

STATE OF WISCONSIN
DEPARTMENT OF NATURAL RESOURCES

**REQUEST FOR APPROVAL OF CONSTRUCTION OF
FACILITIES AT OTHER-THAN-MUNICIPAL
COMMUNITY WATER SYSTEMS**

Return three (3) completed copies of this document to:

Lee H. Boushon, P.E., Section Chief
(608)266-0857
Public Water Systems Section
Wisconsin Department of Natural Resources
P.O. Box 7921
Madison, WI 53707

If you have questions please contact:

Norm Hahn (608)267-7661
Kris Khatri (920) 492-5906
Frank Fuja (414) 263-8749

This request is for approval of: (check appropriate facilities below)

- Well
- Well Pump and Discharge Piping
- Pumphouse
- Pressure Tank(s)

Please complete the sections of this document appropriate for approval of the facilities indicated above.

Completion of this form is mandatory. The Department will not approve your request if this form is not completed. Personally identifiable information on this form will be used for no other purpose.

INTRODUCTION

This application is intended to be used when requesting an approval for construction of facilities at other-than-municipal (OTM) community water systems. All OTM systems with the exception of subdivision systems are required to use these forms when requesting approval. Plans and specifications for subdivision systems must be submitted under the seal of a Professional Engineer. An other-than-municipal community water system for the purposes of plan approval is any interconnected collection of 7 or more homes, 10 or more mobile homes, 10 or more apartments, or 10 or more condominium units.

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WELL SPECIFICATIONS

Facility Information

Facility Name	Owner's Name
Address	Address
City, State, Zip Code	City, State, Zip Code
Telephone Number (include area code)	

Type of Units To Be Served	Number of Units to Be Served
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Well Number	<input checked="" type="checkbox"/> (√ one) New Well <input type="checkbox"/> Replacement Well
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Driller Information

Driller's Name	DNR License Number
Address	Driller's Telephone Number (include area code)
City, State, Zip Code	Drilling Firm's Name

Well Information

Well Location		Town or Municipality		County
Gov't Lot # or ___ 1/4 ___ 1/4 Section ____, T ____, R ____,				
Casing Diameter(s)	Casing Weight(s)	Casing Thickness	Casing Joint Type	
Casing Specification	Screen Type (if screen is proposed)	Drillhole Diameter(s)		
Drilling Method	Grouting Method	Grout Mixture		
Expected Water Bearing Formation(s)				

Drawing Information (see examples)

Is a Well and Property Location Sketch Provided <input type="checkbox"/> Yes <input type="checkbox"/> No	Is a Well Construction Drawing Provided <input type="checkbox"/> Yes <input type="checkbox"/> No
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I have completed this specification sheet, a location drawing, a construction drawing, and I have read the standard well construction specifications. The well will be constructed as indicated and any modifications to the standard specifications are noted on a separate attachment.

Driller's Signature	Date Signed
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I have reviewed the well construction information with the above driller and have authorized the construction of the well as proposed.

Owner's Signature	Date Signed
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STANDARD WELL CONSTRUCTION SPECIFICATIONS

1. Well Location

- a. The well shall be located as shown on the plans.
- b. The well shall be located so as to meet the requirements of s. NR 811.16(4), Wis. Adm. Code. If those separation distances cannot be maintained, the Public Water Supply Section must be contacted for a variance.

2. Driller Qualifications

- a. The well driller shall be a licensed driller registered in the State of Wisconsin under Chapter NR 146, Wis. Adm. Code.

3. Formation Sampling

- a. Formation samples shall be collected at 5 foot intervals and at every change in formation. The samples shall be bagged and shipped to the Wisconsin Geological and Natural History Survey, 3817 Mineral Point Road, Madison, Wisconsin 53705.

4. Materials of Construction

- a. Screens - The screen shall be of continuous slot, wire wound design, type 304 18-8 stainless steel.
- b. Casing - The protective well casing shall be new, unused, nonreclaimed, prime steel casing having the minimum wall thickness specified in table 1, ch. NR 811, Wis. Adm. Code. The casing shall be marked in accordance with ch. NR 112, Wis. Adm. Code, and shall meet ASTM A-53 Grades A or B; ASTM A-106; ASTM A-589 - Type I, Grades A or B, Type II, Grade A; or API 5L, 5LX, 5A, 5AX specifications. The minimum protective casing wall thickness shall be as follows: 6-inch diameter, 0.280-inches; 8-inch diameter, 0.322-inches; 10-inch diameter, 0.365-inches; 12-inch diameter, 0.375 inches.
- c. Joints - The well casing shall be assembled using welded joints meeting s. NR 112.18, Wis. Adm. Code, requirements.
- d. Packers - Packers shall be of a material that will not impart taste, odors, toxic substances or bacteriological contamination to the water in the well. Lead packers shall not be used.

5. Methods of Construction

- a. The well shall be constructed by percussion or rotary methods.
- b. Water used in the construction of the well shall be obtained from an uncontaminated source. The water shall be disinfected with chlorine. A minimum 10 mg/l chlorine residual shall be maintained in the well during the entire construction process.
- c. A drive shoe shall be welded to the bottom of any casing to be driven.
- d. Bentonites, drilling foams, or other drilling aids shall be approved by the Department of Natural Resources prior to their use. Products not on the Department's approved list shall not be used.

6. Well Grouting

- a. The well shall be grouted by one of the approved pressure grouting methods using a grout pump. Approved methods include the conductor pipe method, the grout float shoe method, the well seal method, or the street elbow method. Any of the Halliburton grouting methods may be used in noncreviced formations provided a special request accompanies the request for approval of the well construction and written Department approval is obtained.
- b. Regardless of the method of grouting a grout pump and conductor pipe shall be provided so that if the proposed method of grouting fails an alternate method is available on site.
- c. In fractured bedrock bentonite shall be circulated and circulation to the ground surface achieved prior to grouting the annular space.
- d. The conductor pipe shall be metal or a rubber coated, fiber or steel braided, reinforced hose with a minimum pressure rating of 300 psi. Plastic pipe shall not be used.
- e. Use of grout additives, including bentonite, shall be used only with prior written approval of the Department of Natural Resources.

- f. The grout shall be neat cement grout consisting of ASTM C150, Type 1 or API-10A Portland cement and not more than 6 gallons of water, from a known uncontaminated source, per 94 pounds of cement.
- g. The grout shall be placed from the bottom of the annular opening to the ground surface in one continuous operation.
- h. After grouting the well shall be allowed to stand for a minimum of 72 hours prior to resuming any drilling or pumping operations.

7. Development

- a. All wells shall be developed and pumped until the water is clear and free of sand and turbidity. The development shall be by one or a combination of the following methods; mechanical surging, air surging, over-pumping, hydraulic jetting, or air jetting.

8. Special Development

- a. Prior to any special development such as blasting, hydrofracturing, or chemical conditioning a written approval of the process shall be obtained from the Department of Natural Resources.

9. Final Disinfection

- a. Chlorine shall be used as the disinfectant. The specific compound shall be a bleach without additives, liquid sodium hypochlorite, calcium hypochlorite tablets, or other compounds approved by the Department for use in disinfection of wells. The quantity of chlorine compound shall be sufficient to produce a minimum 100 mg/l residual in the entire well for a minimum of 12 hours.

10. Test Pumping

- a. Set up - After development has been completed a test pump and all necessary accessories including temporary discharge piping, water meter, smooth end sampling faucet, means for measuring water levels, and valving shall be provided. The test pump shall have a capacity equal to the anticipated capacity of the final well pump.
- b. Procedures - The test pumping shall commence after the static water level has recovered from development. The pump test shall be at the rate, in gallons per minute, anticipated for the final well pump. The pump test shall continue until the well has stabilized or until 4 hours has elapsed. Drawdown and pumping rates shall be monitored. The drawdown shall be monitored according to the following schedule.

<u>Elapsed Time (minutes)</u>	<u>Measurement Interval</u>
0-10	Every minute
10-45	Every 5 minutes
45-90	Every 15 minutes
90 and after	Every 30 minutes

- c. Records - The contractor shall keep accurate records of the final pump test and furnish a copy to the Department of Natural Resources upon completion of the well.

11. Plumbness and Alignment

- a. All casings shall be placed concentrically within the drillhole or within each other. The contractor shall furnish all the labor, tools, and equipment necessary to perform plumbness and alignment tests and to demonstrate compliance of the work with the following:
 - i. Variance from the vertical of 2/3 the smallest inside diameter of that part of the well being tested per 100 feet of depth to the depth of the pump setting plus 25% shall not be exceeded.
 - ii. The well shall allow free passage of a 40 foot section of pipe or a dummy to the depth of the pump setting plus 25%. The outside diameter of the pipe or dummy shall not be more than 0.5-inch smaller than the diameter being tested.
- b. The contractor shall maintain an accurate record of the plumbness and alignment tests and furnish a copy to the owner and to the Department of Natural Resources along with the well constructor's report.

12. Capping

- a. The contractor shall provide temporary capping of the well and any unsealed annular space during the construction period when work on the well is not being done. Upon completion of the well a watertight, vandal-proof cap shall be placed on the well until the permanent pump is installed.

13. Water Quality Sampling

- a. Bacteriological Sampling - Two water samples taken at least 8 hours apart shall be taken for bacteriological analysis.
- b. Inorganic Sampling - One water sample shall be collected to be analyzed for inorganic parameters such as nitrates, chlorides, and hardness. A second sample shall be collected in a smaller "metals bottle" and shall be analyzed for iron and manganese.
- c. Organic Sampling - Samples shall be collected to be analyzed for Volatile Organic Chemicals (VOC's) and Synthetic Organic Chemicals (SOC's) as required in the Department approval letter.
- d. Radionuclides - Samples shall be collected to be analyzed for gross alpha and radon gas analyses. The gross alpha sample shall also be analyzed for radium and uranium if required by the Department approval letter.
- e. Bottles - Bottles for sampling shall be obtained from a Safe Drinking Water Act certified laboratory.
- f. Laboratories - A Safe Drinking Water Act certified laboratory shall be used for sample analyses except for radionuclide analyses. A U.S. EPA certified laboratory shall be used for radionuclide analyses. A listing of laboratories is available from the Department of Natural Resources.

14. Reporting

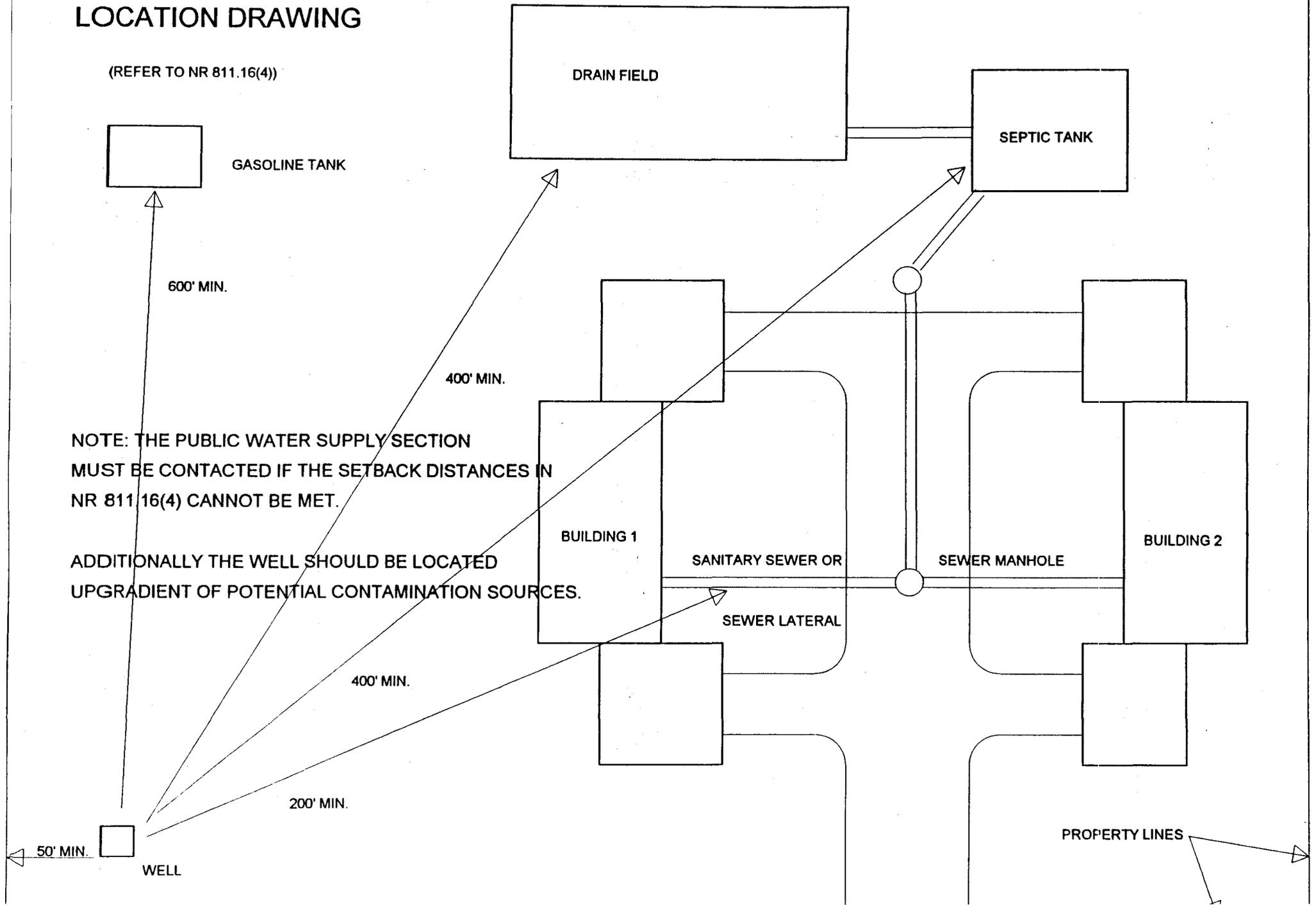
- a. The well driller shall submit a Wisconsin Well Construction Report (Form 3300-77A) to the Department within 30 days following the day the well was constructed. A copy of the report shall be provided to the owner. A copy of the pumping test data and a copy of the plumbness and alignment data shall accompany the construction report to the Department. The report shall be submitted to: Department of Natural Resources, Public Water Supply Section, P.O. Box 7921, Madison, WI 53707.
- b. Completed copies of the Department water quality laboratory reporting forms shall be returned to the Department as soon as the results of the chemical analyses are obtained.
- c. Contamination Source Inventory - A Public Water Supply Contamination Source Inventory (Form 3300-215) shall be completed and returned to the Department prior to placing the well in service.

15. DNR Contact

- a. The local district or area office of the Department of Natural Resources shall be contacted 48 hours in advance of the intended date of well grouting.

LOCATION DRAWING

(REFER TO NR 811.16(4))



GASOLINE TANK

600' MIN.

NOTE: THE PUBLIC WATER SUPPLY SECTION
MUST BE CONTACTED IF THE SETBACK DISTANCES IN
NR 811.16(4) CANNOT BE MET.

ADDITIONALLY THE WELL SHOULD BE LOCATED
UPGRADIENT OF POTENTIAL CONTAMINATION SOURCES.

DRAIN FIELD

SEPTIC TANK

400' MIN.

BUILDING 1

SANITARY SEWER OR

SEWER MANHOLE

BUILDING 2

SEWER LATERAL

400' MIN.

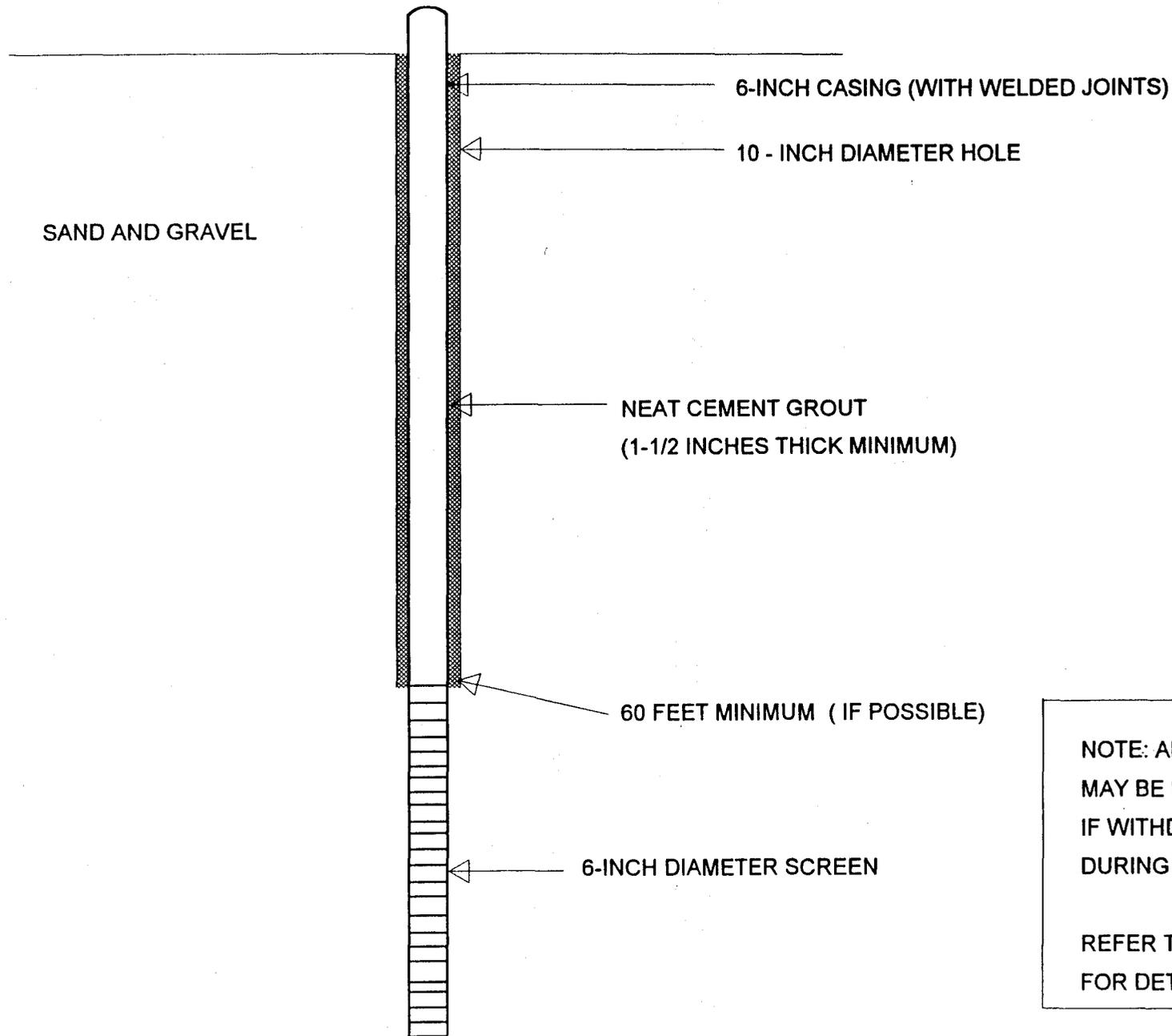
200' MIN.

50' MIN.

WELL

PROPERTY LINES

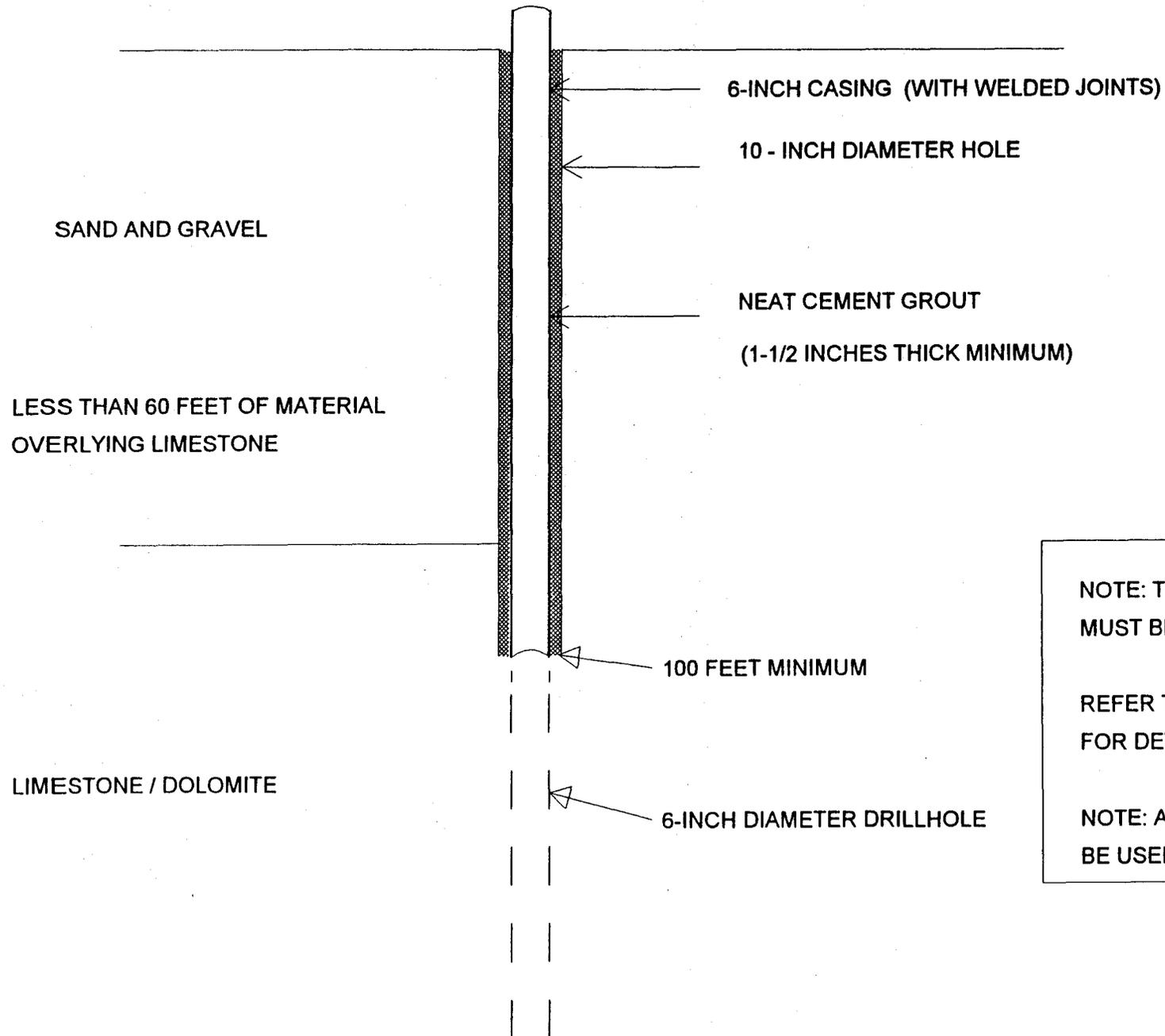
SAND AND GRAVEL WELL CONSTRUCTION



NOTE: AN OUTER WELL CASING
MAY BE USED IN CONSTRUCTION
IF WITHDRAWN AT LEAST 5 FEET
DURING GROUTING.

REFER TO SUBCHAPTER III OF NR 811
FOR DETAILED REQUIREMENTS.

LIMESTONE WELL - LESS THAN 60 FEET OF OVERBURDEN

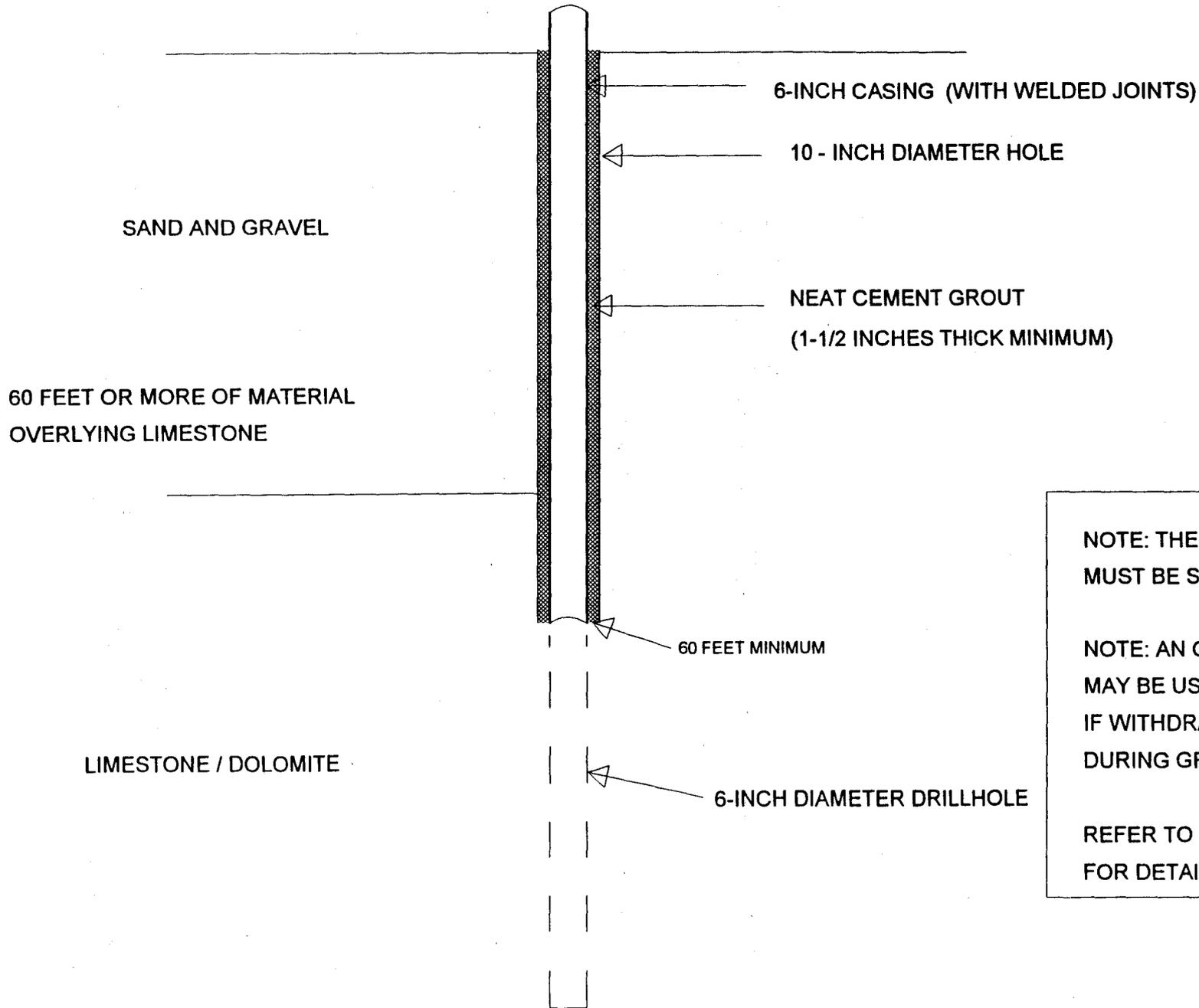


NOTE: THE INNER 6-INCH CASING
MUST BE SEATED INTO FIRM ROCK.

REFER TO SUBCHAPTER III OF NR 811
FOR DETAILED REQUIREMENTS.

NOTE: AN OUTER WELL CASING MAY
BE USED IN CONSTRUCTION

LIMESTONE WELL - 60 FEET OR MORE OF OVERBURDEN

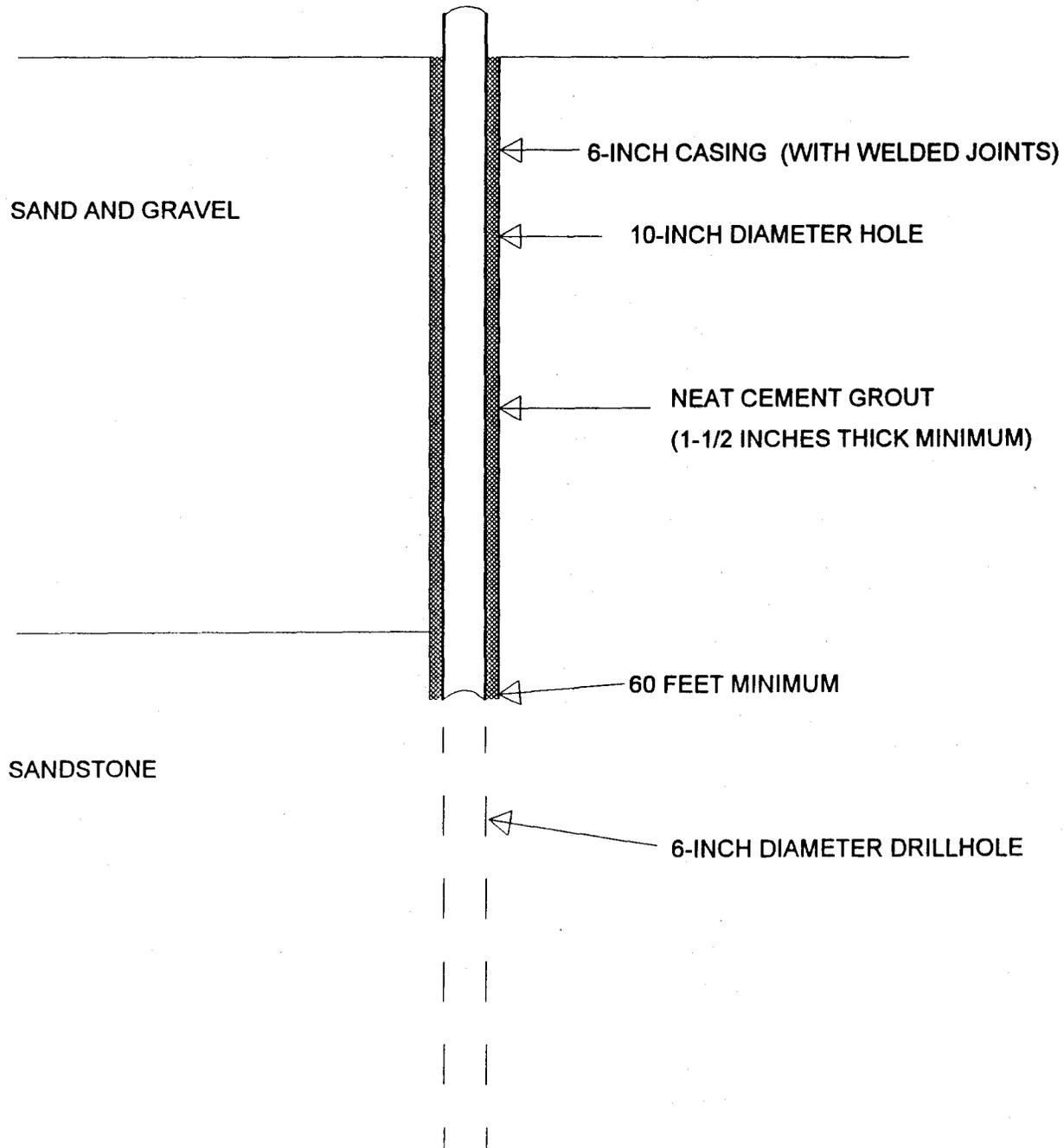


NOTE: THE INNER 6 INCH CASING MUST BE SEATED INTO FIRM ROCK.

NOTE: AN OUTER WELL CASING MAY BE USED IN CONSTRUCTION IF WITHDRAWN AT LEAST 5 FEET DURING GROUTING.

REFER TO SUBCHAPTER III OF NR 811 FOR DETAILED REQUIREMENTS.

SANDSTONE WELL CONSTRUCTION



NOTE: THE INNER CASING
MUST BE SEATED INTO FIRM ROCK.

NOTE: AN OUTER WELL CASING
MAY BE USED IN CONSTRUCTION
IF WITHDRAWN AT LEAST 5 FEET
DURING GROUTING.

REFER TO SUBCHAPTER III OF NR 811
FOR DETAILED REQUIREMENTS.

PUMP SPECIFICATIONS

Facility Information

Facility Name	Owner's Name
Address	Address
City, State, Zip Code	City, State, Zip Code
Telephone Number (include area code)	

Types of Units To Be Served	Number of Units To Be Served
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Well Number	(√ one)	<input type="checkbox"/> New Pump	<input type="checkbox"/> Pump Replacement
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Pump Installer Information

Installer's Name	Installer's DNR License Number
Address	Installer's Telephone Number (Include area code) ()
City, State, Zip Code	Firm Name

Pump Information

Pump Design Capacity _____ gpm at _____ feet of TDH	Pump Manufacturer's Name	
Pump Model Number	Pump Setting (ft.)	Motor Horsepower
Motor RPM	Pump Type (√ one) <input type="checkbox"/> Submersible <input type="checkbox"/> Vertical Turbine	

I have completed this specification sheet and have read the standard specifications. The pump and discharge piping will be installed as indicated and any modifications to the standard specifications are noted below.

Pump Installer's Signature	Date Signed
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I have reviewed the pump installation information with the above installer and will authorize the installation of the pump as proposed.

Owner's Signature	Date Signed
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STANDARD WELL PUMP AND DISCHARGE PIPING SPECIFICATIONS

1. Pump Installer Qualifications

- a. The pump installer shall be a licensed installer registered in the State of Wisconsin under Chapter NR 146, Wis. Adm. Code.

2. Well Pump

- a. Type - The well pump shall be a submersible pump.
- b. Materials - The materials of the pump shall be resistant to the corrosive nature of the water and shall not contain lead.
- c. Lubrication - The pump shall be water lubricated.
- d. Pump Column/Drop Pipe - The pump column or drop pipe shall be steel. Plastic drop pipe shall not be used.
- e. Motor - The motor shall be an electrical motor. The pump motor lubricant or coolant oil shall be an FDA approved white mineral oil, National Formulary, inhibited propylene glycol with FDA approved components, or shall be specifically approved by the Private Water Supply Section of the Department of Natural Resources.

3. Pump Discharge

- a. The pump shall discharge above grade. Submersible pumps shall discharge through a sanitary well seal or plate. Pitless adapters shall not be used.
- b. Water Level Measurement - The well shall be equipped with an airline with altitude gauge for measuring water levels.
- c. Venting - The well shall be equipped with a 24-mesh noncorrodible screened well vent that terminates in a "U"-bend a minimum of 24-inches above the pumphouse floor.

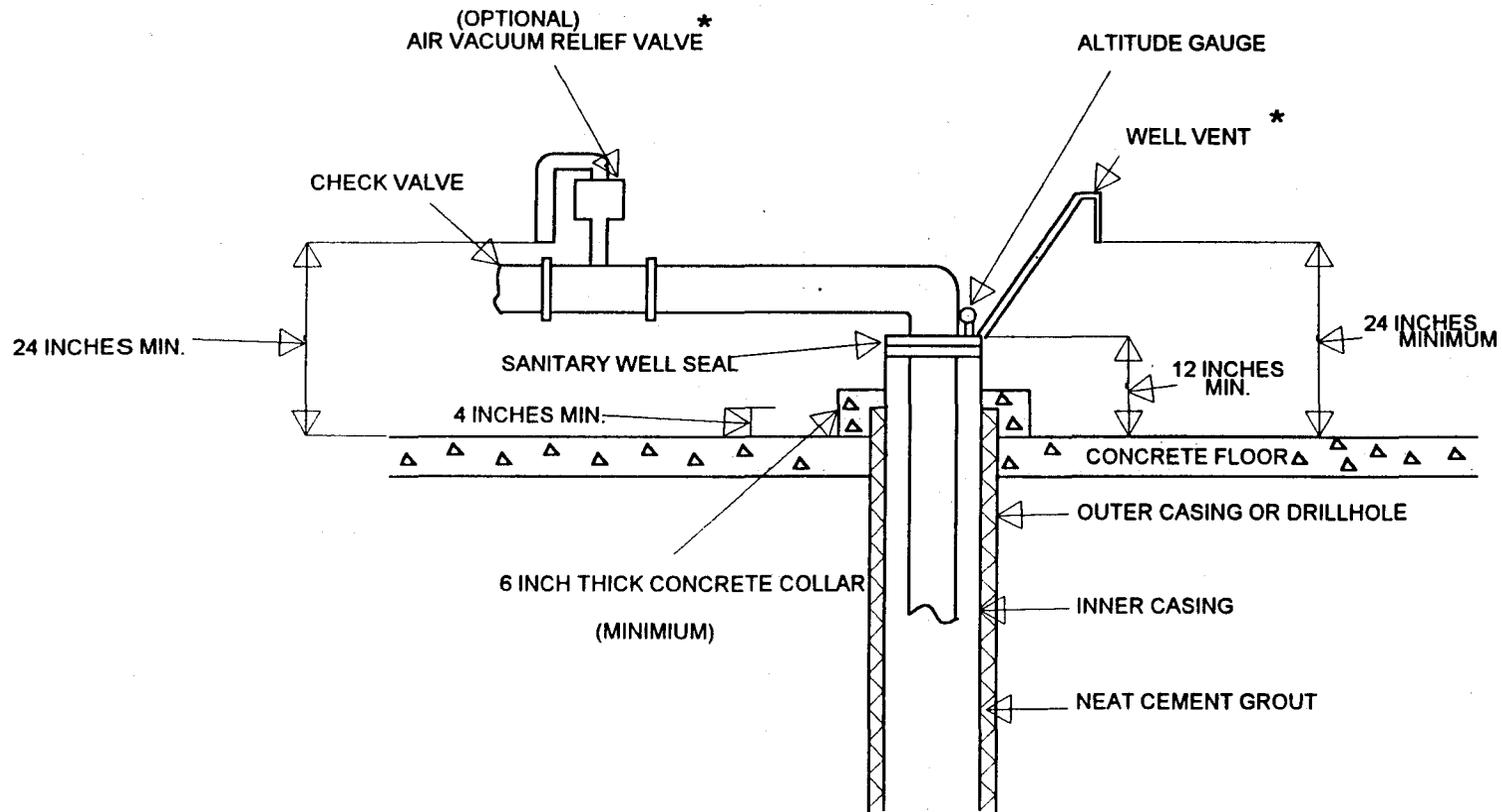
4. Well Discharge Piping

- a. Materials - The well discharge piping within the well house shall be cast iron, ductile iron, copper, or galvanized steel. Plastic pipe shall not be installed within the well house. All discharge piping from the well including the distribution system shall meet the requirements of IHLR 84.

5. Well Discharge Piping Appurtenances

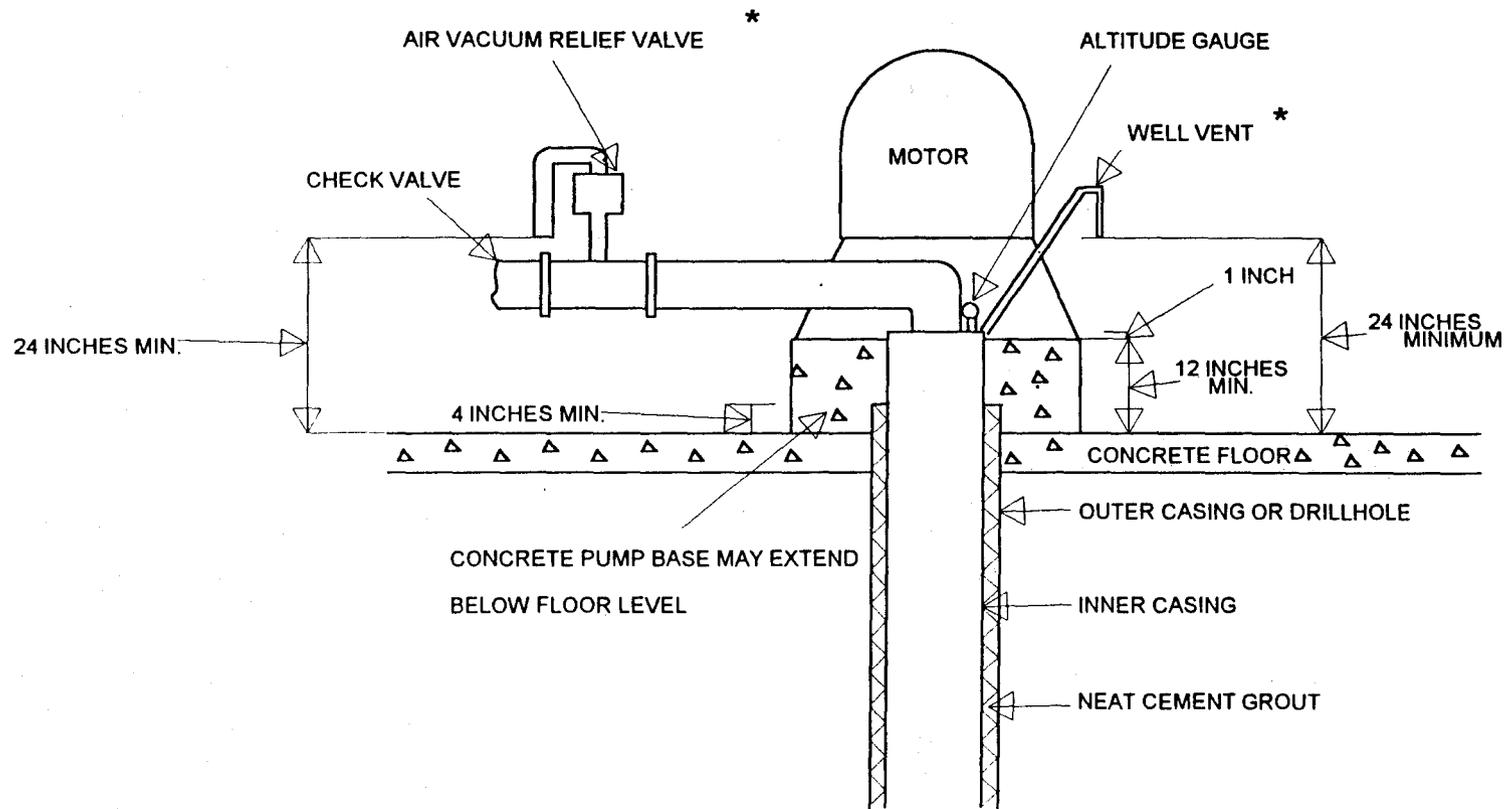
- a. Meter - The well discharge line shall be provided with a space to install a totalizing water meter prior to the first pressure tank if required by the Department at a later date.
- b. Check Valve - A check valve shall be installed in the above grade well discharge piping in addition to any at the top of the submersible pump within the pump column.
- c. Sample Faucet - A smooth end sample faucet shall be installed on the discharge piping.
- d. Pressure Gauge - A pressure gauge shall be installed on the discharge piping.
- e. Shut-off Valve - A gate valve or other suitable shut-off valve shall be installed on the discharge piping.
- f. Pressure Switch - A pressure switch for controlling the pump operation shall be installed and its location shown on the plans.

SUBMERSIBLE PUMP INSTALLATION



* SCREENED WITH 24-MESH NONCORRODIBLE SCREEN

VERTICAL TURBINE PUMP INSTALLATION



* WITH 24-MESH NONCORRODIBLE SCREEN

PRESSURE TANK SPECIFICATIONS

Facility Information

Facility Name	Owner's Name	
Address	Address	
City, State, Zip Code	City, State, Zip Code	
	Telephone Number (include area code) ()	
Type of Units To Be Served	Number of Units	Well Number

Installation Information

Installer's Name	Type of Tank
Address	Tank Manufacturer
City, State, Zip Code	Tank Volume
Installer's Telephone Number (Include area code) ()	Tank Model Number
Firm's Name	Total Number of Tanks

I have completed this specification sheet and have read the standard specifications. The pressure tanks will be installed as indicated and any modifications to the standard specifications are noted below.

Installer's Signature

Date Signed

I have reviewed the pressure tank installation with the above installer and authorized the installation of the tank(s) as proposed.

Owner's Signature

Date Signed

STANDARD SPECIFICATIONS FOR HYDRO-PNEUMATIC TANKS

(PRESSURE TANKS)

1. Type

- a. The hydro-pneumatic tank(s) shall be either a conventional welded steel tank, galvanized tank, or a bladder-type tank.

2. Material

- a. The tank body shall be made of steel. Any bladders or liners shall be NSF approved for use in potable water.
- b. Individually manufactured tanks shall have a minimum 1/4-inch thick sidewall and headwall. The tank shall be identified by a stamp indicating the manufacture's name, a serial number, allowable working pressure and the year fabricated.

3. Appurtenances

- a. All non bladder-type tanks shall be equipped with a pressure gauge, a sight glass, a drain, a pressure relief valve, and an automatic air blowoff. An air compressor shall also be provided and, where the tank is of sufficient size, an access manhole shall be installed.

4. Interior Coatings

- a. Interior coatings shall not be used unless the coating has NSF approval for use in potable water and written approval for use of the specific coating is obtained from the Department of Natural Resources.

5. Sizing

- a. The gross volume of any hydro-pneumatic tank or series of tanks shall be at least 10 times the pumping capacity of the largest well pump. (Example: For a 55 gpm well pump the combined gross volume of the pressure tanks must be 550 gallons or more).

6. Bypass

- a. The piping to the tanks shall be designed to allow bypassing of one or more of the pressure tanks.

7. Pressure Settings

- a. The minimum pressure settings shall be 40 psi cut-in and 60 psi cut-out. Actual pressure settings shall be based on the specific service area and facilities to be served.

PUMPHOUSE SPECIFICATIONS

Facility Information

Facility Name	Owner's Name
Address	Address
City, State, Zip Code	City, State, Zip Code
	Telephone Number (include area code) ()

Type of Units To Be Served	Number of Units To Be Served
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Contractor Information

Contractor's Name	Contractor's Telephone Number (include area code) ()
Address	Firm's Name
City, State, Zip Code	

Pumphouse Information

Will the Pumphouse Be Provided With a Floor Drain <input type="checkbox"/> Yes <input type="checkbox"/> No	What Are The Dimensions of The Proposed Pumphouse Length _____ Width _____ Height _____
How Will the Pumphouse Be Heated	Is a Pumphouse Drawing Provided (see example) <input type="checkbox"/> Yes <input type="checkbox"/> No

I have completed this specification sheet, a pumphouse drawing, and have read the standard pumphouse specifications. A pumphouse will be installed as indicated above with modifications to the standard specifications as noted below.

Contractor's Signature	Date Signed.
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I have reviewed the pumphouse construction with the contractor and authorized the construction of the pumphouse as proposed.

Owner's Signature	Date Signed.
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STANDARD SPECIFICATIONS FOR PUMPHOUSES

1. Building

- a. **Materials** - The pumphouse shall be an insulated, wood frame building.
- b. **Floor** - The pumphouse floor shall be concrete and the top of the floor shall be a minimum of 6 inches above the finished grade.
- c. **Dimensions** - The pumphouse shall be adequately sized to allow installation of the well, pressure tanks, discharge piping, and future chemical addition and/or treatment equipment.
- d. **Door** - The pumphouse shall be provided with at least one door that opens outward. The door shall be equipped with a lock to prevent unauthorized entry.
- e. **Roof hatch** - A roof hatch shall be provided over the well to allow for pulling of the well pump.

2. Building Drains

- a. **Location** - The building floor drain shall be located at least 2 feet from the well.
- b. **Materials** - The building drain piping shall be cast iron or PVC piping meeting s. ILHR 84.30 standards within 10 feet of the well.
- c. **Discharge** - The building drain piping shall discharge to the ground surface a minimum of 25 feet from the pumphouse.

3. Heat

- a. **Adequate heat** shall be provided to prevent freezing within the pumphouse.

"DOGHOUSE" SUBMERSIBLE PUMP HOUSE

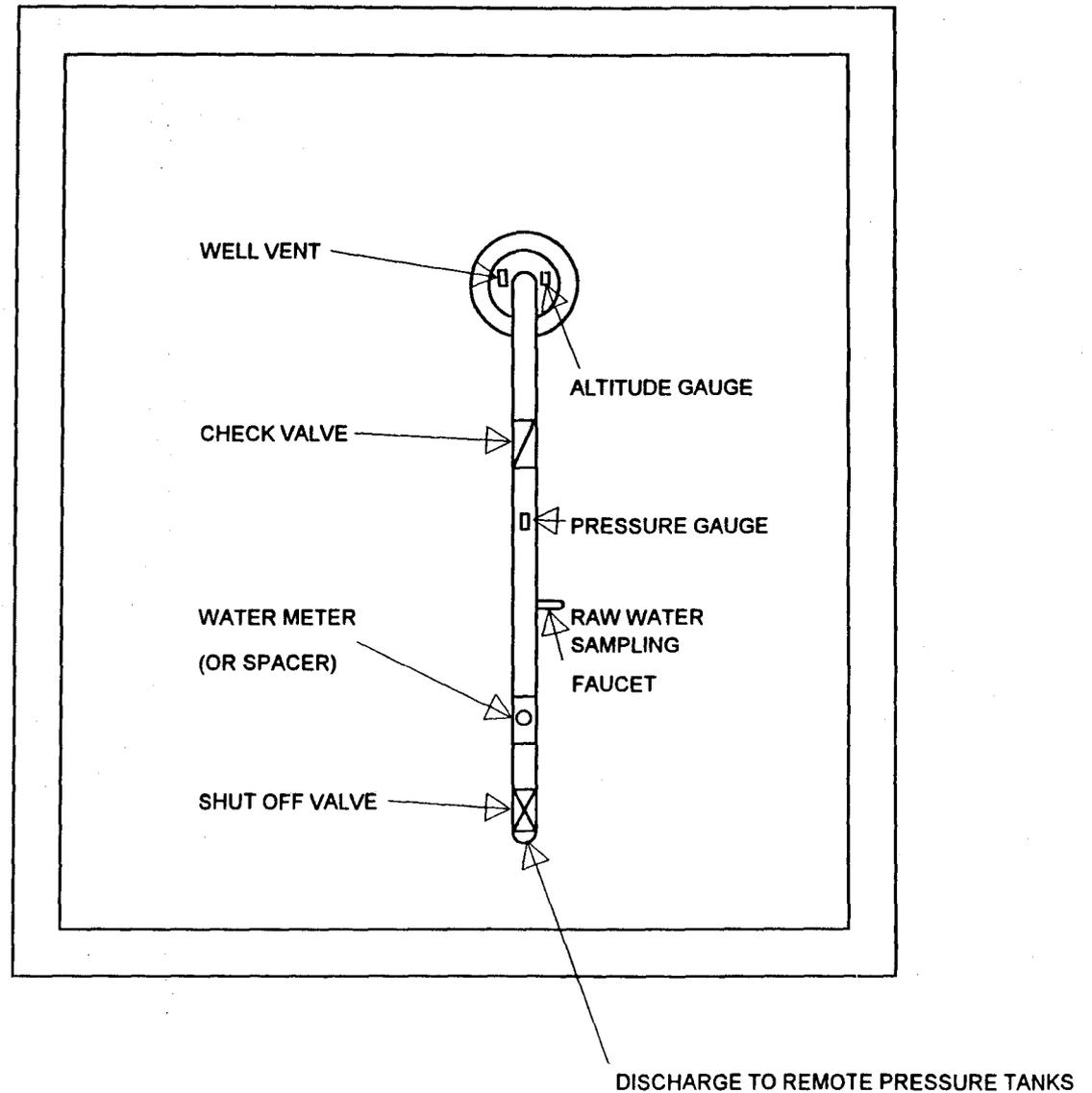
NOTE: PUMP HOUSE MUST HAVE CONCRETE FLOOR.

NOTE: PUMP HOUSE MUST BE HEATED OR PIPING
HEAT TAPED TO PREVENT FREEZING.

NOTE: THE PUMP HOUSE MUST BE LOCKED TO THE
FLOOR SLAB.

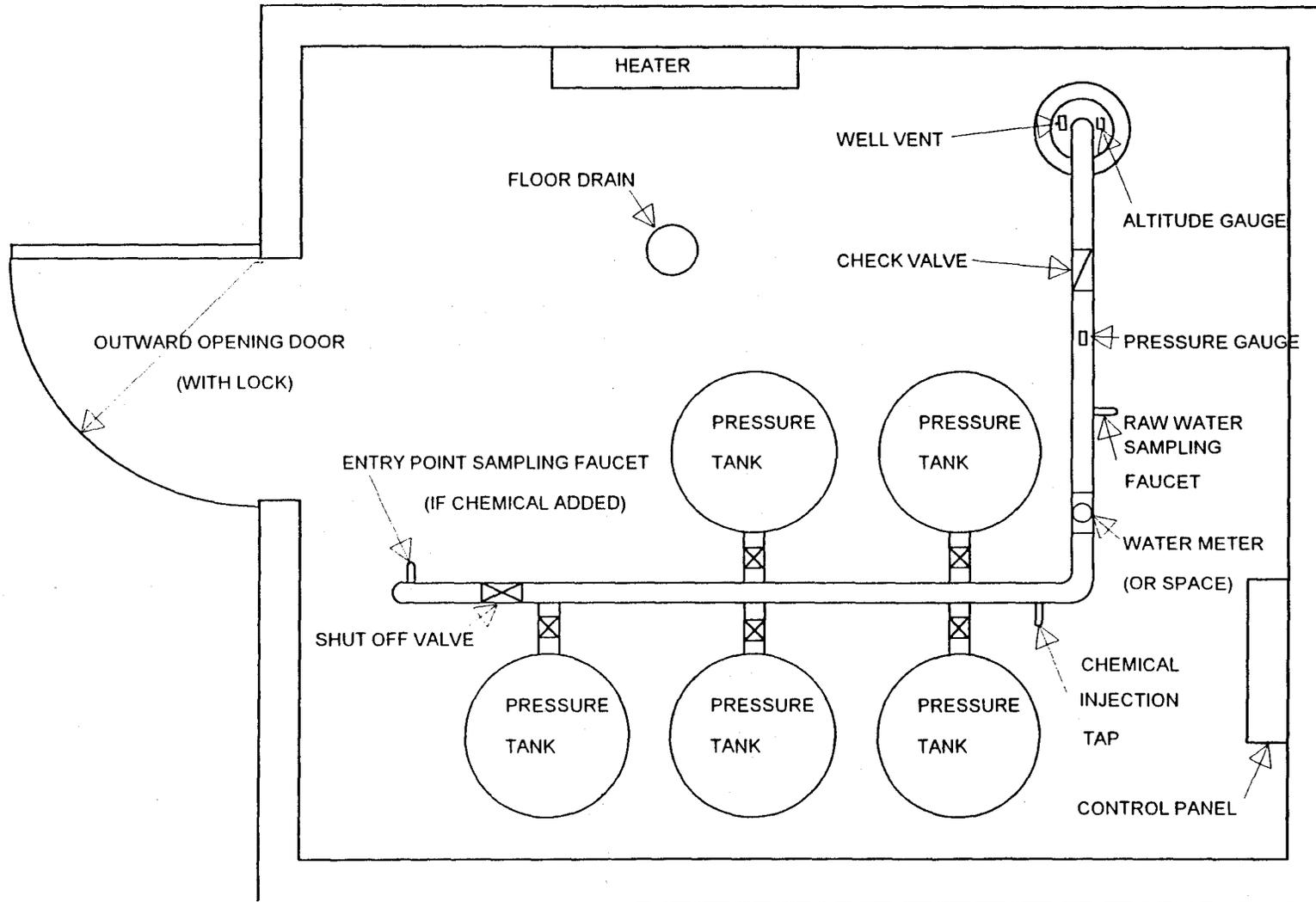
NOTE: THE FLOOR MUST BE SLOPED TO
DRAIN AWAY FROM THE WELL.

NOTE: MUST BE ABLE TO BE OPENED BY ONE PERSON.



SUBMERSIBLE PUMP HOUSE

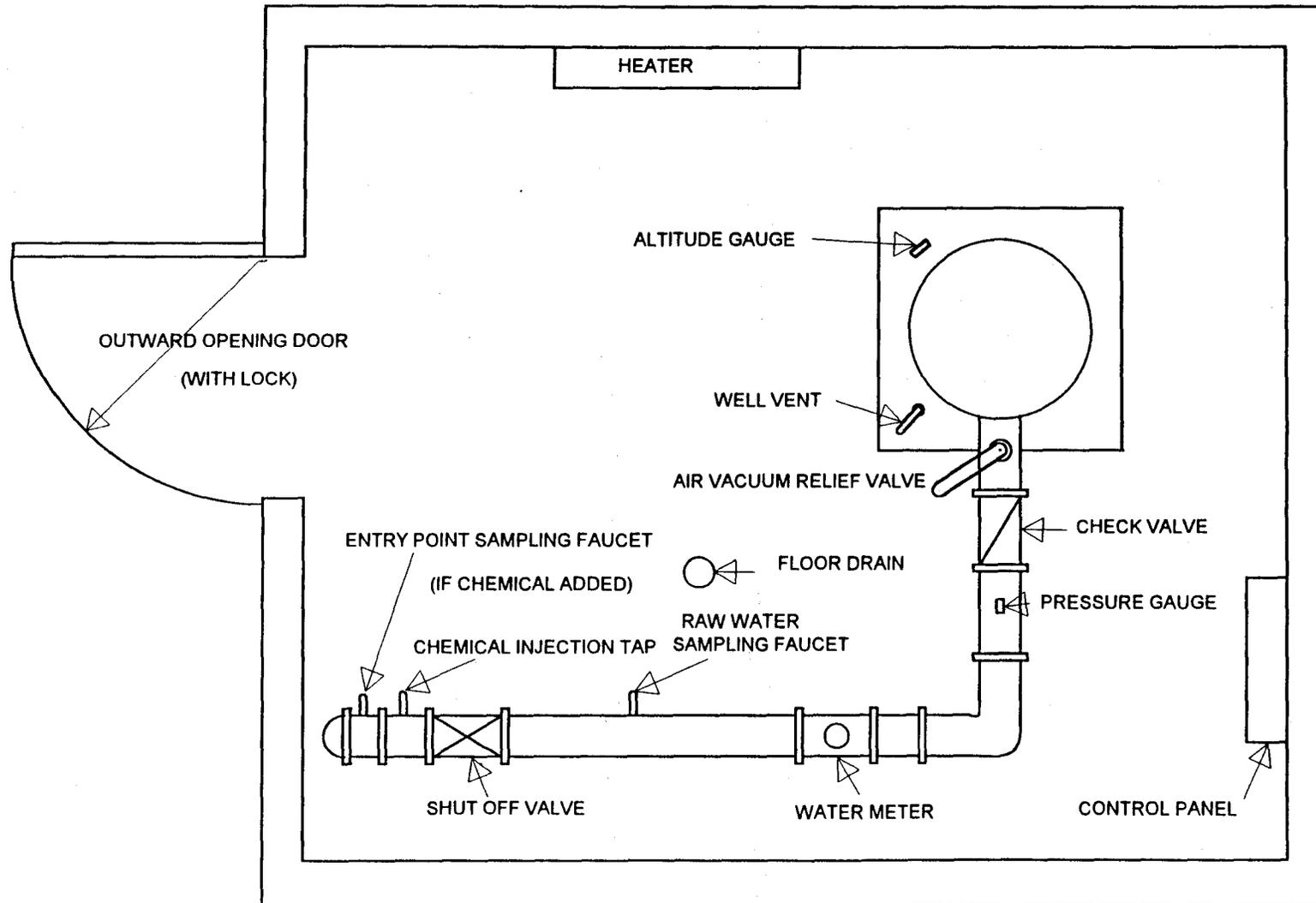
(WITH CONCRETE FLOOR)



NOTE: FLOOR MUST BE SLOPED TO DRAIN.

VERTICAL TURBINE PUMP HOUSE

(WITH CONCRETE FLOOR)



NOTE: FLOOR MUST BE SLOPED TO DRAIN.

