



3800 Laverne Avenue North  
Lake Elmo, MN 55042

(651) 747-3900  
[www.lakeelmo.org](http://www.lakeelmo.org)

## **NOTICE OF MEETING**

The City of Lake Elmo  
Planning Commission will conduct a meeting on  
**Monday June 24, 2019**  
**at 7:00 p.m.**

## **AGENDA**

1. Pledge of Allegiance
2. Approve Agenda
3. Approve Minutes
  - a. May 29, 2019
  - b. June 10, 2019
4. Public Hearings
  - a. Conditional Use Permit - Carmelite Hermitage Chapel (8249 Demontreville Trail)
5. Business Items
  - a. Screening Requirements and Off-Street Parking Regulations in Rural Residential Zoning Districts – Draft Ordinance Amendment
6. Communications/Updates
  - a. City Council Update – June 18, 2019
  - b. Staff Updates
    1. Upcoming Meetings:
      - July 8, 2019
      - July 22, 2019
7. Adjourn

\*\*\*Note: Every effort will be made to accommodate person or persons that need special considerations to attend this meeting due to a health condition or disability. Please contact the Lake Elmo City Clerk if you are in need of special accommodations.



**City of Lake Elmo  
Planning Commission Meeting  
Minutes of June 10, 2019**

Commissioner Weeks called to order the meeting of the Lake Elmo Planning Commission at 7:00 p.m.

**COMMISSIONERS PRESENT:** Cadenhead, Hartley, Holtz, Risner and Weeks

**COMMISSIONERS ABSENT:** Johnson and Steil

**STAFF PRESENT:** Planning Director Roberts

**Approve Agenda:**

M/S/P: Hartley/Risner move to approve the agenda as presented, ***Vote: 6-0, motion carried unanimously.***

**Approve Minutes:**

M/S/P: Cadenhead/Hartley, move to approve the April 8, 2019 minutes as presented, ***Vote: 6-0, motion carried unanimously.***

M/S/P: Hartley/Risner, move to approve the April 22, 2019 minutes as presented, ***Vote: 6-0, motion carried unanimously.***

**Public Hearing – None**

**Business Item – Screening Requirements and Off-Street Parking Regulations in Rural Residential Zoning Districts**

Roberts presented there is some confusion and inconsistency between sections 150.001 and 154.407 of the zoning code. The proposed changes to the ordinance are for lots of an acre or more and take into consideration the comments from the previous meeting.

Holtz asked about if page 2 is replacing page 1, he also asked where 25 ft. size limit came from since it does limit some property owners. Roberts explained that they are taking the language of the two existing sections and combining them into one section so there will be no confusion. Roberts explained the size is commonly used size in other codes.

Holtz asked what “good” condition meant and said “operable” would be a better word. He also asked about “neatly stacked” and suggested that “for safety” is added to provide clarity.

Weeks mentioned she felt it was to provide direction to staff. She drove through the rural areas and did not see issues from the street, she did see properties in technical violation due to boat trailers in the front yard around the lakes.

Cadenhead would like to see a height limit of stacked firewood included. Suggested that durable parking areas be better defined to include not subject to rutting or erosion.

Risner asked about why the rear property line was removed when a side property line was added. Roberts suggested that adding to all property lines would work.

Holtz asked if it was purposeful for a recreational trailer to be excluded from the list of trailers allowed. Roberts suggested that it was not intentionally excluded

Roberts stated that he will schedule the public hearing for the ordinance change for July 8 to include the changes mentioned today.

#### **City Council Updates – June 4, 2019**

1. There was one item on the Consent Agenda – the City of Grant Comprehensive Plan. The City had “not comment” to the plan.
2. They City awarded the road reconstruction and signal lights contract for Keats Avenue and Hudson Boulevard.

#### **Star Tribune Article – June 1, 2019**

Article provided for information only

#### **Staff Updates**

1. Upcoming Meeting
  - a. July 8, 2019 – A Concept Plan for another senior housing development along 39<sup>th</sup> next to Arbor Glen. It will be affiliated with Arbor Glen and aiming for residents 62 and older.

Meeting adjourned at 8:07 pm

Respectfully submitted,

Tanya Nuss  
Permit Technician



## STAFF REPORT

DATE: 6/24/2019

**REGULAR**

ITEM #: 5a

**Public Hearing**

**TO:** Planning Commission  
**FROM:** Ken Roberts, Planning Director  
**AGENDA ITEM:** **Conditional Use Permit – Carmelite Hermitage of the Blessed Virgin Mary**  
**REVIEWED BY:** Ben Prchal, City Planner

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### **BACKGROUND:**

The City has received an application for a conditional use permit (CUP) to allow the construction of a place of worship (chapel) on the property of the Carmelite Hermitage at 8249 Demontreville Trail. This site within a Public and Quasi-Public Open Space zoning district. Places of worship (such as churches and chapels) are conditional uses in the Public and Quasi-Public Open Space zoning district.

### **ISSUE BEFORE PLANNING COMMISSION:**

The Planning Commission is being asked to consider the request for the conditional use permit, conduct a public hearing and make a recommendation to the City Council about the CUP for the proposed chapel at the Carmelite Hermitage at 8249 Demontreville Trail.

### **PROPOSAL DETAILS/ANALYSIS:**

*Applicants:* Carmelite Hermitage of the Blessed Virgin Mary, 8249 Demontreville Trail, Lake Elmo, MN 55042

*Property Owners:* Disclaced Carmelite Nuns of St. Paul, 8251 Demontreville Trail, Lake Elmo, MN 55042

*Location:* ALL OF GOVERNMENT LOT 4, IN SECTION 9, TOWNSHIP 29 NORTH, RANGE 21 WEST, ACCORDING TO THE GOVERNMENT SURVEY CONTAINING 59.4 ACRES OF LAND. ALSO, THE SOUTH 30.6 ACRES OF GOVERNMENT LOT 4 IN SECTION 4, AND THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER OF SAID SECTION 4, ALL IN TOWNSHIP 029 RANGE 021, ACCORDING THE GOVERNMENT

SURVEY, BEING THE SOUTH 688 FEET THEREOF. PID#  
09.029.21.12.0002

*Request:* Conditional Use Permit for a place of worship and religious institution

*Existing Land Use:* Hermitage – A retreat for monks with a community building and garage, cloistered living area with courtyards

*Existing Zoning:* PF – Public and Quasi-Public Open Space

*Surrounding Land Use / Zoning:* North – Properties owned by Discalced Carmelite Nuns (8251 Demontreville Trail) and Jesuit Retreat House (8243 Demontreville Trail);  
South – Single-family homes (Rural Residential);  
East – Single-family homes (Rural Residential);  
West – Lake Demontreville

*Comprehensive Plan Guidance:* 2030 – Public/Park  
2040 – Institutional. As noted the in the 2040 Comprehensive Plan, this land use category identifies land that is used for schools, religious institutions, City Hall, municipal buildings, libraries and other institutional uses.

*History:* In December 1991, the City approved a variance (regarding code requirement for having frontage on a public road) and a master plan for the Carmelite Hermitage of the Blessed Virgin Mary. This master plan included a phasing plan showing four parts or phases and included a court, guest house /library, chapel, cloister, hermitage, community building and workshop. The variance noted that the applicant has a private recorded easement that allows access to the north from their site to Demontreville Trail North (across the adjoining properties).  
In October 2007, the City approved an amendment to the approved master plan to allow an additional accessory building (1,512 square feet) on their site.

*Deadline(s) for Action:* Application Complete – 5-24-2019  
60 Day Deadline – 7-23-2019  
Extension Letter Mailed – No  
120 Day Deadline – N/A

*Applicable Regulations:* §154.210 – Off-Street Parking  
Article XIV: Public and Semi-Public Districts

**Request.** A place of worship in Lake Elmo is a conditional use in the Public and Quasi-Public Open Space district. The City approved the Master Plan for the Carmelite Hermitage in 1991 as previously mentioned in this report, but a conditional use permit was never obtained, as the use was considered permitted at that time. The City adopted the Public and Quasi-Public Open Space ordinance in September of 2000, and this ordinance required conditional use permits for places of worship and set forth certain standards for such a use as well as other district requirements that are in place today.

Because the property does not have a conditional use permit as is required by the Zoning Code, the existing use is considered legal non-conforming. The City’s ordinance states that the lawful use of a building or structure may continue, but that the continuation of the non-conforming use does not include expansion. Since the applicant is requesting expansion of the non-conforming use (by adding a chapel), the City must approve a conditional use permit for the entire property in order for the applicant to add the chapel and to bring the property in to compliance with current zoning requirements. (Note: Conditional use permits run with or are applicable to a specific property, not with a particular owner or person).

**Use on Proposed Site.** The proposed chapel would be to the west of the existing buildings and south of the existing driveway into the site. As shown on the plans, the chapel would be about 8,520 square feet in area with a height of 41 feet, four inches. The applicant noted in their project description that the chapel would be used for liturgical services and for personal prayer and would have seating for 42 guests in addition to the seating for the 12 members of their community.

They also state that since their community members live in a Hermitage and since their way of life is relatively secluded, they do not generate a significant amount of vehicle traffic. They are anticipating an average of 10-15 visitors a day to their site. They have two part-time employees to help maintain the grounds and buildings. The Hermitage is open to the public between 7:30 AM and 4:30 PM. They are not planning to hold regular church or public worship services in the chapel.

**Setback and Impervious Surface Requirements.** The following table outlines how the proposed use adheres to the setback and impervious surface requirements of the Public and Quasi-Public Open Space District.

Public and Quasi Public Open Space Zoning Standards		
Standard	Required	Proposed
Maximum Parcel Area	20 acres	90 acres
Lot Width – Minimum (at ROW)	100 feet	Approximately 1793 feet
Lot Depth – Minimum	150 feet	Approximately 2015 feet
Maximum Height	50 feet	Approximately 41 feet
Maximum Impervious Coverage	15%	1.2%
Front Yard Setback – Building	100 feet	Approximately 1000 feet
Interior Side Yard Setback – Building	100 feet	Approximately 900 feet
Rear Yard Setback - Building	100 feet	Approximately 1000 feet
Parking Lot Setback	100 foot	Approximately 200 feet

**Standards for Places of Worship within the Public and Quasi-Public Zoning District.** The following outlines standards for places of worship as outlined in the Public and Quasi-Public zoning district.

- a. Direct access is provided to a public street classified by the Comprehensive Plan as major collector or arterial;
  - *Staff Comment.* The City approved a variance for the access to this site in 1991. There is an existing driveway that connects the property to Demontreville Trail that is in an access easement that has been in place since 1904.
- b. No use may exceed 235 gallons wastewater generation per day per net acre of land;

- *Staff Comment.* It is unknown how much wastewater is generated, but it is assumed there is no more than 235 gallons being generated per net acre on a 90 acre site.
- c. No on-site sewer system shall be designed to handle more than 5,000 gallons per day;
  - *Staff Comment.* The proposed drainfield is 15,000 square feet in area and according to the SSTS design report dated May 8, 2019 is designed to handle 350 gallons of waste a day.
- d. Exterior athletic fields shall not include spectator seating, public address facilities or lighting;
  - *Staff Comment.* There are no exterior athletic fields.
- e. No freestanding broadcast or telecast antennas are permitted. No broadcast dish or antenna shall extend more than 6 feet above or beyond the principal structure.
  - *Staff Comment.* There are no broadcast or telecast antennas, existing or proposed.

### **Parking Lot Requirements.**

The project plans show a new 18-vehicle parking lot to the west of the entrance driveway and to the northwest of the proposed chapel.

- *Maneuvering Area.* There is sufficient space in and around the parking lot so vehicles do not need to back in to the public street.
- *Surfacing and Drainage.* The majority of the parking lot would have curbing and would be paved with a durable surface. Stormwater drainage would be directed to the northeast to a new infiltration basin on the site.
- *Marking of Parking Spaces.* The Code requires parking areas with five or more spaces to be marked with painted lines at least four inches wide. The plans for the parking lot show striping to meet this requirement.
- *Curbing.* Open off-street parking areas designed to have head-in parking along the property line shall provide a bumper curb or barrier of normal height. The proposed parking lot meets this requirement.
- *Accessible Parking.* The proposed number of parking spaces is 18 and of these, one would be handicap-accessible, which meets the Americans with Disabilities Act (ADA) requirements.
- *Number of Parking Spaces.* The City's parking requirements requires one space per six seats. There are 54 seats within the chapel so the Code would only require 9 parking spaces for the chapel. The applicant has proposed 18 parking spaces thus meeting this requirement.

### **Parking Lot Landscaping and Screening Standards**

- *Perimeter Parking Lot Landscaping.* The proposed parking lot is located in the center of the property – well away from the street right-of-way and from any property lines. The existing trees on the site provide adequate screening and landscaping around the proposed parking lot.

**Landscape Plans.** The applicant has submitted surveys and project plans showing the existing landscaping and wooded areas on the property. Since the site has extensive areas of trees and since the proposed chapel would not be removing any existing trees, staff does not recommend that the City review or require additional landscaping on the property.

**Septic Drainfield.** The existing drainfield is to the south of the existing building and the proposed chapel will not affect the existing drainfield. The project plans show a new drainfield to the south of the proposed chapel. This new drainfield will require a permit from the Washington County Public Health and Environment Department before installation.

**Architectural Standards within the Public and Quasi-Public Open Space.** The exterior design of the chapel is subject to the Performance Standards set forth in Section 154.600(F) of the Zoning Code. The proposed chapel would be constructed with a mix of brick, limestone, marble and have a green shingled roof. These materials meet the requirements for exterior materials as listed in the zoning code and the overall design meets or exceeds all the design standards set in Section 156.600 of the Zoning Code.

**Fire Chief Review.** I have attached the Fire Chief's review comments (dated June 5, 2019) for your consideration. Staff is recommending that the applicant meet all the requirements of the Fire Chief before the City issues a building permit for the chapel.

**City Engineer Review.** The City Engineer's review memo (dated June 17, 2019) is attached to this report. His comments are primarily about stormwater management for the project. He noted:

- The project will require a Valley Branch Watershed District (VBWD).
- The storm water facilities for this development should remain privately owned and maintained.
- The storm water facility 100-year HWL must be fully contained within the subject property and easement must be provided to protect the 100-year HWL flood area.
- The applicant shall provide drainage and utility easement over storm water BMP including the 100-year HWL and pond maintenance access road and access bench.

**Recommendation Findings.** Staff recommends the following findings:

1. The proposed use will not be detrimental to or endanger the public health, safety, comfort, convenience or general welfare of the neighborhood or the city. ***The use of the property for religious facilities, including the proposed chapel, will not be detrimental or in any way endanger the public health, safety, comfort, convenience or welfare of the neighborhood or the City.***
2. The use or development conforms to the City of Lake Elmo Comprehensive Plan. ***The property is guided for Public/Park in the 2030 Comprehensive Plan and Institutional in the proposed 2040 Comprehensive Plan. A place of worship is a conditional use in these land use designations.***
3. The use or development is compatible with the existing neighborhood. ***The use is compatible with the existing neighborhood. The religious facilities in this area were established in the 1950's and Hermitage has been on this site since the 1980's.***
4. The proposed use meets all specific development standards for such use listed in Article 7 of this Chapter. ***The existing and proposed uses meet all specific development standards for such use as listed in Section 154.600 Public and Quasi-Public Open Space.***
5. If the proposed use is in a flood plain management or shoreland area, the proposed use meets all the specific standards for such use listed in Chapter 150, §150.250 through 150.257 (Shoreland Regulations) and Chapter 152 (Flood Plain Management). ***The existing structures and the proposed chapel would be located outside the 0.2% annual chance floodplain and meets shoreland setback requirements.***

6. The proposed use will be designed, constructed, operated and maintained so as to be compatible in appearance with the existing or intended character of the general vicinity and will not change the essential character of that area. ***The proposed chapel is compatible in appearance with the existing and intended character of the general vicinity and will not change the essential character of the area.***
7. The proposed use will not be hazardous or create a nuisance as defined under this Chapter to existing or future neighboring structures. ***The existing religious facilities and the proposed chapel are not nor will they will be hazardous or create a nuisance.***
8. The proposed use will be served adequately by essential public facilities and services, including streets, police and fire protection, drainage structures, refuse disposal, water and sewer systems and schools or will be served adequately by such facilities and services provided by the persons or agencies responsible for the establishment of the proposed use. ***The existing facilities and the proposed chapel are and will be adequately served by essential public facilities and services, including streets, police and fire protection, drainage structures, refuse disposal, water and sewer systems and schools.***
9. The proposed use will not create excessive additional requirements at public cost for public facilities and services and will not be detrimental to the economic welfare of the community. ***The existing facilities and the proposed chapel do not and will not create excessive additional requirements at public cost nor will the existing or proposed facilities on the property be detrimental to the economic welfare of the community.***
10. The proposed use will not involve uses, activities, processes, materials, equipment and conditions of operation that will be detrimental to any persons, property or the general welfare because of excessive production of traffic, noise, smoke, fumes, glare or odors. ***The existing and proposed uses will not excessively produce traffic, noise, smoke, fumes, glare or odors.***
11. Vehicular approaches to the property, where present, will not create traffic congestion or interfere with traffic on surrounding public thoroughfares. ***Vehicular approaches to the property do not and will not create and have not created traffic congestion or interfere with traffic. The number of additional vehicles expected on the property because of the new chapel is minimal and will be limited to certain times and days of the weeks.***
12. The proposed use will not result in the destruction, loss or damage of a natural or scenic feature of major importance. **N/A**

**Recommended Conditions of Approval.** If the Planning Commission wishes to recommend approval, staff recommends the following conditions:

- 1) The applicant must obtain all other necessary City, State, and other governing body permits and approvals before the commencement of any construction activity on the site. These include, but not limited to, a Valley Branch Watershed District permit, approval of revised plans by the City Engineer, a building permit and an on-site wastewater (septic) permit.
- 2) All items and changes outlined by the City Engineer in the memorandum addressing the Carmelite Chapel Conditional Use Permit and Site Improvements dated June 17, 2019 shall be incorporated into the project plans.

- 3) All items outlined by the Fire Chief in his memo dated June 5, 2019, shall be incorporated into the project plans and before the City issues a building permit for the project.
- 4) The applicant must provide written documentation demonstrating adequate wastewater management facilities exist or are proposed to serve the proposed chapel. This should include either a Washington County inspection compliance report for the existing on-site wastewater system or a wastewater management plan and permit approved by Washington County to serve the proposed chapel.
- 5) The applicant or owner receive a building permit from the City for chapel within 12 months of City Council approval of the conditional use permit.
- 6) If the applicant or owner has not taken action toward starting the chapel or if substantial construction of the chapel has not taken place within 12 months of the City's approval of conditional use permit, the CUP approval shall become void. The applicant or owner may request City Council approval of a time extension to start or implement the conditional use permit.

**FISCAL IMPACT:**

None

**OPTIONS:**

The Planning Commission may:

- Recommend approval of the Conditional Use Permit with recommended findings and conditions of approval.
- Recommend approval of the Conditional Use Permit with amended findings and conditions of approval.
- Recommend denial of the Conditional Use Permit, citing findings for denial.

**RECOMMENDATION:**

Staff is recommending approval of the Conditional Use Permit for the Carmelite Hermitage of the Blessed Virgin Mary including the proposed chapel for the property located 8249 Demontreville Road:

***“Move to recommend approval of the conditional use permit for the Carmelite Hermitage including the proposed chapel for the property located at 8249 Demontreville Road with recommended findings and conditions of approval as drafted by Staff.”***

**ATTACHMENTS:**

- Application Narrative dated May 24, 2019
- 4 City Maps
- Site Survey
- Certificate of Survey
- Engineering Project Plans (2 sheets)
- Architectural Plans (5 sheets)
- May 8, 2019 SSTS Design Report
- City Engineer Review Memo dated June 17, 2019
- Fire Chief Review memo dated June 5, 2019
- Neighbor comments (Falzone) dated June 16, 2019

## Land Use Application – 5-24- 2019

### Property Location

All of Government Lot 4 in Section 9, Township 29 north, Range 21 west, City of Lake Elmo, Washington County, Minnesota, according to government survey containing 59.4 acres of land. Also the south 30.6 acres of Government Lot 4 in Section 4, and of the southwest quarter of the southeast quarter of said Section 4, all in Township 29 north, Range 21 west, according to government survey, being the south 688 feet thereof.

### Detailed Reason for the Request

In December of 1991, the City of Lake Elmo approved the master plan of the Carmelite Hermitage of the Blessed Virgin Mary (aka Carmel of the Blessed Virgin Mary). The master plan included a phasing plan of four parts. Phase 1, consisting of a community building and garage was constructed in 1991/92. Phase 2, consisting of a central court yard with covered walkways (cloister) was constructed in 2001/2002. Phase 3 consists of a chapel and is the building we would now like to construct. Phase 4 will consist of a guest building and library. We hope to commence Phase 4 around 2022. We request City approval of a conditional use permit to construct our chapel because it is an essential building of every monastery and will provide needed worship space for the members of the Hermitage and their guests.

### Variance Requests

No variances requested.

## 2a. Contact Information

### Owner of Record

Discalced Carmelite Nuns of Saint Paul  
8251 Demontreville Trail  
Lake Elmo, MN 55042  
651-777-3882

### Authorized Agent

Reverend John Burns  
Carmelite Hermitage of the Blessed Virgin Mary  
8249 Demontreville Trail  
Lake Elmo, MN 55042  
651-779-7351  
[carmelbvm@gmail.com](mailto:carmelbvm@gmail.com)

### Architect

Duncan Stroik  
218 West Washington Avenue  
Suite 1200  
South Bend, IN 46601  
574-232-1783  
[stroik@stroik.com](mailto:stroik@stroik.com)

### Civil Engineer

Paul Cherne, P.E.  
Pioneer Engineering

2422 Enterprise Drive  
Mendota Heights, MN 55120  
651-251-0630  
[pcherne@pioneereng.com](mailto:pcherne@pioneereng.com)

**Surveyor**

Joel Anez  
Landmark Surveying, Inc.  
21070 Olinda Trail North  
Box 65  
Scandia, MN 55073  
651-433-3421  
[inthefield@frontiernet.net](mailto:inthefield@frontiernet.net)

**Septic System**

Jesse Kloepfner  
Steinbrecher Companies, Inc.  
Zimmerman, MN 55398  
763-843-4114  
[septic@IssiMN.com](mailto:septic@IssiMN.com)

**2b. Property Information****Addresses**

Disalced Carmelite Nuns of St. Paul  
8251 Demontreville Trail  
Lake Elmo, MN 55042

Carmelite Hermitage of the Blessed Virgin Mary  
8249 DeMontreville Trail  
Lake Elmo, MN 55042

**Current Zoning**

Public Facility (PF)

**Parcel Size**

90.109 acres  
3,924,760 square feet

**PID**

0902921120002

**Current Legal Description**

All of Government Lot 4 in Section 9, Township 29 north, Range 21 west, City of Lake Elmo, Washington County, Minnesota, according to government survey containing 59.4 acres of land. Also the south 30.6 acres of Government Lot 4 in Section 4, and of the southwest quarter of the southeast quarter of said section 4, all in Township 29 north, Range 21 west, according to government survey, being the south 688 feet thereof.

## **2c. History of the Property**

The property under consideration was homesteaded in the 1800s and remained farm land until 1954. At one time William Jennings was owner of all of Lot 4, Section 9, Township 29, Range 21, and all of Lots 3 and 4 and the West one-half of the Southeast Quarter of Section 4, Township 29, Range 21, West in Washington County, Minnesota.

On 25 August 1904, William Jennings and his wife conveyed to Christian Figge by warranty deed dated that day, Government Lot 4, Section 9, Township 29, Range 21, and also the South 30.6 acres of Lot 4 in Section 4 and of the Southwest Quarter of the Southeast Quarter of Section 4, Township 29, Range 21. As part of said conveyance, William Jennings also granted to Christian Figge a right of way (easement) to Figge's property over Government Lots 3 and 4 in Section 4 as described in a deed recorded in Book 72 of the Book of Deeds, page 80, Washington County, Minnesota. This is the easement from Demontreville Trail across property now owned by the Jesuit Retreat House and to the property under consideration that has existed since 1904.

In 1954, the Discalced Carmelite Nuns of Saint Paul, a non-profit corporation under the laws of the State of Minnesota, were looking for property upon which to build a permanent monastery. They were advised of the property which they now own and entered into negotiations with the current owners.

On 2 February 1954, Phillip C. Mackey and his wife Bernadine R. Mackey conveyed their property, along with its easement, to the Discalced Carmelite Nuns of Saint Paul by warranty deed, dated that day, and filed for record in Washington County, Minnesota, on 4 February 1954. At the time of purchase, said property had been on the market for five years. The Carmelite Nuns built their monastery upon their newly acquired property in 1954/55. They moved into the new monastery in 1955 and have resided there since that time.

In 1983, Rev. John Burns, a Carmelite priest, became chaplain for the Carmelite Nuns in Lake Elmo. After several years, the Carmelite Nuns and Fr. Burns mutually agreed that it would be beneficial to the Carmelite nuns if the Carmelite Fathers and Brothers established their own monastery on the property. This would assure the nuns of future chaplains and allowed the Carmelite Fathers to have a presence in the Twin Cities. In 1987 Carmel of the Blessed Virgin Mary (aka Carmelite Hermitage, Carmelite Hermitage of the Blessed Virgin Mary) was incorporated in the State of Minnesota. Other priests and brothers joined the community over the years.

The Order of Carmelites was founded on Mount Carmel (present State of Israel) sometime before 1200 AD. From there it has spread to six continents. Currently there are about 900 monasteries of nuns with a total membership of 10,000, and 1,000 houses of Carmelite priests and brothers with about a total membership of 6,000. We are part of the Roman Catholic Church.

Our way of life consists of prayer, study, and labor to support ourselves. We also welcome visitors who wish to find a quiet place to refresh their minds and hearts, to reflect and pray, either by themselves or with us, and who may desire to seek guidance for their lives by talking with one of the members of our community. The chapel is the heart of our monastery buildings. Our day is punctuated by liturgical services and times of personal prayer. We live a simple way of life and support ourselves through arts and crafts, organic gardening, maple syrup production, woodworking and self-maintenance of our property and buildings.

## **2d, i.**

The 90 acre tract upon which the new chapel will be built is approximately 60% woodland and 40% prairie and is situated on the east bank of Lake Demontreville. Wildlife is abundant in all areas of the property. We have a personal commitment to live in harmony with our natural surroundings and to employ horticultural practices which do not pollute but rather benefit the environment. We have spent many hours removing buckthorn and diseased trees from our property and planting species of trees and shrubs which are beneficial to wildlife.

The new chapel will be situated just west of the existing buildings of the Hermitage. The land there is almost flat, and construction of the chapel will not require any significant changes to the topography. The hermitage is situated in an open field surrounded by woodlands. The area in the immediate vicinity of the hermitage is planted with lawn, trees, shrubs, and flower beds. Access to the hermitage is provided by a private road from Demontreville Trail. The distance between the hermitage and Demontreville Trail is approximately ½ mile.

Since we live at the Hermitage, and since our way of life is relatively secluded, we leave the Hermitage infrequently, and therefore we do not generate a significant amount of traffic. Visitors to our Hermitage now average 1-2 per day. Additionally, we have regular mail delivery and occasional deliveries by UPS or FedEx. Our new chapel will be open to the public during the day and may generate an increased number of visitors. Because of the remoteness of our property and the fact that we do not advertise, we do not anticipate an increase of visitors beyond an average of 10-15 per day. We do not operate any programs for the public, although we may have a special celebration a few times per year to which guests are invited. We do not anticipate any adverse effects upon the natural areas of our property during or after the construction of the chapel.

#### **2d, ii.**

We currently have seven members in our community, and we may eventually grow to a maximum of twelve members. We have two part-time employees who help to maintain our grounds and buildings. The Hermitage opens to the public at 7:30 AM and closes at 4:30 PM. We have a gate which prevents access to the hermitage after-hours.

Our community building provides living and work spaces for the members of the community, including a kitchen, dining room, laundry, shower room, library, infirmary, and mechanical room. To the west of the community building and attached to it lies the cloister. This consists of a quadrangle surrounded by covered walkways which allow passage from one building to another under a roof. The open interior of the cloister is landscaped with flowerbeds and a pool. Off the north and south sides of the cloister are found the bedrooms of the members of the community. The new chapel will be situated just west of the cloister. The chapel will be used for liturgical services and for personal prayer. It has a planned seating capacity of 42 guests, in addition to the members of our community (12 maximum).

#### **2e, i.**

Since the parcel of land upon which the chapel will be built is very large and since the chapel will be located in the middle of the parcel, we do not foresee that the chapel will cause any inconvenience or disturbance to the neighborhood or to the City. Our community greatly values silence as an appropriate atmosphere for prayer and personal reflection. None of the activities carried on in the new chapel will create noise. The chapel will be built of durable and noble materials which will enhance the beauty of the neighborhood. The safety of our grounds and buildings is important to us. No toxins or harmful waste products are produced as a result of activities at our monastery, and we are committed to recycling and energy conservation.

#### **2e, ii.**

Our parcel of land has always been and continues to be zoned as Public Facility. No change in land use is envisioned in our plans. Since our parcel of land is heavily wooded and borders Lake Demontreville on its west side, we in no way interfere with the development plans of the City of Lake Elmo. The comprehensive plan is for public/park. The rural character of the area will not be changed by the addition of the new chapel building.

**2e, iii.**

Our property is bordered on the south and east by low density private housing, on the north by the Jesuit Retreat House, and on the west by Lake Demontreville. Woodland separates our buildings from the single-family neighborhoods which border our property to the east and to the south. Woodlands also separate us from the Jesuit Retreat House. There is no direct view of our buildings from any neighboring property. There is no incompatibility between our hermitage and the existing neighborhood. We have excellent relations with our neighbors. Many have told us that they are very grateful to live next to our hermitage both because of the prayerful and religious nature of our life and also because of our extensive woodlands.

The Jesuit Retreat House shares the same prayerful and religious activities as we do. Far from being incompatible, our institutions belong to the same church and share a common way of life. The one priest who is resident at the Jesuit Retreat House opposes our new chapel because of a fear that it will increase traffic on the roadway which passes through Jesuit property to reach our hermitage. We have told him that we will work with him to minimize any disturbance to the retreats which take place from Thursday evening through Sunday evening most weeks. Since we do not advertise in any way nor offer programs for the public, we do not anticipate large crowds coming to our hermitage. Visitors will be intermittent and will usually arrive in a single car. By contrast, there may be fifty or more cars which come to and leave from the Jesuit Retreat House at the beginning or end of the weekly retreat. Trucks make food deliveries during the week and a laundry truck comes each week to replace sheets and towels. The Retreat House employs far more people than our Hermitage, and this also adds to the traffic in the area.

**2e, iv.**

Our project conforms to Article 7 of the Zoning Code, including general requirements for parking as regards dimensions and number of parking spaces.

**2e, v.**

The project is not in a flood plain. The project is in a shoreland district. The project meets the setback and lot area requirements of the ordinance. Demontreville Lake is a recreational development lake. The project is a permitted use in the shoreland district

	Ordinance	Proposed
Setback County Road	50	2750'
Setback Public Street	20	1025'
Setback OHW	200	980'
Setback top of bluff	30	220'
Setback OHW- Septic	75	810'
Maximum impervious coverage	15%	1.2%

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**2e, vi.**

The new chapel will be constructed of the same materials as the existing buildings of the hermitage (brick and stone). The monastery of the Carmelite nuns is also a brick structure. The main building complex of the Jesuit Retreat House is a limestone structure. No change in the character of the area will result from the construction of our chapel. The nearest land uses are also religious.

**2e, vii.**

The chapel will be isolated from neighbors and will not create a hazard or nuisance to existing or future neighboring structures.

**2e, viii.**

The project will be served adequately by existing public services and will not create any additional demand for public services. The site utilizes an onsite well and onsite septic system. In 1991 officials from the Lake Elmo Fire Department visited our Hermitage to determine whether our site presented any difficulties of access for the fire department. Fire Chief Dick Sachs stated in writing that our site did not pose any problems to his department. (See attached letter.)

**2e, xi.**

The project will not create a need for additional public services or facilities. No detriment to the economic welfare of the community will result from the construction of our chapel.

**2e, x.**

The chapel will be used for religious purposes by the residents of the Hermitage. Guests and visitors will have access to the chapel at suitable hours of the day. The chapel has a planned seating of 42 persons, but we do not anticipate having nearly this many people at our services on a daily basis. At the present time, we have no more than 0 to 10 visitors a day. Most days the number is 0 to 2. The new chapel will not produce noise, smoke, fumes, glare, or odors, and the increase of traffic on account of the chapel will be minimal.

**2e, xi.**

The site is accessed via a collector street (Demontreville Trail) and a private drive. The additional traffic generated by the chapel is estimated to be 8 average daily trips on most days of the year and 30 average daily trips on a few occasions in a calendar year. Most trips will occur during non-peak hours.

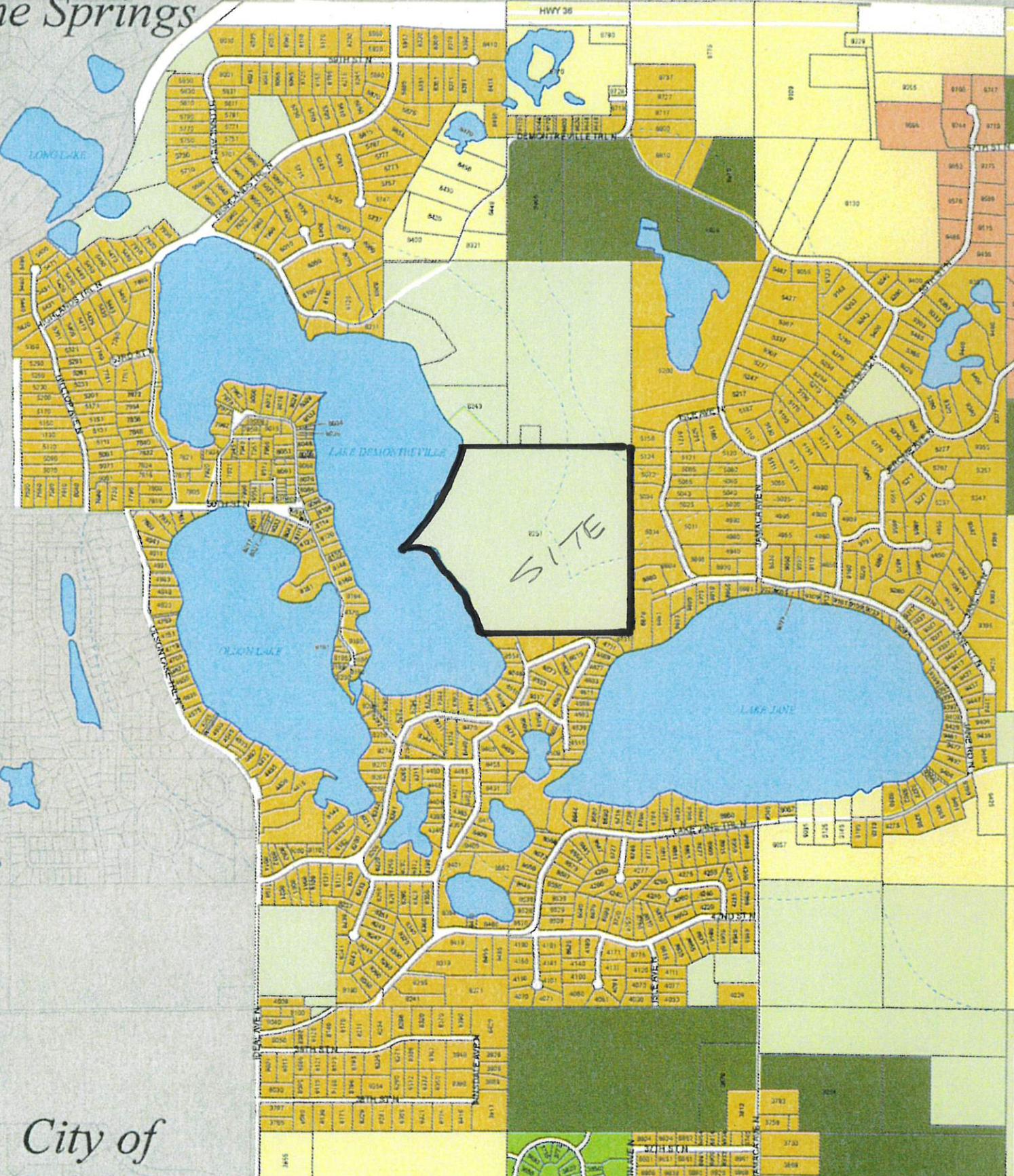
**2e, xii.**

The new chapel will be built in an open field and will result in very minimal tree removal (8-10 evergreens which we ourselves had planted). No wetlands will be impacted. The chapel will be located 980' feet from Lake Demontreville. The final phase of our monastery building program will consist of a building for visitors and guests as well as some rooms for community workshops and library.

**Landscaping Plan**

Because the area around the chapel will be further developed with a guest building, workshops and a small library, we do not plan extensive landscaping around the chapel. Lawn grasses, some foundations shrubs, and a few flower beds will be planted and mulched with wood chips. Mr. Ken Roberts thought that, under these circumstances, it would not be necessary to submit a separate landscaping plan.

City of  
Pine Springs



City of  
Oakdale

**ZONING  
MAP**





Property Viewer





# Property Viewer





### LEGEND

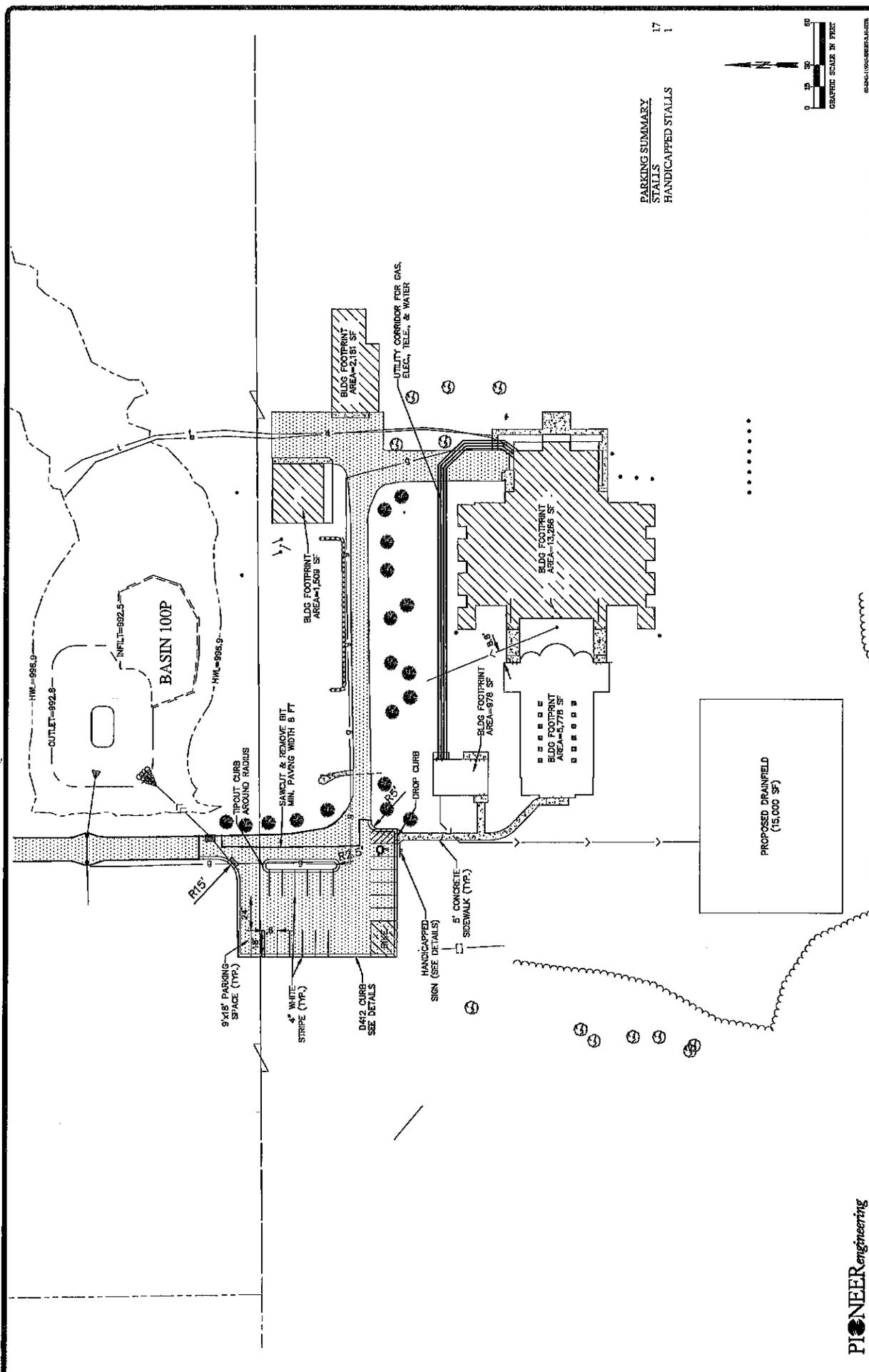
Definition of the survey system is the Washington County Coordinate System, NAD 83, 1983 Adjustment.

Distances are in feet and decimals of a foot.

Contours and elevations were generated using field measurements collected for this project and are based on North American Vertical Datum 1988 Adjustment unless otherwise noted. Contours are at 1 foot intervals.

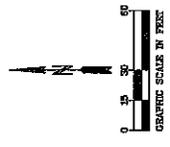
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PARKING SUMMARY  
 STALLS  
 HANDICAPPED STALLS

17  
 1



3.20 of 13

CARMELITE HERMITAGE CHAPEL  
 LAMAR BLVD, MANASSAS, VA

CARMELITE HERMITAGE  
 1500 WESTVIEW LANE, SUITE 100  
 LAMAR BLVD, MANASSAS, VA 20108

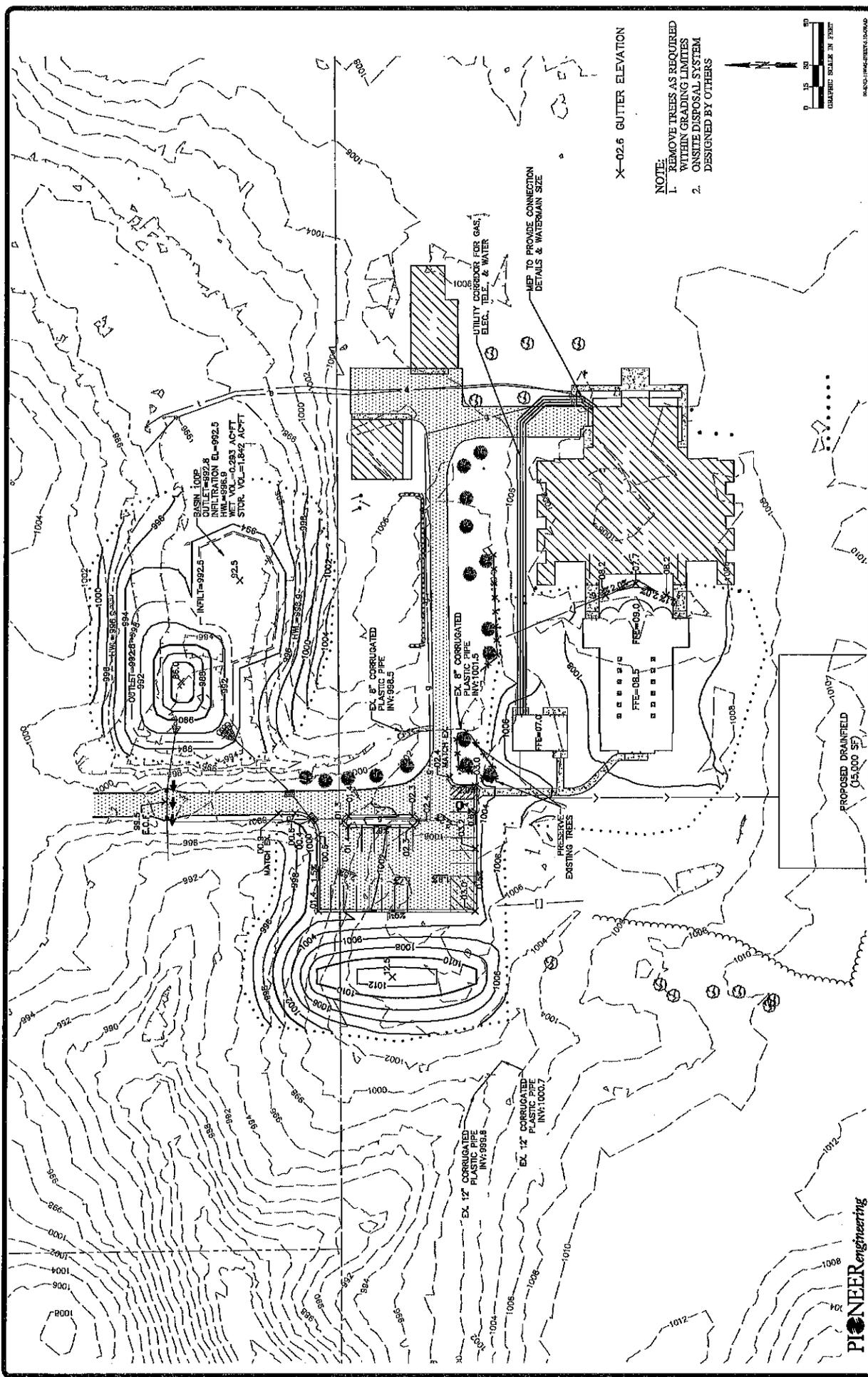
SITE PLAN

DATE	DESCRIPTION
10/15/14	ISSUE FOR PERMITS
08/14/14	ISSUE FOR PERMITS
07/14/14	ISSUE FOR PERMITS

PIONEER engineering  
 2402 DORSETT DRIVE  
 SUITE 100  
 MANASSAS, VA 20108  
 (571) 883-1114  
 WWW.PIONEERENGINEERING.COM

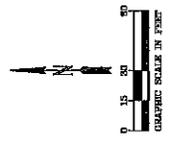
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 2402 DORSETT DRIVE  
 SUITE 100  
 MANASSAS, VA 20108  
 (571) 883-1114  
 WWW.PIONEERENGINEERING.COM



X-02.5 GUTTER ELEVATION

- NOTE:  
 1. REMOVE TREES AS REQUIRED WITHIN GRADING LIMITS  
 2. ON-SITE DISPOSAL SYSTEM DESIGNED BY OTHERS



UTILITY CROSSOVER PER GAS, ELER., TEL., & WATER  
 NIP TO PROVIDE CONNECTION DETAILS & WATERMAIN SIZE

BASEIN LOOP  
 OUTLET=992.5  
 INLET=992.5  
 H.W. ELEVATION  
 NET VOL.=0.283 ACFT  
 STOR. VOL.=1.842 ACFT

EX 8\"/>

EX 8\"/>

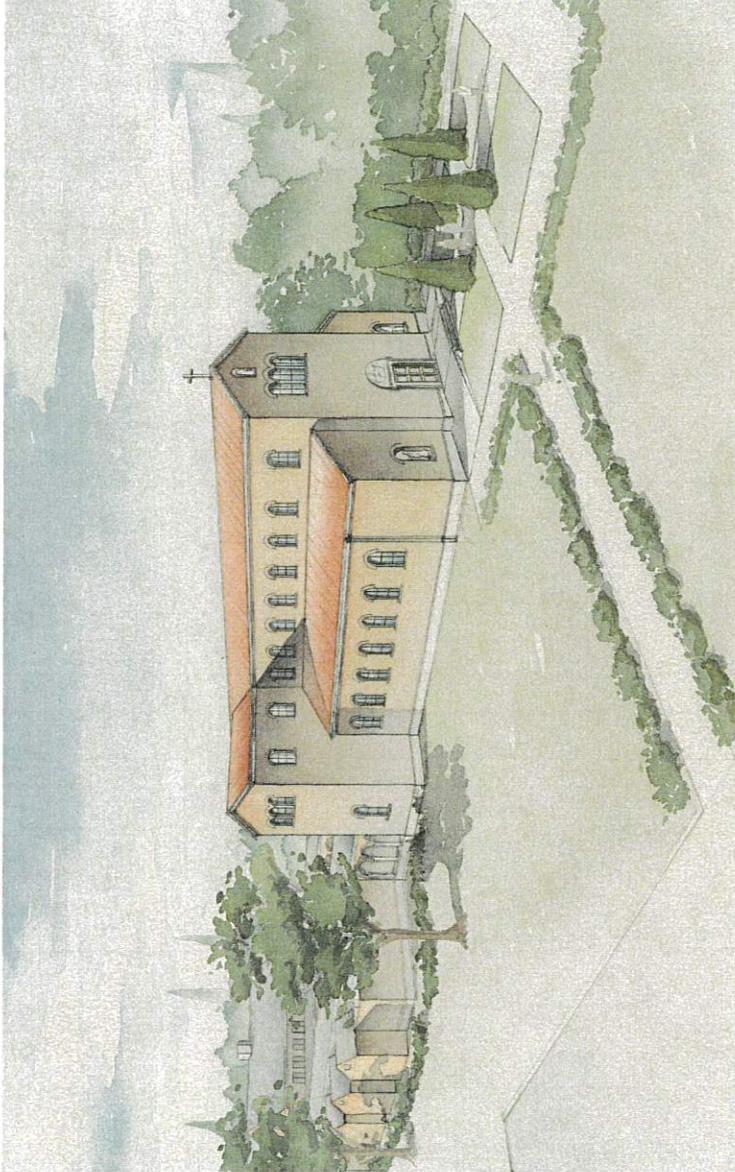
EX 12\"/>

EX 12\"/>

PROPOSED DRAINFIELD  
 (15,000 SF)

<b>PIONEER engineering</b> 2022 Elmwood Drive Memphis, TN 38120 (901) 581-7114 www.pioneereng.com		PROJECT NO. 18-001 DATE: 05-20-2018	SHEET NO. 13 OF 13
GRADING PLAN		CARMELITE HERMITAGE CHAPEL LAKELAND, MISSISSIPPI	

**CARMELITE CHAPEL**  
 CARMELITE HERMITAGE  
 OF THE BLESSED VIRGIN MARY  
 8249 DE MONTREVILLE TRAIL  
 LAKE ELMO, MINNESOTA 55042-9545



OWNERS

CARMELITE HERMITAGE OF THE  
 BLESSED VIRGIN MARY  
 CONTACT: REV. JOHN BURRIS, O.C.A.R.A.  
 8249 DE MONTREVILLE TRAIL  
 LAKE ELMO, MN 55042  
 PHONE: 651/779-2331

STRUCTURAL ENGINEER

LKL ENGINEERS  
 CONTACT: MARK K. KENNEDY  
 2735 NORTH HOLLAND-STYVANIA ROAD  
 TOLSON, IA 54487  
 PHONE: 482/528-2395

M.E.P. ENGINEER

ASSOCIATED CONSULTING  
 ENGINEERING, INC.  
 CONTACT: KELLY LOUDRENGER  
 140 COUNTY PHILIP AVENUE  
 SOUTH BEND, IN 46601  
 PHONE: 482/418-7228

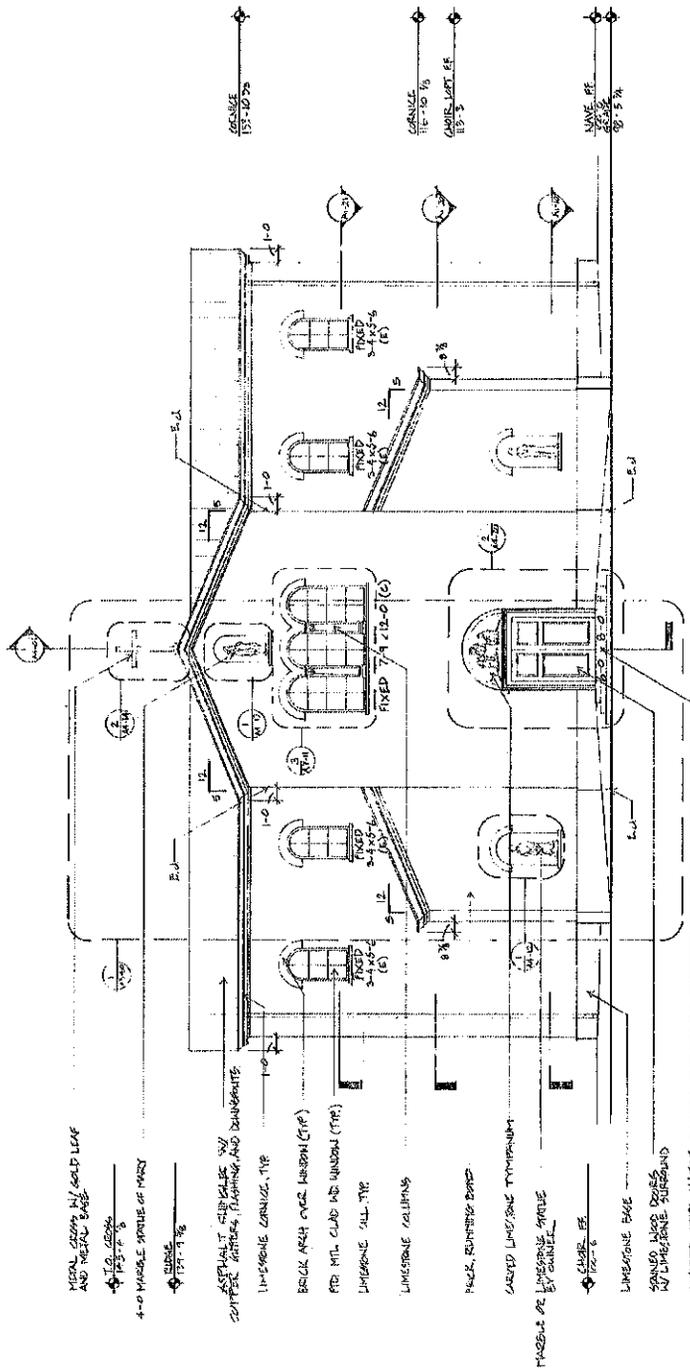
CIVIL ENGINEER, I.A.

PIONEER ENGINEERING  
 CONTACT: PAUL CHERNE  
 2822 ENTERPRISE DRIVE  
 MARIETTA, GA 30067  
 PHONE: 404/884-8194

**DUNCAN G. STROIK ARCHITECT LLC**  
 218 WEST WASHINGTON STREET, SUITE 1200  
 SOUTH BEND, INDIANA 46601  
 574/232-1783; FAX: 574/232-1792

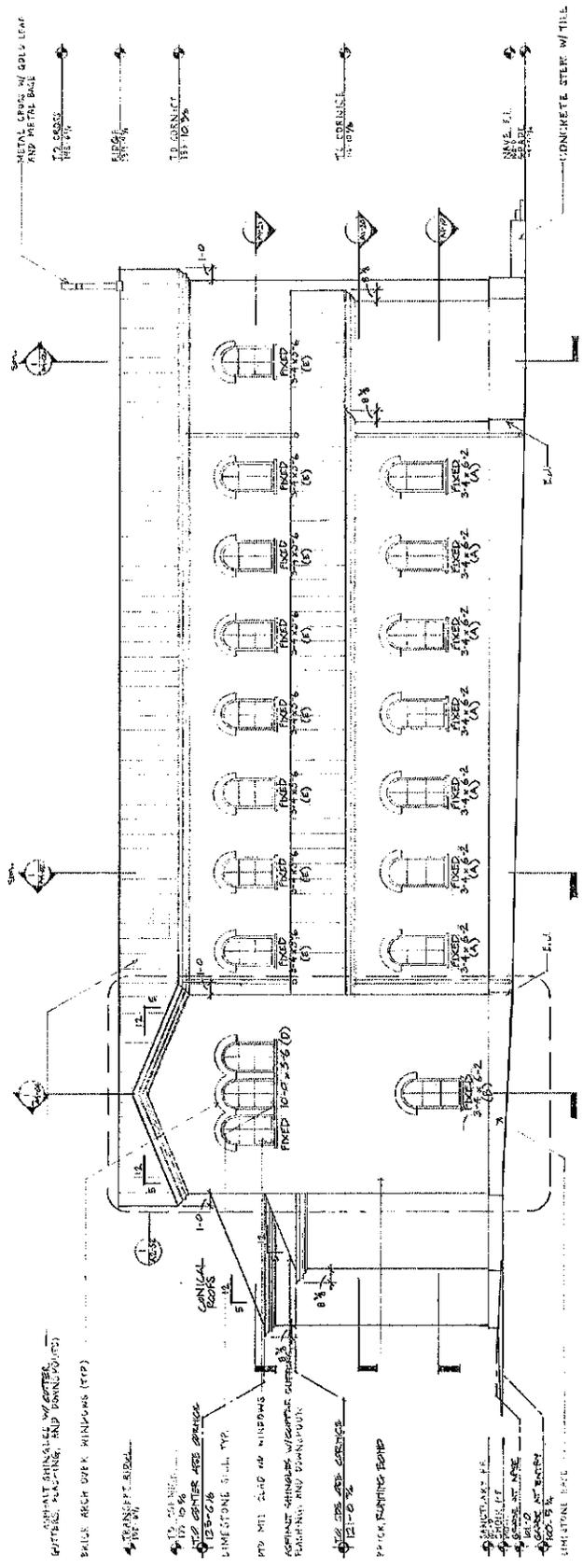
EXTERIOR PERSPECTIVE

SCALE	DATE	REVISION	DATE	BY	CHKD BY
	13 JUNE 2018				
CARMELITE CHAPEL LAKE ELMO, MINNESOTA			DUNCAN G. STROIK ARCHITECT 218 WEST WASHINGTON STREET, SUITE 1200 SOUTH BEND, IN 46601 574/232-1783; 574/232-1792 FAX		
			TO-001		
			© 2018 Duncan G. Stroik Architect, LLC		



① ELEVATION

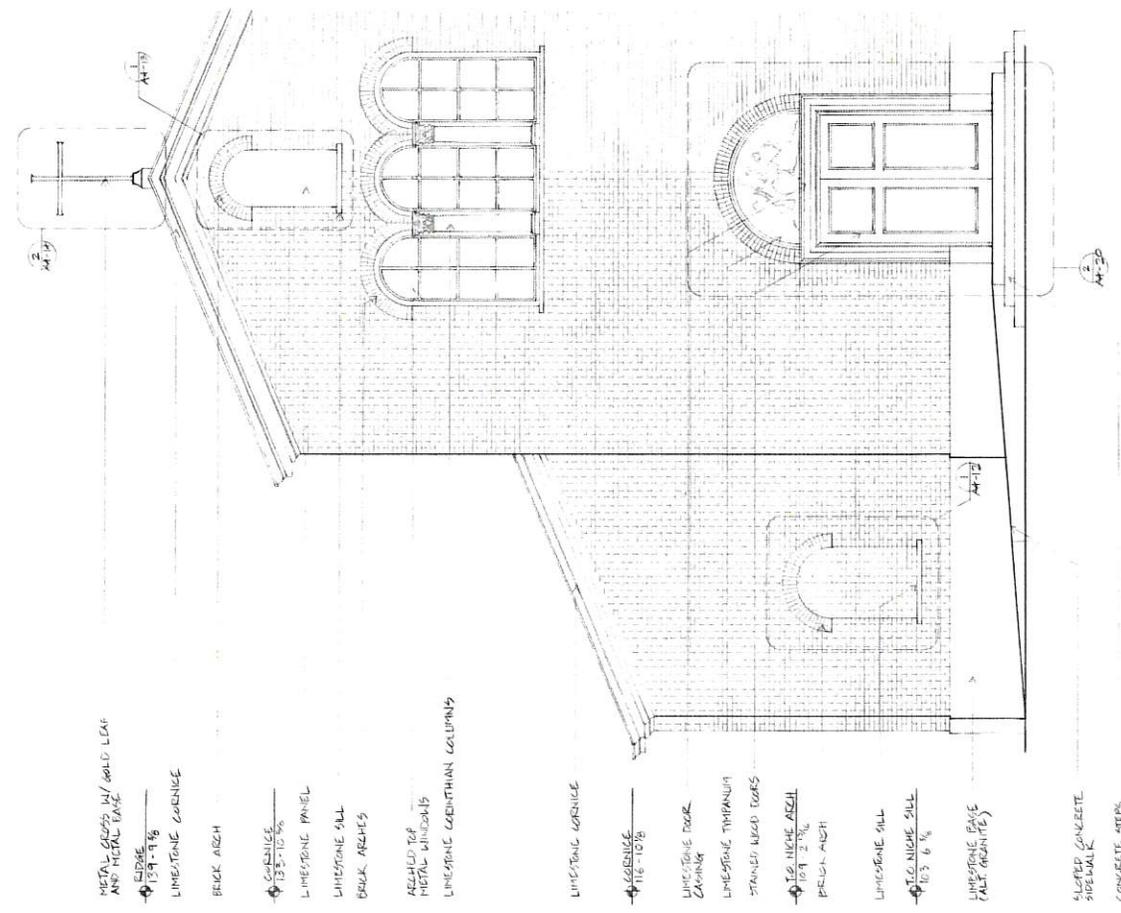
WEST ELEVATION	
DATE	12 APR 2011
SCALE	3/4" = 1'-0"
PROJECT	CARMELETTE CHAPEL LAKE ELMO, MINNESOTA
ARCHITECT	DUNCAN G. STROIN ARCHITECT 218 W. WASHINGTON ST. SUITE 100 ST. PAUL, MN 55102-1000 TEL: 612.222.1111 FAX: 612.222.1112 WWW.DGSAO.COM
SHEET NO.	A277-01



① ELEVATION

NORTH ELEVATION	
DATE	12/22
PROJECT	CARNALITE CHAPEL LAKE ELMO, MINNESOTA
DESIGNED BY	DUNCAN G. STROCK, ARCHITECT 234 SOUTH BROAD ST., SUITE 100 SOUTH BEND, IN 46701-1807
SCALE	1/4" = 1'-0"
REVISION	NO. 1
DRAWN BY	AW-1-C





METAL GLASS W/ GOLD LEAF AND METAL BASE

↑ EAVE 13'9" - 9 1/8"  
LIMESTONE CORNICE

BRICK ARCH

↑ CORNICE 13'8" - 10 1/8"

LIMESTONE PANEL

LIMESTONE SILL  
BRICK ARCHES

ARCHED TOP METAL WINDOWS  
LIMESTONE CORINTHIAN COLUMNS

LIMESTONE CORNICE

↑ CORNICE 11'6" - 10 1/8"

LIMESTONE DOOR CASING

LIMESTONE TYMPANUM

STAINED WOOD DOORS

↑ TO NICHE ARCH 10'9" - 2 1/8"  
PELON ARCH

LIMESTONE SILL

↑ TO NICHE SILL 10'3" - 6 1/8"

LIMESTONE BASE (ALT. GRANITE)

SLOPED CONCRETE SIDEWALK  
CONCRETE STEPS

↑ TO NICHE ARCH 13'4" - 2 1/8"

↑ TO NICHE SILL 13'0" - 10 1/8"

↑ TO WINDOW M.P. 12'11" - 1/4"

↑ TO WINDOW M.P. 12'1" - 4"

↑ TO TYMPANUM 11'5" - 8"

↑ TO DOOR CASING 10'9" - 4"

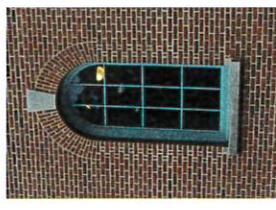
↑ TO STONE BASE 10'2" - 0"

↑ WAVE FF 10'0" - 0"

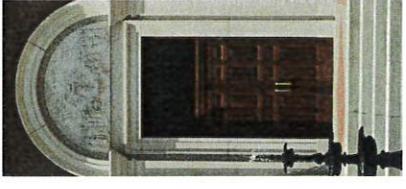
GRADE (VARIES)



LIMESTONE CORNICES



PAINTED METAL CLAD WOOD WINDOWS, WITH SILLS AND BRICK ARCHES



STAINED WOOD DOORS, LIMESTONE SURROUND AND LIMESTONE TYMPANUM



GAF SLATELINE SHINGLE ROOF EMERALD GREEN



BELDEN BRICK ST. SIMON BLEND



RUSTIC BUFF LIMESTONE BASE



COPPER GUTTERS, FLASHING AND DOWNSPOUTS

PHOTO REFERENCE BOARD

SCALE	DATE	DESIGN	BY
1/8" = 1'-0"	18 MAY 2016	CARMELO CHAPEL	LAE EMMO, MINNESOTA
REVISION		DUNCAN G. STROCK, ARCHITECT	218 W. SOUTH BEND, IN 46701
		574/235-1788	574/232-1797 FAX
			© 2016 DUNCAN G. STROCK ARCHITECT, LLC
			R-1

5/8/19



13792 247<sup>th</sup> Avenue – Zimmerman, MN 55398  
Phone (763) 274-0925 Fax (763) 274-0928

Carmelite Monastery  
8249 Demontreville Trail N  
Lake Elmo MN 55042

---

ROLL-OFFS ♦ SEPTIC SYSTEMS ♦ EXCAVATING  
LANDSCAPING ♦ DEMOLITION

## **SSTS Design Summary Report**

On April 19th, 2019, a site evaluation was conducted at 8249 Demontreville Trail N, MN 55082 in Washington County. The PID number is 09.029.21.12.0002

### **Scope of Report**

The purpose of the design report is to create a plan for a new sub-surface treatment system to treat wastewater from the new chapel to be built at the address above. This design details the plan for the required tanks and soil treatment dispersal areas per Washington County Development Code, Chapter Four Subsurface Sewage Treatment System Regulations, Ordinance 206. The system is designed for an Assembly Hall w/ no kitchen plus two (2) full-time employees which will be at the Chapel during day. The system components will be a Type I designed Mound and a total of three Septic & Pump Tanks (1,000-gal; 1,000-gal & 1,000-gal). See Site Plan.

### **Preliminary & Field Evaluation Work**

The Washington County Maps GIS data (<https://maps.co.washington.mn.us/WCGIS/>) was used to determine all property lines, utility Right of Ways, roads and other necessary features required by Ordinance 206, Section 9, Subparts 9.2 thru 9.3 prior to and during site evaluation. See Site Plan for details.

The information available at MN Well Index (<https://mnwellindex.web.health.state.mn.us/>) does not indicate the location of any wells within 100 feet of the proposed area. Section MN Well Index – Research.

The Web Soil Survey data (<https://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>), which is provided by the USDA, was gathered to determine the soil characteristics of the area prior to a field evaluation. See Section Web Soil Survey – Research for more details.

The field evaluation included staking a 50' x 26' soil absorption area, measurements from all setbacks and property line, elevations for absorption area, tanks and soil observations and a minimum of four (4) soil observations within or on the edge of the proposed absorption area for the Soil Treatment Area (STA) and an additional four (4) soil observations were conducted in second Soil Treatment Area identified for future use located to the South of the new Mound.

### **Soil Observations**

The soil borings and pits were conducted, classified and recorded to meet the Washington County Ordinance 206, Section 9, 9.5 thru 9.7. Redox was observed in all Borings & Soil Pits. The limiting layer was observed at 14" at SB1. See attached Soil Observation Logs.

## Wastewater Sources & Flows

The new Chapel is expected to have a seat capacity for 80 guests with 2 employees on staff full-time. The estimated Peak Flow rate is 350 gallons per day (gpd) was calculated using values provided by Chapter 7081.0130, Table I: Estimate design sewage flow from other establishments. A safety factor of 20% was applied to calculate the final Design Peak Flow of 400 gpd.

The Organic Load was calculated using the Estimate of Waste Strengths from Other Establishments chart provided with the University of Minnesota – SSTS Design Forms Worksheet (**see U of MN Design Forms**). The total Organic Loading Rate for 400 gpd for 80 guests (.01 #s / seat) & 2 full-time employees (.05 #s /employee) is **.90 pounds of BOD per day** which will need to be treated each day. This equals **269 mg/L of BOD per day**. If the system was used to max capacity each day, this level of effluent would be considered At-Risk Effluent and might need to be sampled regularly to ensure treatment level C prior to dispersal to the Mound. However, the Septic Tanks, the Dose Tank & Soil Treatment Area have been designed to handle the worst-case scenario flow-rate & waste-strength from this building

The septic tanks & dose tank are sized to provide a retention time of 5 days (typical is 3-days retention) & a **storage capacity of 2 x Peak Flow** in the event of unexpected pump failure.

The total size of the **Soil Absorption Area was increased 25%** to account for a potential of At-Risk Organic Loading rates of BOD & TSS. The Peak Design Flow rate of 400 gpd for a typical Type I system receiving Residential Strength Waste (170 mg/L BOD) would require 1,040 sqft of absorption in Silt Loam soil. The increased size was calculated using the University of Minnesota Chart (Table 5.1; Manual for Septic System Professionals in Minnesota) for determining Organic Loading Rate. The equivalent loading rate for Silt Loam is 0.0007 #/sqft. The required absorption for .90 #s/day BOD @ 400 gpd with an Organic Loading rate of .0007 #/sqft is **1,280 sqft**.

## Type I Mound

The total area for the STA will impact 3,837 sqft (45.3' x 84.7') located to the South of the new Chapel. The newly constructed mound will have an **Absorption Area of 1,300 sqft (26' x 50')**. The observations found redoximorphic soil conditions at 14 inches from the surface and will require 22" of **washed-mound sand** to achieve the necessary vertical separation from the most limiting layer.

The required materials for the sewer line, distribution network, pumps, piping, sand, rock, fill and cover are detailed in the design worksheets included with this design. Please note, all calculations for materials and pumps are estimates. Actual values may change slightly and will need to field verified for correctness. **See U of MN Worksheets for more details.**

The pump used for dosing the pressure bed must deliver a minimum of **22 gallons per minute** and overcome a total dynamic head pressure of **16 feet**. All supply pipes and laterals shall be built to specifications and drain-out completely after each dose to prevent freezing.

**A second 1,300 sqft area** was identified and staked-off **for future use**. No structures or vehicle traffic can occur over this area. Precautions should be taken in the years to come to avoid damaging, compacting or disturbing this area.

## Special Conditions

1. Due to the large flat area, drainage should be maintained throughout the area to avoid ponding around the tanks or at the edges of the Mound.
2. No final sewer elevation was provided by the builder. Elevation and locations are subject to change. No tank can be buried deeper than 4' below grade.

3. Drainback for Supply Line & Freezing - The slope from the Pressure Bed Supply Line must drain back to the dose tank. Additional depth or insulation may be necessary to keep line from freezing if the supply line is buried too shallow.
4. Setbacks to Easements & Property Lines –There was no survey performed prior to site evaluation, so all measures are estimates. The owner and Installer will need to make sure all construction is within required setbacks.

**Other Considerations**

6.1 Building Permit requirements.

No construction shall be allowed by any local unit of government until the permit required for the subsurface sewage treatment system has been issued.

**9.11 Site Protection**

Prior to and during construction or lot improvements, the proposed initial and replacement soil treatment and dispersal areas shall be protected from disturbance, compaction, or other damage by use of stakes and silt fence or snow fence.

**As-Built Drawing**

The Licensed Installer must provide an As-built of the final location of all components. The attached Site Plan is only for reference and should not be considered as final survey

End of Report

---

**Disclaimer**

**As property owner, I agree to use the system within the parameters described above and in the design worksheets. I also agree hold Steinbrecher Companies, Inc and the named designer harmless for any future issues regarding this system.**

---

**Owner Signature**

**Date**

---

Note – This design is not recommended to be permitted until the following areas, included with this design, are signed by property owner.

- Design Summary Report, Preliminary Evaluation Worksheet (section 2) and Homeowner Maintenance Log

# Materials & Specifications

8249 DeMontreville Trail N, Lake Elmo

## Tanks – Minnesota Precast

- 1,000-gallon Septic Tank
- 1,000-gallon Septic Tank
- 1,000-gallon Dose Tank

## Effluent Filter & Alarm

- Polylok 525 w/ Reed Switch for Alarm
- Dual-Alarm Box located in or near house (or Installer equivalent)
- Electrical wire & Junction Box (~100' from building)
- Dedicated 120V circuit for alarm (10 Amp min.)

## Sewer Line

- 4" Sch 40 dia. pipe @ ~ 20'
- Fittings, as necessary

## Pump – Gould PE41 (or similar model)

- 23 GPM
- 16 TDH
- Mechanical (120V rated) Float for Pump On/Off
- Electrical wire & Junction Box, as necessary (~100')
- Dedicated 20 amp, 120V circuit from building to pump

## Supply Line to Pressure Laterals

- 2" sch 40 pipe @ ~ 100'
- Fittings, as necessary

## Pressure Laterals

- 3 – 50' long w/ 1 ½" sch 40 pipe
- 3' spacing (orifices)
- 3/16" diameter orifices (drilled holes)
- Clean-outs at end of each lateral
- 1 ½" Bends, couplings, sweeps and fittings, as necessary

## Inspection pipes

- 4" Sch 40 pipe built to spec in Mound design

## Mound Sand

- Min. Height – 22"
- Absorption Area – 26' x 50'

## Rock Bed

- Dispersal Area – 10' x 50'
- Rock depth – 6" + min 3.5" to cover pipe

## Back Fill & Black Dirt for cover

- See calculations on Mound Materials Worksheet

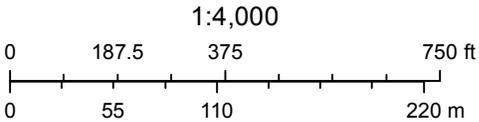
\*Note: All materials quantities for pipe, sand, rock, etc. are only estimates.

\*\*Tonnage calculations for materials may differ from actual volume used onsite.

# Washington County, MN



April 20, 2019



Disclaimer: Map and parcel data are believed to be accurate, but accuracy is not guaranteed. This is not a legal document and should not be substituted for a title search, appraisal, survey, or for zoning verification.

# CERTIFICATE OF SURVEY

PART OF THE SOUTHWEST QUARTER OF THE SOUTHEAST QUARTER,  
SECTION 4, TOWNSHIP 29 NORTH, RANGE 21 WEST,  
AND GOVERNMENT LOT 4 SECTION 9, TOWNSHIP 29 NORTH, RANGE 21 WEST,  
CITY OF LAKE ELMO, WASHINGTON COUNTY, MINNESOTA

TOPOGRAPHIC SURVEY  
PREPARED FOR:  
CARMELITE HERMITAGE  
OF THE BLESSED VIRGIN MARY  
8249 Demontreville Trail North  
Lake Elmo, Minnesota 55042

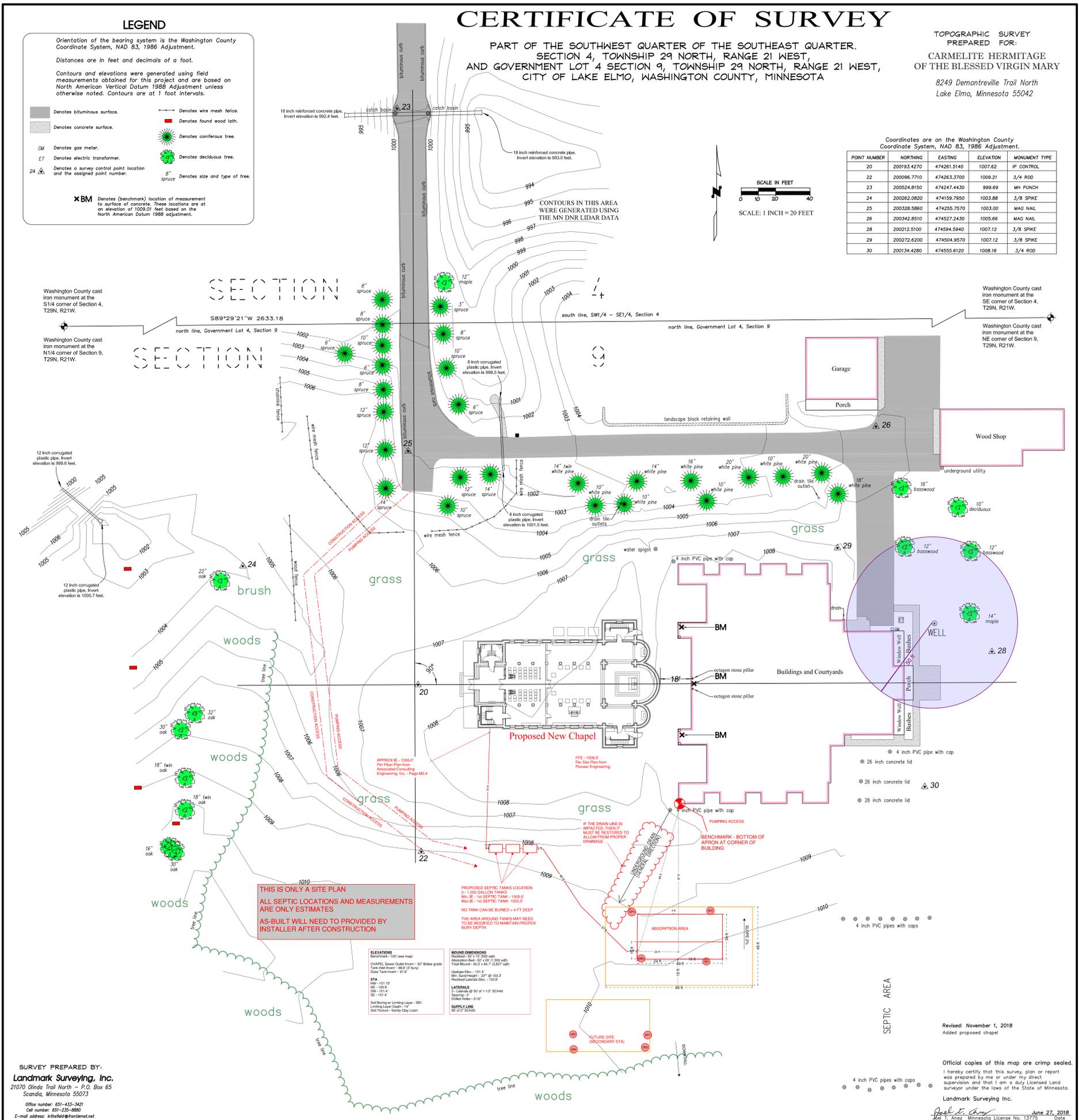
## LEGEND

Orientation of the bearing system is the Washington County Coordinate System, NAD 83, 1986 Adjustment.  
Distances are in feet and decimals of a foot.  
Contours and elevations were generated using field measurements obtained for this project and are based on North American Vertical Datum 1988 Adjustment unless otherwise noted. Contours are at 1 foot intervals.

- Denotes biluminous surface.
- Denotes concrete surface.
- GM Denotes gas meter.
- ET Denotes electric transformer.
- 24  $\Delta$  Denotes a survey control point location and the assigned point number.
- BM Denotes (benchmark) location of measurement to surface of concrete. These locations are at an elevation of 1009.01 feet based on the North American Datum 1988 adjustment.
- Denotes wire mesh fence.
- Denotes found wood lath.
- Denotes coniferous tree.
- Denotes deciduous tree.
- 8" spruce Denotes size and type of tree.

Coordinates are on the Washington County Coordinate System, NAD 83, 1986 Adjustment.

POINT NUMBER	NORTHING	EASTING	ELEVATION	MONUMENT TYPE
20	200193.4270	474261.5140	1007.62	IP CONTROL
22	200096.7710	474263.3700	1009.21	3/4 ROD
23	200524.8150	474247.4430	999.69	MH PUNCH
24	200262.0820	474159.7950	1003.88	3/8 SPIKE
25	200328.5860	474255.7570	1003.00	MAG NAIL
26	200342.8510	474527.2430	1005.66	MAG NAIL
28	200212.5100	474594.5940	1007.12	3/8 SPIKE
29	200272.6200	474504.9570	1007.12	3/8 SPIKE
30	200134.4280	474555.6120	1008.16	3/4 ROD



**THIS IS ONLY A SITE PLAN  
ALL SEPTIC LOCATIONS AND MEASUREMENTS  
ARE ONLY ESTIMATES  
AS-BUILT WILL NEED TO PROVIDED BY  
INSTALLER AFTER CONSTRUCTION**

**ELEVATIONS**  
Benchmark - 100' (see map)  
CHAPEL Sewer Outlet Invert - 30' below grade  
Tank Inlet Invert - 18.0' (2' tank)  
Dose Tank Invert - 97.5'

**GRA**  
MFL - 101.15'  
MS - 102.0'  
SB - 101.4'  
SS - 105.4'

**Soil Boring in Lining Layer - SB1**  
Lining Layer Depth - 14"  
Soil Texture - Sandy Clay Loam

**ROUND DIMENSIONS**  
Proposed - 50' x 10' (50' x 10')  
Absorption Area - 30' x 10' (30' x 10')  
Total Mound - 45.3' x 44.7' (3.83' x 3.83')

**LATERALS**  
3' Laterals @ 50' of 1-1/2" SCH40  
Spacing - 2'  
Drilled Holes - 3-1/2"

**SEWER LINE**  
95' of 2" SCH40

SURVEY PREPARED BY:  
**Landmark Surveying, Inc.**  
21070 Olinda Trail North - P.O. Box 65  
Scandia, Minnesota 55073

Office number: 651-433-3421  
Cell number: 651-255-8800  
E-mail address: info@landmarksurveying.com

Revised: November 1, 2018  
Added proposed chapel

Official copies of this map are crimp sealed.  
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 Land  
surveyor under the laws of the State of Minnesota.

Landmark Surveying, Inc.  
*Paul J. Aron* June 27, 2018  
666 T. Anz Minnesota License No. 13775 Date

# Preliminary Evaluation Worksheet

## 1. Contact Information

v 04.02.2019

Property Owner/Client:  Date Completed:

Site Address:  Project ID:

Email:  Phone:

Mailing Address:

Legal Description:

Parcel ID:  TWP:  SEC:  RNG:

## 2. Flow and General System Information

### A. Client-Provided Information

Project Type:  New Construction  Replacement  Expansion  Repair

Project Use:  Residential  Other Establishment:

Residential use: # Bedrooms:  Dwelling Sq.ft.:  Unfinished Sq. Ft.:

# Adults:  # Children:  # Teenagers:

In-home business (Y/N):  If yes, describe:

- Water-using devices: (check all that apply)
- |  |   |  |
|--|---|--|
| <input type="checkbox"/> Garbage Disposal/Grinder  | <input type="checkbox"/> Dishwasher         | <input type="checkbox"/> Hot Tub*                    |
| <input type="checkbox"/> Sewage pump in basement   | <input type="checkbox"/> Water Softener*    | <input type="checkbox"/> Sump Pump*                  |
| <input type="checkbox"/> Large Bathtub >40 gallons | <input type="checkbox"/> Iron Filter*       | <input type="checkbox"/> Self-Cleaning Humidifier*   |
| <input type="checkbox"/> Clothes Washing Machine   | <input type="checkbox"/> High Eff. Furnace* | <input type="checkbox"/> Other: <input type="text"/> |

\* Clear water source - should not go into system

Additional current or future uses:

Anticipated non-domestic waste:

The above is complete & accurate:

*Client signature & date*

### B. Designer-determined flow Information *Attach additional information as necessary.*

Design Flow:  GPD Anticipated Waste Type:

BOD:  mg/L TSS  mg/L Oil & Grease  mg/L

#	Description	Mn. ID#	Well Depth (ft.)	Casing Depth (ft.)	Confining Layer	STA Setback	Source
1	Monestary Well	Unknown				50	MN Well Index
2							
3							
4							

Additional Well Information:

# Preliminary Evaluation Worksheet

Site within 200' of noncommunity transient well (Y/N)	<input type="text" value="No"/>	Yes, source: <input style="width: 100%;" type="text"/>
Site within a drinking water supply management area (Y/N)	<input type="text" value="No"/>	Yes, source: <input style="width: 100%;" type="text"/>
Site in a Well Head Protection inner wellhead management zone (Y/N)	<input type="text" value="No"/>	Yes, source: <input style="width: 100%;" type="text"/>
Buried water supply pipes within 50 ft of proposed system (Y/N)	<input type="text" value="No"/>	
<b>B. Site located in a shoreland district/area?</b>	<input type="text" value="No"/>	Yes, name: <input style="width: 100%;" type="text"/>
Elevation of ordinary high water level:	<input style="width: 50px;" type="text"/> ft	Source: <input style="width: 100%;" type="text"/>
Classification: <input style="width: 150px;" type="text"/>	Tank Setback: <input style="width: 50px;" type="text"/> ft.	STA Setbk: <input style="width: 50px;" type="text"/> ft.
<b>C. Site located in a floodplain?</b>	<input type="text" value="No"/>	Yes, Type(s): <input style="width: 100%;" type="text"/>
Floodplain designation/elevation (10 Year):	<input style="width: 50px;" type="text"/> ft	Source: <input style="width: 100%;" type="text"/>
Floodplain designation/elevation (100 Year):	<input style="width: 50px;" type="text"/> ft	Source: <input style="width: 100%;" type="text"/>
<b>D. Property Line Id / Source:</b>	<input type="checkbox"/> Owner <input checked="" type="checkbox"/> Survey <input checked="" type="checkbox"/> County GIS <input type="checkbox"/> Plat Map <input type="checkbox"/> Other: <input style="width: 100%;" type="text"/>	
<b>E. ID distance of relevant setbacks on map:</b>	<input checked="" type="checkbox"/> Water <input checked="" type="checkbox"/> Easements <input checked="" type="checkbox"/> Well(s) <input checked="" type="checkbox"/> Building(s) <input checked="" type="checkbox"/> Property Lines <input checked="" type="checkbox"/> OHWL <input type="checkbox"/> Other: <input style="width: 100%;" type="text"/>	

### 4. Preliminary Soil Profile Information From Web Soil Survey (attach map & description)

Map Units:	<input style="width: 95%;" type="text" value="49—Antigo silt loam"/>	Slope Range:	<input style="width: 95%;" type="text" value="0-2"/> %
List landforms:	<input style="width: 95%;" type="text" value="Flats, terraces"/>		
Landform position(s):	<input style="width: 95%;" type="text" value="Plain"/>		
Parent materials:	<input style="width: 95%;" type="text" value="Loess and/or silty glaciofluvial deposits"/>		
Depth to Bedrock/Restrictive Feature:	<input style="width: 50px;" type="text" value="80"/> in	Depth to Watertable:	<input style="width: 50px;" type="text" value="80"/> in
Map Unit Ratings	Septic Tank Absorption Field- At-grade:	<input style="width: 95%;" type="text" value="Very Limited"/>	
	Septic Tank Absorption Field- Mound:	<input style="width: 95%;" type="text" value="Not Limited"/>	
	Septic Tank Absorption Field- Trench:	<input style="width: 95%;" type="text" value="Very Limited"/>	

### 5. Local Government Unit Information

Name of LGU:	<input style="width: 95%;" type="text" value="Washington County"/>
LGU Contact:	<input style="width: 95%;" type="text"/>
LGU-specific setbacks:	<input style="width: 95%;" type="text" value="N/A for this site"/>
LGU-specific design requirements:	<input style="width: 95%;" type="text" value="Contour Late rate for Mound is &lt;= 10"/>
LGU-specific installation requirements:	<input style="width: 95%;" type="text"/>
Notes:	<input style="width: 95%; height: 40px;" type="text"/>

# Field Evaluation Worksheet

<b>1. Project Information</b>		v 04.02.2019
Property Owner/Client:	Carmelite Monastery	Project ID: <input style="width: 100px;" type="text"/>
Site Address:	8249 Demontreville Trail N, Lake Elmo	Date Completed: <input style="width: 100px;" type="text" value="4/19/2019"/>
<b>2. Utility and Structure Information</b>		
Utility Locations Identified	<input checked="" type="checkbox"/> Gopher State One Call # <input style="width: 100px;" type="text"/>	<input type="checkbox"/> Any Private Utilities: <input style="width: 100px;" type="text"/>
Locate and Verify (see Site Evaluation map)	<input checked="" type="checkbox"/> Existing Buildings	<input checked="" type="checkbox"/> Improvements
	<input checked="" type="checkbox"/> Easements	<input checked="" type="checkbox"/> Setbacks
<b>3. Site Information</b>		
Vegetation type(s):	Grass	Landscape position: <input style="width: 100px;" type="text" value="Plain"/>
Percent slope:	<input style="width: 50px;" type="text" value="2"/> %	Slope shape: <input style="width: 100px;" type="text" value="Convex, Linear"/> Slope direction: <input style="width: 100px;" type="text" value="north"/>
Describe the flooding or run-on potential of site: <input style="width: 90%; height: 20px;" type="text"/>		
Describe the need for Type III or Type IV system: <input style="width: 90%; height: 20px;" type="text"/>		
Note: <input style="width: 90%; height: 20px;" type="text"/>		
Elevations and Benchmarks identified on map? (Y/N):	<input style="width: 50px;" type="text" value="Yes"/>	If yes, describe: <input style="width: 150px;" type="text" value="BM = Bottom of Apron"/>
Proposed soil treatment area protected? (Y/N):	<input style="width: 50px;" type="text" value="Yes"/>	If yes, describe: <input style="width: 150px;" type="text" value="See Site Plan"/>
<b>4. General Soils Information</b>		
Filled, Compacted, Disturbed areas (Y/N):	<input style="width: 100px;" type="text" value="No"/>	
If yes, describe:	<input style="width: 95%; height: 100%; border: none;" type="text"/>	
Soil observations were conducted in the proposed system location (Y/N):	<input style="width: 100px;" type="text" value="Yes"/>	
A soil observation in the most limiting area of the proposed system (Y/N):	<input style="width: 100px;" type="text" value="Yes"/>	
Number of soil observations:	<input style="width: 50px;" type="text" value="8"/>	Soil observation logs attached (Y/N): <input style="width: 100px;" type="text" value="Yes"/>
Percolation tests performed & attached (Y/N):	<input style="width: 100px;" type="text" value="No"/>	
<b>5. Phase I. Reporting Information</b>		
Periodically saturated soil:	Depth: <input style="width: 50px;" type="text" value="14"/> in	Elevation: <input style="width: 50px;" type="text" value="100.2"/> ft
Standing water:	<input style="width: 50px;" type="text"/> in	<input style="width: 50px;" type="text"/> ft
Bedrock:	<input style="width: 50px;" type="text"/> in	<input style="width: 50px;" type="text"/> ft
Benchmark:	<input style="width: 50px;" type="text"/>	<input style="width: 50px;" type="text" value="100"/> ft
Benchmark Location:	<input style="width: 90%; height: 20px;" type="text" value="Bottom of Apron @ SW Corner of Existing building. - See Map"/>	
Differences between soil survey and field evaluation:	<input style="width: 90%; height: 20px;" type="text" value="There was no observed loam below silt loam. Depth of layers"/>	
Site evaluation issues / comments:	<input style="width: 90%; height: 20px;" type="text" value="Access for construction from NW corner of site."/>	
Anticipated construction issues:	<input style="width: 90%; height: 20px;" type="text"/>	



# Soil Observation Log

Project ID:

v 04.02.2019

Client: <b>Carmelite Monastery</b>				Location / Address: <b>8249 Demontreville Trail N, Lake Elmo</b>					
Soil parent material(s): (Check all that apply) <input type="checkbox"/> Outwash <input type="checkbox"/> Lacustrine <input checked="" type="checkbox"/> Loess <input type="checkbox"/> Till <input type="checkbox"/> Alluvium <input type="checkbox"/> Bedrock <input type="checkbox"/> Organic Matter									
Landscape Position: (check one) <input checked="" type="checkbox"/> Summit <input type="checkbox"/> Shoulder <input type="checkbox"/> Back/Side Slope <input type="checkbox"/> Foot Slope <input type="checkbox"/> Toe Slope							Slope shape		Convex, Linear
Vegetation: <b>Grass</b>			Soil survey map units: <b>49</b>		Slope %: <b>2.0</b>		Elevation: <b>101.4</b>		
Weather Conditions/Time of Day: <b>Sunny / 1:15 pm</b>						Date: <b>04/19/19</b>			
Observation #/Location: <b>SB1 - Mound - See Map</b>					Observation Type: <b>Auger</b>				
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	----- Structure-----		
							Shape	Grade	Consistence
0-9	Silt Loam	<35%	10YR 3/4				Blocky	Weak	Friable
9-14	Silt Loam	<35%	10YR 6/6				Blocky	Strong	Firm
14-20	Clay Loam	<35%	10YR 6/8	10YR 6/2	Depletions	S1	Blocky	Strong	Firm
				10YR 5/8	Concentrations	S1			

Comments: LL= 14" - 100.2'

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

<b>Jesse Kloepfner</b>		<b>L4043</b>	<b>4/19/2019</b>
(Designer /Inspector)	(Signature)	(License #)	(Date)

# Additional Soil Observation Logs

Project ID:



Client: Carmelite Monastery			Location / Address: 8249 Demontreville Trail N, Lake Elmo						
Soil parent material(s): (Check all that apply)			<input type="checkbox"/> Outwash	<input type="checkbox"/> Lacustrine	<input checked="" type="checkbox"/> Loess	<input type="checkbox"/> Till	<input type="checkbox"/> Alluvium	<input type="checkbox"/> Bedrock	<input type="checkbox"/> Organic Matter
Landscape Position: (check one)			<input checked="" type="checkbox"/> Summit	<input type="checkbox"/> Shoulder	<input type="checkbox"/> Back/Side Slope	<input type="checkbox"/> Foot Slope	<input type="checkbox"/> Toe Slope	Slope shape: Convex, Linear	
Vegetation:	Grass	Soil survey map units:	49	Slope %:	2.0	Elevation:	101.4		
Weather Conditions/Time of Day:		Sunny / 2:45 pm				Date:	04/19/19		
Observation #/Location:		SB2 - Mound - See Map				Observation Type:		Auger	
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I----- Structure-----I		
							Shape	Grade	Consistence
0-8	Silt Loam	<35%	10YR 3/3				Blocky	Weak	Friable
8-15	Silt Loam	<35%	10YR 5/6				Blocky	Strong	Firm
			10YR 4/6						
15-20	Sandy Clay Loam	<35%	10YR 4/6	10YR 6/4	Depletions	S1	Blocky	Strong	Firm
				10YR 5/8	Concentrations	S1			
Comments		LL = 15" - 100.15'							



# Soil Observation Log

Project ID:

v 04.02.2019

Client: Carmelite Monastery				Location / Address: 8249 Demontreville Trail N, Lake Elmo					
Soil parent material(s): (Check all that apply)				<input type="checkbox"/> Outwash <input type="checkbox"/> Lacustrine <input checked="" type="checkbox"/> Loess <input type="checkbox"/> Till <input type="checkbox"/> Alluvium <input type="checkbox"/> Bedrock <input type="checkbox"/> Organic Matter					
Landscape Position: (check one)				<input checked="" type="checkbox"/> Summit <input type="checkbox"/> Shoulder <input type="checkbox"/> Back/Side Slope <input type="checkbox"/> Foot Slope <input type="checkbox"/> Toe Slope			Slope shape: Convex, Linear		
Vegetation: Grass		Soil survey map units: 49		Slope %: 2.0		Elevation (ft): 101.5			
Weather Conditions/Time of Day: Sunny / 1:00 pm				Date: 04/19/19					
Observation #/Location: SP1 - Mound - See Map				Observation Type: Soil Pit					
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	Structure		
							Shape	Grade	Consistence
0-8	Silt Loam	<35%	10YR 3/4				Granular	Weak	Friable
8-15	Silt Loam	<35%	10YR 3/6				Blocky	Strong	Firm
15-20	Clay Loam	<35%	10YR 5/6	10YR 6/4	Depletions	S1	Blocky	Strong	Extremely Firm
				7.5YR 5/8	Concentrations	S1			
20-25	Clay Loam	<35%	10YR 6/8				Blocky	Strong	Extremely Firm
25-27	Sandy Clay	~45%	10YR 6/8	5YR 5/8	Concentrations	S1	Blocky	Strong	Firm
Comments LL = 15" - 99.75'									

# Additional Soil Observation Logs



Project ID:

Client: **Carmelite Monastery**

Location / Address: **8249 Demontreville Trail N, Lake Elmo**

Soil parent material(s): (Check all that apply)     Outwash    Lacustrine    Loess    Till    Alluvium    Bedrock    Organic Matter

Landscape Position: (check one)    Summit    Shoulder    Back/Side Slope    Foot Slope    Toe Slope    Slope shape    Convex, Linear

Vegetation:    Grass    Soil survey map units:    49    Slope %:    1.0    Elevation (ft):    101.2

Weather Conditions/Time of Day:    Sunny / 2:55 pm    Date:    04/19/19

Observation #/Location:    SP2 - Mound - See Map    Observation Type:    Soil Pit

Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	----- Structure-----		
							Shape	Grade	Consistence
0-10	Silt Loam	<35%	10YR 3/3				Granular	Weak	Friable
10-15	Silt Loam	<35%	10YR 3/6				Blocky	Strong	Firm
15-21	Clay Loam	<35%	10YR 6/8	10YR 7/2	Depletions	S1	Blocky	Strong	Extremely Firm
				10YR 5/8	Concentrations	S1			
21-25	Clay Loam	<35%	10YR 6/8	10YR 7/2	Depletions	S1	Blocky	Strong	Extremely Firm

Comments LL = 15" - 100.0'



# Soil Observation Log

Project ID:

v 04.02.2019

Client: <b>Carmelite Monastery</b>				Location / Address: <b>8249 Demontreville Trail N, Lake Elmo</b>					
Soil parent material(s): (Check all that apply) <input type="checkbox"/> Outwash <input type="checkbox"/> Lacustrine <input checked="" type="checkbox"/> Loess <input type="checkbox"/> Till <input type="checkbox"/> Alluvium <input type="checkbox"/> Bedrock <input type="checkbox"/> Organic Matter									
Landscape Position: (check one) <input type="checkbox"/> Summit <input checked="" type="checkbox"/> Shoulder <input type="checkbox"/> Back/Side Slope <input type="checkbox"/> Foot Slope <input type="checkbox"/> Toe Slope							Slope shape: <b>Convex, Linear</b>		
Vegetation: <b>Grass</b>		Soil survey map units: <b>49</b>			Slope %: <b>2.0</b>		Elevation (ft): <b>101.2</b>		
Weather Conditions/Time of Day: <b>Sunny / 2:30 pm</b>					Date: <b>04/19/19</b>				
Observation #/Location:		<b>SP3 - Secondary - See Map</b>				Observation Type: <b>Soil Pit</b>			
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I----- Structure-----I		
							Shape	Grade	Consistence
0-8	Silt Loam	<35%	10YR 3/4				Blocky	Weak	Friable
8-15	Silt Loam	<35%	10YR 3/6				Blocky	Strong	Firm
15-20	Clay Loam	<35%	10YR 5/6	10YR 6/4	Depletions	S1	Blocky	Strong	Extremely Firm
				7.5YR 5/8	Concentrations	S1			
20-25	Clay Loam	<35%	10YR 6/8				Blocky	Strong	Firm
Comments <b>LL = 16" - 99.9'</b>									

# Additional Soil Observation Logs

Project ID:



Client: Carmelite Monastery				Location / Address: 8249 Demontreville Trail N, Lake Elmo					
Soil parent material(s): (Check all that apply) <input type="checkbox"/> Outwash <input type="checkbox"/> Lacustrine <input checked="" type="checkbox"/> Loess <input type="checkbox"/> Till <input type="checkbox"/> Alluvium <input type="checkbox"/> Bedrock <input type="checkbox"/> Organic Matter									
Landscape Position: (check one) <input type="checkbox"/> Summit <input checked="" type="checkbox"/> Shoulder <input type="checkbox"/> Back/Side Slope <input type="checkbox"/> Foot Slope <input type="checkbox"/> Toe Slope							Slope shape: Convex, Linear		
Vegetation: Grass		Soil survey map units: 49		Slope %: 2.0		Elevation (ft): 101.3			
Weather Conditions/Time of Day: Sunny / 1:45 pm						Date: 04/19/19			
Observation #/Location: SB3 - Secondary - See Map					Observation Type: Auger				
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I----- Structure-----I		
							Shape	Grade	Consistence
0-6	Silt Loam	<35%	10YR 3/4				Blocky	Weak	Friable
6-12	Silt Loam	<35%	10YR 4/4				Blocky	Moderate	Firm
12-15	Clay Loam	<35%	10YR 4/6	10YR 6/8	Concentrations	S1	Blocky	Moderate	Firm
				10YR 7/8	Concentrations	S1			
15-20	Clay Loam	<35%	10YR 5/6				Blocky	Strong	Extremely Firm
Comments LL = 12" - 100.3'									



# Soil Observation Log

Project ID:

v 04.02.2019

Client: <b>Carmelite Monastery</b>				Location / Address: <b>8249 Demontreville Trail N, Lake Elmo</b>					
Soil parent material(s): (Check all that apply) <input type="checkbox"/> Outwash <input type="checkbox"/> Lacustrine <input checked="" type="checkbox"/> Loess <input type="checkbox"/> Till <input type="checkbox"/> Alluvium <input type="checkbox"/> Bedrock <input type="checkbox"/> Organic Matter									
Landscape Position: (check one) <input type="checkbox"/> Summit <input checked="" type="checkbox"/> Shoulder <input type="checkbox"/> Back/Side Slope <input type="checkbox"/> Foot Slope <input type="checkbox"/> Toe Slope						Slope shape: <b>Convex, Linear</b>			
Vegetation: <b>Grass</b>		Soil survey map units: <b>49</b>		Slope %: <b>2.0</b>		Elevation (ft): <b>100.3</b>			
Weather Conditions/Time of Day: <b>Sunny / 3:00 pm</b>						Date: <b>04/19/19</b>			
Observation #/Location:		<b>SB4 - Secondary - See Map</b>				Observation Type: <b>Auger</b>			
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I----- Structure-----I		
							Shape	Grade	Consistence
0-5	Silt Loam	<35%	10YR 3/3				Blocky	Weak	Friable
5-11	Silt Loam	<35%	10YR 6/6				Blocky	Moderate	Firm
11-15	Clay Loam	<35%	10YR 5/6				Blocky	Strong	Extremely Firm
			10YR 4/4						
15-20	Clay Loam	<35%	10YR 5/8	10YR 3/6	Concentrations	S1	Blocky	Moderate	Friable
				10YR 6/8	Concentrations	S1			
Comments <b>LL = 15" - 99.0'</b>									

# Additional Soil Observation Logs

Project ID:



Client: Carmelite Monastery				Location / Address: 8249 Demontreville Trail N, Lake Elmo					
Soil parent material(s): (Check all that apply)				<input type="checkbox"/> Outwash <input type="checkbox"/> Lacustrine <input checked="" type="checkbox"/> Loess <input type="checkbox"/> Till <input type="checkbox"/> Alluvium <input type="checkbox"/> Bedrock <input type="checkbox"/> Organic Matter					
Landscape Position: (check one)				<input type="checkbox"/> Summit <input checked="" type="checkbox"/> Shoulder <input type="checkbox"/> Back/Side Slope <input type="checkbox"/> Foot Slope <input type="checkbox"/> Toe Slope		Slope shape: Convex, Linear			
Vegetation: Grass		Soil survey map units: 49		Slope %: 2.0		Elevation (ft): 101			
Weather Conditions/Time of Day: Sunny / 3:15 pm				Date: 04/19/19					
Observation #/Location: SB5 - Secondary - See Map				Observation Type: Auger					
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I----- Structure-----I		
							Shape	Grade	Consistence
0-8	Silt Loam	<35%	10YR 3/3				Blocky	Weak	Friable
8-11	Silt Loam	<35%	10YR 6/6				Blocky	Moderate	Firm
			10YR 5/4						
11-14	Sandy Clay Loam	<35%	10YR 5/6				Blocky	Strong	Extremely Firm
14-20	Sandy Clay	<35%	10YR 5/8	10YR 6/2	Depletions	S1	Blocky	Strong	Extremely Firm
				7.5YR 5/8	Concentrations	S1			
Comments LL = 14" - 99.8'									

**1. PROJECT INFORMATION** v 04.02.2019

Property Owner/Client:  Project ID:

Site Address:  Date:

Email Address:  Phone:

**2. DESIGN FLOW & WASTE STRENGTH** *Attach data / estimate basis for Other Establishments*

Design Flow:  GPD Anticipated Waste Type:

BOD:  mg/L TSS:  mg/L Oil & Grease:  mg/L

Treatment Level:  *Select Treatment Level C for residential septic tank effluent*

**3. HOLDING TANK SIZING**

Minimum Capacity: Residential =400 gal/bedroom, Other Establishment = Design Flow x 5.0, Minimum size 1000 gallons

Code Minimum Holding Tank Capacity:  Gallons in  Tanks or Compartments

Recommended Holding Tank Capacity:  Gallons in  Tanks or Compartments

Type of High Level Alarm:  (Set @ 75% tank capacity)

Comments:

**4. SEPTIC TANK SIZING**

**A. Residential dwellings:**

Number of Bedrooms (Residential):

Code Minimum Septic Tank Capacity:  Gallons in  Tanks or Compartments

Recommended Septic Tank Capacity:  Gallons in  Tanks or Compartments

Effluent Screen & Alarm (Y/N):  Model/Type:

**B. Other Establishments:**

Waste received by:   GPD x  Days Hyd. Retention Time

Code Minimum Septic Tank Capacity:  Gallons in  Tanks or Compartments

Recommended Septic Tank Capacity:  Gallons in  Tanks or Compartments

Effluent Screen & Alarm (Y/N):  Model/Type:

**5. PUMP TANK SIZING**

<p>Pump Tank 1 Capacity (Minimum): <input type="text" value="500"/> Gal</p> <p>Pump Tank 1 Capacity (Recommended): <input type="text" value="1000"/> Gal</p> <p>Pump 1 <input type="text" value="22.0"/> GPM Total Head <input type="text" value="15.6"/> ft</p> <p>Supply Pipe Dia. <input type="text" value="2.00"/> in Dose Vol: <input type="text" value="80.0"/> gal</p>	<p>Pump Tank 2 Capacity (Minimum): <input type="text"/> Gal</p> <p>Pump Tank 2 Capacity (Recommended): <input type="text"/> Gal</p> <p>Pump 2 <input type="text"/> GPM Total Head <input type="text"/> ft</p> <p>Supply Pipe Dia. <input type="text"/> Dose Vol: <input type="text"/> Gal</p>
---	---

<b>6. SYSTEM AND DISTRIBUTION TYPE</b>		Project ID: _____	
Soil Treatment Type:	<input type="text" value="Mound"/>	Distribution Type:	<input type="text" value="Pressure Distribution-Level"/>
Elevation Benchmark:	<input type="text" value="100"/> ft	Benchmark Location:	<input type="text" value="Bottom of Apron @ SW corner"/>
MPCA System Type:	<input type="text"/>	Distribution Media:	<input type="text" value="Rock"/>
Type III/IV Details:	<input type="text"/>		<input type="text"/>

<b>7. SITE EVALUATION SUMMARY:</b>			
Describe Limiting Condition: <input type="text" value="Redoximorphic Features/Saturated Soils"/>			
Layers with >35% Rock Fragments? (yes/no) <input type="text" value="No"/> If yes, describe below: % rock and layer thickness, amount of soil credit and any additional information for addressing the rock fragments in this design.			
Note: <input type="text"/>			
	Depth	Depth	Elevation
Limiting Condition:	<input type="text" value="14"/> inches	<input type="text" value="1.2"/> ft	<input type="text" value="100.2"/> ft
Minimum Req'd Separation:	<input type="text" value="36"/> inches	<input type="text" value="3.0"/> ft	<input type="text"/> Elevation <i>Critical for system compliance</i>
Code Max System Depth:	<input type="text" value="Mound"/> inches	<input type="text" value="-1.8"/> ft	<input type="text" value="102.0"/> ft
This is the maximum depth to the bottom of the distribution media. Negative Depth (ft) means it must be a mound.			
Soil Texture:	<input type="text" value="Silt Loam"/>		
Soil Hyd. Loading Rate:	<input type="text" value="0.50"/> GPD/ft <sup>2</sup>	Percolation Rate:	<input type="text"/> MPI
Contour Loading Rate:	<input type="text" value="10"/>	Note:	<input type="text"/>
Measured Land Slope:	<input type="text" value="2.0"/> %	Note:	<input type="text"/>
Comments:	<input type="text"/>		

<b>8. SOIL TREATMENT AREA DESIGN SUMMARY</b>			
<b>Trench:</b>			
Dispersal Area	<input type="text"/> ft <sup>2</sup>	Sidewall Depth	<input type="text"/> in
Total Lineal Feet	<input type="text"/> ft	No. of Trenches	<input type="text"/>
Contour Loading Rate	<input type="text"/> ft	Min. Length	<input type="text"/> ft
		Trench Width	<input type="text"/> ft
		Code Max. Trench Depth	<input type="text"/> in
		Designed Trench Depth	<input type="text"/> in
<b>Bed:</b>			
Dispersal Area	<input type="text"/> ft <sup>2</sup>	Sidewall Depth	<input type="text"/> in
Bed Width	<input type="text"/> ft	Bed Length	<input type="text"/> ft
		Maximum Bed Depth	<input type="text"/> in
		Designed Bed Depth	<input type="text"/> in
<b>Mound:</b>			
Dispersal Area	<input type="text" value="500.0"/> ft <sup>2</sup>	Bed Length	<input type="text" value="50.0"/> ft
Absorption Width	<input type="text" value="26.0"/> ft	Clean Sand Lift	<input type="text" value="1.8"/> ft
Upslope Berm Width	<input type="text" value="15.3"/> ft	Berm Width (0-1%)	<input type="text"/> ft
Total System Length	<input type="text" value="84.7"/> ft	Downslope Berm	<input type="text" value="20.0"/> ft
		Endslope Berm Width	<input type="text" value="17.3"/> ft
		System Width	<input type="text" value="45.3"/> ft
		Contour Loading Rate	<input type="text" value="10.0"/> gal/ft

Project ID: \_\_\_\_\_

**At-Grade:**

Bed Width  ft      Bed Length  ft      Finished Height  ft  
 Contour Loading Rate  gal/ft      Upslope Berm  ft      Downslope Berm  ft  
 Endslope Berm  ft      System Length  ft      System Width  ft

**Level & Equal Pressure Distribution**

No. of Laterals       Perforation Spacing  ft      Perforation Diameter  in  
 Lateral Diameter  in      Min Dose Volume  gal      Max Dose Volume  gal

**Non-Level and Unequal Pressure Distribution**

	Elevation (ft)	Pipe Size (in)	Pipe Volume (gal/ft)	Pipe Length (ft)	Perf Size (in)	Spacing (ft)	Spacing (in)	
Lateral 1								Minimum Dose Volume <input type="text"/> gal
Lateral 2								
Lateral 3								
Lateral 4								Maximum Dose Volume <input type="text"/> gal
Lateral 5								
Lateral 6								

**9. Additional Info for At-Risk, HSW or Type IV Design**

A. Starting BOD Concentration = Design Flow X Starting BOD (mg/L) X 8.35 ÷ 1,000,000

gpd X  mg/L X 8.35 ÷ 1,000,00 =  lbs. BOD/day

B. Target BOD Concentration = Design Flow X Target BOD (mg/L) X 8.35 ÷ 1,000,000

gpd X  mg/L X 8.35 ÷ 1,000,00 =  lbs. BOD/day

Lbs. BOD To Be Removed:

PreTreatment Technology:  \*Must Meet or Exceed Target

Disinfection Technology:  \*Required for Levels A & B

C. Organic Loading to Soil Treatment Area:

mg/L X  gpd x 8.35 ÷ 1,000,000 ÷  ft<sup>2</sup> =  lbs./day/ft<sup>2</sup>

**10. Comments/Special Design Considerations:**

The Soil Treatment Area is designed to handle potential At-risk Organic Loading Rate of BOD (269 mg/L).  
 - 0.90 [#./day] / .0007 [BOD Organic Loading #/sqft for Silt Loam] = 1,286 sqft required.  
 - Mound Absorption Area = 50' x 26' = 1,300 sqft

All Mound Materials Calculations are only estimates. Actual material amounts & weights may vary.

I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.

(Designer)

(Signature)

(License #)

(Date)

# Mound Design Worksheet

## ≥1% Slope

1. **SYSTEM SIZING:** Project ID: \_\_\_\_\_ v 04.02.2019

- A. Design Flow:  GPD
- B. Soil Loading Rate:  GPD/ft<sup>2</sup>
- C. Depth to Limiting Condition:  ft
- D. Percent Land Slope:  %
- E. Design Media Loading Rate:  GPD/ft<sup>2</sup>
- F. Mound Absorption Ratio:

TABLE IXa				
LOADING RATES FOR DETERMINING BOTTOM ABSORPTION AREA AND ABSORPTION RATIOS USING PERCOLATION TESTS				
Percolation Rate (MPI)	Treatment Level C		Treatment Level A, A-2, B,	
	Absorption Area Loading Rate (gpd/ft <sup>2</sup> )	Mound Absorption Ratio	Absorption Area Loading Rate (gpd/ft <sup>2</sup> )	Mound Absorption Ratio
<0.1	-	1	-	1
0.1 to 5	1.2	1	1.6	1
0.1 to 5 (fine sand and loamy fine sand)	0.6	2	1	1.6
6 to 15	0.78	1.5	1	1.6
16 to 30	0.6	2	0.78	2
31 to 45	0.5	2.4	0.78	2
46 to 60	0.45	2.6	0.6	2.6
61 to 120	-	5	0.3	5.3
>120	-	-	-	-

Table I MOUND CONTOUR LOADING RATES:			
Measured Perc Rate	← OR →	Texture - derived mound absorption ratio	Contour Loading Rate:
≤ 60mpi	← OR →	1.0, 1.3, 2.0, 2.4, 2.6	→ ≤12
61-120 mpi	← OR →	5.0	→ ≤12
≥ 120 mpi*	← OR →	>5.0*	→ ≤6*

\*Systems with these values are not Type I systems. Contour Loading Rate (linear loading rate) is a recommended value.

### 2. DISPERSAL MEDIA SIZING

- A. Calculate Dispersal Bed Area: Design Flow ÷ Design Media Loading Rate = ft<sup>2</sup>  
 GPD ÷  GPD/ft<sup>2</sup> =  ft<sup>2</sup>  
 If a larger dispersal media area is desired, enter size:  ft<sup>2</sup>
- B. Enter Dispersal Bed Width:  ft *Can not exceed 10 feet*
- C. Calculate Contour Loading Rate: Bed Width X Design Media Loading Rate  
 ft<sup>2</sup> X  GPD/ft<sup>2</sup> =  gal/ft *Can not exceed Table 1*
- D. Calculate Minimum Dispersal Bed Length: Dispersal Bed Area ÷ Bed Width = Bed Length  
 ft<sup>2</sup> ÷  ft =  ft

### 3. ABSORPTION AREA SIZING

- A. Calculate Absorption Width: Bed Width X Mound Absorption Ratio = Absorption Width  
 ft X  =  ft
- B. For slopes >1%, the Absorption Width is measured downhill from the upslope edge of the Bed.  
 Calculate Downslope Absorption Width: Absorption Width - Bed Width  
 ft -  ft =  ft

### 4. DISTRIBUTION MEDIA: ROCK

Project ID: \_\_\_\_\_

- A. Rock Depth Below Distribution Pipe  
 in  ft

**5. DISTRIBUTION MEDIA: REGISTERED TREATMENT PRODUCTS: CHAMBERS AND EZFLOW**

A. Enter Dispersal Media:

B. Enter the Component: Length:  ft Width:  ft Depth:  ft

C. Number of Components per Row = Bed Length divided by Component Length (Round up)

ft ÷  ft =  components/row

*Check registered product information for specific application details and design*

D. Actual Bed Length = Number of Components/row X Component Length:

components X  ft =

E. Number of Rows = Bed Width divided by Component Width (Round up)

ft ÷  ft =  rows *Adjust width so this is a whole number.*

F. Total Number of Components = Number of Components per Row X Number of Rows

X  =  components

**6. MOUND SIZING**

A. Calculate Minimum Clean Sand Lift: 3 feet minus Depth to Limiting Condition = Clean Sand Lift

3.0 ft -  1.2 ft =  1.8 ft Design Sand Lift (optional):  ft

B. Upslope Height: Clean Sand Lift + Depth of Media + Depth of Cover cover (1 ft.)

1.8 ft +  0.8 ft +  1.5 ft =  4.1 ft

Land Slope %	0	1	2	3	4	5	6	7	8	9	10	11	12	
Upslope Berm Ratio	3:1	3.00	2.91	2.83	2.75	2.68	2.61	2.54	2.48	2.42	2.36	2.31	2.26	2.21
	4:1	4.00	3.85	3.70	3.57	3.45	3.33	3.23	3.12	3.03	2.94	2.86	2.78	2.70

C. Select Upslope Berm Multiplier (based on land slope):  3.70

D. Calculate Upslope Berm Width: Multiplier X Upslope Mound Height = Upslope Berm Width

3.70 ft X  4.1 ft =  15.3 ft

E. Calculate Drop in Elevation Under Bed: Bed Width X Land Slope ÷ 100 = Drop (ft)

10.0 ft X  2.0 % ÷ 100 =  0.20 ft

F. Calculate Downslope Mound Height: Upslope Height + Drop in Elevation = Downslope Height

4.1 ft +  0.20 ft =  4.3 ft

Land Slope %	0	1	2	3	4	5	6	7	8	9	10	11	12	
Downslope Berm Ratio	3:1	3.00	3.09	3.19	3.30	3.41	3.53	3.66	3.80	3.95	4.11	4.29	4.48	4.69
	4:1	4.00	4.17	4.35	4.54	4.76	5.00	5.26	5.56	5.88	6.25	6.67	7.14	7.69

G. Select Downslope Berm Multiplier (based on land slope):  4.35

H. Calculate Downslope Berm Width: Multiplier X Downslope Height = Downslope Berm Width

4.35 x  4.3 ft =  18.9 ft

I. Calculate Minimum Berm to Cover Absorption Area: Downslope Absorption Width + 4 feet

16.0 ft +  4 ft =  20.0 ft

J. Design Downslope Berm = greater of 4H and 4I:  20.0 ft

K. Select Endslope Berm Multiplier:  4.00 (usually 3.0 or 4.0)

L. Calculate Endslope Berm X Downslope Mound Height = Endslope Berm Width

4.00 ft X  4.3 ft =  17.3 ft

M. Calculate Mound Width: Upslope Berm Width + Bed Width + Downslope Berm Width

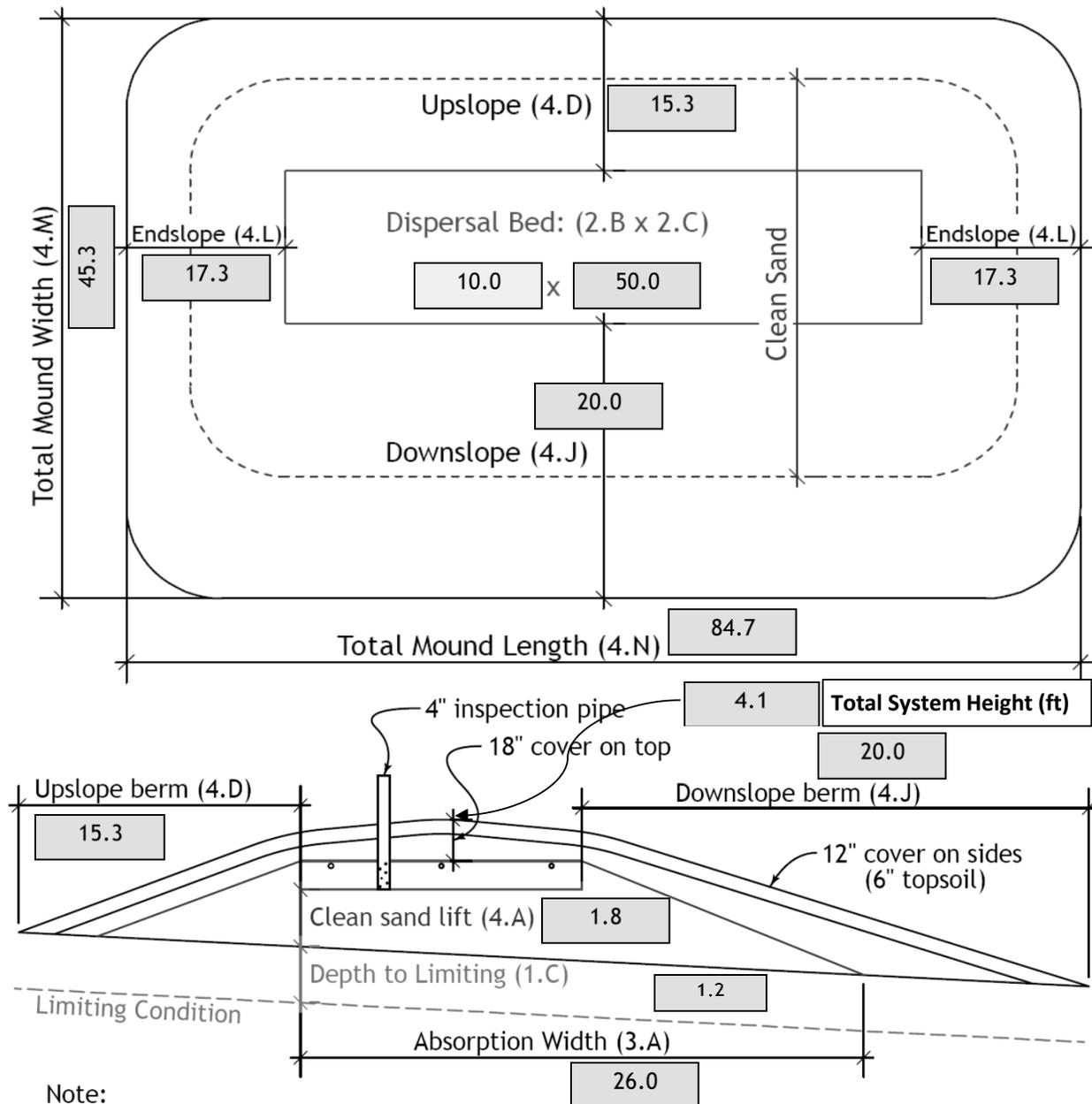
15.3 ft +  10.0 ft +  20.0 ft =  45.3 ft

N. Calculate Mound Length: Endslope Berm Width + Bed Length + Endslope Berm Width

17.3 ft +  50.0 ft +  17.3 ft =  84.7 ft

7. MOUND DIMENSIONS

Project ID:



Note:

For 0 to 1% slopes, *Absorption Width* is measured from the *Bed* equally in both directions. For slopes >1%, *Absorption Width* is measured downhill from the upslope edge of the *Bed*.

Comments:

All berms calculated at 4:1 ratio. Additional material may be needed on downslope to properly grade with hillside.

Project ID:

v 04.02.2019

**A. Rock Volume :** (Rock Below Pipe + Rock to cover pipe (pipe outside dia + ~2 inch) ) X Bed Length X Bed Width = Volume

$$\left( \boxed{6} \text{ in} + \boxed{3.5} \text{ in} \right) \div 12 \times \boxed{50.0} \text{ ft} \times \boxed{10.0} \text{ ft} = \boxed{395.8} \text{ ft}^3$$

Divide ft<sup>3</sup> by 27 ft<sup>3</sup>/yd<sup>3</sup> to calculate cubic yards:  $\boxed{395.8} \text{ ft}^3 \div 27 = \boxed{14.7} \text{ yd}^3$

Add 30% for constructability:  $\boxed{14.7} \text{ yd}^3 \times 1.3 = \boxed{19.1} \text{ yd}^3$

**B. Calculate Clean Sand Volume:**

Volume Under Rock bed : Average Sand Depth x Media Width x Media Length = cubic feet

$$\boxed{2.2} \text{ ft} \times \boxed{10.0} \text{ ft} \times \boxed{50.0} \text{ ft} = \boxed{1116.7} \text{ ft}^3$$

**For a Mound on a slope from 0-1%**

Volume from Length = ((Upslope Mound Height - 1) X Absorption Width Beyond Bed X Media Bed Length)

$$\boxed{\phantom{000}} \text{ ft} - 1) \times \boxed{\phantom{000}} \times \boxed{\phantom{000}} \text{ ft} = \boxed{\phantom{000}}$$

Volume from Width = ((Upslope Mound Height - 1) X Absorption Width Beyond Bed X Media Bed Width)

$$\boxed{\phantom{000}} \text{ ft} - 1) \times \boxed{\phantom{000}} \times \boxed{\phantom{000}} \text{ ft} = \boxed{\phantom{000}}$$

Total Clean Sand Volume : Volume from Length + Volume from Width + Volume Under Media

$$\boxed{\phantom{000}} \text{ ft}^3 + \boxed{\phantom{000}} \text{ ft}^3 + \boxed{\phantom{000}} \text{ ft}^3 = \boxed{\phantom{000}} \text{ ft}^3$$

**For a Mound on a slope greater than 1%**

Upslope Volume : ((Upslope Mound Height - 1) x 3 x Bed Length) ÷ 2 = cubic feet

$$\left( (\boxed{4.1} \text{ ft} - 1) \times 3.0 \text{ ft} \times \boxed{50.0} \right) \div 2 = \boxed{235.0} \text{ ft}^3$$

Downslope Volume : ((Downslope Height - 1) x Downslope Absorption Width x Media Length) ÷ 2 = cubic feet

$$\left( (\boxed{4.3} \text{ ft} - 1) \times \boxed{16.0} \text{ ft} \times \boxed{50.0} \right) \div 2 = \boxed{1333.3} \text{ ft}^3$$

Endslope Volume : (Downslope Mound Height - 1) x 3 x Media Width = cubic feet

$$\left( \boxed{4.3} \text{ ft} - 1) \times 3.0 \text{ ft} \times \boxed{10.0} \text{ ft} = \boxed{100.0} \text{ ft}^3$$

Total Clean Sand Volume : Upslope Volume + Downslope Volume + Endslope Volume + Volume Under Media

$$\boxed{235.0} \text{ ft}^3 + \boxed{1333.3} \text{ ft}^3 + \boxed{100.0} \text{ ft}^3 + \boxed{1116.7} \text{ ft}^3 = \boxed{2785.0} \text{ ft}^3$$

Divide ft<sup>3</sup> by 27 ft<sup>3</sup>/yd<sup>3</sup> to calculate cubic yards:  $\boxed{2785.0} \text{ ft}^3 \div 27 = \boxed{103.1} \text{ yd}^3$

Add 30% for constructability:  $\boxed{103.1} \text{ yd}^3 \times 1.3 = \boxed{134.1} \text{ yd}^3$

**C. Calculate Sandy Berm Volume:**

Total Berm Volume (approx) : ((Avg. Mound Height - 0.5 ft topsoil) x Mound Width x Mound Length) ÷ 2

$$\left( \boxed{4.2} - 0.5 \right) \text{ ft} \times \boxed{45.3} \text{ ft} \times \boxed{84.7} \div 2 = \boxed{7158.4} \text{ ft}^3$$

Total Mound Volume - Clean Sand volume - Rock Volume = cubic feet

$$\boxed{7158.4} \text{ ft}^3 - \boxed{2785.0} \text{ ft}^3 - \boxed{395.8} \text{ ft}^3 = \boxed{3977.5} \text{ ft}^3$$

Divide ft<sup>3</sup> by 27 ft<sup>3</sup>/yd<sup>3</sup> to calculate cubic yards:  $\boxed{3977.5} \text{ ft}^3 \div 27 = \boxed{147.3} \text{ yd}^3$

Add 30% for constructability:  $\boxed{147.3} \text{ yd}^3 \times 1.2 = \boxed{191.5} \text{ yd}^3$

**D. Calculate Topsoil Material Volume: Total Mound Width X Total Mound Length X .5 ft**

$$\boxed{45.3} \text{ ft} \times \boxed{84.7} \text{ ft} \times 0.5 \text{ ft} = \boxed{1917.4} \text{ ft}^3$$

Divide ft<sup>3</sup> by 27 ft<sup>3</sup>/yd<sup>3</sup> to calculate cubic yards:  $\boxed{1917.4} \text{ ft}^3 \div 27 = \boxed{71.0} \text{ yd}^3$

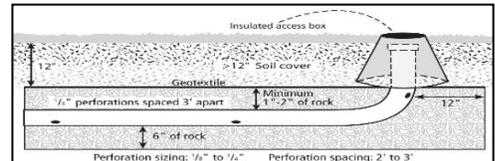
Add 30% for constructability:  $\boxed{71.0} \text{ yd}^3 \times 1.3 = \boxed{54.6} \text{ yd}^3$

# Pressure Distribution Design Worksheet

Project ID:

v 04.02.2019

- Media Bed Width:  ft
- Minimum Number of Laterals in system/zone = Rounded up number of  $[(\text{Media Bed Width} - 4) \div 3] + 1$ .  
 $[(\text{  } - 4) \div 3] + 1 = \text{  } \text{ laterals}$  *Does not apply to at-grades*
- Designer Selected Number of Laterals:  laterals  
*Cannot be less than line 2 (Except in at-grades)*
- Select Perforation Spacing:  ft
- Select Perforation Diameter Size:  in
- Length of Laterals = Media Bed Length - 2 Feet.



- 2ft =  ft *Perforation can not be closer than 1 foot from edge.*

- Determine the Number of Perforation Spaces. Divide the Length of Laterals by the Perforation Spacing and round down to the nearest whole number.

Number of Perforation Spaces =  ft  $\div$   ft =  Spaces

- Number of Perforations per Lateral is equal to 1.0 plus the Number of Perforation Spaces. Check table below to verify the number of perforations per lateral guarantees less than a 10% discharge variation. The value is double with a center manifold.

Perforations Per Lateral =  Spaces + 1 =  Perfs. Per Lateral

Maximum Number of Perforations Per Lateral to Guarantee <10% Discharge Variation											
1/4 Inch Perforations						7/32 Inch Perforations					
Perforation Spacing (Feet)	Pipe Diameter (Inches)					Perforation Spacing (Feet)	Pipe Diameter (Inches)				
	1	1 1/4	1 1/2	2	3		1	1 1/4	1 1/2	2	3
2	10	13	18	30	60	2	11	16	21	34	68
2 1/2	8	12	16	28	54	2 1/2	10	14	20	32	64
3	8	12	16	25	52	3	9	14	19	30	60
3/16 Inch Perforations						1/8 Inch Perforations					
Perforation Spacing (Feet)	Pipe Diameter (Inches)					Perforation Spacing (Feet)	Pipe Diameter (Inches)				
	1	1 1/4	1 1/2	2	3		1	1 1/4	1 1/2	2	3
2	12	18	26	46	87	2	21	33	44	74	149
2 1/2	12	17	24	40	80	2 1/2	20	30	41	69	135
3	12	16	22	37	75	3	20	29	38	64	128

- Total Number of Perforations equals the Number of Perforations per Lateral multiplied by the Number of Perforated Laterals.

Perf. Per Lat. X  Number of Perf. Lat. =  Total Number of Perf.

- Spacing of laterals; Must be greater than 1 foot and no more than 3 feet:  ft

- Select Type of Manifold Connection (End or Center):

- Select Lateral Diameter (See Table):  in

12. Calculate the *Square Feet per Perforation*. Recommended value is 4-11 ft<sup>2</sup> per perforation.

**Does not apply to At-Grades**

a. *Bed Area* = Bed Width (ft) X Bed Length (ft)

$$\boxed{10} \text{ ft} \quad \times \quad \boxed{50} \text{ ft} \quad = \quad \boxed{500} \text{ ft}^2$$

b. *Square Foot per Perforation* = *Bed Area* divided by the *Total Number of Perforations*.

$$\boxed{500} \text{ ft}^2 \quad \div \quad \boxed{51} \text{ perforations} \quad = \quad \boxed{9.8} \text{ ft}^2/\text{perforations}$$

13. Select *Minimum Average Head*:  $\boxed{1.0}$  ft

14. Select *Perforation Discharge* (GPM) based on Table:  $\boxed{0.41}$  GPM per Perforation

15. Determine required *Flow Rate* by multiplying the *Total Number of Perfs.* by the *Perforation Discharge*.

$$\boxed{51} \text{ Perfs} \quad \times \quad \boxed{0.41} \text{ GPM per Perforation} \quad = \quad \boxed{22} \text{ GPM}$$

16. *Volume of Liquid Per Foot of Distribution Piping* (Table II):  $\boxed{0.110}$  Gallons/ft

17. *Volume of Distribution Piping* =

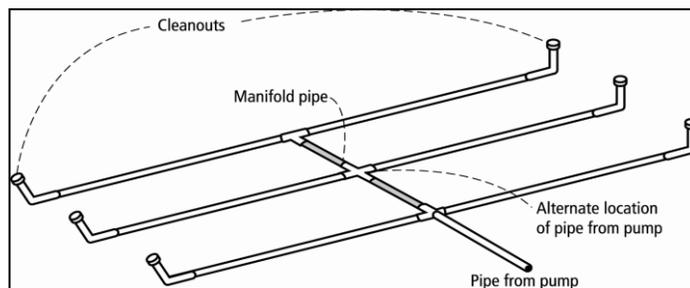
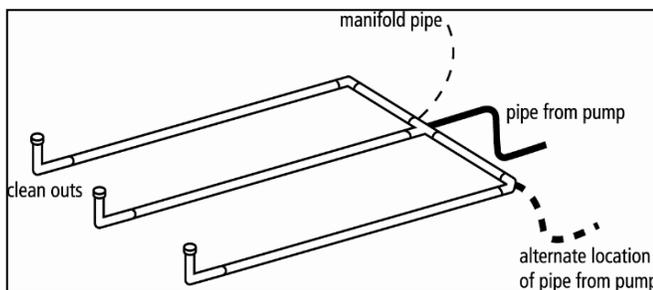
= [Number of Perforated Laterals X Length of Laterals X (Volume of Liquid Per Foot of Distribution Piping)]

$$\boxed{3} \quad \times \quad \boxed{48} \text{ ft} \quad \times \quad \boxed{0.110} \text{ gal/ft} \quad = \quad \boxed{15.8} \text{ Gallons}$$

18. Minimum Delivered Volume = Volume of Distribution Piping X 4

$$\boxed{15.8} \text{ gals} \quad \times \quad 4 \quad = \quad \boxed{63.4} \text{ Gallons}$$

Table II Volume of Liquid in Pipe	
Pipe Diameter (inches)	Liquid Per Foot (Gallons)
1	0.045
1.25	0.078
1.5	0.110
2	0.170
3	0.380
4	0.661



Comments/Special Design Considerations:

1. PUMP CAPACITY Project ID:                      v 04.02.2019

**Pumping to Gravity or Pressure Distribution:** Pressure

1. If pumping to gravity enter the gallon per minute of the pump:                      GPM (10 - 45 gpm)

2. If pumping to a pressurized distribution system: 22.0 GPM

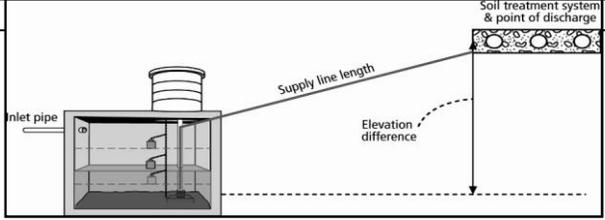
3. Enter pump description: Demand Dosing

**2. HEAD REQUIREMENTS**

A. Elevation Difference 9 ft  
between pump and point of discharge:

B. Distribution Head Loss: 5 ft

C. Additional Head Loss: 0.0 ft (due to special equipment, etc.)



Distribution Head Loss	
Gravity Distribution = 0ft	
Pressure Distribution based on Minimum Average Head Value on Pressure Distribution Worksheet:	
Minimum Average Head	Distribution Head Loss
1ft	5ft
2ft	6ft
5ft	10ft

Flow Rate (GPM)	Pipe Diameter (inches)			
	1	1.25	1.5	2
10	9.1	3.1	1.3	0.3
12	12.8	4.3	1.8	0.4
14	17.0	5.7	2.4	0.6
16	21.8	7.3	3.0	0.7
18		9.1	3.8	0.9
20		11.1	4.6	1.1
25		16.8	6.9	1.7
30		23.5	9.7	2.4
35			12.9	3.2
40			16.5	4.1
45			20.5	5.0
50				6.1
55				7.3
60				8.6
65				10.0
70				11.4
75				13.0
85				16.4
95				20.1

D. 1. Supply Pipe Diameter: 2.0 in

2. Supply Pipe Length: 95 ft

E. Friction Loss in Plastic Pipe per 100ft from Table I:

Friction Loss = 1.34 ft per 100ft of pipe

F. Determine *Equivalent Pipe Length* from pump discharge to soil dispersal area discharge point. Estimate by adding 25% to supply pipe length for fitting loss. *Supply Pipe Length (D.2) X 1.25 = Equivalent Pipe Length*

95 ft X 1.25 = 118.8 ft

G. Calculate *Supply Friction Loss* by multiplying *Friction Loss Per 100ft* (Line E) by the *Equivalent Pipe Length* (Line F) and divide by 100.

Supply Friction Loss = 1.34 ft per 100ft X 118.8 ft ÷ 100 = 1.6 ft

H. *Total Head* requirement is the sum of the *Elevation Difference* (Line A), the *Distribution Head Loss* (Line B), *Additional Head Loss* (Line C), and the *Supply Friction Loss* (Line G)

9.0 ft + 5.0 ft + 0.0 ft + 1.6 ft = 15.6 ft

**3. PUMP SELECTION**

A pump must be selected to deliver at least **22.0** GPM (Line 1 or Line 2) with at least **15.6** feet of total head.

Comments:

**DETERMINE TANK CAPACITY AND DIMENSIONS** Project ID: \_\_\_\_\_ v 04.02.2019

1. A. Design Flow (Design Sum. 1A):  GPD C. Tank Use:

B. Min. required pump tank capacity:  Gal D. Recommended pump tank capacity:  Gal

2. A. Tank Manufacturer:  B. Tank Model:

C. Capacity from manufacturer:  Gallons

D. Gallons per inch from manufacturer:  Gallons per inch

E. Liquid depth of tank from manufacturer:  inches

*Note: Design calculations are based on this specific tank. Substituting a different tank model will change the pump float or timer settings. Contact designer if changes are necessary.*

**DETERMINE DOSING VOLUME**

3 Calculate Volume to Cover Pump (The inlet of the pump must be at least 4-inches from the bottom of the pump tank & 2 inches of water covering the pump is recommended)

(Pump and block height + 2 inches) X Gallons Per Inch (2C or 3E)

(  in + 2 inches ) X  Gallons Per Inch =  Gallons

4 Minimum Delivered Volume = 4 X Volume of Distribution Piping:

-Item 18 of the Pressure Distribution or Item 11 of Non-level  Gallons (Minimum dose)  inches/dose

5 Calculate Maximum Pumpout Volume (25% of Design Flow)

Design Flow:  GPD X 0.25 =  Gallons (Maximum dose)  inches/dose

6 Select a pumpout volume that meets both Minimum and Maximum:  Gallons

7 Calculate Doses Per Day = Design Flow ÷ Delivered Volume

gpd ÷  gal =  Doses

8 Calculate Drainback:

A. Diameter of Supply Pipe =  inches

B. Length of Supply Pipe =  feet

C. Volume of Liquid Per Lineal Foot of Pipe =  Gallons/ft

D. Drainback = Length of Supply Pipe X Volume of Liquid Per Lineal Foot of Pipe

ft X  gal/ft =  Gallons

9. Total Dosing Volume = Delivered Volume plus Drainback

gal +  gal =  Gallons

10. Minimum Alarm Volume = Depth of alarm (2 or 3 inches) X gallons per inch of tank

in X  gal/in =  Gallons

Volume of Liquid in Pipe	
Pipe Diameter (inches)	Liquid Per Foot (Gallons)
1	0.045
1.25	0.078
1.5	0.110
2	0.170
3	0.380
4	0.661

**DEMAND DOSE FLOAT SETTINGS**

11. Calculate Float Separation Distance using Dosing Volume .

Total Dosing Volume /Gallons Per Inch

gal ÷  gal/in =  Inches

12. Measuring from bottom of tank:

A. Distance to set Pump Off Float = Pump + block height + 2 inches

in + 2 in =  Inches

B. Distance to set Pump On Float=Distance to Set Pump-Off Float + Float Separation Distance

in +  in =  Inches

C. Distance to set Alarm Float = Distance to set Pump-On Float + Alarm Depth (2-3 inches)

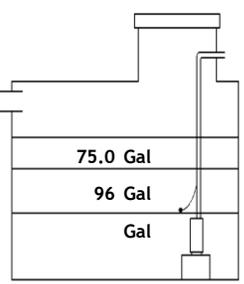
in +  in =  Inches

Inches for Dose: 3.8 in

Alarm Depth 18.8 in

Pump On 15.8 in

Pump Off 12.0 in



Establishment	7081 Specified Type of Establishment	Unit	# of Units	Design Flow per Unit (See Table I)	Total Avg Daily Flow
1	Assembly hall	seat	80	4.00	320
1	Assembly hall	employee	2	15.00	30
<b>Total Flow 7081 Establishments (gpd)</b>					350
<b>Safety Factor (gpd)</b>					50.00
<b>Total Flow 7081 Establishments (gpd)</b>					400.00
Establishment	7081 Specified Type of Establishment - BOD	Unit	# of Units	Design Pounds / Day	Total Avg Daily Flow
1	Assembly hall	seat	80	0.01	0.8
1	Assembly hall	employee	2	0.05	0.1
<b>Total Organic Load 7081 Establishments BOD (lbs/unit/day)</b>					0.90
<b>Total Organic Load 7081 Establishments BOD (mg/L/day)</b>					269

## Estimate of Waste Strengths from Other Establishments

Type of Facility	BOD <sub>5</sub> (mg/L)	BOD <sub>5</sub> (lbs/unit/day)
<b>Airports</b>		
Per passenger	400 - 500	0.02
Per employee	400 - 500	0.05
Apartment houses	240 - 400	0.175/multiple family
Assembly hall (no kitchen)	240 - 400	0.01/seat
Boarding school	240 - 400	
Bowling alley (no kitchen)	240 - 400	0.15/lane
<b>Camps</b>		
Construction (Semi-permanent)	400 - 500	0.140
Country club (member)	400 - 500	0.052/member
Country club (resident)	240 - 400	0.208/resident
Day (no meals)	400 - 500	0.031
Luxury	400 - 500	0.208
Church (no kitchen)	240 - 400	0.02/seat
Country club	400 - 800	0.208/member
Personnel addition	240 - 400	0.04/employee
Day school	240 - 400	0.031/student
Add for showers	240 - 400	0.011/student
Add for cafeteria	500 - 700	0.031/meal
<b>Factory</b>		
No showers	240 - 400	0.073/employee
With showers	240 - 400	0.083/employee
<b>Food service</b>		
Ordinary restaurant	600 - 1500	0.35/seat
24-Hour restaurant	600 - 1500	0.50/seat
Freeway restaurant	600 - 1500	0.70/seat
Tavern (limited food)	400 - 800	0.10/seat
Carry-out (single service)	600 - 800	0.70/100 sqft
Carry-out	200 - 600	0.04/employee
Fast food chain	1000 - 2000	0.80/seat
Kitchen Waste	600 - 1500	0.015/meal
Toilet and Kitchen Waste	600 - 1500	0.021/customer
Additional for bars & cocktail lounges	600 - 1500	0.01/customer
Hospital (not including personnel)	400 - 600	0.518/bed
Laundromat	600 - 800	2.0/machine
Mobile home park	240 - 400	0.40/space
Mobile home park	240 - 400	0.140/person
Motel, Hotel	240 - 400	0.083/bed
Motel, Hotel	240 - 400	0.14/person
Nursing home (not including kitchen or laundry)	400 - 600	0.26/bed
Office building (per 8 hour shift)	240 - 400	0.05/employee
Park, toilets only	400 - 600	0.01/person
Park, bathhouse and flush toilets	240 - 400	0.021/person
Resort hotel, cottage	240 - 400	0.15/room
Add for self-service laundry	600 - 800	2.0/machine
Service station	240 - 400	0.50/toilet or urinal
Service station	240 - 400	0.021vehicle served
Shopping center (no food service or laundry)	400 - 600	0.30/1000 sqft
Shopping center (no food service or laundry)	400 - 600	0.050/employee
Sports Stadium	400 - 600	0.20/person
Swimming pool	300 - 500	0.021/person
<b>Theaters</b>		
Drive-in	400 - 500	0.010/car space
Indoor	240 - 400	0.010/seat
<b>Travel trailer or RV park</b>		
No water/sewer hook up	400 - 800	0.25/space
With water and sewer	400 - 800	0.35/space



## Septic System Management Plan for Above Grade Systems

The goal of a septic system is to protect human health and the environment by properly treating wastewater before returning it to the environment. Your septic system is designed to kill harmful organisms and remove pollutants before the water is recycled back into our lakes, streams and groundwater.

This **management plan** will identify the operation and maintenance activities necessary to ensure long-term performance of your septic system. Some of these activities must be performed by you, the homeowner. Other tasks must be performed by a licensed septic maintainer or service provider. However, it is **YOUR** responsibility to make sure all tasks get accomplished in a timely manner.

The University of Minnesota's *Septic System Owner's Guide* contains additional tips and recommendations designed to extend the effective life of your system and save you money over time.

***Proper septic system design, installation, operation and maintenance means safe and clean water!***

Property Owner	<b>Carmelite Monestary</b>	Email
Property Address	8249 DeMontreville Trail N, Lake Elmo, MN 55402	Property ID
System Designer	<b>Jesse Kloepfner</b>	Contact Info <b>763-843-4114</b>
System Installer	<b>Capra's Utilities</b>	Contact Info <b>651-762-2500</b>
Service Provider/Maintainer		Contact Info
Permitting Authority	<b>Washington County</b>	Contact Info
Permit #		Date Inspected

Keep this Management Plan with your Septic System Owner's Guide. The Septic System Owner's Guide includes a folder to hold maintenance records including pumping, inspection and evaluation reports. Ask your septic professional to also:

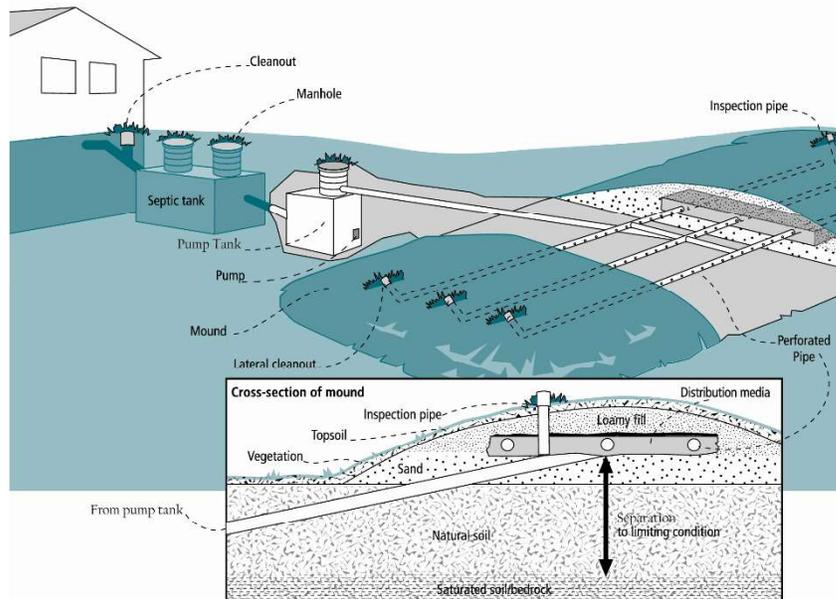
- Attach permit information, designer drawings and as-built of your system, if they are available.
- Keep copies of all pumping records and other maintenance and repair invoices with this document.
- Review this document with your maintenance professional at each visit; discuss any changes in product use, activities, or water-use appliances.

For a copy of the *Septic System Owner's Guide*, visit [www.bookstores.umn.edu](http://www.bookstores.umn.edu) and search for the word "septic" or call 800-322-8642.

**For more information see <http://septic.umn.edu>**



Your Septic System



**Septic System Specifics**

System Type:  I  II  III  IV\*  V\*  
 (Based on MN Rules Chapter 7080.2200 – 2400)  
 \*Additional Management Plan required

System is subject to operating permit\*  
 System uses UV disinfection unit\*  
 Type of advanced treatment unit \_\_\_\_\_

**Dwelling Type**

Number of bedrooms: Assembly Hall (no kitchen)  
 System capacity/ design flow (gpd): 400  
 Anticipated average daily flow (gpd): 280  
 Comments \_\_\_\_\_  
 Business? :  Y  N What type? Church

**Well Construction**

Well depth (ft): \_\_\_\_\_  
 Cased well Casing depth: \_\_\_\_\_  
 Other (specify): \_\_\_\_\_  
 Distance from septic (ft): > 50  
 Is the well on the design drawing?  Y  N

**Septic Tank**

First tank Tank volume: 1000 gallons  
 Does tank have two compartments?  Y  N

Second tank Tank volume: 1000 gallons

Tank is constructed of Concrete

Effluent screen:  Y  N Alarm  Y  N

Pump Tank 1000 gallons  
 Effluent Pump make/model: Installer Choice  
 Pump capacity 22 GPM  
 TDH 16 Feet of head  
 Alarm location TBD

**Soil Treatment Area (STA)**

Mound/At-Grade area (width x length): 45.3 ft x 84.7 ft  
 Rock bed size (width x length): 10 ft x 50 ft  
 Location of additional STA: South of New Mound  
 Type of distribution media: Rock

Inspection ports  Cleanouts  
 Surface water diversions  
 Additional STA not available



## Homeowner Management Tasks

These *operation and maintenance* activities are your responsibility. *Chart on page 6 can help track your activities.*

**Your toilet is not a garbage can. Do not flush anything besides human waste and toilet paper. No wet wipes, cigarette butts, disposal diapers, used medicine, feminine products or other trash!**

The system and septic tanks needs to be  
checked every   36   months

Your service provider or pumper/maintainer should evaluate if your tank needs to be pumped more or less often.

### Seasonally or several times per year

- *Leaks.* Check (listen, look) for leaks in toilets and dripping faucets. Repair leaks promptly.
- *Soil treatment area.* Regularly check for wet or spongy soil around your soil treatment area. If surfaced sewage or strong odors are not corrected by pumping the tank or fixing broken caps and leaks, call your service professional. *Untreated sewage may make humans and animals sick.* Keep bikes, snowmobiles and other traffic off and control borrowing animals.
- *Alarms.* Alarms signal when there is a problem; contact your service professional any time the alarm signals.
- *Lint filter.* If you have a lint filter, check for lint buildup and clean when necessary. If you do not have one, consider adding one after washing machine.
- *Effluent screen.* If you do not have one, consider having one installed the next time the tank is cleaned along with an alarm.

### Annually

- *Water usage rate.* A water meter or another device can be used to monitor your average daily water use. Compare your water usage rate to the design flow of your system (listed on the next page). Contact your septic professional if your average daily flow over the course of a month exceeds 70% of the design flow for your system.
- *Caps.* Make sure that all caps and lids are intact and in place. Inspect for damaged caps at least every fall. Fix or replace damaged caps before winter to help prevent freezing issues.
- *Water conditioning devices.* See Page 5 for a list of devices. When possible, program the recharge frequency based on *water demand (gallons)* rather than *time (days)*. Recharging too frequently may negatively impact your septic system. Consider updating to demand operation if your system currently uses time,
- *Review your water usage rate.* Review the Water Use Appliance chart on Page 5. Discuss any major changes with your service provider or pumper/maintainer.

### During each visit by a service provider or pumper/maintainer

- Make sure that your service professional services the tank through the manhole. (NOT through a 4" or 6" diameter inspection port.)
- Ask how full your tank was with sludge and scum to determine if your service interval is appropriate.
- Ask your pumper/maintainer to accomplish the tasks listed on the Professional Tasks on Page 4.



## Professional Management Tasks

These are the operation and maintenance activities that a pumper/maintainer performs to help ensure long-term performance of your system. At each visit a written report/record must be provided to homeowner.

### Plumbing/Source of Wastewater

- Review the Water Use Appliance Chart on Page 5 with homeowner. Discuss any changes in water use and the impact those changes may have on the septic system.
- Review water usage rates (if available) with homeowner.

### Septic Tank/Pump Tanks

- *Manhole lid.* A riser is recommended if the lid is not accessible from the ground surface. Insulate the riser cover for frost protection.
- *Liquid level.* Check to make sure the tank is not leaking. The liquid level should be level with the bottom of the outlet pipe. (If the water level is below the bottom of the outlet pipe, the tank may not be watertight. If the water level is higher than the bottom of the outlet pipe of the tank, the effluent screen may need cleaning, or there may be ponding in the soil treatment area.)
- *Inspection pipes.* Replace damaged or missing pipes and caps.
- *Baffles.* Check to make sure they are in place and attached, and that inlet/outlet baffles are clear of buildup or obstructions.
- *Effluent screen.* Check to make sure it is in place; clean per manufacturer recommendation. Recommend retrofitted installation if one is not present.
- *Alarm.* Verify that the alarm works.
- *Scum and sludge.* Measure scum and sludge in each compartment of each septic and pump tank, pump if needed.

### Pump

- *Pump and controls.* Check to make sure the pump and controls are operating correctly.
- *Pump vault.* Check to make sure it is in place; clean per manufacturer recommendations.
- *Alarm.* Verify that the alarm works.
- *Drainback.* Check to make sure it is draining properly.
- *Event counter or elapsed time meter.* Check to see if there is an event counter or elapsed time meter for the pump. If there is one or both, calculate the water usage rate and compare to the anticipated use listed on Design and Page 2. Dose Volume: 80 gallons: Pump run time:            On Demand            Minutes

### Soil Treatment Area

- *Inspection pipes.* Check to make sure they are properly capped. Replace caps and pipes that are damaged.
- *Surfacing of effluent.* Check for surfacing effluent or other signs of problems.
- *Lateral flushing.* Check lateral distribution; if cleanouts exist, flush and clean at recommended frequency.
- *Vegetation* - Check to see that a good growth of vegetation is covering the system.

**All other components – evaluate as listed here:**



**Water-Use Appliances and  
Equipment in the Home**

<b>Appliance</b>	<b>Impacts on System</b>	<b>Management Tips</b>
Garbage disposal	<ul style="list-style-type: none"> <li>• Uses additional water.</li> <li>• Adds solids to the tank.</li> <li>• Finely-ground solids may not settle. Unsettled solids can exit the tank and enter the soil treatment area.</li> </ul>	<ul style="list-style-type: none"> <li>• Use of a garbage disposal is not recommended.</li> <li>• Minimize garbage disposal use. Compost instead.</li> <li>• To prevent solids from exiting the tank, have your tank pumped more frequently.</li> <li>• Add an effluent screen to your tank.</li> </ul>
Washing machine	<ul style="list-style-type: none"> <li>• Washing several loads on one day uses a lot of water and may overload your system.</li> <li>• Overloading your system may prevent solids from settling out in the tank. Unsettled solids can exit the tank and enter the soil treatment area.</li> </ul>	<ul style="list-style-type: none"> <li>• Choose a front-loader or water-saving top-loader, these units use less water than older models.</li> <li>• Limit the addition of extra solids to your tank by using liquid or easily biodegradable detergents. Limit use of bleach-based detergents and fabric softeners.</li> <li>• Install a lint filter after the washer and an effluent screen to your tank</li> <li>• Wash only full loads and think even – spread your laundry loads throughout the week.</li> </ul>
Dishwasher	<ul style="list-style-type: none"> <li>• Powdered and/or high-phosphorus detergents can negatively impact the performance of your tank and soil treatment area.</li> <li>• New models promote “no scraping”. They have a garbage disposal inside.</li> </ul>	<ul style="list-style-type: none"> <li>• Use gel detergents. Powdered detergents may add solids to the tank.</li> <li>• Use detergents that are low or no-phosphorus.</li> <li>• Wash only full loads.</li> <li>• Scrape your dishes anyways to keep undigested solids out of your septic system.</li> </ul>
Grinder pump (in home)	<ul style="list-style-type: none"> <li>• Finely-ground solids may not settle. Unsettled solids can exit the tank and enter the soil treatment area.</li> </ul>	<ul style="list-style-type: none"> <li>• Expand septic tank capacity by a factor of 1.5.</li> <li>• Include pump monitoring in your maintenance schedule to ensure that it is working properly.</li> <li>• Add an effluent screen.</li> </ul>
Large bathtub (whirlpool)	<ul style="list-style-type: none"> <li>• Large volume of water may overload your system.</li> <li>• Heavy use of bath oils and soaps can impact biological activity in your tank and soil treatment area.</li> </ul>	<ul style="list-style-type: none"> <li>• Avoid using other water-use appliances at the same time. For example, don’t wash clothes and take a bath at the same time.</li> <li>• Use oils, soaps, and cleaners in the bath or shower sparingly.</li> </ul>
<b>Clean Water Uses</b>	<b>Impacts on System</b>	<b>Management Tips</b>
High-efficiency furnace	<ul style="list-style-type: none"> <li>• Drip may result in frozen pipes during cold weather.</li> </ul>	<ul style="list-style-type: none"> <li>• Re-route water directly out of the house. Do not route furnace discharge to your septic system.</li> </ul>
Water softener Iron filter Reverse osmosis	<ul style="list-style-type: none"> <li>• Salt in recharge water may affect system performance.</li> <li>• Recharge water may hydraulically overload the system.</li> </ul>	<ul style="list-style-type: none"> <li>• These sources produce water that is not sewage and should not go into your septic system.</li> <li>• Reroute water from these sources to another outlet, such as a dry well, draitile or old drainfield.</li> </ul>
Surface drainage Footing drains	<ul style="list-style-type: none"> <li>• Water from these sources will overload the system and is prohibited from entering septic system.</li> </ul>	<ul style="list-style-type: none"> <li>• When replacing, consider using a demand-based recharge vs. a time-based recharge.</li> <li>• Check valves to ensure proper operation; have unit serviced per manufacturer directions</li> </ul>



**Homeowner Maintenance Log**

Track maintenance activities here for easy reference. See list of management tasks on pages 3 and 4.

Activity	Date accomplished									
<b>Check frequently:</b>										
Leaks: check for plumbing leaks*										
Soil treatment area check for surfacing**										
Lint filter: check, clean if needed*										
Effluent screen (if owner-maintained)***										
Alarm**										
<b>Check annually:</b>										
Water usage rate (maximum gpd _____)										
Caps: inspect, replace if needed										
Water use appliances – review use										
Other:										

\*Monthly

\*\*Quarterly

\*\*\*Bi-Annually

Notes:

*"As the owner of this SSTS, I understand it is my responsibility to properly operate and maintain the sewage treatment system on this property, utilizing the Management Plan. If requirements in this Management Plan are not met, I will promptly notify the permitting authority and take necessary corrective actions. If I have a new system, I agree to adequately protect the reserve area for future use as a soil treatment system."*

Property Owner Signature: \_\_\_\_\_

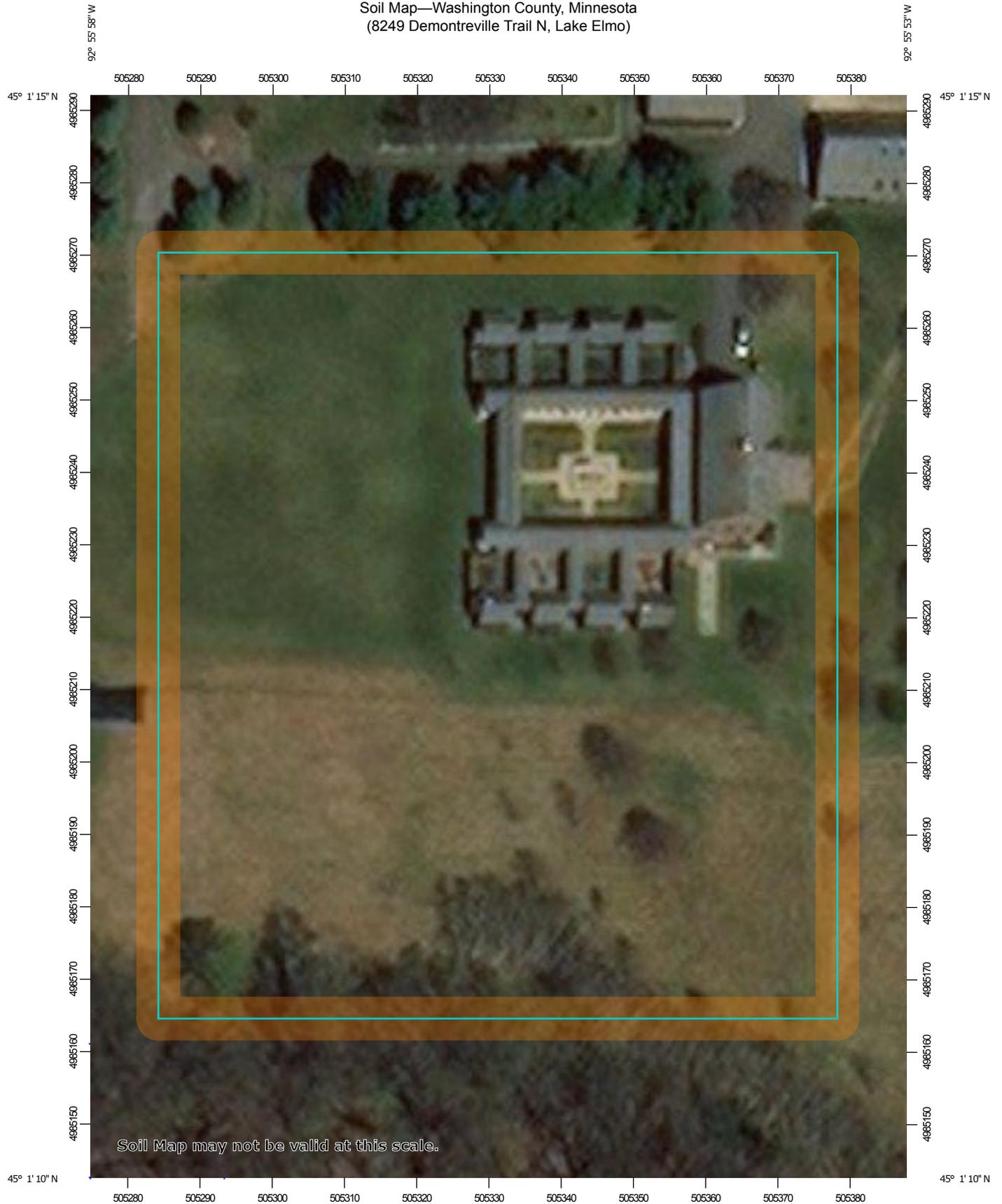
Date \_\_\_\_\_

Management Plan Prepared By: **Jesse Kloepfner**

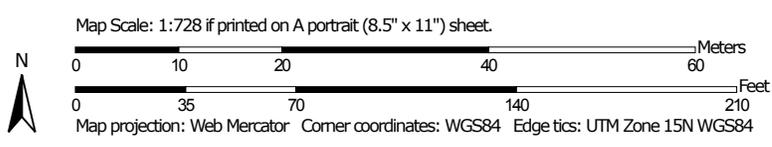
Certification # **C8188**

Permitting Authority: **Washington County**

Soil Map—Washington County, Minnesota  
(8249 Demontreville Trail N, Lake Elmo)



Soil Map may not be valid at this scale.



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

 Soil Map Unit Polygons

 Soil Map Unit Lines

 Soil Map Unit Points

### Special Point Features



Blowout



Borrow Pit



Clay Spot



Closed Depression



Gravel Pit



Gravelly Spot



Landfill



Lava Flow



Marsh or swamp



Mine or Quarry



Miscellaneous Water



Perennial Water



Rock Outcrop



Saline Spot



Sandy Spot



Severely Eroded Spot



Sinkhole



Slide or Slip



Sodic Spot



Spoil Area



Stony Spot



Very Stony Spot



Wet Spot



Other



Special Line Features

### Water Features



Streams and Canals

### Transportation



Rails



Interstate Highways



US Routes



Major Roads



Local Roads

### Background



Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

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Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Washington County, Minnesota

Survey Area Data: Version 14, Oct 9, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 1, 2013—Sep 13, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
49	Antigo silt loam, 0 to 2 percent slopes	2.5	100.0%
<b>Totals for Area of Interest</b>		<b>2.5</b>	<b>100.0%</b>

## Washington County, Minnesota

### 49—Antigo silt loam, 0 to 2 percent slopes

#### Map Unit Setting

*National map unit symbol:* 2tnz7

*Elevation:* 690 to 1,900 feet

*Mean annual precipitation:* 27 to 36 inches

*Mean annual air temperature:* 37 to 46 degrees F

*Frost-free period:* 80 to 150 days

*Farmland classification:* All areas are prime farmland

#### Map Unit Composition

*Antigo and similar soils:* 80 percent

*Minor components:* 20 percent

*Estimates are based on observations, descriptions, and transects of the mapunit.*

#### Description of Antigo

##### Setting

*Landform:* Flats, terraces

*Landform position (three-dimensional):* Tread, rise

*Down-slope shape:* Convex, linear

*Across-slope shape:* Convex, linear

*Parent material:* Loess and/or silty glaciofluvial deposits over loamy glaciofluvial deposits over stratified sandy and gravelly outwash

##### Typical profile

*Ap - 0 to 9 inches:* silt loam

*E - 9 to 12 inches:* silt loam

*B/E - 12 to 19 inches:* silt loam

*Bt1 - 19 to 28 inches:* silt loam

*2Bt2 - 28 to 31 inches:* loam

*2Bt3 - 31 to 33 inches:* very gravelly sandy loam

*3C - 33 to 79 inches:* stratified sand to very gravelly coarse sand

##### Properties and qualities

*Slope:* 0 to 2 percent

*Depth to restrictive feature:* More than 80 inches

*Natural drainage class:* Well drained

*Capacity of the most limiting layer to transmit water (Ksat):*

Moderately high to high (0.60 to 2.00 in/hr)

*Depth to water table:* More than 80 inches

*Frequency of flooding:* None

*Frequency of ponding:* None

*Salinity, maximum in profile:* Nonsaline to very slightly saline (0.0 to 2.0 mmhos/cm)

*Available water storage in profile:* Moderate (about 7.8 inches)

### **Interpretive groups**

*Land capability classification (irrigated):* None specified

*Land capability classification (nonirrigated):* 2s

*Hydrologic Soil Group:* B

*Forage suitability group:* Mod AWC, adequately drained  
(G090BY005WI)

*Other vegetative classification:* Acer saccharum/Hydrophyllum  
(AH), Acer saccharum/Viola-Osmorhiza (AViO)

*Hydric soil rating:* No

### **Minor Components**

#### **Billyboy**

*Percent of map unit:* 8 percent

*Landform:* Flats, terraces

*Landform position (three-dimensional):* Tread, rise

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Other vegetative classification:* Acer saccharum/Caulophyllum-  
Circaea (ACaCi), Acer saccharum/Hydrophyllum (AH), Acer  
saccharum-Tsuga/Maianthemum (ATM), Acer saccharum/Viola-  
Osmorhiza (AViO)

*Hydric soil rating:* No

#### **Sconsin**

*Percent of map unit:* 5 percent

*Landform:* Flats, terraces

*Landform position (three-dimensional):* Tread, rise

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Other vegetative classification:* Acer saccharum/Caulophyllum-  
Circaea (ACaCi), Acer saccharum/Hydrophyllum (AH), Acer  
saccharum-Tsuga/Maianthemum (ATM), Acer saccharum/Viola-  
Osmorhiza (AViO)

*Hydric soil rating:* No

#### **Rosholt**

*Percent of map unit:* 3 percent

*Landform:* Flats, terraces

*Landform position (three-dimensional):* Tread, rise

*Down-slope shape:* Convex, linear

*Across-slope shape:* Convex, linear

*Other vegetative classification:* Acer saccharum/Vaccinium-  
Desmodium (AVDe), Acer saccharum/Athyrium (AAt), Acer  
saccharum/Caulophyllum-Circaea (ACaCi), Acer saccharum-  
Quercus/Viburnum=(Vaccinium) (AQVb-V)

*Hydric soil rating:* No

#### **Brill**

*Percent of map unit:* 2 percent

*Landform:* Flats, terraces

*Landform position (three-dimensional):* Tread, rise

*Down-slope shape:* Linear

*Across-slope shape:* Linear

*Other vegetative classification:* Acer saccharum/Athyrium (AAt),  
Acer saccharum/Caulophyllum-Circaea (ACaCi)

*Hydric soil rating:* No

**Ossmer**

*Percent of map unit:* 2 percent

*Landform:* Flats, terraces

*Landform position (three-dimensional):* Tread, talf

*Down-slope shape:* Linear, concave

*Across-slope shape:* Linear

*Other vegetative classification:* Acer saccharum/Hydrophyllum  
(AH), Acer saccharum-Tsuga/Maianthemum (ATM), Acer  
saccharum/Viola-Osmorhiza (AViO), Tsuga/Maianthemum-  
Coptis (TMC)

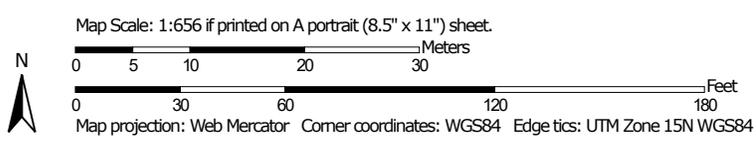
*Hydric soil rating:* No

## Data Source Information

Soil Survey Area: Washington County, Minnesota

Survey Area Data: Version 14, Oct 9, 2018

Septic Tank Absorption Fields -- At-Grade (MN)—Washington County, Minnesota



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons

-  Extremely limited
-  Very limited
-  Moderately limited
-  Slightly limited
-  Not limited
-  Not rated or not available

#### Soil Rating Lines

-  Extremely limited
-  Very limited
-  Moderately limited
-  Slightly limited
-  Not limited
-  Not rated or not available

#### Soil Rating Points

-  Extremely limited
-  Very limited
-  Moderately limited
-  Slightly limited
-  Not limited
-  Not rated or not available

### Water Features

 Streams and Canals

### Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

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Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

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## Septic Tank Absorption Fields — At-Grade (MN)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
49	Antigo silt loam, 0 to 2 percent slopes	Very limited	Antigo (80%)	>= 35% Rock Frags (0.90)	2.2	100.0%
<b>Totals for Area of Interest</b>					<b>2.2</b>	<b>100.0%</b>

Rating	Acres in AOI	Percent of AOI
Very limited	2.2	100.0%
<b>Totals for Area of Interest</b>	<b>2.2</b>	<b>100.0%</b>

### Rating Options

*Aggregation Method: Dominant Condition*

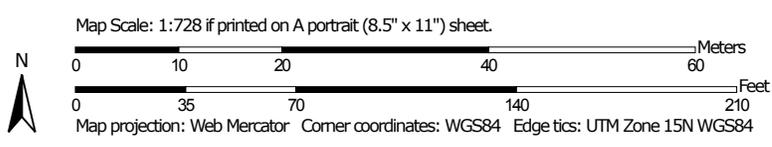
*Component Percent Cutoff: None Specified*

*Tie-break Rule: Higher*

Septic Tank Absorption Fields -- Mound (MN)—Washington County, Minnesota  
(8249 Demontreville Trail N, Lake Elmo)



Soil Map may not be valid at this scale.



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons

-  Extremely limited
-  Very limited
-  Moderately limited
-  Slightly limited
-  Not limited
-  Not rated or not available

#### Soil Rating Lines

-  Extremely limited
-  Very limited
-  Moderately limited
-  Slightly limited
-  Not limited
-  Not rated or not available

#### Soil Rating Points

-  Extremely limited
-  Very limited
-  Moderately limited
-  Slightly limited
-  Not limited
-  Not rated or not available

### Water Features

 Streams and Canals

### Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

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Coordinate System: Web Mercator (EPSG:3857)

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Soil Survey Area: Washington County, Minnesota  
Survey Area Data: Version 14, Oct 9, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 1, 2013—Sep 13, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Septic Tank Absorption Fields — Mound (MN)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
49	Antigo silt loam, 0 to 2 percent slopes	Not limited	Antigo (80%)		2.5	100.0%
			Billyboy (8%)			
			Rosholt (3%)			
<b>Totals for Area of Interest</b>					<b>2.5</b>	<b>100.0%</b>

Rating	Acres in AOI	Percent of AOI
Not limited	2.5	100.0%
<b>Totals for Area of Interest</b>	<b>2.5</b>	<b>100.0%</b>

### Rating Options

*Aggregation Method:* Dominant Condition

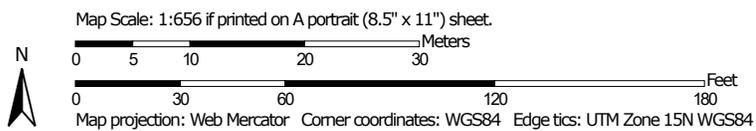
*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher

Septic Tank Absorption Fields -- Trench (MN)—Washington County, Minnesota



Soil Map may not be valid at this scale.



## MAP LEGEND

### Area of Interest (AOI)

 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons

-  Extremely limited
-  Very limited
-  Moderately limited
-  Slightly limited
-  Not limited
-  Not rated or not available

#### Soil Rating Lines

-  Extremely limited
-  Very limited
-  Moderately limited
-  Slightly limited
-  Not limited
-  Not rated or not available

#### Soil Rating Points

-  Extremely limited
-  Very limited
-  Moderately limited
-  Slightly limited
-  Not limited
-  Not rated or not available

### Water Features

 Streams and Canals

### Transportation

-  Rails
-  Interstate Highways
-  US Routes
-  Major Roads
-  Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

**Warning:** Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service  
 Web Soil Survey URL:  
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Washington County, Minnesota  
 Survey Area Data: Version 14, Oct 9, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 1, 2013—Sep 13, 2016

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Septic Tank Absorption Fields — Trench (MN)

Map unit symbol	Map unit name	Rating	Component name (percent)	Rating reasons (numeric values)	Acres in AOI	Percent of AOI
49	Antigo silt loam, 0 to 2 percent slopes	Very limited	Antigo (80%)	>= 35% Rock Frags (0.90) Excessive percolation (0.11)	2.2	100.0%
<b>Totals for Area of Interest</b>					<b>2.2</b>	<b>100.0%</b>

Rating	Acres in AOI	Percent of AOI
Very limited	2.2	100.0%
<b>Totals for Area of Interest</b>	<b>2.2</b>	<b>100.0%</b>

### Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher



# Minnesota Well Index





8249 Demontreville Trl N, Lake Elmo, MN, 55 X 🔍

Search by Zoom to Tools Base Maps Other Links Help



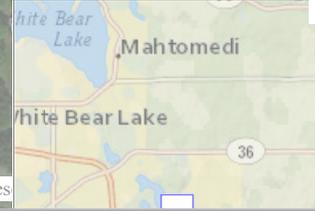
Well List selected

Highlighted are Field Verified Wells. Click Unique Well ID to see detailed well information

Unique Number	Well Name	Address	City	County	Township	Range	Section	Depth(ft)	Elevation(ft)	Casing Depth(ft)	Casing Diameter
<a href="#">489214</a>	CARMELITE MONASTERY	8251 DEMONTREVILLE TR N	LAKE ELMO	Washington	29	21	9	261	1008	201	6

- Selected Wells ●
- Public Wells ◆
- Domestic Wells ●
- Irrigation Wells ■
- Monitor Wells ▲
- Other Wells ★
- Scaled Wells ⊙
- Unverified Wells   ●
- Township Range Section   ■
- DWSMA   ■
- SWBCA   ■

Zoom to see wells, TRS, DWSMA and SWBCA  
 DWSMA: The area managed by a public water supplier to protect their source water  
 SWBCA: Special Well and Boring Construction Area layer



0 150 300ft  
 UTM: 505401 (x), 4985228 (y) Latitude/Longitude: 45.02048 / -92.93145  
 Click map to get township, range and section

# MEMORANDUM

Cara Geheren, P.E. 651.300.4261  
Jack Griffin, P.E. 651.300.4264  
Ryan Stempski, P.E. 651.300.4267  
Chad Isakson, P.E. 651.300.4283

Date: June 17, 2019

To: Ken Roberts, Planning Director Re: Carmelite Site Improvements  
Cc: Chad Isakson, Assistant City Engineer Engineering Site Plan Review  
From: Jack Griffin, P.E., City Engineer

A Site Plan engineering review has been completed for the Carmelite Hermitage Chapel Conditional Use Construction Plan set. The site is located at 8249 DeMontreville Trail North in Lake Elmo. The submittal consisted of the following documentation received on May 28, 2019:

- Site Plans prepared by Pioneer Engineering, dated April 26, 2019.
- Stormwater Management Report prepared by Pioneer Engineering, dated April 26, 2019.
- Certificate of Survey prepared by Landmark Surveying, dated June 27, 2018.
- Wetland Delineation Report prepared by MNR, dated May 2, 2019.
- Septic System Plan prepared by Steinbrecher Companies, Inc., dated May 8, 2019.

Engineering review comments are as follows:

## STORMWATER MANAGEMENT

- A Valley Branch Watershed District (VBWD) permit will be required. The site plan is subject to a storm water management plan (SWMP) meeting State, VBWD and City rules and regulations.
- The SWMP executive summary must be revised and resubmitted to clarify the required standards for this project (City and VBWD) and to demonstrate compliance with those applicable standards.
  - The total new and recreated impervious surface area must be identified in detail.
  - The applicable standards must reference the VBWD rules and Stormwater Rules for the City of Lake Elmo.
  - The report must state the soil types determined by the soil borings. Assumed infiltration rates must be identified in the report and the report must demonstrate drawdown in 48 hrs.
  - A soil boring location map must be provided and verified that sufficient borings have been taken in accordance with the City Engineering Design Standards Manual.
- Storm water facilities proposed for meeting State and VBWD permitting requirements must be designed and constructed in accordance with the City Engineering Design Standards Manual available on the City website, dated March 2017.
- Ownership. The storm water facilities constructed for this development should remain privately owned and maintained.
- Stormwater Maintenance and Easement Agreement. The applicant will be required to execute and record a Stormwater Maintenance and Easement Agreement in the City's standard form of agreement.
- Maintenance Access. Even as privately owned and maintained facilities, maintenance access roads meeting the City engineering design standards must be provided for all storm water facilities.
- Easements. The storm water facility 100-year HWL must be fully contained within the subject property and easements must be provided to protect the 100-year HWL flood area.

- Sheet 4.10. The sanitary sewer and water services must be identified as to size and material. A plan note should be added to indicate the sanitary sewer and water service lines per state plumbing code requirements.
- Sheet 5.10. Revise grading plan to revise storm water BMP site to meet City of Lake Elmo and MN Storm Water Manual standards and as follows:
  - Provide 10:1 aquatic bench and 10:1 maintenance bench around retention BMP.
  - Provide 3:1 length to width ratio for retention basin.
  - Provide defined rip rap overflow location between retention basin and infiltration basin and define overflow spot elevation.
  - Provide retention basin NWL and ensure minimum 3-feet depth. Show NWL level contour on the plan sheet.
  - Provide 100-year HWL contour for the 996.9 HWL. The 100-year HWL of 996.9 is not shown consistent between Sheets 5.10 and 5.30. Revise plans and use spot elevations has required to demonstrate extent of 100-year HWL.
- Sheet 5.10 Provide drainage and utility easement over storm water BMP including the 100-year HWL and pond maintenance access road and access bench. Access road grade must be less than or equal to 10% to the maintenance bench.
- Sheet 5.10. Remove plan note that states “Remove Trees as required within grading limits”. All trees to be removed must be surveyed and shown on the plans. Tree removal may be subject to replacement per City ordinances.
- Sheet 5.20. The rock construction entrance must be positioned for all grading activity on site; not just for basin 100P.
- The site plans must be updated to show the proposed on-site SSTS design. The Septic System Plan prepared by Steinbrecher Companies is not consistent with the site improvements plans.
- The plans must call out detailed site protection from construction activities for the proposed on-site wastewater treatment system and for the proposed storm water infiltration basin.
- No construction may begin until the applicant has received City Engineer approval for the Final Construction Plans; the applicant has obtained and submitted to the City all applicable permits, easements and permissions needed for the project; and a preconstruction meeting has been held by the City’s engineering department.

**Station #1**  
3510 Laverne Ave. No.  
Lake Elmo, MN 55042  
651-770-5006



**Station #2**  
4259 Jamaca Ave. No.  
Lake Elmo, MN. 55042  
651-779-8882

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**LAKE ELMO FIRE DEPARTMENT**

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June 5, 2019

Review of plans for a Conditional Use Permit for construction of the Carmelite Chapel. There was an initial review done in February of 2019, by our then Building Official Mike Bent with regard to the requirement of sprinklers. It was determined that none were required. If the building as presented then is consistent with the current proposal, that determination still stands.

The following items need to be addressed:

- Must meet all applicable codes in the 2015 MN State Fire Code. These requirements also include Appendix D, FIRE APPARATUS ACCESS ROADS.
- With this building not requiring sprinklers, special attention to the following:
  - 503.1.1 “.....shall extend to within 150 feet of all portions of the facility...”
  - Appendix D, Section D105 must be addressed regarding the height of the building (couldn't determine on my plans) and if this section is applicable.
- Will there be any fire hydrants brought into the site?
- Location of Lockbox approved by Fire Chief
- Location of alarm annunciator panel approved by Fire Chief.
- Provide basic overhead view foot print plan of the building, non-architectural, showing rooms, access, utility locations, etc.

Greg Malmquist, Fire Chief

*“Proudly Serving Neighbors & Friends”*

## Tanya Nuss

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**From:** falzonezone <falzonezone@gmail.com>  
**Sent:** Sunday, June 16, 2019 9:11 PM  
**To:** Ken Roberts  
**Subject:** Lake Elmo Planning Commission

**Caution:** This email originated outside our organization; please use caution.

To the Planning Commission of the City of Lake Elmo:

Regarding the proposed "Chapel" at the Carmelite Hermitage of the Blessed Virgin Mary, I speak on behalf of my family at 5124 Isle Avenue North, Lake Elmo, to say that we absolutely support the construction of a new chapel. However, a few years ago, it was mentioned that this new building would require adding a roadway through our street for new access to the Chapel. I am writing to share that we vehemently oppose the construction of a roadway through Isle Avenue.

We have shared a property line with the Carmelites for just over 20 years, and they have been phenomenal neighbors. My family supports their devoted and faith-filled lifestyle, so we are completely in favor of building the Chapel. We want them to do that! However, we feel they should maintain access where it has always been – along DeMontreville Trail. Adding a roadway through Isle Avenue would disrupt the quiet, residential neighborhood that drew us here originally.

When adding a roadway through Isle Avenue was discussed a few years ago, I was informed by sources affiliated with the city that Isle Avenue was not constructed to withstand consistent vehicular traffic – its weight capacity simply is not enough. Even though the Chapel will not draw many visitors, its weight rating would still need to be adequate, and our street just was not built that way.

We love the city of Lake Elmo. It is where our kids grew up, it's where most of our family lives, and it's where we are blessed to call home. Our street has been the place where all of the neighborhood kids grew up playing with each other, where we have gone for countless family bike rides and walks, and where we can take a deep breath from the fast-paced reality of our professional lives.

Isle Avenue is a sanctuary for many of us – not just for my family. It is a safe place. It is a quiet place. It is a lightly-traveled dead end. Because of what this neighborhood means to us, we sincerely ask that you consider maintaining the existing access for the new Chapel.

That said, we wish the Carmelites all the best in the construction of their Chapel. It will be a great addition for their lives, and we are excited for them!

Thank you for considering!

Craig Falzone and family  
5124 Isle Avenue North  
Lake Elmo, MN 55042

Sent from my T-Mobile 4G LTE Device



## STAFF REPORT

DATE: June 24, 2019

**REGULAR**

ITEM #:

**TO:** Planning Commission  
**FROM:** Ben Prchal, City Planner  
**AGENDA ITEM:** Screening Requirements in the Rural Residential Zoning District  
**REVIEWED BY:** Ken Roberts, Planning Director

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### **BACKGROUND:**

City Staff is continuing the amendment process for addressing trailer/recreational vehicle storage on residential properties, firewood, and other items required for screening as directed by the Planning Commission work plan. Staff has been dealing with code enforcement regarding boat/trailer storage on a regular basis. Throughout the enforcement process, of course, many of the residents feel that it is not unreasonable to keep their boat or lawn/landscaping trailer in the front driveway. On June 10<sup>th</sup>, 2019 the Planning Commission reviewed the proposed code changes and offered several suggestions for Staff to make to the proposed code.

### **REVIEW AND ANALYSIS:**

With previous reports focusing in on vehicle storage and firewood, this report will incorporate the final drafted language of the entire section (154.407). If the discussed section is amended, Staff will be recommending the removal of Section 150.001 because each residential district has its own section to address screening and leaving it in place will continue to cause conflicts.

### **Lake Elmo:**

Each residential district, Rural, Urban and Village Mixed use has their own screening requirement section. Those sections are 154.407, 154.456, and 154.507. Realizing that each district might have different expectations Staff has chosen to specifically focus in on the rural district (154.407). Below are the two sections of Code that would have influence over the rural district for screening requirements in the City. Staff has merged the two existing sections and combined aspects of other communities to create new language for the City (*see recommendation section of the report*).

### **§ 154.407 ACCESSORY USES.**

A. *Exterior Storage in Residential Districts.* All materials and equipment shall be stored within a building or be fully screened so as not to be visible from adjoining properties, except for the following:

1. Laundry drying
2. Construction and landscaping materials and equipment currently being used on the premises. Materials kept on the premises for a period exceeding six (6) months shall be screened or stored out of view of the primary street on which the house fronts.
3. Agricultural equipment and materials, if they are used or intended for use on the premises.
4. Off-street parking and storage of vehicles and accessory equipment, as regulated in Article 5, Section 154.102.  
(This reference should be 210)
5. Storage of firewood shall be kept at least ten (10) feet from any habitable structure and screened from view from adjacent properties.
6. Outdoor parking

### **§ 150.001 PROHIBITED WITHOUT SCREENING.**

(A) *Storage of property in Agricultural and Residential districts.* All personal property shall be stored within a building or fully screened so as not to be visible from adjoining properties and public streets, except for the following:

- (1) Laundry, drying;
- (2) Recreational equipment commonly used in residential yards;
- (3) Construction and landscaping materials, and equipment currently (within a period of 6 months) being used on the premises;

- (4) Off-street parking of licensed operable passenger automobiles and pick-up trucks;
- (5) Boats and trailers less than 25 feet in length, if stored in the rear yard more than 10 feet distant from any property line;
- (6) Merchandise being displayed for sale in accordance with the provisions of the zoning code;
- (7) Farm implements in the AG Zoning District; and/or
- (8) Firewood storage for personal use.

**FISCAL IMPACT:**

Staff does not directly foresee a fiscal impact. However, amending the code may decrease the number of complaints received which would reduce Staff time dedicated to code enforcement.

**COMMENTS AND RECOMMENDATION**

Staff is looking for final comments on the following proposed language. A public hearing will be scheduled for the July 8<sup>th</sup> Planning Commission meeting for formal action on the Code changes. As proposed, items would be allowed without screening in the rural zoning districts (A, RR, RT, RS, and RE). The proposed amendments are in red. No parking of commercial trailers is covered in Section 154.210 H.

1. Laundry drying
2. Construction and landscaping materials and equipment currently being used on the premises. Materials kept on the premises for a period exceeding six (6) months shall be screened or stored out of view of the primary street on which the house fronts.
3. Agricultural equipment and materials, if they are used or intended for use on the property.
4. Off-street parking and storage of trailers 25ft in length or less as regulated in Article 7, Section 154.210, are licensed (when applicable) and kept in good and operable condition.
  - a. Trailers shall be licensed to a resident of the property.
  - b. Residential properties are allowed to store one trailer (boat trailer, snowmobile trailer, utility trailer, recreational vehicle, etc.) within the front yard. All other trailers must be stored either in the side or rear yard, and must be at least 5 ft. from all property lines.
  - c. All trailers must be stored on a durable surface with suitable drainage that is not subject to rutting and/or erosion.
  - d. Trailers must not be used as temporary or permanent storage of items as described in Chapter 96 of the City Code.
5. Agricultural equipment and materials, if they are used or intended for use on the premises.
6. Firewood storage, for personal use only.
  - a. Firewood must be stacked in a stable manner, cannot exceed 5 feet in height, and stored only in the side or rear yards. In the case of properties with multiple frontages, wood shall not be stored on a side that abuts a public street.