

Message to Well Owners: “Have it your way”

Introduction

Virtually everywhere in developed and developing nations one will find franchise restaurants selling American-style hamburgers and fries. Yet, only one of those franchise chains (Burger King) markets itself by telling customers to..... “Have it your way”. It encourages consumers to express their expectations so that their meals suit them perfectly.

In the water well industry, drilling contractors and design consultants do not encourage well owners to “have it your way”. Moreover, only few owners announce their expectations for the finished product (the well). Most often the drilling contractor dictates to the owner how a well will be designed and constructed. Even when a consultant is the designer, all too often the designer does not fully involve the owner. Or, in many instances, owners simply defer to the designer/contractor and accept the well as designed and constructed.

But, why should the owner defer to the contractor and be left out of important decisions on well construction? There is no reason for the owner to be relegated to the role of a spectator who simply pays the bill. The owner is the customer and as such he has the right to spell out his expectations for the well’s performance and its operational parameters. Then it should be up to the consultant and contractor to make design decisions that will meet the owner’s expectations for the new well.

The Typical Scenarios

Water well construction projects are either awarded on the basis of a negotiated contract or awarded through competitive bidding. In either case, it is common for the owner to make the award based on the lowest price.

In a negotiated contract, the owner might allow the contractor to prepare a proposed design and tender the construction price. Some give-and-take between the parties then leads to a settlement on the cost. Construction materials, methods of construction, development, and testing are defined by the contractor. In contrast, projects that are competitively bid usually have a set of construction specifications that define the project, construction methods, and materials. However, some specifications are vague when it comes to describing the types of well casing and well screen or slotted casing; this then leaves the matter to the contractor to select those items.

In the case of type steel to be used for casing and well screen, there are several choices: mild steel, copper-bearing steel, high-strength low allow steel, and stainless steel. Each of these are different relative to their performance and cost. When not properly defined by specifications, the types of construction materials chosen by each contractor may vary markedly from bidder to bidder. Because of this, their long-term performance also differs markedly. This is a recipe for problems.

If the owner has made it known to the contractor(s) that the award will be based on the lowest price, the contractor(s) will respond accordingly. To win the contract, a contractor is most likely to select low quality, inexpensive materials and construction methods. If the owner has not defined the construction methods and materials and only made it known that

low-cost is the prime criterion, then contractors will give him low cost, low quality, and poor well performance.

Establishing Expectations

Owners should consider each phase of well design and construction as a collaborative effort with the designer and contractor. An owner should clearly inform a designer and drilling contractor of his expectations for the completed well so as to put the designer/contractor on notice that those expectations are to be used to establish the design criteria. The designer/contractor should respond by selecting construction materials (i.e., casing and screen) that will yield the proper well performance. Key considerations are as follows:

- **Corrosion Resistance** – The low-cost option for steel casing and screen is mild steel (also known as low carbon steel), which has NO corrosion resistance. Mild steel can corrode in less than 10 years, depending upon the water quality of the aquifer(s). Mild steel is also the lowest cost option for steel. A contractor will surely select mild steel unless the owner requests upgraded steel that provides corrosion resistance.
- **Service Life** – Wells can operate from less than 10 years to more than 75 years, depending upon the type of steel that is used for blank casing and well screen. For planning purposes, one can assume the following for useful life of steel: mild steel (10 to 15 years); copper-bearing steel (30 years); high-strength low alloy steel (50 years); and 304 stainless steel (75+ years).
- **Efficiency** – Contractors have options when it comes to the selection of perforated casing and well screen. Mill-slotted pipe is the least expensive and least efficient option. Wire-wrapped screen and louvered screen are equally efficient. A well built with efficient well screen will save the owner money because power costs will be lower. An efficient well screen pays for itself. An owner should understand that a contractor will only offer an efficient screen if he is told to do so. Otherwise, he will select mill-slotted pipe and the owner will be burdened with an inefficient well.
- **Strength** – Collapse strength and tensile strength are key considerations for the structural integrity of water wells. Thin-walled casing has less collapse strength and can very easily be collapsed if the contractor overstresses the well during well development, placement of an annular grout seal, or rapid drawdown during the startup of the pump.
- **Well Development** – A key factor in long-term performance is well development. All too few wells are properly developed. Many contractors falsely believe that simple airlifting for a few hours is sufficient to develop a well. Nothing could be farther from the truth. A well that is not FULLY developed will NEVER function to its full potential. A contractor has only ONE opportunity to develop the well.....and that is during construction. Owners should demand that the well be developed with a surge block and airlifted. It would not be uncommon for a 10-inch (250 mm) well with 150 feet (45 meters) of well screen to require at least 16 hours of mechanical development with the surge block.

Summary

A water well project is a serious investment for any owner. Well design and construction work should be a collaborative effort that includes the participation of the owner, designer and contractor. A passive owner who is not a participant in the pre-design, design, and construction stages of a project might find that his expectations for the well are unmet. Therefore, owners are strongly encouraged to be more than spectators to be assured that when the well is completed they “got it their way”.

The sage contractor could very easily spell out the issues of well construction with the unsuspecting owner to explain the design process. In so doing and will the participation of the owner, the contractor will be able to deliver to his customer a well that will provide long-term service.

About the Author

Robert Turnbull is the Chief Hydrogeologist of Roscoe Moss Company. In this capacity he provides technical support, as needed, to consultants, municipalities, and water districts to plan and design water supply wells. He can be contacted for such information or to answer inquiries regarding this technical memorandum via email at rturnbull@roscoemoss.com. His website is www.blhydro.com. The corporate website for Roscoe Moss Company is www.roscoemoss.com.