

SLOT CHANNELS



Stavby jako z kamene
CS-BETON

www.csbeton.cz



IS01 CSB – SLOT CHANNEL - PROFILE M

color GRAY
surface VIBROCASTING without treatment

The micro-slotted pipes are designed for the discharge of the rain water and oil substances (leakage) from the reinforced surfaces, i.e. dewatering common roads, lay-by areas, parking spaces, courtyards, petrol stations, etc. Due to the relatively low weight of the elements, the system is assembly is possible without any lifting devices.

CSB – channel slot with
slot dashed corner



CSB – channel slot to slot
dashed, with no drop in the bottom



CSB – channel slot
- an element of inspection



IS01 CSB – SLOT CHANNEL - PROFILE M

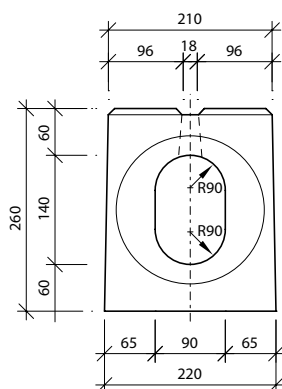
| Basic specifications | JM | Label | Dimensions length/width/height | Weight kg/piece |
|--|------|----------|--------------------------------|-----------------|
| CSB – The dotted slot channel, without slope | pcs. | M-T | 210-220/260/1000 | 103 |
| CSB – The dotted slot channel, with 0,5 % slope | pcs. | M-G | 210-220/260/1000 | 103 - 113 |
| CSB – The dotted slot channel, narožnikový | pcs. | M-corner | 400/260/400 | 67 |
| CSB – Sump unit (tongue-groove) with outlet incl. ductile iron cover | pcs. | M-VO | 210-220/260/1000 | 238 |
| CSB – Sump unit (groove-groove) with outlet incl. ductile iron cover | pcs. | M-VU | 210-220/260/1000 | 236 |
| CSB – Cleaning element (tongue-groove) incl. ductile iron cover | pcs. | M-CO | 210-220/260/1000 | 114 |
| CSB – Cleaning element (tongue-tongue) incl. ductile iron cover | pcs. | M-CS | 210-220/260/1000 | 125 |
| CSB – Front cap (tongue) | pcs. | M-ZU | 210-220/260/120 | 15 |
| CSB – End cap (groove) | pcs. | M-ZZ | 210-220/260/120 | 11 |

BENEFITS & ADVANTAGES

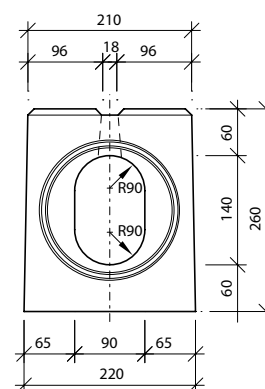
- The basic profile has trapezoid shape
- The flow profile with width 90 and height 140 mm, the elements with internal decline and without
- The length of the basic element is 1 m, weight of the basic element is 103 kg
- The concrete used complies with ČSN EN 206 - 1, the concrete used is resistant to the effects of aggressive environment XF4
- Dimensioned for traffic load D400
- Perfect connection of the elements by means of rubber profiles and special putty = decline impermeability, rubber forms 5 mm joint
- It requires simple maintenance provided by cleaning parts and riggots, riggot and cleaning elements are fitted with alloy grid
- The fitting option in direction arches in recommended radius R 40 m due to maintaining gradual polygon

Nominal dimensions - such as the basic shape:

**Side view
GROOVE**



**Side view
TONGUE**





IS02 CSB - SLOT CHANNEL - PROFILE T

color GRAY
surface VIBROCASTING without treatment

Quick and effective drainage is guaranteed due to the special shape of the inner profile. The profile T-1 slot channel is mainly used in areas where a low installation height is required. This channel type can also be installed in public traffic areas, e.g. with pedestrian zones where bikes are used, without restriction.

CSB – channel with a continuous
slot curb 12 cm



CSB – channel
with slot dotted



CSB – channel
the continuous slot



IS02 CSB - SLOT CHANNEL - PROFILE T

Basic specifications

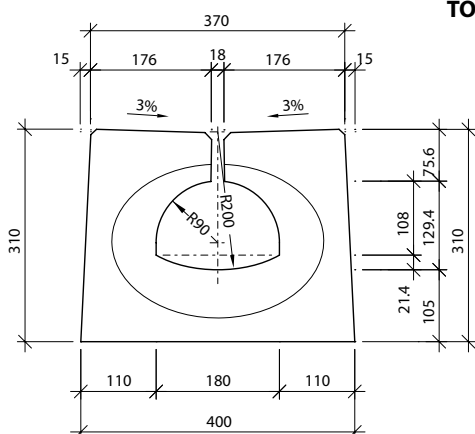
| | JM | Label | Dimensions length/width/height | Weight kg/piece |
|--|------|----------|--------------------------------|-----------------|
| CSB – Slot channel ze szczeliną ciągłą | pcs. | T-0 | 370-400/310/4000 | 945 |
| CSB – The dotted slot channel | pcs. | T-1 | 370-400/310/4000 | 995 |
| CSB – Sump unit (tongue-groove) with outlet incl. ductile iron cover | pcs. | T-V0 | 370-400/310/1000 | 233 |
| CSB – Sump unit (groove-groove) with outlet incl. ductile iron cover | pcs. | T-VU | 370-400/310/1000 | 225 |
| CSB – Cleaning element (tongue-groove) incl. ductile iron cover | pcs. | T-C0 | 370-400/310/1000 | 232 |
| CSB – Cleaning element (tongue-tongue) incl. ductile iron cover | pcs. | T-CS | 370-400/310/1000 | 240 |
| CSB – Fire protection element | pcs. | T-0-PP | 370-400/600/1000 | 511 |
| CSB – Front cap (tongue) | pcs. | T-ZU | 370-400/310/120 | 39 |
| CSB – End cap (groove) | pcs. | T-ZZ | 370-400/310/120 | 27 |
| CSB – Slot channel ze szczeliną ciągłą with curb 12 cm | pcs. | T-3 | 370-400/310/4000 | 1061 |
| CSB – Box drain with cast iron grate with curb 12 cm (tongue, groove) | pcs. | T-3-V0 | 370-400/310/1000 | 266 |
| CSB – Box drain with cast iron grate with curb 12 cm (groove, groove) | pcs. | T-3-VU | 370-400/310/1000 | 257 |
| CSB – Inspection element with cast iron grate with curb 12 cm (tongue, groove) | pcs. | T-3-C0 | 370-400/310/1000 | 264 |
| CSB – Inspection element with cast iron grate with curb 12 cm (tongue, tongue) | pcs. | T-3-CS | 370-400/310/1000 | 272 |
| CSB – Fire protection element with curb 12 cm | pcs. | T-3-PP | 370-410/600/1000 | 543 |
| CSB – Continuous channel with a gap and curb 0-12 cm, ramp | pcs. | T-0-3 | 370-400/310/1000 | 277 |
| CSB – Continuous channel with a gap and curb 0-12 cm, ramp | pcs. | T-3-0 | 370-400/310/1000 | 277 |
| CSB – Curb special | pcs. | T-3-O | 363-370/150/2000 | 310 |
| CSB – Curb special, ramp, left 12-0 cm | pcs. | T-3-O-NL | 363-370/150/1000 | 142 |
| CSB – Curb special, ramp, right 0-12 cm | pcs. | T-O-3-N | 363-370/150/1000 | 142 |
| CSB – Front cap (tongue) with curb 12 cm | pcs. | T-3-ZU | 370-400/310/120 | 42 |
| CSB – End cap (groove) with curb 12 cm | pcs. | T-3-ZZ | 370-400/310/120 | 30 |

BENEFITS & ADVANTAGES

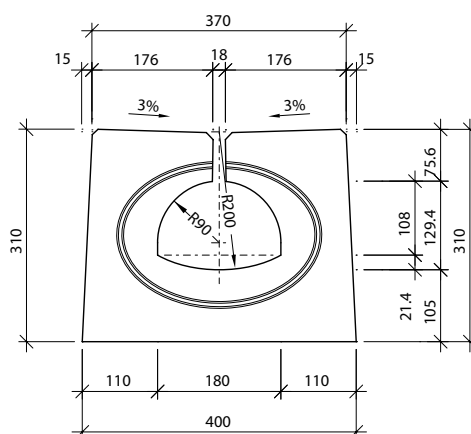
- Element length 4 m - without internal slope
- Inner diameter: 18 x 13 cm
- with interrupted slot - slot width 18 mm
- Drainage cross section: 187 cm²
- 3 % surface slope to the slot
- resilient up to class D 400 kN
- Complete accessories: sump unit, cleaning element, front- and end caps

Nominal dimensions - such as the basic shape:

Side view
GROOVE



Side view
TONGUE





IS04 CSB - SLOT CHANNEL - profile II

color GRAY
surface VIBROCASTING without treatment

Slot channels with profile II have a large drainage cross section and are used in areas with high hydraulic requirements. They ensure controlled surface drainage and are successfully used, mainly in aviation areas, container terminals and industrial or port facilities.

CSB – channel
the continuous slot



CSB – channel
with slot dotted



IS04 CSB – SLOT CHANNEL - profile II

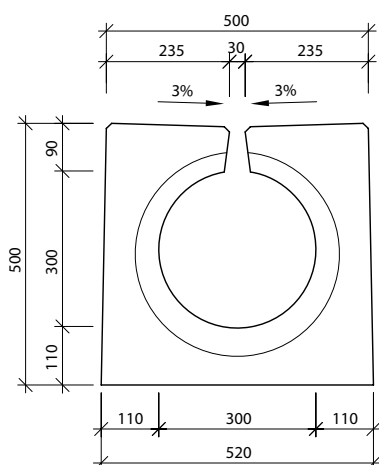
| Basic specifications | JM | Label | Dimensions length/width/height | Weight kg/piece |
|--|------|-------|--------------------------------|-----------------|
| CSB – Slot channel without slope | pcs. | II-0 | 500-520/500/4000 | 1673 |
| CSB – The dotted slot channel | pcs. | II-1 | 500-520/500/4000 | 1700 |
| CSB – Sump unit (tongue-groove) with outlet incl. ductile iron cover | pcs. | II-V0 | 500-520/500/1000 | 347 |
| CSB – Sump unit (groove-groove) with outlet incl. ductile iron cover | pcs. | II-VU | 500-520/500/1000 | 337 |
| CSB – Cleaning element (tongue-groove) incl. ductile iron cover | pcs. | II-C0 | 500-520/500/1000 | 377 |
| CSB – Cleaning element (tongue-tongue) incl. ductile iron cover | pcs. | II-CS | 500-520/500/1000 | 387 |
| CSB – Front cap (tongue) | pcs. | II-ZU | 500-520/500/120 | 84 |
| CSB – End cap (groove) | pcs. | II-ZZ | 500-520/500/120 | 57 |

BENEFITS & ADVANTAGES

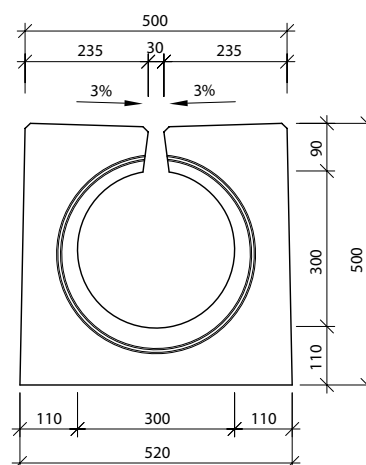
- Element length 4 m - without internal slope
- Inner diameter: 30 x 30
- with interrupted slot - slot width 30 mm
- Drainage cross section: 706 cm² for 30x30
- 3 % surface slope to the slot
- resilient up to class D 400 kN or F 900 kN
- Complete accessories: sump unit, cleaning element, front- and end caps

Nominal dimensions - such as the basic shape:

**Side view
GROOVE**



**Side view
TONGUE**





IS05 CSB - SLOT CHANNEL - profile III

color GRAY
surface VIBROCASTING without treatment

Slot channels with profile III have a large drainage cross section and are used in areas with high hydraulic requirements. They ensure controlled surface drainage and are successfully used, mainly in aviation areas, container terminals and industrial or port facilities.

CSB – channel
the continuous slot



CSB – channel
with slot dotted



IS05 CSB - SLOT CHANNEL - profile III

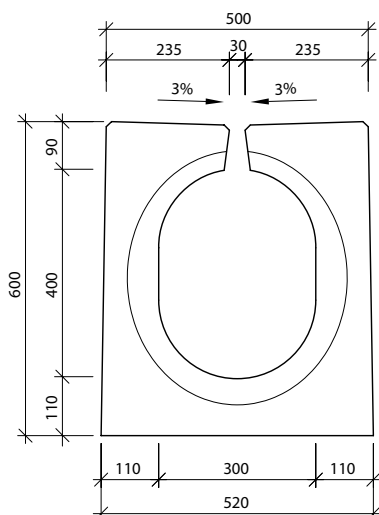
| Basic specifications | JM | Label | Dimensions length/width/height | Weight kg/piece |
|--|------|--------|--------------------------------|-----------------|
| CSB – Slot channel without slope | pcs. | III-0 | 500-520/600/4000 | 1869 |
| CSB – The dotted slot channel | pcs. | III-1 | 500-520/600/4000 | 1897 |
| CSB – Sump unit (tongue-groove) with outlet incl. ductile iron cover | pcs. | III-V0 | 500-520/600/1000 | 396 |
| CSB – Sump unit (groove-groove) with outlet incl. ductile iron cover | pcs. | III-VU | 500-520/600/1000 | 385 |
| CSB – Cleaning element (tongue-groove) incl. ductile iron cover | pcs. | III-C0 | 500-520/600/1000 | 426 |
| CSB – Cleaning element (tongue-tongue) incl. ductile iron cover | pcs. | III-CS | 500-520/600/1000 | 437 |
| CSB – Front cap (tongue) | pcs. | III-ZU | 500-520/600/120 | 102 |
| CSB – End cap (groove) | pcs. | III-ZZ | 500-520/600/120 | 67 |

BENEFITS & ADVANTAGES

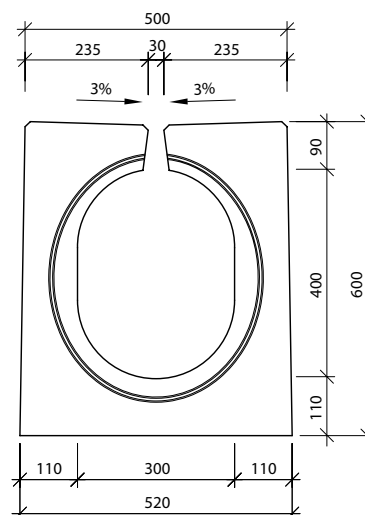
- Element length 4 m - without internal slope
- Inner diameter: 30 x 40 cm
- with interrupted slot - slot width 30 mm
- Drainage cross section: 1.006 cm² for 30x40
- 3 % surface slope to the slot
- resilient up to class D 400 kN or F 900 kN
- Complete accessories: sump unit, cleaning element, front- and end caps

Nominal dimensions - such as the basic shape:

**Side view
GROOVE**



**Side view
TONGUE**





IS06 CSB - SLOT CHANNEL - profile IV

color GRAY
surface VIBROCASTING without treatment

The slotted pipes are designed for the discharge of the rain water and oil substances (leakage) from the reinforced surfaces, i.e. dewatering the most demanding roads, motorways, class I roads, tunnels, airports, parking spaces, etc. The profile has a compliant flow capacity as the profile IV, but the layout of the thrust profile is lower and wider. The element is suitable into the locations with high rain rate with the condition of the lowest bending. They are made only in descent-free variant. The elements are dimensioned for the class of transport load D400, and they are not designed for cross travels.

CSB – channel the continuous slot



CSB – channel with slot dotted



IS06 CSB - SLOT CHANNEL - profile IV

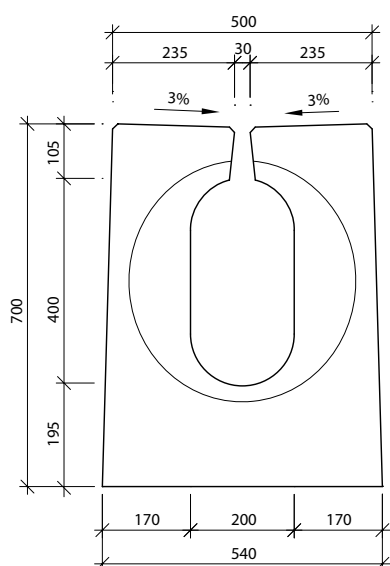
| Basic specifications | JM | Label | Dimensions length/width/height | Weight kg/piece |
|--|------|--------|--------------------------------|-----------------|
| CSB – Slot channel the continuous slot | pcs. | IV-0 | 500-540/700/4000 | 2632 |
| CSB – Slot channel the continuous slot, with 0,5 % slope | pcs. | IV-0-G | 500-540/700/4000 | 2651-2993 |
| CSB – Slot dotted channel | pcs. | IV-1 | 500-540/700/4000 | 2650 |
| CSB – Slot dotted channel ze szczeliną przerywaną, with 0,5 % slope | pcs. | IV-1-G | 500-540/700/4000 | 2669-3011 |
| CSB – Sump unit (tongue-groove) with outlet incl. ductile iron cover | pcs. | IV-V0 | 500-540/700/1000 | 688 |
| CSB – Sump unit (groove-groove) with outlet incl. ductile iron cover | pcs. | IV-VU | 500-540/700/1000 | 668 |
| CSB – Cleaning element (tongue-groove) incl. ductile iron cover | pcs. | IV-C0 | 500-540/700/1000 | 713 |
| CSB – Cleaning element (tongue-tongue) incl. ductile iron cover | pcs. | IV-CS | 500-540/700/1000 | 733 |
| CSB – Front cap (tongue) | pcs. | IV-ZU | 500-540/700/100 | 85 |
| CSB – End cap (groove) | pcs. | IV-ZZ | 500-540/700/150 | 75 |

BENEFITS & ADVANTAGES

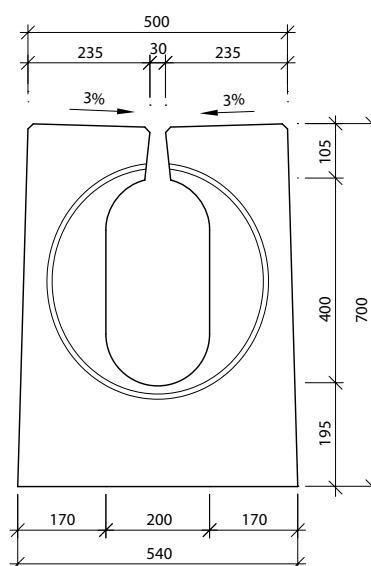
- The basic profile has trapezoid shape
- The flow profile with width 200 and height 400 mm, the elements with internal decline and without
- The length of the basic element is 4 m, weight is between 2.6 and 3.0 t
- The concrete used C 45/55 complies with ČSN EN 206 - 1, the concrete used is resistant to the effects of aggressive environment XF4
- Dimensioned for the traffic load class D400, E600, F900 (only profiles with interrupted slot)
- Perfect connection of the elements by means of rubber profiles and special putty = decline impermeability, rubber forms 5 mm joint
- It requires simple maintenance provided by cleaning parts and riggots, riggot and cleaning elements are fitted with alloy grid or plastic cover
- The fitting option in direction arches in recommended radius R 200 m due to maintaining gradual polygon

Nominal dimensions - such as the basic shape:

**Side view
GROOVE**



**Side view
TONGUE**





IS07 CSB - SLOT CHANNEL - profile V

color GRAY
surface VIBROCASTING without treatment

The line discharge element complies in capacity with the slotted gutters of profile I. The differences of the profile is formed by eccentrically misaligned inflow slot. The misalignment guarantees the sufficiency of space on the application of white guiding strip indicating the edge of the traffic line on the surface of the slotted gutter. The slotted pipes are designed for discharging rainwater in particular from reinforced surfaces of the tunnels and adjacent area. The V profile elements are made in the variance with the curb 12 and 15 cm or without the curb with continual or interrupted slot. The elements are dimensioned for the class of transport load D400. The element with interrupted slot is designed for the declined travels.

CSB – channel with a slot
continuous asymmetric
with curb 15 cm



CSB – channel with a continuous slot
asymmetric



IS07 CSB - SLOT CHANNEL - profile V

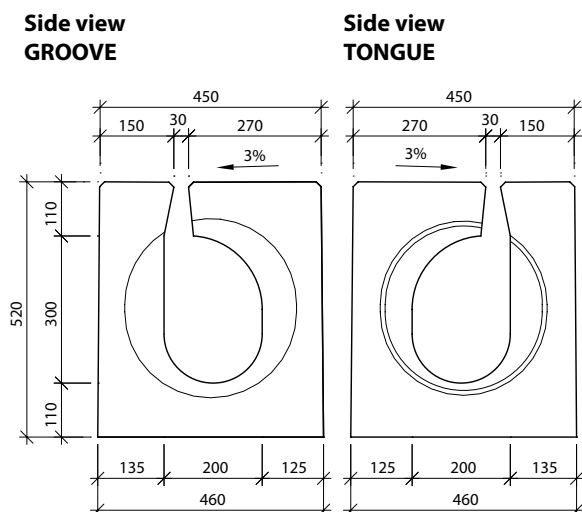
| Basic specifications | JM | Label | Dimensions length/width/height | masa (kg/pcs.) |
|--|------|--------|--------------------------------|----------------|
| CSB – Slot channel with a slot continuous asymmetric | pcs. | V-0 | 450-460/520/4000 | 1660 |
| CSB – Sump unit (tongue-groove) with outlet incl. ductile iron cover | pcs. | V-VO | 450-460/520/4000 | 408 |
| CSB – Sump unit (groove-groove) with outlet incl. ductile iron cover | pcs. | V-VU | 450-460/520/4000 | 356 |
| CSB – Cleaning element (tongue-groove) incl. ductile iron cover | pcs. | V-C0 | 450-460/520/4000 | 345 |
| CSB – Cleaning element (tongue-tongue) incl. ductile iron cover | pcs. | V-CS | 450-460/520/4000 | 465 |
| CSB – Front cap (tongue) | pcs. | V-ZU | 450-460/520/120 | 77 |
| CSB – End cap (groove) | pcs. | V-ZZ | 450-460/520/120 | 54 |
| CSB – Slot channel with a slot continuous asymmetric with curb 15 cm | pcs. | V-4 | 450-460/670/4000 | 1849 |
| CSB – Sump unit with curb 15 cm incl. ductile iron cover - (tongue, groove) | pcs. | V-4-VO | 450-460/670/1000 | 428 |
| CSB – Sump unit with curb 15 cm incl. ductile iron cover - (groove, groove) | pcs. | V-4-VU | 450-460/670/1000 | 376 |
| CSB – Cleaning element with curb 15 cm incl. ductile iron cover - (tongue, groove) | pcs. | V-4-CO | 450-460/670/1000 | 365 |
| CSB – Cleaning element with curb 15 cm incl. ductile iron cover - (groove, groove) | pcs. | V-4-CS | 450-460/670/1000 | 485 |
| CSB – Fire protection element with curb 15 cm | pcs. | V-4-PP | 450-460/670/2000 | 1727 |
| CSB – Front cap (tongue) with curb 15 cm | pcs. | V-4-ZU | 450-460/670/120 | 82 |
| CSB – End cap (groove) with curb 15 cm | pcs. | V-4-ZZ | 450-460/670/120 | 60 |

BENEFITS & ADVANTAGES

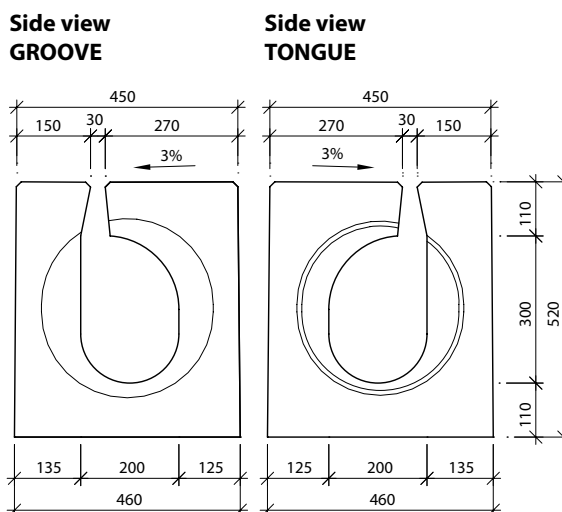
- The basic profile has trapezoid shape and eccentrically misaligned inflow slot
- The slot is made with curb 12 and 15 cm
- The flow profile with width 200 and height 300 mm, the elements without internal decline
- The length of the basic element is 4 m, weight is between 1.6 and 1.9 t
- The concrete used C 45/55 complies with ČSN EN 206 - 1, the concrete used is resistant to the effects of aggressive environment XF4
- Dimensioned for traffic load D400
- Perfect connection of the elements by means of rubber profiles and special putty = decline impermeability, rubber forms 5 mm joint
- It requires simple maintenance provided by cleaning parts and riggots, riggot and cleaning elements are fitted with alloy grid or plastic cover
- The fitting option in direction arches in recommended radius R 200 m due to maintaining gradual polygon

Nominal dimensions - such as the basic shape:

Left profile



Right profile





IS08 CSB - SLOT CHANNEL - profile VI

color GRAY
surface VIBROCASTING without treatment

The item dewatering channel of the highest capacity, the manufacturer CS-BETON s.r.o. Flat drainage, axially aligned transverse profile with continual or interrupted slots. The components are divided by a slot for transverse passages. The system is produced only in curb-free design. The elements are constructed with the load class D400, E600 and F900. The elements VI profile are recognized for high permeability. Therefore, they are designed for extremely high surface drainage or for locations with low zone width, where large area for water intake (inside the drainage) can be used as partial balancing memory in cases of heavy rains.

CSB – channel with a continuous slot



CSB – channel with a slot dashed



IS08 CSB - SLOT CHANNEL - profile VI

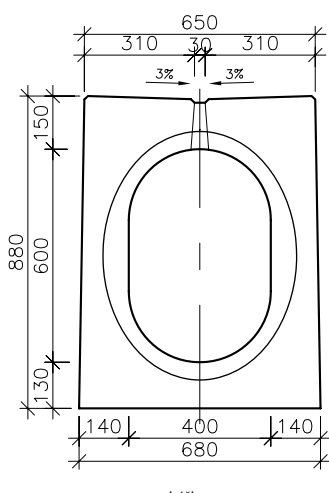
| Basic specifications | JM | Label | Dimensions length/width/height | masa (kg/pcs.) |
|--|------|---------|--------------------------------|----------------|
| CSB - Channel with a slot dotted | pcs. | VI - 1 | 650-680/880/4000 | 3600 |
| CSB - Sump unit (tongue-groove) with outlet incl. ductile iron cover | pcs. | VI - V0 | 650-680/880/2000 | 1526 |
| CSB - Sump unit (groove-groove) with outlet incl. ductile iron cover | pcs. | VI - VU | 650-680/880/2000 | 1526 |
| CSB - Cleaning element (tongue-groove) incl. ductile iron cover | pcs. | VI - C0 | 650-680/880/1000 | 821 |
| CSB - Cleaning element (tongue-tongue) incl. ductile iron cover | pcs. | VI - CS | 650-680/880/1000 | 821 |
| CSB - Front cap (tongue) | pcs. | VI - ZU | 650-680/880/120 | 154 |
| CSB - End cap (groove) | pcs. | VI - ZZ | 650-680/880/120 | 129 |

BENEFITS & ADVANTAGES

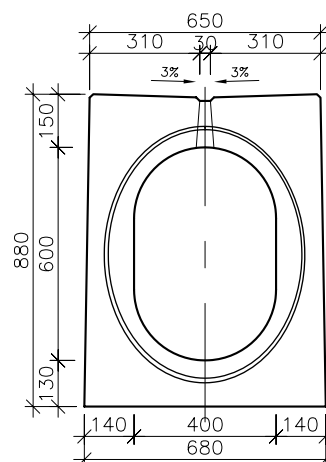
- Gap width 30 mm
- Flow profile width 400 mm and height 600 mm, i.e. Surface useful two 057 cm²
- Elements without the slope
- Cross with profile in height 880 mm and width 650/680 mm
- The base length of modular element 4 m
- The base length of modular element grooveowego 2 m. In order to increase the inflow permeability, it is fitted with 2 baskets. The chamber design includes special drainage reservoirs for retention, 2 pcs connecting plugs Ø 300 mm for connection to sewer (supplied in set).
- The complement sets and terminals for complete inspection.
- The system is designed in resistance to external factors of environment XD4 as per ČSN EN 206-1.
- Concrete reinforcement protection min. 45 mm
- The elements are made from porous concrete with quality C45 / 55, which results in:
- High concrete transverse solidity in pressure and tension.
- Extreme resistance to water and defrosting chemicals.
- Minimum absorption
- Perfect combination of the elements by means of rubber profiles resistant to the oil substances = certified impermeability
- Ability to insert in the arch of recommended radius R = 200 m, within a smooth polygon

Nominal dimensions - such as the basic shape:

**Side view
GROOVE**



**Side view
TONGUE**

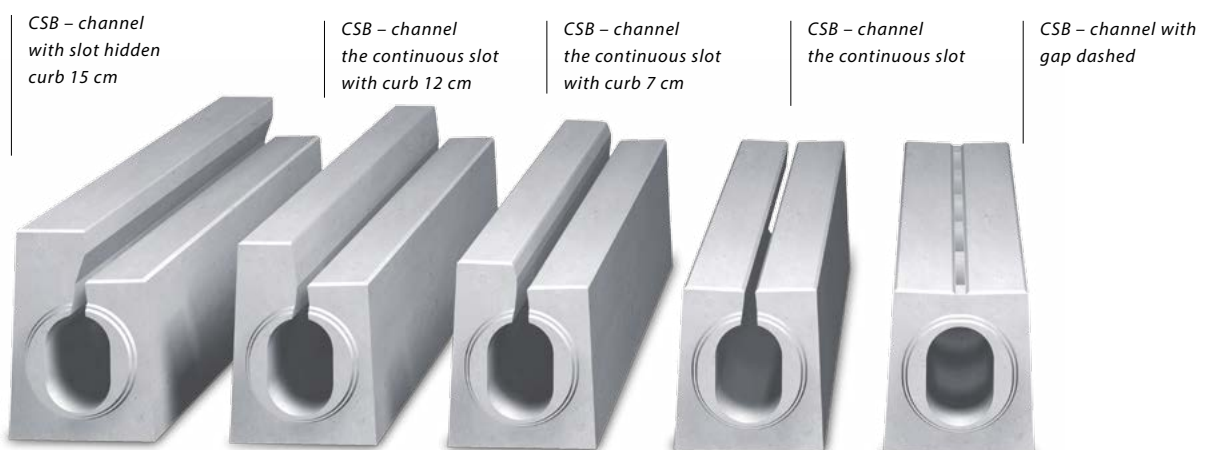




IS03 CSB – SLOT CHANNEL - profile I

color GRAY
surface VIBROCASTING without treatment

These slot channels are available in the most wide-ranging designs, and therefore are the most frequently used. Available with or without inner slope, with continuous, interrupted or covered slot, with or without border, and in the most wide-ranging diameters. These channel profiles are mainly used in motorway construction (hard shoulder/central reservation and tunnels), container terminals, industrial and port facilities and aviation areas.



IS03 CSB - SLOT CHANNEL - profile I

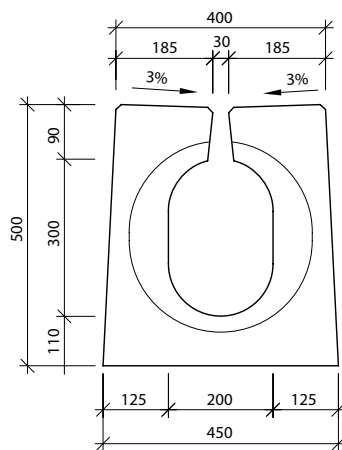
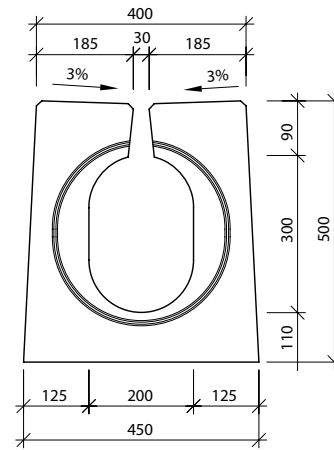
Basic specifications

| | JM | Label | Dimensions length/width/ height | Weight kg/piece |
|--|------|--------|------------------------------------|-----------------|
| CSB – Slot channel the continuous slot | pcs. | I-0 | 400-450/500/4000 | 1496 |
| CSB – Slot channel the continuous slot, with 0,5 % slope | pcs. | I-0-G | 400-450/500/4000 | 1515-1688 |
| CSB – The dotted slot channel | pcs. | I-1 | 400-450/500/4000 | 1510 |
| CSB – The dotted slot channel, with 0,5 % slope | pcs. | I-1-G | 400-450/500/4000 | 1529-1702 |
| CSB – Sump unit (tongue-groove) with outlet incl. ductile iron cover | pcs. | I-V0 | 400-450/500/1000 | 347 |
| CSB – Sump unit (groove-groove) with outlet incl. ductile iron cover | pcs. | I-VU | 400-450/500/1000 | 338 |
| CSB – Cleaning element (tongue-groove) incl. ductile iron cover | pcs. | I-C0 | 400-450/500/1000 | 394 |
| CSB – Cleaning element (tongue-tongue) incl. ductile iron cover | pcs. | I-CS | 400-450/500/1000 | 442 |
| CSB – Fire protection element | pcs. | I-0-PP | 400-495/950/2000 | 1540 |
| CSB – Continuous channel with a gap - a replaceable element | pcs. | I-0-V | 400-450/500/4000 | 823-1688 |
| CSB – Continuous channel with a gap and curb 7cm | pcs. | I-2 | 400-450/500/4000 | 1584 |
| CSB – Continuous channel with a gap and curb 7cm, with 0,5 % slope | pcs. | I-2-G | 400-450/500/4000 | 1603-1771 |
| CSB – Sump unit with curb 7 cm with cast iron grate - (tongue, groove) | pcs. | I-2-V0 | 400-450/500/1000 | 295 |
| CSB – Sump unit with curb 7 cm with cast iron grate – (groove, groove) | pcs. | I-2VU | 400-450/500/1000 | 285 |
| CSB – Cleaning element with curb 7 cm with cast iron grate - (tongue, groove) | pcs. | I-2-C0 | 400-450/500/1000 | 347 |
| CSB – Cleaning element with curb 7 cm with cast iron grate - (tongue, tongue) | pcs. | I-2-CS | 400-450/500/1000 | 404 |
| CSB – Continuous channel with a gap and curb 12 cm | pcs. | I-3 | 400-450/500/4000 | 1704 |
| CSB – Continuous channel with a gap and curb 12 cm, with 0,5 % slope | pcs. | I-3-G | 400-450/500/4000 | 1723-1877 |
| CSB – Continuous channel with a gap and curb 0-12 cm, ramping | pcs. | I-0-3 | 400-450/500/1000 | 400 |
| CSB – Sump unit with curb 12 cm with cast iron grate - (tongue, groove) | pcs. | I-3-V0 | 400-450/500/1000 | 373 |
| CSB – Sump unit with curb 12 cm with cast iron grate – (groove, groove) | pcs. | I-3-VU | 400-450/500/1000 | 364 |
| CSB – Cleaning element with curb 12 cm with cast iron grate (tongue, groove) | pcs. | I-3C0 | 400-450/500/1000 | 420 |
| CSB – Cleaning element with curb 12 cm with cast iron grate (groove, groove) | pcs. | I-3-CS | 400-450/500/1000 | 468 |
| CSB – Fire protection element with curb 12 cm | pcs. | I-3-PP | 400-495/950/2000 | 1739 |
| CSB – Continuous channel with a gap and curb 15 cm | pcs. | I-4 | 400-450/500/4000 | 1710 |
| CSB – Continuous channel with a gap and curb 15 cm, with 0,5 % slope | pcs. | I-4-G | 400-450/500/4000 | 1730-1898 |
| CSB – Continuous channel with a gap and curb 0-15 cm, ramping bezspadkowa | pcs. | I-0-4 | 400-450/500/1000 | 401 |
| CSB – Sump unit with curb 15 cm with cast iron grate - (tongue, groove) | pcs. | I-4-V0 | 400-450/500/1000 | 385 |
| CSB – Sump unit with curb 15 cm with cast iron grate – (groove, groove) | pcs. | I-4-VU | 400-450/500/1000 | 377 |
| CSB – Cleaning element with curb 15 cm with cast iron grate - (tongue, groove) | pcs. | I-4-C0 | 400-450/500/1000 | 432 |
| CSB – Cleaning element with curb 15 cm with cast iron grate - (tongue, tongue) | pcs. | I-4-CS | 400-450/500/1000 | 514 |
| CSB – Fire protection element with curb 15 cm | pcs. | I-4-PP | 400-495/950/2000 | 1728 |
| CSB – Channel with a slot hidden with curb 12 cm | pcs. | I-5 | 400-450/500/4000 | 1681 |
| CSB – Channel with a slot hidden with curb 12 cm, with 0,5 % slope | pcs. | I-5-G | 400-450/500/4000 | 1700-1849 |
| CSB – Channel with a slot hidden with curb 0-12 cm, ramping | pcs. | I-0-5 | 400-450/500/1000 | 404 |
| CSB – Sump unit with curb 12 cm and slot hidden with cast iron grate - (tongue, groove) | pcs. | I-5-V0 | 400-450/500/1000 | 378 |
| CSB – skrzynka odpł z kraw. 12 cm and slot hidden with cast iron grate - (groove, groove) | pcs. | I-5-VU | 400-450/500/1000 | 369 |
| CSB – Cleaning element with curb 12 cm and slot hidden with cast iron grate - (tongue, groove) | pcs. | I-5-C0 | 400-450/500/1000 | 425 |
| CSB – Cleaning element with curb 12 cm and slot hidden with cast iron grate - (tongue, tongue) | pcs. | I-5-CS | 400-450/500/1000 | 473 |
| CSB – Front cap (tongue) | pcs. | I-ZU | 400-450/500/120 | 76 |
| CSB – End cap (groove) | pcs. | I-ZZ | 400-450/500/120 | 51 |
| CSB – Channel with a slot hidden with curb 15 cm | pcs. | I-6 | 400-450/650/4000 | 1738 |
| CSB – Channel with a slot hidden with curb 15 cm, with 0,5 % slope | pcs. | I-6-G | 400-450/650/4000 | 1757-1907 |
| CSB – Sump unit with curb 15 cm and slot hidden with cast iron grate – (tongue, groove) | pcs. | I-6-V0 | 400-450/650/4000 | 383 |
| CSB – Sump unit with curb 15 cm and slot hidden with cast iron grate – (groove, groove) | pcs. | I-6-VU | 400-450/650/4000 | 374 |
| CSB – Cleaning element with curb 15 cm and slot hidden with cast iron grate – (tongue, groove) | pcs. | I-6-C0 | 400-450/650/4000 | 430 |
| CSB – Cleaning element with curb 15 cm and slot hidden with cast iron grate – (tongue, tongue) | pcs. | I-6-CS | 400-450/650/4000 | 478 |

BENEFITS & ADVANTAGES

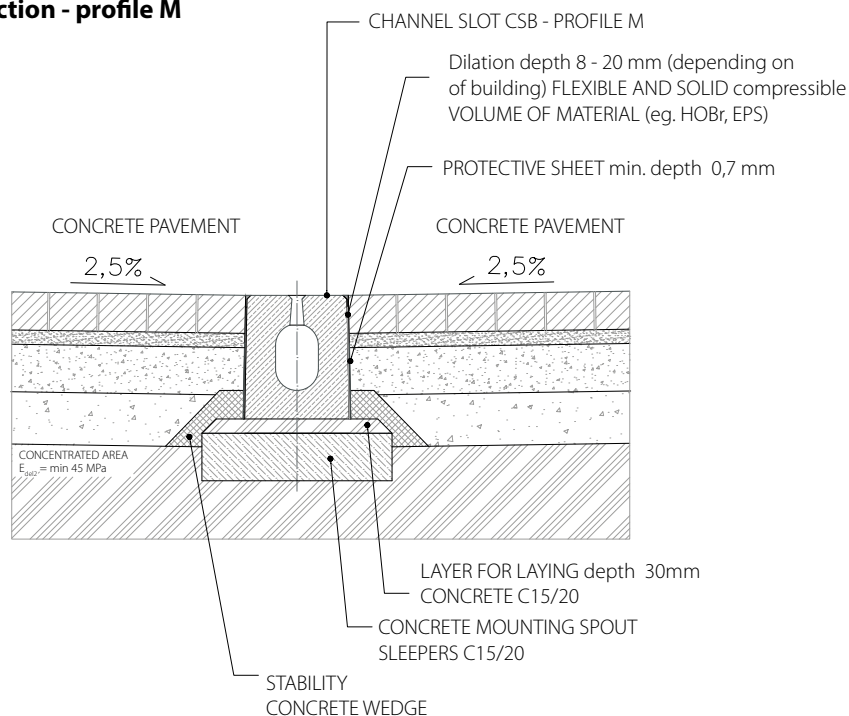
- Element length 4 m - with or without 0.5% internal slope
- Inner diameter: 20 x 30 cm (on request: 30/30 - 28/28 - 26/26 - 24/24 - 22/22 - 20/20)
- can be supplied with interrupted, continuous or covered slot - slot width 30 mm
- Drainage cross section: 514 cm²
- 3 % surface slope to the slot
- with border H = 12 cm in the range
- resilient up to class D 400 kN, E 600 kN or F 900 kN — (channels with border only class D)
- 6 Complete accessories: sump unit, cleaning element, fire protection element, exchange element, front- and end caps

Nominal dimensions - such as the basic shape:

Side view
GROOVESide view
TONGUE

All shapes IS03 family of products can be found in the directory technically part III.

An example of a cross-section - profile M



PROPERTIES AND CHARACTERISTICS

The product characteristics:

The slotted pipes represent modern, perfect, and fast method of dewatering the roads and reinforced surfaces. They comprise of the elements - slotted pipes. The system contains own inlet and cleaning pieces.

The slotted pipes provide fast dewatering of the reinforced surface, even during extreme water inflow and its perfect discharge by the capacity flow profile to the connection to sewer system. It prevents the option of aquaplaning occurrence. They enable perfect arresting of contaminated water from the road surface in order to prevent the contact with the surroundings. The pipes, even with significant flow capacity, are very narrow, therefore they can be placed at 0.5 m width in case of complete roads of non-reinforced verge. During a large capacity and relatively small width of the flow profile, they have significant self-cleaning ability.

The use of the slotted pipe capacity enables in many cases to reduce the length of otherwise worn sewer, significantly reduce the number of sewer connections and inlets.

Various profiles of the pipes offer a wide scope of utilization of various solutions. The pipes with the flat surface provide complete safety during travel on the pipes, even at the highest travel speeds on the roads, and at the same time create an aesthetic and continual crossing of the road into non-reinforced surrounding area.

The slotted pipes made from elements CS-BETON s.r.o. manage high loads, and upon a correct selection of the pipe type, they enable the use at the airports and at very extreme industrial operations. The elements are produced in double design, for load 400 and 900 kN. In particular the profiles with interrupted slot are very resistant even at dynamic load or the effects of horizontal forces. Relative simplicity of the slotted pipe construction with the use of high quality concrete elements ensures long service life of dewatering.

The slotted pipes CS-BETON s.r.o. including the inlet and cleaning pieces are made from concrete C 45/55 XF4, as per ČSN EN 206-1 the elements are resistant to the effects of frost and chemical defrosting substances. Our temperature conditions do not enable the gutter function deterioration due to its freezing.

The slotted pipes can be perfectly connected to the adjacent construction layers of the roads. The robustness of the slotted pipes (the element weight length 4 m is around 1.7 t) enables (with due care) the compaction of the road layers in close vicinity of the gutters with the risk of its shifting. Mild tilting of the side walls of the elements contributes to the best compaction and connection of the tubes to the road construction.

Due to the perfect connection of individual elements of the slotted tubes by means of rubber profiles and special putty, the completed gutter is impermeable for water. Additionally, rubber is resistant to the effects of oil substances. The rubber sealing also prevents mutual contact with the adjacent elements. Rubber forms dilatation joint, around 5 mm.

The slotted pipes are made in basic lengths 4 m. Upon request, it is possible to make pipes of various lengths, e.g. half size pipes, 2 m long. It is possible to order the elements of common lengths, however max. 4 m. Upon agreement with the manufacturer, further adjustments are possible, e.g. minor surface adjustments, side drainage openings, front side chamfer at connection, etc. During the design and use of elements shorter than 4 m or atypical lengths, and elements with various adjustments, it is necessary to consider higher costs and longer delivery period.

The assembly of the slotted pipes during the use of required mechanization is very simple and fast. Special, simple, suspension device for fitting the elements forms a part of supply of CS-BETON s.r.o. However, it is necessary to comply with the technological procedure specified by the manufacturer in order to accurately fit the slotted pipes and ensure their perfect function.

The completed slotted decline, included into the road construction and adjacent terrain, is very resistant to mechanical damage, and it is practically non-destroyable. It requires minimum maintenance which focuses solely on cleaning the flow profile of the pipe, if it becomes clogged. It is provided by the cleaning pieces and inlets, which must be placed within sufficient amount. The distance should be around 40 m and should not exceed 50 m. Regular maintenance of independent inlets is simple due to small width of the pipes. The descent is placed in non-reinforced verge at free road width, therefore the road barrier and another structure cannot prevent a simple pull-out of inlet baskets.

The alloy mesh of the inlet and cleaning pieces are secured from adverse lifting as a result of operation. They are also made in two versions, for load 400 kN from grey alloy, and for load 900 kN for modular alloy. The slotted pipes can be fitted even in direction arches of specific radiuses. The direction angle between two adjacent elements should not exceed 3 grades. The connection impermeability is guaranteed up to this value. This restriction indicates, it could be possible to fit 4 m long pipes in the direction arches with radiuses up to $R = 100$ m, and two meter elements, up to $R = 50$ m. However, the limit values cannot be recommended, because the gutter appears to be insufficiently gradual polygon. Potential compaction of the road layers in close vicinity of the pipes may result in their damage in case of this shape. It is possible to consider the minimum radiuses of at least double values. It means the 4 m long elements require at least radius $R = 200$ m.

Within the full context, the solution of dewatering is provided by means of slotted pipes considering their reliability, safety, and small operating costs; in most cases it is more suitable and also economical than currently used systems. In Germany, the slotted pipes of this type have been used for many years, such as in motorways and airports, as the exclusive solution. Recently, our professionals and public have the option to evaluate the dewatering methods in many constructions in the Czech Republic. The use of slotted pipes is becoming more frequent in our constructions, and the solution of some problems would be impossible.

Important Notice:

The slotted pipes are designed for arresting water from reinforced surfaces and roads, not water in the terrain! It can be connected to the gutter solely in completely rare cases and within small amount. It is always necessary to prevent the clogging of the slot or the pipe with stones and mud (benches for arresting the debris, above groove gutters, perfect grass covering, more frequent and perfect maintenance, etc.) During the use of slotted pipes in small direction arches, individual elements are fitted in the polygon shape. During the compaction of the road layer, it is necessary to make sure it is made close to the pipe, and prevent the damage of the elements. In these cases, it is more suitable to use the cement-concrete roads or paving.

During the assembly of the slotted pipes, high requirements are placed in accurate fitting of the inlets not only in transverse, but also in longitudinal direction because individual pipes cannot be adjusted lengthwise on site. It is therefore more suitable to perform the inlet fitting shortly before placing the slotted pipes after accurate measuring. The construction dimension of the 4 m long elements, is around 4000 mm after fitting the rubber sealing.

Free openings at the beginning of the gutter in the first cleaning part, and at the end of the last part of the inlet, must be clearly indicated. This can be provided by end caps supplied by CS-BETON s.r.o.

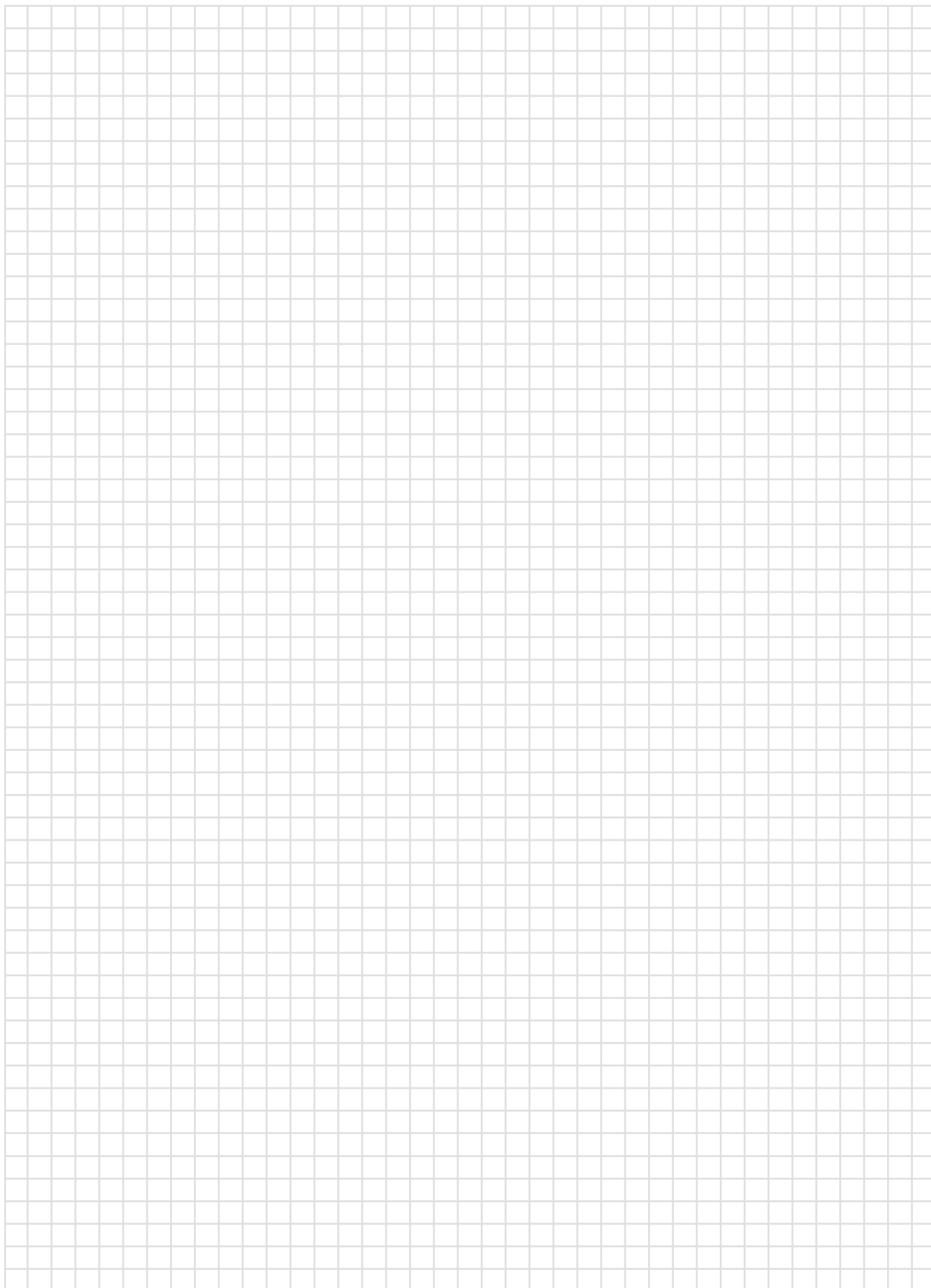
ATTENTION:

The above specified 'important notices' highlight only several basic principles for using and completing the slotted pipes.

The capacity evaluation of the slotted pipes can be provided by the attached hydraulic calculation.

During the design of the slotted pipes the manufacturer, CS-BETON s.r.o., provides the designers with consulting and service. The company performs the evaluation of preliminary design of the engineer focusing on the total technical solution of the roads, surfaces, and construction dewatering. The company confirms or recommends the change of originally proposed gutter profile. They will make a proposal for placing individual elements of the pipes and make their review in order to enable the ordering of the elements by the construction provider. Price offer will also be included for the supply of required elements with the sum total. All above specified services are provided free of charge by CS-BETON s.r.o.

CS-BETON s.r.o. is not responsible for processing a project documentation of the construction or any part thereof. The designer is responsible for correct use of the products in the project documentation, i.e. the construction completion whilst respecting the guaranteed features of the products specified by the declaration on the features as per § 159 Act no. 183/2006 Coll.



Installation guidelines for correct installation.

General installation guidelines:

The following installation guidelines and installation examples are intended for standard applications. The load class and the installation location must be adapted to the local conditions by the planners. The generally recognised technical rules and regulations must be observed.

The authoritative regulations are:

- EN1433 - Drainage channels for vehicular and pedestrian areas

EN 1433 includes an exception for the slot widths of slot channels which are installed in areas where the use of bikes is not permitted. On surfaces on which bikes are used, slot channels with a slot width equal to 30 mm may only be installed so that the longitudinal axis of the slot lies at right angles, or a maximum of $\pm 45^\circ$, to the direction of travel.

Foundation:

The movement of the BG slot channels is carried out as follows depending on the condition of the foundation and the load class:

Cl. D 400 kN, type I - no load-bearing foundation required. The laying is carried out on a mechanically compressed base layer (=frost protection layer) and a blinding/levelling layer made of concrete.

Cl. F 900 kN, type M - structurally calculated reinforced concrete foundation required according to project engineer's specifications. When laying on the reinforced concrete foundation, the connection between channel and foundation must be produced using a suitable volume-stable sealing or grouting mortar, at least 2 cm thick, with quality at least C 25/30. When using a grouting mortar, the slot channel must be positioned and aligned on appropriate spacers. When backfilling the channel, it must be ensured that there is even insertion and continuous support of the channel (avoid backfilling from one side).

Lifting tool:

Reinforced concrete slot channels must be unloaded and moved using suitable lifting tools which allow for even and precise lifting and lowering (e.g. truck-mounted crane, appropriate digger). The components must be suspended centrally. Lifting tools available on loan from BG.

First the lower part of the lifting tool is lowered into the slot channel and turned 90° to ensure that it is protected against rotation in the slot. Then the lifting device of the crane or digger can be hooked onto the lifting tool and the channel can be moved easily and safely.





Butt joints and sealing:

Ensure that the first channel in the line is precisely positioned. During laying, the surfaces must be precisely aligned.

Before bringing the elements together, the socket must be cleaned and the gasket applied to the point. The supplied lubricant is applied evenly to the gasket and to the sealing surface of the socket.

The slot channel hanging on the lifting tool must then be brought to the channel that has already be laid, until the gasket is evenly covered and the parts can be securely pushed together. The width of the butt joint must be permanently set at min. 5 mm to max. 15 mm. For uniform joints, we recommend, the use of wooden slats with a thickness of around 10 mm for example.

Covering surfaces and expansion joints:

Implementation of the road surface covering (asphalt, concrete, etc.) must be carried out according to the planned specifications. When connecting concrete surfaces, sufficiently large dilation joints (expansion joints) must be produced along the channel so that no temperature-related expansion forces affect the sides of the channel.

Throughout the entire height of the channel, a continuous, suitable polystyrene plate or a bituminous softboard plate must be installed along the longitudinal joint between the channel and concrete cover. These plates must be able to absorb the expansion forces of the concrete cover and may not transfer/dissipate the horizontal forces of the concrete cover onto the channel.

IMPORTANT!

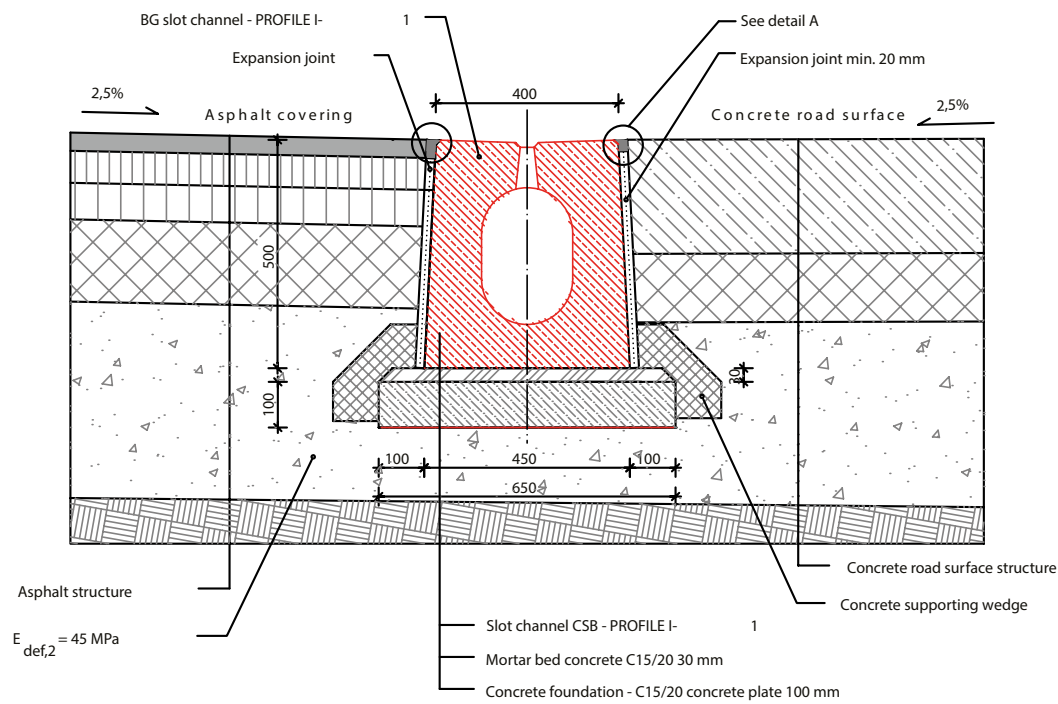
- Anyone implementing this must ensure that there is no rigid connection between the adjacent road surface covering (foundation, base layer, cover) and the channel.

All adjacent covers must permanently run at least at the same level as the channel surface in order to avoid mechanical damage (e.g. snow clearing) and in order to ensure proper water drainage.

Following completion of the adjacent surfaces, the longitudinal and transverse joints of the channels must be filled with a non-shrink sealant. It must be ensured that the transverse joints between the individual channel units are permanently formed so that minor, temperature-related longitudinal movements of the slot channels can be absorbed. In order to avoid spalling, the slot channels must not be driven on during the construction phase. When working with machines and vehicles, ensure that the channels are not damaged.



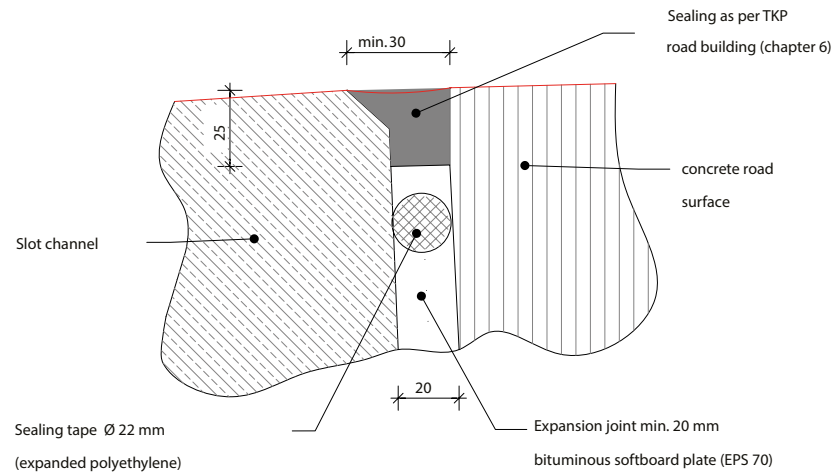
Channel with concrete and asphalt connection:



Expansion joint detail:

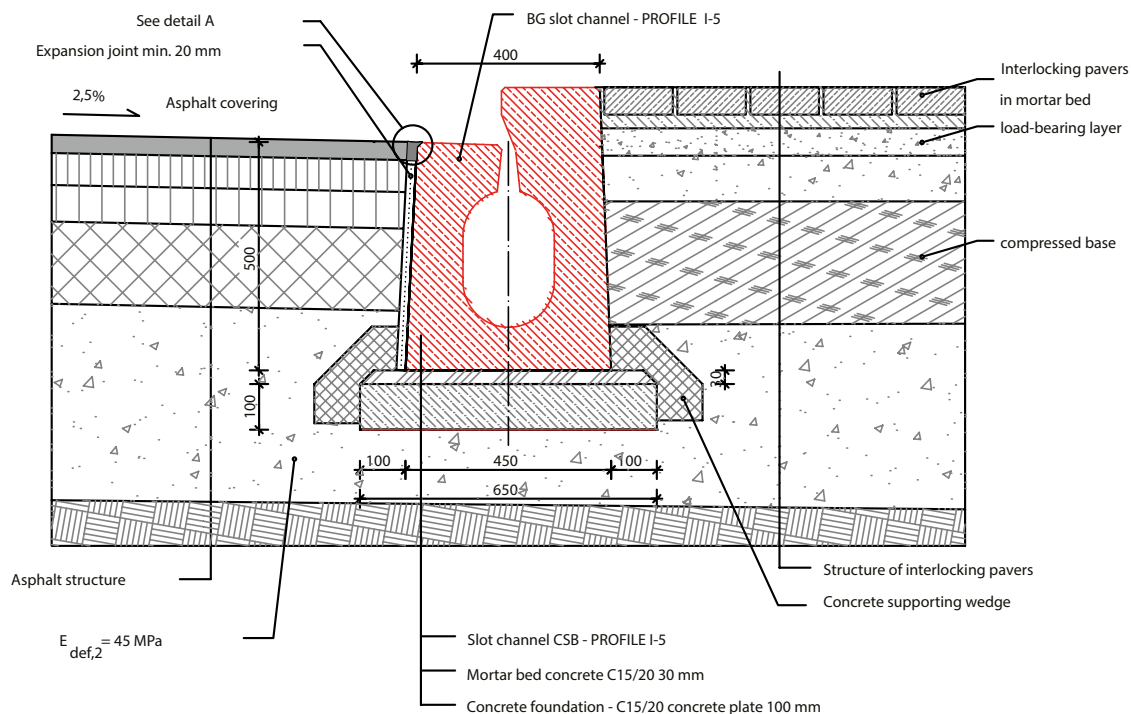
Note: Expansion joint e.g. EPS70, bituminous softboard plate, ...

Detail A:

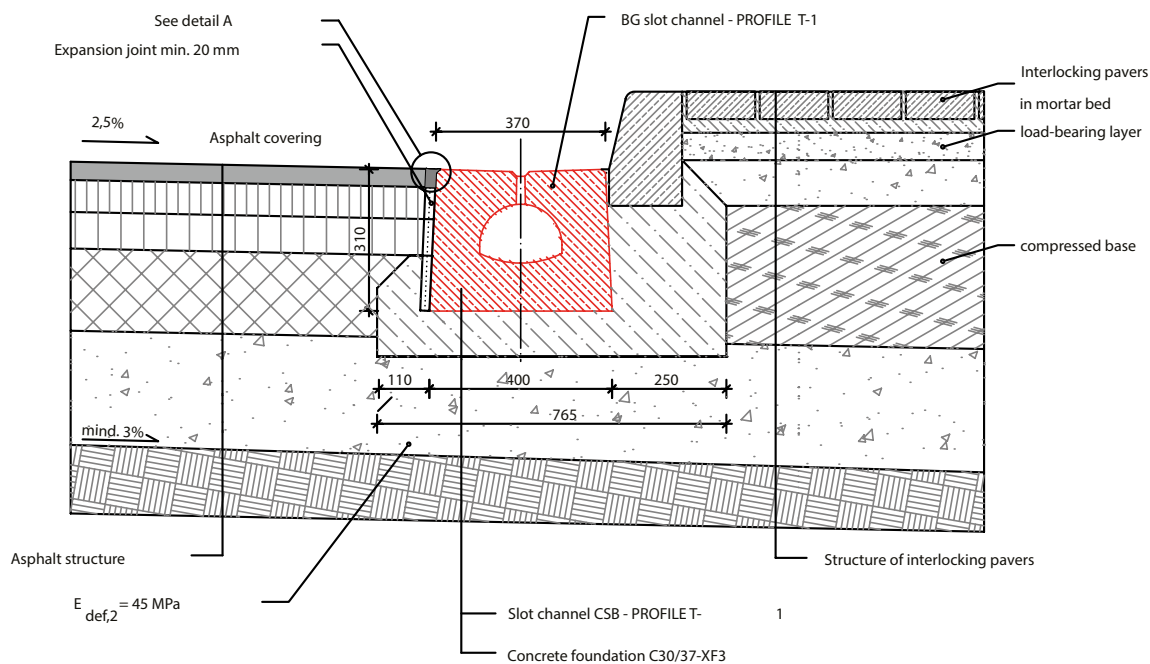




Channel profile I-5 with border:



Channel profile T1 laid in a border:



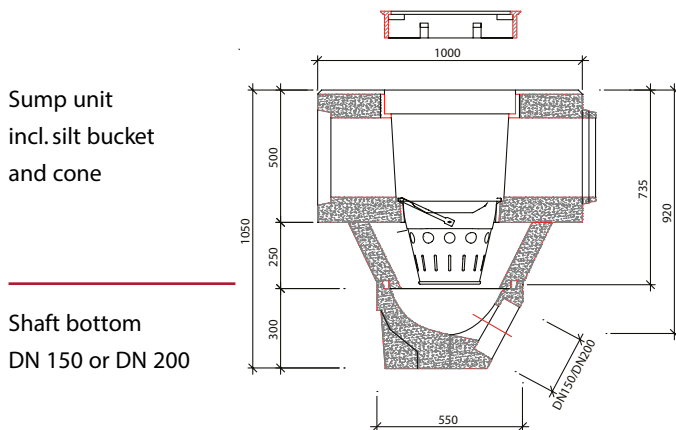
Accessories.

Sump unit

The sump unit is produced with an element length of 1000 mm and supplied in 2 parts. Firstly, the lower part must be laid so that it will not twist or tilt, then the upper part can be placed on top of this with pre-formed base drainage. The upper part is available in 2 different designs: depending on the connection options or position in the channel line, with groove-groove or tongue-groove system.

The cast iron cover must be securely screwed into the frame.
A plastic cover can also be be optionally provided.

Installation detail for the sump unit:



Sump unit (on shaft)



Sump unit top part



installed sump unit

Accessories.

Silt bucket (integrated into sump unit):

A galvanised silt bucket is included in the sales set. It is used to trap coarse dirt and can be cleaned at any time.

Cleaning element

The cleaning element also has an element length of 1000 mm and is provided in 2 different designs: depending on connection options/ position in the channel line, with tongue-groove or tongue-tongue system. The plastic cover is screwed into the cleaning element and can be opened quickly and easily during cleaning work. Cast iron cover on request.

Front caps / end caps

Front caps (tongue) or end caps (groove) ensure a clean and tight closure of the channel line.



Special parts.

Fire protection element

The fire protection element, with an element length of 2000 mm, is used for safe drainage of burning liquids, e.g. in tunnel construction. The installation of a bleed air valve prevents liquid from continuing burning in the channel line. The integrated fire shutter also increases safety.



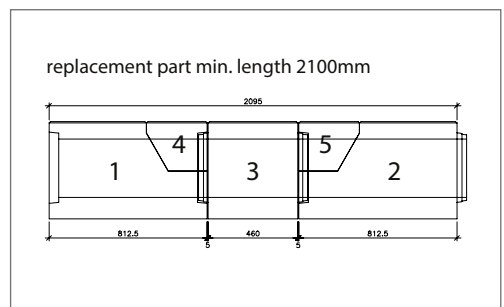
Curved element

The curved element can be used to lay channel lines in a radius of min. 7° to maximum 45°. This flexibility makes installation much easier.



Replacement element / adapter

The replacement element set consists of 5 individual parts which allow for easy replacement of damaged elements in the existing channel line. The „replacement part“ (no. 3) can be supplied in a wide range of installation lengths, from a minimum of 2100 mm to a maximum of 4000 mm.



References.

BG slot channels

with interrupted, continuous or covered slot

For motorways, tunnels, airport terminals and similar heavily-used surfaces.









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