



Engineering & Construction  
ENGINEERING

CODICE - CODE  
D.73.ZA.W.74565.14.007.00

PAGINA - PAGE  
1 di/of 9

TITOLO - TITLE

LINGUE DISPONIBILI - AVAILABLE LANGUAGE: IT

## SPECIFICA TECNICA

### 132kV Foundation Layouts

**D.73.ZA.W.74564.14.007.00**

1. AUR-OHL-CIV-MP-007 Rev 2 - Monopole Foundation 1250kNm Moment (Type 2)
2. AUR-OHL-CIV-MP-009 Rev 3 - Monopole Foundation 1500kNm Moment (Type 2)
3. AUR-OHL-CIV-MP-013 Rev 2 - Monopole Foundation 2000kNm Moment (Type 2)
4. D-DT-7850 - Set 5 Sheet 1\_2 - Intermediate Monopole Foundation - Rock
5. D-DT-7850 - Set 5 Sheet 2\_2 - Intermediate Monopole Foundation - 300kPA
6. D-DT-7850 - Set 5 Sheet 3\_2 - Intermediate Monopole Foundation - 150kPA
7. D-DT-7850 - Set 5 Sheet 4\_2 - Intermediate Monopole Foundation - 100kPA
8. D-DT-7850 - Set 5 Sheet 5\_2 - Intermediate Monopole Foundation - 50kPA

**ISSUED FOR  
CONSTRUCTION**

C W Hoffman

<b>00</b>	18/11/2019	Issue for Construction (IFC) - 132kV OHL Foundation Layouts	Aurecon	S Paliso	C Hoffman
<b>0A</b>	17/09/2019	Issue for Validation - 132kV OHL Foundation Layouts	Aurecon	J Kriel	C Hoffman
REV. REV.	DATA DATE	DESCRIZIONE DESCRIPTION	PREPARATO PREPARED	CONTROLLATO CHECKED	APPROVATO APPROVED
Scopo di utilizzo / Utilization Scope					
Eskom Selfbuild Works			S Mehlomakulu	S Mehlomakulu	Shahil Juggernath
		EGP DATA EGP DATE	EGP VERIFICATO EGP VERIFIED	EGP CONTRIBUTI EGP CONTRIBUTED	EGP VALIDATO EGP VALIDATED
PROGETTO / IMPIANTO PROJECT / PLANT		CODICE - CODE			
Soetwater Wind Farm	TIPO TYPE	EMITT. ISSUER	PAESE COUNTRY	TEC. TEC.	IMPIANTO PLANT
	<b>D</b>	<b>7</b>	<b>3</b>	<b>Z</b>	<b>A</b>
	<b>W</b>	<b>7</b>	<b>4</b>	<b>5</b>	<b>6</b>
	<b>5</b>	<b>1</b>	<b>4</b>	<b>0</b>	<b>0</b>
	<b>7</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>
	<b>0</b>	<b>0</b>	<b>0</b>	<b>7</b>	<b>0</b>
CLASSIFICAZIONE CLASSIFICATION			RIF. ARCHIVIO ARCHIVE ID		00000000
<input type="checkbox"/> PUBBLICO PUBLIC <input checked="" type="checkbox"/> AZIENDALE COMPANY <input type="checkbox"/> RISERVATO CONFIDENTIAL <input type="checkbox"/> RISTRETTO RESTRICTED					

Questo documento contiene informazioni di proprietà di Enel Green Power s.p.a e deve essere utilizzato esclusivamente dal destinatario in relazione alle finalità per le quali è stato ricevuto. E' vietata qualsiasi forma di riproduzione o di divulgazione senza l'esplicito consenso di Enel Green Power s.p.a

*This document is property of Enel Green Power s.p.a It is strictly forbidden to reproduce this document, in whole or in part, and to provide to others any related information without the previous written consent by Enel Green Power s.p.a*

1

2

3

4

A

B

C

D

E

F

A

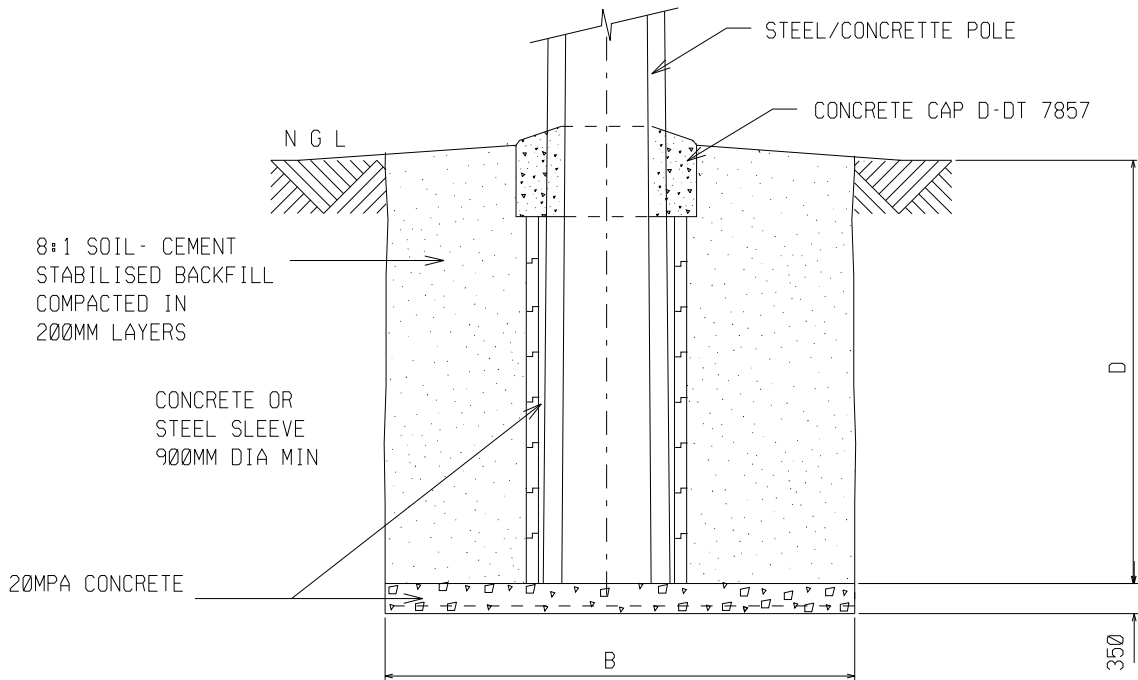
B

C

D

E

F



REF. 245 STEEL FABRIC TO  
SABS 1024 WITH 50MM  
COVER ON BOTTOM

SQUARE

# Information Only

NOTE: VOLUMES ARE  
APPROXIMATE ONLY

INTERMEDIATE STRUCTURE FOUNDATION  
FOR SUBMERGED, LOOSE COHESIONLESS SOILS  
TYPE 4 (50KPA)

23kN POLE LOAD	POLE LENGTH (m)	PLANTING DEPTH D (m)	B (m)	EXCAVATION VOLUME m <sup>3</sup>	BACKFILL SOIL/CEMENT m <sup>3</sup>	20MPa CONCRETE m <sup>3</sup>
	20	2.6	4.10	49.421	42.624	5.714
	21	2.7	4.00	48.640	42.041	5.440
	22	2.8	3.90	47.759	41.293	5.171
	23	2.9	3.80	46.786	40.510	4.909
	24	3.0	3.70	45.725	39.640	4.655
37kN POLE LOAD	POLE LENGTH (m)	PLANTING DEPTH D (m)	B (m)	EXCAVATION VOLUME m <sup>3</sup>	BACKFILL SOIL/CEMENT m <sup>3</sup>	20MPa CONCRETE m <sup>3</sup>
	20	2.6	6.60	128.066	112.173	14.811
	21	2.7	6.40	124.518	108.204	13.926
	22	2.8	6.30	124.626	109.837	13.495
	23	2.9	6.10	120.560	106.543	12.651
	24	3.0	6.00	120.24	106.570	12.24

2 RETICULATION REMOVED FROM TITLE BLOCK

N.M.

P.A.T.

P.A.T.

31.01.10

1 STEEL POLE CHANGED TO STEEL/CONCRETE POLE

N.M.

B.HILL

B.HILL

05.08.08

REV

REVISION DESCRIPTION

BY

CHKD

AUTH

DATE

PROJECT NO.



AUTH:

DATE: / /

CHKD: D VAN TONDER

DATE: 25/10/2002

DRAWN: N VAN TONDER  
S NAIDOO

DATE: 22/10/2002

DISTRIBUTION TECHNOLOGY  
RETICULATION/SUB-TRANSMISSION LINES  
INTERMEDIATE FREESTANDING MONOPOLES  
FOUNDATION DETAILS - 50 KPA

D DT 7850

SET

SHEET

REVISION

5

5

2

1

2

3

4 A4L

A

B

C

D

E

F

A

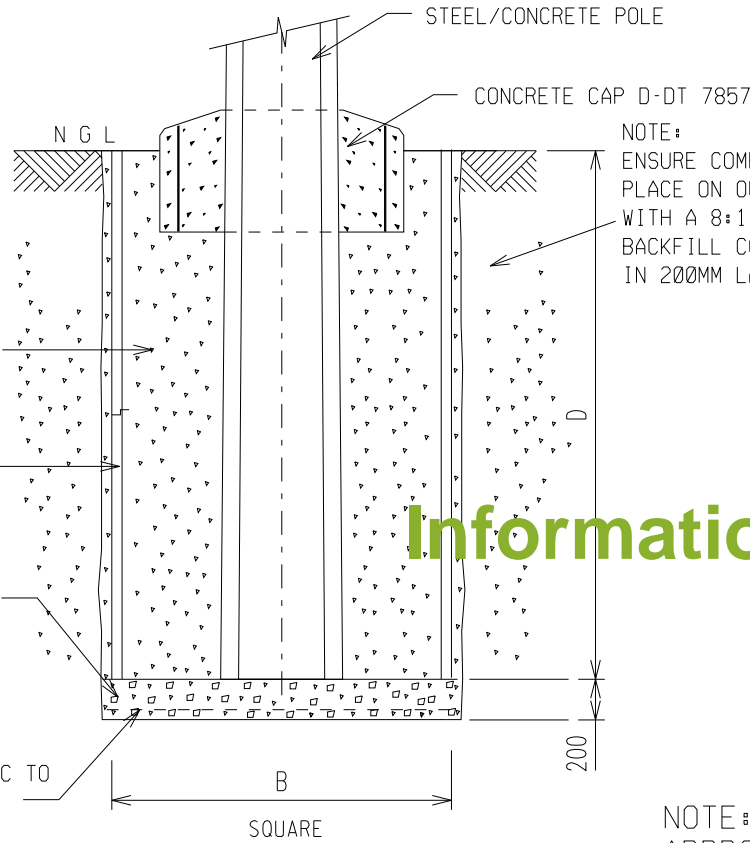
B

C

D

E

F



8:1 SOIL - CEMENT  
STABILISED BACKFILL  
COMPACTED IN  
200MM LAYERS

CONCRETE OR  
STEEL SLEEVE

10MPA CONCRETE

REF. 245 STEEL FABRIC TO  
SABS 1024 WITH 50MM  
COVER ON BOTTOM

SQUARE

NOTE:  
ENSURE COMPACTION TAKES  
PLACE ON OUTSIDE OF SLEEVE  
WITH A 8:1 CONCRETE - SAND  
BACKFILL COMPACTED  
IN 200MM LAYERS

NOTE: VOLUMES ARE  
APPROXIMATE ONLY

INTERMEDIATE STRUCTURE FOUNDATION  
FOR SANDY, LOSE COHESIONLESS SOILS  
TYPE 3 (100KPA)

	POLE LENGTH (m)	PLANTING DEPTH D (m)	B (m)	EXCAVATION VOLUME m <sup>3</sup>	BACKFILL SOIL/CEMENT m <sup>3</sup>	10MPa CONCRETE m <sup>3</sup>
23KN POLE LOAD	20	2.6	2.00	11.2	9.318	0.8
	21	2.7	2.00	11.6	9.641	0.8
	22	2.8	2.00	12.0	9.905	0.8
	23	2.9	1.90	11.19	9.103	0.722
	24	3.0	1.90	11.55	9.4	0.722
37KN POLE LOAD	20	2.6	3.30	30.492	27.233	2.178
	21	2.7	3.20	29.696	26.489	2.048
	22	2.8	3.10	28.83	25.613	1.922
	23	2.9	3.10	29.79	26.503	1.922
	24	3.0	3.00	28.8	25.570	1.8

2	RETICULATION REMOVED FROM TITLE BLOCK	N.M.	P.A.T.	P.A.T.	31.01.10	
1	STEEL POLE CHANGED TO STEEL/CONCRETE POLE AND NOTE ADDED	N.M.	B.HILL	B.HILL	05.08.08	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.

AUTH:	A BEKKER
DATE:	NOV 2005
CHKD:	S LE ROUX
DATE:	NOV 2005
DRAWN:	B MOICHELA
DATE:	OCT 2005

DISTRIBUTION TECHNOLOGY  
SUB-TRANSMISSION LINES  
INTERMEDIATE FREESTANDING MONOPOLES  
FOUNDATION DETAILS - 100KPA

D DT 7850	SET	SHEET	REVISION
	5	4	2

1

2

3

4

A

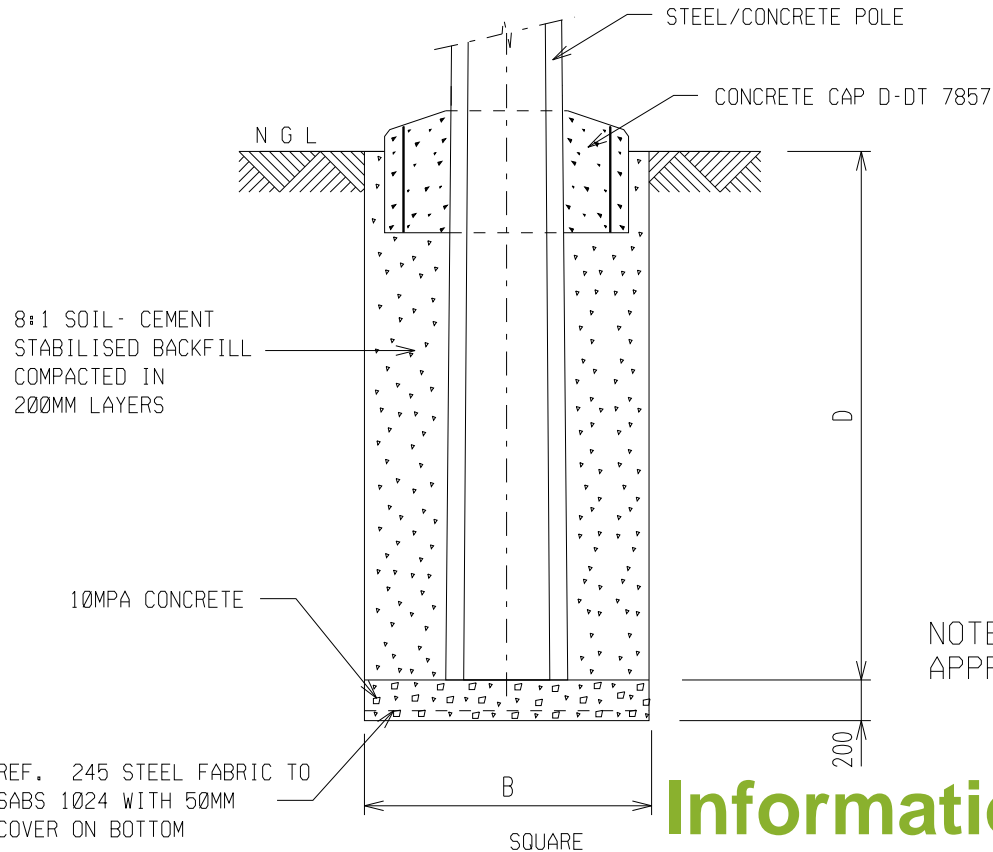
A

B

B

C

C



INTERMEDIATE STRUCTURE FOUNDATION  
FOR INTERMEDIATE SOILS TYPE 2 (150KPA)

POLE LENGTH (m)	PLANTING DEPTH D (m)	B (m)	EXCAVATION VOLUME m <sup>3</sup>	BACKFILL SOIL/CEMENT m <sup>3</sup>	10MPa CONCRETE m <sup>3</sup>
20	2.6	1.40	5.488	4.014	0.392
21	2.7	1.40	5.684	4.133	0.392
22	2.8	1.30	5.07	3.437	0.338
23	2.9	1.30	5.239	3.535	0.338
24	3.0	1.30	5.408	3.64	0.338
POLE LENGTH (m)	PLANTING DEPTH D (m)	B (m)	EXCAVATION VOLUME m <sup>3</sup>	BACKFILL SOIL/CEMENT m <sup>3</sup>	10MPa CONCRETE m <sup>3</sup>
20	2.6	2.20	13.552	11.502	0.968
21	2.7	2.20	14.036	11.909	0.968
22	2.8	2.10	13.23	11.053	0.882
23	2.9	2.10	13.671	11.423	0.882
24	3.0	2.00	12.8	10.570	0.8

D

D

E

E

2	RETICULATION REMOVED FROM TITLE BLOCK	N.M.	P.A.T.	P.A.T.	31.01.10	
1	STEEL POLE CHANGED TO STEEL/CONCRETE POLE	N.M.	B.HILL	B.HILL	05.08.08	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.

F

F

<p><b>Eskom</b> Distribution</p> <p>AUTH: A BEKKER</p> <p>DATE: NOV 2005</p> <p>CHKD: S LE ROUX</p> <p>DATE: NOV 2005</p> <p>DRAWN: B MOICHELA</p> <p>DATE: OCT 2005</p>	<p>DISTRIBUTION TECHNOLOGY</p> <p>SUB-TRANSMISSION LINES</p> <p>INTERMEDIATE FREESTANDING MONOPOLES</p> <p>FOUNDATION DETAILS - 150 KPA</p>				
			SET	SHEET	REVISION
	D DT 7850		5	3	2

1

2

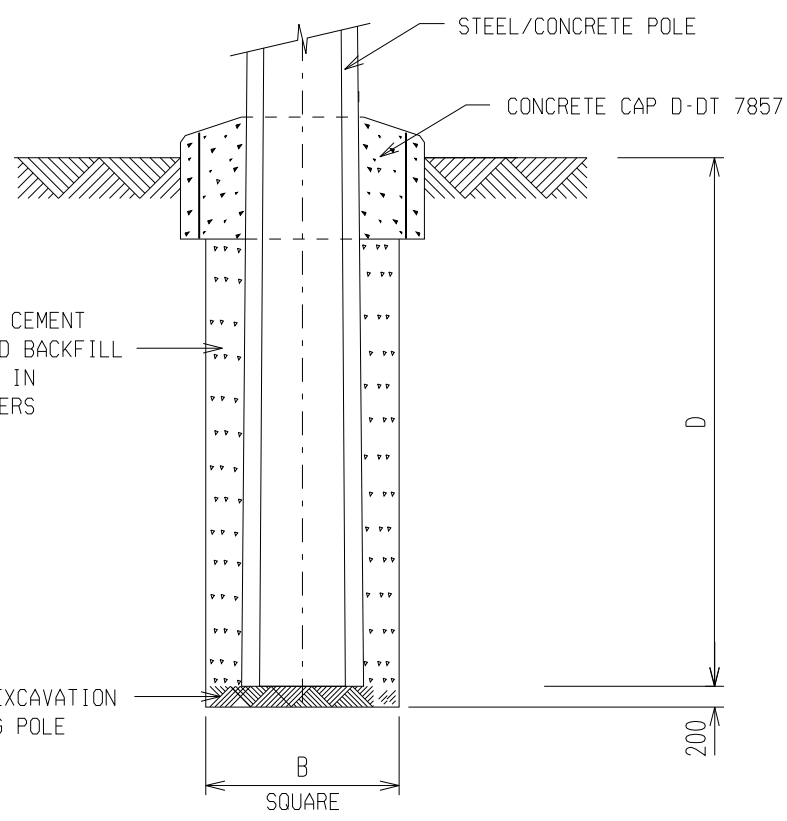
3

4 A4L

1 2 3 4

A

A



B

B

C

C

# Information Only

INTERMEDIATE STRUCTURE FOUNDATION  
FOR NORMAL SOILS TYPE 1 (300KPA)

D

D

37kN & 23kN POLE LOAD	POLE LENGTH (m)	PLANTING DEPTH D (m)	B (m)	EXCAVATION VOLUME m <sup>3</sup>	BACKFILL SOIL/CEMENT m <sup>3</sup>	20MPa CONCRETE m <sup>3</sup>
	20	2.6	1.10	3.48	2.155	0.242
	21	2.7	1.10	3.601	2.199	0.242
	22	2.8	1.10	3.722	2.185	0.242
	23	2.9	1.10	3.843	2.235	0.242
24	3.0	1.10	3.964	2.292	0.242	

NOTE : VOLUMES ARE APPROXIMATE ONLY

E

E

2	RETICULATION REMOVED FROM TITLE BLOCK	N.M.	P.A.T.	P.A.T.	31.01.10	
1	STEEL POLE CHANGED TO STEEL/CONCRETE POLE	N.M.	B.HILL	B.HILL	05.08.08	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.

F

F

**Eskom Distribution**

AUTH: A BEKKER  
DATE: NOV 2005  
CHKD: S LE ROUX  
DATE: NOV 2005  
DRAWN: B MOICHELA  
DATE: OCT 2005

DISTRIBUTION TECHNOLOGY  
SUB-TRANSMISSION LINES  
INTERMEDIATE FREESTANDING MONOPOLES  
FOUNDATION DETAILS - 300KPA

D DT 7850

SET	SHEET	REVISION
5	2	2

1 2 3 4 A4L

1

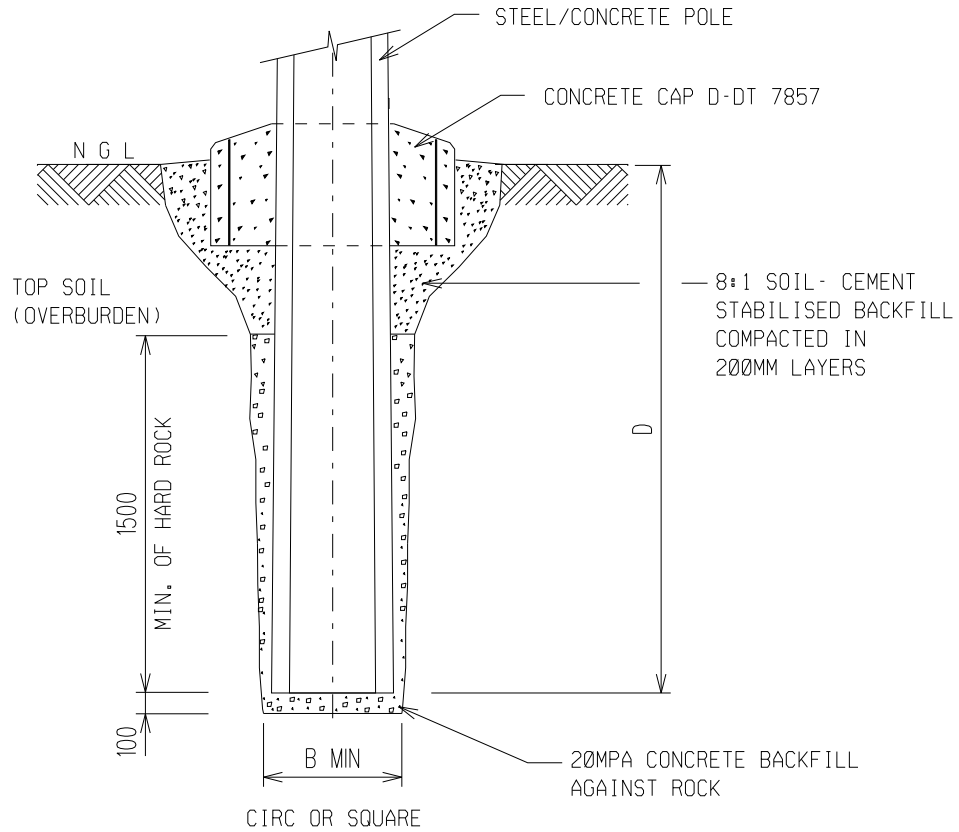
2

3

4

A

A



B

B

C

C

INTERMEDIATE STRUCTURE FOUNDATION  
FOR ROCK AND SOFT ROCK (MIN 500KPA)

D

D

37kN & 23kN TIP LOADS	POLE LENGTH (m)	PLANTING DEPTH D (M)	B (m)	EXCAVATION VOLUME m <sup>3</sup>	BACKFILL SOIL/CEMENT m <sup>3</sup>	20MPa CONCRETE m <sup>3</sup>
	20	2.6	0.70	1.461	0.0839	0.295
	21	2.7	0.75	1.592	0.1099	0.323
	22	2.8	0.80	1.783	0.1088	0.379
	23	2.9	0.85	1.995	0.173	0.456
	24	3.0	0.90	2.230	0.262	0.538

E

E

NOTE: VOLUMES ARE APPROXIMATE ONLY  
"B" DIMS ARE MINIMUM TO FIT POLE INTO EXCAVATION

2	RETICULATION REMOVED FROM TITLE BLOCK	N.M.	P.A.T.	P.A.T.	31.01.10	
1	STEEL POLE CHANGED TO STEEL/CONCRETE POLE	N.M.	B.HILL	B.HILL	05.08.08	
REV	REVISION DESCRIPTION	BY	CHKD	AUTH	DATE	PROJECT NO.

F

F

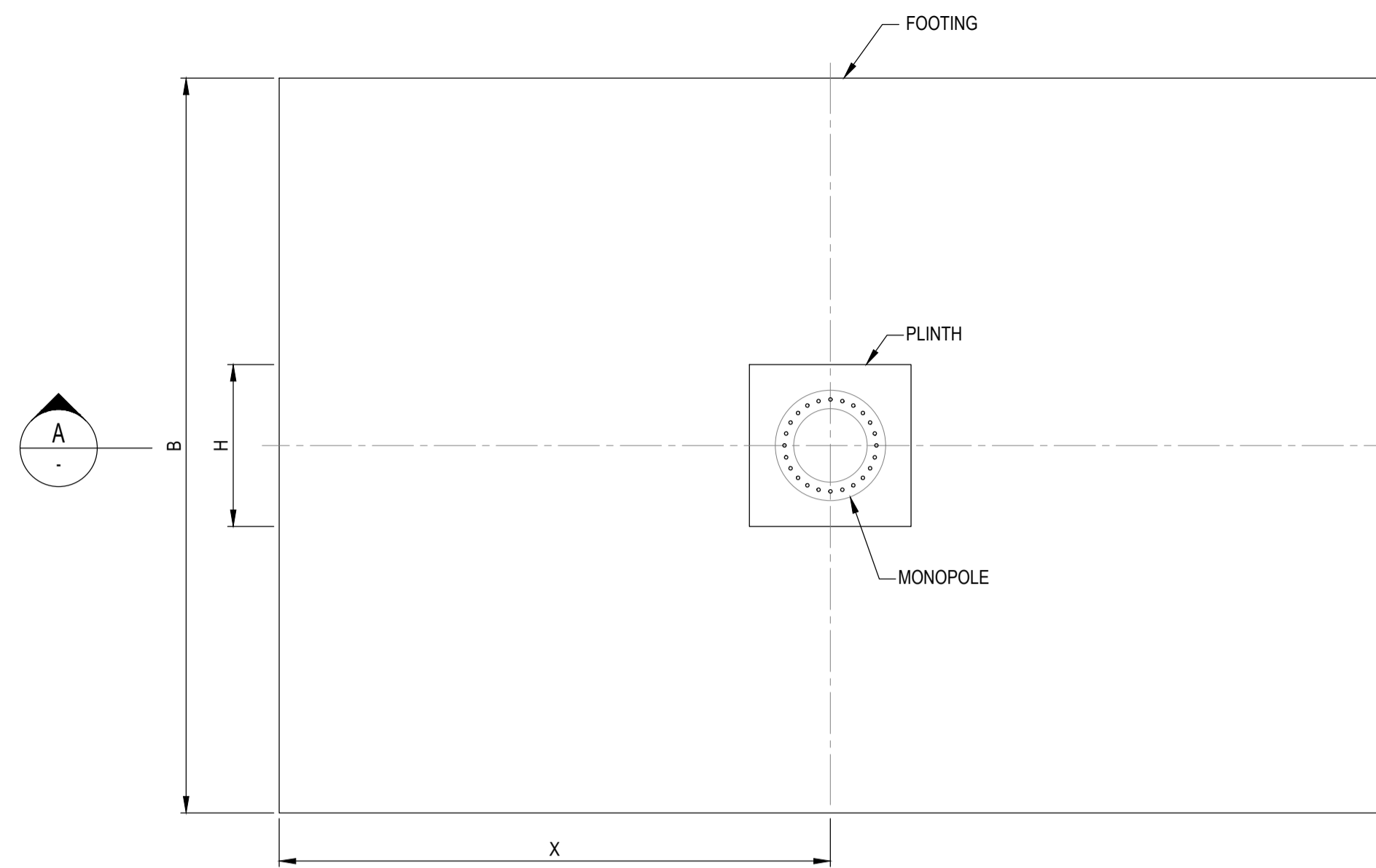
	DISTRIBUTION TECHNOLOGY					
	SUB-TRANSMISSION LINES					
	INTERMEDIATE FREESTANDING MONOPOLES					
	FOUNDATION DETAILS - ROCK					
				SET	SHEET	REVISION
				5	1	2
AUTH: A BEKKER		D DT 7850				
DATE: NOV 2005						
CHKD: S LE ROUX						
DATE: NOV 2005						
DRAWN: B MOICHELA						
DATE: OCT 2005						

1

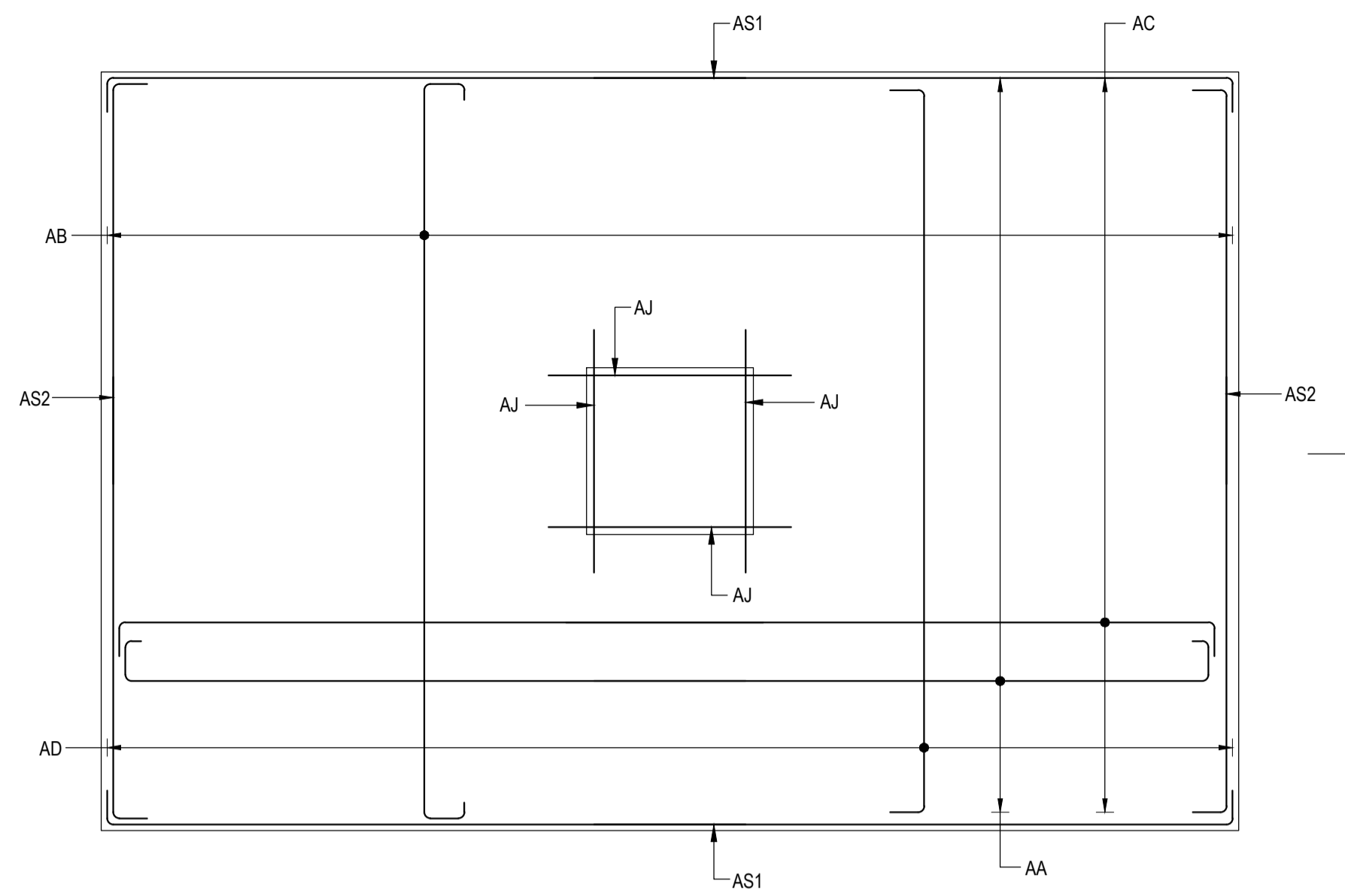
2

3

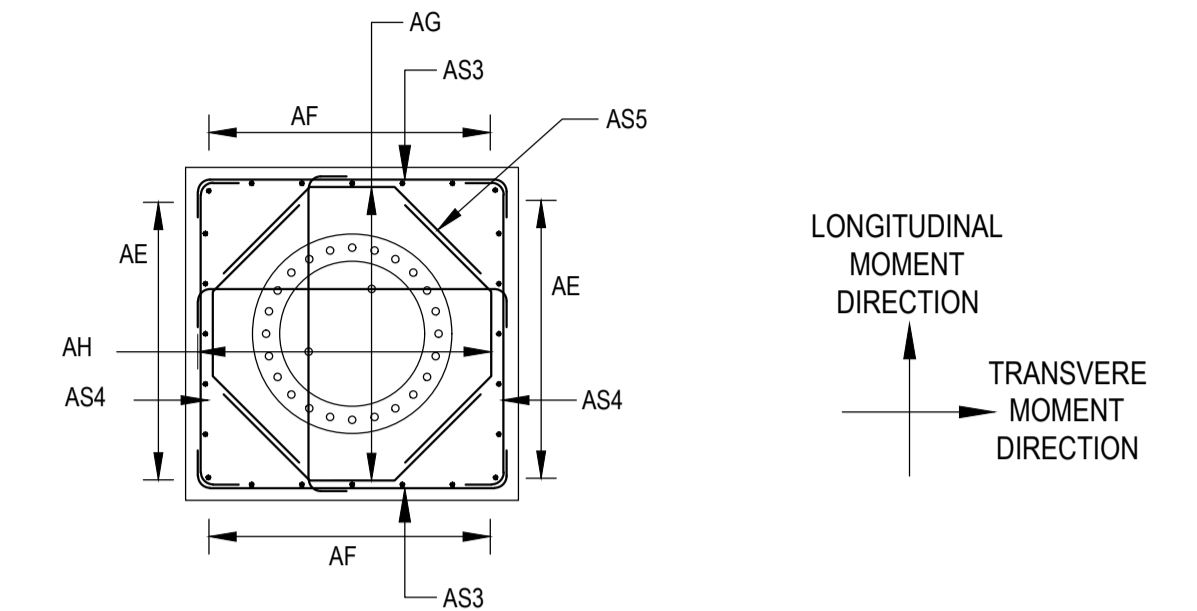
4 A4L



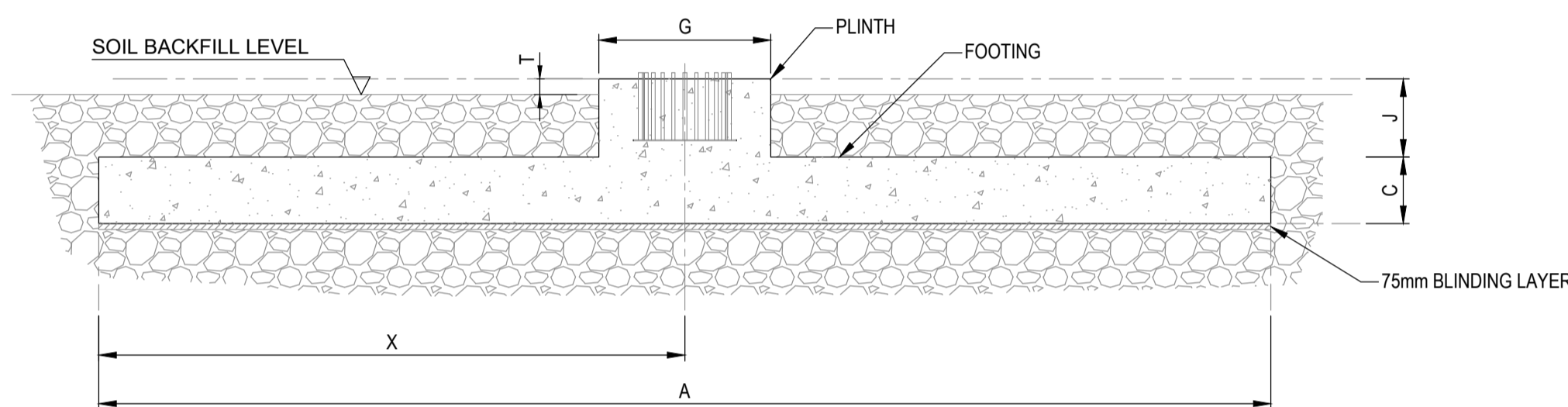
CONCRETE DETAILS - PLAN VIEW  
1:75



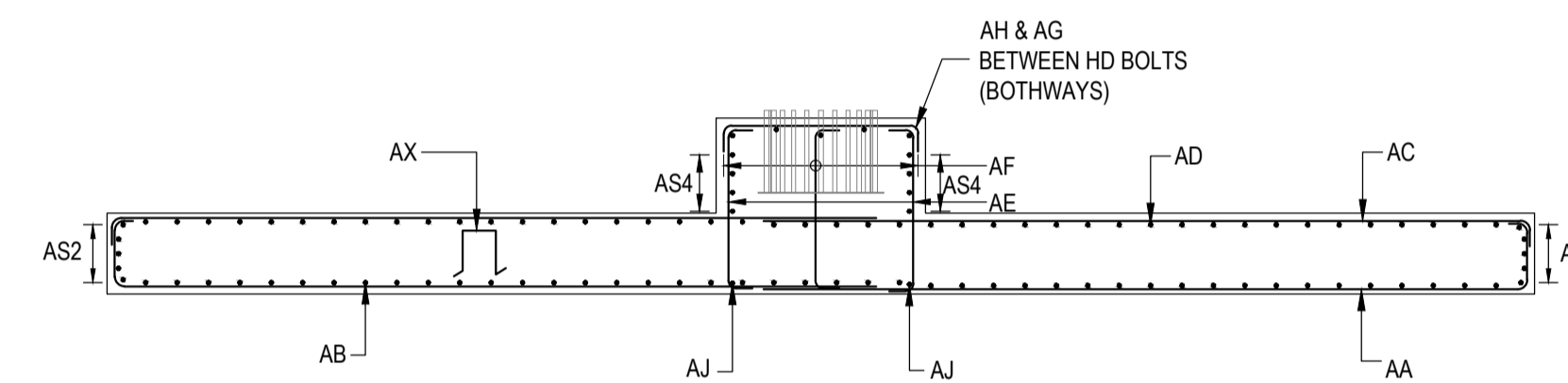
REINFORCEMENT DETAILS - PLAN VIEW  
1:75



PLINTH - PLAN VIEW  
1:50



SECTION A  
1:75



SECTION B  
1:75

**BENDING SCHEDULE**

MEMBER	No. OF	BARS PER MEMB	DIA. MESH	LENGTH	TOTAL NUM-BER	MARK	SC	BENDING				
								A	B	C	D	E/R
FOOTING	1	38	Y 25	8050	37.5	AA	55	300	197	7325	197	300
	1	45	Y 16	5450	45	AB	55	192	193	4834	193	192
	1	25	Y 16	7650	25	AC	38	192	7334	192		
	1	37	Y 12	5100	37	AD	38	150	4838	150		
	2	1	Y 12	7550	2	AS1	38	150	7288	150		
	2	1	Y 12	5050	2	AS2	38	150	4806	150		
PLINTH	1	38	Y 12	1150	38	AX	83	288	185	294	294	
	2	9	Y 32	1700	18	AE	38	384	1113	384		
	2	9	Y 32	1750	18	AF	38	384	1161	384		
	1	9	Y 32	2450	9	AG	38	384	1818	384		
	1	9	Y 32	2450	9	AH	38	384	1818	384		
	2	4	Y 12	2000	8	AS3	38	150	1774	150		
	2	4	Y 12	2000	8	AS4	38	150	1774	150		
	4	7	Y 10	2350	28	AS5	49	800	800	760	570	570
	1	4	Y 32	3000	4	AJ	20	3000				

MASS (kg)	Y8	Y10	Y12	Y16	Y20	Y25	Y32	Y40	TOTAL
R	0	0	0	0	0	0	0	0	0
YIT	0	41	257	689	0	1163	746	0	2896
MESH	0	0	0	0	0	0	0	0	0
TOTAL	0	41	257	689	0	1163	746	0	2896

**FOUNDATION SUMMARY**

DESCRIPTION	VALUE	UNITS
MAXIMUM BENDING MOMENT CAPACITY	2160.0	kNm
DESIGN TRANSVERSE MOMENT	2000.0	kNm
DESIGN LONGITUDINAL MOMENT	800.0	kNm
DESIGN VERTICAL FORCE	118.0	kN
SITE CLEARANCE	44.3	m <sup>2</sup>
CONCRETE VOLUME	18.2	m <sup>3</sup>
CONCRETE MASS	44.5	ton
BINDING LAYER VOLUME	2.8	m <sup>3</sup>
BINDING LAYER MASS	6.9	ton
SOIL EXCAVATION VOLUME (0-2m)	47.8	m <sup>3</sup>
SOIL EXCAVATION VOLUME (2-4m)	0.0	m <sup>3</sup>
SOIL BACKFILL VOLUME	27.6	m <sup>3</sup>
FORMWORK SMOOTH SURFACE AREA	8.0	m <sup>2</sup>
FORMWORK ROUGH SURFACE AREA	10.0	m <sup>2</sup>
CONCRETE STRENGTH, F <sub>cu</sub>	0.0	MPa
CONCRETE WEIGHT DENSITY	24.0	kN/m <sup>3</sup>
CONCRETE COVER	75.0	mm
ESKOM SOIL TYPE	2	
SOIL MAXIMUM BEARING PRESSURE	150.0	kN/m <sup>2</sup>
SOIL WEIGHT, DENSITY	16.0	kN/m <sup>3</sup>
STEEL CAPACITY, F <sub>y</sub>	450.0	MPa
STEEL MASS DENSITY	7850.0	kg/m <sup>3</sup>

**FOUNDATION DIMENSIONS**

DESCRIPTION	VALUE	UNITS
A	7.50	m
B	5.00	m
C	0.40	m
D	N/A	m
E	N/A	m
F	N/A	m
G	2.00	m
H	2.00	m
J	1.00	m
X	3.75	m
T	0.20	m

**REINFORCEMENT SUMMARY**

LABEL	DESCRIPTION
AA	38 Y 25 - AA - 125 ( B1 )
AB	45 Y 16 - AB - 125 ( B2 )
AC	25 Y 16 - AC - 200 ( T1 )
AD	37 Y 12 - AD - 200 ( T2 )
AE	9 Y 32 - AE - EQ.SP. - S.F.
AF	9 Y 32 - AF - EQ.SP. - E.F.
AG	9 Y 32 - AG - 200 ( T1 )
AH	9 Y 32 - AH - 200 ( T2 )
AS1	1 Y 12 - AS1 - EQ.SP. - E.F.
AS2	1 Y 12 - AS2 - EQ.SP. - S.F.
AS3	4 Y 12 - AS3 - EQ.SP. - E.F.
AS4	4 Y 12 - AS4 - EQ.SP. - S.F.
AX	38 Y 12 - AX - 1000 E.W. FROM B1 TO T2
AS5	7 Y 10 - AS5 - 200 - LINK
AJ	4 Y 32 - AJ - EQ.SP. ( B1 & B2 )

**NOTES**

- REFER ANY DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCEMENT OF WORK.
- OBTAIN ENGINEERS WRITTEN AUTHORIZATION FOR ALL AMENDMENTS PRIOR TO COMMENCEMENT OF WORK.
- DESIGN FOUNDATION BEARING CAPACITY AS PER ESKOM STANDARD 240-47172620 (TRMSCAAC 5.2)
- ALL CONCRETE WORK IS TO BE FOUND ON AN IN-SITU ENGINEERED MATTRESS DESIGNED TO PROVIDE THE REQUIRED BEARING CAPACITY AND STIFFNESS.
- DESIGN ACCORDING TO SANS DESIGN CODES.
- CONCRETE STRENGTH AT 28 DAYS:  
REINFORCED CONCRETE: 30 Mpa  
BLINDING CONCRETE: 10 Mpa
- MINIMUM CONCRETE COVER TO REINFORCEMENT: 75mm FOR SIDES, TOP AND BOTTOM.
- 75mm BLINDING TO BE PROVIDED UNDER FOUNDATIONS.
- ALL CONCRETE MUST BE MOIST CURED BY AN APPROVED METHOD FOR 7 DAYS AFTER FINAL SET OF CONCRETE. ENGINEER MAY ADJUST CURING PERIOD DEPENDING ON WEATHER CONDITIONS.
- ALL CIVIL WORKS SHALL COMPLY WITH SANS 1200, ACCURACY LEVEL 2.
- PROVIDE A 20 x 20mm CHAMFER TO ALL EXPOSED CORNERS.
- SMOOTH OFF-SHUTTER FINISH TO EXPOSED CONCRETE.
- GROUTING: "M-BED STANDARD" (UNO) OR SIMILAR APPROVED.
- ONLY HIGH TENSILE REINFORCEMENT STEEL (Y) USED THROUGHOUT FOUNDATION.
- ENSURE LONG DIRECTION OF FOUNDATION TO BE ORIENTATED TOWARDS THE BISECTOR OF THE CONNECTED POWER LINES (EXCLUDING TERMINAL POINTS).
- EARTH TAIL TO BE CONNECTED TO THE HD BOLTS AND REINFORCEMENT STEEL AND BROUGHT OUT OF THE FOUNDATION AS PER THE SPECIFICATIONS.
- UNFACTORED LOADS SHOWN ON THE DRAWINGS. THE FOLLOWING SAFETY FACTORS HAVE BEEN APPLIED: CIVIL = 1.35
- WHERE IT IS NECESSARY FOR BARS TO LAP, MIN LAP LENGTH = 45 x BAR DIAMETER.

**aurecon**  
Issued for Construction  
Fayaz Ali Sattar (Pr Eng 20110103)  
Date: 15 Nov 2019

**aurecon**  
www.aurecongroup.com

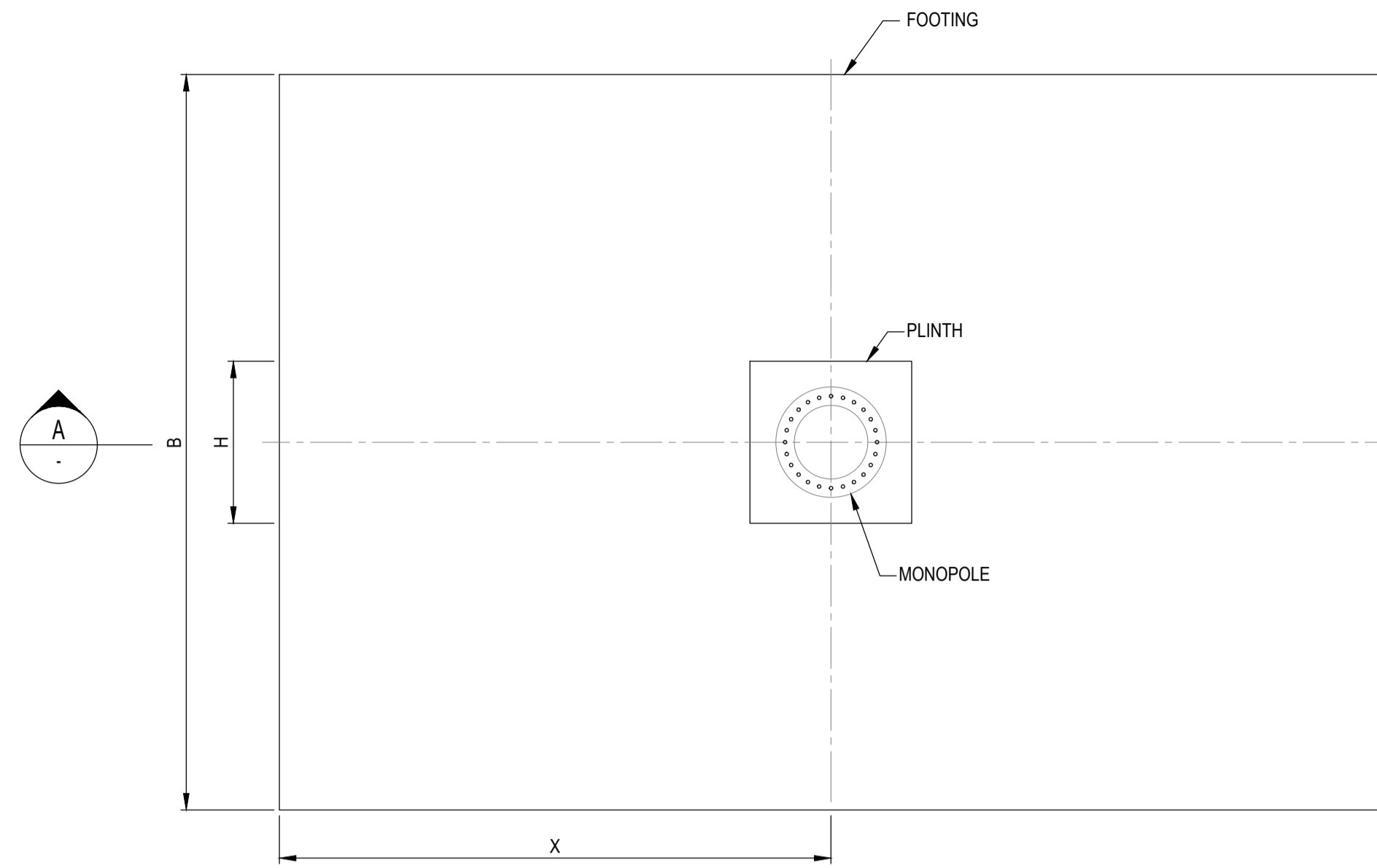
REV	DATE	REVISION DETAILS	APPROVED
2	10/03/17	ISSUED FOR CONSTRUCTION	H. NIEHAUS
1	10/02/17	ISSUED FOR CONSTRUCTION	P. VAN DER SPUY
0	09/12/16	ISSUED FOR CONSTRUCTION	P. VAN DER SPUY
A	07/12/16	ISSUED FOR CONSTRUCTION	P. VAN DER SPUY

APPROVED	DRAWN	DESIGNED
	J. BRUSSOW	J. BRUSSOW
	CHECKED P. VAN DER SPUY	
	APPROVED	
		10/02/17

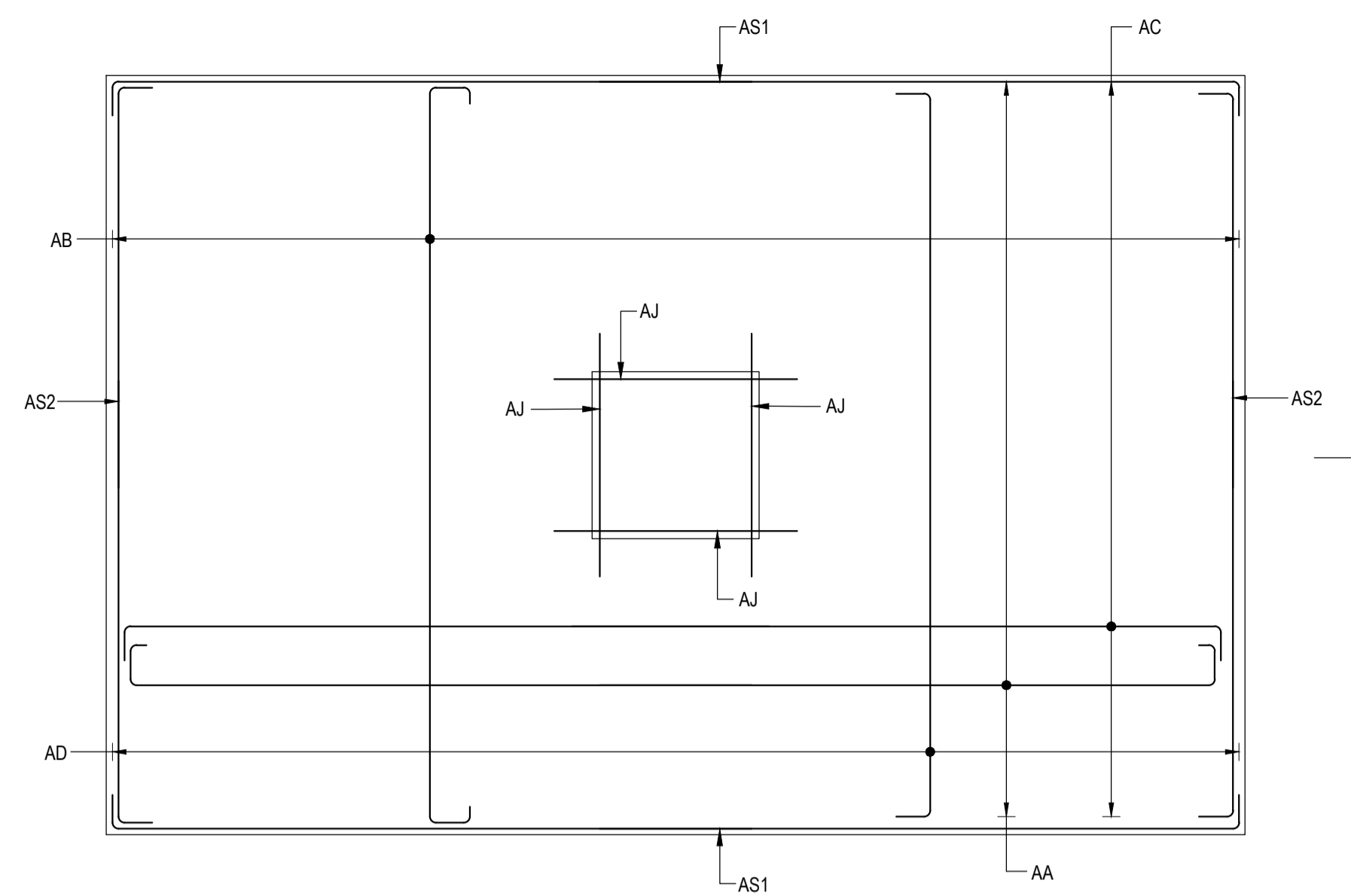
PROJECT	TITLE
AURECON STANDARD DRAWINGS	STANDARD MONOPOLE FOUNDATION 2 000 kNm MOMENT (TYPE 2)

FOR CONSTRUCTION	
PROJECT No.	EP-0040
SCALE	AS SHOWN
DRAWING No.	AUR-OHL-CIV-MP-013
SIZE	A1
REV	2

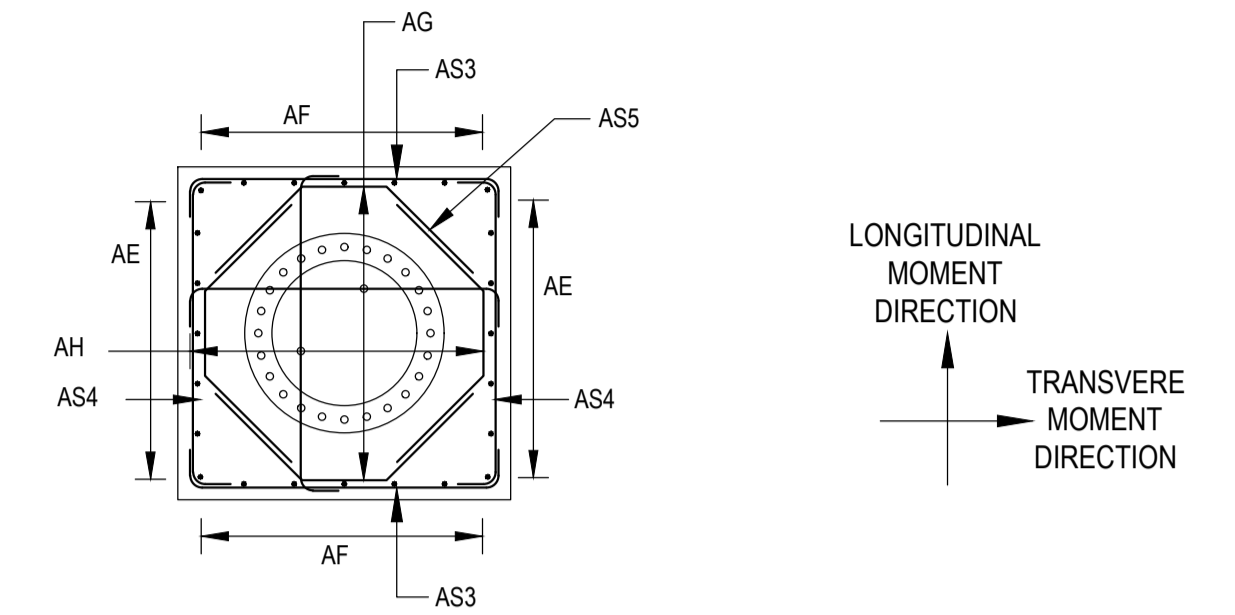
THE MASTER HELD AT AURECON CAPE TOWN TRANSPORT UNIT BEARS THE ORIGINAL SIGN OF APPROVAL



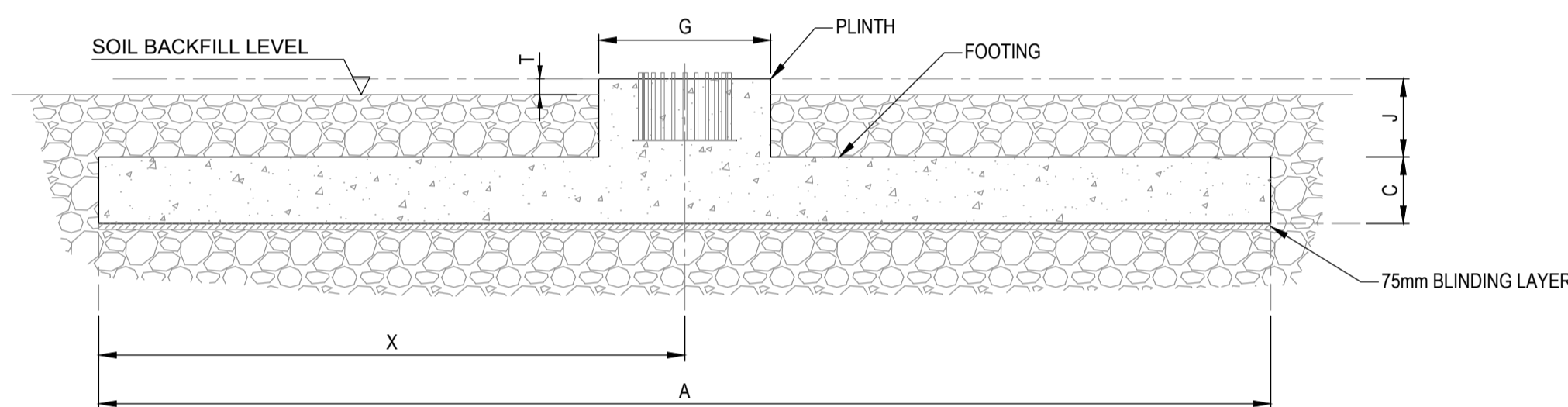
CONCRETE DETAILS - PLAN VIEW  
1:75



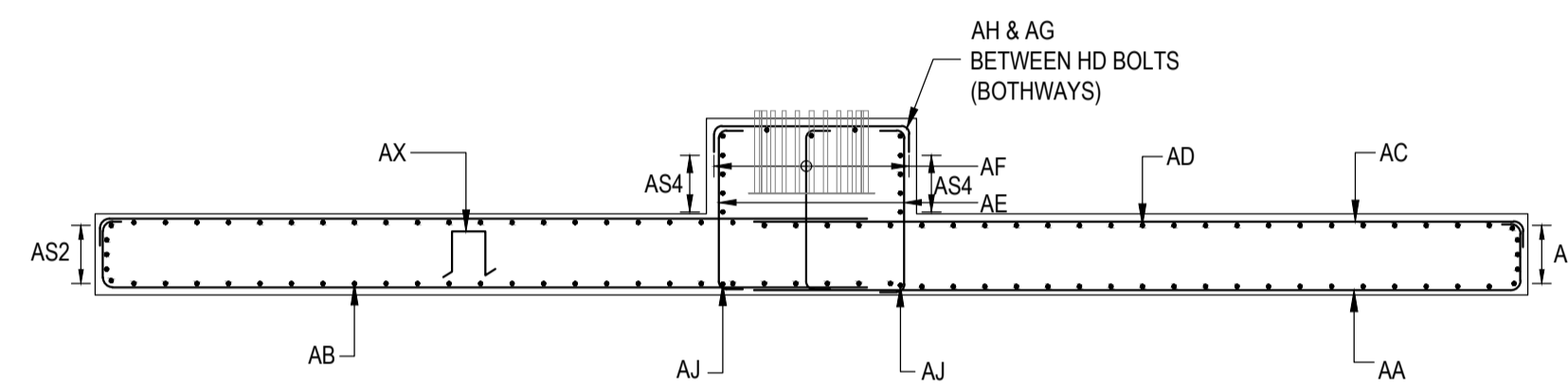
REINFORCEMENT DETAILS - PLAN VIEW  
1:75



PLINTH - PLAN VIEW  
1:50



SECTION A  
1:75



SECTION B  
1:75

**BENDING SCHEDULE**

MEMBER	No. OF	BARS PER MEMB	DIA. MESH	LENGTH	TOTAL NUM-BER	MARK	SC	BENDING				
								A	B	C	D	E/R
FOOTING	1	27	Y 25	7450	27	AA	55	300	197	6725	197	300
	1	51	Y 12	5000	51	AB	55	150	197	4438	197	150
	1	23	Y 16	7050	23	AC	38	192	6734	192		
	1	34	Y 12	4700	34	AD	38	150	4438	150		
	2	1	Y 12	6950	2	AS1	38	150	6688	150		
	2	1	Y 12	4650	2	AS2	38	150	4414	150		
	1	32	Y 12	1300	32	AX	83	288	185	369	369	
	PLINTH	2	7	Y 32	1750	14	AE	38	384	1117	384	
2		7	Y 32	1750	14	AF	38	384	1161	384		
1		7	Y 32	2250	7	AG	38	384	1618	384		
1		7	Y 32	2250	7	AH	38	384	1618	384		
2		4	Y 12	1800	8	AS3	38	150	1574	150		
2		4	Y 12	1800	8	AS4	38	150	1574	150		
4		7	Y 10	2150	28	AS5	49	800	800	560	570	570
1		4	Y 32	2800	4	AJ	20	2800				

MASS (kg)	Y8	Y10	Y12	Y16	Y20	Y25	Y32	Y40	TOTAL
R	0	0	0	0	0	0	0	0	0
YIT	0	37	451	256	0	775	579	0	2098
MESH	0	0	0	0	0	0	0	0	0
TOTAL	0	37	451	256	0	775	579	0	2098

**FOUNDATION SUMMARY**

DESCRIPTION	VALUE	UNITS
MAXIMUM BENDING MOMENT CAPACITY	1620.0	kNm
DESIGN TRANSVERSE MOMENT	1500.0	kNm
DESIGN LONGITUDINAL MOMENT	600.0	kNm
DESIGN VERTICAL FORCE	107.0	kN
SITE CLEARANCE	37.5	m <sup>2</sup>
CONCRETE VOLUME	15.3	m <sup>3</sup>
CONCRETE MASS	37.4	ton
BINDING LAYER VOLUME	2.4	m <sup>3</sup>
BINDING LAYER MASS	5.8	ton
SOIL EXCAVATION VOLUME (0-2m)	40.5	m <sup>3</sup>
SOIL EXCAVATION VOLUME (2-4m)	0.0	m <sup>3</sup>
SOIL BACKFILL VOLUME	23.4	m <sup>3</sup>
FORMWORK SMOOTH SURFACE AREA	7.2	m <sup>2</sup>
FORMWORK ROUGH SURFACE AREA	9.2	m <sup>2</sup>
CONCRETE STRENGTH, F <sub>cu</sub>	30.0	MPa
CONCRETE WEIGHT DENSITY	24.0	kN/m <sup>3</sup>
CONCRETE COVER	75.0	mm
ESKOM SOIL TYPE	2	
SOIL MAXIMUM BEARING PRESSURE	150.0	kN/m <sup>2</sup>
SOIL WEIGHT, DENSITY	16.0	kN/m <sup>3</sup>
STEEL CAPACITY, F <sub>y</sub>	450.0	MPa
STEEL MASS DENSITY	7850.0	kg/m <sup>3</sup>

**FOUNDATION DIMENSIONS**

DESCRIPTION	VALUE	UNITS
A	6.90	m
B	4.60	m
C	0.40	m
D	N/A	m
E	N/A	m
F	N/A	m
G	1.80	m
H	1.80	m
J	1.00	m
X	3.45	m
T	0.20	m

**REINFORCEMENT SUMMARY**

LABEL	DESCRIPTION
AA	27 Y 25 - AA - 150 ( B1 )
AB	51 Y 12 - AB - 125 ( B2 )
AC	23 Y 16 - AC - 200 ( T1 )
AD	34 Y 12 - AD - 200 ( T2 )
AE	7 Y 32 - AE - EQ.SP. - S.F.
AF	7 Y 32 - AF - EQ.SP. - E.F.
AG	7 Y 32 - AG - 240 ( T1 )
AH	7 Y 32 - AH - 240 ( T2 )
AS1	1 Y 12 - AS1 - EQ.SP. - E.F.
AS2	1 Y 12 - AS2 - EQ.SP. - S.F.
AS3	4 Y 12 - AS3 - EQ.SP. - E.F.
AS4	4 Y 12 - AS4 - EQ.SP. - S.F.
AX	32 Y 12 - AX - 1000 E.W. FROM B1 TO T2
AS5	7 Y 10 - AS5 - 200 - LINK
AJ	4 Y 32 - AJ - EQ.SP. ( B1 & B2 )

**NOTES**

- REFER ANY DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCEMENT OF WORK.
- OBTAIN ENGINEERS WRITTEN AUTHORIZATION FOR ALL AMENDMENTS PRIOR TO COMMENCEMENT OF WORK.
- DESIGN FOUNDATION BEARING CAPACITY AS PER ESKOM STANDARD 240-47172620 (TRMSCAAC 5.2)
- ALL CONCRETE WORK IS TO BE FOUND ON AN IN-SITU ENGINEERED MATTRESS DESIGNED TO PROVIDE THE REQUIRED BEARING CAPACITY AND STIFFNESS.
- DESIGN ACCORDING TO SANS DESIGN CODES.
- CONCRETE STRENGTH AT 28 DAYS:  
REINFORCED CONCRETE: 30 Mpa  
BLINDING CONCRETE: 10 Mpa
- MINIMUM CONCRETE COVER TO REINFORCEMENT: 75mm FOR SIDES, TOP AND BOTTOM.
- 75mm BLINDING TO BE PROVIDED UNDER FOUNDATIONS.
- ALL CONCRETE MUST BE MOIST CURED BY AN APPROVED METHOD FOR 7 DAYS AFTER FINAL SET OF CONCRETE. ENGINEER MAY ADJUST CURING PERIOD DEPENDING ON WEATHER CONDITIONS.
- ALL CIVIL WORKS SHALL COMPLY WITH SANS 1200, ACCURACY LEVEL 2.
- PROVIDE A 20 x 20mm CHAMFER TO ALL EXPOSED CORNERS.
- SMOOTH OFF-SHUTTER FINISH TO EXPOSED CONCRETE.
- GROUTING: "M-BED STANDARD" (UNO) OR SIMILAR APPROVED.
- ONLY HIGH TENSILE REINFORCEMENT STEEL (Y) USED THROUGHOUT FOUNDATION.
- ENSURE LONG DIRECTION OF FOUNDATION TO BE ORIENTATED TOWARDS THE BISECTOR OF THE CONNECTED POWER LINES (EXCLUDING TERMINAL POINTS).
- EARTH TAIL TO BE CONNECTED TO THE HD BOLTS AND REINFORCEMENT STEEL AND BROUGHT OUT OF THE FOUNDATION AS PER THE SPECIFICATIONS.
- UNFACTORED LOADS SHOWN ON THE DRAWINGS. THE FOLLOWING SAFETY FACTORS HAVE BEEN APPLIED: CIVIL = 1.35
- WHERE IT IS NECESSARY FOR BARS TO LAP, MIN LAP LENGTH = 45 x BAR DIAMETER.

**aurecon**  
Issued for Construction  
Fayaz Ali Sattar (Pr Eng 20110103)  
Date: 15 Nov 2019

**aurecon**  
www.aurecongroup.com

REV	DATE	REVISION DETAILS	APPROVED
3	10/03/17	ISSUED FOR CONSTRUCTION	H. NIEHAUS
2	10/02/17	ISSUED FOR CONSTRUCTION	P. VAN DER SPUY
1	09/12/16	ISSUED FOR CONSTRUCTION	P. VAN DER SPUY
0	11/10/16	ISSUED FOR CONSTRUCTION	H. NIEHAUS
A	15/07/16	ISSUED FOR CONSTRUCTION	P. VAN DER SPUY

PROJECT	TITLE
AURECON STANDARD DRAWINGS	STANDARD MONOPOLE FOUNDATION 1 500 kNm MOMENT (TYPE 2)

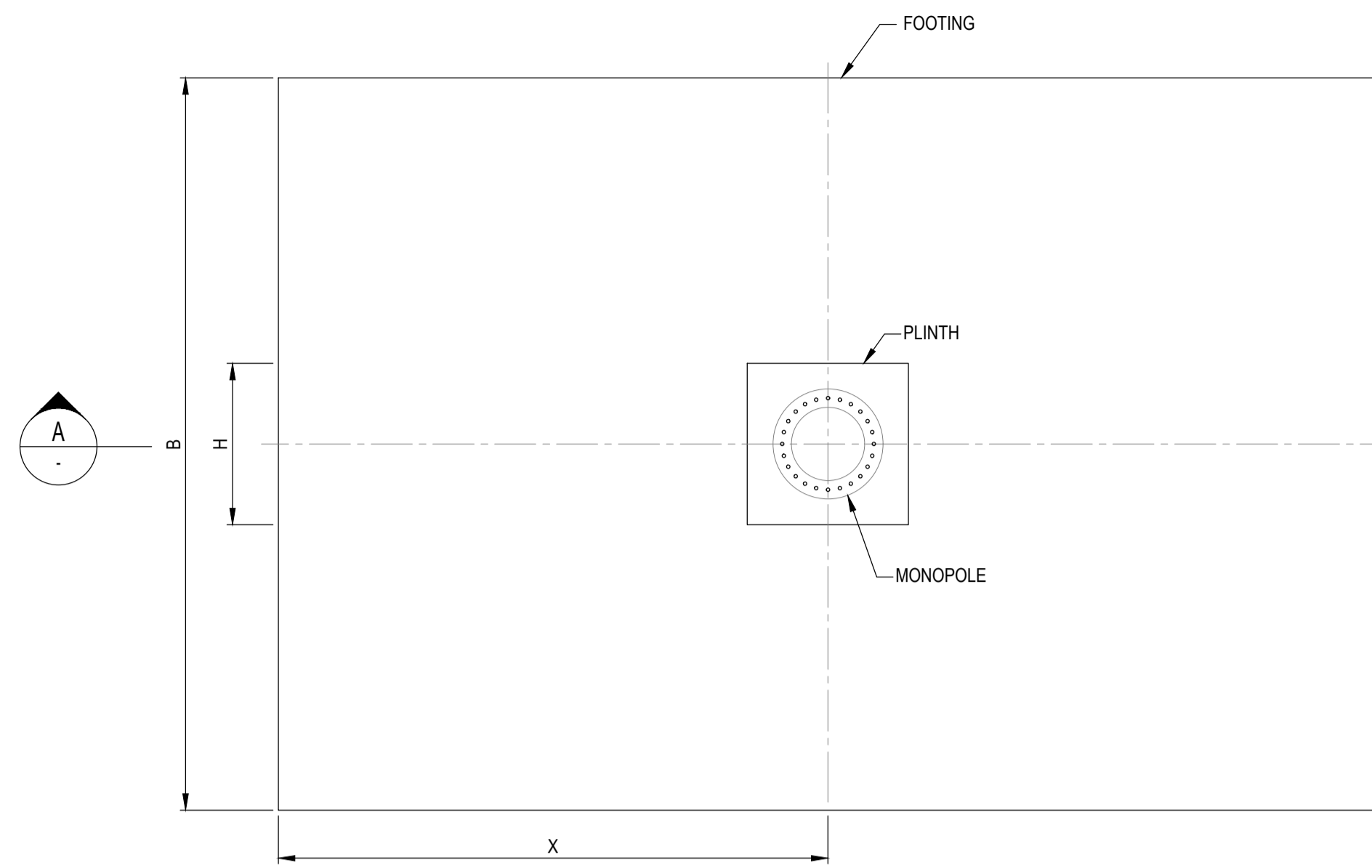
DRAWN	DESIGNED
J. BRUSSOW	J. BRUSSOW
CHECKED H. NIEHAUS	
APPROVED	

PROJECT	TITLE
AURECON STANDARD DRAWINGS	STANDARD MONOPOLE FOUNDATION 1 500 kNm MOMENT (TYPE 2)

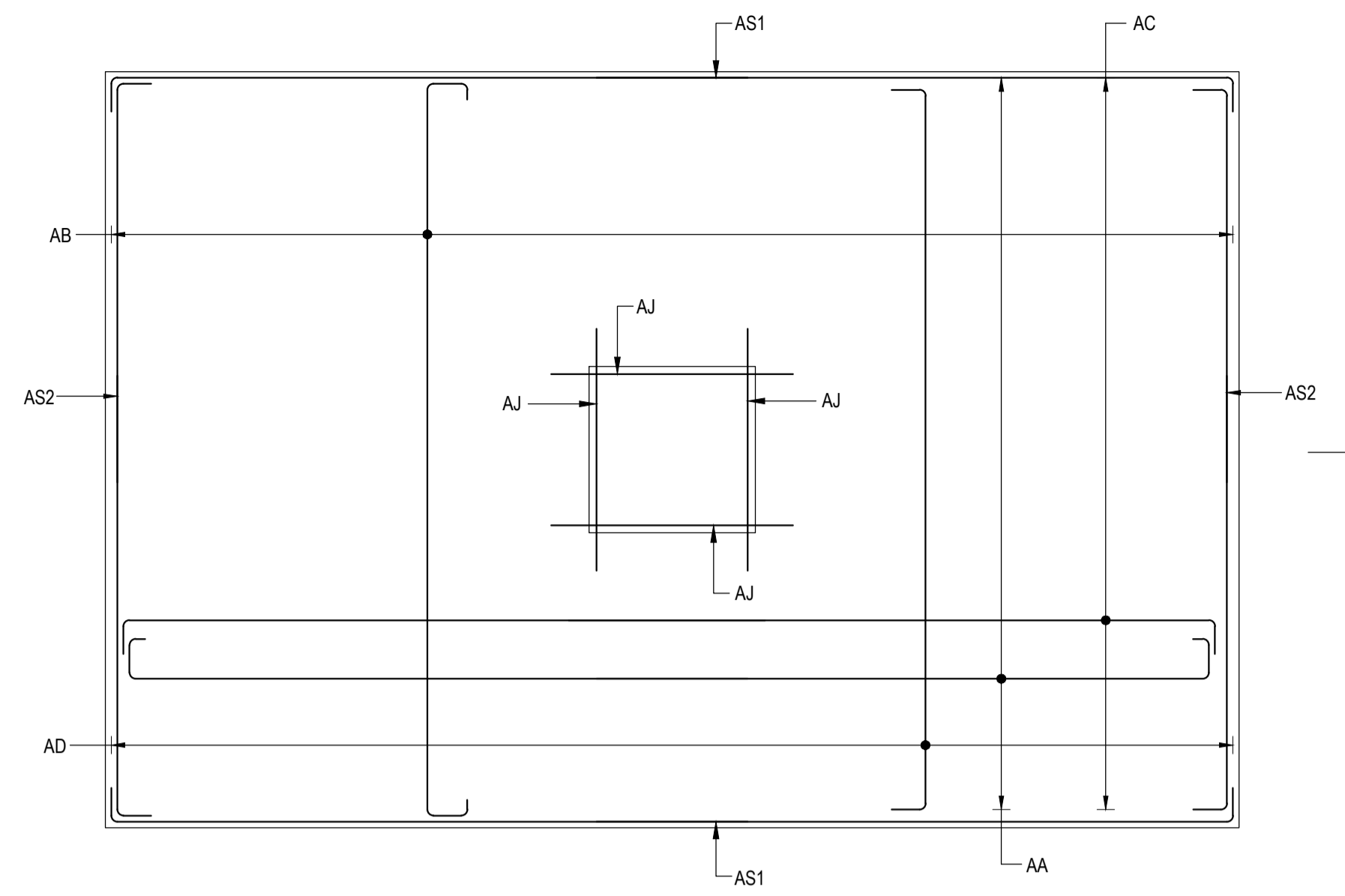
FOR CONSTRUCTION
PROJECT No. EP-0040
SCALE AS SHOWN
DRAWING No. AUR-OHL-CIV-MP-009
SIZE A1
REV 3

THE MASTER HELD AT AURECON CAPE TOWN TRANSPORT UNIT BEARS THE ORIGINAL SIGN OF APPROVAL

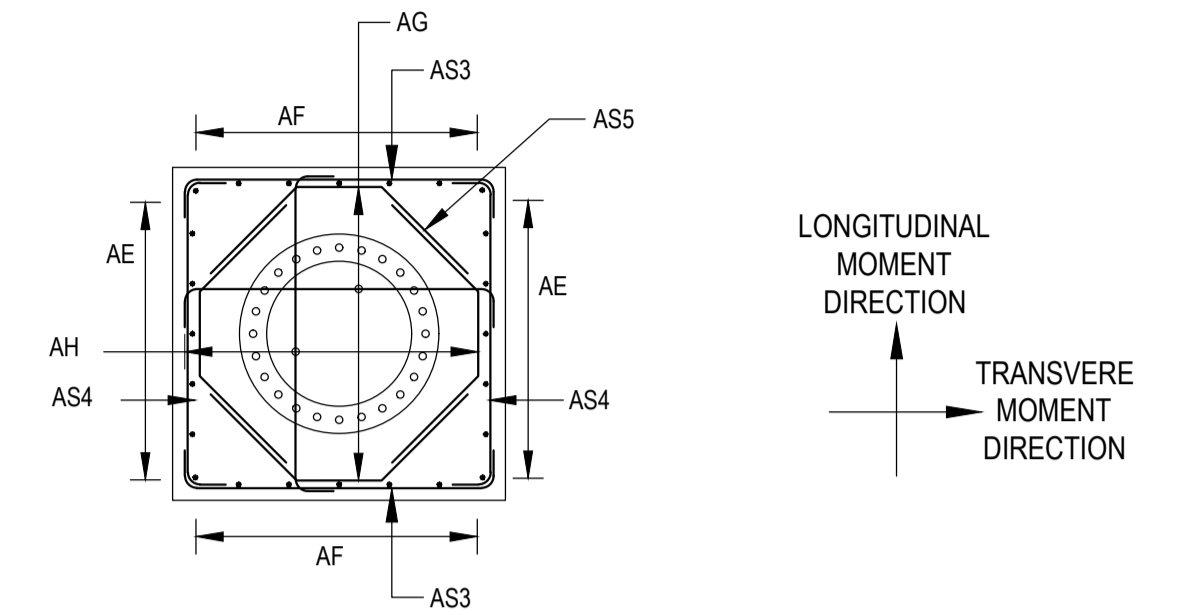




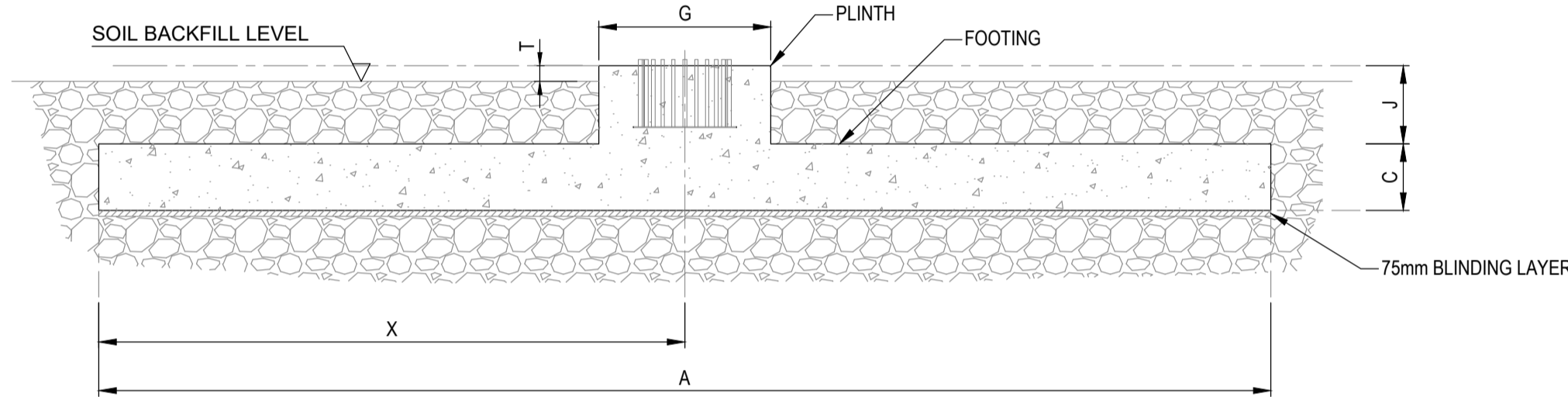
CONCRETE DETAILS - PLAN VIEW  
1:75



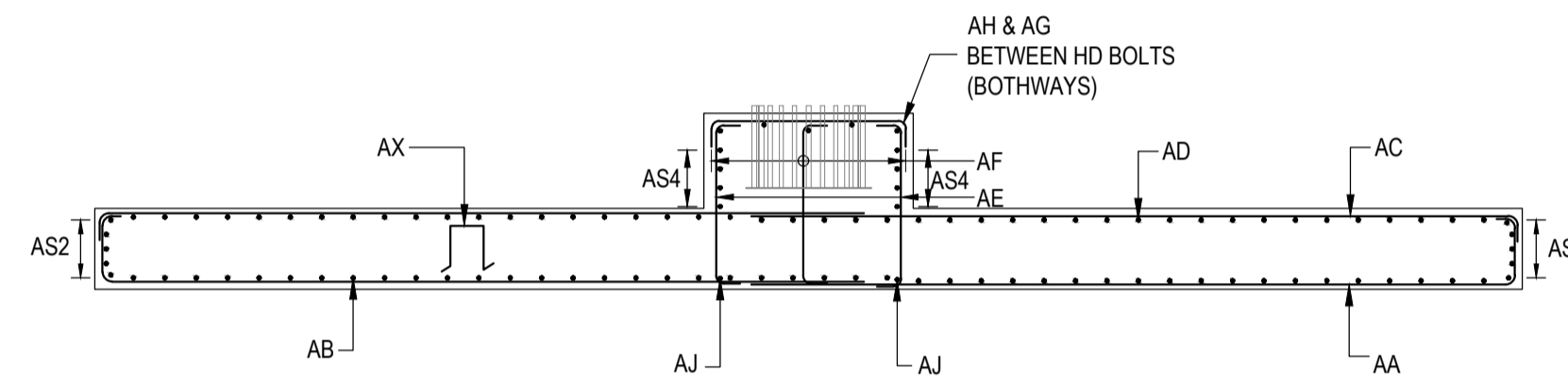
REINFORCEMENT DETAILS - PLAN VIEW  
1:75



PLINTH - PLAN VIEW  
1:50



SECTION A  
1:75



SECTION B  
1:75

BENDING SCHEDULE

MEMBER	No. OF	BARS PER MEMB	DIA. MESH	LENGTH	TOTAL NUM-BER	MARK	SC	BENDING				
								A	B	C	D	E/R
FOOTING	1	26	Y 25	6950	25.5	AA	55	300	197	6225	197	300
	1	51	Y 12	5000	51	AB	55	150	197	4438	197	150
	1	21	Y 16	6550	21	AC	38	192	6234	192		
	1	32	Y 12	4350	32	AD	38	150	4105	150		
	2	1	Y 12	6450	2	AS1	38	150	6188	150		
	2	1	Y 12	4300	2	AS2	38	150	4081	150		
	1	28	Y 12	1300	28	AX	83	288	185	369	369	
	PLINTH	2	11	Y 25	1600	22	AE	38	300	1138	300	
2		10	Y 25	1650	20	AF	38	300	1175	300		
1		11	Y 25	2000	11	AG	38	300	1525	300		
1		10	Y 25	2000	10	AH	38	300	1525	300		
2		4	Y 12	1750	8	AS3	38	150	1488	150		
2		4	Y 12	1750	8	AS4	38	150	1488	150		
4		7	Y 10	2050	28	AS5	49	800	800	460	570	570
1		4	Y 25	2700	4	AJ	20	2700				

MASS (kg)	Y8	Y10	Y12	Y16	Y20	Y25	Y32	Y40	TOTAL
R	0	0	0	0	0	0	0	0	0
Y/T	0	35	426	217	0	1149	0	0	1828
MESH	0	0	0	0	0	0	0	0	0
TOTAL	0	35	426	217	0	1149	0	0	1828

FOUNDATION SUMMARY

DESCRIPTION	VALUE	UNITS
MAXIMUM BENDING MOMENT CAPACITY	1350.0	kNm
DESIGN TRANSVERSE MOMENT	1250.0	kNm
DESIGN LONGITUDINAL MOMENT	500.0	kNm
DESIGN VERTICAL FORCE	107.0	kN
SITE CLEARANCE	32.2	m <sup>2</sup>
CONCRETE VOLUME	13.2	m <sup>3</sup>
CONCRETE MASS	32.4	ton
BINDING LAYER VOLUME	2.0	m <sup>3</sup>
BINDING LAYER MASS	5.0	ton
SOIL EXCAVATION VOLUME (0-2m)	34.8	m <sup>3</sup>
SOIL EXCAVATION VOLUME (2-4m)	0.0	m <sup>3</sup>
SOIL BACKFILL VOLUME	20.1	m <sup>3</sup>
FORMWORK SMOOTH SURFACE AREA	6.8	m <sup>2</sup>
FORMWORK ROUGH SURFACE AREA	8.5	m <sup>2</sup>
CONCRETE STRENGTH, F <sub>cu</sub>	30.0	MPa
CONCRETE WEIGHT DENSITY	24.0	kN/m <sup>3</sup>
CONCRETE COVER	75.0	mm
ESKOM SOIL TYPE	2	
SOIL MAXIMUM BEARING PRESSURE	150.0	kN/m <sup>2</sup>
SOIL WEIGHT, DENSITY	16.0	kN/m <sup>3</sup>
STEEL CAPACITY, F <sub>y</sub>	450.0	MPa
STEEL MASS DENSITY	7850.0	kg/m <sup>3</sup>

FOUNDATION DIMENSIONS

DESCRIPTION	VALUE	UNITS
A	6.40	m
B	4.27	m
C	0.40	m
D	N/A	m
E	N/A	m
F	N/A	m
G	1.70	m
H	1.70	m
J	1.00	m
X	3.20	m
T	0.20	m

REINFORCEMENT SUMMARY

LABEL	DESCRIPTION
AA	26 Y 25 - AA - 150 ( B1 )
AB	51 Y 12 - AB - 125 ( B2 )
AC	21 Y 16 - AC - 200 ( T1 )
AD	32 Y 12 - AD - 200 ( T2 )
AE	11 Y 25 - AE - EQ.SP - S.F.
AF	10 Y 25 - AF - EQ.SP - E.F.
AG	11 Y 25 - AG - 150 ( T1 )
AH	10 Y 25 - AH - 150 ( T2 )
AS1	1 Y 12 - AS1 - EQ.SP - E.F.
AS2	1 Y 12 - AS2 - EQ.SP - S.F.
AS3	4 Y 12 - AS3 - EQ.SP - E.F.
AS4	4 Y 12 - AS4 - EQ.SP - S.F.
AX	28 Y 12 - AX - 1000 E.W. FROM B1 TO T2
AS5	7 Y 10 - AS5 - 200 - LINK
AJ	4 Y 25 - AJ - EQ.SP. ( B1 & B2 )

NOTES

- REFER ANY DISCREPANCIES TO THE ENGINEER PRIOR TO COMMENCEMENT OF WORK.
- OBTAIN ENGINEERS WRITTEN AUTHORIZATION FOR ALL AMENDMENTS PRIOR TO COMMENCEMENT OF WORK.
- DESIGN FOUNDATION BEARING CAPACITY AS PER ESKOM STANDARD 240-47172620 (TRMSCAAC 5.2)
- ALL CONCRETE WORK IS TO BE FOUND ON AN IN-SITU ENGINEERED MATTRESS DESIGNED TO PROVIDE THE REQUIRED BEARING CAPACITY AND STIFFNESS.
- DESIGN ACCORDING TO SANS DESIGN CODES.
- CONCRETE STRENGTH AT 28 DAYS:  
REINFORCED CONCRETE: 30 Mpa  
BLINDING CONCRETE: 10 Mpa
- MINIMUM CONCRETE COVER TO REINFORCEMENT: 75mm FOR SIDES, TOP AND BOTTOM.
- 75mm BLINDING TO BE PROVIDED UNDER FOUNDATIONS.
- ALL CONCRETE MUST BE MOIST CURED BY AN APPROVED METHOD FOR 7 DAYS AFTER FINAL SET OF CONCRETE. ENGINEER MAY ADJUST CURING PERIOD DEPENDING ON WEATHER CONDITIONS.
- ALL CIVIL WORKS SHALL COMPLY WITH SANS 1200, ACCURACY LEVEL 2.
- PROVIDE A 20 x 20mm CHAMFER TO ALL EXPOSED CORNERS.
- SMOOTH OFF-SHUTTER FINISH TO EXPOSED CONCRETE.
- GROUTING: "M-BED STANDARD" (UNO) OR SIMILAR APPROVED.
- ONLY HIGH TENSILE REINFORCEMENT STEEL (Y) USED THROUGHOUT FOUNDATION.
- ENSURE LONG DIRECTION OF FOUNDATION TO BE ORIENTATED TOWARDS THE BISECTOR OF THE CONNECTED POWER LINES (EXCLUDING TERMINAL POINTS).
- EARTH TAIL TO BE CONNECTED TO THE HD BOLTS AND REINFORCEMENT STEEL AND BROUGHT OUT OF THE FOUNDATION AS PER THE SPECIFICATIONS.
- UNFACTORED LOADS SHOWN ON THE DRAWINGS. THE FOLLOWING SAFETY FACTORS HAVE BEEN APPLIED: CIVIL = 1.35
- WHERE IT IS NECESSARY FOR BARS TO LAP, MIN LAP LENGTH = 45 x BAR DIAMETER.

REV	DATE	REVISION DETAILS	APPROVED
2	10/03/17	ISSUED FOR CONSTRUCTION	H. NIEHAUS
1	10/02/17	ISSUED FOR CONSTRUCTION	P. VAN DER SPUY
0	09/12/16	ISSUED FOR CONSTRUCTION	P. VAN DER SPUY
A	07/12/16	ISSUED FOR CONSTRUCTION	P. VAN DER SPUY

APPROVED	DRAWN	DESIGNED
	J. BRUSSOW	J. BRUSSOW
	CHECKED P. VAN DER SPUY	
	APPROVED	
		10/02/17

PROJECT	TITLE
AURECON STANDARD DRAWINGS	STANDARD MONOPOLE FOUNDATION 1 250 kNm MOMENT (TYPE 2)

FOR CONSTRUCTION	
PROJECT No.	EP-0040
SCALE	AS SHOWN
DRAWING No.	AUR-OHL-CIV-MP-007
SIZE	A1
REV	2