Gidrolica

Water drainage system manufacture

Gidroloica surface flow system installation and operation manual C250 loading class

Technical manual

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GidrolicaC250 loading class surface flow system installation and operation manual

For the maximal service life and most effective operation of surface flow systems it is recommended to follow the below mentioned installation and operation requirements.

All the surface flow elements should be selected in accordance with the load class and their water-transmitting capacity. Water drainage gutter installation diagram is indicated on Fig. 2.3.

Gutters are laid down in a trench on a concrete basement. The installation should be commenced with gutter or sand catcher installation at the lower trace mark from which the drainage canal lay down line can be marked.

1. Shell bottom should be supported with the drainage layer – basement of puddled gravel and sand mix. Artificial basement is 10 cm thick.

2. The waterproofing material (such materials as glassine, "Asbestos felt" may be used as waterproofing material) should be laid down the built basement of break stone M 400 (GOST 8267-93). Then concrete mat of cement and concrete B 25 F200 W6 (GOST 26633-91) is made. Basement thickness depends on the load applied to the gutter during operation (Table 1).

Concrete should be laid before the level, 5 mm lower than the gutter bottom design mark.

Table 1. Dimensions of concrete shell depending on the loading class (according to EN1433)

Loading class	A15	B125	C250
Concrete shell width, C, mm	80	100	100
Concrete shell thickness, H, mm	100	100	150
Concrete mat class	B25	B25	B25

3. Upon completion of the concrete basement board plywood form panel or reusable formwork is installed.

The formwork should be strong, tight and stable under the influence of installation, transportation loads as well as loads when concrete laying. Plywood panel, sawn wood and other wooden materials should be saturated of covered with waterproof solutions. Formwork end faces of sawn wood should be protected from moisture with waterproof sealing and from mechanical damage with plastic or metal shells. The formwork installed should not have any deviations from vertical and horizontal axes of basement established by gutter line.

4. Before concrete mix laying all the formwork cavities and internal surfaces should be cleaned of rubbish and foreign matters. 10 mm thick M 150 cement and sand solution levelling course is made on the completed concrete plate basement according to the gutter basement width (Fig. 1)

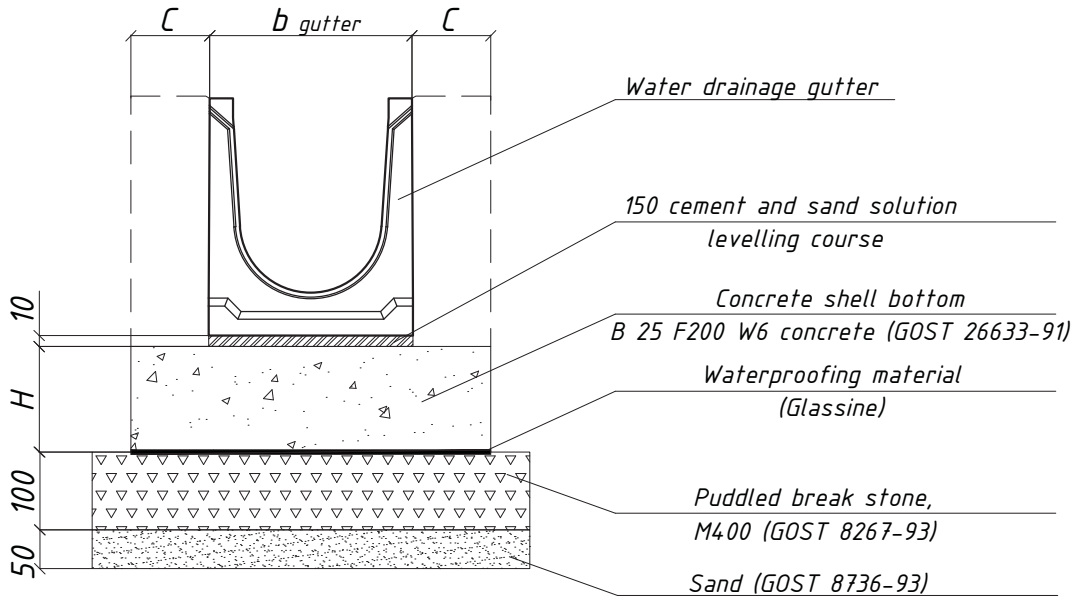


Fig. 1 Concrete water drainage gutter installation diagram

5. The gutters are matched according to the tongue-in-groove. After installing the gutter its direction should be checked according to the height marks from four sides according to the angle bar top.

6. After setting the sand catcher and the adjacent gutters into the design position the shell walls should be joint grouted. To avoid shear of canals the concrete should be laid around them in horizontal layers without technology gap along with the laying direction to one side in all the layers. Every next concrete mix layer should be laid up to the beginning of the concrete adhesion in the previously laid layer. For the higher loading zones the concrete is laid on the gutter on all the height.

To preserve the concrete qualities and to increase strength obtaining the newly laid concrete should be covered with the film till the concrete obtains the strength level at least 70%.

7. The formwork should be dismantled after the concrete achieves the stripping strength level.

8. If needed, gutter joints should be greased with sealing (GOST 25945).

9. To arrange the sealing joint at the border between the joint grouting and gutter shell at the concrete laying stage the flexible polystyrene foam formwork should be applied along both sides of the water drainage gutters to make joint cells.

After filling in the design strength joint grouting shell remove the temporary polystyrene foam seal. The seal should be dismantled in a mechanical way with the help of metal brush. Before sealing the joint should be cleaned with the brushing device, blown off and dried with hot air plants. Joint drying is the obligatory operation. Joint walls should be treated with priming, then the joint cell should be filled in with sealing (GOST 25945).

10. To seal the gutter and adjacent asphalt concrete joint a bitumen polymer clamping film should be used. Sealing is performed under the influence of high-temperature asphalt concrete mix which leads to melting of the film and it will form a protective layer.

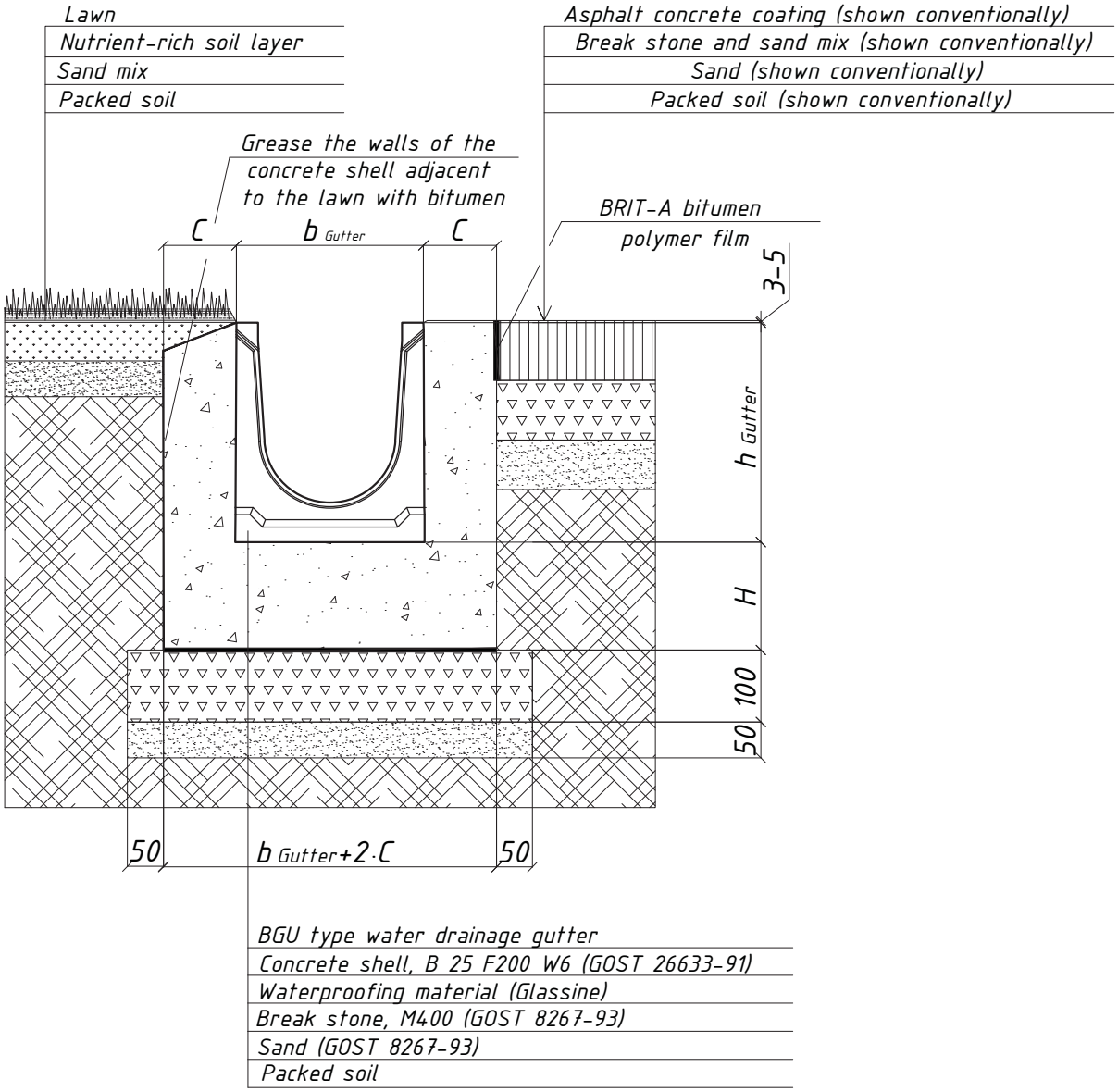


Fig. 2 BGU type concrete water drainage gutter installation diagram

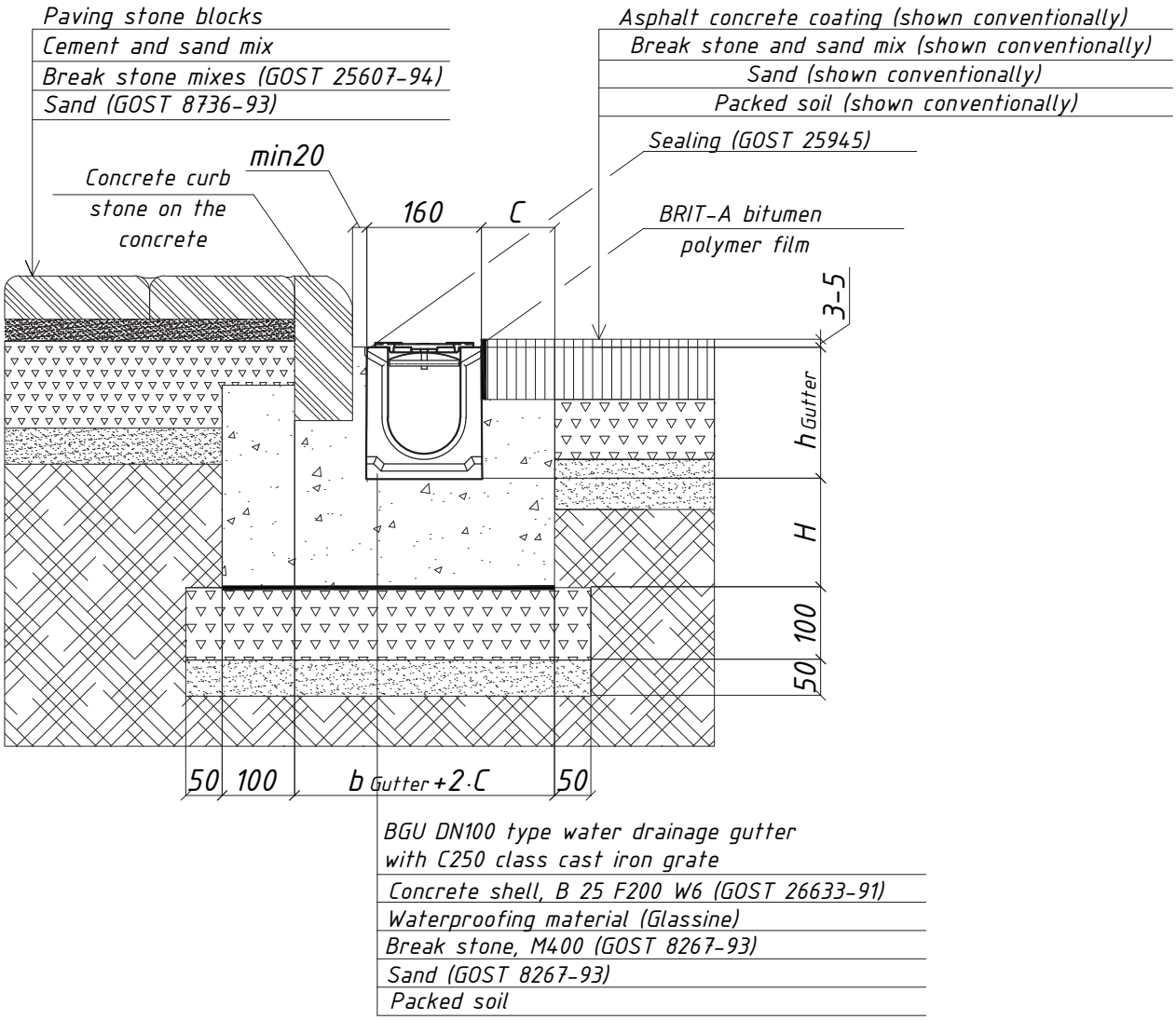


Fig. 3Installation diagram for BGU type concrete water drainage gutter with C250 class cast iron grate

11. When joint grouting the shell on all the gutter height the expansion joint should be taken into account. Transverseexpansion joint should be arranged in the cast-in-place gutter shell at the concrete laying stage by means of soft sealing laying (GOST 15588-86), d=20 mm. At the stage of joint arrangement a packing cord of foam rubber d30 mm (GOST 6467-79) should be installed over the sealing. After lying the cord the joint cell is filled in with the sealing (GOST 25945). The expansion joint is greased on the gutter bottom with the sealing over the packing cord. Transverse cord step is no more than 20 m.

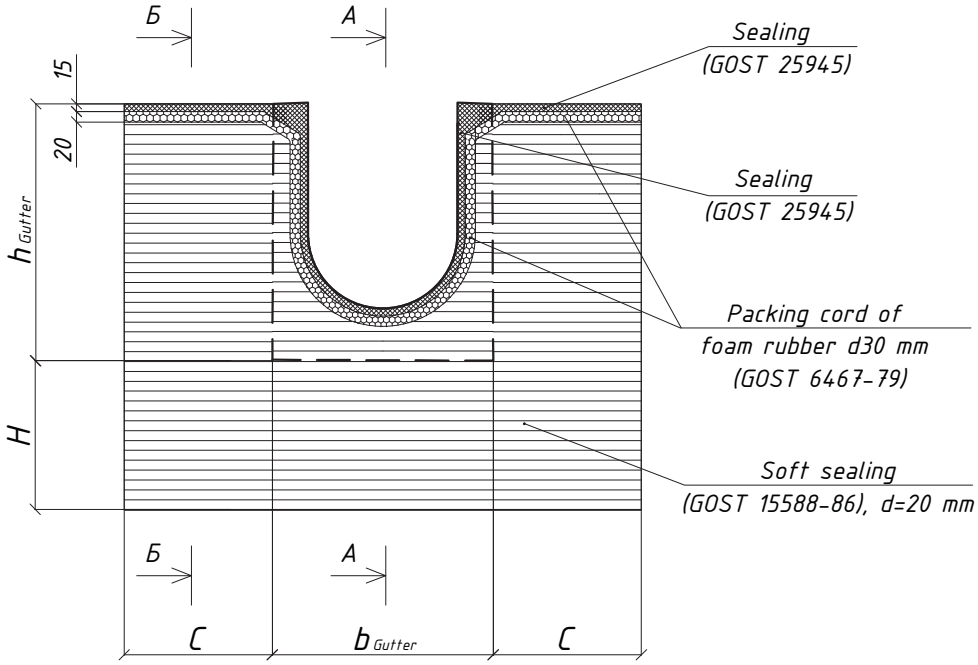
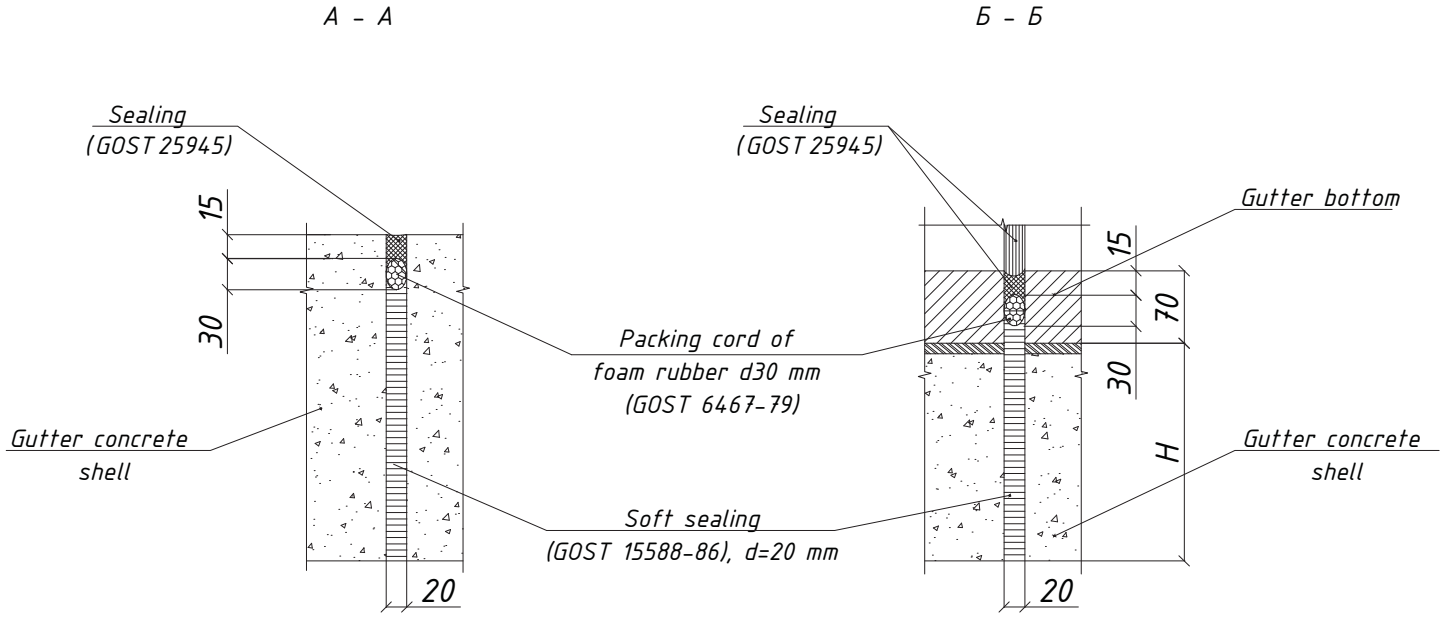


Fig. 4 Expansion joint arrangement diagram



12. After the installation the sewer grate level should be 3-5 mm less than the paving level. When asphalt paving the territory an asphalt paver may run over the canal line.

13. If needed to match the gutters at arbitrary angle other than 90° it is necessary to saw the gutters and grates in the place of joint at the angle equal to half of the required angle.

14. To provide the ideal water drainage it is recommended to regularly control the degree of stop-up and, as needed, clean the gutters to preserve their transmitting capacity. Besides, it is necessary to remove acid, toxic chemicals, reagents (for example, deicing agents) and other highly chemical substance remains from the gutter to prevent gutter damage. A special point to note is the timely cleaning of sand catchers as their stop-up leads to decrease in the water transmitting capacity of all the surface flow system.

Ways of cleaning the surface flow system:

1. Mechanical way – involves dismantling the canal grates and removal of stop-ups mechanically (brush, shovel).

2. Hydro-dynamic way – is based on application of a special equipment including high-pressure apparatus and firefighting machines.

3. Thermal way – involves cleaning the canals in the winter and spring from ice. This process is performed by heating gutters with the help of burners or by transporting hot water through them.