

RTU Testing Review Nr. 64-98 Determination of Waterproofing

RIGA TECHNICAL UNIVERSITY

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TESTING REVIEW Nr. 64-98

<i>Customer.</i>	"ORIONS" Ltd., St. Skolas 6, Ogre
<i>Order:</i>	V-41A-98
<i>Testing object:</i>	Concrete samples - cylinders (diam. 146 mm), what have been bored from Riga city BAS "Daugavgriva" 4 th block panels of aerotank.
<i>Samples delivery date:</i>	18.06.98.
<i>Samples verification date.</i>	18.06.98.-06.07.98.
<i>Way of testing:</i>	Determination of waterproofness
<i>Verifications have been done under</i>	GOST 12730.5-84

1. Boring of the samples

In June 18, 1998, from Riga city waste water mechanic and biological treatment station "Daugavgriva" there have been bored 3 concrete cylinders from each panel of 4th block outer wall 10th panel and from inner wall 14th panel in 1,5 m altitude. The diameter of bored cylinders 146 mm, height 150 ... 170 mm. These samples have been bored from the same panels, from what have been bored the samples for the examination in the October of 1996 (see the 1 st enclosure).

It has to be mentioned that the aerotank 4th block delimitation constructions - wall panels on surface had been treated with hydroinsulation material PENETRON.

2. Preparing of the samples and waterproofness verification

Bored cylinders had been sawed with diamond circular saw as to get the samples with height of 15 cm with sufficient smooth and perpendicular cut. Then the

samples had been washed, dried at temperature +70 °C and cooled.

Waterproofness of the samples had been determined with the moist spot method in conformity with the State standard GOST 1273.5-84 requests. The scheme of verification equipment with the set samples are showed at 2nd enclosure.

As the outer diameter of the cylinders was 146 mm, so it was not possible to put them correctly between the collapsible metal and rubber rings (by the data of passport the diameter of samples has to be 150 ± 1mm), because it was not possible to press the packing rubber rings tightly to concrete cylinder (in order to exclude later casual water leakage between the concrete sample and collapsible casing).

The standard allows to treat the concrete cylinders outer circumference surface with any material what excludes the later water leak through the cylinder sides, giving water under the pressure from the sample lower side. For insulation of the samples side surfaces there have been used the epoxide resin and fiberglass material in two plies.

Putting the cylinders in verification equipment, each sample has up and under the rubber pressure rings, what outer diameter was 19 cm, but inner - 12 cm. the plane rubber pressure rings covered the parallel ends of concrete cylinders over the samples circumference in 18 mm wide place (calculating from the concrete cylinders outer side). Under the upper rubber ring there have been placed the massive metal pressure ring, what has been attracted tightly with 4 bolts - in such way there have been averted the water filtration from the sample under by sample sides. The water had not filter through the concrete samples side surfaces, because the cylinders side surfaces had been treated with hydroinsulation materials. In such way the water, what have been given under the pressure from the cylinders lower side, could move up just through the concrete. After the tight fixation of samples under them from lower side with the pressure there have been given water, increasing the pressure by stages - with step 0,2 MPa. The pressure had been kept constant 16 hours to each stage. The obtained results (with the endured pressure showings) are summarized in Table #1 and Table #2.

Table #1

The results of waterproofness verification of concrete samples

Nr. of samples	Boring place	Stood under the water pressure, kgf/cm: (MPa), hours				
		6 (0.6)	8 (0.8)	10 (1.0)	12 (1.2)	14 (1.4)
1	"A" place of measurement	16	16	16	16	16

2	10 th panel, 1.5 m height,	16	16	16		
3	1. measure point	16	16	16	16	16
4	"C" place of measurement	16	16			
5	14 th panel, 1.5 m height,	16	16	16		
6	7. measure point	16	-			

Table #2

The comparing results of waterproofness verification of concrete samples

Nr. of samples	Boring place	Stood under the water pressure, kgf/cm ²	
		Samples bored in 1996 (before the covering of PENETRON)	Samples bored in 1998 (after the covering of PENETRON)
1	"A" place of measurement	4	14
2	10 th panel, 1.5 m height,	6	10
3	1. measure point		14
	<i>Average ratio</i>	<i>5. 0</i>	<i>12. 7</i>
4	"C" place of measurement	8	8
5	14 th panel, 1.5 m height,	6	10
6	7. measure point		6
	<i>Average ratio</i>	<i>7. 0</i>	<i>8. 0</i>

Chair of Building Materials.

Associate Professor, Dr. sc. ing. /Signature/ V. Zvejnieks

(Certificate Nr. 1106 issued by LBS "Physical verification and testing of building materials of buildings and edifices elements")

Director of laboratory, Ms. sc. ing. /Signature/G. Shahmenko

(Certificate Nr. 828 issued by LBS "Testing of building materials")

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Enclosure Nr. 1

Extract from "Examination conclusion of Riga city waste water mechanic and biological treatment station "Daugavgriva" aerotank 4th block main delimitation ferroconcrete constructions technical condition" (agreement Nr. 6260/96, September - December, 1996)

Table #22

Waterproofness verification results

Nr. of sample	Sample boring place	Water pressure p.kgf/cm ²	Waterproofness make
3	"A" place of measurement 10th panel,	4 6	W4
4	1.5 m height, 1. measure point "C" place of measurement		W6
5	14 th panel,	8	W8
6	1.5 m height, 7. measure point	6	W6

Note: These results have been obtained from samples in October, 1996.

