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| POLITECHNIKA WARSZAWSKA  WYDZIAŁ INŻYNIERII LĄDOWEJ  **ZAKŁAD INŻYNIERII MATERIAŁÓW BUDOWLANYCH** | | |
| LABORATORY EXERCISE REPORT **BUILDING MATERIALS 2 - LABORATORY** | | |
| **Lightweight concrete design: ITB method** | | |
| Author: | Group: ............. | Semester 3 |
| Tutor: | Stationary studies | Academic Year …………. |

# Task aim

The aim of the task was to ……………………………………………………………………………………………………..… …………………………………………………………………………………………………………………………………….

# Design assumptionS:

|  |  |
| --- | --- |
| **Concrete compressive class** | C …./….. |
| **Components:** | Cement: ………………………………......  Water: tap water (EN 1008)  Aggregate:   * Fraction 0/4 mm: natural sand / ~~lightweight sand~~ * Fraction 4/8 mm: artificial lightweight aggregate “Keramzyt” * Fraction 8/16 mm: artificial lightweight aggregate “Keramzyt” |
|
|

# TEST RESULTS – BULK DENSITY IN THE LOOSE STATE OF LIGHTWEIGHT AGGREGATE

Real bulk density in the loose state of the artificial lightweight aggregate

“Keramzyt” 4/8 mm: = …………………. kg/m3

“Keramzyt” 8/16 mm: = …………………. kg/m3

# DETERMINATION OF THE COMPOSITION

fck,cube = ……………….. MPa σ = ……………….. MPa fcm = fck,cube + 2σ = ……………….. MPa

fcm = A1(C/W – 0.5) 🡪 c/w = ……………….

## ADOPTED COMPOSITION

Adopted composition of lightweight concrete with natural sand and “keramzyt 25” (of the theoretical bulk density in the loos state of 800 and 700 kg/m3) for the determined C/W (Figure 2 from the instruction) per 1 m3 of concrete mix:

|  |  |  |
| --- | --- | --- |
| **Component** | **Bulk density  in the loose state, kg/m3** | **Mass per 1 m3, kg** |
| **Cement** |  |  |
| **Water** |  |
| **Fraction 0/4 mm: natural sand** |  |
| **Fraction 4/8 mm: artificial lightweight aggregate “Keramzyt 25”** | 800 |  |
| **Fraction 8/16 mm: artificial lightweight aggregate “Keramzyt 25”** | 700 |  |

## ADJUSTED COMPOSITION

Composition of lightweight concrete with natural sand and two real “keramzyt” fractions (of the tested bulk density in the loose state) per 1 m3 and 7 dm3 of concrete mix:

|  |  |  |  |
| --- | --- | --- | --- |
| **Component** | **Bulk density  in the loose state, kg/m3** | **Mass per 1 m3, kg** | **Mass per 7 dm3, kg** |
| **Cement** |  |  |  |
| **Water** |  |  |
| **Fraction 0/4 mm: natural sand** |  |  |
| **Fraction 4/8 mm: artificial lightweight aggregate “Keramzyt”** |  |  |  |
| **Fraction 8/16 mm: artificial lightweight aggregate “Keramzyt”** |  |  |  |

# TEST RESULTS – CONSISTENCY CLASS

|  |  |  |
| --- | --- | --- |
| **Test method** | **Test result (with units)** | **Consistency class** |
|  |  |  |

# TEST RESULTS – CONSISTENCY CLASS

Approximate contents aggregate fractions in lightweight concrete:

|  |  |  |
| --- | --- | --- |
| **Fraction** | **Content, %** | **Compact or semi-compact  concrete?** |
| **0/4 mm** |  |
| **4/8 mm** |  |
| **8/16 mm** |  |

# CONCLUSIONS

……………………………………………………………………………………………………………….……………………………………………………………………………………………………………….……………………………………………………………………………………………………………….………………………………………………………………………………………………………………………………………………………………………………………………………………………….……………………………………………………………………………………………………………….……………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………………….

# Notes & CALCULATIONS

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