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## Instructions for use

### Construction Specifications 36—Roller Compound

#### 1. Applicability

Construction Specification 36 is applicable to the types of roller compacted concrete (RCC) construction entailed in NRCS operations where high material quality is not negotiable. This specification is oriented toward smaller RCC projects, such as overtopping spillways, where suitable aggregates are commercially available. Additional considerations may be required if this specification is to be used for major RCC dam projects. Areas of added and/or expanded consideration include: development of aggregate sources, mix performance, responsibility for mix design, shear strength, foundation and lift joint treatment, facing systems, seepage control, crack control, instrumentation, quality control, and test section.

#### 2. Construction specifications

Construction Specification 63, Treatment of Rock Surfaces, shall be included with Construction Specification 36 when RCC will be installed on a rock foundation. Note per chapter 1, Construction Specification 94, Contractor Quality Control, shall be used in conjunction with Construction Specification 36.

#### 3. Material specifications

The following material specifications complement Construction Specification 36:

**Aggregates**—524, Aggregates for Roller Compacted Concrete

**Cement**—531, Portland Cement

**Fly ash**—532, Supplementary Cementitious Materials

**Blast-furnace slag**—532, Supplementary Cementitious Materials

**Water reducing and/or retarding admixtures**—533, Chemical Admixtures for Concrete

**Curing compound**—534, Concrete Curing Compound

#### 4. Included Items

Items to be included in contract specifications and drawings follow:

- a. Complete engineering and structural detail drawings of the structure. (See Section 6, National Engineering Handbook.)
- b. Deviation, if any, from the requirement that the aggregate fines have a plasticity index less than four, as specified in Material Specification 524, Aggregates for Roller Compacted Concrete, Section 3, Gradation.
- c. Special provisions for acceptance of aggregate, if any, as mentioned in Material Specification 524, Aggregates for Roller Compacted Concrete, Section 5, Acceptance.
- d. Special provisions for specific mix requirements, if any, as mentioned in Material Specification 524, Aggregates for Roller Compacted Concrete, Section 5, Acceptance.
- e. Deviation, if any, from the class of pozzolan, as specified in Section 2, Material. For fly ash, specify supplementary optional physical requirements listed in ASTM C618 if applicable. For example, if fly ash is required to control alkali-silica reaction, specify, "In Section 2, fly ash shall meet the supplemental optional physical requirement for effectiveness in controlling alkali-silica reaction as stated in ASTM C618." If it is required to improve resistance to moderate sulfate attack, specify, "In Section 2, fly ash shall meet the supplemental optional physical requirement for effectiveness in contributing to sulfate resistance, Procedure A for moderate sulfate exposure after 6 months exposure as stated in ASTM C618."
- f. Deviations, if any, from the requirements for aggregates, as specified in Section 2, Material.
- g. Deviations, if any, from the requirements for quantity and timing of use of cement and poz-

- zolan specified to be stored onsite, as specified in Section 2, Material, Material handling and processing.
- h. The location of disposal area(s) for segregated or contaminated aggregates, as mentioned in Section 2, Material, Material handling and processing.
- i. Deviations, if any, from requirements for the quantity of aggregates specified to be stockpiled and maintained at the mixing plant location, as specified in Section 2, Material, Material handling and processing.
- j. Deviation, if any, from the requirement to provide trial mix production submittals, in writing for approval, to the engineer no later than 30 days prior to trial mix production, as specified in Section 3, Submittals, Trial mix production submittals.
- k. Deviation, if any, from the requirement to submit a final written plan for RCC production methods, materials, plant, equipment, and personnel 7 days prior to beginning RCC production, as specified in Section 3, Test Section, Submittals.
- l. Deviation, if any, from the requirement to provide RCC production submittals, in writing for approval, to the engineer no later than 24 hours after the records are produced, as specified in Section 3, Submittals, RCC production submittals.
- m. The minimum compressive strength for the RCC job mix, as mentioned in Section 5, RCC Mix Design.
- n. Deviations, if any, from the lab test requirements in Section 5, RCC Mix Design, Trial mix design parameters.
- o. Restrictions, if any, on allowing the contractor to propose the location of the test section, as mentioned in Section 6, Test Section.
- p. Deviation, if any, from the requirement that the contractor remove and dispose of the test section, as mentioned in Section 6, Test Section.
- q. Additional techniques, materials, and equipment, if any, to be demonstrated in the test section, as mentioned in Section 6, Test Section.
- r. Deviations, if any, from the tolerances on vertical surfaces in the test section, as specified in Section 6, Test Section.
- s. Deviations, if any, from the required number of cores to be extracted from the test section, as specified in Section 6, Test Section, Compressive strength tests.
- t. The location of disposal area(s) for waste RCC, including RCC produced from the beginning of startup until a uniform mix is consistently discharged from the mixer, as mentioned in Section 8, Mixing.
- u. The maximum RCC temperature at the time of placement, as mentioned in Section 10, Weather, Hot weather placement.
- v. The moisture content, depth, and degree of compaction required to prepare the foundation, as mentioned in Section 11, Foundation Preparation, Earthen foundations.
- w. Deviations, if any, from the required number and frequency of moisture and wet density tests to be performed on compacted RCC, as specified in Section 13, Compaction.
- x. Deviations, if any, from the required frequency of compressive strength tests and coring, as specified in Section 14, Record Testing.
- y. The joint treatment method for each joint condition, as mentioned in Section 15, Lift Joints.
- z. Restrictions, if any, on allowing the use of curing compound, as mentioned in Section 16, Curing and protection. If curing compound is allowed, specify in section 22, type and class of curing compound. Refer to table A-31 in the Instructions for Construction Specification 31, Concrete for Major Structures, for guidance in selecting the curing compound (ASTM C309) or curing and sealing compound (ASTM C1315). Include the type and class as applicable. For example state, "In section 2, curing compound shall comply with ASTM C309, Type 2 or ASTM C1315, Type II."

- aa. Deviations, if any, from the requirements for the finish and appearance of formed vertical surfaces in Section 17, Vertical Surfaces.
- ab. The requirements for the finish and appearance of unformed vertical surfaces, as mentioned in Section 17, Vertical Surfaces.
- ac. Deviations, if any, from the requirement to patch cavities or specific requirements related to patching cavities as mentioned in Section 19, RCC Repair, Replacement, and Patching.
- ad. The location of disposal area(s) for loose RCC material that falls into the basin or accumulates at the toe of the structure, as mentioned in Section 20, Cleanup of Spillage.
- ae. Deviation, if any, from the requirement that no deduction in volume is made for embedded items, as mentioned in Section 21, Measurement and Payment.
- af. Deviations, if any, from the limits of measurement as specified in Section 21, Measurement and Payment.
- af. Deviations, if any, from the limits of measurement as specified in Section 21, Measurement and Payment.
- ag. Deviation, if any, from including the volume of RCC in the test section in the total volume for payment under the main RCC bid item, as specified in Section 21, Measurement and Payment.
- ah. A separate bid item, if applicable, for treating rock surfaces under Construction Specification 63, Treatment of Rock Surfaces.
- ai. A separate bid item, if applicable, for the test section as specified in Section 6, Test Section.
- aj. Coordination between Construction Specification 94, Contractor Quality Control, if used, and Construction Specification 36 to provide for the specification of, and payment for, all work related to contractor quality control without conflict or overlap.

## 5. Methods

### Section 15, Lift Joints

Typically, the same joint treatment method is specified for both intermediate and cold joints on a given project. However, on larger, more complex structures, the designer may specify different levels of treatment for these two joint conditions. For applications where the shear strength of lift joints is critical, such as large RCC dams, consider adding to the Items of Work and Construction Details the requirement that intermediate and cold joint lift surfaces be pressure washed to expose the aggregate immediately prior to placing any required treatment material and RCC on the lift surface.

**Treatment Method I**—Intended for use with fresh joints; or with all three joint conditions where joint bond and seepage control are not critical.

**Treatment Method II**—Intended for use with intermediate and cold joints where joint bond is critical.

**Treatment Method III**—Intended for use with intermediate and cold joints where joint bond and seepage control are critical.

Treatment Methods II and III may be specified for use with intermediate and/or cold joints, when joint bond and seepage control are not critical, as an incentive for the contractor to avoid intermediate and/or cold joints.

## 6. Items of work and construction details

Starting at the top of page 36–21, prepare and outline job specific “Items of Work and Construction Details” (IWCD) in accordance with these instructions. Include reference to subsidiary items as mentioned in Section 21, Measurement and Payment.

