NATURAL RESOURCES CONSERVATION SERVICE
Wyoming
CONSTRUCTION SPECIFICATIONS
FOR
AGRICHEMICAL HANDLING FACILITY
(REINFORCED CONCRETE)

_____ (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 U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) regulations.

EXCAVATION

The foundation area will be excavated 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.

CONCRETE

Concrete work under these specifications shall be constructed to the dimensions, lines, and grades as shown on the drawings. The subgrade for concrete shall be prepared as shown on the drawings or as directed by the technician.

Concrete compressive strength shall be at least 4000 pounds per square inch (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 six (6) sacks cement per cubic yard of concrete, except fly ash may be used as substitution for not greater than 15 percent of the Portland cement. Ready-mix concrete suppliers can precertify their concrete mix. When a precertified mix is used, the mix number will be shown on the concrete delivery ticket. Non certified ready-mix suppliers shall furnish mix design and concrete cylinder test break data for 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.

Coarse aggregate shall be a 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 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. Forms shall not be removed without the approval of the technician.

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 the placement of concrete. The minimum splice length for deformed bars is 30 bar diameters, and for welded wire mesh the larger of six (6) inches or two (2) mesh spacings.

Polypropylene fibrillated fiber concrete reinforcement shall be 100 percent virgin

polypropylene fibers containing no reprocessed olefin materials. Material shall meet requirements of ASTM C 1116, Type 111, 4.1.3 and ASTM C 1116 (Ref. ASTM C 1018) Performance Level 1, I5 outlined in Section 21, Note 17, with an average minimum Residual Strength of 50 psi, of four (4) beams from a single batch. The individual fibers shall have a graded length of no less than 3/4 to 1-1/2 inches. Where a rough concrete finish will be used, fiber lengths of 1 to 1-1/2 inches are preferred. When specified for use, fibers shall be added to the concrete mix at a minimum rate of 1-1/2 pounds per cubic yard of concrete. The fibers shall be blended into the concrete mix according to the manufacturer's specifications. The concrete supplier shall furnish a copy of the manufacturer's technical data to verify compliance with these requirements.

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 three (3) inches, plus or minus one (1) inch, unless cylinder test break data is submitted showing that compressive strength can be achieved with the higher slump.

Construction joints shall be provided as shown in the plans or as approved by the engineer. Joints shall be thoroughly cleaned and laitance removed before a new pour is made. Each joint shall be wetted immediately before the placing of new concrete.

Expansion and contraction joints shall be located as specified on the drawings. When specified, waterstops shall be placed in each expansion contraction joint. The waterstop shall be non-metallic. Installation shall be in accordance with specific manufacturer's specifications. Waterstops 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 or waffle type 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 seven (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 compound shall be applied as soon as practicable after the concrete is finished. The sealing compound 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.

BACKFILL

Backfill materials shall be free from rocks, stones, sod, brush, roots or other perishable or unsuitable material. Cobbles and rock fragments having a maximum dimension of more than three (3) inches shall not be used within one (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 material.

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 four (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 two (2) feet of any structure. Hand directed tampers or compactors shall be used on areas not accessible to heavy compaction equipment and within two (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 (2) feet over the top of the pipe. The layer thickness for equipment compacted fills shall not exceed eight (8) inches prior to compaction.

Compaction of backfill adjacent to structures shall not be for at least ten (10) days following the placement of the concrete.

CONDUITS

Conduits shall be new pipe of the type, class and size as shown on the drawings. Any damage to protective coatings shall be repaired prior to backfilling. Repairs shall be in accordance with manufacturer's recommendations. Conduits shall be firmly and uniformly bedded throughout its length and shall be installed to the lines and grades shown on the drawings and/or staked in the field.

DRAIN FILL

When gravel bedding under the floor and/or sidewall drainage is shown on the drawings, the fill material shall conform to the requirements of ASTM C 33.

METAL

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 (2) coats of synthetic primer paint and one (1) 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. Waste earth material shall be smoothed and seeded.

ADDITIONAL SPECIFICATIONS