

Toyota Kohki Co., Ltd., Tokio, 183-0035 Japan

Variety types of drainages

Since its foundation of 1966, Toyota Kohki has been developed its technologies and contributed to the concrete industry as a leading mould manufacturing company for precast concrete products in Japan. Each Toyotaforms is custom made to meet individual customer's requests. Various types of precast concrete products in Japan have been shown in CPI and how Toyota Kohki has contributed to the product development as mould professionals. In this issue variety types of drainages used in throughout Japan will be presented.

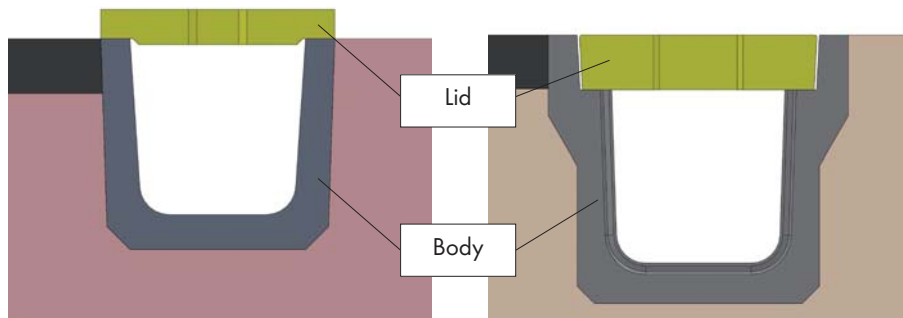


Fig. 1

Fig. 2

Recently Japan has become mature motorized society and its system has supported the high economic activities in Japan. Regardless of urban and rural location, most of roads are covered with asphalt pavement and this contributes to increase the driving safety and speed. Along with the improvement of roads network, the development of drainage products and their techniques became essential as well. As a result, the drainage techniques help to increase the safety not only for vehicles but also for pedestrians, and to keep the clean road environment by flowing dust and grit into drainage with rainfall.

Fig.1, called JIS-U, has been used for over 60 years and is the most basic type of drainage in Japan. The usages of JIS-U are depending on the traffic quantity and the circumstance of road shoulder. JIS-U has different types of lid used for vehicles or pedestrians. Sometimes, it is used without lid. Each lid has hand-holes on its joint-sides to allow you to lift up and remove easily by hands and collect water into the drainage through the holes.

Fig. 2, called Drop-Lid Drainage, is designed for eliminating the different level between drainage and road by setting the lid into the body of the drainage. Different thickness of the lid is used depending on the different load circumstance.

These types of road drainages are required to remove lid when doing maintenance. The longitudinal gradient is necessary to effectively flow rainwater into drainage outlet. As shown in Fig 3, Variable Slope Drainage (VS Drainage) can freely set the longitudinal gradient onto its base. When constructing long distance water drainage, it is usually required to deepen the height of the drainage to slope inside the drains. Toyotaforms made it possible by using an adjustable mould to produce the VS drainage with different height. The longitudinal gradient can be made by pouring the concrete into the drainage after setting on construction site. Comparing with Fig 1 and 2, it can be seen that Fig 3 highly performs on draining water when used at flatland. Since nearly 30 years ago, Slit Type Drainage (Lid Integral Type Drainage) has

been popularly used as well (see Fig 4). Because the lid is integrated with its body, this structure reduces rickety noise and collects the water/rainfall from the slit on the top. In addition, some of these products have designs on the surface for non-slip and great-looking.

Recently permeable asphalt pavement (Porous asphalt pavement) has been popularly used. The permeable pavement enables to effectively collect rain water into the porous asphalt pavement, let it flow along the impervious zone, and finally flow in the drainage through the side holes. This system sharply decreases the number of paddles on the roads, clears the driver's sight, reduces the risk of slipping, and therefore improves the safety of driving in the rain. Furthermore, this effectively performs on reducing the noise pollution (car noise) by being diffused and absorbed into the voids on the pavement.

Rainwater drainage system and function has been developed and improved the safety and the environmental friendliness. The development underlies the efforts of precast concrete product manufacturers who provide the high quality and high functionality with reasonable costs and large amounts.

Likewise, Toyota Kohki Co., Ltd. has contributed to the precast concrete industry and collaborated with customers to increase the product quality and productivity by enhancing the mould quality as a leading mould manufacturer in Japan. Toyotaforms that is water-tight, high durability, high productivity, and ease of use, have



Fig. 3a: Construction Site

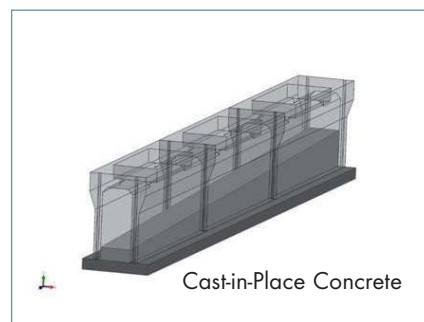


Fig. 3b: Slopes are made on site



Fig. 3c: Toyota Mould



Fig 4a: Example at a mall street



Fig 4b: Example of dividing strip



Fig 4c: Stocked product



Fig 4d: Toyota Mould

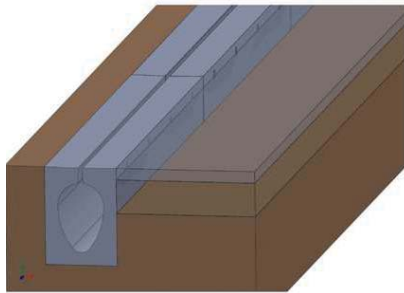


Fig. 5a

widely been used more and more countries.

Toyota Kohki will participate in the following exhibitions; EXCON 2011 (Bangalore, India), ICCX Russia 2011 (St. Petersburg, Russia), Concrete Show India 2012

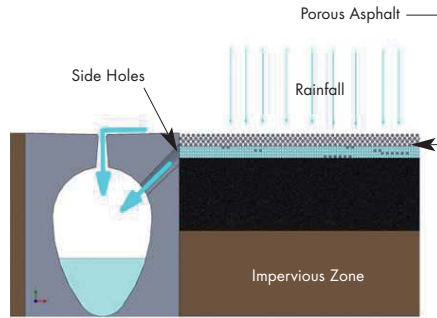


Fig. 5b

(Mumbai, India), and NPCA 2012 (Orlando, Florida, USA). At EXCON 2011, we will display an Egg-shaped Drain and U-shaped Drain at our booth on the 3rd floor in the Japan Pavilion area. Please visit and see our high quality mould for your

high quality concrete products. Concrete products manufactured by Toyotaforms will be exhibited as well. ■

FURTHER INFORMATION



Toyota Kohki Co., Ltd.
 6-12-8 Yatsuya Fuchu-shi
 Tokio, 183-0035 Japan
 T +81 42 3666011
 F +81 42 3642530
info@toyotaforms.com
www.toyotaforms.com