This drawing is valid for all Illinois counties except Jackson, Franklin, Williamson, Hamilton, White, Saline, Gallatin, Union, Johnson, Pope, Hardin, Alexander, Pulaski, and Massac.

**Design Assumptions**
1. Meets ACI 318-14 and NEA Part 536
2. Concrete mix must be designed to yield a 28 day compressive strength of 4000 psi. All rebar must be Grade 60.
3. Lateral pressure from manure = 65 psf (per CFS 313, unprotected from precipitation)
4. Soil Density = 130 psf
5. Allowable Soil Bearing Pressure = 2000 psf
6. Surcharge Load = 200 psf

**Design Notes**
7. This standard design can be used with 0 to 4 foot soil backfill.
8. Vehicular traffic is allowed next to the wall.
9. The wall is designed as a freestanding wall – HOWEVER, if the wall is restrained by an opposing wall with the same backfill height, minimum floor slab length must be at least 35 feet (not including footing). See AWMF Supplement IL 651.10-17 for more details.

**Construction Notes**
10. All reinforcing steel must have a minimum concrete cover over reinforcement of 3 inches except the cover at top of slab is 2 inches.
11. Lap splices of reinforcing steel must have a minimum lapped length of: Mark B & C #4 bars = 33", All other #4 bars = 25", #6 bars = 32".
12. Place concrete on top of 3 inch layer of approved base course material. Approved base course material includes IDOT Grad No CA 7, 8, 11, 12, 13, 14, 15, 16 or FA 1, 2, 4.
13. The 5 inch floor slab will have #4 bars at 15 inch spacing each way.
14. Where the floor slab exceeds 30 feet in length or width, install watertight contraction joints with dowel bars. See Page 4 for details.
15. The wall will be held with contraction and expansion joints. No section of wall will be over 30 feet long between contraction joints, and no more than 90 feet between expansion joints. See page 4 for details of contraction joint. See page 2 for details of expansion joint.
16. Place a construction joint anywhere the concrete placement is not continuous and the joint will have concrete with no filling material. See Construction Joint Notes on page 3.
17. Connect and weld all stopwater splices and intersections according to manufacturers instructions.
18. Fill expansion joints with preformed expansion joint filler with a minimum thickness of 1/2 inch. Joint filler must conform to ASTM D 1752 Type I, II, or III; D 3994; or D 1752 Not To Scale.
**DRAINAGE NOTES:**
1. Provide perimeter drain if water table can rise above floor level.
2. Perimeter drain pipe and gravel/geotextile filter is to be routed around all sides of the tank and drain freely to a surface water outlet or other subsurface drainage outlet.
3. Perimeter drain pipe and fittings must be perforated, corrugated polyethylene (CPT) meeting ASTM specifications listed below:

<table>
<thead>
<tr>
<th>CPT</th>
<th>ASTM F405, F667</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dual Wall CPT</td>
<td>ASTM F2306, F2848, F405, F667</td>
</tr>
</tbody>
</table>

4. Drain fill will consist of sand, gravel or concrete aggregate mixture with a minimum size of 3” and not more than 5% passing a #200 sieve. Qualifying IDOT gradations for drain fill include: CA-1, CA-3, CA-5, CA-7, CA-8, CA-11, CA-12, CA-13, CA-14, CA-15, CA-16, CA-18

5. Geotextile (non-woven, needle punched) minimum criteria:
   - Grab tensile strength (lb) ASTM D 4632 202
   - Elongation at failure (%) ASTM D 4632 ≤ 50
   - Tear strength (lb) ASTM D 4533 ≤ 79
   - Puncture strength (lb) ASTM D 6241 4.33
   - Ultraviolet light (% retained strength) ASTM D 4355 min 50
   - Apparent opening size (AOS) ASTM D 4751 0.22 mm (US sieve size 70)
   - Permeability sec⁻¹ ASTM D 4491 0.7 min 0.70

6. Overlap any geotextile splices a minimum of 18 inches.
7. Encase all drain fill with geotextile.

**Construction Joint Notes**
1. A construction joint must be prepared when the concrete pour is not continuous, typically between the floor and wall.
2. Prepare all joints that will be in contact with new concrete as per note 5.
3. Let concrete cure at least 12 hours prior to steel tying and form construction for the next pour.
4. New concrete must not be placed until the hardened concrete has cured at least 12 hours.
5. Construction joints must be prepared using one of the following two methods:
   - **Method 1** - Water-Air or Sandblasting. Clean the joint surface of all unsatisfactory concrete, laitance, coatings, stains, and debris by sandblasting or high-pressure air-water cutting, or both. Sandblasting can be used after the concrete has gained sufficient strength to resist excessive cutting, and high-pressure air-water cutting can be used as soon as the concrete has hardened sufficiently to prevent the jet from displacing the coarse aggregates. The surface of the concrete in place must be cut to expose clean, sound aggregate, but not so deep as to undercut the edges of larger particles of the aggregate. Cut the surface to at least 1/4" depth. Thoroughly wash the surface to remove all material after cutting.
   - **Method 2** - Mechanical. Clean the joint surface of all unsatisfactory concrete, laitance, coatings, stains, and debris by washing and scrubbing with a wire brush, wire broom, or other means approved by the engineer to expose coarse aggregate without displacing it. The surface must be roughened to at least 1/4" depth.
6. All construction joints must be wetted and standing water removed immediately before new concrete is placed.
7. New concrete must be sufficiently vibrated to ensure good contact into the prepared joint.
8. Keyways or steel plates cannot be substituted for the construction joint methods above.

**PERIMETER DRAIN DETAIL**
Scale 3/4" = 1'-0"

**EXAMPLE WALL JOINT PLACEMENT SEQUENCE**

```
--- 3'0"  --- 3'0"  --- 3'0"

<table>
<thead>
<tr>
<th>Expansion Joint</th>
<th>Construction Joint</th>
<th>Construction Joint</th>
<th>Expansion Joint</th>
</tr>
</thead>
</table>
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**CORNER DETAIL—PLAN VIEW**
Scale 1/2" = 1'-0"
SECTION @ DOWEL CENTERLINE
FLOOR SLAB CONTRACTION JOINT
Scale: 1" = 1' - 0"

Note: Dowel sleeve for contraction joints may be manufactured plastic sleeve, PVC sleeve, grease, or any other means to prevent a bond between half of the dowel and the concrete. Place a Dowel Sleeve on One End of Each Dowel.

FLOOR SLAB CONTRACTION JOINT 30' C.C. SPACING
Not To Scale

WALL CONTRACTION JOINT 30' C.C. SPACING
Not To Scale

FOOTING CORNER REINFORCING
PLAN VIEW
Scale: 1/4" = 1' - 0"