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# Trench Shoring SYSTEMS

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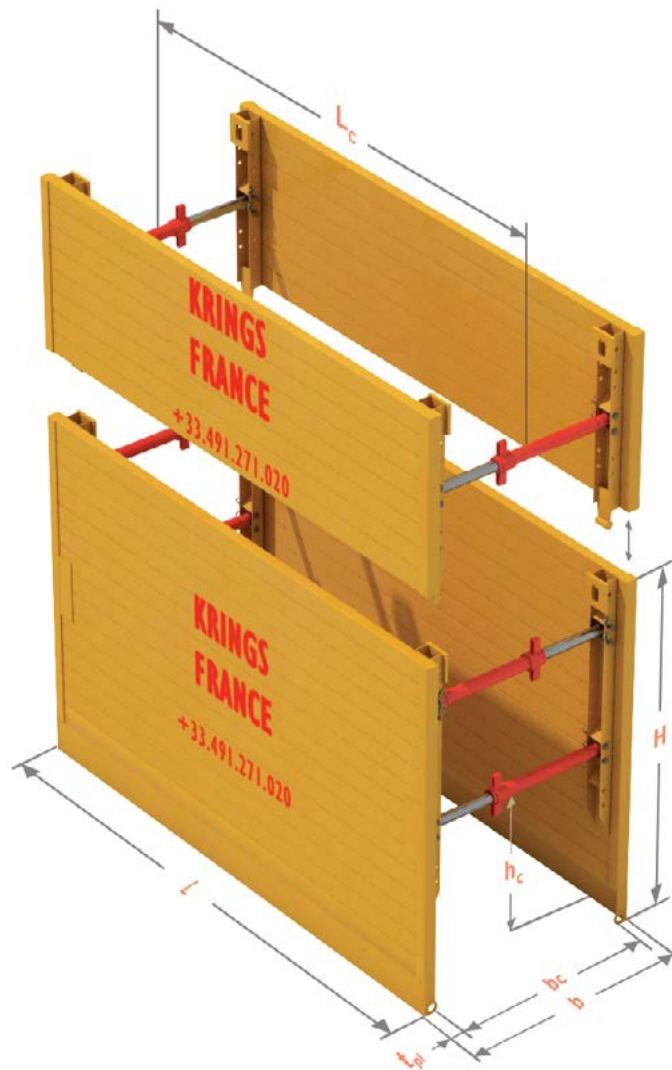
|                                                            |      |
|------------------------------------------------------------|------|
| > KVL LIGHT BOX .....                                      | P.4  |
| > KS 60 STANDARD BOX .....                                 | P.7  |
| > KS 100 STANDARD BOX .....                                | P.10 |
| > KSECK MANHOLE TRENCH BOX .....                           | P.13 |
| > MINI KKP SHEET PILE GUIDE BOX .....                      | P.16 |
| > STANDARD KKP SHEET PILE GUIDE BOX .....                  | P.20 |
| > PARALLEL SLIDING SYSTEM EGPV SINGLE SLIDING SYSTEM ..... | P.23 |
| > PARALLEL SLIDING SYSTEM DGPV DOUBLE SLIDE SYSTEM .....   | P.26 |
| > SPINDLE SLIDING SYSTEM DGFP DOUBLE SLIDE SYSTEM .....    | P.30 |
| > SLIDING SYSTEM CORNER SLIDE RAILS .....                  | P.33 |
| > PIT BOX SHEET PILES .....                                | P.37 |





|                                         |                      |
|-----------------------------------------|----------------------|
| <b>Unit Length</b>                      | 2.00 m - 3.50 m      |
| <b>Height Base Box</b>                  | 1.50 - 2.00 m        |
| <b>Height Top Extension Box</b>         | 0.50 - 1.00 m        |
| <b>Vertical Clearance under Spindle</b> | 0.98m Max.           |
| <b>Weight</b>                           | 465 kg - 805 kg      |
| <b>Recommended Depth</b>                | up to 3.00m          |
| <b>Lifting means</b>                    | excavator ≈ 5 to 13t |

- This is the lightest in the steel trench box range. A small excavator can easily handle it. The KVL trench box is ideal for laying small diameter pipes at small depths.
- The 5 types of KVL spindles allow trench widths from 650mm to 2800mm.
- This box is ideal for urban sites and can be associated with the mini sheet pile guide box.



|            |                                  |
|------------|----------------------------------|
| <b>H</b>   | Panel height                     |
| <b>L</b>   | Panel length                     |
| <b>hc</b>  | Vertical clearance under spindle |
| <b>Lc</b>  | Clearance between spindles       |
| <b>bc</b>  | Effective width                  |
| <b>b</b>   | Overall width                    |
| <b>tpl</b> | Panel thickness                  |



| Base Panel LxH |     | Box Weight | Vertical clearance under spindle $h_c$ | Clearance between spindles $L_c$ | Panel thickness $t_{pl}$ | Maximum load ed      |
|----------------|-----|------------|----------------------------------------|----------------------------------|--------------------------|----------------------|
| [m]            |     | [kg]       | [mm]                                   | [m]                              | [mm]                     | [kN/m <sup>2</sup> ] |
| KVL 2.00x      | 1.5 | 465        | 720                                    | 1.69                             | 60                       | 53.3                 |
|                | 2.0 | 595        | 980                                    |                                  |                          | 40.8                 |
| KVL 2.50x      | 1.5 | 595        | 720                                    | 2.19                             |                          | 42.6                 |
|                | 2.0 | 700        | 980                                    |                                  |                          | 32.6                 |
| KVL 3.00x      | 1.5 | 625        | 720                                    | 2.69                             |                          | 32.0                 |
|                | 2.0 | 805        | 980                                    |                                  |                          | 27.2                 |
| KVL 3.50x      | 1.5 | 835        | 720                                    | 3.19                             | 30.0                     |                      |
|                | 2.0 | 1090       | 980                                    |                                  | 30.0                     |                      |

| Top Extension Panel |     | Box Weight | Vertical clearance under spindle $h_c$ | Clearance between spindles $L_c$ | Panel thickness $t_{pl}$ | Maximum load ed |
|---------------------|-----|------------|----------------------------------------|----------------------------------|--------------------------|-----------------|
| KVL 2.00x           | 0.5 | 205        | -                                      | 1.69                             | 60                       | 53.3            |
|                     | 1.0 | 325        | -                                      |                                  |                          | 40.8            |
| KVL 2.50x           | 0.5 | 235        | -                                      | 2.19                             |                          | 42.6            |
|                     | 1.0 | 380        | -                                      |                                  |                          | 32.6            |
| KVL 3.00x           | 0.5 | 270        | -                                      | 2.69                             |                          | 32.0            |
|                     | 1.0 | 435        | -                                      |                                  |                          | 27.2            |
| KVL 3.50x           | 0.5 | 330        | -                                      | 3.19                             | 30.0                     |                 |
|                     | 1.0 | 570        | -                                      |                                  | 30.0                     |                 |

For any other dimensions, please consult us.

**Tensile forces at the points of extraction, connection and towing (in the vertical direction) :**

- Lifting eyes at the panel head  $R_d=229kN$
- Bottom eyes of the panel  $R_d=23kN$



| Pipe Extension lengths | Effective Width $b_c$ | Overall Width $b$ | Weight |
|------------------------|-----------------------|-------------------|--------|
|                        | [m]                   | [m]               | [kg]   |
| A                      | 0.53 - 0.63           | 0.65 - 0.75       | 12.4   |
| B                      | 0.62 - 0.81           | 0.74 - 0.93       | 13.5   |
| C                      | 0.80 - 1.17           | 0.92 - 1.29       | 15.7   |
| D                      | 1.16 - 1.89           | 1.28 - 2.01       | 19.4   |
| E                      | 1.87 - 2.60           | 2.00 - 2.73       | 34.0   |

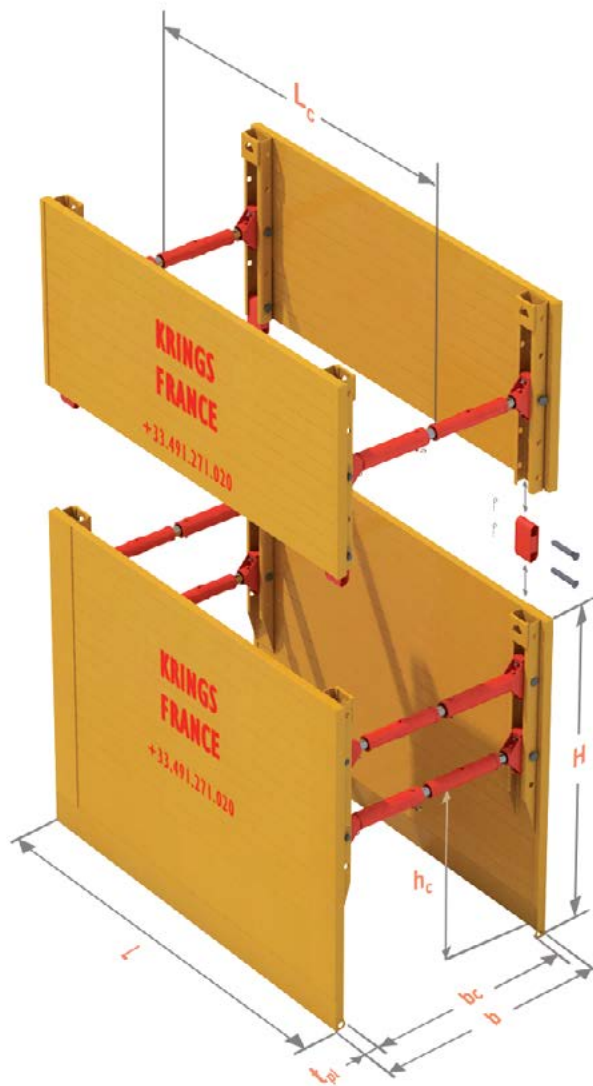




|                                         |                       |
|-----------------------------------------|-----------------------|
| <b>Unit Length</b>                      | 2.00 m - 3.50 m       |
| <b>Height Base Box</b>                  | 2.40 m                |
| <b>Height Top Extension Box</b>         | 1.30 m                |
| <b>Vertical Clearance under Spindle</b> | 1.35m maximum         |
| <b>Weight</b>                           | 1120 kg - 1710 kg     |
| <b>Recommended Depth</b>                | up to 4.00 m          |
| <b>Lifting means</b>                    | excavator ≈ 12 to 18t |

➤ This box combines strength with light weight. It uses spindles from the “heavy range” and utilises coupling extension pipes to give adjustable widths.

➤ The narrow thickness of the panels (60mm) maximises the working area and thus limits the support of the trench.



|                       |                                  |
|-----------------------|----------------------------------|
| <b>H</b>              | Panel height                     |
| <b>L</b>              | Panel length                     |
| <b>hc</b>             | Vertical clearance under spindle |
| <b>Lc</b>             | Clearance between spindles       |
| <b>bc</b>             | Effective width                  |
| <b>b</b>              | Overall width                    |
| <b>t<sub>pt</sub></b> | Panel thickness                  |



| Base Panel LxH      | Box Weight | Vertical clearance under spindle $h_c$ | Clearance between spindles $L_c$ | Panel thickness $t_{pl}$ | Maximum load ed      |
|---------------------|------------|----------------------------------------|----------------------------------|--------------------------|----------------------|
| [m]                 | [kg]       | [m]                                    | [m]                              | [mm]                     | [kN/m <sup>2</sup> ] |
| KS 2.00x2.40        | 1120       | 1.35                                   | 1.60                             | 60                       | 66.2                 |
| KS 2.5x2.40         | 1240       | 1.35                                   | 2.10                             |                          | 49.8                 |
| KS 3.0x2.40         | 1365       | 1.35                                   | 2.60                             |                          | 33.0                 |
| KS 3.50x2.40        | 1720       | 1.35                                   | 3.03                             |                          | 32.9                 |
| Top Extension Panel | Box Weight | Vertical clearance under spindle $h_c$ | Clearance between spindles $L_c$ | Panel thickness $t_{pl}$ | Maximum load ed      |
| KSA 2.00x1.30       | 610        | -                                      | 1.60                             | 60                       | 66.2                 |
| KSA 2.50x1.30       | 680        | -                                      | 2.10                             |                          | 49.8                 |
| KSA 3.00x1.30       | 750        | -                                      | 2.60                             |                          | 33.0                 |
| KSA 3.50x1.30       | 960        | -                                      | 3.03                             |                          | 32.9                 |

For any other dimensions, please consult us.

**Tensile forces at the points of extraction, connection and towing (in the vertical direction) :**

- Lifting eyes at the panel head     $R_d=229kN$
- Bottom eyes of the panel          $R_d=23kN$

| Pipe Extension lengths | Effective Width $b_c$ | Overall Width $b$ | Weight |
|------------------------|-----------------------|-------------------|--------|
| [mm]                   | [m]                   | [m]               | [kg]   |
| 0                      | 0.99-1.33             | 1.11-1.45         | 71.0   |
| 300                    | 1.29-1.63             | 1.41-1.75         | + 15.5 |
| 500                    | 1.49-1.83             | 1.61-1.95         | + 20.0 |
| 800                    | 1.79-2.13             | 1.91-2.25         | + 26.7 |
| 1000                   | 1.99-2.33             | 2.11-2.45         | + 31.1 |





|                                         |                       |
|-----------------------------------------|-----------------------|
| <b>Unit Length</b>                      | 2.00 m - 5.00 m       |
| <b>Height Base Box</b>                  | 2.40 - 2.90 m         |
| <b>Height Top Extension Box</b>         | 1.30 m                |
| <b>Vertical Clearance under Spindle</b> | 1.55 - 1.85 m maximum |
| <b>Weight</b>                           | 1456 kg - 2780 kg     |
| <b>Recommended Depth</b>                | up to 5.00m           |
| <b>Lifting means</b>                    | excavator ≈ 15 to 20t |

- Universally accepted as the most popular trench box.
- Its strength and ease of use make it suitable for most types of trenches.
- It's new design permits a vertical clearance under spindle of 1.55m, and even 1.85m with 2.90m height boxes ( please consult us ).



|                       |                                  |
|-----------------------|----------------------------------|
| <b>H</b>              | Panel height                     |
| <b>L</b>              | Panel length                     |
| <b>hc</b>             | Vertical clearance under spindle |
| <b>Lc</b>             | Clearance between spindles       |
| <b>bc</b>             | Effective width                  |
| <b>b</b>              | Overall width                    |
| <b>t<sub>pt</sub></b> | Panel thickness                  |



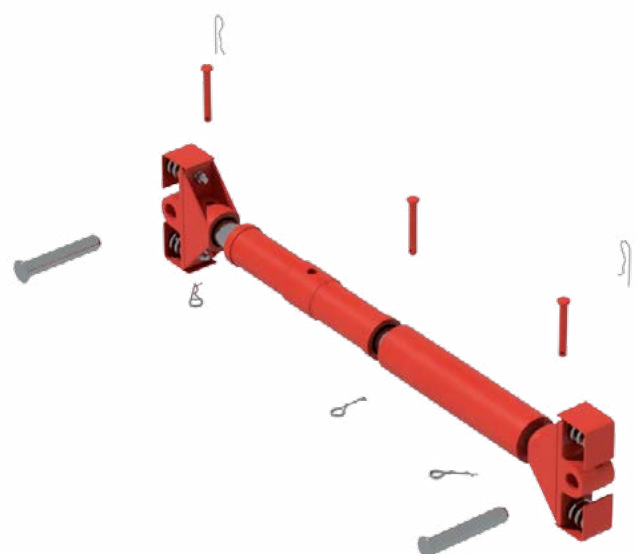
| Base Panel LxH      | Box Weight  | Vertical clearance under spindle $h_c$ | Clearance between spindles $L_c$ | Panel thickness $t_{pl}$ | Maximum load $ed$    |
|---------------------|-------------|----------------------------------------|----------------------------------|--------------------------|----------------------|
| [m]                 | [kg]        | [m]                                    | [m]                              | [mm]                     | [kN/m <sup>2</sup> ] |
| KS 2.00x2.40        | 1460        | 1.54                                   | 1.61                             | 100                      | 97.5                 |
| KS 2.50x2.40        | 1650        | 1.54                                   | 2.11                             |                          | 78.0                 |
| KS 3.00x2.40        | 1850        | 1.54                                   | 2.61                             |                          | 65.0                 |
| KS 3.50x2.40        | 2050        | 1.54                                   | 3.11                             |                          | 55.7                 |
| KS 3.75x2.40        | 2150        | 1.54                                   | 3.36                             |                          | 51.3                 |
| <b>KS 3.75x2.90</b> | <b>2630</b> | <b>1.87</b>                            | <b>3.36</b>                      |                          | <b>45.0</b>          |
| KS 4.00x2.40        | 2240        | 1.54                                   | 3.61                             | 120                      | 44.6                 |
| KS 4.50x2.40        | 2570        | 1.54                                   | 4.11                             |                          | 42.9                 |
| KS 5.00x2.40        | 2780        | 1.54                                   | 4.61                             |                          | 34.3                 |
|                     |             |                                        |                                  |                          |                      |
| Top Extension Panel | Box Weight  | Vertical clearance under spindle $h_c$ | Clearance between spindles $L_c$ | Panel thickness $t_{pl}$ | Maximum load $ed$    |
| KSA 2.00x1.30       | 840         | -                                      | 1.61                             | 100                      | 97.5                 |
| KSA 2.50x1.30       | 970         | -                                      | 2.11                             |                          | 78.0                 |
| KSA 3.00x1.30       | 1090        | -                                      | 2.61                             |                          | 65.0                 |
| KSA 3.50x1.30       | 1210        | -                                      | 3.11                             |                          | 55.7                 |
| KSA 3.75x1.30       | 1270        | -                                      | 3.36                             |                          | 51.3                 |
| KSA 4.00x1.30       | 1340        | -                                      | 3.61                             |                          | 44.6                 |
| KSA 4.50x1.30       | 1690        | -                                      | 4.11                             | 120                      | 42.9                 |
| KSA 5.00x1.30       | 1830        | -                                      | 4.61                             |                          | 34.3                 |

For any other dimensions, please consult us.

**Tensile forces at the points of extraction, connection and towing (in the vertical direction) :**

- Lifting eyes at the panel head       $R_d=229kN$
- Bottom eyes of the panel               $R_d=47kN$

| Pipe Extension lengths | Effective Width $b_c$ | Overall Width $b$ | Weight |
|------------------------|-----------------------|-------------------|--------|
| [mm]                   | [m]                   | [m]               | [kg]   |
| 0                      | 0.99-1.33             | 1.20-1.54         | 71.0   |
| 300                    | 1.29-1.63             | 1.50-1.84         | + 15.5 |
| 500                    | 1.49-1.83             | 1.70-2.04         | + 20.0 |
| 800                    | 1.79-2.13             | 2.00-2.34         | + 26.7 |
| 1000                   | 1.99-2.33             | 2.20-2.54         | + 31.1 |

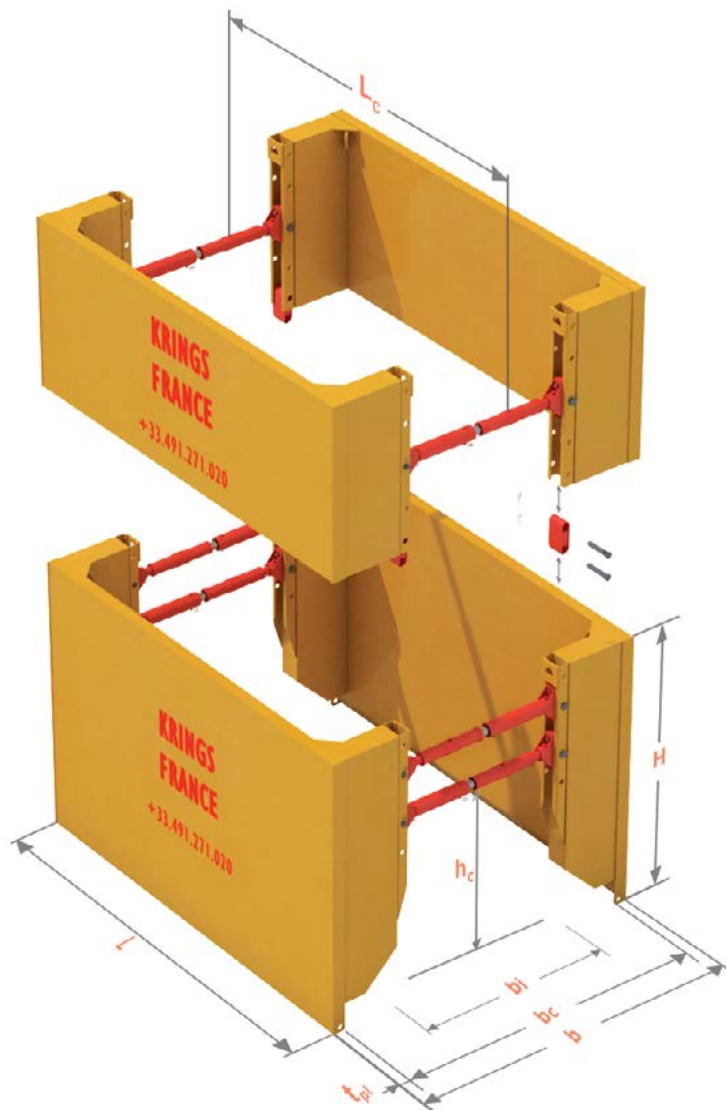




|                                         |                       |
|-----------------------------------------|-----------------------|
| <b>Unit Length</b>                      | 2.00 m - 3.50 m       |
| <b>Height Base Box</b>                  | 2.40 m                |
| <b>Height Top Extension Box</b>         | 1.40 m                |
| <b>Vertical Clearance under Spindle</b> | Max. 1.54 m           |
| <b>Weight</b>                           | 1730 kg - 2330 kg     |
| <b>Recommended Depth</b>                | up to 4.00m           |
| <b>Lifting means</b>                    | excavator ≈ 12 to 18t |

➤ Specially designed to protect particular areas such as manholes, this trench box is provided with “L” shape returns on which we set the spindles.

➤ The installation of the pre-cast elements is easily made in its center without sacrificing the current open trench width.



|                       |                                  |
|-----------------------|----------------------------------|
| <b>H</b>              | Panel height                     |
| <b>L</b>              | Panel length                     |
| <b>h<sub>c</sub></b>  | Vertical clearance under spindle |
| <b>L<sub>c</sub></b>  | Clearance between spindles       |
| <b>b<sub>c</sub></b>  | Effective width                  |
| <b>b</b>              | Overall width                    |
| <b>t<sub>pt</sub></b> | Panel thickness                  |



# KSECK 60 MANHOLE TRENCH BOX



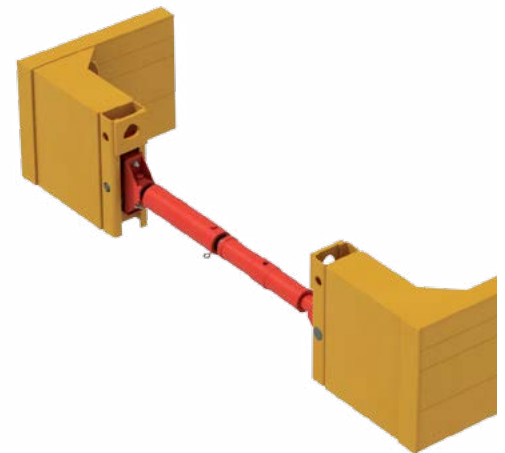
| Base Panel LxH | Panel Height                                         | Box Weight                                             | Vertical clearance under spindle $h_c$ | Clearance between spindles $L_c$ | Panel thickness $t_{pl}$ | Maximum load ed      |
|----------------|------------------------------------------------------|--------------------------------------------------------|----------------------------------------|----------------------------------|--------------------------|----------------------|
| [m]            | $\frac{\text{Base panel [m]}}{\text{Top panel [m]}}$ | $\frac{\text{Base panel [kg]}}{\text{Top panel [kg]}}$ | [m]                                    | [m]                              | [mm]                     | [kN/m <sup>2</sup> ] |
| KSECK 2.00     | $\frac{2,4}{1,4}$                                    | $\frac{1344}{827}$                                     | 1.35                                   | 1.58                             | 60                       | 66.2                 |
| KSECK 2.50     | $\frac{2,4}{1,4}$                                    | $\frac{1464}{897}$                                     | 1.35                                   | 2.08                             |                          | 49.8                 |
| KSECK 3.00     | $\frac{2,4}{1,4}$                                    | $\frac{1584}{967}$                                     | 1.35                                   | 2.58                             |                          | 33.0                 |
| KSECK 3.50     | $\frac{2,4}{1,4}$                                    | $\frac{1934}{1167}$                                    | 1.35                                   | 3.08                             |                          | 32.9                 |

For any other dimensions, please consult us.

**Tensile forces at the points of extraction, connection and towing (in the vertical direction) :**

- Lifting eyes at the panel head    Rd=229kN
- Bottom eyes of the panel        Rd=47kN

| Pipe Extension lengths | Effective Width between profiles $b_i$ | Effective Width $b_c$ | Overall Width $b$ | Weight |
|------------------------|----------------------------------------|-----------------------|-------------------|--------|
| [mm]                   | [m]                                    | [m]                   | [m]               | [kg]   |
| 0                      | 0.99-1.33                              | 1.79 - 2.13           | 1.91 - 2.25       | 71.0   |
| 300                    | 1.29-1.63                              | 2.09 - 2.43           | 2.21 - 2.55       | + 15.5 |
| 500                    | 1.49-1.83                              | 2.29 - 2.63           | 2.41 - 2.75       | + 20.0 |
| 800                    | 1.79-2.13                              | 2.59 - 2.93           | 2.71 - 3.05       | + 26.7 |
| 1000                   | 1.99-2.33                              | 2.79 - 3.13           | 2.91 - 3.25       | + 31.1 |



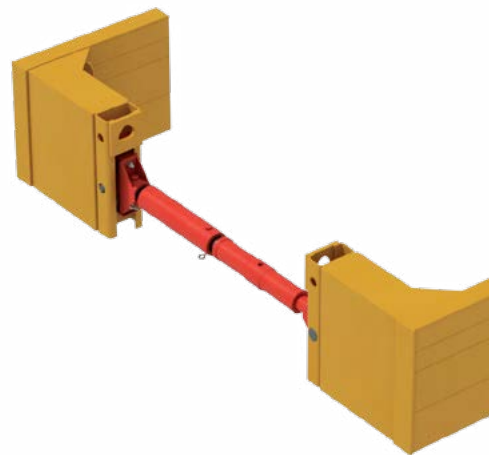
| Base Panel LxH | Panel Height                                         | Box Weight                                             | Vertical clearance under spindle $h_c$ | Clearance between spindles $L_c$ | Panel thickness $t_{pl}$ | Maximum load ed      |      |
|----------------|------------------------------------------------------|--------------------------------------------------------|----------------------------------------|----------------------------------|--------------------------|----------------------|------|
| [m]            | $\frac{\text{Base panel [m]}}{\text{Top panel [m]}}$ | $\frac{\text{Base panel [kg]}}{\text{Top panel [kg]}}$ | [m]                                    | [m]                              | [mm]                     | [kN/m <sup>2</sup> ] |      |
| KSECK 2.00     | 2,4                                                  | 1750                                                   | 1.35                                   | 1.58                             | 100                      | 97.5                 |      |
|                | 1,4                                                  | 1170                                                   |                                        |                                  |                          |                      |      |
| KSECK 2.50     | 2,4                                                  | 1950                                                   | 1.35                                   | 2.08                             |                          |                      | 78.0 |
|                | 1,4                                                  | 1300                                                   |                                        |                                  |                          |                      |      |
| KSECK 3.00     | 2,4                                                  | 2150                                                   | 1.35                                   | 2.58                             |                          |                      | 65.0 |
|                | 1,4                                                  | 1430                                                   |                                        |                                  |                          |                      |      |
| KSECK 3.50     | 2,4                                                  | 2340                                                   | 1.35                                   | 3.08                             | 55.7                     |                      |      |
|                | 1,4                                                  | 1560                                                   |                                        |                                  |                          |                      |      |

For any other dimensions, please consult us.

**Tensile forces at the points of extraction, connection and towing (in the vertical direction) :**

- Lifting eyes at the panel head  $R_d=229\text{kN}$
- Bottom eyes of the panel  $R_d=47\text{kN}$

| Pipe Extension lengths | Effective Width between profiles $b_i$ | Effective Width $b_c$ | Overall Width $b$ | Weight |
|------------------------|----------------------------------------|-----------------------|-------------------|--------|
| [mm]                   | [m]                                    | [m]                   | [m]               | [kg]   |
| 0                      | 0.99-1.33                              | 1.99 - 2.33           | 2.20 - 2.54       | 71.0   |
| 300                    | 1.29-1.63                              | 2.29 - 2.63           | 2.50 - 2.84       | + 15.5 |
| 500                    | 1.49-1.83                              | 2.49 - 2.83           | 2.70 - 3.04       | + 20.0 |
| 800                    | 1.79-2.13                              | 2.79 - 3.13           | 3.00 - 3.34       | + 26.7 |
| 1000                   | 1.99-2.33                              | 2.99 - 3.33           | 3.20 - 3.54       | + 31.1 |



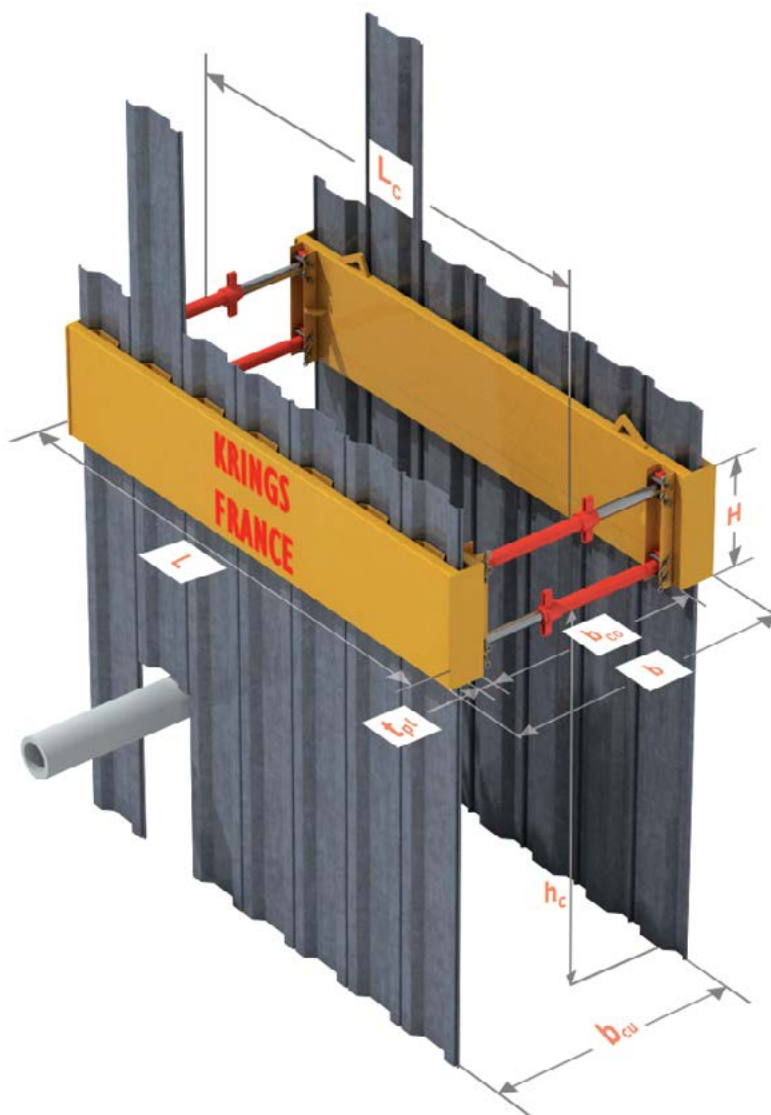


|                          |                      |
|--------------------------|----------------------|
| <b>Unit Length</b>       | 2.00 m - 2.8 m       |
| <b>Height Box</b>        | 0.60 m               |
| <b>Weight</b>            | 560 kg - 730 kg      |
| <b>Recommended Depth</b> | up to 3.50m          |
| <b>Lifting means</b>     | excavator ≈ 7 to 13t |

➤ This steel box is manufactured with an internal structure which receives, guides and maintains at his top, the KD 4-6 sheet piles. Steel profiles of 400mm or 600mm to cross the existing transverse networks without damaging them.

➤ Ideal mini sheet pile guiding frame for job sites in urban areas at depths of up to 3m. With a minimum of place and a maximum underground working space.

➤ Specially designed for use with a backhoe, the system can be logically used in conjunction with the KVL light boxes. Both use the same struts.



|                       |                                  |
|-----------------------|----------------------------------|
| <b>H</b>              | Panel height                     |
| <b>L</b>              | Panel length                     |
| <b>L<sub>c</sub></b>  | Clearance between spindles       |
| <b>b<sub>co</sub></b> | Width between the guiding frames |
| <b>b<sub>cu</sub></b> | Width between sheet piles        |
| <b>b</b>              | Overall width                    |
| <b>t<sub>pt</sub></b> | Panel frame thickness            |



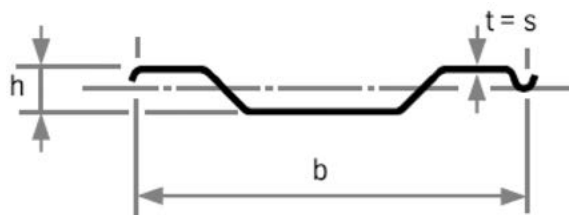
| Base Panel LxH | Box Weight | Number of sheet piles | Clearance between spindles $L_c$ | Panel thickness int. $t_{pl}$ | Bending strain at limit state $q_d$ |
|----------------|------------|-----------------------|----------------------------------|-------------------------------|-------------------------------------|
| [mm]           | [kg]       | [KD4]                 | [m]                              | [mm]                          | [kN/m]                              |
| KKP 2040x600   | 560        | 10                    | 1.74                             | 60                            | 92.6                                |
| KKP 2440x600   | 650        | 12                    | 2.14                             | 60                            | 61.8                                |
| KKP 2840x600   | 730        | 14                    | 2.54                             | 60                            | 44.2                                |

For any other dimensions, please consult us.

**Tensile forces at the points of extraction, connection and towing (in the vertical direction) :**

➤ Lifting eyes at the panel head  $R_d=229\text{kN}$

## KD 4/6



| Width b | Height h | Thickness t | Section modulus $W_y$ | Moment of inertia $I_y$ | Bending moment Md | Single pile weight | Wall weight          |
|---------|----------|-------------|-----------------------|-------------------------|-------------------|--------------------|----------------------|
| [mm]    | [mm]     | [mm]        | [cm <sup>3</sup> /m]  | [cm <sup>4</sup> /m]    | [kNm/m]           | [kg/m]             | [kg/m <sup>2</sup> ] |
| 400     | 50       | 6           | 102                   | 254                     | 25.5              | 22.1               | 55.3                 |

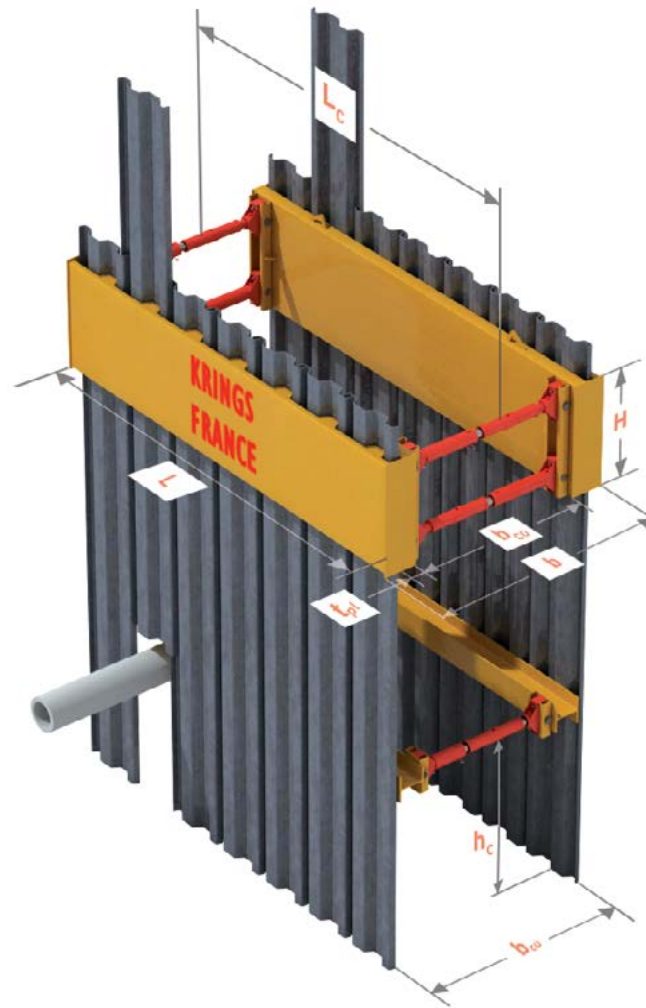
| Spindle type | Width between the guiding frames $b_{co}$ | Width between sheet piles $b_{cu}$ | Overall width b | Weight |
|--------------|-------------------------------------------|------------------------------------|-----------------|--------|
|              | [m]                                       | [m]                                | [m]             | [kg]   |
| A            | 0.53 - 0.63                               | 0.65 - 0.75                        | 0.89 - 0.99     | 12.4   |
| B            | 0.62 - 0.81                               | 0.74 - 0.93                        | 0.98 - 1.17     | 13.5   |
| C            | 0.80 - 1.17                               | 0.92 - 1.29                        | 1.16 - 1.53     | 15.7   |
| D            | 1.16 - 1.89                               | 1.28 - 2.01                        | 1.52 - 2.25     | 19.4   |
| E            | 1.87 - 2.60                               | 2.00 - 2,73                        | 2.24 - 2.97     | 34.0   |





|                          |                       |
|--------------------------|-----------------------|
| <b>Unit Length</b>       | 3.00 m - 4.0 m        |
| <b>Height Box</b>        | 1.00 m                |
| <b>Weight</b>            | 1730 kg - 2170 kg     |
| <b>Recommended Depth</b> | up to 7.50m           |
| <b>Lifting means</b>     | excavator ≈ 15 to 18t |

- Ideal for urban job sites. Economical and safe.
- The KKP guiding structure allows the sheet piles to be guided throughout their descent using the dig and push method ("lowering and cut" method).
- Where there are underground existing services, the KKP sheet pile guide is dual fitted for use with the KS100 spindles and slide rail systems.



|                       |                                  |
|-----------------------|----------------------------------|
| <b>H</b>              | Panel height                     |
| <b>L</b>              | Panel length                     |
| <b>L<sub>c</sub></b>  | Clearance between spindles       |
| <b>b<sub>co</sub></b> | Width between the guiding frames |
| <b>b<sub>Cu</sub></b> | Width between sheet piles        |
| <b>b</b>              | Overall width                    |
| <b>t<sub>pt</sub></b> | Panel frame thickness            |



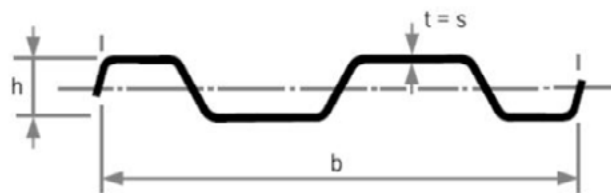
| Base Panel<br>LxH | Box Weight | Number of<br>sheet piles | Clearance between<br>spindles $L_c$ | Panel<br>thickness int.<br>$t_{pl}$ | Bending strain<br>at limit state $q_d$ |
|-------------------|------------|--------------------------|-------------------------------------|-------------------------------------|----------------------------------------|
| [m]               | [kg]       | [KD6]                    | [m]                                 | [mm]                                | [kN/m]                                 |
| KKP 2.94x1.00     | 1730       | 10                       | 2.51                                | 120                                 | 154.9                                  |
| KKP 3.52x1.00     | 1970       | 12                       | 3.09                                | 120                                 | 107.1                                  |
| KKP 4.02x1.00     | 2170       | 14                       | 3.59                                | 120                                 | 81.6                                   |

These panels can be interlock with the single or double sliding system.  
For any other dimensions, please consult us.

**Tensile forces at the points of extraction, connection and towing (in the vertical direction) :**

- Lifting eyes at the panel head  $R_d=229kN$

## KD 6/8



| Width b | Height h | Thickness t | Section modulus $W_y$ | Moment of inertia $I_y$ | Bending moment $M_d$ | Single pile weight | Wall weight          |
|---------|----------|-------------|-----------------------|-------------------------|----------------------|--------------------|----------------------|
| [mm]    | [mm]     | [mm]        | [cm <sup>3</sup> /m]  | [cm <sup>4</sup> /m]    | [kNm/m]              | [kg/m]             | [kg/m <sup>2</sup> ] |
| 600     | 80       | 8           | 242                   | 969                     | 60.5                 | 50.0               | 83.3                 |

| Pipe Extension lengths | Width between the guiding frames $b_{co}$ | Width between sheet piles $b_{cu}$ | Overall width b | Weight |
|------------------------|-------------------------------------------|------------------------------------|-----------------|--------|
| [mm]                   | [m]                                       | [m]                                | [m]             | [kg]   |
| 0                      | 0.99-1.29                                 | 1.23-1.53                          | 1.54-1.84       | 71.0   |
| 300                    | 1.29-1.59                                 | 1.53-1.83                          | 1.84-2.14       | + 15.5 |
| 500                    | 1.49-1.79                                 | 1.73-2.03                          | 2.04-2.34       | + 20.0 |
| 800                    | 1.79-2.09                                 | 2.03-2.33                          | 2.34-2.64       | + 26.7 |
| 1000                   | 1.99-2.29                                 | 2.23-2.53                          | 2.54-2.84       | + 31.1 |



# PARALLEL SLIDING SYSTEM

## EGPV SINGLE SLIDING SYSTEM



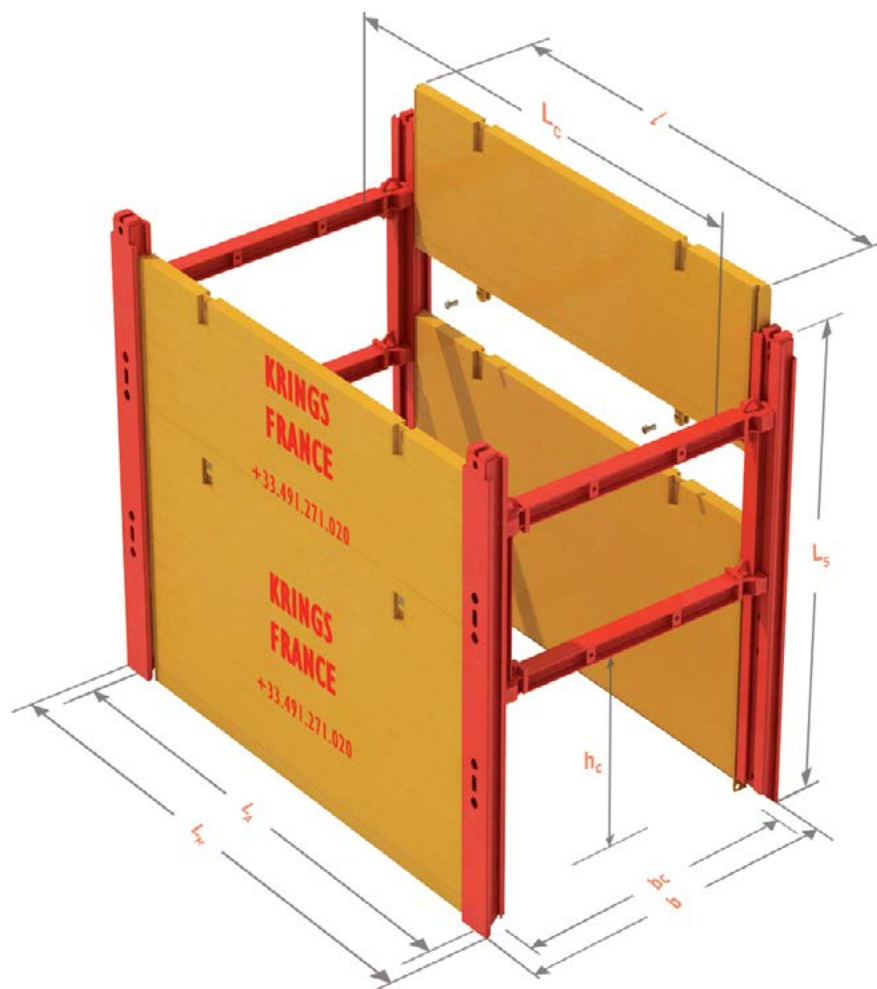
|                          |                       |
|--------------------------|-----------------------|
| <b>Recommended Depth</b> | Max. 4.0 m            |
| <b>Length of Rail</b>    | 4.0 m                 |
| <b>Weight of Rail</b>    | 495 kg                |
| <b>Bending Moment</b>    | 338 kN.m              |
| <b>Stretch Length</b>    | 2.0 m - 6.25 m        |
| <b>Lifting means</b>     | excavator ≈ 15 to 25t |

➤ The single EGPV sliding system allows shoring down up to 4.0m depth. An ideal alternative to the trench where ground conditions are more difficult.

➤ However and based on soil condition, the monoblok boxes are inappropriate. This is the reason why we have developed the light and single slide system. During the excavation and the “ dig and push “ processes, the panels are guided through the single slide rails.

# PARALLEL SLIDING SYSTEM

## EGPV SINGLE SLIDING SYSTEM



|                      |                                            |
|----------------------|--------------------------------------------|
| <b>H</b>             | Panel height                               |
| <b>L</b>             | Panel length                               |
| <b>L<sub>C</sub></b> | Clearance between sliding frames           |
| <b>L<sub>S</sub></b> | Rail length                                |
| <b>L<sub>M</sub></b> | Overall length                             |
| <b>b<sub>C</sub></b> | Effective width between panels             |
| <b>b</b>             | Overall width                              |
| <b>h<sub>C</sub></b> | Vertical Clearance under the sliding frame |



# PARALLEL SLIDING SYSTEM

## EGPV SINGLE SLIDING SYSTEM



| Base Panel LxH | Panel Height                                         | Panel Weight                                           | Overall length $L_m$ | Clearance between sliding frames $L_c$ | Panel thickness $t_{pl}$ | Maximum load ed      |       |
|----------------|------------------------------------------------------|--------------------------------------------------------|----------------------|----------------------------------------|--------------------------|----------------------|-------|
| [m]            | $\frac{\text{Base panel [m]}}{\text{Top panel [m]}}$ | $\frac{\text{Base panel [kg]}}{\text{Top panel [kg]}}$ | [m]                  | [m]                                    | [mm]                     | [kN/m <sup>2</sup> ] |       |
| KR 2.00        | 2,4                                                  | 510                                                    | 2.56                 | 2.10                                   | 100                      | 171.6                |       |
|                | 1,4                                                  | 335                                                    |                      |                                        |                          |                      |       |
| KR 2.50        | 2,4                                                  | 605                                                    | 3.06                 | 2.60                                   |                          |                      | 110.4 |
|                | 1,4                                                  | 400                                                    |                      |                                        |                          |                      |       |
| KR 3.00        | 2,4                                                  | 690                                                    | 3.56                 | 3.10                                   |                          | 81.1                 |       |
|                | 1,4                                                  | 450                                                    |                      |                                        |                          |                      |       |
| KR 3.50        | 2,4                                                  | 805                                                    | 4.06                 | 3.60                                   |                          |                      | 56.6  |
|                | 1,4                                                  | 525                                                    |                      |                                        |                          |                      |       |
| KR 4.00        | 2,4                                                  | 1170                                                   | 4.56                 | 4.10                                   | 120                      | 71.0                 |       |
|                | 1,4                                                  | 745                                                    |                      |                                        |                          |                      |       |
| KR 4.50        | 2,4                                                  | 1305                                                   | 5.06                 | 4.60                                   |                          |                      | 56.2  |
|                | 1,4                                                  | 830                                                    |                      |                                        |                          |                      |       |
| KR 5.00        | 2,4                                                  | 1635                                                   | 5.56                 | 5.10                                   |                          | 72.1                 |       |
|                | 1,4                                                  | 1020                                                   |                      |                                        |                          |                      |       |
| KR 6.25        | 2,4                                                  | 3510                                                   | 6.78                 | 6.32                                   |                          |                      | 66.0  |
|                | 1,4                                                  | 2315                                                   |                      |                                        |                          |                      |       |

For any other dimensions, please consult us.

### Tensile forces at the points of extraction, connection and towing (in the vertical direction) :

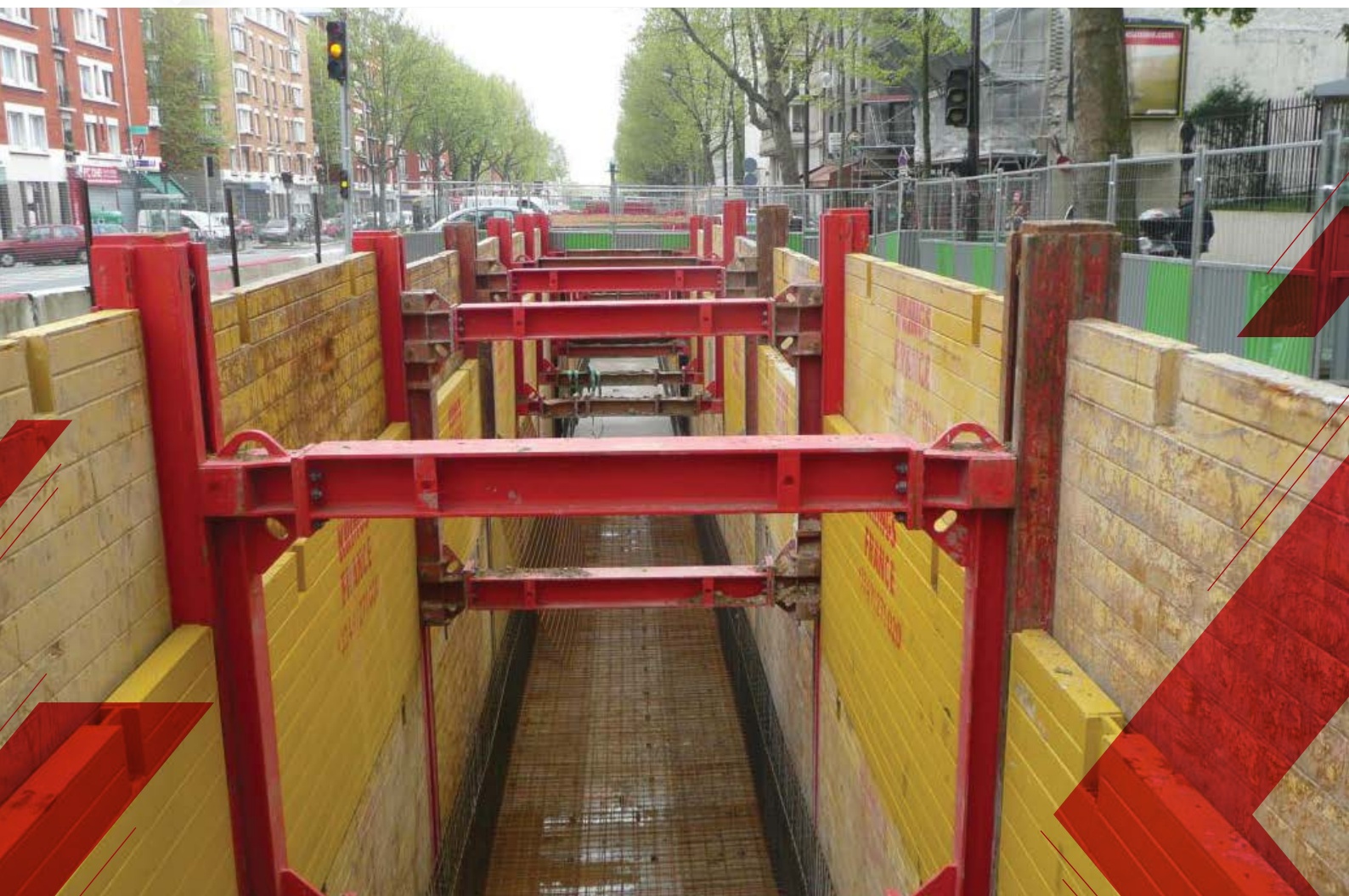
- Lifting ring at the rail head       $R_d=229\text{kN}$
- Lifting eyes at the panel head       $R_d=229\text{kN}$
- Bottom eyes of the panel       $R_d=47\text{kN}$



| Minimum effective width $b_c$ | Minimum overall width $b$ | Frame weight (2 rails without spacers) |
|-------------------------------|---------------------------|----------------------------------------|
| [mm]                          | [mm]                      | [kg]                                   |
| 482                           | 804                       | 1186                                   |

# PARALLEL SLIDING SYSTEM

## DGPV DOUBLE SLIDE SYSTEM

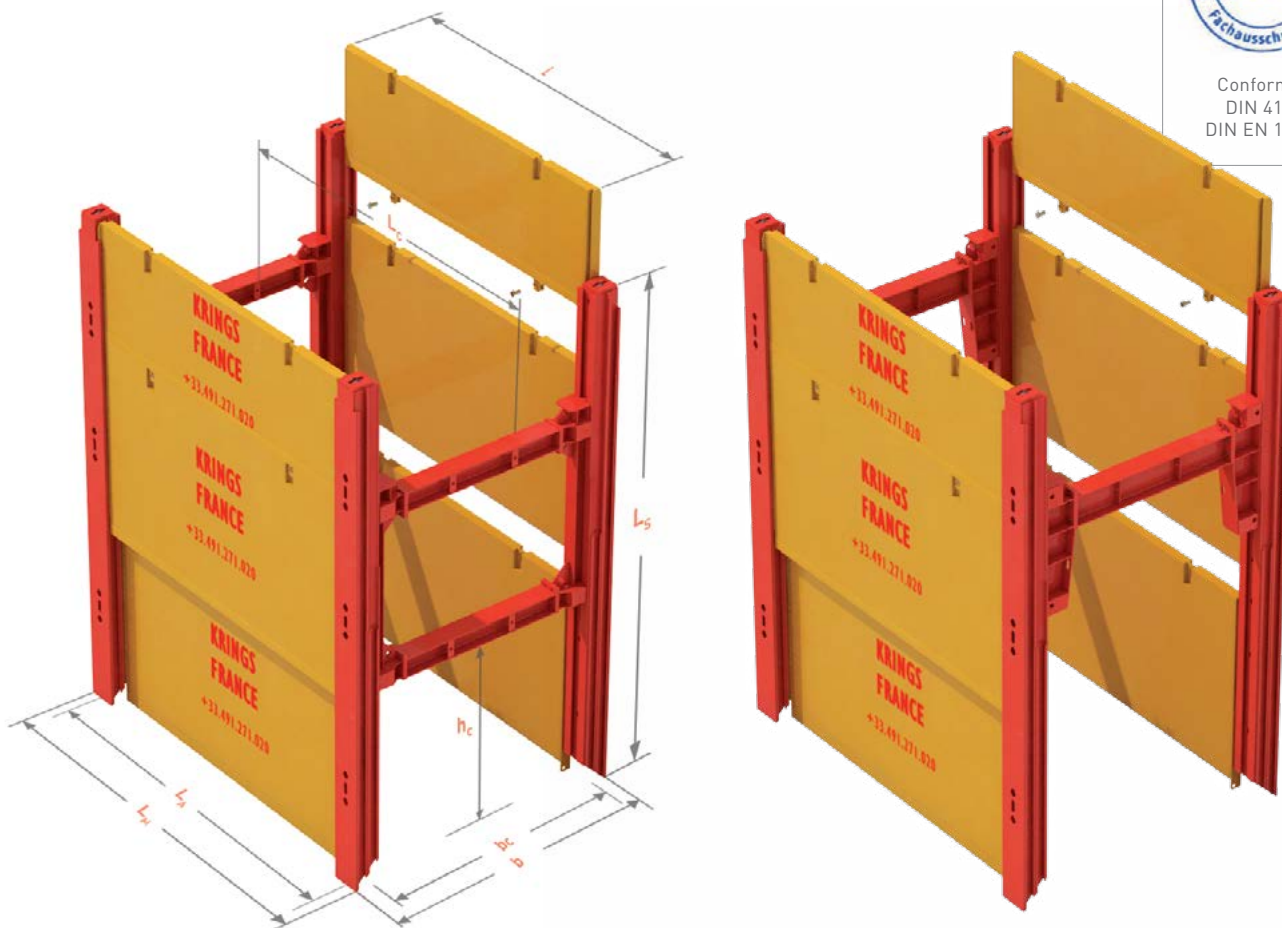


|                          |                               |
|--------------------------|-------------------------------|
| <b>Recommended Depth</b> | Max. 8.0 m                    |
| <b>Length of Rail</b>    | 4.8 / 6.0 / 7.5 m             |
| <b>Weight of Rail</b>    | 1075 / 1355 / 1780 kg         |
| <b>Bending Moment</b>    | 1020 / 1020 / 1106 kN.m       |
| <b>Stretch Length</b>    | 2.0 m - 6.25 m                |
| <b>Lifting means</b>     | excavator $\approx$ 25 to 45t |

➤ The excellence and most commonly use Double Slide System on job sites. The panels are guided and slide down through the robust double slide rails. The double slide Rails stand parallel, while pushed down with the bucket; and the sliding HEB frame or "buggy car" assures a constant width.

➤ The individual action exercised on every element separately, facilitates the removal and extraction, so reducing the strengths of friction of the retained ground.

# PARALLEL SLIDING SYSTEM DGPV DOUBLE SLIDE SYSTEM



|                      |                                        |
|----------------------|----------------------------------------|
| <b>H</b>             | Panel height                           |
| <b>L</b>             | Panel length                           |
| <b>L<sub>c</sub></b> | Clearance space between sliding frames |
| <b>L<sub>s</sub></b> | Rail length                            |
| <b>L<sub>m</sub></b> | Overall length                         |
| <b>b<sub>c</sub></b> | Effective width between panels         |
| <b>b</b>             | Overall width                          |
| <b>h<sub>c</sub></b> | Vertical Clearance under sliding frame |



# PARALLEL SLIDING SYSTEM

## DGPV DOUBLE SLIDE SYSTEM

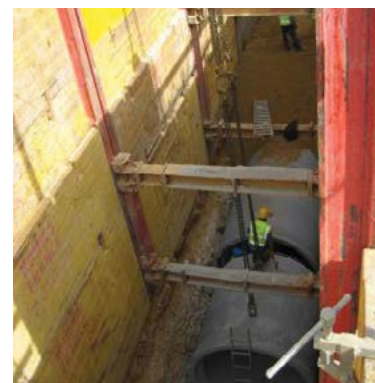


| Base Panel LxH | Panel Height                                         | Panel Weight                                           | Overall length $L_m$ | Clearance between sliding frames $L_c$ | Panel thickness $t_{pl}$ | Maximum load ed      |
|----------------|------------------------------------------------------|--------------------------------------------------------|----------------------|----------------------------------------|--------------------------|----------------------|
| [m]            | $\frac{\text{Base panel [m]}}{\text{Top panel [m]}}$ | $\frac{\text{Base panel [kg]}}{\text{Top panel [kg]}}$ | [m]                  | [m]                                    | [mm]                     | [kN/m <sup>2</sup> ] |
| KR 2.00        | $\frac{2,4}{1,4}$                                    | $\frac{510}{335}$                                      | 2.56                 | 2.10                                   | 100                      | 171.6                |
| KR 2.50        | $\frac{2,4}{1,4}$                                    | $\frac{605}{395}$                                      | 3.06                 | 2.60                                   |                          | 110.4                |
| KR 3.00        | $\frac{2,4}{1,4}$                                    | $\frac{690}{450}$                                      | 3.56                 | 3.10                                   |                          | 81.1                 |
| KR 3.50        | $\frac{2,4}{1,4}$                                    | $\frac{805}{525}$                                      | 4.06                 | 3.60                                   |                          | 56.6                 |
| KR 4.00        | $\frac{2,4}{1,4}$                                    | $\frac{1165}{745}$                                     | 4.56                 | 4.10                                   | 120                      | 71.0                 |
| KR 4.50        | $\frac{2,4}{1,4}$                                    | $\frac{1305}{830}$                                     | 5.06                 | 4.60                                   |                          | 56.2                 |
| KR 5.00        | $\frac{2,4}{1,4}$                                    | $\frac{1630}{1020}$                                    | 5.56                 | 5.10                                   |                          | 73.1                 |
| KR 6.25        | $\frac{2,4}{1,4}$                                    | $\frac{3510}{2315}$                                    | 6.78                 | 6.33                                   |                          | 66.0                 |

For any other dimensions, please consult us.

### Tensile forces at the points of extraction, connection and towing (in the vertical direction) :

- Lifting ring at the rail head       $R_d=229\text{kN}$
- Lifting eyes at the panel head       $R_d=229\text{kN}$
- Bottom eyes of the panel       $R_d=47\text{kN}$



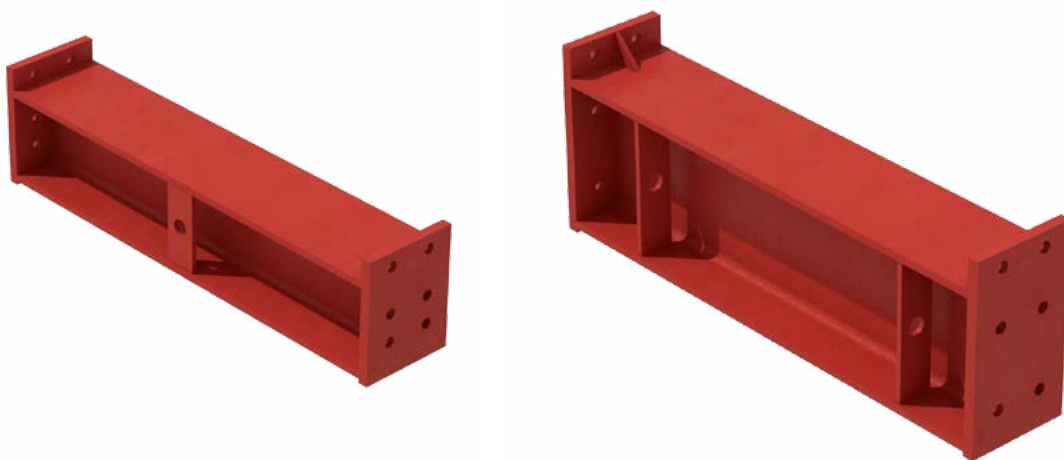
# PARALLEL SLIDING SYSTEM

## DGPV DOUBLE SLIDE SYSTEM



| Type of rail | Length | Thickness of rail | Bending moment | Weight |
|--------------|--------|-------------------|----------------|--------|
|              | [m]    | [mm]              | [kNm]          | [kg]   |
| DGPV         | 4.80   | 320               | 1020           | 1075   |
| DGPV         | 6.00   | 320               | 1020           | 1355   |
| DGPV         | 7.50   | 325               | 1106           | 1780   |

| Type of Sliding Frame | Length | Spacer dimension | Minimum width between panels | Weight |
|-----------------------|--------|------------------|------------------------------|--------|
|                       | [m]    | [mm]             | [m]                          | [kg]   |
| DGLW                  | 2.00   | 240*305          | 0.73                         | 308    |
| DGLW                  | 2.80   | 240*305          | 0.73                         | 343    |
| DGU-LW                | 1.45   | 300*580          | 0.92                         | 488    |



# SPINDLE SLIDING SYSTEM

## DGFP DOUBLE SLIDE SYSTEM



|                          |                              |
|--------------------------|------------------------------|
| <b>Recommended Depth</b> | Max. 7.5 m                   |
| <b>Length of Rail</b>    | 4.5 / 5.5 m                  |
| <b>Weight of Rail</b>    | 397 / 489 kg                 |
| <b>Bending Moment</b>    | 360 kN.m                     |
| <b>Stretch Length</b>    | 2.0 m - 6.25 m               |
| <b>Lifting means</b>     | excavator $\approx$ 25 - 30t |

➤ This DGFP double slide system is the oldest system but still very much in use for large areas. Simple and quick to assemble, it combines versatility with multi-functionality.

➤ It's the lightest of all the double slide systems. The variable widths are adjusted with standard spindles (the same than for the trench boxes). Spring spindles holder or jacks are fixed to the rails.

# SPINDLE SLIDING SYSTEM

## DGFP DOUBLE SLIDE SYSTEM



|                      |                                            |
|----------------------|--------------------------------------------|
| <b>H</b>             | Panel height                               |
| <b>L</b>             | Panel length                               |
| <b>L<sub>c</sub></b> | Clearance between spacers                  |
| <b>L<sub>s</sub></b> | Rail length                                |
| <b>L<sub>m</sub></b> | Overall length                             |
| <b>b<sub>c</sub></b> | Effective width between panels             |
| <b>b</b>             | Overall width                              |
| <b>h<sub>c</sub></b> | Vertical Clearance under the sliding frame |



# SPINDLE SLIDING SYSTEM

## DGFP DOUBLE SLIDE SYSTEM



| Base Panel<br>LxH | Panel Height                    | Panel Weight                      | Overall<br>length $L_m$ | Clearance<br>between sliding<br>frames $L_c$ | Panel<br>thickness<br>$t_{pl}$ | Maximum<br>load ed   |
|-------------------|---------------------------------|-----------------------------------|-------------------------|----------------------------------------------|--------------------------------|----------------------|
| [m]               | Base panel [m]<br>Top panel [m] | Base panel [kg]<br>Top panel [kg] | [m]                     | [m]                                          | [mm]                           | [kN/m <sup>2</sup> ] |
| KR 2.00           | 2,4                             | 510                               | 2.35                    | 2.03                                         | 100                            | 171.6                |
|                   | 1,4                             | 335                               |                         |                                              |                                |                      |
| KR 2.50           | 2,4                             | 605                               | 2.85                    | 2.53                                         |                                |                      |
|                   | 1,4                             | 395                               |                         |                                              |                                |                      |
| KR 3.00           | 2,4                             | 690                               | 3.27                    | 2.95                                         |                                |                      |
|                   | 1,4                             | 450                               |                         |                                              |                                |                      |
| KR 3.50           | 2,4                             | 805                               | 3.85                    | 3.53                                         |                                |                      |
|                   | 1,4                             | 525                               |                         |                                              |                                |                      |
| KR 4.00           | 2,4                             | 1165                              | 4.35                    | 4.03                                         | 120                            | 71.0                 |
|                   | 1,4                             | 745                               |                         |                                              |                                |                      |
| KR 4.50           | 2,4                             | 1305                              | 4.85                    | 4.53                                         |                                |                      |
|                   | 1,4                             | 830                               |                         |                                              |                                |                      |
| KR 5.00           | 2,4                             | 1630                              | 5.35                    | 5.03                                         |                                |                      |
|                   | 1,4                             | 1020                              |                         |                                              |                                |                      |
| KR 6.25           | 2,4                             | 3510                              | 6.57                    | 6.26                                         |                                |                      |
|                   | 1,4                             | 2315                              |                         |                                              |                                |                      |

For any other dimensions, please consult us.

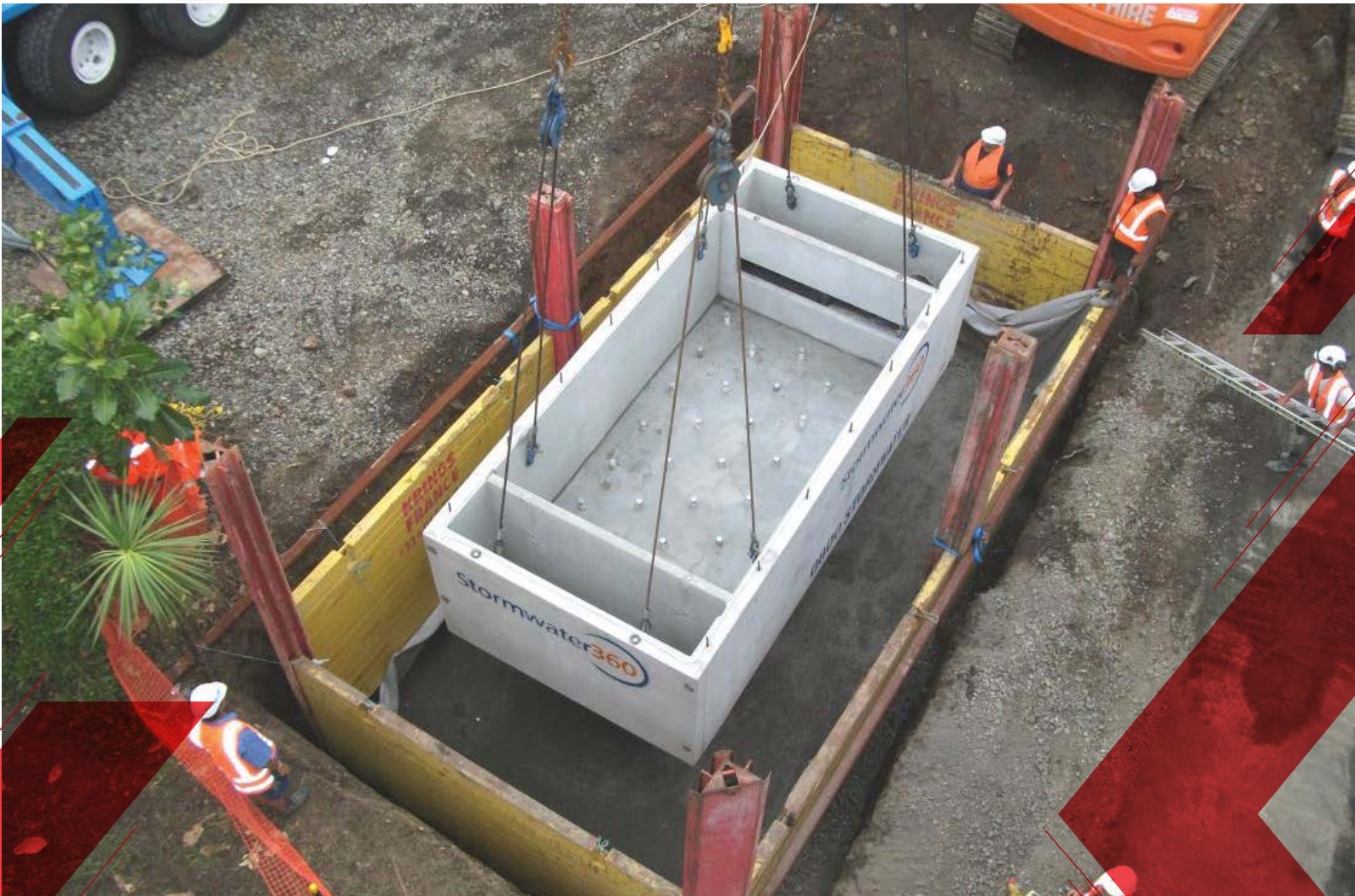
### Tensile forces at the points of extraction, connection and towing (in the vertical direction) :

- Lifting ring at the rail head  $R_d=229kN$
- Lifting eyes at the panel head  $R_d=229kN$
- Bottom eyes of the panel  $R_d=47kN$

| Minimum<br>effective<br>width $b_c$ | Minimum<br>overall<br>width $b$ | Frame weight<br>(2 rails without<br>spindle-extensions) |
|-------------------------------------|---------------------------------|---------------------------------------------------------|
| [mm]                                | [mm]                            | [kg]                                                    |
| 871                                 | 1671                            | 1007/1191                                               |



# SLIDING SYSTEM CORNER SLIDE RAILS



|                          |                      |
|--------------------------|----------------------|
| <b>Recommended Depth</b> | Max. 8.0 m           |
| <b>Length of Rail</b>    | 3.5 / 5.5 / 7.5 m    |
| <b>Weight of Rail</b>    | 192 / 840 / 1155 kg  |
| <b>Bending Moment</b>    | 113 / 363 kN.m       |
| <b>Stretch Length</b>    | 2.0 m - 6.25 m       |
| <b>Lifting means</b>     | Excavator ≈ 25 – 45t |

- This system is used where there is a requirement for shoring four sides of an excavation and to reduce its overall size.
- Various sliding corner rails and panels, guarantee multiple dimensional combinations while assuring comfort and safety.
- Ideal for the installation of tanks, construction of pits, wells and pumping stations.

Note: KKP sheet pile frames can be substituted for solid panels on two sides where entry & exit is required or where services cross the excavation.

# SLIDING SYSTEM CORNER SLIDE RAILS



|                      |                                |
|----------------------|--------------------------------|
| <b>L</b>             | Panel height                   |
| <b>L<sub>s</sub></b> | Corner Rail length             |
| <b>L<sub>m</sub></b> | Overall length                 |
| <b>b<sub>c</sub></b> | Effective width between panels |
| <b>b</b>             | Overall width                  |



# SLIDING SYSTEM

## SINGLE CORNER SLIDE RAILS



| Panel length | Panel Height                    | Panel Weight                      | Panel thickness | Maximum load ed      | Working width $b_c$ | Overall length-panel | Overall length-corner rail |
|--------------|---------------------------------|-----------------------------------|-----------------|----------------------|---------------------|----------------------|----------------------------|
| [m]          | Base panel [m]<br>Top panel [m] | Base panel [kg]<br>Top panel [kg] | [mm]            | [kN/m <sup>2</sup> ] | [m]                 | [m]                  | [m]                        |
| KR 2.00      | 2,4                             | 510                               | 100             | 171.6                | 2,10                | 2,30                 | 2,41                       |
|              | 1,4                             | 335                               |                 |                      |                     |                      |                            |
| KR 2.50      | 2,4                             | 605                               |                 | 110.4                | 2,60                | 2,80                 | 2,91                       |
|              | 1,4                             | 395                               |                 |                      |                     |                      |                            |
| KR 3.00      | 2,4                             | 690                               |                 | 81.1                 | 3,02                | 3,22                 | 3,33                       |
|              | 1,4                             | 450                               |                 |                      |                     |                      |                            |
| KR 3.50      | 2,4                             | 805                               |                 | 56.6                 | 3,60                | 3,80                 | 3,91                       |
|              | 1,4                             | 525                               |                 |                      |                     |                      |                            |
| KR 4.00      | 2,4                             | 1165                              | 120             | 71.0                 | 4,06                | 4,30                 | 4,41                       |
|              | 1,4                             | 745                               |                 |                      |                     |                      |                            |
| KR 4.50      | 2,4                             | 1305                              |                 | 56.2                 | 4,56                | 4,80                 | 4,91                       |
|              | 1,4                             | 830                               |                 |                      |                     |                      |                            |
| KR 5.00      | 2,4                             | 1630                              |                 | 73.1                 | 5,06                | 5,30                 | 5,41                       |
|              | 1,4                             | 1020                              |                 |                      |                     |                      |                            |
| KR 6.25      | 2,4                             | 3510                              |                 | 66.0                 | 6,29                | 6,53                 | 6,64                       |
|              | 1,4                             | 2315                              |                 |                      |                     |                      |                            |

For any other dimensions, please consult us.

### EGECK 3000/3500/4000

| Bending moment | Overall width mini b | Corner rail weight |
|----------------|----------------------|--------------------|
| [kNm]          | [mm]                 | [kg]               |
| 113            | 218                  | 164/192/218        |



# SLIDING SYSTEM

## DOUBLE CORNER SLIDE RAIL



| Panel length | Panel thickness | CORNER RAILS SD     |                      |                            | CORNER RAILS HD     |                      |                            |
|--------------|-----------------|---------------------|----------------------|----------------------------|---------------------|----------------------|----------------------------|
|              |                 | working width $b_c$ | Overall length-panel | Overall length-corner rail | working width $b_c$ | Overall length-panel | Overall length-corner rail |
| [m]          | [mm]            | [m]                 | [m]                  | [m]                        | [m]                 | [m]                  | [m]                        |
| KR 2.00      | 100             | 2,10                | 2,60                 | 2,71                       | 2,15                | 2,65                 | 2,77                       |
| KR 2.50      |                 | 2,60                | 3,10                 | 3,21                       | 2,65                | 3,15                 | 3,27                       |
| KR 3.00      |                 | 3,02                | 3,52                 | 3,63                       | 3,07                | 3,57                 | 3,69                       |
| KR 3.50      |                 | 3,60                | 4,10                 | 4,21                       | 3,65                | 4,15                 | 4,27                       |
| KR 4.00      | 120             | 4,06                | 4,60                 | 4,71                       | 4,11                | 4,65                 | 4,77                       |
| KR 4.50      |                 | 4,56                | 5,10                 | 5,21                       | 4,61                | 5,15                 | 5,27                       |
| KR 5.00      |                 | 5,06                | 5,60                 | 5,71                       | 5,11                | 5,65                 | 5,77                       |
| KR 6.25      |                 | 6,29                | 6,83                 | 6,94                       | 6,33                | 6,87                 | 7,00                       |

For other dimensions, please consult us.

### DGECK 4500/5000/5500

| Bending moment | Overall width mini b | Corner rail weight |
|----------------|----------------------|--------------------|
| [kNm]          | [mm]                 | [kg]               |
| 363            | 305                  | 714/780/840        |

SD = Standard

HD = Heavy Duty, anti rotation device



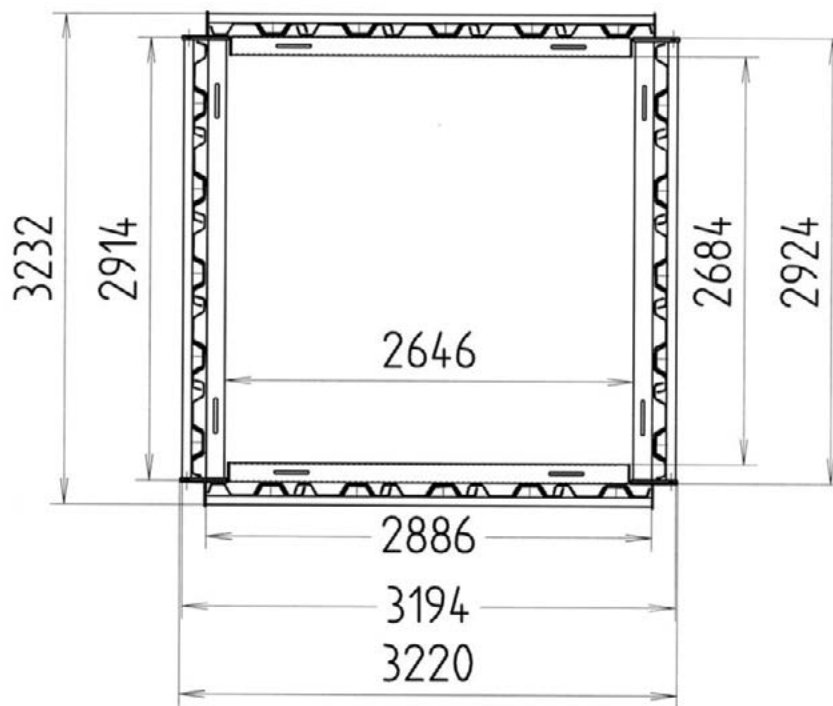


|                                       |            |
|---------------------------------------|------------|
| <b>Recommended depth</b>              | Max. 4.5 m |
| <b>Panel length</b>                   | 3.20 m     |
| <b>Effective width between panels</b> | 2.65 m     |
| <b>Complete box weight</b>            | 2650 kg    |
| <b>Type of sheet pile</b>             | KD6-8      |
| <b>N° of sheet piles per pit</b>      | 20 units   |

➤ This sheet pile guide box is ideal for urban works and specially designed for congested working areas.

➤ The KD6-8 sheet piles are guided during the excavation and the “dig and push” processes; therefore reducing ground decompression.

# PIT BOX SHEET PILES



|                        |                        |
|------------------------|------------------------|
| <b>Sheet pile type</b> | KD6-8                  |
| <b>Width</b>           | 600 mm                 |
| <b>Height</b>          | 80 mm                  |
| <b>Thickness</b>       | 8 mm                   |
| <b>Weight</b>          | 50 kg/m                |
| <b>Section Modulus</b> | 242 cm <sup>3</sup> /m |





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