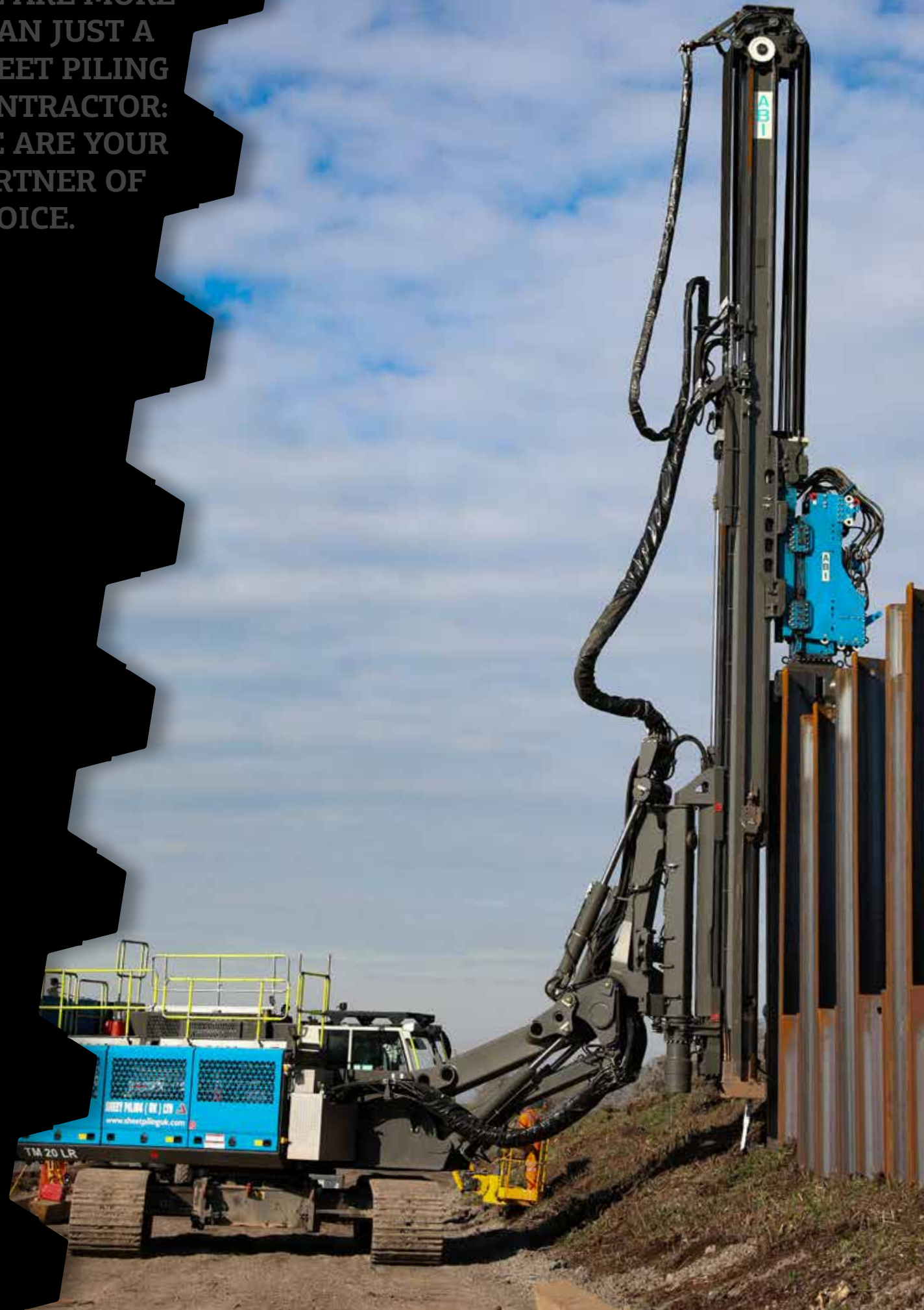


TRACKED PLANT TECHNICAL SPECIFICATIONS

ANCHORS
IN FREE PILING
STEEL WEEP HOLES
RETAINING PILES
VINYL PILING
CORNER PILES
COFFERDAMS
T BASEMENTS
FOUNDATIONS
ATORY PILING
SHEET PILING
INE WORKS
SITE PILES
ANCHORS
TE PILING
P HOLES
T PILES
WALLS
ILING
ILES
AMS
TTS
IS
G

**WE ARE MORE
THAN JUST A
SHEET PILING
CONTRACTOR:
WE ARE YOUR
PARTNER OF
CHOICE.**



CONTENTS

4. **ABI TM 20 LR Long Reach Rig**
Technical Specifications and Diagrams.
6. **ABI TM 20 Leader Rig**
Technical Specifications and Diagrams.
8. **ABI TM 18/22 HD Leader Rig**
Technical Specifications and Diagrams.
10. **ABI TM 13/16 SL Leader Rig**
Technical Specifications and Diagrams.
12. **ABI TM 12/15 Standard Reach Rig**
Technical Specifications and Diagrams.
13. **ABI TM 12/15 Long Reach Rig**
Technical Specifications and Diagrams.
14. **Bauer RTG 21 Leader Rig**
Technical Specifications and Diagrams.
16. **Kobelco SK350 LC Excavator Rig**
Technical Specs., Diagrams and Working Range.
18. **Kobelco SK380 SRLC Excavator Rig**
Technical Specs., Diagrams and Working Range.
20. **Sennebogen 673R Crawler Crane**
Technical Specs., Diagrams, Working Range.
22. **Sennebogen 653E Crawler Crane**
Technical Specs., Diagrams, Working Range.
24. **Sennebogen 643R Crawler Crane**
Technical Specs., Diagrams, Working Range.
26. **Kobelco CKG900E Crawler Crane**
Technical Specs., Diagrams, Working Range.
28. **Sennebogen 673R Lifting Capacities**
29. **Sennebogen 653E Lifting Capacities**
30. **Sennebogen 643R Lifting Capacities**
31. **Kobelco CKG900E Crawler Crane**
32. **Plant Loadings**
Piling Rig and Crawler Crane Bearing Pressures.
34. **Noise Assessments**
35. **Ground Borne Vibration Assessments**
36. **Platform Requirements**
Installation, Maintenance, Repair & Reinstatement.
37. **Working Platform Certificate**

INTRODUCTION

This document presents relevant data sheets and technical specifications for all tracked plant currently operated by Sheet Piling (UK) Ltd.

This includes Telescopic Leader Rigs, Excavator Piling Rigs and Crawler Cranes.

The purpose of the document is to assist Contractors, Developers, Clients and Engineers in various Health & Safety technical submissions and Temporary Works designs required for contractual and third party approvals to carry out sheet piling works on any particular project.

Plant loading information is presented for all tracked plant in the format required for Working Platform Designs to the BRE Digest 470 'Working Platforms for Tracked Plant'.

Also included is technical information on Noise and Vibration Assessments for vibratory installation.

“As one of the UK’s leading driven steel piling contractors, Sheet Piling (UK) Ltd has built its reputation on solid foundations.”



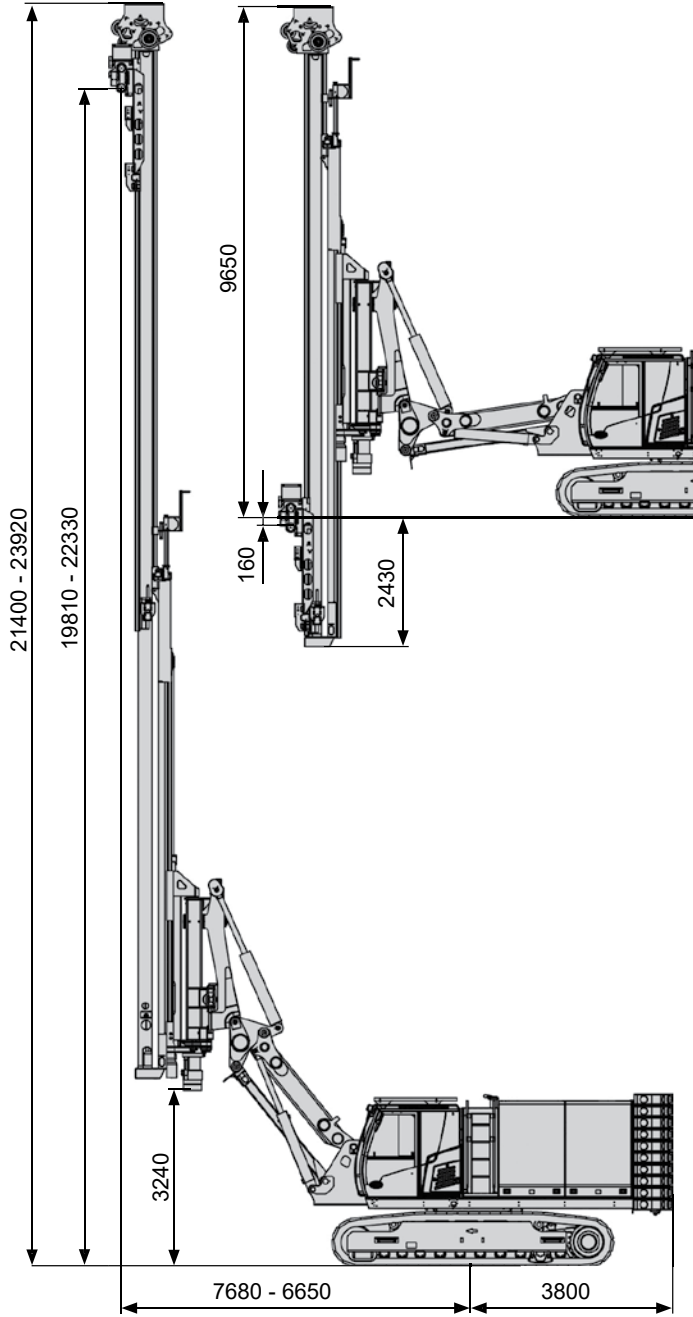
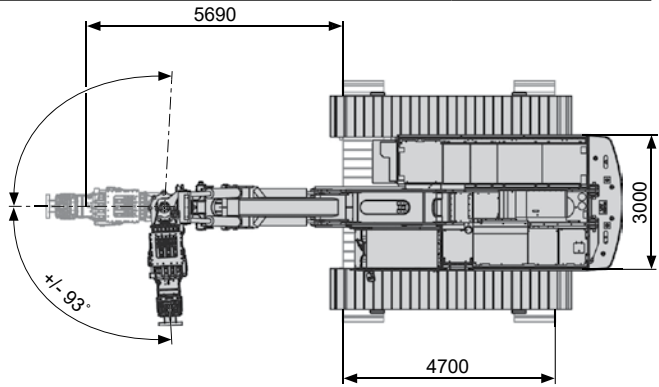
ABI TM 20 LONG REACH RIG

| Base Carrier | SR35 F (HD) |
|------------------|-------------|
| Engine Type | CAT C18 |
| Engine Power | 470 kW |
| Operating Weight | 84.5 tonnes |
| Transport Weight | 79.1 tonnes |

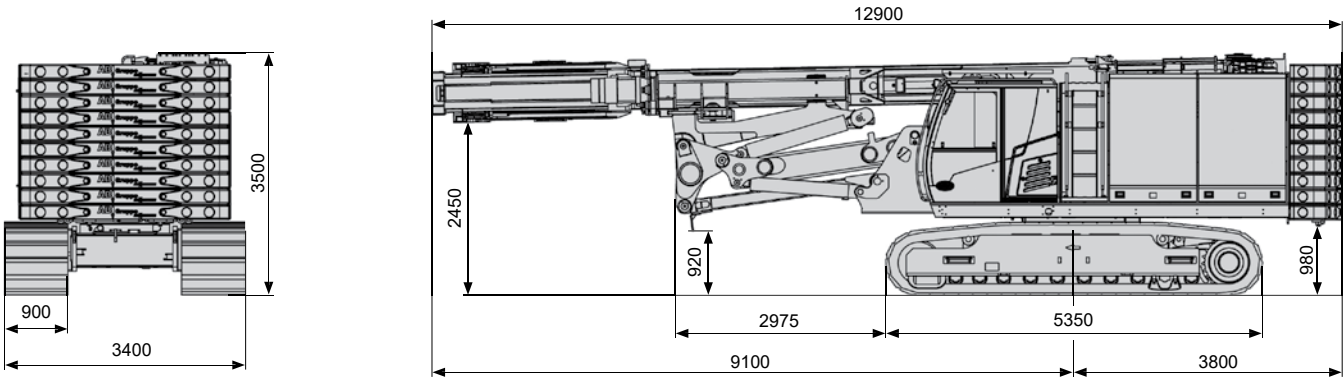
| Telescopic Leader Mast | TM 20 |
|------------------------|---------|
| Total Height | 23.92 m |
| Maximum Pile Length | 20.0 m |
| Crowd Force | 180 kN |
| Extraction Force | 180 kN |

| Vibro Hammer | MRZV 30VV |
|-------------------|-------------|
| Static Moment | 0-30 kgm |
| Docking System | D6 |
| Frequency | 2140/minute |
| Centrifugal Force | 1500 kN |
| Weight | 5390 kg |

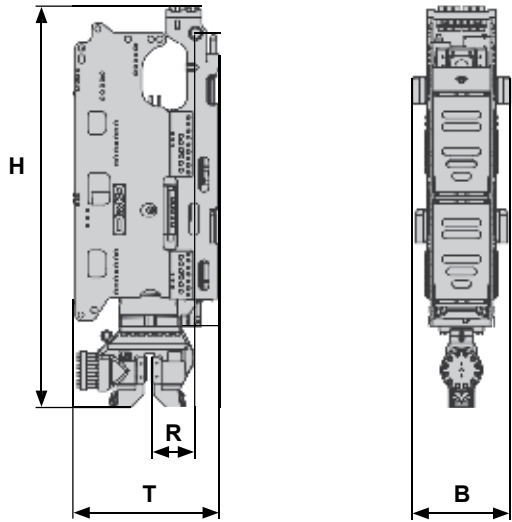
| Augering | |
|-------------|------------|
| Auger Model | MDBA 7000 |
| Torque | 7.0 tonnes |



DIMENSIONS: TRANSPORTATION



VIBROHAMMER: MRZV 30VV with D6 Docking Station



| Vibro Hammer | MRZV 30VV |
|---------------------------|-----------|
| (H) Length | 3405 mm |
| (B) Width | 790 mm |
| (T) Depth | 1465 mm |
| (R) Guide to Driving Axle | 360 mm |

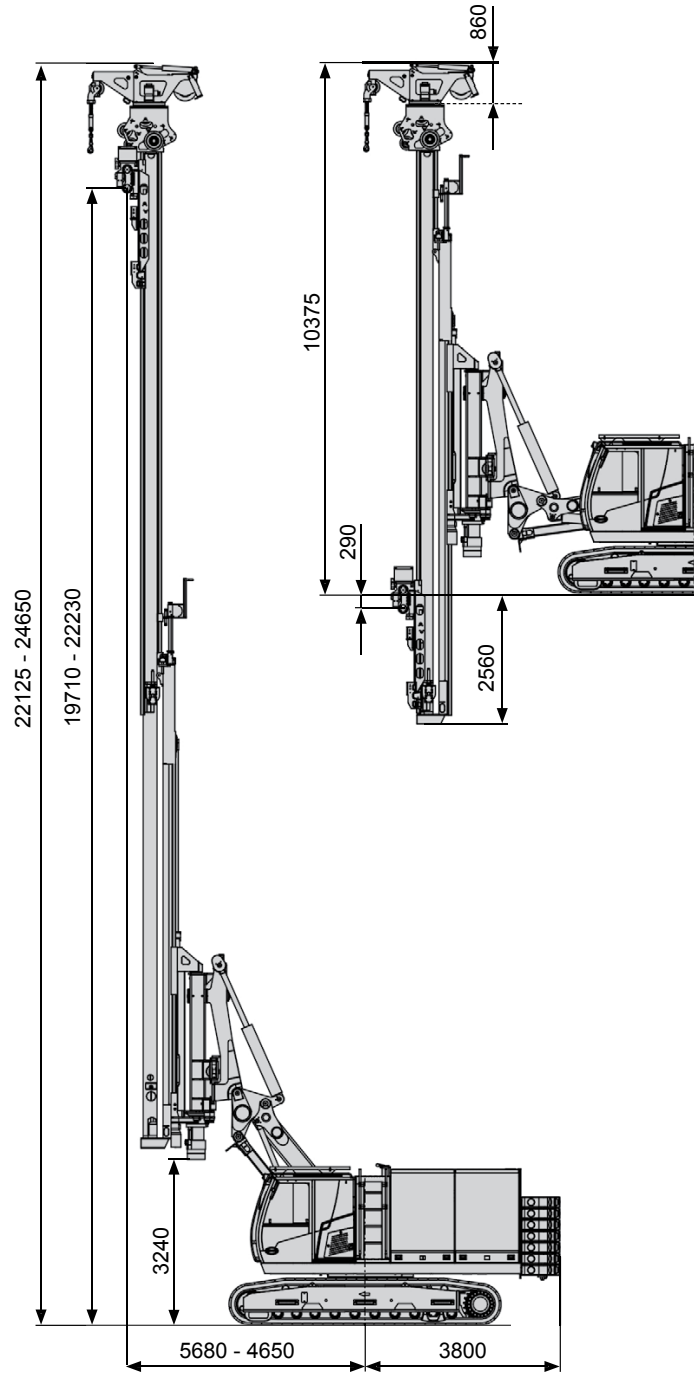
ABI TM 20 LEADER RIG

| Base Carrier | SR35 F |
|------------------|-------------|
| Engine Type | CAT C18 |
| Engine Power | 470 kW |
| Operating Weight | 69.6 tonnes |
| Transport Weight | 64.8 tonnes |

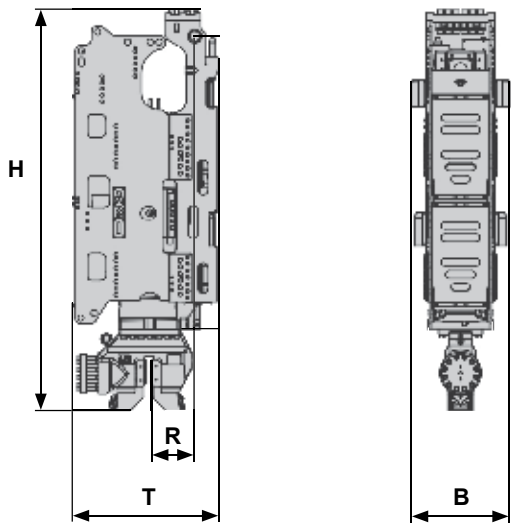
| Telescopic Leader Mast | TM 20 |
|------------------------|---------|
| Total Height | 24.65 m |
| Maximum Pile Length | 20.0 m |
| Crowd Force | 200 kN |
| Extraction Force | 235 kN |

| Vibro Hammer | MRZV 30VV |
|-------------------|-------------|
| Static Moment | 0-30 kgm |
| Docking System | D6 |
| Frequency | 2140/minute |
| Centrifugal Force | 1500 kN |
| Weight | 5390 kg |

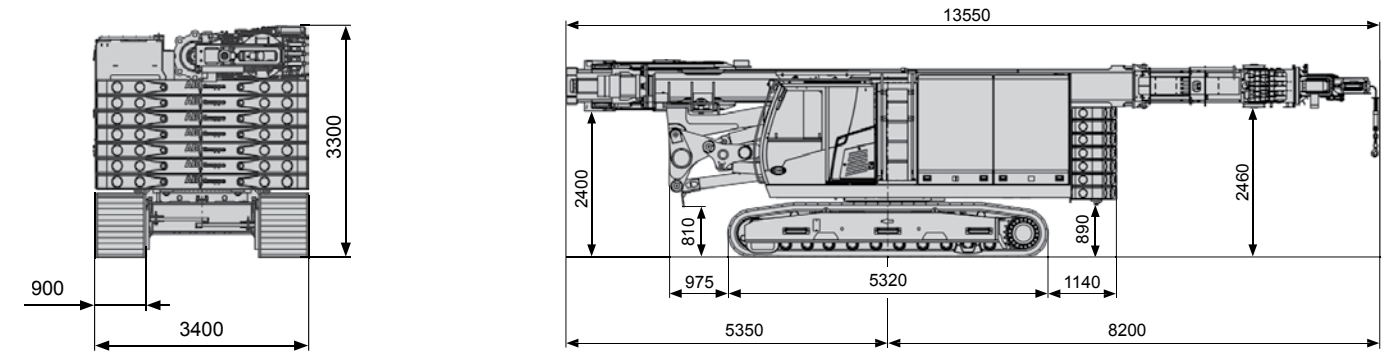
| Augering | |
|-------------|------------|
| Auger Model | MDBA 7000 |
| Torque | 7.0 tonnes |



VIBROHAMMER: MRZV 30VV with D6 Docking Station



DIMENSIONS: TRANSPORTATION



| Vibro Hammer | MRZV 30VV |
|---------------------------|-----------|
| (H) Length | 3405 mm |
| (B) Width | 790 mm |
| (T) Depth | 1465 mm |
| (R) Guide to Driving Axle | 360 mm |

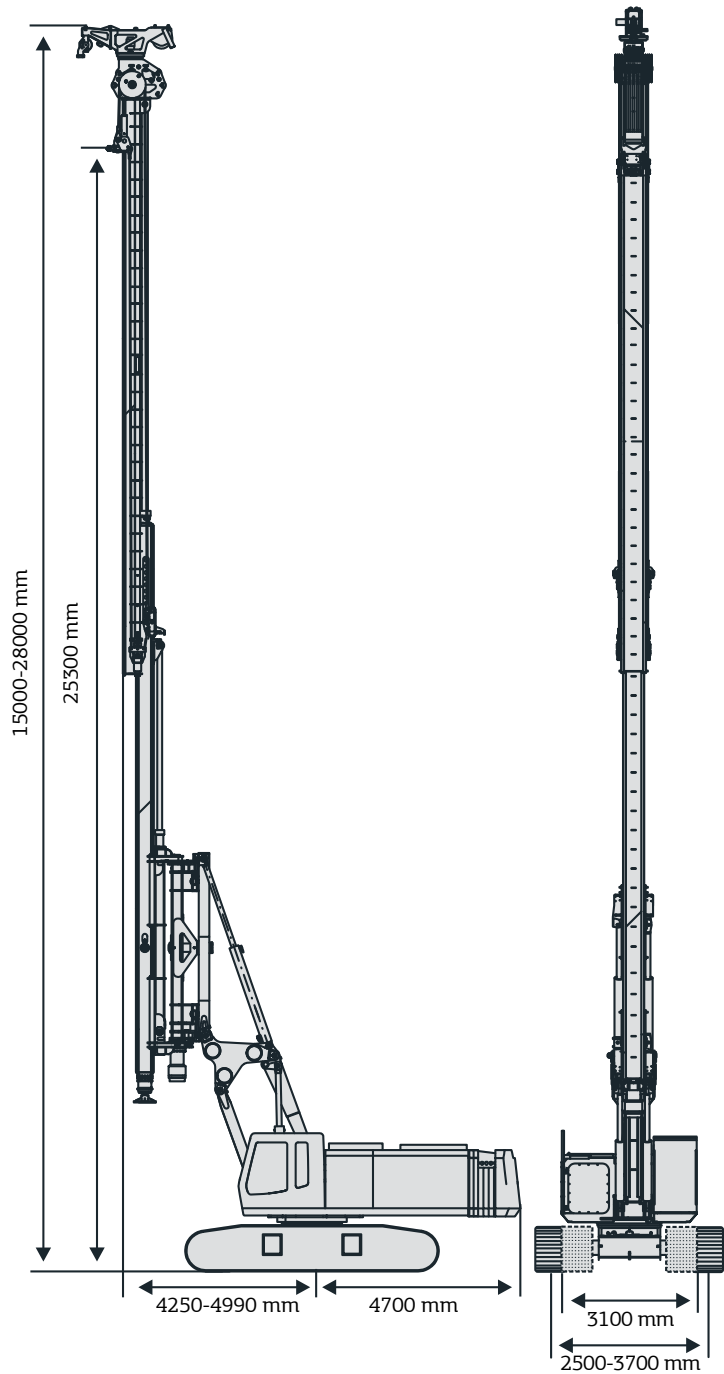
ABI TM 18/22 HD LEADER RIG

| Base Carrier | SR 50 T |
|------------------|-----------|
| Engine Type | CAT C18 |
| Engine Power | 570 kW |
| Operating Weight | 75 tonnes |
| Transport Weight | 70 tonnes |

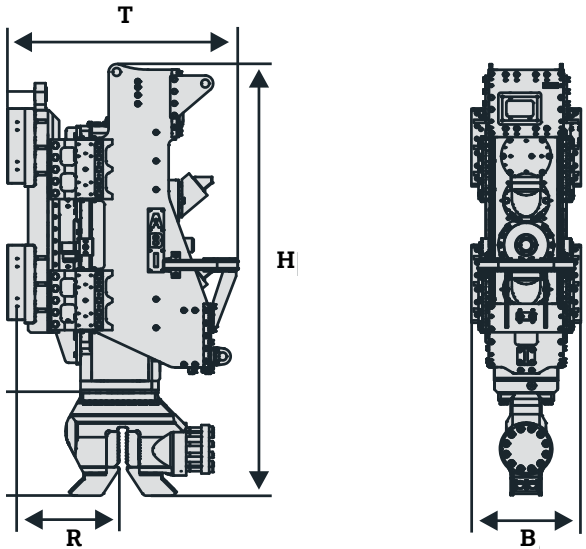
| Telescopic Leader Mast | TM 18/22 HD |
|------------------------|-------------|
| Total Height | 28.00 m |
| Maximum Pile Length | 22.0 m |
| Crowd Force | 120 kN |
| Extraction Force | 200 kN |

| Vibro Hammer | MRZV 30V |
|-------------------|-------------|
| Static Moment | 0-30 kgm |
| Amplitude | 15.5 mm |
| Frequency | 2135/minute |
| Centrifugal Force | 1500 kN |
| Weight | 5350 kg |

| Augering | |
|-------------|-----------|
| Auger Model | MDBA 7000 |
| Torque | 7 tonnes |



VIBROHAMMER: MRZV 30V



| Vibro Hammer | MRZV 30V |
|---------------------------|----------|
| (H) Length | 3220 mm |
| (B) Width | 690 mm |
| (T) Depth | 1525 mm |
| (R) Guide to Driving Axle | 650 mm |

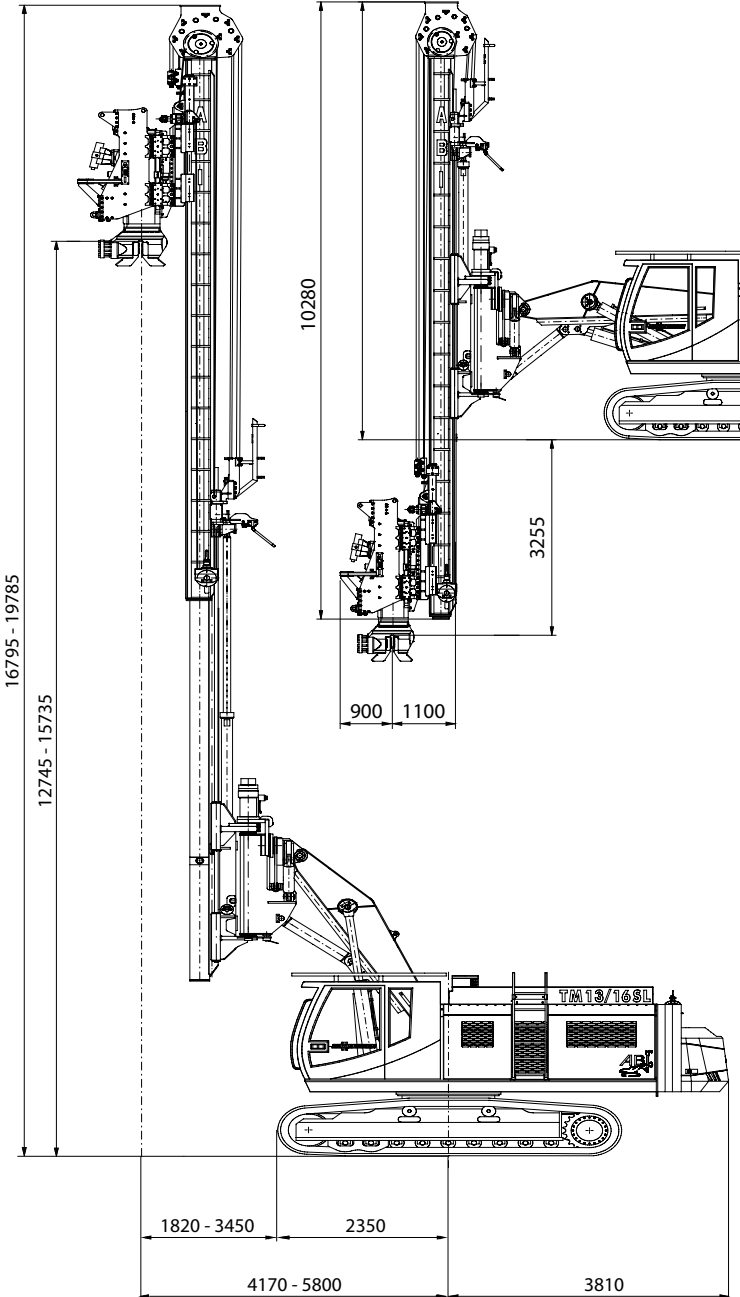
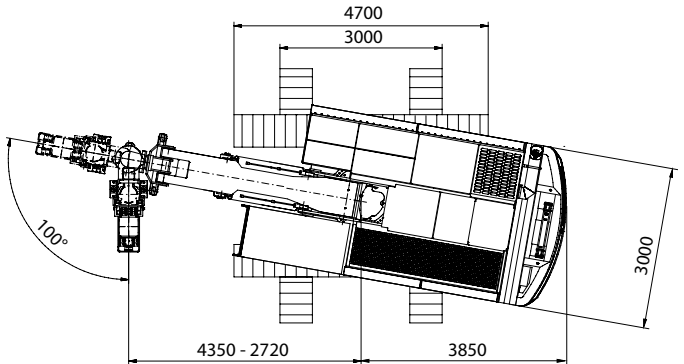
ABI TM 13/16 SL LEADER RIG

| Base Carrier | SR35 T-E |
|------------------|-----------|
| Engine Type | CAT C15 |
| Engine Power | 433 kW |
| Operating Weight | 50 tonnes |
| Transport Weight | 45 tonnes |

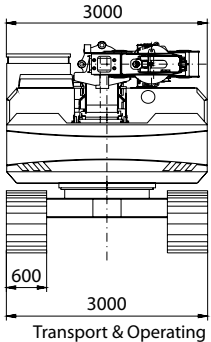
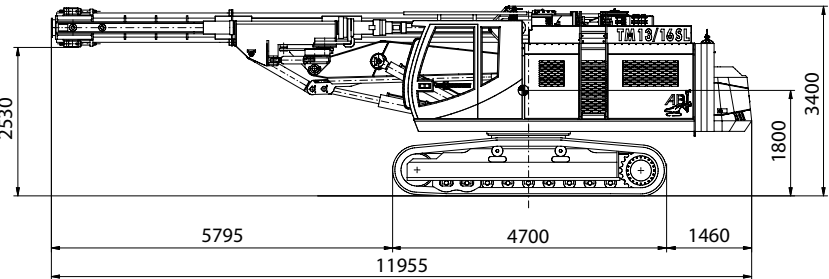
| Telescopic Leader Mast | TM 13/16 SL |
|------------------------|-------------|
| Total Height | 19.8 m |
| Maximum Pile Length | 16 m |
| Crowd Force | 90 kN |
| Extraction Force | 175 kN |

| Vibro Hammer | MRZV 25VV |
|-------------------|-------------|
| Static Moment | 0-25 kgm |
| Amplitude | 18.0 mm |
| Frequency | 1910/minute |
| Centrifugal Force | 1350 kN |
| Weight with Clamp | 4170 kg |

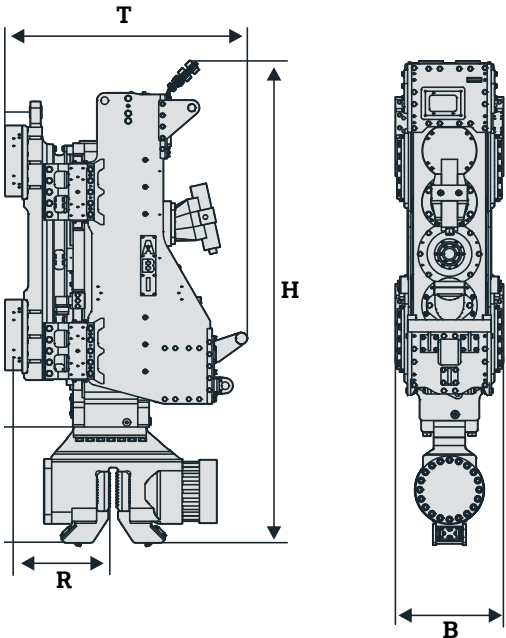
| Augering | |
|-------------|-----------|
| Auger Model | MBDA 4000 |
| Torque | 4 tonnes |



DIMENSIONS: TRANSPORTATION



VIBROHAMMER: MRZV 25VV



| Vibro Hammer | MRZV 25VV |
|---------------------------|-----------|
| (H) Length | 3085 mm |
| (B) Width | 690 mm |
| (T) Depth | 1345 mm |
| (R) Guide to Driving Axle | 650 mm |

ABI TM 12/15 LONG REACH

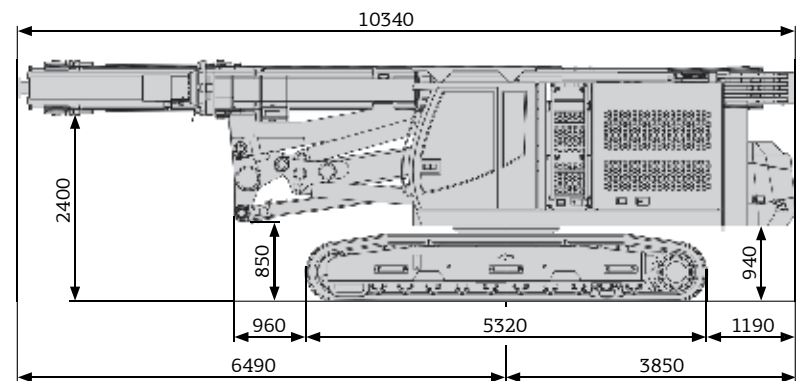
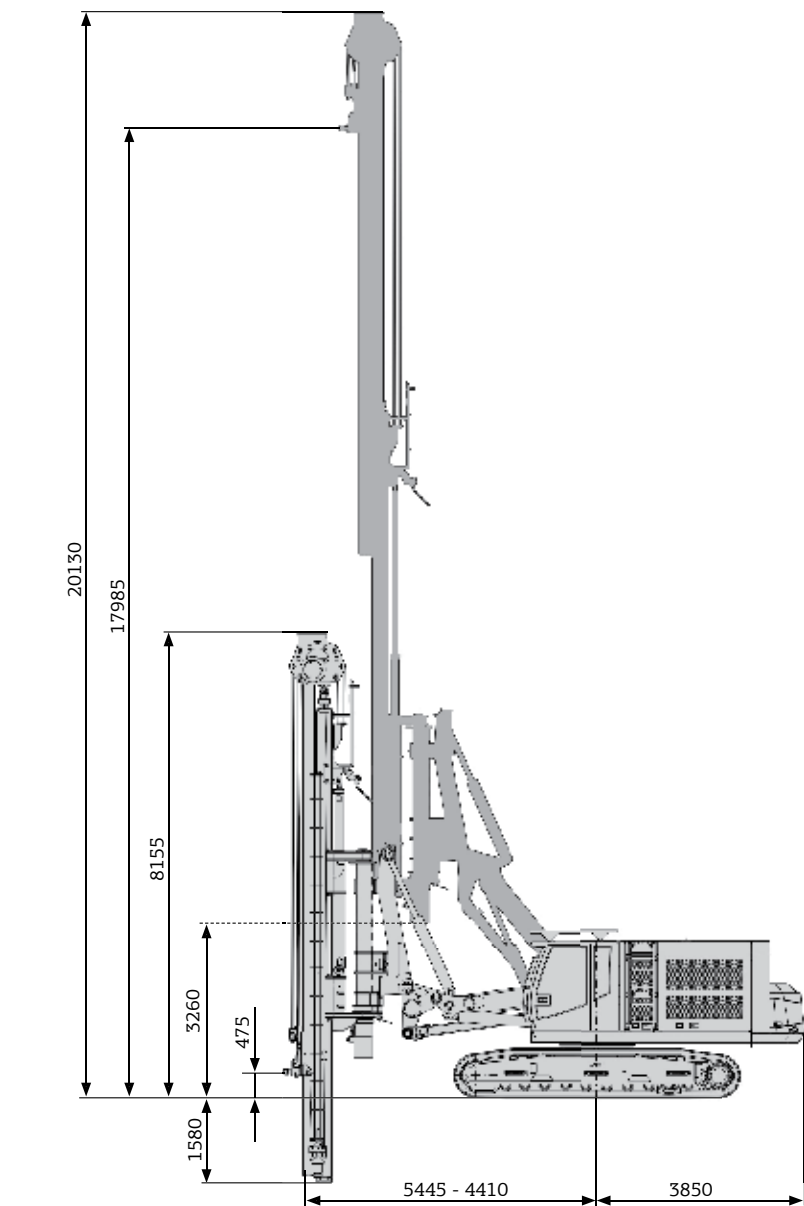
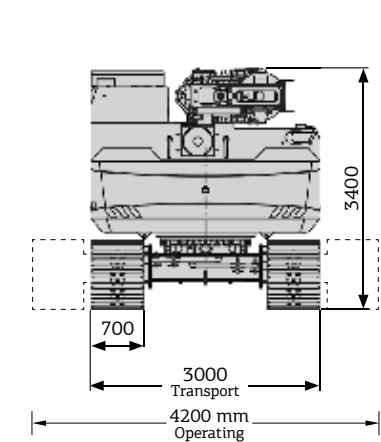
ABI TM 12/15 - STANDARD REACH CONFIGURATION

| Base Carrier | | SR 30 T-E |
|------------------|--|------------|
| Engine Type | | Scania DC9 |
| Engine Power | | 294 kW |
| Operating Weight | | 59 tonnes |
| Transport Weight | | 55 tonnes |

| Telescopic Leader Mast | | TM 12/15 |
|------------------------|--|----------|
| Total Height | | 20.1 m |
| Maximum Pile Length | | 15 m |
| Crowd Force | | 90 kN |
| Extraction Force | | 175 kN |

| Vibro Hammer | | MRZV 20VV |
|-------------------|--|-------------|
| Static Moment | | 0-20 kgm |
| Amplitude | | 16.0 mm |
| Frequency | | 2135/minute |
| Centrifugal Force | | 1200 kN |
| Weight with Clamp | | 4220 kg |

| Augering | | |
|-------------|--|-----------|
| Auger Model | | MBDA 4000 |
| Torque | | 4 tonnes |



LEADER RIG

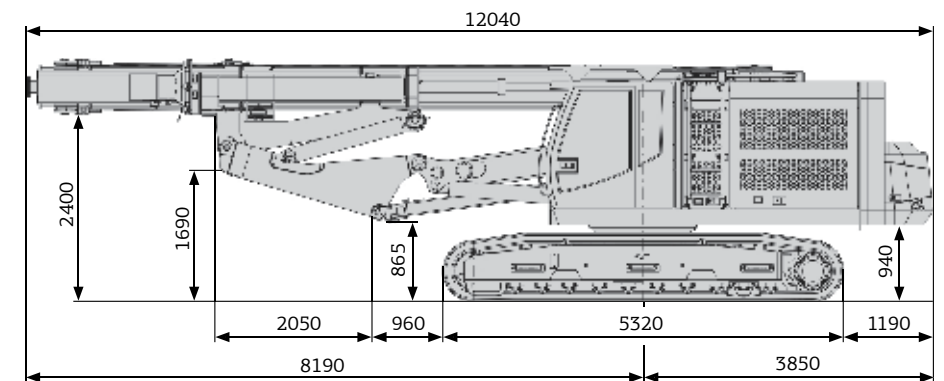
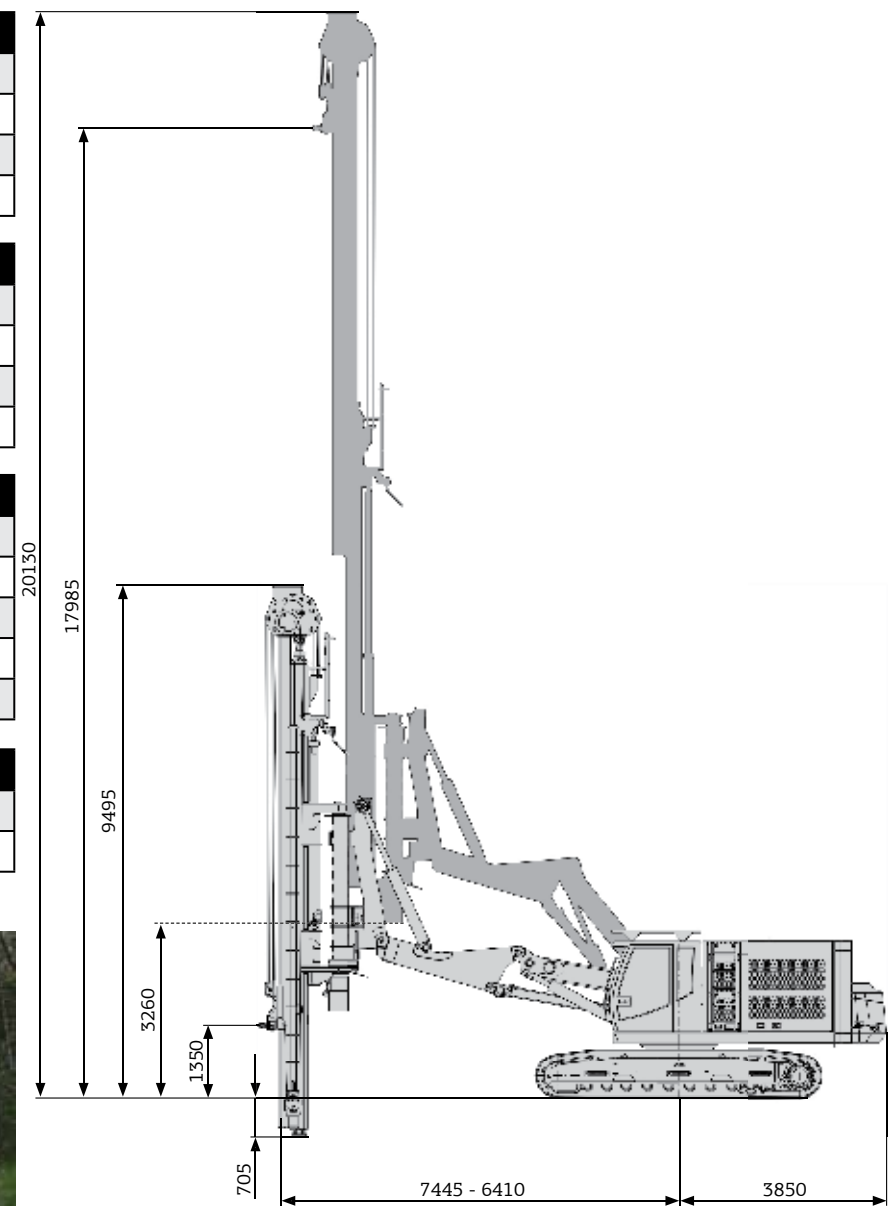
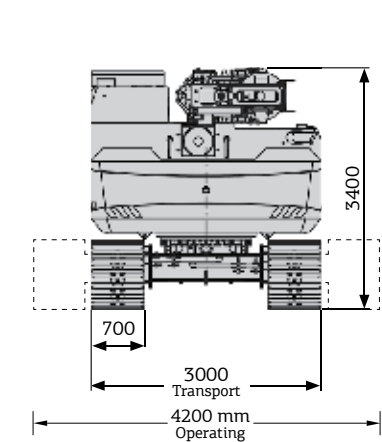
ABI TM 12/15 - LONG REACH CONFIGURATION

| Base Carrier | | SR 30 T-E |
|------------------|--|------------|
| Engine Type | | Scania DC9 |
| Engine Power | | 294 kW |
| Operating Weight | | 61 tonnes |
| Transport Weight | | 57 tonnes |

| Telescopic Leader Mast | | TM 12/15 |
|------------------------|--|----------|
| Total Height | | 20.1 m |
| Maximum Pile Length | | 15 m |
| Crowd Force | | 90 kN |
| Extraction Force | | 100 kN |

| Vibro Hammer | | MRZV 20VV |
|-------------------|--|-------------|
| Static Moment | | 0-20 kgm |
| Amplitude | | 16.0 mm |
| Frequency | | 2135/minute |
| Centrifugal Force | | 1200 kN |
| Weight with Clamp | | 4220 kg |

| Augering | | |
|-------------|--|-----------|
| Auger Model | | MBDA 4000 |
| Torque | | 4 tonnes |



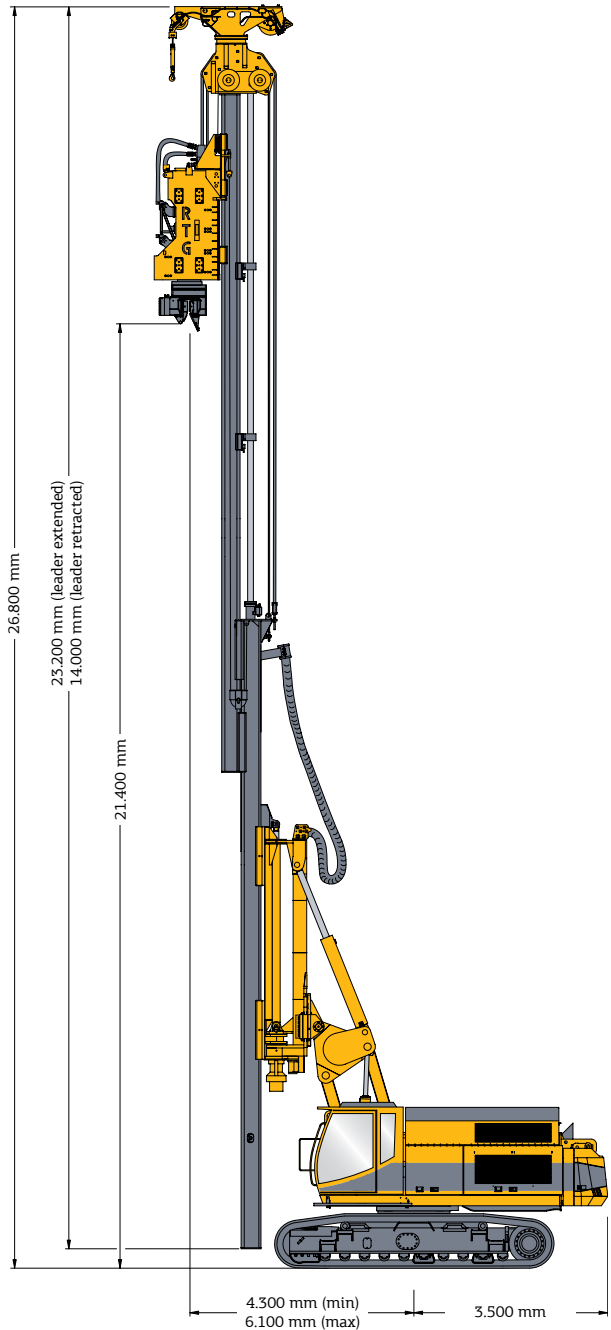
BAUER RTG 21 LEADER RIG

| Base Carrier | | BS 60-RS |
|------------------|--|-----------|
| Engine Type | | CAT C18 |
| Engine Power | | 570 kW |
| Operating Weight | | 78 tonnes |
| Transport Weight | | 73 tonnes |

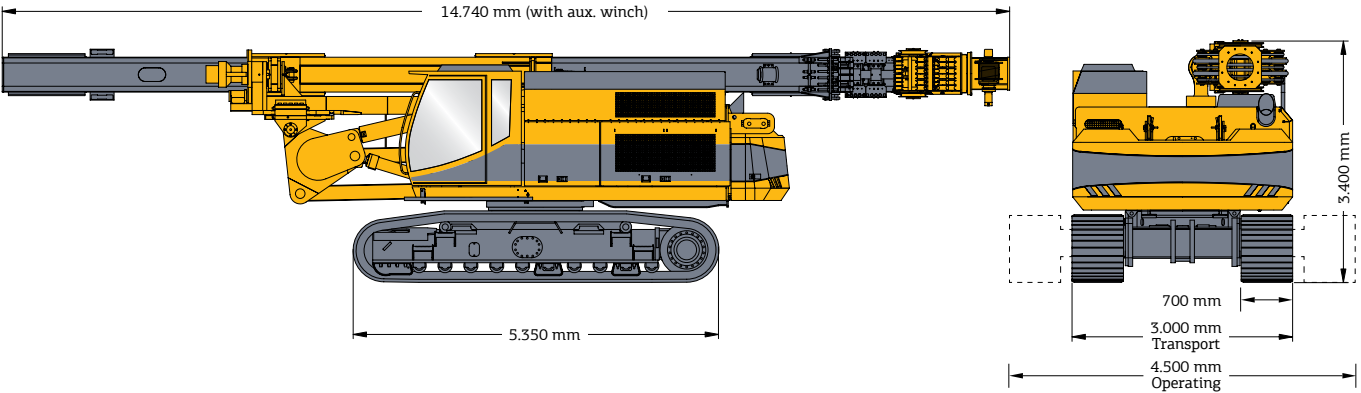
| Telescopic Leader Mast | | RTG 21 |
|------------------------|--|--------|
| Total Height | | 26.8 m |
| Maximum Pile Length | | 21 m |
| Crowd Force | | 140 kN |
| Extraction Force | | 260 kN |

| Vibro Hammer | | MR 150V |
|-------------------|--|-------------|
| Static Moment | | 0-28.4 kgm |
| Amplitude | | 18.0 mm |
| Frequency | | 2200/minute |
| Centrifugal Force | | 1500 kN |
| Weight | | 6000 kg |

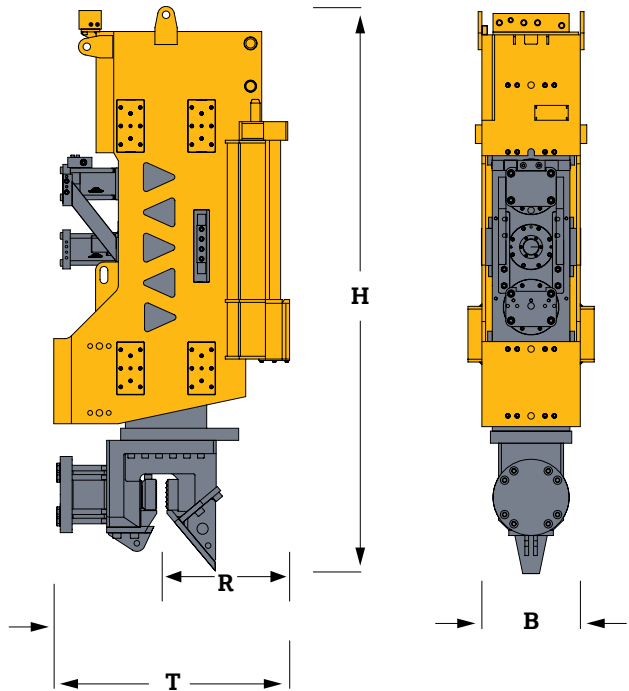
| Augering | | |
|-------------|--|----------|
| Auger Model | | BK60 |
| Torque | | 6 tonnes |



DIMENSIONS: TRANSPORTATION



VIBROHAMMER: MR 150V



| Vibro Hammer | MR 150V |
|--------------------------|---------|
| (H) Length | 3200 mm |
| (B) Width | 530 mm |
| (T) Depth | 1400 mm |
| (R) Distance to the Wall | 670 mm |

KOBELCO SK350 LC EXCAVATOR RIG

| Base Machine | SK350 LC |
|------------------|------------------|
| Engine Type | HINO J08EYD-KSSA |
| Engine Power | 213 kW |
| Fuel Tank | 503 litres |
| Hydraulic Tank | 410 litres |
| Undercarriage | Fixed |
| Operating Weight | 36.6 tonnes |

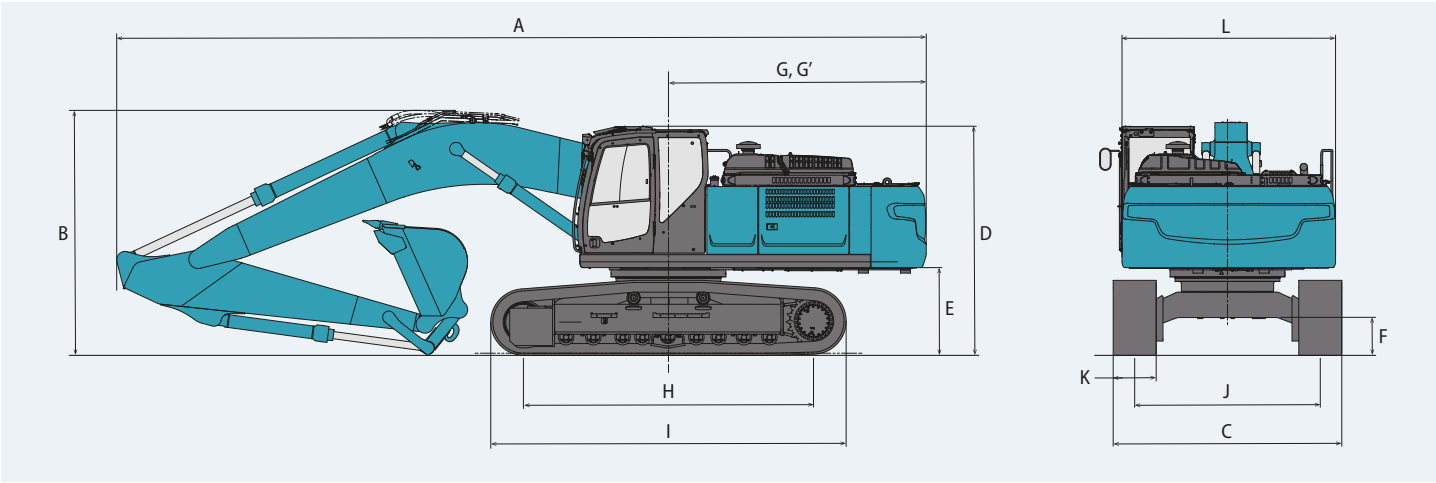
| Vibro Hammer | Movax SG75 |
|-------------------|------------------|
| Static Moment | 7.6 kgm |
| Frequency | 2300-3000/minute |
| Centrifugal Force | 750 kN |
| Weight | 3330-3620 kg |

| DIMENSIONS: KOBELCO SK350 LC EXCAVATOR | | |
|--|---|-------|
| A | Overall length | 11300 |
| B | Overall height (to top of boom) | 3420 |
| C | Overall width | 3190 |
| D | Overall height (to top of cab) | 3200 |
| E | Ground clearance of rear end* | 1190 |
| F | Ground clearance* | 485 |
| G | Tail swing radius | 3600 |
| G' | Distance from centre of swing to rear end | 3600 |
| H | Tumbler distance | 4050 |
| I | Overall length of crawler | 4960 |
| J | Track gauge | 2590 |
| K | Shoe width | 600 |
| L | Overall width of upperstructure | 2980 |

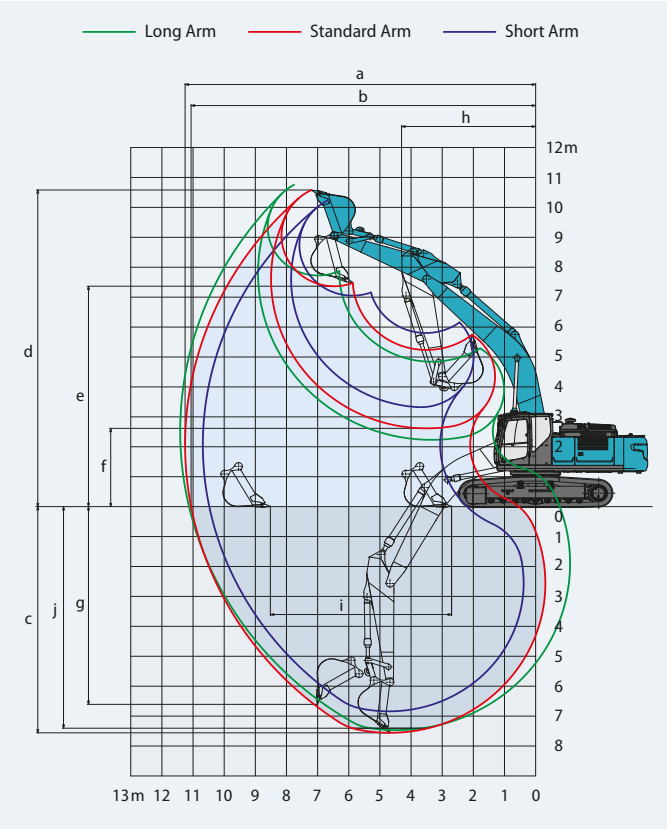
*Without including height of shoe



With SG-75 Vibratory Hammer Attachment



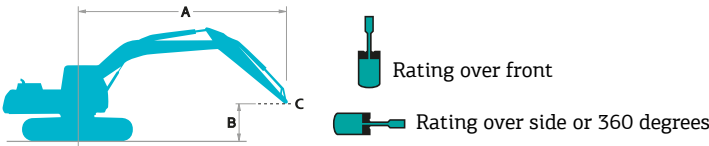
WORKING RANGE: BOOM REACH AND RADIUS/OVER HANG

















| WORKING RANGES | | | |
|-------------------------------|---|----|-------|
| A | Maximum digging reach | mm | 11260 |
| B | Maximum digging reach (ground level) | mm | 11060 |
| C | Maximum digging depth | mm | 7560 |
| D | Maximum digging height | mm | 10580 |
| E | Maximum dumping clearance | mm | 7370 |
| F | Minimum dumping clearance | mm | 2620 |
| G | Maximum vertical wall digging depth | mm | 6110 |
| H | Minimum swing radius | mm | 4310 |
| I | Horizontal digging stroke at ground level | mm | 5820 |
| J | Digging depth for 2.4 m (8') flat bottom | mm | 7400 |
| Bucket capacity ISO heaped m³ | | mm | 1400 |

LIFTING CAPACITIES:

A - Reach from swing centerline to arm top
B - Arm top height above/below ground
C - Lift point
Relief valve setting: 37.8 MPa {585 kgf/cm²}



| SK350 LC Boom: 6.50m Arm: 3.30m Bucket: without Shoe: 600mm (Heavy Lift) | | | | | | | | | | | | | | | | |
|--|----|---|---|---|---|---|---|---|---|---|---|---|---|---|---|--------|
| B | A | 1.5m | | 3.0m | | 4.5m | | 6.0m | | 7.5m | | 9.0m | | At Max. Reach | | Radius |
| | |  |  |  |  |  |  |  |  |  |  |  |  |  |  | |
| 9.0m | kg | | | | | | | | | | | | | *6,370 | *6,370 | 6.56 m |
| 7.5m | kg | | | | | | | | | *7,810 | *7,810 | | | *5,840 | *5,840 | 7.86 m |
| 6.0m | kg | | | | | | | | | *7,930 | *7,930 | | | *5,640 | *5,640 | 8.71 m |
| 4.5m | kg | | | | | | | *9,720 | *9,720 | *8,490 | 7,700 | *7,850 | 5,750 | *5,650 | 5,480 | 9.25 m |
| 3.0m | kg | | | | | *15,090 | *15,090 | *11,160 | 10,160 | *9,230 | 7,360 | *8,160 | 5,600 | *5,830 | 5,110 | 9.25 m |
| 1.5m | kg | | | | | *17,300 | 14,250 | *12,430 | 9,580 | *9,940 | 7,040 | 8,400 | 5,430 | *6,200 | 4,980 | 9.54 m |
| G.L. | kg | | | | | *18,060 | 13,770 | *13,170 | 9,200 | *10,400 | 6,810 | 8,270 | 5,320 | *6,830 | 5,070 | 9.33 m |
| -1.5m | kg | | | *15,390 | *15,390 | *17,700 | 13,670 | *13,230 | 9,040 | *10,420 | 6,700 | | | *7,890 | 5,410 | 8.85 m |
| -3.0m | kg | *17,520 | *17,520 | *22,280 | *22,280 | *16,380 | 13,810 | *12,490 | 9,080 | *9,690 | 6,750 | | | *8,640 | 6,160 | 8.07 m |
| -4.5m | kg | | | *18,200 | *18,200 | *13,800 | *13,800 | *10,490 | 9,330 | | | | | *8,540 | 7,810 | 6.88 m |

KOBELCO SK380 SRLC EXCAVATOR RIG

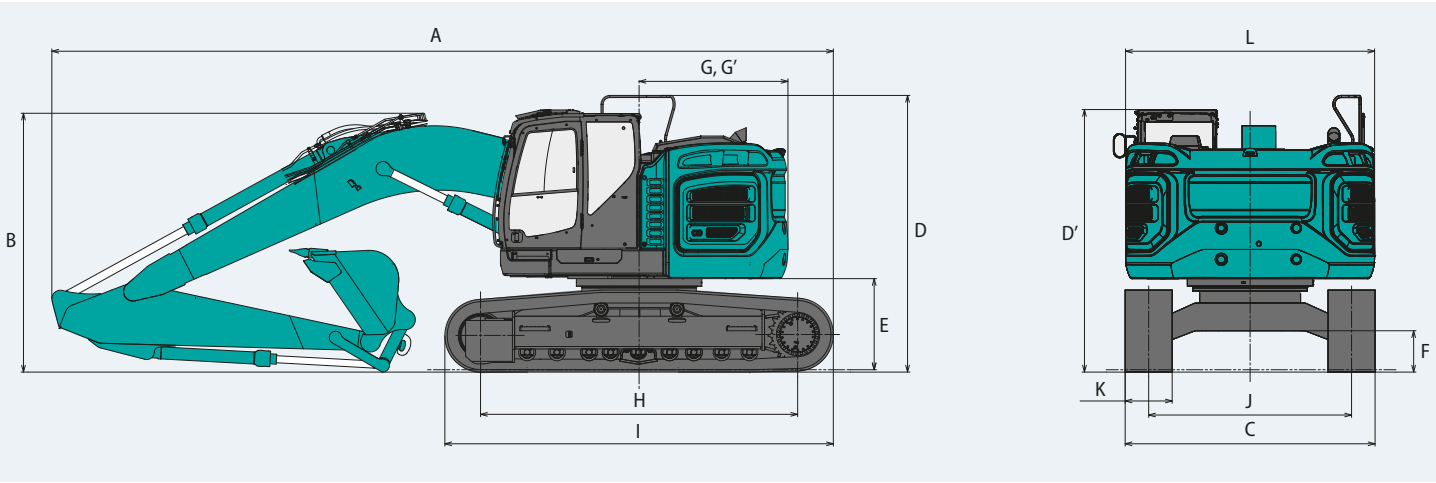
| Base Machine | SK380 SRLC |
|------------------|------------------|
| Engine Type | HINO J08EYD-KSDS |
| Engine Power | 200 kW |
| Fuel Tank | 350 litres |
| Hydraulic Tank | 440 litres |
| Undercarriage | Fixed |
| Operating Weight | 36.5 tonnes |

| Vibro Hammer | Movax SG60 |
|----------------------|-------------|
| Static Moment | 6.1 kgm |
| Frequency | 2600/minute |
| Centrifugal Force | 600 kN |
| Weight without Clamp | 2600 kg |

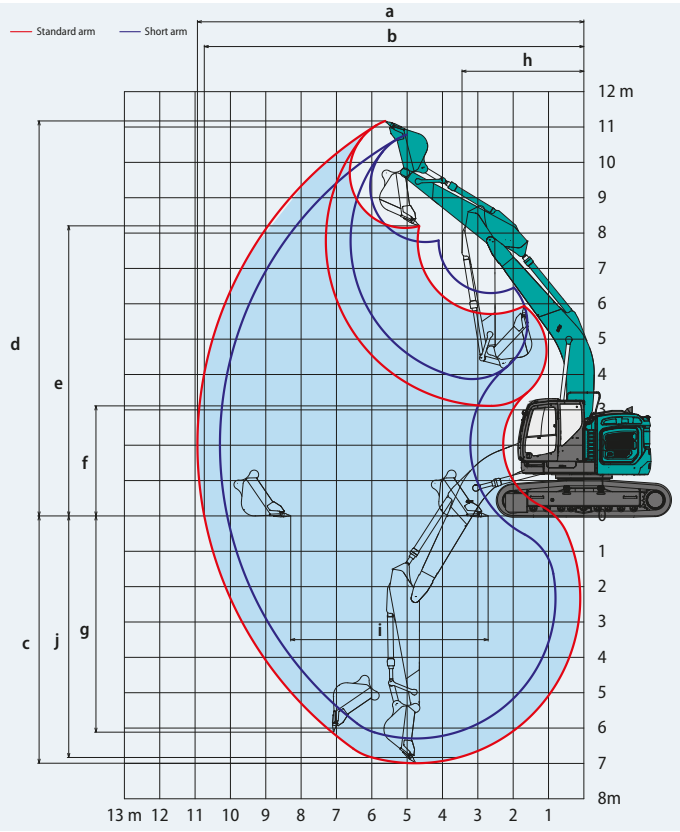
| DIMENSIONS: KOBELCO SK380 SRLC EXCAVATOR | | |
|--|---|------|
| A | Overall length | 9470 |
| B | Overall height (to top of boom) | 3100 |
| C | Overall width | 3190 |
| D | Overall height (to top of handrail) | 3530 |
| D' | Overall height (to top of cab) | 3360 |
| E | Ground clearance of rear end* | 1160 |
| F | Ground clearance* | 485 |
| G | Tail swing radius | 1900 |
| G' | Distance from centre of swing to rear end | 1900 |
| H | Tumbler distance | 4050 |
| I | Overall length of crawler | 4960 |
| J | Track gauge | 2590 |
| K | Shoe width | 600 |
| L | Overall width of upperstructure | 3180 |



With SG-60 Vibratory Hammer Attachment



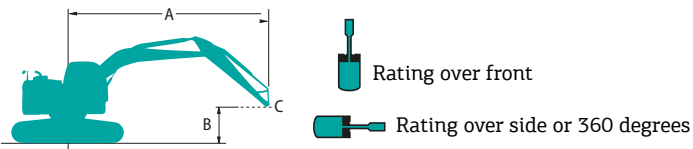
WORKING RANGE: BOOM REACH AND RADIUS/OVER HANG












| WORKING RANGES | | | |
|----------------|---|----|-------|
| A | Maximum digging reach | mm | 10930 |
| B | Maximum digging reach (ground level) | mm | 10740 |
| C | Maximum digging depth | mm | 6990 |
| D | Maximum digging height | mm | 11170 |
| E | Maximum dumping clearance | mm | 8150 |
| F | Minimum dumping clearance | mm | 3110 |
| G | Maximum vertical wall digging depth | mm | 6110 |
| H | Minimum swing radius | mm | 3450 |
| I | Horizontal digging stroke at ground level | mm | 5590 |
| J | Digging depth for 2.4 m (8') flat bottom | mm | 6830 |

LIFTING CAPACITIES:

A - Reach from swing centerline to arm top
B - Arm top height above/below ground
C - Lift point
Relief valve setting: 37.8 MPa {385 kgf/cm²}



| SK380SRLC Boom: 6.20m Arm: 2.40m Counterweight: 9,000kg Shoe: 600mm (Heavy Lift) | | | | | | | | | | | | |
|--|----|---|---|---|---|---|---|---|---|---|---|--------|
| A | | 3.0m | | 4.5m | | 6.0m | | 7.5m | | At Max. Reach | | Radius |
| | |  |  |  |  |  |  |  |  |  |  | |
| 9.0m | kg | | | | | | | | | *8,950 | *8,950 | 5.04 m |
| 7.5m | kg | | | | | *8,630 | *8,630 | | | *7,680 | 7,080 | 6.72 m |
| 6.0m | kg | | | *10,240 | *10,240 | *9,010 | 8,450 | *8,510 | 5,870 | *7,230 | 5,540 | 7.74 m |
| 4.5m | kg | | | *13,030 | 12,370 | *10,150 | 8,040 | *8,840 | 5,720 | *7,150 | 4,780 | 8.36 m |
| 3.0m | kg | | | | | *11,540 | 7,550 | 9,330 | 5,500 | *7,340 | 4,410 | 8.67 m |
| 1.5m | kg | | | | | *12,610 | 7,150 | 9,090 | 5,280 | 7,310 | 4,290 | 8.71 m |
| G.L. | kg | | | *15,460 | 10,410 | 12,440 | 6,940 | 8,940 | 5,150 | 7,530 | 4,390 | 8.47 m |
| -1.5m | kg | *11,100 | *11,100 | *16,530 | 10,460 | 12,390 | 6,890 | 8,920 | 5,130 | 8,260 | 4,790 | 7.94 m |
| -3.0m | kg | *18,730 | *18,730 | *14,550 | 10,650 | *11,150 | 7,010 | | | *8,880 | 5,720 | 7.03 m |
| -4.5m | kg | | | *10,840 | *10,840 | | | | | *8,260 | 8,180 | 5.58 m |

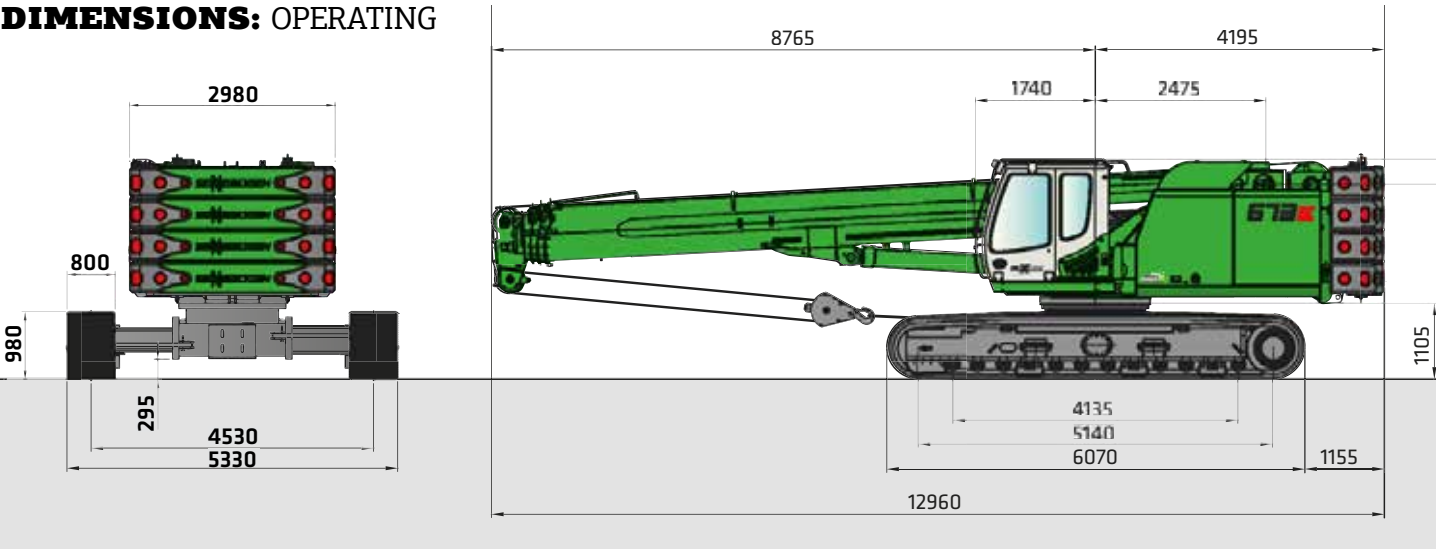
SENNEBOGEN 673R CRAWLER CRANE

| Machine Model | 673R |
|-------------------------|------------------|
| Engine Type | Deutz TCD 6.1 L6 |
| Engine Power | 160 kW |
| Emission Standards | Euro Stage 3a |
| Fuel Tank Capacity | 540 litres |
| Hydraulic Tank Capacity | 765 litres |
| Undercarriage | Telescopic |
| Operating Weight | 70 tonnes |

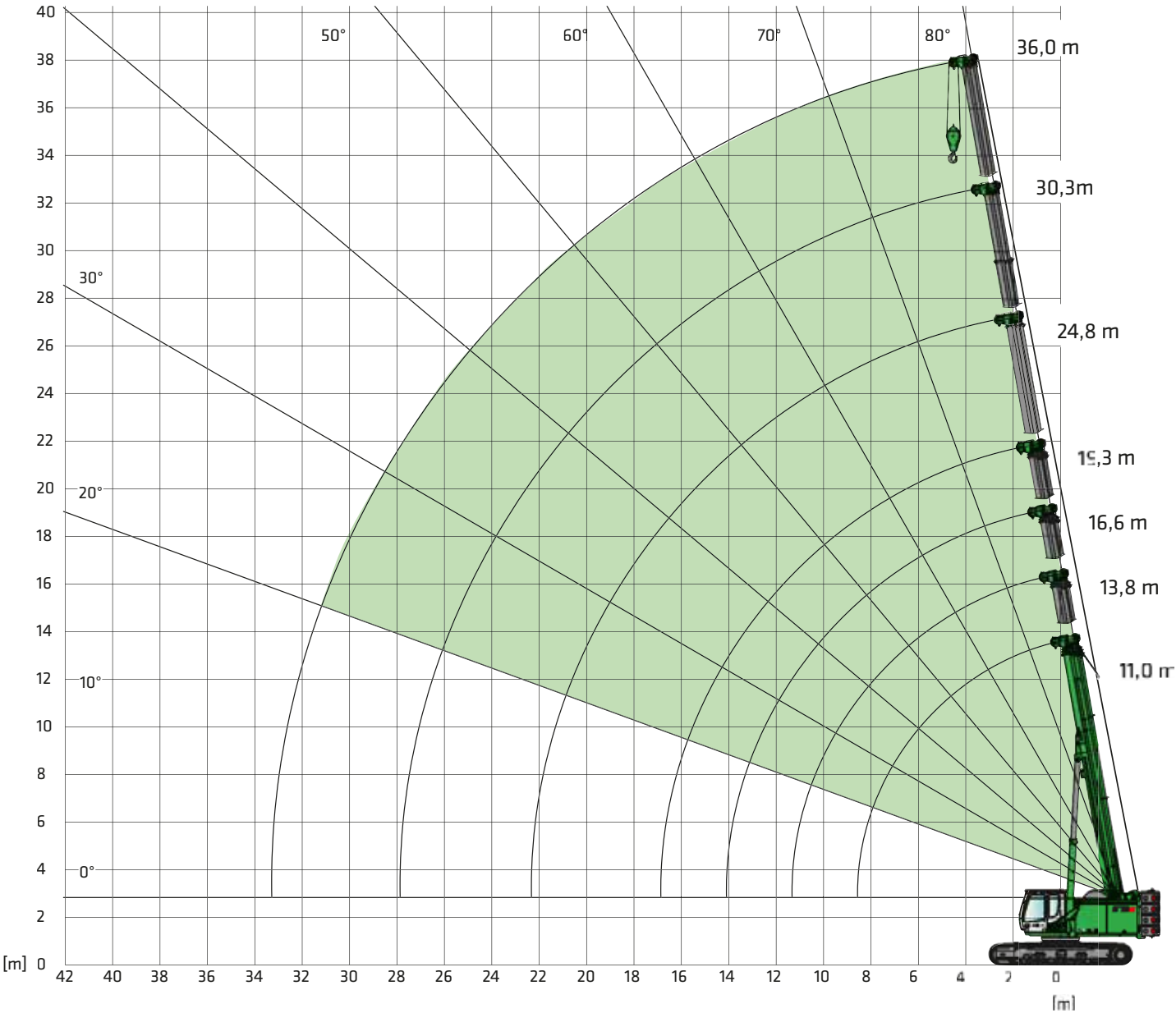
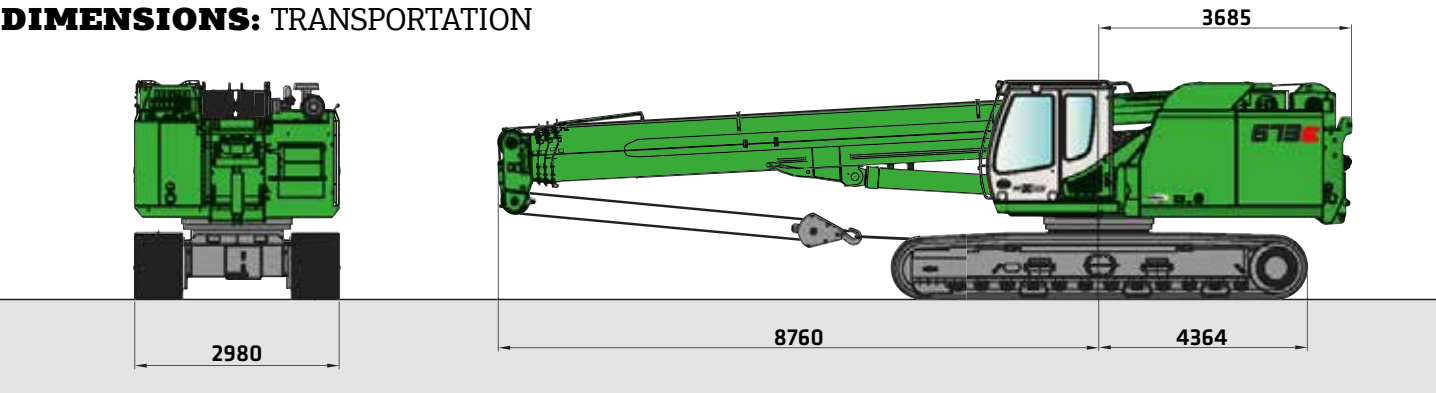


673R: 360° TELESCOPIC BOOM 36M

DIMENSIONS: OPERATING



DIMENSIONS: TRANSPORTATION



SENNEBOGEN 653E CRAWLER CRANE

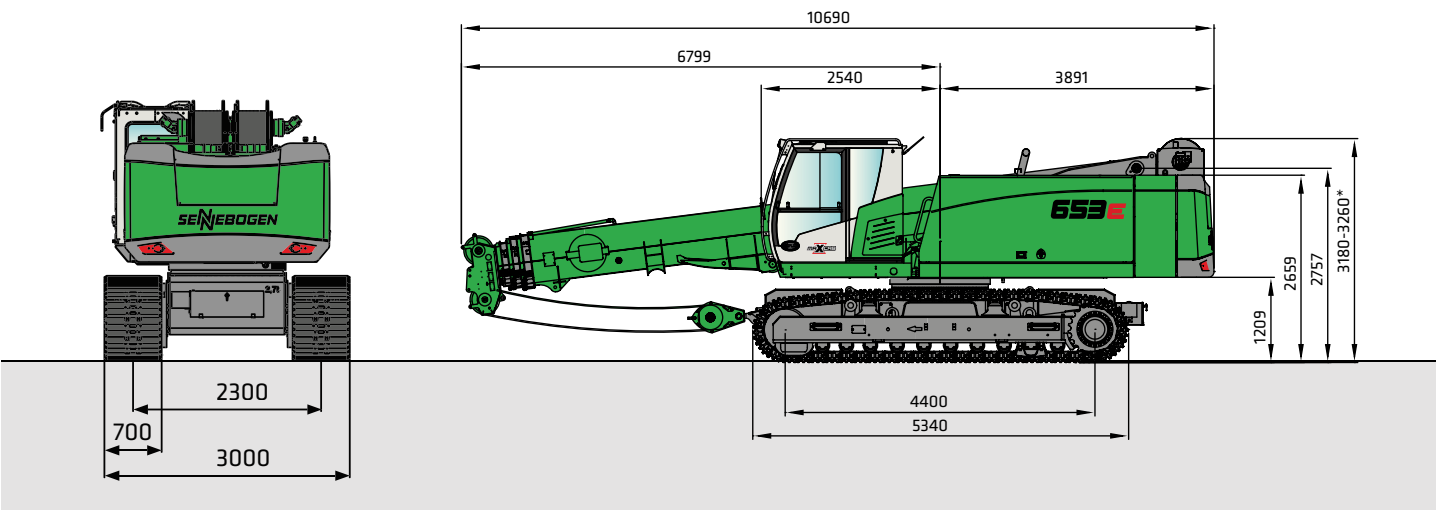
| Machine Model | 653E |
|-------------------------|-----------------|
| Engine Type | Cummins QSB 4.5 |
| Engine Power | 119 kW |
| Emission Standards | Euro Stage IV |
| Fuel Tank Capacity | 360 litres |
| Hydraulic Tank Capacity | 500 litres |
| Undercarriage | Telescopic |
| Operating Weight | 50.2 tonnes |



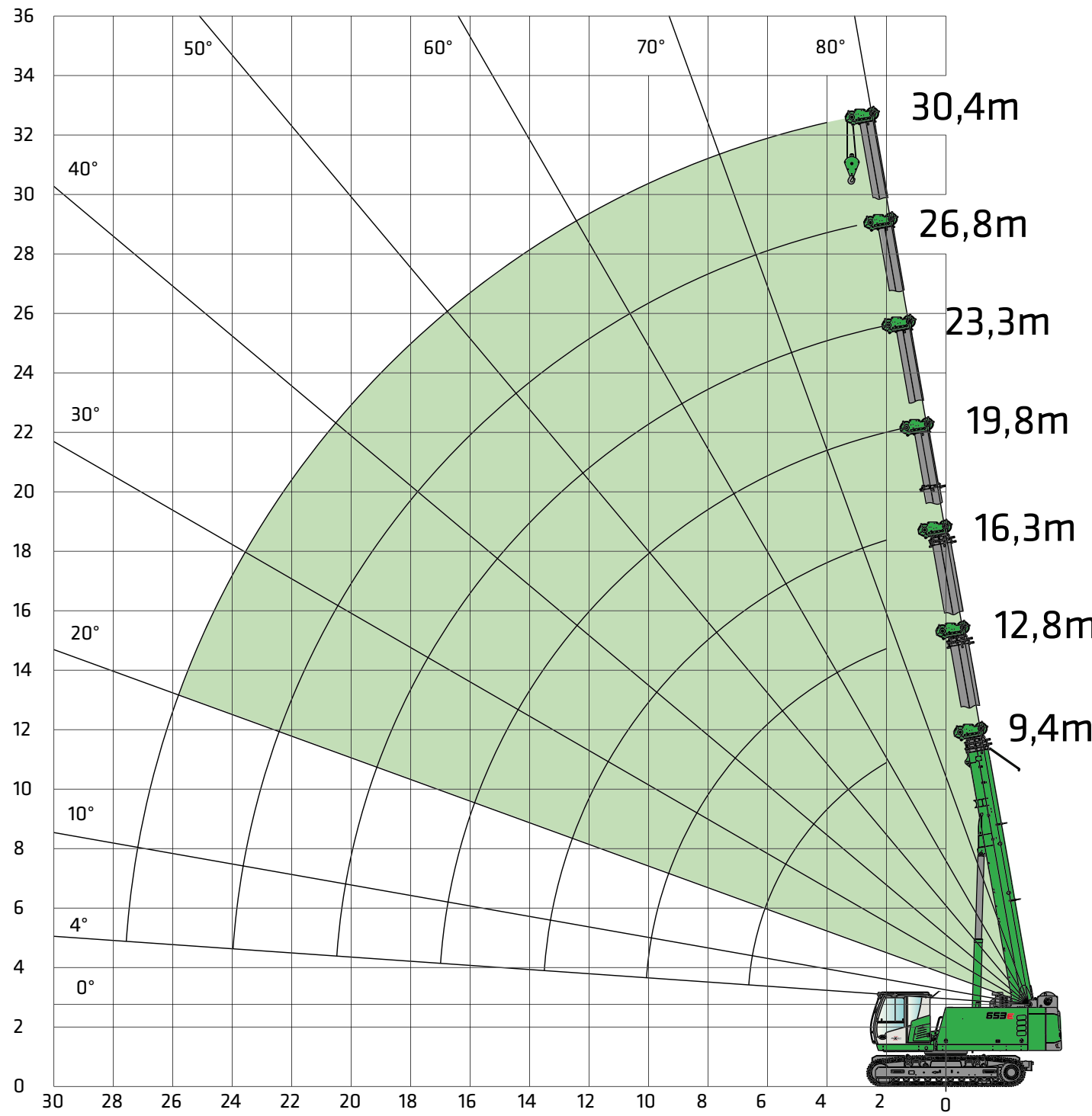
DIMENSIONS: OPERATING



DIMENSIONS: TRANSPORTATION



653E: 360° TELESCOPIC BOOM 30M

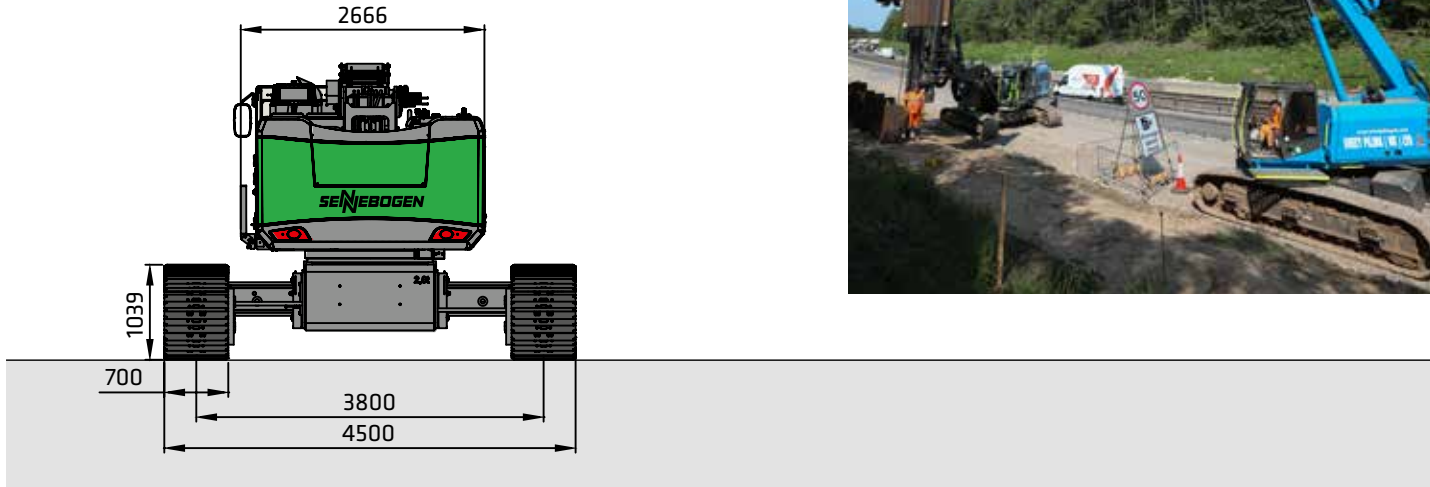


SENNEBOGEN 643R CRAWLER CRANE

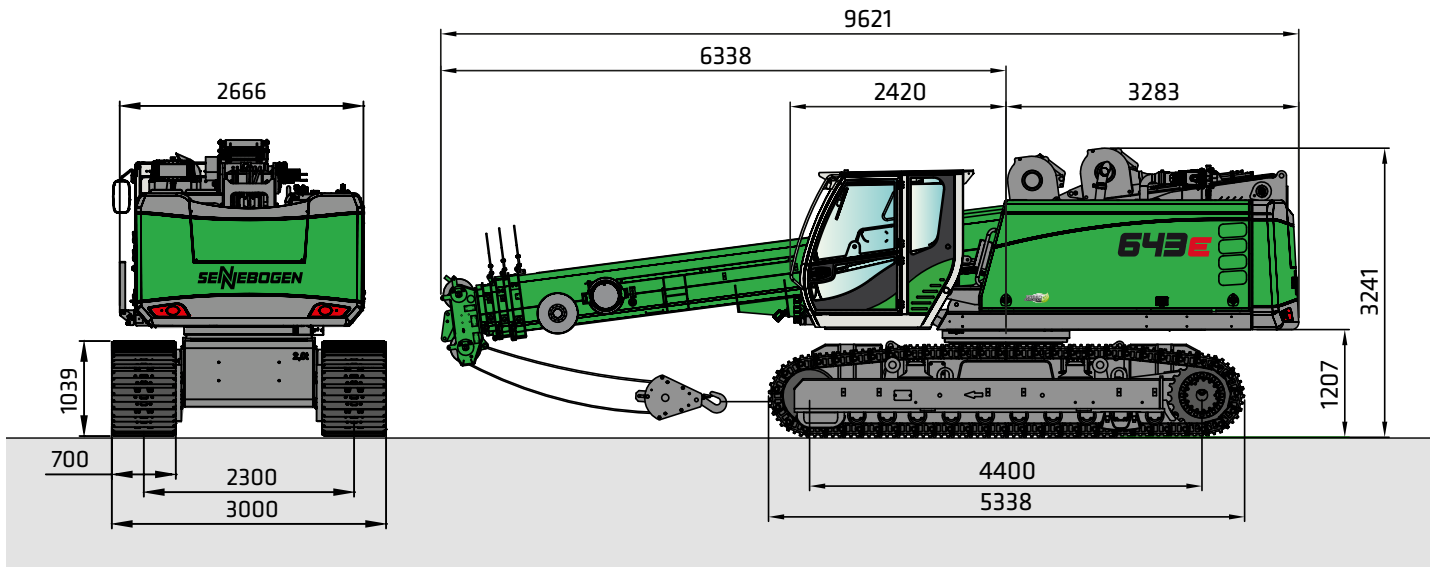
| Machine Model | 643R |
|-------------------------|-----------------|
| Engine Type | Cummins QSB 4.5 |
| Engine Power | 119 kW |
| Emission Standards | Euro Stage 3a |
| Fuel Tank Capacity | 360 litres |
| Hydraulic Tank Capacity | 500 litres |
| Undercarriage | Telescopic |
| Operating Weight | 42 tonnes |



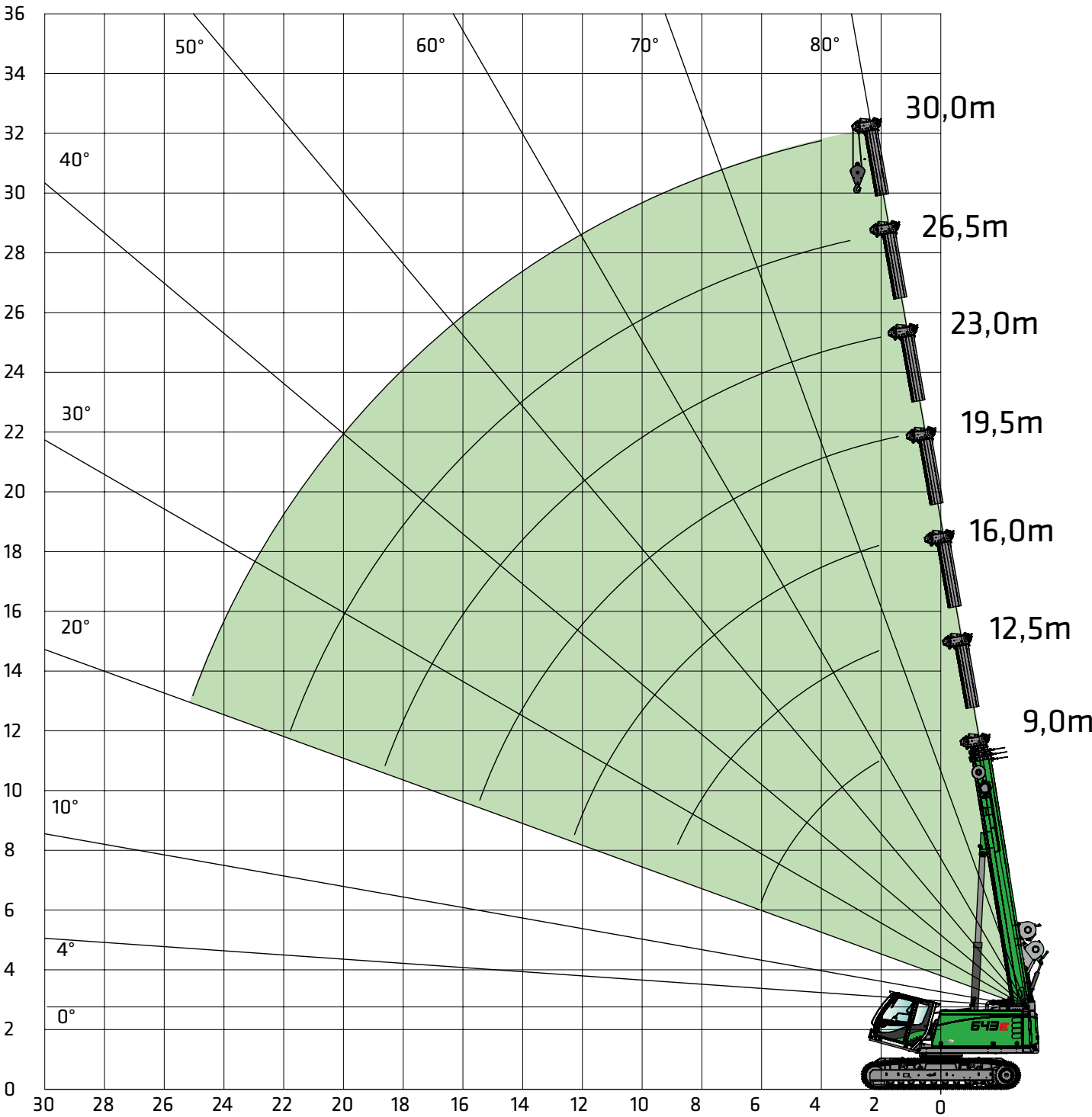
DIMENSIONS: OPERATING



DIMENSIONS: TRANSPORTATION



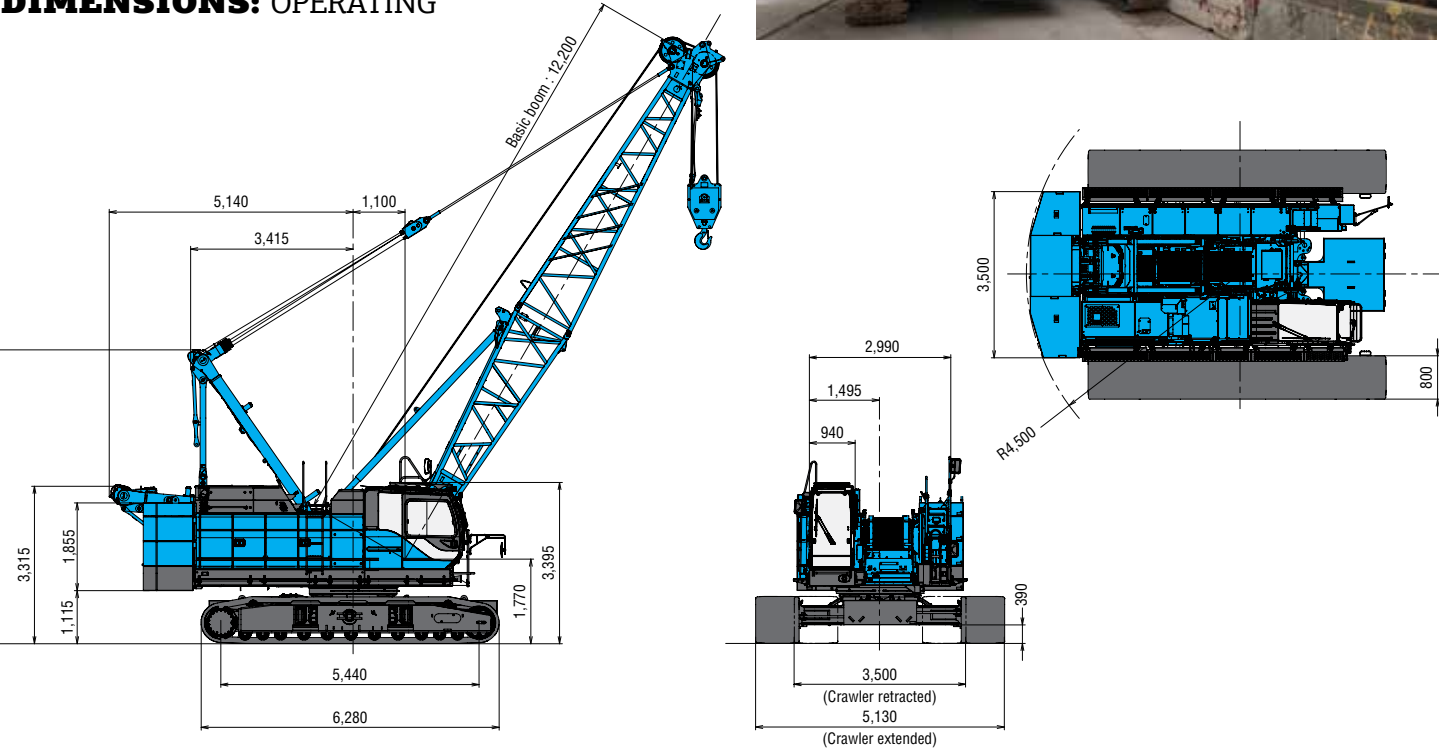
643R: 360° TELESCOPIC BOOM 30M



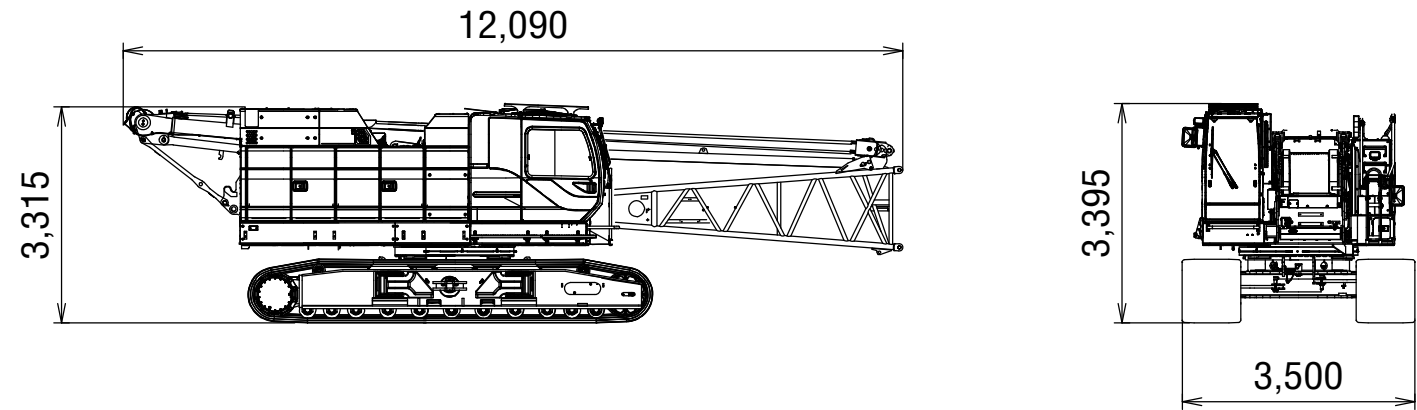
KOBELCO CKG900E CRAWLER CRANE

| Machine Model | CKG900E |
|-------------------------|--------------|
| Engine Type | HINO J08E-YD |
| Engine Power | 213 kW |
| Emission Standards | Euro Stage 5 |
| Fuel Tank Capacity | 400 litres |
| Hydraulic Tank Capacity | 440 litres |
| Undercarriage | Telescopic |
| Operating Weight | 90 tonnes |

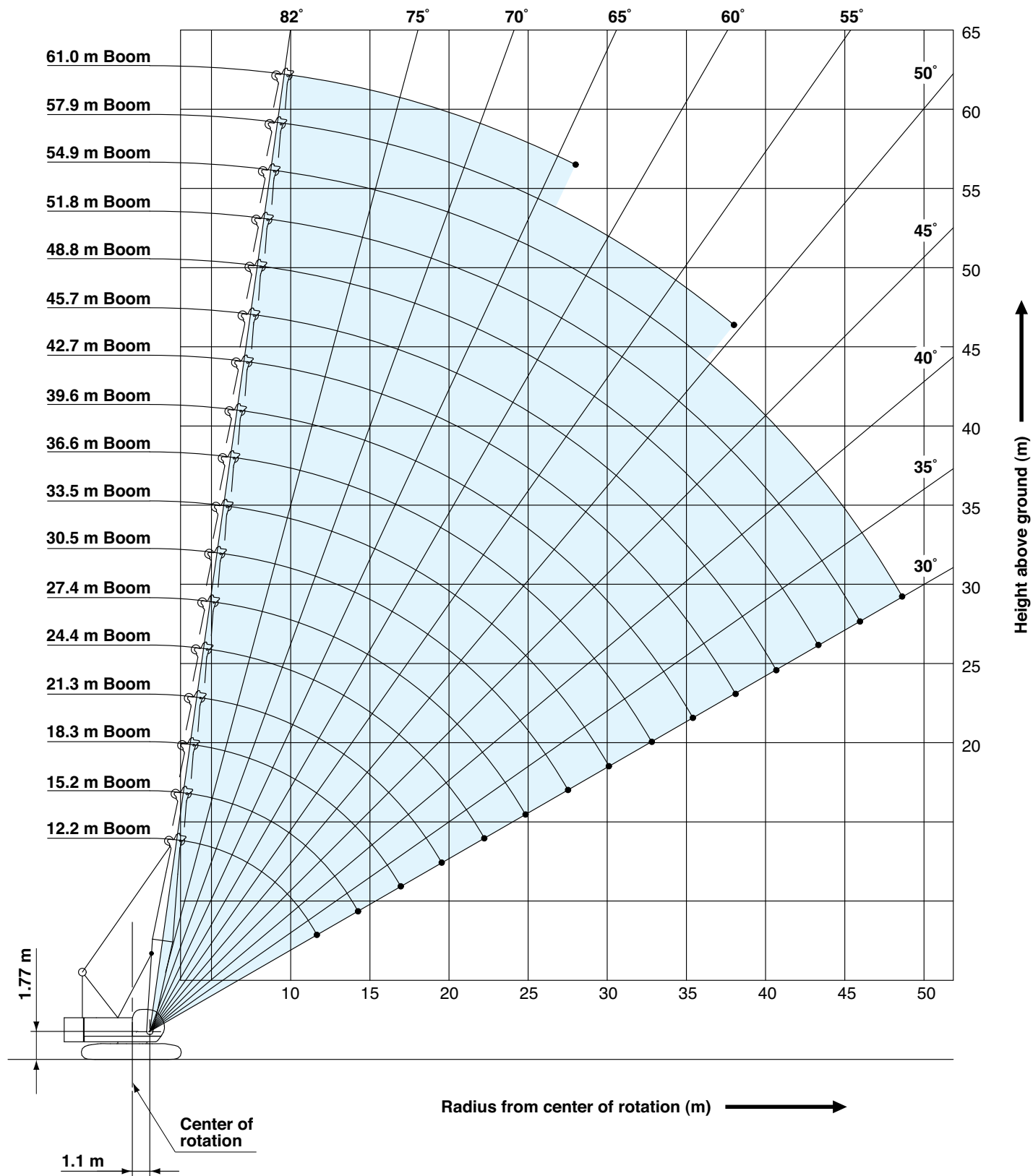
DIMENSIONS: OPERATING



DIMENSIONS: TRANSPORTATION
























CKG900E: CRANE BOOM
























SENNEBOGEN 673R CRAWLER CRANE

LIFT CAPACITIES: MAIN BOOM

| | Boom Length (m) | | | | | | |
|---|---|---|---|---|--|---|---|
| | 11,0 | 13,8 | 16,6 | 19,3 | 24,8 | 30,3 | 36,0 |
| Counterweight (t) |  17,4 |  17,4 |  17,4 |  17,4 |  17,4 |  17,4 |  17,4 |
| Carbody Counterweight (t) |  0,0 |  0,0 |  0,0 |  0,0 |  0,0 |  0,0 |  0,0 |
| Undercarriage Track Width (m) |  4,6 |  4,6 |  4,6 |  4,6 |  4,6 |  4,6 |  4,6 |
| Working Radius (m) | | | | | | | |
| 2,0 | 70,0 | | | | | | |
| 2,5 | 70,0 | | | | | | |
| 3,0 | 67,2 | | | | | | |
| 4,0 | 56,0 | 39,5 | 37,8 | 29,0 | 22,5 | 21,0 | |
| 5,0 | 44,9 | 39,5 | 32,9 | 28,5 | 22,5 | 20,1 | 14,5 |
| 6,0 | 37,3 | 36,9 | 29,1 | 25,1 | 22,1 | 18,4 | 14,5 |
| 7,0 | 31,7 | 31,4 | 26,1 | 22,5 | 19,9 | 16,9 | 14,2 |
| 8,0 | 26,5 | 25,8 | 23,6 | 20,3 | 18,0 | 15,4 | 13,4 |
| 9,0 | | 21,4 | 21,5 | 18,5 | 16,4 | 14,1 | 12,6 |
| 10,0 | | 18,1 | 18,6 | 16,9 | 15,0 | 13,0 | 11,8 |
| 12,0 | | 15,5/11,0m | 16,0 | 12,8 | 12,8 | 11,0 | 10,2 |
| 14,0 | | | 12,2/13,0m | 9,8 | 10,1 | 9,5 | 8,7 |
| 16,0 | | | | 7,7 | 7,9 | 8,3 | 7,5 |
| 18,0 | | | | | 6,3 | 6,8 | 6,5 |
| 20,0 | | | | | 5,1 | 5,5 | 5,7 |
| 22,0 | | | | | 4,5/21,0m | 4,5 | 4,8 |
| 24,0 | | | | | | 3,7 | 3,9 |
| 26,0 | | | | | | 3,0 | 3,3 |
| 28,0 | | | | | | | 2,7 |
| 30,0 | | | | | | | 2,2 |
| 32,0 | | | | | | | 1,8 |
| 34,0 | | | | | | | |
| 36,0 | | | | | | | |
| 38,0 | | | | | | | |
| 40,0 | | | | | | | |
| Parts Reeving | 14 | 14 | 11 | 9 | 7 | 5 | 3 |
| i | 0% | 33% | 66% | 100% | 100% | 100% | 100% |
| ii | 0% | 0% | 0% | 0% | 33% | 66% | 100% |
| iii | 0% | 0% | 0% | 0% | 33% | 66% | 100% |
| When the jib is mounted at the basic mainboom the rated loads have to be reduced. | | | | | | | |
| Reduction of Load (kg) | 770 | 610 | 510 | 430 | 340 | 280 | 240 |

SENNEBOGEN 653E CRAWLER CRANE






















LIFT CAPACITIES: MAIN BOOM

| | Boom Length (m) | | | | | | |
|-------------------------------|--|--|--|--|--|--|--|
| | 9,4 | 12,8 | 16,3 | 19,8 | 23,3 | 26,8 | 30,4 |
| Counterweight (t) |  8,9 |  8,9 |  8,9 |  8,9 |  8,9 |  8,9 |  8,9 |
| Carbody Counterweight (t) |  5,5 |  5,5 |  5,5 |  5,5 |  5,5 |  5,5 |  5,5 |
| Undercarriage Track Width (m) |  3,8 |  3,8 |  3,8 |  3,8 |  3,8 |  3,8 |  3,8 |
| Working Radius (m) | | | | | | | |
| 2,0 | 50,0 | 31,0 | 28,0 | 15,6 | 14,5 | | |
| 3,0 | 45,0 | 31,0 | 25,0 | 15,6 | 14,5 | 12,7 | |
| 4,0 | 38,0 | 31,0 | 22,0 | 15,6 | 14,5 | 12,6 | 9,2 |
| 5,0 | 30,0 | 28,0 | 19,3 | 15,6 | 14,2 | 12,4 | 9,2 |
| 6,0 | 22,0 | 22,5 | 16,9 | 14,9 | 13,6 | 11,9 | 9,2 |
| 7,0 | | 17,5 | 15,0 | 13,6 | 12,5 | 11,1 | 9,1 |
| 8,0 | | 14,2 | 13,5 | 12,2 | 11,2 | 10,3 | 8,7 |
| 9,0 | | 11,7 | 11,7 | 11,1 | 10,2 | 9,4 | 8,2 |
| 10,0 | | | 9,9 | 10,1 | 9,3 | 8,6 | 7,8 |
| 11,0 | | | 8,5 | 8,9 | 8,5 | 8,0 | 7,3 |
| 12,0 | | | 7,4 | 7,7 | 7,9 | 7,3 | 6,8 |
| 13,0 | | | 6,4 | 6,8 | 7,1 | 6,8 | 6,4 |
| 14,0 | | | | 6,0 | 6,2 | 6,3 | 5,9 |
| 15,0 | | | | 5,4 | 5,6 | 5,8 | 5,6 |
| 16,0 | | | | 4,8 | 5,0 | 5,2 | 5,2 |
| 17,0 | | | | | 4,5 | 4,7 | 4,9 |
| 18,0 | | | | | 4,1 | 4,3 | 4,4 |
| 19,0 | | | | | 3,7 | 3,9 | 4,1 |
| 20,0 | | | | | 3,3 | 3,6 | 3,7 |
| 21,0 | | | | | | 3,3 | 3,4 |
| 22,0 | | | | | | 3,0 | 3,1 |
| 23,0 | | | | | | 2,7 | 2,9 |
| 24,0 | | | | | | | 2,6 |
| 25,0 | | | | | | | 2,4 |
| 26,0 | | | | | | | 2,2 |
| Parts Reeving | 4 | 3 | 3 | 2 | 2 | 2 | 1 |
| i | 0% | 50% | 100% | 100% | 100% | 100% | 100% |
| ii | 0% | 0% | 0% | 25% | 50% | 75% | 100% |
| iii | 0% | 0% | 0% | 25% | 50% | 75% | 100% |
| | | | | | | | |
| Reduction of Load | 580 | 420 | 330 | 270 | 230 | 200 | 180 |

SENNEBOGEN 643R

CRAWLER CRANE





































LIFT CAPACITIES: MAIN BOOM

| | Boom Length (m) | | | | | | |
|-------------------------------|---|---|---|---|--|---|---|
| | 9,0 | 12,5 | 16,0 | 19,5 | 23,0 | 26,5 | 30,0 |
| Counterweight (t) |  7,0 |  7,0 |  7,0 |  7,0 |  7,0 |  7,0 |  7,0 |
| Carbody Counterweight (t) |  4,0 |  4,0 |  4,0 |  4,0 |  4,0 |  4,0 |  4,0 |
| Undercarriage Track Width (m) |  3,8 |  3,8 |  3,8 |  3,8 |  3,8 |  3,8 |  3,8 |
| Working Radius (m) | | | | | | | |
| 2,0 | 40,0 | | | | | | |
| 3,0 | 35,0 | 20,0 | 15,0 | 14,0 | 11,0 | 8,9 | 5,0 |
| 4,0 | 30,2 | 20,0 | 15,0 | 14,0 | 11,0 | 8,9 | 5,0 |
| 5,0 | 25,5 | 20,0 | 15,0 | 13,3 | 11,0 | 8,6 | 5,0 |
| 6,0 | 18,6 | 18,5 | 14,9 | 12,0 | 10,3 | 8,3 | 5,0 |
| 7,0 | 12,2/6,2m | 14,3 | 13,2 | 10,9 | 9,5 | 7,8 | 5,0 |
| 8,0 | | 11,5 | 11,4 | 9,8 | 8,7 | 7,4 | 5,0 |
| 9,0 | | 9,5 | 9,4 | 9,0 | 7,9 | 6,9 | 5,0 |
| 10,0 | | 7,5/9,6m | 8,0 | 8,3 | 7,1 | 6,4 | 5,0 |
| 11,0 | | | 6,8 | 7,2 | 6,5 | 5,9 | 5,0 |
| 12,0 | | | 5,9 | 6,2 | 5,9 | 5,5 | 5,0 |
| 13,0 | | | 5,0 | 5,4 | 5,5 | 5,1 | 4,7 |
| 14,0 | | | | 4,8 | 5,0 | 4,8 | 4,4 |
| 15,0 | | | | 4,2 | 4,5 | 4,5 | 4,1 |
| 16,0 | | | | 3,7 | 4,0 | 4,2 | 3,8 |
| 17,0 | | | | 3,5/16,6m | 3,6 | 3,7 | 3,6 |
| 18,0 | | | | | 3,2 | 3,4 | 3,3 |
| 19,0 | | | | | 2,9 | 3,0 | 3,1 |
| 20,0 | | | | | 2,6 | 2,7 | 2,9 |
| 21,0 | | | | | 2,5/20,1m | 2,5 | 2,6 |
| 22,0 | | | | | | 2,2 | 2,4 |
| 23,0 | | | | | | 1,9/23,6m | 2,2 |
| 24,0 | | | | | | | 2,0 |
| 25,0 | | | | | | | 1,8 |
| 26,0 | | | | | | | 1,6 |
| 27,0 | | | | | | | 1,5 |
| 28,0 | | | | | | | 1,5/27,1m |
| Parts Reeving | 10 | 6 | 5 | 4 | 4 | 3 | 2 |
| i | 0% | 50% | 100% | 100% | 100% | 100% | 100% |
| ii | 0% | 0% | 0% | 25% | 50% | 75% | 100% |
| iii | 0% | 0% | 0% | 25% | 50% | 75% | 100% |

KOBELO CKG900E

CRAWLER CRANE

LIFT CAPACITIES: MAIN BOOM

| | Boom Length (m) | | | | | | | | | | | |
|-------------------------------|--|--|--|--|--|--|--|--|--|--|--|--|
| | 12.2 | 15.2 | 18.3 | 21.3 | 24.4 | 27.4 | 30.5 | 33.5 | 36.6 | 39.6 | 42.7 | 45.7 |
| Counter-weight (t) |  31.9 |  31.9 |  31.9 |  31.9 |  31.9 |  31.9 |  31.9 |  31.9 |  31.9 |  31.9 |  31.9 |  31.9 |
| Carbody Weight (t) |  14.4 |  14.4 |  14.4 |  14.4 |  14.4 |  14.4 |  14.4 |  14.4 |  14.4 |  14.4 |  14.4 |  14.4 |
| Undercarriage Track Width (m) |  5.1 |  5.1 |  5.1 |  5.1 |  5.1 |  5.1 |  5.1 |  5.1 |  5.1 |  5.1 |  5.1 |  5.1 |
| Working Radius (m) | | | | | | | | | | | | |
| 3.6 | 100.0* | | | | | | | | | | | |
| 3.9 | 90.0 | 89.9 | 89.7 | | | | | | | | | |
| 4.0 | 89.0 | 88.9 | 88.7 | 4.3m/68.4 | | | | | | | | |
| 4.5 | 79.6 | 79.5 | 79.4 | 68.4 | 4.7m/68.4 | | | | | | | |
| 5.0 | 72.1 | 71.9 | 71.8 | 68.4 | 67.6 | 5.1m/57.0 | | | | | | |
| 5.5 | 65.8 | 65.7 | 65.5 | 63.6 | 60.6 | 57.0 | 5.6m/54.0 | | | | | |
| 6.0 | 60.5 | 60.3 | 59.9 | 57.5 | 54.9 | 52.7 | 50.5 | 45.6 | 6.4m/41.9 | 6.8m/34.2 | | |
| 7.0 | 48.6 | 48.5 | 48.4 | 48.1 | 46.2 | 44.5 | 42.9 | 41.5 | 40.0 | 34.2 | 7.3m/31.9 | 7.7m/28.0 |
| 8.0 | 39.9 | 39.8 | 39.7 | 39.9 | 39.8 | 38.5 | 37.2 | 36.1 | 35.0 | 33.9 | 31.4 | 27.8 |
| 9.0 | 33.8 | 33.7 | 33.6 | 33.8 | 33.6 | 33.6 | 32.8 | 31.9 | 31.0 | 30.1 | 29.2 | 26.2 |
| 10.0 | 29.3 | 29.2 | 29.1 | 29.2 | 29.1 | 29.0 | 28.9 | 28.5 | 27.7 | 27.0 | 26.2 | 24.5 |
| 12.0 | 11.8m/22.9 | 22.9 | 22.8 | 22.9 | 22.8 | 22.7 | 22.6 | 22.6 | 22.5 | 22.3 | 21.7 | 21.2 |
| 14.0 | | 18.8 | 18.6 | 18.8 | 18.6 | 18.5 | 18.4 | 18.4 | 18.3 | 18.3 | 18.1 | 18.0 |
| 16.0 | | 14.4m/18.1 | 15.7 | 15.8 | 15.7 | 15.6 | 15.5 | 15.4 | 15.3 | 15.3 | 15.2 | 15.1 |
| 18.0 | | | 17.0m/14.5 | 13.7 | 13.5 | 13.4 | 13.3 | 13.2 | 13.1 | 13.1 | 12.9 | 12.9 |
| 20.0 | | | | 19.6m/12.2 | 11.8 | 11.7 | 11.6 | 11.5 | 11.4 | 11.4 | 11.2 | 11.2 |
| 22.0 | | | | | 10.5 | 10.4 | 10.2 | 10.2 | 10.0 | 10.0 | 9.9 | 9.8 |
| 24.0 | | | | | 22.3m/10.3 | 9.3 | 9.1 | 9.1 | 8.9 | 8.9 | 8.7 | 8.7 |
| 26.0 | | | | | | 24.9m/8.8 | 8.2 | 8.2 | 8.0 | 8.0 | 7.8 | 7.7 |
| 28.0 | | | | | | | 27.6m/7.6 | 7.4 | 7.2 | 7.2 | 7.0 | 7.0 |
| 30.0 | | | | | | | | 6.8 | 6.6 | 6.5 | 6.4 | 6.3 |
| 32.0 | | | | | | | | 30.2m/6.7 | 6.0 | 6.0 | 5.8 | 5.7 |
| 34.0 | | | | | | | | | 32.9m/5.8 | 5.5 | 5.3 | 5.2 |
| 36.0 | | | | | | | | | | 35.5m/5.1 | 4.8 | 4.8 |
| 38.0 | | | | | | | | | | | 4.4 | 4.4 |
| 40.0 | | | | | | | | | | | 38.1m/4.4 | 4.0 |
| 44.0 | | | | | | | | | | | | 40.8m/3.9 |
| Reeves | 8 | 8 | 8 | 6 | 6 | 5 | 5 | 4 | 4 | 3 | 3 | 3 |

Ratings according to EN13000. Ratings shown in (blue boxes) are determined by the strength of the boom or other structural components. Lifting capacities may vary depending on hook used or with/without auxiliary sheave. Please refer rated chart in operator's cabin. * The value are theoretical result.

PLANT LOADINGS

PILING RIG & CRAWLER CRANE BEARING PRESSURES

| Plant Manufacturer & Model | Track Pad Width (m) | Track Bearing length (m) | Working Weight (Te) | Max Crowd Force (kN) | Max Extraction Force (kN) | Case 1 Loading Standing or Travelling | | Case 1 Loading Handling | | Case 2 Loading Installation | | Case 2 Loading Extraction [1] | | Notes [2] |
|--|------------------------|--------------------------------|------------------------|----------------------------|---------------------------------|--|--|--|--|--|--|--|--|---|
| | | | | | | Max Rectangular Bearing Pressure (kN/m²) | Equivalent Track Bearing Length (m) | Max Rectangular Bearing Pressure (kN/m²) | Equivalent Track Bearing Length (m) | Max Rectangular Bearing Pressure (kN/m²) | Equivalent Track Bearing Length (m) | Max Rectangular Bearing Pressure (kN/m²) | Equivalent Track Bearing Length (m) | PLEASE NOTE: Track Loadings and Track Lengths quoted are based strictly on the following operational limitations noted below for each item of plant. |
| Sheet Piling Rigs | | | | | | | | | | | | | | |
| ABI TM 20 LR Long Reach | 0.90 | 4.40 | 84 | 180 | 180 | 260 | 2.38 | N/A | N/A | 199 | 2.36 | 315 | 1.87 | Maximum Working Radius = 8.04m Maximum Crowd Force = 120kN Maximum Extraction Force = 120kN |
| ABI TM 20 | 0.90 | 4.50 | 74 | 200 | 235 | 194 | 2.64 | N/A | N/A | 218 | 1.48 | 371 | 1.51 | Maximum Working Radius = 6.05m Maximum Crowd Force = 145kN Maximum Extraction Force = 185kN |
| ABI TM 18/22 HD | 0.70 | 4.80 | 82 | 120 | 200 | 203 | 3.49 | N/A | N/A | 215 | 2.52 | 313 | 2.64 | Maximum Working Radius = 5.70m Maximum Crowd Force = 120kN Maximum Extraction Force = 200kN |
| ABI TM 13/16 SL | 0.60 | 3.85 | 50 | 90 | 175 | 200 | 3.08 | N/A | N/A | 204 | 2.32 | 291 | 2.30 | Maximum Working Radius = 5.79m Maximum Crowd Force = 58kN Maximum Extraction Force = 109kN |
| ABI TM 12/15 LR Long Reach | 0.70 | 4.51 | 62 | 90 | 100 | 194 | 2.77 | N/A | N/A | 121 | 3.56 | 320 | 1.70 | Maximum Working Radius = 8.08m Maximum Crowd Force = 72kN Maximum Extraction Force = 80kN Handling of Sheet Pile is NOT Permitted |
| Bauer RTG 21T | 0.70 | 4.42 | 78 | 140 | 260 | 343 | 2.23 | N/A | N/A | 222 | 2.91 | 372 | 1.85 | Maximum Working Radius = 5.91m Maximum Crowd Force = 60kN Maximum Extraction Force = 20kN |
| Kobelco SK380 SRLC Excavator Piling Rig | 0.80 | 4.05 | 40 | 60 | 60 | 154 | 2.29 | 201 | 1.91 | 162 | 1.76 | 178 | 2.08 | Maximum Working Radius = 8.0m Maximum Load = 5Te (Bundle Piles) |
| Kobelco SK350 LC Excavator Piling Rig | 0.80 | 4.05 | 40 | 60 | 60 | 128 | 2.90 | 148 | 2.41 | 165 | 1.80 | 171 | 2.20 | Maximum Working Radius = 8.0m Maximum Load = 5Te (Bundle Piles) |
| Crawler Cranes | | | | | | | | | | | | | | |
| Sennebogen 673R | 0.70 | 5.10 | 70 | N/A | N/A | 184 | 2.66 | 291 | 2.46 | - | - | - | - | Maximum Radius / Maximum Load Minimum Radius / Maximum Load |
| Sennebogen 653E | 0.70 | 4.40 | 50 | N/A | N/A | 94 | 3.82 | 241 | 1.92 | - | - | - | - | Maximum Radius / Maximum Load Minimum Radius / Maximum Load |
| Sennebogen 643R | 0.70 | 4.40 | 42 | N/A | N/A | 121 | 2.94 | 237 | 3.28 | - | - | - | - | Maximum Radius / Maximum Load Minimum Radius / Maximum Load |
| Kobelco CKG900E | 0.80 | 5.44 | 90 | N/A | N/A | 163 | 3.40 | 357 | 2.78 | - | - | - | - | Maximum Radius / Maximum Load Minimum Radius / Maximum Load 3.5Te Hook Block / 3 Fall Duties Jib Length = 24.4m (Min) / 45.7m (Max) |

1. Extraction load case applicable to both pile extraction and pre-augering activities.

2. Maximum crowd and extraction force only possible with reduced reach.

Updated October 2023

NOISE ASSESSMENTS

GENERAL INTRODUCTION

All piling activity generates noise. The consequences of the additional noise may be a health hazard or a cause of annoyance to the general public.

Construction site noise levels, in decibels (dB), are usually ‘A-weighted’ to give measurements and levels relative to the sensitivity of the human ear.

The accepted measure of noise is the equivalent ‘A-weighted’ sound pressure level, L_{Aeq} , relative to a specified time period, T.

A number of factors are likely to affect the acceptability of noise arising from construction sites which include:

- Site location.
- Existing background noise levels.
- Duration of site operations.
- Hours of work.
- Provision of additional mitigation measures.

If noise levels increase from the background level by 3dB (A) then the change is just perceptible. If the noise level increases by 10dB (A) then it is perceived as being twice as loud. A 20dB (A) increase implies a tenfold increase in noise level.

DESIGN STANDARDS & REFERENCES

- **BS 5228 (2009) Part 1** - Code of practice for noise and vibration control on construction and open sites.
- **Control of Pollution Act (CoPA) 1974** - Applications for prior consent for work on construction sites.

FORMULA FOR CALCULATION OF NOISE

The base sound pressure levels for specialist piling equipment can be obtained from relevant manufacturers and typical values are summarised below:

- High Frequency Vibrohammers ie. MRZV 18V L_{pA} = 115 dB(A)
- Hydraulic Drop Hammers L_{pA} = 125dB (A).

Noise attenuates with distance from the source which can be defined by empirical equations.

Therefore to calculate an equivalent continuous A-weighted sound level over an ‘effective’ working day

duration the following equations are used:

$$L_{Aeq} = L_p A - 20 \log (R) - 8 \text{ For } R < 25\text{m}$$

$$L_{Aeq} = L_p A - 25 \log (R) - 1 \text{ For } R > 25\text{m}$$

Where, R = Distance from Noise Source (m).

In general, piling operations will typically run between 10% and 50% of the working day.

Consequently the previously presented formula can be further modified according to the following equation:

$$L_{Aeq} \text{ (red)} = L_{Aeq} + 10 \log \left(\frac{t_1}{T} \right)$$

Where:

t_1 = Actual piling time.
T = Total working period per day.

TYPICAL WORKED EXAMPLE

Assuming the sheet piles are installed using an ABI MRZV 18V vibratory hammer the following are noted:

- Base Sound Pressure Level L_{pA} = 115 dB (A)

Therefore the following attenuated noise level of various distances from the source can be calculated as follows:

| Distance ‘R’ (m) | 2.0 | 5.0 | 10.0 | 25.0 |
|--|-----|-----|------|------|
| Attenuated noise level L_{Aeq} dB(A) | 101 | 93 | 87 | 79 |

| Distance ‘R’ (m) | 50.0 | 75.0 | 100.0 | 150.0 |
|--|------|------|-------|-------|
| Attenuated noise level L_{Aeq} dB(A) | 72 | 67 | 64 | 60 |

Assuming a maximum piling duration of 5 hours per day (ie. 50%) the calculated values above can be further modified as follows:

| Distance ‘R’ (m) | 2.0 | 5.0 | 10.0 | 25.0 |
|--|-----|-----|------|------|
| Attenuated noise level L_{Aeq} (red) dB(A) | 98 | 90 | 84 | 76 |

| Distance ‘R’ (m) | 50.0 | 75.0 | 100.0 | 150.0 |
|--|------|------|-------|-------|
| Attenuated noise level L_{Aeq} (red) dB(A) | 69 | 64 | 61 | 57 |

Consequently the attenuated noise levels, as adjusted for time of piling operations, are reduced at various distances from the noise source by approximately 3 dB(A).

GROUND BORNE VIBRATION ASSESSMENTS

GENERAL INTRODUCTION

The installation of steel sheet piles using vibratory installation techniques will inevitably result in ground borne vibrations. The vibration level is a function of the power rating and frequency of the vibrohammer from which peak particle velocities and particle accelerations can be calculated based on to some extent the type and nature of soils. The vibration levels at the source will naturally attenuate with distance.

DESIGN STANDARDS & REFERENCES

- **BS 5228 (1992) Part 4** - Code of practice for noise and vibration control applicable to piling.
- **BS 5228 (2009) Part 2** - Code of practice for noise and vibration control applicable to piling.
- **British Steel (CORUS)** - Control of vibration and noise during piling.
- **BS 7385 Part 1** - Guide for measurement of vibrations and evaluation of their effects on buildings.
- **BS 7385 Part 2** - Guide on damage levels from ground borne vibrations.

FORMULA FOR CALCULATION OF PEAK PARTICLE VELOCITY (PPV)

For vibratory driven sheet piles, the maximum peak particle velocity (PPV) can be derived from the following empirical formula:

$$V_{res} = \frac{C \cdot \sqrt{W}}{r}$$

Where:

- V_{res} = Maximum peak particle velocity (mm/sec).
- C = Soil Hammer Factor (Recommended as 1.0 for vibratory hammer).
- W = The maximum hammer energy per cycle (J).
- r = Horizontal distance from piling operations (m).

TYPICAL WORKED EXAMPLE

Assuming the sheet piles are installed using an ABI MRZV 18S Vibratory Hammer the following are noted:

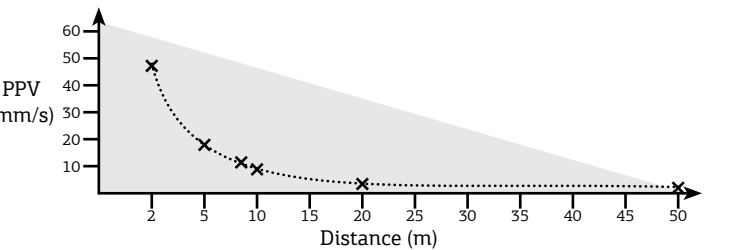
- Stated Power Rating = 433 kW.
- Frequency = 2250 rpm (37Hz).
- Energy = 433 kW/37Hz.
= 11702J/Cycle.
- Efficiency = 80%
- Hammer energy (w) = 11702J x 80% = 9362J

Therefore an assessment of the possible vibration levels can be undertaken using the formula presented in BS5228 Part 4 (1992).

The results of this example are presented below:

| Distance (m) | 2.0 | 5.0 | 8.0 | 10.0 |
|----------------------|------|------|------|------|
| Predicted PPV (mm/s) | 48.4 | 19.4 | 12.1 | 9.7 |

| Distance (m) | 12.0 | 15.0 | 20.0 | 50.0 |
|----------------------|------|------|------|------|
| Predicted PPV (mm/s) | 8.1 | 6.5 | 4.8 | 1.9 |



FURTHER COMMENTS

The revised standard, BS5228 Part 2 (2009) presents an equation for vibratory installation of piles which is based on percentage confidence levels based on the predicted vibration not being exceeded.

This method is entirely empirical and does not take account of soil conditions or hammer type.

Experience suggests there is some correlation with the BS5228 Paart 2 (1992) method based on 33.3% probability of exceeding confidence levels.

GUIDANCE ON PILING PLATFORM REQUIREMENTS

GENERAL INTRODUCTION

This document is intended for use by designers and engineers considering the piling platform requirements for a project utilising Sheet Piling (UK) Ltd equipment and it only applies to ground supported working platforms for tracked plant construction on granular material.

The information is based upon details supplied by the plant manufacturers and Sheet Piling (UK) Ltd own experiences of the plant performance.

To produce the bearing pressures an analysis has been conducted in accordance with the agreed procedures of the FPS and cover the typical working envelope within which piling plant is operated. Further analysis should be undertaken when operating equipment outside of this envelope and when the situation requires different loads or constraints from those noted within this document.

A piling platform designer should take into account any imposed loading by other plant, the ground conditions, the effects of weather, platform deterioration with time, soft spots and the platform maintenance regime.

In accordance with the BRE guidance document (published June 2004) on Design, Installation and Maintenance of Working Platforms the loads for each rig have been analysed and are presented for the two load cases of Case 1 and Case 2.

Case 1 loading applies to the situation when the rig or crane operator is unlikely to be able to aid recovery from an imminent platform failure.

Operations in which this type of loading condition applies could include standing, travelling and handling.

Case 2 loading applies to the situation when the rig or crane operator can control the load safely, for example by releasing the line load, or by reducing power, to aid recovery from an imminent platform failure.

Operations in which this type of loading condition applies could include installing/extracting a sheet pile, and/or drilling/extracting an auger. Consequently, a lower factor of safety can be adopted for this loading case.

These operations include sheet pile installation, extraction and preaugering (where applicable).

INSTALLATION

The Sheet Piling (UK) Ltd Platform Certificate is mandatory for all sites where a piling rig or attendant plant operates. It must be signed by an authorised representative of the Principal Contractor. This merely confirms that the legal duties required under CDM have been carried out.

The working platform provides access for all piling plant, ancillary plant, deliveries, subcontractors and personnel associated with the piling operations. Properly designed and installed, the working platform could also provide suitable and safe access for following trades for the whole project.

One of the main causes of rig instability is a result of poor definition of the edge of the working platform. In general the working platform should be clearing defined relative to the proposed pile line to suit the method of installation and/or extraction. This ensures sufficient safe working area for the piling personnel and attendance plant.

Where access ramps are used to move between working levels these must be of sufficient gradient and width to allow the piling plant to move safely within the stability constraints of the machine. Ramps must be in a straight line between working areas. Piling rigs and cranes cannot change direction on ramps. Where a change in direction is required, this must be on a flat level platform.

MAINTENANCE, REPAIR AND REINSTATEMENT

The working platform must be kept free draining. Water and arisings which are allowed to build up on the working platform can hide recently constructed piles, trip hazards, unstable ground and excavations.

Obstructions encountered during the piling process will generally require excavation to remove them. This can create a 'soft spot' which can result in the rig overturning. **It is essential that any excavations made in the working platform are reinstated to the designed standard, including any reinforcement and separation filter/membrane.**

Inspection of the platform should be an ongoing process throughout the design life of the platform. Any damaged areas must be reinstated to the designed standard.

WORKING PLATFORM CERTIFICATE

| | |
|---------------------------------------|--|
| Project Name | |
| Work area covered by this certificate | |

PART 1: WORKING PLATFORM DESIGN

| | |
|------------------------------|--|
| Equipment to be used on site | |
| Maximum Plant Loading | |

(Note: BR470 Working Platforms for Tracked Plant: Good practice guide to the design, installation, maintenance and report of ground supported platforms is available for HS BRE Press - Tel: 01344 328 038).

| | | |
|-----------------------|-----|---------------------|
| Designer Name | | |
| Designer Organisation | | |
| Contact Telephone | | |
| Is Testing Specified? | No: | Yes: (give details) |

PART 2: VERIFICATION BY PRINCIPAL CONTRACTOR

The working platform detailed above has been designed, installed to the design and, if specified, tested to safely support the equipment detailed in Part 1 above. The limits of the platform have been clearly identified on site as necessary.

This working platform will be REGULARLY INSPECTED, MAINTAINED, MODIFIED, REPAIRED and REINSTATED to the as-designed condition after any excavation or damage, throughout the period when the equipment is on the site. A completed copy of this certificate signed by an authorised person from the Principal Contractor shall be given to each user of the working platform prior to commencement of any works on site.

| | | | |
|-----------------|--|-----------|--|
| Name & Position | | Date | |
| Organisation | | Signature | |

Sheet Piling (UK) Ltd are committed to develop this initiative and supports the principle of reducing accidents by the certification of properly designed prepared and maintained working platforms.

Address

Oakfield House
Rough Hey Road
Grimsargh
Preston
Lancashire
PR2 5AR
United Kingdom

Telephone

+44 (0)1772 79 41 41

Facsimile

+44 (0)1772 79 51 51

Email

enquiries@sheetpilinguk.com

f Facebook

facebook.com/sheetpilinguk

Website

www.sheetpilinguk.com

 Twitter

twitter.com/sheetpilinguk

[illegible]