PLANNING COMMISSION
DATE: 3/24/14
AGENDA ITEM: 4B – PUBLIC HEARING
CASE # 2014-08

ITEM: Horning Lot Size Variance – Krause's Addition, Lot 9

SUBMITTED BY: Kyle Klatt, Community Development Director

REVIEWED BY: Nick Johnson, City Planner

SUMMARY AND ACTION REQUESTED:

The Planning Commission is being asked to consider a request from Suzanne Horning (as Trustee of the Suzanne R.W. Horning Trust) for a variance that would classify Lot 9 of Krause's Addition to Lake Elmo as a buildable lot. The lot currently does not meet the City's minimum lot size for a lot of record in a RS – Rural Single Family Residential Zoning District. The applicant has also requested a variance from Section 154.017 of the Zoning Ordinance, which states that any variance granted by the City "shall expire if work does not commence within 12 months of the date of the granting of the variance. The applicant has asked that the 12-month time limit be waived for this request.

GENERAL INFORMATION

Applicant: Briggs and Morgan (Christine Cirilli), 2200 IDS Center, 80 South 8th Street, Minneapolis, MN acting on behalf of:

Suzanne Horning (Trustee), 8991 Jane Road North

Property Owners: Suzanne and Robert Horning Trust, 8991 Jane Road North

Location: Lot 9 of Krause's Addition to Lake Elmo. PID Number 09.029.21.11.0015

Request: Variance – Lot Size and Time Limit for Completion

Existing Land Use: Vacant parcel, prior recreation use (tennis courts) accessory to 8991 Jane Road North

Existing Zoning: RS – Rural Single Family

Surrounding Land Use: Single family residential

Surrounding Zoning: RS – Rural Single Family

Comprehensive Plan: Rural Single Family

Proposed Zoning: No Change

History: Krause's Addition was platted in 1963. The home at 8991 Jane Road North (across the street and also owned by the applicant) was constructed in 1979. The City granted a lot size variance for the subject property in 1985, but no home was ever

built on the site. A permit to install a tennis court on the subject property was approved later in 1985.

Deadline for Action: Application Complete – 2/3/14
60 Day Deadline – 4/3/14
Extension Letter Mailed – No
120 Day Deadline – 6/3/14

Applicable Regulations: 154.450 – RS – Rural Single Family Residential Zoning District
154.109 – Variances (Administration and Enforcement)
150.250 – Shoreland Overlay District

REQUEST DETAILS

The City of Lake Elmo has received a request from Briggs and Morgan, PA acting on behalf of Suzanne Horning, for a variance from the minimum lot size requirements in the RS – Rural Single Family Residential zoning district. The application also includes a request for the City to waive the one-year deadline for completion of the work proposed under the variance. In this case, the applicant has requested that the variance be granted without a deadline so that a home could be built on the lot at an unspecified time in the future. The applicant is therefore not proposing to construct any buildings on the property, and is instead seeking a variance to classify the lot as a buildable parcel in advance of any specific building plans for the property.

The lot under consideration is 0.785 acres (34,195 square feet) in size and the minimum lot size within the RS – Rural Single Family Residential zoning district is 1.5 acres. As an existing lot of record, otherwise known as a lot that was platted prior to the City's zoning regulations becoming effective, this property would be considered buildable if it met 60% of the district's minimum lot size. The applicant would therefore need at least 0.9 acres (39,204 square feet) for this lot to be considered buildable under the current zoning regulations.

The site is currently occupied by a tennis court that was built in the mid-1980's, and has served as an accessory use to the home located at 8991 Jane Road North. Should the variance be approved, the applicant intends to convey the lot to her children as a buildable lot, although she has not provided any specific time frame for a home to be constructed. The application materials include a septic system analysis documenting that a system compliant with Washington County septic regulations may be constructed on the property. For the purposes of this report, the septic designer assumed that a new home would be built on the same area presently occupied by the tennis court.

In addition to the above-referenced septic report, the applicant has provided a detailed project narrative with an analysis of the required variance findings. The applicant has also provided a detailed survey of the lot showing the existing topography, drainage patterns, tree cover, and improvements that are currently situated on the property. There are no specific site development plans, and any future construction on this property will need to comply with the City's zoning and subdivision requirements (with the exception of minimum lot size should the variance be granted).

BACKGROUND

The lot that is the subject of the variance request is part of Krause's Addition to the City of Lake Elmo, which was platted in 1963 when this area was still part of East Oakdale Township. The attached copy of the plat shows that the lot is the same size as it was when originally subdivided. It

likely would have been considered buildable up to the incorporation of the area into the City of Lake Elmo and the adoption of City zoning regulations in the late 1970's. The home at 8991 Jane Road North was constructed in 1979, and it appears that this property (Lot 7) and the subject property (Lot 9) have been under common ownership since at least this time. In June of 1985, a previous owner applied for and was granted a variance by the City to grant Lot 9 status as a buildable lot. It appears that this action was taken in response to the City's adoption of the 1.5-acre minimum lot size for single-family residential lots in this neighborhood. No home was ever constructed after the granting of the variance, and a tennis court was installed on the property later in 1985.

As noted in the application materials, the present owner acquired the property sometime in 1985. It appears that the property transfer occurred after the construction of the tennis court. Additionally, the applicant has described that City assessed the subject property as a buildable lot in 1985 for a City project. Based on this information, it does appear that the City would have considered the lot to be a buildable lot at the time the property was purchased by the applicant. The applicant has also pointed out that the property has been assessed as a buildable lot the entire time that they have owned it.

When the City was planning for the reconstruction of Jane Road North in 2012, the Planning Department was asked to review the assessment rolls for the project and to identify vacant, buildable parcels that would need to pay an assessment. Lot 9 of Krause's Addition was not deemed buildable because it does not meet the 60% size requirement referenced above. Because the current Zoning Regulations include a one-year time limitation concerning the time frame for construction of projects subject to a variance, it is Staff's opinion that the 60% requirement does apply in this situation. The applicant has therefore submitted a variance request in order to re-classify this property as a builable lot.

The applicant's parcel is situated at the intersection of Jamaca Avenue North and Jane Road North, and is approximately 230 feet north of Lake Jane. Other than a tennis court, there have been no other improvements constructed on the site. There is a fairly heavy amount of tree cover surrounding the tennis court around the periphery of the lot. All of the surrounding lots are occupied by single family residential homes. In general, the properties to the north and west are larger lots (1.5 acres), while the properties to the south and east are smaller lots (generally under 1 acre). In particular, there is a cluster of homes along the northern edge of Lake Jane than are very similar in size, and sometimes smaller, than the applicant's parcel.

PLANNING AND ZONING ISSUES

In reviewing the applicable codes that apply to the subject property, Staff would like the Planning Commission to consider the following as it reviews this request:

- **RS District Setbacks**. Any new construction on the lot will need to comply with all required setbacks for the RS District. The portion of the lot that abuts Jamaca Avenue North is considered the front property line, and is therefore subject to a slightly larger setback.

- **Driveway Access**. Although the City Code does not include any restrictions on the location of a driveway on the property, Staff is recommending that any future driveway access Jane Road North instead of Jamaca Avenue North, since the latter is the less traveled roadway in adjacent to the lot.

- **Impervious Coverage**. The RS District allows a maximum impervious coverage of 25% while the Shoreland Ordinance limits lot coverage to 15% or 6,000 square feet, whichever is greater. The tennis court currently occupies 7,395 square feet, which is 21.6% of the lot. At the time a new house is constructed on the property, the applicant will need to comply with the maximum impervious coverage allowed under the Shoreland Ordinance.

- **Shoreland Setbacks**. The lot is far enough away from Lake Jane that any new structure will be able to comply with structure and septic system setbacks.

- **Drainage Area**. There is an existing drainage area immediately to the west and to the northwest of the applicant's lot, and it appears that a portion of the drainage area is also located on this lot. While the adjacent Sprinborn's Green Acres plat includes a drainage easement over the adjacent lots, there is currently no such easement in place on the applicant's property. Staff is recommending that the applicant be required to provide a drainage easement over the portion of the lot that collects storm water runoff as a condition of approval and prior to the issuance of any building permits for the property.

- **Septic and Drainfield Areas**. The subject parcel is large enough to meet the City's minimum requirement of 20,000 square feet for a primary and secondary septic system site.

- **Surrounding Lots**. The neighboring lots within the public hearing notification area range in size from 11,424 square feet (0.26 acres) to 83,025 square feet (1.9 acres), and of these 13 lots, the average size is 41,592 square feet (0.95 acres).

- **Variance Expiration**. The City Code specifies that variances are valid one year from the date a variance is issued. If construction has not taken place within one year, the variance becomes void. While the applicant has requested a full waiver of this requirement, Staff is recommending that the City maintain a specific deadline for construction of a home on the parcel. Staff is suggesting five years as a reasonable expectation.

REVIEW AND ANALYSIS

An applicant must establish and demonstrate compliance with the variance criteria set forth in Lake Elmo City Code Section 154.017 before an exception or modification to city code requirements can be granted. These criteria are listed below, along with comments from Staff regarding applicability of these criteria to the applicant's request.

1) **Practical Difficulties**. A variance to the provision of this chapter may be granted by the Board of Adjustment upon the application by the owner of the affected property where the strict enforcement of this chapter would cause practical difficulties because of circumstances unique to the individual property under consideration and then only when it is demonstrated that such actions will be in keeping with the spirit and intent of this chapter. Definition of practical difficulties - "Practical difficulties" as used in connection with the granting of a variance, means that the property owner proposes to use the property in a reasonable manner not permitted by an official control.

Under this standard, the City would need to find that the classification of the subject parcel as a buildable lot is a reasonable use of the property not otherwise permitted under the zoning ordinance. In this instance, the property was originally platted as a buildable lot and there is evidence in the

City's records that the current owner purchased the property with the understanding that it was a buildable lot. Additionally, the lot is consistent in size with other parcels platted at the same time and that have subsequently been built upon. The property has direct access to a platted and improved street, and a house can be placed on the property in manner consistent with the surrounding homes. Concerning the time extension associated with the variance request, Staff is recommending that a 5-year deadline is a reasonable expectation for construction of a new home. Proposed findings related to this criterion are as follows:

FINDINGS*: That the proposed use is reasonable because the lot was platted as a buildable parcel and all other parcels of similar size have had houses constructed on them since the subdivision was approved. The property is very close to meeting the required 0.9 acre minimum lot size requirement, and construction of a home on this lot will not be any more obstructive than structures built on lots meeting the 0.9 acre requirement. The applicant also purchased the lot at the time is was a buildable parcel, and the continued use of the property for a tennis court is not reasonable given the separation of this parcel by road right-of-way from any others under common ownership. The applicant has demonstrated the ability to install a complaint septic system on the property. A five year deadline for construction of a home on the property is a reasonable period of time for this work to be completed.*

2) **Unique Circumstances**. The plight of the landowner is due to circumstances unique to the property not created by the landowner.

In order to demonstrate compliance with this standard, the Planning Commission would need to identify those aspects of the applicant's property that would not pertain to other properties within the same zoning classification. In this case, the lot was platted as a buildable lot within an older subdivision. Other properties in the area were platted at a later date and under a different set regulations. The property owner also purchased the lot as a buildable lot, and the site has been assessed as such for the past 25 years. Again, Staff is suggesting some findings that could be considered by the Planning Commission as follows:

FINDINGS*: That the applicant's property is unique due to former platting of this property as a buildable lot and continued classification of the property as buildable since the lot was subdivided. The applicant purchased the property with the understanding that a house could someday be built on the property, and City records indicate that the lot was indeed buildable at the time of purchase. Other homes on neighboring smaller lots were constructed prior to the adoption of the City's zoning regulations.*

3) **Character of Locality**. The proposed variance will not alter the essential character of the locality in which the property in question is located.

A formal set of findings related to this standard is suggested as follows:

FINDINGS*: The applicant's lot is larger than many of the lots in the surrounding neighborhood and is close to the minimum size needed to be considered buildable. The lot is of sufficient size to allow the installation of a compliant septic system and to allow the placement of a home on the parcel consistent with neighboring structures.*

4) **Adjacent Properties and Traffic**. The proposed variance will not impair an adequate supply of light and air to property adjacent to the property in question or substantially increase the congestion of the public streets or substantially diminish or impair property values within the neighborhood.

Propose findings for this criterion are as follows:

FINDINGS. *No impacts above and beyond those considered normal for any other single-family lot in the surrounding neighborhood would be expected should the variance be granted.*

Please note that the applicant has also provided a set of findings as part of the attached narrative and supporting documentation included with the application.

Considering the potential findings of fact as suggested in the preceding section, Staff is recommending approval of the variance request based on the findings noted in items 1-4 above and with conditions of approval related to the drainage area on the site, the location of the driveway access, and the time limit for the expiration of the variance.

DRAFT FINDINGS

Please refer to the comments in the previous section. Staff will be reviewing these findings with the Commission at its meeting.

RECCOMENDATION:

Staff recommends that the Planning Commission recommend approval of the request from Briggs and Morgan, PA acting on behalf of Suzanne Horning, for a variance from the minimum lot size requirements in the RS – Rural Single Family Residential zoning district and from the maximum time of one year for which a variance is valid. This recommendation includes the following conditions of approval:

1) The driveway for the future home of the lot shall access Jane Road North. Driveway access to Jamaca Avenue North shall be prohibited.
2) The applicant shall provide a drainage easement for the portion of the lot that collects storm water runoff from the subject property and adjacent parcels prior to the issuance of a building permit for the site. The specific location of the drainage easement shall be approved by the City Engineer.
3) The variance shall be valid for a period of five years, but may be renewed upon review and approval by the Board of Adjustment.
4) A grading, erosion control, and storm water management plan shall be submitted in conjunction with a building permit for the property.
5) The applicant shall secure any required permits from the Valley Branch Watershed District prior to commencing any grading or construction activity on the site.

The suggestion motion for taking action on the Staff recommendation is as follows:

"Move to recommend approval of the request for a variance from the minimum lot size requirements in the RS – Rural Single Family Residential zoning district and from the maximum time of one year for which a variance is valid, subject to the conditions of approval as recommended by Staff"

ATTACHMENTS:

1. Application Form
2. Application and Project Narrative

3. Existing Site Conditions/Survey
4. Location Map
5. Krause's Addition Plat
6. Septic System Report – Tom Trooien

ORDER OF BUSINESS:

- Introduction.....Community Development Director
- Report by Staff.....Community Development Director
- Questions from the Commission..... Chair & Commission Members
- Open the Public Hearing.....Chair
- Close the Public Hearing.....Chair
- Discussion by the Commission..... Chair & Commission Members
- Action by the Commission..... Chair & Commission Members

Fee $_____

City of Lake Elmo
DEVELOPMENT APPLICATION FORM

- ☐ Comprehensive Plan Amendment
- ☐ Zoning District Amendment
- ☐ Text Amendment
- ☐ Flood Plain C.U.P. Conditional Use Permit
- ☐ Conditional Use Permit (C.U.P.)
- ☒ Variance * (See below)
- ☐ Minor Subdivision
- ☐ Lot Line Adjustment
- ☐ Residential Subdivision Sketch/Concept Plan
- ☐ Site & Building Plan Review
- ☐ Residential Subdivision Preliminary/Final Plat
  - ○ 01 – 10 Lots
  - ○ 11 – 20 Lots
  - ○ 21 Lots or More
- ☐ Excavating & Grading Permit
- ☐ Appeal
- ☐ PUD

APPLICANT: Suzanne Horning, as Trustee (see attached) 8991 Jane Road North, Lake Elmo, MN 55042
(Name) (Mailing Address) (Zip)

TELEPHONES: 239-765-8708 (Florida Phone Number)
(Home) (Work) (Mobile) (Fax)

FEE OWNER: Suzanne Horning, as Trustee (see attached) 8991 Jane Road North, Lake Elmo, MN 55042
(Name) (Mailing Address) (Zip)

TELEPHONES: 239-765-8708 (Florida Phone Number)
(Home) (Work) (Mobile) (Fax)

PROPERTY LOCATION (Address and Complete (Long) Legal Description): Krause's Addition Lot 9
Subdivision Cd 37425

DETAILED REASON FOR REQUEST: Please see attached.

***VARIANCE REQUESTS:** As outlined in Section 301.060 C. of the Lake Elmo Municipal Code, the Applicant must demonstrate a hardship before a variance can be granted. The hardship related to this application is as follows:
Please see attached.

In signing this application, I hereby acknowledge that I have read and fully understand the applicable provisions of the Zoning and Subdivision Ordinances and current administrative procedures. I further acknowledge the fee explanation as outlined in the application procedures and hereby agree to pay all statements received from the City pertaining to additional application expense.

Suzanne R. Horning 1/13/14
Signature of Applicant Date

_____
Signature of Applicant Date

BRIGGS
BRIGGS AND MORGAN

2200 IDS Center
80 South 8th Street
Minneapolis MN 55402-2157
tel 612.977.8400
fax 612.977.8650

February 3, 2014

Christie J. Cirilli
(612) 977-8926
ccirilli@briggs.com

VIA E-MAIL

Kyle Klatt
Planning Director
Lake Elmo City Hall
3800 Laverne Avenue North
Lake Elmo, MN 55042

Re: Application for Variance - Krause's Addition, Lot 9 Subdivision Cd 37425

We represent Suzanne Horning, as Trustee of the Suzanne R.W. Horning Qualified Personal Residence Trust (the "Applicant"), in connection with her application for a variance. The Applicant requests that the City grant a variance for the property legally described as Krause's Addition, Lot 9 Subdivision Cd 37425, located in the City of Lake Elmo (the "Property").

Please find attached as exhibits written statements as required by the Variance Procedure for the City of Lake Elmo. Also included with this letter is (1) the Applicant's completed and signed land use application form; (2) verification of the Applicant's ownership of the Property; (3) address labels for the certified list of property owners located within three hundred fifty (350) feet of the subject property obtained from and certified by a licensed abstractor; (4) the proposed septic design plan for the Property; and (5) copies of a certified survey depicting the Property.

We look forward to working with you in this matter.

Sincerely,

Christie J. Cirilli

CJC

cc: Sue Horning
Dan Cole

EXHIBIT A

(List of Current Property Owners/Applicant)

Suzanne R.W. Horning, Trustee of the Suzanne R.W. Horning Qualified Personal Residence Trust under Agreement dated December 26, 2008, by Quit Claim Deed dated December 26, 2008, filed December 31, 2008, as Document No. 3720033.

EXHIBIT B

(List of Site Data)

1. Legal Description: Krause's Addition, Lot 9 Subdivision Cd 37425

2. Parcel Identification Number: 09.029.21.11.0015

3. Parcel Size (in acres and square feet): 0.785 acres/34,194.6 square feet

4. Existing Use of Land: Vacant parcel

5. Current Zoning: R1 One-Family Residential District

EXHIBIT C

(Provision of Zoning Code for which Applicant seeks a variance)

The Applicant is seeking a variance under Sections 154.041 and 154.080 of the Zoning Code. Section 154.041, which applies to R-1 One-Family Residential Districts, requires a minimum buildable lot size of 1-1/2 acre per unit without sanitary sewer or 24,000 square feet per unit with sanitary sewer. Section 154.080 contains an exception to this for any "existing lot." An "existing lot" is defined as "a lot or parcel of land in a residential district which was of record as a separate lot or parcel in the office of the County Recorder or Registrar of Titles, on or before the effective date of th[e] chapter." Section 154.080 states that "[a]ny [existing] lot or parcel of land which is in a residential district may be used for single-family detached dwelling purposes, provided the area and width of the lot are within 60% of the minimum requirements of this chapter; provided, all setback requirements of this chapter must be maintained; and provided, it can be demonstrated safe and adequate sewage treatment systems can be installed to serve the permanent dwelling."

The Property at issue therefore qualifies as an exception to the general lot requirements of Section 154.041 and must instead comply with the 60% (0.90 acre) lot requirement of Section 154.080. At 0.785 acres, the Property falls just short of the buildable lot requirements for existing lots in R1 One-Family Residential Districts. As a result, the Applicant is seeking a variance to the existing lot requirement contained in Section 154.080.

Finally, the Applicant is seeking a variance from Section 154.017 of the Zoning Code, which mandates that any variance granted by the City "shall expire if work does not commence within 12 months of the date of granting such variance or if that use ceases for more than 6 consecutive months." Because the Applicant desires to convey the Property to her children through her estate for buildable-lot purposes, any such work performed on the Property would not commence until after the twelve (12) month period required under Section 154.017 of the Zoning Code.

EXHIBIT D

(Written Description of Proposal)

The Applicant proposes the issuance of a variance to Section 154.080 of the Zoning Code and request that the Property, at 0.785 acres, be characterized as a buildable lot under the Zoning Code.

The Applicant further requests a variance to the requirement under Section 154.017 that work be commenced within twelve (12) months of the variance's issue date. The variance to the buildable lot size will be of no use to the Applicant without a variance to this requirement as well.

EXHIBIT E

(Narrative of Pre-Application Discussions)

Christie Cirilli, Attorney with Briggs & Morgan, P.A. (the "Applicant's Counsel") spoke with Kyle Klatt, the Planning Director for the City of Lake Elmo (the "Planning Director"), on behalf of the Applicant. Applicant's Counsel discussed Applicant's pursuance of a variance under Section 154.017 of the Lake Elmo Zoning Code. Applicant's Counsel inquired regarding the current standard for variances applied by the City of Lake Elmo. The Planning Director confirmed that the "practical difficulties" standard, as discussed in Minnesota Statutes 462.357, had been adopted by the City and incorporated into Section 154.017 of the Lake Elmo Zoning Code.

The Planning Director stated that the Property had been characterized as a non-buildable lot since 1979, but acknowledged that the Property was improperly assessed and taxed as a buildable lot during the Applicant's ownership of the Property. Applicant's Counsel explained to the Planning Director that the Property was being assessed and taxed as a buildable lot when the Applicant purchased the Property, and as a result, the Applicant believed she was buying land with buildable lot value. Applicant's Counsel explained to the Planning Director that the Property was of little or no value to the Applicant or anyone else without characterization as a buildable lot because the Applicant was interested in transferring the Property via her estate to her children for buildable purposes. The Planning Director acknowledged the erroneous taxation of the Property, despite stating that the zoning classification of the property is separate and distinct from the taxation of the parcel – meaning that the fact that the Property was taxed as a buildable lot does not change the fact that it was characterized as unbuildable under the zoning code. The Planning Director confirmed, however, that the fact that the Applicant purchased the parcel at a buildable lot price and for buildable lot value would be considered by the Planning Commission in its decision of whether or not to grant a variance.

The Planning Director explained that he was not sure how much application of the new "practical difficulties" standard would affect the Planning Commission's analysis and issuance of variances. The Planning Commission has not had many variance applications come before it since the new standard took effect. The Planning Director informed Applicant's Counsel that, if the Planning Commission were to grant a variance for the Property, work would have to be commenced on the Property within 12 months of the date the variance was granted – otherwise, the variance would expire. Applicant's Counsel responded that this may be an issue for Applicant, and an additional variance may be requested to waive this requirement.

The Applicant also separately had conversations with the City regarding her Property. In particular, the Applicant spoke with Dean Zuleger, the City Administrator for the City of Lake

Elmo, who informed the Applicant that he was unaware of any issues with the buildable nature of the Property. Mr. Zuleger acknowledged that other buildable lots in the area were of a similar size to the Property and that he did not see any reason why the Property should not be buildable as well. The discussions with Mr. Zuleger also revealed a prior variance that was issued for the Property in 1985. Upon following up with the Planning Director, there was not much information on file with the City regarding said variance, only that a variance was issued at that time regarding the buildable nature of the Property. This prior variance supports the current application for a variance for the Property.

The Applicant's Counsel further had discussions with Mr. Klatt regarding a variance passed by the Lake Elmo City Council on October 15, 2013, which variance was passed despite a recommendation from the Planning Commission to deny such variance. The property related to the variance request was of a considerably smaller size than the Applicant's property and was located on the shoreline. Mr. Klatt explained that the primary reason for granting the variance was that the property had room for adequate septic systems, and as a result the City Council passed the variance.

EXHIBIT F

(Explanation of Applicant's Practical Difficulties)

Section 154.017 of the Zoning Code states that a variance shall be granted "where strict enforcement of the [Zoning Code] would cause practical difficulties because of circumstances unique to the individual property under consideration and then only when it is demonstrated that such actions will be in keeping with the spirit and intent of this chapter." Under this Section, the "practical difficulties" standard means that "the property owner proposes to use the property in a reasonable manner not permitted by an official control."

The Applicant is proposing to use the Property in a reasonable manner not permitted by an official control. At 0.785 acres, the Property has been characterized as a non-buildable lot by the Zoning Code, which has a buildable lot size requirement for existing lots of 0.90 acres. The Applicant is proposing to reclassify the Property as a buildable lot prior to her conveyance of the Property through her estate. Given that the Property's acreage constitutes roughly 87% of the buildable lot size requirement, the Property is very close to meeting the required buildable lot size under the Zoning Code. As a result, it is unlikely that any structure built on the Property (that complied with the Zoning Code's building requirements) would be notably more obstructive than structures built on lots meeting the minimum 0.90 acre requirement.

The Property is zoned for residential use and the Applicant will have no use for the Property if it is not classified as a buildable lot. The other lots surrounding the Property are not much larger than the Property and were grandfathered in under the Zoning Code, as the Property at issue should have been. The Property was a platted lot approved by the City at its current size and was intended to be buildable. Therefore, classifying the Property as a buildable lot will not alter the "spirit and intent of the chapter."

Given that the proposed use of the Property is not unreasonable and that the Property should have been previously grandfathered in under the Zoning Code, the Planning Commission should grant a variance given the particularly unusual circumstances of the Applicant, as described on Exhibit G.

EXHIBIT G

(Explanation of Applicant's Unique Circumstances)

Section 154.017 of the Zoning Code further states that a variance shall only be granted where "[t]he plight of the landowner is due to circumstances unique to the property not created by the landowner." The Applicant at issue has particularly unusual circumstances, which are not by fault of her own.

The Applicant was not the subdivider of the surrounding development and therefore did not create the problem. At the time the Applicant purchased the Property in 1985, the Applicant believed the Property was buildable. The Property was platted and approved by the City at its current size. The surrounding lots were of a similar size and were characterized as buildable. The Applicant paid a buildable lot value for the Property and has been paying taxes, assessed by Washington County, Minnesota, on that buildable lot value for the past twenty-seven (27) years. As a result, the Applicant had good reason to believe that she owned buildable land. The Applicant's belief that the land was buildable affected her decision to purchase and retain the Property.

The Property was specifically characterized as an assessable lot on the City's assessment role on September 10, 1985, at which time the City held a meeting for approval of a special assessment by local property owners. By characterizing the Property as an assessable lot, the City was acknowledging the value the Property was receiving from City improvements and assessing a fee on the Property for those improvements. The Property does not, however, receive any value from City improvements if it is not also buildable. As a result, the City's characterization of the Property as an assessable lot suggests that the Property was intended to be buildable as well.

The Applicant had no reason to believe that her land was not buildable. Any plight of the Applicant was due to the error of other parties. As a result, the Applicant has unique circumstances that she has not created and which justify the City's grant of a variance for the Property.

EXHIBIT H

(Essential Character of Neighborhood)

In order to obtain a variance from the City, the Applicant is required to show that the issuance of a variance would not alter the essential character of the neighborhood in which the Property is located. In other words, the Property must be consistent and not interfere with the use of the property surrounding it.

The Property is located in Krause's Addition of the City of Lake Elmo. Other lots within Krause's Addition that have houses built on them are not discernibly different in size than the Property. As previously stated, many of these lots were grandfathered in when the Zoning Code requirements changed, and the Property at issue should have been grandfathered in as well. Furthermore, the City Council recently granted a variance on October 15, 2013 for a lot of a considerably smaller size than the Applicant's property, constituting approximately 0.4 acres of land. The City Council's primary reason for granting the variance was that the property had adequate room for appropriate septic systems on the property. The Applicant's Property also has adequate room for appropriate septic systems on the property, with room for both a primary and backup drainfield location, as demonstrated by the septic design submitted in connection with the application. In addition, unlike the property at issue in the October 15, 2013 variance request, the Applicant's property is not located on the shoreline and therefore any building on the Applicant's Property won't interfere with any of the neighboring property rights associated therewith.

Springborn's Green Acres, which adjoins the Property to the North, contains two lots (Lot 2 and Lot 3) that both have less buildable area than the Property at issue, due to drainage and utility easements that bisect each lot. Lot 2 and Lot 3 are shown to each constitute 1.6 acres, but their buildable lot areas are actually only 150 feet by 170 feet due to the easements burdening each lot. Therefore, if granted a variance, the buildable lot area of the Property at issue would be greater than that of both Lot 2 and Lot 3 in Springborn's Green Acres.

Given the size of lots surrounding the Property and adequate room for appropriate septic systems on the property, the issuance of a variance for the Property would not alter the essential character of the neighborhood.

THE HORNING PROPERTY

LOT 9, KRAUSE'S ADDITION

49XX JAMACA AVENUE NORTH

CITY OF LAKE ELMO, WASHINGTON COUNTY, MINNESOTA

49XX JAMACA AVENUE NORTH (FROM SOUTH)
LAKE ELMO, MINNESOTA

KEMPER & ASSOCIATES INC.
PROFESSIONAL LAND SURVEYORS
721 OLD HIGHWAY 8 N.W.
NEW BRIGHTON, MINNESOTA 55112
651-631-0301
FAX 651-631-9805
Email: kemper@pro-net.net
www.kempersurveys.com

VICINITY MAP
(NO SCALE)

FLOODPLAIN SUMMARY

SUBJECT PROPERTY LIES IN FLOOD ZONE "X" (AREAS DETERMINED TO BE OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN ACCORDING TO THE FEDERAL EMERGENCY MANAGEMENT AGENCY FLOOD INSURANCE RATE MAP No. 27163C0041E WITH AN EFFECTIVE DATE OF FEBRUARY 1, 2010)

49XX JAMACA AVENUE NORTH
(WEST SIDE OF TENNIS COURT)
LAKE ELMO, MINNESOTA

49XX JAMACA AVENUE NORTH
(NORTH SIDE OF TENNIS COURT SHOWING ADJACENT HOUSE)
LAKE ELMO, MINNESOTA

ZONING REQUIREMENTS

ZONED R4 - ONE-FAMILY RESIDENTIAL
SUBJECT TO SHORELAND OVERLAY DISTRICT

MINIMUM LOT SIZE: 1.5 ACRES (UNSEWERED)
(4,000 SQ. FT. TO 12,000 SQ. FT. (SEWERED))

FOR EXISTING PLATTED LOTS, OWNING ON OR BEFORE THE DATE OF THIS ORDINANCE, MAY BE CONSIDERED BUILDABLE IF THE LOT IS EQUAL OR THE MINIMUM LOT AREA REQUIRED IN THE DISTRICT (NOT LESS THAN 15 ACRES OR 20,234 SQ. FT.)

MINIMUM LOT WIDTH: 175 FEET
MAXIMUM BUILDING HEIGHT: 35 FEET
MAXIMUM IMPERVIOUS COVERAGE: 25%
BUILDING SETBACKS FROM PROPERTY LINES:

FRONT:	50 FEET
SIDE (WITH DRIVE):	30 FEET
SIDE (CORNER):	25 FEET
REAR:	40 FEET
ARTERIAL STREET:	50 FEET

SHORELAND OVERLAY DISTRICT SUMMARY:

MAXIMUM IMPERVIOUS COVERAGE: 15% OR 4,000 SQ. FT., WHICHEVER IS GREATER

MINIMUM LOT AREA: 1.5 ACRES (UNSEWERED)

MINIMUM LOT WIDTH AT FRONT SETBACK: 175 FEET

BLUFF OR STEEP TREATMENT REGULATIONS:
REFER TO CHAPTER 9 OF "LOWER ST. CROIX STORMWATER MANAGEMENT PLAN" BY THE WASHINGTON CONSERVATION DISTRICT FOR SPECIFIC DETAILS ON THE REQUIREMENTS FOR BUFFER SYSTEMS.

ALL STRUCTURES MUST BE AT LEAST 30 FEET FROM BLUFF LINE. SEPTIC AND ASSOCIATED DRAINFIELDS MUST BE AT LEAST 75 FEET FROM BLUFF LINE. ALL STRUCTURES, SEPTIC AND AREA SUBSTITUTION SYSTEMS AND ASSOCIATED DRAINFIELDS MUST BE PLACED TO MEET THE REQUIREMENTS OF THE FIRST ORDINANCE IN MANAGEMENT.

SEPTIC SYSTEM SETBACKS:

FROM STREAM (TOWN):	100 FEET
FROM BLUFF:	75 FEET
FROM WATER WELL:	50 FEET
FROM WETLAND:	50 FEET
FROM TILE TREATMENT AND DISPERSAL AREA:	50 FEET

WATER SUPPLY WELLS:

FROM SEPTIC TANK:	50 FEET
FROM SEPTIC DRAINFIELD:	100 FEET
FROM WATER SUPPLY WELLS:	50 FEET
FROM BLUFF:	30 FEET
FROM STREAM:	100 FEET
FROM WETLAND:	50 FEET
FROM TILE TREATMENT AND DISPERSAL AREA:	50 FEET

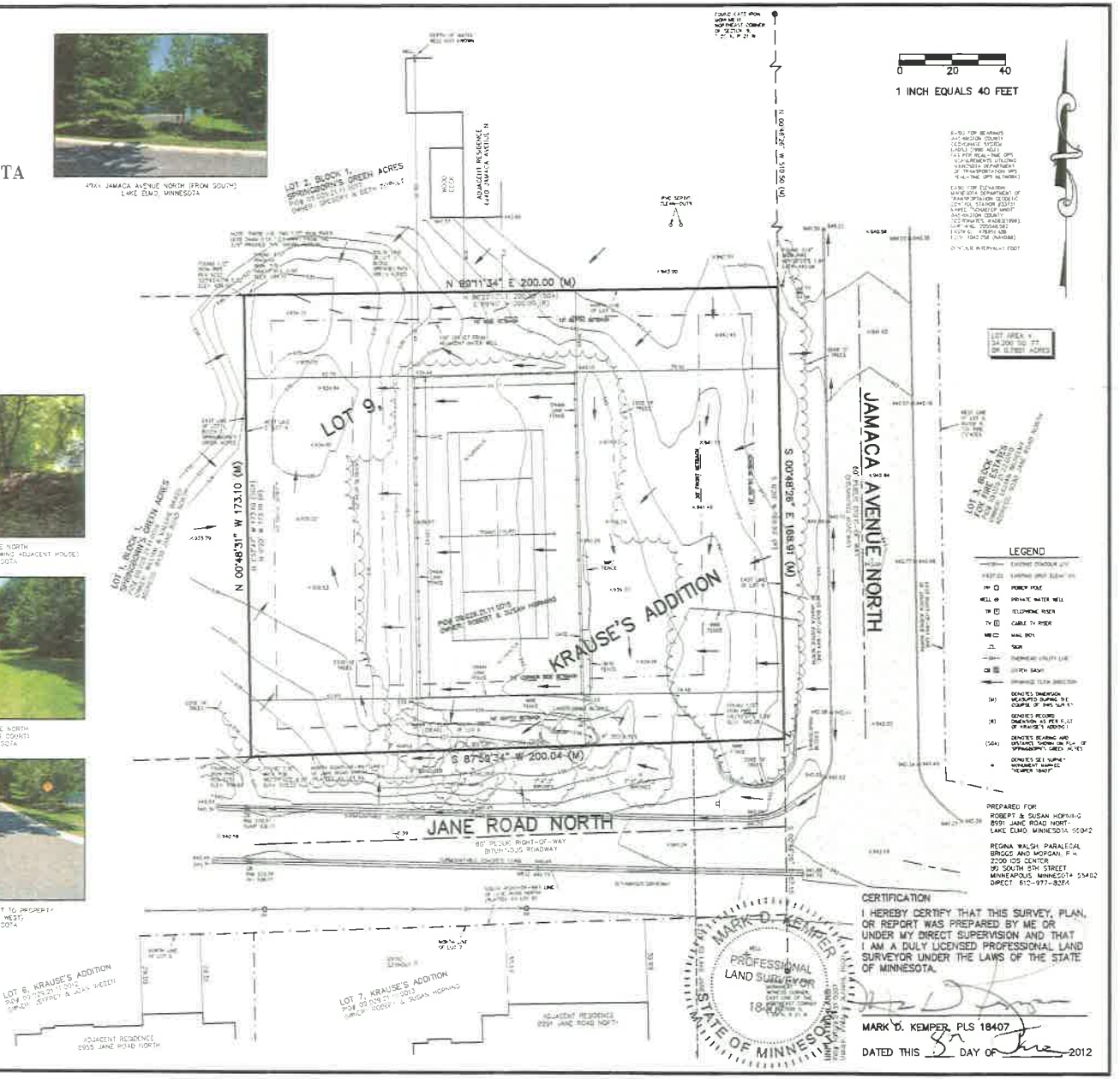
AS PER CITY OF LAKE ELMO ZONING CODE. CONTACT LAKE ELMO PLANNING DIRECTOR, CITY OF LAKE ELMO, 651-777-5510, AND WASHINGTON COUNTY DEPARTMENT OF PUBLIC HEALTH REGARDING STATE REGULATIONS.

JAMACA AVENUE NORTH, ADJACENT TO PROPERTY
(FROM SOUTH FACING NORTH)
LAKE ELMO, MINNESOTA

JANE ROAD NORTH, ADJACENT TO PROPERTY
(FROM EAST FACING WEST)
LAKE ELMO, MINNESOTA

EXISTING IMPERVIOUS COVERAGE

AREA OF TENNIS COURT: 7,344 SQ. FT.
TOTAL AREA OF LOT: 174,240 SQ. FT.
EXISTING IMPERVIOUS PERCENTAGE: 21.8%



CERTIFICATION

I HEREBY CERTIFY THAT THIS SURVEY, PLAN, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MINNESOTA.

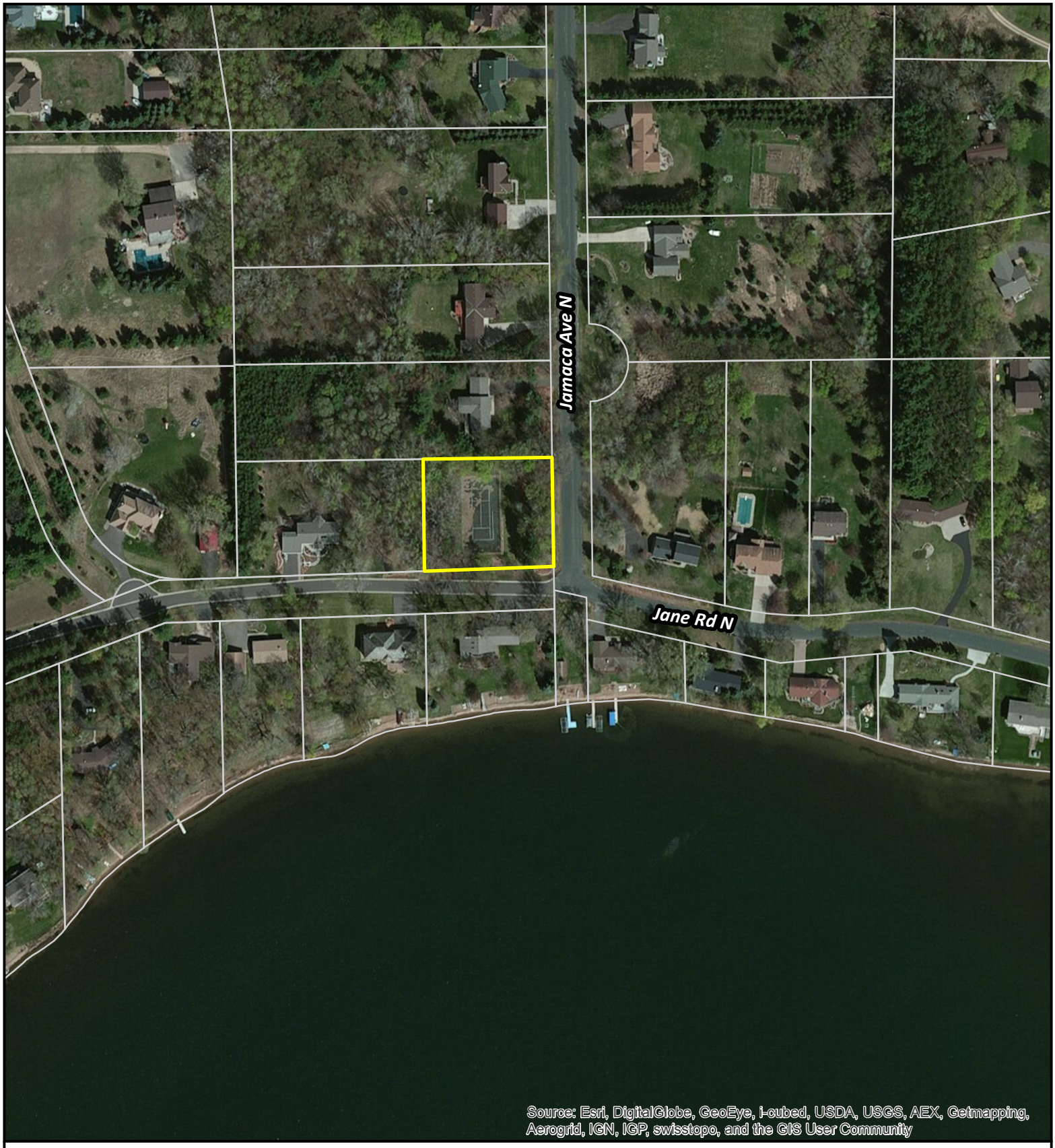
MARK D. KEMPER, PLS 18407

DATED THIS 5th DAY OF June 2012

CERTIFICATE OF SURVEY

12084 (12084S.DWG)

N:\Projects\12084\12084S.dwg, 6/6/2012 4:56:05 PM



Location Map: 09.029.21.11.0015

THE CITY OF LAKE ELMO

Data Scource: Washington County, MN
2-26-2014

Variance Request
09.029.21.11.0015

0 100 200 400 Feet

1"=200'

N

KRAUSE'S ADDITION

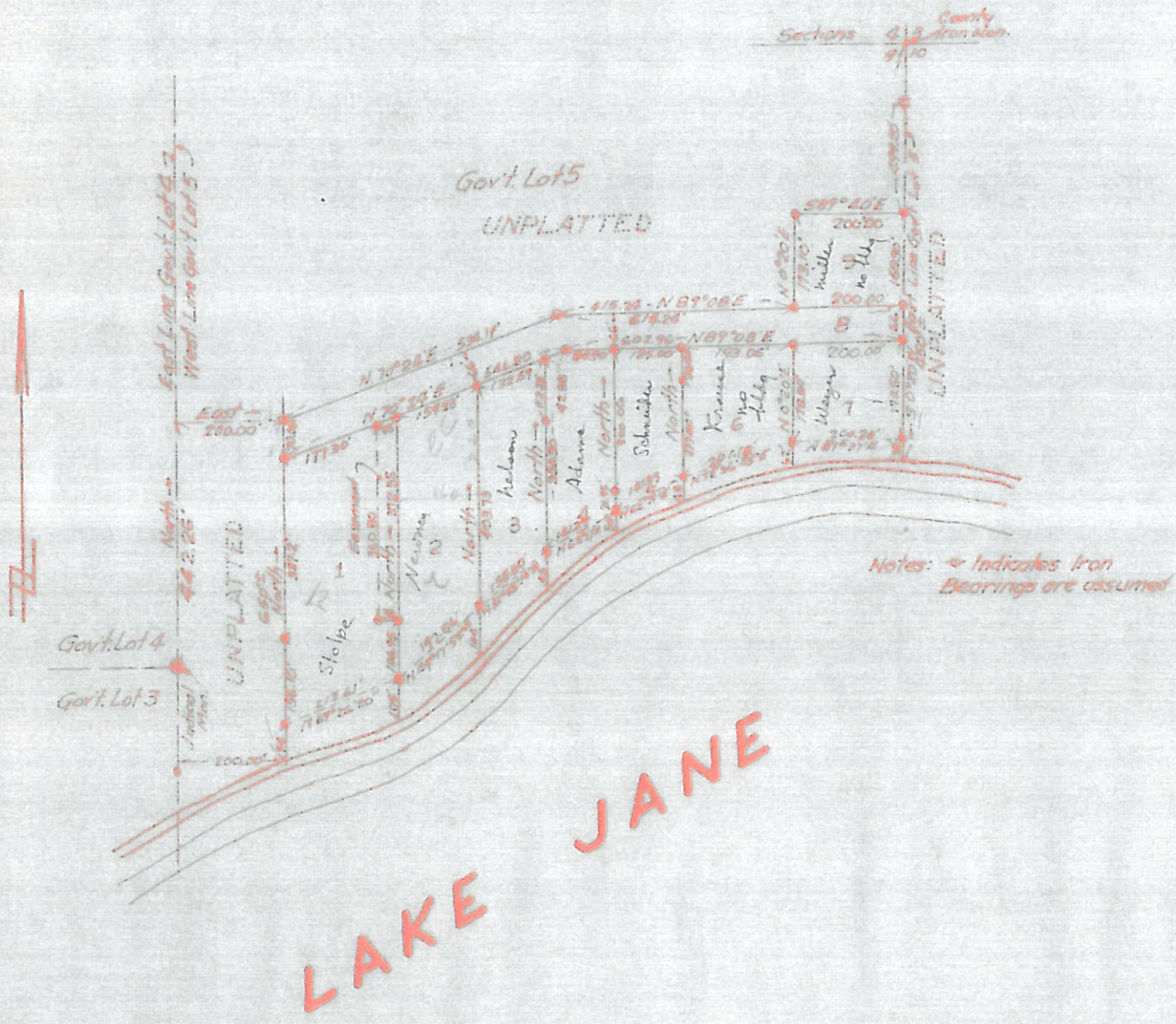
PART OF GOVT. LOT 5 SECTION 9, T 29 N., R 21 W.

EAST OAKDALE TOWNSHIP - WASHINGTON COUNTY

MINNESOTA

SCALE: 1 IN. = 200 FT.

J.R. Hoffman
Surveyor



I surveyed the property described on this and to having placed iron monuments at same are correct, there is no undrained d road nor easement on or across same the land conveyed in fee in each recorded the same as the land shown on this plat preceding each particular recorded

This plat approved and accepted by the Town Board of Washington County, Minnesota this [illegible] day of [illegible]

Maynard L.
Chairman, Town Board,

MOUND SYSTEM DESIGN
INDIVIDUAL SEWAGE TREATMENT SYSTEM

Owner's Name	SUZANNE HORNING
Job Site Address	LOT 9, KRAUSE'S ADDITION 49XX JAMACA AVE.
City or Township	LAKE ELMO
Use of Building	SFD

Design Flow Rate 750	Perc Rate 16-30	Land Slope 1	Percent
Two Required Tank Sizes 1500 Gallons	1000 Gallons	Lift Station Tank Size 1200	Gallons
Rock Bed Width 10		Rock Bed Length 75	
Required Absorption Width 20	Feet	Depth of Clean Sand Fill at Upslope Edge of Rock Layer	Feet
Minimum Downslope Dike Width After Accounting for the Absorption Area 13			Feet
Minimum Upslope Dike 10	Feet	Minimum Length of Dike 95	Feet

Any Other Special Conditions THIS DESIGN IS INTENDED TO DEMONSTRATE SUITABILITY OF LOT FOR SEPTIC PURPOSES ONLY IN ORDER TO OBTAIN A ZONING VARIANCE. ANY CHANGES OF FUTURE HOUSE OR SEPTIC LOCATION WILL REQUIRE ADDITIONAL TESTING OR SIZING TO SEPTIC SYSTEM

COMPLETE THE PRESSURE DISTRIBUTION SYSTEM WORK SHEET ATTACHED.

This design **must be accompanied by a site plan** that clearly shows the location of the area tested and approved by the following (MOUND SYSTEMS SITE PLANS MUST CLEARLY SHOW THE LOCATION OF THE MOUND):

1. Use an appropriate scale and indicate direction by use of a north arrow.
2. Show **ALL** property boundaries, rights-of-way, easements, wetlands. If necessary, an enlarged detail of house site may also be required.
3. Show location of house, garage, driveway and all other improvements existing or proposed.
4. Show location and layout of sewage treatment mound, and back-up mound.
5. Show location of water supply (well and/or community supply line).
6. Dimension all setbacks and separation distances.

This system has been designed by a Pollution Control Agency (PCA) Certified Professional.

Designer Name TOM TROOIEN PCA Certification # 1568

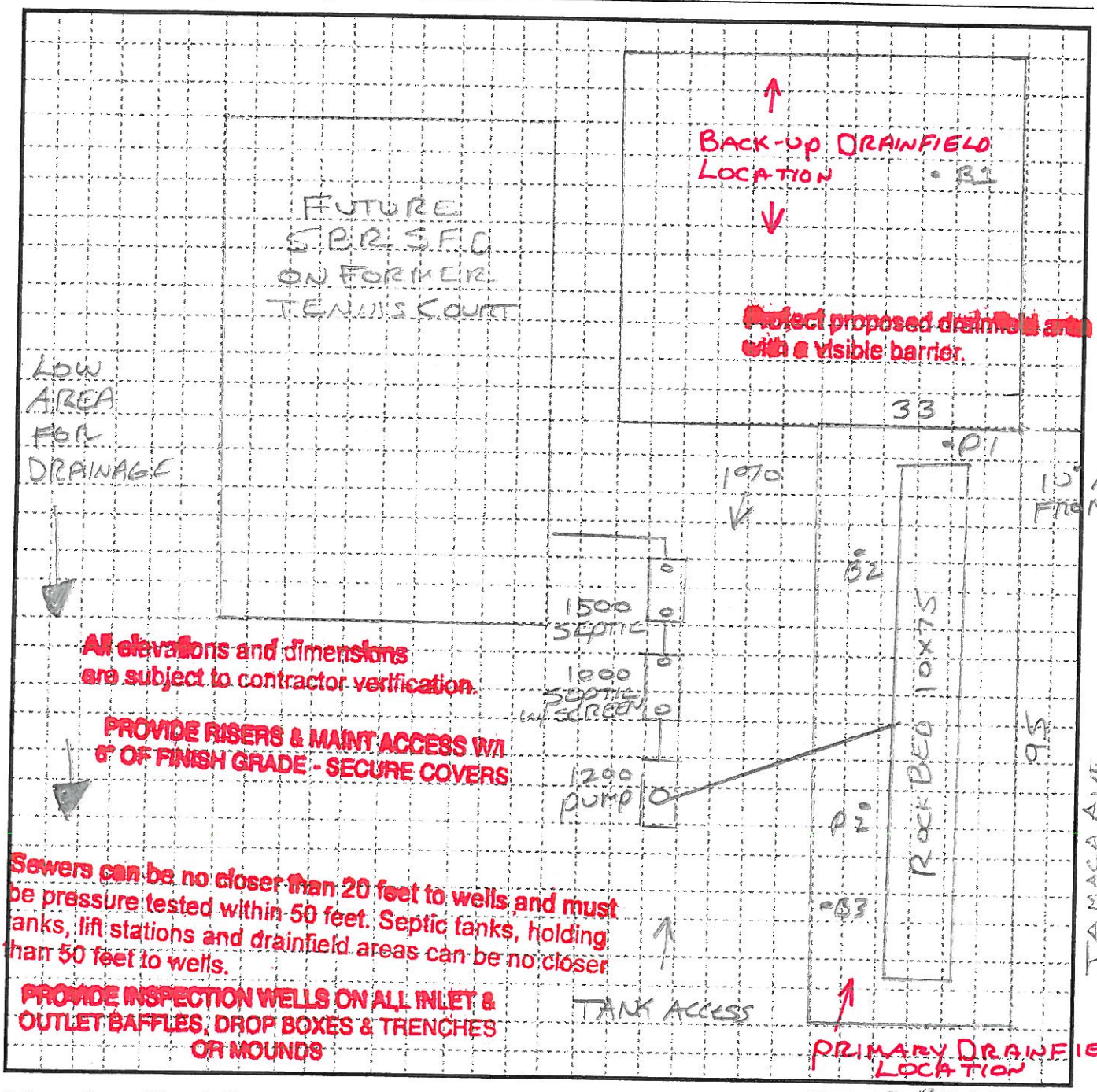
Address 12020 SQUARE LAKE TR. STILLWATER MN 55082 Phone # 612-594-4496

Signature Tom Trooien Date 8-11-12

Site Evaluation Map Date 8-11-12 Site Evaluator TOM TRODDEN

Legal location and directions to lot _____

Any surface signs of compaction? _____



Mapping Checklist Map scale: 1:25 Lot dimensions: _____

Indicate north ↑ Locate dwelling __ and other improvements __

Locate existing and/or proposed system, __ replacement area, __ unsuitable areas __

Indicate easements: phone __ electric __ gas __ Show slope: ____% direction __

Indicate setbacks: building 20' __ property lines 10' __ water well 100'/50' __

water suction pipe 50' __ pressure pipe 10' __ streams, lakes, rivers 50'/75'/100' __

Locate borings, perc tests, indicating elevation, __ horizontal and vertical reference points __

Is proposed location staked? __ Accessible for pumping? __

MOUND DESIGN WORKSHEET
(For Flows up to 1200 gpd)

A. FLOW
Estimated 750 gpd
or measured _____ x 1.5 = _____ gpd.

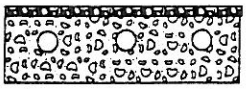
Estimated Sewage Flows in Gallons per day (gpd)				
Number of Bedrooms	Type I	Type II	Type III	Type IV
2	300	225	180	60% of the values in Type I, II or III columns
3	450	300	218	
4	600	375	256	
5	750	450	294	
6	900	525	332	
7	1050	600	370	
8	1200	675	408	

B. SEPTIC TANK LIQUID VOLUMES
1500 gallons +1000

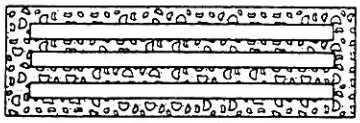
C. SOILS (refer to site evaluation)
1. Depth to restricting layer = 29 inches _____ feet
2. Depth of percolation tests = 12 inches
3. Texture Silt Loam Percolation rate 16-30 mpi
4. Land slope 1 %

Septic Tank Capacities (in gallons)		
Number of Bedrooms	Minimum Liquid Capacity	Liquid capacity with garbage disposal
2 or less	750	1125
3 or 4	1000	1500
5 or 6	1500	2250
7, 8 or 9	2000	3000

D. ROCK LAYER DIMENSIONS
1. Multiply flow rate by 0.83 to obtain required area of rock layer: A x 0.83 = 1.00
750 gpd x 0.83 1.00 sq. ft./gpd = 750 sq. ft.
2. Select width of rock layer (max 10' if <120 mpi max 5') = 10 ft.
3. Length of rock layer = area ÷ width =
750 sq. ft. ÷ 10 ft. = 75 ft.



Width 10 ft
<120mpi <10'
>120mpi <5'



Length 75 ft

E. ROCK VOLUME
1. Multiply rock area by rock depth to get cubic feet of rock; 750 sq. ft. x 1 ft. = 750 cu. ft.
2. Divide cu. ft. by 27 cu. ft./cu. yd. to get cubic yards;
750 cu. ft. ÷ 27 = 28 cu. yd.
3. Multiply cubic yards by 1.4 to get weight of rock in tons; 28 cu. yd. x 1.4 ton/cu. yd. = 39 tons.

F. ABSORPTION WIDTH
1. Percolation rate in top 12 inches of soil is 16-30 mpi
Texture Silt Loam

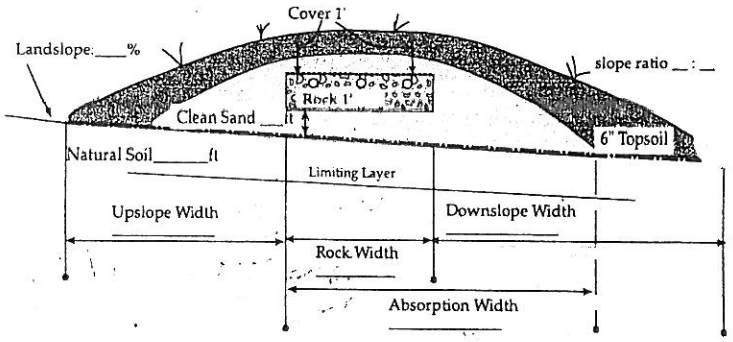
2. Select allowable soil loading rate from table;
.60 gpd/ft²

3. Calculate adsorption width ratio by dividing rock layer loading rate of 1.20 gpd/ft2 by allowable soil loading rate;
1.20 gpd/ft² ÷ .60 gpd/ft² = 2.00.

4. Multiply adsorption width ratio by rock layer width to get required adsorption width;
10 x 2.00 ft = 20 ft

Absorption Width Sizing Table			
Percolation Rate in Minutes per Inch (MPI)	Soil Texture	Gallons per day per square foot	Ratio of Absorption width to Rock Layer Width
Faster than 0.1	Coarse Sand	1.20	1.00
0.1 to 5	Sand	1.20	1.00
0.1 to 5	Fine Sand	0.60	2.00
6 to 15	Sandy Loam	0.79	1.52
16 to 30	Loam	0.60	2.00
31 to 45	Silt Loam	0.50	2.40
46 to 60	Clay Loam	0.45	2.67
60 to 120	Clay	0.24	5.00
Slower than 120	Clay	0.20	6.00

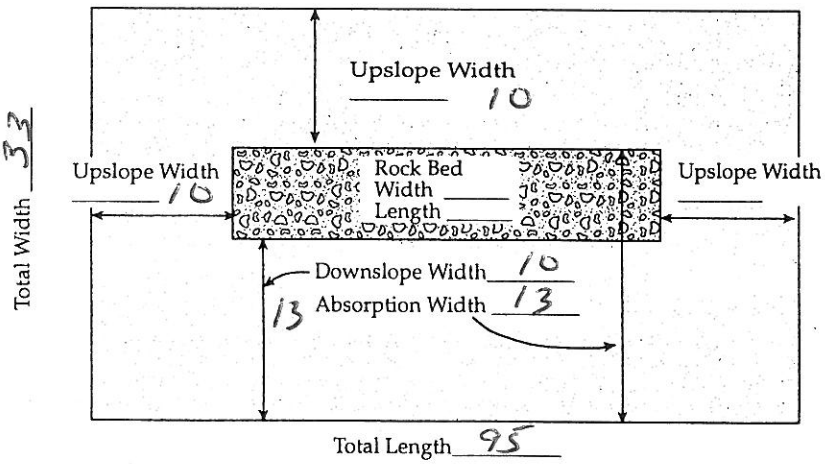
G. MOUND SLOPE WIDTH & LENGTH
(landslope 1% or more)



1. Subtract rock layer width from absorption width to obtain minimum downslope width
20 ft - 10 ft = 10 feet
2. Calculate minimum mound size
a. Determine depth of clean sand fill at upslope edge of rock layer:
Separation 3' - 2 ft = 1 feet
b. Add depth of clean sand for separation (2a) at upslope edge, depth of rock layer (1 foot) to depth of cover (1 foot) to find the mound height at the upslope edge of rock layer;
1 ft + 1ft + 1ft = 3 feet
c. Enter table with landslope and upslope ratio. Select berm multiplier of 3.85.
d. Multiply berm multiplier by upslope mound height to find upslope width:
3 x 3.85 = 12 feet
e. Multiply rock layer width by landslope to determine drop in elevation;
10 x 1 % ÷ 100 = .1 feet
f. Add depth of clean sand for slope difference (2e) at downslope rock edge, to the mound height at the upslope edge of rock layer (2b) to find the downslope mound height;
3 ft + .1 ft = 3.1 feet
g. Enter table with landslope and downslope ratio. Select downslope multiplier of 4.17.
h. Multiply downslope multiplier by downslope mound height to get downslope width:
3.1 x 4.17 = 13 feet
i. Compare the values of step G.1 10 and Step G.2h 13
Select the greater of the two values as the downslope width: 13 feet
j. Total mound width is the sum of upslope (G.2d) width plus rock layer width (D.2) plus downslope width(G.2i);
10 ft + 10 ft + 13 ft = 33 feet
k. Total mound length is the sum of upslope width (G.2d) plus rock layer length (D.3) plus upslope width (G.2d);
10 ft + 10 ft + 75 ft = 95 feet

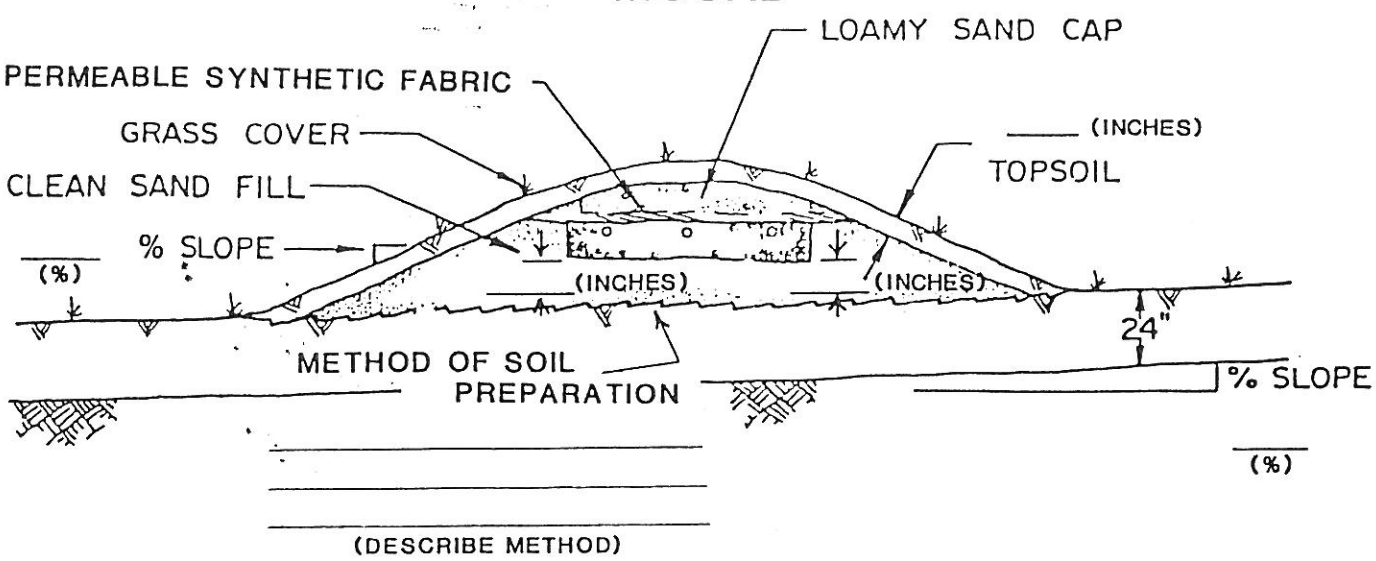
SLOPE MULTIPLIER TABLE

Land Slope, in %	UPSLOPE multipliers for various slope ratios						DOWNSLOPE multipliers for various slope ratios				
	3:1	4:1	5:1	6:1	7:1	8:1	3:1	4:1	5:1	6:1	7:1
0	3.0	4.0	5.0	6.0	7.0	8.0	3.0	4.0	5.0	6.0	7.0
1	2.91	3.85	4.76	5.66	6.54	7.41	3.09	4.17	5.26	6.38	7.53
2	2.83	3.70	4.54	5.36	6.14	6.90	3.19	4.35	5.56	6.82	8.14
3	2.75	3.57	4.35	5.08	5.79	6.45	3.30	4.54	5.88	7.32	8.86
4	2.68	3.45	4.17	4.84	5.46	6.06	3.41	4.76	6.25	7.89	9.72
5	2.61	3.33	4.00	4.62	5.19	5.71	3.53	5.00	6.67	8.57	10.77
6	2.54	3.23	3.85	4.41	4.93	5.41	3.66	5.26	7.14	9.38	12.07
7	2.48	3.12	3.70	4.23	4.70	5.13	3.80	5.56	7.69	10.34	13.73
8	2.42	3.03	3.57	4.05	4.49	4.88	3.95	5.88	8.33	11.54	15.91
9	2.36	2.94	3.45	3.90	4.30	4.65	4.11	6.25	9.09	13.04	18.92
10	2.31	2.86	3.33	3.75	4.12	4.44	4.29	6.67	10.00	15.00	23.[illegible]
11	2.26	2.78	3.23	3.61	3.95	4.26	4.48	7.14	11.11	17.65	30.
12	2.21	2.70	3.12	3.49	3.80	4.08	4.69	7.69	12.50	21.43	43.75

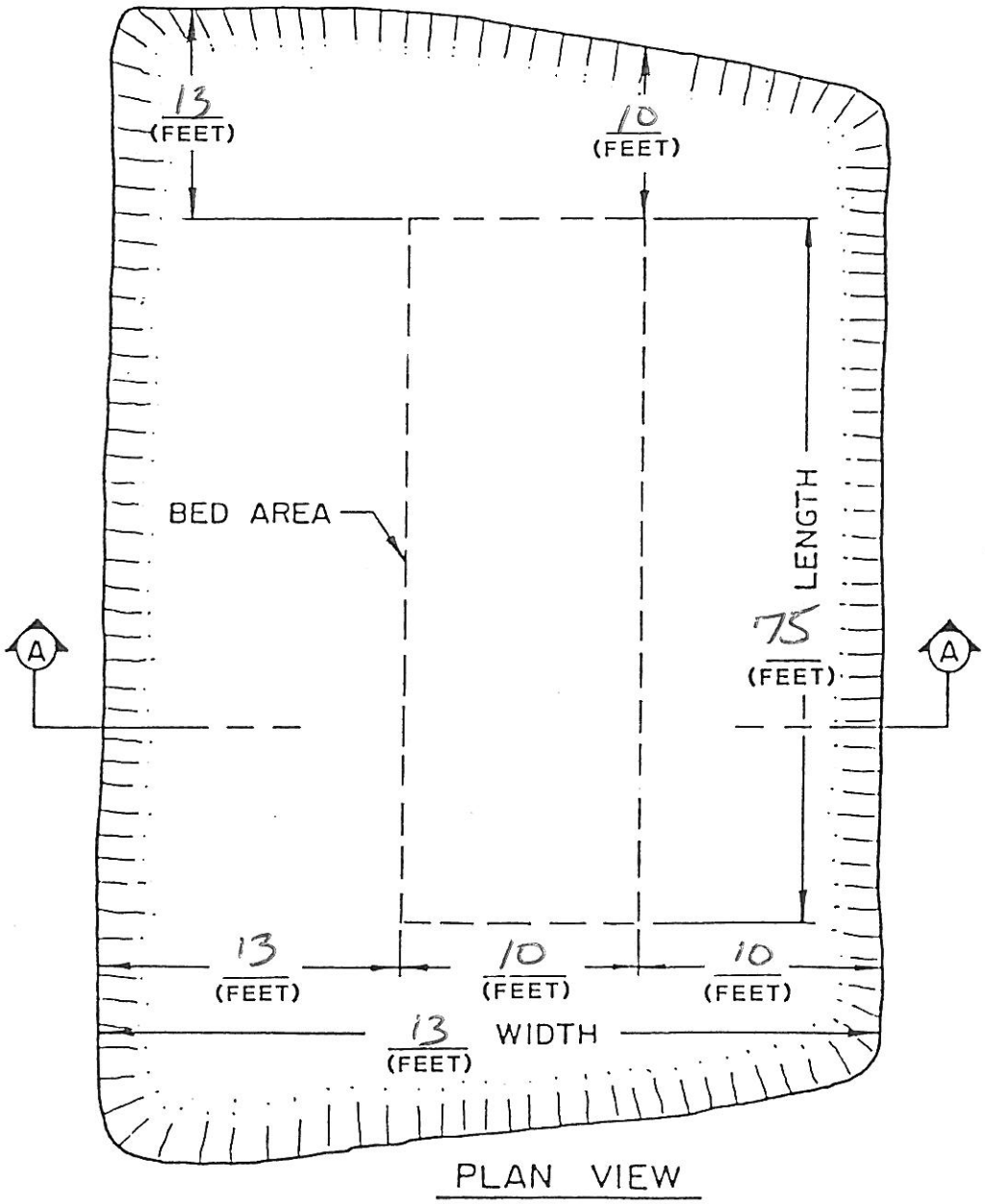


Final Dimensions:
33 x 95

MOUND



CROSS SECTION A-A



PLAN VIEW

PERCOLATION TEST SHEET

Test hole location P1 Hole # _____

TIME	INTERVAL (MINUTES)	WATER DEPTH	WATER DROP (fraction)	WATER DROP (decimal)	PERC RATE CALCULATION
12:45	START	8	1 3/4	1.75	30 / 1.75 = 17 A
1:15	30	6 1/4			TIME ÷ DROP (Decimal) = PERC
1:15	REFILL	8	1 13/16	1.81	30 / 1.81 = 17 B
1:45	30	6 3/16			TIME ÷ DROP (Decimal) = PERC
1:45	REFILL	8	1 5/8	1.63	30 / 1.63 = 18 C
2:15	30	6 3/8			TIME ÷ DROP (Decimal) = PERC
____	REFILL	____	____	____	____ ÷ ____ = ____ D
____	____	____			TIME ÷ DROP (Decimal) = PERC
____	REFILL	____	____	____	____ ÷ ____ = ____ E
____	____	____			TIME ÷ DROP (Decimal) = PERC
____	REFILL	____	____	____	____ ÷ ____ = ____ F
____	____	____			TIME ÷ DROP (Decimal) = PERC
____	REFILL	____	____	____	____ ÷ ____ = ____ G
____	____	____			TIME ÷ DROP (Decimal) = PERC
____	REFILL	____	____	____	____ ÷ ____ = ____ H
____	____	____			TIME ÷ DROP (Decimal) = PERC

conversion
1/16 = .0
1/8 = .13
3/16 = .19
1/4 = .25
5/16 = .31
3/8 = .38
7/16 = .44
1/2 = .5
9/16 = .56
5/8 = .63
11/16 = .69
3/4 = .75
13/16 = .81
7/8 = .88
15/16 = .94

P2

TIME	INTERVAL (MINUTES)	WATER DEPTH	WATER DROP (fraction)	WATER DROP (decimal)	PERC RATE CALCULATION
12:50	START	8	1 7/8	1.88	30 / 1.88 = 16 A
1:20	30	6 1/8			TIME ÷ DROP (Decimal) = PERC
1:20	REFILL	8	1 3/4	1.75	30 / 1.75 = 17 B
1:50	30	6 1/4			TIME ÷ DROP (Decimal) = PERC
1:50	REFILL	8	1 1/2	1.5	30 / 1.5 = 20 C
2:20	30	6 1/2			TIME ÷ DROP (Decimal) = PERC
____	REFILL	____	____	____	____ ÷ ____ = ____ D
____	____	____			TIME ÷ DROP (Decimal) = PERC
____	REFILL	____	____	____	____ ÷ ____ = ____ E
____	____	____			TIME ÷ DROP (Decimal) = PERC
____	REFILL	____	____	____	____ ÷ ____ = ____ F
____	____	____			TIME ÷ DROP (Decimal) = PERC
____	REFILL	____	____	____	____ ÷ ____ = ____ G
____	____	____			TIME ÷ DROP (Decimal) = PERC
____	REFILL	____	____	____	____ ÷ ____ = ____ H
____	____	____			TIME ÷ DROP = PERC

conversion
1/16 = .06
1/8 = .13
3/16 = .19
1/4 = .25
5/16 = .31
3/8 = .38
7/16 = .44
1/2 = .5
9/16 = .56
5/8 = .63
11/16 = .69
3/4 = .75
13/16 = .81
7/8 = .88

Soil Boring Log

Date: 8-11-12

Project Location: 49XX JAMACA AVE LAKE ELMO, MN 55042

Client: _____

Address: _____

City _____ State _____ Zip _____

Borings made by: TOM TROOIEN

Lic. # 1568

Boring method: Auger X Pit (Probe) Other _____

Color classification system: (Munsell) Other _____

Boring Number B1

Surface Elevation _____

Soil type at system depth: _____

Depth (Feet)	Texture	Color
7"	LOAMY TOPSOIL	10YR 3/2
1	FINE SILT LOAM	10YR 4/6
43"	SANDY SILT LOAM	7.5YR 5/6
4		
5		
6		
60"		
7		

Slope: 1 %

End of boring at 6 feet.

Standing water table: yes (no)

Present at _____ feet of depth,

_____ hours after boring.

Mottled soil: MOTTLES @ 52"

Observed at _____ feet of depth.

Not present in boring hole _____.

Observations and comments:

Boring Number B2

Surface Elevation _____

Soil type at system depth: _____

Depth (Feet)	Texture	Color
6"	LOAMY TOPSOIL	10YR 3/2
1	FINE SILT LOAM	10YR 4/6
38"	SANDY SILT LOAM	7.5YR 5/6
46"		
4		
5		
6		
7		

Slope: 1 %

End of boring at 46" ~~feet.~~

Standing water table: yes (no)

Present at _____ feet of depth,

_____ hours after boring.

Mottled soil: MOTTLES @ 40"

Observed at _____ feet of depth.

Not present in boring hole _____.

Observations and comments:

Soil Boring Log

Date: _____

Project Location: _____

Client: _____ Borings made by: _____

Address: _____

City _____ State _____ Zip _____ Lic. # _____

Boring method: Auger _____ Pit Probe Other _____ Color classification system: Munsell Other _____

Boring Number B3
Surface Elevation _____
Soil type at system depth: _____

Depth (Feet)	Texture	Color
–	LOAMY TOPSOIL	10YR 3/2
1	FINE SILT LOAM	10YR 5/6
2	SANDY SILT LOAM	7.5YR 4/6
3		
4		
5		
6		
7		

Slope: 1 %
End of boring at 38" ~~feet.~~

Standing water table: yes (no)
Present at _____ feet of depth,
_____ hours after boring.

Mottled soil: MOTTLES @ 29"
Observed at _____ feet of depth.
Not present in boring hole _____.
Observations and comments:

Boring Number _____
Surface Elevation _____
Soil type at system depth: _____

Depth (Feet)	Texture	Color
–		
1		
2		
3		
4		
5		
6		
7		

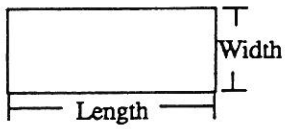
Slope: _____ %
End of boring at _____ feet.

Standing water table: yes no
Present at _____ feet of depth,
_____ hours after boring.

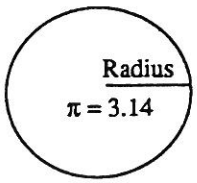
Mottled soil:
Observed at _____ feet of depth.
Not present in boring hole _____.
Observations and comments:

Sizing of Pump Station

1. Determine Surface Area
   Rectangle = Area = L x W
   5 x 10 = 50 square feet



   Circle = Area = π x (Radius)²
   3.14 x _____ x _____ = _____ square feet



   Other = Get Surface Area from Manufacturer
   _____ square feet

2. Calculate Gallons Per Inch
   There are 7.5 gallons per cubic foot of volume, therefore you must multiply the area times the conversion factor and divide by 12 inches per foot to calculate gallons per inch
   Area x 7.5 ÷ 12
   50 x 7.5 ÷ 12 = 31 gallons/inch

3. Calculate Gallons to Cover Pump (with 2 inches of water covering pump)
   (Height (in) + 2 inches) x gallons/inch
   (10 + 2) x 31 = 370 gallons

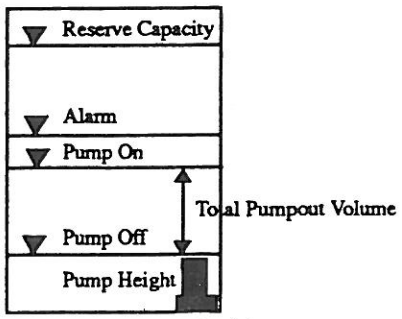
Estimated Sewage Flow in Gallons per Day (gpd)				
Number of Bedrooms	Type I	Type II	Type III	Type IV
2	300	225	180	60% of the values in the other columns
3	450	300	218	
4	600	375	256	
5	750	450	294	
6	900	525	332	
7	1050	600	370	
8	1200	675	408	

4. Calculate Total Pumpout Volume
   A. To maximize pump life select sump size for 4 to 5 pump operations per day.
   750 gpd ÷ 5 = 150 gallons per dose
   B. Calculate drainback
      a. Determine total pipe length, 50 feet.
      b. Determine liquid volume of pipe, 10 gallons per 100 feet. (see page F-13)
      c. Multiply length by volume: Drainback quantity =
      50 feet x 10 gallons ÷ 100 ft. = 5 gallons.
   C. Total pump out volume equals dose volume + drainback
   150 gallons per dose + 5 gallons = 155 Total gallons

Pipe diameter (inches)	Gallons per 100 feet
1	4.49
1.25	7.77
1.5	10.58
2	17.43
2.5	24.87
3	38.4
4	66.1

5. Calculate Volume for Alarm (typically 2 to 3 inches)
   Depth (in) x gallons/inch =
   31 x 2 = 62 gallons

6. Calculate Reserve Capacity (75% the daily flow)
   Daily flow (see page D-7) x .75 =
   750 x .75 = 560 gallons



7. Calculate total gallons
   gallons over pump + gallons pumpout + gallons alarm + gallons reserve
   3 + 4 + 5 + 6
   370 + 155 + 62 + 560 = 1147 gallons USE A 1200 GALLON PUMP TANK

8. Total Depth (Total gallon divided by gallon per inch)
   Total Gallon ÷ gallon/inch
   _____ ÷ _____ = _____ inches

9. Float Separation Distance (equal total pumpout volume)
   Total pumpout volume ÷ gallons/inch
   155 ÷ 31 = 5 inches

PUMP SELECTION PROCEDURE

A. Determine pump capacity:

gravity distribution

1. Minimum required discharge is 10 gpm
2. Maximum suggested discharge is 45 gpm

pressure distribution

see pressure design worksheeet

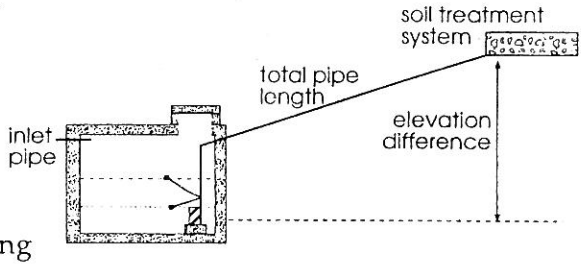
Selected pump capacity: 30 **gpm**

Perforation Discharges in gpm				
head (feet)	perforation diameter (inches)			
	1/8*	3/16	7/32	1/4
1.0[a]	0.18	0.42	0.56	0.74
2.0[b]	0.26	0.59	0.80	1.04
5.0	0.41	0.94	1.26	1.65

[a] Use 1.0 foot for single-family homes.
[b] Use 2.0 feet for anything else.
* Potential for plugging

B. Determine head requirements:

1. Elevation difference between pump and point of discharge.
   8 ± **feet**
2. Special head requirement:
   If pumping to a pressure distribution system, five feet for pressure required at manifold. If gravity system, zero. 5 **feet**
3. Friction loss
   a. Enter friction loss table with gpm and pipe diameter. Read friction loss in feet per 100 feet from table.
   F.L. = 1.55 ft./100 ft of pipe
   b. Determine total pipe length from pump to discharge point. Estimate by adding 25 percent to pipe length for fitting loss. Equivalent pipe length times 1.25 = total pipe length
   50 x 1.25 = 625 feet
   c. Calculate total friction loss by multiplying friction loss in ft/100 ft by equivalent pipe length.
   Total friction loss = 62.5 x 1.55 ÷100 = 1 **feet**



4. Total head required is the sum of elevation difference, special head requirements, and total friction loss.
   8 + 5 + 1 (1) (2) (3c)

Total head: 14 **feet**

Friction Loss in Plastic Pipe Per 100 feet			
flow rate gpm	nominal pipe diameter 1.5"	2"	3"
20	2.47	0.73	0.11
25	3.73	1.11	0.16
30	5.23	1.55	0.23
35	6.96	2.06	0.30
40	8.91	2.64	0.39
45	11.07	3.28	0.48
50	13.46	3.99	0.58
55		4.76	0.70
60		5.60	0.82
65		6.48	0.95
70		7.44	1.09

C. Pump selection

1. A pump must be selected to deliver at least 30 gpm (Step A) with at least 14 **feet of total head** (Step B).

Table III Minimum Setback Distances (Feet)

Feature	Sewage Tank	Soil Treatment Area
Water Supply Well less than 50 feet deep and not encountering at least ten feet of impervious material.	50	100
Any other water supply well or buried water suction pipe	50	50
Buried pipe distributing water under pressure	10	10
Occupied buildings and buildings with basements or crawl spaces	10	20
Non-occupied structures	5	10
Property lines	10*	10*
Above ground swimming pools	10	10
In ground swimming pools	10	10
The Ordinary High Water Mark of:		
Natural Environment Lakes and Streams	150*	150*
Recreation Development Lakes and Streams	75*	75*
General Development Lakes and Streams	75*	75*
All unclassified waters	75*	75*
St. Croix River Rural Districts	150*	150*
St. Croix River Urban Districts	100*	100*
Blufflines:		
St. Croix River Blufflines	40*	40*
Shoreland Blufflines	20*	20*