

REINFORCED CONCRETE PRESSURE PIPE CONDUITS

1. APPLICABILITY

Construction Specification 41 is applicable to the construction of principal spillway conduits appurtenant to earth dams using bedded or cradled reinforced concrete pressure pipe. It may also be applied to the construction of any type of reinforced concrete pipe conduit that crosses under or through an earth dam or other deep earth fill.

2. MATERIAL SPECIFICATIONS

The following specifications are complementary to Construction Specification 41:

- a. Reinforced Concrete Pressure Pipe. Material Specification 541
- b. Joint Sealing Compound. Material Specification 536
- c. Preformed Expansion Joint Filler. Material Specification 535
- d. Portland Cement Concrete for Bedding and Cradles. Construction Specification 31

3. ITEMS TO BE INCLUDED IN CONTRACT SPECIFICATIONS AND DRAWINGS

- a. Line and grade of the conduit. Include statement in items of work that pipe shall be laid so that there is no reversal of grade between joints, unless shown on drawings.
- b. Details of the pipe bedding or cradle, including joint details.
- c. Excavation and backfill requirements, if applicable.
- d. Pay limits or actual limits for excavation.
- e. Details of wall fittings and other special pipe fittings.
- f. Special requirements for foundation preparation.
- g. Type of pipe.
- h. Size of pipe.
- i. Strength of pipe in terms of three-edge bearing load and internal pressure.
- j. Statement on acceptability for project use of pipe or pipe specimens tested in three-edge bearing test within the limits specified in Material Specification 541.
- k. Maximum allowable offset in alignment of interior pipe surface at joints, if tolerance is limited by cavitation hazard.

- l. Method of pressure test selected. See item 4b. Identify any variance from ASTM C 924 for air test criteria.
- m. Minimum joint length and minimum limiting angle of the joints according to definitions in Material Specification 541. Industry recommendation is to limit joint deflections to 1 1/2-inches.
- n. Type and class of expansion joint filler.
- o. Class of concrete for bedding or cradle and support blocks.
- p. Statement that metal strips covering the joints as specified in Section 4 are not required, if applicable. (If the conduit rests on bedrock so no appreciable movement will take place at the joints, metal cover strips generally will not be needed.)

4. DISCUSSION OF METHODS

a. Section 3, Laying the Pipe

- (1) Method 1 is the preferred method of stating the instructions for connecting pipe sections.
- (2) Method 2 is intended for use when special problems are anticipated or when the pipe to be furnished requires special methods of connection.

b. Section 5, Pressure Testing

- (1) Method 1 is considered adequate for principal spillway conduits that will operate under pressure intermittently at normal frequencies.
- (2) Method 2 may be required for principal spillway conduits that will operate under pressure for extended periods of time or at very frequent intervals.
- (3) Method 3 may be required where water is at a premium or unavailable, otherwise is not recommended because of potential size limitations and safety concerns.
- (4) Method 4 may be required for conduits that operate under pressure when large pipe diameters or other project restraints make method 2 and/or 3 difficult, expensive or unsafe to test.

c. Section 6, Measurement and Payment

- (1) Method 1 must be used when it is desired to base payment on the measurement of the laid length of the conduit.
- (2) Method 2 must be used when it is desired to base payment on the summation of the nominal laying lengths of the pipe sections used.

d. Sections 3 and 6

When specifications are prepared using electronic procedures and all but one method are deleted for use in the contract specification, delete the following and left justify the remaining text.

(1) Section 3 "Use with Either Method"

(2) Section 6 "All Methods The following provisions apply to all methods of measurements and payment."