M&E Consultants
Soil & Water Engineering Solutions

Gonzales County SWCD
Poultry Litter Storage Building
Specifications

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The seal appearing on this document was authorized by William H. Erion, P.E. 84920 on October 12, 2004.

See Additional Material and Construction Specifications dated September 2011 for requirements that supersede portions of this General Specification.

NATURAL RESOURCES CONSERVATION SERVICE
CONSERVATION PROCATICE GENERAL SPECIFICATIONS

POULTRY LITTER STORAGE BUILDING

(No.)

Code 313

1. SCOPE

The work covered by this specification shall consist of the clearing and grubbing, excavation, backfill, concrete, reinforcing steel, timber, fasteners, and other appurtenances required for the construction of poultry litter storage buildings.

Construction shall be carried out in such a manner that erosion, air, water and noise pollution will be minimized and held with legal limits established by local, state and federal regulations. All structures shall be constructed in accordance with approved plans, local building codes and industry standards.

2. CLEARING AND GRUBBING

All trees, brush, stumps, boulders, rubbish and manure shall be removed from the foundation, storage and spoil area(s) before excavation is performed. All material cleared from the area shall be disposed by burning or burying on-site or hauling to an appropriate landfill. All burning shall conform to state and federal laws and regulations. Trees and other cleared vegetation will be cut flush with the ground surface in spoil areas. The foundation and/or storage area will have all stump, roots and vegetation removed. The general area around buildings will also require grubbing as necessary to complement the engineering or his/her agent.

3. EXCAVATION

Topsoil excavated form the site shall be stockpiled for later placement around the completed structure. Soil containing excessive organic material shall be removed from the foundation area. The excavation shall be completed to the specified lines and grades shown on the plans and staked in the field. Spoil shall be spread and placed to generally blend with the existing terrain and not pond water. Excavation and spoil placement shall be accomplished so as to divert runoff from the foundation area.

4. EARTHFILL

Earth material placed for pads, or foundations shall be of the type material specified and free of detrimental amounts of sod, roots, stones or other debris. Placing of earthfill shall begin at the lowest point of the foundation and be brought up in approximately horizontal lifts not exceeding eight inches in thickness. Hauling and compacting equipment shall be routed over each lift a minimum of three passes or so that specified compaction is obtained.
Moisture control: All fill material shall have a moisture content sufficient for the required compaction. Fill material which is too dry shall be moistened by adding water and/or thoroughly mixing with moist fill until an acceptable moisture level is obtained. Fill material which is too wet shall be allowed to dry out naturally or by machine rolling and/or shall be thoroughly mixed with dry fill material until an acceptable moisture level is obtained.

The moisture content of the fill shall be maintained within the limits to:

1. Prevent bulking or dilatence of the material under the action of the hauling or compacting equipment.
2. Prevent adherences of the fill material to the equipment.
3. Ensure the crushing and blending of the soil clods and aggregation into a homogeneous mass.
4. Contain adequate moisture so that a sample will remain formed when molded in the hand without soil or water squeezing though the fingers.

5. TIMBER FABRICATION AND INSTALLATION

The structure shall be constructed on a firm foundation to the lines and grades shown on the plans. In no case will the dimensions and spacings be modified in a way which would reduce the strength of the structure. All framing shall be true and exact. Timber shall be accurately cut and assembled to a close fit.

Appropriate bracing for safety and structural stability during construction shall be practiced in accordance with applicable building codes.

See Additional Material and Construction Specifications for updated requirements

Wood and Timber: ~~All material shall be sound wood, free from decay, and or good quality. All lumber shall be graded in accordance with the Standard Grading Rules for Southern Pine Lumber, with a minimum grading of Number 2 (No. 2 non-dense grading is not acceptable). Except as otherwise specified on the plans. Unless otherwise specified, all material shall be furnished in American Standard dressed sizes. All sizes specified are normal sizes. All structural timber and lumber, except, purlins, shall be pressure treated. Treated timber and lumber shall be impregnated with the specified type and quantity of preservative and conform to Federal Specification TT-W-571. The minimum net retention of the common preservative, chromated cooper arsenate, shall be 0.4 pcf for dimension lumber used above ground in contact with manure and 0.6 pcf for structural posts or timbers in contact with the ground.~~

See Additional Material and Construction Specifications for updated requirements

Handling and Storing: ~~All timber and lumber stored at the site of the work shall be neatly stacked on supports at least twelve inches above ground surface and protected for the weather by suitable covering. Untreated material shall be so stacked and stripped as to permit free circulation of air between the tiers and courses. Treated timber may be close stacked. The ground underneath and in the vicinity of all stacks shall be cleared of weeds and rubbish. The use of cant hooks, peavies, or other pointed tools, except end hooks, will not be permitted in the handling of structural timber, lumber, or trusses. Treated timber shall be handled with rope slings or other methods which will prevent the breaking or bruising of outer fibers, or penetration of the surface in any manor.~~

See Additional Material and Construction Specifications for updated requirements

Fasteners: ~~Connections between wood members requiring bolts may be initially done with appropriately sized nails until such time as it is expedient to add the bolts, unless specified otherwise in the drawings. Bolts shall be added as soon as practicable, before the building is declared structurally sound, and before being accepted as complete. Nails and spikes shall be drive with just sufficient force to set the heads flush with the surface of the wood. Holes for machine bolts shall be minimum of 1/32" larger than the bolt but no more than 1/16" larger. Appropriately sized washers shall be used in contact with all bolt heads and nuts that would otherwise be in contact with the wood.~~

~~Hot-dipped zinc coated nails or screws shall be used in all structural farming and all connections containing pressure treated lumber. Spiral or annular ring shank nails shall also be used in these connections to provide a higher withdrawal resistance.~~

Roofing: Roofing shall be galvanized metal in standard lengths and widths. Roofing material shall be a minimum twenty-nine (29) gauge with ¾" ribs. Roofing shall be installed in accordance with manufactures recommendations. If any other type of roofing material is desired, it must first be approved by the engineer. Nails used to attach roofing material to the purlins shall be lead-headed nails, aluminum nails with neoprene washers, or other type as approved by the NRCS engineer.

6. STEEL REINFORCEMENT

Reinforcement steel and welded wire fabric shall be new, clean, and free of oil, grease, paints and flaky rust. Steel bars for concrete reinforcement shall be deformed billet-steel bars, conforming to ASTM Specification A-615, Grade 40 or 60. Welded wire fabric shall conform to the requirements of ASTM Specification A-185.

Reinforcement steel shall be accurately placed as specified and secured in position in a manner which will prevent it displacement during placement of the concrete. If reinforcing steel is spliced, the splices shall provide an overlap equal to 30 times the diameter of the smaller bar in the splice and shall be tied at both ends of the splice. Field bending of the steel will be permitted. Heating of steel for bending will not be permitted.

Reinforcement steel and welded wire fabric shall be suspended off the ground and other concrete contact surfaces by using chairs or concrete bricks, concrete blocks or prices of blocks, wire strands, or other approved method prior to the placing of concrete. Use of stones, wood materials, earth, earth clods, clay bricks, scrap metal and other unapproved materials will not be permitted. Unless otherwise specified, welded wire fabric shall be splices in the following manner:

1. Adjacent section shall be spliced end to end (longitudinal lap) by overlapping a minimum of one full mesh plus two inches, plus the length of the two end overhangs. The splice length is measured from the end or the longitudinal wire in one pieces of fabric to thee end of the longitudinal wires in the lapped piece of fabric.
2. Adjacent sections shall be spliced side to side (transverse lap) by overlapping a minimum of on full mesh plus two inches. The splice length shall be measured from the center of the first longitudinal wire in one piece of fabric to the center line of the first longitudinal wire in the lapped piece of fabric.

7. CONCRETE

Design Mix: The concrete mixture shall be no less than five bags per yard mix. The water content shall not exceed six gallons per bag of cement in the mixture. Any mix used shall have a designed minimum 28-day compressive strength of 3,000 pounds per square inch (psi). The concrete shall contain a standard known brand of Portland cement with washed sand and gravel. Clean water shall be used in the mix. Calcium Chloride and other chemical admixtures for concrete will not be accepted unless expressly specified in the drawings or specifications.

Consistency: The amount of water used in the concrete shall be the minimum necessary to obtain the required workability. The consistency of the concrete shall be such that it can be worked readily into the corners and angles of the forms and around reinforcement but without permitting the materials to segregate or excess free water to collect on the surface. The slump shall be between two and five inches as tested by "The Test for Slump for Portland Cement Concrete", ASTM Specification C-143.

Forms: Forms shall be of wood, steel, or other approved material.

Forms shall be true to line and grade, mortar tight, and sufficiently rigid to prevent objectionable deformation under load. Form surfaces shall be smooth, free from irregularities, dents, sags, or holes when used for permanently exposed surfaces. Bolts and rods used for internal ties shall be so arranged that, when the forms are removed, metal will not be less than one inch from any concrete surface. Forms for walls and vertical sections two (2) feet high and over shall be stabilized with adequate tie rods, walers, cat-heads and sufficient bracing to prevent shifting or movement of forms during placing of concrete.

Forms for exposed surfaces shall be coated with a non-staining form release agent which shall be applied before the concrete is placed. All excess release agent on the form surfaces and any on surfaces requiring bonding with concrete shall be removed.

All form removal shall be accomplished in such a manner as to prevent injury to the concrete. Forms for floor slabs and such work may be removed after a minimum of 24-hours. Forms for walls shall be left in place for a minimum of three (3) days. All repair work must be done immediately after removal of forms.

Timing and Temperature: Concrete shall be placed within one-and-one-half (1-1/2) hours after introduction of water to the cement and aggregates. Concrete shall not be placed when the outside temperature is expected to fall below 40 degrees F. at the time the concrete is delivered and placed at the work site. Concrete shall not be exposed to freezing temperatures during the curing period. Concrete, when deposited in forms during hot weather, will have a temperature not greater than 90 degrees F., at the time of placement. Ice may be used as a portion of the mixing water to control temperature provided all ice is melted in the mixing process. When the outside temperature reaches or exceeds 90 degrees F., the concrete shall be place within 45 minutes after batching.

Conveying and Placing: No concrete shall be placed until the approving official has given approval of the in-place sub-grade, form, reinforcing steel, and any other items involved or affected by the concrete placement.

Concrete shall be conveyed from mixer to forms as rapidly as practicable by methods which will prevent segregation or loss of ingredients. Hoppers and chutes, pipes, or "elephant trunks" may be used. There shall be no vertical drop greater than five feet.

Unless otherwise authorized, all concrete shall be placed upon clean, damp surfaces free from frost, ice, standing and running water, and never upon soft mud, dried portions of earth, or fill that does not meet specified compaction requirements. Soft mud or other unacceptable foundation material shall be removed and replaced with gravel or other approved material.

Concrete shall be deposited as close as possible to its final position in the forms. Concrete shall be thoroughly consolidated by rodding or mechanically vibrating the concrete in place supplemented by hand-spading and tamping to remove air voids. Vibrating equipment shall be used when pouring walls and other thing sections.

Concrete for floor sections shall be place in one continuous layer, however, all section of the floor do not have to be poured at one time. Construction joints shall be placed where needed and my be at locations specified for control joints. The joint may be formed into a key way by using a metal or wooded form. A smooth, vertical construction joint will not be permitted. Control joints shall be paced as shown on the plans.

Finishing: Defective concrete, honeycombed areas, voids left by the removal of tie rods, and unacceptable ridges left on concrete surfaces shall be repaired immediately after the removal of forms unless otherwise authorized and directed. Voids left by the removal or tie rods shall be removed and completely filled with mortar.

Curing: Concrete shall be prevented form drying for a curing period of a least seven days after it is placed. All exposed surfaces of concrete shall be protected from the direct rays of the sun for at least these first seven days. All concrete shall be cured by keeping continuously moist for the entire curing period, or until curing compound is applied. Moisture shall be maintained by sprinkling, flooding, fog spraying, or by covering with materials kept continuously moist such as canvas, cloth mats, straw, sand polyethylene, or other approved material. Wood forms (except plywood) left in place during the curing period shall be kept wet. Formed surfaces shall be thoroughly wetted immediately after forms are removed and shall be kept wet until patching and repairs are completed. Water or covering shall be applied in such a way that the concrete surface is not eroded or otherwise damaged.

If a curing compound is used, two coats of it will be applied to all concrete surfaces except construction joints and surfaces to which other concrete will be bonded. The compound shall be sprayed on the moist concrete surfaces as soon as free water has disappeared, but shall not be applied to any surface until patching, repairs and finishing of the surface are complete. Curing compound shall meet the requirements of ASTM Specification c-309, Type 2, whist pigmented.

8. FINAL GRADING AND SEEDING

The area adjacent and in the immediate vicinity of the structure shall be shaped to blend with the natural surrounding and to compliment the structure and work area around it. Shaping shall be in such a way as to drain or divert all overland and roof runoff safely away from the structure and surrounding work area.

All disturbed area around the structure, including spoil areas, shall be vegetated and/or surfaced with gravel, chert, or some other acceptable covering as permitted by the NRCS approving authority. Spoil areas not used for any other purpose shall be vegetated.

Permanent vegetation will be established to plant species and by method prescribed by the approving official. All vegetating of disturbed areas will be done as critical area planting and shall include liming, fertilizing, seedbed peroration, seeding and mulching. Temporary vegetations may be used when conditions permanent vegetation. Disturbed areas shall be mulched regardless of seeding dates.

If farm animals will have access to the vegetated area, it will be appropriately fenced until vegetation is well established.

Additional Material and Construction Specifications

For Poultry Litter Storage Barns and Composters

September 2011

These are applicable to TX-EN-0443, TX-EN-0444, TX-EN-0445, and the composter drawings. These requirements supersede the lumber and fastener requirements prescribed in the applicable construction specifications. This provides requirements and recommendations relating to the construction of litter storage barns, composters, and combination structures.

Truss Legs: Truss legs shall be painted with a high quality corrosion resistant pain such as coal tar enamel where treated wood comes in contact with the metal.

The same paint shall be applied on the bolt connections at the base of the truss to reduce potential for corrosion.

Wood and Timber: All material shall be sound wood, free from decay, and of good quality. All lumber shall be graded in accordance with the Standard Grading Rules for Southern Pine Lumber, with a minimum grading of Number 2 (No. 2 non-dense grading is not acceptable) except as otherwise specified on the plans. Unless otherwise specified, all material shall be furnished in American Standard dressed sizes. All sizes specified are nominal sizes.

Lumber – Treatment Level Required:

Purlins do not require treatment. All other lumber shall meet the following requirements for wood treatment:

-- All posts shall be treated in accordance with AWPA Standard U1 to the requirements of Use Category 4B (AWPA UC-4B Ground Contact – Heavy Duty) or in accordance with approved report from ICC Safe to meet the requirements for Ground Contact – Critical Structure.

-- All other wood, including plywood, 2x4's, 2x6's (except purlins), shall be treated in accordance with AWPA Standard U1 to the requirements of Use Category 4A (AWPA UC-4A Ground Contact – General Use) or in accordance with approved report by ICC Safe to meet the requirements for Ground Contact – General Use.

Lumber – Labeling: Each treated wood item delivered to the job site shall be identified with a label, brand, or stamp that includes: the product name or logo; treatment company name and location; names of the preservative components; treatment end use category; minimum retention; and the applicable AWPA treatment standard or the number of the evaluation report from an evaluation service recognized by the International Code Council at *http://www.iccsafe.org*.

Note: These pages were not in the initial package signed and sealed by William H. Erion. Mr. Erion agreed with the changes via e-mail correspondence in August 2011.

Lumber – Handling and Storing: All timber and lumber stored at the site of the work shall be neatly stacked on supports at least six (?) inches above ground surface and protected from weather by rain-proof covering. Untreated material shall be so stacked and stripped as to permit free circulation of air between the tiers and courses. Treated timber may be close-stacked. The ground underneath and in the vicinity of all stacks shall be cleared of weeds and rubbish. The use of cant hooks, peavies, or other pointed tools, except end hooks, will not be permitted in the handling of structural timber, lumber, or trusses. Treated timber shall be handled with rope slings or other methods which will prevent the breaking or bruising of outer fibers, or penetration of the surface in any manner.

Fasteners and Connectors: All fasteners, connectors, and any other metal contacting preservative treated wood shall be hot-dip galvanized or stainless steel. All fasteners, connectors, and any other metal contacting alkali copper quaternary (ACQ) or copper azole (CA) treated wood shall be stainless steel grade 304 or 316. Galvanizing for fasteners shall conform to ASTM A153. Galvanizing for connectors made from steel sheet shall conform to ASTM A653, Class G185. Galvanizing for all other metal in contact with preservative treated wood shall conform to ASTM A123. Stainless steel shall be AISI Type 304 or 316.

For wood treatment approved by ICC Safe, fasteners must comply with the treatment report requirements and be verified prior to installation to meet those requirements.

Connections between wood members requiring bolts may be initially done with appropriately sized nails until such time as it is expedient to add the bolts, unless specified otherwise in the drawings. Bolts shall be added as soon as practicable, before the building is declared structurally sound, and before being accepted as complete. Nails and spikes shall be driven with sufficient force to set the heads flush with the surface of the wood. Holes for machine bolts shall be a minimum of 1/32-inch larger than the bolt but no more than 1/16-inch larger.

Appropriately sized washers shall be used in contact with all bolt heads and nuts that would otherwise be in contact with the wood.

Spiral or annular ring shank nails, hot-dipped galvanized coated nails or screws shall be used in all structural framing to provide a higher withdrawal resistance.

Other fasteners must be ***approved in writing prior to installation*** by the NRCS Engineer with concurrence from the NRCS Zone Engineer.

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