

**A STRUCTURAL ENGINEERING REPORT ON THE RECENT NEW HOUSE  
ADDITION TO THE TROY RHODES PROPERTY**

Located in Aitkin County at  
18308 Gull Lane  
McGregor, MN. 55780

Prepared for  
Mr. Troy Rhodes  
18308 Gull Lane  
McGregor, MN. 55780

Prepared By

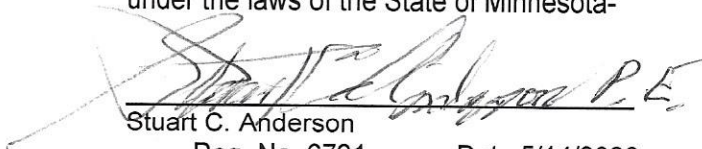
**STUART ANDERSON PROFESSIONAL ENGINEERING SERVICE INC.**

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Ref. Project C2027 Date: May 14, 2020

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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 5/14/2020

# A STRUCTURAL REPORT ON THE PROPOSED HOUSE ADDITION TO THE RHODES MINNEWAWA LAKE AREA PROPERTY

## SUMMARY AND CONCLUSIONS:

As requested by Mr. Troy Rhodes, the property owner, we have reviewed the documents submitted to us for the new rural Aitkin County home addition he has added to the Rhode's property located some distance off shore from Lake Minnewawa at 18308 Gull Lane, McGregor, MN. in rural Aitkin Co., MN.

The site plan is included here in Appendix A, which was submitted by email for our information from Mr. Rhodes on May 13, 2020. Mr. Rhodes has constructed a small addition to the present house that is partially within the code safety limits of ten feet from an existing septic tank. The basic layout and design of the existing septic field and the recently constructed new home building addition was by others. Our review is in regard to, and limited to the effect of the closely adjacent new house addition's structure onto that of the existing disposal system septic tank; and also regarding that existing septic tank system's effect onto the proposed, closely adjacent, recently added residential structure.

The existing and new building locations are roughly sketched on the site plan layout of Appendix A, page A1. The clearance limits are noted as five feet on that site plan drawing. Mr. Rhodes noted that the new addition is over the twenty foot limit from the septic system drain field rock bed. The site plan did not have a north arrow, so we assumed north was at the top of the page, for descriptive purposes.

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

It is our professional opinion that the discharge flow through a properly working septic tank, sized for the moderate loading of this residence, as shown on the Appendix A site plan, should have no significant effect in reducing the bearing capacity of those nearby house structure foundations. More specifically, those lightly loaded foundations should have no adverse effect onto the septic tank due to the five foot separation. **Based on these facts, we conclude the Plan as presented by Mr. Rhodes is acceptable from a Structural Engineer's evaluation.**

## OBSERVATIONS:

Our observations were limited to the documentation submitted to us. The site plan of the lot that was given to us (see Appendix A, page A1) shows a rough sketch noting the small wing addition to the house, on the apparent south side, is only five feet from the septic tank. The existing Sanitary Septic System is located further south, beyond the twenty foot limit, though this is not noted so. The new house addition is located between the existing house and the existing septic tank.

Photos of the house were also included, but when printed, it is with a grossly exaggerated distortion of the vertical scale (see Appendix P, pages P1 & P2). For instance in photo 1, the entry door on the new house wing, which is adjacent to the existing septic tank, is almost as wide as it is tall. This distortion does appear strange, but the principle, that the roof drains to the left of the picture is still obvious, indicating that the roof support framing also appear parallel to the adjacent wall; indicating that wall is relatively lightly loaded.

We were advised this new wing adjacent to the septic tank is on shallow foundations enclosing a crawl space under the main floor. The notation on the site plan, Appendix A page A1 indicates the site soil is sand.

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## PROBLEM ANALYSIS AND CALCULATIONS:

The referenced site plan of Appendix A, page A1 and photos of Appendix P, page P1 & P2, were furnished us by Mr. Rhodes. They show the problem of the septic tank being within ten feet of the south wall of the recent house expansion. We are advised the addition was actually measured as being five feet to the septic tank wall. Scaling from the photos, it appears the recent addition was about 12 ft. x 12 ft. in plan.

No calculations were performed to determine strength, load capacity or bearing values of the house structure. In general, a wood framed house superstructure will distribute the roof loading at the eave line in a uniform manner onto the building support bearing walls and onto the foundation. We were advised that the addition, which scales about 12' x 12' in plan, is a one story structure with a crawl space, but no habitable basement. We calculate the footing loading for this wood frame structure addition would probably not exceed a bearing pressure of 950 lb. per linear foot of the concrete masonry unit footing wall. When plotted on a cross section of the crawl space footing, in relation with the buried septic tank, the pressure zone of the footing is clear of the tank at the tank base, proving that the building addition exerts no lateral pressure onto the tank wall.

The man door of the addition is directly opposite of the septic tank. A porch landing should have its access steps either to the east or west, or both, to avoid conflicting with the septic tank vent pipe. In addition, we suggest installing light post and chain guards around the tank area to restrict heavy foot traffic over the tank.

In addition, the owner is advised that in the event, if ever the tank has to be replaced; special sheathing and shoring will be necessary to prevent the tank's excavation from undermining the house addition's foundations.

## REVIEW AND RECOMMENDATIONS:

We reviewed the proposed new house location regarding the desired reduction in the code required clearance distances regarding their influence on the existing Septic System components. The house may be located as close as five feet from the septic tank.

**We conclude, the proposed location of the new House south wall and foundation may be located at the present location of five feet from the septic tank, as defined on the attached Appendix A, page A1 without significant adverse structural effects on the tank from the house foundation, or negative effects on the house addition.**

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 that are below the elevation of the top of the drain field, such as the typical below grade habitable basement. Another reason is to reduce the risk to structural foundations 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 requirement is to prevent the construction from undermining and disturbing functional portions of the drain system. The soil and installation layout described in Appendix A should not be subject to these types of adverse actions. Care should be exercised during any additional construction to not damage the nearby septic system components. Keep heavy equipment off of the septic tank and the septic drain field.

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.

## **A STRUCTURAL REPORT ON THE PROPOSED HOUSE ADDITION TO THE RHODES MINNEWAWA LAKE AREA PROPERTY**

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. Troy Rhodes the home owner.

END OF REPORT