

**HOMEOWNERS GUIDE FOR  
DRIVE POINT  
WATER SUPPLY SYSTEMS  
AND  
HAND PUMPS**

**PREPARED BY**

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April 1995**

## PHILOSOPHY AND CONCERNS OVER CONSTRUCTION REQUIREMENTS FOR DRIVE POINT WATER SYSTEMS

No doubt the information and construction requirements found on the following pages will not be what your father or next door neighbor installed or what your grandfather installed all so many years ago. Water supplies in your grandfather's day was a resource that merely needed development. Elaborate methods were devised to capture water from surface springs, rivers, lakes and large diameter wells were dug into water bearing soils. As years past it was found that mere development was not enough. Contamination easily entered these water supplies and compromised public health.

These concerns were addressed with construction requirements designed to prevent contaminants from entering the water well or water system. Yet as the years past, construction practices were found to be inadequate as contaminants were not only found in individual wells but in the aquifers from which they drew water. Thus, we have learned that ground water is not an inexhaustible commodity that we can afford to take for granted.

Michigan's Public Health Code, Part 127 of Act 368, P.A. 1978 has recently been revised to address these concerns. However, in doing so, some concerns have been created over the construction of driven wells. The installation of a drop pipe or suction line inside the drive casing is the biggest concern that has been brought to our attention by the public. Because the drive point is no longer under suction, the water recharging the casing is by gravity. If the pumping rate exceeds the rate at which water flows into the casing from the aquifer, suction will be broken and the well will fail to produce water. Many of these problems can be avoided by following the recommended construction methods addressed by this manual. Some of the parts and equipment referred to in this manual are not readily available. They may however, may be obtained by ordering through any hardware which you frequent. Should you still have any difficulty in obtaining these parts feel free to contact the health department for help.

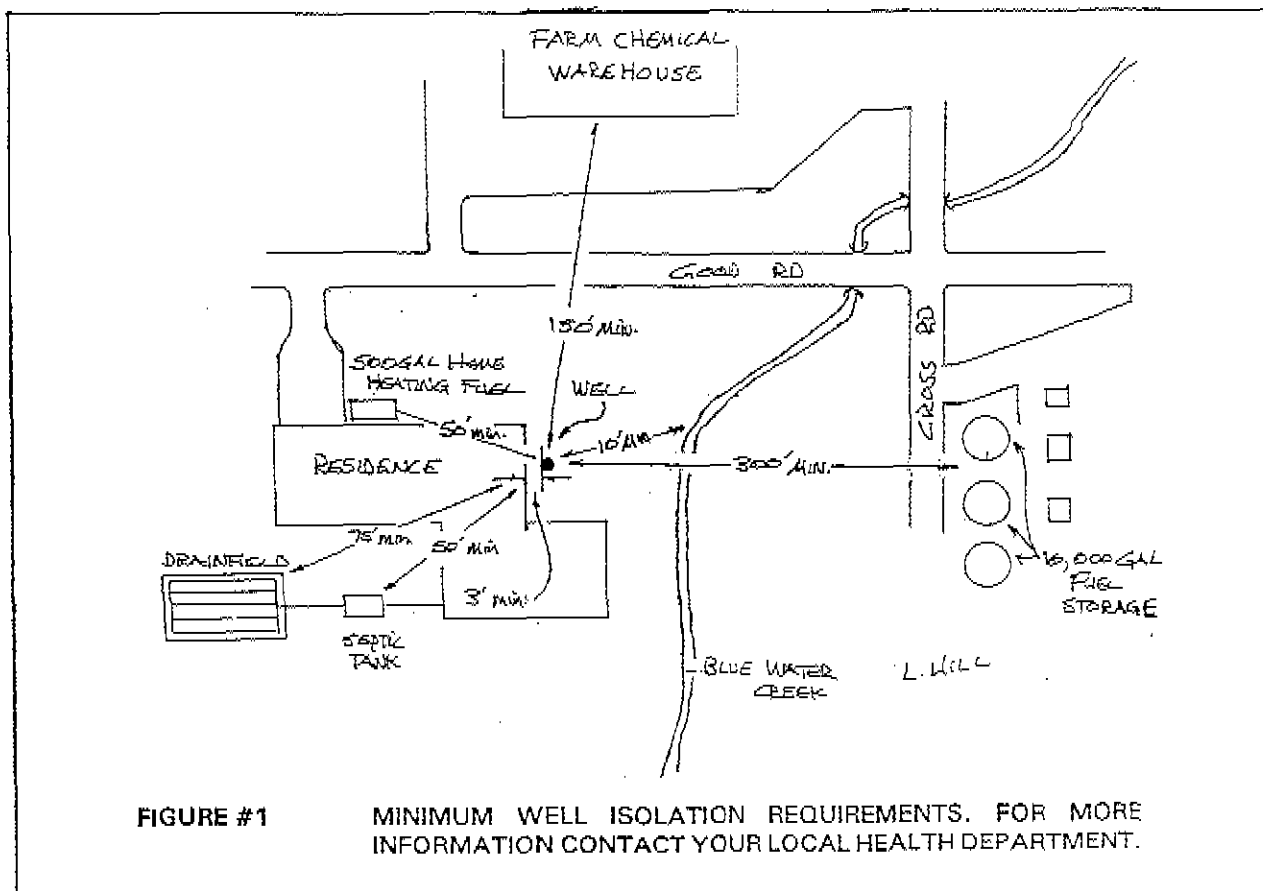
THE FOLLOWING RULES ARE REMOVED IN PART FROM PART 127 OF ACT 368, P.A. 1978 MICHIGAN'S PUBLIC HEALTH CODE PERTAINING TO THE INSTALLATION OF DRIVE POINTS, ASSOCIATED PIPING, PUMPING AND STORAGE EQUIPMENT INCLUDING HAND PUMPS. THEY HAVE BEEN ASSEMBLED HERE TO ASSIST THE HOMEOWNER IN CONSTRUCTING AN APPROVED WATER SUPPLY.

R 325.1601

**Definition:**

Rule 101a (1)

"Basement offset" means a below grade well room or pump room which has walls and a floor that are constructed of concrete or its equivalent, which is reasonably watertight, and which is attached directly to, and drained into, an approved basement in a manner that provides access for the maintenance of the water supply system components.



R 325.1603 Definition:

Rule 105 (5) "Grout" means a material that has a low permeability, such as cement, bentonite grout, bentonite chips, bentonite pellets, granular bentonite, or other materials which have equivalent sealing properties and which are approved in writing by the Department before use.

## WELL ISOLATION REQUIREMENTS

ISOLATION FROM	TO WELL
Rule 122.(1)(a) Active landfill operation, or area used for the application of sewage sludge.	800 Feet
Rule 122.(1)(b) Land application or injection of effluent/digested sludge, sewage treatment facility, gas, oil wells, petroleum processing or storage facilities, underground or aboveground storage tanks 1100 gallons or more.	300 Feet
Rule 122.(1)(c) Preparation or storage area for fertilizers, agricultural chemicals.	150 Feet
<b>Marquette Co. Environmental Health Code:</b> Subsurface sewage disposal systems, dry wells, pressurized sewer, seepage pits, cesspools, an animal or poultry yard, an outhouse or other wastewater disposal unit where liquid wastes drain into the soil. Marquette County Environmental Health Code.	75 Feet
Rule 122.(1)(d) Septic tanks, sewage pump chambers, grease traps, underground or above ground fuel storage tanks of 1100 gallons or more with an approved secondary containment.	50 Feet
Rule 122.(1)(f) Underground or above ground storage tanks of 1100 gallons or less storing motor or heating fuels of non-commercial use.	50 Feet
Rule 122.(1)(g) Buried gravity pressure or gravity flow sewer constructed of cast iron or schedule 40 plastic, a sump pit or unfilled space below the ground surface (except a crawl space), and surface water.	10 Feet
Rule 124.(1) Buildings, pump rooms and any projection thereof.	3 Feet

- R 325.1624 Wells; in relation to buildings**
- Rule 124 (1) Three (3) feet from a building, pump room or any projection thereof.
- Rule 124 (2) A well shall be accessible for cleaning, treatment, repair, testing, inspection, and other attention as may be necessary.
- R 325.1625 Wells; areas subject to flooding.**
- Rule 125 (1) A well shall not be located in an area that is subject to flooding.
- Rule 125 (2) A well owner shall grade the ground surface that is immediately adjacent to the well casing so that surface water is diverted away from the well.
- R 325.1626 Construction of wells; steel casing.**
- Rule 126. (1) Steel pipe that is used as permanent well casing shall be new pipe that is manufactured in compliance with the standards of ASTM specification A 53-90b in compliance with the standards of API, specification 5L-90.
- Rule 126. (2) Steel Pipe that is used as permanent well casing shall be at least standard weight...
- Rule 126. (3) Each length of steel pipe that is used as permanent well casing shall be legibly marked, by the manufacturer, kind of pipe, weight or schedule, outside diameter, specification number, length, heat or lot number.

Table 1  
Steel Well Casing  
Pipe Weights and Dimensions\*

Nominal Pipe Size (Inches)	Weight/ Schedule	Weight Lbs. Per Ft. Plain End	Weight Lbs. Per Ft. Threaded/ Couplings	Wall Thickness (Inches)	Outside Diameter (Inches)	Inside Diameter (Inches)
1 1/4	Std./40	2.27	2.30	.140	1.660	1.380
1 1/2	"	2.72	2.75	.145	1.900	1.610
2	"	3.65	3.75	.154	2.375	2.067

- R 325. 1627 Well construction; steel casings and joints.**
- Rule 127. (1) Steel pipe that is used as permanent well casing shall be watertight throughout its length.
- Rule 127. (2) Couplings that are used on threaded casing shall be recessed or reamed and drifted and manufactured to API specifications 5L-90. Couplings shall have a design, taper and type of thread that is consistent with the thread of the pipe and threads shall not be exposed on the pipe.

R 325.1632 Well construction; casing depth, termination.

Rule 132 (3)

A casing shall extend not less than 25 feet below, and terminate not less than 12 inches above, the ground surface. A well that has less than 26 feet of casing shall not be used without obtaining written approval from the health officer.

Rule 132 (4)

The top 25 feet of a well casing shall not be used as a suction line unless the well casing is protected by a standard weight or heavier outer casing.

R 325.1632(a) Well construction; casing diameter and installation.

Rule 132a. (1)

Steel pipe that is used as a permanent casing for a driven well point shall not be less than 1 1/4 inches inside diameter.

R 325.1635 Well construction; grouting driven casings.

Rule 135 (a)

Where temporary casing or oversized bore hole is not used, dry granular bentonite shall be maintained around the permanent casing as it is being driven. (SEE FIGURE #2) *(The most readily available source for bentonite is from a local well drilling firm.)*

FIGURE #2

GROUTING OF A DRIVE POINT CAN BE ACCOMPLISHED BY DIGGING A FUNNEL SHAPED HOLE AROUND THE DRIVE PIPE AND KEEPING IT FULL OF DRY BENTONITE CHIPS.

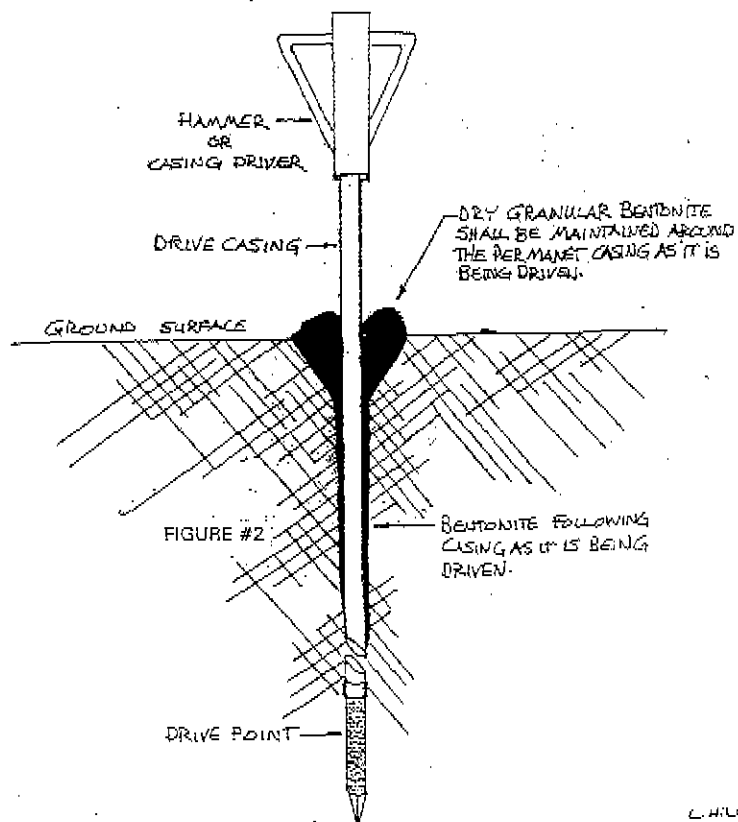
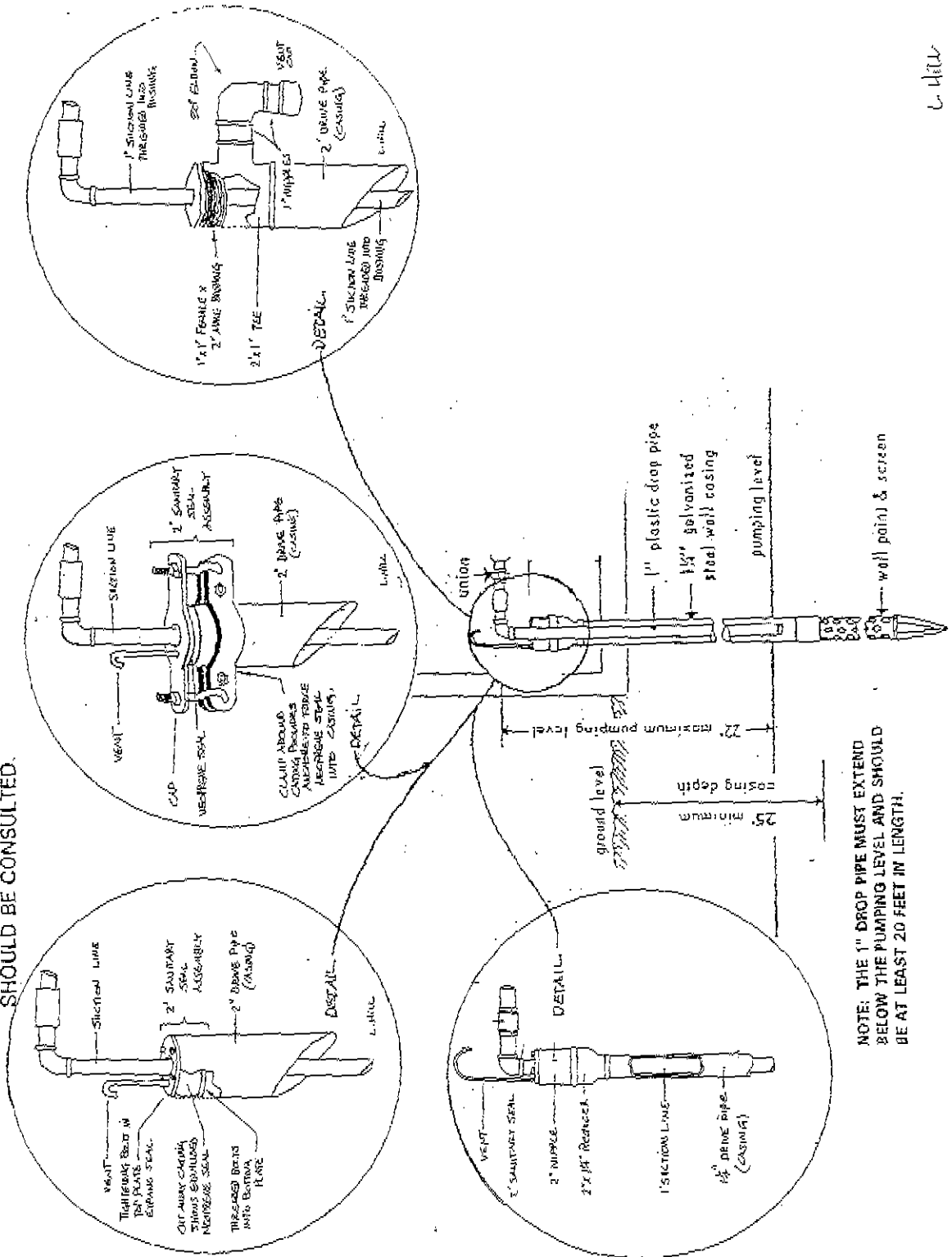


FIGURE #3 DRIVEN WELL INSTALLATION AND METHODS OF WELL HEAD COMPLETION. DEPICTED ARE COMMONLY USED METHODS TO PREVENT CONTAMINATES FROM ENTERING THE WELL. ALTERNATE METHODS DO EXIST HOWEVER, YOUR LOCAL HEALTH DEPARTMENT SHOULD BE CONSULTED.



NOTE: THE 1" DROP PIPE MUST EXTEND BELOW THE PUMPING LEVEL AND SHOULD BE AT LEAST 20 FEET IN LENGTH.

L. Hill

- 325.1639 Well construction; developing and pumping rate.**  
 Rule 139 (5) A new, repaired, or reconditioned well shall be developed and pumped to waste at a pumping rate which equals or exceeds that of the permanent pump, until the water is as clear as possible.
- R 325.1641 Well construction; above grade casing connections.**  
 Rule 141. Above grade connection into the top or side of a well casing shall be done by a threaded connection, welded connection, rubber expansion sealer. (SEE FIGURE #3)
- R 325.1642 Wells construction; below grade casing connections.**  
 Rule 142. (1) A connection to a well casing below the surface of the ground shall be protected by approved threaded or welded joints or by a threaded pitless adaptor. (SEE FIGURE #10)
- R 325.1651 Pump and well casing housing and location.**  
 Rule 151 (1) A room that houses pumping equipment or the top of a well casing shall be constructed above the ground surface (SEE FIGURE #4) or, the room may be located below grade if it is a basement offset defined in Rule 101a (1). (SEE FIGURE #5)
- Rule 151 (2) A pump or pumping equipment may be located within a crawl space beneath a single family dwelling if the space does not accumulate water. (SEE FIGURE #6)
- Rule 151 (3) A pump room, basement offset, crawl space, or well house shall provide access for maintenance.

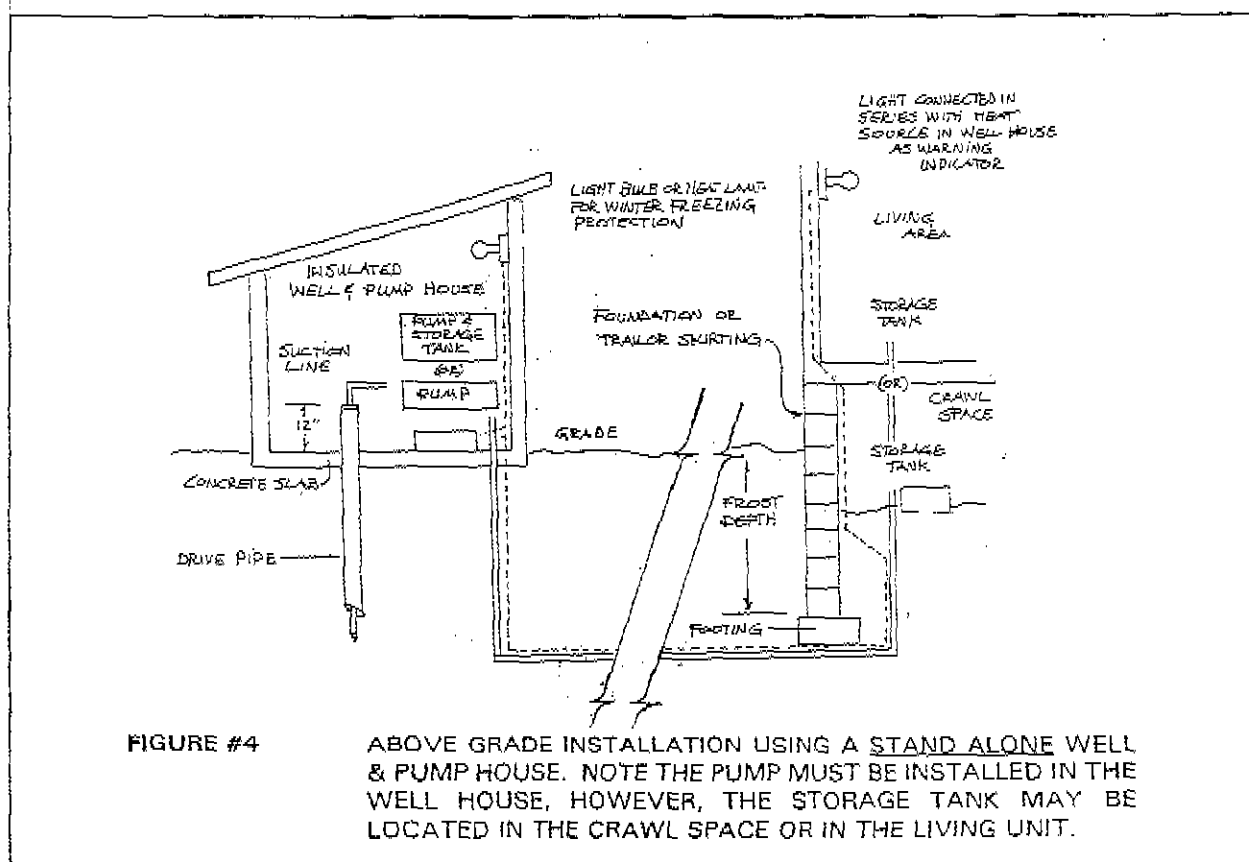
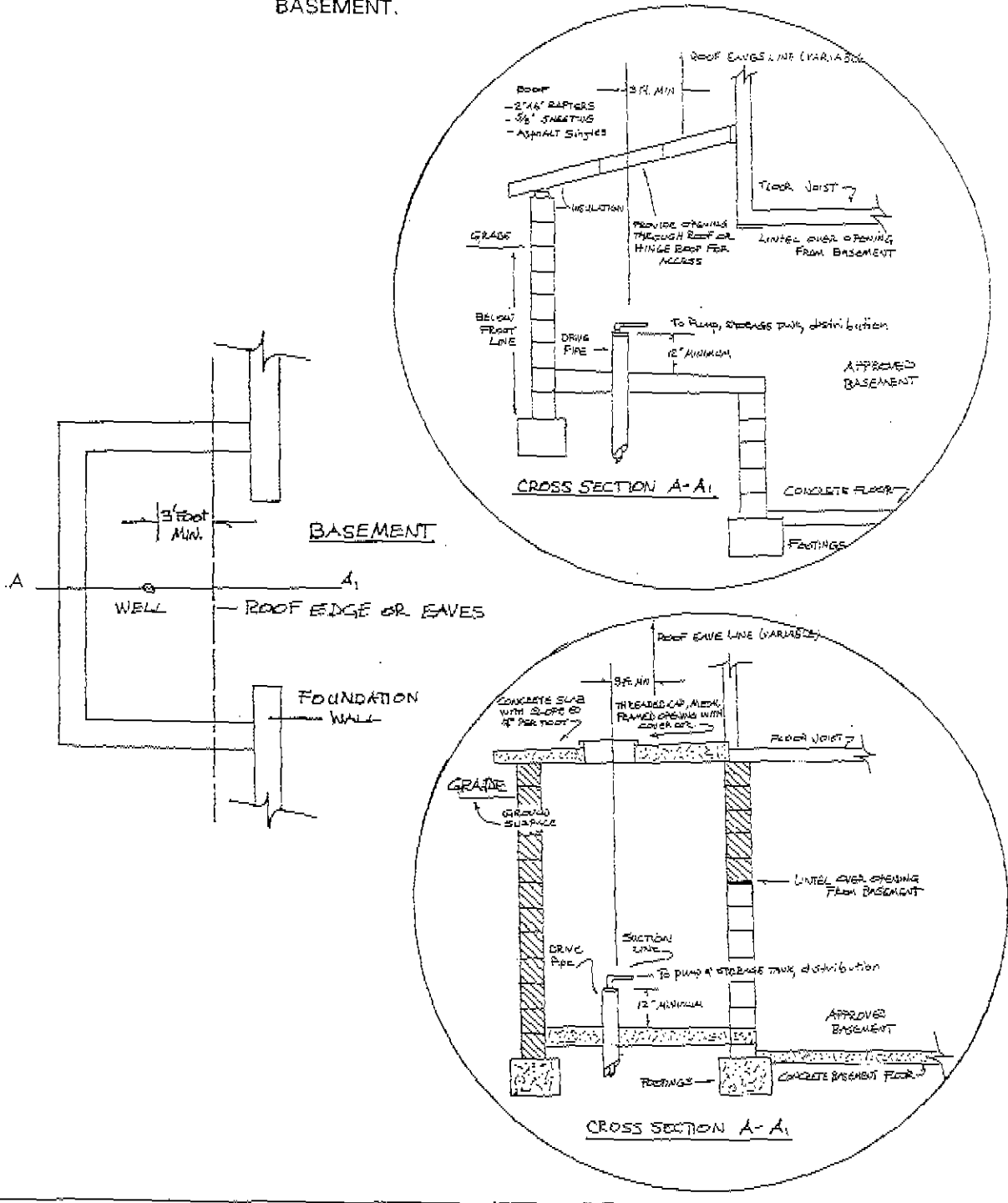
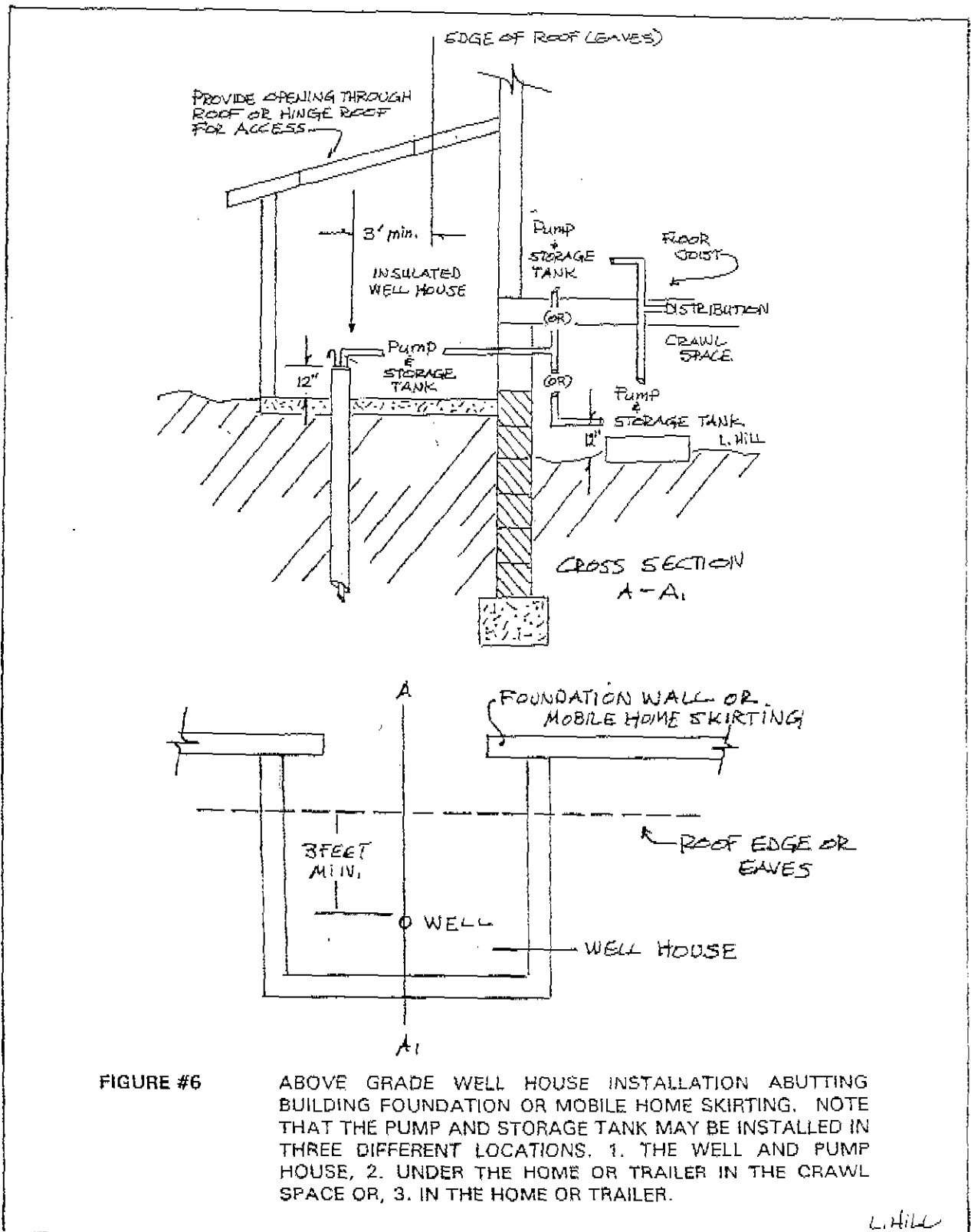




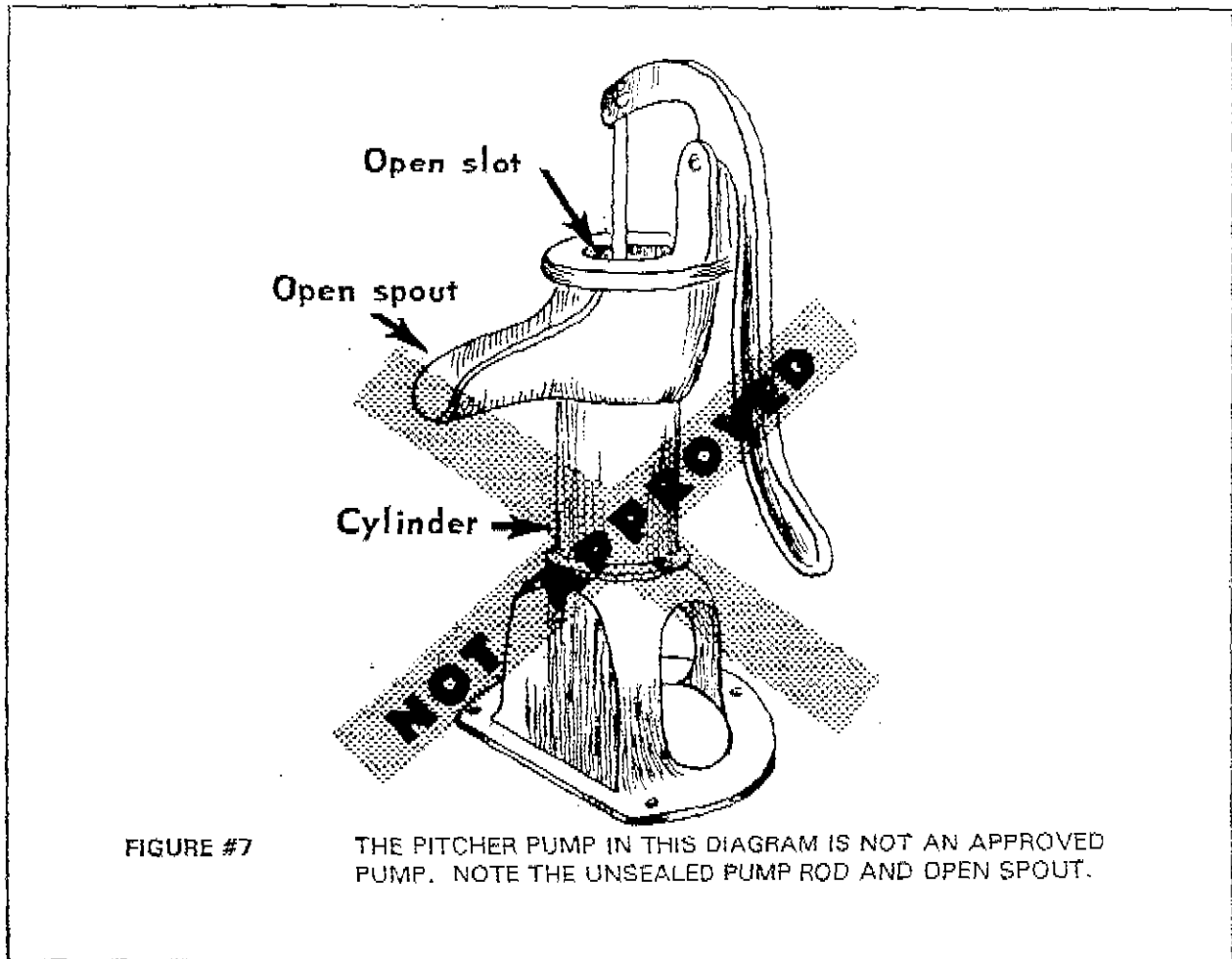
FIGURE #5 TWO DIFFERENT APPROVED BASEMENT OFFSET INSTALLATIONS. NOTE THE PUMP AND STORAGE TANK MAY BE LOCATED EITHER IN THE PUMP HOUSE OR IN THE BASEMENT.





**R 325.1653 Pump installation, design and maintenance.**

Rule 153 (1) A pump shall be constructed so that there are no unprotected openings into the interior of the pump or well casing. (SEE FIGURE #7)



Rule 153 (2) A power driven pump shall be attached to the casing or approved suction or discharge line by a water tight connection.

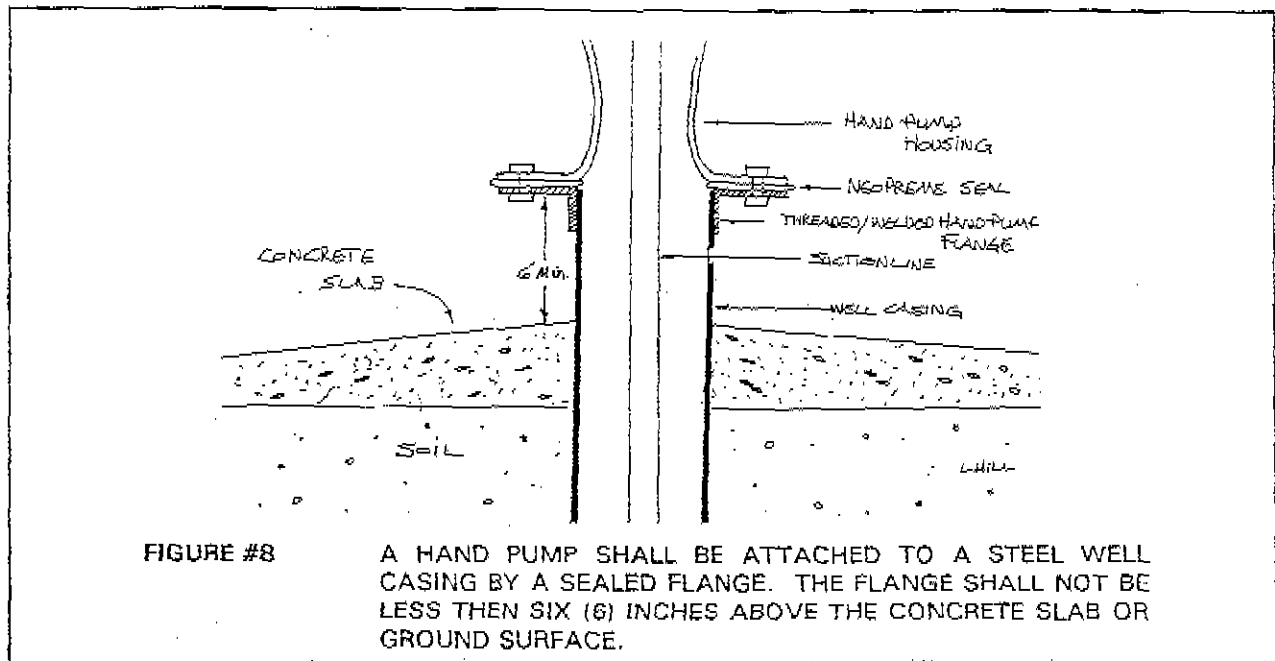
Rule 153 (3) A pump shall be installed, and maintained so that priming is not required for ordinary use.

Rule 153 (4) Plastic pump drop pipe shall be in compliance with the material requirements for water service lines as described in Rule 155 (2).

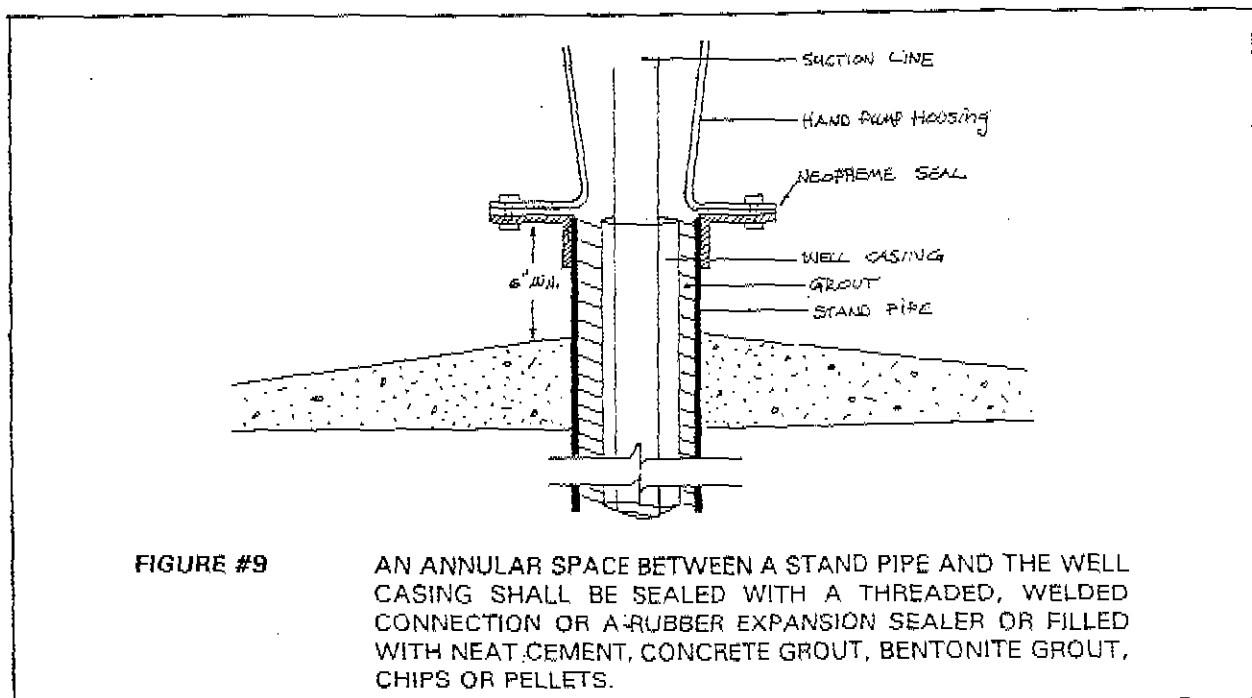
**R 325.1653a Hand pump installation.**

Rule 153a (1) A hand pump, hand pump head, hand pump stand, or similar device shall be installed in accordance with Rule 153 and Rule 157 and shall have a closed downward spout and a sealed pump rod packing assembly.

Rule 153a (2) A hand pump shall be attached to a steel well casing by a sealed flange. The flange shall be not less than six (6) inches above the concrete slab or ground surface. (SEE FIGURE #8)



An annular space between a stand pipe and a well casing shall be sealed in accordance with Rule 141 or materials listed in Rule 163 (5). (SEE FIGURE #9)



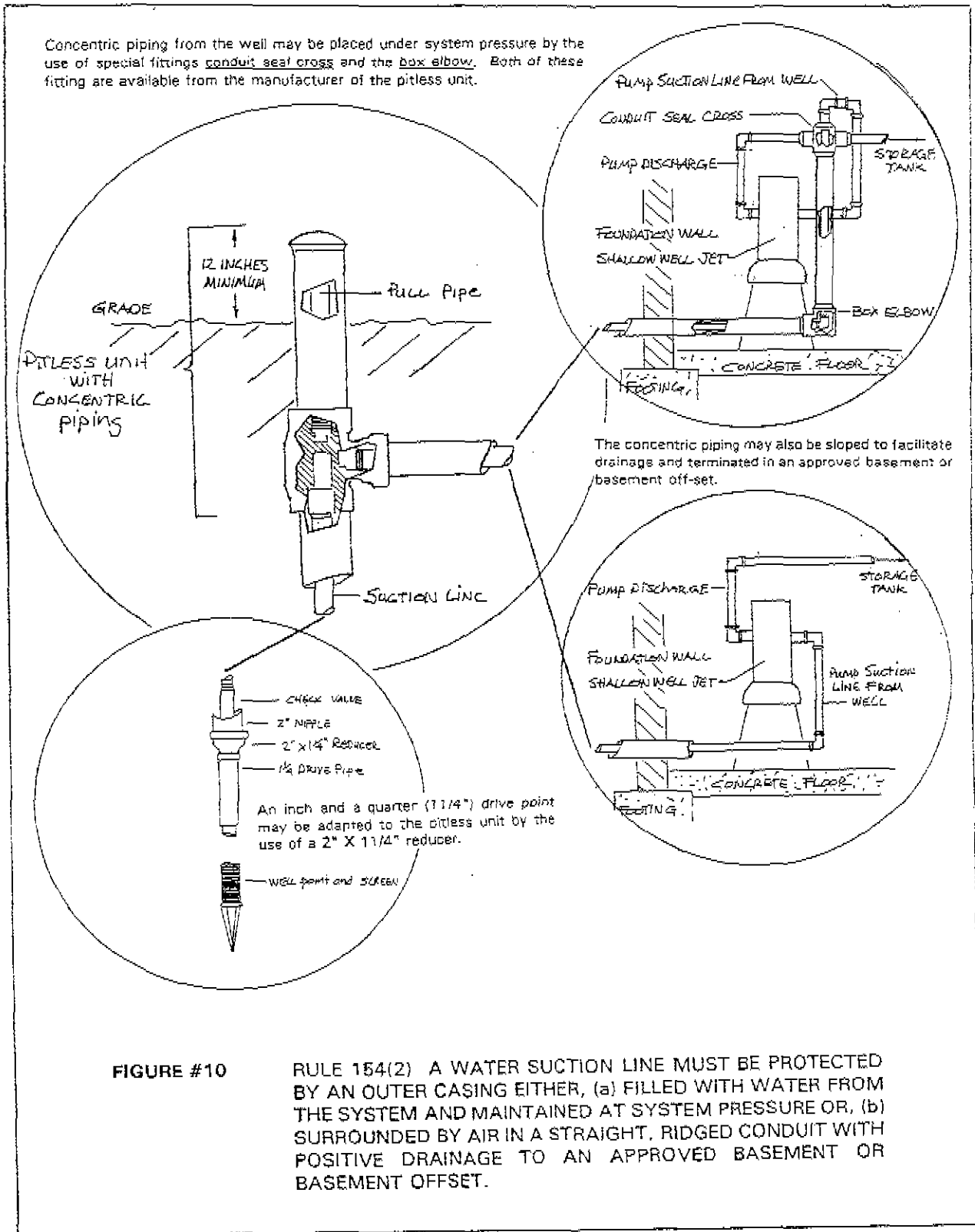


FIGURE #10

RULE 154(2) A WATER SUCTION LINE MUST BE PROTECTED BY AN OUTER CASING EITHER, (a) FILLED WITH WATER FROM THE SYSTEM AND MAINTAINED AT SYSTEM PRESSURE OR, (b) SURROUNDED BY AIR IN A STRAIGHT, RIDGED CONDUIT WITH POSITIVE DRAINAGE TO AN APPROVED BASEMENT OR BASEMENT OFFSET.

R. 325.1654 **Pump installation; water suction lines.**

Rule 154(1) A water service line shall be copper, galvanized steel, or plastic piping.

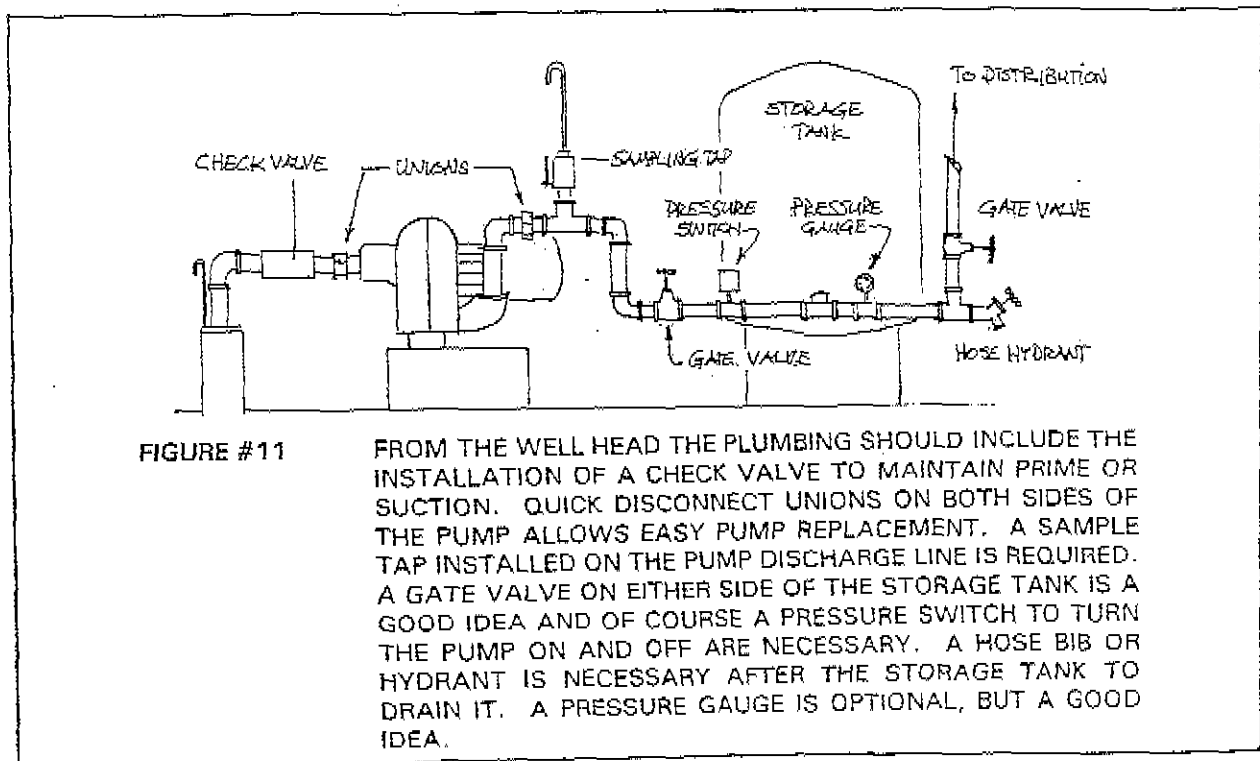
Rule 154(2) A water suction line that is outside the well casing shall be protected by:

1. Fully exposing the line and suspending it a minimum of 12 inches above an approved basement offset or pump room.
2. Fully exposing the line above the ground surface,
3. Situating the line within an outer casing with the annular space filled with water from the system and maintained at system pressure. (SEE FIGURE #10)
4. Surrounding the line by an air space in a straight ridged conduit which does not have joints and which has positive drainage by gravity to the ground surface or to an approved basement or basement offset, pump room. The connection to the well casing shall be in accordance with Rules 141 and 142. The total length of suction line protected by the outer casing shall not be greater than twenty (20) feet. (SEE FIGURE #10)

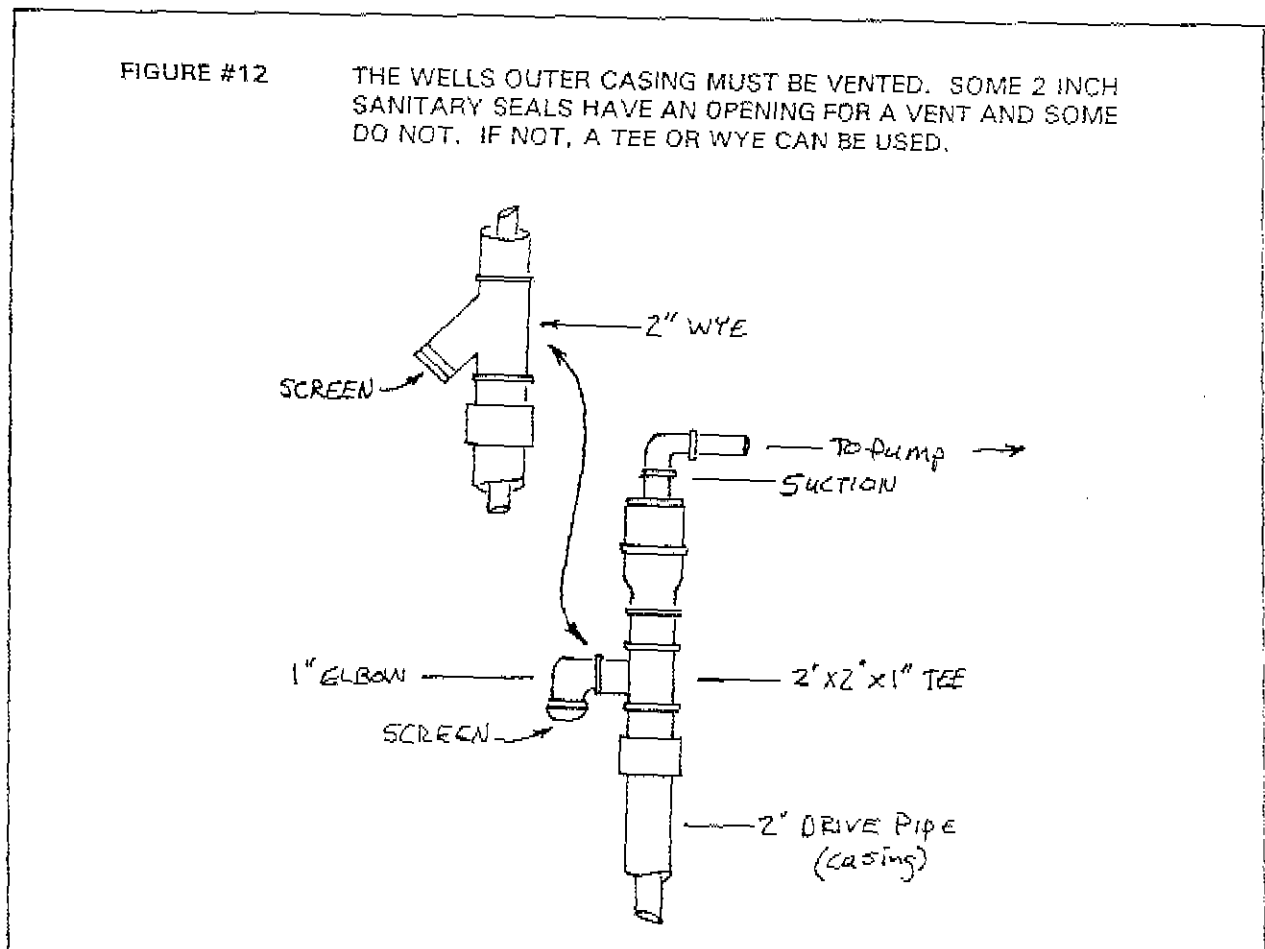
R 325.1655 **Water service line (liner or drop pipe).**

Rule 155 (2)

Plastic water service line material shall have a minimum rated working pressure of 160 psi and be in compliance with ASTM specifications D 2239-89, D 2737-89, D 2662-89, D 2666-89, or D 1785-91.



- R 325.1656 **Pump installation; pressure tanks.**  
 Rule 156 (1) A pressure tank shall be installed in an approved pump room, well house, crawl space, basement offset, or basement. (SEE FIGURE #11)
- R 325.1657 **Pump installation; vents.**  
 Rule 157 (1) A casing vent shall be provided on all well caps and seals. The vent shall be a minimum of 1/4 inch in diameter, screened (20 mesh per inch minimum and 30 mesh per inch maximum), pointed downward, and terminate at a point not less than 12 inches above the ground or approved basement offset, pump room, or round surface or a minimum 24 inches above any known flood level. (SEE FIGURE #12)



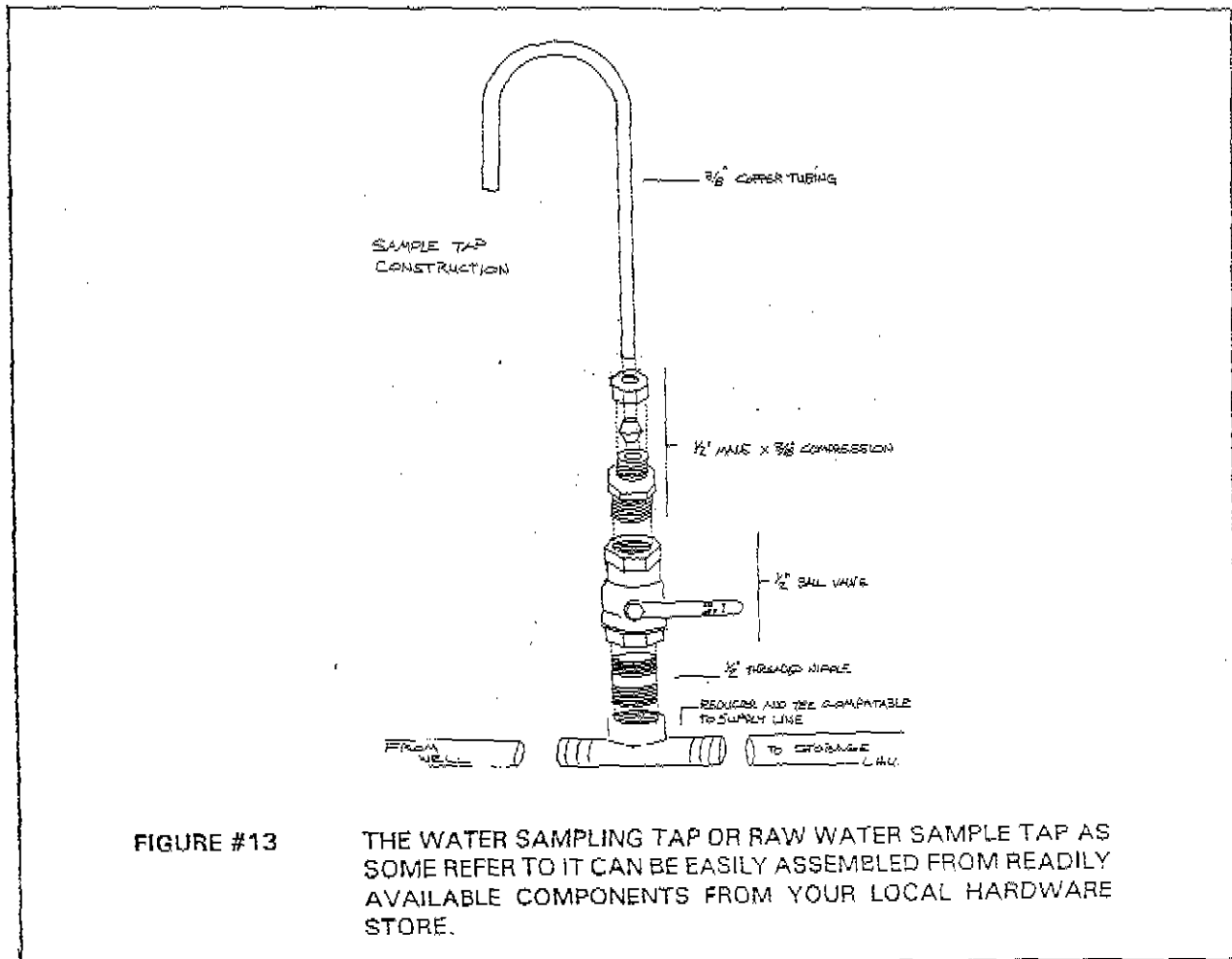
- R 325.157a **Pump installation; well caps and seals.**  
 Rule 157a Well caps and seals shall be weather tight and vermin proof, provide venting pursuant to the provisions of Rule 157(1) and be tightly secured to the well casing

R 325.1658

**Pump installation; sample taps.**

Rule 158.

Provisions shall be made for the collection of water samples by installing a downward faucet, not less than eight (8) inches above the floor, in a convenient location at the pressure tank or as near to the well as possible. (SEE FIGURE #13)



R 325.1661

**Well, pump, distribution system disinfection and sampling.**

Rule 161 (1)

After thoroughly pumping to waste as per Rule 139 a well and the pumping equipment shall be disinfected with chlorine that is applied to obtain a chlorine concentration and minimum contact period specified in table 5 in all parts of the water supply system before pumping to waste and flushing the chlorine solution from the system.

Rule 161 (2)

Before placing the water supply into service, and after all traces of chlorine solution have been flushed from the system, one or more water samples shall be collected and tested negative for organisms from the coliform group.



R 325.1675 Well records  
Rule 175 (1)

Within 60 days of the date of the completion of a well, the well driller (homeowner in this case) shall furnish the two copies of the well log to the health department and retain one copy for himself. (SEE FIGURE #14)

**MICHIGAN DEPARTMENT OF PUBLIC HEALTH  
WATER WELL AND PUMP RECORD**

**1. LOCATION**  
 COUNTY: MARQUETTE  
 TOWNSHIP: CHAMPION  
 RANGE: 12E  
 SECTION: 25N

**2. WELL LOCATION**  
 3/4 mile North of Mays & Co. Rd. at intersection on Left side of Co. Rd.

**3. WELL DEPTH**  
 Depth: 20 ft

**4. WELL CONSTRUCTION**  
 Type:  Open Well  
 Material:  Galvanized Steel  
 Casing:  2" Galvanized Steel

**5. PUMP**  
 Type:  Hand Pump  
 Capacity: 1/2 GPM

**6. SIGNATURES**  
 Homeowner: [Signature]  
 Contractor: [Signature]  
 Date: 6/21/04

FIGURE #14

WELL AND PUMP RECORD FORMS ARE AVAILABLE FROM YOUR LOCAL HEALTH DEPARTMENTS, ENVIRONMENTAL HEALTH DIVISION. SHOULD YOU NEED HELP CALL YOUR LOCAL ENVIRONMENTAL HEALTH SPECIALIST.