

NATURAL RESOURCES CONSERVATION SERVICE  
Wyoming  
CONSTRUCTION SPECIFICATIONS  
FOR  
STRUCTURE FOR WATER CONTROL  
(PIPE STAND)

(Owner/Operator)

(Project Title)

GENERAL

Installation shall be in accordance with an approved design and plan. Details of construction shown on the drawings but not included herein are considered as a part of this specification. Construction activities shall be in accordance with applicable OSHA regulations.

EXCAVATION

The foundation area will be cleared of all roots, brush, sod and debris. The cut-off trench and wing wall trench shall be excavated to allow the placement of the structure to the lines and grades shown on the drawings or as staked in the field. Any over-excavation will be backfilled with select material and compacted to the density of the surrounding material. The structure shall be placed on a firm foundation. Unsuitable materials shall be removed.

PIPE MATERIALS

Corrugated steel pipe shall be metallic zinc coated, aluminum coated, or aluminum-zinc alloy coated conforming to the requirements of ASTM A 742, A 760, A 761, A 762, A 849, A 875, A 885, and A 929 for the specified type, class, fabrication of pipe and coating. Polymer-coated pipe, unless otherwise specified on the drawings or under ADDITIONAL SPECIFICATIONS, shall be coated on each side with a minimum thickness of 0.01 inches (10 mils), designated as grade 10/10 in ASTM A 762.

Aluminum corrugated pipe shall conform to the requirements of ASTM B 745, B 746 or B 790 for the specified pipe sheet thickness, shape

type, and fabrication method. Bituminous coatings when specified shall conform to the requirements of ASTM A 849.

Concrete pipe shall conform to the requirements of ASTM C 14, C 76, C 118 or C 505 for the type of pipe specified.

Other pipe materials shall meet the requirements as listed in the ADDITIONAL SPECIFICATIONS or as shown on the drawings.

CONCRETE

Concrete work under these specifications shall be constructed to the dimensions, lines, and grades as shown on the drawings.

Concrete compressive strength shall be at least 3000 psi at 28 days. The mix design shall be in accordance with ASTM C 94 and this specification. The concrete shall be proportioned to include not less than 5 sacks cement per cubic yard of concrete when a water reducing admixture is used, except fly ash may be used as substitution for not greater than 20 percent of the Portland cement. Ready-mix suppliers shall furnish mix design and concrete cylinder test break data for Technician or Engineer approval prior to placement.

Cement shall be low alkali Type II or IIA Portland cement.

Fly ash shall conform to requirements of ASTM C 618 as applicable.

Water reducing admixtures shall be Type "A" meeting the requirements of ASTM C 494.

Coarse aggregate shall be maximum size of 1-1/2 inches per designations in ASTM C 33.

Air entrainment conforming to the requirements of ASTM C 260, shall be used. The air content shall be 5 to 7 percent.

Forms shall conform to the shapes, lines, and dimensions as shown on the drawings. They shall be braced and/or tied together so as to maintain position and shape and be sufficiently tight to prevent leakage of mortar. Forms shall be thoroughly oiled or wetted and cleaned of debris prior to placement of concrete.

Reinforcing steel deformed bars shall meet the requirements of ASTM A 615 and welded wire reinforcement shall meet the requirements of ASTM A 185. All reinforcement shall be free from rust, oil, grease, paint or other deleterious matter. Items to be embedded in the concrete shall be positioned accurately and firmly anchored to prevent displacement during placement of concrete. The minimum splice length for deformed bars is 30 bar diameters and for welded wire mesh the larger of 6 inches or 2 mesh spacings.

Snap ties shall be equipped with cones, she-bolts or other devices that permit their removal to a depth of at least 1-inch without injury to the concrete.

Concrete shall be deposited as closely as possible to its final position and shall be worked into the corners and angles of the forms and around all reinforcement and embedded items in a manner to prevent segregation of aggregates or excessive laitance. Consolidation of concrete shall be accomplished by means of internal type mechanical vibrators, rodding, spading, or hand tamping. Concrete slump shall be in the range of 3 inches plus or minus 1 inch, unless cylinder test break data is submitted showing that compressive strength can be achieved with the higher slump.

Joints shall be located as specified on the drawings. When specified waterstops shall be placed in each joint. The waterstop shall be non-metallic. Installation shall be in accordance with specific manufacture specifications. The waterstop shall be anchored to prevent displacement during placement of concrete.

Finishing. After the concrete has been consolidated, the unformed surfaces shall be given a wood float finish. Immediately after form removal, formed surfaces shall be cleaned of all defective concrete and effectively repaired. Snap ties shall be removed and the holes mortared.

Protection and Curing. Concrete shall be prevented from drying for a curing period of at least 7 days after it is placed. Exposed surfaces shall be kept continuously moist for the entire period. For formed surfaces, the protection may be accomplished by leaving the forms in place and keeping them wet for the entire curing period. Moisture shall be maintained by sprinkling, flooding, or fog spraying or by covering with continuously moistened canvas, cloth mats, straw, earth, or other approved material. In lieu of water curing, the concrete shall be cured by spraying with an approved sealing compound. The sealing compounds shall be applied as soon as practicable after the concrete is finished. Sealing compounds shall meet or exceed the requirements of ASTM C 309. All surfaces shall be kept moist until the compound is applied.

Concreting in Cold Weather. Before any concrete is placed, all ice, snow and frost shall be completely removed from all surfaces to be in contact with the new concrete and the temperature of these surfaces shall be raised to as close as may be practical to the temperature of the new concrete that is to be placed thereon. No concrete shall be placed on a frozen subgrade or on one that contains frozen materials. Concrete shall not be mixed or placed when daily minimum atmospheric temperature is less than 40 degrees F., unless facilities are provided to ensure the adequate protection of the concrete. Temperature of the concrete at the time of placing shall not be less than 50 degrees F. nor more than 90 degrees F. The use of accelerators or antifreeze compounds will not be allowed.

Concreting in Hot Weather. The Contractor shall apply effective means to maintain the temperature of the concrete below 90°F during mixing, conveying, and placing.

#### BACKFILL

Backfill materials shall be free of rocks, stones, sod, brush, roots, or other perishable or unsuitable material. Cobble and rock fragments having a maximum dimension of more than three inches shall not be used within 1 foot of the structure. To the extent they are suitable excavated materials will be used to complete necessary backfills.

The moisture content of fill material shall be maintained within the limits required to prevent the adherence of the fill material to the treads and tracks of equipment and ensure the crushing and blending of the soil clods. Generally when soil material is squeezed in the hand it will retain a ball shape, but there will not be free water on the surface. Supplemental water, when required, shall be applied to get water uniformly dispersed throughout the fill materials.

Fill placed around structures will be brought up at approximately uniform height on all sides of the structure. Hand directed tamper compacted fills shall be placed in layers not exceeding 4 inch thickness prior to being compacted. The backfill material shall be compacted to a density equal to that of the adjacent ground. Heavy compaction equipment shall not be operated within 2 feet of any structure. Hand directed tampers or compactors shall be used on areas not accessible to heavy compaction equipment and within 2 feet of any structure. The passage of heavy equipment will not be allowed over any type of conduit until the compacted backfill has been placed a minimum of two feet over the top of the pipe. The layer thickness for equipment compacted fills shall not exceed 8 inches prior to compaction.

Compaction of backfill adjacent to structures shall not be for at least 10 days after the placement of concrete.

#### METAL ITEMS

Metal used for gratings, screens, frames for openings, etc. shall be “merchant” or “commercial” quality unless otherwise noted. All steel members shall be painted with two coats of synthetic primer paint and one coat of aluminum paint or equivalent protective coatings.

#### CLEAN-UP

The site shall be cleared of all unused materials, forms etc. needed for the construction.

#### ADDITIONAL SPECIFICATIONS