

THE VALUE OF PROFESSIONAL ENGINEERING ADVICE

By

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Most of this article is about the process of designing and/or selecting an on- site sewage system and the possibility of saving \$2500 more or less in the construction of a septic field. Imagine having \$2500 +/- to spend on the construction/remodelling of your kitchen and/or bathroom rather than spending this money on your new or replacement septic system.

The intention of this article is to provide the public basic information on design and/or selection critical for the construction of an on-site sewage system. Armed with this information it is possible that the public may make informed, cost saving decisions, on the construction and/or replacement of an on-site sewage system.

Further to my article, “Buyer Beware” in Volume 8 No 5 of this publication, I reported on the pit falls of development and other general problems associated with the purchase of property. In this article I wish to expand/examine some of the basic concepts outlined in the general development of subdivisions and/or individual lots. I intend to focus on the design/selection of on-site sewage systems for individual home construction.

In the beginning of my time, about 16 years ago, I stumbled across the possibility, that as an engineer, I could become a qualified person according to the Department Of Health and Fitness. I was so enthused with the process that my Father, (Reg), and I took the course later to finally become qualified persons, on or about, 14 years later with the Approval of the current regulations by the *Lieutenant Governor of Nova Scotia May 20, 1997*.

In this interim of 14 years, I worked mainly as a consultant engineer designing systems that the Department of Health/Environment had turned down and/or could not approve. With this success, as being a consultant engineer, all of my applications were approved and to this date, all systems that have been properly maintained have not malfunctioned. I credit this to developing a comprehensive design and construction inspection schedule. Many others would recognise this process as Section 38A or Section 39. This function was a process administered by the various Boards of Health through out the province and at this date they have been abolished and replaced with the new regulations, as adopted in 1997.

This article is not about my past involvement as an engineer, however it is more about education and evaluation of the current on-site –sewage regulations. On that note, it is worthy to mentioned that as Chairman of the Act Enforcement Committee for the Association of Professional Engineers of Nova Scotia, we have worked on providing a brief to government on a draft set of regulations that clearly defines the role of the engineer, contractor, QP2 and inspector in the process of constructing an on-site sewage system.

For the average citizen of Nova Scotia these regulations could be a major obstacle in developing a subdivision and/or construction of individual family homes. One of the obstacles may be the frustration as to what is not known about the property and what could be known about the property to mitigate any construction expense and to maintain the standards of Public Health. We may hear of the homeowner who has paid \$12,000+/- for a system that was selected by a QP2 (Qualified person) as opposed to a system designed by a QP1 (Engineer) for an \$8000.00+/- system cost.

Many would ask, “how this could be?” and any simple answer could actually not explain the differences, however as an expert in On-Site Sewage Design it is very easily to dissect the cost differences and the reasons for same. The intention of this article is not to shoot down the current regulations ,but to expand on the options that are available to the public. Many of the options available to the public are unknown and/or are hidden, as it is not the kind of awareness that the general contractor, developer, or homeowner would know about.

Many of the general public would be astonished to know that if they took the intencitive to study the current situation, they would come away knowing that the biggest difference between the construction cost of a system is the difference of the qualification of a QP2 and an engineer. In many cases, it is possible that there is a 30% +/- cost saving measures related to providing an engineered designed septic system, as opposed to a selection by a QP2. In some cases for individual lots the system costs would be reflected in the difference of fees between the engineer and/or the QP2. In other words, the extra fee you might pay for an engineer would be offset in the additional cost of the construction by a system selected by a QP2.

On the larger scale, a complete subdivision design by and engineer would significantly offset the cost by the possibility of additional lots and smaller system designs, that all translate to lower development cost. These savings would be passed down to the average lot purchaser through the profitability of the overall cost of the subdivision development and the respective costs of the individual lots and septic systems. If this was the case, then it is easy to imagine that you could have an additional \$2500, more or less, to spend on your kitchen/bathrooms, rather than your septic system.

For that purpose it would appear beneficial to have the engineer design the subdivisions and provide the appropriate lots sizes and the proposes system designated area, (PSDA) for construction of the on -site sewage systems at the building permit stage. The engineer could in the subdivision approval process provide a designed and/or selected system for consideration at the home building permit stage. The homeowner could then effectively decide on that basis to have a selected system constructed and/or have a designed system

constructed.

In some instances the cost differential between the engineer and the QP2 could come down only to the cost of the additional sand fill. However in a fairly large percentage of situations it may be possible that the lot may only be designed by an engineer and /or the system design by an engineer could result in a cost saving of \$2500 or more after the engineers fees have been paid. This is where the confusion begins.

Many potential homeowners/contractors do not have easy access to this information as it is generated from a review of the lot characteristics i.e., Soil type, amount of permeable soil, slope and dwelling type considerations.

If this information was available or accessible by way of regulation it would be the developer and./or home owner who would decide if they wanted to pay more for the construction and less for the selection and/or more for the design and significantly less for the construction of an on-site sewage system. This could be determined by each potential homebuilder by requesting an estimate of installation from an On-Site-Sewage Installer. The cost differences between an engineered designed and/or selected system would then be known

If this information was provided on the approved subdivision plan it would be enough of a guide for the septic contractor to approximate the possible cost savings. From there the potential home owner could compare the potential cost differential and systems types to determine if a QP1 (Engineer), QP2 septic installer, and/or a Qp2 would be retained to provide the necessary paperwork for approval of the on-site-sewage system. This process for demonstration purposes is simplified to provide a general basis of what is possible. It really is a simple process where the developer provides the potential lot purchaser with the approved subdivision septic plan for that lot. The plan is then given to an installer for a bid to install on the basis of a selected and/or designed system. If the differences comes down to the cost of the sand and that of the engineers' fee , then it would be obvious that more sand could provide a better level of protection and be as cost effective providing that the additional sand does not cause additional expenses in achieving the final landscaping of the lot. The homeowner can make this decision much in the same fashion on how comparative shopping is done for other aspects of building the home. The bottom line is that the homeowner can make an informed decision on the construction of the on-site sewage system. On that basis the differences between a QP2 selected system and an engineered system come into perspective on a cost basis for the construction of the system and also the effect the septic system would have to the final Landscaping of the lot.

I know that from my past involvement any time you can avoid a mound or C3 of approximately 4' high on your lot it is a great saving in system cost and landscaping. To construct an engineered Raised C2 of approximately 2' height and the added benefit of not being required to have a pump makes more sense. . These conditions exist and unless the public is made aware of these differences then the situation of over costly selected systems will prevail over a cost effective engineered system. It is easy to see that \$2500 could be saved very quickly in most instances.

For the worst case comparison between a selected C3 and an engineered raised C2 the savings could amount to \$3500 after the engineer has been paid. This is possible as no pump and pump chamber would be required, less sand fill, landscaping and the need to hire an electrician to hook up the pump with alarm circuits would not be required. This will avoid the inconvenience should your power fail and being unable to use the toilet. However you could buy a battery back up etc., but all in all these add to the additional costs. The list could go on and on, however, it is determined on an individual lot by lot situation.

To elaborate a bit more on this subject it should be the objective of the homebuilder to determine if the chosen house design can meet or match the particulars of the lot chosen for construction. It therefore is a necessity to have at hand the anticipated concepts of the building location and any requirements of the home owners to have windows in the basement, how large can they be and will there be a level grade walk-out from the recreation room to the backyard. etc. The list goes on and is generated by the individual needs of the homeowner.

Therefore to modify the On-Site Sewage Regulations to defining the division of labour between that of a QP1 and QP2 would provide more cost effective construction costs and a much more informed decision making process by the public.

In order for this to be possible it is my opinion that the design of the initial subdivision be performed by engineers to maximise the developers balance sheet with respect to the overall number of lots to be create and to minimise the buyers cost of lot acquisition and overall dwelling septic system cost. Providing a division of labour between the engineer and the Qp2 individual can create this. Therefore it is my professional opinion that subdivision design, lots sizes and system designations be performed by the engineer and that the individual lot Septic development be either by engineers and/or by QP2's as determined by the economics of the individual lots and respective system costs by or engineering/QP2 selection fees.

This can only become possible with changes to the current regulations. The possibility of changes to the current regulations lays at the hands of government and for the present time the Act Enforcement Committee for the Association of Professional Engineers of Nova Scotia is proposing a change that will be a benefit to all Nova Scotia's.

In reading the above it is my pre-conception that you may wonder what is this all about and how does it relate on how I might have \$2500 more to spend on my bathroom and kitchen rather than my septic field. All I can say at this point in time is that as a consumer you must be informed to make the right decisions. The cost differential could amount to a total cost savings of \$2500 more or less and in the long run can be summed up by my previous article in The Contractor's Desk titled "Buyer Beware".

For those who wish to further explore their options I would be pleased to assist you regarding same, be it for an entire subdivision and/or an individual lot. I can be reached at my Dartmouth office at 434-4600, Tatamagouche 657-3456 and/or toll free 1-800-210-1227. or by e-mail address civtech@ns.sympatico.ca

