

Flow Mechanism and Control for Fresh Concrete

2 units (selection)

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Target) The objective of this subject is to understand the recent technology on consistency of fresh concrete in process of mixing or flowing in the construction machine, such as concrete mixer, concrete pump or concrete agitator.

Outline) Mechanical behavior of concrete materials in process of mixing, conveying and compacting using the visualization technique of fresh concrete. Application of the rheology to fresh concrete. Design of self-compacting concrete and eco-concrete. Concept for construction design, which is the performance-based design. Basic concept for new types of structure such as partially prestressed concrete structures.

Style) Lecture in combination with Portfolio

Keyword) *visualizaion technique of fresh concrete, application of visualized analysis on fresh concrete, deformed pipe, agitator drum, diaphragm wall, consistency test, bi-axial forced mixing type mixer, vertical continuous mixer with gravity*

Requirement) It is necessary for students to learn the basic attainments on the concrete engineering.

Goal)

1. The purpose is to understand the visualization technique of fresh concrete.
2. The purpose is to understand the application of flow analysis in process of mixing or flowing in the construction machine.

Schedule)

1. Guidance
2. Visualizaion technique of fresh concrete (historical development).
3. Visualizaion technique of fresh concrete (materials used).
4. Visualizaion technique of fresh concrete (method of image analysis).
5. Visualizaion technique of fresh concrete (scale effect of model concrete).
6. Visualizaion technique of fresh concrete (problem to be solved).
7. Application of visualized analysis on fresh concrete flowing through the tapered pipe.
8. Application of visualized analysis on fresh concrete flowing through the bend pipe or bifurcated pipe.
9. Application of visualized analysis on fresh concrete discharging of agitator drum..

10. Application of visualized analysis on fresh concrete mixing in agitator drum.
11. Application of visualized analysis on fresh concrete placing for diaphragm wall.
12. Application of visualized analysis on fresh concrete flowing in the vessel of consistency test.
13. Application of visualized analysis on self-compacting concrete casting in the slab form.
14. Application of visualized analysis on fresh concrete in process of mixing in bi-axial forced mixing type mixer.
15. Application of visualized analysis on fresh concrete in process of mixing in vertical continuous mixer with gravity.
16. Preliminary

Evaluation Criteria) Evaluate by reports or presentations or each subject.

Textbook) Handout of phot copying materials for each subject.

Contents) <http://cms.db.tokushima-u.ac.jp/cgi-bin/toURL?EID=216903>

Note) It is necessary getting the unit of lecture and understanding the lecture for 2 hours to prepare of the lecture for 2 hours. and review of the lecture for 2 hours