

**A STRUCTURAL ENGINEERING REPORT ON THE PROPOSED GARAGE
BLDG. ADDITION AT THE WESLEY BOALS LAKE PROPERTY**

Located in Aitkin County on Minnewawa Lake
at
47928 209TH. Place
McGregor, MN. 55760

Prepared for
Mr. Wesley Boals, the Owner

Prepared By

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Ref. Project C1915 Date: May 21, 2019

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I hereby certify that this report and
related calculations were prepared by me
and that I am a duly Licensed Engineer
under the laws of the State of Minnesota-



Stuart C. Anderson

Reg. No. 6721

Date 5/21/19

A STRUCTURAL REPORT ON THE PROPOSED GARAGE BLDG. ADDITION TO THE WESLEY BOALS MINNEWAWA LAKE PROPERTY

SUMMARY AND CONCLUSIONS:

As requested by Mr. Wesley Boals, the property owner, we have reviewed the documents submitted to us in regard to the proposed new garage building to be located at the Boals property. The property is located at 47928 209th. Place, McGregor, MN. 55760, in rural Aitkin Co. on Minnewawa Lake.

The site plan and building data included here in Appendix A, was submitted by e-mail for our information by Mr. Boals on May 19, 2019. The basic layout and design of the existing septic field and the proposed garage building were by others. Our review is in regard to, and limited to, the effect of the sanitary system drain field onto the proposed new garage building foundations; and also regarding the proposed garage foundation load and construction effects onto the adjacent septic field components.

From the documents sent us and attached in Appendix A, it is apparent that the new garage addition will be only thirteen feet from the existing septic system drain field. **This is less than 20 feet clearance required by code from the sanitary drain field rock bed at the closest point.** Viewing the site plan of Appendix A, the septic tank is shown located thirteen feet south of the , garage building, well beyond the ten foot code limit.

It is our understanding the owners are applying for a variance on the code restrictions that require a distance of 10 feet from the Septic tank and 20 feet to the drain field's rock bed from any structure. The zoning officer may have questions regarding the variance application concerning potential effects of the drain field on the proposed nearby garage foundation support system; and vice versa.

The new garage building location is confined to the location shown on the site plan of Appendix A. As noted above, it will be encroaching onto the code's minimum requirement of 20 feet of space required from the rock bed. However, it is our opinion that the discharge flow through a properly working septic field, sized for the moderate loading of this lake shore residence as indicated on the Appendix A plans, should have no significant effect in reducing the bearing capacity of the proposed nearby shallow depth garage building foundations. **Based on these facts, we conclude the Site Plan, as presented by Mr. Boals, is acceptable from a Structural Engineer's evaluation.**

OBSERVATIONS:

Our observations were limited to the documentation submitted to us. The site plan of the Boals lake home lot that was given to us (Appendix A, page A1) show Lake Minnewawa, to the east of the Boals property with the house and garage between the lake and the septic field. The present septic system drain field is located alongside the north property line. The house is located adjacent to the south property line, 100 ft. from the lake. The new garage is to be located between the house and the septic system drain field with thirteen feet clearance to the septic field.

We were advised that the new garage building structure will be a conventional slab on grade founded structure, with wood framed perimeter walls and conventional wood framed roof truss construction. We were advised that due to the property limits, other facility locations, convenience, access and topography of the land; the desired location of the new garage building is restricted to that area shown on the drawing of Appendix A page A1.

PROBLEM ANALYSIS AND CALCULATIONS:

No calculations were performed to determine strength, load capacity or bearing values of the garage structure components. This report, as noted above, is in regard to, and limited to, the effect of the sanitary system drain field onto the proposed new garage building foundations and vice-versa.

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In general, a wood framed stick built (stud wall) superstructure building will distribute the roof loading at the eave line in a uniform manner to the building wall and the thickened slab edge of the garage building. The roof structure loading for this garage building would probably add a load of about 1,000 lb. per lineal foot to the thickened slab edge footing, which would be considered a moderately light soil bearing pressure. If a small area of the garage footing edge were subject to a piping action by a malfunction of the septic drain system, the lightly loaded foundation slab's thickened and reinforced edge should bridge over such an unlikely, but possible, "piping" type of erosion gap without affecting the structural integrity of the foundation/slab.

A potential problem could be an adverse effect of the structural excavation work for the garage building foundation on the nearby septic system drain lines. However, the construction excavation for the shallow depth footings will require a foundation depth of only a foot or two at that adjacent northwest area. This will not jeopardize the existing rock bed by undermining, so the new garage building construction should have no detrimental effect onto the existing drain field. However, construction equipment must be kept off of the drain field area.

REVIEW AND RECOMMENDATIONS:

We reviewed the proposed garage building location regarding its influence on the existing waste disposal system (or vice versa) as given to us by Mr. Boals. We payed special attention to the proposed garage building location in regard to the septic system drain field. The garage building is to be located thirteen feet or so from the existing septic system drain field.

We conclude, the garage building and it's foundation addition may be located as shown on attached Appendix A, page A1 without significant adverse structural effects. Following construction, closeness of the drain lines of a properly functioning septic system in normal soils for this type of structure should have no significant detrimental effect on the foundation support for the reported building installation in accordance with the documents and email data sent us, and included in Appendix A

.We understand that current code clearance requirements are 10 feet to a septic containment tank and 20 feet to the drain field. The apparent reasons for the distance criteria between a building and a septic system tank and drain field are to prevent contamination of habitable spaces, such as basements, and to reduce the risk to structural foundation damage from erosion or a wash out in the event of a failure of the tank or development of a "piping" channel in the soil from the drain field. Another purpose for the distance is to prevent the construction from undermining and disturbing functional portions of the drain system. Care should be exercised during construction to not damage the near by drain field. It is important to keep heavy equipment off of it.

The conclusions of this report represent our professional opinions. They are based on the limitations of observable items regarding the materials and procedures to be used in the construction. Our conclusions are also based on our research, experience, assumptions and judgment regarding comparable material and conditions of the construction.

The civil, structural and foundation engineering services performed for this project have been conducted in a manner consistent with that level of skill and care ordinarily exercised by other members of the profession currently practicing in this area under similar budgetary and time constraints. No other warrantee, express or implied, is made.

This report represents our completion of this project, based on our understanding of the scope of services requested. It is presented for the exclusive use of Mr. Wesley Boals, the home owner.

END OF REPORT

Per # 29-0-059106

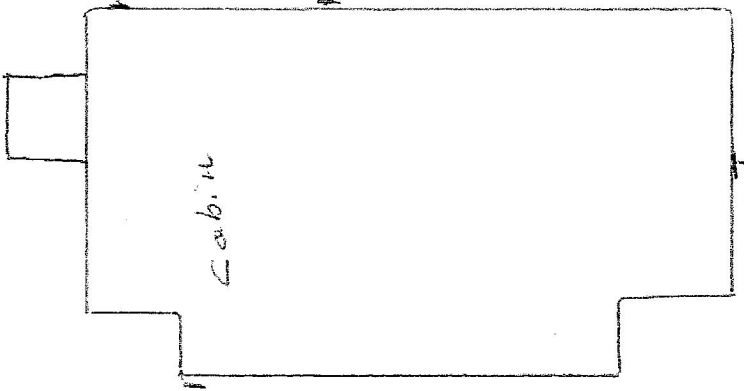
North Property Line

South Property Line



Lake shore

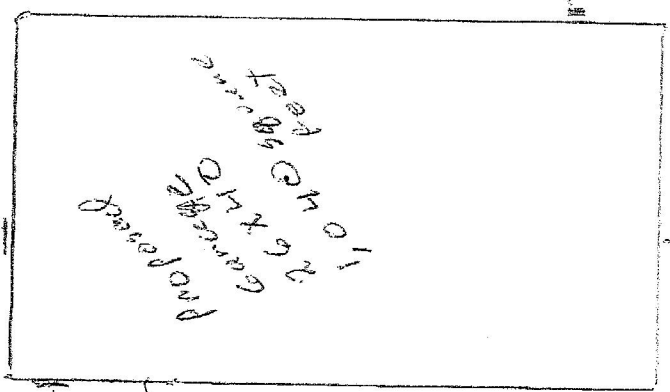
1,000 feet
20 feet
10 well



Cabin

10 feet

20 feet



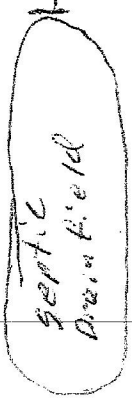
10 feet

13 feet



Propane Tank

13 feet



Septic Area Field

Driveway