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# MIX DESIGN OF HIGH PERFORMANCE WET SHOTCRETE

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*In order to reduce the springback rate of wet shotcrete and prepare high-performance wet shotcrete that meets on-site construction requirements and save costs, the Weiwu Expressway Suiguangshen Intercity Railway-Qianhai Turnback Line Tunnel is used as the engineering background, through on-site cooperation Selection of ratio parameters, design of mix ratio, on-site rebound rate test, sprayed large slab test and other methods, through optimization to find the mix ratio that best meets the actual engineering requirements and meets the principle of saving economic costs, so as to effectively reduce the rebound of wet shotcrete rate.*

The equipment used in the spraying test is the TK500 wet spraying machine produced by Chengdu Yanfeng Technology Co., Ltd. Each mix ratio cuts and processes 6 sets of split tensile test piece (1d, 3d, 7d, 28d, 56d, 90d compressive strength), 1 One set of tensile test pieces (28d strength), one set of flexural test pieces (28d strength) and one set of electric flux test pieces (56d) are used to test the mechanical properties of shotcrete [1-2].

The steps to make the test piece are: (1) Preparation and weighing of raw materials; (2) Equipment trial run; (3) Spray large board and bracket installation; (4) Prepare materials according to the mix ratio; (5) Spray large plates layer by layer; (6) Cutting and processing of test pieces. The detailed production process is shown in Figure 1-8.

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**Figure 1. – Raw material preparation diagram**

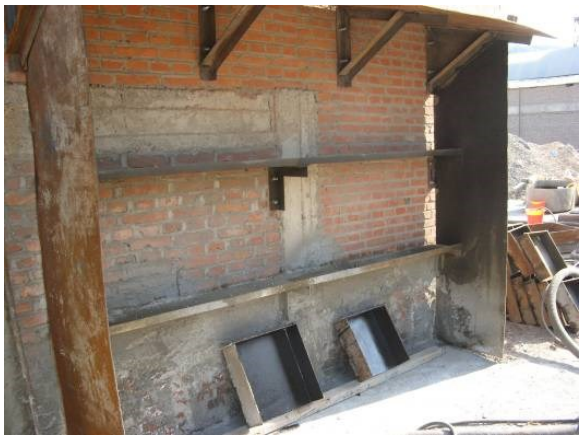

**Figure 2. – Spray bracket and large plate**

**Figure 3. – Loading**

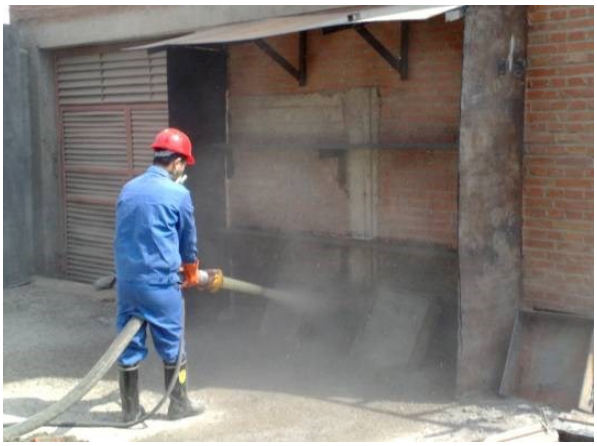

**Figure 4. – Spray hand spraying large plate**

**Figure 5. – The working state of the nozzle**

**Figure 6. – The large plate after spraying**

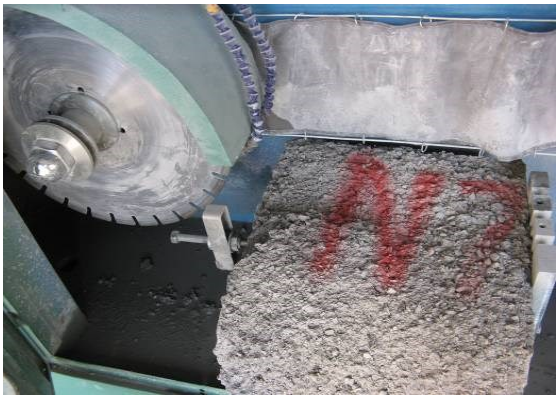

**Figure 7. – Large plate cutting**

**Figure 8. – Slab core drilling**

In addition to meeting the design reference strength, the shotcrete mix ratio should also meet the requirements of spraying construction, such as low rebound rate, low dust concentration, and good pressure-feeding performance.

REFERENCES

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