

**FLI** structures

# 5G Monopoles

5G multi-user loading.

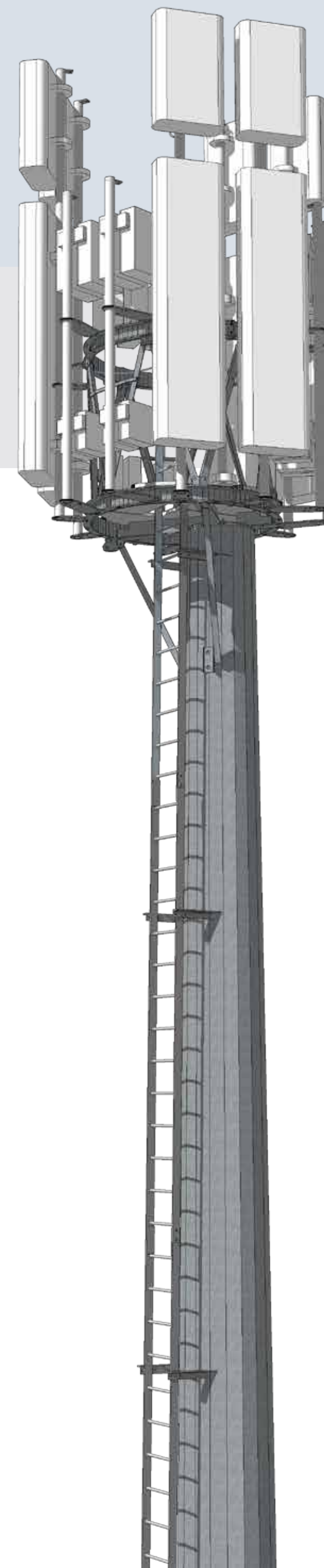
2 or 3 ring headframes and multiple headframe options for site share.

Heights up to 35m.

Optimised structure delivers a slimmer profile and reduces fatigue at the base.

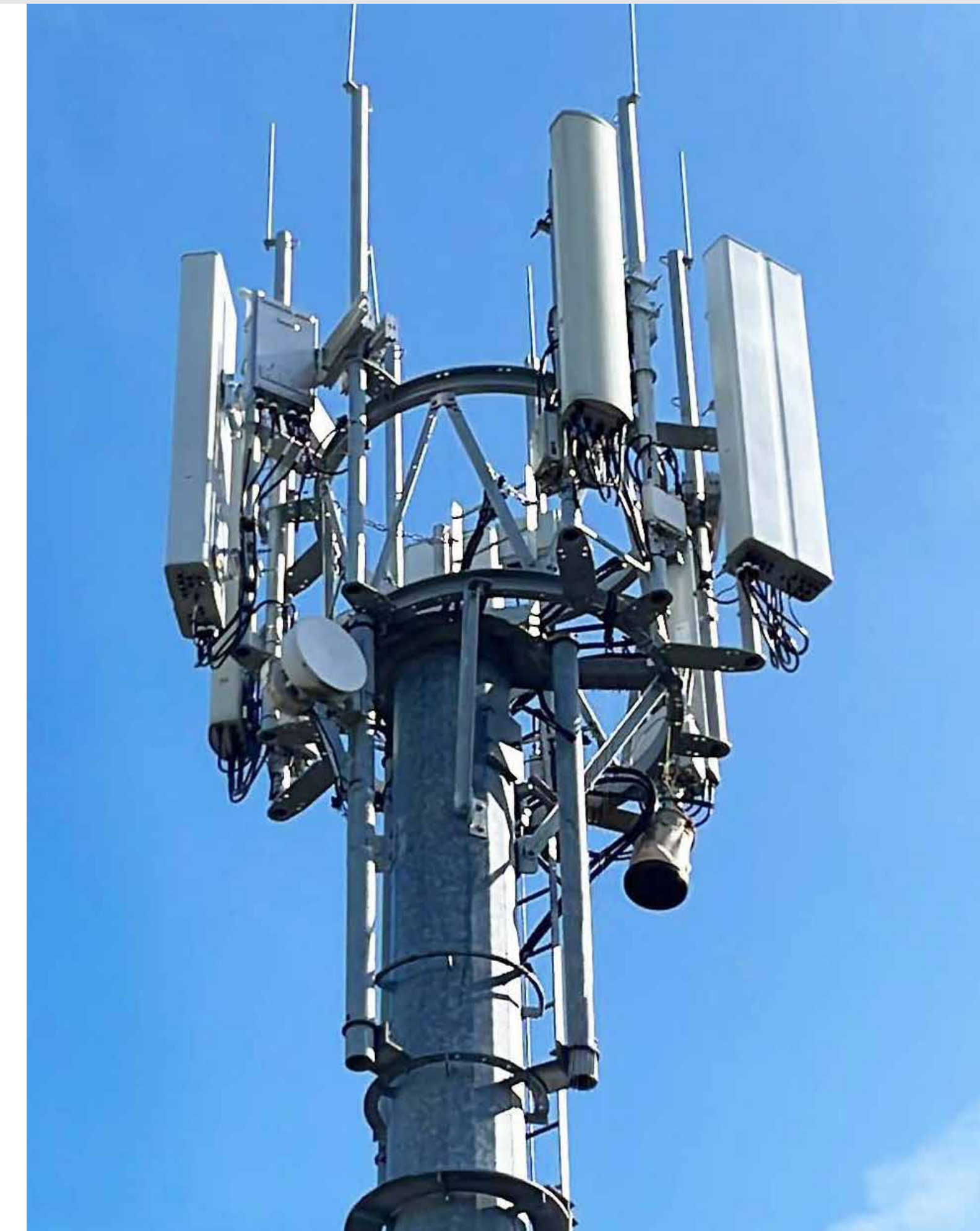
Dual feeder hatch for easier rigging and site sharing.

Feeder hanger at each hatch level.



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01452 722200

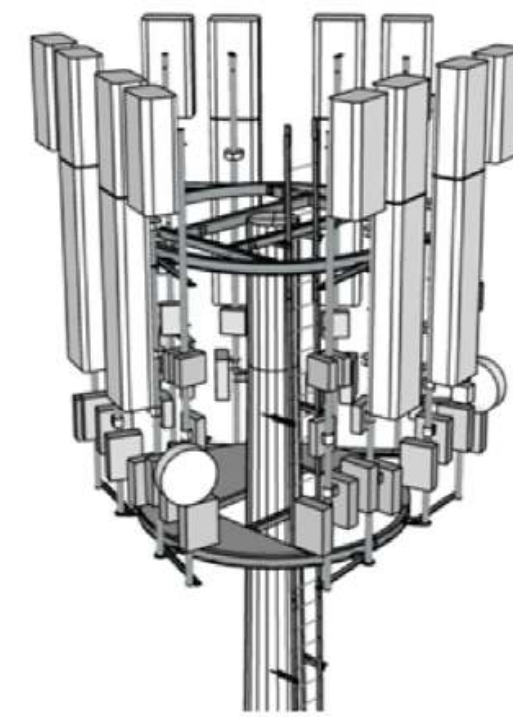
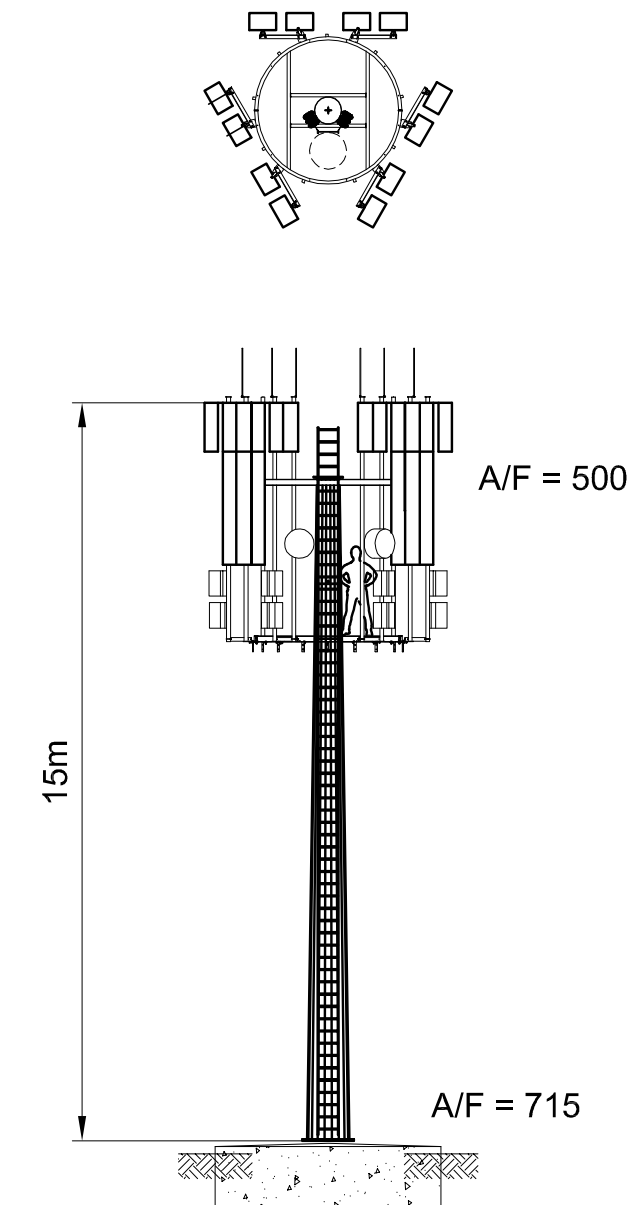
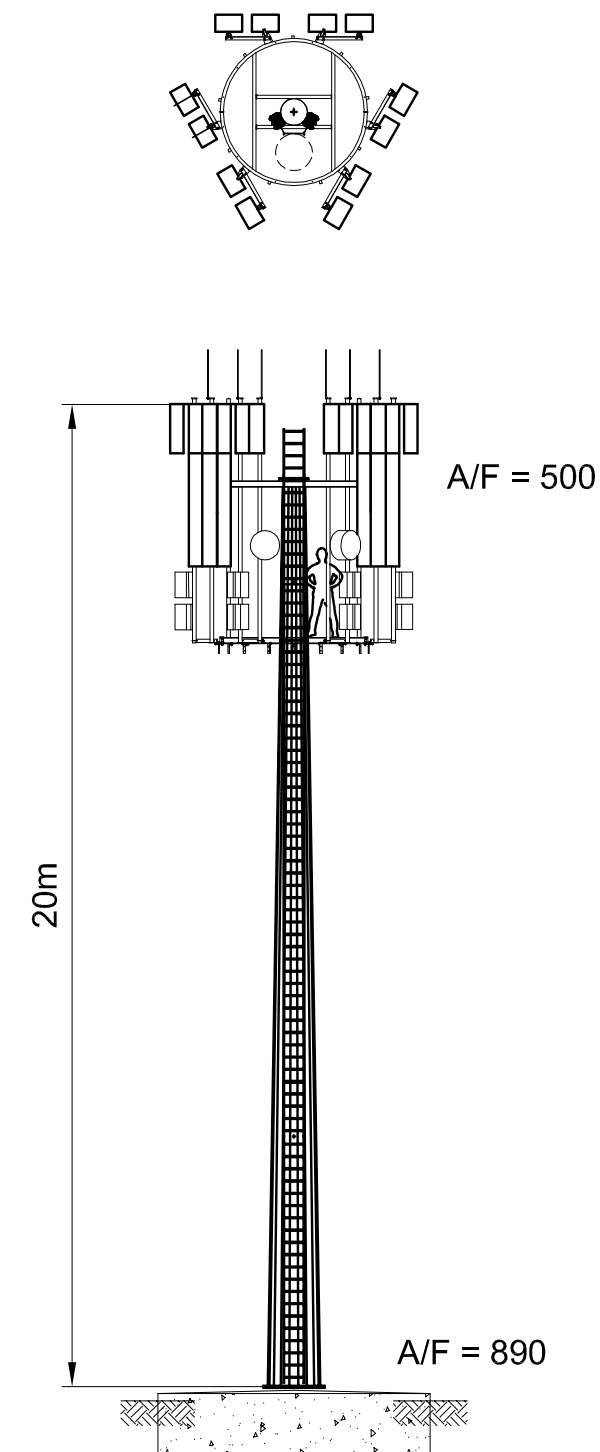
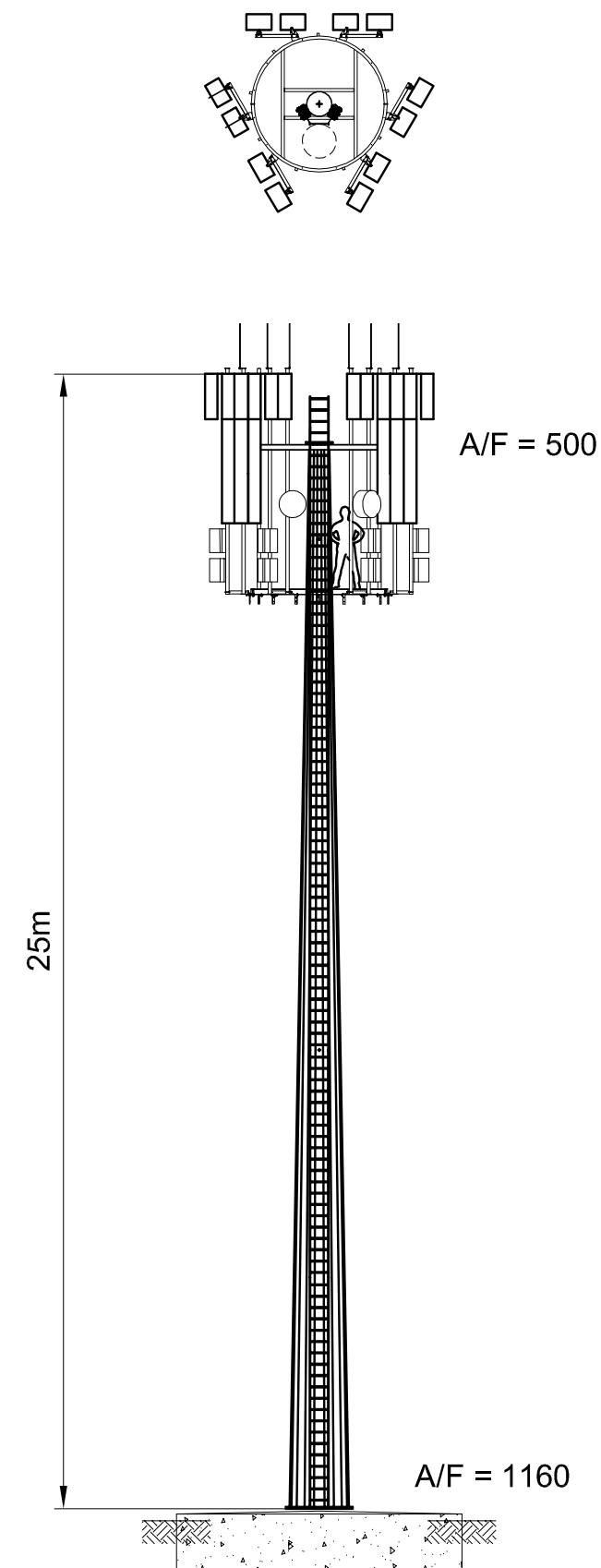
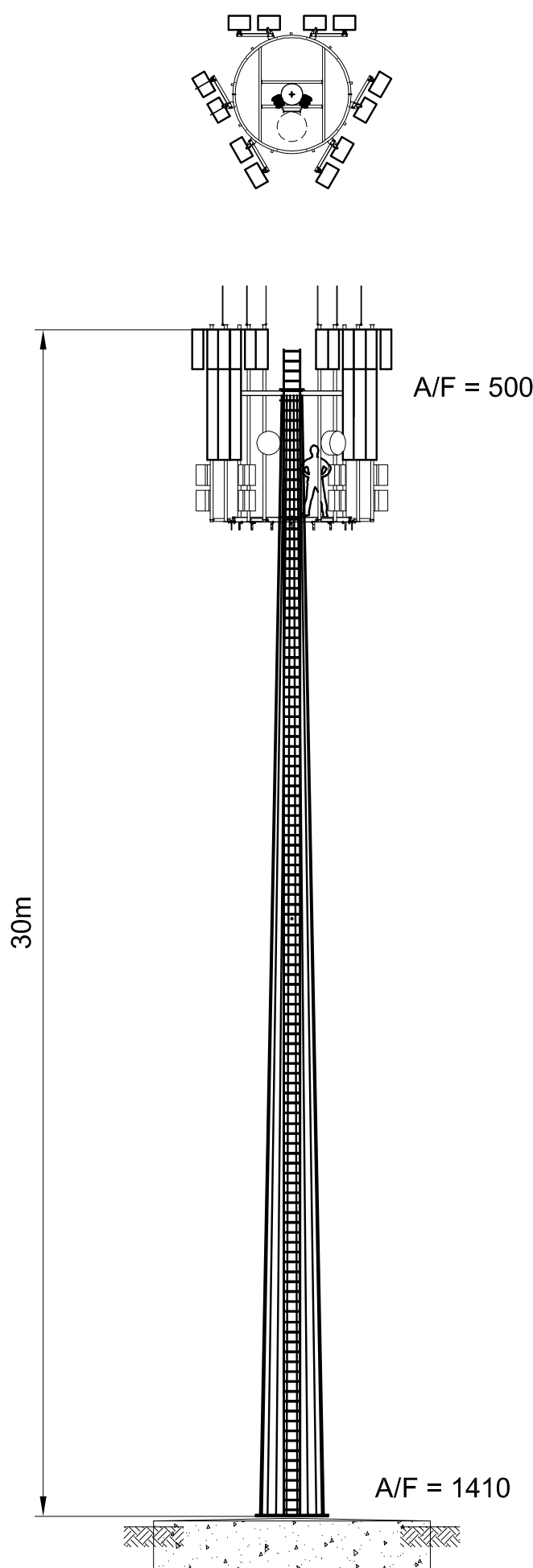


# FLI monopoles across existing networks

Having designed, built and installed a full range of monopoles across the existing networks .....



# DM3 2 Ring 5G Monopole



3D PICTORIAL REPRESENTATION OF A 2 RING HEAFRAME

MONOPOLE REFERENCE	DM3.2R/30
H.D BOLTS T.B.C.	
UNFACTORED FORCES AT TOP OF BASE	
FOUNDATION SIZE = 6.1m X 6.1m X 1.2m DP	
MOMENT	1750 kNm
HORIZ SHEAR	84 kN
VERTICAL LOAD	100 kN

MONOPOLE REFERENCE	DM3.2R/25
H.D BOLTS T.B.C.	
UNFACTORED FORCES AT TOP OF BASE	
FOUNDATION SIZE = 5.6m X 5.6m X 1.2m DP	
MOMENT	1289 kNm
HORIZ SHEAR	72 kN
VERTICAL LOAD	76 kN

MONOPOLE REFERENCE	DM3.2R/20
H.D BOLTS T.B.C.	
UNFACTORED FORCES AT TOP OF BASE	
FOUNDATION SIZE = 4.9m X 4.9m X 1.2m DP	
MOMENT	881 kNm
HORIZ SHEAR	60 kN
VERTICAL LOAD	58 kN

MONOPOLE REFERENCE	DM3.2R/15
H.D BOLTS T.B.C.	
UNFACTORED FORCES AT TOP OF BASE	
FOUNDATION SIZE = 4.2m X 4.2m X 1.2m DP	
MOMENT	534 kNm
HORIZ SHEAR	48 kN
VERTICAL LOAD	46 kN

DO NOT SCALE IF IN DOUBT ASK

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UNLESS OTHERWISE STATED:-  
 MATERIAL:- GRADE AS PER FLI LTD FORM 11G  
 FINISH:- GALVANISED TO BS EN ISO 1461  
 DIMENSIONS:- MILLIMETRES (mm)  
 WELD INSP:- AS PER NISS LATEST EDITION ANNEX 'B'  
 TOLERANCES:-  
 CUT LENGTH = ±2mm  
 HOLE CENTRES = ±2mm  
 ANGULAR CUT = ±0.25°  
 FABRICATED ASSY = ±3mm  
 PCD = ±1mm

CERTIFIED TO EXECUTION CLASS EXC2  
 NON PRELOADED BOLTING ASSEMBLIES TO BS EN 15048-1

NOTES:-  
 Design Codes  
 • The Institution of Lighting Engineers, PLG 07 (2013) High Masts for Lighting & CCTV- 2000 Edition.  
 • BS EN 1991-1-4  
 • BS EN 1993-1 (Holding Down Bolts)

Capacity:  
 TOP HEADFRAME:  
 6 No. 4.4m Apertures (comprising 6 x 3.3m + 6 x 1.1m)  
 24 No. RRU, 12 MHA, 12 No. Active Routers, 6 BoB  
 Located at o/all monopole height -2.5m  
 4 No. Ø600 DRL  
 24 LDF 5-50 Feeders, 4 Beldon internal & 6 Fibre / Power feeders.

Environmental Loading Parameters:  
 Windspeed: 24.4m/s 10 Minute Mean  
 Altitude: 150m  
 Terrain Category: Country  
 Distance from sea: 10 km  
 Return Period: 50 years ULS & SLS  
 No orographic features considered

Partial Factors:  
 Partial safety factor on wind speed  $\gamma_f$ : 1.6  
 Partial safety factor on design strength:  
 $\gamma_m$ : 1.2 (Shaft & base plate)  
 $\gamma_m$ : 1.3 (Holding down bolts)

Serviceability Requirements:  
 Maximum rotation of dishes <0.85°  
 Maximum rotation of antenna <0.85°

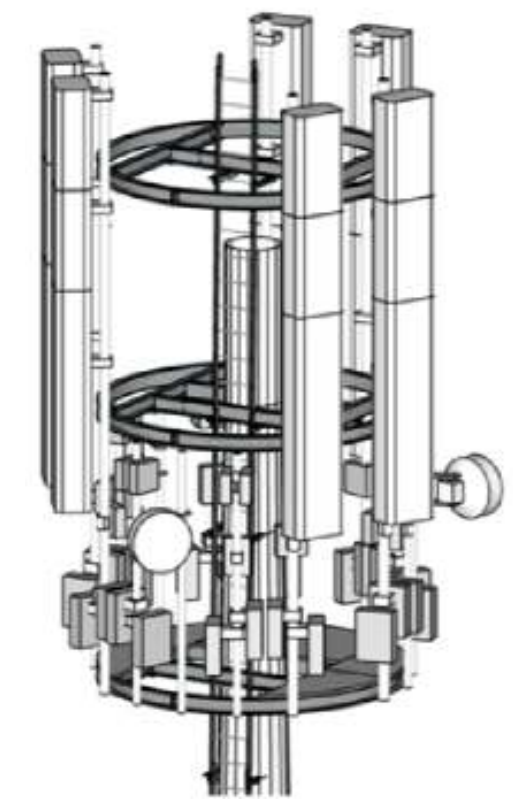
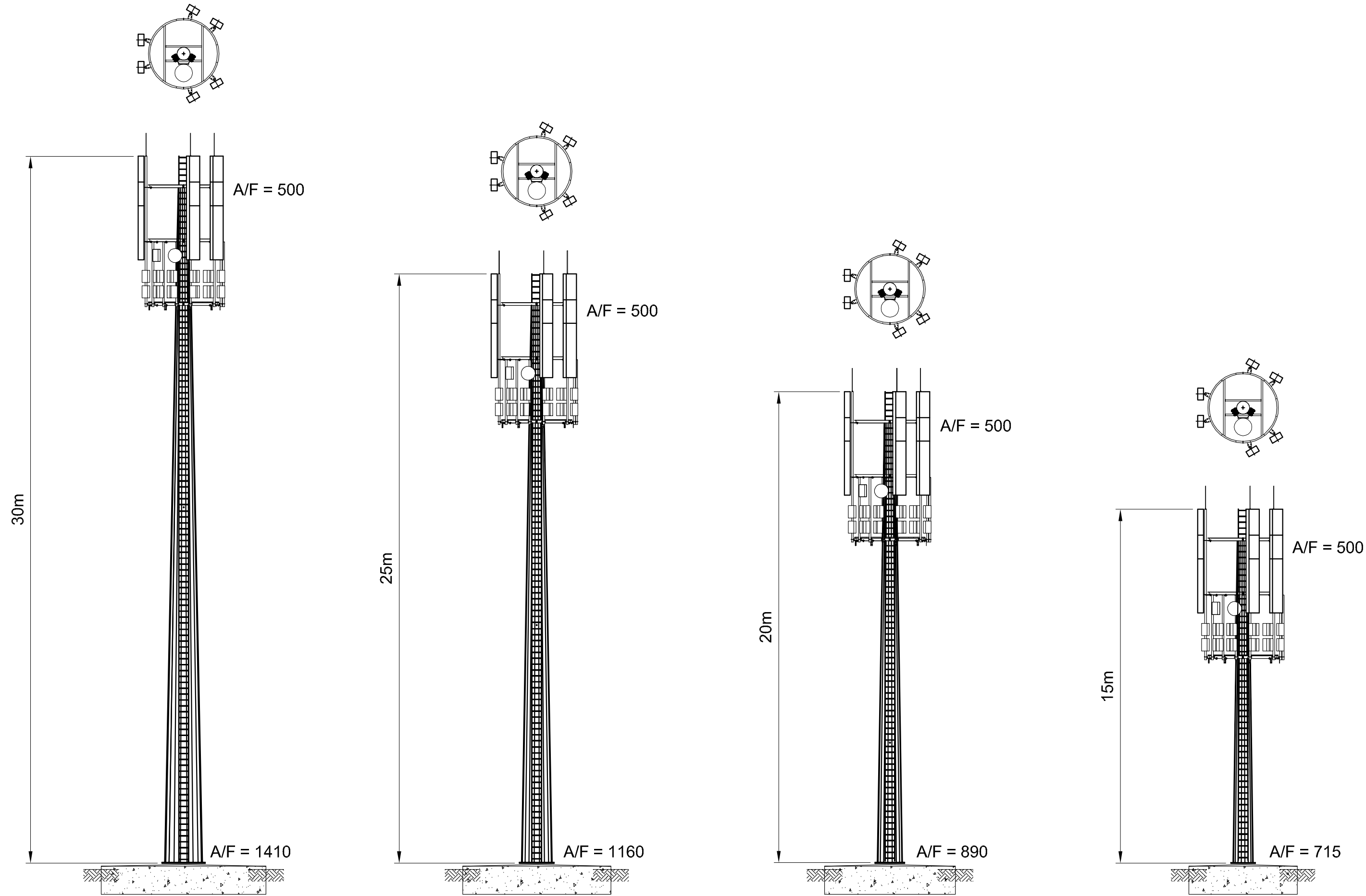
Material Specification:  
 All plates BS EN 10025 S275JO or Better  
 Plates 25mm thick and above to be S355J2 or Better.

ISSUE	DATE	MODIFICATION	CKD
G	21/02/22	GENERAL DRG UPDATE	BP
F	04/08/21	ADD DM3 REF INFORMATION	BP
E	27-07-21	HD INFO ADDED	BP
D	15/09/20	CAPACITY NOTE UPDATED	BP
C	04/09/20	MONOPOLE HT & 3D IMAGE UPDATED	AS
B	21/02/20	APERTURE LTH DECREASED TO 3.3m ON DRG	TCB
A	17/02/20	FIRST ISSUE	BP



DATE: 17/02/20	SCALE: N.T.S	F&L REF: ----
DRN: BP	CKD: TCB	APP'D: BP
CUSTOMER: [ ]		
ORDER No. [ ]		
TITLE: DM3 2 RING 5G MONOPOLE PLANNING DRAWING FOR 30m 25m, 20m & 15m MONOPOLES		
DRG No. SK4044	REV. G	

# DM3 3 Ring 5G Monopole



3D PICTORIAL REPRESENTATION OF A 3 RING HEAFRAME

MONOPOLE REFERENCE	DM3. 3R/30
H.D BOLTS T.B.C.	
UNFACTORED FORCES AT TOP OF BASE	
FOUNDATION SIZE = 6.1m X 6.1m X 1.2m DP	
MOMENT	1750 kNm
HORIZ SHEAR	84 kN
VERTICAL LOAD	100 kN

MONOPOLE REFERENCE	DM3. 3R/25
H.D BOLTS T.B.C.	
UNFACTORED FORCES AT TOP OF BASE	
FOUNDATION SIZE = 5.6m X 5.6m X 1.2m DP	
MOMENT	1289 kNm
HORIZ SHEAR	72 kN
VERTICAL LOAD	76 kN

MONOPOLE REFERENCE	MD3. 3R/20
H.D BOLTS T.B.C.	
UNFACTORED FORCES AT TOP OF BASE	
FOUNDATION SIZE = 4.9m X 4.9m X 1.2m DP	
MOMENT	881 kNm
HORIZ SHEAR	60 kN
VERTICAL LOAD	58 kN

MONOPOLE REFERENCE	MD3. 3R/15
H.D BOLTS T.B.C.	
UNFACTORED FORCES AT TOP OF BASE	
FOUNDATION SIZE = 4.2m X 4.2m X 1.2m DP	
MOMENT	534 kNm
HORIZ SHEAR	48 kN
VERTICAL LOAD	46 kN

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UNLESS OTHERWISE STATED:-  
 MATERIAL:- GRADE AS PER FLI LTD FORM 11G  
 FINISH:- GALVANISED TO BS EN ISO 1461  
 DIMENSIONS:- MILLIMETRES (mm)  
 WELD INSP:- AS PER NSSS LATEST EDITION ANNEX 'B'  
 TOLERANCES:-  
 CUT LENGTH = ±2mm  
 HOLE CENTRES = ±2mm  
 ANGULAR CUT = ±0.25°  
 FABRICATED ASSY = ±3mm  
 PCD = ±1mm

CERTIFIED TO EXECUTION CLASS EXC2  
 NON PRELOADED BOLTING ASSEMBLIES TO BS EN 15048-1

NOTES:-  
 Design Codes  
 • The Institution of Lighting Engineers, PLG 07 (2013) High Masts for Lighting & CCTV- 2000 Edition.  
 • BS EN 1991-1-4  
 • BS EN 1993-1 (Holding Down Bolts)

Capacity:  
 TOP HEADFRAME:  
 6 No. 4.4m Apertures  
 24 No.RRU, 12 MHA, 12 No. Active Routers  
 6 BoB  
 Located at o/all monopole height -2.5m  
 5 No. Ø600 DRL  
 24 LDF 5-50 Feeders + 5 Beldon internal,  
 + 6 fibre / power feeders

Environmental Loading Parameters:  
 Windspeed: 24.4m/s 10 Minute Mean  
 Altitude: 150m  
 Terrain Category: Country  
 Distance from sea: 10 km  
 Return Period: 50 years ULS & SLS

No orographic features considered  
 Partial Factors:  
 Partial safety factor on wind speed  $\gamma_f$ : 1.6  
 Partial safety factor on design strength:  
 $\gamma_m$ : 1.2 (Shaft & base plate)  
 $\gamma_m$ : 1.3 (Holding down bolts)

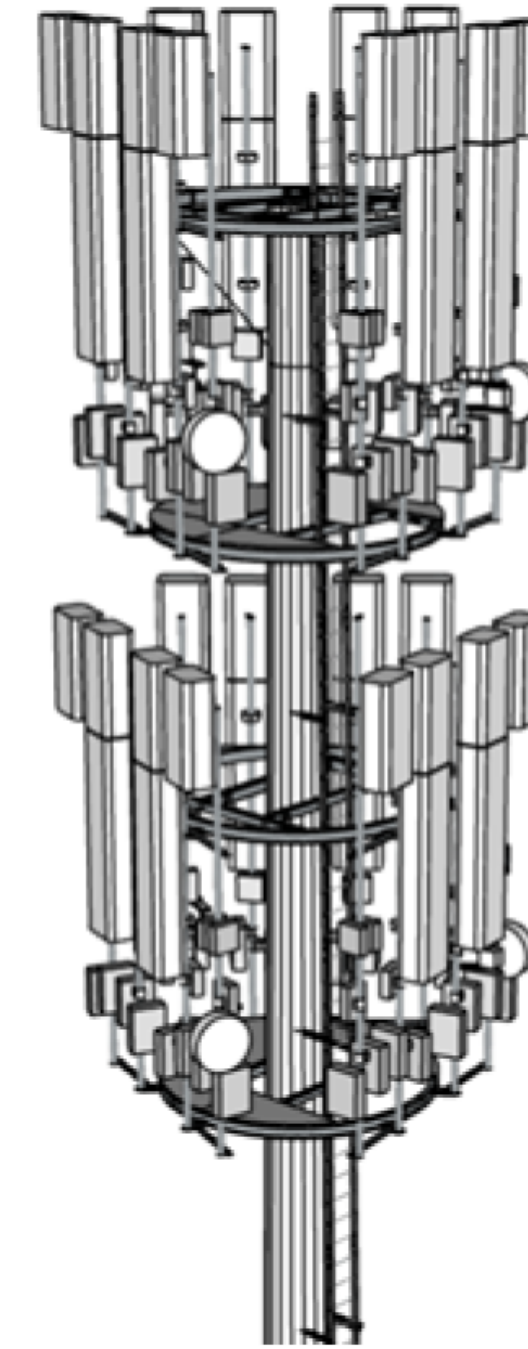
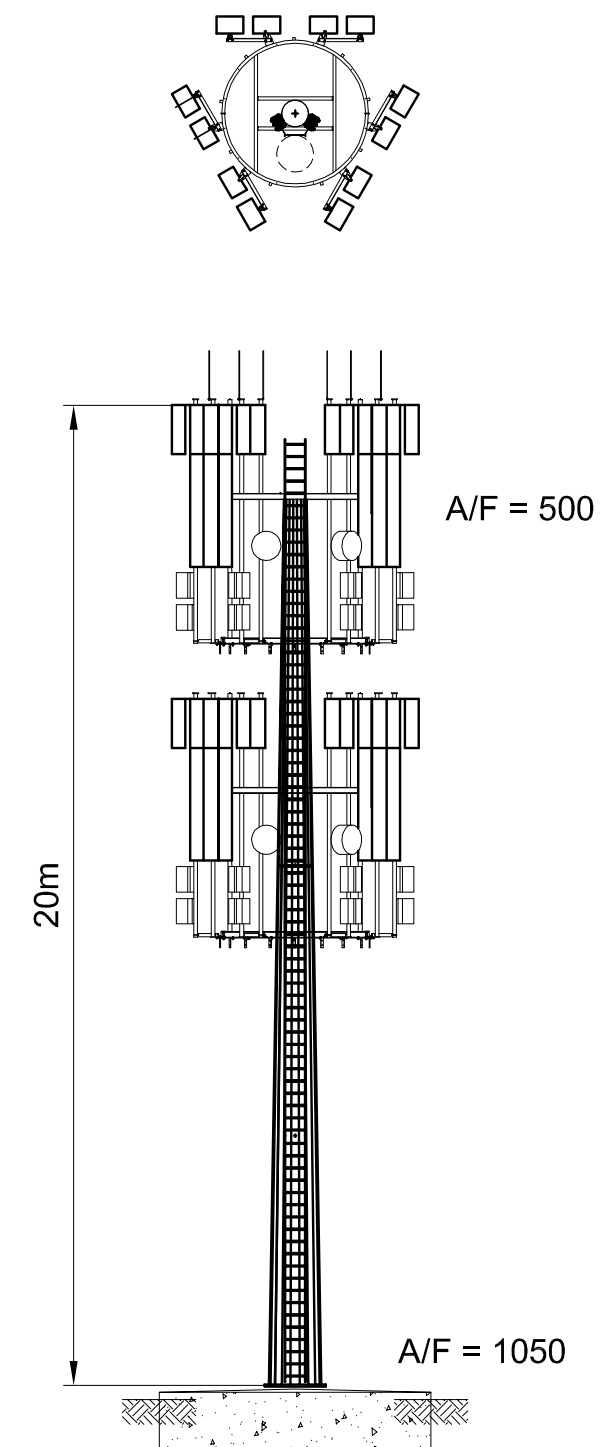
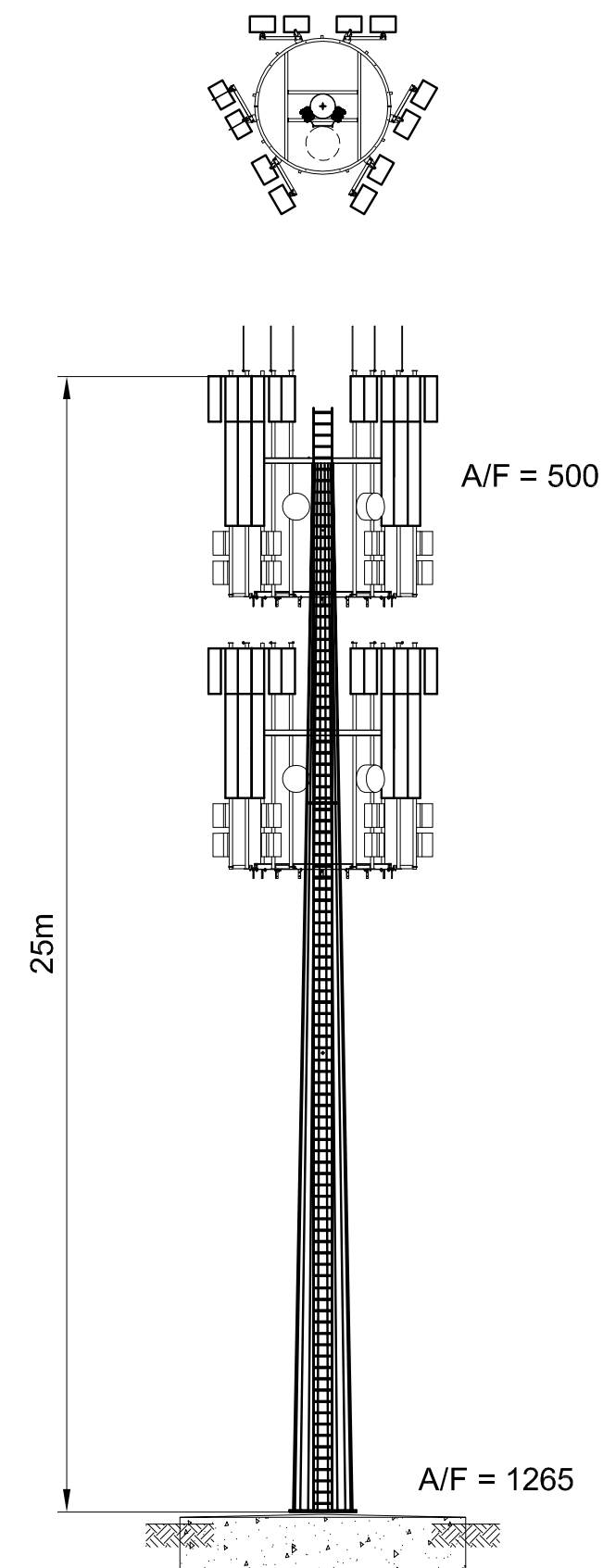
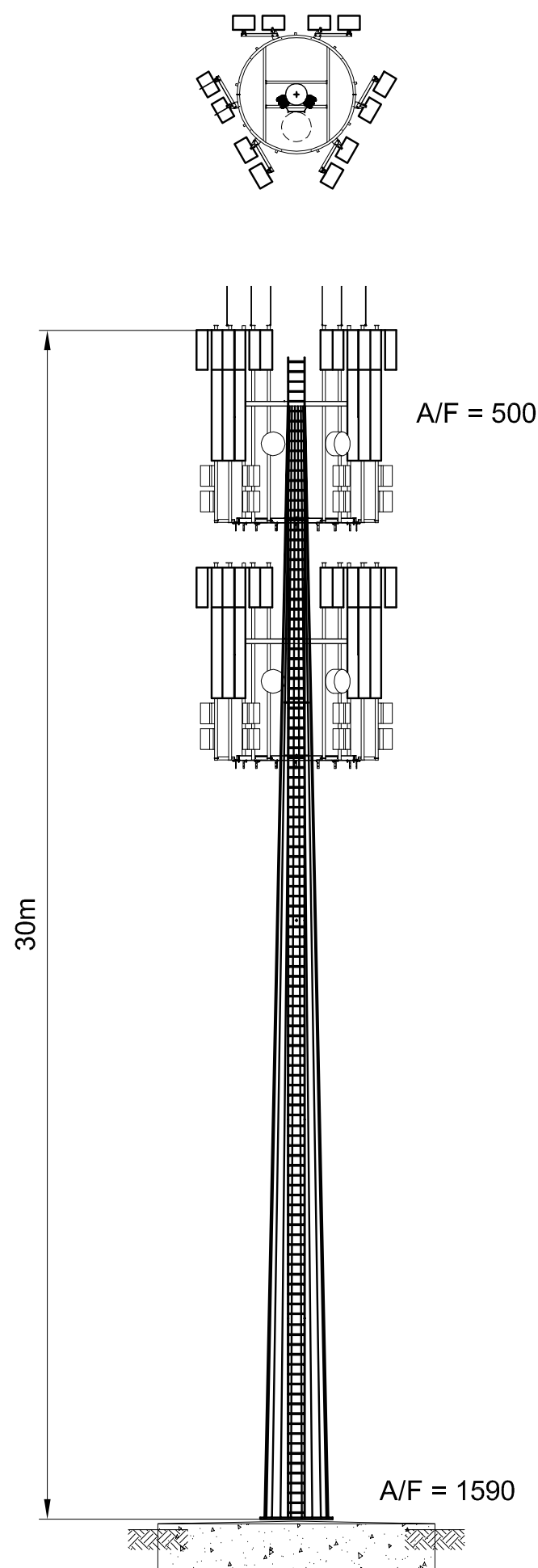
Serviceability Requirements:  
 Maximum rotation of dishes <0.85°  
 Maximum rotation of antenna <0.85°  
 Material Specification:  
 All plates BS EN 10025 S275JO or Better  
 Plates 25mm thick and above to be S355J2 or Better.

E	21/02/22	GENERAL DRG UPDATE	BP
D	09/08/21	30m BOLT No INCREASED FROM 18 x M36	BB
C	15/09/20	CAPACITY NOTE UPDATED	BP
B	04/09/20	3D PICTORIAL IMAGE UPDATED	AS
A	17/02/20	FIRST ISSUE	BP
ISSUE	DATE	MODIFICATION	CKD



DATE:	17/02/20	SCALE:	N.T.S	F&L REF:	-----
DRN:	BP	CKD:	TCB	APP'D:	BP
CUSTOMER	DM3. 3R STANDARD PRODUCT				
ORDER No.					
TITLE	DM3. 3R 3 RING 5G MONOPOLE PLANNING DRAWING FOR 30m 25m, 20m & 15m MONOPOLES				
DRG No.	SK4043	REV.	E		

# DM4 Dual Headframe 5G Monopole



3D PICTORIAL  
REPRESENTATION OF  
A 2 RING HEADFRAME

MONOPOLE REFERENCE	FL/DM4/30
H.D BOLTS T.B.C.	
UNFACTORED FORCES AT TOP OF BASE	
FOUNDATION SIZE = 7.0m X 7.0m X 1.2m DP	
MOMENT	2610 kNm
HORIZ SHEAR	126 kN
VERTICAL LOAD	141 kN

MONOPOLE REFERENCE	FL/DM4/25
H.D BOLTS T.B.C.	
UNFACTORED FORCES AT TOP OF BASE	
FOUNDATION SIZE = 6.3m X 6.3m X 1.2m DP	
MOMENT	1912 kNm
HORIZ SHEAR	110 kN
VERTICAL LOAD	113 kN

MONOPOLE REFERENCE	FL/DM4/20
H.D BOLTS T.B.C.	
UNFACTORED FORCES AT TOP OF BASE	
FOUNDATION SIZE = 5.55m X 5.55m X 1.2m DP	
MOMENT	1272 kNm
HORIZ SHEAR	95 kN
VERTICAL LOAD	91 kN

ORIGINAL SIZE A3

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UNLESS OTHERWISE STATED:-  
MATERIAL:- GRADE AS PER FLI LTD FORM 11G  
FINISH:- GALVANISED TO BS EN ISO 1461  
DIMENSIONS:- MILLIMETRES (mm)  
WELD INSP:- AS PER NISS LATEST EDITION ANNEX 'B'  
TOLERANCES:-  
CUT LENGTH = ±2mm  
HOLE CENTRES = ±2mm  
ANGULAR CUT = ±0.25°  
FABRICATED ASSY = ±3mm  
PCD = ±1mm

CERTIFIED TO EXECUTION CLASS EXC2  
NON PRELOADED BOLTING ASSEMBLIES TO BS EN 15048-1

NOTES:-  
Design Codes  
• The Institution of Lighting Engineers,  
PLG 07 (2013) High Masts for Lighting  
& CCTV- 2000 Edition.  
• BS EN 1991-1-4  
• BS EN 1993-1 (Holding Down Bolts)

Capacity:  
EACH HEADFRAMES:  
6 No. 4.4m Apertures (comprising 6 x 3.3m  
+ 6 x 1.1m)  
24 No.RRU, 12 MHA, 12 No. Active Routers,  
6 BoB  
Located at o/all monopole height -2.5m  
4 No. Ø600 DRL  
24 LDF 5-50 Feeders, 4 Beldon internal & 6  
Fibre / Power feeders.

Environmental Loading Parameters:  
Windspeed: 24.4m/s 10 Minute Mean  
Altitude: 175m  
Terrain Category: Country  
Distance from sea: 10 km  
Return Period: 50 years ULS & SLS

No orographic features considered  
Partial Factors:  
Partial safety factor on wind speed  $\gamma_f$ : 1.6  
Partial safety factor on design strength:  
 $\gamma_m$ : 1.2 (Shaft & base plate)  
 $\gamma_m$ : 1.3 (Holding down bolts)

Serviceability Requirements:  
Maximum rotation of dishes <0.85°  
Maximum rotation of antenna <0.85°  
Material Specification:  
All plates BS EN 10025 S275JO or Better  
Plates 25mm thick and above to be S355J2  
or Better.

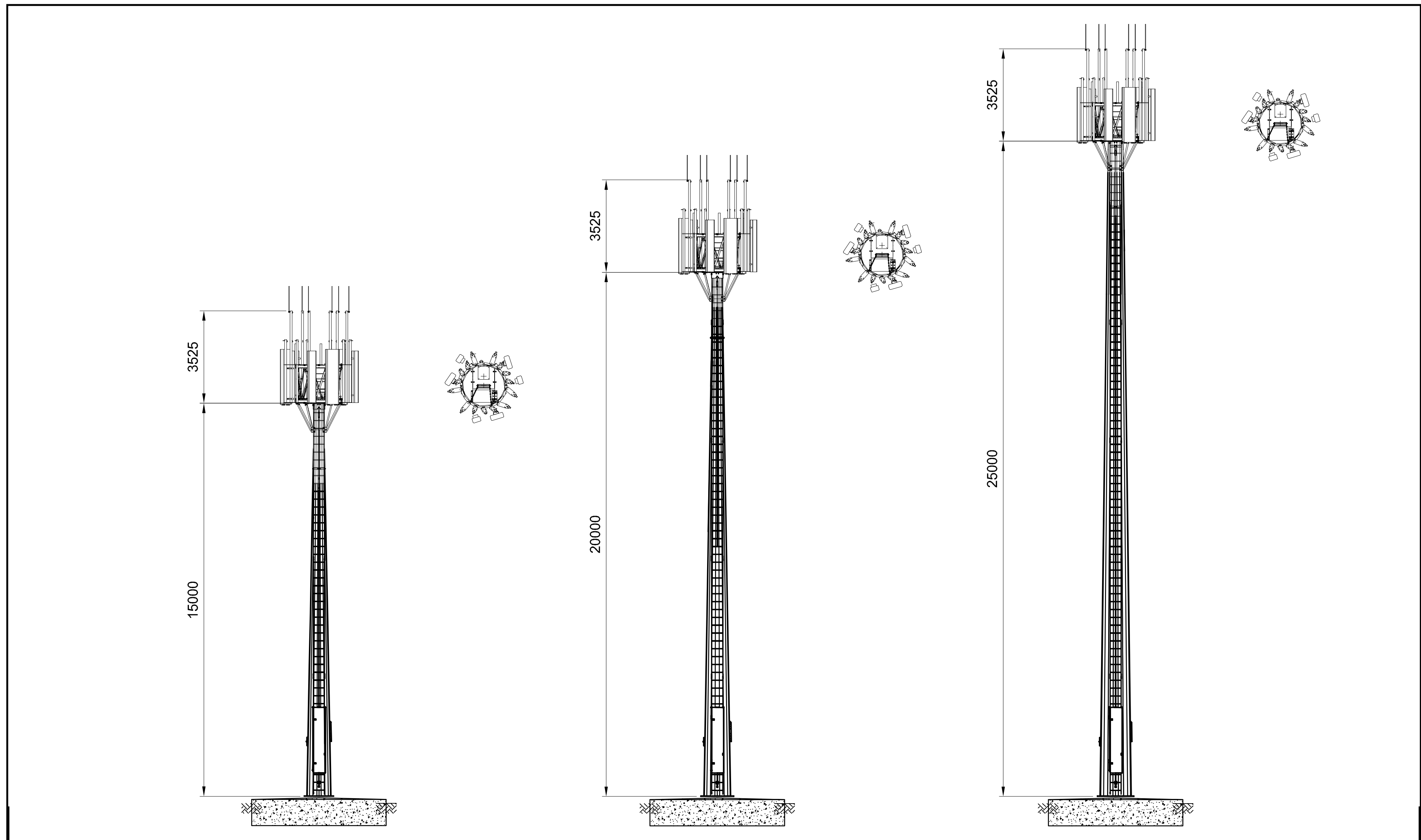
ISSUE	DATE	MODIFICATION	CKD
C	21/02/22	GENERAL DRG UPDATE	BP
B	15/09/20	CAPACITY NOTE UPDATED.	BP
A	04/09/20	FIRST ISSUE	TCB




DATE: 04/09/20	SCALE: NTS	F&L REF: -----
DRN: AS	CKD: TCB	APP'D: TCB
CUSTOMER: DM4 STANDARD PRODUCT		
ORDER No. -----		
TITLE: DM4 DUAL HEADFRAME 5G MONOPOLE PLANNING DRAWING FOR 30m 25m & 20m MONOPOLES		
DRG No. SK4143	REV. C	

# DM5G 5G Monopole

- Slimmer pole
- Surmounted headframe
- Lighter structure
- Lower cost



				UNLESS OTHERWISE STATED MATERIAL:- GRADES AS PER FLI LTD FORM 11G FINISH:- GALVANISED TO BS EN ISO 1461 DIMENSIONS:- MILLIMETRES (mm) TOLERANCES:- AS PER FLI LTD - FORM 15D WELD INSP: AS PER NSSS LATEST EDITION ANNEX 'B' CERTIFIED TO EXECUTION CLASS EXC2 NON PRELOADED BOLTING ASSEMBLIES TO BS EN 15048-1		 <small>FRANCIS &amp; LEWIS INTERNATIONAL LTD TEL: +44 (0)1452 722200 WEB: WWW.FLI.CO.UK</small>		CUSTOMER FLI	
								ORDER No. -----	
								TITLE	
								PLANNING DRAWING FOR 15m, 20m & 25m MONOPOLE c/w UNILATERAL HEADFRAME	
A	07/04/22	FIRST ISSUE	BP	F&L REF: -----	DATE: 07/04/22	SCALE: N.T.S	DRN: BP	CKD: TP	APP'D: BP
ISSUE	DATE	MODIFICATION	CKD	F&L REF: -----	DATE: 07/04/22	SCALE: N.T.S	DRN: BP	CKD: TP	APP'D: BP
							DRG No.	SK4324	REV. A

ORIGINAL SIZE A3

**FLI** structures

# 5G Offset Headframe

5G loading.

Multi user.

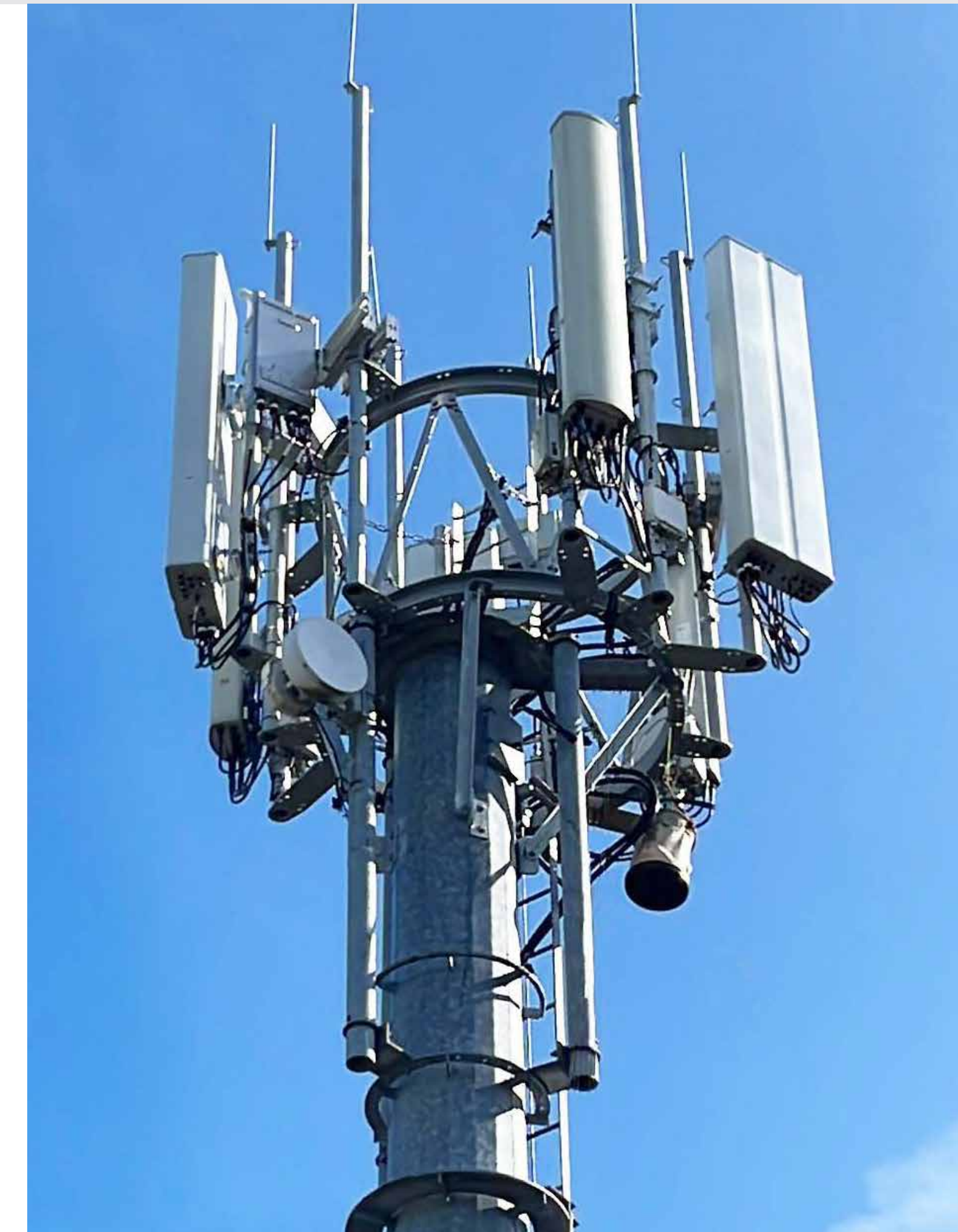
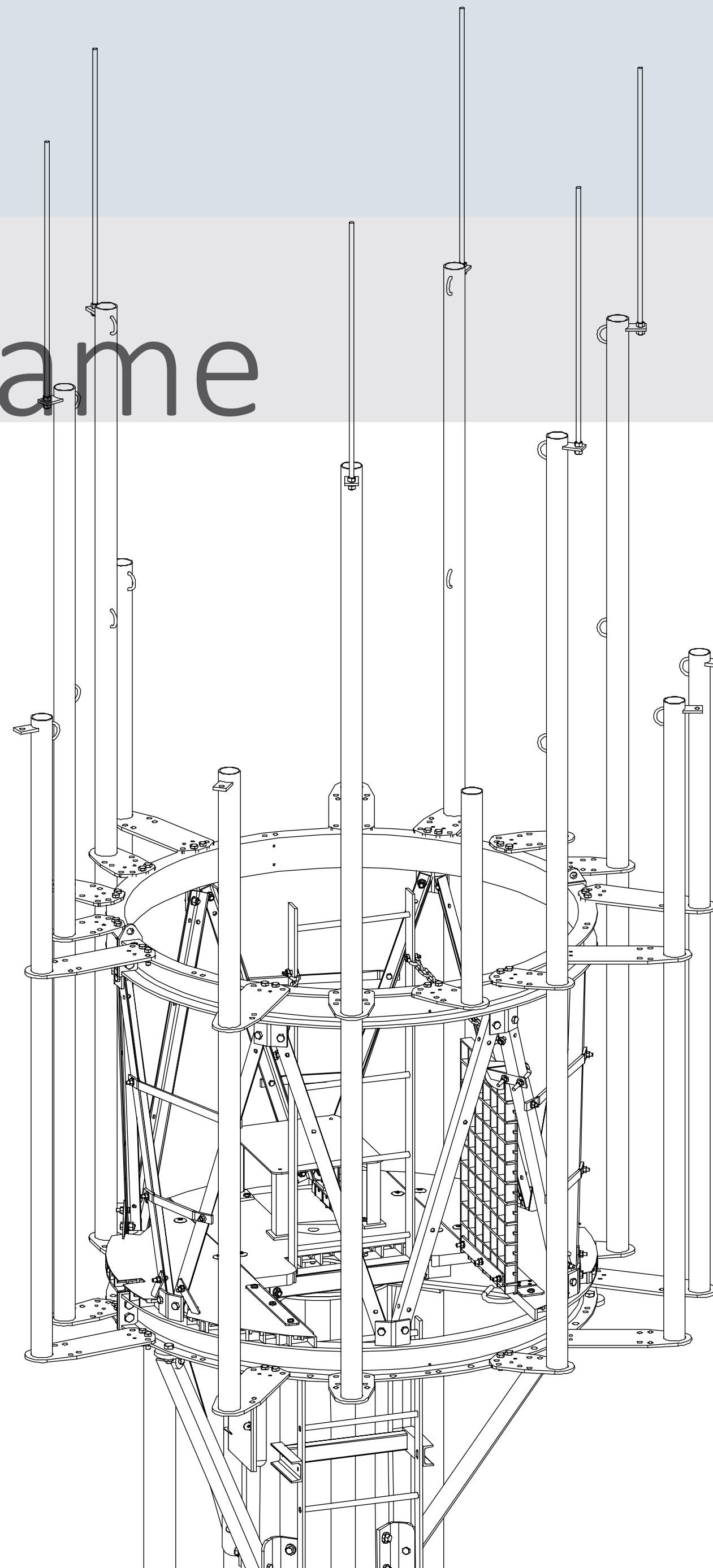
Clear work platform gives excellent access to equipment.

Surmounted design enables shorter pole.

Adjustable pole mounts increases mounting options.

Upgrade existing poles to 5G.

Original headframe on DM5G.



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**FLI** structures

# Hand Build Monopoles

The 'Rocket' monopole is designed for rail sites where cranes are unable to access, so a hand build tower provides the solution. Once materials are on site the works can be carried out in green zone.

Installed using derrick lifting kits, monopole sections are lifted into place without a crane or the need for works during possessions.





**FLI** structures

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01452 722200

# Bespoke Monopoles

In addition to off the shelf monopole designs, FLI are also experienced producing bespoke structures into telecoms and other markets.

