

Technical Bulletin

TB 0367 – Changes to transmission pole foundation design

Date: 27/03/2025

Content Owner: Kieran Shanahan – Engineering Delivery Manager

Approved By: Peter Langdon – Head of Asset Planning & Performance

Purpose

This technical bulletin informs our internal staff and Authorized Service Providers (ASPs) about the changes to pole foundation designs for new Transmission pole installation in Endeavour Energy network.

Background

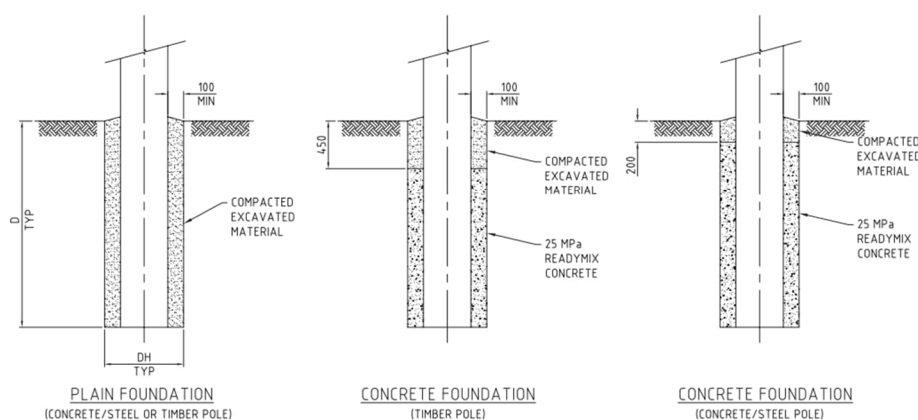
Concrete dust is a significant concern for workers' health and safety, especially when using concrete mix bags for concrete pole foundations. The fine particulate matter generated during the handling and processing of concrete can become airborne, posing respiratory hazards. Exposure to concrete dust can lead to short-term health effects such as respiratory irritation, coughing, and eye discomfort, as well as some long-term health risks.

To manage these risks, the current hierarchy of controls includes using appropriate personal protective equipment (PPE), as well as implementing wetting methods, proper ventilation, and dust extraction systems. While these measures are helpful, they are not sufficient to completely eliminate the risk.

A working group was formed with members from Design, Engineering Delivery, Field Operations, and Health & Safety to explore further options to reduce this risk. The working group came up with a solution to replace concrete with road base, based on recommendations from subject matter experts (SMEs) after a detailed analysis of different foundation types. This design has been verified on-site by performing destructive tests for various foundation types.

Actions

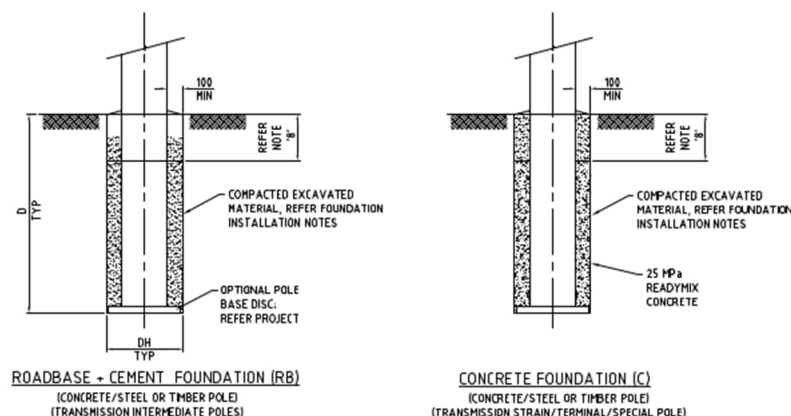
Drawing 367719 Rev B has been updated to Rev C, replacing Plain foundation with Road base and Cement foundation. Detailed changes to the drawing can be found in Annexure A.



Existing foundation types for transmission poles



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New foundation types for transmission poles

The new road base foundations are suitable for intermediate poles with medium bearing soil or higher. Concrete pole foundations will still be used for strain, terminal, or special poles where higher foundation capacities are required and when the poles are installed in weak soil conditions. When concrete foundations to be used, it is recommended to use appropriate personal protective equipment (PPE), and implementing wetting methods, proper ventilation, and dust extraction systems.

Whenever the Roadbase and Cement foundation is deployed, approved Roadbase material must be used. The approved road base has been added to the Approved Material List (AML), and these changes will appear in the AML in the next quarterly update

Item Description	Material Number/Part number	Suppliers/Address *
Natural Road base as per 3051 Edition 7 DGB20 Class 1B sampling as per AS1141.3.1	TBA/ DGB20	Parklea Sand & Soil /729 George St, South Windsor NSW 2756

**Currently we have one supplier approved on the AML and other suppliers will be added in due course.*

Implementation

The contents of this Technical Bulletin shall be implemented immediately for all transmission pole foundations.

Impacted Standards

The contents of this technical bulletin will be included in the next update of:

- MCI0005

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Contacts

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Annexure A

REV	DESCRIPTION	DATE	BY	CHKD	APPD
1	ISSUED	07/02/12	W. Leong		

NOTES

- THESE FOUNDATIONS ARE MINIMUM DIAMETER AND DEPTH FOR MEDIUM BEARING SOILS.
- TIMBER POLE DIMENSIONS ARE MINIMUM FOR 80MPa TIMBER POLES.
- CONCRETE/STEEL POLES ARE SHOWN AS LENGTH (m) (ULTIMATE STRENGTH (kN)) TIMBER POLES ARE SHOWN AS LENGTH (m) RATING AS PER DISC ON POLE.
- FOUNDATION DEPTHS SHALL BE VERIFIED USING SOFTWARE (LPILE OR EQUIVALENT).
- FOUNDATION DIMENSIONS SHALL BE VERIFIED AGAINST THE GEOTECHNICAL INVESTIGATION REPORT.
- USE OF STEEL LINER/CONCRETE PIPE IS PROJECT SPECIFIC.
- FOUNDATIONS TOP BACKFILL:
d = 450 (TIMBER POLE)
d = 200 (CONCRETE/STEEL POLE)

FOUNDATION INSTALLATION NOTES

ROADBASE AND CEMENT FOUNDATIONS

- REFER (R0000) FOR THE DETAIL ON USING ROADBASE FOR POLE FOUNDATION.
- THIS FOUNDATION IS SUITABLE FOR MEDIUM BEARING SOIL OR HIGHER, FOR OTHER SOIL BEARING TYPES (SOFT SAND, SILTY CLAY, ROCK ETC), CONTACT DESIGN OFFICE.
- ROADBASE SHALL BE PROCURED FROM AN APPROVED VENDOR AND VERIFIED TEST REPORTS.
- USE TWO CENT BAGS AT THE BOTTOM OF THE FOUNDATION TO FORM A BASE. ADD WATER, COMPACT WELL AND HYDRAULIC RAM. ALTERNATIVELY USE CONCRETE BASE DISC AS PER NOTE 7.
- USE ROADBASE WITH DRY CEMENT (5:1 - 5 VOLUMES OF ROADBASE AND 1 VOLUME OF CEMENT) IN 200mm LAYERS ADD WATER, COMPACT WELL WITH HYDRAULIC RAM.
- BACK FILL THE TOP (50 mm) WITH PLAIN ROAD BASE OR NATIVE SOIL MATERIAL AND COMPACT WITH HYDRAULIC RAM.
- COMPACT IN LAYERS (200mm) AND SLOPED AWAY FROM THE POLE TO NATURAL SURFACE.

CONCRETE FOUNDATIONS

- THIS FOUNDATION IS SUITABLE FOR SOFT TO MEDIUM BEARING SOIL, FOR OTHER SOIL BEARING TYPES (ROCK ETC), CONTACT DESIGN OFFICE.
- INSTALL 25MPa READYMIX CONCRETE TO WITHIN 450mm OF SURFACE FOR TIMBER POLES AND 200mm OF SURFACE FOR CONCRETE POLES.
- COMPACT IN LAYERS WITH EXCAVATED MATERIAL FOR BALANCE OF FOUNDATION (150mm) FOR TIMBER POLES AND 200mm FOR CONCRETE POLES.
- SUBSTITUTE PREMIXED OR CONCRETE MIXED ON SITE (RATIO 4 GRAVEL, 2 SAND AND 1 CEMENT) FOR RACECOURSE/REMOTE SITES.
- SUBSTITUTE QUICK SET CONCRETE FOR POLE REPLACEMENT WITH LIMITED CURING TIME.

POLE CODE (m/kN)	TP DIA (mm) (NOF)	BUTT DIA (mm) (NOF)	MASS (kg) (NOF)	HOLE DIA (mm) (NOF)	MIN DEPTH UNSTAYED (m) D
8/60	405	525	2278	900	3.8
17/32	315	570	3778	900	5.1
17/44	360	615	4275	900	5.5
17/60	458	705	5445	900	6.9
18.5/32	315	570	4238	900	5.2
18.5/44	360	630	4990	900	5.8
18.5/60	458	720	4995	1000	6.2
20/32	315	615	4738	900	5.3
20/40	360	660	5458	900	5.8
20/60	458	750	6078	1000	6.4
21.4/32	315	636	5278	900	5.5
21.4/40	360	681	5928	900	5.9
21.4/60	458	771	7548	1000	6.6
23/32	315	660	5798	900	5.6
23/40	360	705	6638	900	6.1
23/60	458	795	8328	1000	6.7
24/32	315	675	6180	900	5.7
24/40	360	720	7038	900	6.2
24/60	458	810	8890	1000	6.8

POLE CODE (m/kN)	TP DIA (mm) (NOF)	BUTT DIA (mm) (NOF)	MASS (kg) (NOF)	HOLE DIA (mm) (NOF)	MIN DEPTH UNSTAYED (m) D
18.5/32	250	621	1,118	900	3.2
18.5/44	255	708	1,238	900	3.6
18.5/60	318	774	1,668	1000	4.2
21.0/32	250	625	1,240	900	3.6
21.0/40	255	748	1,318	1000	3.6
21.0/60	318	810	1,858	1000	4.4
21.4/32	250	660	1,368	900	3.5
21.4/44	255	761	1,540	1000	3.7
21.4/60	318	849	2,020	1000	4.2
23.0/32	250	782	1,598	900	3.6
23.0/40	255	818	1,778	1000	3.9
23.0/60	318	877	2,370	1000	4.3

POLE CODE (m/kN)	TP DIA (mm) (NOF)	BUTT DIA (mm) (NOF)	MASS (kg) (NOF)	HOLE DIA (mm) (NOF)	MIN DEPTH UNSTAYED (m) D
17/4	190	308	367	750	2.9
17/8	264	411	439	750	2.9
17/12	398	463	462	750	2.9
18.5/4	190	352	372	750	2.35
18.5/8	264	436	441	750	2.35
18.5/12	398	488	500	750	2.35
20/4	190	365	387	750	2.5
20/8	266	441	463	750	2.5
20/12	321	496	517	750	2.5
21.5/4	190	379	402	750	2.65
21.5/8	267	456	479	750	2.65
21.5/12	322	511	534	750	2.65
23/4	190	389	414	750	2.8
23/8	266	447	492	750	2.8
23/12	322	523	598	750	2.8

ROADBASE + CEMENT FOUNDATION (RB)
(CONCRETE/STEEL OR TIMBER POLE)
(TRANSMISSION INTERMEDIATE POLES)

CONCRETE FOUNDATION (C)
(CONCRETE/STEEL OR TIMBER POLE)
(TRANSMISSION STRAIN/TERMINAL/SPECIAL POLE)

Endeavour Energy	DO NOT SCALE COPYING IN UNLIMITED	APPROVED D. Asvastas / G. Schafer
ORIGINAL SCALE APPROVED W. Leong	DATE 07/02/12	PROJECT A2P 367719
DRAWN LH	CHKD RL	SHEET No. 1 OF 1 SHEETS

OVERHEAD TRANSMISSION
POLE FOUNDATION
DETAILS

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