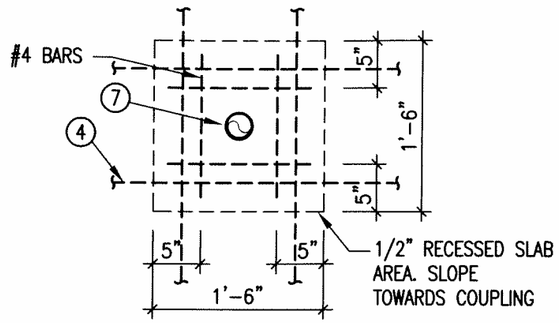
STORAGE IN GALLONS

H HEIGHT (FEET)	LENGTH (FEET)	D WATER DEPTH (FEET)	WIDTH (FEET)			
			5	10	15	20
2	20	1.75	896	2,118	3,340	4,562
2	15	1.75	656	1,551	2,445	3,340
2	10	1.75	416	983	1,551	2,118
2	5	1.75	176	416	656	896
1.5	20	1.25	640	1,513	2,386	3,258
1.5	15	1.25	469	1,108	1,747	2,386
1.5	10	1.25	297	702	1,108	1,513
1.5	5	1.25	126	297	469	640
1	20	0.75	384	908	1,431	1,955
1	15	0.75	281	665	1,048	1,431
1	10	0.75	178	421	665	908
1	5	0.75	75	178	281	384

KEYED NOTES

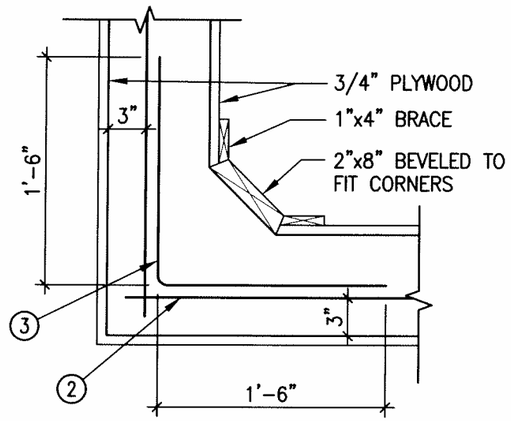
AS INDICATED BY: (#)→

1. VERTICAL REINFORCING #3 AT 18" W/ MINIMUM 12" HORIZONTAL LEG
2. HORIZONTAL REINFORCING #3 AS SHOWN.
3. #3 HORIZONTAL INTERVENING TIE BARS
4. SLAB REINFORCEMENT #3 AT 18" EACH WAY OR 6x6– W4.0xW4.0 WWF
5. 2" OUTLET PIPE
6. 2" OVERFLOW & DRAIN PIPE OR PROVIDE AUTOMATIC LEVEL CONTROL VALVES AND FLOAT
7. 2" THREADED COUPLING
8. SMALL SUMP REFER DETAIL THIS SHEET



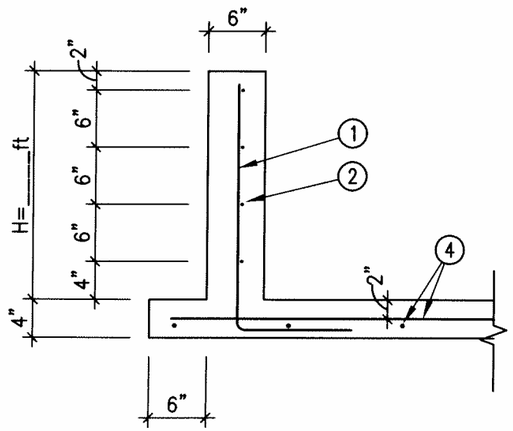
SUMP DETAIL

NO SCALE



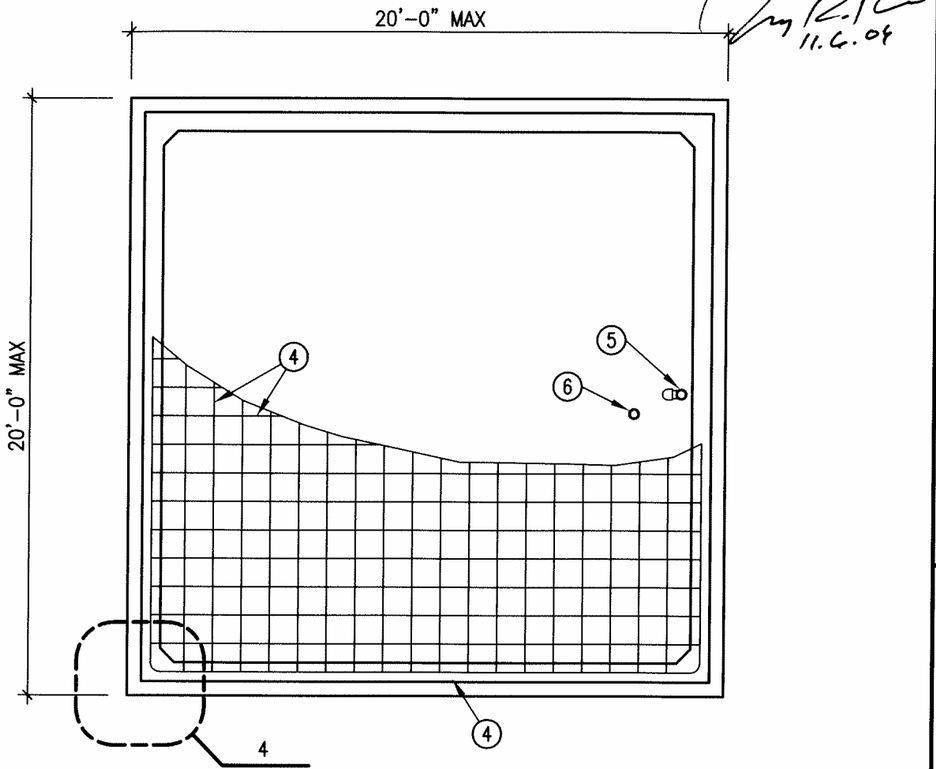
4 CORNER SECTION

1"=1'–0"



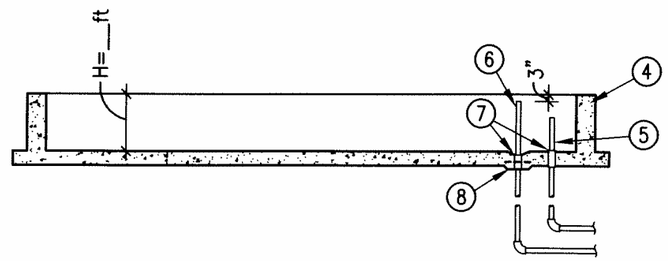
TYPICAL WALL SECTION

3/4"=1'–0"



PLAN

NO SCALE



SECTION

NO SCALE

STATE OF TEXAS
JOSEPH R. RAPIER
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LICENSED PROFESSIONAL ENGINEER
11.6.04

THIS DRAWING WAS PREPARED FOR NRCS BY: PARROLL, SMITH & COOPER, INC. CONSULTING ENGINEERS

DESIGNED BY: SRS
DRAWN BY: AND
CHECKED BY: RED
FILE NAME: TX-EN-0496.DWG
DATE PLOTTED: 25 MAY 2005

WATERING FACILITY (TROUGH)
REINFORCED CONCRETE FLOOR
WITH FORMED REINFORCED
CONCRETE WALLS
(MAXIMUM 2' DEPTH,
20' WIDTH AND 20' LENGTH)

NRCS Natural Resources Conservation Service
U.S. Department of Agriculture

REVISIONS DATE

DRAWING NO. TX–EN–0496

SHEET 1 OF 2

GENERAL NOTES

1. DIMENSIONS MAY VARY AS FOLLOWS: MAXIMUM 2'–0" DEEP, MAXIMUM 20'–0" WIDTH AND MAXIMUM 20'–0" LENGTH.

2. MATERIAL PROPERTIES
   CONCRETE FLOOR SLAB AND WALLS: 3000psi AT 28 DAYS
   REINFORCING: GRADE 60 ASTM A–615
   PIPING: NEW GALVANIZED, BRONZE, COPPER, OR PLASTIC PVC. PVC SHALL BE SCHEDULE 40 OR SCHEDULE 80 IF THREADED

3. VALVES OR PIPES SHALL BE PROTECTED BY SHIELDS OR COVERS TO PREVENT DAMAGE BY LIVESTOCK

4. CONSTRUCTION PROCEDURES

   A. PREPARE FOUNDATION BY LEVELING AND SMOOTHING AREA WHERE FACILITY IS TO BE CONSTRUCTED. A MINIMUM OF A 4" LAYER OF LOOSE FRIABLE MATERIAL IS REQUIRED BETWEEN BOTTOM OF FLOOR AND SUBGRADE. THIS LAYER SHALL BE FREE OF DEBRIS AND ROCKS OR PEBBLES LARGER THAN 1/2 INCH IN DIAMETER. THE OUTLET AND DRAIN PIPES SHOULD BE POSITIONED BEFORE FINAL SMOOTHING OF THE FOUNDATION. PLACE A VAPOR BARRIER CONSISTING OF POLYETHYLENE SHEET 10 MILS THICK BETWEEN THE SUBGRADE AND THE CONCRETE.

   B. REINFORCING STEEL IS TIED IN PLACE BY TYING THE VERTICAL BARS TO THE HORIZONTAL BARS. SPLICED REINFORCING BARS SHALL BE OVERLAPPED AT LEAST 12 INCHES. TIE THE FLOOR SLAB REINFORCEMENT IN PLACE SO THAT IT IS 2 INCHES BELOW THE FINISHED SURFACE OF THE FLOOR SLAB. THE SLAB REINFORCEMENT WILL REST ON THE HORIZONTALLY PROJECTING LEGS OF THE VERTICAL BARS.

   C. MAINTAIN A 2" CLEAR COVER FOR ALL CONCRETE.

   D. THE CONCRETE FOR THE FLOOR SLAB AND WALL IS POURED AS ONE UNIT AFTER THE VERTICAL BARS, AFTER THE INTERVENING TIE BARS, AND THE SLAB REINFORCEMENT ARE IN PLACE. CARE SHOULD BE USED IN PLACING THE CONCRETE TO AVOID SEGREGATION. TOP OF FLOOR SLAB SHOULD BE TROWELED TO A REASONABLY SMOOTH FINISH. TAMP THE CONCRETE INTO THE FORMS AS IT IS POURED TO INSURE TIGHT BOND TO REINFORCING STEEL TO YIELD A DENSE CONCRETE REASONABLY FREE OF VOIDS. AFTER THE FORMS ARE REMOVED ALL EXPOSED VOIDS SHOULD BE FILLED WITH CEMENT–SAND MORTAR AND THE ENTIRE SURFACE SCRUBBED TO ACCOMPLISH A DENSE SMOOTH SURFACE.

5. CORNER SECTION BEVELED FOR EASY REMOVAL OF FORMS. SECTIONS SHAPE ALSO WILL INCREASE AMOUNT OF CONCRETE AT CORNERS.

CONCRETE WATERING TROUGH CONCRETE QUANTITY CUBIC YARDS (CY)					
		WIDTH (FEET)			
SLAB QUANTITY		5	10	15	20
LENGTH – FEET	5	1	1	1	2
	10	1	2	2	3
	15	1	2	3	4
	20	2	3	4	5
WALL QUANTITY WALL HEIGHT = 1 FT.					
LENGTH – FEET	5	1	1	1	1
	10	1	1	1	2
	15	1	1	2	2
	20	1	2	2	2
WALL QUANTITY WALL HEIGHT = 1.5 FT.					
LENGTH – FEET	5	1	1	2	2
	10	1	2	2	2
	15	2	2	2	2
	20	2	2	2	3
WALL QUANTITY WALL HEIGHT = 2 FT.					
LENGTH – FEET	5	1	2	2	2
	10	2	2	2	3
	15	2	2	3	3
	20	2	3	3	3

CONCRETE WATERING TROUGH REINFORCING QUANTITY					
		WIDTH (FEET)			
WWF – SQUARE FEET		5	10	15	20
LENGTH – FEET	5	28	54	80	106
	10	54	105	156	208
	15	80	156	233	309
	20	106	208	309	410
#3 SLAB BARS – LINEAR FEET					
LENGTH – FEET	5	36	74	107.5	141
	10	74	152	220.5	289
	15	107.5	220.5	319	417.5
	20	141	289	417.5	546
#3 BARS – LINEAR FEET – 1 FOOT WALL HEIGHT					
LENGTH – FEET	5	72	100	126	152
	10	100	128	154	180
	15	126	154	180	206
	20	152	180	206	232
#3 BARS – LINEAR FEET – 1.5 FOOT WALL HEIGHT					
LENGTH – FEET	5	108	150	189	228
	10	150	192	231	270
	15	189	231	270	309
	20	228	270	309	348
#3 BARS – LINEAR FEET – 2 FOOT WALL HEIGHT					
LENGTH – FEET	5	144	200	252	304
	10	200	256	308	360
	15	252	308	360	412
	20	304	360	412	464

NOTES:
1 QUANTITIES DO NOT INCLUDE AN ALLOWANCE FOR WASTE
2 QUANTITIES ARE NOT ROUNDED UP TO THE NEAREST WHOLE YARD OR FOOT

STATE OF TEXAS
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10.21.08

THIS DRAWING WAS PREPARED FOR NRCS BY: ESA

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DRAWN BY: AJO
CHECKED BY: ESA
FILE NAME: TX-EN-0496.DWG
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WATERING FACILITY (TROUGH)
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SHEET 2 OF 2