



International Code Council

ICC IS-3DACT Committee Minutes

3. Approval of Agenda

Chair Mr. Bora Gencturk asked if there was any opposition to the agenda. There were no objections. The agenda was unanimously approved.

4. Approval of Previous Meeting Minutes

Mr. Gencturk asked if there was any opposition to the previous meeting minutes. There were no objections. The previous meeting minutes were unanimously approved.

5. Update on Work Groups

a. Materials Work Group (Bing Tian)

Mr. Bing Tian stated that the Materials Work Group finished Chapter 3 and submitted it to the full committee for comments and balloting for today. He also mentioned a separate meeting was held to address the need for a mock-up wall requirement.

b. Structural Work Group (Jared Brewe)

Mr. Jared Brewe shared they are waiting to see how the committee feels about Chapter 3 to have a good sense of direction to finalize the structural provisions in Chapter 4.

6. Committee Vote – Chapter 3 – 3D Printing Material Laboratory Prequalification – Testing Methods and Performance Requirements

Mr. Gencturk started the discussion with the title of Chapter 3. He emphasized that 3D Printing Materials means either 3D Concrete or 3D Mortar.

He then proceeded to Section 301.1 - Material mixture constituents. Mr. David Langefeld commented that ASTM C1157 should be added to the section for cement requirements. Mr. Tian agreed. Mr. Gencturk added this into the section. Mr. Tian commented that ASTM C144 and ASTM C330 should be added for the aggregate requirements. Mr. Werner Hellmer asked whether lightweight aggregates compounded the structural requirements in Chapter 4. Mr. Langefeld asked whether the requirements on gradation should be more lenient, allowing a supplier to use a gradation outside of the standards. Mr. Tian replied that this was not a good idea from a safety point. He said there is more to the standards than gradation, there are purity, debris, and organic content requirements. Mr. Daniel Galvez Moreno agreed with Mr. Langefeld. He said that using aggregates complying to the standards may not result in the best printable material. Mr. Gencturk agreed with Mr. Tian. He said the gradation and other properties of the aggregates are tied together. Mr. Tian stated that it is too liberal approach to go beyond the standards. Mr. Adil Tamimi agreed with Mr. Gencturk and Mr. Tian. Mr. Abdul Peerzada stated that different gradation can be achieved through blending while still being code compliant.

Mr. Mahmut Ekenel questioned the validity of adding ASTM C330. He said the lightweight factor

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Gencturk then proposed to settle for 0.10% for both the concrete and mortar and to take out the fiber-reinforced materials language.

Mr. Gencturk then called for a three minute break.

After the break, the discussion turned to section 303.4 ±Flexural strength of 3D printing material with fibers. Mr. Gabriel Carrera commented that tensile strength affects the structural performance of the structure made with the proposed design methodology and asked why only the fiber-reinforced materials to be tested. Mr. Devine agreed with this comment. Mr. Gencturk asked when tensile strength of concrete is used, and if the section was necessary. Mr. Brewe responded that it could be applicable when designing plain concrete elements. Mr. Ekenel commented that the title of the section should be changed to toughness since the measurement ASTM C1609 measures is toughness. Mr. Gencturk asked when is the test would be needed. Mr. Ekenel responded that for material performance it is used to compare different fibers, but for the intent the section was written it might not be needed. Mr. Christopher Kaufmann and Mr. Gencturk agreed with this. Mr. Gencturk then deleted this section.

Mr. Carrera asked a general question about Section 303 D Q G Z K \ W K H U H Z D V Q ¶ W D G on printed concrete in the lab. Mr. Gencturk replied that that will be addressed in Chapter 5 which is on field testing.

For section 303.5 ±Interior wall finish test, Mr. Hellmer asked if this needs to be included. Mr. Gencturk stated that it was material specific. Mr. Ekenel mentioned it was a fire issue for the fibers and was good to keep in because it is required in the IBC. Mr. Brewe mentioned that word 'shell' should be omitted as it was a term used in Chapter 4. Mr. Gencturk agreed and removed this word.

For section 304.1 ±Freezing and thawing resistance, Mr. Gencturk brought up the phrase all specimens ¶ is not needed because that is what the definition of average D V V X P H V µ D O O V S H F L P H Q V ¶ D U W. Brewe brought up that ASTM C666 has been withdrawn. Mr. Peerzada mentioned that it is in the process of being revalidated. Mr. Brewe asked which method, A or B, should be mentioned. Mr. Ekenel stated Method A with 300 cycles and a durability factor of 80% was the method id33e1 0 0 1 41004 Tf6 11.04 hBT3 0 G¶Tf1 0 0 1 JTJbo 0 1 10

