIRE
H24	С	TERMINATION TRANSFORMER WITH OVERHEAD EARTHWIRE
H25	В	INTERMEDIATE TRANSFORMER WISHBONE CONSTRUCTION
H26-1	С	VERTICAL STRAIN
H26-2	А	INLINE STRAIN WITH OVER HEAD EARTH WIRE
H27	В	WISHBONE CONSTRUCTION WITH TEE-OFF
H28	В	VERTICAL STRAIN ANGLE WITH OVERHEAD EARTHWIRE
H29-1	С	FAULT INDICATOR LV AERIAL SUPPLY ARRANGEMENT
H30	С	SURGE ARRESTOR STANDARD LINE INSTALLATION
H31	F	22kV CAPACITOR BANK WITH 10 kVA TRANSFORMER (SINGLE/DOUBLE BUSHING)
H32	Н	33kV CAP BANK WITH SWITCH AND 10kVA OR 25kVA TRANSFORMER (SINGLE/TWO BUSHING) CONNECTION DETAILS
H33-1	С	INLINE LAYOUT TYPE GE VR-1 50A-100A DETAILS
H33-2	С	INLINE DETAIL TYPE GE VR-1 50A-100A CONSTRUCTION DETAIL
H33-3	А	OFFSET DETAIL TYPE GE VR-1 50A-100A ARRANGEMENT
133-3A	А	OFFSET DETAIL TYPE GE VR-1 50A-100A DETAILS
133-4	А	OFFSET DETAIL TYPE GE VR-1 50A-100A CONSTRUCTION DETAIL
134	А	SHUNT REACTOR
H40-1	F	INTERMEDIATE
140-2	Е	1 PHASE ANTI CLASH / ANTI GALAH INTERMEDIATE
	В	RUNNING DISC OR TERMINATION WITH / WITHOUT TERMINATION
H41-2	D	SINGLE PHASE STRAIN ANGLE
H41-3	А	1 PHASE ANTI CLASH / ANTI GALAH TERMINATION
441-4	А	SINGLE PHASE ANTI CLASH / ANTI GALAH STRAIN
	С	SINGLE PHASE TEE-OFF TO STRAIN WITH OR WITHOUT DROPOUT FUSE
H42-2	А	INTERMEDIATE WITH CABLE TERMINATION
H43	D	TEE OFF WITHOUT DROPOUT FUSE
144-1	Е	DOUBLE TERMINATION
H44-2	В	TRIPLE TERMINATION
	Н	INTERMEDIATE TRANSFORMER WITH OR WITHOUT DROPOUT FUSE
H46-2	А	2Ph IN-LINE 2Ph TRANSFORMER WITH DROPOUT FUSE
H47-1	F	TERMINATION TRANSFORMER WITH OR WITHOUT DROPOUT FUSE
H47-2	F	3 PH INLINE/1 PH TRANSFORMER WITH DROPOUT FUSE
H47-3	C	DOUBLE TERMINATION TRANSFORMER WITHOUT DROPOUT FUSE
H47-4	A	1Ph CABLE TERMINATION TRANSFORMER WITH/WITHOUT DROPOUT FUSE
H48-1	G	TWIN MOUNTED TRANSFORMER (1 PHASE) EACH SIDE OF POLE
H48-2	B	VERTICAL MOUNTED TRANSFORMER (I THASE) EACH SIDE OF FOLE
	В С	EARTH & LV PHASE CONNECTIONS
H49	C	EANTH & LY THAJE CONNECTIONJ

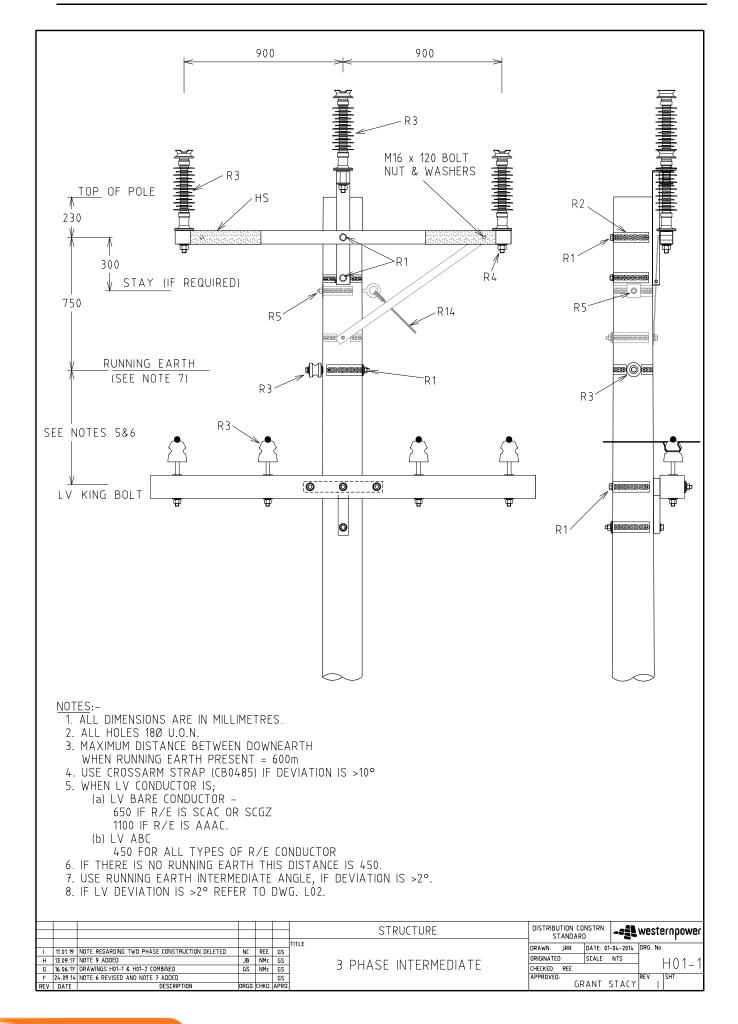
Number	Revision	DESCRIPTION
H50	С	EARTH & LV PHASE CONNECTIONS THREE & FOUR TRANSFORMERS SETUP
H52-1	В	STANDARD DOWN EARTH – RUNNING EARTH
H52-2	А	EXTENDED OR REMOTE DOWN EARTH – RUNNING EARTH
H53	В	1 PHASE IN-LINE STRAIN WITH SECTIONALISER & BYPASS FUSE
H60-4	А	3 PH. RECLOSER / LOAD BREAK SWITCH HV BARE – HV ABC/HENDRIX WITH LV ARIAL SUPPLY
H61-1	F	POLE MOUNTED 3 PH RECLOSER / LOAD BREAK SWITCH WITH BY-PASS SWITCH
H61-2	F	POLE MOUNTED 3 PH RECLOSER / LOAD BREAK SWITCH WITH BY-PASS SWITCH (ARIEL LV SUPPLY)
H63-2	D	1 PHASE RECLOSER / LOAD BREAK SWITCH BY-PASS ISOLATORS/STRAIN TERMINATION WITH SINGLE PHASE TX SUPPLY

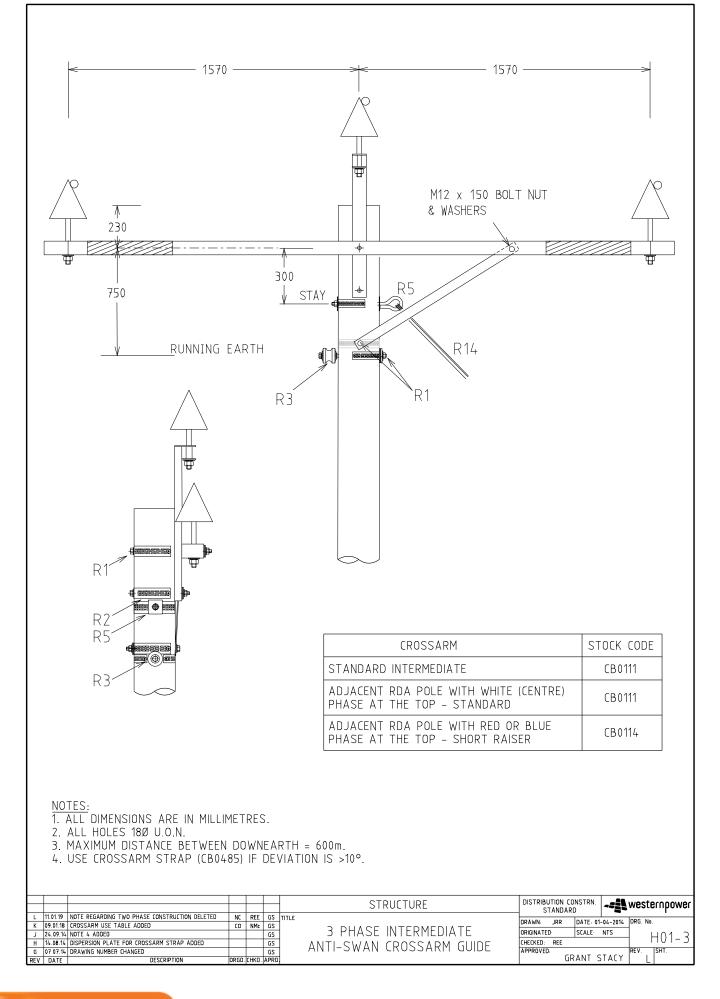
	Drawings	HV HENDRIX
H100	Е	INTERMEDIATE POLE 0 - 2 DEGREES
H101	D	INTERMEDIATE ANGLE POLE 2 – 30 DEGREES
H102	С	INTERMEDIATE ANGLE POLE 31 – 60 DEGREES
H103	D	DOUBLE TERMINATION 61 – 90 DEGREES
H104	В	TERMINATION POLE FOR CABLE CONNECTION
H105	С	INTERMEDIATE TEE-OFF FROM EXISTING COVERED CONDUCTOR WITH DOF DRILLING DETAILS
H106	D	INTERMEDIATE TEE-OFF FROM EXISTING BARE CONDUCTOR WITH D.O.F DRILLING DETAILS
H107	D	INTERMEDIATE POLE CROSSING DRILLING DETAILS
H108-1	В	OPEN AERIAL TO COVERED CONDUCTOR WITH SURGE ARRESTERS
H108-2	С	IN-LINE (0-6°) STRAIN COVERED CONDUCTOR WITH SURGE ARRESTERS
H109	D	PTS COVERED CONDUCTOR TERMINATED MESSENGER WIRE
H110	D	PTS COVERED CONDUCTOR TO OPEN AERIAL
H111	F	INTERMEDIATE TRANSFORMER COVERED CONDUCTOR DRILLING DETAILS
H112	F	TERMINATION TRANSFORMER WITH DROP OUT FUSE DRILLING DETAILS

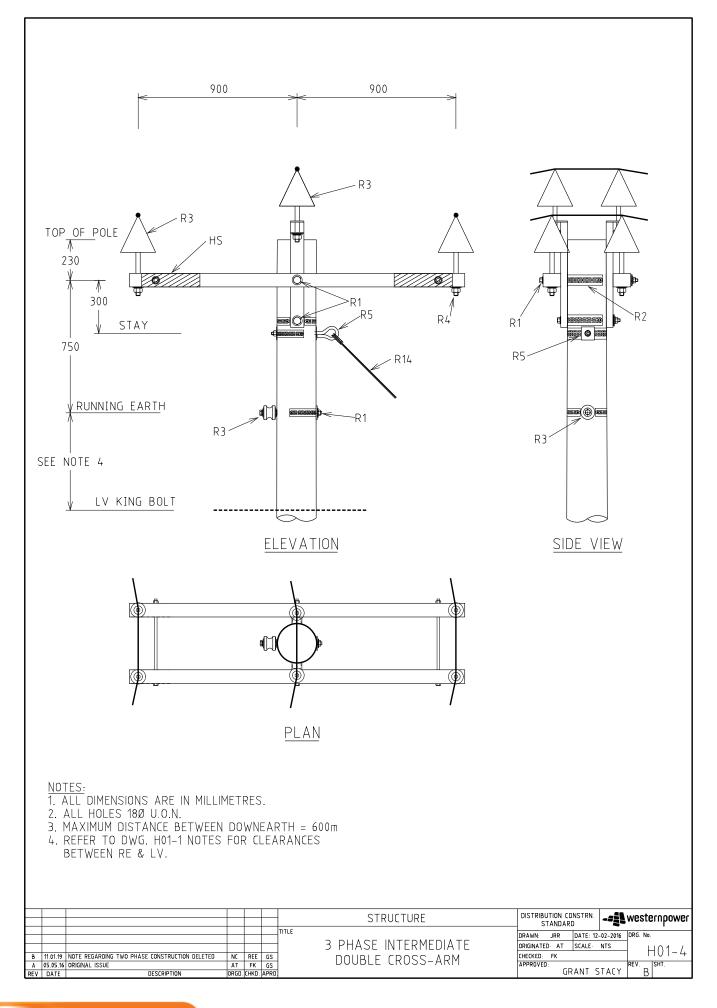


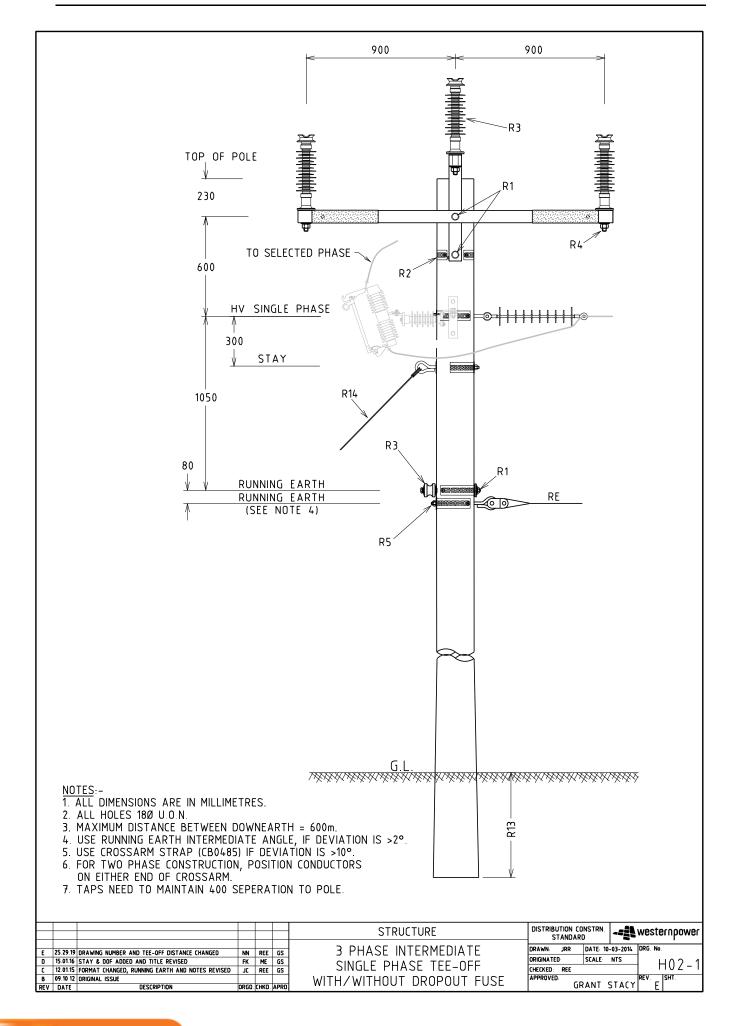
HV BARE

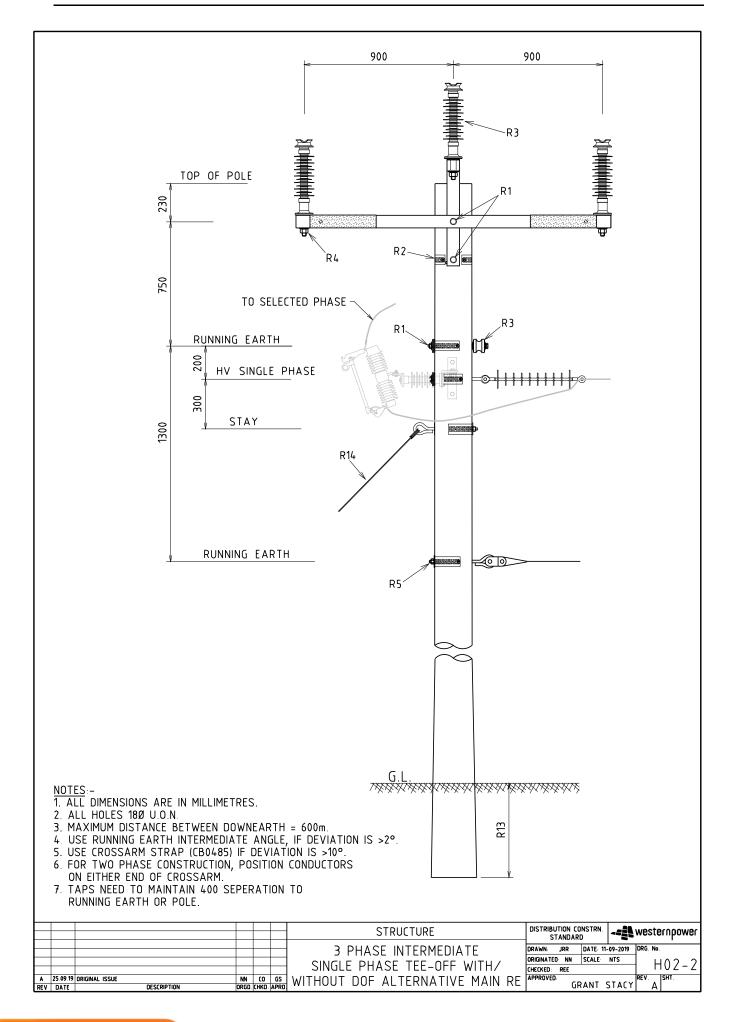


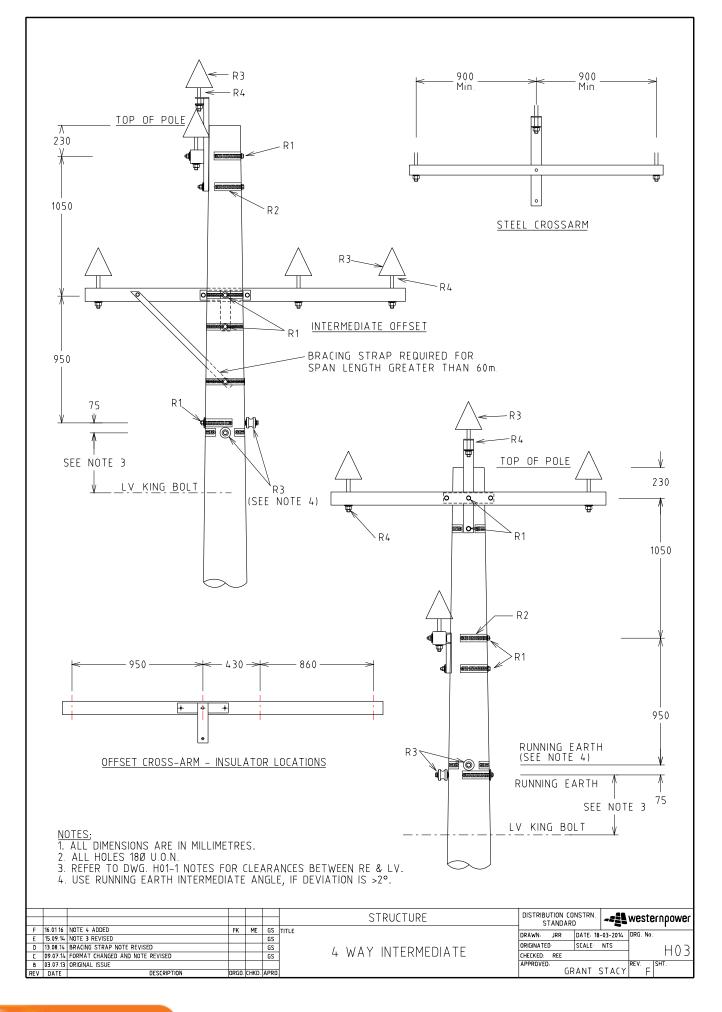


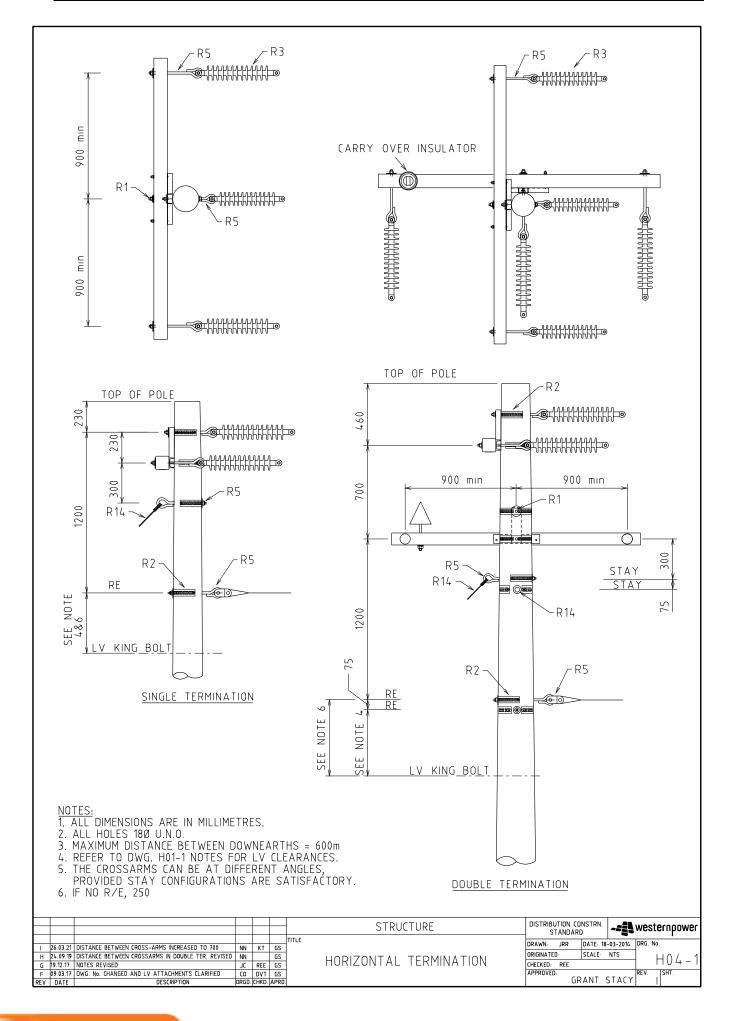


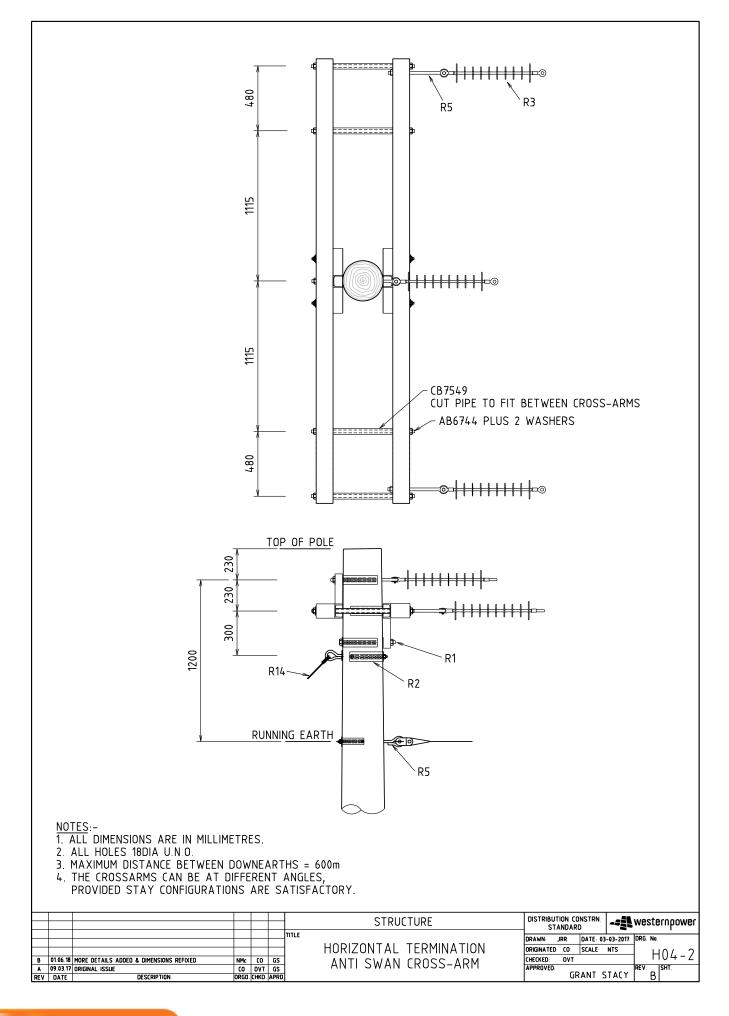


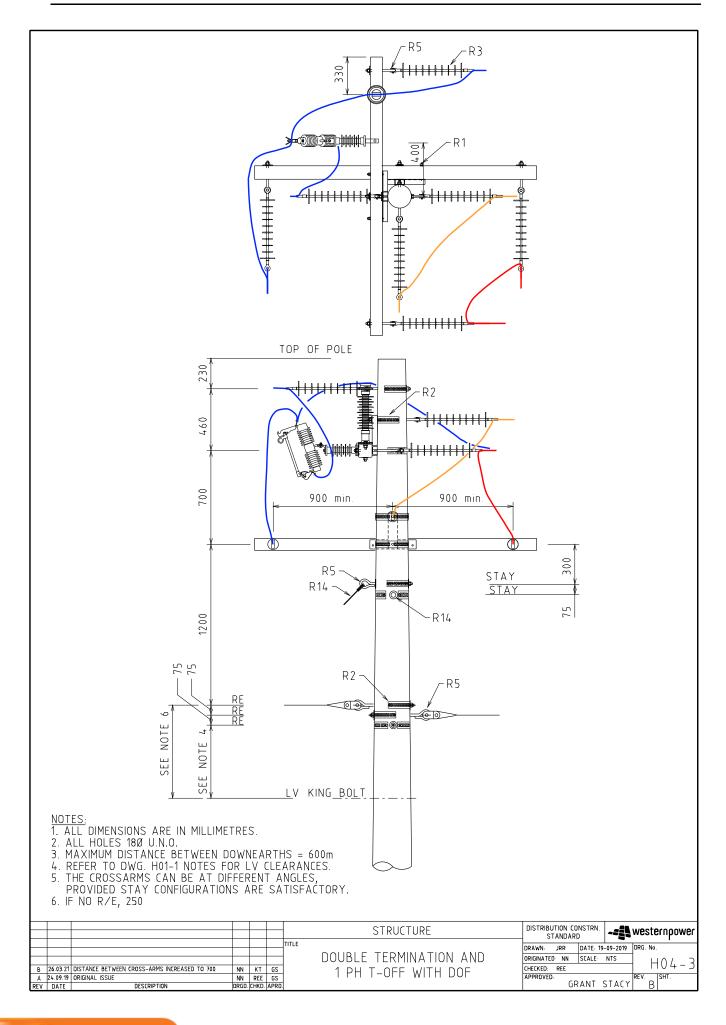


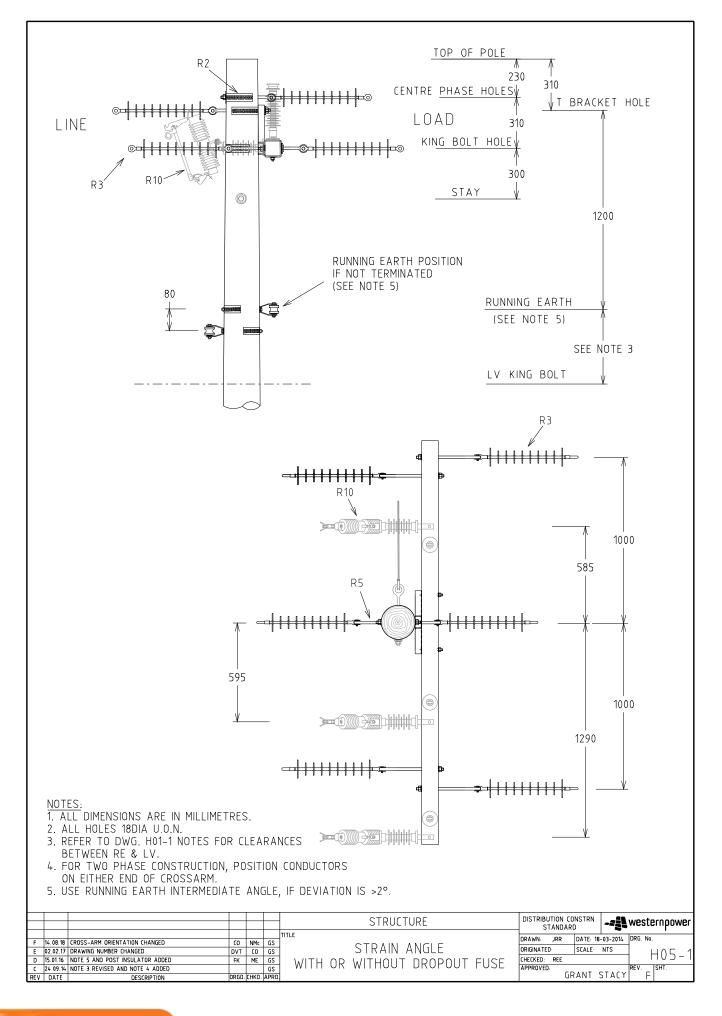




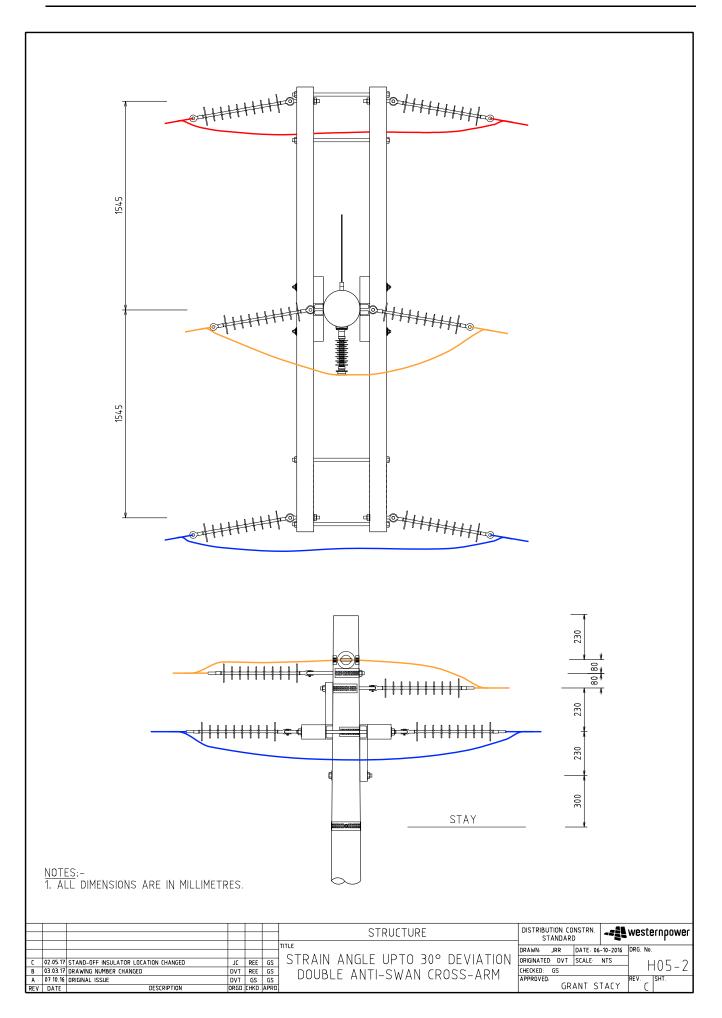


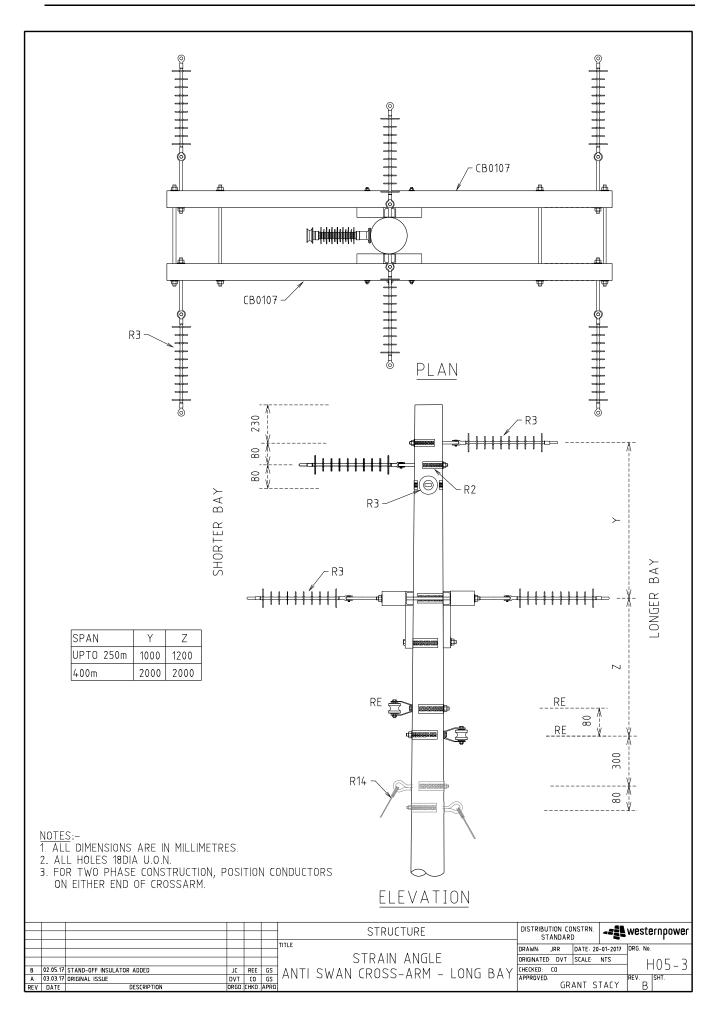


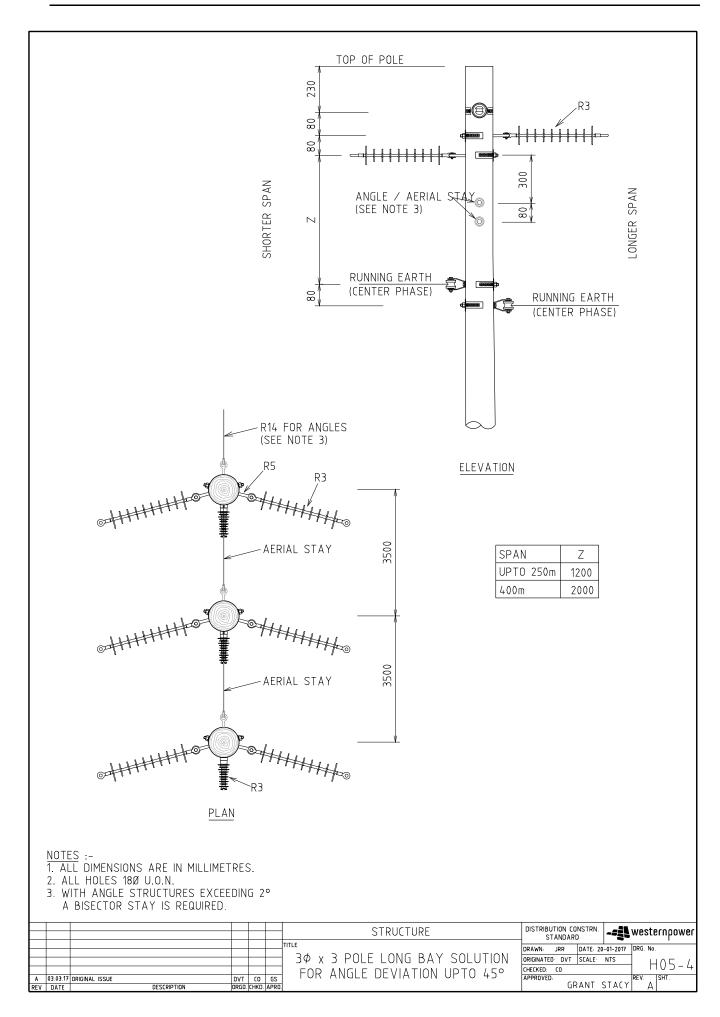


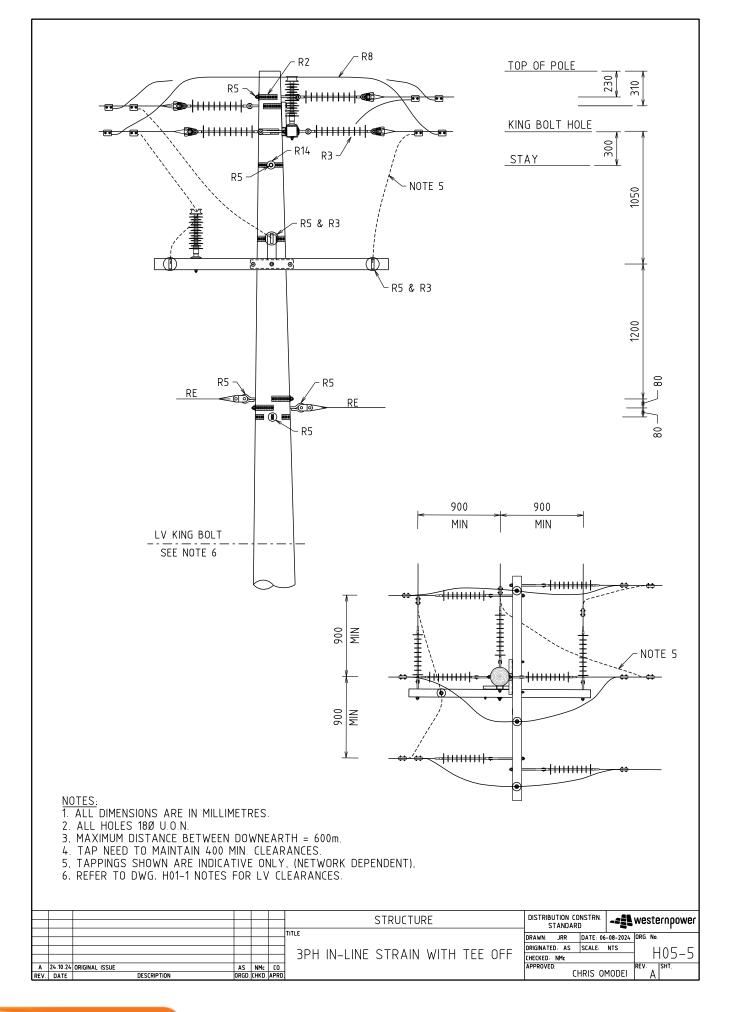


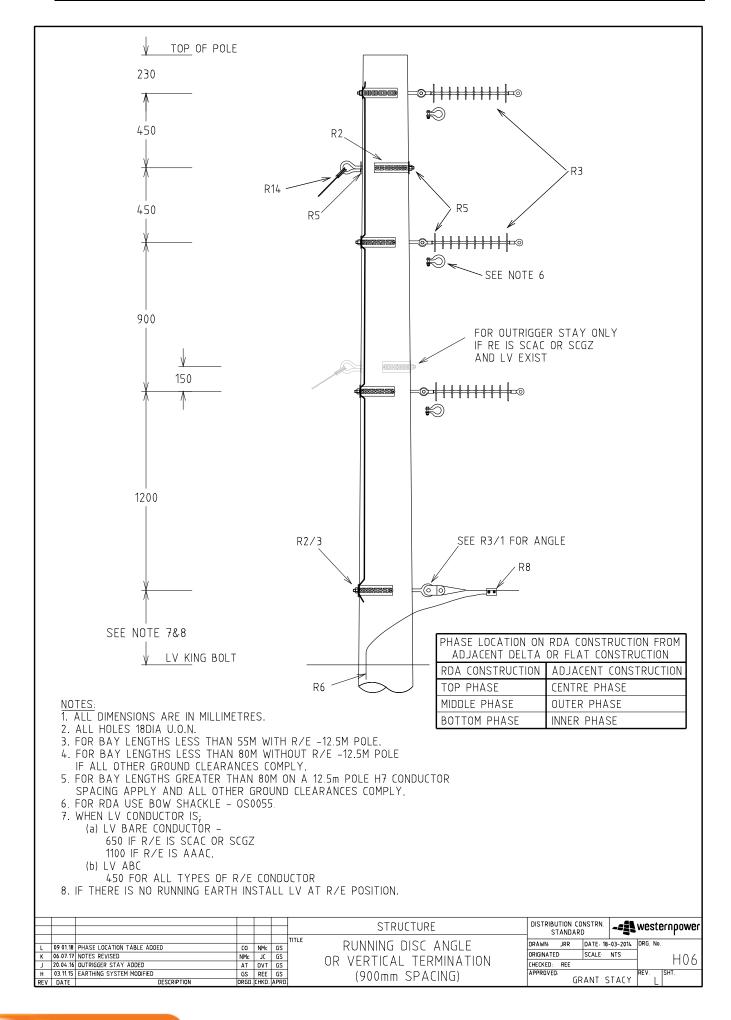


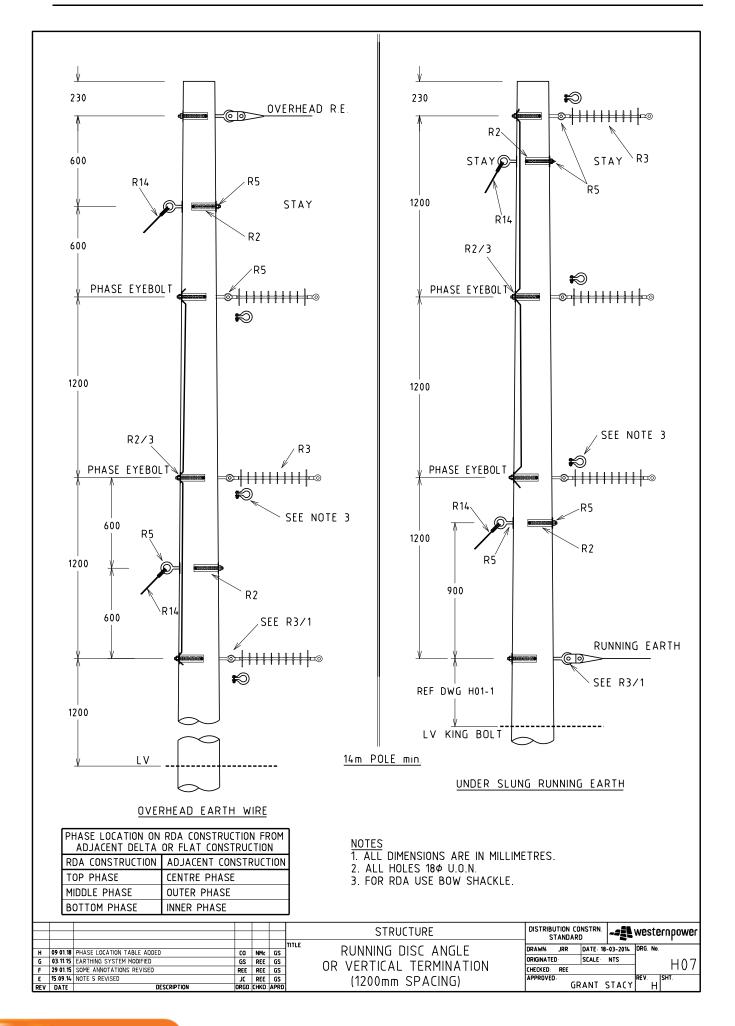


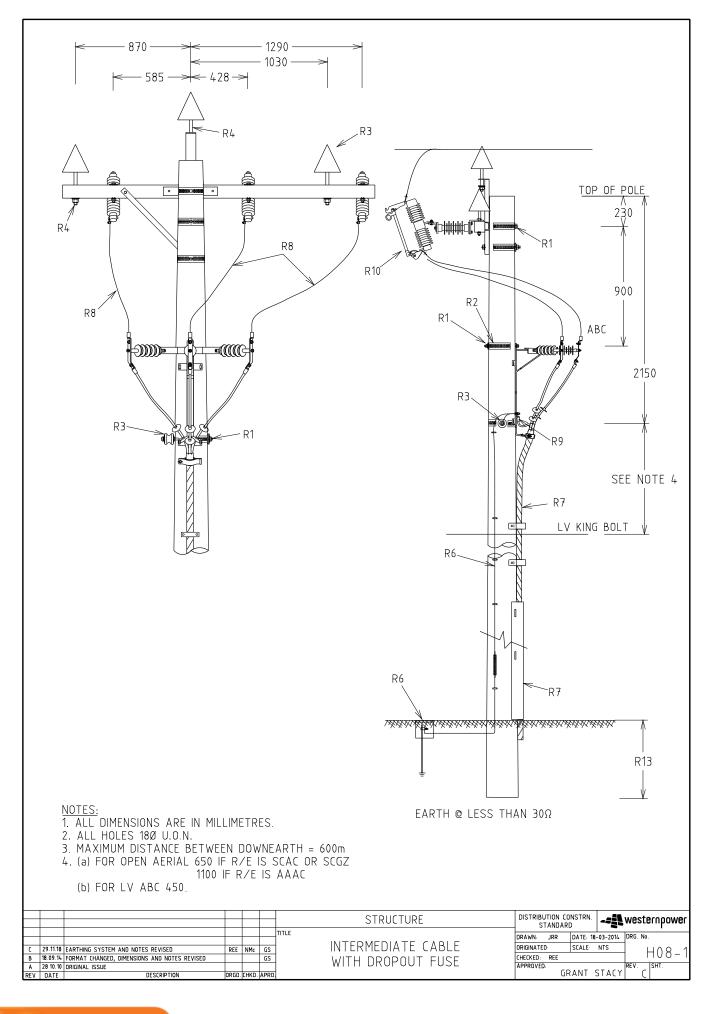


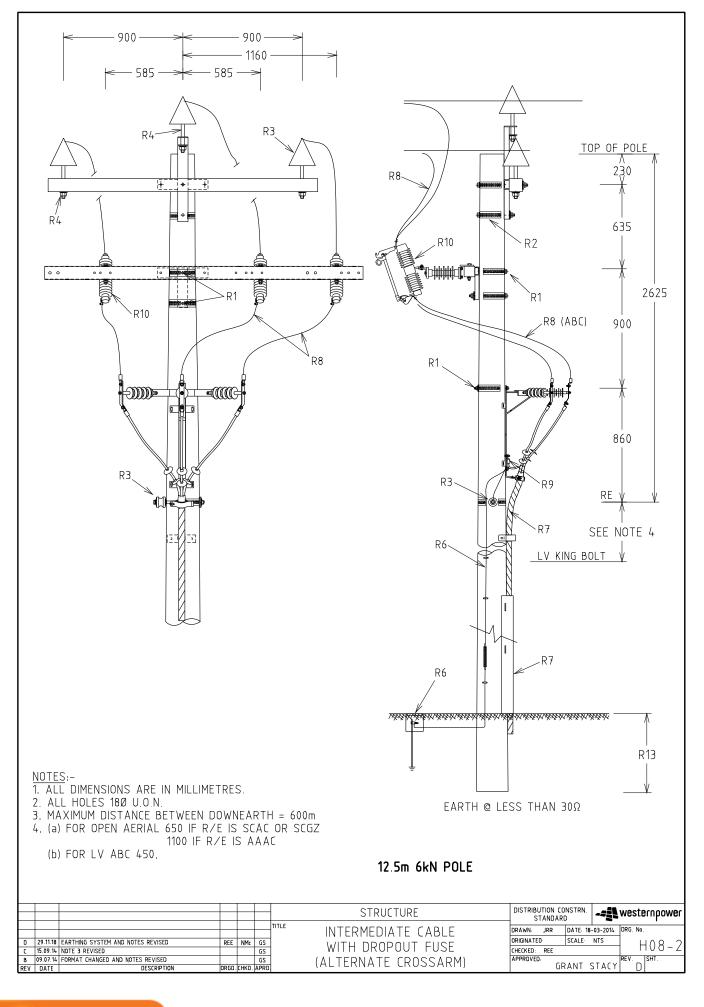


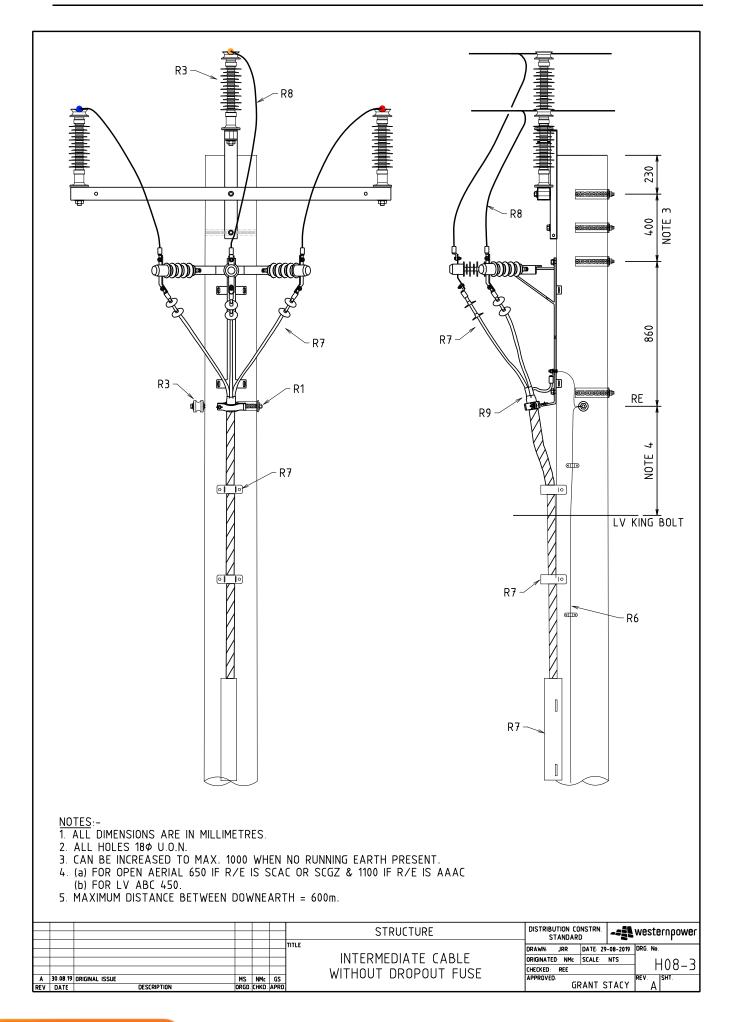


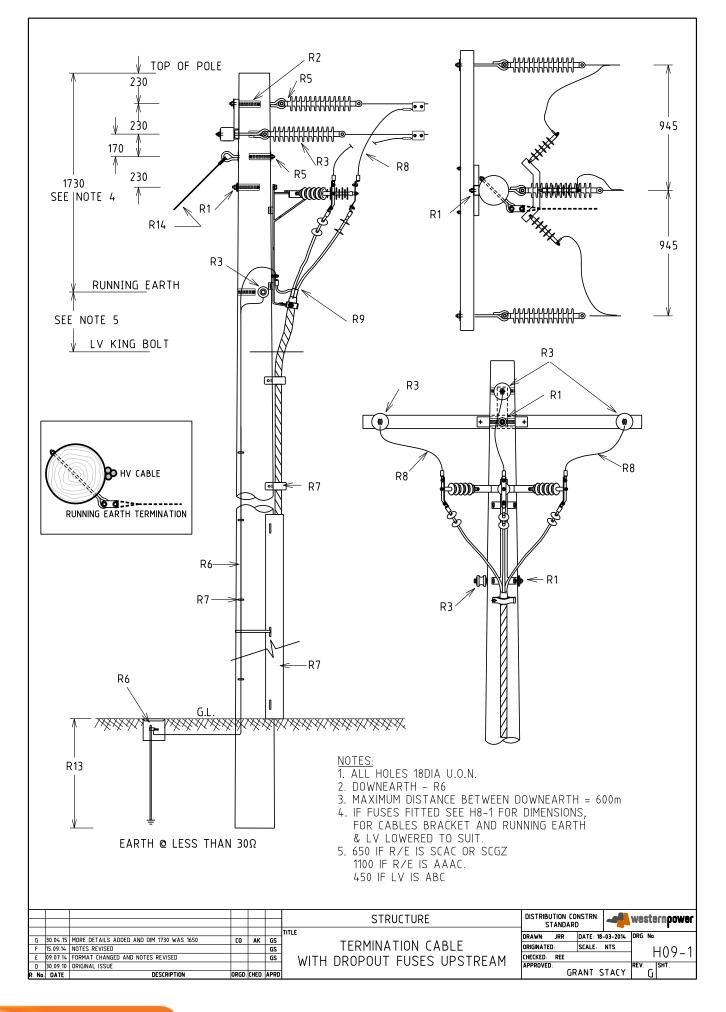


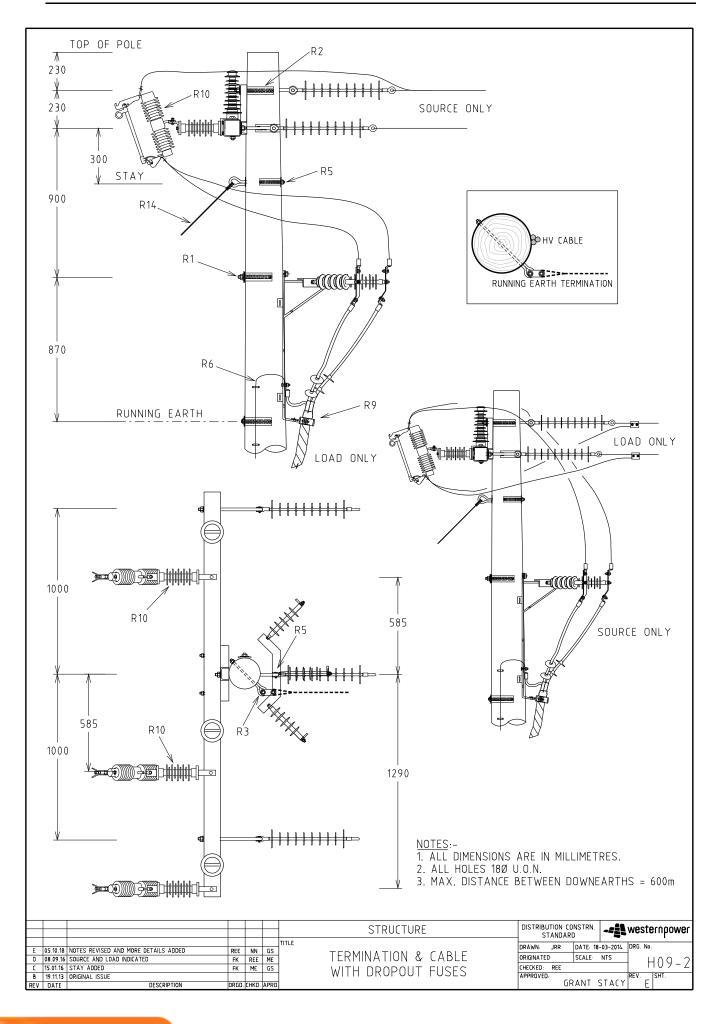


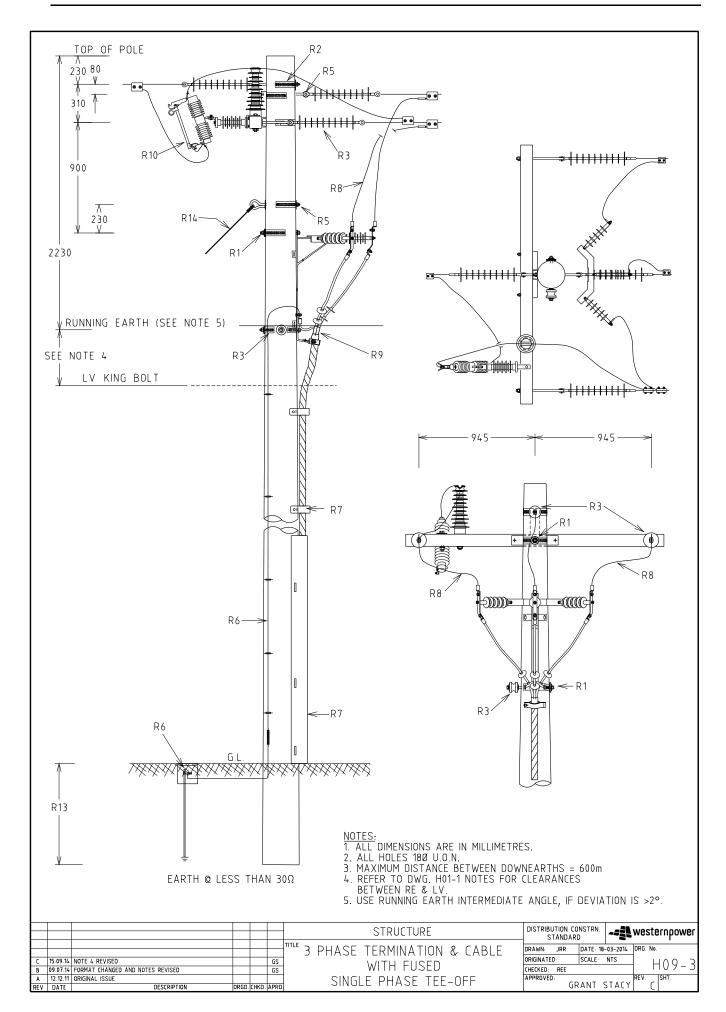


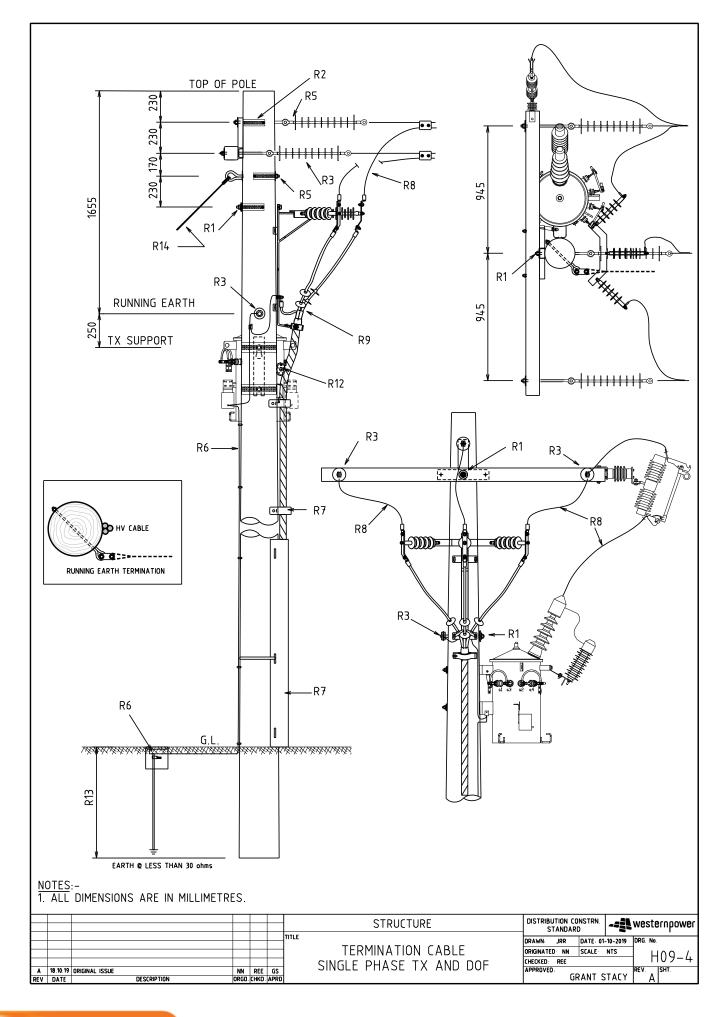


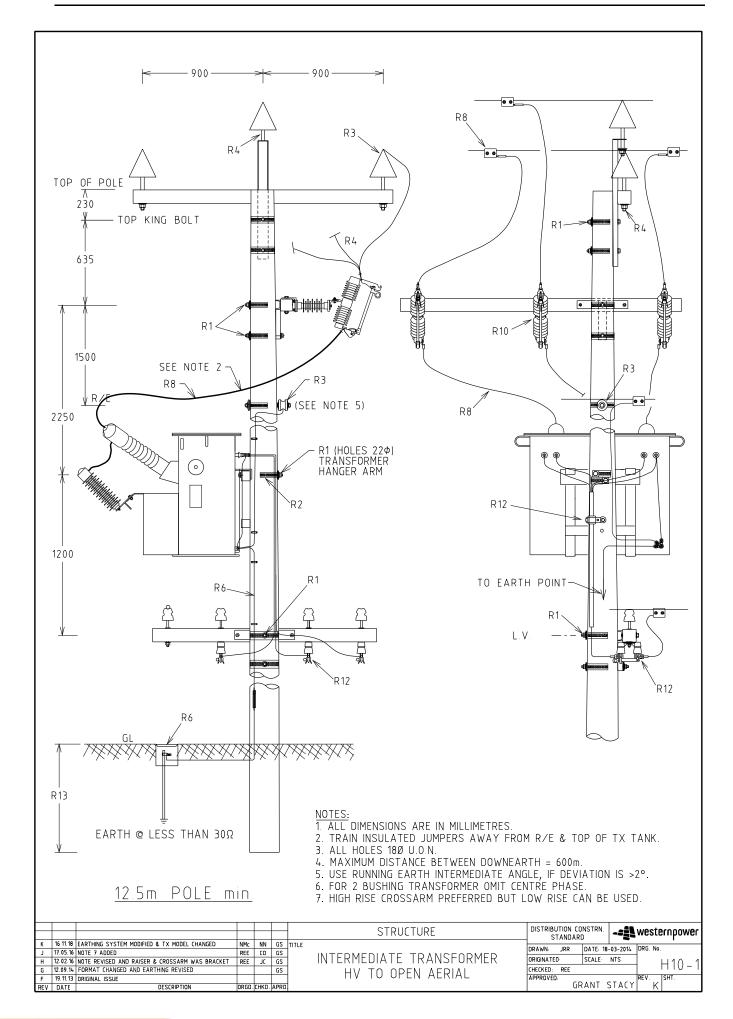


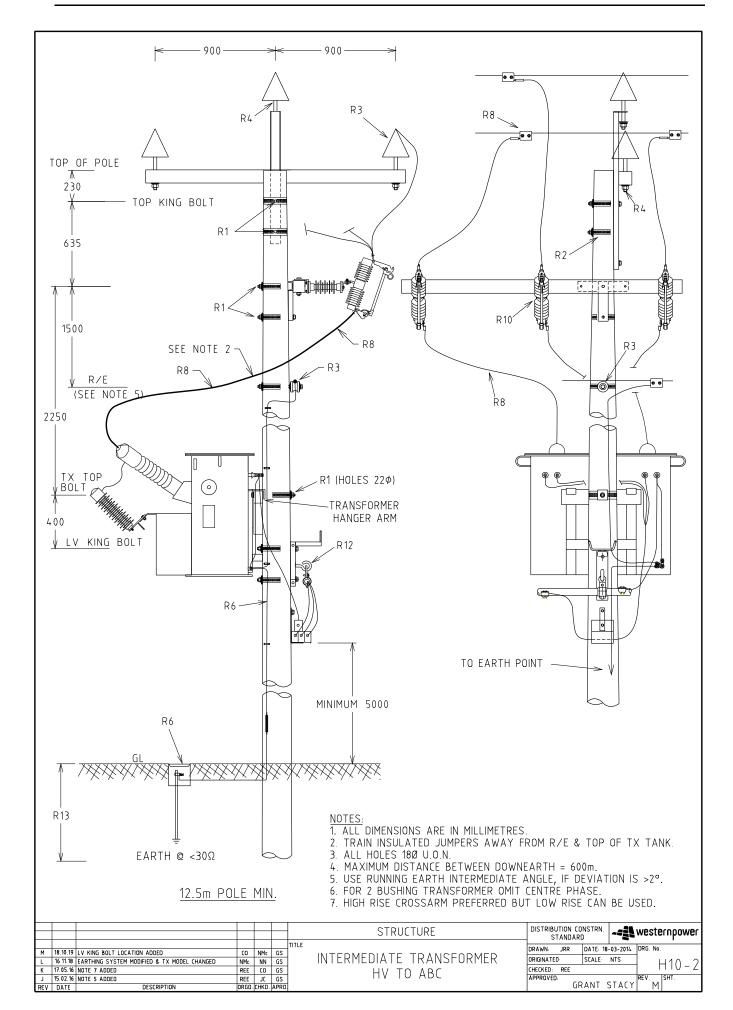


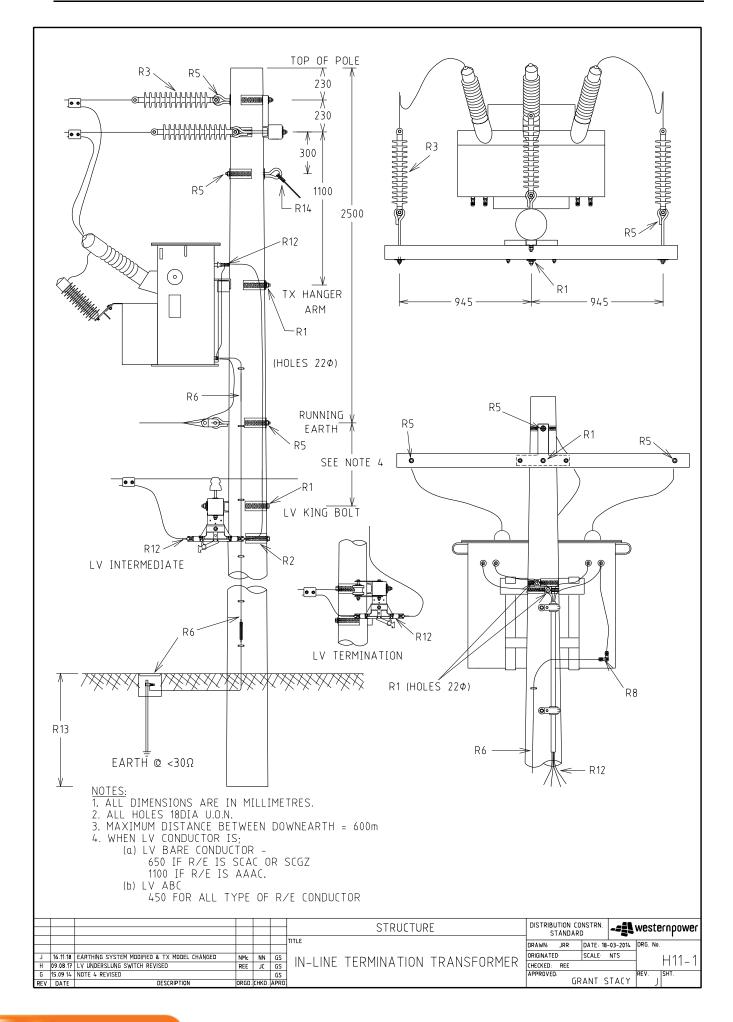


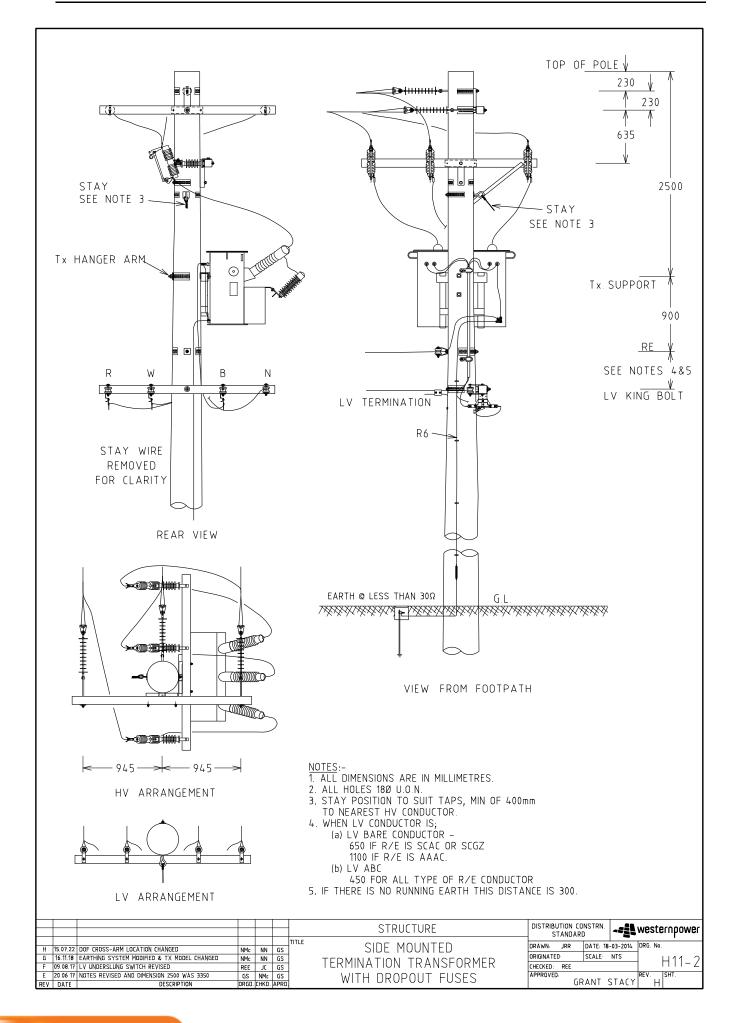


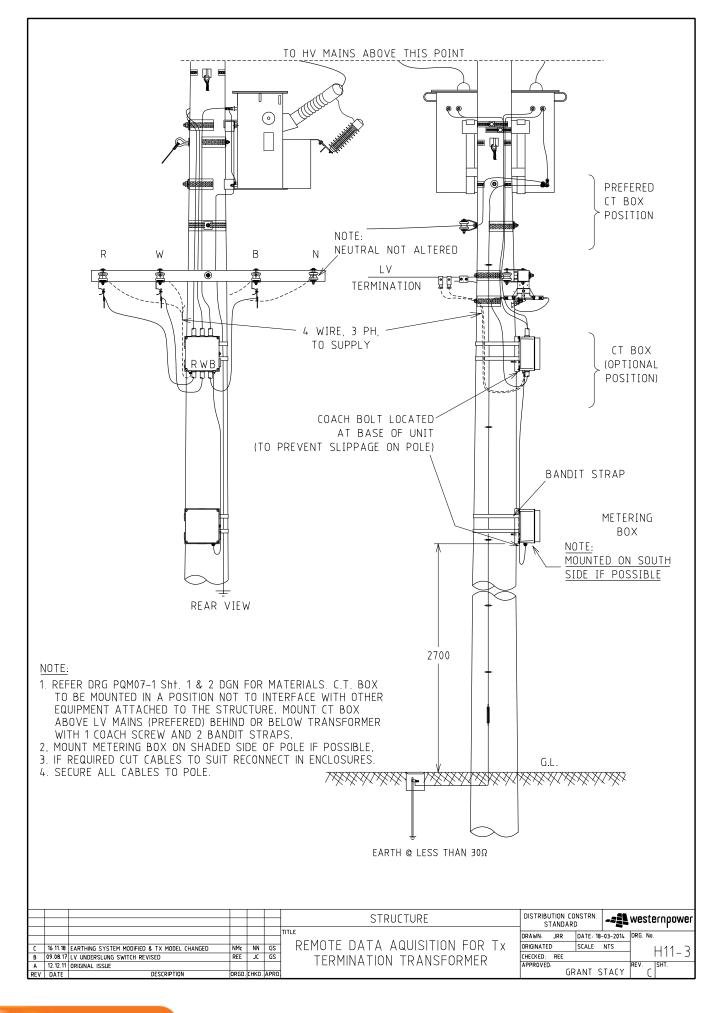


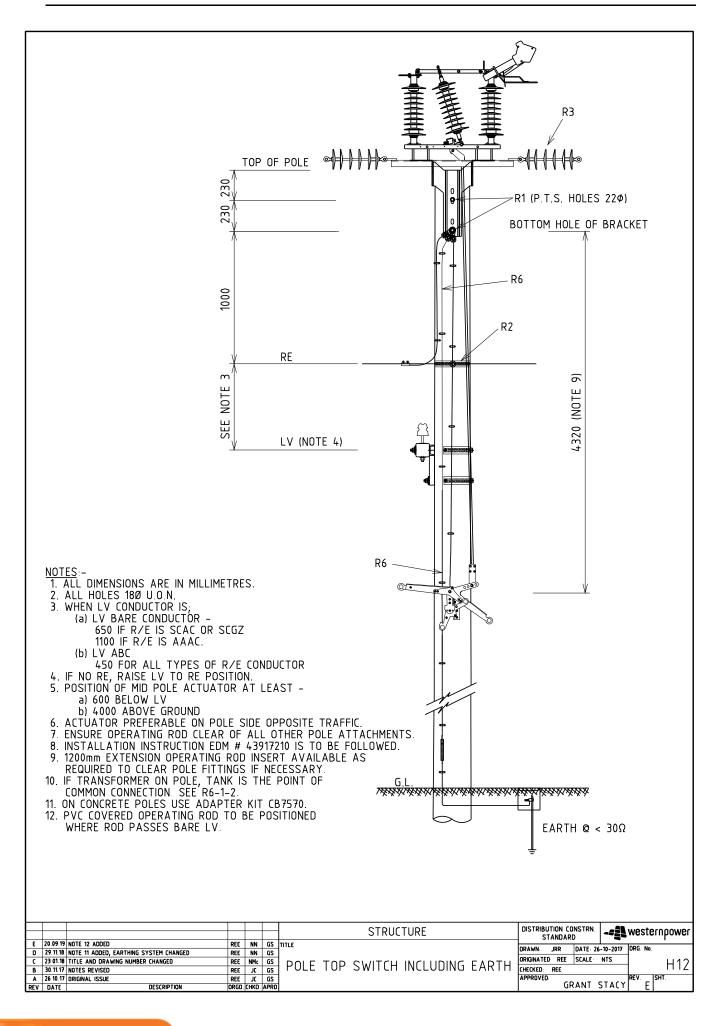


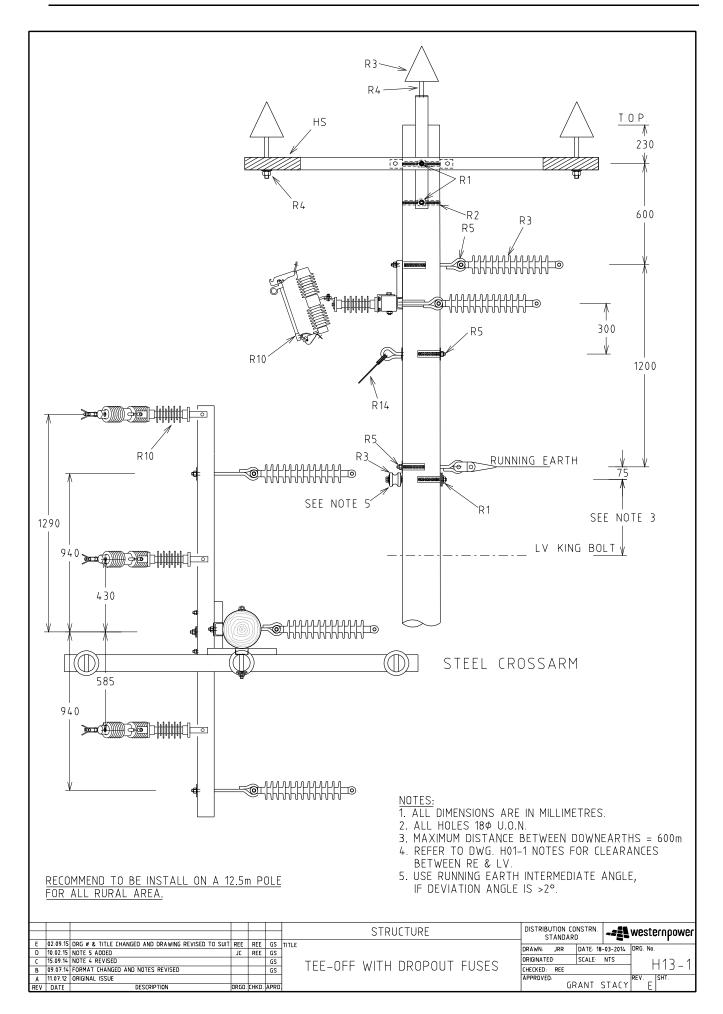


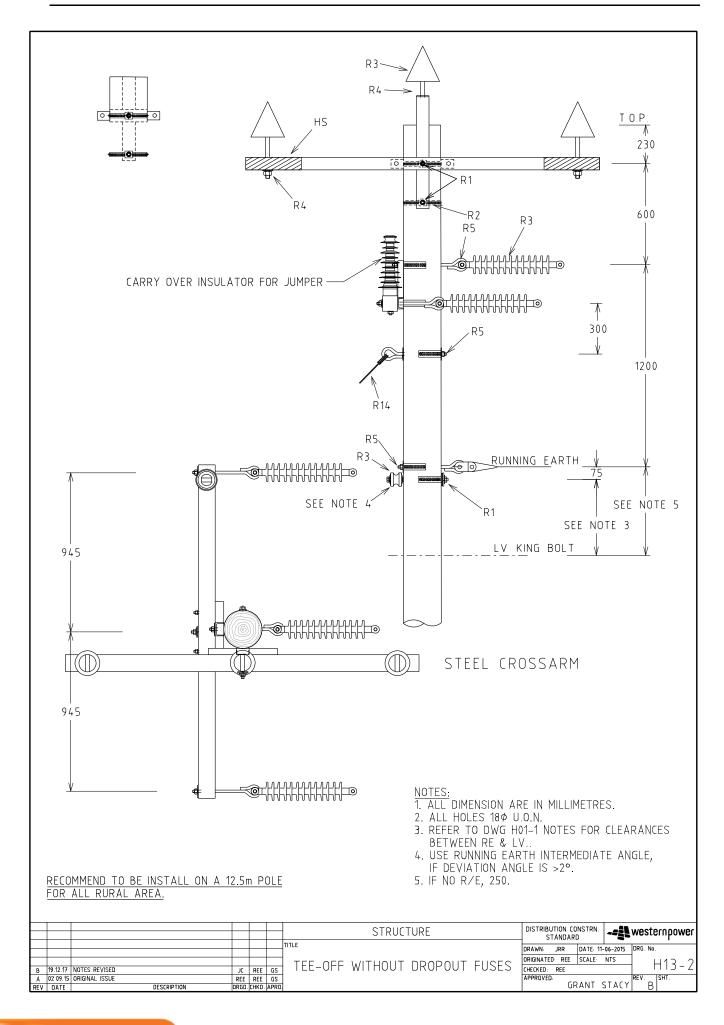


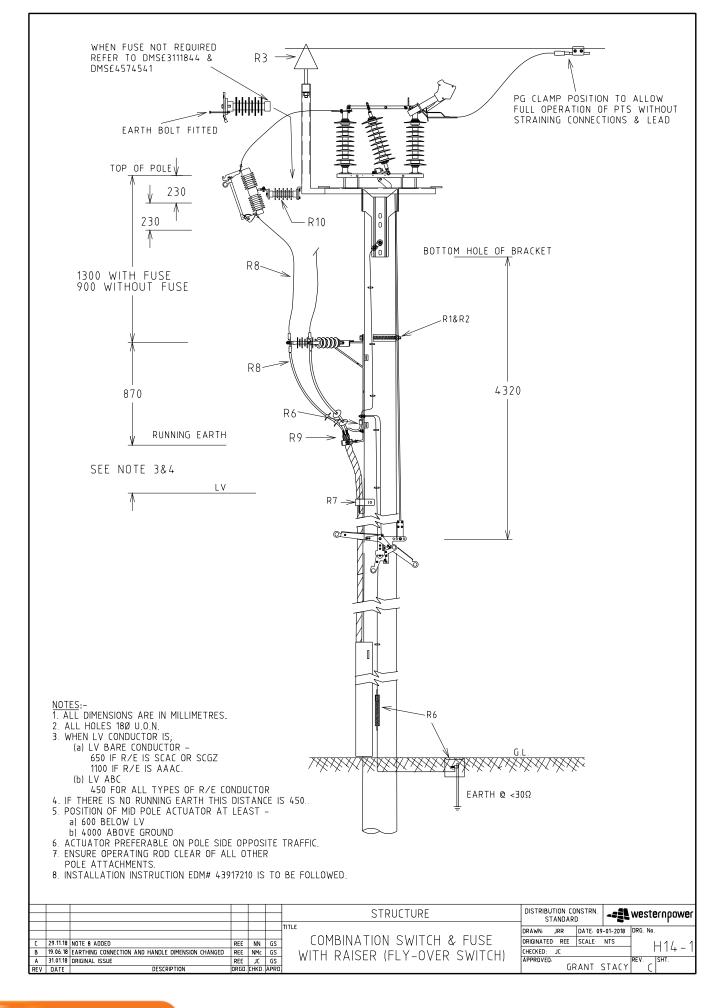


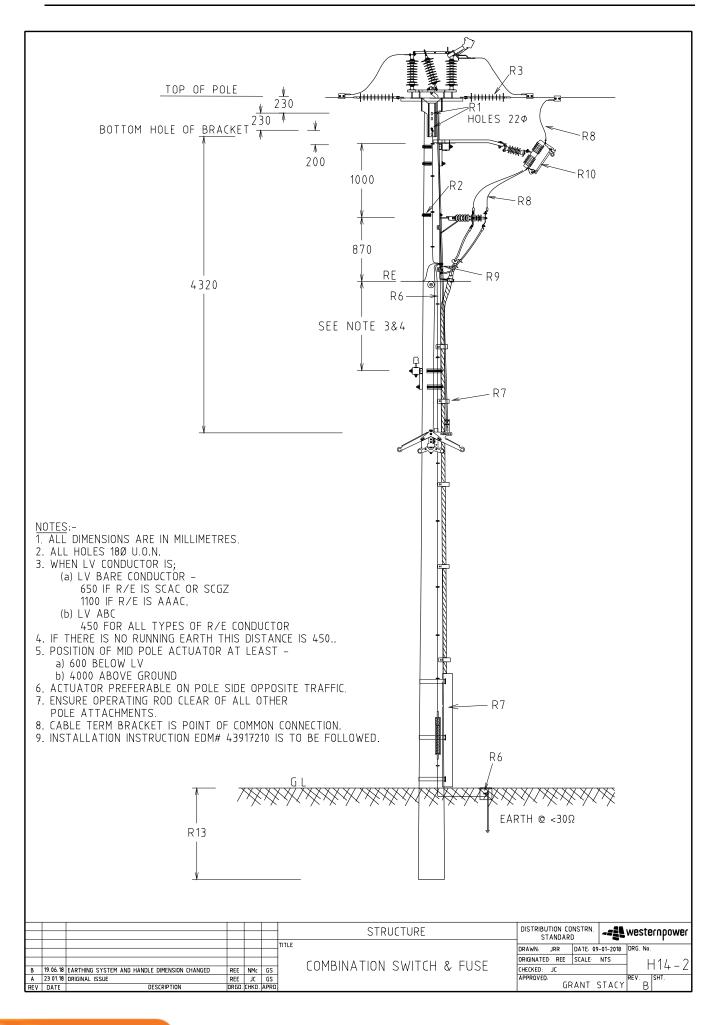


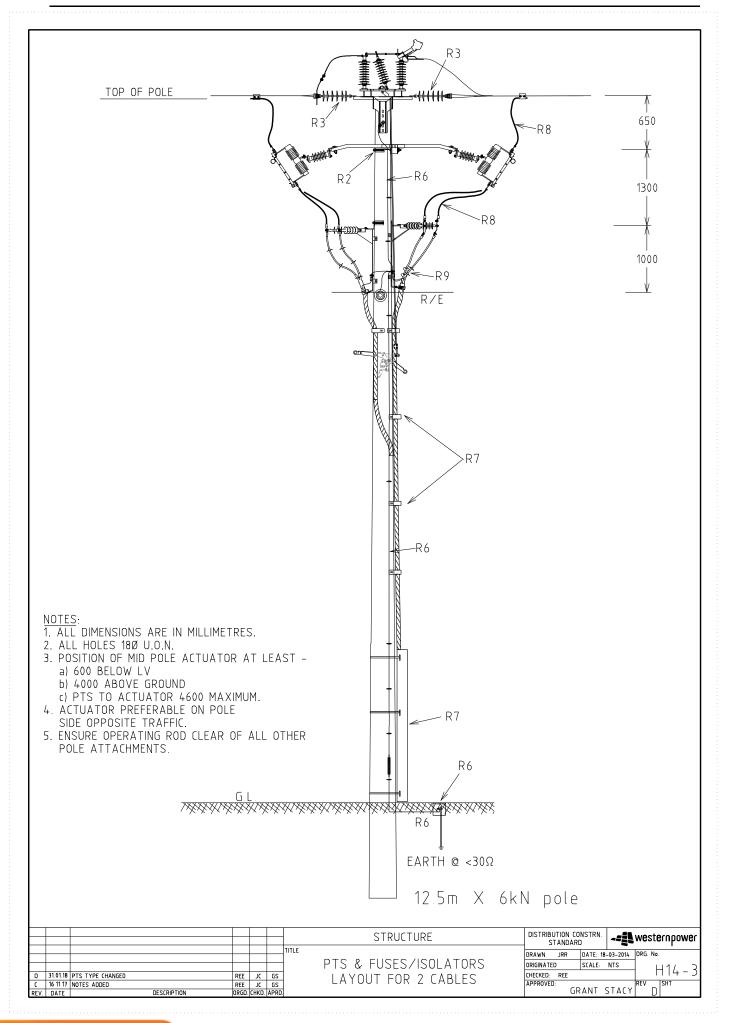




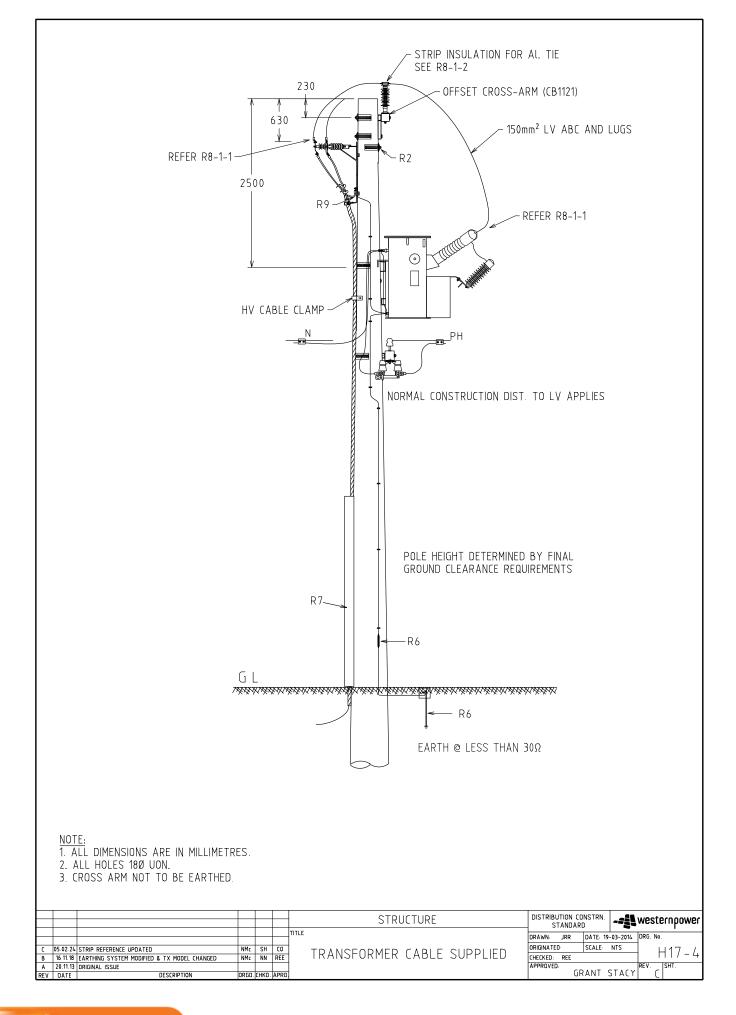


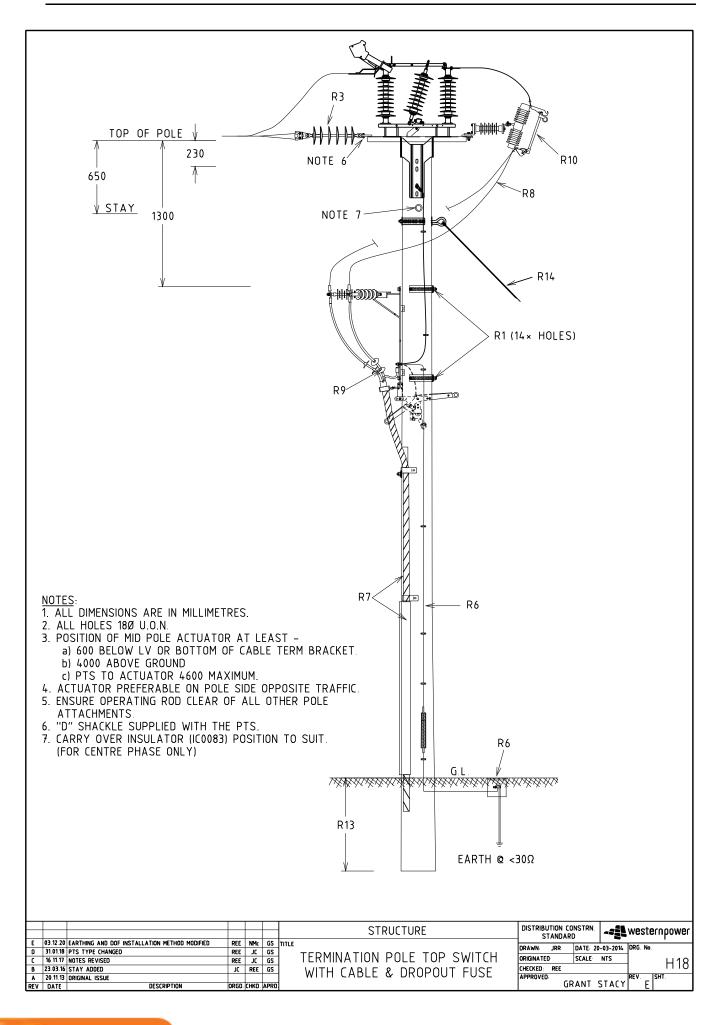


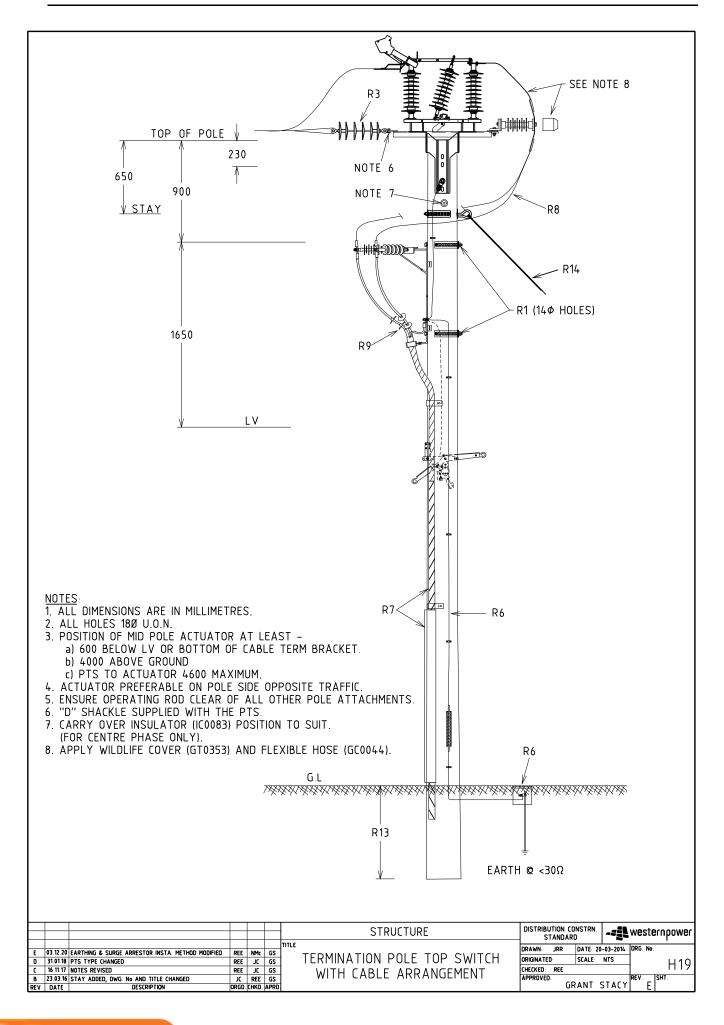


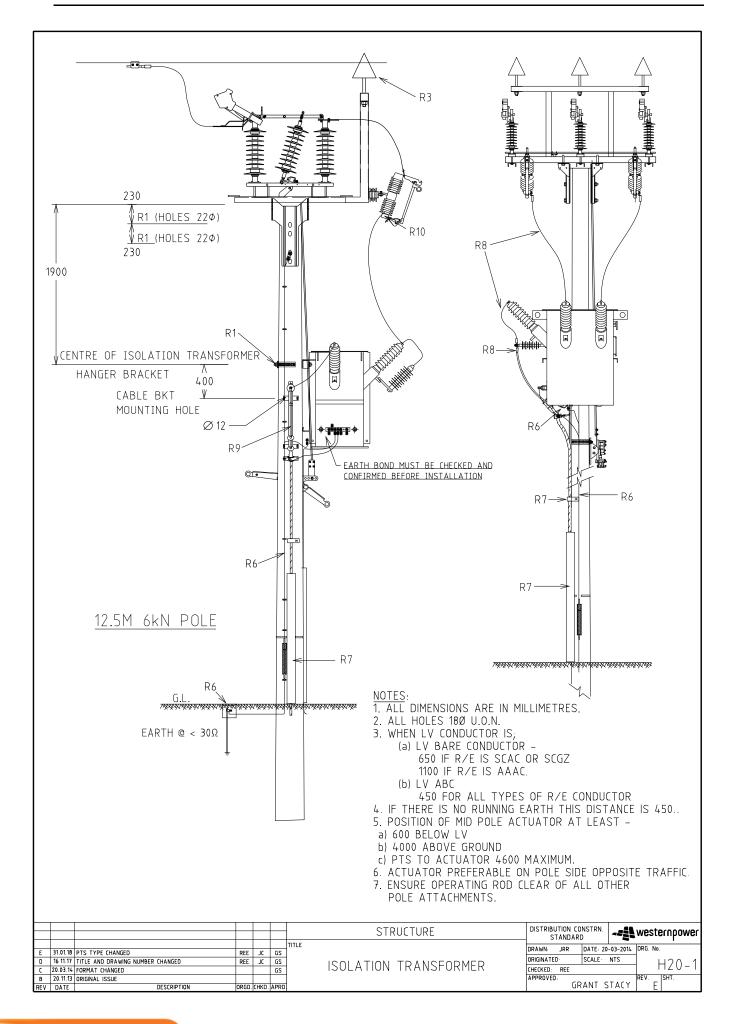


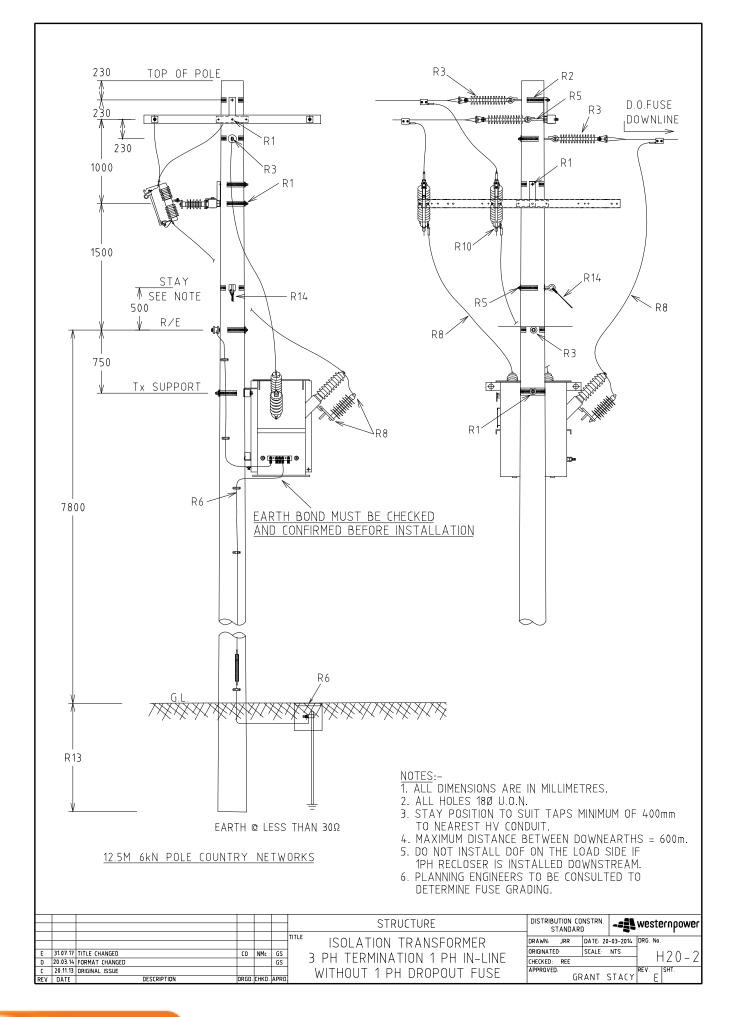
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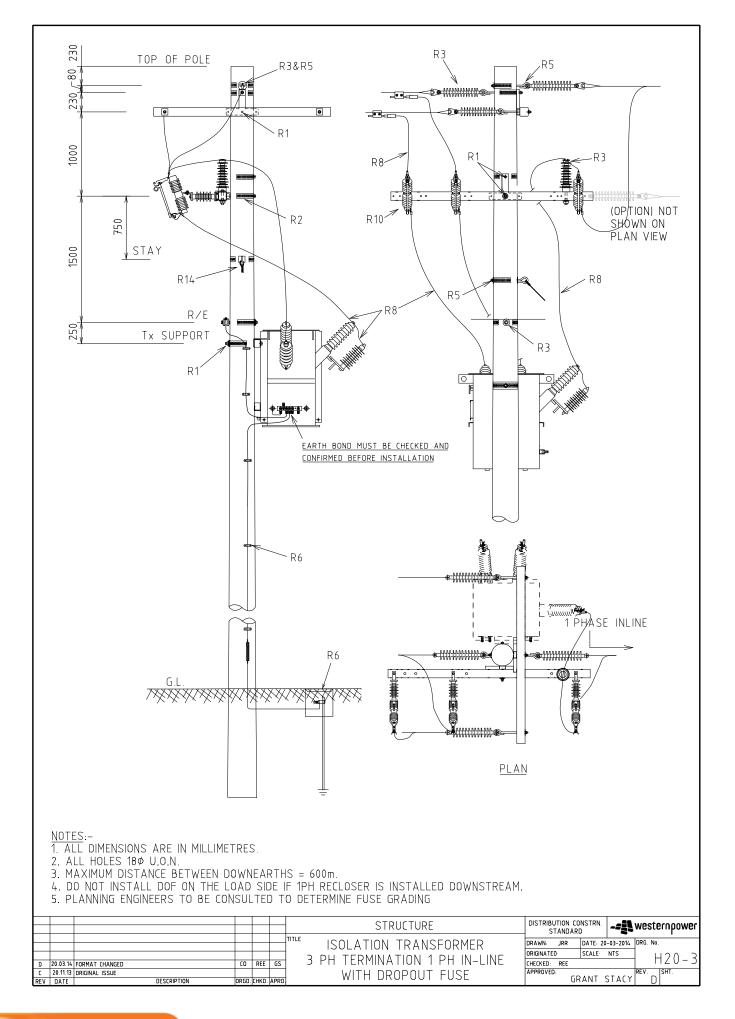


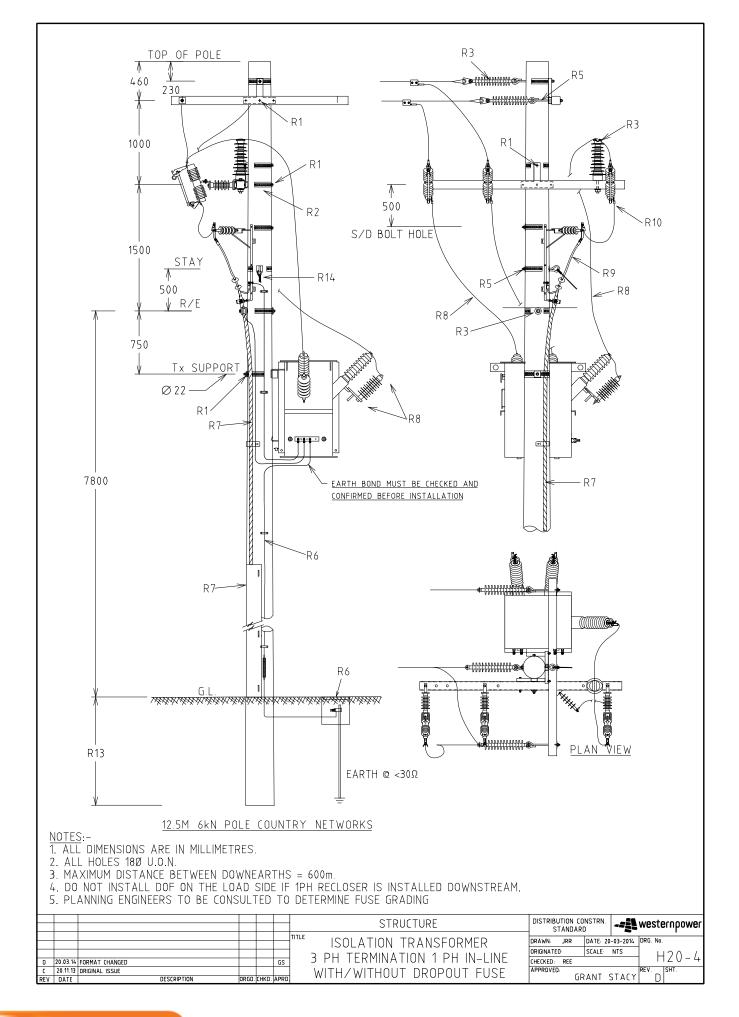




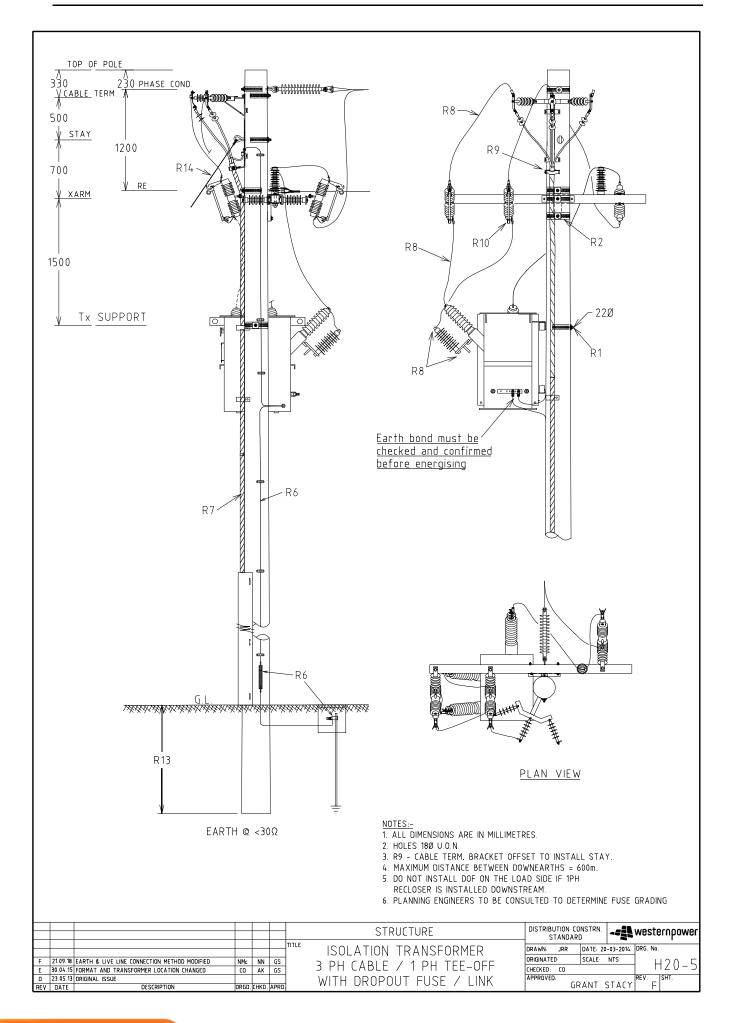


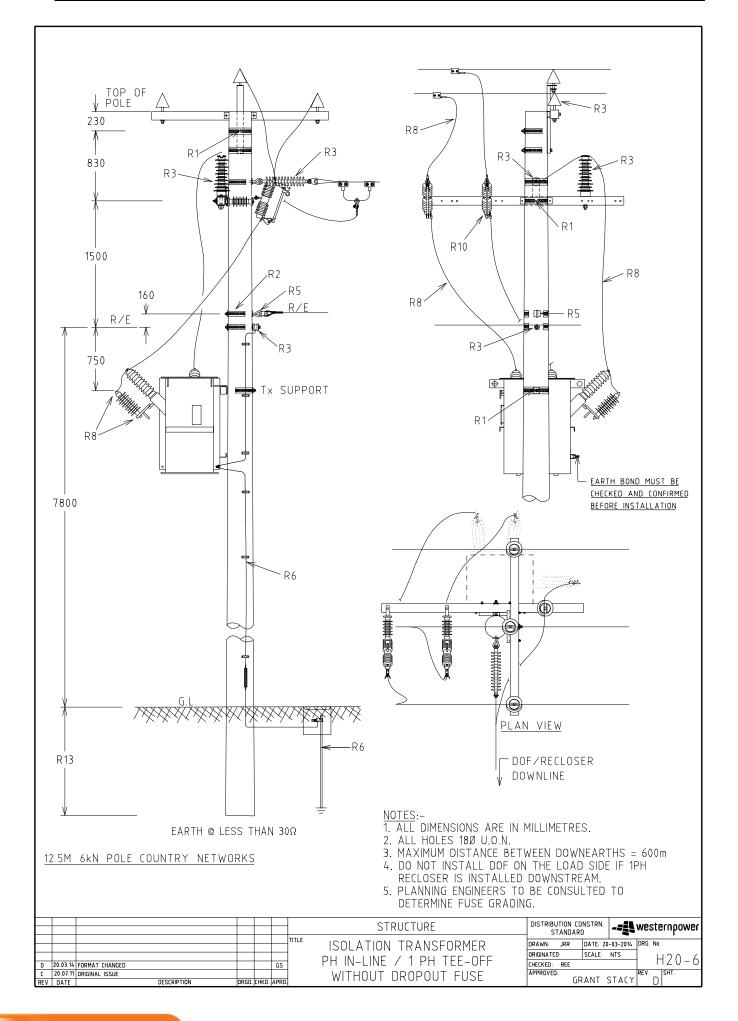


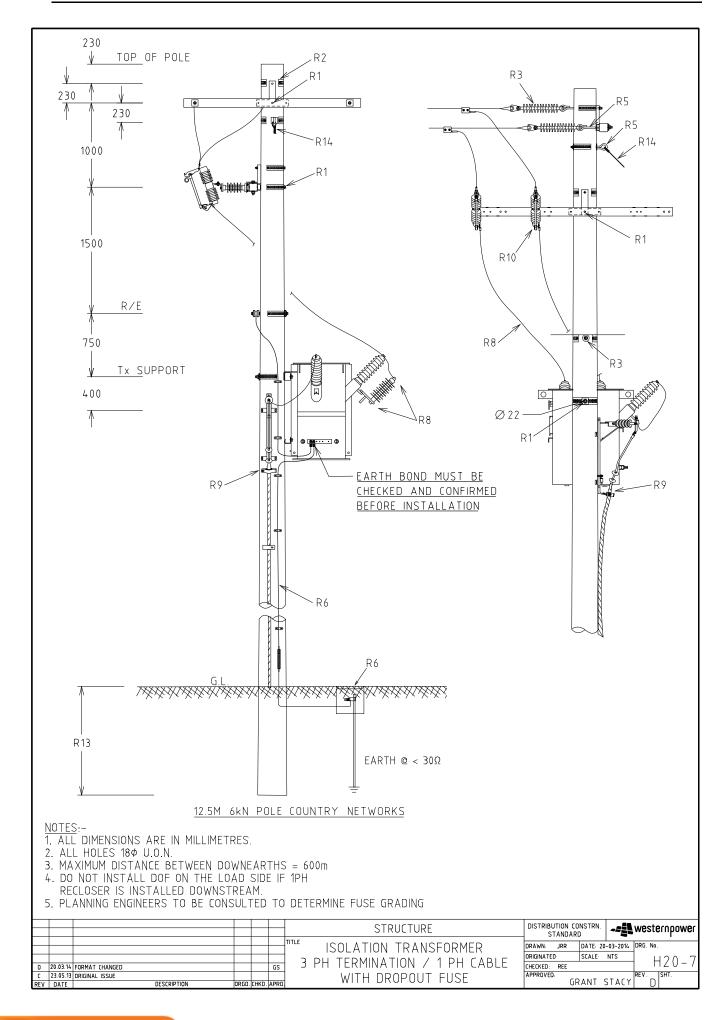


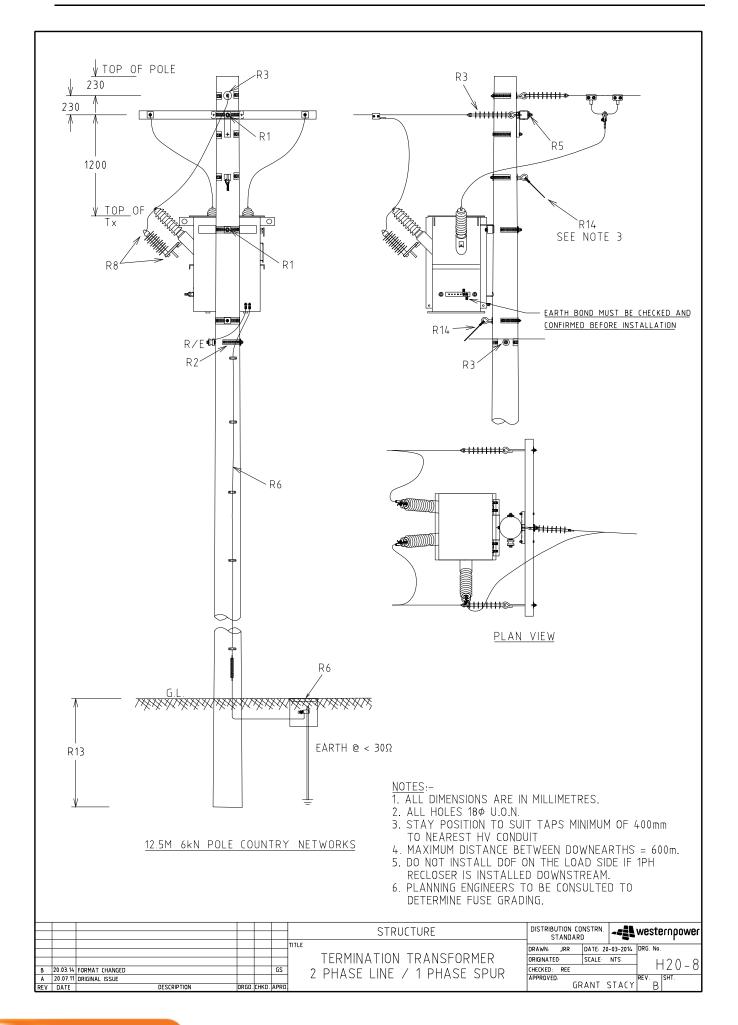


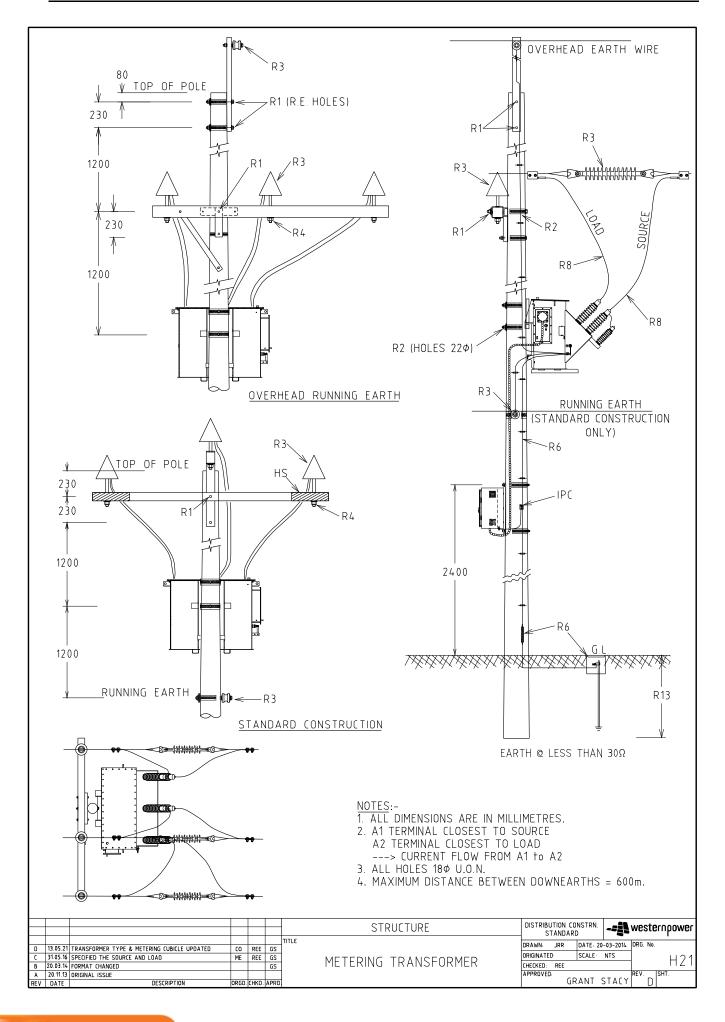


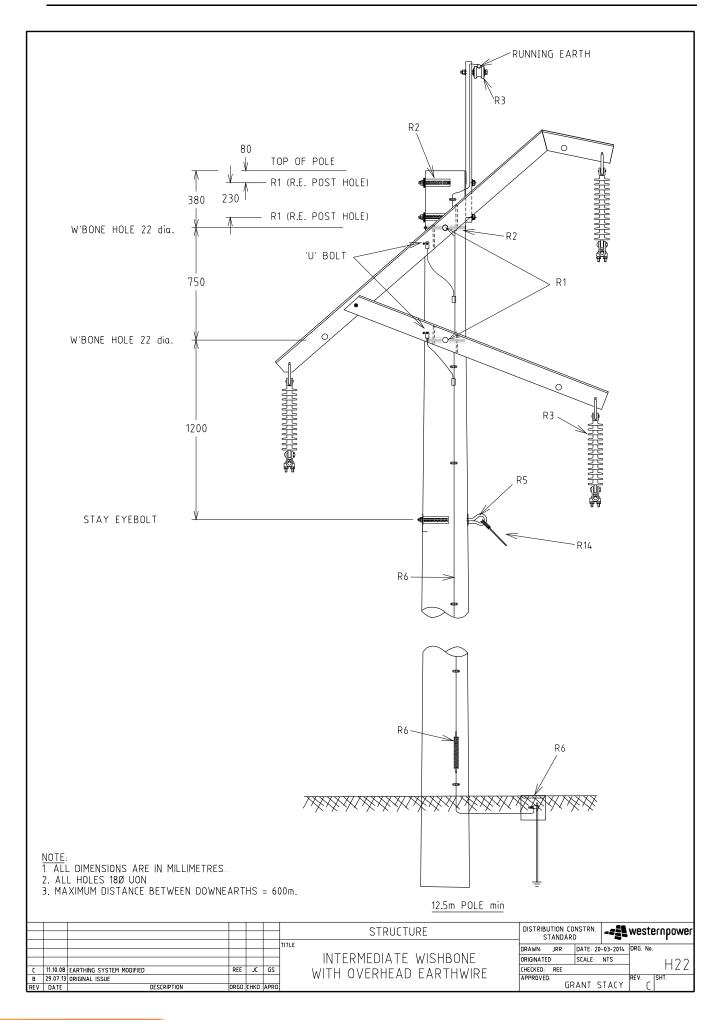


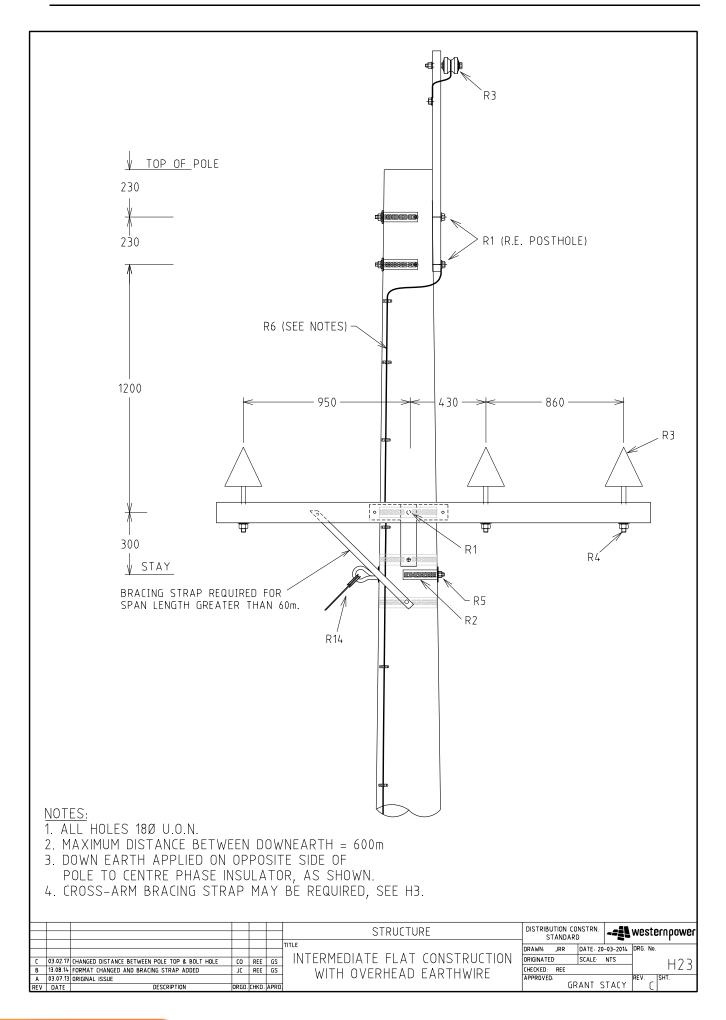




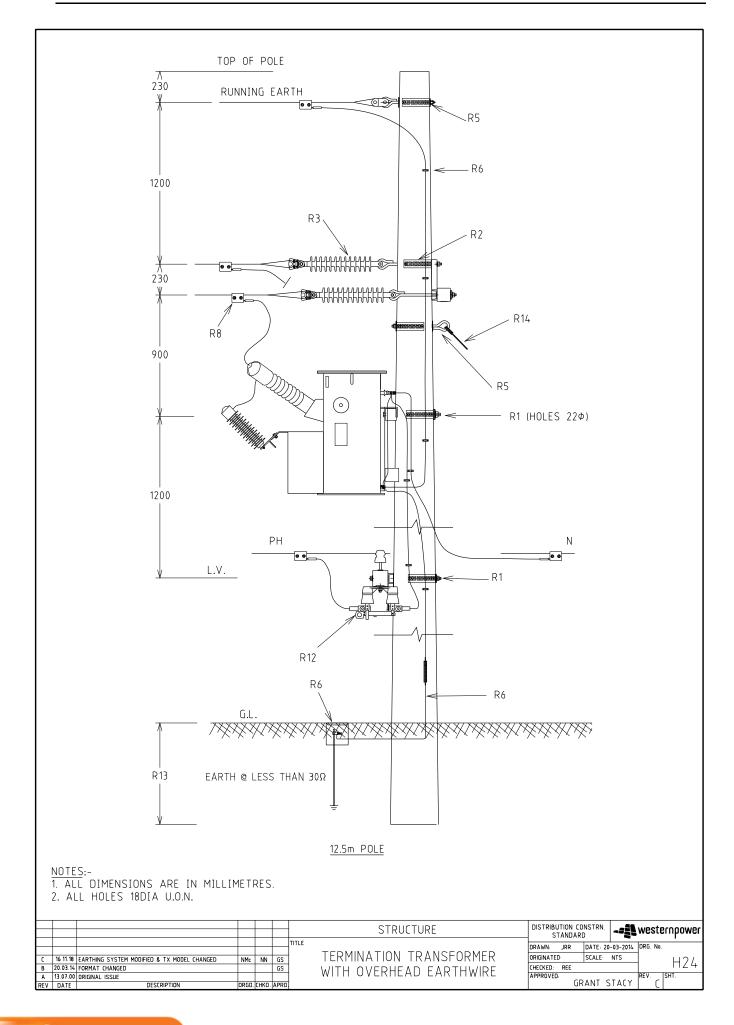


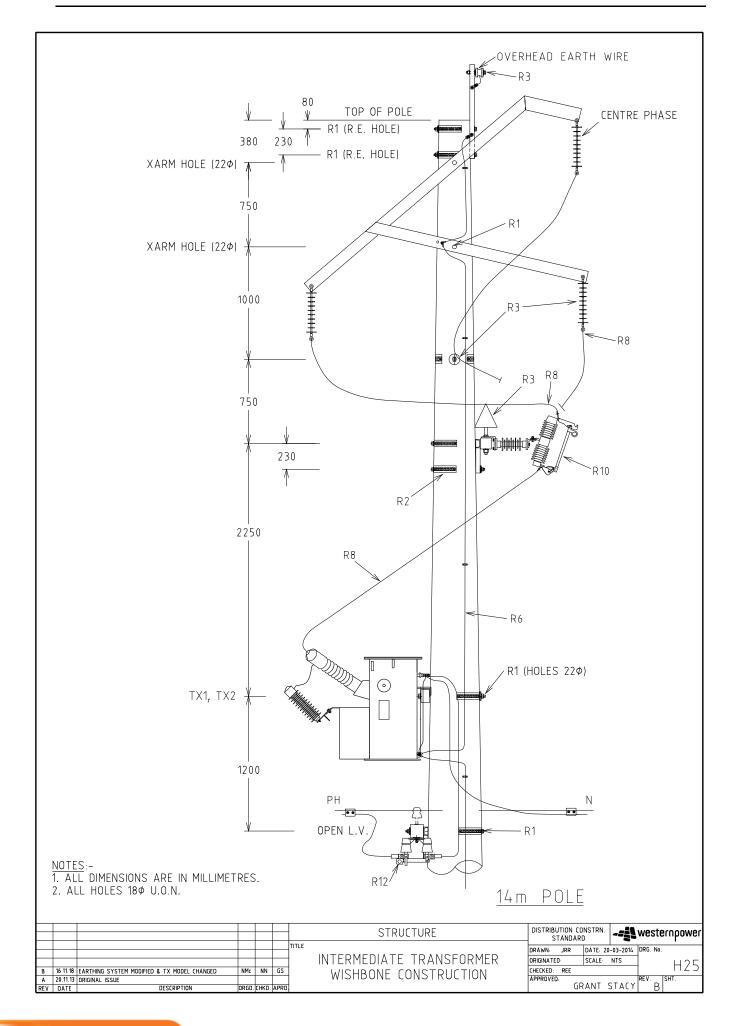


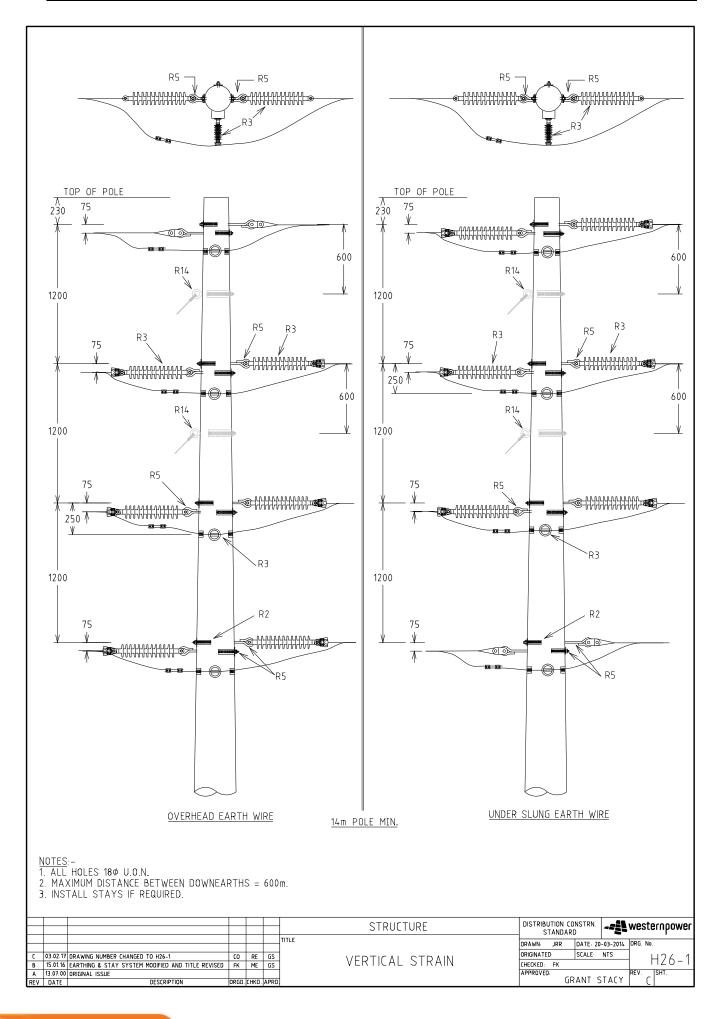


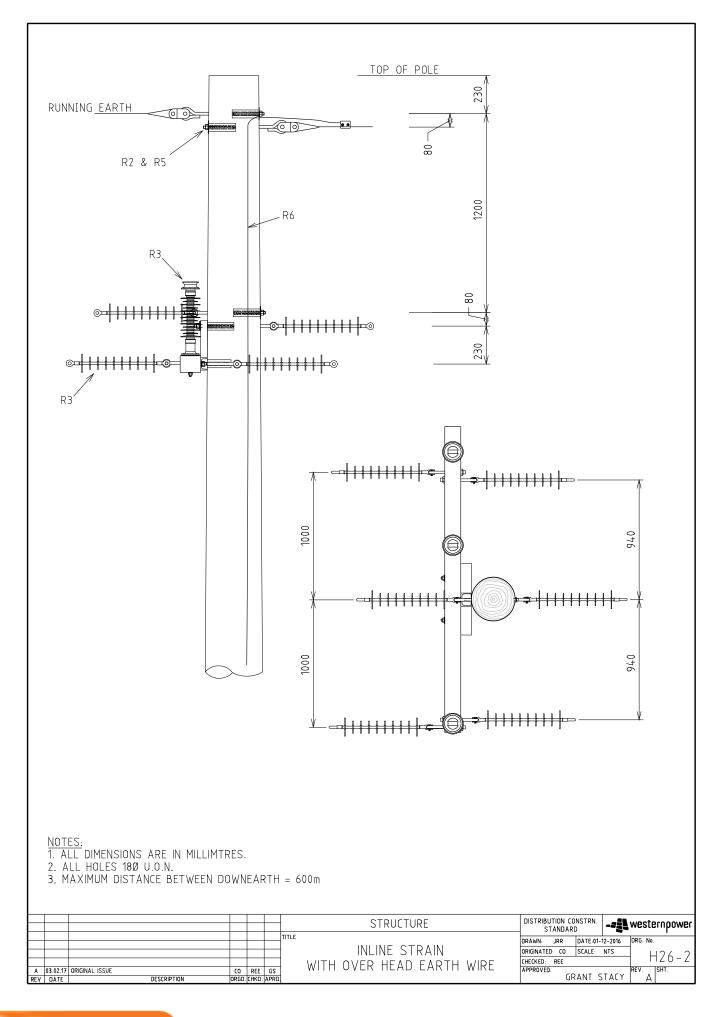


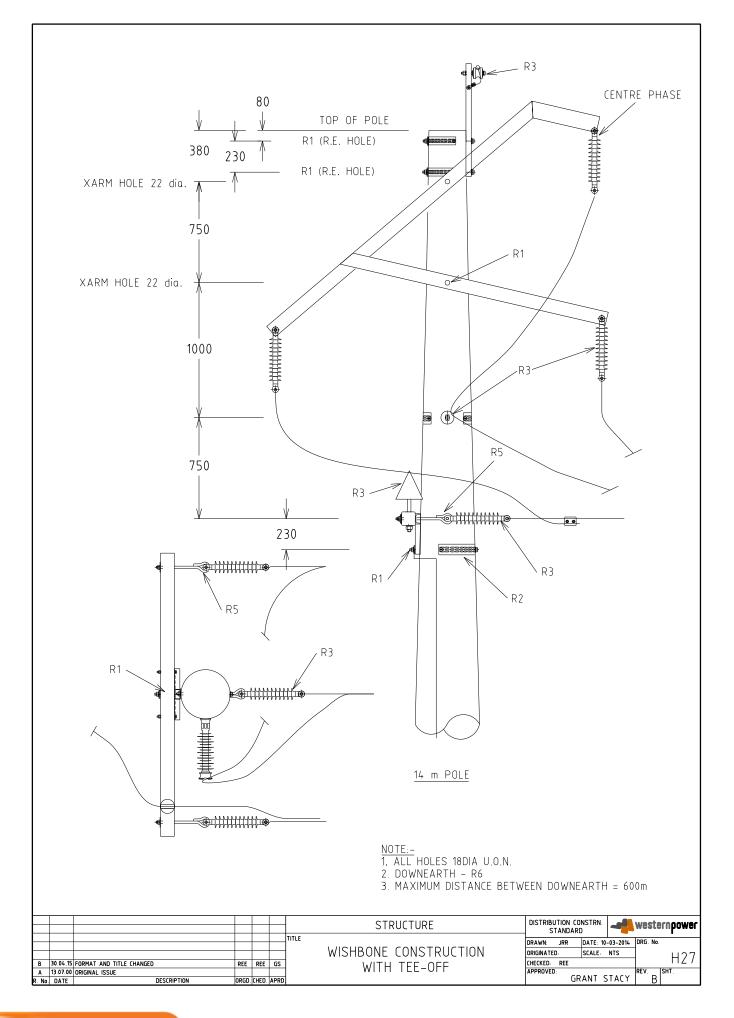


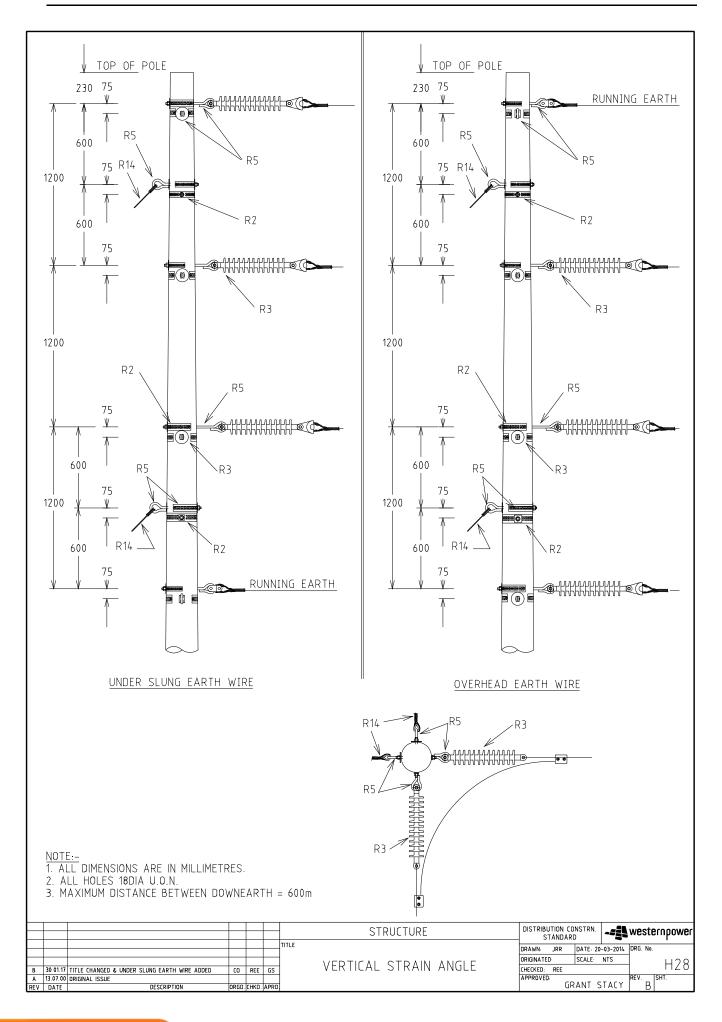


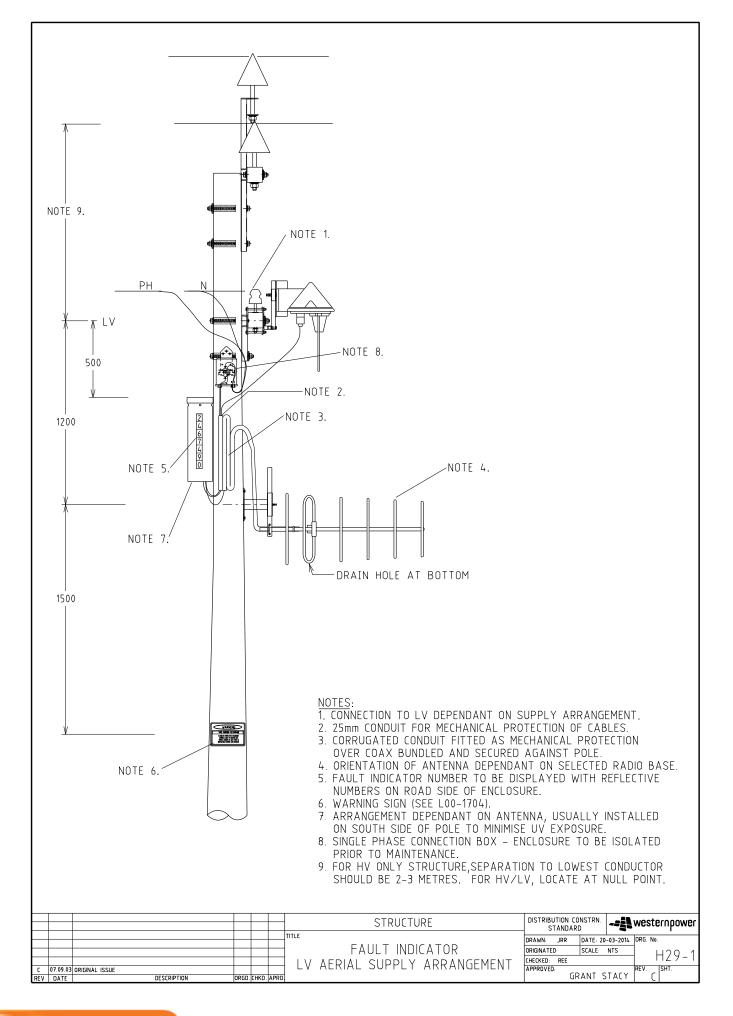


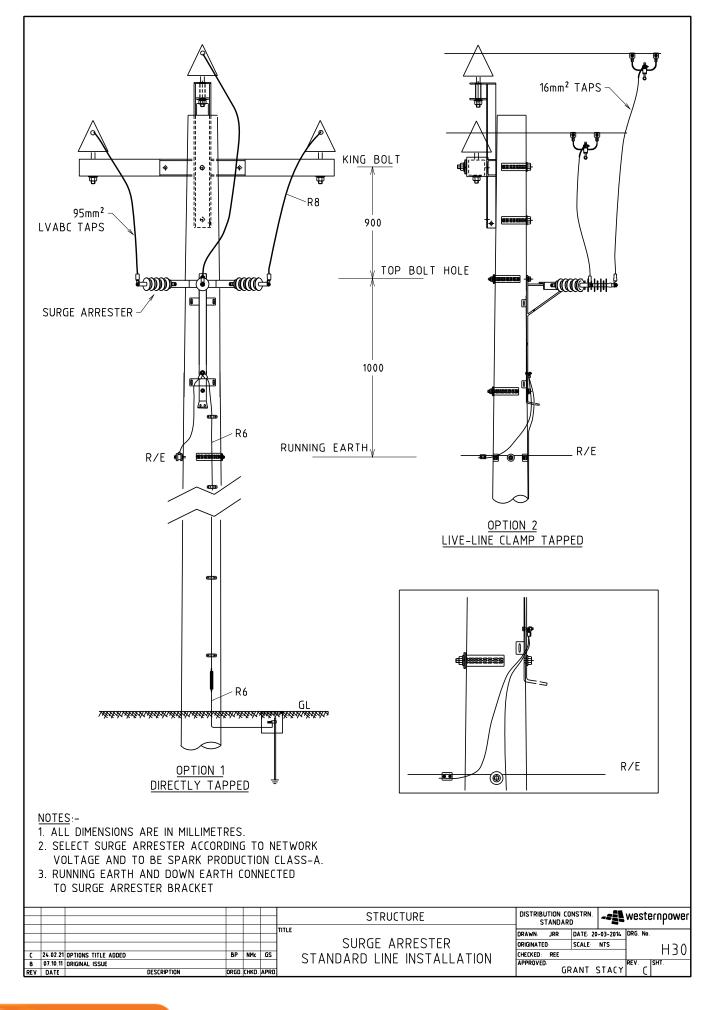


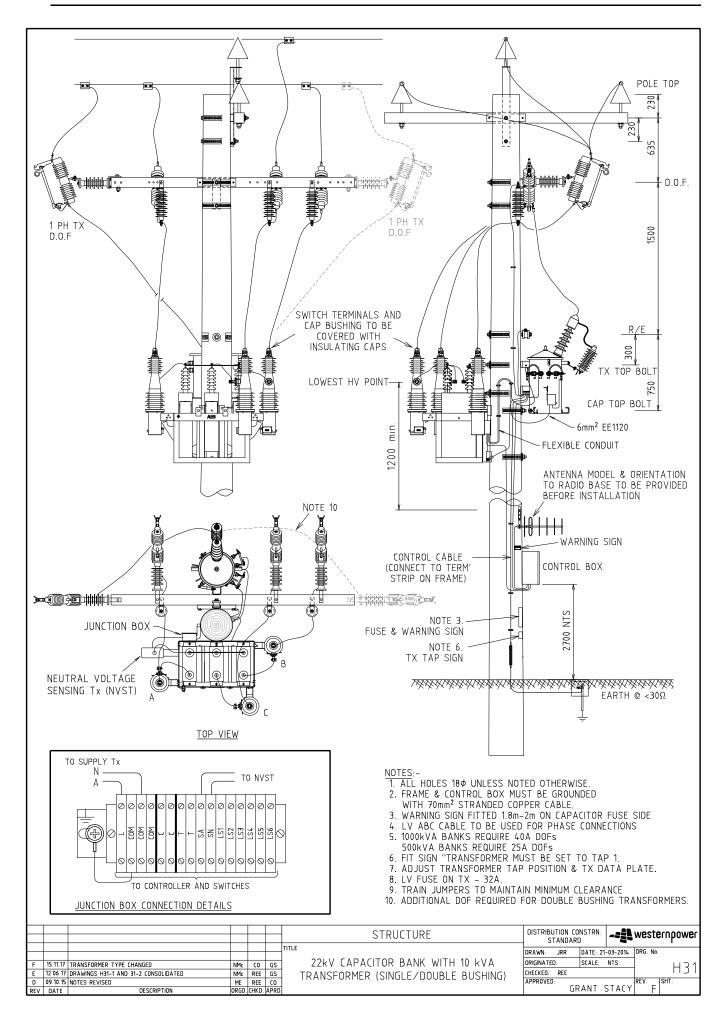


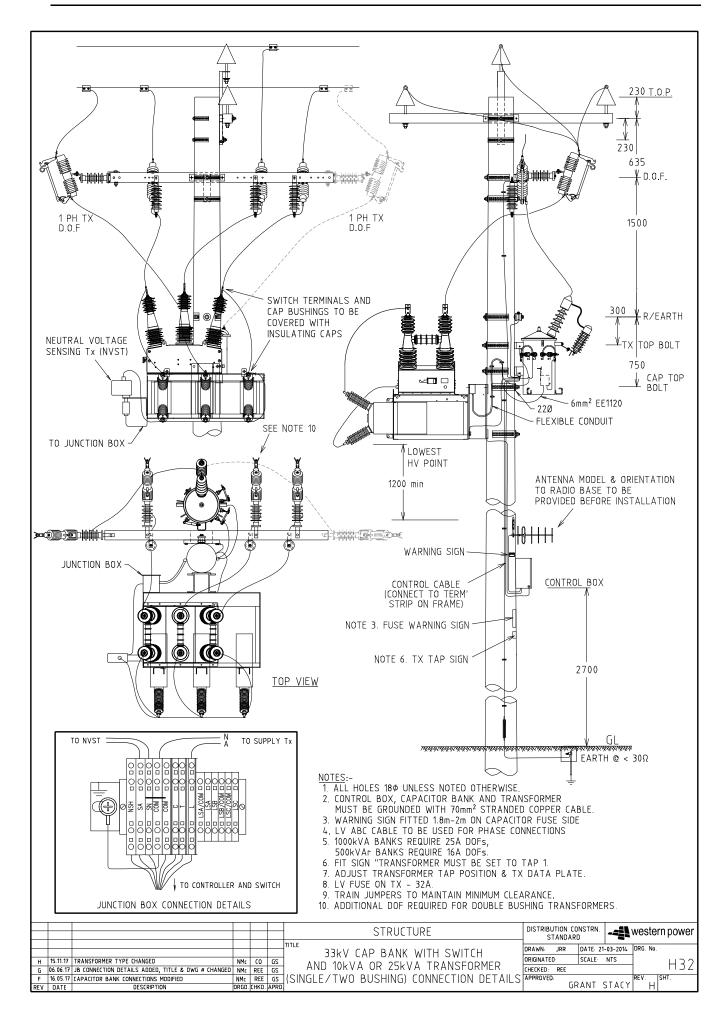


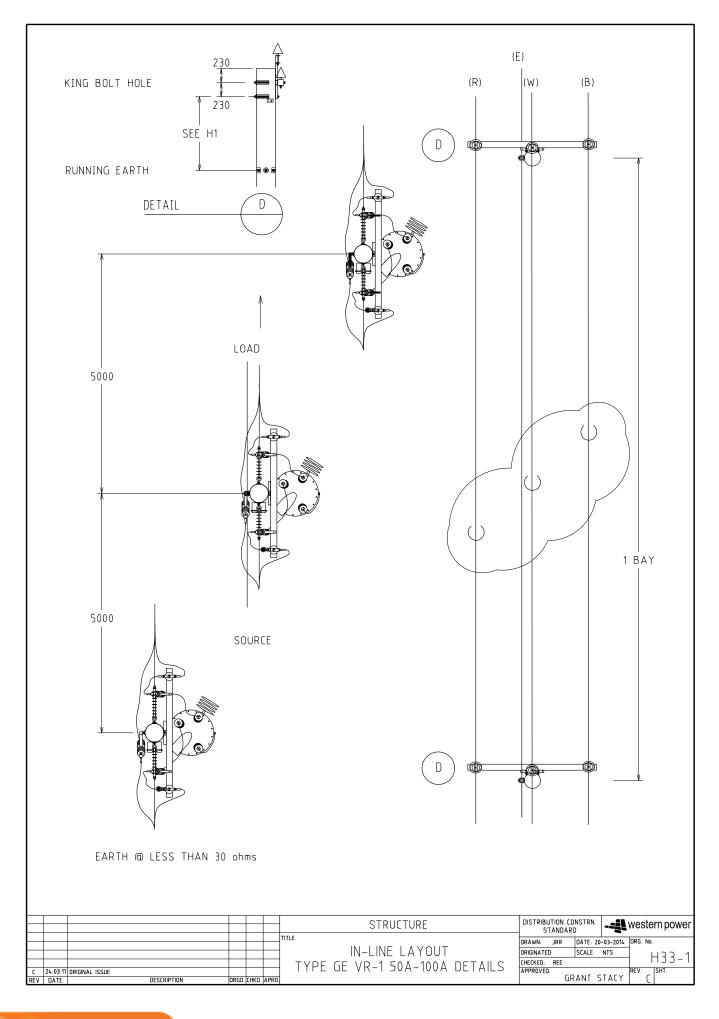


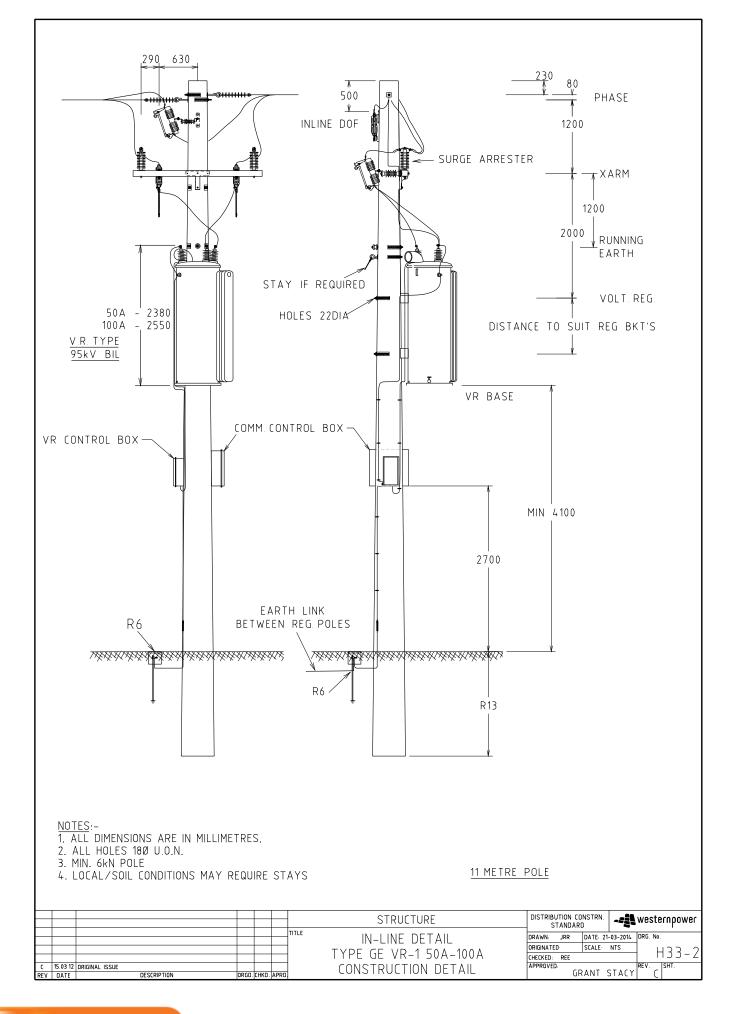


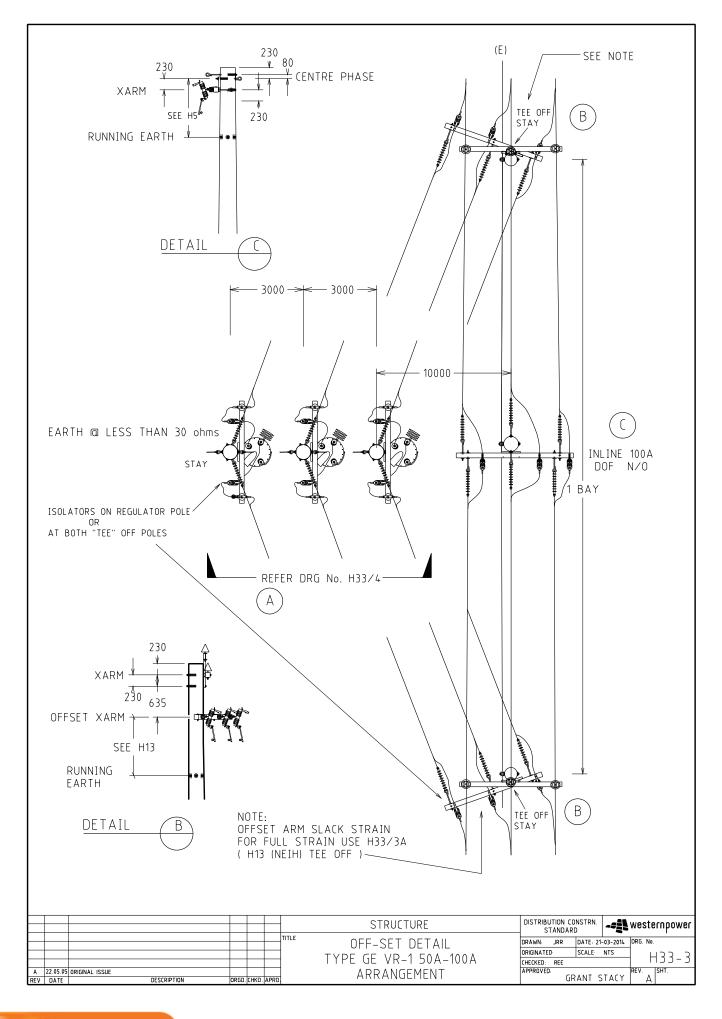


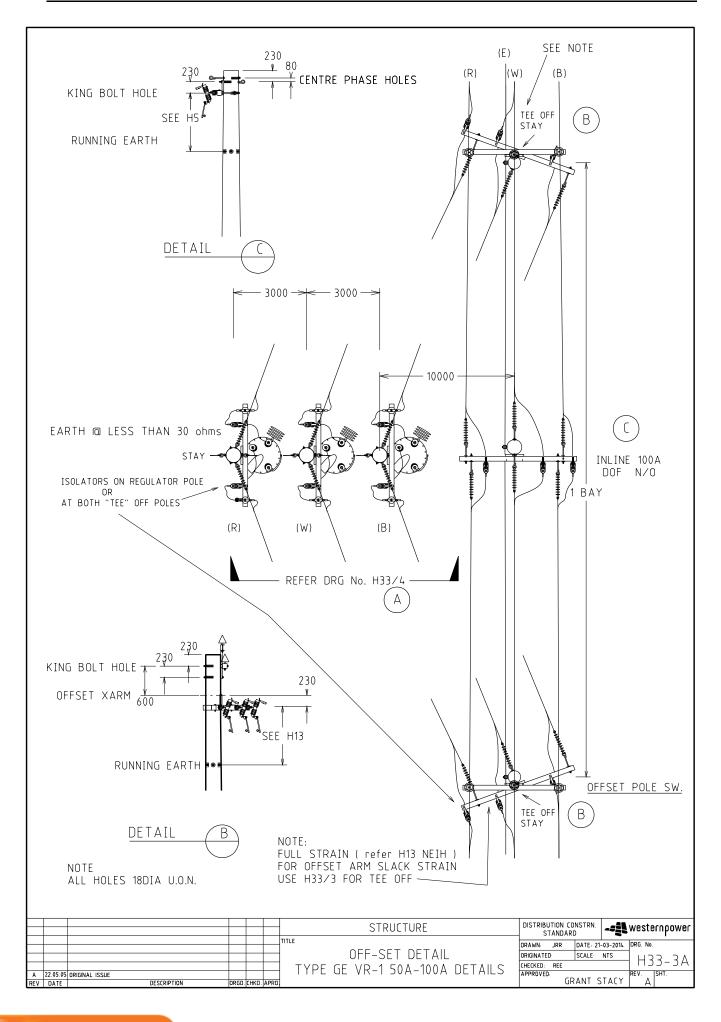


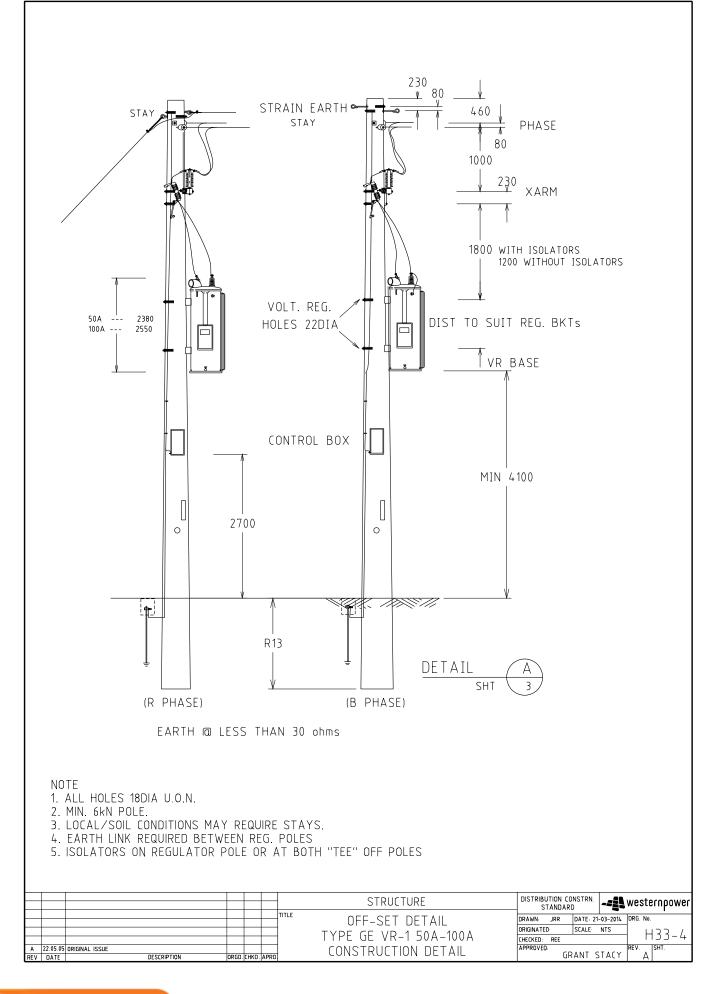




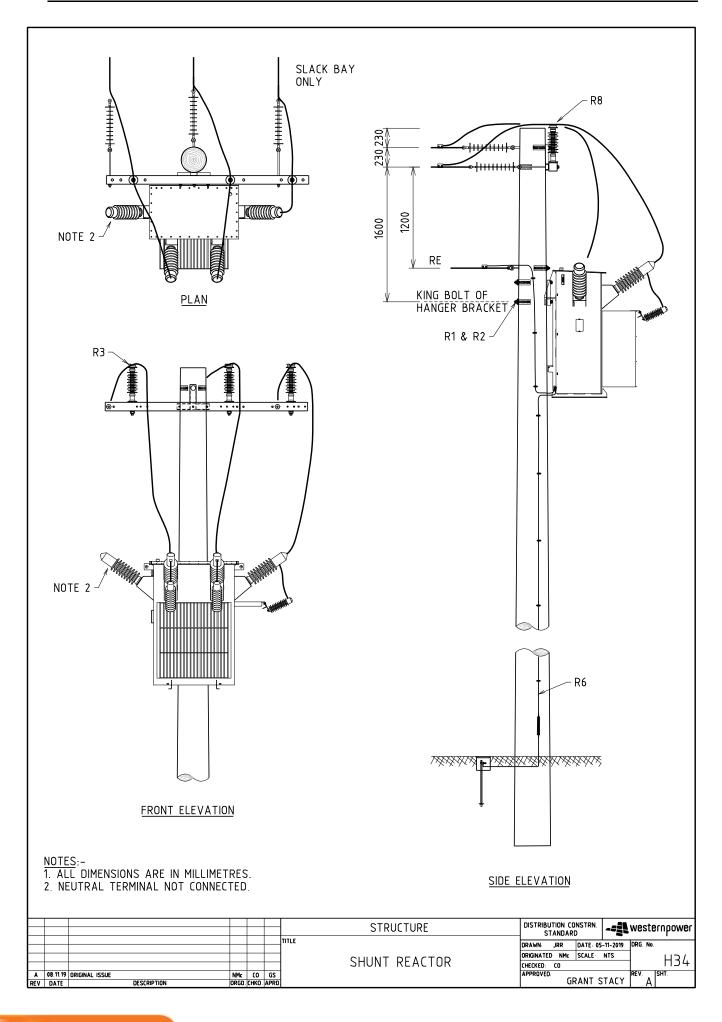


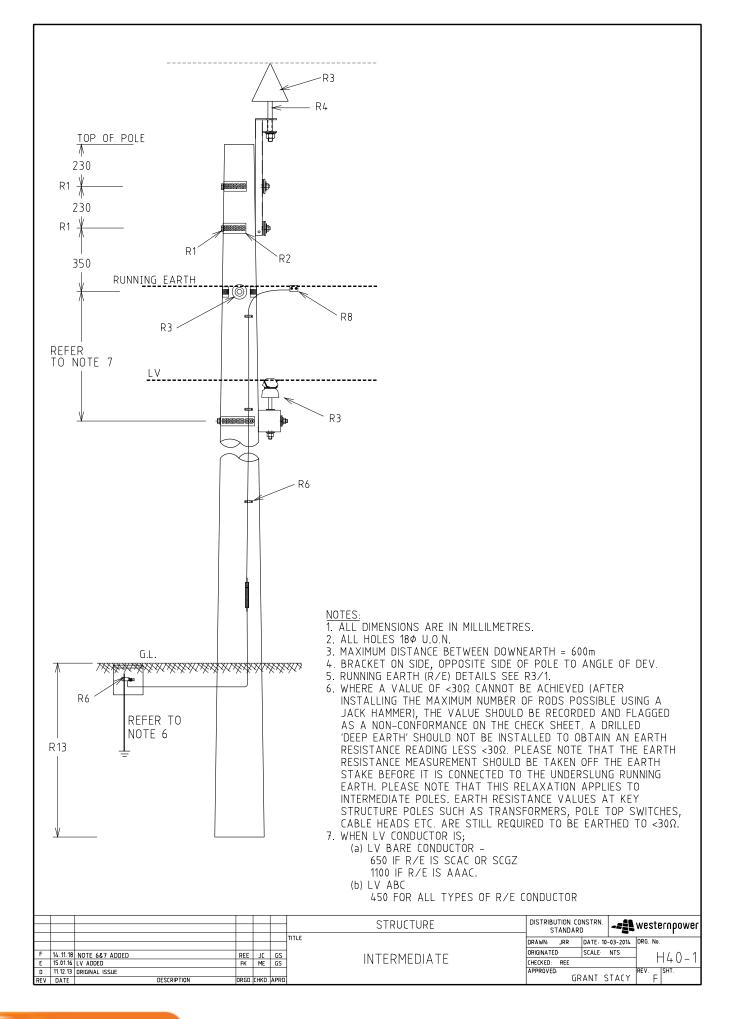


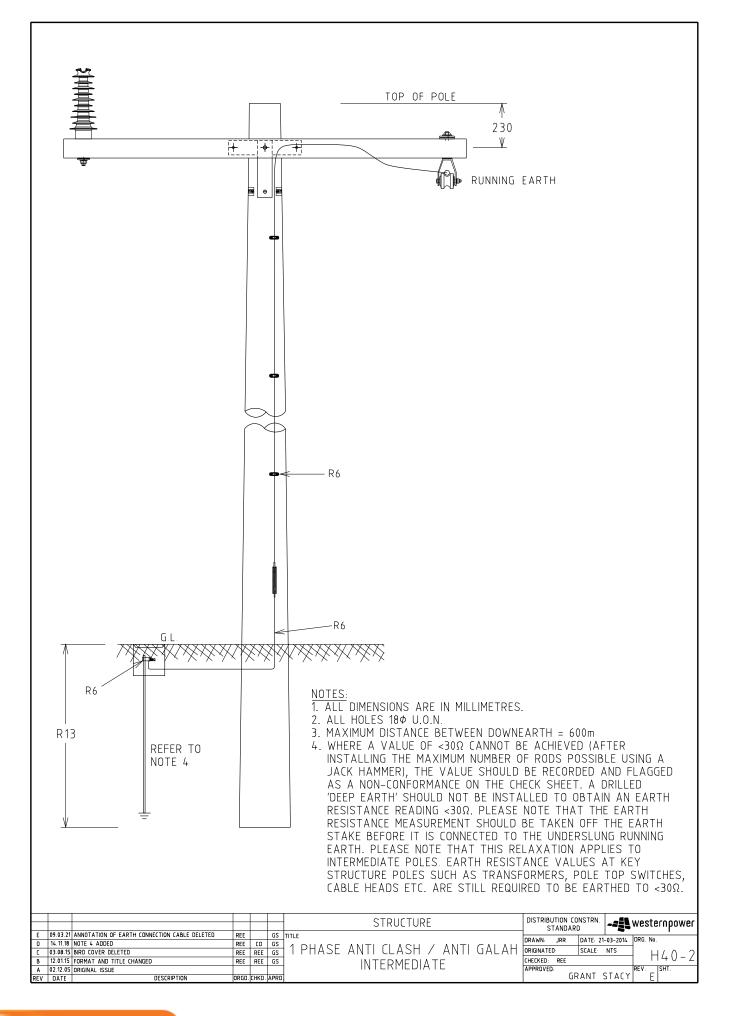


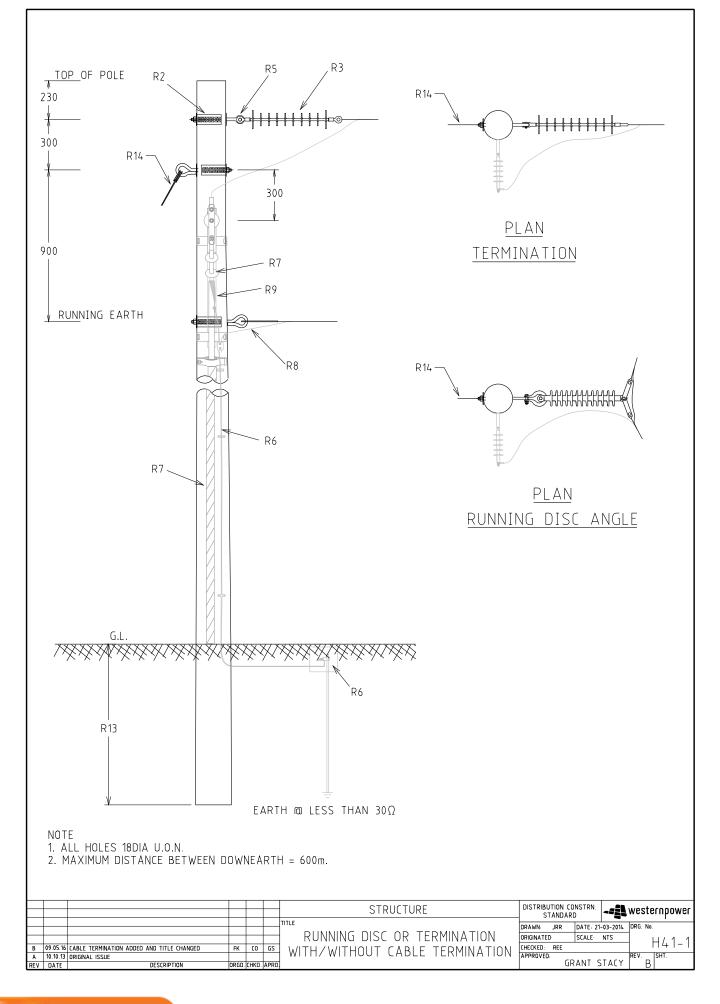


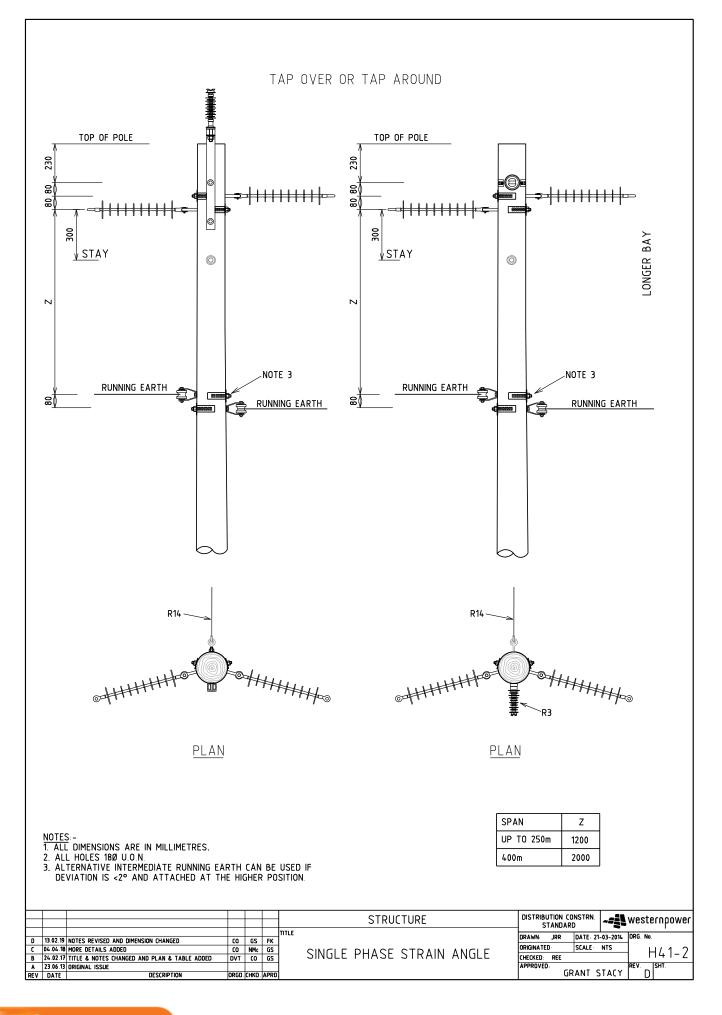


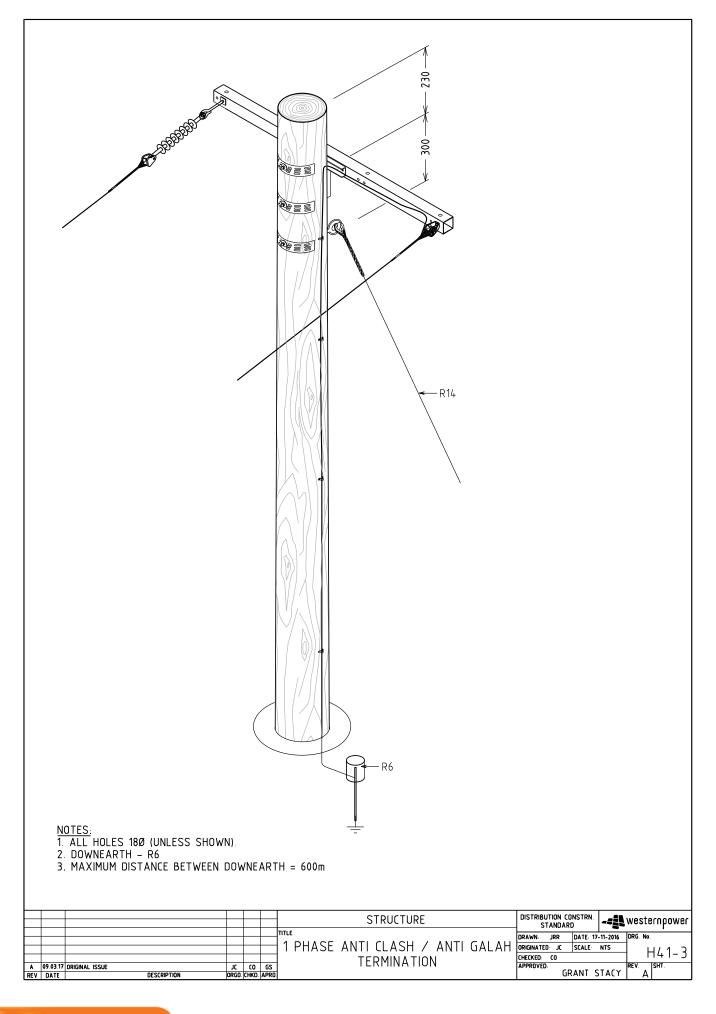


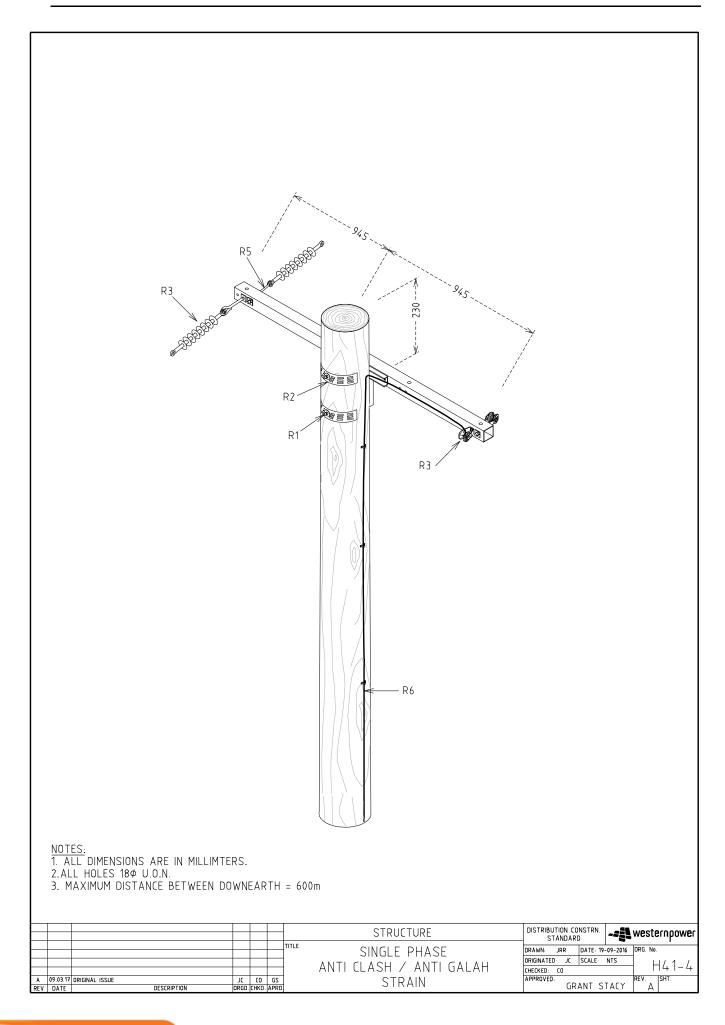


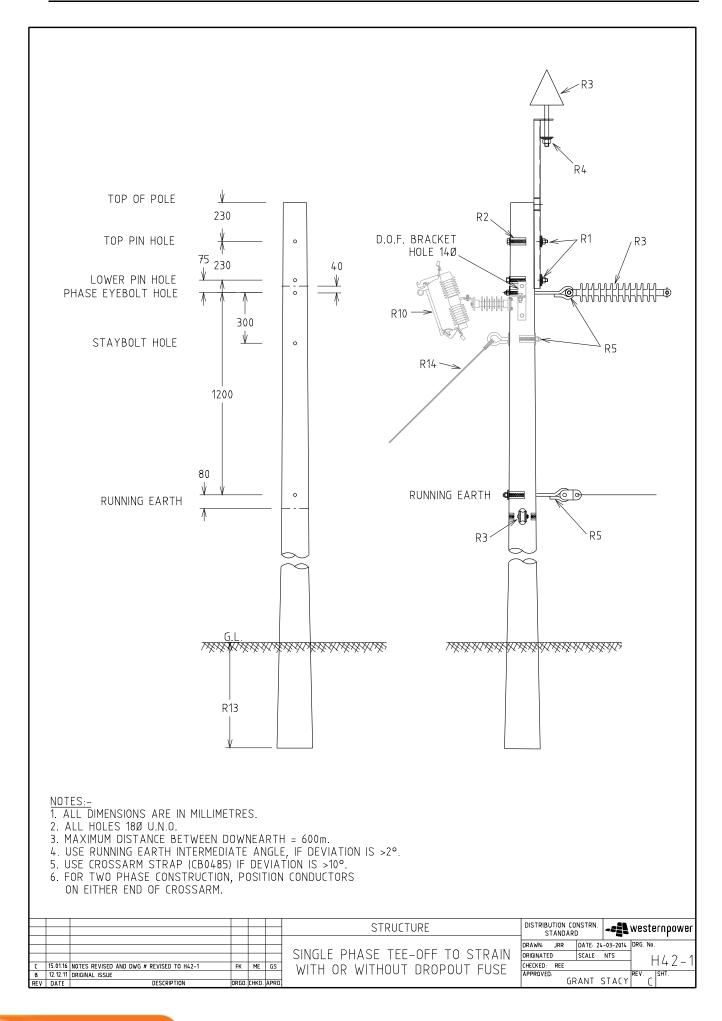


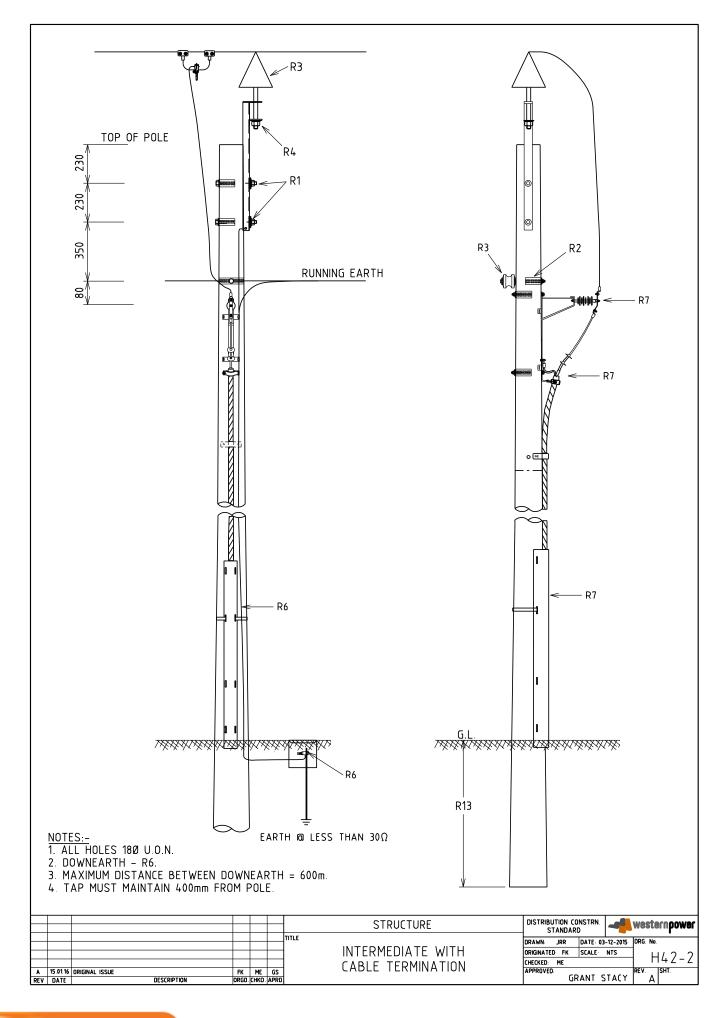


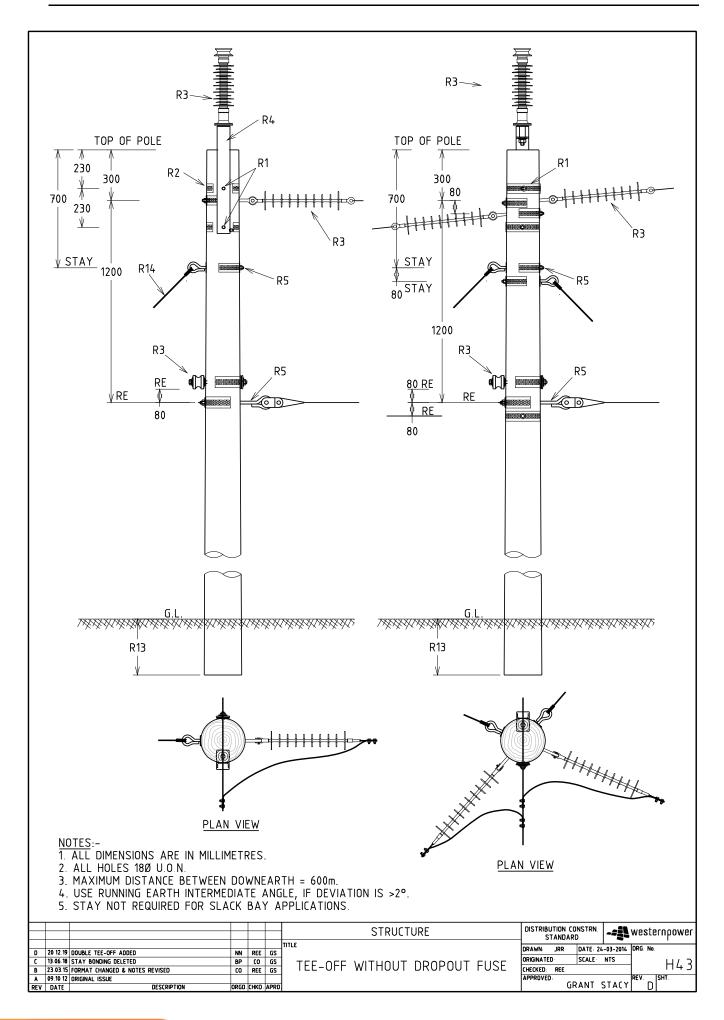


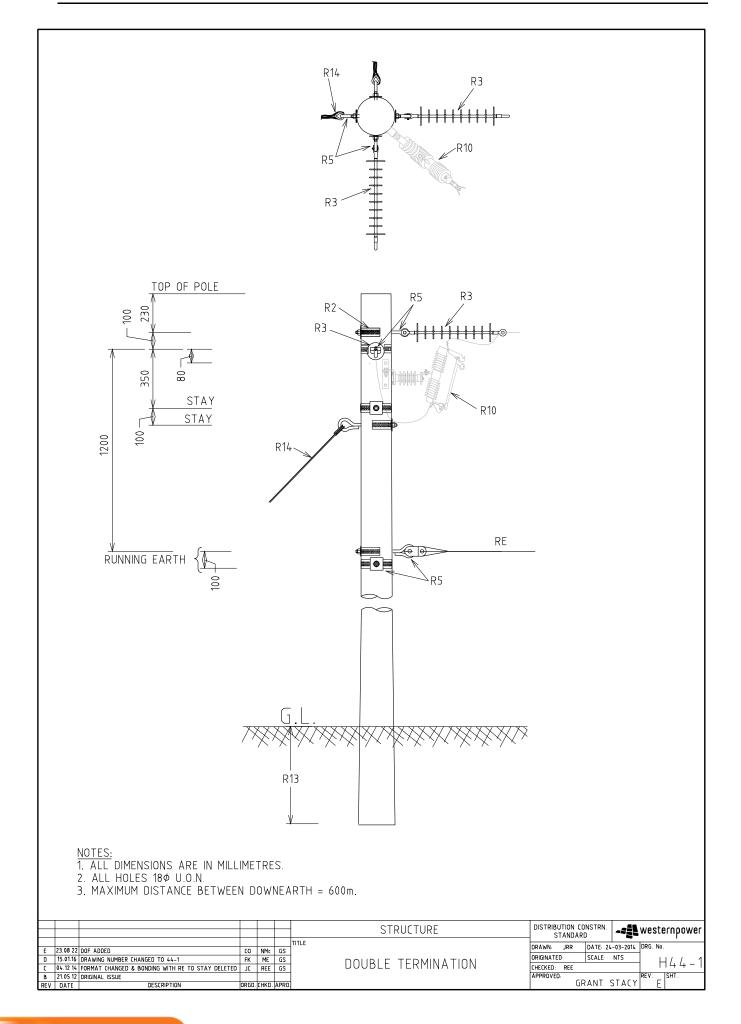


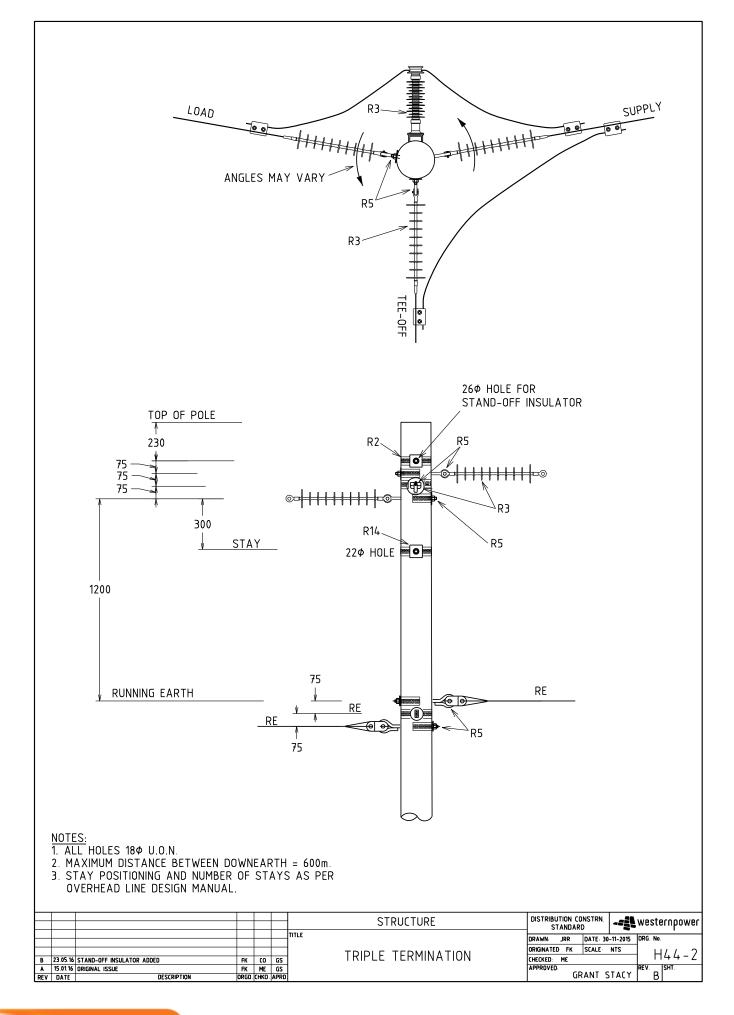


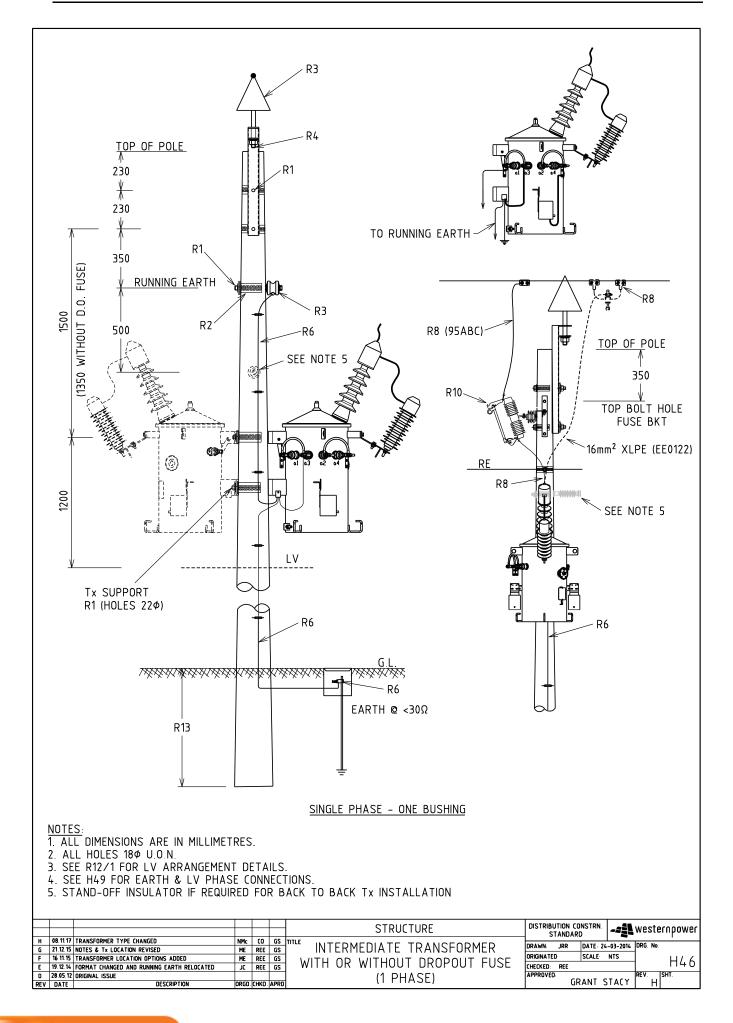


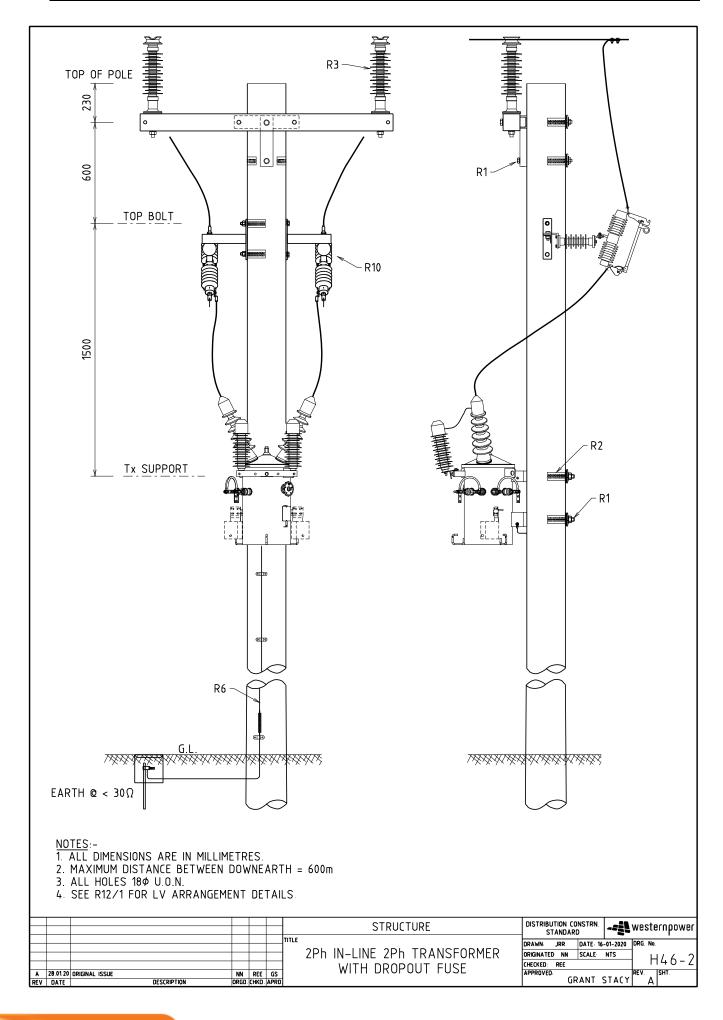


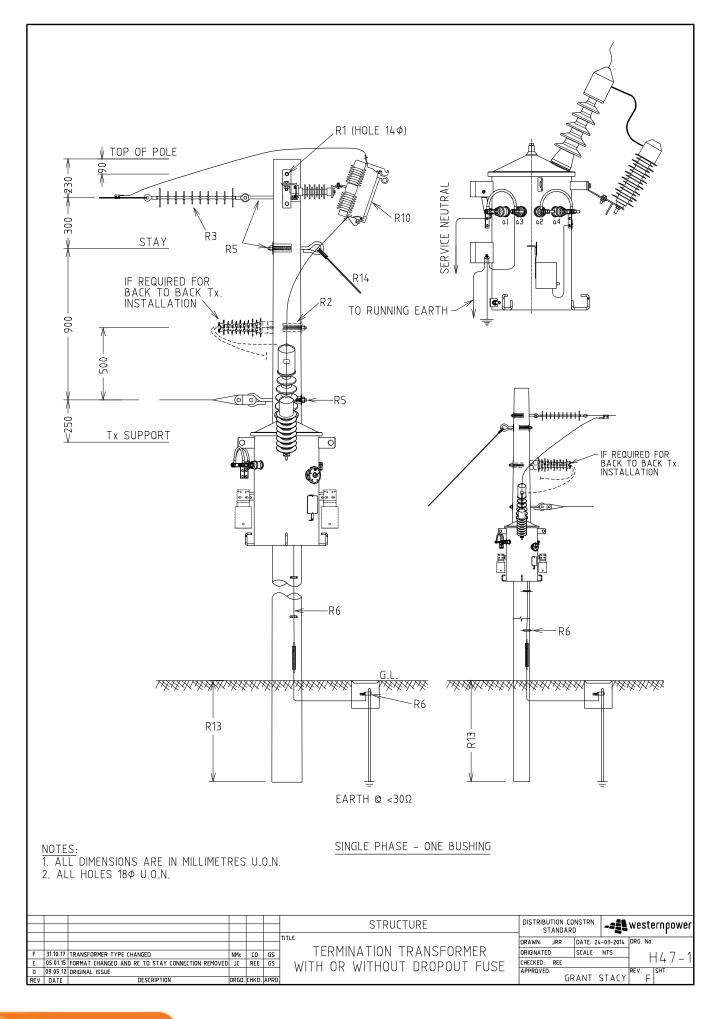


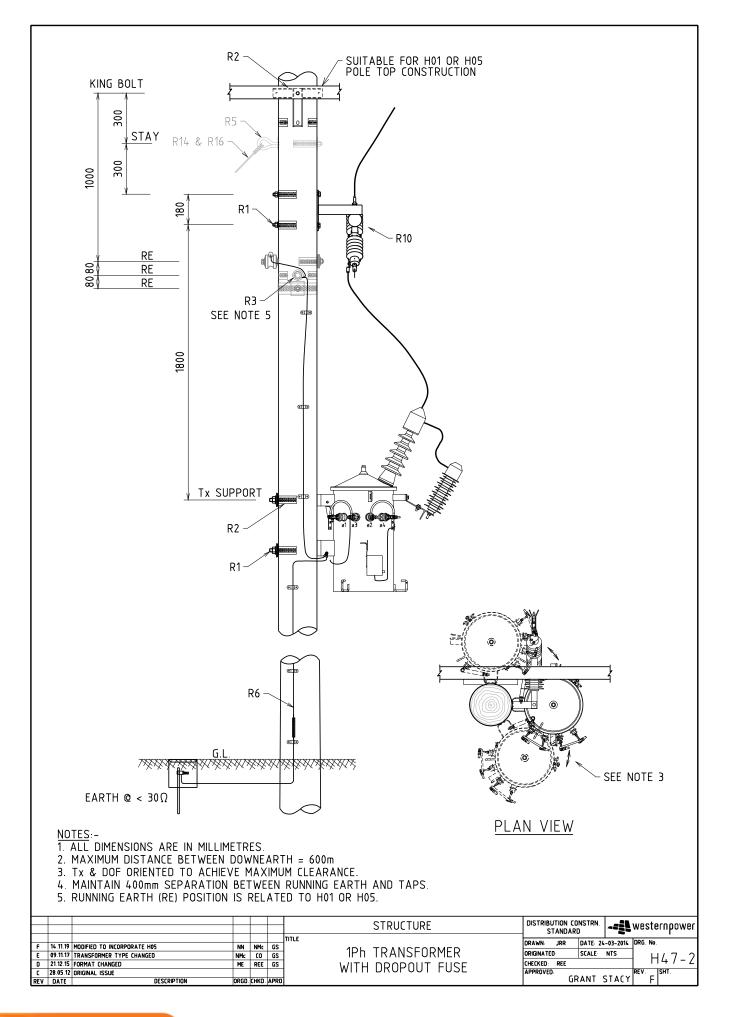


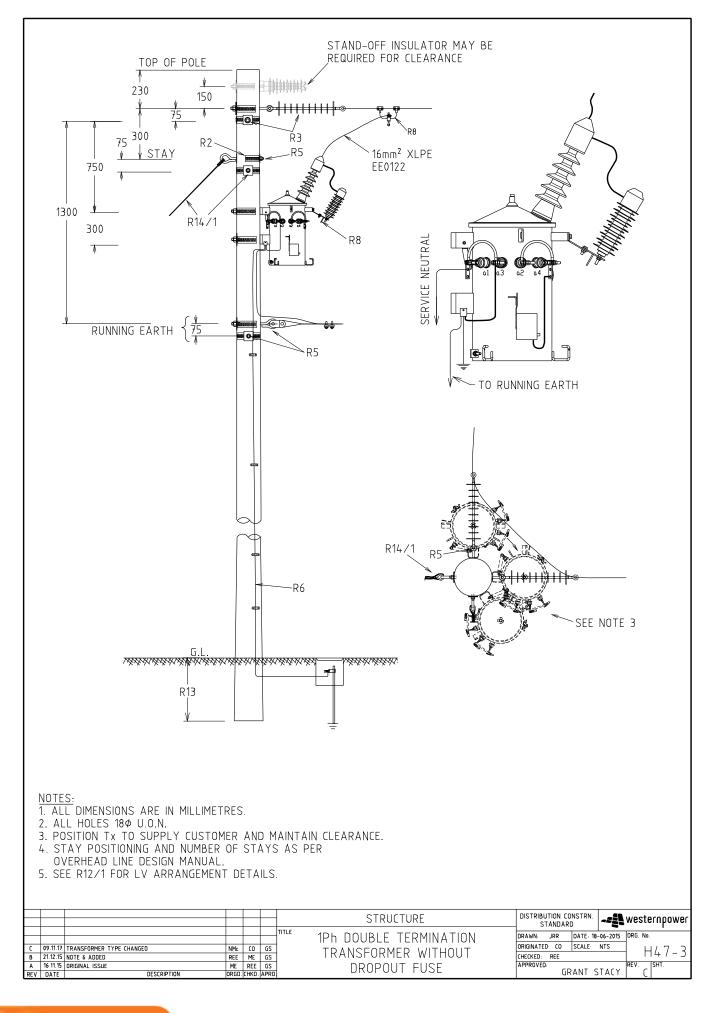


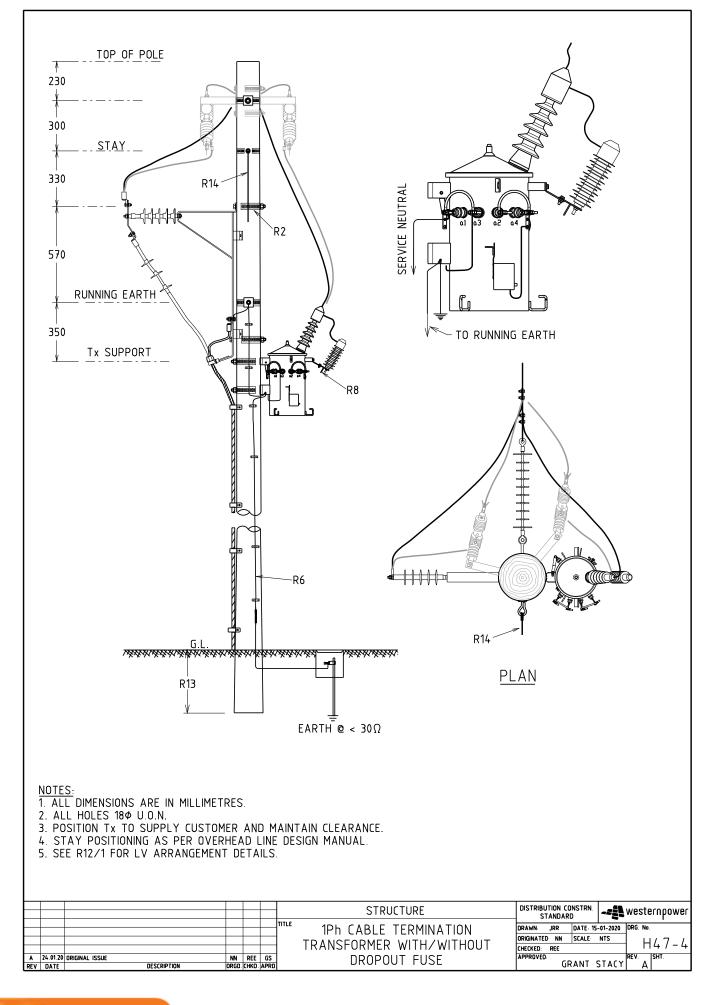


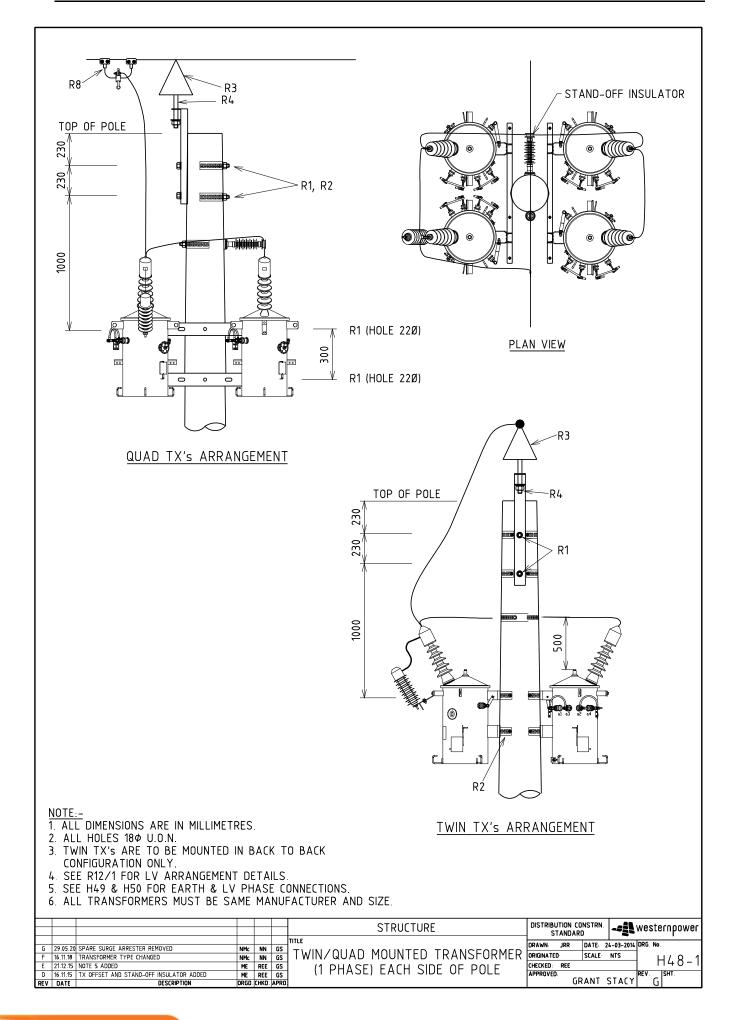


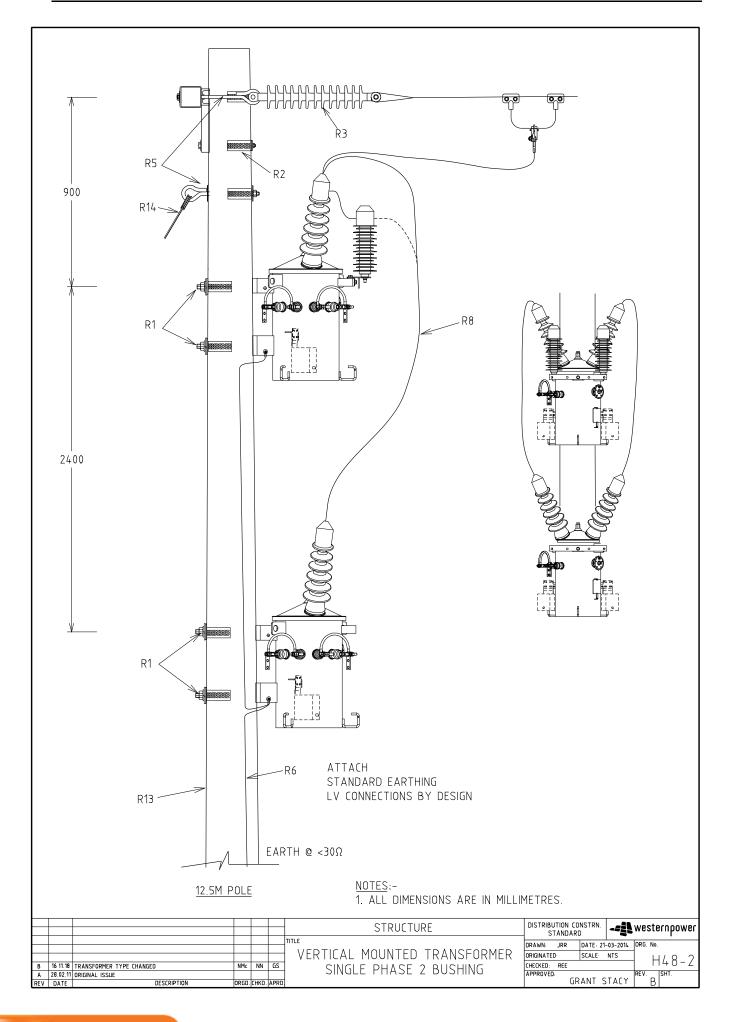


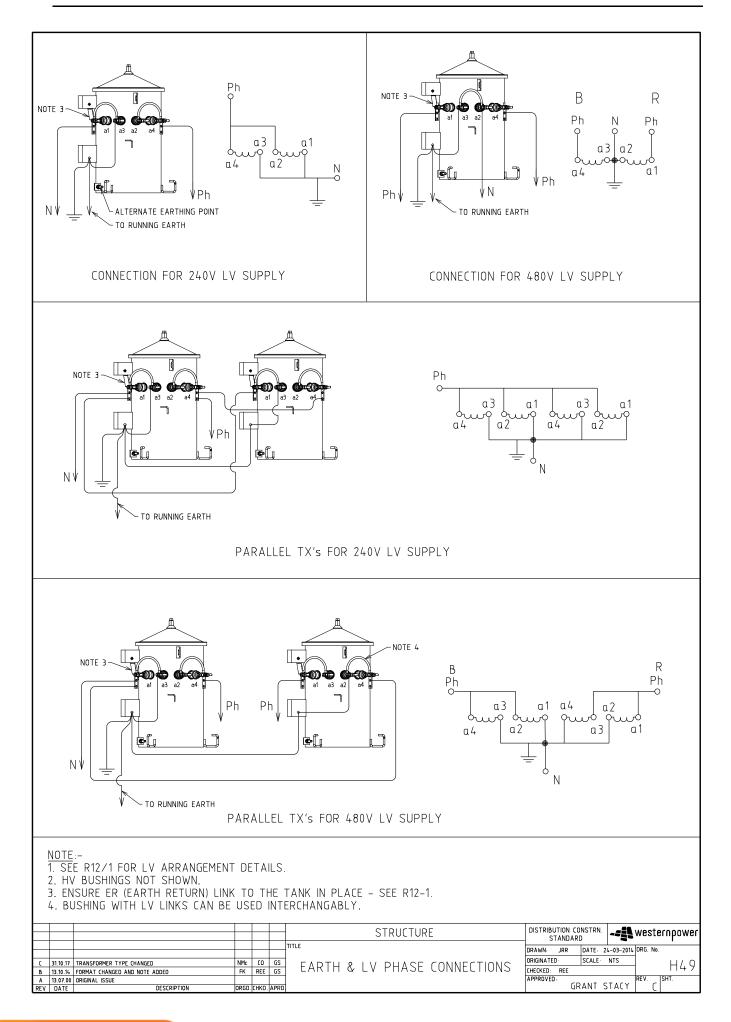


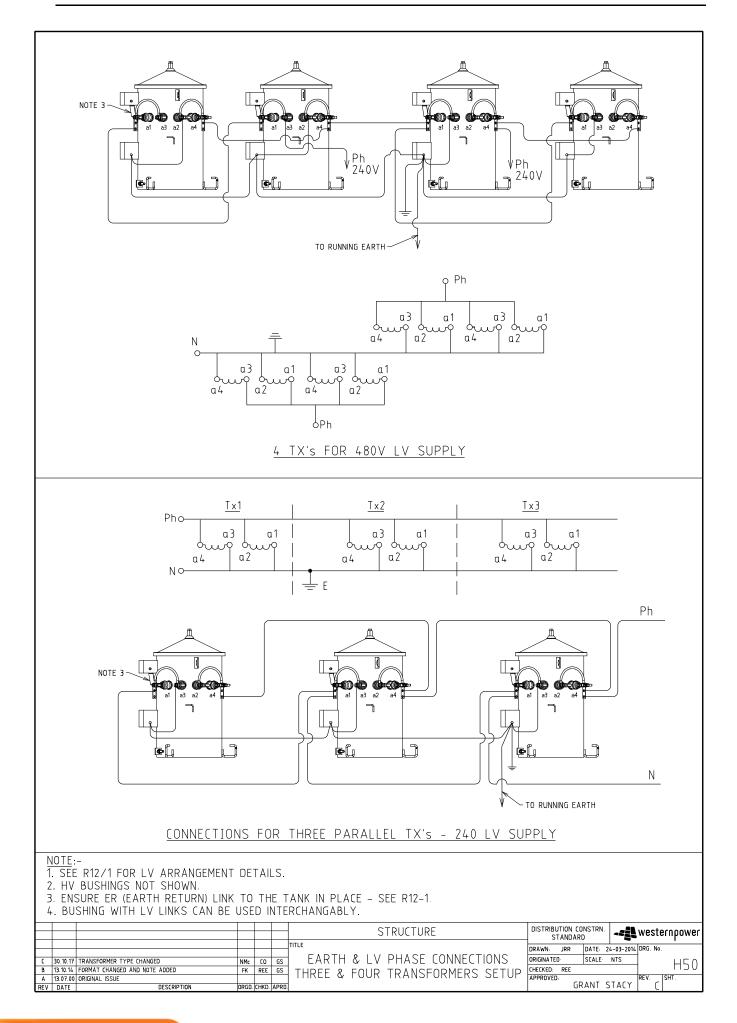




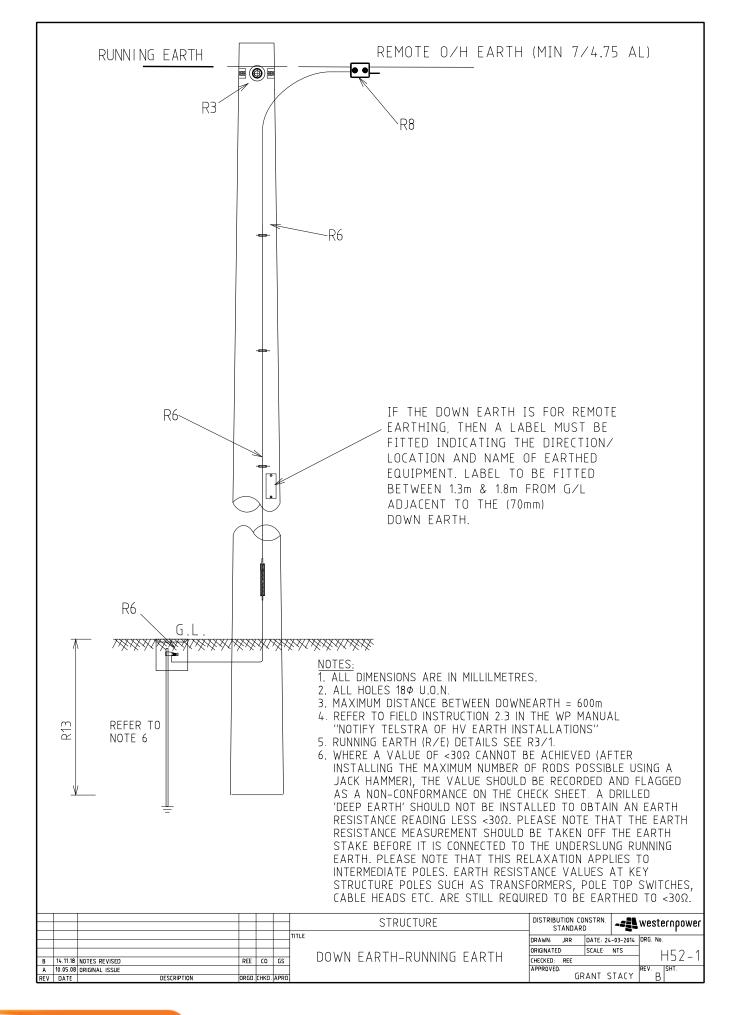


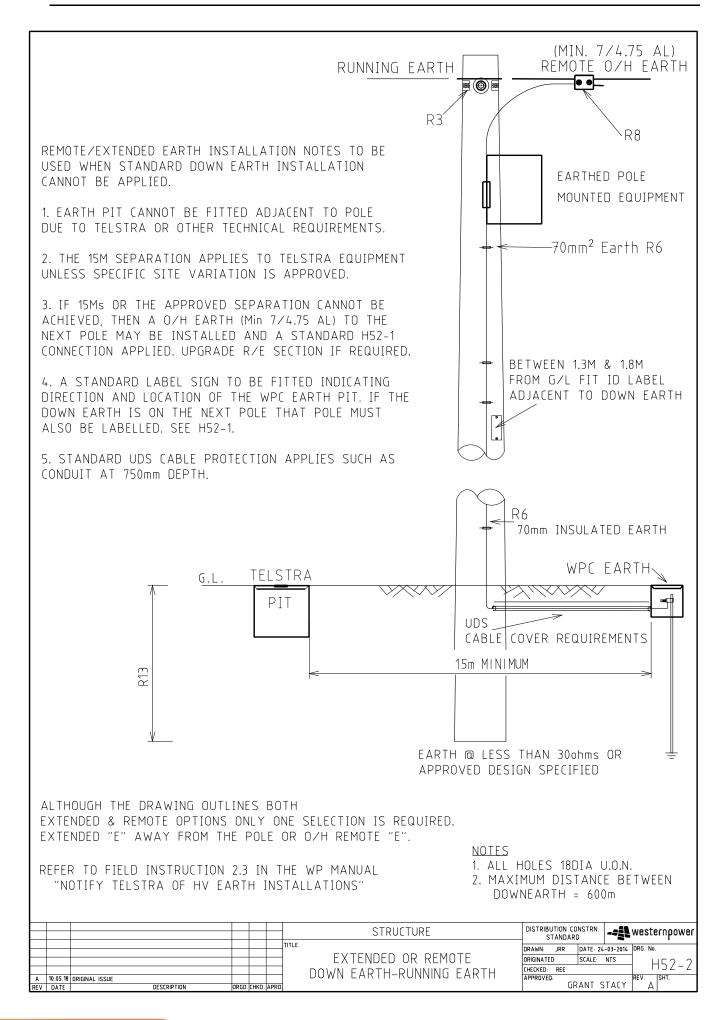


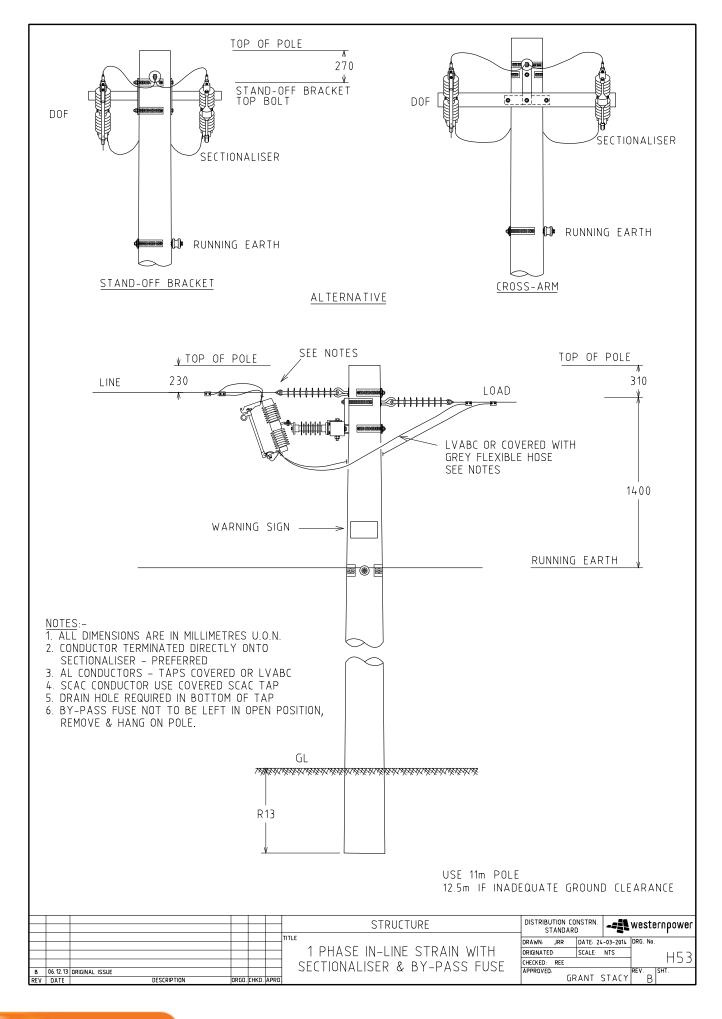


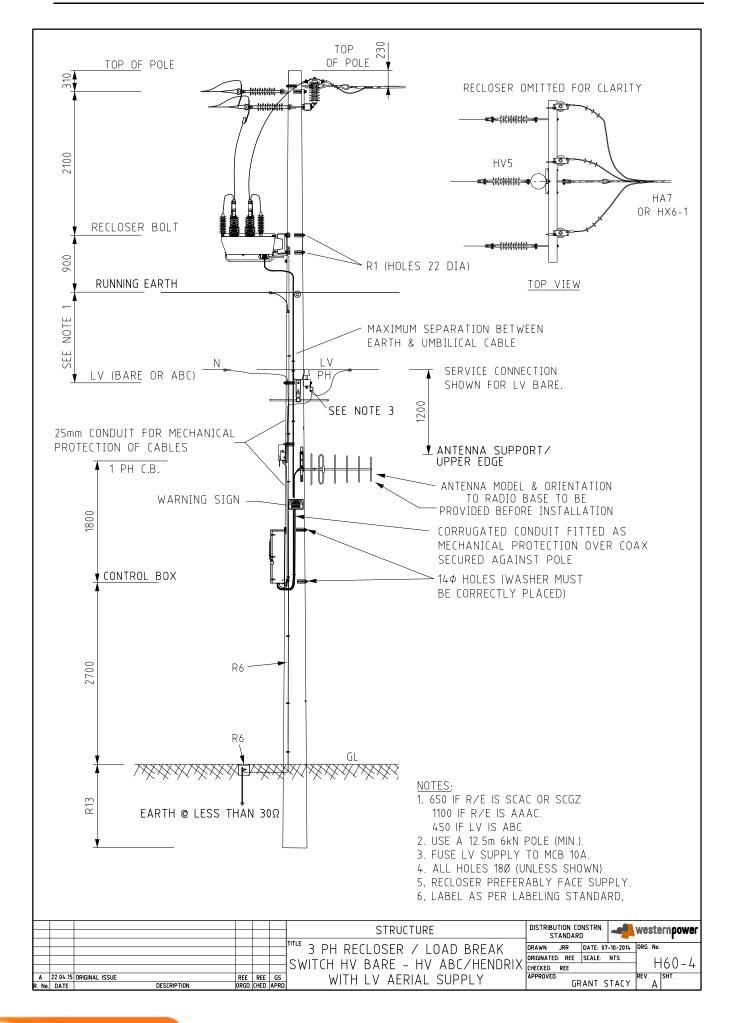


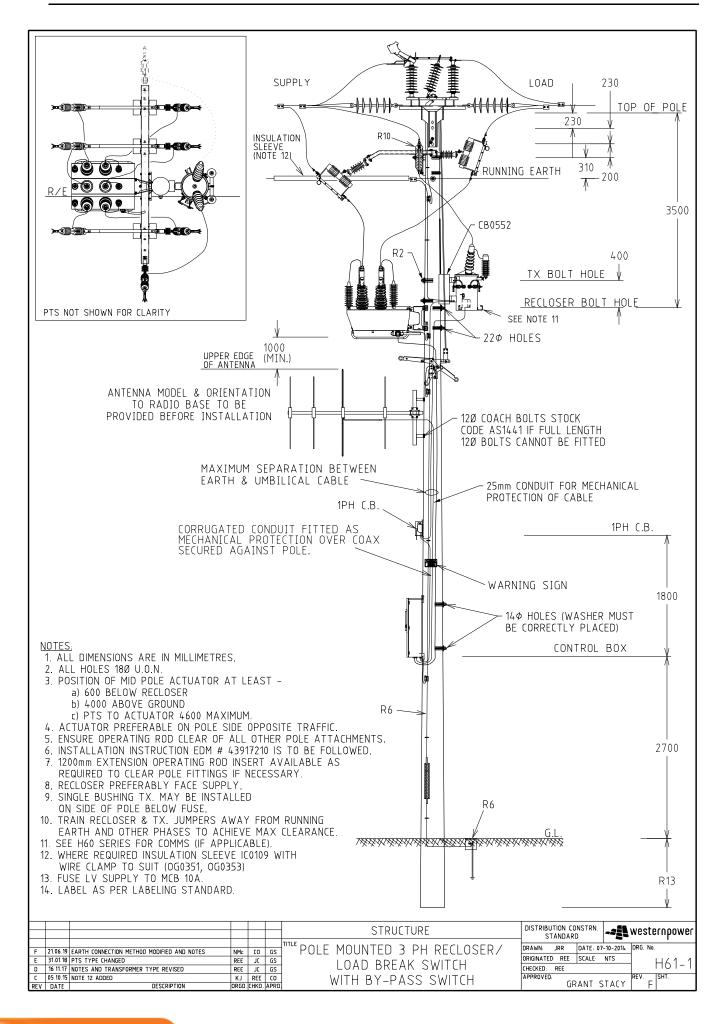


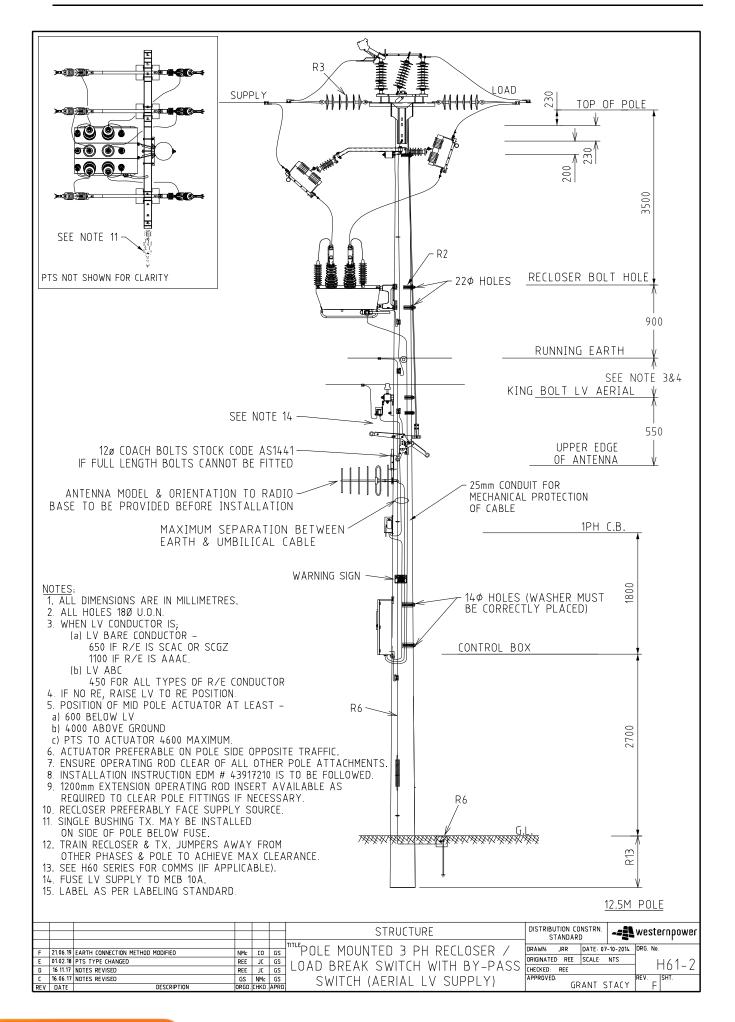


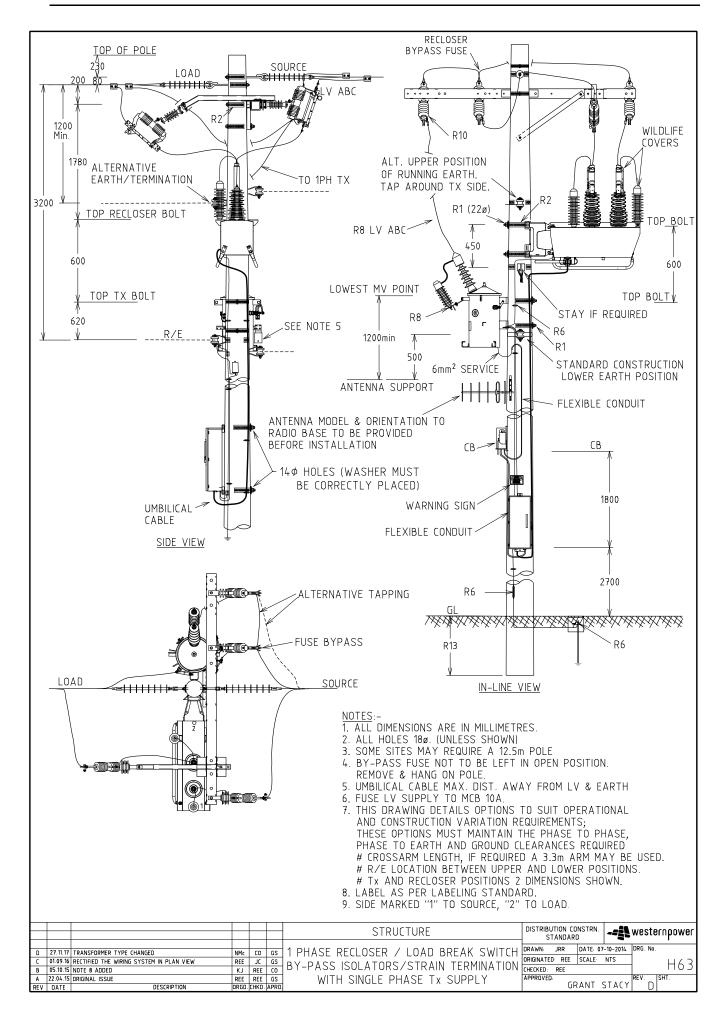






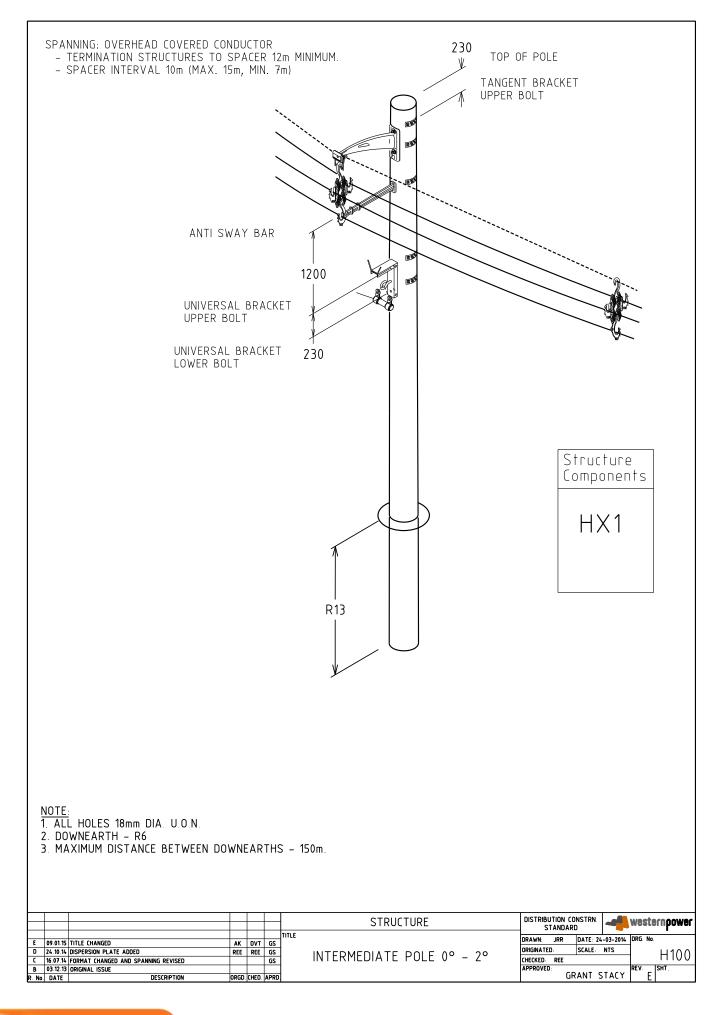


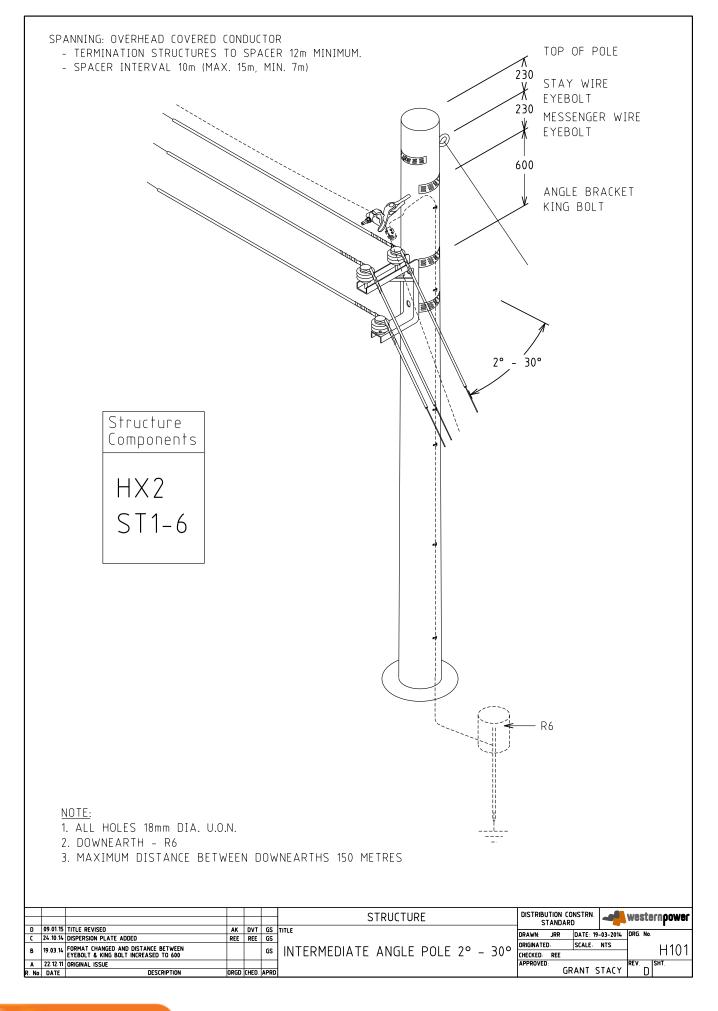


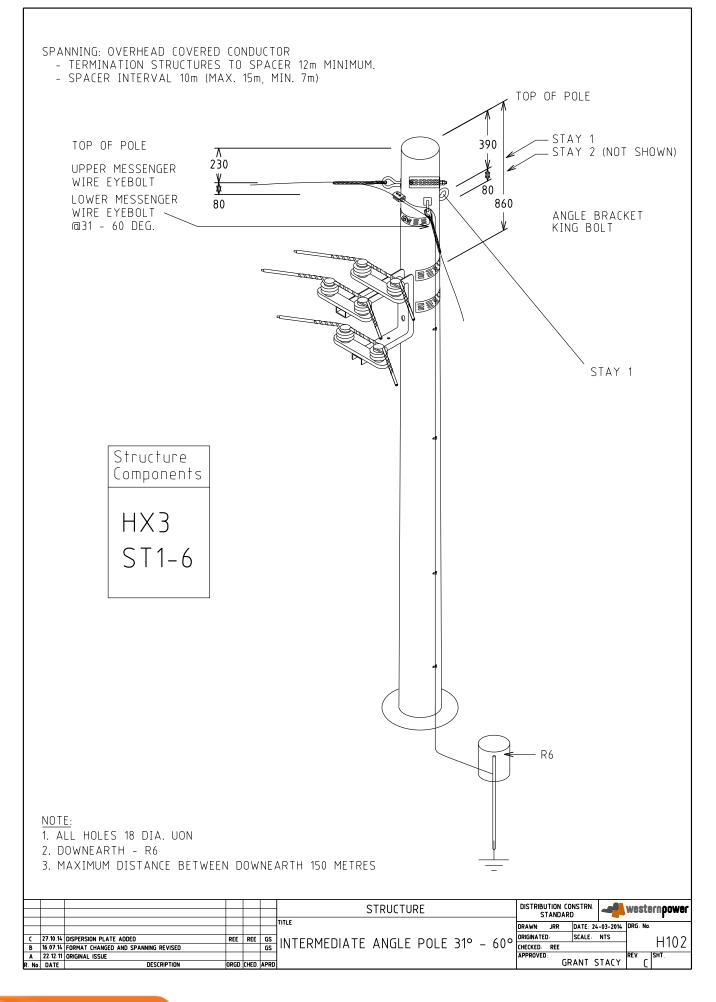


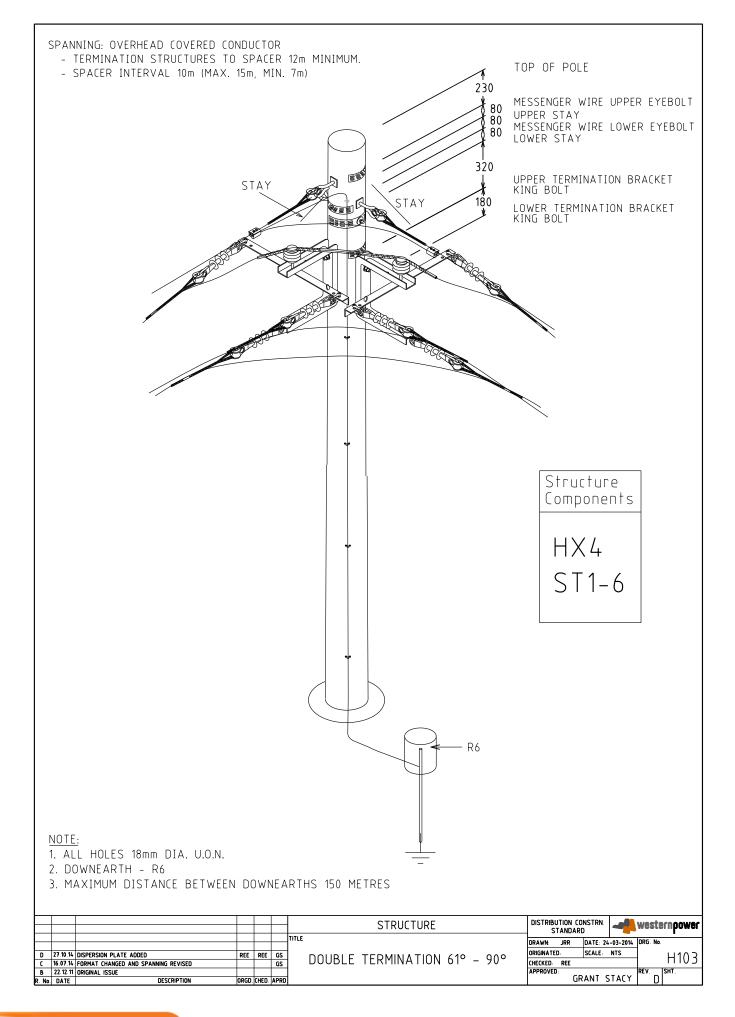
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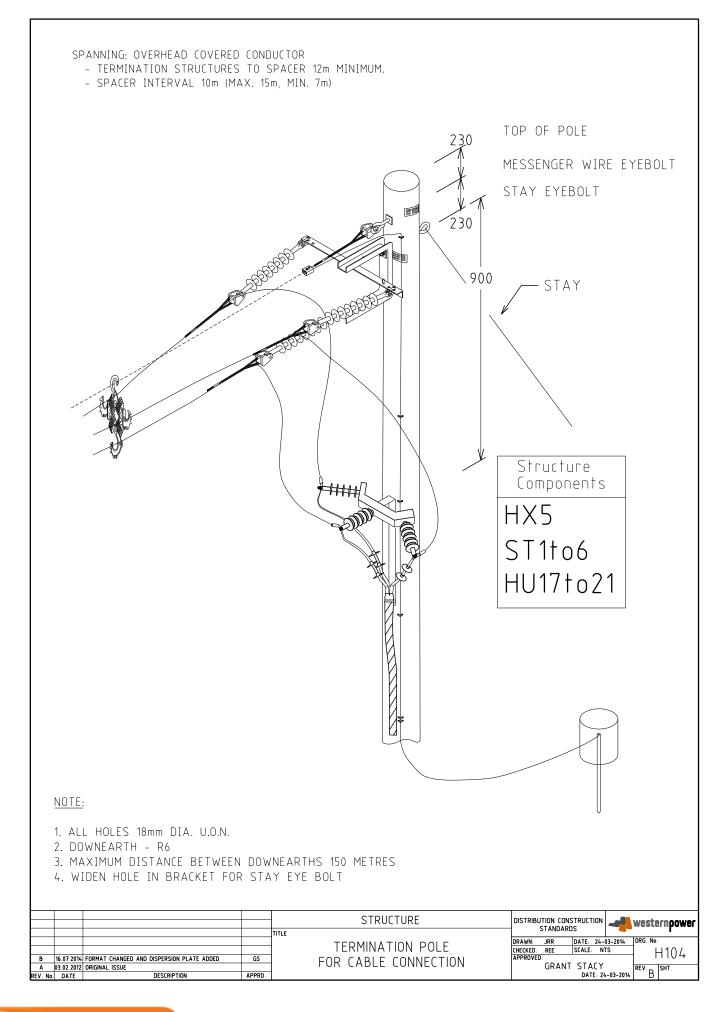




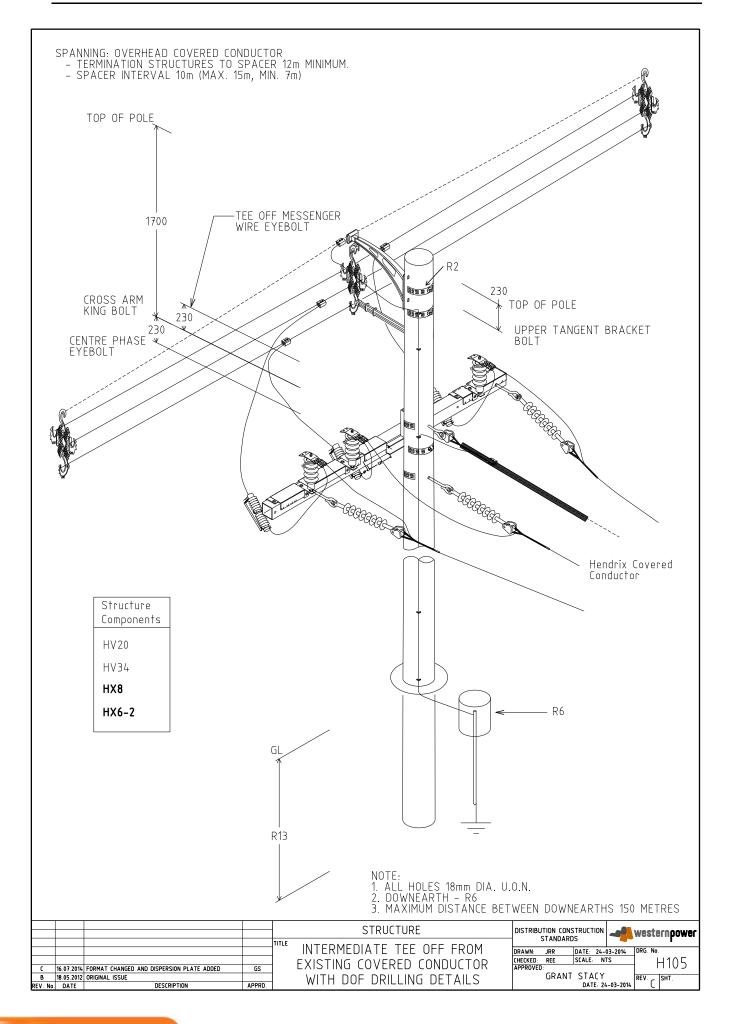


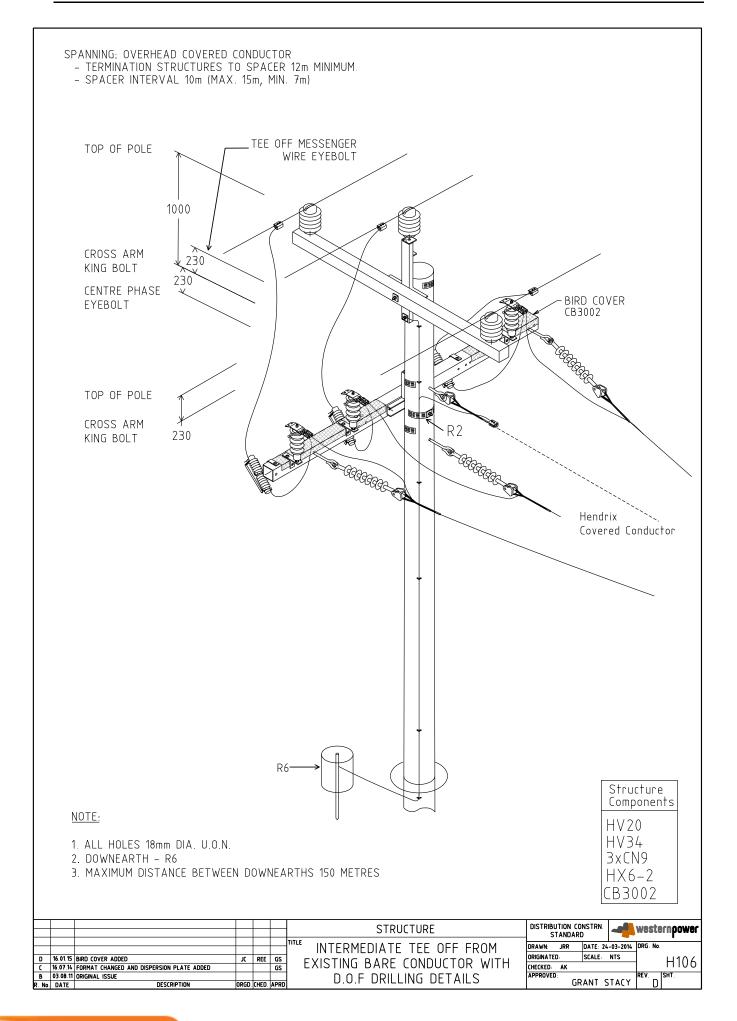












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