

BIRCOsir | Installation Instructions

A number of details must be observed when installing BIRCOsir. For a comprehensive description please read [here](#).

To guarantee smooth operation and compliance with the requirements of DIN EN 1433, the following general installation instructions must be observed:

1. Prior to installation, the correct load class in accordance with DIN EN 1433 must be selected.
 2. Thanks to the high level of stability, laying the BIRCOsir channels is conducted on an earth-moist C 25/30 strip of foundation concrete at least 15 cm high which must be haunched both sides. No additional concrete surround or reinforcement on the sides is required⁽¹⁾. Begin laying the channel line following the outfall unit with the highest channel at the drain and form the channel line with the next-smallest number
 3. All adjoining pavement surfaces must run **permanently at a level of some 3 to 5 mm higher than the upper edge of the channel. In order to achieve this, we recommend laying the first two to three rows of pavement surfacing in the mortar bed.** Because there is no concrete encasing, the surface pavement can run right up to the channel without any problems.
 4. For installation in concrete surfaces or reinforced concrete constructions, running joints must be provided on both sides to compensate horizontal forces that emerge. These joints should be planned at an interval of some 0.2 to 0.5 metres from the channel. In sealing the adjacent areas it must be ensured that there is no mechanical damage to the channel units. Joints running transverse to the channel line must be arranged every 5 – 6 metres in the adjacent concrete surfaces (in-situ concrete) so that they run through a channel joint.
 5. BIRCO drainage units are fitted with a safety sealing joint on the channel end. In accordance with DIN EN 1433, once laying has been completed this safety seam can be further treated with a plastic modified mortar or a permanently elastic sealing material (for example SF-Connect).
 6. Proceed analogously when installing the outfall unit.
- + Local particularities can require special installation methods that have to be examined and taken into account by the planner(s). The installation must comply with the latest regulations and guidelines such as ZTVT, ZTV concrete, ZTV bit and RStO.
 - + Construction in accordance with the Construction Tendering and Contract Regulations (VOB) Part C, DIN 18318 “Transport Route Construction”.
 - + Additional technical regulations and guidelines for pavement surfaces in road construction (ZTVT-StB) and ZTV Asphalt.
 - + Additional technical regulations and guidelines for ground work in road construction (ZTVE-StB).
 - + Guidelines for the standardisation of the pavement of public thoroughfares (RStO).
 - + Preparation of the ATV DIN 18299 performance description “General Regulations for Construction Work of all Types”.
 - + The respectively correct load class in accordance with DIN EN 1433, “Drainage channels for vehicular and pedestrian areas”.

⁽¹⁾Exception:

When using BIRCOsir in heavy-duty areas with frequent traffic, it may be necessary to encase the channel with concrete on the sides to compensate for the high levels of horizontal forces that could potentially emerge.

Fast, safe installation | Efficient time & cost management

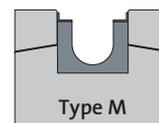
- + The one-piece Type M channel unit only needs partial concrete surround, reducing casing and concrete casting work.

i Introduction to 2 models

- + **Type I:** Requires no load-bearing foundation and/or no full concrete surround: e.g., BIRCOmassiv.
- + **Type M:** Requires a load-bearing foundation and/or full concrete surround: e.g., BIRCOsir.



Type I



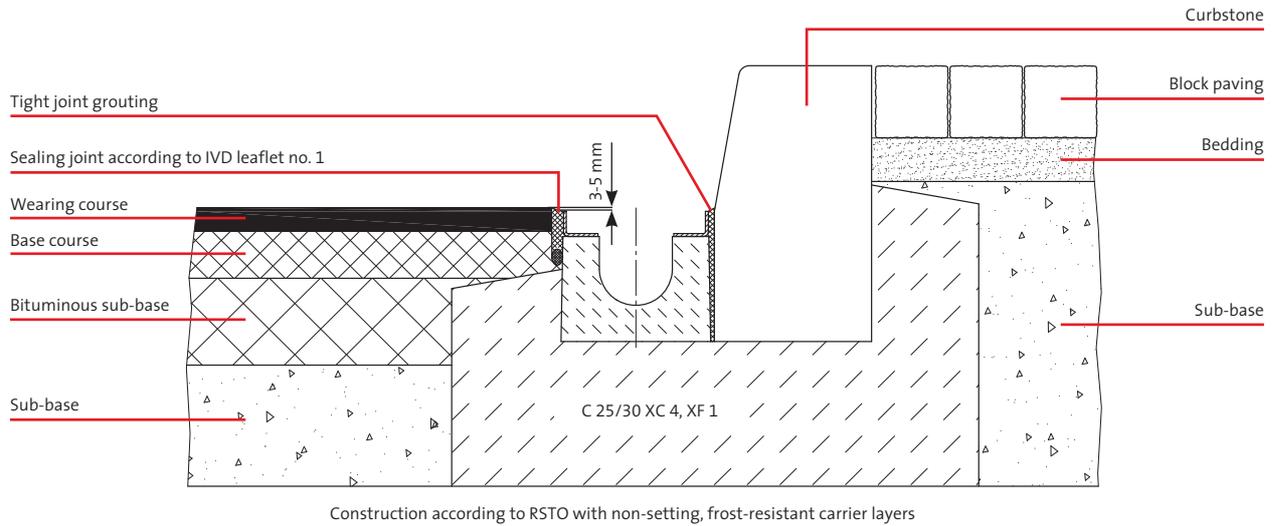
Type M



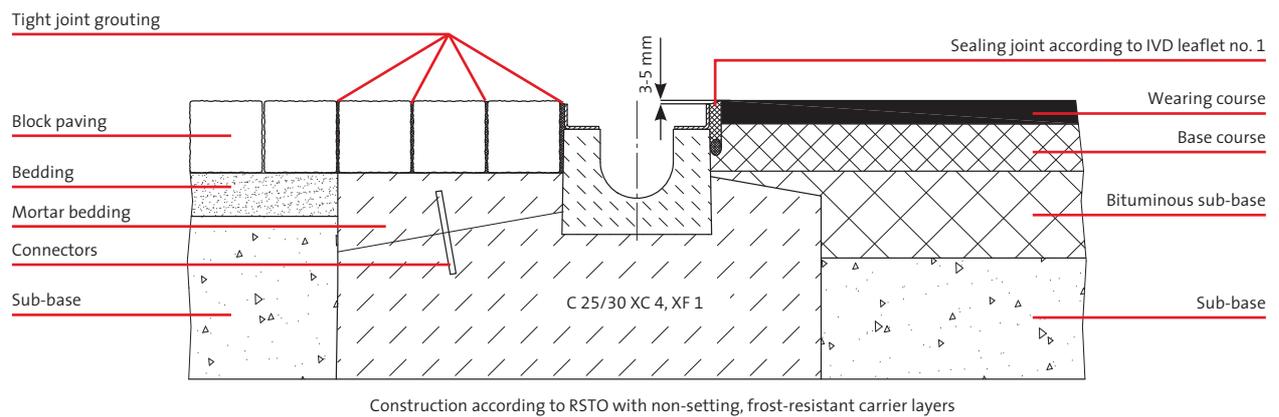
BIRCOsir Installation Examples

Installation instructions for traffic areas with heavy wheel loads.
 Urban construction | Industrial construction | Parking lots

BIRCOsir NW 100, Type M, Load Class A 15 – E 600
 Drawings No. 20724



BIRCOsir NW 100, Type M, Load Class A 15 – E 600
 Drawings No. 20724

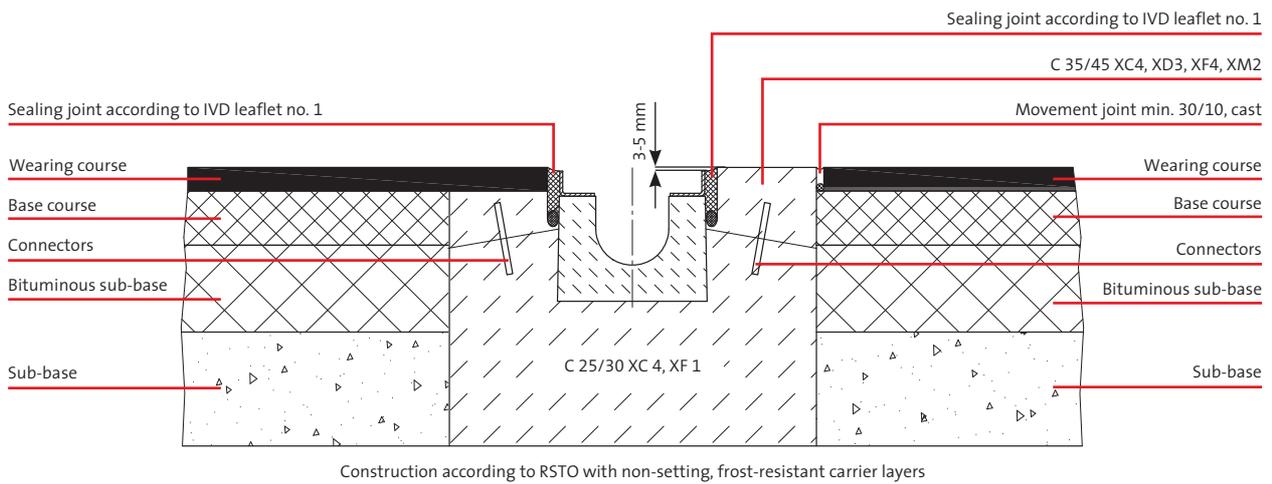


The planning of movement joints must be conducted from on the basis of engineering considerations. When laying the channel line in a full concrete surround, movement joints at right angles to the channel line must be installed every 12 metres. Constructed in accordance with RSTO using non-setting frost-free sub-bases. Exception up to D 400: Not for use across the carriage- way of highways or motorways.



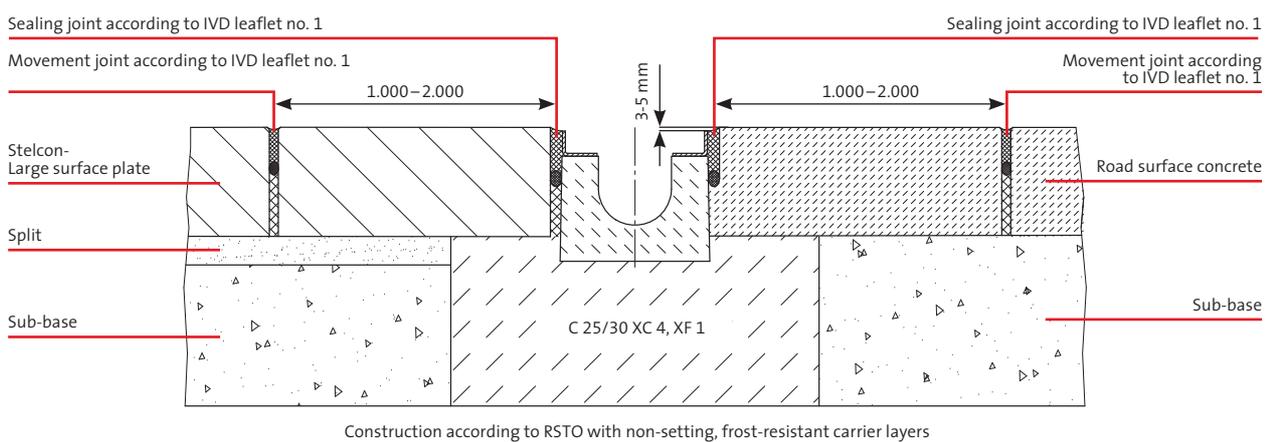
BIRCOsir NW 100, Type M, for heavy-duty areas subjected to frequent use (Load Class D 400 / E 600 / F 900)

Drawings No. 20724



BIRCOsir NW 100, Type M, for heavy-duty areas subjected to frequent use (Load Class D 400 / E 600 / F 900)

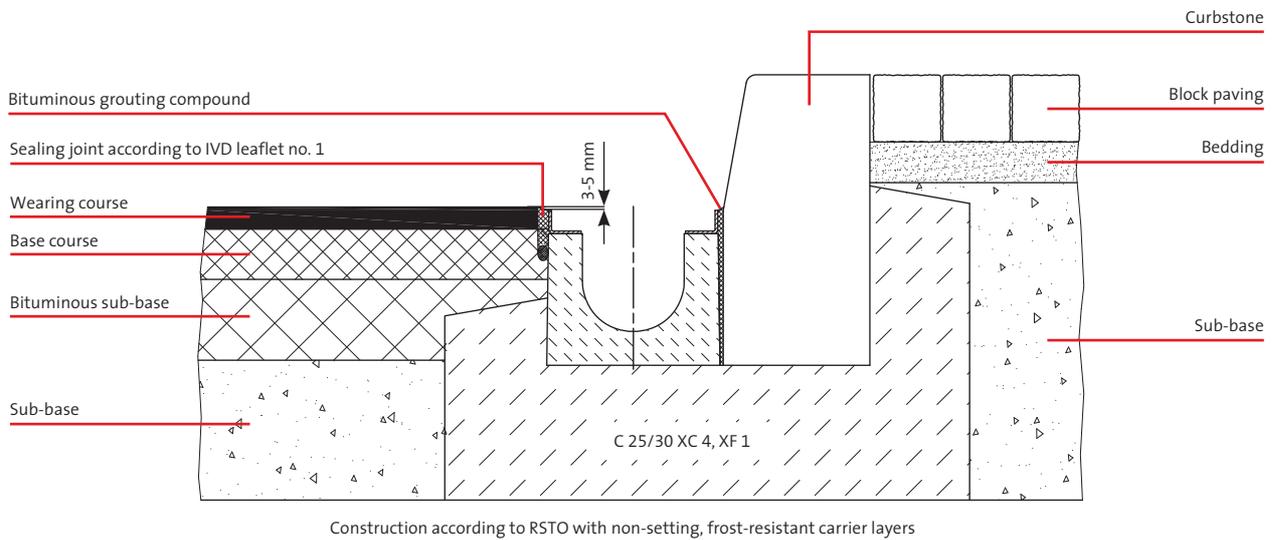
Drawings No. 20724



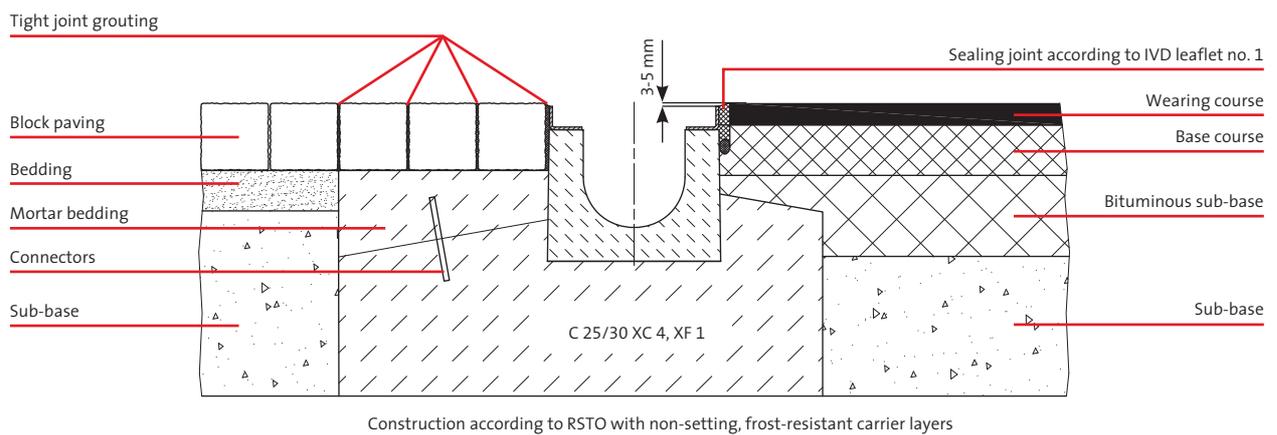
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BIRCOsir NW 150, Type M, Load Class A 15 – E 600
 Drawings No. 20723



BIRCOsir NW 150, Type M, Load Class A 15 – E 600
 Drawings No. 20723

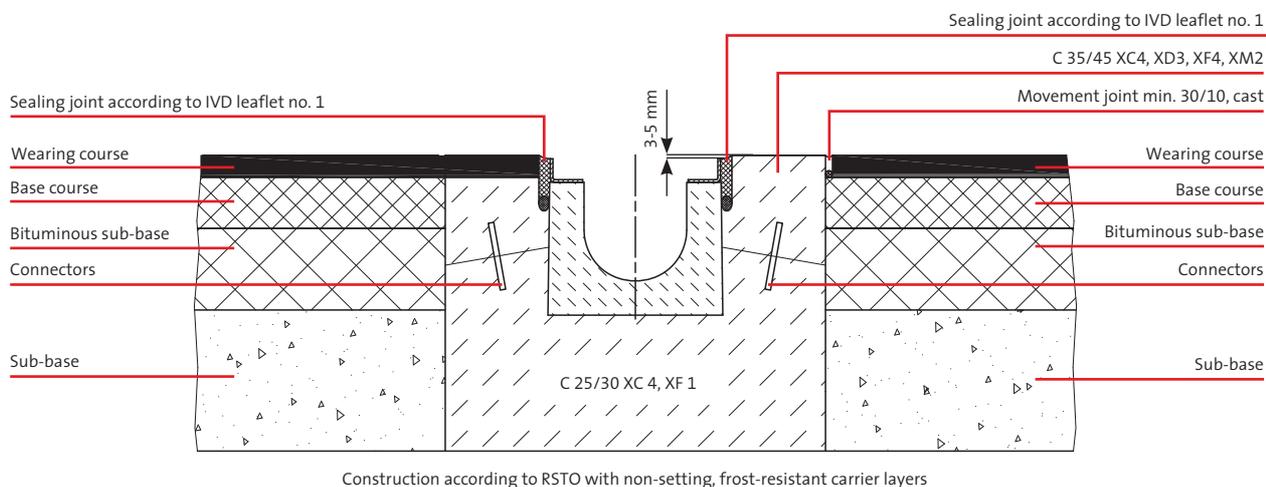


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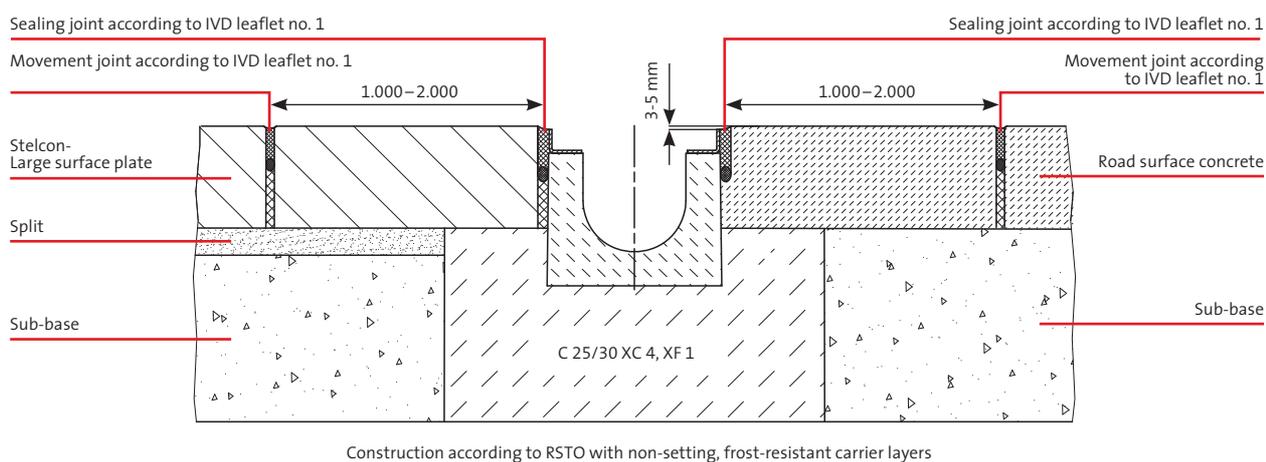
BIRCOsir NW 150, Type M, for heavy-duty areas subjected to frequent use (Load Class D 400 / E 600 / F 900)

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BIRCOsir NW 150, Type M, for heavy-duty areas subjected to frequent use (Load Class D 400 / E 600 / F 900)

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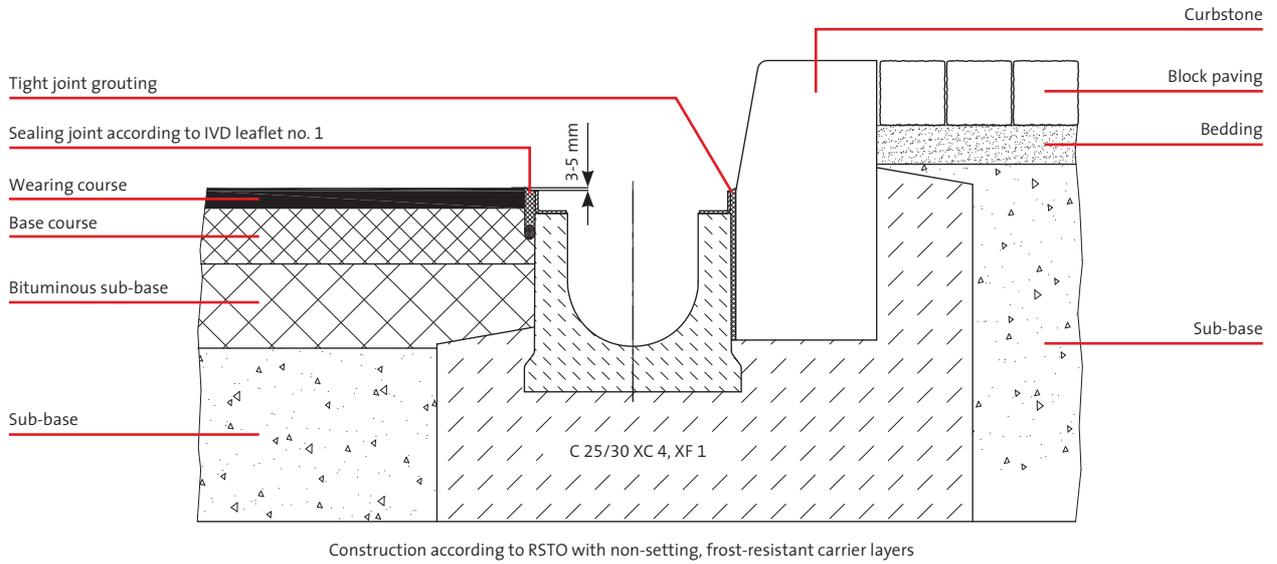


The planning of movement joints must be conducted from on the basis of engineering considerations. When laying the channel line in a full concrete surround, movement joints at right angles to the channel line must be installed every 12 metres. Constructed in accordance with RSTO using non-setting frost-free sub-bases

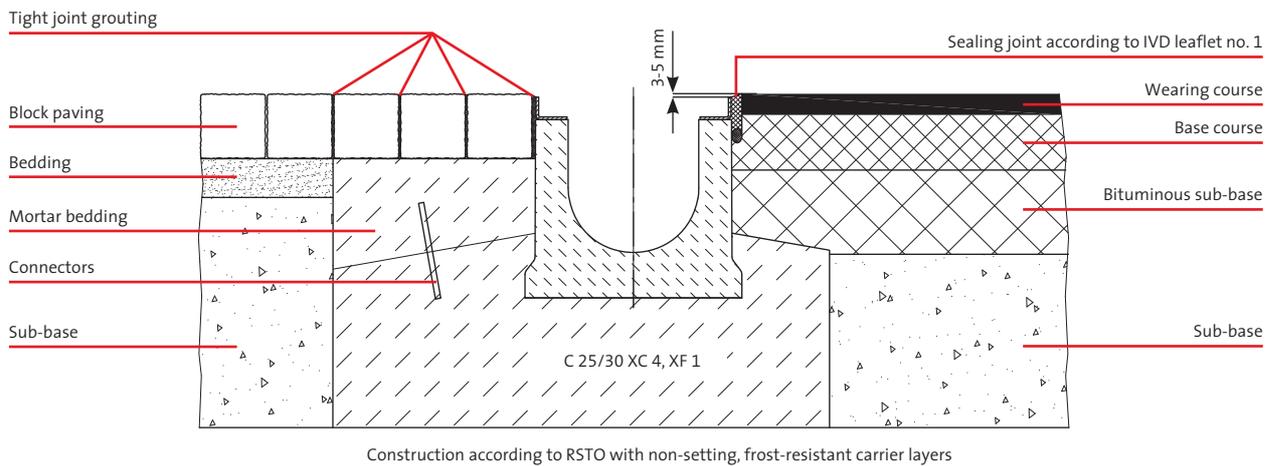
Exception up to D 400: Not for use across the carriage-way of highways or motorways.



BIRCOsir NW 200 AS, Type M, Load Class A 15 – E 600 Drawings No. 20710



BIRCOsir NW 200 AS, Type M, Load Class A 15 – E 600 Drawings No. 20710

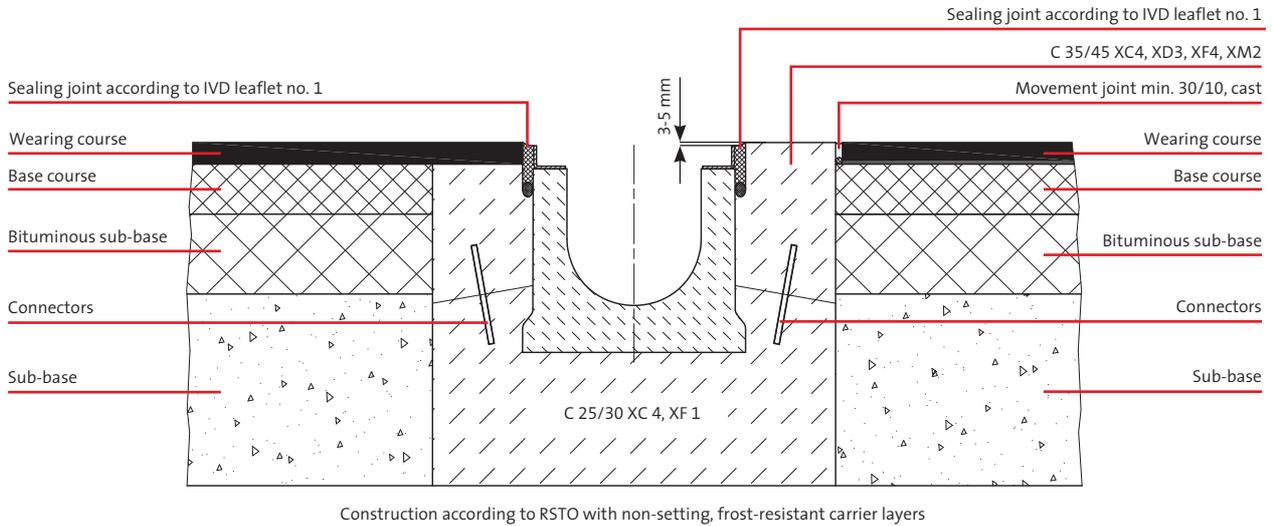


The planning of movement joints must be conducted from on the basis of engineering considerations. When laying the channel line in a full concrete surround, movement joints at right angles to the channel line must be installed every 12 metres.
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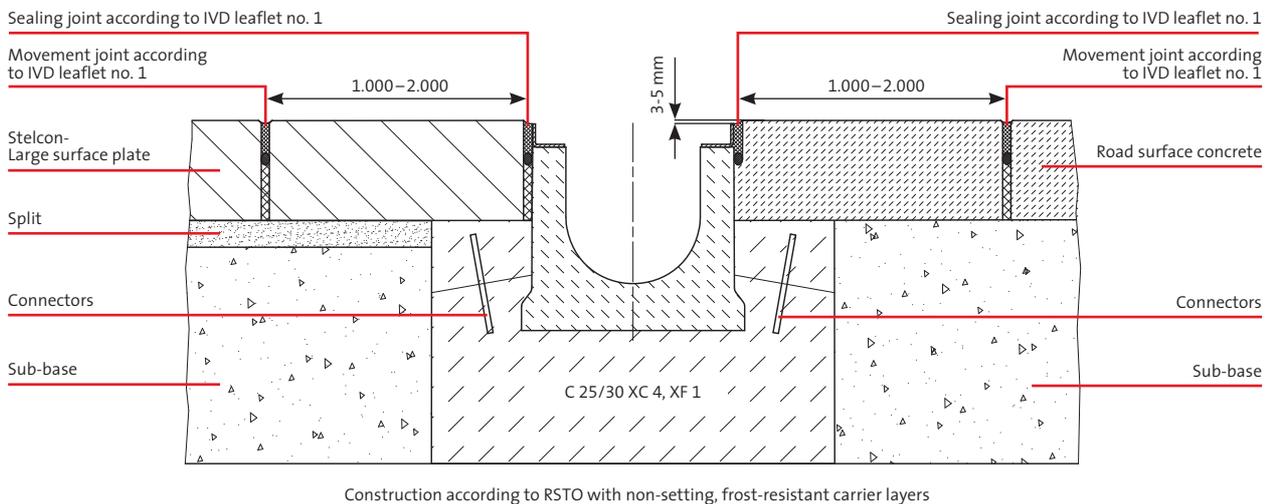
BIRCOsir NW 200 AS, Type M, for heavy-duty areas subjected to frequent use (Load Class D 400 / E 600 / F 900)

Drawings No. 20710



BIRCOsir NW 200 AS, Type M, for heavy-duty areas subjected to frequent use (Load Class D 400 / E 600 / F 900)

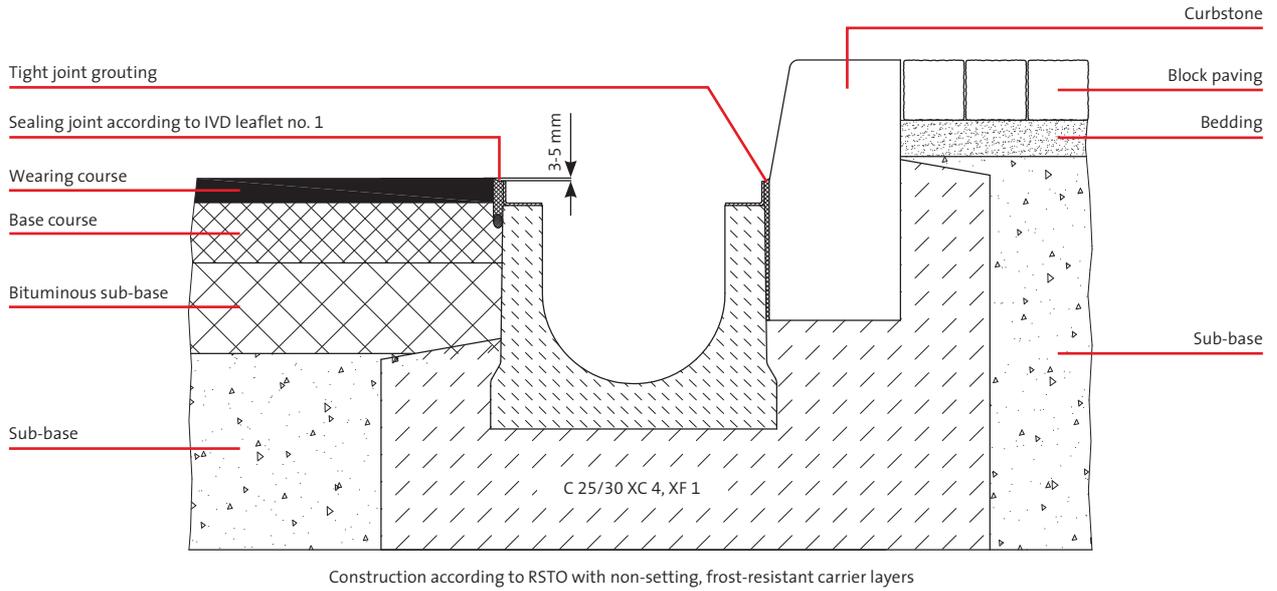
Drawings No. 20710



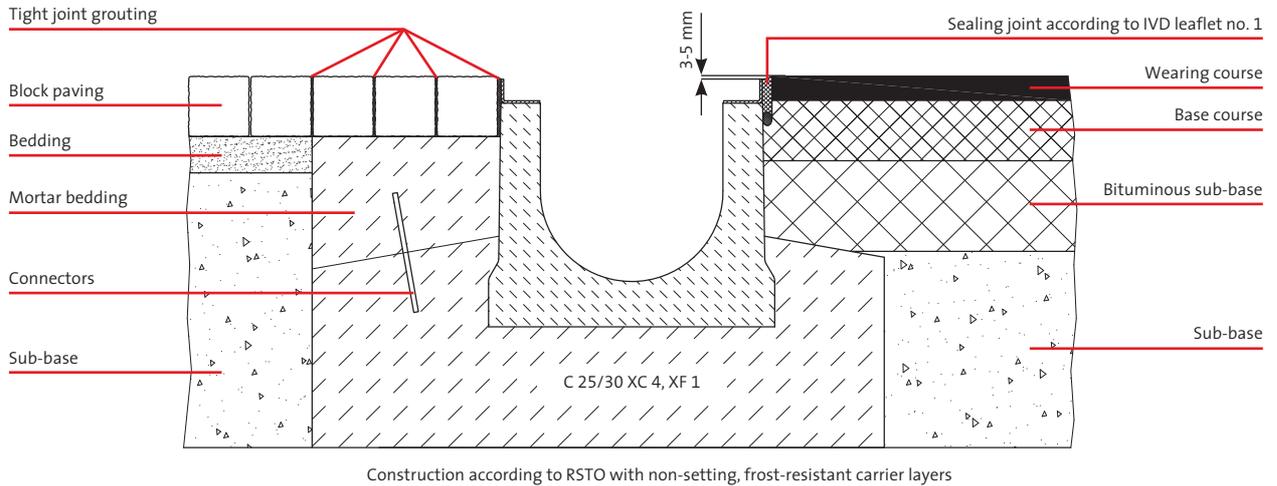
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BIRCOsir NW 300 AS, Type M, Load Class A 15 – E 600 Drawings No. 20512



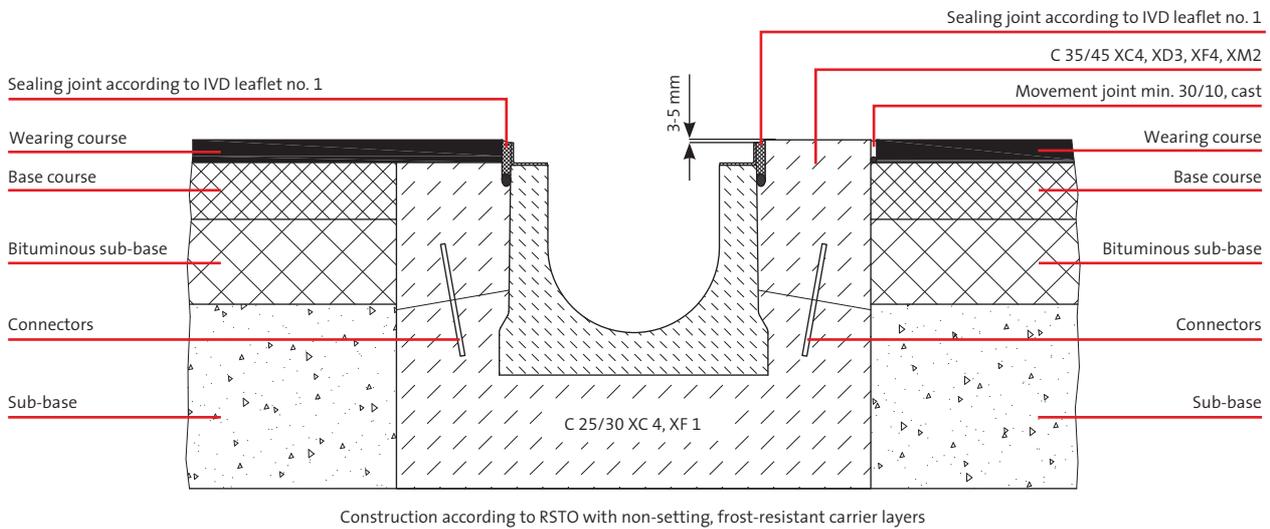
BIRCOsir NW 300 AS, Type M, Load Class A 15 – E 600 Drawings No. 20512



The planning of movement joints must be conducted from on the basis of engineering considerations. When laying the channel line in a full concrete surround, movement joints at right angles to the channel line must be installed every 12 metres. Constructed in accordance with RSTO using non-setting frost-free sub-bases. Exception up to D 400: Not for use across the carriage- way of highways or motorways.

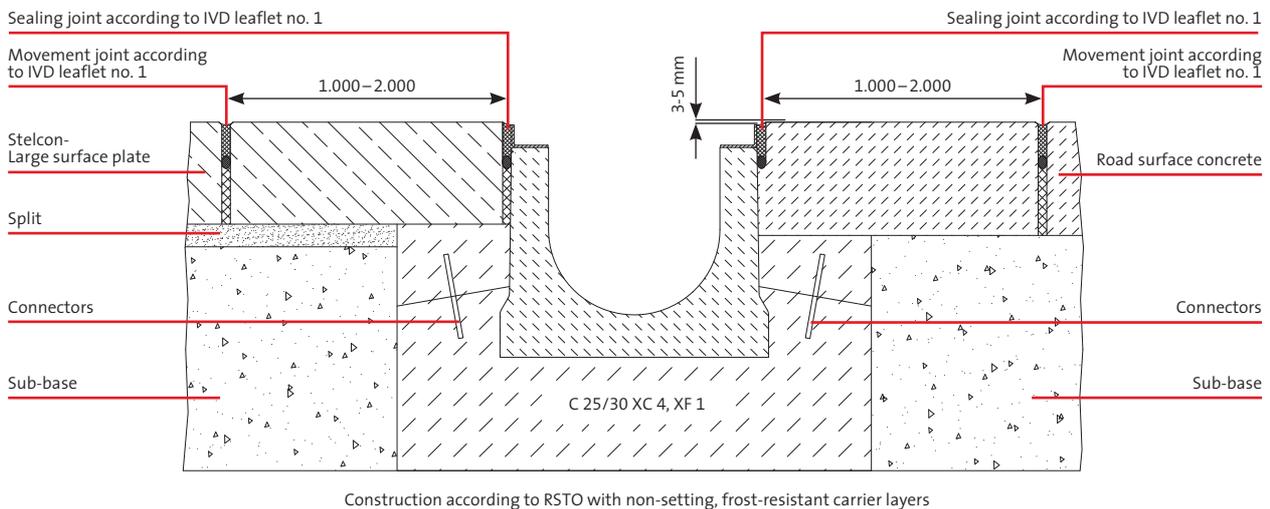
BIRCOsir NW 300 AS, Type M, for heavy-duty areas subjected to frequent use (Load Class D 400 / E 600 / F 900)

Drawings No. 20512



BIRCOsir NW 300 AS, Type M, for heavy-duty areas subjected to frequent use (Load Class D 400 / E 600 / F 900)

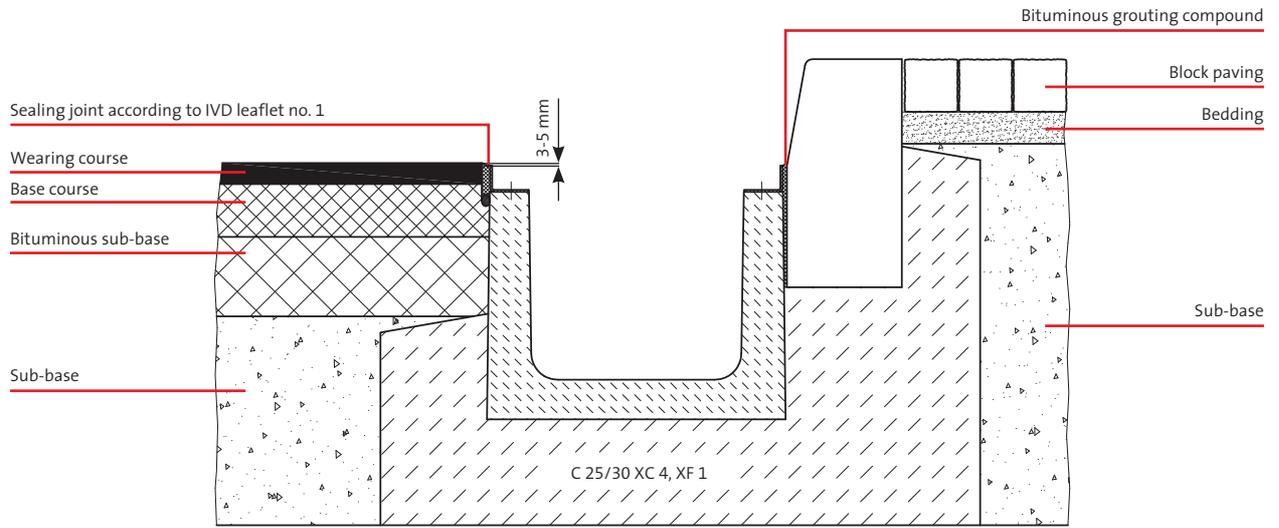
Drawings No. 20512



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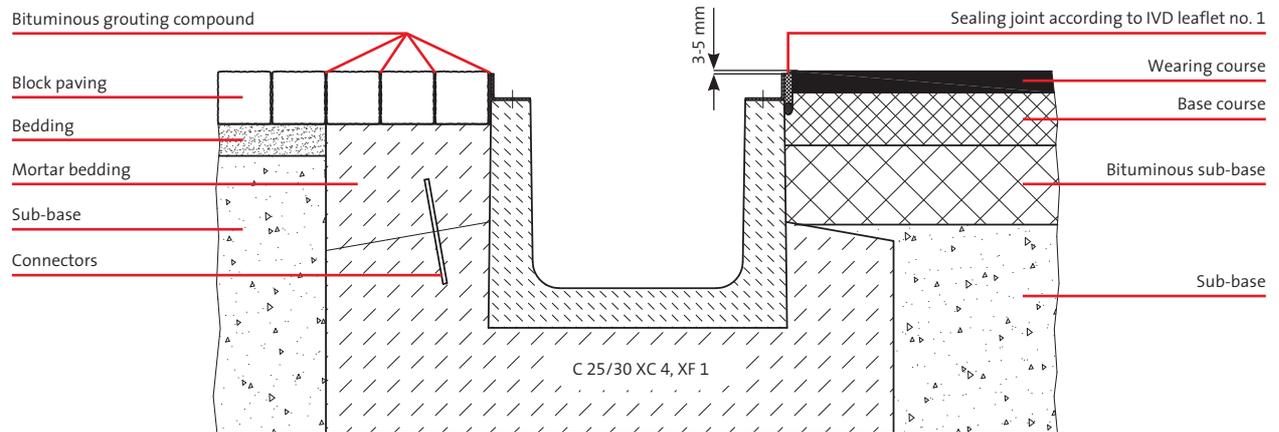


BIRCOsir NW 400, Type M, Load Class A 15 – E 600 Drawings No. 20257



Construction according to RSTO with non-setting, frost-resistant carrier layers

BIRCOsir NW 400, Type M, Load Class A 15 – E 600 Drawings No. 20257



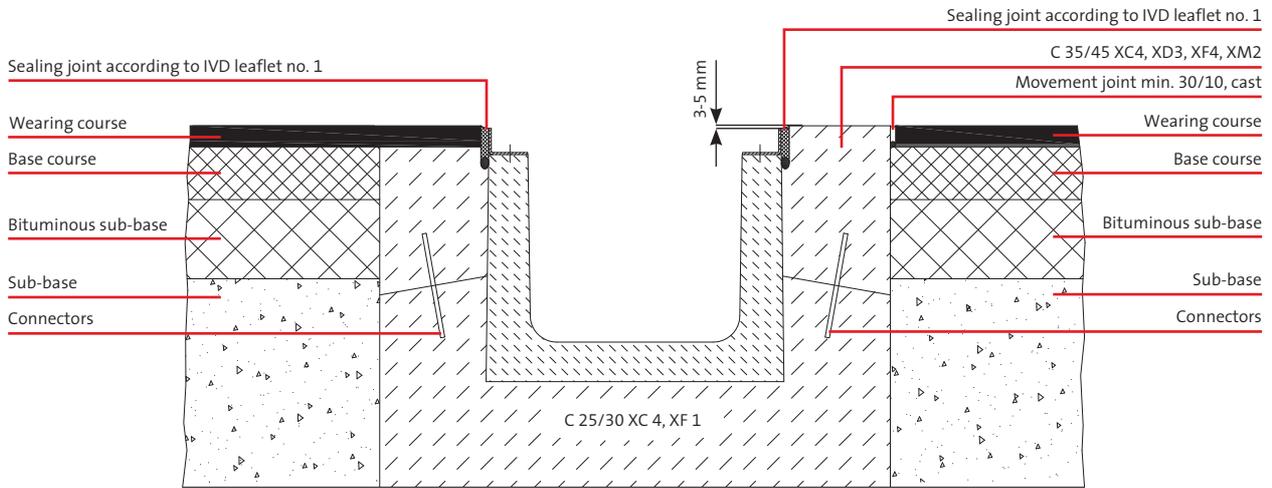
Construction according to RSTO with non-setting, frost-resistant carrier layers

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Exception up to D 400: Not for use across the carriage- way of highways or motorways.



BIRCOsir NW 400, Type M, for heavy-duty areas subjected to frequent use (Load Class D 400 / E 600 / F 900)

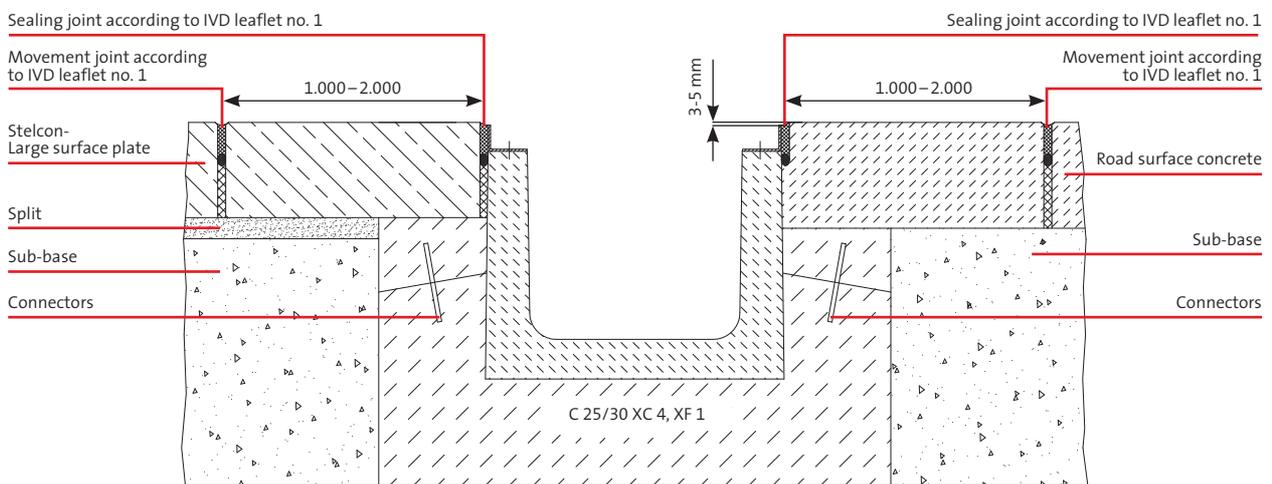
Drawings No. 20257



Construction according to RSTO with non-setting, frost-resistant carrier layers

BIRCOsir NW 400, Type M for heavy-duty areas subjected to frequent use (Load Class D 400 / E 600 / F 900)

Drawings No. 20257

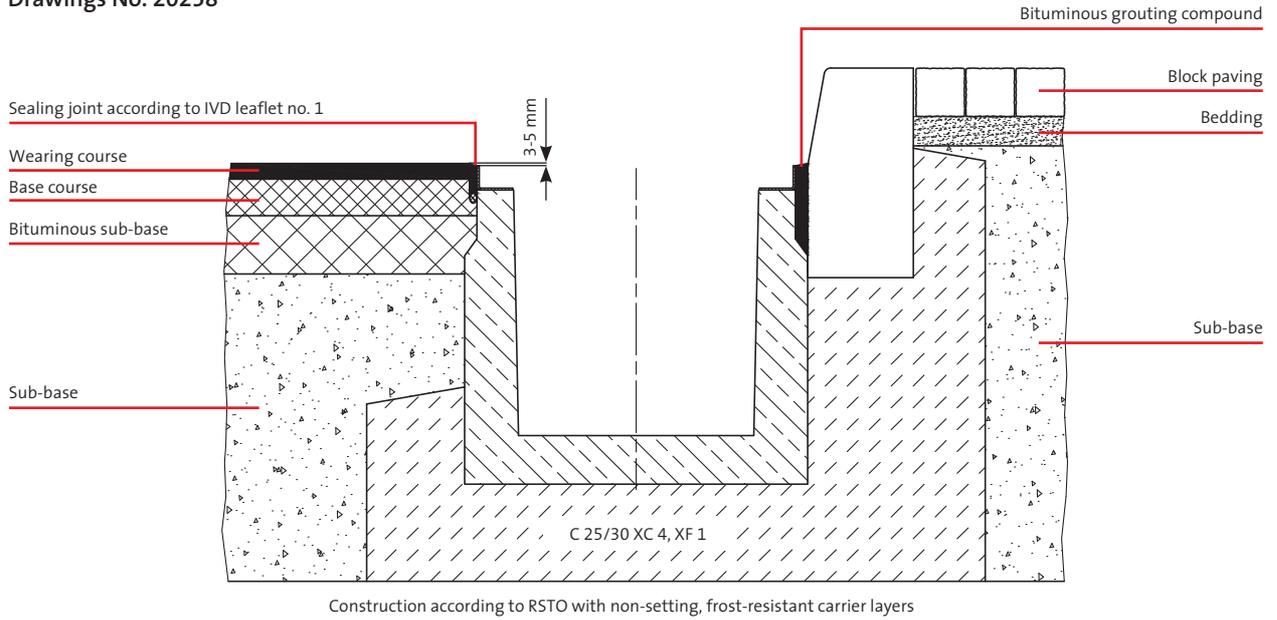


Construction according to RSTO with non-setting, frost-resistant carrier layers

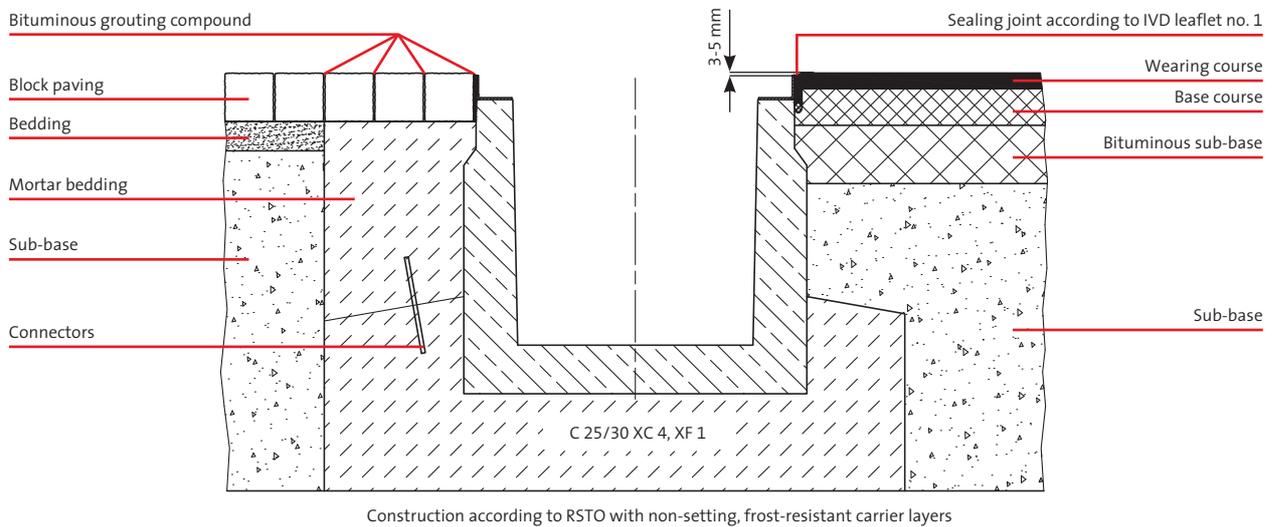
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BIRCOsir NW 500, Type M, Load Class A 15 – E 600 Drawings No. 20258



BIRCOsir NW 500, Type M, Load Class A 15 – E 600 Drawings No. 20258

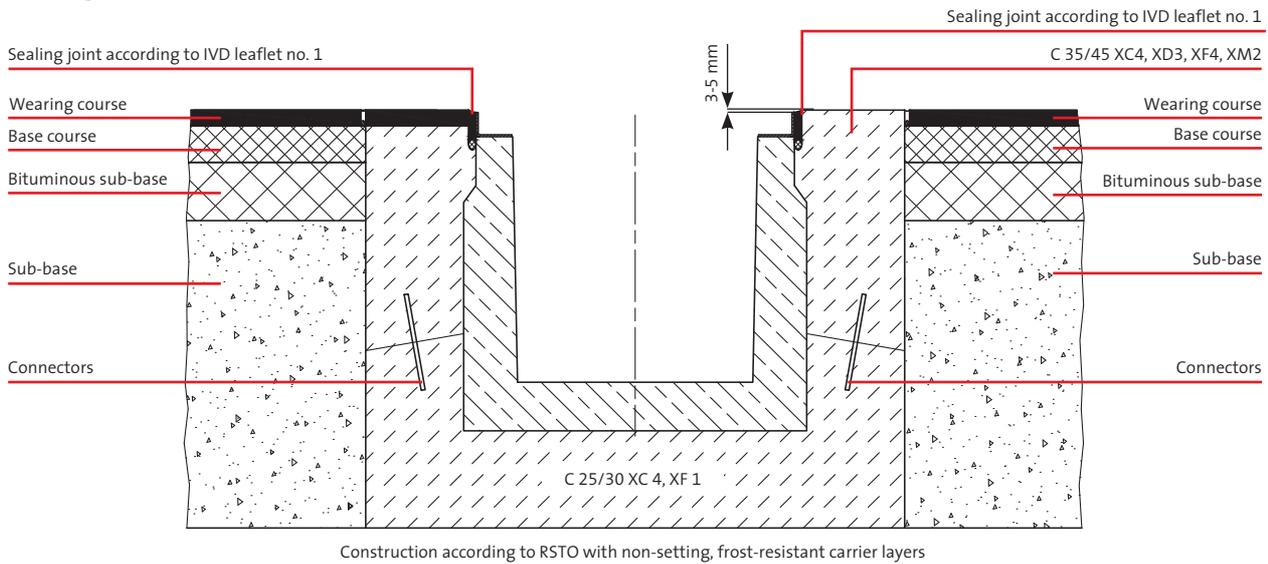


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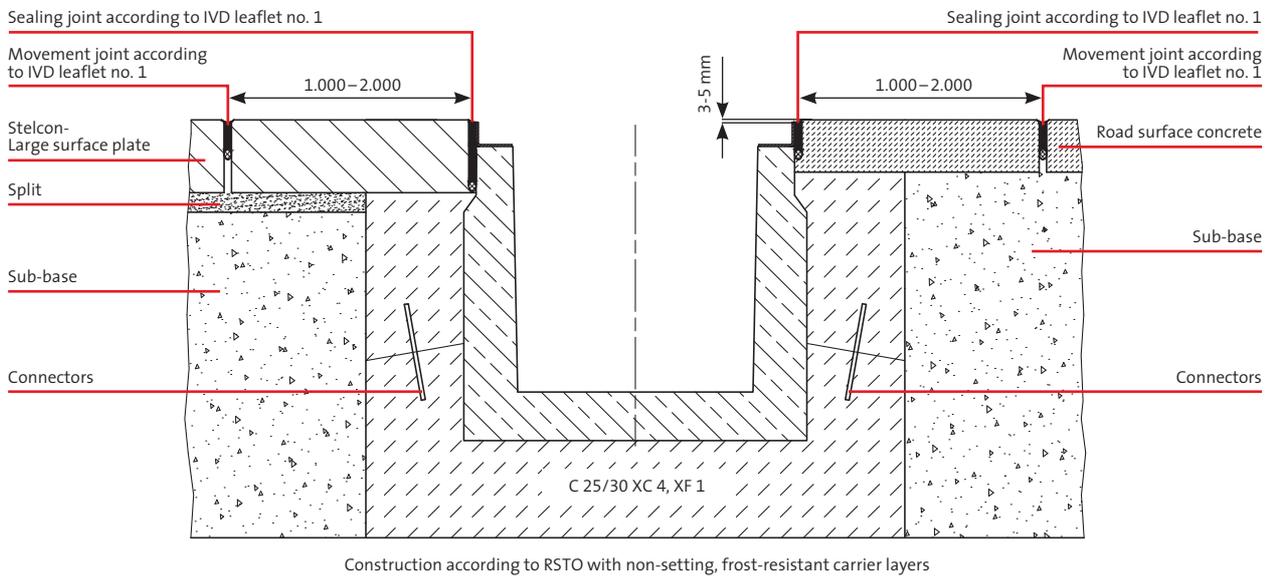
BIRCOsir NW 500, Type M, for heavy-duty areas subjected to frequent use (Load Class D 400 / E 600 / F 900)

Drawings No. 20258



BIRCOsir NW 500, Type M, for heavy-duty areas subjected to frequent use (Load Class D 400 / E 600 / F 900)

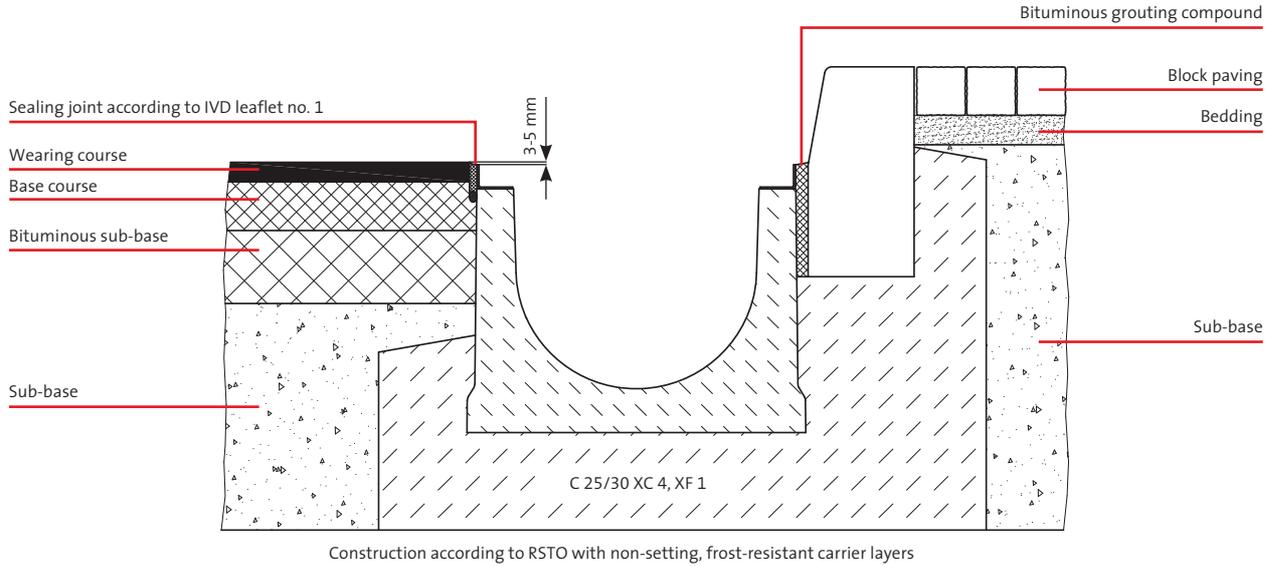
Drawings No. 20258



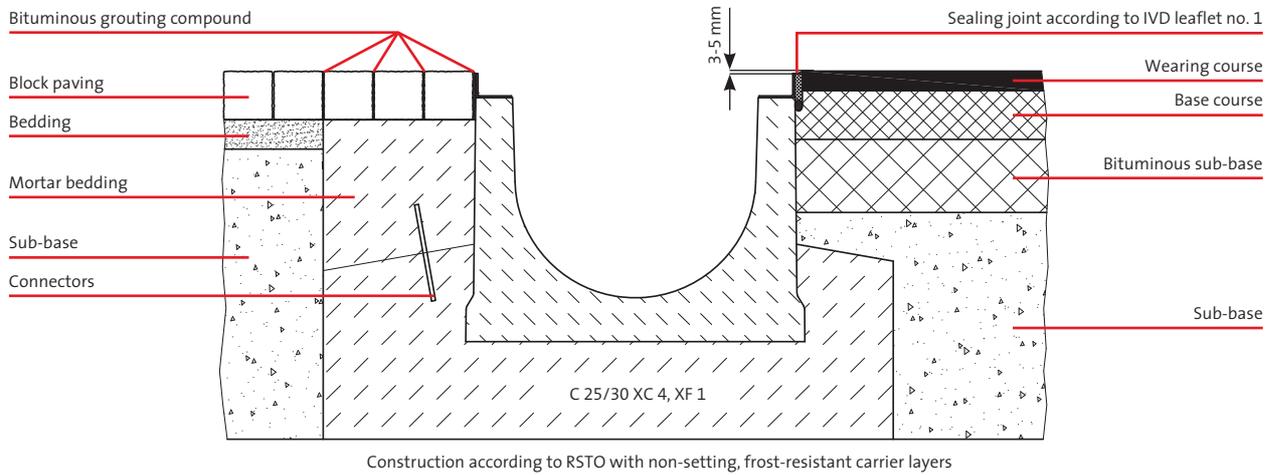
The planning of movement joints must be conducted from on the basis of engineering considerations. When laying the channel line in a full concrete surround, movement joints at right angles to the channel line must be installed every 12 metres. Constructed in accordance with RSTO using non-settling frost-free sub-bases. Exception up to D 400: Not for use across the carriage-way of highways or motorways.



BIRCOsir NW 500 AS, Type M, Load Class A 15 – D 400 Drawings No. 20285



BIRCOsir NW 500 AS, Type M, Load Class A 15 – D 400 Drawings No. 20285

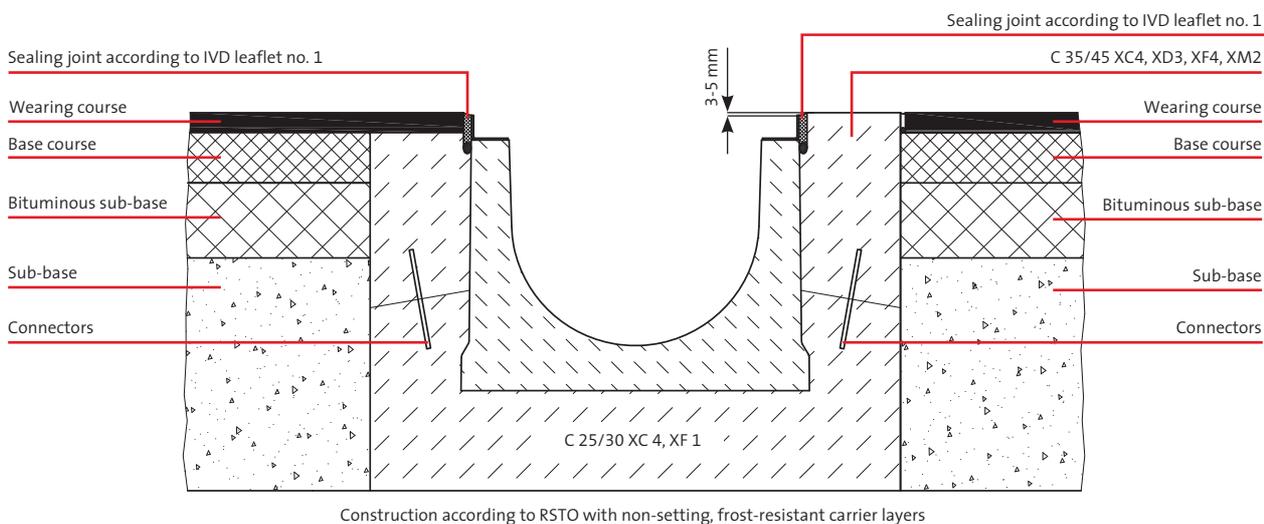


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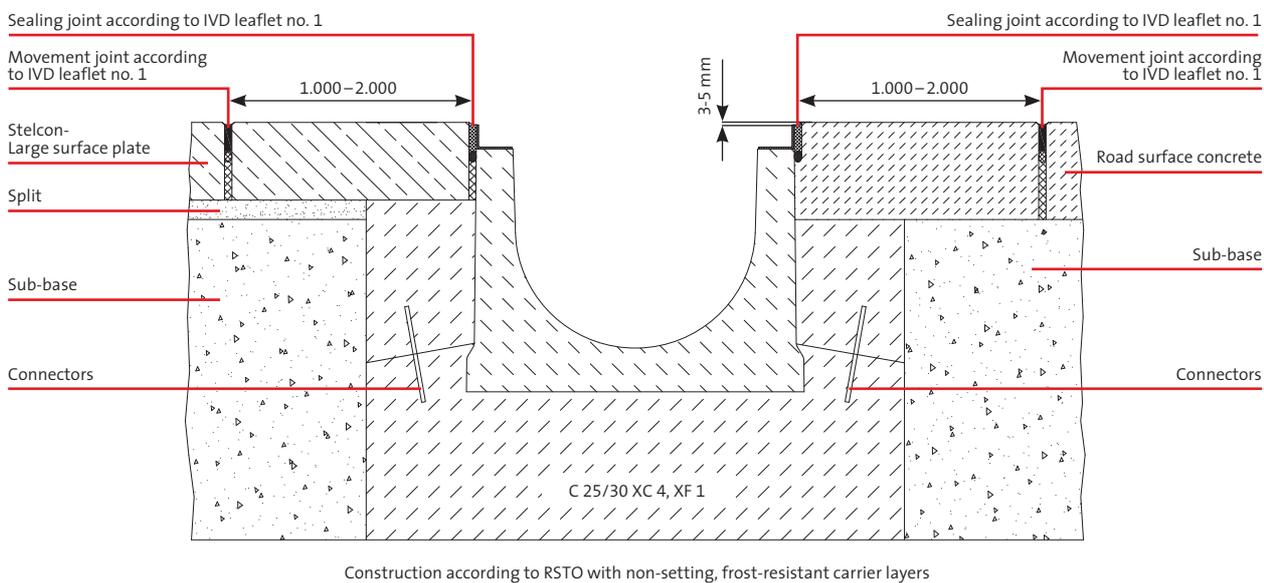
BIRCOsir NW 500 AS, Type M, for heavy-duty areas subjected to frequent use (Load Class E 600 / F 900)

Drawings No. 20285



BIRCOsir NW 500 AS, Type M, for heavy-duty areas subjected to frequent use (Load Class E 600 / F 900)

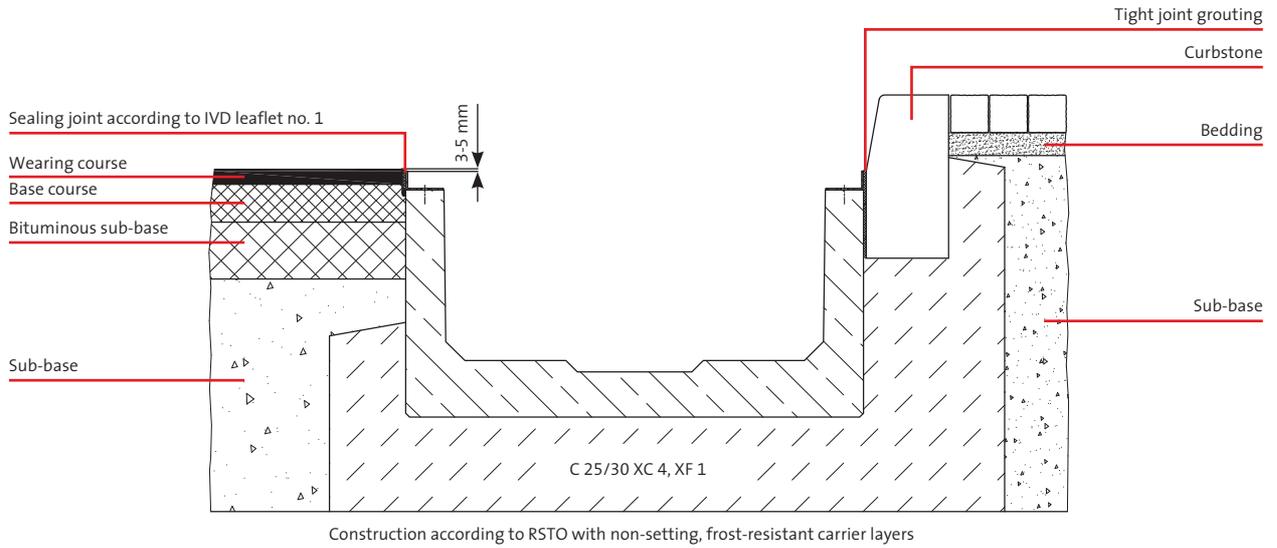
Drawings No. 20285



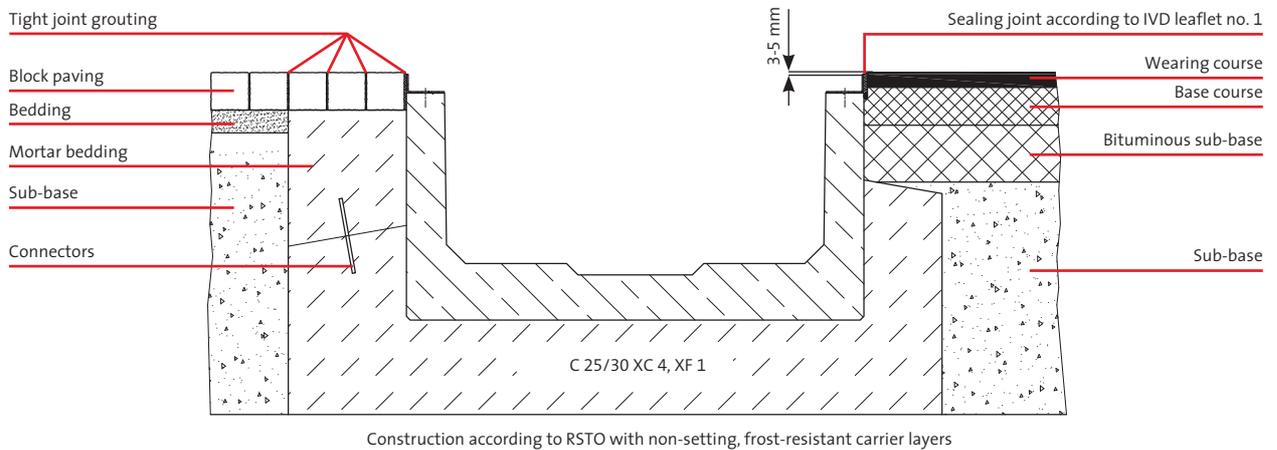
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BIRCOsir NW 1000, Type M, Load Class A 15 – D 400
 Drawings No. 20254



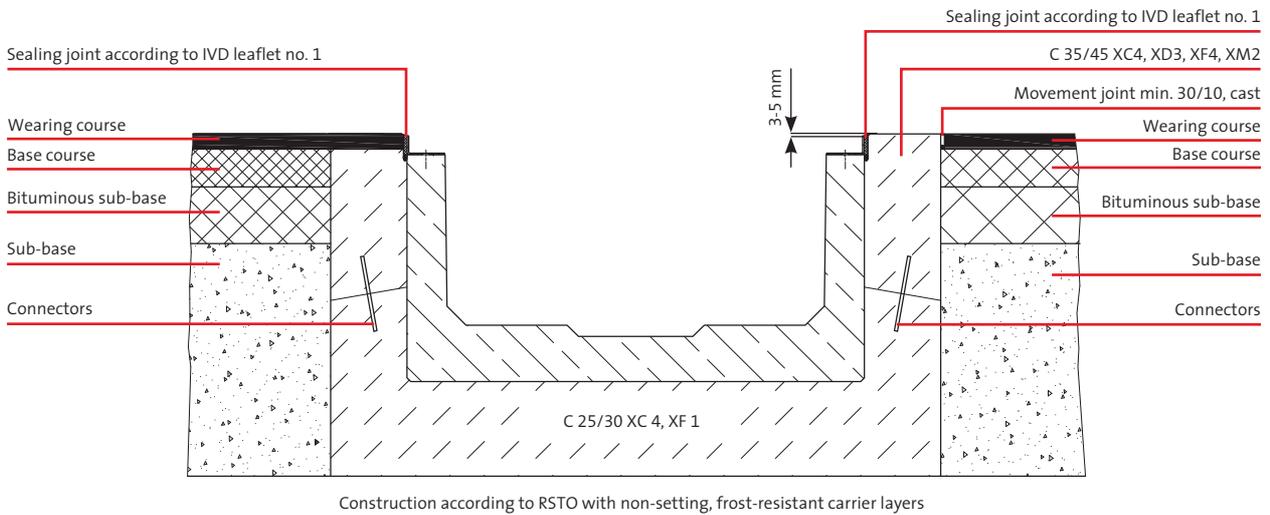
BIRCOsir NW 1000, Type M, Load Class A 15 – D 400
 Drawings No. 20254



The planning of movement joints must be conducted from on the basis of engineering considerations. When laying the channel line in a full concrete surround, movement joints at right angles to the channel line must be installed every 12 metres.
 Constructed in accordance with RSTO using non-settling frost-free sub-bases
 Exception up to D 400: Not for use across the carriage- way of highways or motorways.

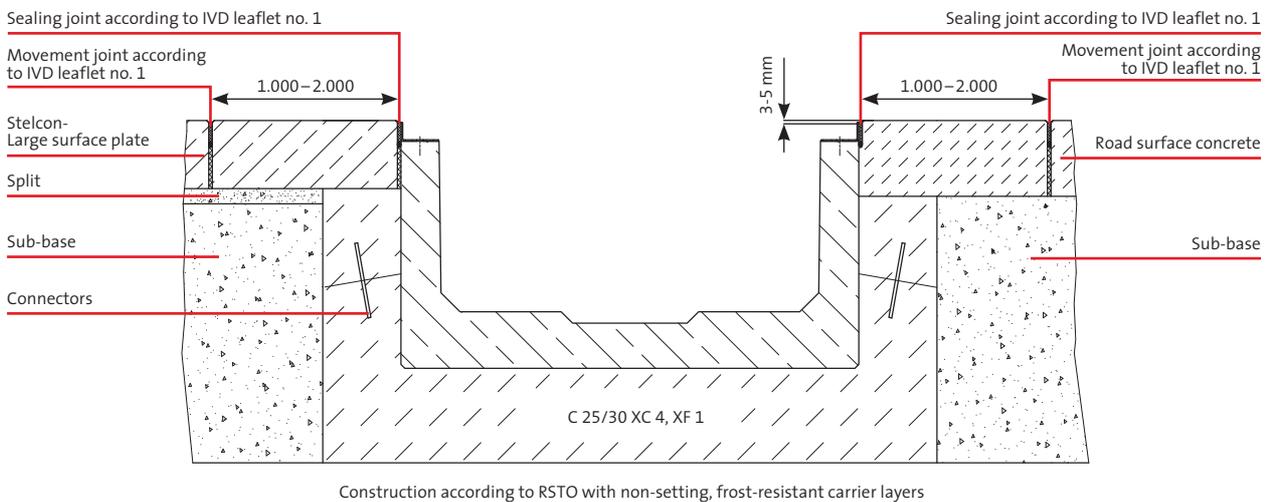
BIRCOsir NW 1000, Type M, for heavy-duty areas subjected to frequent use (Load Class D 400)

Drawings No. 20254



BIRCOsir NW 1000, Type M, for heavy-duty areas subjected to frequent use (Load Class D 400)

Drawings No. 20254



The planning of movement joints must be conducted from on the basis of engineering considerations. When laying the channel line in a full concrete surround, movement joints at right angles to the channel line must be installed every 12 metres. Constructed in accordance with RSTO using non-setting frost-free sub-bases. Exception up to D 400: Not for use across the carriage-way of highways or motorways.



When pavement surfaces are being laid and pressed, it must be ensured that the pavement material is not forced against the channels. The dimensions of the concrete surround must be adapted to the circumstances on-site and must consist of at least 15 cm. If no bond can be created between the base and the surround, then dowel bars or flotation control made of $\varnothing 8$ mm reinforced bars are to be installed every 30 cm. The concrete qualities indicated are minimum values. Requirements related to the installation location according to DIN 1045-2 or DIN EN 206-1

regarding for instance resistance to frost and de-icing salt are to be taken into account in the choice of the concrete.

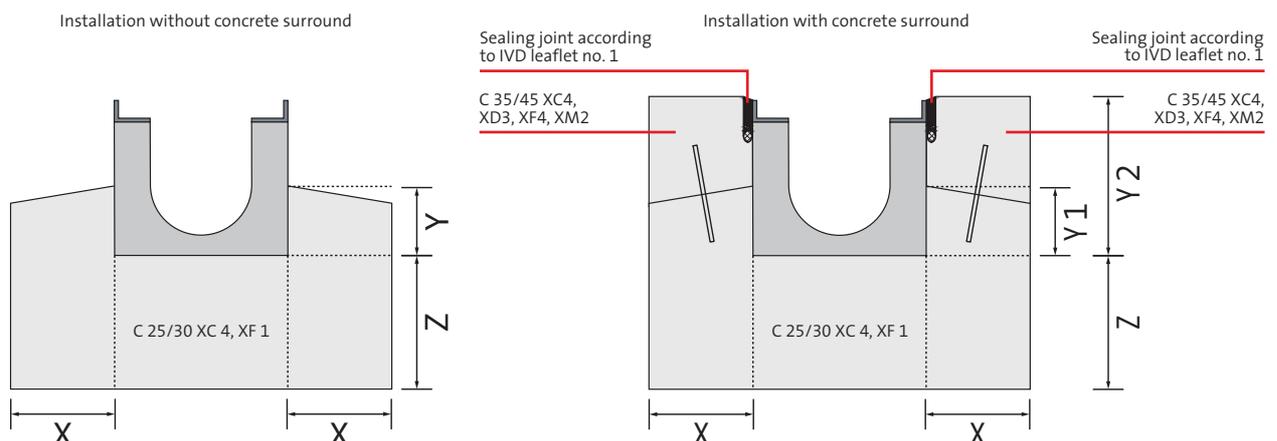
Bolt connection note:

For heavy-duty load areas subjected to frequent traffic and in vehicle manoeuvring areas, we recommend using threaded bolts instead of fast connection systems (such as Easylock). Torque moments for screw fastening the gratings are to be set at M12 = 60 Nm, M16 = 100 Nm. The bolts must be re-tightened at regular intervals.

BIRCOsir concrete surround overview

The manufacturer’s installation instructions must be followed in order to comply with the requirements stipulated by DIN EN 1433.

BIRCOsir									
NW	Type	Load class	X	Y/Y 1	Y 2	Z	Drawing No.	Page	
BIRCOsir 100	M	A 15 – E 600	≥ 150	≥ 100	–	≥ 200	20724	58	
BIRCOsir 100	M	D 400 – F 900	≥ 150	≥ 100	Construction height + 5 mm	≥ 200	20724	59	
BIRCOsir 150	M	A 15 – E 600	≥ 150	≥ 100	–	≥ 200	20723	60	
BIRCOsir 150	M	D 400 – F 900	≥ 150	≥ 100	Construction height + 5 mm	≥ 200	20723	61	
BIRCOsir 200 AS	M	A 15 – E 600	≥ 150	≥ 100	–	≥ 200	20710	62	
BIRCOsir 200 AS	M	D 400 – F 900	≥ 150	≥ 100	Construction height + 5 mm	≥ 200	20710	63	
BIRCOsir 300 AS	M	A 15 – E 600	≥ 200	≥ 100	–	≥ 200	20512	64	
BIRCOsir 300 AS	M	D 400 – F 900	≥ 200	≥ 100	Construction height + 5 mm	≥ 200	20512	65	
BIRCOsir 400	M	A 15 – E 600	≥ 200	≥ 200	–	≥ 200	20257	66	
BIRCOsir 400	M	D 400 – F 900	≥ 200	≥ 200	Construction height + 5 mm	≥ 200	20257	67	
BIRCOsir 500	M	A 15 – E 600	≥ 200	≥ 200	–	≥ 200	20258	68	
BIRCOsir 500	M	D 400 – F 900	≥ 200	≥ 200	Construction height + 5 mm	≥ 200	20258	69	
BIRCOsir 500 AS	M	A 15 – E 600	≥ 200	≥ 200	–	≥ 200	20285	70	
BIRCOsir 500 AS	M	D 400 – F 900	≥ 200	≥ 200	Construction height + 5 mm	≥ 200	20285	71	
BIRCOsir 1000	M	A 15 – E 600	≥ 200	≥ 250	–	≥ 250	20254	72	
BIRCOsir 1000	M	D 400 – F 900	≥ 200	≥ 250	Construction height + 5 mm	≥ 250	20254	73	



BIRCOsir Drainage Capacities

BIRCO channel systems provide outstanding drainage performance. BIRCO offers a calculation service in addition to this diagram.

BIRCOsir NW 100

CL = 1000 mm	Drainage capacity at the channel end	Cross-sectional area at the channel end
Nr. 0/0	4,94 l/sec	89,0 cm ²
No. 1	8,25 l/sec	99,0 cm ²
No. 2	9,08 l/sec	109,0 cm ²
No. 3	9,92 l/sec	119,0 cm ²
No. 4	10,75 l/sec	129,0 cm ²
No. 5	11,58 l/sec	139,0 cm ²
No. 5/0	7,72 l/sec	139,0 cm ²
No. 6	12,42 l/sec	149,0 cm ²
No. 7	13,25 l/sec	159,0 cm ²
No. 8	14,08 l/sec	169,0 cm ²
No. 9	14,92 l/sec	179,0 cm ²
No. 10	15,75 l/sec	189,0 cm ²
No. 10/0	10,50 l/sec	189,0 cm ²
No. 11	16,58 l/sec	199,0 cm ²
No. 12	17,42 l/sec	209,0 cm ²
No. 13	18,25 l/sec	219,0 cm ²
No. 14	19,08 l/sec	229,0 cm ²
No. 15	19,92 l/sec	239,0 cm ²
No. 15/0	13,30 l/sec	239,0 cm ²

BIRCOsir NW 150

CL = 1000 mm	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0	11,17 l/sec	201,0 cm ²
No. 1	12,29 l/sec	208,5 cm ²
No. 2	12,73 l/sec	216,0 cm ²
No. 3	13,17 l/sec	223,5 cm ²
No. 4	13,61 l/sec	231,0 cm ²
No. 5	14,05 l/sec	238,5 cm ²
No. 5/0	13,25 l/sec	238,5 cm ²
No. 6	14,50 l/sec	246,0 cm ²
No. 7	14,94 l/sec	253,5 cm ²
No. 8	15,38 l/sec	261,0 cm ²
No. 9	15,82 l/sec	268,5 cm ²
No. 10	16,26 l/sec	276,0 cm ²
No. 10/0	15,33 l/sec	276,0 cm ²
No. 11	16,71 l/sec	283,5 cm ²
No. 12	17,15 l/sec	291,0 cm ²
No. 13	17,59 l/sec	298,5 cm ²
No. 14	18,03 l/sec	306,0 cm ²
No. 15	18,47 l/sec	313,5 cm ²
No. 15/0	17,42 l/sec	313,5 cm ²
No. 16	18,92 l/sec	321,0 cm ²
No. 17	19,36 l/sec	328,5 cm ²
No. 18	19,80 l/sec	336,0 cm ²
No. 19	20,24 l/sec	343,5 cm ²
No. 20	20,68 l/sec	351,0 cm ²

The tables can only give guidelines for the dimensioning. On-site conditions such as positions of manholes already installed, number of channel lines etc. cannot and have not been taken into account. We therefore recommend making use of our hydraulic calculation service which provides you with a draft proposal.



BIRCOsir NW 200 AS

Cl = 1000 mm	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0	20,89 l/sec	367,0 cm ²
No. 1	22,75 l/sec	386,0 cm ²
No. 2	23,33 l/sec	396,0 cm ²
No. 3	23,92 l/sec	406,0 cm ²
No. 4	24,51 l/sec	416,0 cm ²
No. 5	25,10 l/sec	426,0 cm ²
No. 5/0	23,67 l/sec	426,0 cm ²
No. 6	25,69 l/sec	436,0 cm ²
No. 7	26,28 l/sec	446,0 cm ²
No. 8	26,87 l/sec	456,0 cm ²
No. 9	27,46 l/sec	466,0 cm ²
No. 10	28,05 l/sec	476,0 cm ²
No. 10/0	24,44 l/sec	476,0 cm ²
No. 20/0	32,00 l/sec	576,0 cm ²

BIRCOsir NW 300 AS

	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 1/2	82,1 l/sec	758,4 cm ²
No. 3/4	86,1 l/sec	788,4 cm ²
No. 5/6	90,0 l/sec	818,4 cm ²
No. 7/8	94,0 l/sec	848,4 cm ²
No. 9/10	98,0 l/sec	878,4 cm ²
No. 11/12	102,0 l/sec	908,4 cm ²
No. 13/14	106,0 l/sec	938,4 cm ²
No. 15/16	110,0 l/sec	968,4 cm ²
No. 17/18	114,0 l/sec	998,4 cm ²
No. 19/20	118,0 l/sec	1028,4 cm ²
No. 21/22	122,1 l/sec	1058,4 cm ²
No. 23/24	126,1 l/sec	1088,4 cm ²
No. 25/26	130,1 l/sec	1118,4 cm ²
No. 27/28	134,2 l/sec	1148,4 cm ²
No. 1	80,2 l/sec	743,4 cm ²
No. 2	82,1 l/sec	758,4 cm ²
No. 3	84,1 l/sec	773,4 cm ²
No. 4	86,1 l/sec	788,4 cm ²
No. 5	88,0 l/sec	803,4 cm ²
No. 6	90,0 l/sec	818,4 cm ²
No. 7	92,0 l/sec	833,4 cm ²
No. 8	94,0 l/sec	848,4 cm ²
No. 9	96,0 l/sec	863,4 cm ²
No. 10	98,0 l/sec	878,4 cm ²
No. 11	100,0 l/sec	893,4 cm ²
No. 12	102,0 l/sec	908,4 cm ²
No. 13	104,0 l/sec	923,4 cm ²
No. 14	106,0 l/sec	938,4 cm ²
No. 15	108,0 l/sec	953,4 cm ²
No. 16	110,0 l/sec	968,4 cm ²
No. 17	112,0 l/sec	983,4 cm ²
No. 18	114,0 l/sec	998,4 cm ²
No. 19	116,0 l/sec	1013,4 cm ²
No. 20	118,0 l/sec	1028,4 cm ²
No. 21	120,0 l/sec	1043,4 cm ²
No. 22	122,1 l/sec	1058,4 cm ²
No. 23	124,1 l/sec	1073,4 cm ²
No. 24	126,1 l/sec	1088,4 cm ²
No. 25	128,1 l/sec	1103,4 cm ²
No. 26	130,1 l/sec	1118,4 cm ²
No. 27	132,2 l/sec	1133,4 cm ²
No. 28	134,2 l/sec	1148,4 cm ²



BIRCOsir NW 400

	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0	74,91 l/sec	1348,0 cm ²

BIRCOsir NW 500 AS

	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0	137,5 l/sec	2475,95 cm ²

BIRCOsir NW 500

	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0	133,3 l/sec	2400,0 cm ²

BIRCOsir NW 1000

	Drainage capacity at the channel end	Cross-sectional area at the channel end
No. 0/0	252,8 l/sec	4550,0 cm ²

Hole drilling horizontal and vertical

We can fit BIRCOsir channels with horizontal or vertical bore holes for directly fitting feed and drainage lines according to your plans. The connections available differ according to the nominal widths, ranging from DN 100 to DN 300. The diameters are matched with channel base pipes; different pipes are available upon request. BIRCO also supplies ready-made pipe connections and silt buckets with vertical drilling upon request.

BIRCOsir | Maximum bore hole diameter

NW	Bore hole, horizontal maximal	Bore hole, vertical maximal
100 mm	DN 150	DN 100
150 mm	DN 200	DN 150
200 mm	DN 250	DN 200
300 mm	DN 300	DN 300
400 mm	DN 300	DN 300
500 mm	DN 300	DN 300
1000 mm	DN 300	DN 300

BIRCOservice

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- + BIRCO offers you an individual customisation and bore hole service ex-factory.

