COMPRESSIVE STRENGTH WITH MODULUS OF ELASTICITY

BS EN 13286-43:2003

Project Title :	**Beaulieiu**	Tested By :	**HL/GLC**
Job Number :	**60544202**	Reported By :	**GLC**
Core Number:	**C1M1_39**	Checked By :	**NAL**
Location of Testing :	**AECOM Laboratory, NG9 6RZ**	Date of Issue :	**27 October 2017**

Sample details :

Sample Origin :	Laboratory manufactured	Shape :	Cylinder
Sample Condition :	As received	Storage :	Room temperature (20 °C)
Date of Coring :	08 September 2017		
Date of Test :	06 October 2017		
Test Temperature :	21ºC		

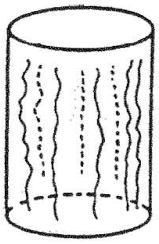
Dimensions :

Average Length :	298.8 mm
Average Diameter :	149.3 mm
Ratio of Diameter : Length :	1:2.00

Test Results :

Density :	**2320 kg/m³**
Maximum Load at Failure :	**18.8 kN**
Compressive Strength :	**1.1 N/mm²**
Appearance at Failure :	**Type D - Satisfactory**
Estimated in-situ cube strength :	**1.5 N/mm²**
Modulus of Elasticity :	**23.5**
Method Used :	**Compressive strength**

Failure Sketch



Solid lines for material failures.

Dashed lines for apparent weakness failure.

$$E_c \text{ or } E_t = \frac{1{,}2\,F_r}{\pi\,D^2\,\varepsilon_3}$$

Ec	elastic modulus in compression (Gpa)				
Et	elastic modulus in tension (GPa)	D	Diameter of the test specimen	ε3	longitudinal strain of the specimen when F=0.3Fr
Fr	maximum force sustained (kN)				

Comments and Deviations:

Determination of volume by water displacement method.

For water saturated - specimens conditioned for a minimum of 48 hours prior to testing.

Calculation and result from National Annex NA Guidance on the use of BS EN 12504-1:2009

Diameter: Length ratio out of specification.

Checked by: -	**Neil Longstaff**	Date: -	**27 October 2017**

COMPRESSIVE STRENGTH WITH MODULUS OF ELASTICITY

BS EN 13286-43:2003

Project Title :	**Beaulieiu**	Tested By :	**HL/GLC**
Job Number :	**60544202**	Reported By :	**GLC**
Core Number:	**C1M1_40**	Checked By :	**NAL**
Location of Testing :	**AECOM Laboratory, NG9 6RZ**	Date of Issue :	**27 October 2017**

Sample details :

Sample Origin :	Laboratory manufactured	Shape :	Cylinder
Sample Condition :	As received	Storage :	Room temperature (20 °C)
Date of Coring :	08 September 2017		
Date of Test :	06 October 2017		
Test Temperature :	21ºC		

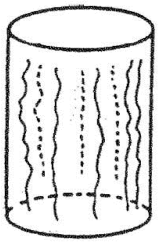
Dimensions :

Average Length :	297.0 mm
Average Diameter :	149.4 mm
Ratio of Diameter : Length :	1:1.99

Test Results :

Density :	**2250 kg/m³**
Maximum Load at Failure :	**40.18 kN**
Compressive Strength :	**2.3 N/mm²**
Appearance at Failure :	**Type D - Satisfactory**
Estimated in-situ cube strength :	**3.0 N/mm²**
Modulus of Elasticity :	**Test failed** *
Method Used :	**Compressive strength**

Failure Sketch



Solid lines for material failures.

Dashed lines for apparent weakness failure.

$$E_c \quad \text{or} \quad E_t = \frac{1{,}2\,F_r}{\pi\,D^2\,\varepsilon_3}$$

Ec	elastic modulus in compression (Gpa)				
Et	elastic modulus in tension (GPa)	D	Diameter of the test specimen	ε3	longitudinal strain of the specimen when F=0.3Fr
Fr	maximum force sustained (kN)				

Comments and Deviations:

Determination of volume by water displacement method.

For water saturated - specimens conditioned for a minimum of 48 hours prior to testing.

Calculation and result from National Annex NA Guidance on the use of BS EN 12504-1:2009

Diameter: Length ratio out of specification.

* a malfunction of the stress gauges: recorded incorrect values

Checked by: -	**Neil Longstaff**	Date: -	**27 October 2017**

COMPRESSIVE STRENGTH WITH MODULUS OF ELASTICITY

BS EN 13286-43:2003

Project Title :	**Beaulieiu**	Tested By :	**HL/GLC**
Job Number :	**60544202**	Reported By :	**GLC**
Core Number:	**C2M1_34**	Checked By :	**NAL**
Location of Testing :	**AECOM Laboratory, NG9 6RZ**	Date of Issue :	**27 October 2017**

Sample details :

Sample Origin :	Laboratory manufactured	Shape :	Cylinder
Sample Condition :	As received	Storage :	Room temperature (20 °C)
Date of Coring :	07 September 2017		
Date of Test :	05 October 2017		
Test Temperature :	21ºC		

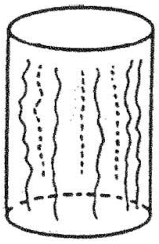
Dimensions :

Average Length :	302.9 mm
Average Diameter :	147.8 mm
Ratio of Diameter : Length :	1:2.05

Test Results :

Density :	**2350 kg/m³**
Maximum Load at Failure :	**34.02 kN**
Compressive Strength :	**2.0 N/mm²**
Appearance at Failure :	**Type D - Satisfactory**
Estimated in-situ cube strength :	**2.5 N/mm²**
Modulus of Elasticity :	**Test failed** *
Method Used :	**Compressive strength**

Failure Sketch



Solid lines for material failures.

Dashed lines for apparent weakness failure.

$$E_c \quad \text{or} \quad E_t = \frac{1{,}2\,F_r}{\pi\,D^2\,\varepsilon_3}$$

Ec	elastic modulus in compression (Gpa)				
Et	elastic modulus in tension (GPa)	D	Diameter of the test specimen	ε3	longitudinal strain of the specimen when F=0.3Fr
Fr	maximum force sustained (kN)				

Comments and Deviations:

Determination of volume by water displacement method.

For water saturated - specimens conditioned for a minimum of 48 hours prior to testing.

Calculation and result from National Annex NA Guidance on the use of BS EN 12504-1:2009

Diameter: Length ratio out of specification.

* a malfunction of the stress gauges: recorded incorrect values

Checked by: -	**Neil Longstaff**	Date: -	**27 October 2017**

COMPRESSIVE STRENGTH WITH MODULUS OF ELASTICITY

BS EN 13286-43:2003

Project Title :	**Beaulieiu**	Tested By :	**HL/GLC**
Job Number :	**60544202**	Reported By :	**GLC**
Core Number:	**C2M1_33**	Checked By :	**NAL**
Location of Testing :	**AECOM Laboratory, NG9 6RZ**	Date of Issue :	**27 October 2017**

Sample details :

Sample Origin :	Laboratory manufactured	Shape :	Cylinder
Sample Condition :	As received	Storage :	Room temperature (20 °C)
Date of Coring :	07 September 2017		
Date of Test :	05 October 2017		
Test Temperature :	21ºC		

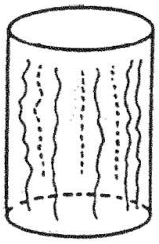
Dimensions :

Average Length :	301.0 mm
Average Diameter :	149.0 mm
Ratio of Diameter : Length :	1:2.02

Test Results :

Density :	**2350 kg/m³**
Maximum Load at Failure :	**26.62 kN**
Compressive Strength :	**1.5 N/mm²**
Appearance at Failure :	**Type D - Satisfactory**
Estimated in-situ cube strength :	**2.0 N/mm²**
Modulus of Elasticity :	**41.5**
Method Used :	**Compressive strength**

Failure Sketch



Solid lines for material failures.

Dashed lines for apparent weakness failure.

$$E_c \quad \text{or} \quad E_t = \frac{1{,}2\,F_r}{\pi\,D^2\,\varepsilon_3}$$

Ec	elastic modulus in compression (Gpa)				
Et	elastic modulus in tension (GPa)	D	Diameter of the test specimen	ε3	longitudinal strain of the specimen when F=0.3Fr
Fr	maximum force sustained (kN)				

Comments and Deviations:

Determination of volume by water displacement method.

For water saturated - specimens conditioned for a minimum of 48 hours prior to testing.

Calculation and result from National Annex NA Guidance on the use of BS EN 12504-1:2009

Diameter: Length ratio out of specification.

Checked by: -	**Neil Longstaff**	Date: -	**27 October 2017**

COMPRESSIVE STRENGTH WITH MODULUS OF ELASTICITY

BS EN 13286-43:2003

Project Title :	**Beaulieiu**	Tested By :	**HL/GLC**
Job Number :	**60544202**	Reported By :	**GLC**
Core Number:	**C3M1_41**	Checked By :	**NAL**
Location of Testing :	**AECOM Laboratory, NG9 6RZ**	Date of Issue :	**27 October 2017**

Sample details :

Sample Origin :	Laboratory manufactured	Shape :	Cylinder
Sample Condition :	As received	Storage :	Room temperature (20 °C)
Date of Coring :	08 September 2017		
Date of Test :	06 October 2017		
Test Temperature :	21ºC		

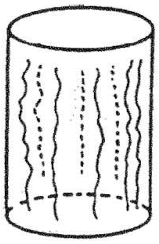
Dimensions :

Average Length :	305.3 mm
Average Diameter :	149.8 mm
Ratio of Diameter : Length :	1:2.04

Test Results :

Density :	**2120 kg/m³** *
Maximum Load at Failure :	**50.01 kN**
Compressive Strength :	**2.8 N/mm²**
Appearance at Failure :	**Type D - Satisfactory**
Estimated in-situ cube strength :	**3.5 N/mm²**
Modulus of Elasticity :	**Test failed** **
Method Used :	**Compressive strength**

Failure Sketch



Solid lines for material failures.

Dashed lines for apparent weakness failure.

$$E_c \text{ or } E_t = \frac{1{,}2\,F_r}{\pi\,D^2\,\varepsilon_3}$$

Ec	elastic modulus in compression (Gpa)				
Et	elastic modulus in tension (GPa)	D	Diameter of the test specimen	ε3	longitudinal strain of the specimen when F=0.3Fr
Fr	maximum force sustained (kN)				

Comments and Deviations:

Determination of volume by water displacement method.

For water saturated - specimens conditioned for a minimum of 48 hours prior to testing.

Calculation and result from National Annex NA Guidance on the use of BS EN 12504-1:2009

Diameter: Length ratio out of specification.

*specimen too heavy to be weighted in water. Density not calculated and assumed same as similar specimens.

** a malfunction of the stress gauges: recorded incorrect values

Checked by: -	**Neil Longstaff**	Date: -	**27 October 2017**

COMPRESSIVE STRENGTH WITH MODULUS OF ELASTICITY

BS EN 13286-43:2003

Project Title :	**Beaulieiu**	Tested By :	**HL/GLC**
Job Number :	**60544202**	Reported By :	**GLC**
Core Number:	**C3M1_42**	Checked By :	**NAL**
Location of Testing :	**AECOM Laboratory, NG9 6RZ**	Date of Issue :	**27 October 2017**

Sample details :

Sample Origin :	Laboratory manufactured	Shape :	Cylinder
Sample Condition :	As received	Storage :	Room temperature (20 °C)
Date of Coring :	08 September 2017		
Date of Test :	06 October 2017		
Test Temperature :	21ºC		

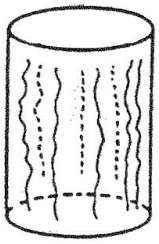
Dimensions :

Average Length :	314.3 mm
Average Diameter :	150.4 mm
Ratio of Diameter : Length :	1:2.09

Test Results :

Density :	**2110 kg/m³**
Maximum Load at Failure :	**43.25 kN**
Compressive Strength :	**2.4 N/mm²**
Appearance at Failure :	**Type D - Satisfactory**
Estimated in-situ cube strength :	**3.0 N/mm²**
Modulus of Elasticity :	**40.5**
Method Used :	**Compressive strength**

Failure Sketch



Solid lines for material failures.

Dashed lines for apparent weakness failure.

$$E_c \quad \text{or} \quad E_t = \frac{1{,}2\,F_r}{\pi\,D^2\,\varepsilon_3}$$

Ec	elastic modulus in compression (Gpa)				
Et	elastic modulus in tension (GPa)	D	Diameter of the test specimen	ε3	longitudinal strain of the specimen when F=0.3Fr
Fr	maximum force sustained (kN)				

Comments and Deviations:

Determination of volume by water displacement method.

For water saturated - specimens conditioned for a minimum of 48 hours prior to testing.

Calculation and result from National Annex NA Guidance on the use of BS EN 12504-1:2009

Diameter: Length ratio out of specification.

*specimen too heavy to be weighted in water. Density not calculated and assumed same as similar specimens.

Checked by: -	**Neil Longstaff**	Date: -	**27 October 2017**