Adjusting units / seating rings and gully cover slabs

General guidance notes 26th July 2019

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General

These notes are raised as general guidance on the handling and installation of adjusting units / seating rings and gully cover slabs. Further information can be found on the Elite Precast Concrete webpages

Adjusting units / seating rings and gully cover slabs provide a quick, easily installed and durable alternative to the traditional two courses of engineering bricks

Handling

In order to maintain compatibility with masonry course thicknesses and to allow for manual handling the adjusting units / seating rings and gully cover slabs are necessarily slender in section and must be handled accordingly

Adjusting units / seating rings and gully cover slabs are supplied on heavy duty pallets and banded. Adjusting units / seating rings are supplied upside down and should be turned over for installation. This will reveal the finger recesses and will aid installation

Offloading of the pallets is generally by fork lift truck or telehandler and care should be exercised when travelling over uneven ground to avoid the pallets bouncing on the forks and impact loading the units

Pallets should be stored on a level surface to avoid twisting

The nature of these products is such that even under ideal handling conditions hairline cracks can develop. Such hairline cracks are normal, within the National annex to EN 1992 acceptable limits and will not affect the performance or durability of the units in service

After installation any imposed loading is purely compressive and there is no reason to expect a hairline crack to develop further. Indeed autogenous healing can be expected to seal such cracks in time

All Elite adjusting units / seating rings and gully cover slabs incorporate handling reinforcement and cracked units can be handled and installed safely

Installation

Construction of manholes should be in accordance with “Sewers for adoption”

Adjusting units / seating rings and gully cover slabs should be installed fully supported on a nominal 10mm bed of at least M6 (class ii) mortar, aligned vertically and pointed flush

In adverse weather the installed units should be covered to prevent rainwater scouring the wet mortar

Annex A – Definitions

Adjusting unit (BS EN 1917):

A component without a joint or installed step, to adjust the total height of a structure and/or to accommodate an appropriate frame and cover

Note: Adjusting units are also referred to as seating rings

Gully cover slab (BS 5911-6):

A frame or surround manufactured from concrete, with or without a drainage slot, to accommodate a road gully grating and frame

Mortar (BS EN 998-2)

A mix of one or more inorganic binders, aggregates, water and sometimes additions and/or admixtures for bedding, jointing and pointing masonry

Mortar may be factory manufactured and supplied ready to use or site mixed

Ready to use mortars should be a minimum M6 / class (ii) and may be retarded

Site mixed mortars should be mixed only as required and as can be used within 2 hours of mixing. Site mixed mortars should be proportioned in accordance with BS 5628 / PD 6678 to a minimum prescribed mortar designation (ii):

Mortar designation	Prescribed mortars (traditional proportion of materials by volume)[A]				Mortar class that may be assumed	Suitable for use in environmental condition
	Cement[B]: lime : sand with or without air entrainment	Cement[B]: sand with or without air entrainment	Masonry cement[C]: sand	Masonry cement[D]: sand		
(i)	1:0 to ¼ :3	1:3	Not suitable	Not suitable	M12	Severe (S)
(ii)	1:½ :4:4½	1:3 to 4	1:2½ to 3½	1:3	M6	Severe (S)
(iii)	1:1:5 to 6	1:5 to 6	1:4 to 5	1:3½ to 4	M4	Moderate (M)
(iv)	1:2:8 to 9	1:7 to 8	1:5½ to 6½	1:4½	M2	Passive (P)

[A] When the sand portion is given as, for example, 5 to 6, the lower figure should be used with sands containing a higher proportion of fines, whilst the higher figure should be used with sands containing a lower proportion of fines

Mixing water should be drawn from a mains potable supply or its suitability proven by testing in accordance with BS 1008

Annex B – Supporting documentation

Extract from National annex to EN 1992 -Eurocode 2: Design of concrete structures:

Table NA.4 — Recommended values of w_{max}

Exposure	Reinforced members and prestressed members without bonded tendons (quasi-permanent load combination) mm	Prestressed members with bonded tendons (frequent load combination) mm
X0, XC1	0,3[a]	0,2
XC2, XC3, XC4	0,3	0,2[b]
XD1, XD2, XD3, XS1, XS2, XS3		0,2 and decompression[c]

[a] For X0, XC1 exposure classes, crack width has no influence on durability and this limit is set to produce acceptable appearance. In the absence of specific requirements for appearance this limit may be relaxed.
[b] For these exposure classes, in addition, decompression should be checked under the quasi-permanent combination of loads.
[c] w_{max} = 0,2 mm applies to parts of the member that do not have to be checked for decompression.

In the absence of specific requirements (e.g. water-tightness), it may be assumed that limiting the calculated crack widths to the values of w_{max} given in Table NA.4, under the quasi-permanent combination of loads, will generally be satisfactory for reinforced concrete members in buildings with respect to appearance and durability.

Extract from the Concrete Society – http://concrete.org.uk/fingertipsnuggets.asp?cmd=display&id=651

Autogenous healing

Autogenous healing is the natural process of crack repair that can occur in concrete in the presence of moisture, and the absence of tensile stress. The repair is by a combination of mechanical blocking by particles carried into the crack with the water and the deposition of calcium carbonate from the cementitious material.

Autogenous healing has practical applications for closing dormant cracks in a moist environment, such as may be found in mass structures and in water retaining or watertight structures.

Extract from CONCRETE MATERIALS AND DESIGN CHALLENGES FACING THE ENGINEER - LIQUID RETAINING STRUCTURES K.A. Theodosiou Pr Eng

Autogenous healing can occur: causes water flow to reduce and even stop altogether

The healing process was found to be a combination of:

- mechanical blocking, and
- chemical precipitation of calcium carbonate

Self-healing occurs in cracks if they are narrower than 0,3 mm.