

Sewage, Wastewater and Sanitation Hearing Board Meeting Notice and Agenda

Members

Ronald J. Anderson, P.E., Chair
Matthew Buehler
Vonnie Fundin
Nick Vestbie, P.E.
Matt Smith - Alternate
Ray Pezonella, P.E - Alternate

Wednesday, January 30, 2019
4:00 p.m.

Washoe County Administration Complex, Building B
Health District South Conference Room
1001 East Ninth Street
Reno, NV

An item listed with asterisk (*) next to it is an item for which no action will be taken.

4:00 p.m.

1. *Roll Call and Determination of Quorum
2. *Pledge of Allegiance
3. *Public Comment

Any person is invited to speak on any item on or off the agenda during this period. Action may not be taken on any matter raised during this public comment period until the matter is specifically listed on an agenda as an action item.

4. **Approval of Agenda – (For possible action)**
January 30, 2019
5. **Approval of Draft Minutes – (For possible action)**
November 20, 2018

6. **Public Hearing** to consider an appeal to the Health District's decision to require the relocation of a residential onsite sewage disposal system pursuant to Section 120.040 of the Regulations of the Washoe County District Board of Health Governing Sewage, Wastewater, and Sanitation. (Held over from November 20th, 2018 Meeting)– **(For possible action)**
Staff Representative: David Kelly

Ron and Denise Jahn
3285 Maranatha Road
Reno, Nevada
Assessor's Parcel Number 046-031-10

7. **Public Hearing** to determine whether or not to recommend approval to the District Board of Health for a variance for APN 038-084-05 sections 040.100, 100.020 and 100.090 based on percolation rates for native soils being substantially lower than acceptable for a conventional onsite sewage disposal system of the Regulations of the Washoe County District Board of Health Governing Sewage, Wastewater, and Sanitation. (Held over from November 20th, 2018 Meeting) – **(For possible action)**
Staff Representative: David Kelly

Dante and Joinece Frasca
630 Hill Lane
Verdi, Nevada 89439
Assessor's Parcel Number 038-084-05

- 8. Public Hearing** to determine whether or not to recommend approval to the District Board of Health for a variance for APN 017-320-20 section 040.100 Table 2 Setback to a Watercourse of the Regulations of the Washoe County District Board of Health Governing Sewage, Wastewater, and Sanitation. – **(For possible action)**
Staff Representative: Latricia Lord

Robert Togliatti
19445 Togliatti Way
Reno, Nevada 89439
Assessor's Parcel Number 017-320-20

- 9. Public Hearing** to determine whether or not to recommend approval to the District Board of Health for a variance for APN 030-204-07 section 040.100 Table 1 Minimum Lot Size According to Slope Over Disposal Area of the Regulations of the Washoe County District Board of Health Governing Sewage, Wastewater, and Sanitation. – **(For possible action)**
Staff Representative: David Kelly

Mark & Kathleen Olsen
5025 Pleasant View Drive
Sparks, NV 89434

- 10. Public Hearing** to request a standing meeting date for SWS Board. – **(For possible action)**
Staff Representative: David Kelly

- 11. Public Hearing** to determine whether or not to recommend approval to the District Board of Health of a proposed change in Section 120.075 of the Washoe County Health District Regulations Governing Sewage, Wastewater, and Sanitation regarding the minimum acreage for second dwellings. – **(For possible action)**
Staff Representative: David Kelly

12. *Public Comment

Any person is invited to speak on any item on or off the agenda during this period. Action may not be taken on any matter raised during this public comment period until the matter is specifically listed on an agenda as an action item.

13. Adjournment – (For possible action)

Possible Changes to Agenda Order and Timing: Items on the agenda may be taken out of order, combined with other items, withdrawn from the agenda, moved to the agenda of another later meeting, moved to or from the Consent section, or they may be voted on in a block. Items with a specific time designation will not be heard prior to the stated time, but may be heard later. Items listed in the Consent section of the agenda are voted on as a block and will not be read or considered separately unless withdrawn from the Consent agenda.

Special Accommodations: The Sewage, Wastewater and Sanitation Board Meetings are accessible to the disabled. Disabled members of the public who require special accommodations or assistance at the meeting are requested to notify Administrative Health Services in writing at the Washoe County Health District, 1001 East Ninth Street, Building B, Reno, NV 89512, or by calling 775.328.2415, 24 hours prior to the meeting.

Public Comment: During the "Public Comment" items, anyone may speak pertaining to any matter either on or off the agenda, to include items to be heard on consent. For the remainder of the agenda, public comment will only be heard during items that are not marked with an asterisk (*). Any public comment for hearing items will be heard before action is taken on the item and must be about the specific item being considered by the Board. In order to speak during any public

comment, each speaker must fill out a "Request to Speak" form and/or submit comments for the record to the Recording Secretary. Public comment and presentations for individual agenda items are limited as follows: fifteen minutes each for staff and appellant presentations, five minutes for a speaker representing a group, and three minutes for individual speakers unless extended by questions from the Board or by action of the Chair.

Response to Public Comment: The Sewage, Wastewater and Sanitation Board can deliberate or take action only if a matter has been listed on an agenda properly posted prior to the meeting. During the public comment period, speakers may address matters listed or not listed on the published agenda. The *Open Meeting Law* does not expressly prohibit responses to public comments by the Sewage, Wastewater and Sanitation Board. However, responses from the Board members to unlisted public comment topics could become deliberation on a matter without notice to the public. On the advice of legal counsel and to ensure the public has notice of all matters the Sewage, Wastewater and Sanitation Board will consider, Board members may choose not to respond to public comments, except to correct factual inaccuracies, ask for Health District Staff action or to ask that a matter be listed on a future agenda. The Sewage, Wastewater and Sanitation Board may do this either during the public comment item or during the following item: "Board Comments – Limited to Announcement or Issues for future Agendas."

Posting of Agenda; Location of Website:

Pursuant to NRS 241.020, Notice of this meeting was posted at the following locations:

Washoe County Health District, 1001 E. 9th St., Reno, NV
Downtown Reno Library, 301 S. Center St., Reno, NV
Reno City Hall, 1 E. 1st St., Reno, NV
Sparks City Hall, 431 Prater Way, Sparks, NV
Washoe County Administration Building, 1001 E. 9th St, Reno, NV
Washoe County Health District Website www.washoecounty.us/health
State of Nevada Website: <https://notice.nv.gov>

How to Get Copies of Agenda and Support Materials: Supporting materials are available to the public at the Washoe County Health District located at 1001 E. 9th Street, in Reno, Nevada. Ms. Laura Rogers, Administrative Secretary to the District Board of Health is the person designated by the Washoe County District Board of Health to respond to requests for supporting materials. Ms. Rogers is located at the Washoe County Health District and may be reached by telephone at (775) 328-2415 or by email at lrogers@washoecounty.us. Supporting materials are also available at the Washoe County Health District Website www.washoecounty.us/health pursuant to the requirements of NRS 241.020.

SEWAGE, WASTEWATER, AND SANITATION HEARING BOARD MEETING MINUTES

Members

Ronald J. Anderson, P.E., Chair
Matthew Buehler
Vonnie Fundin
Nick Vestbie, P.E.
Matt Smith – Alternate
Ray Pezonella, P.E. - Alternate

Tuesday, November 20, 2018

6:00 p.m.

**Washoe County Administration Complex
Health District South Conference Room
1001 East Ninth Street
Reno, NV**

6:00 p.m.

1. *Roll Call and Determination of Quorum

Chair Anderson called the meeting to order at 6:15 p.m. once a quorum was present.

The following members and staff were present:

Members present: Ronald J. Anderson, P.E., Chair
Matthew Buehler
Vonnie Fundin

Members absent: Nick Vestbie, P.E.

Staff present: Leslie Admirand, DA
Jim English
Dave Kelly
Latricia Lord

Ms. Valentin verified a quorum was present.

2. *Pledge of Allegiance

Those present pledged allegiance to the flag.

3. *Public Comment

As there was no one wishing to speak, Chair Anderson closed the public comment period.

4. Approval of Agenda

November 20, 2018

Chair Anderson informed he would need to abstain from item number eight and that Mr. Fundin requested to abstain on agenda item number six due to conflict of interest, and that no quorum would be available.

Mr. Buehler moved to accept the agenda of the November 20, 2018 Sewage, Wastewater, & Sanitation Hearing Board (SWS Hearing Board) regular meeting as written, postponing agenda

items number six and eight until another meeting can be scheduled. Mr. Fundin seconded the motion which was approved three in favor and none against.

5. Approval of Draft Minutes

October 10, 2018

Chair Anderson commented he did not have the draft minutes in his hard copy agenda packet.

Mr. Kelly apologized for the oversight and relayed Laura sent the draft minutes with the electronic packet they received. Chair Anderson requested highlights.

DDA Admirand stated the minutes needed to be approved at this meeting.

Chair Anderson requested highlights. DDA Admirand provided a verbal summary review of the minutes for the board members.

Mr. Fundin moved to accept the minutes of the October 10, 2018 Sewage, Wastewater, & Sanitation Board (SWS Board) regular meeting as written. Mr. Buehler seconded the motion which was approved three in favor and none against.

Mr. Kelly stated he will be contacting the Board to determine the next available date for a quorum to hear items number 6 and 8.

6. Public Hearing to consider an appeal to the Health District's decision to require the relocation of a residential onsite sewage disposal system pursuant to Section 120.040 of the Regulations of the Washoe County District Board of Health Governing Sewage, Wastewater, and Sanitation. – **(Item postponed to the next scheduled SWS Hearing Board Meeting)**

Staff Representative: Latricia Lord

7. Public Hearing to determine whether or not to recommend approval to the District Board of Health for a variance for APN 084-200-80 of Sections 040.007 regarding the minimum setback to a domestic well from a residential onsite sewage disposal system as required in Section 040.007 of the Regulations of the Washoe County District Board of Health Governing Well Construction.

Staff Representative: David Kelly

Jerry Turley
240 School Street
Wadsworth, Nevada 89442
Assessor's Parcel Number 084-200-80

Mr. Kelly, Senior Environmental Health Specialist for septics and wells, thanked the board for meeting tonight as it is a difficult month to make time available. He informed this item is important to go before the District Board of Health (DBOH) at their next DBOH Meeting because of their out of water situation. He informed of a discussion with Chair Anderson before the meeting who had opined the plan was a bit inadequate for his standards to address the items in placing the well. Mr. Kelly stated he believed he would be able to answer any questions to the satisfaction of the Board in regards to their concerns.

Mr. Kelly noted this is one of the Verdi and Wadsworth properties he spoke to the board about last month, this being one of the Wadsworth properties he had mentioned.

Mr. Kelly informed the property owner had begun discussing the need to place a well on his property about three months ago. He stated the owner previously had been feeding off the well of a neighboring property. Mr. Kelly informed he wasn't sure of the details, but his understanding was that the quality and flow declined and ultimately they did not have access to a satisfactory source of water and therefore needs to drill a well on his property.

Mr. Kelly stated EHS staff had looked at the property and discovered that, where the septic

system is, there was wasn't a location to place a well on the property that would meet the one hundred foot setback requirement. He informed the one location that would meet the setback requirements sits directly under power lines so was not an option.

When speaking with the power company and the drillers to determine whether power could be temporarily disconnected to allow for drilling, it was his understanding this approach wasn't an option. He informed the farthest the drilling company could get from the septic system was ninety-five feet from the septic tank. Mr. Kelly referred the Board to the parcel map/plot map as the drawing would relay more information.

While the depiction of the septic system on the plot plan provided is not clear, Mr. Kelly informed the location of the septic tank had been field verified over a year. He stated staff is comfortable that a new well can be placed ninety-five feet from the septic system, informing that the leach field is a single run straight from the tank, not three wavy lines as depicted in the map.

Mr. Kelly informed there are two issues on this property:

1. The placement of the well will only be ninety-five feet from the septic tank. They cannot meet the one hundred foot setback requirement.
2. The well placement will also not meet the minimum one hundred foot setback to the required future septic leach field repair area. Based on staff analysis, the proposed well location will potentially only be able to maintain an eighty foot setback to future leach fields.

Staff has reviewed previous variances and found that the normal condition of approval acceptable by the SWS Hearing Board for approval of a reduced setback variance is an increased seal depth. During the last SWS Hearing Board meeting, Mr. Fundin (board member and licensed well driller) also discussed his belief that setbacks could be horizontal as well as diagonal. Based on his opinion, staff recommends that the conditions of approval include that the well will be set as far from the current and future septic systems as possible and that the seal be increased by one foot in depth for every foot of setback that cannot be met. The property already requires a minimum of one hundred foot seal, so based on the estimated setback of eighty feet to the future repair, the seal would be increased to one hundred twenty feet.

Mr. Kelly reviewed the Findings of Fact and Conditions of Approval as outlined in the Staff Report.

Mr. Fundin opined that a one foot increase in the seal depth for each foot of setback that could not be achieved per regulations may be too little. He pointed out that, depending on how much a setback was missed, a one to one ratio may not meet the intent of achieving the one hundred foot distance from the septic system. He opined a two to one ratio may be more appropriate and a minimum of one hundred foot seals should be the standard for all properties, noting that seals are not an expensive protective measure.

Mr. Kelly acknowledged the concern and stated that the Board had the right to increase the conditions of approval. He indicated that staff recommendations were based on two considerations. First, that because the property already requires a one hundred foot seal, the hypotenuse in this case would exceed the minimum one hundred foot horizontal setback. Second, staff knows that drillers also face other concerns, such as drilling to specific depths to capture zones of water, and that excessive seals may conflict with these issues. Therefore, the intent was to not require more sealing than absolutely necessary.

Mr. Fundin stated that with the property already requiring a one hundred foot seal, the one to one ratio would be acceptable for this property, but would not suffice in all instances.

Mr. Buehler inquired about soil conditions to which Mr. Kelly said it was unknown. Mr. Anderson asked Mr. Fundin if seals ever go down into groundwater levels. Mr. Fundin said yes,

occasionally seals are placed below groundwater levels, particularly if you are attempting to seal off contaminated zones. He said that the drilling industry is more concerned with protecting the void that they created with boring and that placing the seal is a good protective measure to prevent potential contamination from finding a route to groundwater through the void.

Mr. Anderson stated that he would defer to Mr. Fundin's expertise. Mr. Fundin again said that the one to one ratio was acceptable in this case but for future cases, if the property has a fifty foot minimum seal, the ratio should be 2 feet for every foot of setback missed.

Mr. Anderson opined that he would like to see better plot maps in the future. Mr. Kelly agreed and stated that one of the concerns that caused staff to begin exploring the potential for a "blanket variance" during the last SWS meeting was that, in these small property situations, money is a huge issue for the property owners. They often times need to keep costs very low, meaning that they are doing their own plot maps and may not have their drillers to assist them with technical details and recommendations.

Mr. Buehler moved to support staff and present to the District Board of Health for approval Variance Case #1-18W (Jerry Turley) to allow the approval of the well permit H18-0228WELL with less than the required one hundred foot setback to proposed well location, subject to the conditions of approval indicated in the staff report. Chair Anderson seconded the motion which was approved three in favor and none against.

8. Public Hearing to determine whether or not to recommend approval to the District Board of Health for a variance for APN 038-084-05 sections 040.100, 100.020 and 100.090 based on percolation rates for native soils being substantially lower than acceptable for a conventional onsite sewage disposal system of the Regulations of the Washoe County District Board of Health Governing Sewage, Wastewater, and Sanitation. – **(Item postponed to the next scheduled SWS Hearing Board Meeting)**

Staff Representative: Dave Kelly

9. *Public Comment

As there was no one wishing to speak, Chair Anderson closed the public comment period.

10. Adjournment

At 6:40 p.m., Chair Anderson moved to adjourn the meeting. Mr. Buehler seconded the motion which was approved three in favor and none against.

Respectfully submitted,

James English, Environmental Health Specialist Supervisor
Secretary to the Sewage, Wastewater and Sanitation Board

Paula Valentin, Administrative Assistant I
Recording

STAFF REPORT

BOARD MEETING DATE: November 20, 2018

TO: Sewage, Wastewater, and Sanitation Hearing Advisory Board
FROM: James English, EHS Supervisor
775-328-2610, jenglish@washoecounty.us
SUBJECT: Public Hearing to consider appeal of Health District's decision to require relocation of an existing septic system as the system is currently not located on the subject property.

SUMMARY

This staff report summarizes the Environmental Health Services (EHS) Division's review of the submitted appeal for your recommendation regarding EHS staff requiring the relocation of an existing septic system in order to be utilized for a new home. The system in dispute is not fully located on the subject property of 3285 Maranatha Road and portions of the system are located within two separate easements and on two adjoining properties.

PREVIOUS ACTION

In order to receive approval for building permit number WBLD 18-106696, the applicant submitted a revised plan that proposed the system will be fully relocated onto the subject property and within the prescribed easement. That plan was approved on October 12, 2018. The homeowners are requesting an appeal of the decision requiring the septic system be relocated on to the subject property. If the appeal is denied, the Certificate of Occupancy for the new home will be contingent upon relocating the system onto the property.

BACKGROUND

On April 3, 2018 Residential Designer, Jason Warfield contacted David Kelly, Senior Environmental Health Specialist via email requesting clarification on the subject property. The email stated the original house burned down in the 90's and the septic tank and system have been kept intact since but are located within an easement on the neighboring property. The email further stated the septic system had been located, the tank pumped and the contractor performing the work stated the system works. Mr. Warfield stated the homeowners would like to use the system for a new home and wanted to verify there would be no issues with our department. Mr. Kelly responded with the following options:

1. If the system is existing and functional, it may be tied into, provided,
 - a. It is sized for the building and the new building will not violate a setback to the system.
 - b. It is located on the property or in a legal easement. EHS would require proof of that in the form of some sort of legal document.
 - c. If ANY modification of the system is required for the building, the entire system needs to be brought up to code.

2. If the system is located off of the property, then it needs to be relocated onto the property as part of the project.
3. If there are any other code issues, but the system is on the property
 - a. We require designation of two fully code compliant repairs.
 - b. If sizing information is not available for the repairs, we reserve the right to require a test trench and/or percolation test to determine the appropriate sizing prior to approving the property build out.

On August 2, 2018, Washoe County Building Permit application WBLD18-106696 was received by EHS. EHS staff conducted a lot check of the property and it was determined the plot plan did not accurately reflect the correct length and location of the existing septic system, as located by Waters Vacuum Truck Service. It also indicated the septic tank was located partially outside of the prescribed easement and the leach line was also located outside the prescribed easement for the property. The plan was placed in corrections on August 22, 2018 until the following items were addressed:

1. The plot plan shall reflect the accurate length of the existing leach field.
2. The septic system must be relocated onto the subject property since it was not completely within the prescribed easement.

In order to verify the septic location, the property was surveyed and an accurate plot was created (Reference Sheet A1.0 as provided by the homeowner). As the plot indicates, the septic system is located in two separate easements and possibly two separate properties, none of which meet WCHD regulations. In order to receive approval for Building Permit WBLD18-106696 a revised plot plan was received on October 10, 2018 showing the existing system will be relocated onto the subject property and within the prescribed easement for Parcel F. This plan was approved on October 12, 2018.

The Regulations of the Washoe County District Board of Health Governing Sewage, Wastewater, and Sanitation (regulations) section 120.040 states that an on-site sewage disposal system shall be located entirely upon the parcel upon which the building it serves is located. Current procedure for EHS staff in the event of a property build-out is if the septic system is off the property and not in a legal easement, the system must be relocated back onto the property. This procedure helps to clean up previous incorrect installations and ensures adequate space is available for proper sewage disposal for both current and future repairs. If the build out is a fire re-build, EHS procedures will allow for the hook up to the existing system as long as the building footprint remains the same. If the property is redeveloped, normal septic installation procedures are followed.

In this situation, the fire occurred over 20 years ago and the building footprint is not the same, therefore EHS is not treating this as a fire re-build, but as new development. All new development requires septic systems to comply with 120.040 and have the septic system fully located on the property it serves. This septic system should be relocated in order to meet WCHD Sewage, Wastewater, and Sanitation Hearing Regulations.

RECOMMENDATION

Based on information presented, staff recommends: The Sewage, Wastewater, and Sanitation Hearing Advisory Board deny the appeal request and uphold EHS staff decision to require relocation of the septic system onto the property.

Subject: Public Hearing, SWS Board

Date: November 20, 2018

Page 3 of 3

POSSIBLE MOTION

Should the Board agree with staff's recommendation, a possible motion would be "move to deny the appeal of the Health District's requirement to relocate the system onto 3285 Maranatha Road as part of WBLD18-106696."

WASHOE COUNTY
HEALTH DISTRICT
ENHANCING QUALITY OF LIFE

WASHOE COUNTY HEALTH DISTRICT
ENVIRONMENTAL HEALTH SERVICES DIVISION
1001 East Ninth Street • PO Box 11130 • Reno, Nevada 89520
Telephone (775) 328-2434 • Fax (775) 328-6176
www.washoecounty.us/health

Office Use Only

APPEAL APPLICATION

Date: 10/10/18

Name of Applicant: RON AND DENISE JAHN

Mailing Address: 1540 BUTTERFLY DR
RENO NV 89523

Phone: 775-560-1111 Email Address: renobombero@charter.net

Title of Regulations: Regulations of the Washoe County District Board of Health Governing Sewage, Sanitation and Wastewater

Written Description of WCHD Decision(s) Proposed for Appeal: MOVING THE SEPTIC SYSTEM
(SEE ATTACHED)

Relevant Regulatory Sections: 120.040

Reason for Appeal: WE ARE APPEALING THE DIRECTION TO MOVE THE
EXISTING SEPTIC SYSTEM. PLEASE SEE ATTACHED LETTER.

The following items must be submitted with this application:

JOB ADDRESS 3285 MARANATHA RD WASHOE VALLEY, NV

SIZE OF PARCEL 2.5 ACRES /Acre

COPY OF LEGAL DESCRIPTION AND VERIFICATION OF CURRENT VESTING ON TITLE

EXISTING PARCEL(S) APN(S) 046-031-10 LOT F BLOCK

Ron Jahn Denise Jahn
Signature

10/10/2018
Date Signed

October 8, 2018

To Whom It May Concern:

We purchased the property at 3285 Maranatha Road in March 2003. At that time, the property had a barn, electricity, a well and septic system. The house that had been on the property previously, had been destroyed by fire in approximately 1998. We are now, finally, applying for permits to build our retirement home.

This year, to expedite the permit process, we had the septic system measured and tested by Waters Septic Tank Service to ensure it was functioning properly and was the appropriate size for the home we are building. We had them install risers and covers to easily locate them in the future. Waters also replaced 75' of leach lines as they had been overgrown by roots and could not be cleaned out. In addition, we had them install a clean out/access pipe. We have spent \$5,417 and a lot of time and energy in preparation for our septic system permit (copies attached). A survey was done by Landmark Surveying. You have a copy of the topo map he has provided to us. To our surprise, the newest topo map shows the two septic covers right at the line and slightly over the line separating the two septic easements for Parcels E and F (ours).

We have spent quite a bit of time researching and it seems there are two possible reasons for this misalignment:

1) When the septic system was installed 36+ years ago, the method of surveying was quite different from the current practice of using a GPS now, which was perhaps not quite as accurate, and therefore, the system was inadvertently placed incorrectly, although still within an easement. Regardless of the accuracy of the mapping or placement, the system was approved by Washoe County at the time and has existed ever since.

2) Parcel Map 607, recorded on June 28, 1978, shows only one septic easement, for Parcel E, with a measurement of 40' wide and 60' long. Subsequently, on Parcel Map 1329, recorded April 14, 1982, you will see two septic easements, which changed the size of the original easement for Parcel E to 40' wide and 100' long, to match the size of the easement for Parcel F. They are now each 40'x100' for a total area of 40' x 200' and are on the two neighboring parcels, Parcels D-4 and D-2. These same septic easements are seen on Record of Survey Map 5767A, dated August 2016. It seems reasonable to conclude that lengthening the easement for Parcel E could have absorbed a small portion of the area of our septic tank. The risers and covers were not there at the time, so they were not visible and again, GPS was not used at the time. The septic system servicing our parcel was approved by Washoe County for the house that previously existed and has been there for 36+ years.

Since the placement of the existing septic system is only off by a few feet, and is still within the overall easement area, it does not seem reasonable or sensible to disrupt the system by moving it, or to cause major disruption to two neighboring properties in the process. This septic system has existed in its current location for 36+ years, it has been certified that it is fully functioning and meets the size requirements for our house. We incurred a \$5,417 expense in good faith to show compliance and to add more expense (estimated between \$10,000 and \$18,000) to move the system only a few feet would result in an additional financial hardship as well. In addition, there is enough room within the easement for a future repair field, if the need arises.

The disruption and expense involved in moving this system a few feet will not result in any improvement of the system and seems punitive. We respectfully ask that you allow the previously approved septic system to remain as it has been for 36+ years and approve our building permit in a timely manner.

Thank you very much for your time and consideration.

Respectfully,

Handwritten signatures of Ron and Denise Jahn in black ink.

Ron and Denise Jahn

On 9/6/2018 9:52 AM, Kelly, David A wrote:

Ron and Denise -

Jim and I spoke yesterday afternoon. The decision is what my emails have indicated in the past – the septic needs to be brought up code. As we discussed, I believe that there are three broad routes forward:

- 1) Modify the septic in order to bring it into compliance. Modifications might include moving portions of the system that are outside the easement back in, or it may be easier to simply abandon the existing and installing a new one. That would be up to you but I am happy to discuss options with you. The revision would require the entire septic to be accurately plotted and call out how the system will be modified in order to bring it into code. Though we have no original records on this system, based on the sizing of surrounding systems and the length of line located by Waters, we believe that the original system on this property was 13' deep and 45' long and sized for up to 3 bedrooms. We are willing to honor this sizing provided that no groundwater is encountered. Any modification would have to meet this minimum sizing for a 3 bedroom house or additional property exploration would need to be done (test trench).
- 2) Correct the easement in order to bring the system into compliance. The entire system would need to be located inside of the easement.
- 3) Appeal this decision to the Sewage, Wastewater, and Sanitation Board. There is no cost to the appeal, however, the likelihood is that the meeting would take place in October at the earliest as the agenda for this month has already been set.

In all situations, the property needs to have both a primary and repair area that meet all required setbacks. Please let me know how you would like to proceed or if you have any questions.

David Kelly, REHS

Environmental Health Specialist | Environmental Health | Washoe County Health District

dakelly@washoecounty.us | O: (775) 328-2630 | 1001 E. Ninth St., Bldg. B, Reno, NV 89512

**WASHOE COUNTY
HEALTH DISTRICT**
ENHANCING QUALITY OF LIFE



Waters

VACUUM TRUCK SERVICE



P.O. BOX 18160 RENO, NEVADA 89511
775-825-1595

The following information is provided to facilitate the processing of loan reports and septic tank permits. See attached limitations, terms, and conditions for more information.

Property owner:	Ron Jahn	Phone:	775-746-0223		
		Phone:			
Address:	3285 Maranatha Road	City:	Carson City	State:	NV
				Zip:	89704

Title Co:		Contact:	
Phone:			

Date of pumping:	5/17/18
Septic material:	Concrete - 1500 Gallons
Location of tank:	25 feet east of clean out. tank is 4 feet deep.
Condition of septic tank lids & covers:	Inlet and Outlet Lids are satisfactory.
Condition of inlet & outlet T's:	Inlet and Outlet T's are satisfactory
Condition of baffle & baffle vent spaces:	Center baffle is satisfactory.
Repairs required of sewage disposal system:	None
Abnormalities observed:	None
Repairs performed on sewage disposal system:	None
Other:	Home has a garbage disposal per homeowner. Performed a 30-minute hydrostatic test with no runback from leach field. Hydrostatic test was satisfactory, Septic system is functioning properly at this time.

NOTICE

This inspection report is based solely on a visual observation by the driver/serviceman. This inspection report is not an expressed or implied warranty or guarantee of the fitness of the septic system. Septic systems have a limited life span and are subject to failure at any time. Septic systems can be adversely affected by house vacancy, heavy water usage, leaky plumbing, ground water infiltration, abusive usage, improper maintenance and natural conditions. Prospective purchasers should consider the usage and age of the system and do their own site inspection prior to purchase. Note that all residential septic tanks should be pumped every 2 to 5 years to protect tanks and leach fields from damage.


Michael Angel, Waters Vacuum Truck Service



INVOICE

775-825-1585
PO Box 18360 • Reno, Nevada 89511 • NV CONTR. LIC. #33075

ACCT#:	INVOICE#:
DATE: 8/6/14	P.O.#:
BILL TO:	
1540 BATTERBY	
RENO, NV 89513	

CUSTOMER NAME: BOB JAHN
3225 OLD 395
CARSON CITY, NV

QUANTITY	DESCRIPTION	UNIT PRICE	TOTAL
	EXEC LOCATE TANK		
	TANK APPROXIMATELY 25' E OF		
	ST APPROX 4' DEEP		
	<i>PD</i>		
	<i>CHECK</i>		
	<i>2250</i>		
			<i>2300</i>

ACCEPTED BY:

Thank You

Waters Excavation, Inc. 1540 BATTERBY RD. CARSON CITY, NV 89513
Copyright © 2014 Waters Excavation, Inc. All rights reserved. Printed at the rate of
1.5% PER MONTH (which is an annual percentage rate of 18%).



PO Box 18160 Reno, NV 89511
775-825-1595 | www.watersvacuum.com

VACUUM TRUCK SERVICE



RECIPIENT:

Ron Jahn

1540 Butterfly Drive
Reno, Nevada 89523

Phone: 775-746-0223

Invoice #2340

Issued 02/02/2018
Due 03/04/2018
Paid 02/15/2018

Total \$917.50

SERVICE ADDRESS:

3285 Maranatha Road
Carson City, Nevada 89704

For Services Rendered

SERVICE / PRODUCT	DESCRIPTION	QTY.	UNIT COST	TOTAL
02/01/2018				
Mini Excavator	Hourly Rate for Use of Mini Excavator - 2 Hour Minimum	2.5	\$185.00	\$462.50*
Risers	6" Ring Segment	10	\$32.50	\$325.00*
Riser Lid - Domed	Domed Riser Lid	2	\$65.00	\$130.00*



Total \$917.50
Paid - \$917.50
Invoice balance \$0.00

* Non-taxable

Exposed the inlet and outlet lids to the septic tank with the mini-excavator. Found that the inlet had 3' of existing risers on it. Added 1' of riser and a dome lid to bring it to grade level. Installed 4' of risers and a dome lid on the outlet side of the septic tank.

Thank you for your business.

Waters

VACUUM TRUCK SERVICE



775-825-1595 / 888-909-PUMP

www.watersvacuum.com

Manifest # **7571**

Job #: 2156

WORK RECEIPT

Customer: Ron Jones Contact (if different than Customer): _____

Work Address: 385 Miramonte Road

City: Orange County State: Nevada County: _____

Service Cost: \$ 125 * Cash Check Credit Card Billing PO # (if required): _____

***NOT AN INVOICE. FINAL PRICE MAY DIFFER BASED ON CONTRACT TERMS AND/OR OTHER FACTORS UNKNOWN TO OUR DRIVER.**

Notes: 1 hr e-lance @ \$125/hr. Was locating hole when at 30' b 1
large rocks, line is broken. Tank level was low so we filled it
up to outlet l.c. Water level is 10" from the top of the outlet
baffle. Tank is 1500 gal.

DISPOSAL MANIFEST/WASTE RELEASE CUSTODY RECORD

Waste Type: Septic/Sewage Grease Trap Storm Drain Sand/Oil Separator Other: _____

Disposal Site: Carico Farms (S) Carico Farms (G) CSR Lockwood Landfill TMWRF Other: _____

Gallons Collected: _____ pH: _____

DRIVER/TRANSPORTER CERTIFICATION

I certify that the information contained on this form is true and accurate to the best of my knowledge, and further certify that the truck listed below does not contain hazardous waste. I also certify that the date listed below is the date the waste was collected.

Driver Signature: [Signature] Date: 04/19/2018

Truck/Unit Number(s): 9213

CUSTOMER CERTIFICATION

~~Residential Customers:~~ I hereby certify that the waste collected at the work address listed above contains domestic household use waste only, and is not an Industrial/Commercial facility. I also certify that the transporter representative pumped the tank completely and to the best of my knowledge the transporter's vehicle contains only household domestic waste.

~~Commercial/Industrial Customers:~~ I hereby certify that the waste collected at the work address listed above is non-hazardous to the best of my knowledge and that said waste is tested annually by an independent, state-certified lab, if required by law. I also certify that the transporter representative pumped the tank completely and the transporter's vehicle contains only non-hazardous waste to the best of my knowledge. I also understand that this record must be kept on site for review by city/county/state inspectors.

Customer or Authorized Agent Signature: [Signature] Date: 04/19/2018

Print Name: _____ Phone: (____) - _____ - _____



PO Box 18160 Reno, NV 89511
775-825-1595 | www.watersvacuum.com

VACUUM TRUCK SERVICE



RECIPIENT:

Ron Jahn
1540 Butterfly Drive
Reno, Nevada 89523

Phone: 775-746-0223

SERVICE ADDRESS:

3285 Maranatha Road
Carson City, Nevada 89704

For Services Rendered

Invoice #3321	
Issued	04/20/2018
Due	05/20/2018
Paid	05/17/2018
Total	\$125.00

SERVICE / PRODUCT	DESCRIPTION	QTY.	UNIT COST	TOTAL
04/19/2018				
Electronic Locating & Push Rod Video	Use of E-Locator or Push Rod Video	1	\$125.00	\$125.00*

PAID

* Non-taxable

Made an attempt to electronic locate the leach field. While locating hit large roots at 20'. The line is broken. The liquid level in the septic tank was low. Filled tank to operating level. The liquid level was 10" from the top of the outlet baffle and 11" from the top of the inlet baffle. The septic tank is a 1500 gallon tank. May need a bigger mini-excavator due to the size of the boulders near the location to expose the line and repair the break.

Thank you for your business.

Total	\$125.00
Paid	- \$125.00
Invoice balance	\$0.00



PO Box 18160 Reno, NV 89511
775-825-1595 | www.watersvacuum.com



RECIPIENT:

Ron Jahn
1540 Butterfly Drive
Reno, Nevada 89523

Phone: 775-746-0223

SERVICE ADDRESS:

3285 Maranatha Road
Carson City, Nevada 89704

For Services Rendered

Invoice #3805	
Issued	05/18/2018
Due	06/17/2018
Paid	05/18/2018
Total	\$845.00

SERVICE / PRODUCT	DESCRIPTION	QTY.	UNIT COST	TOTAL
05/17/2018				
Reno 1500	Pumping of 1500 Gallon Concrete Non-Baffled Septic Tank	1	\$515.00	\$515.00*
Real Estate Inspection	Septic Inspection For Sale of Home	1	\$150.00	\$150.00*
Hydro-Flushing to Remove Excessive Solids	Charge For High Pressure Water Removal of Sludge	1	\$180.00	\$180.00*



* Non-taxable

Thank you for your business.

Total	\$845.00
Paid	- \$845.00
Invoice balance	\$0.00



PO Box 18160 Reno, NV 89511
775-825-1595 | www.watersvacuum.com

VACUUM TRUCK SERVICE



RECIPIENT:

Ron Jahn

1540 Butterfly Drive
Reno, Nevada 89523

Phone: 775-746-0223

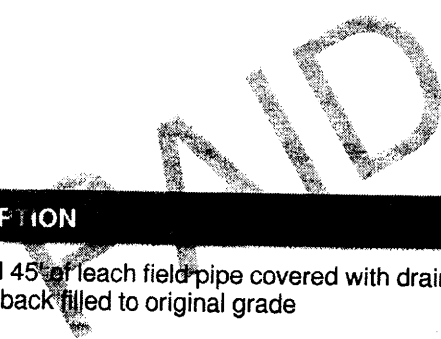
SERVICE ADDRESS:

3285 Maranatha Road
Carson City, Nevada 89704

For Services Rendered

Invoice #3731

Issued	05/16/2018
Due	06/15/2018
Paid	05/17/2018
Total	\$2,000.00



SERVICE / PRODUCT	DESCRIPTION	QTY.	UNIT COST	TOTAL
Dig up and replace leach field pipe	Replaced 45' of leach field pipe covered with drain rock and back filled to original grade	1	\$2,000.00	\$2,000.00

Thank you for your business.

Total	\$2,000.00
Paid	- \$2,000.00
Invoice balance	\$0.00



PO Box 18160 Reno, NV 89511
775-825-1595 | www.watersvacuum.com

VACUUM TRUCK SERVICE



RECIPIENT:

Ron Jahn
1540 Butterfly Drive
Reno, Nevada 89523

Phone: 775-746-0223

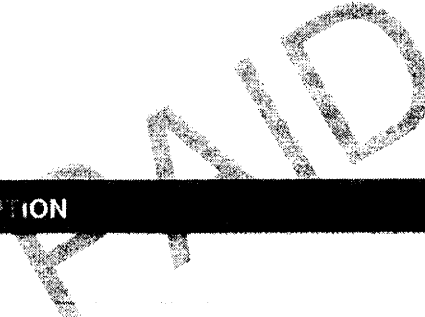
SERVICE ADDRESS:

3285 Maranatha Road
Carson City, Nevada 89704

For Services Rendered

Invoice #3610

Issued	05/09/2018
Due	06/08/2018
Paid	05/17/2018
Total	\$1,300.00



SERVICE / PRODUCT	DESCRIPTION	QTY.	UNIT COST	TOTAL
05/07/2018				
Replace approximately 20' of outlet line then locate and water check leach field	Field not taking water at this time	1	\$1,300.00	\$1,300.00

Thank you for your business.

Total	\$1,300.00
Paid	-\$1,300.00
Invoice balance	\$0.00

DOC # 4577218

04/06/2016 03:19:04 PM

Requested By

JAMES P PACE

Washoe County Recorder

Lawrence R. Burtness - Recorder

Fee: \$19.00 RPTT: \$0.00

Page 1 of 3

APN: 046-031-10

When recorded, return Deed to:

James P. Pace
448 Hill Street
Reno, NV 89501



Send tax statements to:

Ronald H. & Denise A. Jahn
1540 Butterfly Dr.
Reno, NV 89523

The undersigned hereby affirm that this document submitted for recording does not contain the social security number of any person or persons.
(Pursuant to NRS 239b.030)

SPACE ABOVE FOR RECORDERS USE


GRANT, BARGAIN, & SALE DEED

RONALD H. JAHN and DENISE A. JAHN, husband and wife, hereby grant, bargain and sell to RONALD H. JAHN and DENISE A. JAHN as Trustees of THE JAHN FAMILY TRUST dated 3-28-, 2016, all of their right, title, and interest in the real property situated in the County of Washoe, State of Nevada, described as follows:

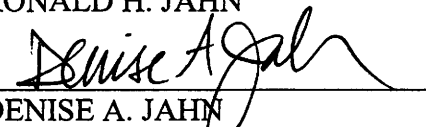
SEE ATTACHED EXHIBIT "A"

TOGETHER with all and singular the tenements, hereditaments and appurtenances, thereunto belonging or in anywise appertaining, and any reversions, remainders, rents, issues or profits thereof.

Dated this 28th day of March, 2016.



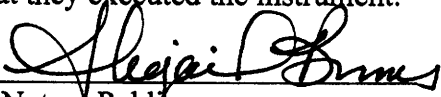
RONALD H. JAHN



DENISE A. JAHN

STATE OF NEVADA)
) ss.
COUNTY OF WASHOE)

On this 28th day of March, 2016, personally appeared before me, a Notary Public, RONALD H. JAHN and DENISE A. JAHN, personally known (or proved) to me to be the persons whose names are subscribed to the foregoing instrument, and who acknowledged that they executed the instrument.



Notary Public

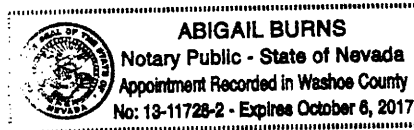


EXHIBIT "A"
Legal Description

PARCEL 1:

Parcel F as shown on Parcel Map No. 607 filed in the office of the County Recorder of Washoe County, Nevada, June 28, 1978, File No. 541416, Official Records.

PARCEL 2:

A non-exclusive easement, 50 feet in width, for roadway, drainage and utility purposes which lies 25 feet each side of and parallel to the following described centerline:

Commencing at the $\frac{1}{4}$ corner of Sections 34 and 35 said Township and Range marked by a G.L.O. capped pipe; thence South $89^{\circ}25'50''$ W., along the East-West center $\frac{1}{4}$ line of Section 34, a distance of 811.89 feet to an intersection with the Westerly right of way line of old highway U.S. 395; thence South $03^{\circ}20'00''$ W., along said right of way line, a distance of 25.06 feet to the TRUE POINT OF BEGINNING; thence leaving said right of way line, South $89^{\circ}25'50''$ W., along a line 25 feet Southerly of and parallel to the East-West center $\frac{1}{4}$ line of said Section 34, a distance of 742.51 feet; thence South $39^{\circ}20'49''$ W., a distance of 305.53 feet; thence North $79^{\circ}52'25''$ W., a distance of 190.42 feet; thence South $45^{\circ}39'17''$ W., a distance of 247.61 feet to a point on the East line of parcel conveyed to Lawrence G. Brown et ux by Deed recorded July 24, 1972, in Book 655, Page 259, Document No. 252412, Official Records, from which the Northeast corner of said parcel bears North $01^{\circ}42'05''$ E., a distance of 122.65 feet.

PARCEL 3:

A non-exclusive easement 50 feet in width for roadway, drainage and utility purposes which lies 25 feet each side of and parallel to the following described centerline:

Commencing at the $\frac{1}{4}$ corner of Section 34 and 35 said Township and Range marked by a G.L.O. capped pipe; thence South $89^{\circ}25'50''$ W., along the East-West center $\frac{1}{4}$ line of Section 34, a distance of 811.89 feet to an intersection with the Westerly right of way line of old highway U.S. 395; thence South $03^{\circ}20'00''$ W., along said right of way line, a distance of 25.06 feet; thence leaving said right of way line, South $89^{\circ}25'50''$ W., along a line 25 feet Southerly of and parallel to the East-West Center $\frac{1}{4}$ line of said Section 34, a distance of 742.51 feet; thence South $39^{\circ}20'49''$ W., a distance of 305.53 feet to the TRUE POINT OF BEGINNING; thence South to a point on the North line of Parcel D of Parcel Map No. 268, filed June 8, 1976, File No. 411544.

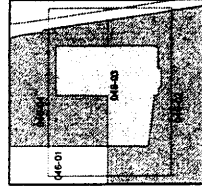
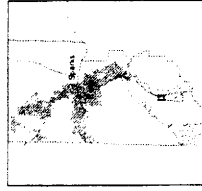
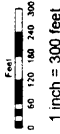
Subject to easements 10 feet in width for underground power and sewer lines and 25 feet in width for ingress and egress to and from Parcel E, all as shown on said Parcel Map No. 607.

The above metes and bounds description appeared previously in that certain document recorded October 11, 1995 as Document No. 1932895 of Official Records.

Assessor's Map Number

046-03

STATE OF NEVADA
WASHOE COUNTY
ASSESSOR'S OFFICE
Michael E. Clark, Assessor
1001 East Third Street
Building D
Reno, NV 89517
Phone: (775) 332-2331

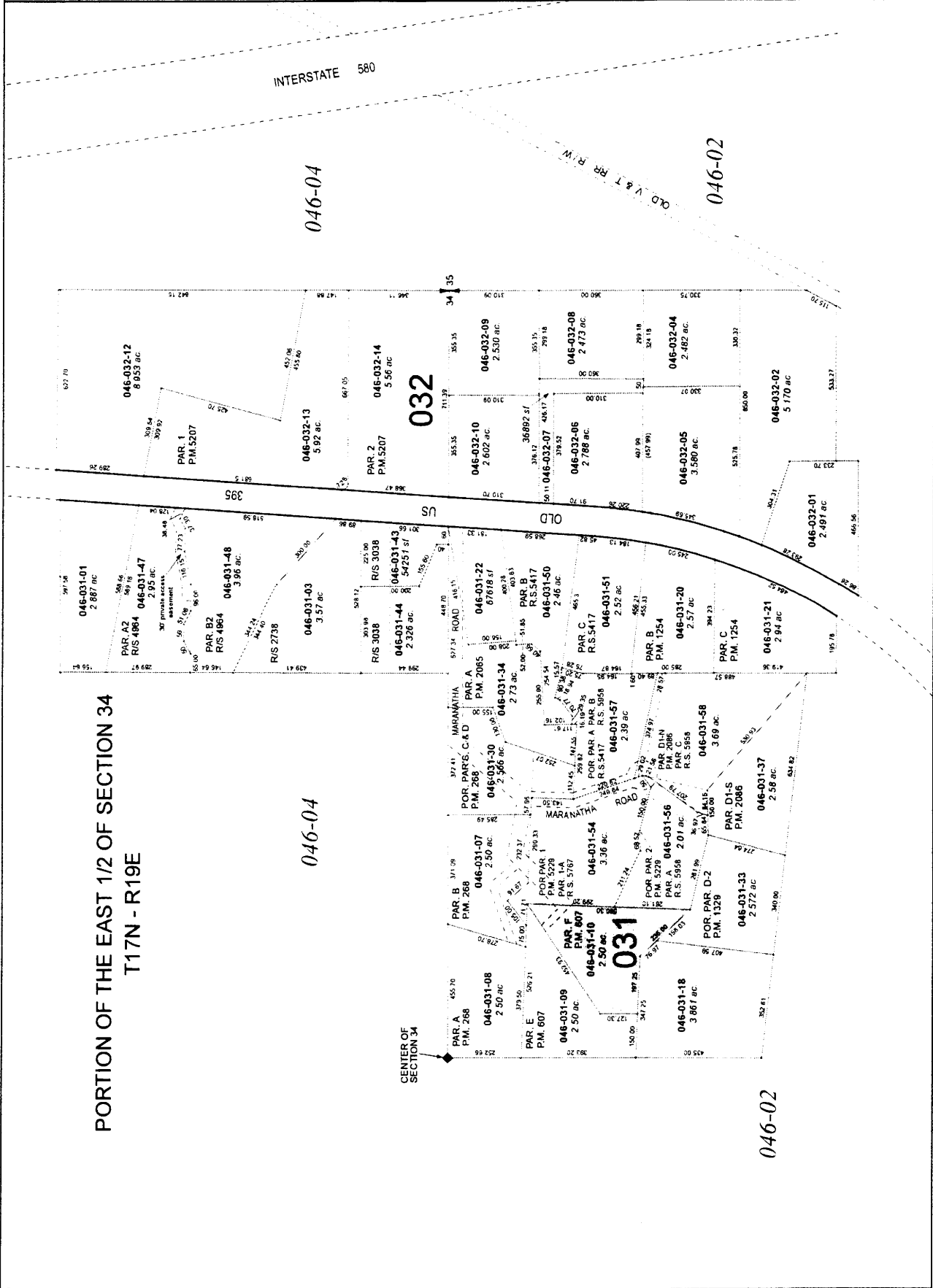


created by **CFB 3/19/2012**
last updated **SR 9/26/16 JFK 5/20/18**

area previously shown on map(s)

NOTE: This map was prepared for the use of the Washoe County Assessor for assessment and is not intended for any other purpose. No liability is assumed as to the sufficiency or accuracy of the data delineated herein.

**PORTION OF THE EAST 1/2 OF SECTION 34
T17N - R19E**



CENTER OF SECTION 34

INTERSTATE 580

046-04

046-02

032

046-04

031

046-02

- 046-031-01 2.887 ac
- PAR A2 RIS 4984 046-031-47 3.90 ac
- PAR B2 RIS 4984 046-031-48 3.96 ac
- RIS 2738
- 046-031-03 3.57 ac
- RIS 3038
- 046-031-44 2.368 ac
- RIS 3038
- 046-031-43 5.4251 ac
- 046-031-32 6.7618 ac
- 046-031-34 2.73 ac
- 046-031-30 2.956 ac
- 046-031-07 2.50 ac
- 046-031-08 2.50 ac
- 046-031-09 2.50 ac
- 046-031-10 2.50 ac
- 046-031-18 3.867 ac
- 046-031-14 5.56 ac
- 046-032-10 2.602 ac
- 046-032-07 2.786 ac
- 046-032-06 2.786 ac
- 046-032-05 3.580 ac
- 046-032-04 2.482 ac
- 046-032-08 2.473 ac
- 046-032-02 5.170 ac
- 046-032-01 2.491 ac
- 046-031-21 2.94 ac
- 046-031-20 2.57 ac
- 046-031-58 3.09 ac
- 046-031-37 2.36 ac
- 046-031-33 2.572 ac
- 046-031-56 2.01 ac
- 046-031-54 3.36 ac
- 046-031-57 2.39 ac
- 046-031-55 2.39 ac
- 046-031-53 2.39 ac
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- 046-031-05 2.46 ac
- 046-031-04 2.46 ac
- 046-031-03 2.46 ac
- 046-031-02 2.46 ac
- 046-031-01 2.46 ac

609

SURVEYORS CERTIFICATE

I, ROBERT L. FULLER, DO HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE PLAT OF THE LANDS SHOWN HEREON AS TAKEN FROM THE FIELD NOTES OF THE SURVEY MADE BY ME AND Betsy T. Brown, Lawrence G. & Betsy T. Brown, in accordance with the laws of the State of Nevada, and that the same are in accordance with the original records of the Surveyors Office of Washoe County, Nevada, and that the same are in accordance with the original records of the Surveyors Office of Washoe County, Nevada, and that the same are in accordance with the original records of the Surveyors Office of Washoe County, Nevada.



ROBERT L. FULLER METRALS 2006

OWNERS CERTIFICATE

WE, THE UNDERSIGNED, LAWRENCE G. & BETSY T. BROWN, in accordance with the laws of the State of Nevada, and that the same are in accordance with the original records of the Surveyors Office of Washoe County, Nevada, and that the same are in accordance with the original records of the Surveyors Office of Washoe County, Nevada, and that the same are in accordance with the original records of the Surveyors Office of Washoe County, Nevada.

STATE OF NEVADA S.S. CARSON CITY

ON THIS 15th DAY OF MAY 1978, LAWRENCE G. & BETSY T. BROWN DID ORIGINALLY MAKE SAID PLAT AND RECORD THE SAME IN THE PUBLIC UTILITY COMPANY'S RECORDS IN CARSON CITY, NEVADA, AND THAT THEY EXECUTED THE FOREGOING CERTIFICATE FREELY AND VOLUNTARILY FOR THE USES AND PURPOSES STATED THEREIN.

COUNTY COMMISSIONERS CERTIFICATE

APPROVED AND ACCEPTED BY THE WASHOE COUNTY COMMISSIONERS AT THEIR REGULAR MEETING HELD AT CARSON CITY, NEVADA, ON THIS 15th DAY OF MAY 1978, FOR SUBSTITUTION PURPOSES IN THE PUBLIC UTILITY COMPANY'S RECORDS.



UTILITY COMPANIES CERTIFICATE

THE UTILITY EASEMENTS SHOWN ON THIS PLAT HAVE BEEN REVIEWED IN CONNECTION WITH A.R.S. 278 AND ARE HEREBY APPROVED AND ACCEPTED BY THE BOARD OF DIRECTORS OF THE PUBLIC UTILITY COMPANY OF NEVADA AND SIERRA PACIFIC POWER CO. ON THIS 15th DAY OF JUNE, 1978.

A PUBLIC UTILITY EASEMENT IS ALSO HEREBY GRANTED WITHIN EACH PARCEL SHOWN HEREON TO THE PUBLIC UTILITY COMPANY OF NEVADA AND SIERRA PACIFIC POWER CO. FOR THE INSTALLATION AND MAINTENANCE OF RECORDS AT THE TIME OF INSTALLATION AND THE UTILITY COMPANY.

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS THE MERIDIAN OF CARSON CITY, NEVADA, RECORDS FROM OLD U.S. 395 (S. 03° 20' 00" W.)

FILE NO. 541416

FILED FOR RECORD AT THE OFFICE OF THE CLERK OF WASHOE COUNTY, NEVADA, ON THIS 15th DAY OF MAY 1978 AT 10:00 AM. BY CLERK OF WASHOE COUNTY, NEVADA.

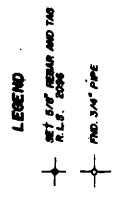
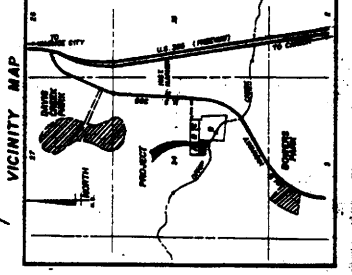
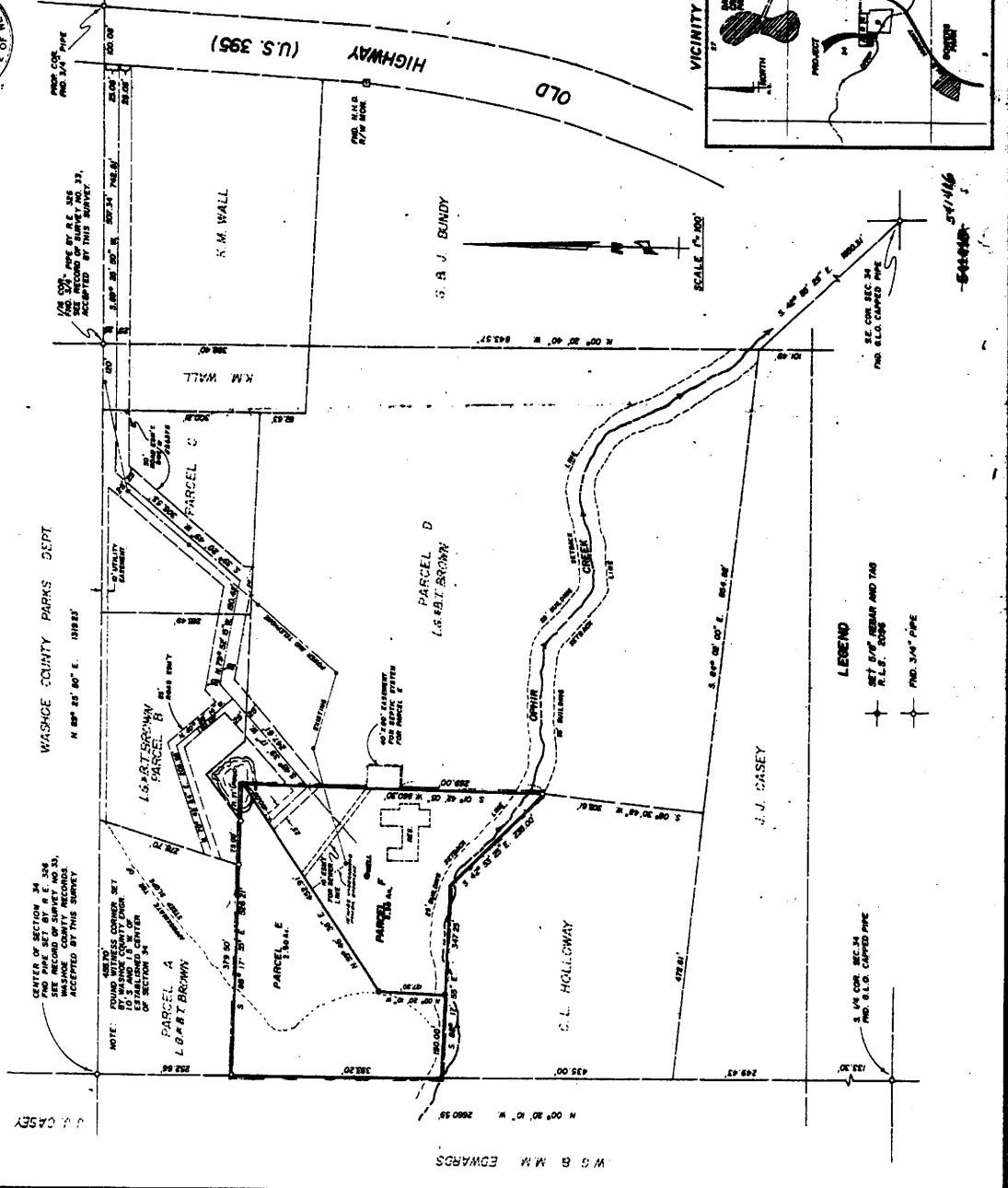
James K. Jones
WASHOE COUNTY ENGINEER
Robert C. Johnson

SEE: 5-5-78

2ND PARCEL MAP FOR
LAWRENCE G. & BETSY T. BROWN
A DIVISION OF A PORTION OF THE NW 1/4
OF THE S.E. 1/4 OF SECTION 34, T.17 N.,
R.15 E., M.D.B. 64, WASHOE COUNTY,
NEVADA.

R.L. FULLER ENGINEERS
100 BOX 577
CARSON CITY, NEVADA
MAY 4, 1978

SHEET 1 OF 1
PARCEL MAP NO. 602



607

File number was written wrong corrected to 541416 5/1/78

QUALITATIVE INDEXES SHOULD BE EXAMINED FOR ANY SUBSEQUENT CHANGES TO THIS MAP

SURVEYOR'S CERTIFICATE

I, ROBERT L. FULLER DO HEREBY CERTIFY THAT THIS IS A TRUE AND ACCURATE PLAT OF THE LANDS SHOWN HEREON AS TAKEN FROM THE FIELD NOTES OF A SURVEY MADE BY ME AT THE INSTANCES OF LAWRENCE G. & BETSY T. BROWN AND THAT THE SAME ARE IN ACCORDANCE WITH THE ACTS OF THE LEGISLATURE OF THE STATE OF NEVADA AND THE DECISIONS OF THE SUPREME COURT OF THE SAME IN THE MATTER OF THE APPLICANTS AND THAT THE POSITIONS INDICATED HEREON, AND ARE SUFFICIENT TO ENABLE THIS SURVEY TO BE RETRACED.

ROBERT L. FULLER MEY.A.C.E. & R.L.S. IN 8088

OWNER'S CERTIFICATE

THIS IS TO CERTIFY THAT THE UNDERSIGNED, LAWRENCE G. & BETSY T. BROWN, HAVE READ AND UNDERSTOOD THE FOREGOING CERTIFICATE AND THAT WE HAVE RECEIVED FROM THE SURVEYOR A TRUE AND ACCURATE COPY OF THE SAME AND THAT WE HAVE RECEIVED FROM THE SURVEYOR ALL UTILITY AND ACCESS EASEMENTS TO BE USED THEREON.

LAWRENCE G. BROWN BETSY T. BROWN

STATE OF NEVADA (S.S.) COUNTY OF WASHOE

ON THIS 21ST DAY OF AUGUST, 1961, LAWRENCE G. AND BETSY T. BROWN DID APPEAR PERSONALLY before me, the undersigned, a Justice of the Peace, and executed the foregoing CERTIFICATE TRUST AND POSSESSORSHIP FOR THE USES STATED THEREIN.

My Comm. No. 10000 FOR THE STATE OF NEVADA



COUNTY COMMISSIONERS CERTIFICATE

RESOLVED AND ORDERED ON THE 21ST DAY OF AUGUST, 1961, THAT THE FOREGOING CERTIFICATE BE RECORDED AT THEIR OFFICIAL MEETING HELD ON THE 21ST DAY OF AUGUST, 1961.

ATTEST: J. J. S. CLARK, CLERK OF THE WASHOE COUNTY COMMISSION

UTILITY COMPANIES CERTIFICATE

THE UTILITY EASEMENTS SHOWN ON THIS PLAT HAVE BEEN REVIEWED IN ACCORDANCE WITH N.R.S. 278 AND ARE HEREBY APPROVED AND ACCEPTED BY THE WASHOE COUNTY COMMISSIONERS AND THE WASHOE COUNTY PUBLIC UTILITY COMPANY AND THE WASHOE COUNTY WATER SUPPLY COMPANY ON THIS 21ST DAY OF AUGUST, 1961.

A PUBLIC UTILITY EASEMENT IS ALSO HEREBY GRANTED WITHIN EACH PARCEL FOR THE EXCLUSIVE PURPOSE OF INSTALLING AND MAINTAINING UTILITY SERVICE TO BE PROVIDED BY THE WASHOE COUNTY PUBLIC UTILITY COMPANY AT THE TIME OF INSTALLATION AND THE UTILITY COMPANY.

RECORDER'S CERTIFICATE

FILE NO. 7202337
FILED FOR RECORD AT THE REQUEST OF: LAWRENCE G. & BETSY T. BROWN ON THIS 21ST DAY OF AUGUST, 1961, IN THE OFFICIAL RECORDS OF WASHOE COUNTY, NEVADA.

J. J. S. CLARK
WASHOE COUNTY RECORDER

DEPUTY

FEES: \$10.00

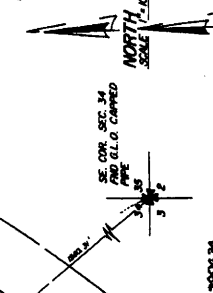
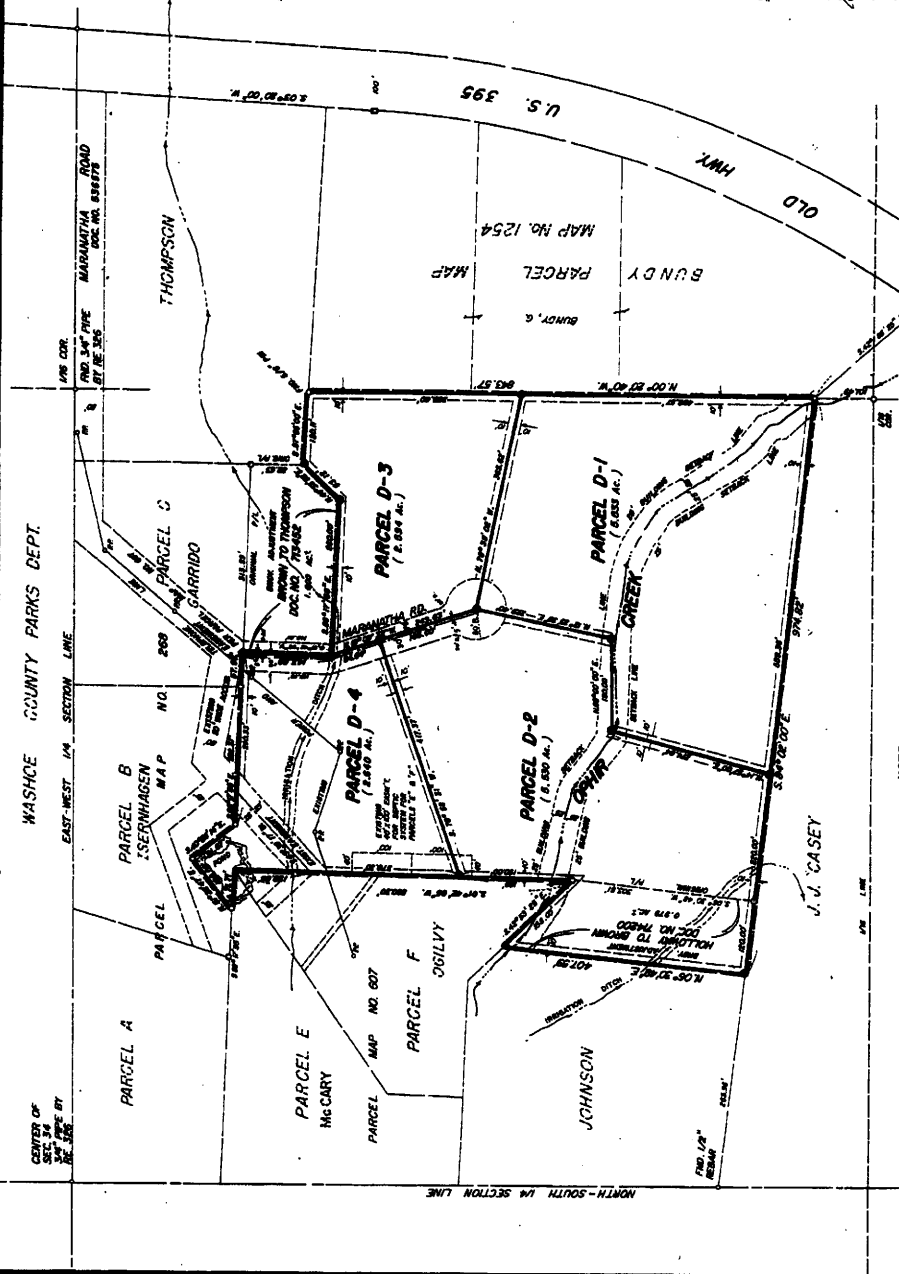
3RD PARCEL MAP FOR LAWRENCE G. BROWN AND BETSY T. BROWN

A PORTION OF PARCEL D, AS SHOWN ON PARCEL MAP NO. 8315, IS LOCATED WITHIN THE AREA OF THE SECTION 34, T.17N., R.95E., S.40R. & 41R., WASHOE COUNTY, NEVADA.

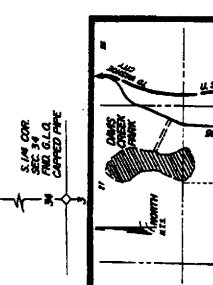
R. L. FULLER ENGINEERING
P.O. BOX 517
CARSON CITY, NEVADA
AUG. 21, 1961

SHEET 1 OF 1 SHEET

Parcel Map # 1329



NOTE
Parcels D-1 and D-2 as shown herein may be adjusted by the 1/4" scale across extension established in Document No. 74850, recorded December 21, 1960, in the official records of Washoe County, Nevada.



LEGEND
 ○ FOUND ANCHOR
 + SET 8"x8" MARK W/ THE R.L.S. IN 8088
 — BASIS OF BEARING FOR THIS SURVEY IS TAKEN FROM ANCHOR POINT ACCORDING TO U.S. G.S. 1607 (1 & 2) OF 1911.
 — PUBLIC UTILITY EASEMENTS FOR THE PURPOSES OF INSTALLING AND MAINTAINING UTILITY SERVICE TO BE PROVIDED BY THE WASHOE COUNTY PUBLIC UTILITY COMPANY AT THE TIME OF INSTALLATION AND THE UTILITY COMPANY.

1329

1329

See Certificate of Amendment see 24 1747 B 760

5767A

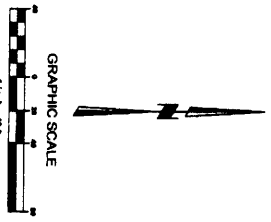
- LEGEND**
- FOUND MONUMENT AS NOTED
 - DIMENSION POINT, MONUMENT FOUND OR SET
 - △ GEODETIC CONTROL POINT AS NOTED
 - APN ASSASSIN PARCEL NUMBER
 - PM PARCEL MAP
 - PLP PUBLIC UTILITY EASEMENT
 - DOC DOCUMENT
 - NO NUMBER

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS SURVEY IS THE NEVADA STATE PLANE COORDINATE SYSTEM, WEST ZONE, GDA, NAD83/1114, PER WASHOE COUNTY COORDINATES SHOWN AND ADJUSTED BY A GEOIDAL FACTOR OF 0.0000129. ALL DIMENSIONS ARE GROUND DISTANCES.

TOTAL AREA

5.80 ACRES ±



RECORD OF SURVEY IN SUPPORT OF A BOUNDARY LINE ADJUSTMENT FOR

JAN LECLAIRE-CHARBONNEAU

AN ADJUSTMENT OF PARCEL 1 AND PARCEL 2 OF PARCEL MAP 1229 WASHOE COUNTY

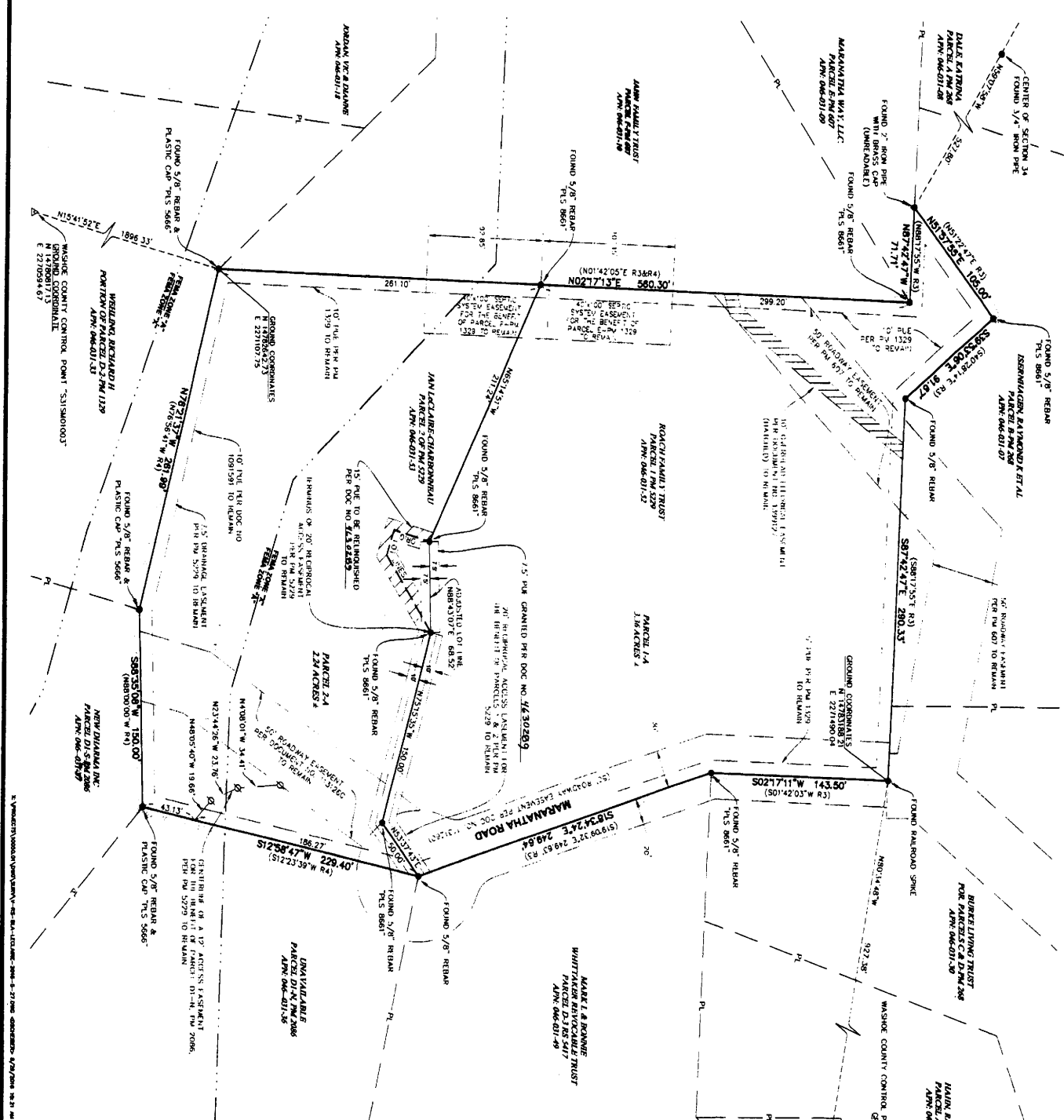
DATE: 2/2/2018

BY: [Signature]

FOR: [Signature]

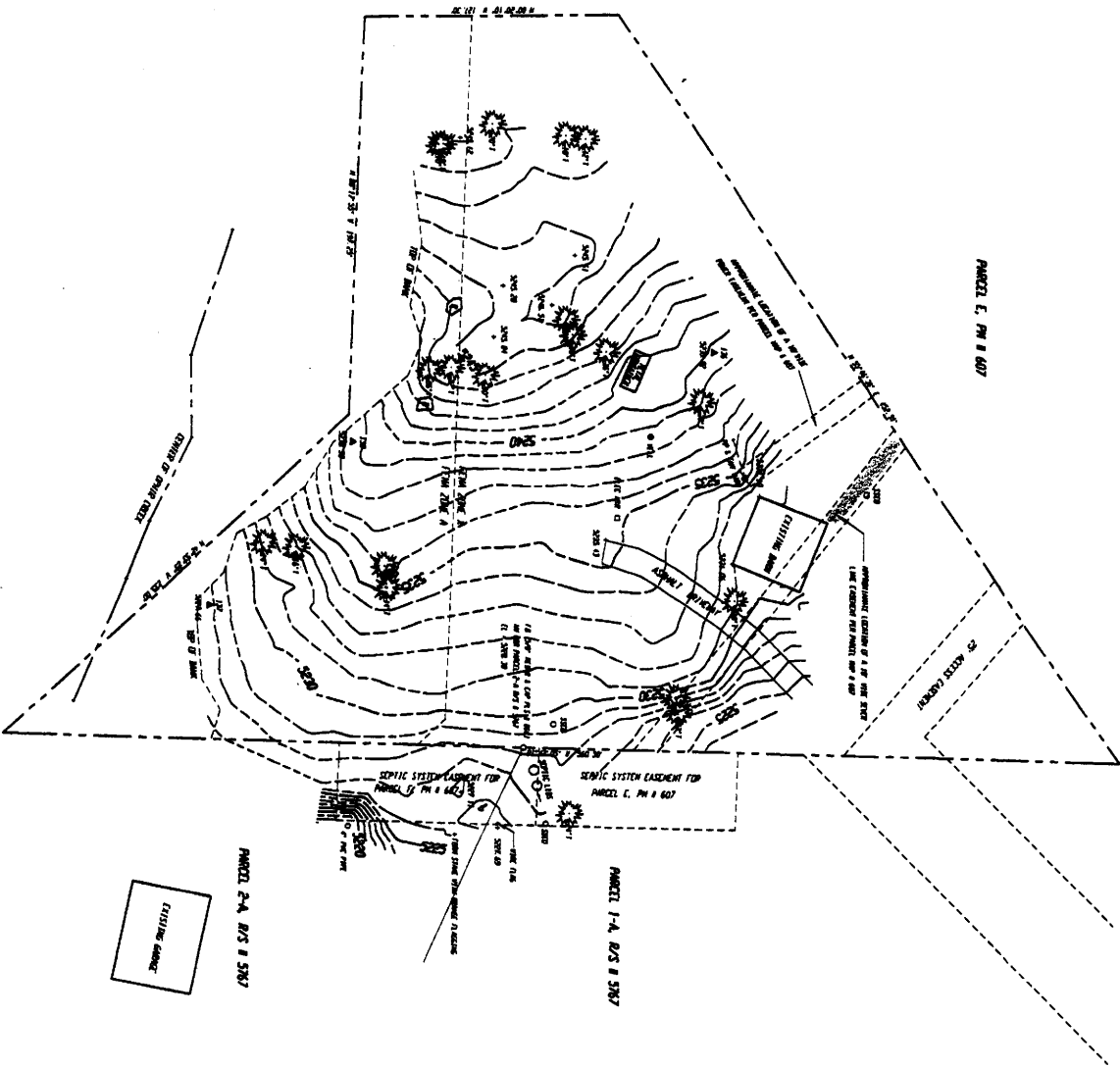
Record of Survey Map 5767A

44-36370



CUMULATIVE INDEXES SHOULD BE EXAMINED FOR ANY SUBSEQUENT CHANGES TO THIS MAP

5767A



PARCEL E, PW # 607

PARCEL 2-A, B/S # 582

PARCEL 1-A, B/S # 582

EXISTING GARAGE

SCALE 1"=30'

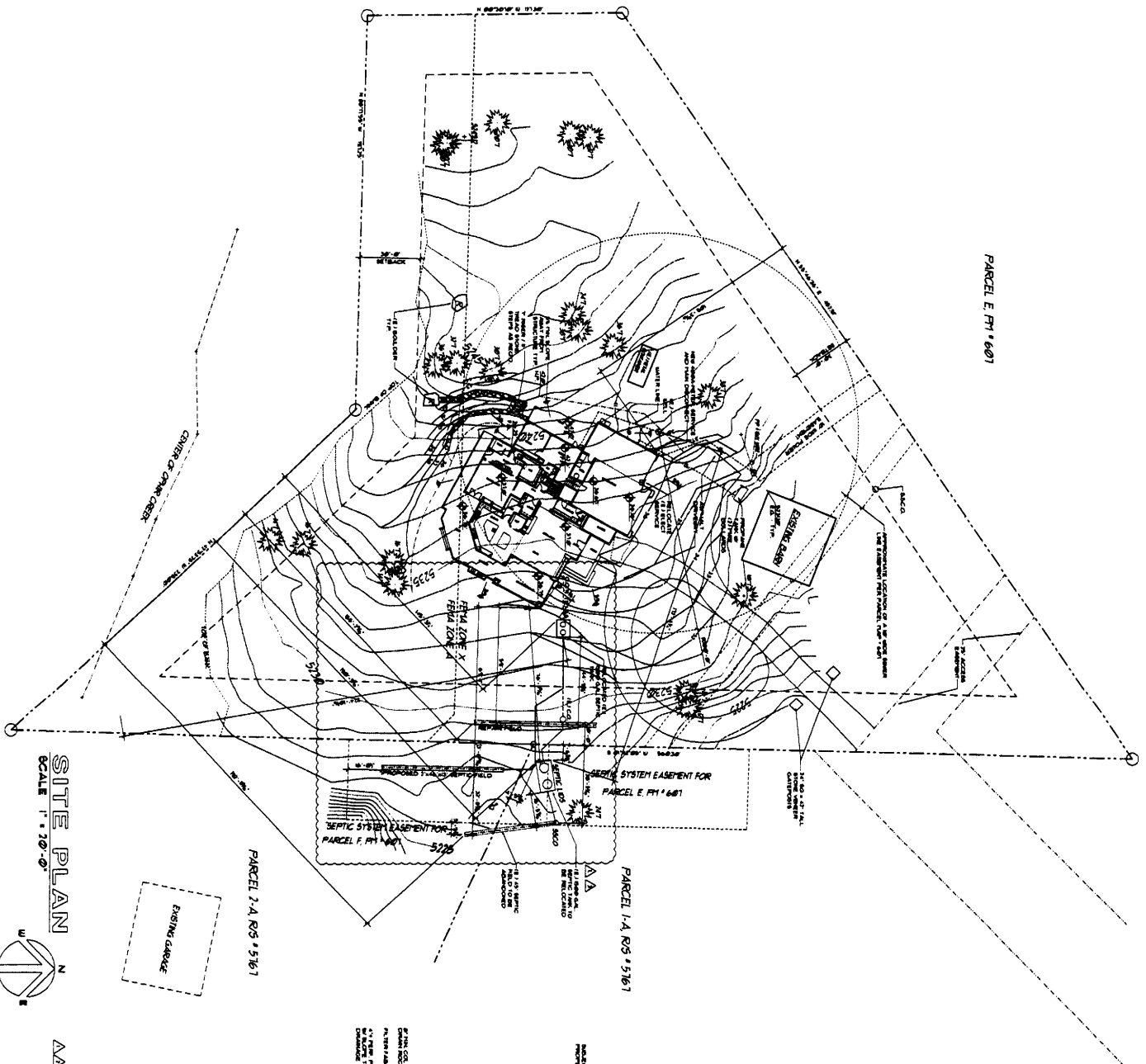


NOTES
 1. THIS PLAN IS SUBMITTED FOR THE PROPOSED SEPTIC SYSTEM AND THE SEPTIC SYSTEM CASEMENTS. THE LOCATION OF THE SEPTIC SYSTEM CASEMENTS IS SHOWN BY THE DASHED LINES. THE LOCATION OF THE SEPTIC SYSTEM CASEMENTS IS SHOWN BY THE DASHED LINES. THE LOCATION OF THE SEPTIC SYSTEM CASEMENTS IS SHOWN BY THE DASHED LINES.

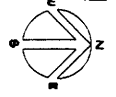
<p>TOPOG MAP</p> <p>1"=30'</p> <p>AD. NUMBER 000000</p> <p>PREPARED BY: LANDMARK SURVEYING</p> <p>2000 BROADWAY TERRACE</p> <p>MEMPHIS, TN 38103</p>	
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2018

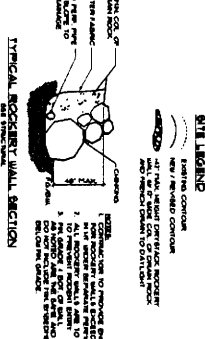
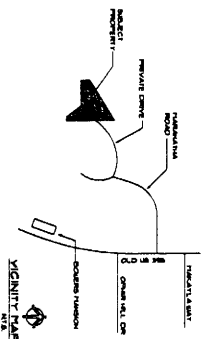
PARCEL E, P11 # 601



SITE PLAN
SCALE 1" = 10'-0"



- GENERAL NOTES:**
1. CHECK ALL PARTS OF THE CONTRACT.
 2. EXISTING UTILITIES SHALL BE MAINTAINED.
 3. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY OF LAS VEGAS, NEVADA, LOCAL ORDINANCES, AND THE NATIONAL BUILDING CODE.
 4. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY OF LAS VEGAS, NEVADA, LOCAL ORDINANCES, AND THE NATIONAL BUILDING CODE.
 5. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY OF LAS VEGAS, NEVADA, LOCAL ORDINANCES, AND THE NATIONAL BUILDING CODE.
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 7. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY OF LAS VEGAS, NEVADA, LOCAL ORDINANCES, AND THE NATIONAL BUILDING CODE.
 8. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY OF LAS VEGAS, NEVADA, LOCAL ORDINANCES, AND THE NATIONAL BUILDING CODE.
 9. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY OF LAS VEGAS, NEVADA, LOCAL ORDINANCES, AND THE NATIONAL BUILDING CODE.
 10. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY OF LAS VEGAS, NEVADA, LOCAL ORDINANCES, AND THE NATIONAL BUILDING CODE.



SOIL ANALYSIS:
CONDUCTED BY: [Name]
DATE: [Date]
RESULTS: [Text]

DESIGN CRITERIA:
[Text]

LOT INFORMATION:
[Text]

OWNER INFORMATION:
[Text]

GRAADING QUANTITIES:
[Text]

JASON WARFIELD
RESIDENTIAL DESIGN L.L.C.
LICENSE # 585-RD
642 LANDER STREET
SUITE 100
LAS VEGAS, NV 89108
775-824-8857 O. 775-748-8858 F.

LAHN RESIDENCE
NEW RESIDENCE
3285 MARAMATHA DRIVE
WASHOE COUNTY, NEVADA

A1.0
1-25-18

STAFF REPORT

BOARD MEETING DATE: November 20, 2018

TO: Sewage, Wastewater, and Sanitation Hearing Advisory Board

FROM: James English, EHS Supervisor
775-328-2610, jenglish@washoecounty.us

SUBJECT: Variance Case #1-18S; Variance to Multiple Portions of Regulations, including Setbacks to Irrigations Ditches, Placement of a Septic Field in Soils with Outside of the Allowable Percolation Rates, and Installation of an Alternative Treatment System, For the Purpose of Installing a Repair, Parcel 038-084-05, 630 Hill Lane, Verdi, NV

Recommendation

Staff is offering a neutral recommendation to the Sewage, Wastewater and Sanitation (SWS) Hearing Board in the presented Variance Case #1-18S (Dante Frasca) to allow the approval of the septic repair permit (permit number to be determined) with less than the required 100 foot (or 25 foot) setback to neighboring irrigation ditches, allowing a septic to be placed in soils outside of the allowable percolation rates and installing an alternative treatment system.

Background

In June and July of 2018, EHS was contacted by Waters Septic Company regarding the need for a repair leach field at 630 Hill Lane. Over the course of July and August, discussions continued regarding the potentially failing septic system.

The original system was records consisted only of a location, with no actual design. Therefore, a new test trench was asked for to determine the appropriate design criteria and groundwater levels. Maximum probable seasonal groundwater was called at 4 feet below ground surface. Percolation testing was conducted by licensed engineer Ron Anderson. Percolation rates were determined to be very slow, well outside of allowable Washoe County Regulations. The Washoe County Health District Regulations of the Washoe County District Board of Health Governing Sewage, Wastewater, and Sanitation (regulations) section 100.090 only allow for engineered septic systems to be installed in soils with percolation rates as slow as 90 minutes per inch and the soils were tested to be 480 minutes per inch.

In August of 2018, an initial proposal was submitted by the property owner's engineer. After review, EHS informed Mr. Anderson that there the proposal did not meet the required irrigation ditch setbacks (Regulations Section 040.100 - 100 feet or 25' if sealed to prevent infiltration and exfiltration of water) and would need a variance if they could not be met. That proposal also included an alternative treatment method (section 060.100 requires alternative treatment devices to go to SWS Board) and attempted to utilize sand as a substitute for fill material. Both of those items also fall outside of EHS standard plan review allowances and provided cause for a submittal to the SWS Board for a variance.

ENVIRONMENTAL HEALTH SERVICES

1001 East Ninth Street Building B | Reno, Nevada 89512

EHS Office: 775-328-2434 | Fax: 775-328-6176 | washoecounty.us/health

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The new plan was submitted with a variance application on November 5. It proposes an alternative secondary treatment system along with disinfection. The treatment system has NSF/ANSI 40 and 245 certifications, standards which verify their ability to meet EPA secondary effluent treatment requirements for municipal treatment facilities for nitrogen reduction and other contaminants. The goal is to produce effluent that will not pose a risk to public health to allow for a discharge method of subsurface drip irrigation. In theory, should the system function correctly and the effluent be properly cleaned, it would create the basis for allowing a reduced setback to irrigation ditches, as the public health threat posed by the discharge would be essentially eliminated.

The sizing of the system is based on the percolation rates that were found and the style of discharge is based on literature research provided by the design engineer. The discharge fields would be rotated to allow for rest periods and the existing sand filter would be utilized as a backup field.

The proposal also includes sealing the irrigation ditch for a long portion of the property. Section 040.100 does allow for a reduced setback to lined or sealed irrigation ditches. The proposed sealing would protect the system to some extent, but the system would still not meet the required 25' setbacks from the sealed portion or the 100' setbacks from the non-sealed portion.

The primary concern of EHS regarding the proposal is that the basis of the reduced setbacks is relies on the proper functioning of the treatment system. Washoe County does not have the resources to continually monitor these types of systems or the property owners and for this reason has typically only supported passive systems that do not require this level of maintenance. The onus would fall on the homeowner for the upkeep. While the proposal calls for a mandatory 3 year maintenance contract, EHS views the property for its entire life. There are also the ancillary potential concerns about what would happen if the company that produces the treatment goes out of business, and/or if there is availability of someone with sufficient knowledge to maintain and certify the systems functionality. If for some reason the system was not kept up, the Health District would have no way of knowing and/or correcting the issue.

With these concerns, EHS must maintain a neutral position and recommend that the Board put in place stringent conditions with an understanding that there will be no actual regulatory oversight or enforcement that the conditions will be met on an ongoing basis.

Findings of Fact

1. Will the proposed variance result in contamination of water to the extent it cannot be used for its existing or expected use?

Reply: If the system functions as intended, then the effluent discharge to groundwater should be clean and not pose a threat to groundwater contamination. That would be reliant on the property owner (and future property owners) maintaining the system as intended and conducting the required sampling. No regulatory oversight of this would be possible at this time as EHS does not have the resources nor the regulatory structure in place to ensure that the requirements were met.

2. Will the proposed variance pose a threat to public health?

Reply: There are two primary ways that sewage can pose a threat to public health, direct exposure and groundwater contamination in areas with domestic wells. Sewage

discharged underground should not allow for direct exposure as long as the field functions, the same as any onsite sewage disposal system. As indicated in question #1, the system should also not cause a groundwater contamination issue as long as the system is maintained and functions properly.

3. Are there other reasonable alternatives?

Reply: Washoe County regulations allow for a passive sand filtration system to be installed in soils between 60-90 minutes per inch and only a 2 foot vertical setback to groundwater. With the percolation rates of the soils, the other option would be removal of soils and replacement with fill materials. Engineers have designed systems to meet these requirements; while records do not exist, the best guess is that the original system was designed this way. EHS would accept a standard sand filter with fill and an appropriate design on this property. The comparable cost to the homeowner is unknown.

Conditions of Approval

- A maintenance contract is required with record keeping requirements. A minimum of annual maintenance and certification is required with records kept for a minimum of 5 years. Records must be made available to WCHD upon request.
- All instances system non-function must be reported to WCHD for review and repaired immediately. In the event of failure to maintain or lack of system function, WCHD may require sampling and/or impose restrictions on the property based on the functionality of the treatment system, up to and including additional repair.
- All conditions of approval must be recorded to the deed of the property with language that does not allow for the removal from the deed without Health District approval or connection to municipal sewer.

Possible Motion

Should the SWS Hearing Board wish to approve the variance application, a possible motion would be “Move to present to the District Board of Health a recommendation for approval of Variance Case #1-18S (Dante Frasca) to allow the approval of a septic repair permit as proposed, including all recommended conditions.”

The SWS Board may also formulate their own motion or request additional information from the applicant if desired.

WASHOE COUNTY
HEALTH DISTRICT
ENHANCING QUALITY OF LIFE

WASHOE COUNTY HEALTH DISTRICT
ENVIRONMENTAL HEALTH SERVICES DIVISION
1001 East Ninth Street • PO Box 11130 • Reno, Nevada 89520
Telephone (775) 328-2434 • Fax (775) 328-6176
www.washoecounty.us/health

Office Use Only

Fee Paid _____
Date Paid _____
Cash/CC/Check _____
Receipt No. _____
Date Appl. Received _____
Considered Comp. _____

**APPLICATION FOR VARIANCE
TO THE REGULATIONS GOVERNING SEWAGE,
SANITATION AND WASTEWATER**

DATE 10/29/18 PROJECT NAME Hill Lane Septic System Repair

OWNER

Name Dante & Joinece Frasca

Address 630 Hill Lane, Verdi, Nevada 89439

Phone (775) 813-4502

Email Address dmartin@watersvacuum.com

ENGINEER

Name Ronald J Anderson

Address 1255 Joy Lake Road, Reno, Nevada 89511

Phone (775) 846-4163

Email Address rldband@aol.com

The following items must be submitted with this application:

JOB ADDRESS 630 Hill Lane, Verdi, Nevada 89439

SIZE OF PARCEL 1.44 /Acre

COPY OF LEGAL DESCRIPTION AND VERIFICATION OF CURRENT VESTING ON TITLE

EXISTING PARCEL(S) APN(S) 3,808,405 LOT 1 BLOCK P.M.2150

REASON FOR VARIANCE REQUEST Percolation rates for native soils are substantially slower than acceptable for conventional sewer effluent infiltration systems.

SECTION(S) OF REGULATIONS TO BE VARIED 040.100, 100.020, 100.090, etc.

IF A PARCEL MAP: PROJECT NAME _____

APN(S) _____ LOT _____ BLOCK _____

IF TENTATIVE MAP: PROJECT NAME _____

NUMBER OF PROPOSED LOTS _____ LOTS REQUIRING VARIANCES _____

LOT DESCRIPTION(S) _____

Prepare and submit this original application with 9 copies and 10 copies of a construction plot plan with specifications drawn to scale (minimum 1 inch = 30 feet) and include the required following requirements:

- ✓ Vicinity map.
- ✓ The direction of North.
- ✓ A diagram of the location of roadways, easements or areas subject to vehicular traffic, material storage or large animal habitation.

... continued from previous page

- ✓ A diagram of the location and distance to any well and on-site sewage disposal system within 150 feet of the subject property (if none, so indicate).
- ✓ A diagram of the distances from the proposed on-site disposal system to any proposed or existing on-site well.
- ✓ A diagram of the location of any percolation hole or test trench(es) on the property.
- ✓ A diagram to scale of the location of all proposed on-site sewage disposal system components, including a delineated area for future replacement of disposal trench(es).
- ✓ A diagram of the distance to any available sewer system (if none, so indicate).
- ✓ The number of bedrooms in the proposed building.
- ✓ The maximum slope across the disposal area. (3%)
- ✓ A diagram of the lot dimensions and total lot area.
- ✓ The location of water supply lines. (WELL LOCATION)
- ✓ A diagram of all structures on site.
- ✓ A diagram of all existing and proposed drainage improvements.
- ✓ A diagram of the location of any watercourse and/or natural drainage channel within 150 feet of the property (if none, so indicate).
- ✓ Soil logs and percolation test results, including calculations and actual field data (if required).
- ✓ Sewage loading calculations and application rates.
- ✓ System sizing calculations.
- ✓ Pertinent geological and hydrogeological information.
- ✓ Construction drawings, cross-sections and specifications of the proposed system.
- Certification by an engineer that the proposed system is properly designed to function for at least ten (10) years (engineer's seal).
- Submit a completed Notice of Special On-Site Requirements. We will give you the form after variance is approved by the District Board of Health.

BE PREPARED TO SUBMIT:

- ✓ Other information may be required to enable the Board to adequately consider the application.

THE SUBMITTED DATA, DOCUMENTS AND DESIGNS MUST DEMONSTRATE WHETHER:

1. The proposed system will significantly and/or adversely impact any water so that the water may no longer be used for its existing or expected beneficial use.
2. The proposed system will be detrimental or pose a danger to the public health, safety or create or contribute to a public health hazard.
3. Other reasonable alternatives for compliance with these regulations are available to the applicant. State the alternatives considered, including reasons for rejection.

172400ALL INFORMATION MUST BE PROVIDED AND THIS APPLICATION MUST BE PROPERLY COMPLETED PRIOR TO SUBMITTAL. FAILURE TO DO SO MAY RESULT IN SIGNIFICANT DELAYS TO THE PROCESSING OF THIS VARIANCE REQUEST.

SUBSURFACE TRICKLE IRRIGATION SYSTEM FOR ON-SITE WASTEWATER DISPOSAL AND REUSE

Dr. B.L. Carlile P.E.
Cert. Prof. Soil Scientist†

Dr. A. Sanjines, Mech. E.
Geoflow, Inc. §

Summary of Process Description

The subsurface trickle irrigation system described in this report utilizes an aerobic treatment system in conjunction with a proven subsurface water application system developed by GEOFLOW, Inc. to offer a total system concept for safe and effective sewage disposal for site conditions considered marginal or unsuitable for conventional septic tank systems.

The integrated system described here is an improved dosing and distribution concept compared to the low pressure pipe system, approved and utilized in many states to overcome soil/site limitations. The proposed system is also an effective irrigation system allowing reuse of treated wastewater in home and lawn settings without the concerns of direct exposure of the effluent to human and animal populations.

The system proposed is an integrated package consisting of several components, each designed for a specific purpose in the treatment and disposal of wastewater by trickle irrigation. including:

1. Primary treatment - the wastewater is first passed through a primary tank to achieve physical settling of macro-solids and to assist in degradation of some pollutants including oil and grease. This will be achieved in a septic tank for home systems and a properly designed primary tank for larger flow systems
2. Secondary treatment - the primary effluent will be further treated in a secondary treatment process by extended aeration in a Clearstream Aerobic Treatment System that has been fully field and lab tested to show achievement of effluent quality of better than 20 mg/l Biological Oxygen Demand (BOD) and 20 mg/l Total Suspended Solids (TSS) at maximum design flow.
3. Disinfection - the secondary effluent will be treated by chlorination ozonation or ultra-violet radiation at adequate dosage to achieve disinfection of pathogens to drinking water quality standards.
4. Filtration - the treated effluent is passed through a 150 mesh disc filter, with manual or automatic backwash, prior to irrigation.
5. Subsurface irrigation - the relatively clean effluent is injected 6 to 10 inches below the soil surface through trickle emitters located on 24 inch centers throughout the disposal area. The effluent will be applied in several "pulses" per day at rates not to exceed the water absorption capacity of the soil. A typical system would be dosed 5 to 8 times per day at 50 gallons per dose. A

† Carlile and Associates, Inc. PO Box 2677 College Station, TX 77841

§ Geoflow, Inc. Subsurface Irrigation. 236 W. Portal Ave, #327 San Francisco, CA 94127

submersible effluent pump with water level controls in a pump tank will be used to control dosing volumes in most systems.

6. Economics - the estimated system cost will be slightly higher than a typical low pressure pipe or surface irrigation disposal system. The subsurface trickle system does offer a suitable irrigation system for lawns and landscape beds whereas the low pressure pipe system cannot be considered an efficient replacement for an irrigation system. While surface irrigation of wastewater is limited to off-hours application to remote or low use areas of a lot, the subsurface trickle irrigation system can be utilized for the entire high-use lawn area even through some fresh make-up water may be required to be added during peak water use months.

A schematic diagram of the treatment process is shown in Figure 1 and a typical field layout of the trickle irrigation system is shown in Figure 2.

Introduction

Many homes, communities, businesses, and schools in rural United States do not have access to public sewage treatment facilities and must treat and dispose of the daily sewage flow through on-site disposal systems or by wastewater treatment systems whose effluent flows to a receiving stream for discharge.

In the past, the system most often chosen because it was the simplest and cheapest to build was the conventional septic tank followed by soil trenches filled with stone which served as underground storage reservoirs and absorption surfaces for disposal of the sewage in the surrounding soil. Because of site specific factors such as poor soils, high water tables and excessive slopes, as well as the limitations of gravity distribution for large flows, the conventional septic tank-soil absorption systems often malfunctioned after a limited period of use.

Several alternatives have been developed and used for repair and replacement of the conventional septic tank system for these poor site locations. The major consideration in assessing the suitability of these alternatives for such installation were:

- 1) simple and reliable - ability to operate over a long period without continuous presence of a skilled operator
- 2) efficient - simple to install and efficient in operation with minimum operational costs
- 3) environmental impact - health, aesthetic and water quality problems should be minimized
- 4) costs - both installation and O & M costs should be within the range of current alternatives available
- 5) potential for reuse - effluents from the system should have potential for reuse for irrigation of lawns and shrubs with minimum impact on underlying groundwater

The soil absorption systems developed and most utilized currently for these fragile site installations include the low pressure pipe (LPP) system, and the surface irrigation system. Each of these systems have specific site and soil criteria where best utilized and require detailed site investigations for proper

design. It is proposed that the subsurface trickle irrigation system proposed here is an improved and suitable replacement for both of the systems.

Soil Absorption System

The major factor in design of a satisfactory on-site waste disposal system for poor soil conditions can be summarized as follows: 1) distribution, 2) dosing, 3) sewage placement, and 4) improved pre-treatment and disinfection.

Distribution cannot be over-emphasized in the design of any on-site system for "low perc" soils due to the need to spread sewage over large land areas. The effluent must be distributed evenly over this large area so as not to exceed the capacity of the soil to absorb the hydraulic load. Adequate distribution is extremely hard, if not impossible, to achieve in any currently designed gravity flow system. Some portion of the system is inherently overloaded which results in initiation of the clogging phenomena and hence the "progressive failure" observed in many such systems. Low pressure systems improve on the distribution concept but have limitations in "low perc" soils in that trenches can only be installed on 4 or 5 foot centers and the relatively high flow from drilled orifices often result in effluent surfacing.

Dosing of effluent is equally important in maintaining the aerobic status of the soil system in and around the distribution trench, thus preventing the clogging or "slimming up" of soil interfaces and subsequent failure. Dosing concepts can be described as either 1) short term dosing or 2) alternate dosing.

Short term dosing usually refers to multiply daily dosings of effluent into a single system with several hours or sometimes days of resting and re-aeration between each dose. Two to eight doses per day has been shown to be satisfactory in systems designed for pressure dosing in either subsurface or surface application.

Alternate dosing refers to dual or multiple fields where one part of field receives all of the effluent for a specified period. at which time the effluent is switched to the alternate plot. This can be done each pump cycle, once per day or switched only when one field has a problem. Both short term and alternate dosing is often utilized in trickle irrigation systems.

Both dosing concepts as well as combinations and modifications of the above have been successfully utilized in several states to treat and dispose of sewage from individual homes as well as cluster developments, school systems, and mobile home parks with flows of up to 50,000 gpd.

The design factor of sewage placement refers to the concept of placing the sewage in the soil zone or horizon most conducive to absorption, treatment, and re-aeration. In soils with high water tables this usually means at least a one or two foot separation between the seasonal water table and the point of sewage injection. For soils with restrictive clay horizons or hardpans, the sewage should be injected as high above the restrictive zone as possible. This minimum separation allows for lateral or horizontal flow of effluent away from the distribution trench or pipe before interception by the restrictive zone and allows for more uniform absorption through the restricting layer. This, coupled with enhanced treatment of the sewage in the better soils above the restrictive horizon, greatly enhances the quality of effluent impacting the restrictive

horizon. Generally, water tables and restricting layers must be deeper than 36" for conventional gravity systems to function adequately on such sites.

The final design factor is that of pre-treatment and disinfection. This factor becomes most important on sites located on fragile conditions such as high water tables and/or on soils having restrictive horizons near the surface. These conditions result in the potential for effluent impacting groundwater or surface water quality near the site location. If the soil treatment zone is not sufficient to adequately treat the injected sewage flow, some pre-treatment and disinfection must be utilized prior to soil disposal to offer needed protection of surface and ground water resources.

System Design Parameters.

A. Primary and Secondary Pre-treatment -

Both primary and secondary pre-treatment will be afforded to the sewage to achieve greater than 90 percent removal of suspended solids and organic contaminants from the wastewater prior to disinfection and disposal.

Primary treatment will be by anaerobic treatment in an initial settling tank with at least 1 day detention time. Primary treatment is both a physical and biological process that achieves about 40% degradation of soluble BOD and 50 to 60% removal of solids by physical settling.

Secondary treatment will be by the aerobic process which applies the principles of an aerobic environment to provide more rapid and complete decomposition of organic waste material, greater reduction of pathogens, and oxidation of nitrogen products as compared to an anaerobic environment. A Clearstream aerobic system that is properly sized and maintained should provide an additional 85 to 90 percent removal of BOD and TSS from the wastewater.

Aerobic decomposition and treatment can be accomplished at the least cost through small mechanically aerated treatment systems. The better small aerobic units are capable of producing an effluent exceeding that of the most sophisticated municipal treatment plants. Table 1 shows the summary of effluent quality from a two year operational study of the Clearstream Aerobic Treatment System, field tested at several homes in Florida and Texas and by extensive testing of the unit by the National Sanitation Foundation, a national independent testing agency.

The aerobic treatment unit described here treats the primary effluent by extended aeration in a mechanically aerated contact chamber. The aerated wastewater in the contact chamber is well mixed to provide optimum exposure of the microorganism to the waste material. There is also a significant reduction of pathogenic bacteria during this process. After approximately 24 hours of aerobic contact, the activated wastewater is clarified in a settling chamber and the settled solids returned to the aeration chamber. The settled and clarified effluent is discharged from the settling chamber through an improved design discharge assembly to minimize solids carryover.

Aerobic treatment of domestic wastewater can be accomplished in other ways. Sand filtration is a process sometimes used whereby the domestic wastewater is first given primary treatment in a septic tank to reduce solids

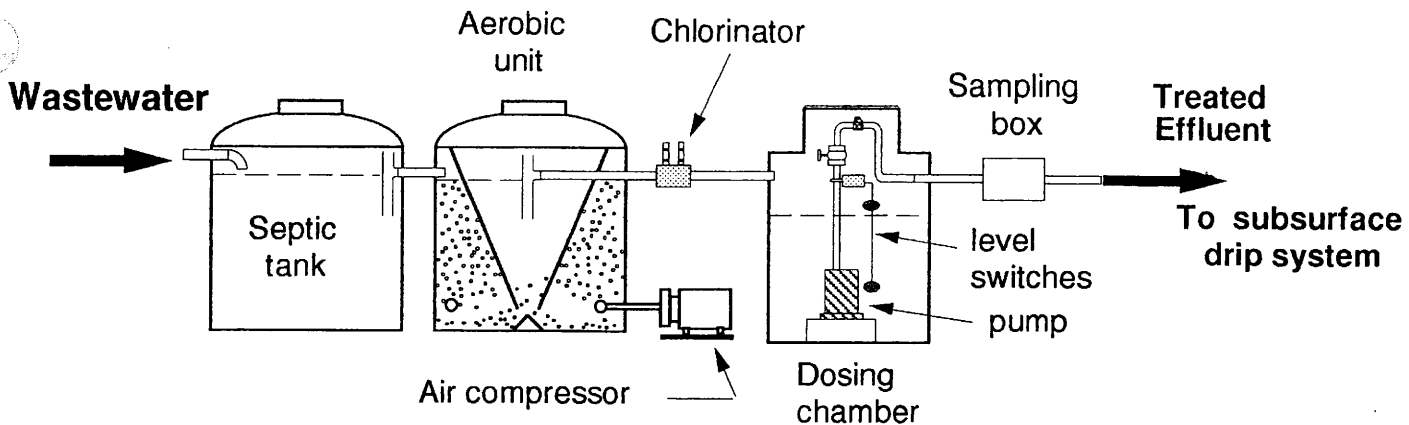
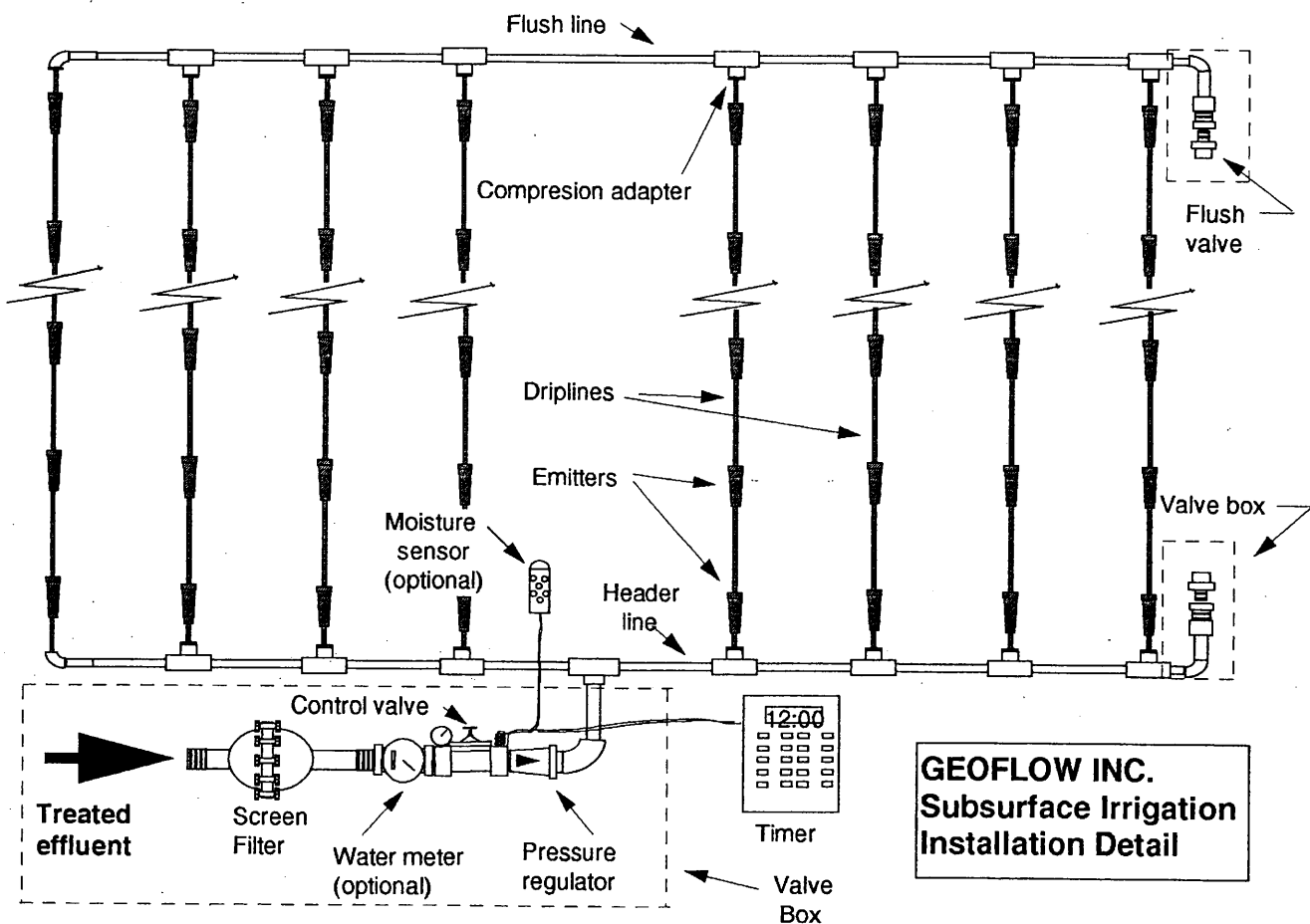


Figure 1. Pretreatment System



GEOFLOW INC.
Subsurface Irrigation
Installation Detail

Figure 2. Subsurface irrigation system

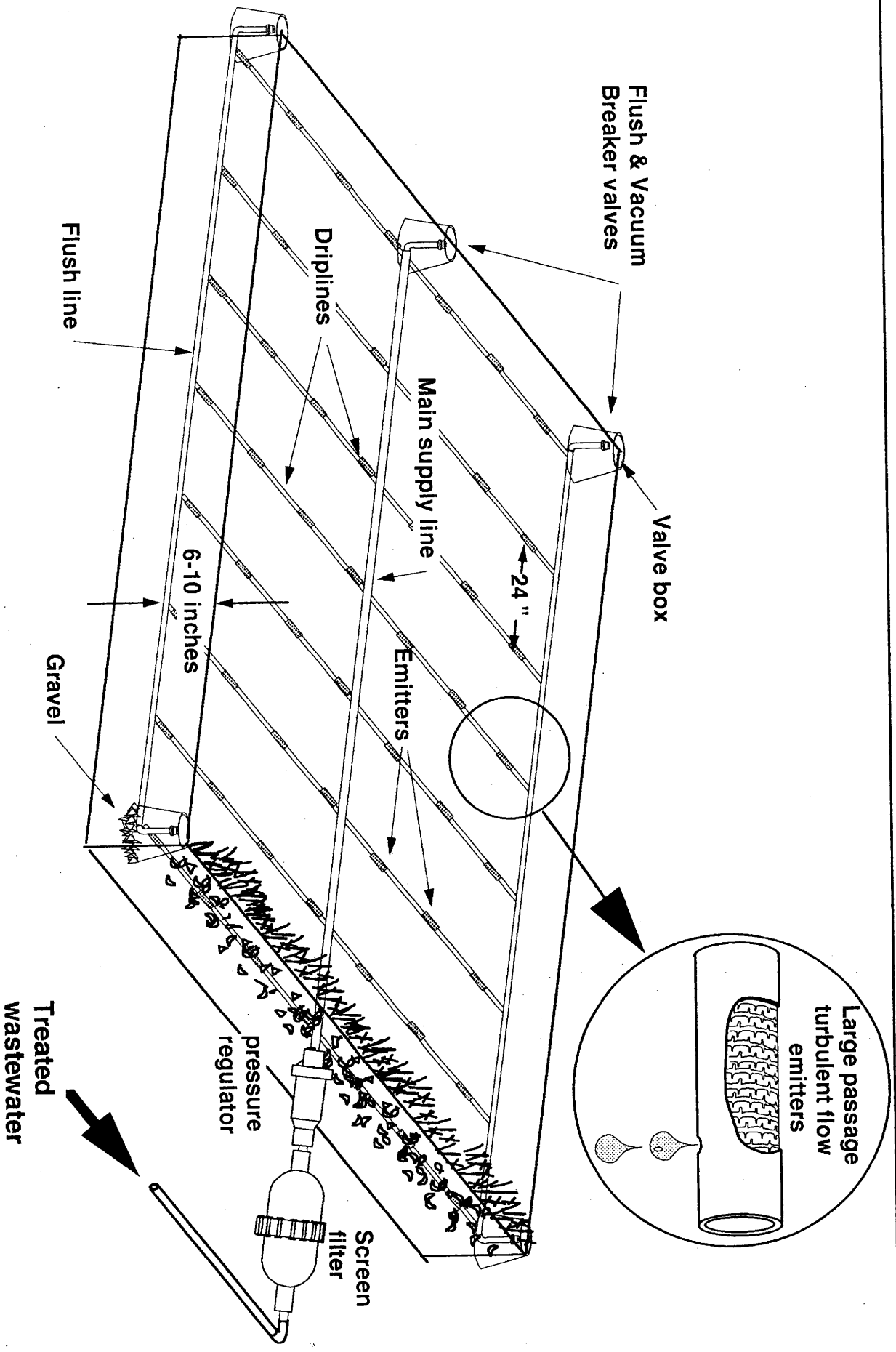


Figure 3. Subsurface drip installation diagram.

Ozone concentration in very low amounts and at very short contact time is capable of disinfecting and deodorizing the effluent. This process has only recently been utilized for home waste treatment due to the high installation and operation costs of previous ozonation systems. However, recent breakthrough in small ozonation equipment and generation by UV methods have resulted in small home units very economical to install and operate. These units provide safe, dependable and economical disinfection of home wastewater without the concerns or management problems associated with chlorine disinfection.

C. Final Treatment and Reuse by Subsurface Irrigation

Decentralizing the treatment process and producing a safe effluent at the point of generation makes reuse an attractive activity. Reusing aerobic, disinfected wastewater instead of potable water for non-potable uses like flower-bed and shrubbery sub-irrigation reduces the effective cost of the system and can lead to significant reduction in per capita demands for potable water supplies. Applying wastewater to the soil is in itself a very effective treatment process. There are many chemical, biological and physical processes that occur in the soil that substantially improve the quality of wastewater (1, 11, 12).

Trickle Emitter Design

A reliable subsurface trickle irrigation system for wastewater combines the advantages of high irrigation efficiency and water economy with that of safe underground application.

The major concern and problem with drip or trickle irrigation has always been the risk of clogging of emitters, even when using clean well-water. This has resulted in the design and use of relatively larger diameter outlets in the emitters. However, by using larger outlet emitters in subsurface drip systems, root intrusion became the main constraint. Roots seeking moisture and nutrients have been shown to enter drip irrigation lines and block them in the same manner they enter sewer pipes (2).

Because of the amount of impurities associated with wastewater and the potential for bacterial growth in the lines, the constraints of emitter blockage is quite real and must be addressed. To minimize this problem, the emitters should have relatively large diameter outlets. GEOFLOW™ has developed an emitter with "turbulent flow long path" design that has the largest flow area for a given flow rate of any emitters in use today. These emitters operate at a flow rate of 1 to 2 GPH with 0.06 to 0.07 inch orifices.

To solve the problem of root intrusion, the ROOTGUARD®¹ process was developed. This is an exclusive GEOFLOW™ process by which an environmentally safe herbicide (TREFLAN®²) is compounded into the emitters to protect them from root intrusion for many years. The quantities of herbicide used are very small since only a small area around the emitter orifice has to be

¹ ROOTGUARD® is a registered Agrifim Irrigation trade mark. The ROOTGUARD technology is used under license from the Battelle Memorial Institute.

² TREFLAN® is a trademark of Dow-Elanco

and then applied intermittently to the surface of a sand bed of 2.5 to 3 foot depth. The most efficient sand filtration method is the recirculating sand filter (RSF). The RSF offers a high degree of treatment with a minimum of maintenance or nuisance problems compared to the standard intermittent sand filter. The RSF when loaded at a raw waste hydraulic loading of 2.5-3.0 gal/ft² per day produces a high quality effluent of similar characteristics to that of the better aerobic treatment units.

Table 1. Typical field data of effluent quality from Clearstream* Home Aerobic Treatment Units.

No of Units	Location	Sam ples	BOD (mg/l)	TSS (mg/l)	pH	Fecal colif. /100ml
6	Orlando, FL	8	5.5	5.1	6.7	-
1	Rockwall, TX (Note 1)	3	3	10	7.5	21
1	Rockwall, TX (Note 2)	3	<3.0	<1	7.5	<3
1	NSF testing	120	5 - 10	5- 10	7.2	-

Note 1) Before Ozonation

Note 2) After Ozonation

The slow rate, intermittent sand filter, when designed at an hydraulic loading of 1.5 to 2 gal/ ft² per day of septic tank effluent can also produce a high quality effluent, but will require more frequent maintenance than the RSF system. Frequent raking of the sand surface and periodic replacement of the top few inches of filter sand are periodically required. Odor problems are also a frequent complaint of the intermittent sand filter unless the septic tank effluent is dosed on the filter in a subsurface gravel bed. Since the RSF system is dosed with an aerobic mixture of 4 parts filter effluent and 1 part septic effluent, odors are not a serious problem.

While sand filters can produce an effluent of equivalent quality to the better aerobic treatment units, the initial high cost of installation is the only downside of this system. Installation costs often run at two or more times that of the mechanically aerated system. Operational costs of the sand filter will be slightly less but will require several years of operations to recover the difference in costs.

B. Disinfection

The treatment by chlorination, ozonation, or UV radiation of the effluent discharged from the aerobic cell represents the final step of a "safe" pre-treatment system designed to allow maximum reuse of the wastewater in a landscape mode. The potential of ozonation for deactivating viruses and bacteria, detoxifying organic compounds and oxidizing any odorous components make it the logical choice for systems installed in lake shore settings or in extremely high groundwater conditions.

* Clearstream Wastewater Systems, P.O. Box 705, Silsbee, TX 77656

protected. Because of the very limited movement of ROOTGUARD in the soil and its virtual insolubility in water, only the roots that try to enter the emitter orifice will be inhibited. The herbicide used is environmentally safe since it does not move in the soil or dissolve in water and is not absorbed by the plants, ROOTGUARD has been registered by the Environmental Protection Agency for use in landscaping and food crop irrigation (EPA registration no. 1471-70).

The turbulent flow emitters used by GEOFLOW in the proposed wastewater systems are made out of polypropylene and polyethylene and are resistant to most acids and substances likely to be found in domestic wastewater. The pre-treatment unit with disinfection designed in conjunction with the system should keep the bacterial slimes under control in the system and the 150 mesh disc filter installed in-line of the header should remove any extraneous solids which might be of size to plug the emitter orifice.

All these components integrated into a reliable sub-irrigation system makes this a unique process for domestic waste disposal. Other systems of a similar nature are being promoted and used in some southeastern states. One such system called Mo-Dad-1 system utilizes the RAM drip emitter, a rubber diaphragm pressure compensating emitter. The rubber diaphragm reduces the outlet orifice during operation, making it highly susceptible to clogging. Even though the orifice opens when pressure is off, the chances of intermittent plugging with bacterial slimes are quite high.

A rubber diaphragm is susceptible to attack by oil, gasoline products and oxidizing agents, resulting in a likely change in the physical characteristics of the rubber over time and thus affecting the uniformity of flow in the emitters. Deposits also tend to build up at the seat of the diaphragm over time, changing the flow characteristics of the emitter.

The RAM type emitter is not protected against root intrusion and is susceptible to plugging by roots (2). Only the GEOFLOW emitter protected by ROOTGUARD® can offer positive protection against a very serious threat of root plugging.

Soil Application Design

The instantaneous water application rate of the system must not exceed the water absorption capacity of the soil. A determination of the instantaneous water absorption capacity of the soil is difficult, however, since the value varies with the water content of the soil. As the soil approaches saturation with water, the absorption rate reduces to an equilibrium rate called the "saturated hydraulic conductivity." Wastewater application rates should be less than 10 percent of this saturated equilibrium

Even though the trickle irrigation system maximizes the soil absorption rate through the low rate of application, thus keeping the soil below saturation, there will be times when the soil is at or near saturation from rainfall events. The design must account for these periods and assume the worst case condition of soil saturation. By designing for a safety factor of 10 or 12, based on the saturated hydraulic conductivity, the system will be under-loaded most of the time but should function without surface failure during extreme wet periods.

Using a safety factor of 12, a suitable design criteria would be to load the system at the estimated hydraulic conductivity but apply water for only a total of

2 hours per day out of the available 24 hours. By applying wastewater for a total of 2 hour per day, particularly if applied in "pulses" or short doses several times per day near the soil surface where the soil dries the quickest, this would keep the soil absorption rate at the highest value and minimize the potential of water surfacing on poor soil conditions.

As stated previously, this design criteria will under-load the system at all times except when the soil is at or near saturation from rainfall. If designing for an efficient irrigation system, the water supply may not be sufficient to meet the demands of a lawn or landscaped area during peak water demand months. This problem can be overcome by either of two solutions: add additional fresh-water make-up to the system during the growing season to supply the needed water for plants in question; or split the system into two or more fields with necessary valves and only use one of the fields during the peak water demand months and alternate the fields during winter months or extremely wet periods

Table 2 shows the recommended hydraulic loading rates for various soil conditions, using a safety factor of 12 with regard to the equilibrium saturated hydraulic conductivity rate of the soil. These loading rates assume a treated, disinfected effluent with BOD and TSS values of less than 20 mg/l is produced in the pre treatment system.

Table 2. Minimum surface area required to dispose of 100 gpd

Soil type	Soil absorption rates		Design Hydraulic Loading rate gal / ft ² -day	Total Area required ft ² / 100gal per day
	Est. Soil Perc. rate min/in	Hydraulic. Conductivity. in/hr		
Coarse- sand	<5	>2	2.0	52
Fine sand	5-10	1.5-2	1.6	65
Sandy loam	10-20	1.0-1.5	1.3	80
loam	20-30	0.75-1.0	0.9	115
Clay loam	30-45	0.5-0.75	0.6	175
Silt-clay loam	45-60	0.3-0.5	0.4	260
Clay non-swell	60-90	0.2-0.3	0.2	520
Clay - swell	90-120	0.1-0.2	0.1	1040
Poor clay	>120	<0.1	0.075	1380

System Installation

Pre-treatment System

For individual home systems, a 500 gallon septic tank and an aerobic treatment system of 500 gallons per day capacity is generally used for homes of 4 bedrooms or less. For larger homes, a 600 - 750 gallon per day aerobic unit should be used.

After primary and secondary treatment, disinfection is the next step to reduce pathogen levels in the effluent and minimize bacterial growth in the field lines and emitters. The usual treatment to control bacterial slime growth is chlorination on a continuous basis to achieve a residual concentration of 1-2

mg/l. If ozone or UV disinfection is used, which have no residual effect in the lines, then chlorine should be applied on an intermittent basis at a rate of 10-20 mg/l just before the system is finished dosing the last dose of the day.

Chlorine may be introduced into the system either as liquid, solid or gas forms. For home systems, the liquid or solid form is more appropriate. Since calcium hypochlorite tablets may flake when dissolving and chlorine may cause some iron and manganese precipitation, it is better to chlorinate ahead of the final filter so that any particulates are removed.

Pump Tank and Controls

Dosing and irrigation supply will be by a submersible effluent pump located in a 150-300 gallon storage tank. The operation of the pump will be by a simple float on-off level switch in the tank. The "on" level switch will activate the pump when the tank reaches a high water mark and the low level switch will turn the pump off when the tank reaches a predetermined minimum water level. For a typical system this volume would be 50-100 gallons. For a 250 to 500 GPD system, this results in 3 to 10 irrigation pulses per day. For systems on sloping ground where water drains from the pipes to the lower points of the system after each pulse or dose, larger doses and fewer pulses per day would be more suitable. Irrigation uniformity is best maintained with irrigation pulses of 10 minutes or more.

Filter Requirements

The recommended disc filter uses a 150 mesh screen that filters out particles larger than about 100 microns. The type of emitter used in GEOFLOW trickle systems will not have problems with this particular size since the diameter of the flow path is 14 to 17 times larger, or 0.056 inches (1400 microns) for the 1 GPH emitter to 0.08 inches (2,000 microns) for the 2 GPH emitter. To maintain the proper water quality for the drip system, the filters are easily backwashed manually or equipped with automatic back flush triggered by a timer or a pressure differential switch. The installation schematic of the in-line filter is shown in the typical system lay-out.

Flow Regulator

Under normal conditions, the pressure in the trickle lines should be maintained between 20 and 25 psi during operations. This is controlled by a pressure regulator located in-line following the filter. The emitter lines are connected at each end by a PVC header line and flush line to allow optimum pressure equilibrium in the system. Flush /vacuum release valves are located at each end of these lines to allow a small amount of water to be automatically flushed from the system every time it is started and avoid dirt suck back when the system is switched off. This is important to prevent solids from accumulating at the ends of these lines and to prevent dirt from entering the lines.

The schematic of a typical field layout of the trickle irrigation system shows only a single field. For systems over 2000 ft in size or having over 500 emitters, the system would be split into 2 or more fields of equal size. Flow for a dual field system would be alternated through the use of a mechanical valve which automatically switches fields each time the pump is activated.

For systems with more than 2 fields, the operation of each field is controlled with an irrigation controller utilizing electric solenoid valves for each field station. By separating the system into several fields, smaller pumps and more uniform distribution can be achieved. Where soil conditions vary, some fields may be programmed to receive less water than other fields of the system .

Trickle Emitter Lines

A normal home system would have emitter lines placed on 2 foot centers with a 2 foot emitter spacing such that each emitter supplies a 4 ft area (Fig. 3). These lines are best placed at depths of 6-10 inches below the surface. This is a typical design for systems on sandy and loamy soils which will have a cover crop of lawn grass. Other line spacing may be used for special use situations such as for landscape beds where shrubs and trees are to be watered and are planted on an irregular spacing. Closer line spacings of 15 to 18 inches can be used on clay soils where lateral movement of water is restricted.

The shallow depth of installation is an advantage of the trickle irrigation system since the topsoil or surface soil is generally the most permeable soil for accepting water. The topsoil also dries the fastest after a rainfall event and will maintain the highest water absorption rate. Where restrictive horizons such as hardpans or claypans are present or sites with seasonal high water tables near the surface, shallow placement allows the dispersement of water above these zones. Where fill material is used to increase the soil depth on such problem sites, the trickle emitter lines can be laid on the original soil surface and the fill material carefully placed over the lines.

Table 3. Water application table for a 1 Gallon/hour emitter

Water application (inches of water per hour)

Emitter spacing (in)	Drip line spacing (inches)						
	12	15	18	24	36	48	60
12	1.60	1.28	1.07	0.80	0.53	0.40	0.32
15	1.28	1.03	0.86	0.64	0.43	0.32	0.26
18	1.07	0.86	0.71	0.53	0.36	0.27	0.21
24	0.80	0.64	0.53	0.40	0.27	0.20	0.16
36	0.53	0.43	0.36	0.27	0.18	0.13	0.11
48	0.40	0.32	0.27	0.20	0.13	0.10	0.08
60	0.32	0.26	0.21	0.16	0.11	0.08	0.06

All trickle irrigation systems are dependent on a good vegetative cover to prevent erosion from the field and utilize the water applied to the rooting zone. Sites should be quickly sodded or seeded and mulched with appropriate lawn grasses immediately after installation. Most lawn grasses will use 0.25 to 0.35 inches of water per day during the peak growing season. This calculates to be about 0.16 to 0.22 gal/ft /day, a significant part of the daily effluent loading. By overseeding lawns with winter ryegrass, this use efficiency can be continued through much of the year.

For vegetation using 0.16 to 0.22 gal/ft² /day by evapo-transpiration, the typical home sewage flow of 250 gallons per day would supply the water needs of a landscaped area of 1150 to 1600 sq. ft. without having to add fresh make-up water. For systems larger than this, the plants will suffer water stress during the hot dry months unless additional fresh water is applied.

To determine the rate of water application from various trickle irrigation designs, Table 3 gives the rate for a 1 gph emitter at various line and emitter spacings. These values assume the water is equally distributed between the emitters.

Calculation Example

As a sample calculation, a 450 GPD home system has to be designed. The system is to be located on a silty clay loam soil with an estimated saturated hydraulic conductivity of 0.4 in/hr. Turf grass will be grown on the site with a peak evapotranspiration of 0.25 inches per day. The site is a level site.

- a) Field area required (Table 2)
 $260 \text{ ft} / 100 \text{ gpd} \times 4.5 = 1170 \text{ ft}^2$
 - b) Emitter line spacing = 24"
 Emitter line required = $1170 \text{ ft}^2 / 2\text{ft} = 585 \text{ ft}$
 - c) Emitter spacing = 24"
 - d) Total number emitters = $585\text{ft}/2\text{ft}=293$ emitters
 - e) Emitter flow rate = 1.13 GPH
 - f) Total flow = $293 \times 1.13 \text{ GPH} = 331 \text{ GPH}$
 - g) Daily irrigation time = $0.25 \text{ in/day} / (0.40 \times 1.13) = 0.55 \text{ hours/day}$ (Table 3)
 - h) Pumping rate required = 331 GPH/ No. of sectors= $331 \text{ GPH} / 1$ or 5.5 GPM
 - i) System operating pressure = 20 psi = 46 ft
 - j) Pumping Head
 Pressure H = 46
 Friction H = 5
 Elev. H = 4' (pump depth below grade)
 Total = 55'
 - k) Pump Selection - Meyers E3, submersible
 Effluent pump - 5.8 GPM @ 55' head
 - l) The water depth applied at 450 GPD over 1170 ft² (there are 231 cu. inches per gallon)
 $450 / 1170 = 0.38 \text{ gal} / \text{ft}^2$. Or $\times (231 \text{ cu. in} / \text{gal}) / (144 \text{ in}^2 / \text{ft}^2) = 0.61 \text{ in/day}$
 - m) Water depth applied if only typical household waste flow of 300 GPD were available = 0.40 in
 - n) Irrigation area required to apply 300 GPD at a peak water use rate of 0.25 in/day
 $= 1170 \text{ ft}^2 \times 0.40 / 0.25 = 1875 \text{ ft}^2$
- To get most efficient use of the average daily wastewater supply, an area of 1875 ft² would be selected.
- o) If a 75 gallon dosing volume were used for an average flow of 300 gallons per day, about 4 irrigation cycles per day would be made, lasting about 14 minutes each.
 - p) If 1875 ft² are selected so that the maximum area is irrigated, then to keep the same small pump, it would be convenient to divide the plot into two sectors of 940 ft² each. Following the same calculation procedure, the flow per sector will be 4.47 GPM, and the time to dispose of 75 gallons will be 17 minutes. To dispose of 300 GPD it will take four irrigation cycles. Irrigation to the sectors will be alternated.

Design Summary

Design flow rate = 450 GPD
 Normal flow rate = 300 GPD
 Minimum irrigation area required = 1170 ft²
 Most efficient irrigation area = 1875 ft²
 Daily irrigation time 0.86 - 1.4 hr/d

Design Layout
 (see Fig. 3)



Anderson & Associates
Engineering

October 19, 2018

Dan Martin
Waters Excavation Inc.
P.O. Box 10266
Reno, Nevada 89502

**Subject: Percolation Tests for Assessor Parcel 038-084-05
630 Hill Lane, Verdi, Nevada**

Dear Mr. Martin,

As requested, I have performed percolation tests for the above referenced parcel within Crystal Peak Estates in the Verdi area. This property is shown as 1.44 acres on current Washoe County Assessor's maps. The parcel is located in the northwest quarter of Section 18, Township 19 North, Range 18 East. The site slopes west to east at grades of about 1-2 percent.

The purpose of the investigation was to:

- (1) Determine the percolation rate of the native soils at a possible disposal field repair area.
- (2) Provide general design recommendations for a septic system repair.

This property is located generally within the Truckee River Canyon on an alluvial outwash described as a Donner Lake outwash (Nevada Bureau of Mine 1987 Geology folio) with shallow "Argillioc" soils. The alluvium is generally composed of clay and clay minerals with sands and gravels containing some large granite boulders. These types of soils were encountered during our investigation.

One (1) test pit was excavated on the site north of the existing infiltration sand filter to reveal general subsurface soil conditions. See the attached site sketch. Surface water, ground water or perched ground water was encountered. Soil logs are in the appendix. Washoe County standard percolation tests were performed in two (2) test holes. Below is a summary of the test results.



SUMMARY OF PERCOLATION TESTS

<u>Test Hole</u>	<u>Depth</u>	<u>Percolation Rate</u>	<u>Soil Description</u>
#1	12"	480 minutes/inch	0"-16" gray colored clayey-sand
#2	29"	320 minutes/inch	16" - 4' transition to tan colored clayey-sand 4'-5.3' tan colored clayey sand with roots*

* ground water was at about 5.3' below ground surface.

Based on my percolation test results, and logs of native soils, I believe measured percolation rates are slower than allowed for standard Washoe County infiltration systems. An aerobic system with UV disinfection followed by a sand filter bed, **Geo-Flow emitters** or another type of engineered system may be acceptable for this area. Percolation test results were beyond the limits for a standard conventional system. One may consider a new repair system while the existing system is rested and modified as an alternating field. See the notes below.

SITE DESIGN RECOMMENDATIONS

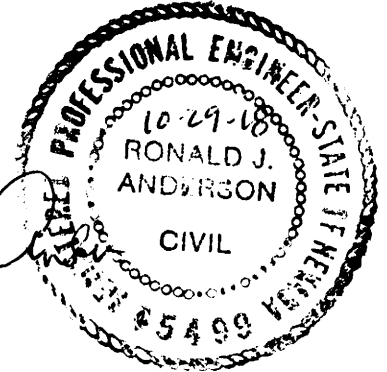
- 1) Portions of the existing system should be uncovered and evaluated for potential causes of failure. Possible causes can be crushed pipe, broken distribution box, pump station malfunction, root intrusion, etc. The existing system should be left in an operational condition as a alternating backup to the repair system.
- 2) Surface runoff **must** be directed away from the existing and proposed field by the use of swales, subsurface drains, etc.
- 3) The final design layout must be according to all applicable regulations including slope constraints, building setbacks, property line setbacks, grading and drainage constraints, etc.
- 4) Monitor pipes should be installed to help in the operation maintenance of the new and existing systems.

If you have any questions or would like a proposal for design services please call.



Anderson & Associates
Engineering

Sincerely,



Ronald J. Anderson
Civil Engineer 5499

Exp. 12-31-10

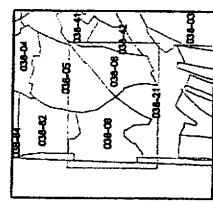
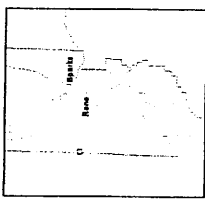
attachments: parcel map, field notes, Geo-Flow design calc', Washoe Co. Inspection

Assessor's Map Number
038-08

STATE OF NEVADA
WASHOE COUNTY
ASSESSOR'S OFFICE
Joshua G. Wilson, Assessor
9001 East Mack Street
Reno, Nevada 89512
(775) 226-2231



0 50 100 150 200
Feet
1 Inch = 200 Feet



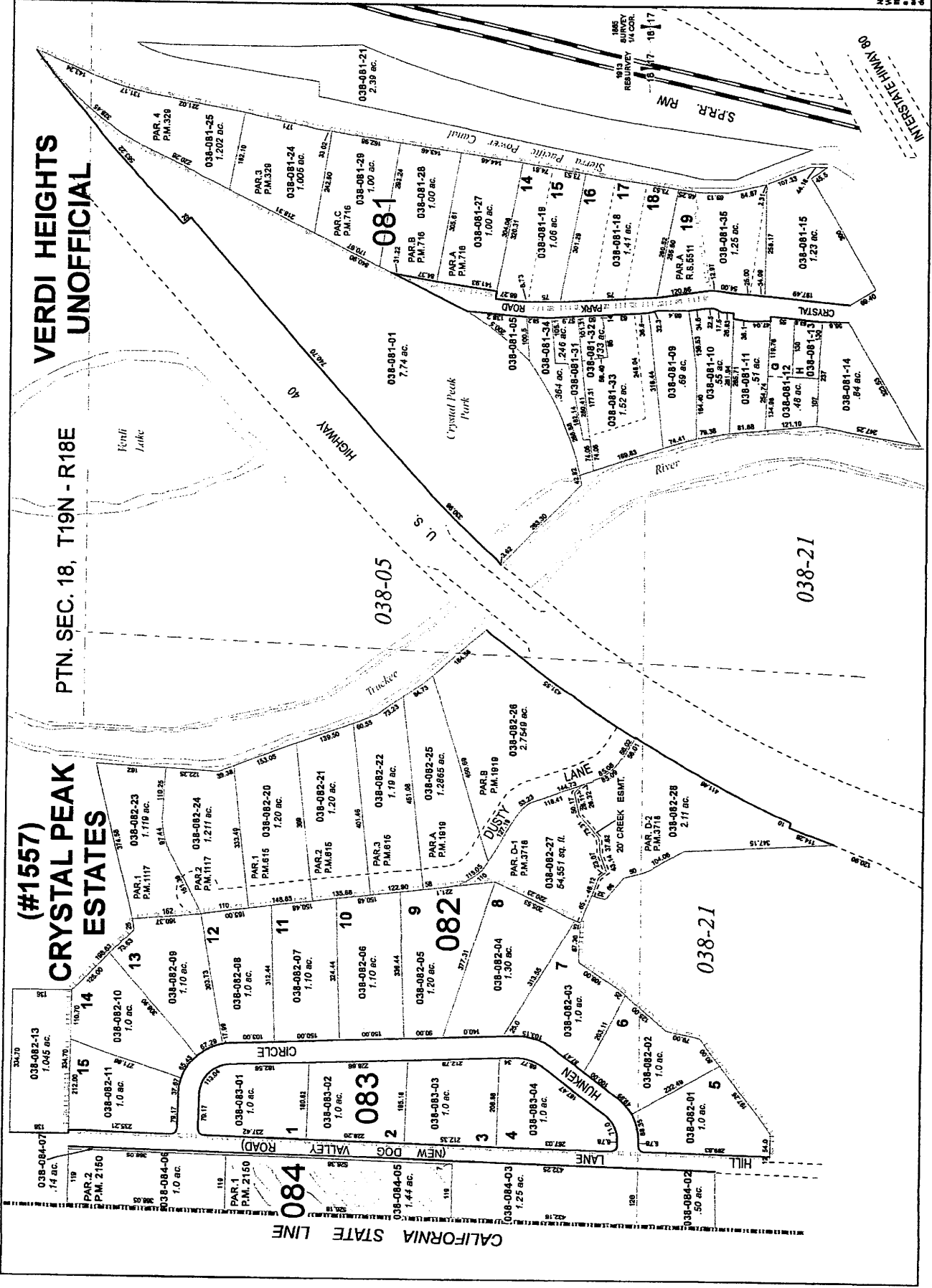
created by: **CFB 09/25/2013**
last updated:
area previously shown on maps)

NOTE: This map was prepared for the use of the Washoe County Assessor for assessment and administrative purposes only. It does not represent a survey or other professional service. The accuracy of the information is assumed to be the responsibility of the contractor of the data obtained from it.

VERDI HEIGHTS UNOFFICIAL

PTN. SEC. 18, T19N - R18E

(#1557) CRYSTAL PEAK ESTATES



CALIFORNIA STATE LINE

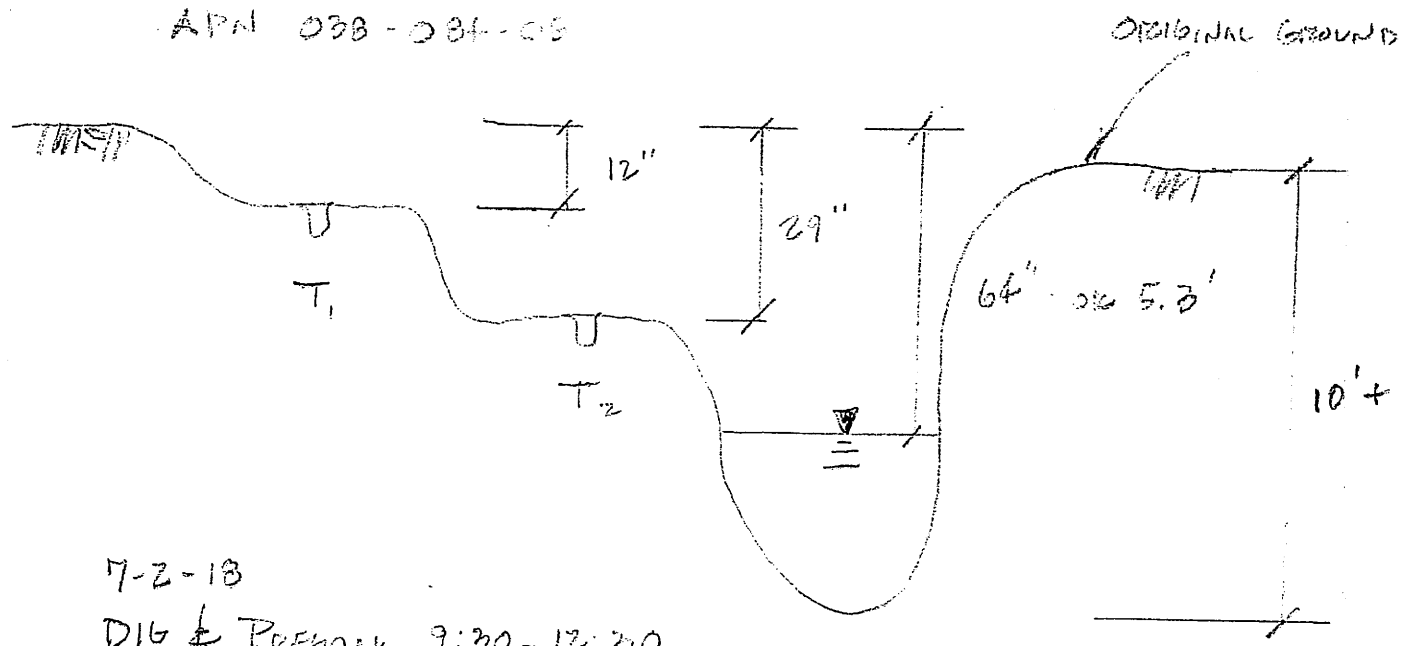
PERCOLATION TESTS

7-3-18

630 HILL LANE, TERRELL

TRSA

APN 038-084-05



7-2-18

DIG & PERFORM 9:30-12:30

TIME 7-3-18	DROP (INCHES)	
	T ₁	T ₂
11:30	-	-
12:00	1/16"	1/8"
12:30	1/16"	3/32"
1:00	1/16"	3/32"
	<hr/>	<hr/>
MEASURED PERC (MIN./INCH)	480	320

PERCOLATION TENTH

7-4-18
Z>A

630 HILL LANE, VEED

APN 038-084-05

SOIL LOG:

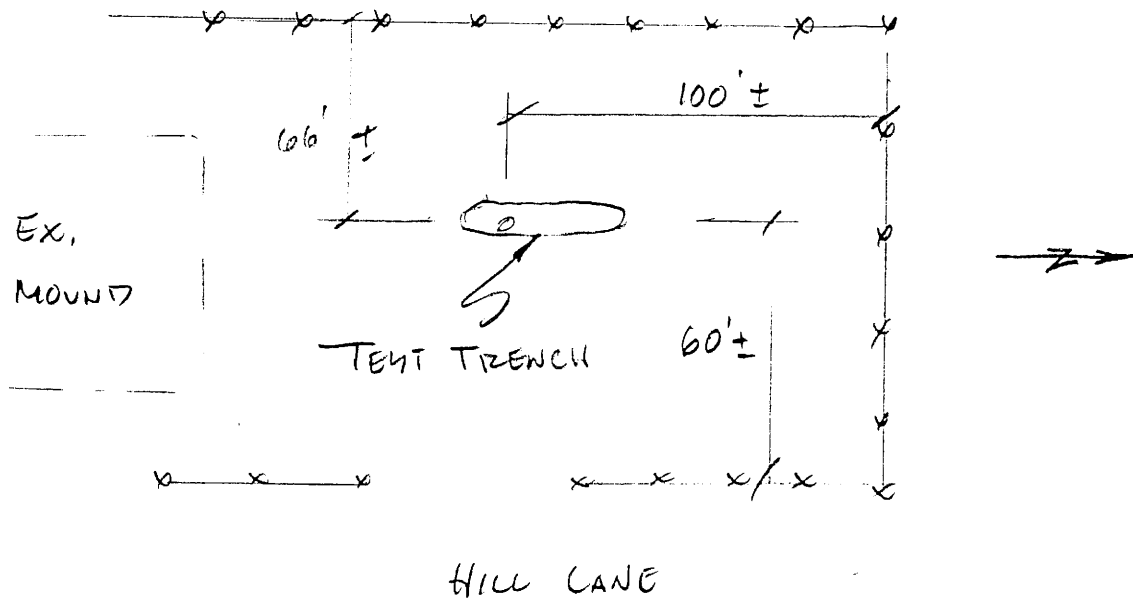
0-16" GRAY COLORED CLAYEY - SAND < 5% GRAVEL

16"-4' TRANSITION TO A TAN COLORED
SANDY - CLAY w/ SMERKS ON SIDEWALL

4-5' TAN COLORED SILTY - SAND

ROOTS TO 5' B.G.S.

SITE SKETCH:



630 HILL LANE

10-19-18

GEOFLOW DESIGN CALC / SUMMARY

RJA

a) FIELD AREA PROVIDED = $80 \times 92 = 7360 \text{ ft}^2$ OK

USE 450 gpd DESIGN FLOW

* MIN AREA REQ'D PER TABLE 2 = $4.5 \times 1380 \text{ gal/day/ft}^2$
PER GEOFLOW W/ RECOMMENDED SEASONAL FACTOR OF SAFETY = 6210 ft^2 OK

* MIN AREA PER PETZC TEST (480 min/inch @ 12" SGS)

$\frac{5}{\sqrt{480}} = 0.228 \text{ gal/day/ft}^2$

$\frac{450}{0.228} = 1972 \text{ ft}^2$ OK

b) EMITTER LINE SPACING = 24"

OF EMITTER PROVIDED $\approx \frac{4 \times 11 \times 80}{2} = 1760$ EMITTERS

c) EMITTER FLOW RATE $\approx 0.53 \text{ gph}$

TOTAL FIELD = $0.53 \times 1760 = 932.8 \text{ gph}$
OR 15.5 gpm

d) PUMPING RATE REQ'D $\geq 15.5 \text{ gpm}$

e) TOTAL HEAD REQ'D $\approx 55'$

ZOELLER 135/4185 $\rightarrow 67'$ HEAD @ 15 gpm OK

Home » Assessor » Real Property Assessment Data

Real Property Assessment Data

WASHOE COUNTY ASSESSOR PROPERTY DATA		10/29/2018
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APN: 038-084-05 Card 1 of 1

Owner Information & Legal Description
 Situs 630 HILL LN, WASHOE COUNTY 89439
 Owner 1 CASCI, BRIAN V & LINDSAY C
 Mail Address PO BOX 235
 VERDI NV 89439
 Rec Doc No 4427716 Rec Date 06/29/2018
 Prior Owner FRASCA TRUST, DANTE A & JONIECE J
 Prior Doc 2302191
 Keyline Desc PM 2150 LT 1
 Subdivision UNSPECIFIED
 Lot: 1 Block: Sub Map#
 Record of Survey Map: Parcel Map# 2150
 Section: Township: 19 Range: 18 SPC
 Tax Dist 4011 Add'l Tax info Prior APN
 Tax Cap Status 2019 Sales Letter Mailed, High Cap Applied

Building Information
 Quality R45 Good-Very Good Bldg Type Sgl Fam Res
 Stories TWO STORY Square Feet 3,044
 Year Built 1992 Square Feet does not include Basement or Garage Conversion Area.
 W.A.Y. 1992 Finished Bsmt 0
 Bedrooms 3 Unfin Bsmt 0
 Full Baths 3 Bsmt Type
 Half Baths 0 Gar Conv Sq Foot 0
 Fixtures 14 Total Gar Area 870
 Fireplaces 1 Gar Type ATTACHED
 Heat Type FA Det Garage 0
 Sec Heat Type Bsmt Gar Door 0
 Ext Walls SIDING/FR Sub Floor WOOD
 Sec Ext Walls BR VENEER/FR Frame FRAME
 Roof Cover COMP SHINGLE Construction Mod 0
 Obsr/Bldg Adj 0 Units/Bldg 1
 % Complete 100% Units/Parcel 1

Land Use 200
 Size 62,726 SqFt or ~ 1.44 Acre

Land Information
 Zoning LDS Sewer Septic NBC FCCF
 Water Well Street Paved NBC Map FC NBC Map

Valuation Information

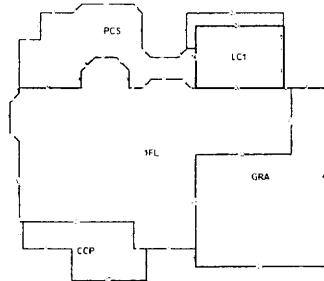
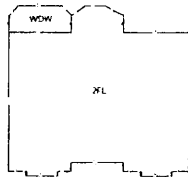
Valuation History	2017/18 FV	2018/19 FV	V-Code	DOR	Doc Date	Value/Sale Price	Grantor	Grantee
Taxable Land Value	140,000	180,000	2D	200	06-29-2018	800,000	FRASCA TRUST, DANTE A & JONIECE J	CASCI BRIAN V & LINDSAY C
Taxable Improvement Value	278,267	277,615	3B	200	02-01-1999	300,000		FRASCA TRUST, DANTE A & JONIECE J
Taxable Total	418,267	457,615	1G	100	12-01-1987	67,500		
Assessed Land Value	49,000	63,000						
Assessed Improvement Value	97,393	97,165						
Total Assessed	146,393	160,165						

Sales/Transfer Information/Recorded Document

Building #1 Sketch

Property Photo





All parcel data on this page is for use by the Washoe County Assessor for assessment purposes only. Zoning information should be verified with the appropriate planning agency. Summary data may not be a complete representation of the parcel. All Parcels are reappraised each year. This is a true and accurate copy of the records of the Washoe County Assessor's Office as of 10/28/2018.

WASHOE COUNTY
HEALTH DISTRICT
ENHANCING QUALITY OF LIFE

WASHOE COUNTY HEALTH DISTRICT
ENVIRONMENTAL HEALTH SERVICES DIVISION
1001 East Ninth Street • PO Box 11130 • Reno, NV 89520
Telephone (775) 328-2434 • Fax (775) 328-6176
www.washoecounty.us/health

SWS TEST TRENCH INSPECTION

Office Use Only

Fee Paid _____
Date Paid _____
Cash/CC/Check _____
Receipt No. _____

The section below must be filled out in order to receive inspection results:

APN: 038-084-05 Permit #: 4567 Date of Inspection: 6/29/2018 Time of Inspection: 12:00 PM
Site Address: 630 Hill Lane
Inspection Requestor: Dan Martin Phone #: 775-742-4776
Email/Mail to: dmartin@watersvacuum.com

Attach map or plot plan showing property, vicinity map and location of proposed test trench location.

Trench GPS Coordinates: 39.515041, -120.001794

Soil Log: Trench #: 1 Depth: 6' Engineered / Estimated Perc. Rate (mpi): Percolation test to be done by engineer

Log Comments: 0 - 2' Top soil, roots,

2' - 6' - Sandy clay, medium to hard compaction, roots,

6' - Ground water encountered (High Seasonal Ground Water called at 4' from existing surface).

Ground Water: Yes No Depth: 6' (HSGW at 4') Bedrock: Yes No Depth: _____

Fractured Rock: Yes No Depth/Range: _____

Standard Septic System Allowed

Soil not Suitable for Standard System

A 1-3 bedroom house requires a 1,000 gal. tank with:

- _____ leach line(s), _____ feet wide, by _____ feet deep, by _____ feet long or

A 4 bedroom house requires a 1,200 gal. tank with:

- _____ leach line(s), _____ feet wide, by _____ feet deep, by _____ feet long or

A 5-6 bedroom house requires a 1,500 gal. tank with:

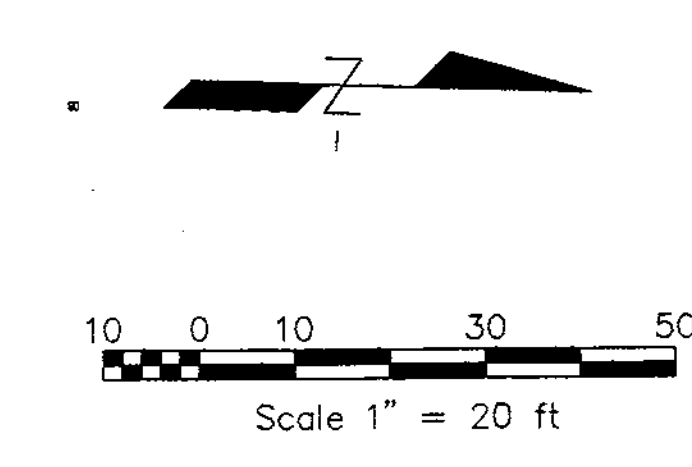
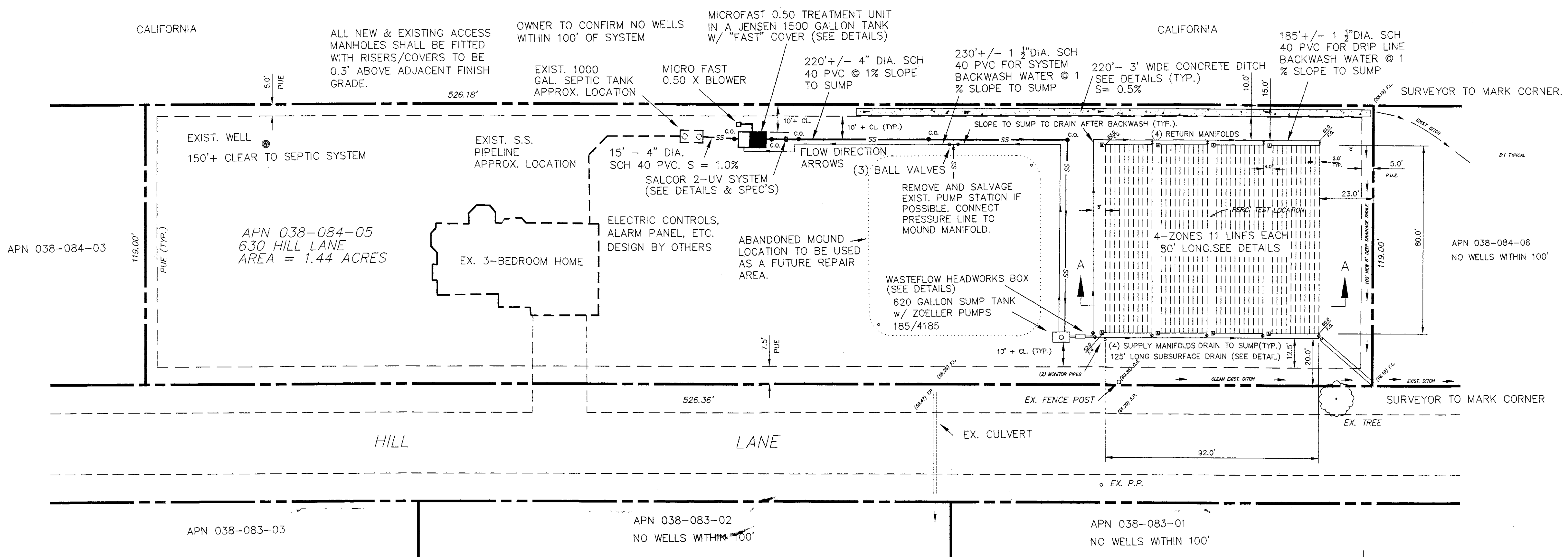
- _____ leach line(s), _____ feet wide, by _____ feet deep, by _____ feet long or

Other: _____

Perforated pipe is to be set at _____ feet below grade.

Comments: Water encounter at 6' from existing ground surface. High seasonal ground water called at 4' from existing ground surface. If any ground water is encountered during construction please stop and contact the Washoe County Health Department. The size for the septic system will be determined by the results from the percolation test to be conducted by an engineer.

Inspected by: Scott Strickler Date: 7/2/2018

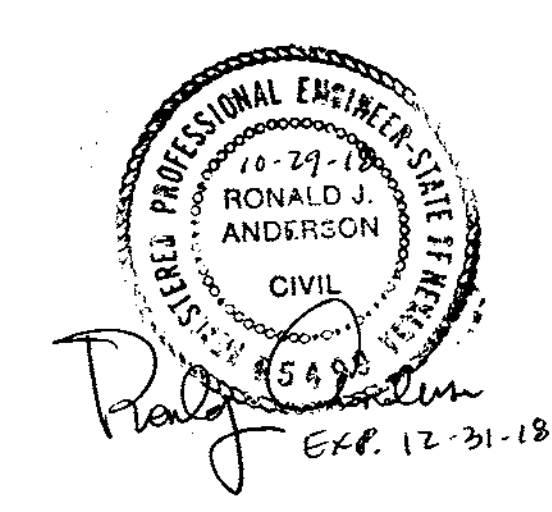
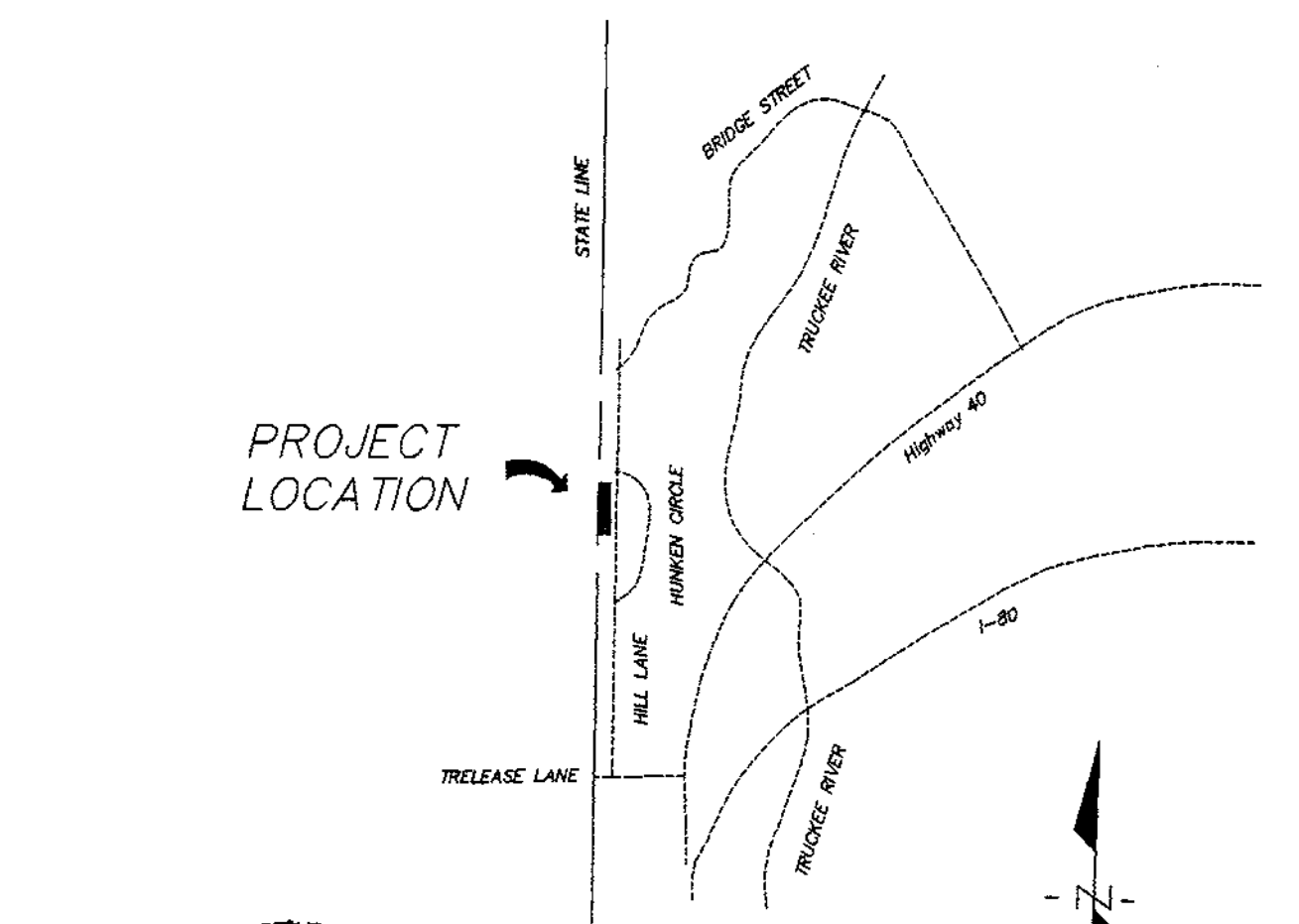
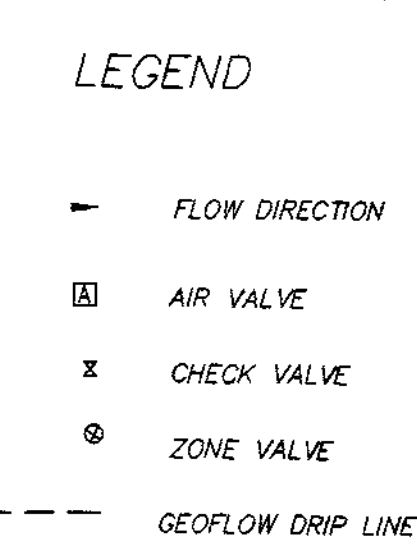


SEPTIC SYSTEM REPAIR PLAN
1" = 20'

- NOTES:**
- PUBLIC WATER AND SEWER FACILITIES ARE NOT AVAILABLE
 - NO WELLS ARE LOCATED WITHIN 100' OF THE PROPOSED SAND FILTER.
 - OWNER WILL USE COUNTY SEWER & WATER WHEN IT IS AVAILABLE
 - NO WATER FILTER BACKWASH IS ALLOWED IN THE PROPOSED FILTRATION SYSTEM.
 - THE EXISTING RESIDENCE HAS 3 BEDROOMS MAXIMUM.
 - NO 100 YEAR FEMA FLOOD PLAIN AT SEPTIC SYSTEM.
 - NO PUBLIC SEWER SYSTEMS WITHIN 400' OF PROPERTY
 - EXISTING WELLS SHOWN SHALL BE VERIFIED BY THE OWNER.

- General Notes**
- All work shall be done in conformance with these plans, specifications and design details including Washoe County District Health Department Regulations governing sewage, wastewater, and sanitation and recommendations contained in EPA Design Manual (625/1-80-012 "Purple Book") For On Site Waste Water Disposal Systems.
 - Good construction techniques are essential if the mound is to function properly. The following techniques must be followed. A contract for testing and inspection services is required.
- SITE PREPARATION**
- All truck & backhoe traffic over the disposal area is prohibited to avoid native soil compaction.
 - Reference stakes will be offset from the grading operations for proper orientation of the mound and inspection purposes.
 - Surface soils will be raked to a level surface at the grades indicated. Excavation must be witnessed and approved by a soils engineer.
 - The entire surface of the sand-soil interface shall be raked 6 inches deep parallel to the mound length. Plowing or rotary tilling shall not be done when the soil is wet to avoid compacting the native soil.

- FILL PLACEMENT**
- Fill shall be placed with care. Construction vehicles will be prohibited on fill material until a 2 foot vertical separation between the sand-fill interface is achieved.
 - All grades must be verified at interfaces between materials in the mound before the next lift is placed.
 - Special attention must be given to the bottom of the absorption bed. The bottom of the absorption bed must be verified for proper grades by the engineer before any sand is placed.
- DISTRIBUTION NETWORK PLACEMENT**
- Careful placement of the coarse aggregate is required. Ruts in the bottom of the aggregate bed are not allowed.
 - The manifold must be placed so it will drain between doses. Laterals must be laid level.
 - At least 4" of aggregate will be placed over the crown of the pipe. A suitable backfill barrier covers the aggregate (see section).
- COVERING**
- Native soils can be placed over the top of the bed.
 - The entire mound surface must be covered with sod.
 - Shrubs can be planted around the base and up the side slopes. Shrubs should be somewhat moisture tolerant since the downslope perimeter may become somewhat moist during early spring and late fall.

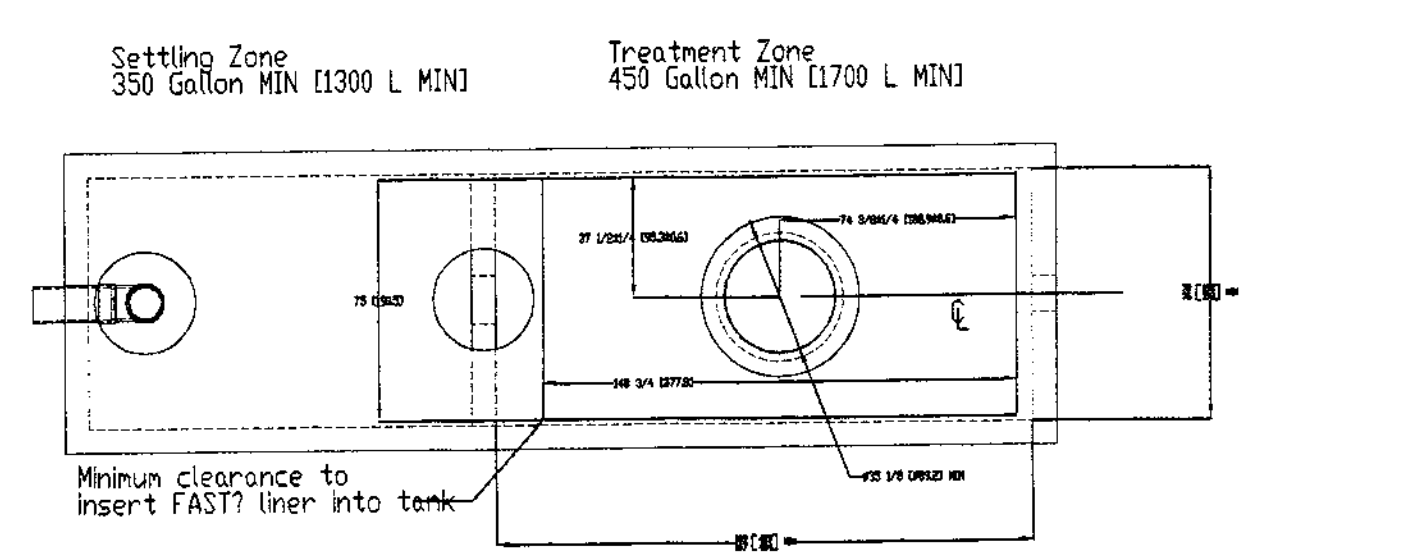
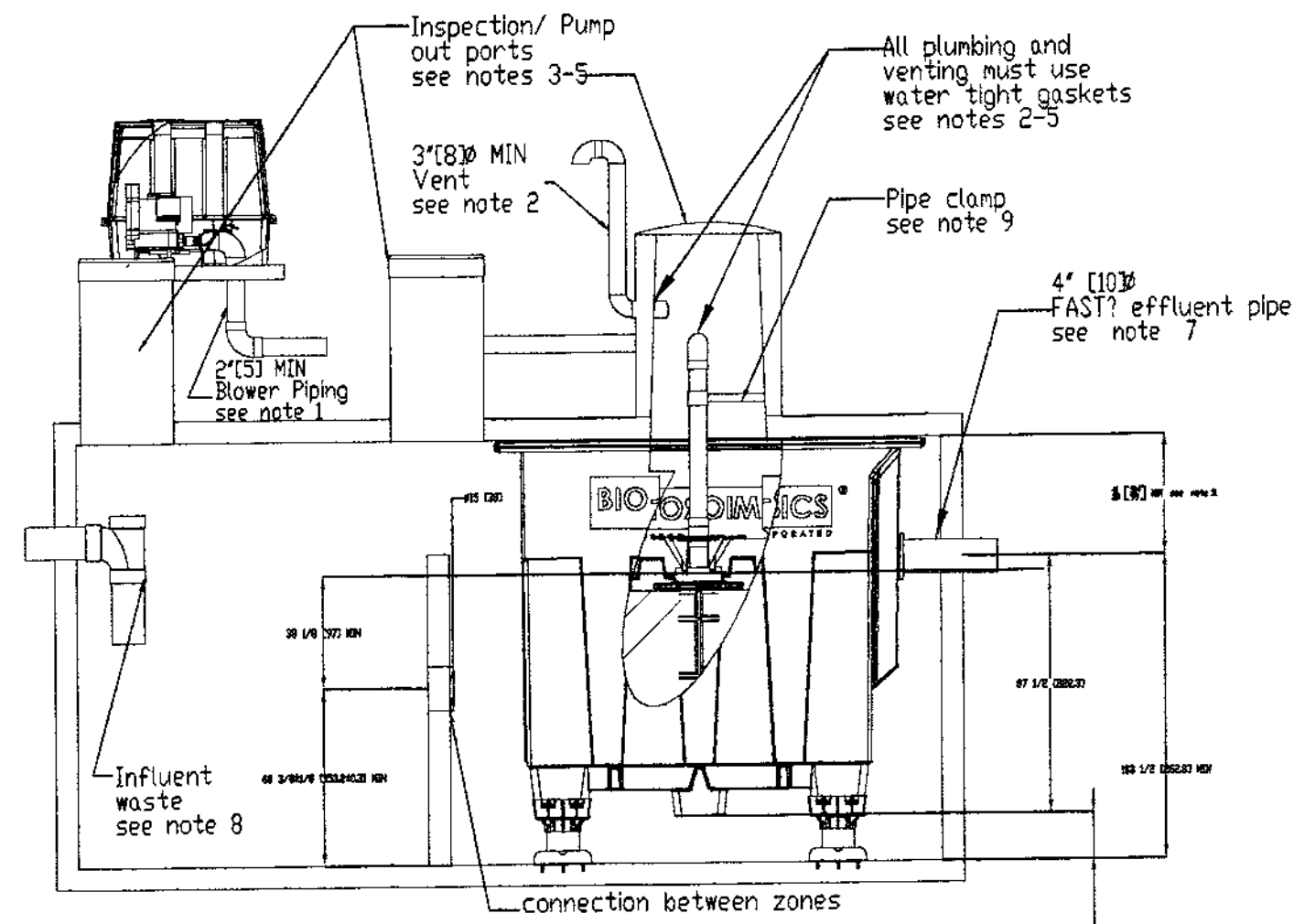


SEPTIC SYSTEM REPAIR DESIGN
for
FRASCA TRUST, DANTE & JOINCE

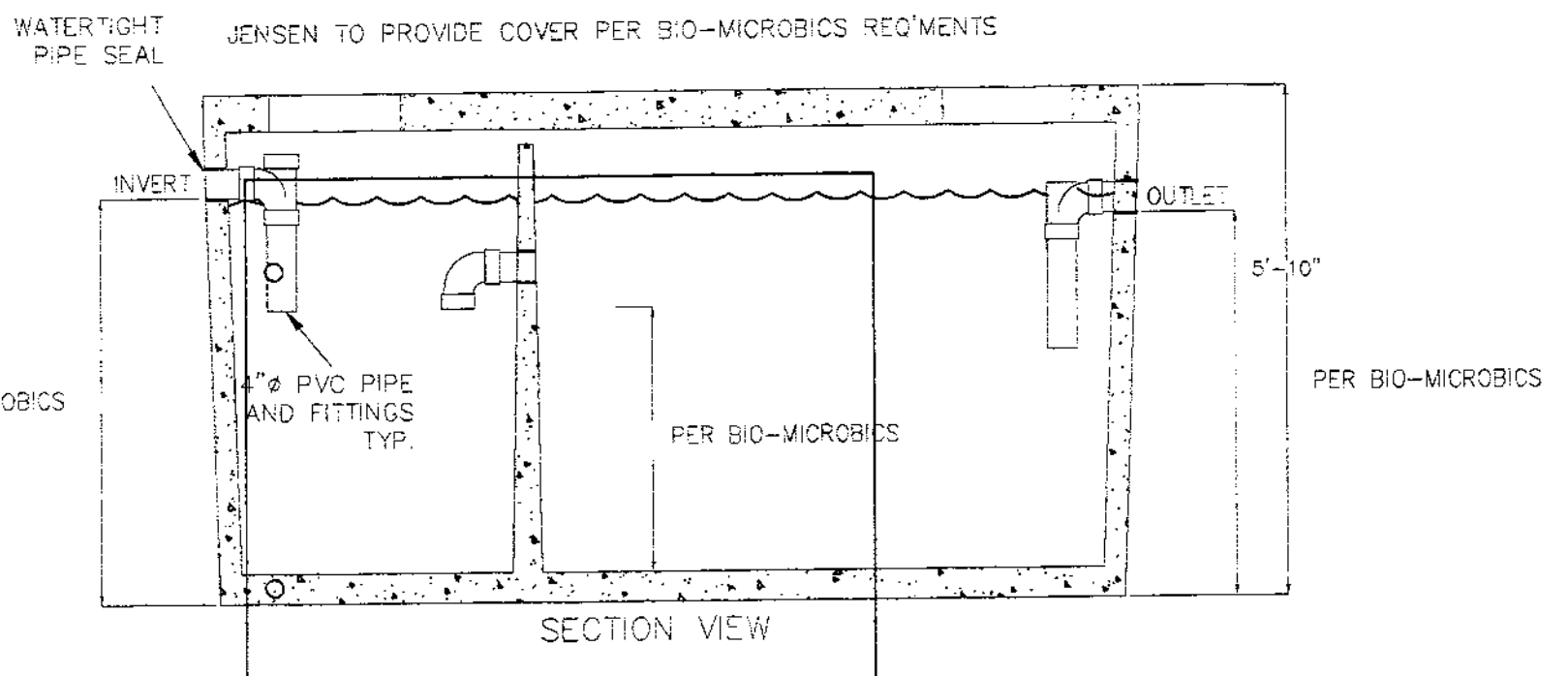
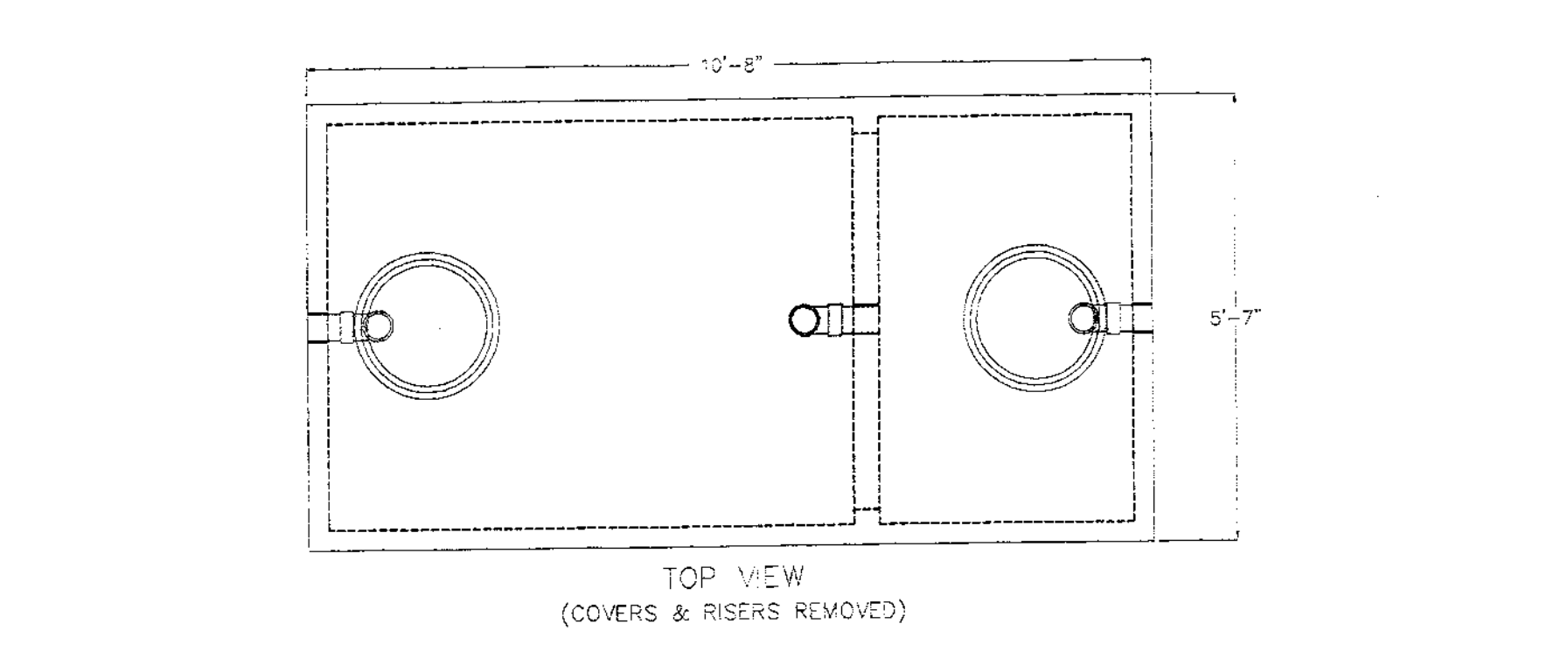
PROPERTY: 630 HILL LANE, VERDI, NEVADA, 89439, APN: 038-084-05

CONTACT: FRASCA TRUSTEE, DANTE & JOINCE, 630 HILL LANE, VERDI, NEVADA, 89439, 775-691-7866

ANDERSON & ASSOCIATES ENGINEERING
1255 JOY LAKE RD., RENO, NV 89511, (775) 846-4163



MicroFAST 0.50 L TREATMENT SYSTEM BIO-MICROBICS ? 2014



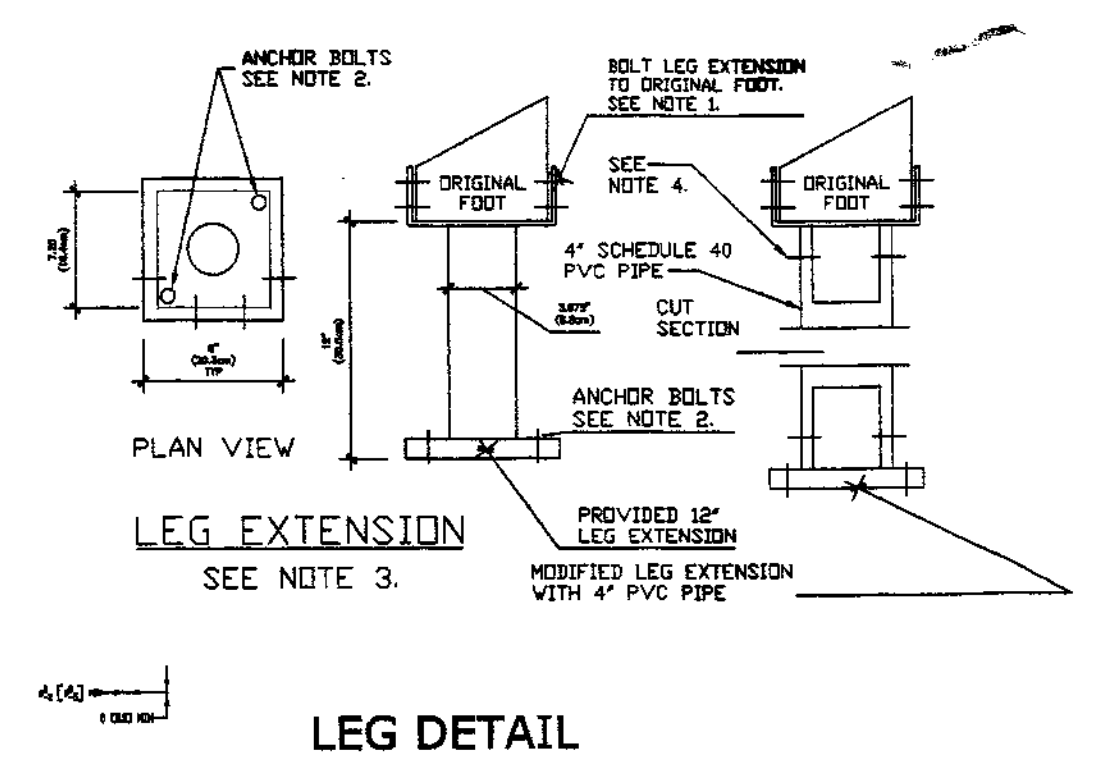
Liquid Capacity: 1500 Gallons
 Box Design Load: 4' of Soil Cover + 200 lbs./sq. ft. surcharge and 2,500 lb. wheel load with 4' of soil cover.
 conforms to ASTM C1227, OSI "STEP" Tank Specification, and NPCA Best Practice Manual.

JENSEN MONOLITHIC 1500 GALLON SEPTIC TANK
 SHOP DRAWING REVIEW AND APPROVAL REQUIRED BY BIO-MICROBICS

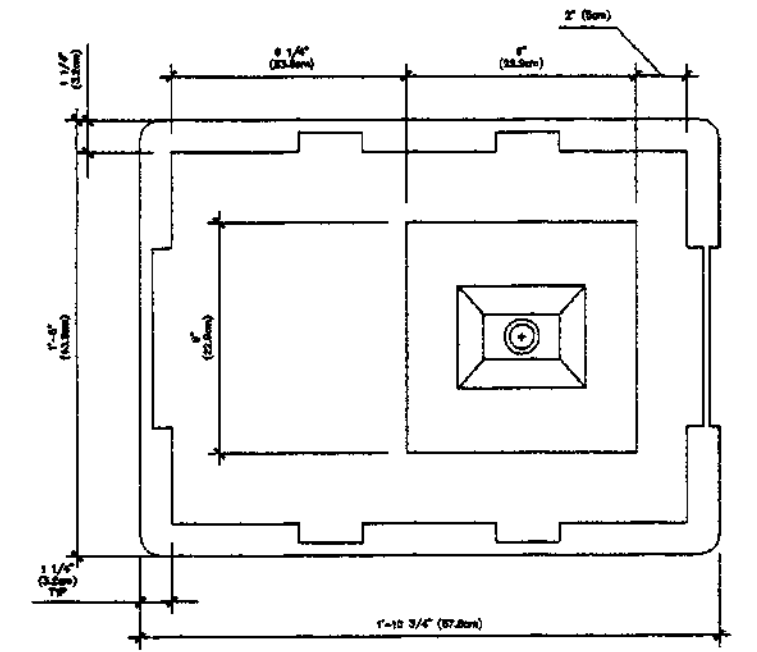
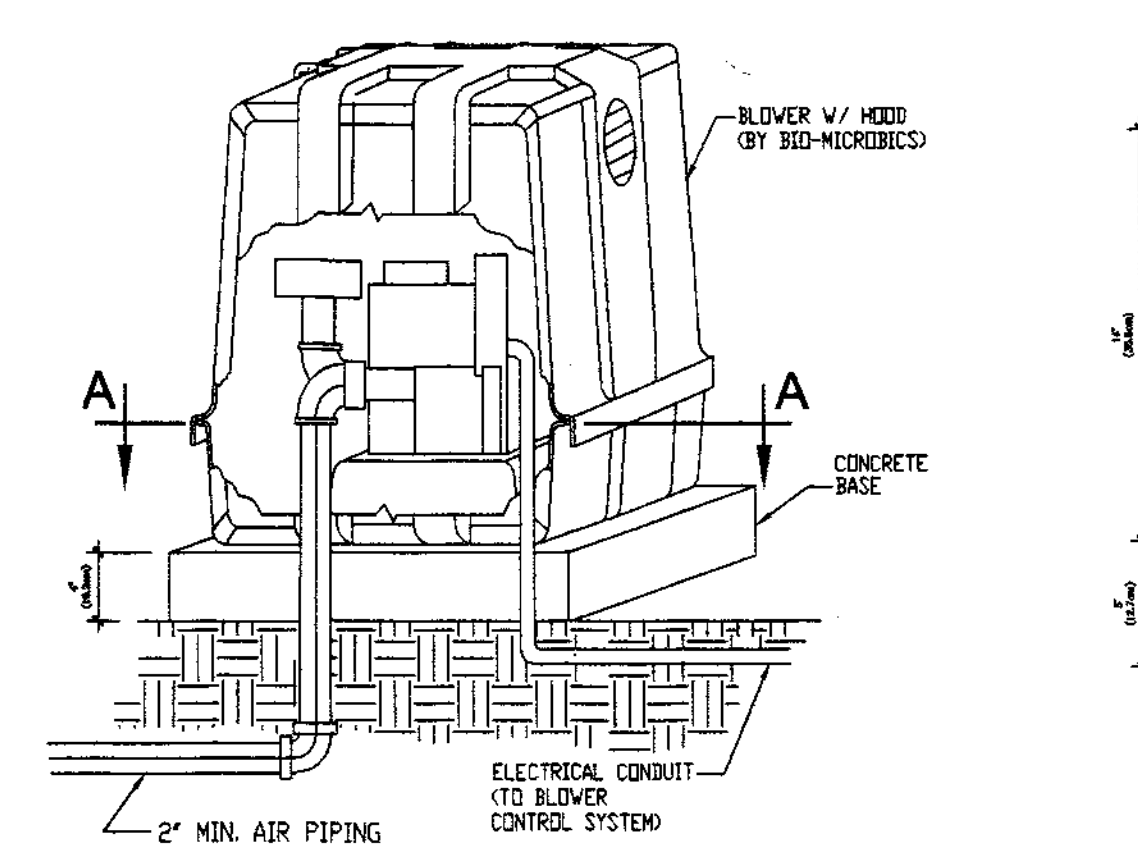
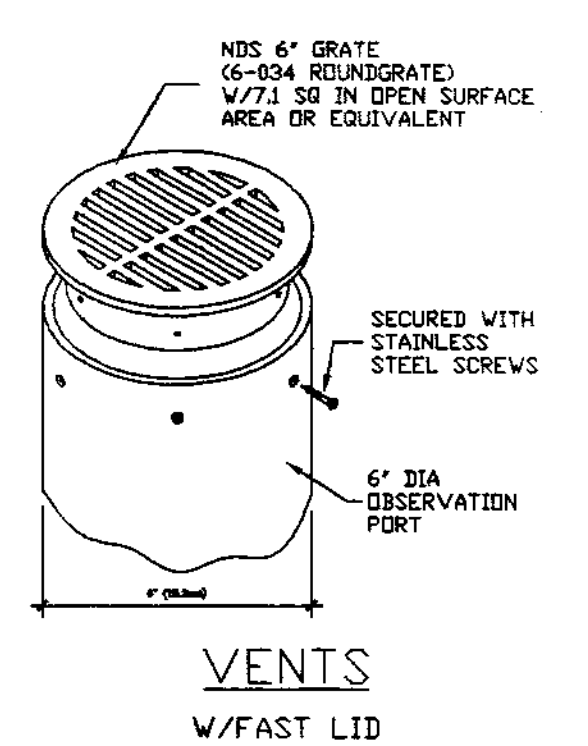
- NOTES**
- Airline piping to FAST? may not exceed 100 FT (30m) total length and have a maximum of 4 elbows in the piping system. For distances greater than 100 FT (30m) consult factory. Blower must be located above flood levels on a concrete base 26" X 20" X 2" (65 X 50 X 5cm) min.
 - Vent to desired location and cover opening with a vent grate with at least 7 sq in (45 sq. cm) open surface area. Secure with stainless steel screws. Vent piping must not allow condensate build up or create back pressure. Vent must be above finished grade or higher (see sheet 4 of 4).
 - All appurtenances to FAST? (e.g. tanks, access ports, electrical, etc.) must conform to all applicable country, state, province, and local plumbing and electrical codes. Pump out access shall be adequate to thoroughly clean out both zones.
 - All inspection, viewing and pump out ports must be secured to prevent accidental or unauthorized access.
 - Tank, piping, conduit, etc. are provided by others. Blower control system by Bio-Microbics, Inc. See Installation Manual.
 - If less than the specified minimums are considered necessary, consult factory for guidance.
 - All piping and ancillary equipment installed after FAST must not impede or restrict free flow of effluent.
 - The tank(s) shall be designed to prevent air passage between the settling zone/tank and the treatment zone and preventing an air lock. Examples include a baffle wall sealed to the lid or treatment zone inlet line with a pipe cap. Consult factory for guidance.
 - The air supply line into the FAST? unit must be secured to prevent vibration induced damage. The air supply line should be secured with a non-corrosive clamp every 2' min (60 cm). See alternate air supply option on sheet 4 of 4.
 - Specialized treatment levels may require specific features to be incorporated into the design. Consult factory for guidance.
 - Min. height may be reduced, consult factory and reference "Low Profile Module Procedure.pdf"
 - Refer to sheet 4 of 4 for leg extensions requirements.

- 1. GENERAL**
 The contractor shall furnish and install (1) MicroFAST0.50 treatment system as manufactured by Bio-Microbics, Inc. The treatment system shall be complete with all needed equipment as shown on the drawings and specified herein.
- The principal items of equipment shall include the FAST? system insert, blower assembly, blower controls and leg extensions or lid. All other items will be provided by others. The MicroFAST 0.50 unit shall be situated within a 450 Gallon (1700L) minimum compartment as shown on the drawings. Suggested maximum settling zone is (1) X the daily flow. Tank must provide adequate pump out access and conform to local, state, and all other applicable codes. The contractor shall coordinate the proper fabrication of the tank between the FAST system and tank supplier with regard to fabrication of the tank, installation of the FAST unit, and delivery to the job site.
- 2. OPERATING CONDITIONS**
 The MicroFAST 0.50 treatment system shall be capable of treating the wastewater produced by typical family activities (bath, laundry, kitchen, etc.) ranging from (1) one to (8) eight people and not to exceed 500 US Gallons per day (1800 LPD) provided the waste contains nothing that will interfere with biological treatment. The FAST system is a biological treatment system not meant for non-biodegradable or industrial wastewater.
- 3. MEDIA**
 The FAST? media shall be manufactured of rigid PVC, polyethylene, or polypropylene and it shall be supported by the polyethylene insert. The media shall be fixed in position and contain no moving or wearing parts and shall not corrode. The media shall be designed and installed to ensure that sloughed solids descend through the media to the bottom of the septic tank.
- 4. BLOWER**
 The MicroFAST 0.50 unit shall come equipped with a regenerative type blower capable of delivering 17-25 CFM (31-46 m³/hr). The blower assembly shall include an inlet filter with metal filter element. The blower shall be mounted outside the tank on a contractor supplied concrete base. Blower piping to the tank shall use non-corrosive material (PVC, Galvanized, or stainless Steel). Do not run galvanized pipe inside the treatment tank. Refer to Installation Manual for further details.
- 5. REMOTE MOUNTED BLOWER**
 The blower shall be placed on a contractor supplied concrete base. The blower must not sit in standing water and its elevation must be higher than the tank and normal flood level. A two-piece, rectangular housing shall be provided. The discharge air line from the blower to the MicroFAST? system shall be provided and installed by the contractor.
- 6. ELECTRICAL**
 The electrical source should be within 150 feet (45 meters) of the blower consult local codes for longer wiring distances. All wiring must conform to all applicable codes (IEC, NEC, etc.). Wiring distances must prevent significant voltage loss. Input power should be 110/220VAC, 1Ø, 35/17 FLA, or 50 Electrical systems 220VAC, 1Ø, 19 FLA. Other voltages and phases are also available. Actual power consumption varies with site conditions. All conduit and wiring shall be supplied by contractor.
- 7. CONTROLS**
 The control panel provides power to the blower and contains an alarm system consisting of a visual and audible alarm capable of signaling blower circuit failure and high water conditions. The control panel is equipped with SFR? (Sequencing Fixed Reactor) timed control feature. A manual alarm silence button is included.
- 8. INSTALLATION AND OPERATING INSTRUCTIONS**
 All work must be done in accordance with local codes and regulations. Installation of the FAST 0.50 shall be done in accordance with the written instructions provided by the manufacturer. Manuals shall be furnished, which will include a description of system installation, operation, and maintenance procedures.
- 9. FLOW AND DOSING**
 FAST? systems have been successfully designed, tested and certified receiving gravity, demand-based influent flow. When influent flow is controlled by pump or other means to help with highly variable flow conditions, then multiple dosing events should be used to maximize performance. The flow rate shall not exceed 5 gpm (19 Lpm) with a maximum hourly flow not to exceed 10% of the design daily flow (50 gpm (190 LPH)).
- 10. WARRANTY**
 Bio-Microbics, Inc. warrants all new residential FAST? models (MicroFAST? 0.50, 0.625, 0.75, 0.90, and 1.5) against defects in materials and workmanship for a period of two years after installation or three years from date of shipment which ever occurs first. All other FAST? system models are warranted for a period of one year after installation or eighteen months from date of shipment, whichever occurs first. All are subject to the following terms and conditions below:
- During the warranty period, if any part is defective or fails to perform as specified when operating at design conditions, and if the equipment has been installed and is being operated and maintained in accordance with the written instructions provided by Bio-Microbics, Inc., Bio-Microbics, Inc. will repair or replace at its discretion such defective parts free of charge. Defective parts must be returned by owner to Bio-Microbics, Inc.'s factory postage paid, if so requested. The cost of labor and all other expenses resulting from replacement of the defective parts and from installation of parts furnished under this warranty and regular maintenance items such as filters or bulbs shall be borne by the owner. This warranty does not cover general system misuse, operator components which have been damaged by flooding or any components that have been disassembled by unauthorized persons, improperly installed or damaged due to altered or improper wiring or overload protection. This warranty applies only to the treatment plant and does not include any of the structure, wiring, plumbing, drainage, septic tank or disposal system. Bio-Microbics, Inc. reserves the right to revise, change or modify the construction and/or design of the FAST system, or any component part or parts thereof, without incurring any obligation to make such changes or modifications in present equipment. Bio-Microbics, Inc. is not responsible for consequential or incidental damages of any nature resulting from such things as, but not limited to, defect in design, material, or workmanship, or delays in delivery, replacements or repairs.
- THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES EXPRESS OR IMPLIED. BIO-MICROBICS SPECIFICALLY DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. NO REPRESENTATIVE OR PERSON IS AUTHORIZED TO GIVE ANY OTHER WARRANTY OR TO ASSUME FOR BIO-MICROBICS, INC. ANY OTHER LIABILITY IN CONNECTION WITH THE SALE OF ITS PRODUCTS. Contact your local distributor for parts and service.

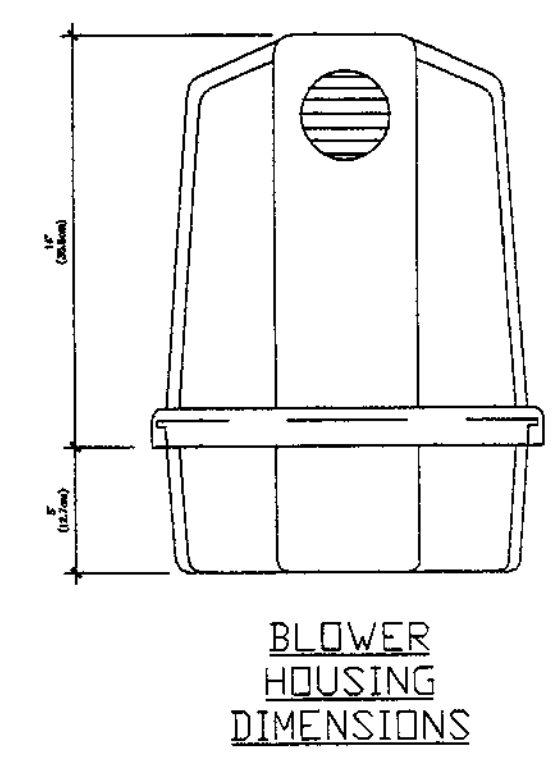
MicroFAST 0.50 WASTEWATER TREATMENT SYSTEM SPECIFICATIONS BIO-MICROBICS ? 2014



- NOTES**
- SECURE ORIGINAL 7" X 7" FOOT TO LEG EXTENSION BY PLACING TWO (2) SCREWS IN EACH SIDE OF THE LEG EXTENSION. EIGHT (8) SCREWS PER FOOT ARE INCLUDED AND SHOULD BE USED ON EACH OF THE FOUR (4) CORNER LEG EXTENSIONS.
 - ANCHOR THE LEG EXTENSIONS (4 CORNER LEGS ONLY) TO THE BASE OF THE TANK. PLACE BOLTS AT OPPOSITE CORNERS OF THE LEG EXTENSION BASE.
 - TO ELONGATE FOOT PAST THE PROVIDED 12", CUT THE 3" X 1/2" LEG EXTENSION IN THE CENTER INTO TWO SEPARATE PIECES. THEN CUT A SCH 40 PVC PIPE TO THE DESIRED LENGTH AND SLIP THE PIPE OVER THE TOP AND BOTTOM CUT SECTIONS OF THE LEG EXTENSIONS.
 - ATTACH PIPES WITH STAINLESS STEEL SCREWS.
 - VENT TO BE LOCATED ABOVE FINISH GRADE OR HIGHER TO AVOID INFILTRATION. CAP WITH 6" VENT GRATE W/AT LEAST 7.1 SQ. IN. OF OPEN SURFACE AREA. SECURE WITH STAINLESS STEEL SCREWS (SEE MCF 0.75 L DWG).



BLOWER HOUSING BASE DIMENSIONS (SECTION A-A)



BLOWER HOUSING DIMENSIONS

MicroFAST 0.50 X BLOWER ASSEMBLY

APP'D
 REVISIONS
 DATE
 DATE
 DATE

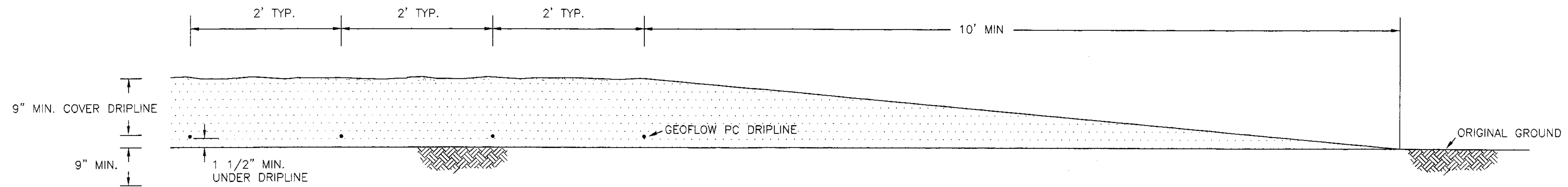
Anderson & Associates Engineering
 1255 Jay Lake Road
 Reno, NV 89511
 (775) 848-4163

NEVADA

DETAIL PLAN
ONSITE EFFLUENT TREATMENT
 630 HILL LANE

SCALE

DESIGNED:
 DRAWN:
 COMP:
 CHECKED:
 DATE:
 SHEET NO.
 D-1
 2 OF 5 SHEETS
 JOB NO.



NATIVE SOILS SHALL BE THOROUGHLY AND UNIFORMLY GRADED TO PROVIDE A UNIFORM SLOPE BETWEEN THE AREA OF THE RETURN MANIFOLD AND THE SUPPLY MANIFOLD (APPROX. 100' X 100' AREA), THEN TILLED A MINIMUM OF 6-INCHES DEPTH BEFORE PLACEMENT OF ANY IMPORTED SOIL.

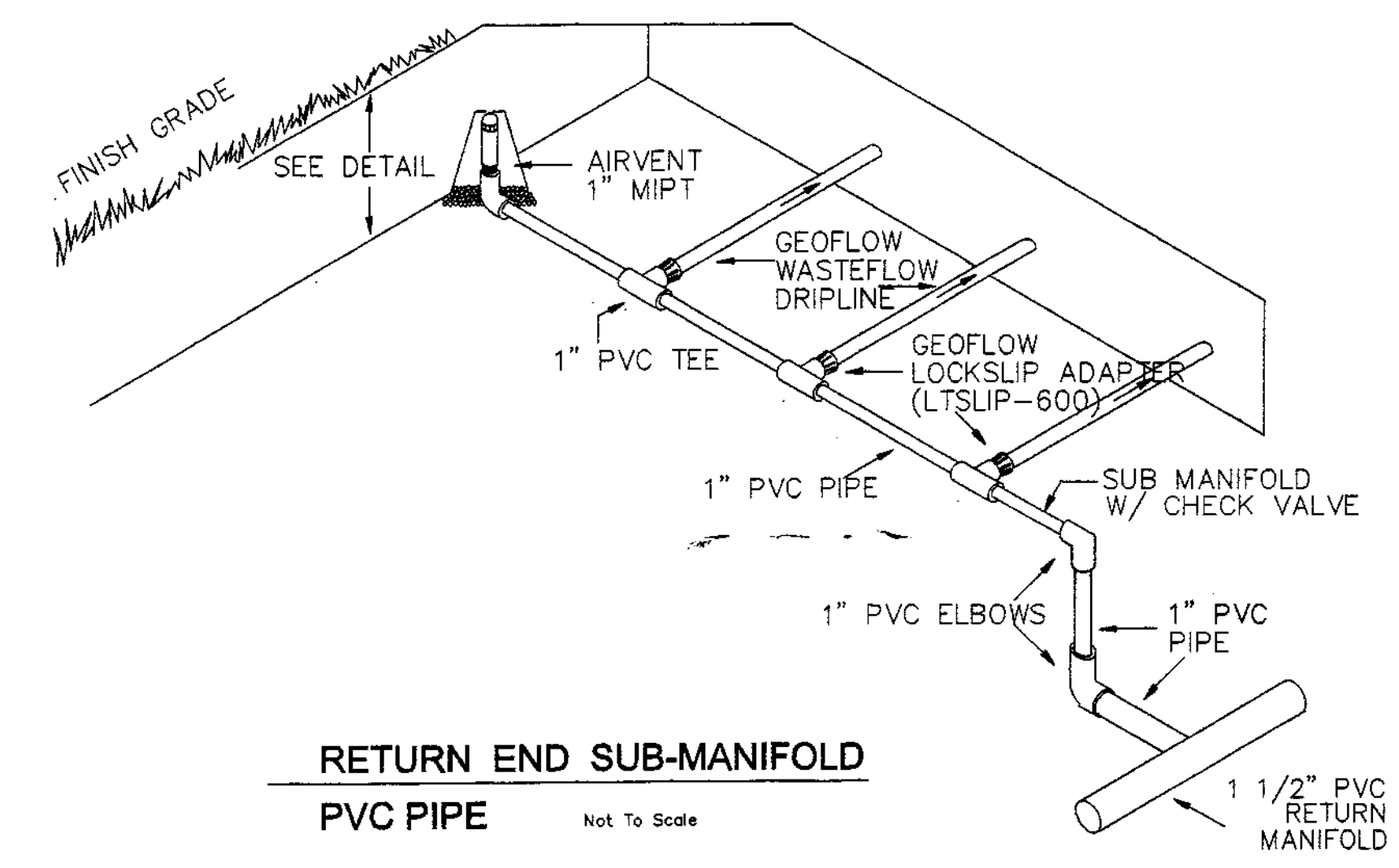
ALL IMPORT SOILS SHALL BE APPROVED BY THE DESIGN ENGINEER AND LANDSCAPE ARCHITECT. THE INITIAL 6-INCH LAYER OF IMPORT SOIL SHALL BE DECOMPOSED GRANITE (D.G.) OR PIT RUN TYPE MATERIAL APPROVED BY THE ENGINEER. THE BALANCE OF IMPORT SOIL SHALL BE APPROVED BY A LANDSCAPE ARCHITECT THAT IS

COMPATIBLE WITH THE LANDSCAPE DESIGN APPROVED BY THE OWNER. AT A MINIMUM

ALL FINISH GRADED SURFACE SOILS AND DISTURBED AREAS SHALL HAVE EROSION CONTROL PER STATE OF NEVADA NDOT SPECIFICATION SECTION 211 AND AS APPROVED BY A LANDSCAPE ARCHITECT

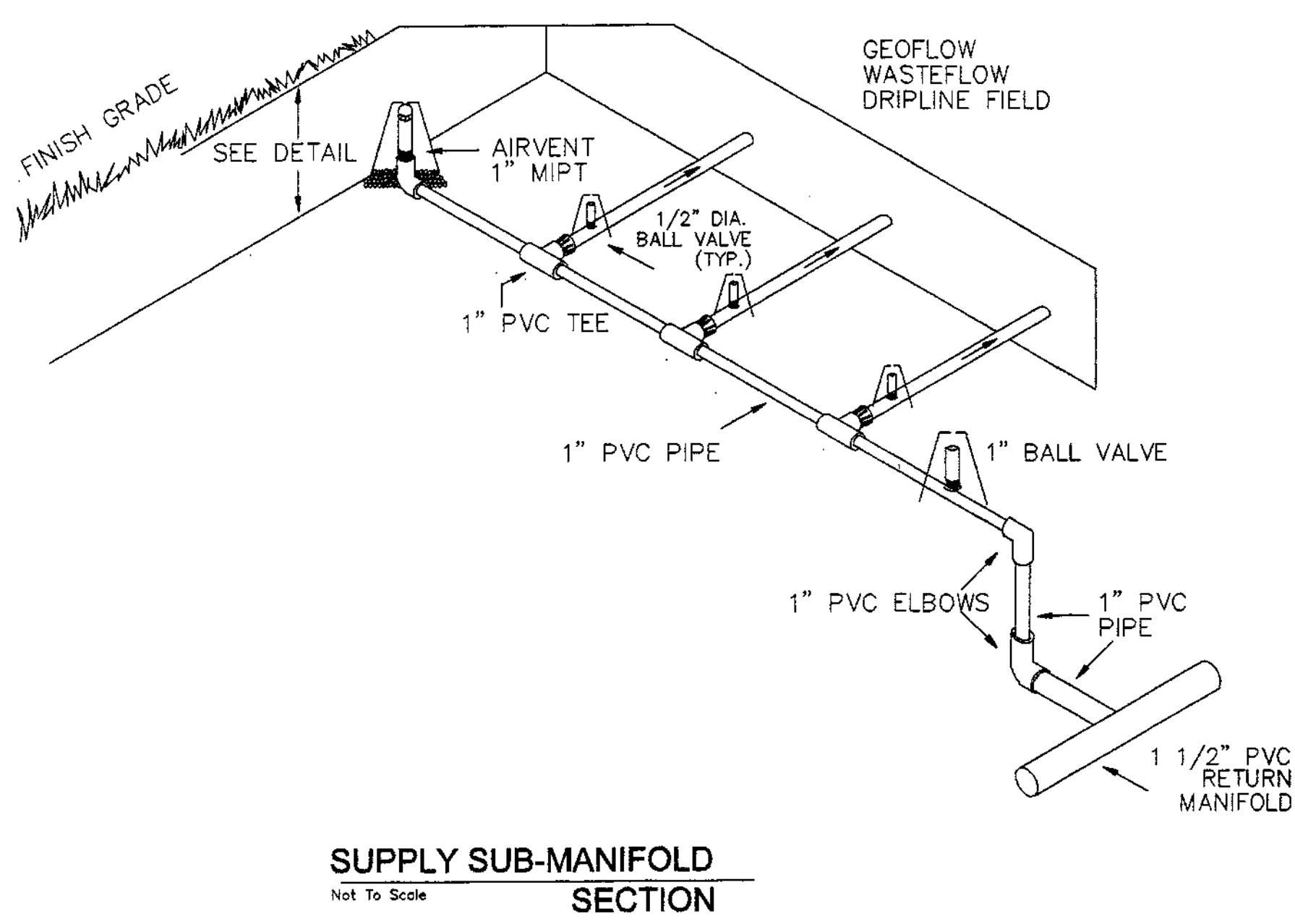
SECTION A-A

Not To Scale



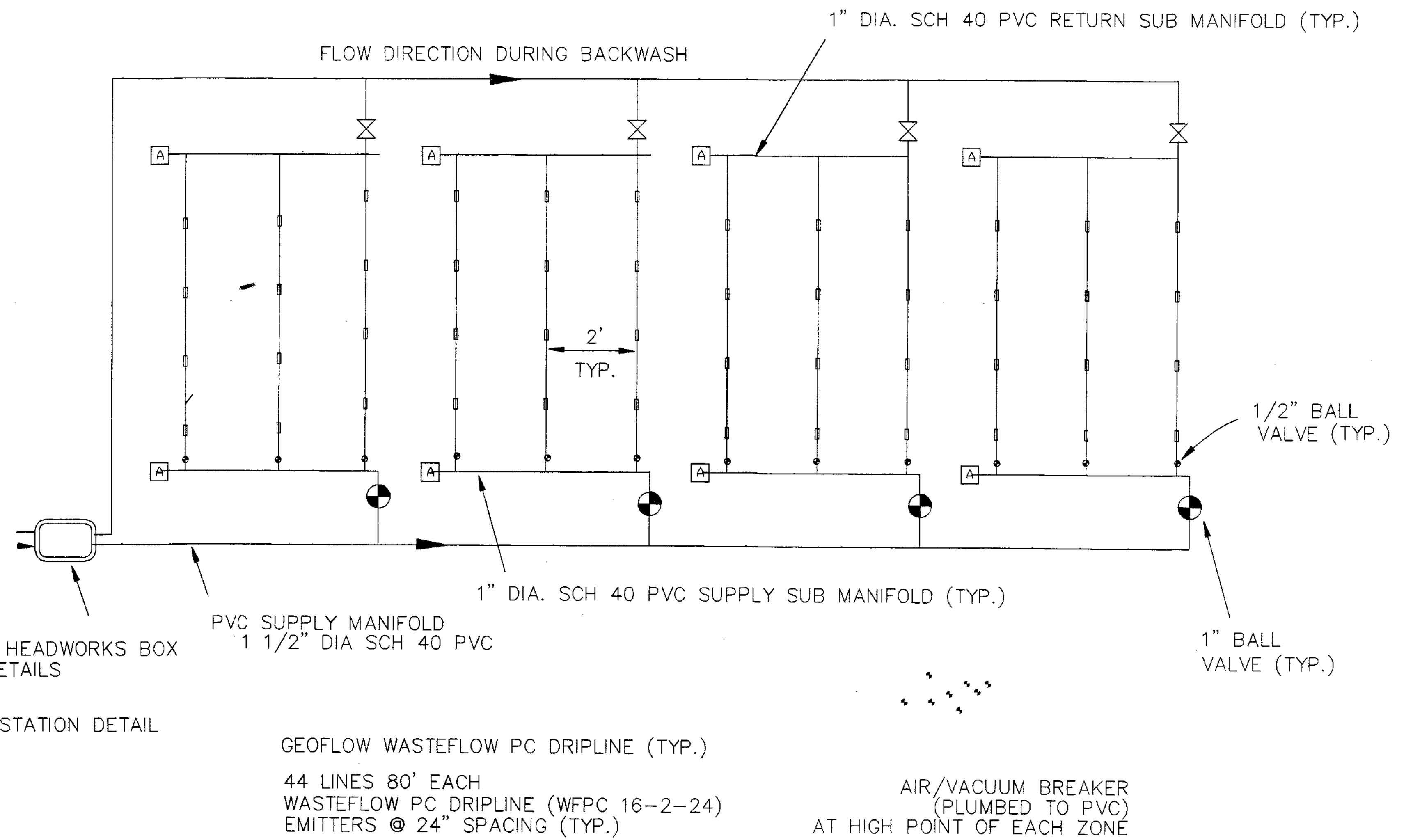
**RETURN END SUB-MANIFOLD
PVC PIPE**

Not To Scale



**SUPPLY SUB-MANIFOLD
SECTION**

Not To Scale



SCHEMATIC PIPE DIAGRAM

Not To Scale

- LEGEND**
- WASTEFLOW HEADWORKS WITH VORTEX FILTER AND FLUSH VALVES
 - AIR/VACUUM BREAKER
 - PRESSURE REGULATOR
 - FLUSH VALVE
 - BALL VALVE
 - CHECK VALVE

APP'D	REVISIONS	DATE

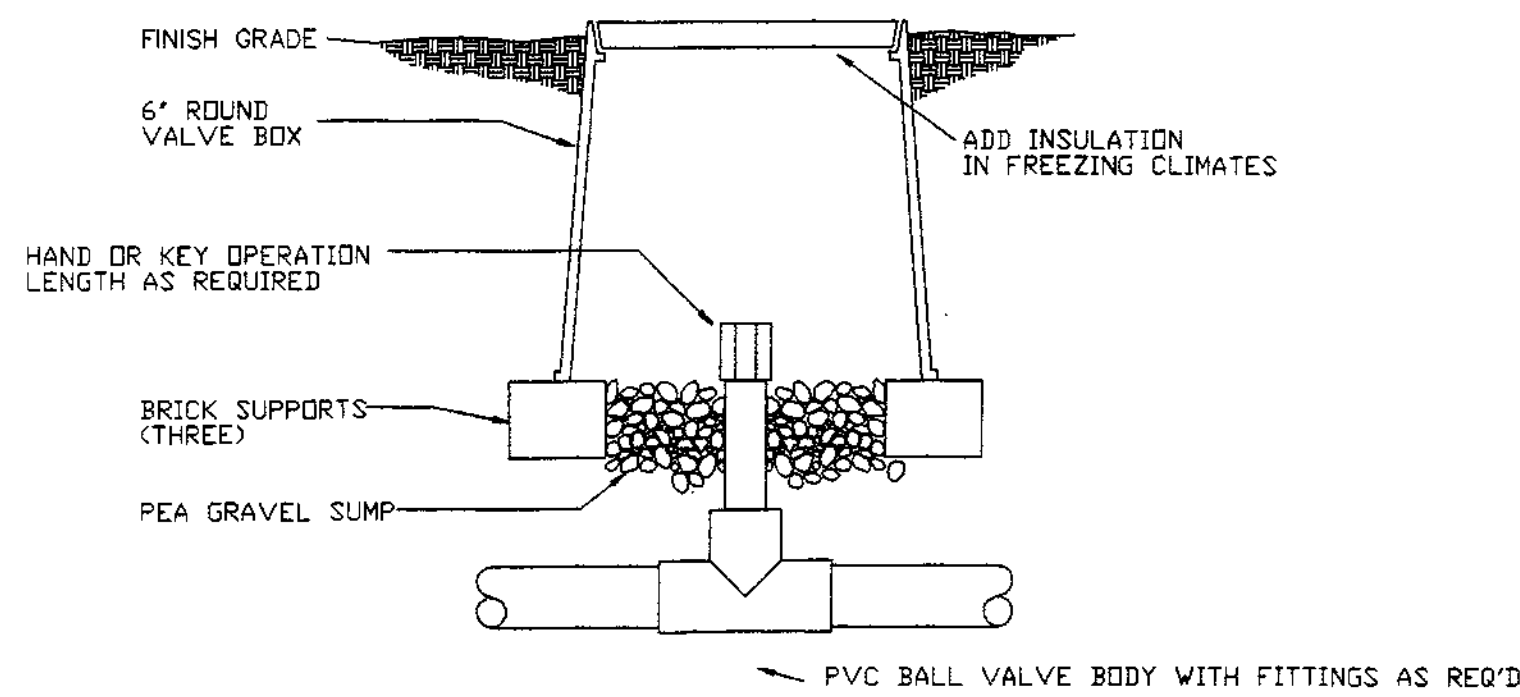
Anderson & Associates Engineering
 1855 N. Lake Blvd
 Reno, NV 89503
 (775) 846-4163

NEVADA

ONSITE EFFLUENT TREATMENT
 630 HILL LANE

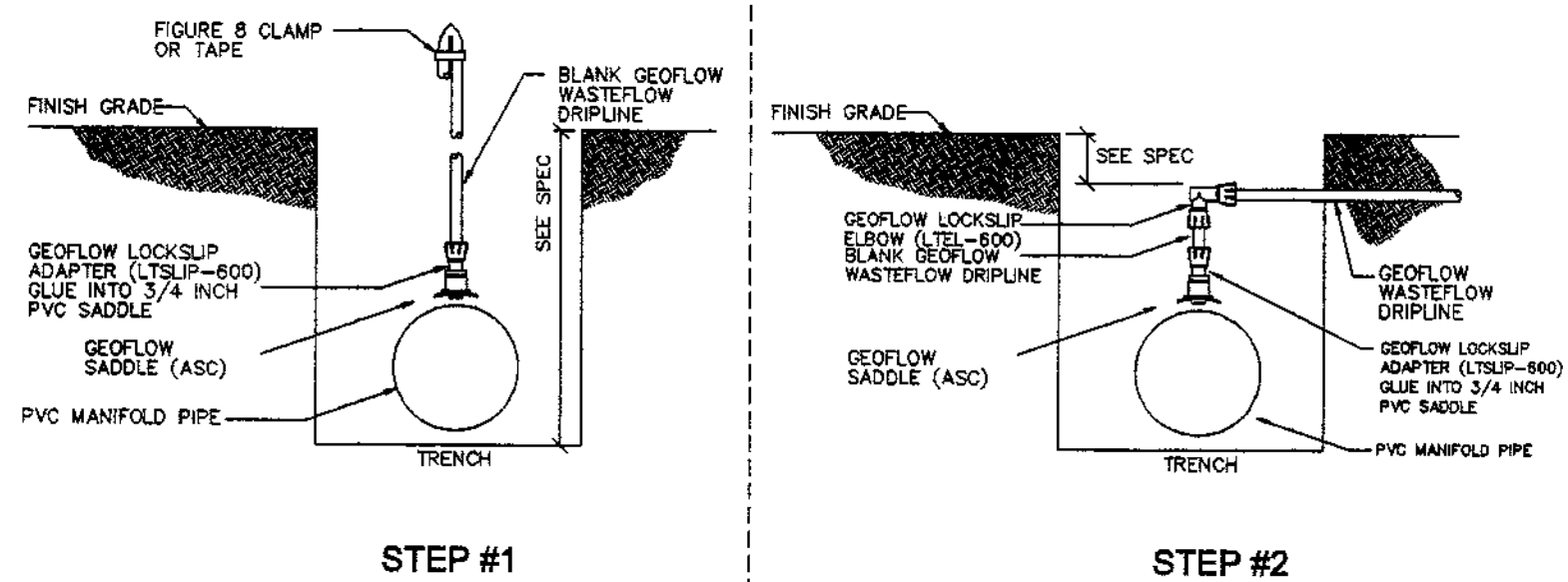
SCALE

DESIGNED:
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COMP.:
CHECKED:
DATE:
SHEET NO. D-2
3 OF 5 SHEETS
JOB NO.



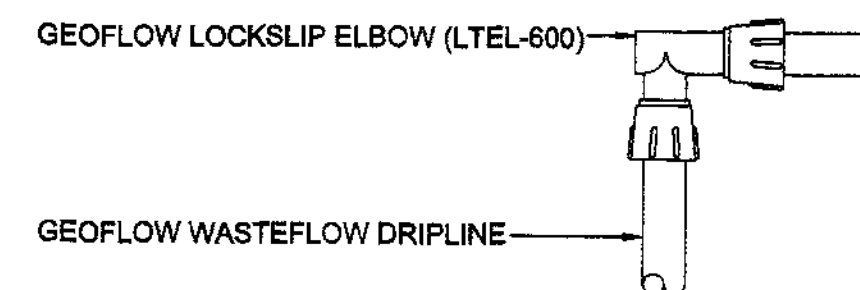
BALL VALVE ASSEMBLY
(PLUMBED TO PVC OR DIPLINE)

Not To Scale



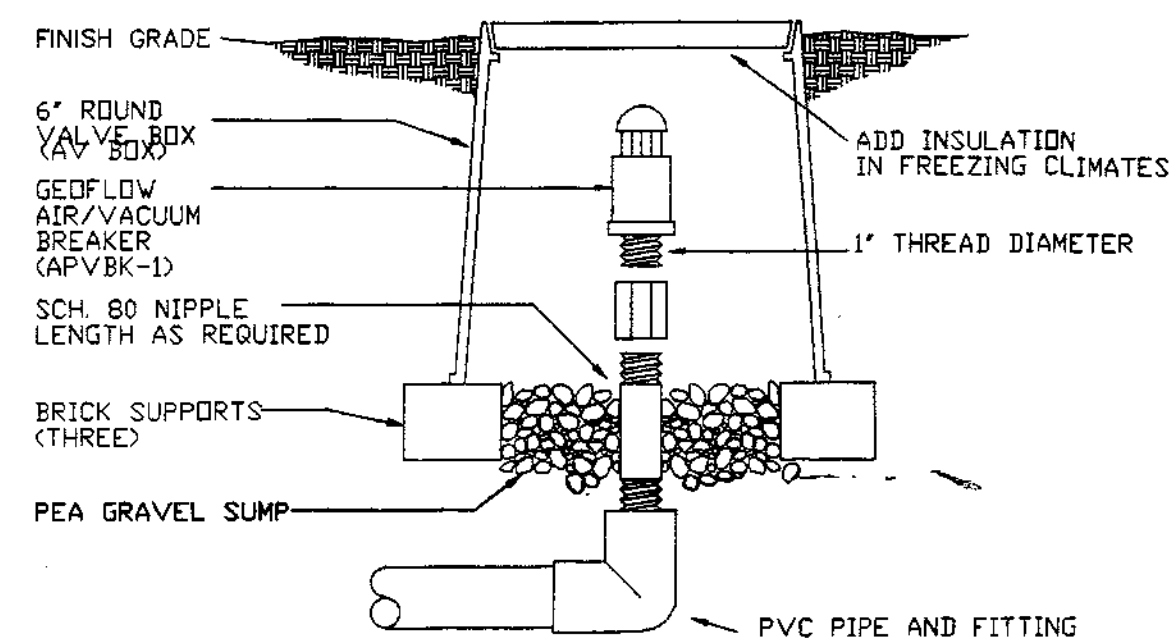
SADDLE MANIFOLD

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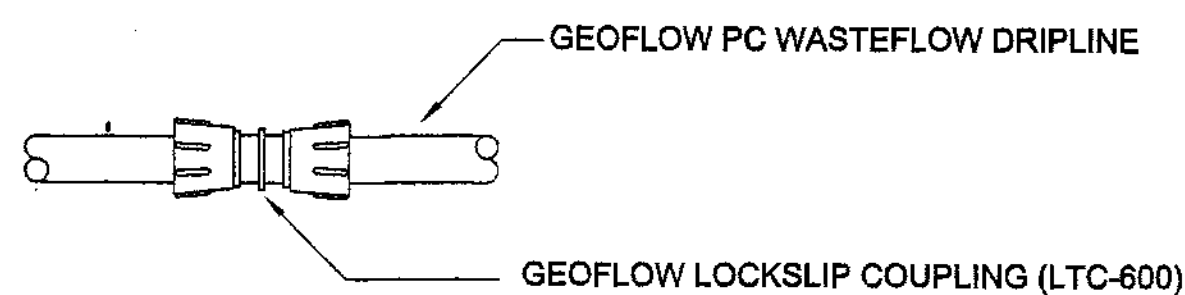
LOCKSLIP ELBOW (LTEL-600)

Not To Scale



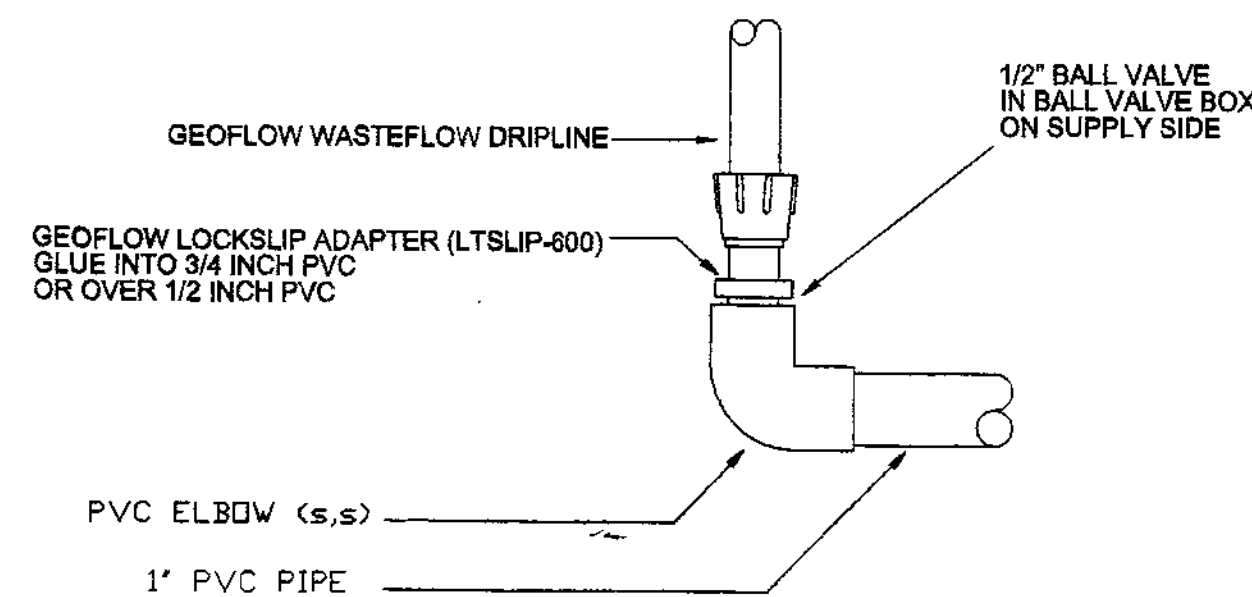
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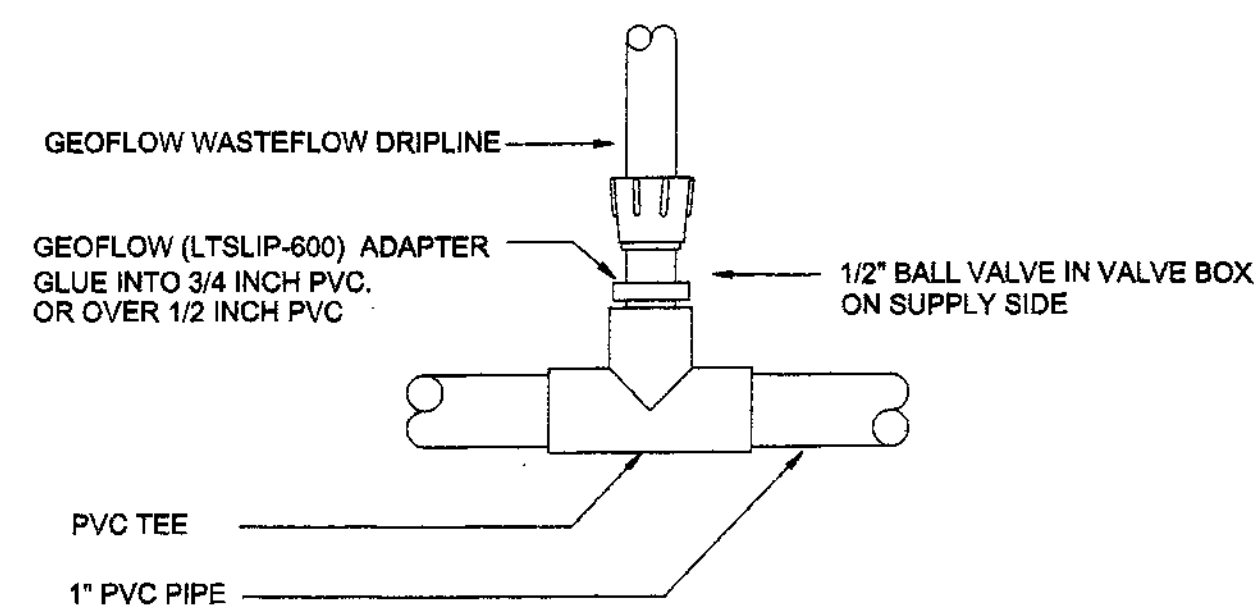
LOCKSLIP COUPLING (LTC-600)

Not To Scale



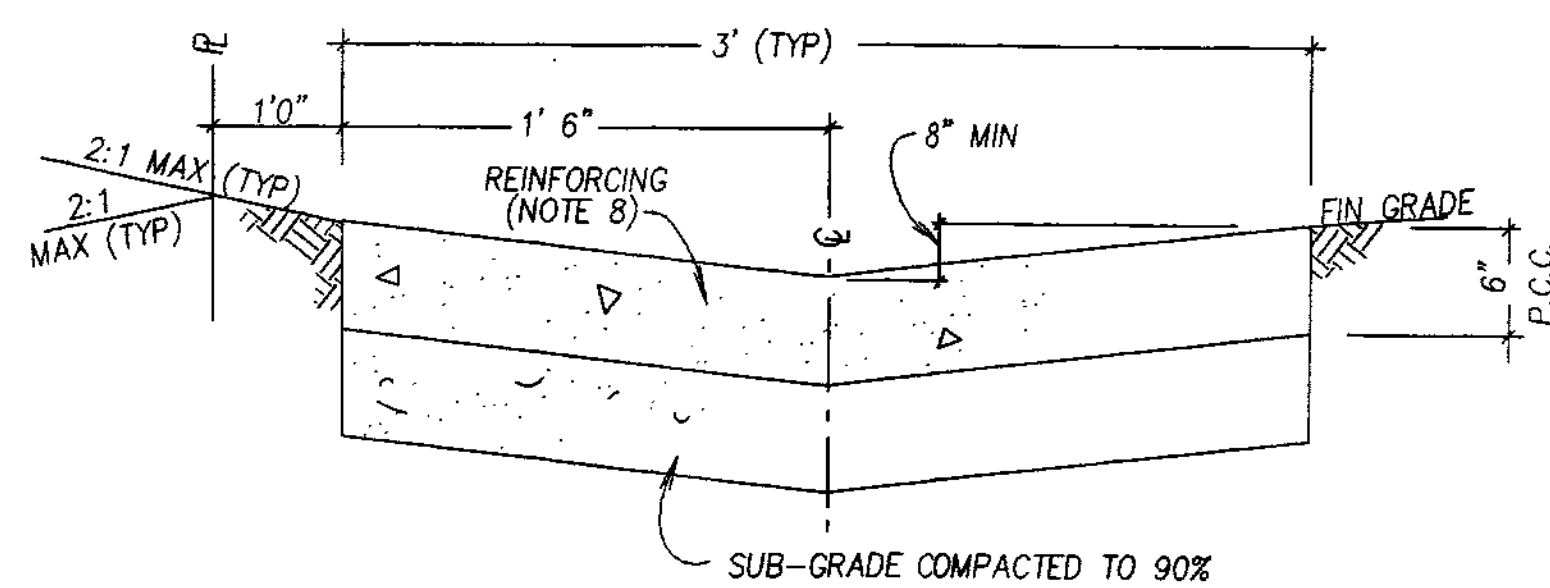
MANIFOLD CONNECTION (PVC TO ADAPTER)

Not To Scale



MANIFOLD CONNECTION (PVC TO ADAPTER)

Not To Scale



CONCRETE DRAINAGE SWALE

Not To Scale

NOTES

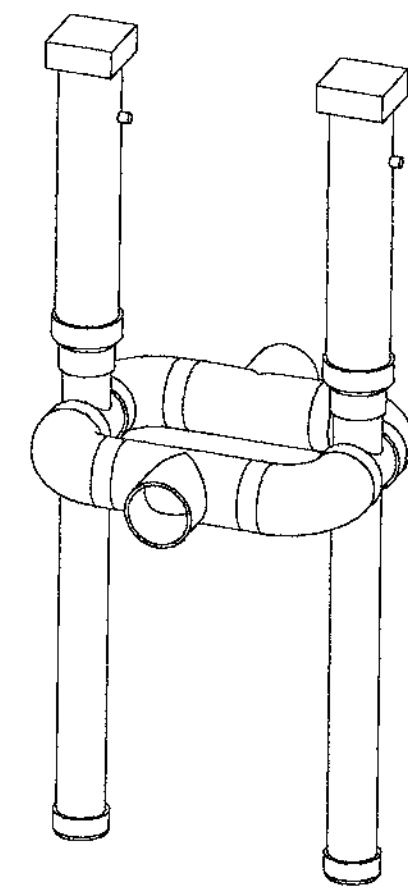
1. SEE SHEET 1 OF 5.
2. PORTLAND CEMENT CONC (P.C.C.) SHALL BE MIN 4000psi COMPRESSIVE STRENGTH @ 28 DAYS & MIN 6.25 sacks OF TYPE II CEMENT (588 lbs) PER CU.YD. OF CONCRETE W/4.5-7.5% AIR ENTRAINMENT. SLUMP SHALL BE 1\"/>

REV. NO.	DATE	REVISIONS

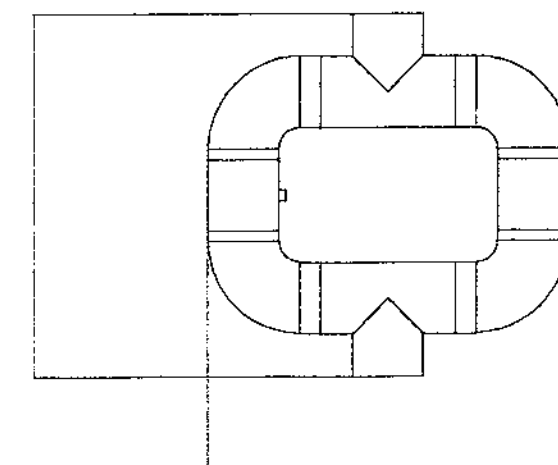
Anderson & Associates Engineering
1255 Joy Lake Road
Reno, Nevada 89511
(775) 846-4163

NEVADA
DETAIL PLAN
ONSITE EFFLUENT TREATMENT
630 HILL LANE

SCALE
DESIGNED:
DRAWN:
COMP:
CHECKED:
DATE:
SHEET NO.
D-3
4 OF 5 SHEETS
JOB NO.



2-UP PARALLEL



NOTES: UNLESS OTHERWISE SPECIFIED:
 1. FLOW: 12 GPM
 2. INLET AND OUTLET PORTS 4" SCHEDULE 40 PIPE

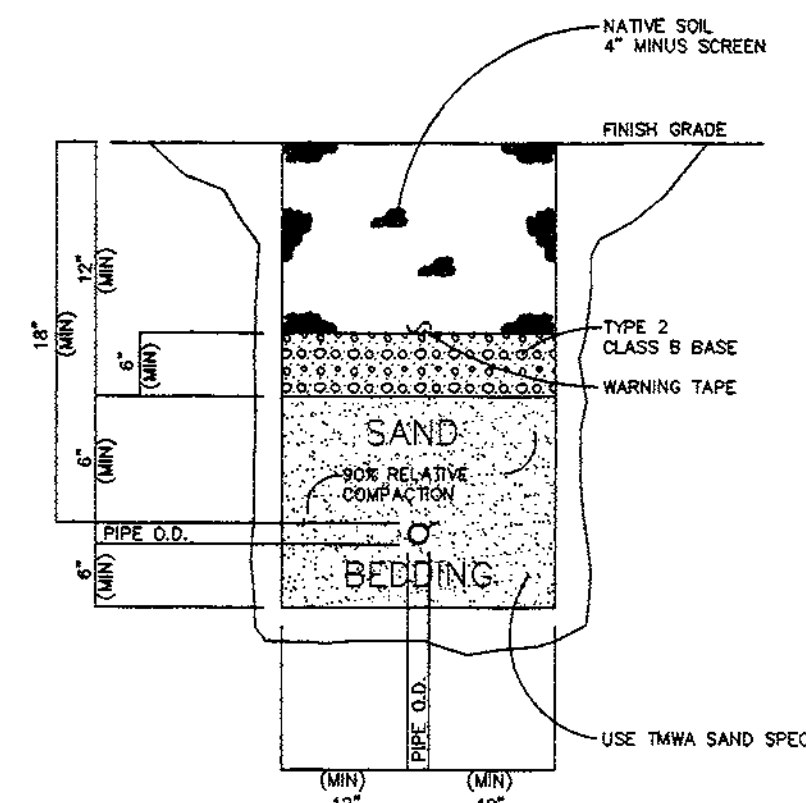
INLET AND OUTLET PORTS 4" SCHEDULE 40 PIPE
 INLET AND OUTLET PORTS 4" SCHEDULE 40 PIPE

SALCOR INC. UV DISINFECTION SYSTEM

NOT TO SCALE

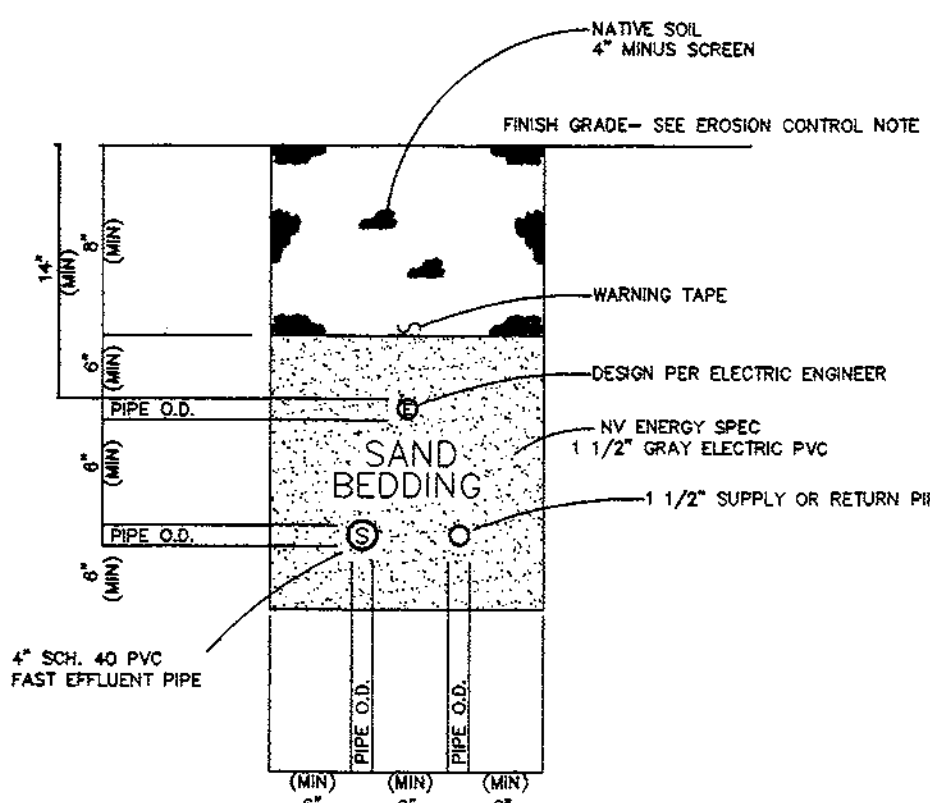
Salcor Inc

447 Ammunition Rd
 Fallbrook, CA 92028-3292
 (760) 731-9960



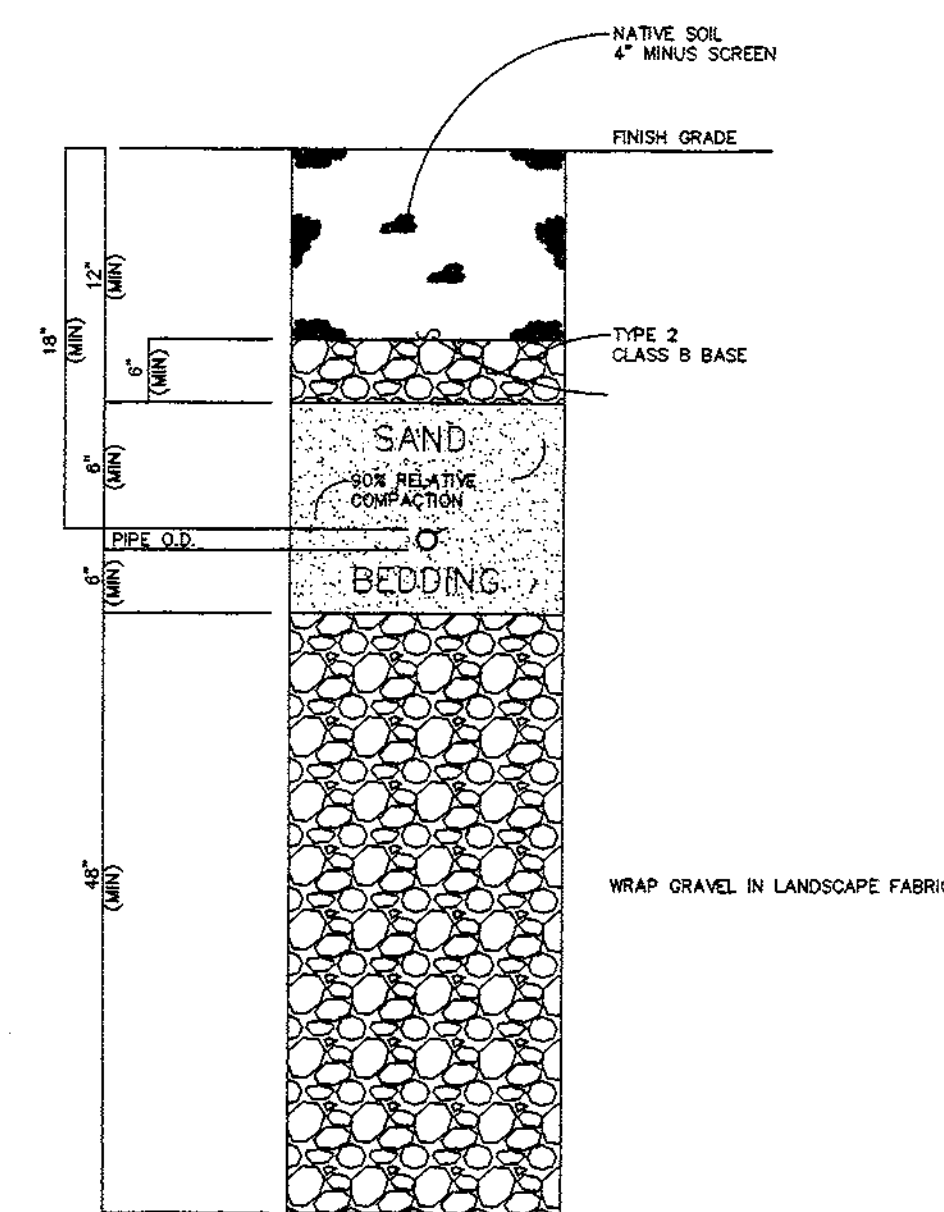
TRENCH DETAIL

NOT TO SCALE
 BLOWER PIPE & HOUSE SERVICE



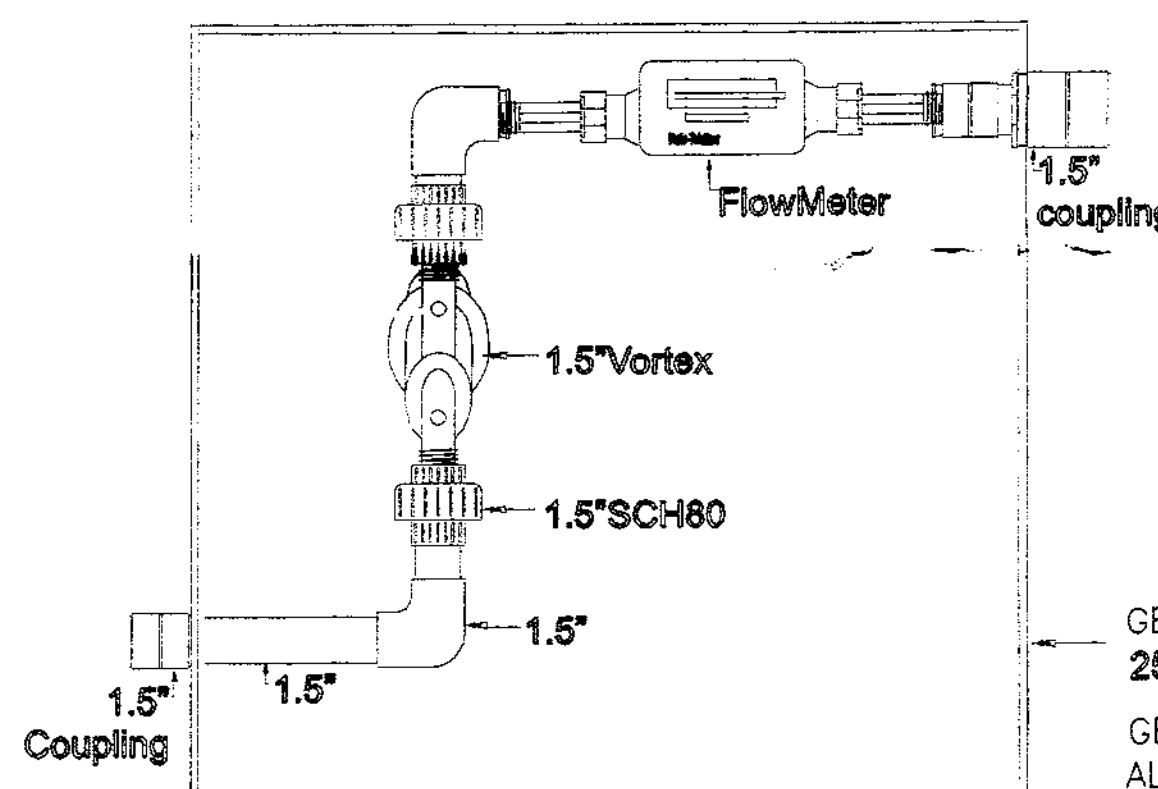
EFFLUENT SERVICE TRENCH

NOT TO SCALE



SUPPLY TRENCH DETAIL

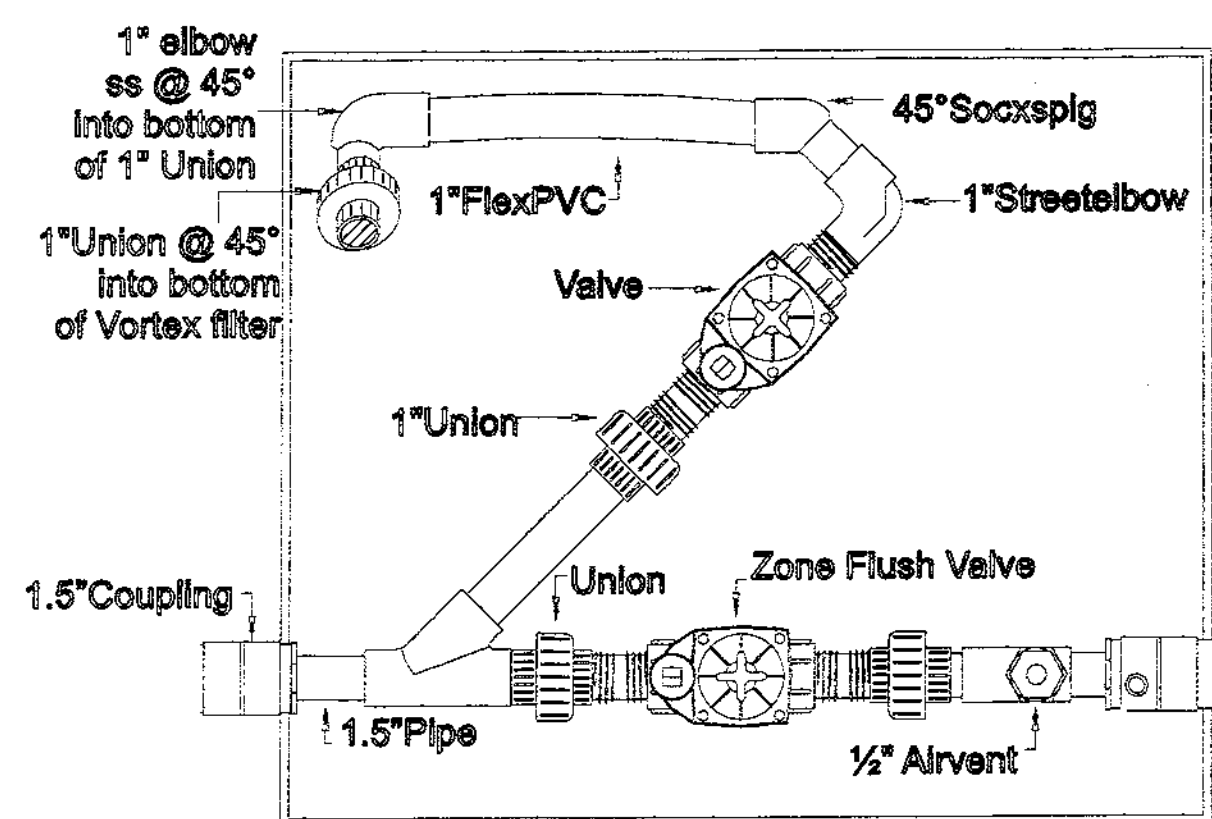
NOT TO SCALE
 SEE SHEET 1 OF 5



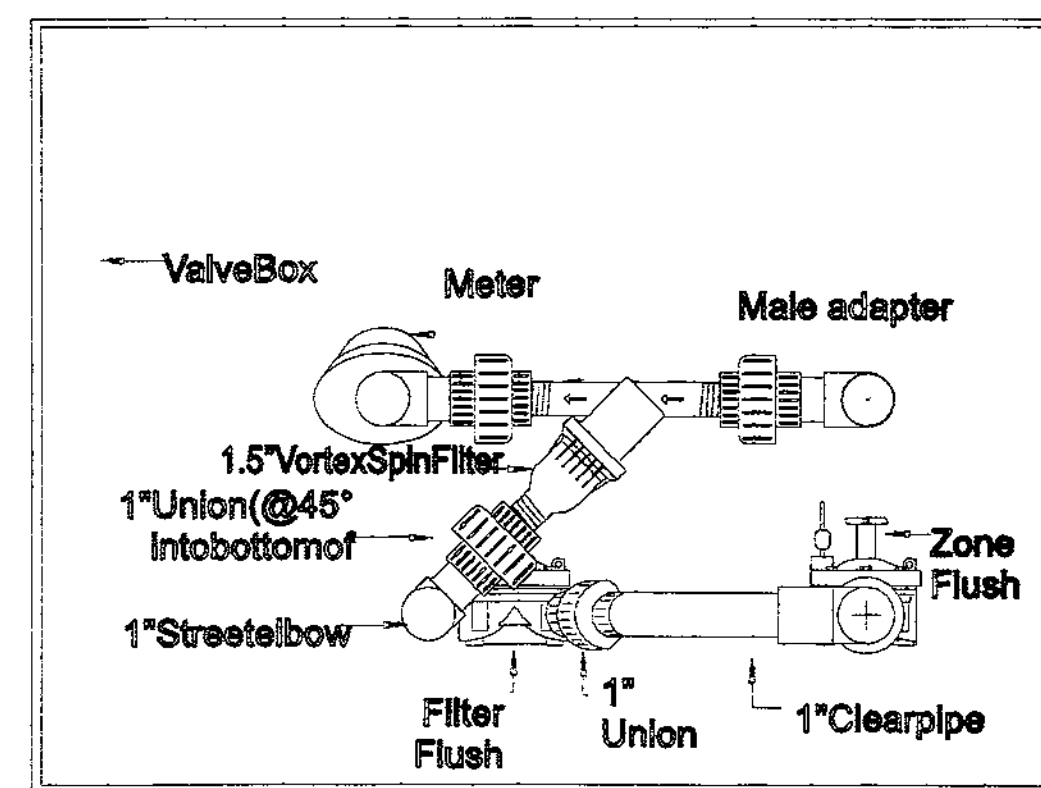
GEOFLOW VALVE BOX WITH 3' RISERS
 25.5"x25.5"x22"

GEOFLOW WHWU-D-1.5F-A-DDS
 ALL GEOFLOW PRODUCTS REQ' SHOP DRAWING REVIEW & APPROVAL.

TOPVIEW
 TopLayer



TOPVIEW
 Bottomlayer

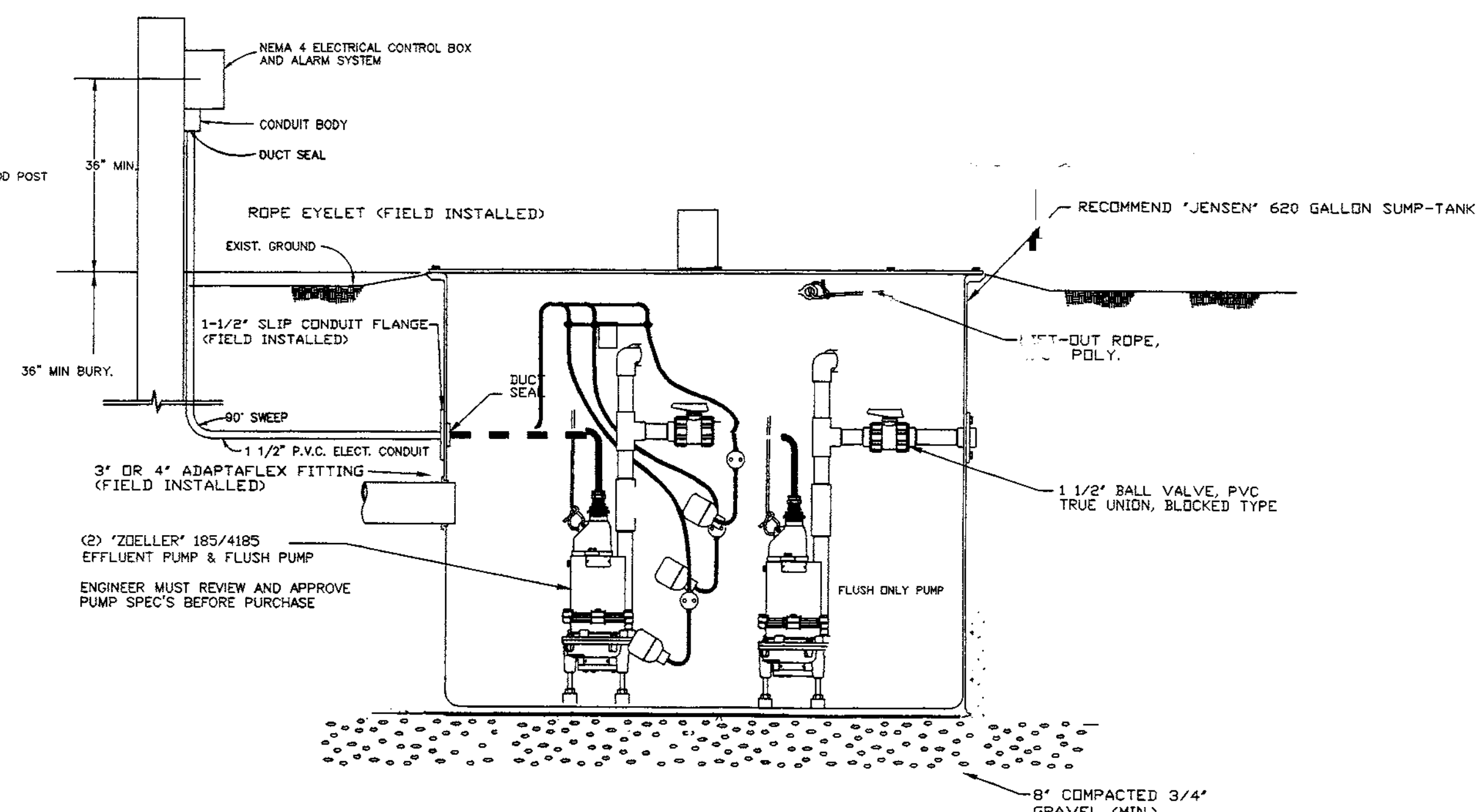


SIDEVIEW

WASTEFLOW HEADWORKS ULTRA Vortex1.5

NotToScale

GEOFLOW SHOP DRAWING REVIEW & APPROVAL REQUIRED



SCHMATIC PUMP STATION DETAIL

ZOELLER SHOP DRAWING REVIEW AND APPROVAL REQUIRED

NOTES:

1. INLET HUB & ROPE EYELET TO BE LOCATED & INSTALLED IN THE FIELD BY INSTALLER.
2. FLOAT LEVELS TO BE SET IN THE FIELD BY INSTALLER & APPROVED BY ENGINEER.
3. TOP OF ACCESS COVER TO BE 4" MIN. ABOVE GROUND. GROUND TO SLOPE AWAY FROM STATION TO DIRECT RUN-OFF AWAY FROM THE STATION.
4. ENGINEER MUST REVIEW AND APPROVE SHOP DRAWING FOR PUMP STATION AND PUMP BEFORE ANY PURCHASE. SEE PUMP SIZING CALC'.

REV. NO.	DATE	REVISIONS

Anderson & Associates Engineering
 1255 Jay Lake Road
 Reno, Nevada 89511
 (775) 846-4163

NEVADA

DETAIL PLAN
ONSITE EFFLUENT TREATMENT
 630 HILL LANE

DESIGNED:
DRAWN:
COMP:
CHECKED:
DATE:
SHEET NO.

D-4
 5 OF 5 SHEETS
 JOB NO.

STAFF REPORT

BOARD MEETING DATE: January 30, 2019

TO: Sewage, Wastewater, and Sanitation Hearing Advisory Board
FROM: James English, EHS Supervisor
775-328-2610, jenglish@washoecounty.us
SUBJECT: Variance Case #1-19S; Variance to Section 040.100 Table 2 Setback to a Watercourse, Parcel 017-320-20, 19445 Togliatti Way, Reno, NV

SUMMARY

This staff report summarizes the Environmental Health Services Division's (EHS) review of the submitted variance application for your decision to recommend or deny approval to the District Board of Health (DBOH) a variance for APN 017-320-20 which is owned by Robert Angelo Togliatti. The variance requests a reduced setback to a watercourse by way of encasing the building sewer line with concrete within an approximate 110' long zone to extend past the required 50' setback on each side of a seasonal irrigation ditch.

Previous Action

There has been no previous action with this variance request. A Washoe County Building Department permit application (WBLD18-1085360) was received by EHS on December 19, 2018. The parcel in question has been developed with a domestic well.

Background

Environmental Health Services staff has worked with the engineer to find the best possible solution to design an onsite sewage disposal system (OSDS) for this property. The property is five acres, is served by a private well and has a seasonal irrigation ditch flowing through it from south to north when water is present. During the design phase to build on the property and place an OSDS, it was determined there are few options for meeting all applicable setbacks to the irrigation ditch required in the Regulations of the Washoe County District Board of Health Governing Sewage, Wastewater and Sanitation (SWS) and also meet the setbacks to the private well.

Section 040.100 of the SWS Regulations requires building sewer lines meet a minimum 50' horizontal setback to watercourses. Section 040.100 also requires the septic tank, dosing tank and the disposal trench(s) meet a minimum 100' horizontal setback to watercourses. Section 010.305 of the SWS Regulations defines a watercourse to include an irrigation ditch.

The property owner contracted with Black Eagle Consulting, Inc. to design an OSDS to be the most protective of the public and environmental health for the parcel. The proposed design has the building sewer line encased with concrete within an approximate 110' long zone on each side of the seasonal irrigation ditch. The building sewer line will then be buried below the irrigation ditch. All other

portions of the OSDS are proposed to be located outside the 100' setback to the irrigation ditch as required in Section 040.100.

Staff has been on site to validate the proposed OSDS layout. Based on field observations it is noted the proposed design layout matches the property in question.

Findings of Fact

The Board must consider the following when making a recommendation on this variance to the DBOH:

1. Will the proposed variance result in contamination of water to the extent it cannot be used for its existing or expected use?

Reply: If the system functions as intended, then there should be not effluent discharge to irrigation water or groundwater and should not pose a threat to groundwater contamination. If the solid effluent line crossing the irrigation ditch fails, it could possibly contaminate the water in the irrigation ditch with raw sewage until such time as the flow is stopped.

2. Will the proposed variance pose a threat to public health?

Reply: There are two primary ways that sewage can pose a threat to public health, direct exposure via surface and groundwater contamination in areas with domestic wells. Direct exposure in this situation would most likely occur if the concrete encasement is compromised. EHS feels this is unlikely as it will be buried and not easily accessible. As indicated in question #1, the system should also not cause a groundwater contamination issue as long as the system is maintained and functions properly.

3. Are there other reasonable alternatives?

Reply: In order to maintain all applicable setbacks and not cross the irrigation ditch the applicant could perform one of the following alternatives:

- a. Construct the house on the western end of the property rather than the eastern end. This design is likely not feasible due to egress issues from the surrounding residential streets.
- b. Relocate the well and utilize that space to construct the sand filter bed.
- c. Reroute the irrigation ditch to the western or eastern end of the property. This option is also likely not feasible as the irrigation ditch crosses Togliatti way into neighboring properties.

The comparable cost to the homeowner for the above alternatives is unknown.

Conditions of Approval

1. Any instances of system non-function must be reported to WCHD for review and shall be repaired immediately. In the event of failure to maintain or lack of system function, WCHD may require sampling and/or impose restrictions on the property based on the functionality of the treatment system, up to and including additional repair.

2. Require recording of the variance to the parcel to ensure proper public records notification in the event the property is sold to any other person or entity. Recording may not be removed without Health District approval.

Recommendation

Staff recommends the Sewage, Wastewater and Sanitation (SWS) Hearing Board support the presented Variance Case #1-19S (Angelo Togliatti) to allow the approval of portions of a septic system (WBLD18-108536) with less than the required 50' setback to a watercourse. The variance requests a reduced setback to a watercourse by way of encasing the building sewer line with concrete within an approximate 110' long zone to extend past the required 50' setback on each side of a seasonal irrigation ditch.

Possible Motion

Should the SWS Hearing Board wish to approve the variance application, the four possible motions would be:

1. "Move to present to the District Board of Health a recommendation for approval of Variance Case #1-19S (Robert Angelo Togliatti) to allow the approval of a septic system as proposed, including all recommended conditions"; OR
2. "Move to present to the District Board of Health a recommendation for approval of Variance Case #1-19S (Robert Angelo Togliatti) to allow the approval of a septic system as proposed, without conditions"; OR
3. "Move to present to the District Board of Health a recommendation for approval of Variance Case #1-19S (Robert Angelo Togliatti) to allow the approval of a septic system as proposed, with the following conditions (list conditions)"; OR
4. "Move to present to the District Board of Health a denial of Variance Case #1-19S (Robert Angelo Togliatti).

The SWS Board may also formulate their own motion or request additional information from the applicant if desired.

Washoe County



Health District

WASHOE COUNTY HEALTH DISTRICT
ENVIRONMENTAL HEALTH SERVICES DIVISION
1001 East Ninth Street • PO Box 11130 • Reno, Nevada 89520
Telephone (775) 328-2434 • Fax (775) 328-6176
www.washoecounty.us/health

Office Use Only

Fee Paid _____
Date Paid _____
Cash/CC/Check _____
Receipt No. _____
Date Appl. Received _____
Considered Comp. _____

APPLICATION FOR VARIANCE
TO THE REGULATIONS GOVERNING SEWAGE,
SANITATION AND WASTEWATER

DATE 1/7/19 PROJECT NAME TOGLIATTI HOME

OWNER

ENGINEER

Name Angelo Togliatti

Name Black Edge Consulting

Address 19445 Togliatti Way
Reno 89521

Address 1345 Capital Blvd
Reno NV 89502

Phone 719-371-2916

Phone _____

Email Address _____

Email Address _____

The following items must be submitted with this application:

JOB ADDRESS 19445 Togliatti Way Reno 89521

SIZE OF PARCEL 9.5 /Acre

COPY OF LEGAL DESCRIPTION AND VERIFICATION OF CURRENT VESTING ON TITLE

EXISTING PARCEL(S) APN(S) 017-320-20 LOT 2 BLOCK _____

REASON FOR VARIANCE REQUEST sewer line to cross driveway
driv

SECTION(S) OF REGULATIONS TO BE VARIED WCHD SWS 040.100 Table 2

IF A PARCEL MAP: PROJECT NAME _____

APN(S) _____ LOT _____ BLOCK _____

IF TENTATIVE MAP: PROJECT NAME _____

NUMBER OF PROPOSED LOTS _____ LOTS REQUIRING VARIANCES _____

LOT DESCRIPTION(S) _____

Prepare and submit this original application with 9 copies and 10 copies of a construction plot plan with specifications drawn to scale (minimum 1 inch = 30 feet) and include the required following requirements:

- Vicinity map.
- The direction of North.
- A diagram of the location of roadways, easements or areas subject to vehicular traffic, material storage or large animal habitation.

Mr. Brian Noreen
A1 Builder Invests LLC
129 Curnow Canyon Road
Reno, NV 89510

Project No.: 2206-01-1
December 17, 2018

RE: Percolation Testing and Septic System Design
Single-Family Residence at 19445 Togliatti Way: APN 017-320-20
Washoe County, Nevada

Dear Mr. Noreen:

Black Eagle Consulting, Inc. (BEC) is pleased to present the design of an on-site sewage disposal system (septic system) for the proposed single-family residence to be located within a 5-acre parcel, Assessor's Parcel Number (APN) 017-320-20, located at 19445 Togliatti Way in the Pleasant Valley community of Washoe County, Nevada. Our design is based on the results of our field investigation, including percolation tests completed on November 1, 2018, Washoe County Health District (WCHD) *Regulations of the Washoe County District Board of Health Governing Sewage, Wastewater, and Sanitation* (WCHD, 2013), and engineering analysis. This design report includes the results of our site exploration, percolation testing and design recommendations, drawings, and construction specifications for the proposed septic system.

Project Description

The proposed single-family residence will be constructed within an approximately 5-acre parcel located at 19445 Togliatti Way in Washoe County, Nevada. The site is entirely contained in Section 4, Township 17 North, Range 20 East, Mount Diablo Meridian. The project area is bordered to the west, north and east by single-family farmhouses and to the south by the Hidden Lake residential subdivision. Access to the site is obtained off of a private road, Anne Lane.

The proposed residence will be a 3 bedroom home with an attached garage. The property includes an existing private well in the northeast corner and has several active irrigation/drainage ditches within the eastern portion of the site. The proposed septic field will be located west of the residence in a location that will maintain setback distances from the private well and the active drainage channels. However, the sewer pipe between the septic tank and dosing tank will require crossing beneath a drainage channel, and a variance from WCHD will be necessary to construct this system. No area east of the drainage channel can maintain setback distances from the existing well and active ditches. No public sewer is presently available in the area; therefore, the proposed home will need an on-site septic system for sewage disposal. On-site sewage disposal will be provided using an engineered septic system.

Site Conditions

The site consists of undeveloped rangeland used for horses and possibly cattle in the past. The site is nearly flat with slight slope to the northwest. Existing drainage ditches are present along the eastern boundary of the site and cross north-south through the central portion of the site. The home site will be constructed along the eastern border of the parcel. To avoid adding water to the foundation soils, the existing drainage ditch on the



Black Eagle Consulting, Inc.
Geotechnical & Construction Services

1345 Capital Boulevard, Suite A
Reno, Nevada 89502-7140

Tel: 775/359-6600 Fax: 775/359-7766
Email: mail@blackeagleconsulting.com

east property boundary has been rerouted to the west into the existing north-south ditch. Vertical relief within the parcel is about 3 to 5 feet. The location of the disposal field is controlled by a minimum 100-foot setback from the existing private well and a 100-foot setback from the north-south drainage channel. The septic field will require constructing a raised sand filter bed due to shallow groundwater conditions.

Exploration and Percolation Testing

The site was explored on November 1 and 2, 2018, by excavating 2 test pits using a John Deere® 160 LC track-mounted excavator. Percolation testing was performed near the surface in both test pits. The maximum depth of exploration was approximately 4 feet beneath the existing ground surface. The locations of the percolation test pits are shown on the enclosed full-size septic system design drawing Plate 1 (On-Site Septic System Layout).

A geologist examined and identified all soils in the field in accordance with the American Society for Testing and Materials (ASTM) D 2488. The logs of the percolation test pits are presented as Plate 2 (Test Pit Logs), and a Unified Soil Classification System (USCS) chart has been included as Plate 3 (USCS Soil Classification Chart). Bulk samples for index testing were collected from the trench wall sides at specific depths in each soil horizon. Test pits were backfilled upon completion of percolation testing. Backfill was loosely placed and the area re-graded to the extent possible with equipment on hand.

Two percolation tests were performed in percolation test pits TP-01 and TP-02 at the ground surface. Groundwater was encountered at a depth of approximately 0.5 feet beneath the existing ground surface. Percolation tests were conducted in accordance with the procedure in Section 090 of the WCHD (2013) procedures. The percolation tests were run after an approximate 24-hour presoaking period, and the measurement interval observed was 30 minutes. Measured percolation rates and associated data are summarized in Table 1 (Percolation Tests Summary). Percolation test results are included in Appendix A (Percolation Test Results). A description and diagram of the percolation test procedure is included as Plate 4 (Percolation Test Procedures).

Percolation Test Pit Number (TP)	Depth of Percolation Test (feet)	Groundwater Table (feet)	Material Tested	Final Percolation Rate (minutes/inch)
TP-01	1.0	0.5	Silty Sand	60
TP-02	1.2	0.5	Silty Sand	25.3

Prior to our exploration and percolation testing activities, on your behalf BEC submitted a test trench permit application and paid the permit fee to WCHD and coordinated with WCHD personnel to inspect the percolation test pits. The test trench inspection report from WCHD is enclosed as Appendix B (WCHD Test Trench Inspection Report).



General Soil Conditions

The overall site consists of Quaternary Age *Young Alluvium* (Hudson et. al, 2009). This map unit includes all young and active unconsolidated sediments. At the project site, the soils encountered are flood plain deposits of interbedded silty and clayey sand with lesser clay layers. The soils typically are brown to gray, very moist to wet, loose to medium dense, and contain about 25 to 40 percent non-plastic to low plasticity fines and 60 to 75 percent mostly fine and some medium sand.

Groundwater was encountered near the existing ground surface. Initial water levels were approximately 1.5 feet below grade, but stabilized groundwater levels were 4 to 6 inches beneath the existing grade.

Discussion and Septic System Design

Due to the presence of shallow groundwater, a septic system with conventional disposal trenches is not feasible. The shallow groundwater conditions require an engineered sand filter bed system for both the primary and backup leach fields. In order to build the sand filter bed, a minimum of 2 feet of engineered fill will be necessary to raise the base of the sand filter from the groundwater. This type of system will be referred to as a raised mound system below.

Moderate percolation rates were measured in the silty sand soils. It is noted that although percolation testing was performed approximately 200 feet from the proposed leach field, the required engineered fill material and overlying sand filter system will constitute the percolation stratum. The engineered fill shall have a percolation rate between 20 and 60 minutes per inch (mpi). Percolation through native soils beneath the engineered fill material will be minimal because the seasonal high groundwater is at the existing ground surface.

For residential septic systems, the number of bedrooms typically controls septic tank size. The proposed residence will have 3 bedrooms based on the information provided by you; as such, a septic tank size of 1,000 gallons is required for this project (WCHD Section 060.005). A Jensen Precast® model MU-1000 multi-use septic tank will be appropriate. This septic tank is specifically designed for shallow groundwater conditions to resist buoyancy uplift forces and hydrostatic pressure. Risers shall be added, as necessary, to extend both tank lids to the ground surface.

It should be noted that local suppliers do not specifically make a prepackaged dosing pump tank for deep burial and shallow groundwater conditions. A 48-inch-inside-diameter, precast PCC manhole is appropriate for use in this system along with an Orenco EasyPak BEP 10DD-DB pump package. The invert elevation of the inlet sewer pipe should be a minimum of 38 inches above the bottom of the manhole to allow for a minimum 300 gallon capacity. The minimum design requirements for the pump are 10 gallons per minute pump rate and 19.2 feet dynamic head.

Placement of the septic tank must observe a 10-foot minimum setback from the building foundation; a 5-foot setback from the disposal field; a 10-foot setback from any water lines; a 10-foot setback from the property line or easements; a 25-foot setback from drainage courses; a 100-foot setback from water courses; and a 100-foot



setback from any private wells or a 150-foot setback from public wells in accordance with WCHD (2013). A private well and active drainage/irrigation channels are located within the site, and the septic system must observe a minimum 100-foot setback from the well.

For design of the sand filter leach field, a design flow rate of 1,000 gallons per day was used (liquid volume of the septic tank). Percolation rates of 25 and 60 mpi were measured in the subsurface soils, and a percolation rate of 60 mpi was used to size the primary and secondary leach fields. Sizing and design of the sand filter disposal fields has been performed in accordance with WCHD (2013) regulations. Using a design percolation rate of 60 mpi, we calculate that the minimum required area for the sand filter disposal field is 516 square feet (sf). With this, for the primary disposal field, our design provides a sand filter bed measuring 18 feet in width by 29 feet in length (total sand filter disposal field of 522 sf). Based on the allowable maximum application rate on the sand filter bed and site grades, a dosing tank with a pump/lift station will be required for the sand filter system. Based on our site exploration and WCHD test trench inspection, the design groundwater elevation is considered the existing ground surface. Therefore, engineered fill will be required to raise the sand filter bed to the minimum 2 feet vertical distance above the expected high groundwater condition. Calculations of our design are included in Appendix C (Septic System Sizing and Design Calculations).

The on-site septic system will utilize a standard gravity-fed system to distribute effluent from the residence to a septic tank and then a dosing pump tank. The effluent will then be pumped to a distribution box and gravity fed to a disposal field consisting of a sand filter bed. Our design plans for the on-site septic system are included as Plates 5a and 5b (Septic System Details). Plate 5b shows the profile views of the septic tank and sand filter beds with invert elevations. Invert elevations for the septic tank and dosing siphon tank are also shown on Plate 5a. Plate 1 shows the approximate locations of the test pits. The invert elevation calculations also enclosed in Appendix C.

The location of the backup sand filter leach field will be south of and more than 10 feet away from the primary field. The backup field will have the same size and configuration as the primary field. If the primary field is ever to fail, the backup field shall be constructed generally following the details shown on Plate 5b. For the backup field, a sewer pipe will need to be installed extending from the dosing tank to a new distribution box that is located close to the backup field in a similar configuration as the layout shown for the primary leach field in Plate 1. The backup leach field area will also require construction of a raised mound sand filter bed disposal field.

Construction Specifications

Beyond the construction recommendations included within the project plans, the following items should also be followed during construction:

- The septic tank and dosing pump tank will be installed below the groundwater table, necessitating dewatering for installation.
- The foundation for the septic tank and dosing pump tank shall consist of a minimum of 6 inches of Class C or D drain rock (*Standard Specifications for Public Works Construction [SSPWC], 2012*) compacted with a vibratory plate compactor or an approved equivalent.



- Backfill placed behind the septic tank, dosing siphon tank, and distribution box shall be compacted with hand equipment within 3 feet horizontally of the structure within structural areas.
- The sewer pipe connecting the septic tank to the distribution box shall be SDR17 solid, 4-inch-diameter pipe (or an approved equivalent).
- All sewer pipe beneath the groundwater table should be bedded with and the pipe zone backfilled with Class C or D drain rock (*SSPWC*, 2012).
- All compaction associated with construction of the septic system shall follow ASTM D 1557 and shall be compacted to a minimum 90 percent relative compaction within all structural areas unless more stringent compaction requirements are outlined in the project's soils report.
- The filter sand must meet the requirements of WCHD (refer to Filter Sand Notes in Plate 5b). The test results for the filter sand shall be reviewed and approved by the design engineer.
- The impermeable membrane shall not be damaged during installation. If damaged, it shall be fixed in an appropriate manner to provide the needed sealing on the sides of the sand filter bed. Due to the construction of 3H:1V (horizontal to vertical) side slopes for the raised mound system and the requirement to achieve a 20-foot distance beyond the field to daylight (WCHD 040.045), the impermeable membrane shall extend beyond the bottom of the sand filter bed where necessary up to 2 feet below the bottom elevation of the sand filter bed system. This will require a narrow trench to about 2 feet depth on the side of the excavation for the sand filter bed and then placement of an impermeable membrane.

Variance Application Considerations

The proposed on-site disposal system has been designed in general accordance with WCHD requirements; however, not all setback requirements have been met due to the presence of water courses west and south of the home site and a private well on the site. Therefore, a *Variance to the Regulations Governing Sewage, Sanitation and Wastewater* will be necessary. These plans and specifications detail crossing an active water course with solid sewer pipe, which typically has a setback requirement of 50 feet. The specified crossing will fully encase the sewer pipe using Portland cement concrete within an approximate 110-foot-long zone to extend past the necessary 50-foot setback. The locations of the existing water course, the desired home site, and the existing well prohibit constructing the system east of the water course, avoiding the crossing. Because the system utilizes sealed pipe and the pipe will be protected from incidental damage using concrete encasement, no impact will be made upon the water course for existing or expected beneficial use or will contribute to a public health hazard. As required by the variance application, this system has been designed to properly function for at least 10 years. In the event of leach field failure, construction of the backup leach field will utilize the existing infrastructure, including the water course crossing and dosing tank.

Other design alternatives include building the home west of the water course, constructing a long berm adjacent to the driveway, or rerouting the existing water course. These plans and specifications have been prepared to allow the home to be constructed as planned and desired (i.e., such that moving the home is not necessary). For a long berm to be constructed, the sand filter would encroach into a different water course's 100-foot



Mr. Brian Noreen
A1 Builder Invests LLC
December 17, 2018

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setback (this water course has been rerouted to direct water away from the building foundation). Additionally, this location is not desirable due to the sand filter/mound encroaching on the driveway, resulting in hardscapes/traffic within the sand filter area (which is not allowed). Rerouting the water course is not feasible due to its fixed exit point from the property and culvert crossing of Togliatti Way.

Closing

The recommendations presented in this report are based on the assumption that sufficient field inspection and construction review will be provided during all phases of construction. During construction, we should have the opportunity to provide sufficient on-site observation of preparation and grading, excavation, fill placement, and septic system installation. These observations would allow us to verify that the conditions are as anticipated and that the contractor's work is in conformance with the approved plans and specifications.

This report has been prepared in accordance with generally accepted geotechnical and civil engineering practices. The analysis, design, and recommendations submitted are based upon field exploration and percolation testing performed at the locations shown on Plate 1 and discussed within this report. This report does not reflect soil variations that may become evident during the construction period, at which time re-evaluation of the recommendations may be necessary. The client shall be responsible for distribution of this design report to all regulatory agencies, designers, and contractors whose work is related to geotechnical factors and the construction of the septic system. We should be notified of any design changes in other disciplines, particularly grading changes and location changes, to review our septic design and, if necessary, to provide a revised design; these services will be performed as an additional scope of work.

We wish to thank you for the opportunity to provide our services and look forward to the possibility of working with you during construction.

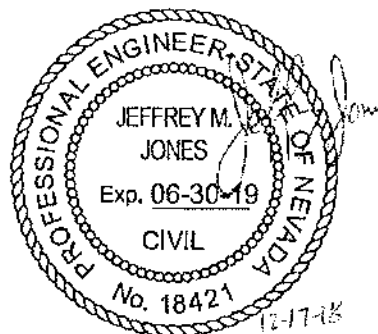
Please feel free to contact us should you have any questions regarding this report.

Sincerely,

Black Eagle Consulting, Inc.



Jonathan Payne
Project Geologist



Jeffrey M. Jones, P.E.
Senior Geotechnical Engineer



Black Eagle Consulting, Inc.
Geotechnical & Construction Services

1345 Capital Boulevard, Suite A
Reno, Nevada 89502-7140

Tel: 775/359-6600 Fax: 775/359-7766
Email: mail@blackeagleconsulting.com

Mr. Brian Noreen
A1 Builder Invests LLC
December 17, 2018

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JP:JM:cjr

Enclosures: Plate 1 – On-Site Septic System Layout
Plate 2 – Test Pit Logs
Plate 3 – USCS Soil Classification Chart
Plate 4 – Percolation Test Procedures
Plates 5a and 5b – Septic System Details
Appendix A - Percolation Test Results
Appendix B - WCHD Test Trench Inspection Report
Appendix C - Septic System Sizing and Design Calculations

Copies to: Addressee (3 copies and PDF via email)

References

- American Society for Testing and Materials (ASTM), 2015, *Soil and Rock; Dimension Stone; Geosynthetics*, Volume 4.08.
- Hudson, Donald M., Stephen B. Castor, and Larry J. Garside, 2009, *Preliminary Geologic Map of the Virginia City Quadrangle, Washoe, Storey and Lyon Counties, and Carson City, Nevada*, Nevada Bureau of Mines and Geology (NBMG) Map M-165.
- Standard Specifications for Public Works Construction (SSPWC)*, 2012 (Washoe County, Sparks-Reno, Carson City, Yerington, Nevada).
- Washoe County Health District (WCHD), 2013, *Regulations of the Washoe County District Board of Health Governing Sewage, Wastewater, and Sanitation*.



Black Eagle Consulting, Inc.
Geotechnical & Construction Services

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Tel: 775/359-6600 Fax: 775/359-7766
Email: mail@blackeagleconsulting.com

PLATES

APPENDIX A

PERCOLATION TEST RESULTS



PERCOLATION TEST RESULTS

Project Name: 19445 Togliatti Way
 Project Location: Washoe County, NV
 Test Location: Leach Field
 Test Pit Number: TP-01
 Test Performed by: JP

Date of Test: 11/2/2018
 Project No.: 2206-01-1
 Test depth (ft): 1
 Reviewed by: Jeffery Jones, P.E.
 Registration No.: 18421

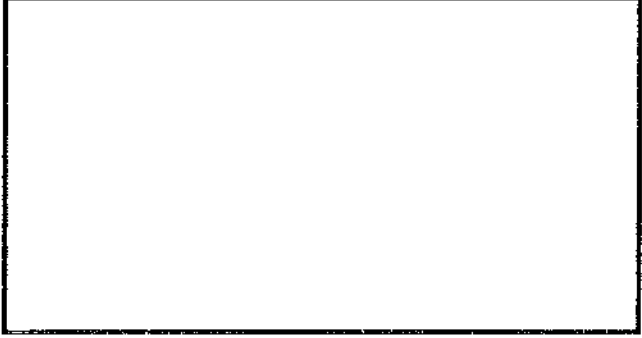
TEST DATA:

Time of Presoaking (hours) 24

Water depth in hole at start of test (inches): 1"

Time of Reading	Time Difference (minutes) (1)	Depth to Water (inches)	Depth Difference (inches) (2)	Percolation Rate (minutes/inch) $1 \div 2$	Comments
10:29:00		1 7/16			Start Test
10:59:00	0:30:00	2 1/16	10/16	48.00	
10:59:00		1 7/16			Refill
11:29:00	0:30:00	1 15/16	8/16	60.00	
11:29:00		1 7/16			Refill
11:59:00	0:30:00	1 15/16	8/16	60.00	End Test

Notes:
 Shallow groundwater (within perc test hole). Test performed starting with 1 inch head above static groundwater level.





PERCOLATION TEST RESULTS

Project Name: 19445 Togliatti Way
 Project Location: Washoe County, NV
 Test Location: Leach Field
 Test Pit Number: TP-02
 Test Performed by: JP

Date of Test: 11/2/2018
 Project No.: 2206-01-1
 Test depth (ft): 1.2
 Reviewed by: Vimal P. Vimalaraj, P.E.
 Registration No.: 19732

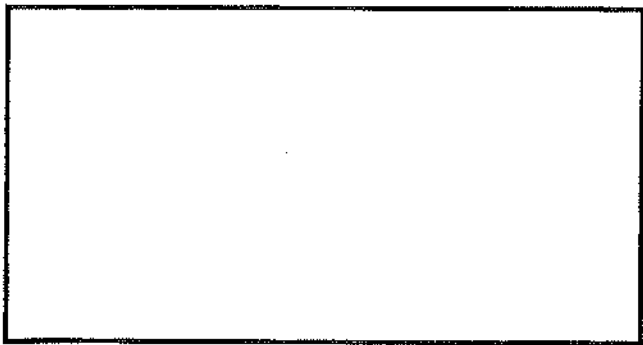
TEST DATA:

Time of Presoaking (hours) 24

Water depth in hole at start of test (inches): 1"

Time of Reading	Time Difference (minutes) (1)	Depth to Water (inches)	Depth Difference (inches) (2)	Percolation Rate (minutes/inch) $1 \div 2$	Comments
10:31:00		1 7/16			Start Test
11:01:00	0:30:00	2 11/16	1 4/16	24.00	
11:01:00		1 7/16			Refill
11:31:00	0:30:00	2 10/16	1 3/16	25.26	
11:31:00		1 7/16			Refill
12:01:00	0:30:00	2 10/16	1 3/16	25.26	End Test

Notes:
 Shallow groundwater (within perc test hole). Test performed starting with 3 inches head above static groundwater level.



APPENDIX B

WCHD TEST TRENCH INSPECTION REPORT

WASHOE COUNTY
HEALTH DISTRICT
ENHANCING QUALITY OF LIFE

WASHOE COUNTY HEALTH DISTRICT
ENVIRONMENTAL HEALTH SERVICES DIVISION
1001 East Ninth Street • PO Box 11130 • Reno, NV 89520
Telephone (775) 328-2434 • Fax (775) 328-6176
www.washoecounty.us/health

Office Use Only

Fee Paid _____
Date Paid _____
Cash/CC/Check _____
Receipt No. _____

SWS TEST TRENCH INSPECTION

APN: 017-320-20 Permit #: 4631 Date of Inspection: 10/31/2018 Time of Inspection: 9:30am

Site Address: 19445 Togliatti Way

Inspection Requestor: Jeff Jones (Black Eagle Consulting) Phone #: 775-359-6600

Mail to: jjones@blackeagleconsulting.com

Attach map or plot plan showing property, vicinity map and location of proposed test trench location.

Trench GPS Coordinates: _____

Soil Log: Trench #: 1/2 Depth: GW@6" Engineered / Estimated Perc. Rate (mpi): TBD by Eng

Log Comments: _____

Trench 1- GW at 6" below grade, High Seasonal at surface

Trench 2- GW at 6" below grade, High Seasonal at surface

Ground Water: Yes No Depth: HS @ Surface Bedrock: Yes No Depth: _____

Fractured Rock: Yes No Depth/Range: _____

Standard Septic System Allowed Soil not Suitable for Standard System

A 1-3 bedroom house requires a 1,000 gal. tank with:

- _____ leach line(s), _____ feet wide, by _____ feet deep, by _____ feet long or

A 4 bedroom house requires a 1,200 gal. tank with:

- _____ leach line(s), _____ feet wide, by _____ feet deep, by _____ feet long or

A 5-6 bedroom house requires a 1,500 gal. tank with:

- _____ leach line(s), _____ feet wide, by _____ feet deep, by _____ feet long or

Other: Must maintain 2' of separation between ground surface and bottom of sand filter.

Perforated pipe is to be set at N/A feet below grade.

Comments: Irrigation ditches and ponds on subject and neighboring properties- must maintain at least 100' setback to any water body. Setback reduced to 25' if water body is lined (impermeable membrane or concrete).

Mounded sand filter required- 2' of engineered fill below sand filter. Engineered fill design and specifications must be addressed on plan submittal.

Inspected by: Ellen Messinger-Patton Date: 11/5/2018

APPENDIX C

SEPTIC SYSTEM SIZING AND DESIGN CALCULATIONS

Project Name:	19445 Togliatti Way	Developed By:	PV
Project No:	2206-01-1	Calculated By:	jp
Description:	Sand Filter Disposal System	Checked By:	PV
	Groundwater at 0.5 feet	Date:	11/2/2018
	Design GW = ground surface.		

Septic System Design with Sand Filter Disposal Field

Reference: 1. District Board of Health Regulations Governing Sewage, Wastewater, and Sanitation
Washoe County, Nevada, January 2013 (WCHD)

1. Septic Tank Volume Calculations:

Lot Size	5 acre
Slope in the disposal area	0.5 %
Number of bedrooms	3 Reconfirmed with Owner & Project Team
Select Septic Tank Capacity depending on available model (Jensen Precast)	
Required minimum tank size	1000 gallons
1000 gallons tank Jensen Precast, specialty tank required for high GW condition:	

2. Sand Filter Area Calculations:

Method 1:

Field Percolation Rate, PR=	60 min/inch (mpi)
Design Percolation Rate, PD =	60 mpi
Application Rate, AR = 5/√PD =	0.645 gallon/ft ²
Required Sand Filter Area = 1/3 (Vst / AR) =	516 ft ²
The width of the sand filter =	18 ft
Required length =	28.7 feet

Method 2:

Additional Filter Bed Area Check (Requested by WCHD):
Based on dosing rate (1.33 gallon per sf) & number of bedrooms

Gallons per bedroom =	150.0 gallons
Total gallons =	450.0 gallons for 3 bedrooms
Required Sand Filter Area = Total gallons based on number of bedroom / dosing rate	338.3 ft ²

Provide the maximum from Method 1 & Method 2: 516.4 ft²

Note: Provide primary and backup field with 522 sf (see layout in the plan)
Provided sand filter area = 18*29 = 522 sf

Number of distribution pipe per system =	4 (per layout)
Length of the distribution pipe =	28 feet (total length from layout)
Diameter of the distribution pipe =	4 inches

Daily dosing rate = 1000/540 = 1.85 gallon per sf > 1.33 gallon per sf max allowed so a dosing tank is required for intermediate dosing rate

3. Dosing Tank Calculations:

Volume of the distribution pipes, Vdp =	9.8 ft ³ =	73.1 gallon
Required Volume per dosing cycle = 0.7xVdp =	51 gallons	(Note 6, Section 100.105, WCHD)
Note:	Use Jensen Precast 48-inch I.D. manhole with EasyPak BEP-10DD-DB pump package with 55 gallons discharge volume. Specialty tank required for high GW condition.	
Number of dosing cycle on a peak day = (based on the dosing tank discharge volume)	20	

4. Maximum System Depth (GW setback)

Field Percolation Rate, PR=	60 min/inch (mpi)
-----------------------------	-------------------

GW depth effectively at existing grade. Must provide 2 feet of fill beneath sand filter bed.

Raised mound system necessary due to shallow groundwater.

Project Name: 19445 Togliatti Way
 Project No: 2206-01-1
 Description: Sand Filter Disposal System
 Groundwater is very shallow
 Design GW = at ground surface (4634.5')

Developed By: PV
 Calculated By: JP
 Checked By: PV
 Date: 11/2/2018

Septic System Invert Elevation Calculations

- Reference: 1. District Board of Health Regulations Governing Sewage, Wastewater, and Sanitation
 Washoe County, Nevada, January 2013 (WCHD)
 2. International Plumbing Code -2009 (IPC)

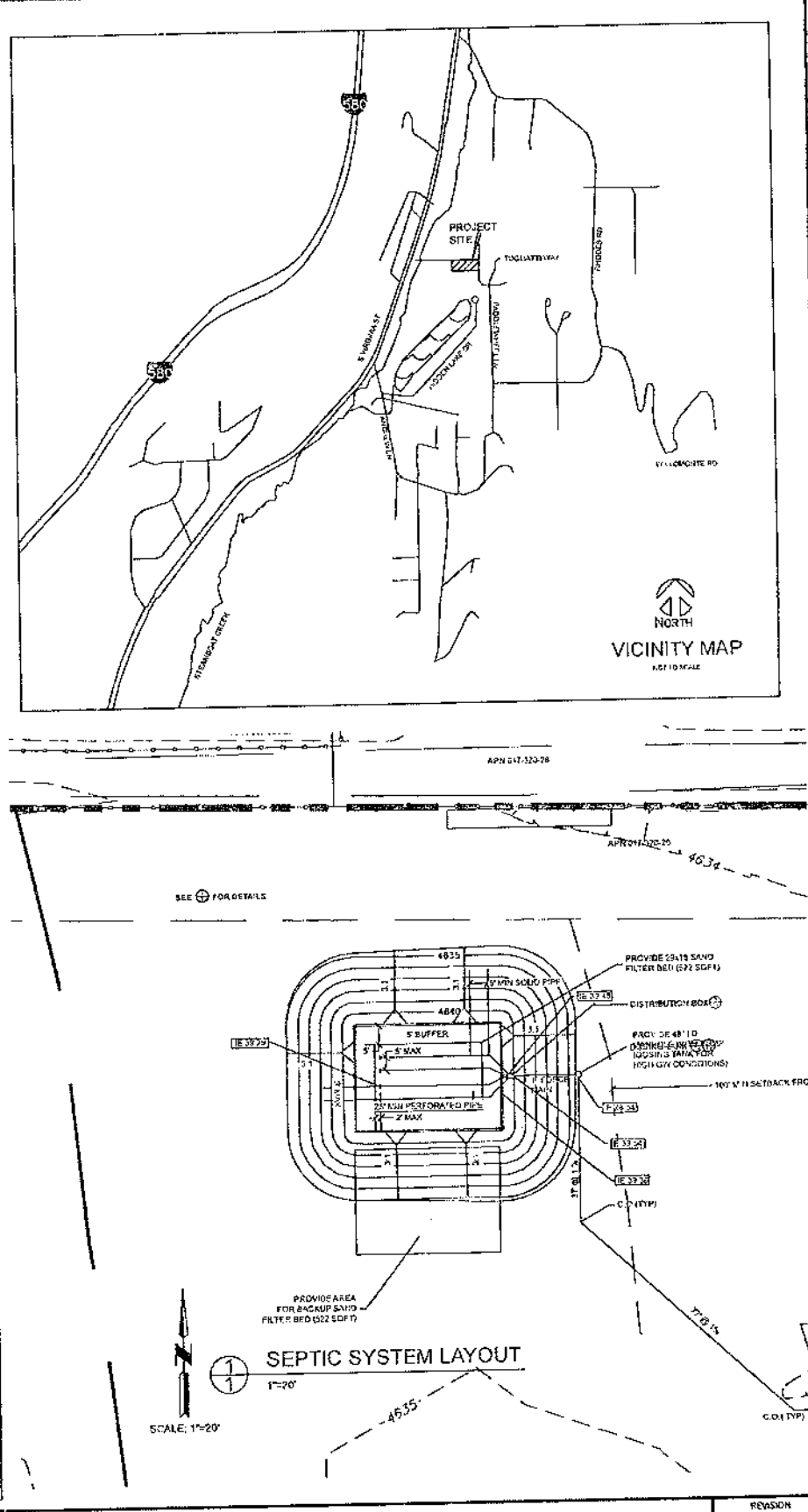
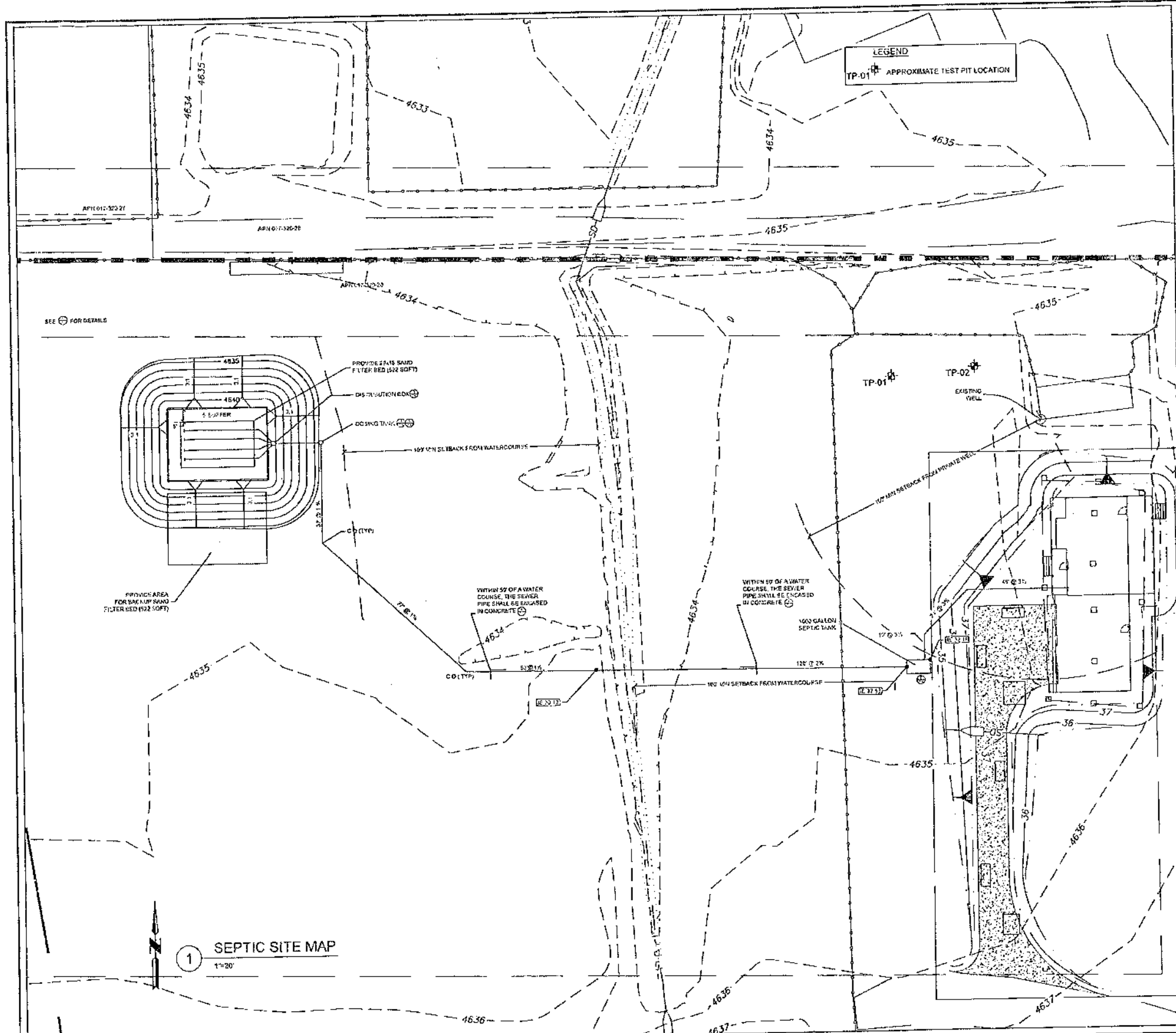
Component	Model	Start	End	Finished Grade (ft)	Height above Invert (Inch)	Length (ft)	Slope (%)	Drop (Inch)	Head (Inch)	Invert Elevation (ft)		Cover (ft)
										Inlet	Outlet	
Solid Sewage Pipe		Building	Septic Tank	38.00	2.0	74	3.00%			35.00	32.78	3.94
Septic Tank	Jensen MU-1000	-	-	36.00	17.0	-		2	0	32.78	32.61	1.89
Solid Sewage Pipe		Septic Tank	Clean Out	35.00	2.0	120	2.00%			32.61	30.21	3.42
Solid Sewage Pipe		Clean Out	Dosing Tank	35.00	2.0	167	1.00%			30.21	28.54	5.46
Dosing Tank	Jensen 48" Manhole	-	-	36.00	13.0	-		0	132	28.54	39.54	0.87
Sewage Force Main		Dosing Tank	Dist. Box	41.50	2.0	18				39.54	39.54	1.79
Distribution Box	Jensen D-5	-	-	41.50	7.5	-		1	0	39.54	39.46	1.37
Solid Sewage Pipe		Dist. Box	Disposal Field	41.50	2.0	10	1.00%			39.46	39.36	1.92
Disposal Field	Sand Filter System	-	-	41.50	4.0	29	0.25%			39.36	39.29	1.84

Diameter of the Solid Sewage Pipe = 4 inches
 Diameter of the Sewage Force Main Pipe = 2 inches
 Diameter of the Perforated Sewage Pipe = 4 inches

Design groundwater elevation at disposal field = 34.5 feet
 Depth of filter sand (24") & drain rock (6") below distribution pipe invert = 2.5 feet
 Depth between sand filter bottom and groundwater level = 2.32 feet

Design bottom elevation of Sand Filter Bed = sand filter outlet el - filter dep 36.50 feet
 Original ground elevation of sand filter bed = 34.5 feet
 Depth of sand filter bed from O.G. = -2.00 feet

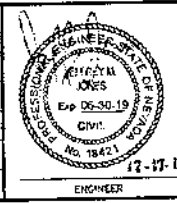
24" sand and 6" class C drain rock
 Check 2 feet Minimum? **OK**



1 SEPTIC SITE MAP
1"=20'

SEPTIC SYSTEM LAYOUT
1"=20'

REVISIONS			
NO.	DESCRIPTION	BY	DATE
1	ISSUED FOR WCHD APPROVAL		
2			
3			
4			



	BY	DATE
DESIGNED	JP	12-5-18
DRAWN	VJ	12-13-18
CHECKED	JP	12-14-18
APPROVED		
CLIENT APPROVAL		
SCALE	AS SHOWN	
PROJECT NO.	2206-01-1	

Black Eagle Consulting, Inc.
Geotechnical & Construction Services
1545 Capital Boulevard, Suite A
Reno, Nevada 89502-7149
Telephone: 775/758-8800
Facsimile: 775/249-7113

A1 BUILDER INVESTS, INC.
**SITE MAP AND DISPOSAL FIELD
DETAIL**
19445 TOGLIATTI WAY, APN 017-320-20

WASHOE COUNTY

NEVADA

REVISION
1
DRAWING NO.
Plate 1
1 of 3 SHEETS



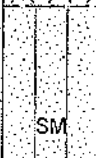

LOG OF TEST PIT TP-01

 Date Excavated: 11/1/2018

 Logged by: JP

 Equipment: John Deere 160 LC

 Surface Elevation (ft) 4634.5

SAMPLE NUMBER	SAMPLE	POCKET PEN. (tsf)	MOISTURE (%)	PI	DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION
					▼		Depth to Ground Water: .5 ft. Comments: N 4361285 E 263653 UTM NAD83
A					2		Silty Sand Brown to gray, reduced color, very moist to wet, loose to medium dense, with an estimated 25-35% non-plastic to low plasticity fines and 65-75% mostly fine to medium sand.
					4		Trace thin interbeds of silty clay.
					6		



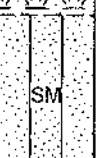
LOG OF TEST PIT TP-02

 Date Excavated: 11/1/2018

 Logged by: JP

 Equipment: John Deere 160 LC

 Surface Elevation (ft) 4634.8

SAMPLE NUMBER	SAMPLE	POCKET PEN. (tsf)	MOISTURE (%)	PI	DEPTH (feet)	GRAPHIC LOG	MATERIAL DESCRIPTION
					▼		Depth to Ground Water: .8 ft. Comments: N 4361285 E 263653 UTM NAD83
A					2		Silty Sand Brown to gray, reduced color, very moist to wet, loose to medium dense, with an estimated 30-40% non-plastic to low plasticity fines and 60-70% mostly fine to medium sand.
					4		Trace thin interbeds of silty clay.
					6		

REC-TP-1 2206011 GP.J LAGNN07.GOT 11/2/2018



Black Eagle Consulting, Inc.
 1345 Capital Blvd., Suite A
 Reno, Nevada 89502-7140
 Phone: (775) 359-6600 Fax: (775) 359-7766

A1 Builder Invests, LLC
 19445 Togliatti Way - APN 017-320-20
 Washoe County, Nevada 2206-01-1 Plate 2

SOIL CLASSIFICATION CHART

EXPLORATION SAMPLE TERMINOLOGY

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GP	POORLY-GRADED GRAVELS, GRAVEL-SAND MIXTURES, LITTLE OR NO FINES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
				SM	SILTY SANDS, SAND-SILT MIXTURES
				SC	CLAYEY SANDS, SAND-CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MED. PL. PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICACEOUS OR PATAGACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, MUCK, SWAMP SOILS WITH HIGH ORGANIC CONTENTS
FILL MATERIAL				--	FILL MATERIAL, NON-NATIVE

Sample Type	Sample Symbol	Sample Code
Auger Cuttings		Auger
Bulk (Grab) Sample		Grab
Modified California Sampler		MC
Shelby Tube		SH or ST
Standard Penetration Test		SPT
Split Spoon		SS
No Sample		

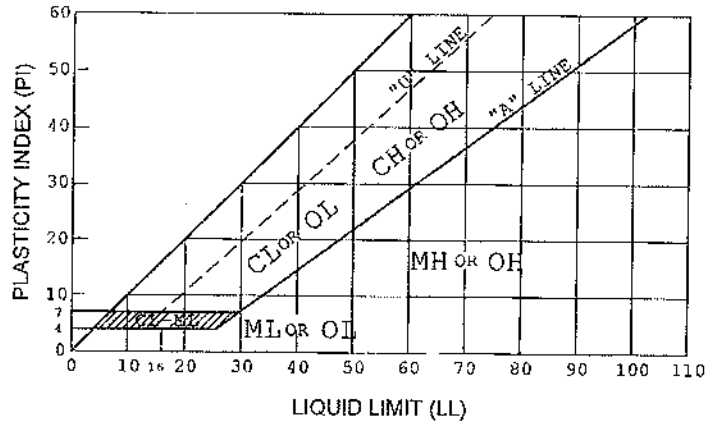
GRAIN SIZE TERMINOLOGY

Component of Sample	Size Range
Boulders	Over 12 in. (300mm)
Cobbles	12 in. to 3 in. (300mm to 75mm)
Gravel	3 in. to #4 sieve (75mm to 4.75mm)
Sand	# 4 to #200 sieve (4.75mm to 0.074mm)
Silt or Clay	Passing #200 sieve (0.074mm)

RELATIVE DENSITY OF GRANULAR SOILS

N - Blows/ft	Relative Density
0 - 4	Very Loose
5 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
greater than 50	Very Dense

PLASTICITY CHART



FOR CLASSIFICATION OF FINE-GRAINED SOILS AND FINE-GRAINED FRACTION OF COARSE-GRAINED SOILS

CONSISTENCY OF COHESIVE SOILS

Unconfined Compressive Strength, psf	N - Blows/ft	Consistency
less than 500	0 - 1	Very Soft
500 - 1,000	2 - 4	Soft
1,000 - 2,000	5 - 8	Firm
2,000 - 4,000	9 - 15	Stiff
4,000 - 8,000	16 - 30	Very Stiff
8,000 - 16,000	31 - 60	Hard
greater than 16,000	greater than 60	Very Hard

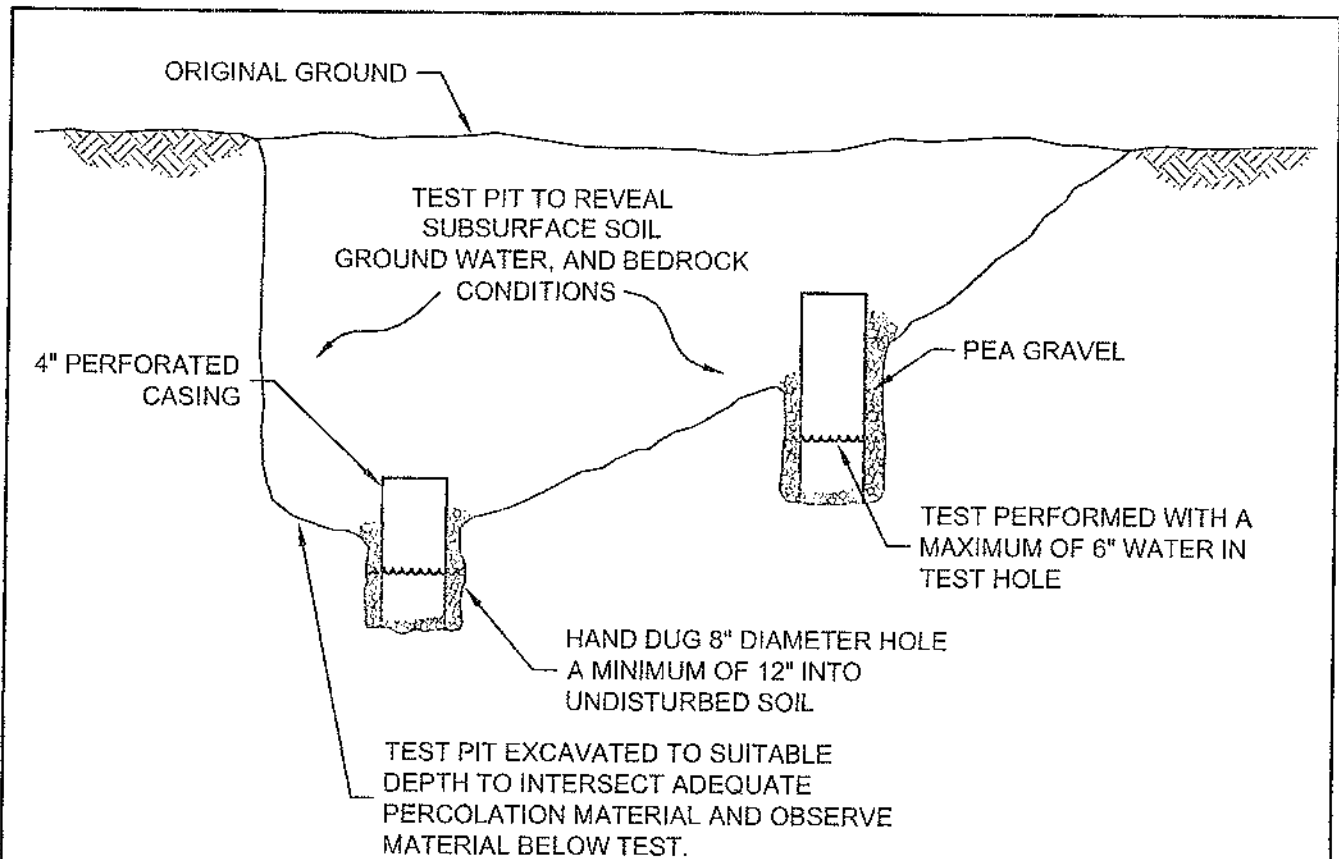
USCS CHART 220601-1.GPJ US LAB GDT 12/14/2018



Black Eagle Consulting, Inc.
1345 Capital Blvd., Suite A
Reno, Nevada 89502-7140
Telephone: (775) 359-6600
Fax: (775) 359-7766

USCS Soil Classification Chart

Project: 19445 Togliatti Way - APN 017-320-20
Location: Washoe County, Nevada
Project Number: 2206-01-1 Plate:



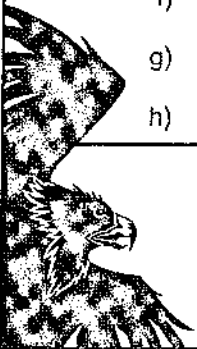
TEST PROCEDURE

FOR SANDY SOILS, WHERE 12" OF WATER SEEPS AWAY IMMEDIATELY AND THE SECOND FILLING OF 12" OF WATER SEEPS AWAY IN LESS THAN 10 MINUTES, THE TEST PROCEEDS AS FOLLOWS:

- a) WATER ADDED TO A POINT NOT MORE THAN 6" ABOVE GRAVEL
- b) WATER LEVELS MEASURED AT 10 MINUTE INTERVALS FOR 1 HOUR
- c) IF WATER SEEPS AWAY IN LESS THAN 10 MINUTES, SHORTER INTERVALS MAYBE USED
- d) WATER DEPTH DURING TESTING SHALL NOT EXCEED 6" ABOVE BOTTOM OF HOLE
- e) FINAL WATER DROP USED TO CALCULATE PERCOLATION RATE

FOR OTHER SOILS,

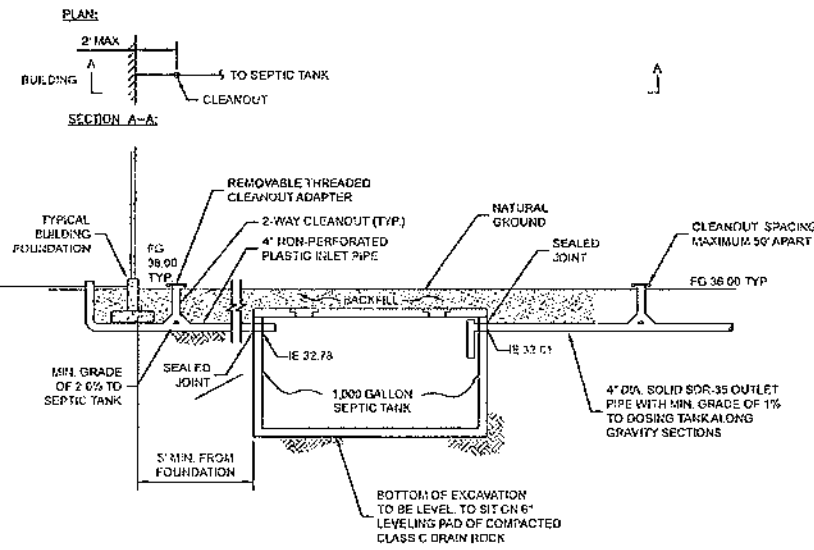
- a) HOLE FILLED 12" WITH WATER AND MAINTAINED FOR 4 HOURS
- b) SOIL ALLOWED TO SWELL 16-30 HOURS (SOAKING PERIOD)
- c) WATER ADDED TO A POINT NOT MORE THAN 6" ABOVE BOTTOM OF HOLE
- d) WATER LEVELS MEASURED AT 30 MINUTE INTERVALS FOR 4 HOURS
- e) WATER DEPTH DURING TESTING SHOULD NOT EXCEED 6" ABOVE BOTTOM OF HOLE
- f) TEST CONTINUES UNTIL TWO SUCCESSIVE WATER LEVEL DROPS DO NOT VARY BY MORE THAN 1/16 INCH. AT LEAST THREE MEASUREMENTS SHALL BE MADE.
- g) IF 6" OF WATER SEEPS AWAY IN LESS THAN 30 MINUTES, MEASURE 10 MINUTE INTERVALS FOR 1 HOUR (ABOVE PROCEDURE FOR SANDY SOILS)
- h) FINAL WATER DROP USED TO CALCULATE PERCOLATION RATE



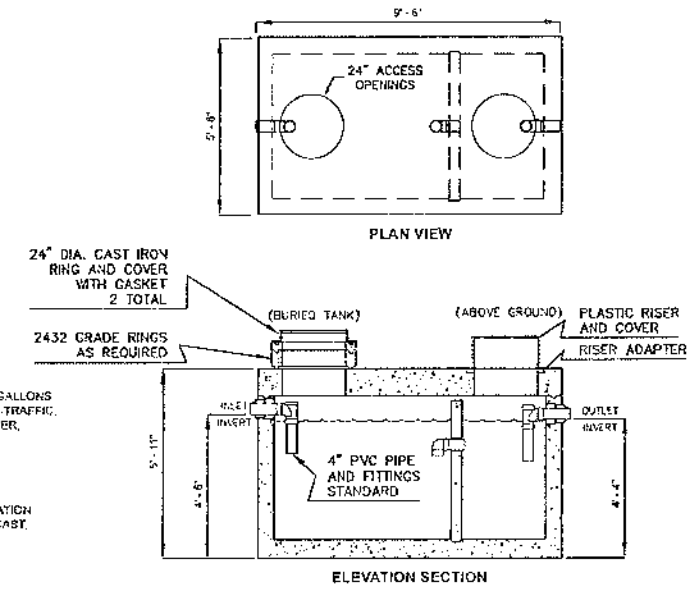
Black Eagle Consulting, Inc.
 Geotechnical & Construction Services
 1345 Capital Boulevard, Suite A
 Reno, Nevada 89502-7140
 Telephone: 775/359-6600
 Facsimile: 775/359-7766

APN 017-320-20
PERCOLATION TEST PROCEDURE
 SEPTIC SYSTEM DESIGN
 Washoe County, NEVADA

Project No.
 2206-01-1
 Plate 4



1
5a
NOT TO SCALE



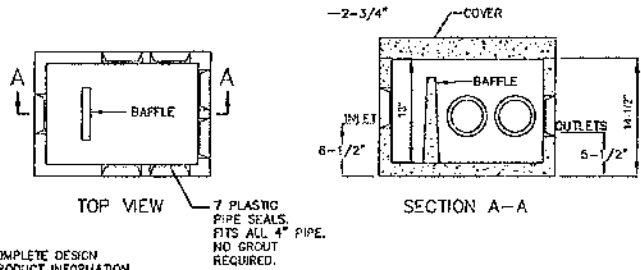
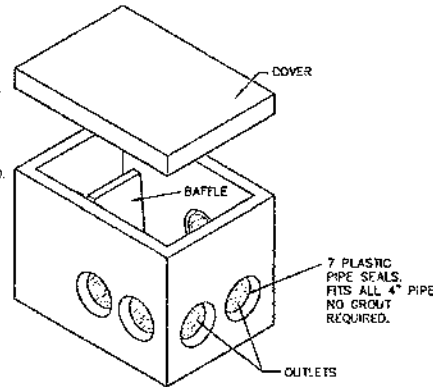
2
5a
NOT TO SCALE

- SEPTIC TANK NOTES**
1. INLET AND OUTLET PIPES TO BE LAID ON A SUITABLY COMPACTED TRENCH AT A MIN. GRADE OF 2% AND 1% RESPECTIVELY.
 2. SEPTIC TANK TO BE LOCATED AT A MINIMUM 5' AWAY FROM ANY PERMANENT STRUCTURES, 5' FROM THE DISPOSAL SYSTEM, 10' FROM WATER AND PROPERTY LINES, 100' FROM PRIVATE WELLS, 50' FROM PUBLIC WATER COURSES, AND 150' FROM PUBLIC WELLS.
 3. BOTTOM OF EXCAVATIONS FOR SEPTIC TANK TO BE LEVEL, SUBGRADE TO BE UNDISTURBED WHERE GW IS ENCOUNTERED TANK TO BE PLACED ON 6\"/>

DISTRIBUTION BOX NOTES

1. BOTTOM OF THE EXCAVATION FOR DISTRIBUTION BOX TO BE LEVEL, SUBGRADE TO BE AT LEAST 90 PERCENT COMPACTION (ASTM D1557).
2. DISTRIBUTION BOX INLET AND OUTLET PIPES SHALL BE PROPERLY SEALED AND SHALL BE TESTED AT INSTALLATION.
3. FOR COMPLETE DESIGN AND PRODUCT INFORMATION CONTACT JENSEN PRECAST.
4. BACKFILL AROUND DISTRIBUTION BOX SHALL BE HAND COMPACTED ONLY, NO EQUIPMENT ALLOWED.

WEIGHT:
BOX - 160 LBS.
COVER - 45 LBS.

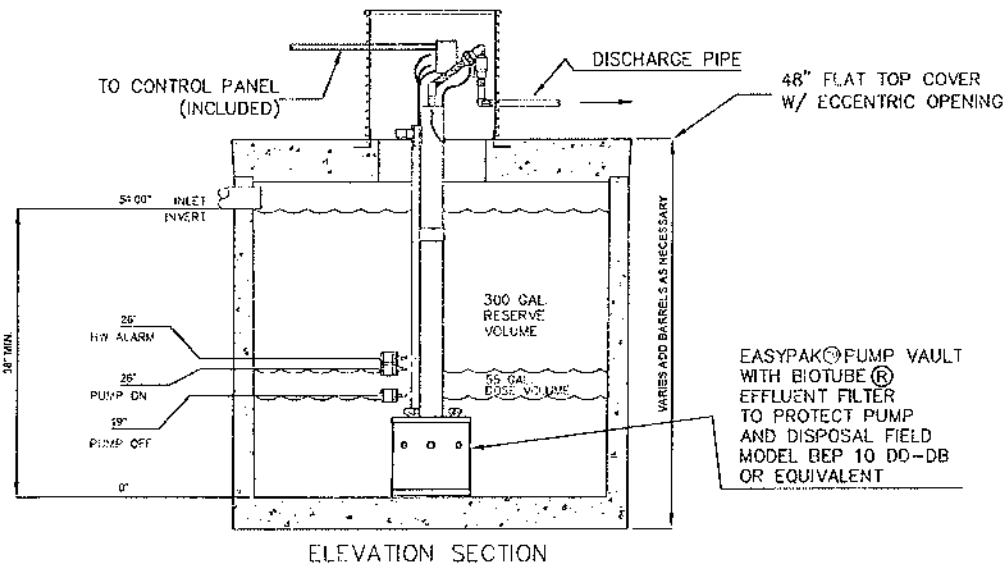


FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN PRECAST.

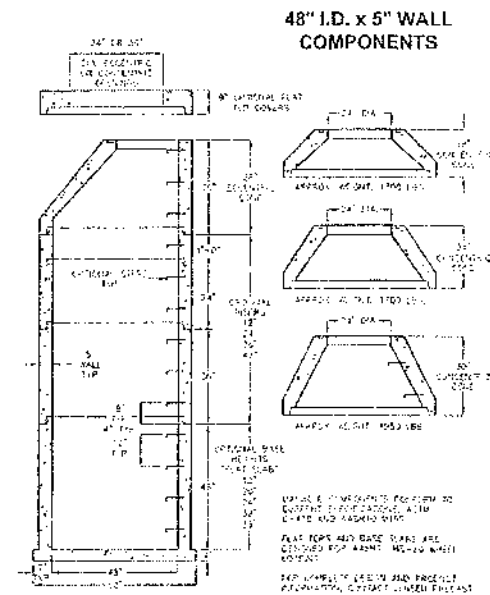
3
5a
NOT TO SCALE

DOSING TANK/PUMP STATION NOTES

1. INLET AND OUTLET PIPES TO BE LAID ON SUITABLY COMPACTED TRENCH.
2. DOSING TANK TO BE LOCATED AT A MINIMUM OF 5' FROM ANY PERMANENT STRUCTURES, 5' FROM ANY DISPOSAL SYSTEMS, 10' FROM WATER LINES, AND 100' FROM NON-PUBLIC WELLS, STREAMS, LAKES, OR WATER COURSES.
3. BOTTOM OF EXCAVATION FOR SEPTIC AND DOSING TANKS TO BE LEVEL, SUBGRADE TO BE 5\"/>



4
5a
NOT TO SCALE



5
5a
NOT TO SCALE

REVISIONS			
NO.	DESCRIPTION	BY	DATE
1	ISSUED FOR WCHD APPROVAL		

	BY	DATE
DESIGNED	JP	12-5-18
DRAWN	VJ	12-13-18
CHECKED	JP	12-14-18
APPROVED		
CLIENT APPROVAL		
SCALE	AS SHOWN	
PROJECT NO.	2206-01-1	

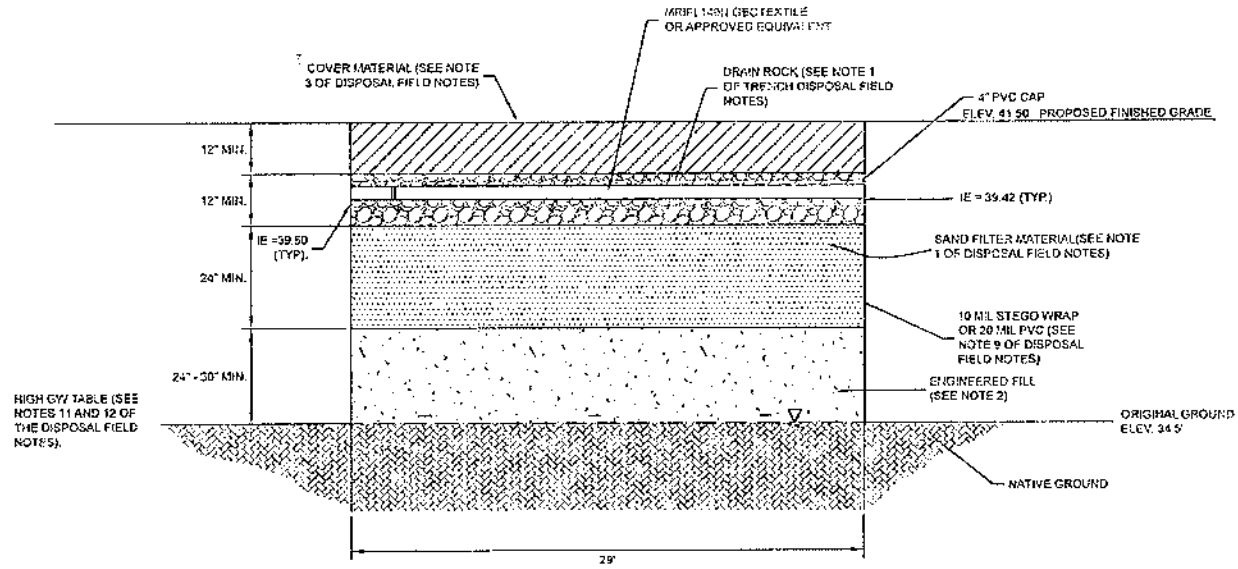
Black Eagle Consulting, Inc.
Geotechnical & Construction Services
1345 Digital Boulevard, Suite A
Reno, Nevada 89502-7140
Telephone: 775/334-1000
Facsimile: 775/334-7741

A1 BUILDER INVESTS, INC.
DETAILS FOR SEPTIC DESIGN
19445 TOGLIATTI WAY, APN 017-320-20
WASHOE COUNTY, NEVADA

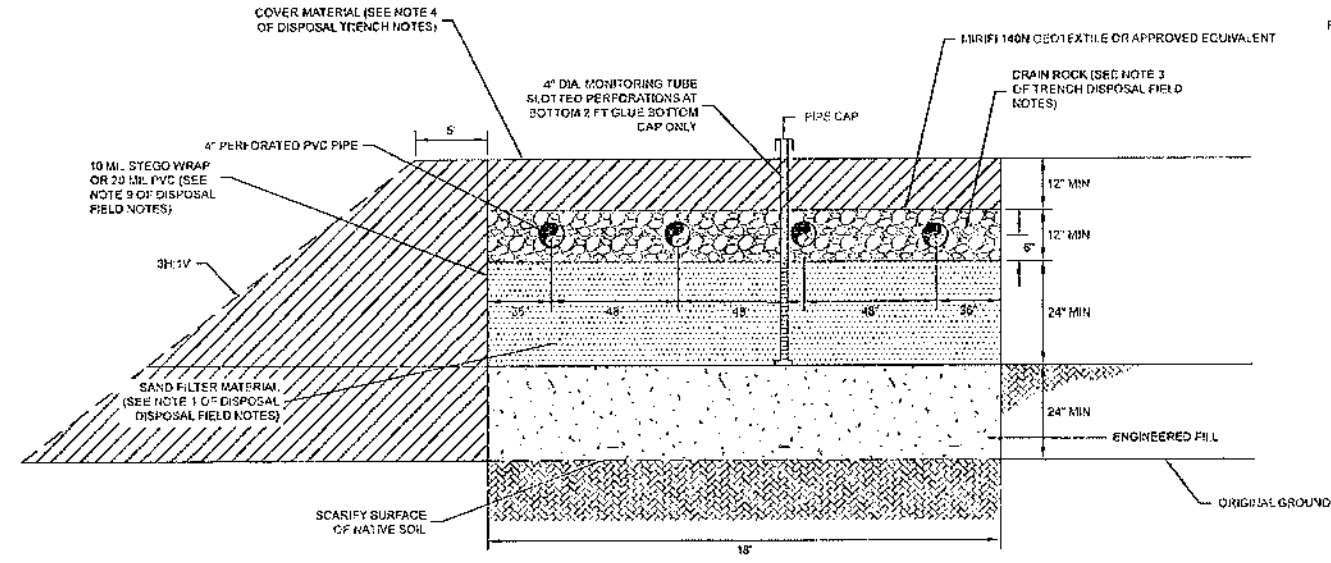
REVISION
1
DRAWING NO.
Plate 5a
2 of 3 SHEETS

DISPOSAL FIELD NOTES

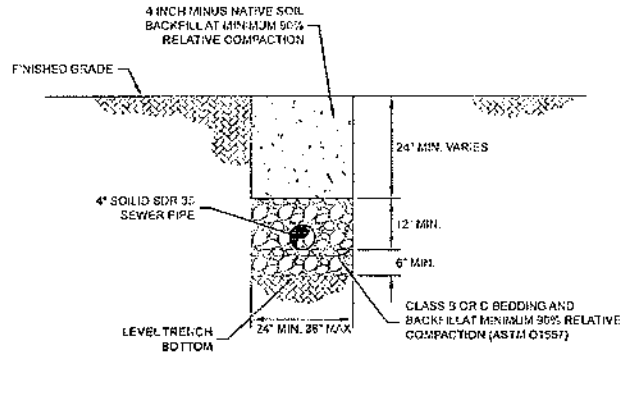
- SAND USED IN SAND FILTER MUST MEET WASHOE COUNTY DISTRICT HEALTH REGULATIONS (100.033-9.0).
- ENGINEERED FILL MATERIAL SHALL BE LIGHTLY COMPACTED AND HAVE AN IN PLACE PERCOLATION RATE OF 20-60 MINUTES PER INCH.
- DRAIN ROCK USED IN SAND FILTER MUST BE WASHED CLASS D OR D AND MEET WASHOE COUNTY DISTRICT HEALTH REGULATIONS (100.033-9.0).
- COVER AND SIDE SLOPE MATERIAL MAY CONSIST OF NATIVE SOILS (DISTRICT HEALTH REGULATIONS (100.033-9.0)).
- TWO MONITORING TUBES SHALL BE INSTALLED.
- CAP ENDS OF EACH PERFORATED PIPE IN DISPOSAL TRENCH AS SHOWN.
- USE MAXIMUM SEWER PIPE BENDS AND LATERALS OF 45 DEGREES.
- DOSING TANKS AND DISTRIBUTION BOXES TO BE LOCATED A MINIMUM OF 5' FROM DISPOSAL FIELD.
- 10 MIL STEGO WRAP OR 20 MIL PVC USED ON BOTH SIDES AND ENDS OF DISPOSAL FIELD TO BOTTOM OF SAND FILTER, OR EXTENDED TO MEET DAYLIGHT REQUIREMENTS (WCHD 04.049).
- SUBSURFACE CONDITIONS SHALL BE INSPECTED AND VERIFIED BY BLACK EAGLE CONSULTING, INC. DURING CONSTRUCTION.
- GROUND WATER TABLE SHOWN AS DETERMINED BY WASHOE COUNTY HEALTH DEPARTMENT.
- DESIGN BASED ON EXISTING GROUND ELEVATION OF 4934 AT SAND FILTER BED AND SEASONAL HIGH GROUND WATER AT 4934 FT ABOVE MEAN SEA LEVEL.
- THE BOTTOM OF THE DISPOSAL FIELD SHALL BE LEVEL.
- PERFORATED PVC PIPES SHALL GRADE DOWN 0.2 TO 0.3 PERCENT WITHIN DISPOSAL FIELD.



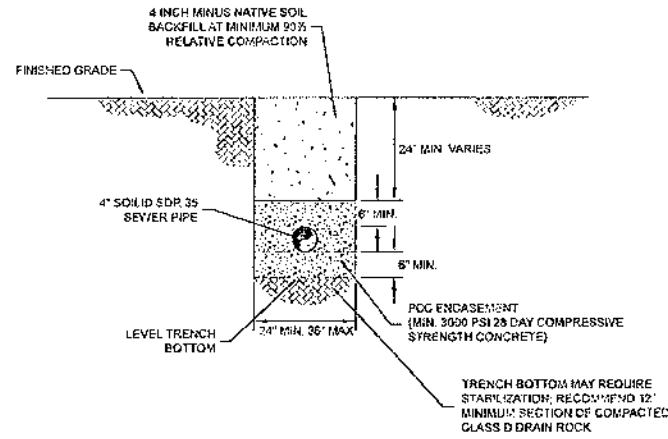
1
5b
TYPICAL SAND FILTER DISPOSAL FIELD PROFILE
NOT TO SCALE



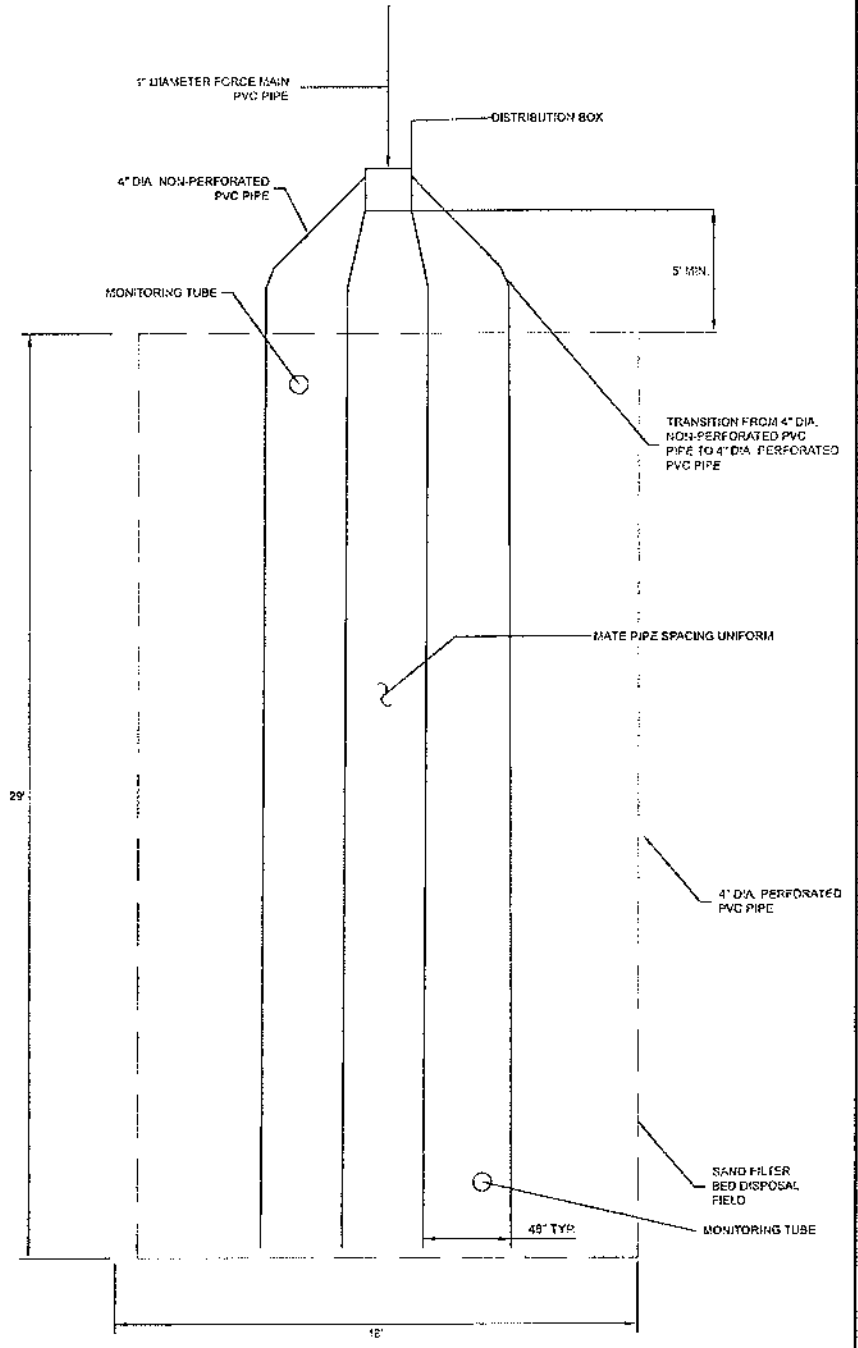
2
5b
SAND FILTER BED CROSS SECTION
NOT TO SCALE



3
5b
TYPICAL SEWER TRENCH CROSS SECTION
NOT TO SCALE



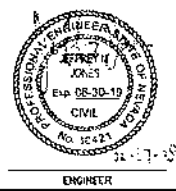
4
5b
IRRIGATION CHANNEL CROSSING SEWER TRENCH CROSS SECTION
NOT TO SCALE



5
5b
TYPICAL SAND FILTER BED DISPOSAL TRENCH LAYOUT
NOT TO SCALE

- IRRIGATION CHANNEL CROSSING NOTES**
- WITHIN 50 FT OF IRRIGATION CHANNELS OR WATER COURSES SEWER PIPE SHALL BE FULLY ENCASED WITH PORTLAND CEMENT CONCRETE.
 - THE ENCASEMENT THICKNESS SHALL BE A MINIMUM OF 6" AROUND THE ENTIRE PIPE.
 - PRIOR TO PCC PLACEMENT, THE SEWER PIPE SHALL BE SECURED TO PREVENT FLOATING OR DISTURBING THE PIPE.
 - PIPE GRADE SHALL BE INSPECTED BY BLACK EAGLE CONSULTING, INC. BEFORE CONCRETE PLACEMENT.

REVISIONS			
NO.	DESCRIPTION	BY	DATE
1	ISSUED FOR WCHD APPROVAL		

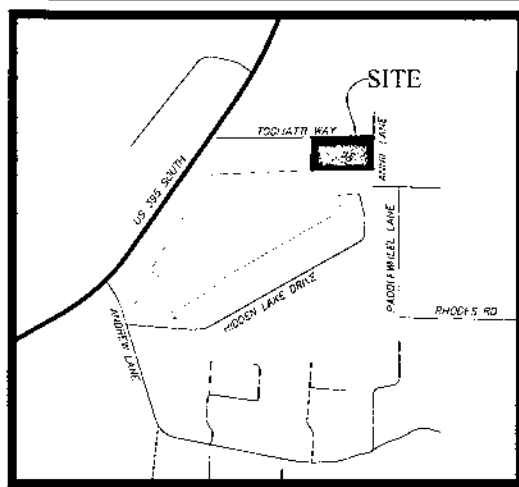


BY	DATE
DESIGNED JP	12-5-18
DRAWN WJ	12-13-18
CHECKED JP	12-14-18
APPROVED	
CUSTOMER APPROVAL	
SCALE AS SHOWN	
PROJECT NO. 2206-01-1	

Black Eagle Consulting, Inc.
Geotechnical & Construction Services
1345 Sophia Boulevard, Suite A
Reno, Nevada 89502-7149
Telephone: 775/256-6800
Facsimile: 775/256-7146

A1 BUILDER INVESTS, INC.
DETAILS FOR SEPTIC DESIGN
19445 TOGLIATTI WAY, APN 017-320-20
WASHOE COUNTY NEVADA

REVISION
1
DRAWING NO.
Plate 5b
3 of 3 SHEETS



VICINITY MAP

16950 S VIRGINIA ST
TOGLIATTI
APN 017-320-21
7.3 ACRES

NOTES:

1. ALL CONSTRUCTION SHALL BE PER WASHOE COUNTY SPECIFICATIONS AND ORDINANCES, WASHOE COUNTY NEVADA.
2. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND FEES REQUIRED FOR CONSTRUCTION.
3. THE CONTRACTOR SHALL VERIFY IN FIELD ALL ELEVATIONS, DIMENSIONS, FLOW LINES, EXISTING CONDITIONS, AND POINTS OF CONNECTION WITH ADJACENT PROPERTY (PUBLIC OR PRIVATE). ANY DISCREPANCIES SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL DAMAGE TO EXISTING UTILITIES DURING CONSTRUCTION.
4. THE CONTRACTOR SHALL MAINTAIN A DUST CONTROL PROGRAM, INCLUDING WATERING OF OPEN AREAS. THE CONTRACTOR SHALL ALSO MAINTAIN CONFORMANCE WITH SECTION 040.030 OF THE WASHOE COUNTY AIR POLLUTION REGULATIONS.
5. THE CONTRACTOR SHALL MAINTAIN AN ON-GOING PROCESS OF REMOVAL OF ALL SPRAYED OR EXHAUSTION MATERIAL ON ALL PAVED SURFACES.
6. LAND GRADING SHALL BE DONE IN A METHOD TO PREVENT DUST FROM TRAVELING TO ADJACENT LOTS.
7. THE CONTRACTOR SHALL NOTIFY ALL AFFECTED PUBLIC ENTRIES 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
8. THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER, THE SOILS ENGINEER, WASHOE COUNTY, TRWA, AND NV ENERGY 48 HOURS PRIOR TO COMMENCEMENT OF WORK.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGE TO EXISTING UTILITIES ENCOUNTERED DURING CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE UTILITY COMPANIES FOR LOCATIONS OR NOT-HOLDING PRIOR TO CONSTRUCTION.
10. ADD 1600 FEET TO ALL SPOT ELEVATIONS.

LEGEND:

- GRAVEL AREA
- MANHOLE (DASHED IF EXISTING)
- STORM DRAIN MAIN (DASHED IF EXISTING)
- SANITARY SEWER MAIN (DASHED IF EXISTING)
- SANITARY SEWER LATERAL
- CELFANOUT
- WATER MAIN (DASHED IF EXISTING)
- WATER SURFACE
- FENCELINE
- ELECTRICAL
- EXISTING CONTOUR
- PROPOSED CONTOUR
- EXISTING
- SLOPE IN PERCENT
- ELEVATION @ FINISH GRADE
- ELEVATION @ GRADE BREAK
- ELEVATION @ FLOW LINE

BASIS OF BEARINGS:

THE BASIS OF BEARINGS FOR THIS PROJECT IS NAD 83/94 NEVADA STATE PLANE COORDINATE SYSTEM, WEST ZONE BASED ON THE "D" WASHOE COUNTY CONTROL POINTS "93J5M0101" AND "93J5M0102" HAVING A BEARING OF N28°32'04"W AS SHOWN HEREON. A COMBINED GRID TO GRID FACTOR OF 1.000197939 WAS USED. ALL DISTANCES SHOWN HEREON ARE GROUND DISTANCES.

BASIS OF ELEVATIONS:

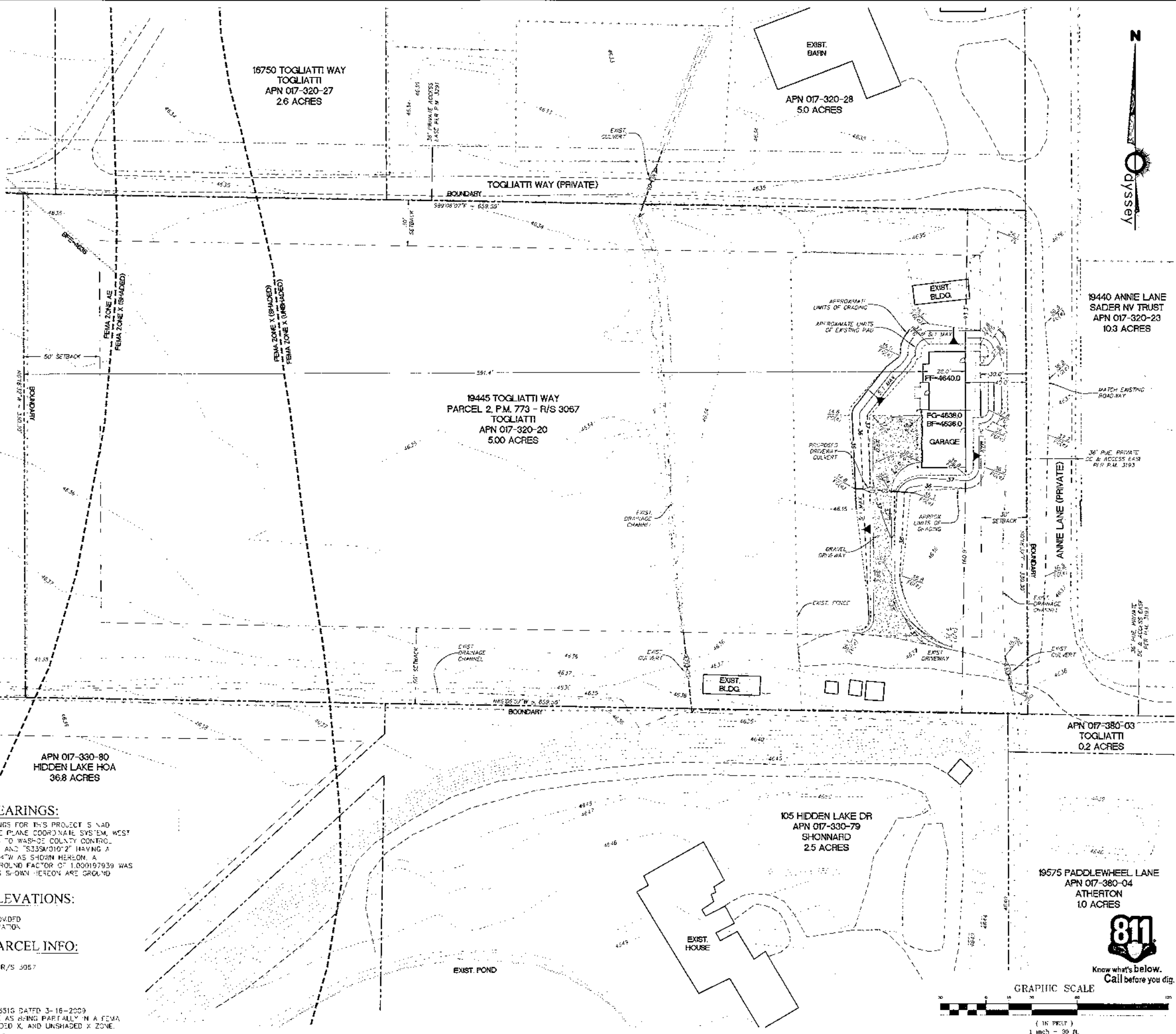
DATUM: NAVD 88
WASHOE COUNTY PROVIDED TO-GRADE INFORMATION

EXISTING PARCEL INFO:

APN: 017-320-20
PARCEL 2, P.M. 773, R/S 3057
5.00 ACRES
ZONING: DR

FEMA INFO:

FEMA FIRM 32031C35351G DATED 3-16-2009
DESIGNATES THIS SITE AS BEING PARTIALLY IN A FEMA FLOOD ZONE AE, SHADED X, AND UNSHADED X ZONE.



REV.	DATE	DESCRIPTION	BY	APP'D

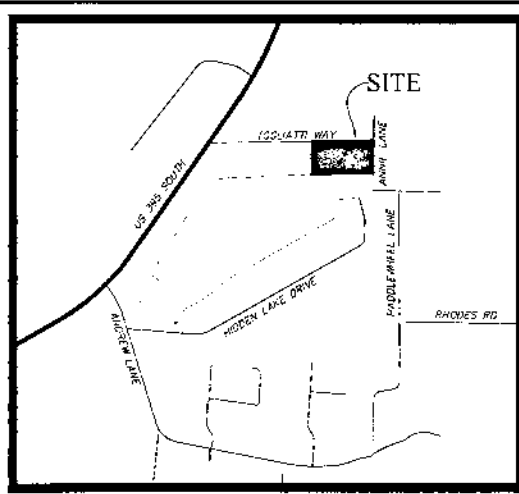
DATE: 11-15-18
DRAWN BY: ACAD2017
DESIGNED BY: G.S.W.
CHECKED BY: G.S.W.

ANGELO TOGLIATTI RESIDENCE
APN 017-320-20
CIVIL PLOT PLAN

NEVADA
WASHOE COUNTY

811
Know what's below.
Call before you dig.

SCALE
HORIZ. 1" = 30'
VERT. 1" = 10'
JOB NO.
SHEET
C-1
OF
1



VICINITY MAP

16950 S VIRGINIA ST
TOGLIATTI
APN 017-320-21
7.3 ACRES

16750 TOGLIATTI WAY
TOGLIATTI
APN 017-320-27
2.6 ACRES

EXIST. BARN
APN 017-320-28
5.0 ACRES

19440 ANNE LANE
SADER NV TRUST
APN 017-320-23
10.3 ACRES

19445 TOGLIATTI WAY
PARCEL 2, P.M. 773 - R/S 3067
TOGLIATTI
APN 017-320-20
5.00 ACRES

APN 017-380-03
TOGLIATTI
0.2 ACRES

APN 017-330-80
HIDDEN LAKE HOA
36.8 ACRES

105 HIDDEN LAKE DR
APN 017-330-79
SHONNARD
2.5 ACRES

19575 PADDLEWHEEL LANE
APN 017-380-04
ATHERTON
1.0 ACRES

NOTES:

1. ALL CONSTRUCTION SHALL BE PER UNIFORM STANDARD SPECIFICATIONS AND DRAWINGS, WASHOE COUNTY, NEVADA.
2. THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL NECESSARY PERMITS AND FEES REQUIRED FOR CONSTRUCTION.
3. THE CONTRACTOR SHALL VERIFY IN FIELD, ALL ELEVATIONS, DIMENSIONS, FLOW LINES, EXISTING CONDITIONS, AND POINTS OF CONNECTION WITH ADJACENT PROPERTY (PUBLIC OR PRIVATE). ANY DISCREPANCIES SHALL BE CALLED TO THE ATTENTION OF THE ENGINEER PRIOR TO PROCEEDING WITH CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR ANY AND ALL DAMAGE TO EXISTING UTILITIES DURING CONSTRUCTION.
4. THE CONTRACTOR SHALL MAINTAIN A DUST CONTROL PROGRAM, INCLUDING WATERING OF DRIVE AREAS. THE CONTRACTOR SHALL ALSO MAINTAIN CONFORMANCE WITH SECTION 040.02 OF THE WASHOE COUNTY AIR POLLUTION REGULATIONS.
5. THE CONTRACTOR SHALL MAINTAIN AN ON-GOING PROCESS OF REMOVAL OF ALL SPILLAGE OR EXCAVATION MATERIAL ON ALL PAVED STREETS.
6. LAND GRADING SHALL BE DONE IN A MANNER TO PREVENT DUST FROM TRAVERSING THE PROPERTY LINE.
7. THE CONTRACTOR SHALL NOTIFY ALL AFFECTED PUBLIC ENTITIES 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
8. THE CONTRACTOR SHALL NOTIFY THE PROJECT ENGINEER, THE SOILS ENGINEER, WASHOE COUNTY, TMAA, AND NV ENERGY 48 HOURS PRIOR TO COMMENCEMENT OF WORK.
9. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY AND ALL DAMAGE TO EXISTING UTILITIES ENCOUNTERED DURING CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE UTILITY COMPANIES FOR LOCATIONS OF UTILITIES PRIOR TO CONSTRUCTION.
10. ADD 4500 FEET TO ALL SPOT ELEVATIONS.

- LEGEND:**
- GRAVEL AREA
 - MANHOLE (DASHED IF EXISTING)
 - SEWER DRAIN MAIN (DASHED IF EXISTING)
 - SANITARY SEWER MAIN (DASHED IF EXISTING)
 - SANITARY SEWER LATERAL
 - CLEARCUT
 - WATER MAIN (DASHED IF EXISTING)
 - WATER SURFACE
 - FENCE LINE
 - ELECTRIC
 - EXISTING CONTOUR
 - PROPOSED CONTOUR
 - EXISTING
 - SLOPE IN PERCENT
 - ELEVATION @ FINISH GRADE
 - ELEVATION @ GRADE BREAK
 - ELEVATION @ FLOW LINE

BASIS OF BEARINGS:
THE BASIS OF BEARINGS FOR THIS PROJECT IS NAD 83/94 NEVADA STATE PLANE COORDINATE SYSTEM, WEST ZONE BASED ON TIES TO WASHOE COUNTY CONTROL POINTS "S335M0101" AND "S335M0102" HAVING A BEARING OF N28°32'04"W AS SHOWN HEREON. A COMBINED GRID TO GROUND FACTOR OF 1.000197538 WAS USED. ALL DISTANCES SHOWN HEREON ARE GROUND DISTANCES.

BASIS OF ELEVATIONS:
CALUM NAVD 88
WASHOE COUNTY PROVIDED TO GEOGRAPHIC INFORMATION

EXISTING PARCEL INFO:
APN: 017-320-20
PARCEL 2, P.M. 773, R/S 3067
5.00 ACRES
ZONING: CR

FEMA INFO:
FEMA FIRM 3203C3335G DATED 3/16/2009
DESIGNATES THIS SITE AS BEING PARTIALLY IN A FEMA FLOOD ZONE AF, S-AEED X, AND UNS-AEED X ZONE.



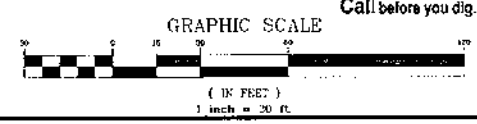
REV.	DATE	DESCRIPTION	BY	APP'D

DATE: 11-15-18
DRAWN BY: ACAD2017
DESIGNED BY: G.S.W.
CHECKED BY: G.S.W.

ANGELO TOGLIATTI RESIDENCE
APN 017-320-20
CIVIL PLOT PLAN
NEVADA
WASHOE COUNTY

800 N. HOA BLVD., SUITE 104, SPARKS, NV 89431
(775) 359-3303 FAX (775) 359-3326
CIVIL ENGINEERING
INCORPORATED

SCALE	HORIZONTAL 1" = 30'
VERT.	1" = 10'
JOB NO.	
SHEET	C-1
OF	1



STAFF REPORT

BOARD MEETING DATE: January 30, 2019

TO: Sewage, Wastewater, and Sanitation Hearing Advisory Board

FROM: James English, EHS Supervisor
775-328-2610, jenglish@washoecounty.us

SUBJECT: Variance Case #2-19S; Variance to Section 040.100 Table 1 Minimum Lot Size According to Slope Over Disposal Area, Parcel 030-204-07, 5025 Pleasant View Dr., Washoe County, NV

SUMMARY

This staff report summarizes the Environmental Health Services Division's (EHS) review of the submitted variance application for your decision to recommend or deny approval to the District Board of Health (DBOH) a variance for APN 030-204-07 which is owned by Mark and Kathleen Olsen. The variance requests a second dwelling on a parcel that is only sized for one dwelling.

Previous Action

There has been no previous action with this variance request. The parcel in question will be served by an onsite well.

Background

The variance correctly identifies the Washoe County Health District (WCHD) Regulations Governing Sewage, Wastewater, and Sanitation (regulations) required minimum acreage on the property as 1.5 acres per septic system (see Table 1, Minimum Lot Size According to Slope Over Disposal Area). The property owner wishes to construct two separate dwellings, one with three (3) bedrooms and one with a single bedroom. Section 120.075 requires that additional dwellings have their own septic system. The lot in question is 1.63 acres and by regulations would require three (3) acres for two (2) dwellings.

The regulations would not prohibit a single dwelling with four (4) bedrooms, or even more, provided the septic system is sized correctly. The basic premise of the variance request is that because the property is able to support a much larger single system, two separate dwellings with a total number of four (4) bedrooms will not create an adverse impact.

The proposal provides for a main dwelling of three (3) bedrooms and an accessory dwelling of one (1) bedroom, each with a 1000 gallon system. The regulations require that each system is sized to a minimum of 1000 gallons, or able to support up to three (3) bedrooms, even if the existing dwelling is smaller than three (3) bedrooms. Unless the Board places conditions on the variance, the Health District would allow expansion of the accessory dwelling up to three (3) bedrooms with the proposed system.

Staff has been on site to validate the proposed OSDS layout. Outside of a couple of minor design concerns that can be worked out during the Building Permit process, based on field observations it is believed that the proposed design layout matches the property and that the systems can be placed on-site meeting all setbacks. WCHD would allow a single system of this size on the property; this variance essentially allows for the system to be split in order to allow for two dwellings.

Findings of Fact

The Board must consider the following when making a recommendation on this variance to the DBOH:

1. Will the proposed variance result in contamination of water to the extent it cannot be used for its existing or expected use?

Reply: The proposed systems would be able to meet all relevant setbacks that a normal system would and so should not pose any additional threat to groundwater. Since the total system size between the two dwellings would be allowed for a single dwelling, it is not expected that any excessive sewage disposal or concentration that would be any different from a single dwelling would occur.

2. Will the proposed variance pose a threat to public health?

Reply: There are two primary ways that sewage can pose a threat to public health, direct exposure via surface and groundwater contamination in areas with domestic wells. All sewage would be discharged underground preventing direct exposure and as all setbacks and design requirements are met, no increased risk of groundwater contamination is expected.

3. Are there other reasonable alternatives?

Reply: WCHD regulations would require a minimum of three (3) acres on this property in order to allow for two dwellings. There is no alternative to placing the second dwelling other than the variance.

Conditions of Approval

1. WCHD is not recommending any conditions of approval at this time, as the overall sewage disposal is less than expected from that of a 6 bedrooms house and system. In these situations in the past, SWS Boards have deemed it appropriate to include restrictions on the total allowable bedrooms for either the primary or secondary dwelling. If the Board does determine that to be an appropriate measure, any conditions they set should be required to be recorded to the title, not be removed without Health District approval.

Recommendation

Staff recommends the Sewage, Wastewater and Sanitation (SWS) Hearing Board support the presented Variance Case #2-19S (Mark & Kathleen Olsen) to allow the approval of a secondary dwelling and septic system, with or without any bedroom restrictions that they may feel appropriate.

Possible Motion

Should the SWS Hearing Board wish to approve the variance application, the three possible motions would be:

1. “Move to present to the District Board of Health a recommendation for approval of Variance Case #2-19S (Mark & Kathleen Olsen) to allow the approval of a septic system as proposed, including all recommended conditions”; OR
2. “Move to present to the District Board of Health a recommendation for approval of Variance Case #2-19S (Mark & Kathleen Olsen) to allow the approval of a septic system as proposed, without conditions”; OR
3. “Move to present to the District Board of Health a recommendation for approval of Variance Case #2-19S (Mark & Kathleen Olsen) to allow the approval of a septic system as proposed, with the following conditions (list conditions)”; OR
4. “Move to present to the District Board of Health a denial of Variance care #2-19S (Mark & Kathleen Olsen).

The SWS Board may also formulate their own motion or request additional information from the applicant if desired.

H-713-40 2HSP08

<p>WASHOE COUNTY HEALTH DISTRICT ENHANCING QUALITY OF LIFE</p>	<p>WASHOE COUNTY HEALTH DISTRICT ENVIRONMENTAL HEALTH SERVICES DIVISION 1001 East Ninth Street • PO Box 11130 • Reno, Nevada 89520 Telephone (775) 328-2434 • Fax (775) 328-6176 www.washoecounty.us/health</p> <p>APPLICATION FOR VARIANCE TO THE REGULATIONS GOVERNING SEWAGE, SANITATION AND WASTEWATER</p>	<p>Office Use Only</p> <p>Fee Paid <u>\$2277.00</u></p> <p>Date Paid <u>11-26-18</u></p> <p>Cash/CC/Check <u>1397</u></p> <p>Receipt No. <u>104153</u></p> <p>Date Appl. Received <u>11/26/18</u></p> <p>Considered Comp. _____</p>
--	--	---

DATE 11/26/18 PROJECT NAME Pleasant View Septic System Designs for Residence & Guest House

OWNER

Name Mark & Kathleen Olsen

Address 1895 Prince Way, Reno, NV 89503

1-310-617-8420

Phone _____

Email Address mgolson@advancedgeoscience.com

ENGINEER

Name Ronald Anderson

Address 1255 Joy Lake Road, Reno, NV 89511

Phone 846-4163

Email Address rldband@aol.com

The following items must be submitted with this application:

JOB ADDRESS 5025 Pleasant View Drive

SIZE OF PARCEL 1.63 /Acre

COPY OF LEGAL DESCRIPTION AND VERIFICATION OF CURRENT VESTING ON TITLE

EXISTING PARCEL(S) APN(S) 3,020,407 LOT 29 BLOCK T.M. 1603a

REASON FOR VARIANCE REQUEST The owner wants to build a 3-bedroom house with a 1-bedroom guest house.

This parcel has more than adequate space for 2-independent standard septic systems each with repair areas.

Approval will be consistent with efforts for in-fill development to help reduce the area's housing shortage.

SECTION(S) OF REGULATIONS TO BE VARIED 040.020 Table 1, (average slope is 12%), between 10% - 20%

requires this parcel to have 1.5 acres for each house. The subject property has 1.631 acres adequate for 4-bedrooms.

IF A PARCEL MAP: PROJECT NAME _____

APN(S) _____ LOT _____ BLOCK _____

IF TENTATIVE MAP: PROJECT NAME _____

NUMBER OF PROPOSED LOTS _____ LOTS REQUIRING VARIANCES _____

LOT DESCRIPTION(S) _____

Prepare and submit this original application with 9 copies and 10 copies of a construction plot plan with specifications drawn to scale (minimum 1 inch = 30 feet) and include the required following requirements:

- Vicinity map.
- The direction of North.
- A diagram of the location of roadways, easements or areas subject to vehicular traffic, material storage or large animal habitation.

... continued from previous page

- ☒ A diagram of the location and distance to any well and on-site sewage disposal system within 150 feet of the subject property (if none, so indicate).
- ☒ A diagram of the distances from the proposed on-site disposal system to any proposed or existing on-site well.
- ☒ A diagram of the location of any percolation hole or test trench(es) on the property.
- ☒ A diagram to scale of the location of all proposed on-site sewage disposal system components, including a delineated area for future replacement of disposal trench(es).
- ☒ A diagram of the distance to any available sewer system (if none, so indicate).
- ☒ The number of bedrooms in the proposed building.
- ☒ The maximum slope across the disposal area.
- ☒ A diagram of the lot dimensions and total lot area.
- ☒ The location of water supply lines.
- ☒ A diagram of all structures on site.
- ☒ A diagram of all existing and proposed drainage improvements.
- ☒ A diagram of the location of any watercourse and/or natural drainage channel within 150 feet of the property (if none, so indicate).
- ☒ Soil logs and percolation test results, including calculations and actual field data (if required).
- ☒ Sewage loading calculations and application rates.
- ☒ System sizing calculations.
- ☒ Pertinent geological and hydrogeological information.
- ☒ Construction drawings, cross-sections and specifications of the proposed system.
- ☒ Certification by an engineer that the proposed system is properly designed to function for at least ten (10) years (engineer's seal).
- ☒ Submit a completed Notice of Special On-Site Requirements. We will give you the form after variance is approved by the District Board of Health.

BE PREPARED TO SUBMIT:

- ☒ Other information may be required to enable the Board to adequately consider the application.

THE SUBMITTED DATA, DOCUMENTS AND DESIGNS MUST DEMONSTRATE WHETHER:

1. The proposed system will significantly and/or adversely impact any water so that the water may no longer be used for its existing or expected beneficial use.
2. The proposed system will be detrimental or pose a danger to the public health, safety or create or contribute to a public health hazard.
3. Other reasonable alternatives for compliance with these regulations are available to the applicant. State the alternatives considered, including reasons for rejection.

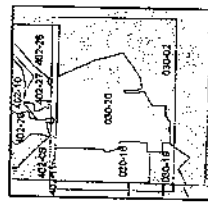
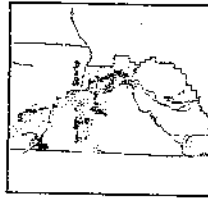
172400ALL INFORMATION MUST BE PROVIDED AND THIS APPLICATION MUST BE PROPERLY COMPLETED PRIOR TO SUBMITTAL. FAILURE TO DO SO MAY RESULT IN SIGNIFICANT DELAYS TO THE PROCESSING OF THIS VARIANCE REQUEST.

Assessor's Map Number
030-20

STATE OF NEVADA
WASHOE COUNTY
ASSESSOR'S OFFICE
Joshua G. Wilson, Assessor
1001 East Main Street
Reno, Nevada 89502
(775) 335-2321



0 50 100 150 200
Feet
1 inch = 200 feet



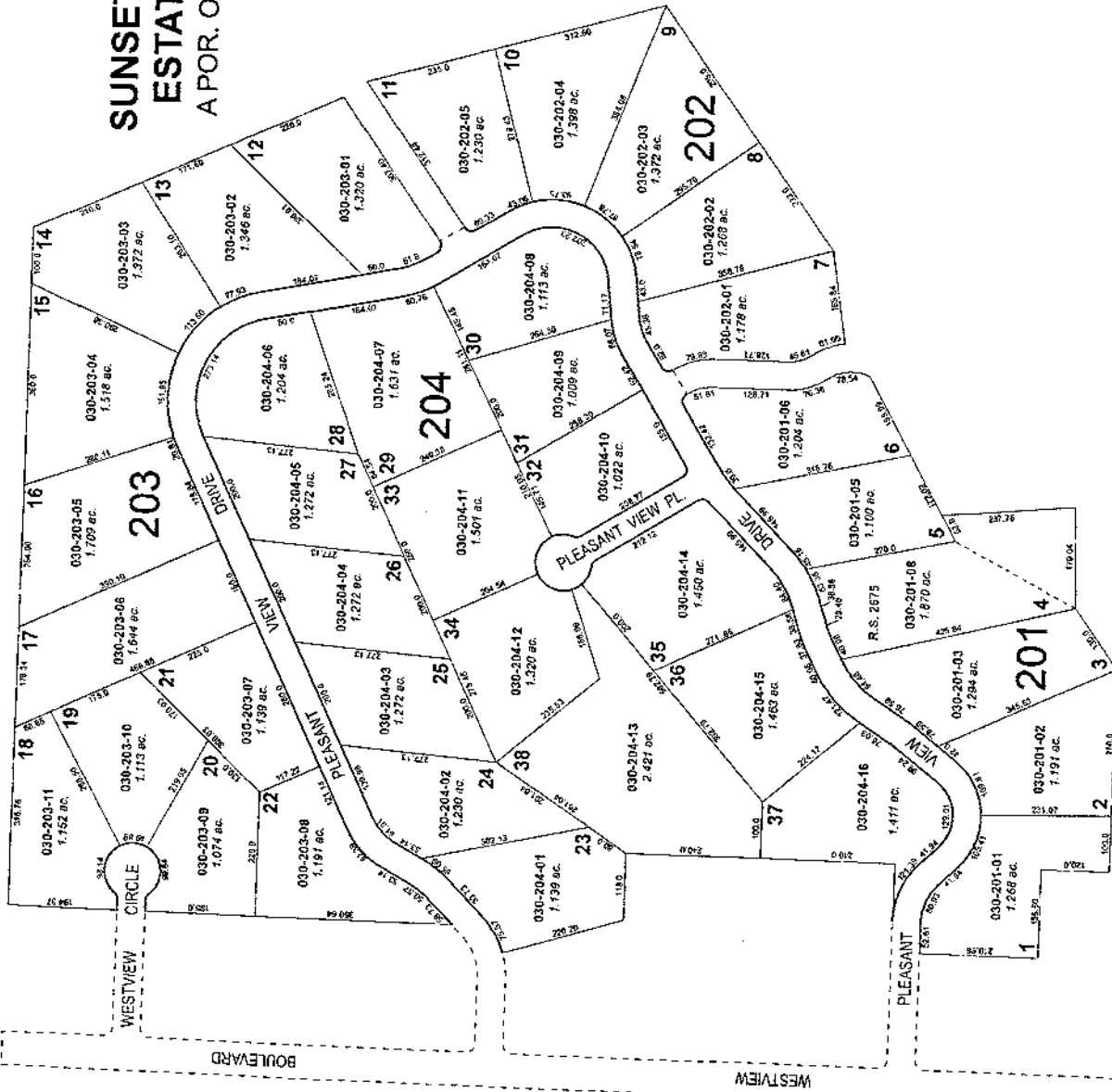
created by: **NLH 11/01/2012**

last updated:

see previously shown drawings

NOTE: This map was prepared for the use of the Washoe County Assessor's Office for administrative purposes only. It does not represent a survey of the premises. No liability is assumed by the Assessor's Office for any errors or omissions that may be discovered through.

(#1603)
SUNSET VIEW RANCHO
ESTATES UNIT NO. 2
A POR. OF THE N 1/2 OF SEC. 1
T19N - R20E

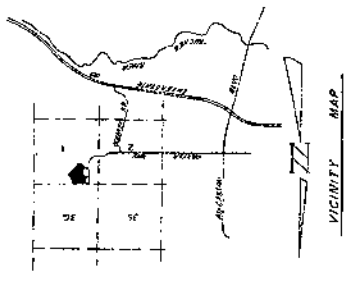
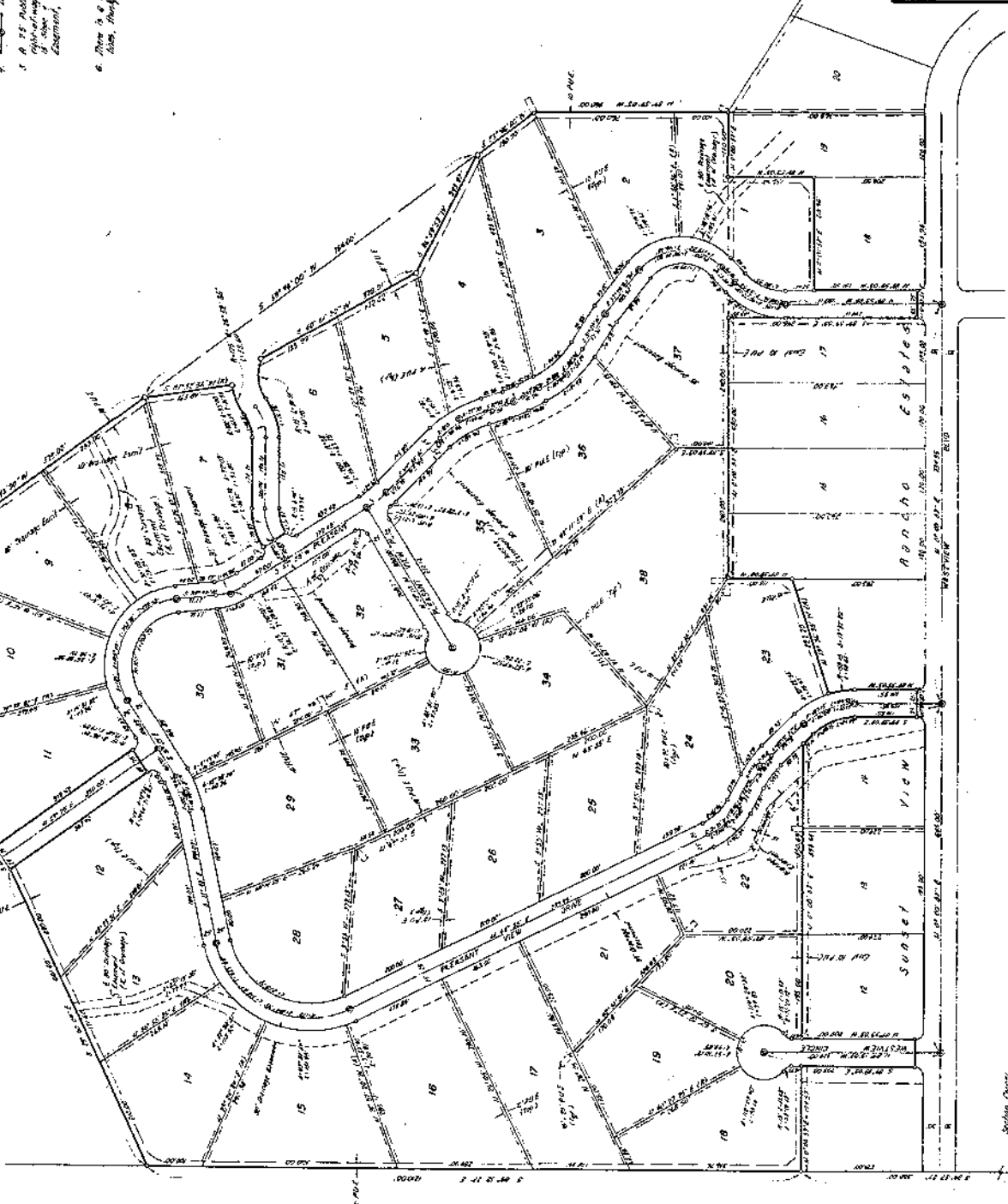


1603A



NOTES

1. Basis of bearings: The bearings of sunset view Subdivision as shown on Sunset View Ranch Estates.
2. A water utility easement is hereby granted within each of the acreage parcels of this subdivision and maintaining utility service facilities in their proper location, including, without limitation, the right of access at all times to the installation and the utility company.
3. P.U.C. denotes Public Utility Easement.
4. Includes County Standard Survey Measurement.
5. A 10' Public Utility Easement is hereby granted along all existing and proposed utility lines, including, without limitation, the right of access at all times to the installation and the utility company.
6. There is a 5' Surface Easement Easement and P.U.C. along all of them, there.



427840

SUBDIVISION PLAN
OF
**SUNSET VIEW RANCHO ESTATES,
UNIT NO. 2**
SITUATE IN NW 1/4 SEC. 1, T.19N., R.20E., M.08B.M.
OSGOOD ENGINEERS
RENO, NEVADA
MARCH 1976
SHEET 2 OF 2

CONJUNCTIVE WORKS SHOULD BE EXAMINED FOR SUBSEQUENT CHANGES TO THIS MAP

Subdivision - Tract Map # 1603A

1603A

Home » Assessor » Real Property Assessment Data

Real Property Assessment Data

WASHOE COUNTY ASSESSOR PROPERTY DATA										11/25/2018					
APN: 090-204-07 Card 1 of 1															
Owner Information & Legal Description						Building Information									
Status: 5025 PLEASANT VIEW DR, WASHOE COUNTY 89434						Quality:		Bldg Type:							
Owner: MOREAU-OLSEN, KATHLEEN						Stories:		Square Feet: 0							
Mail Address: PO BOX 4258						Year Built: 0		Square Feet does not include Basement or Garage Conversion Area.							
PALOS VERDES PENINSULA CA 90274						W.A.Y.: 0		Finished Bsmt: 0							
Rec Doc No: 4814956		Rec Date: 05/16/2018				Bedrooms: 0		Unfin Bsmt: 0							
Prior Owner: MOREAU-OLSEN, KATHLEEN						Full Baths: 0		Bsmt Type:							
Prior Doc: 4814821						Half Baths: 0		Gar Conv Sq Foot: 0							
Keyline Desc: SUNSET VIEW RANCHO EST 2 LT 29						Fixtures:		Total Gar Area: 0							
Subdivision: SUNSET VIEW RANCHO ESTATES 2						Fireplaces: 0		Gar Type:							
Lot: 29		Block:		Sub Map#:		Heat Type:		Det Garage: 0							
Record of Survey Map#:		Parcel Map#:				Sec Heat Type:		Bsmt Gar Door: 0							
Section: 1		Township: 19		Range: 20		Ext Walls:		Sub Floor:							
SPC:		Tax Dist: 4000		Add'l Tax Info:		Sec Ext Walls:		Frame:							
Prior APN:		Tax Cap Status: Use does not qualify for Low Cap, High Cap Applied		Roof Cover:		Obso/Bldg Adj: 0		Construction Mod: 0							
% Complete: 0		%:		Units/Bldg: 0		Units/Parcel: 0									
Land Information															
Land Use: 120		Zoning: A1		Sewer: None		NBC: DRHF									
Size: 71,046 SqFt or - 1.631 Acre		Water: None		Street: Paved		NBC Map: DR NBC Map									
Valuation Information						Sales/Transfer Information/Recorded Document									
Valuation History		2017/18 FV		2018/19 FV		V-Code DOR		Doc Date		Value/Sale Price		Grantor		Grantee	
Taxable Land Value		58,000		64,400		3BCT 120		05-16-2018		0		MOREAU-OLSEN, KATHLEEN		MOREAU-OLSEN, KATHLEEN	
Taxable Improvement Value		0		0		1G 120		05-15-2018		155,000		WALKER, MYNEER G		MOREAU-OLSEN, KATHLEEN	
Taxable Total		58,000		64,400		1G 100		06-30-1988		0		WALKER, MYNEER G			
Assessed Land Value		20,300		22,540		1G 100		11-01-1985		42,500					
Assessed Improvement Value		0		0				04-01-1977		16,000					
Total Assessed		20,300		22,540											
Building #1 Sketch						Property Photo									

If the property sketch is not available on-line you can obtain a copy by calling (775) 328-2277 or send an email to exemptions@washoecounty.us with 'Sketch Request' in the subject line. Please include the APN.



All parcel data on this page is for use by the Washoe County Assessor for assessment purposes only. Zoning information should be verified with the appropriate planning agency. Summary data may not be a complete representation of the parcel. All Parcels are reappraised each year. This is a true and accurate copy of the records of the Washoe County Assessor's Office as of 11/24/2018.

WASHOE COUNTY HEALTH DISTRICT
ENHANCING QUALITY OF LIFE

WASHOE COUNTY HEALTH DISTRICT
ENVIRONMENTAL HEALTH SERVICES DIVISION
1001 East Ninth Street • PO Box 11130 • Reno, NV 89520
Telephone (775) 328-2434 • Fax (775) 328-6176
www.washoecounty.us/health

SWS TEST TRENCH INSPECTION

Office Use Only

Fee Paid _____
Date Paid _____
Cash/CC/Check _____
Receipt No. _____

The section below must be filled out in order to receive inspection results:

APN: 030-204-07 Permit #: 4580 Date of Inspection: 8/7/2018 Time of Inspection: 09:45
Site Address: 5025 Pleasant View Drive
Inspection Requestor: Dan (Waters) Phone #: 742-4776
Email/Mail to: dmartin@watersvacuum.com

Attach map or plot plan showing property, vicinity map and location of proposed test trench location.

Trench GPS Coordinates: 39.54725, -119.69116

Soil Log: Trench #: 1 Depth: 13' Engineered / Estimated Perc. Rate (mpi): 45

Log Comments: 0'-2.5' (clayey top soil, roots to 1')

2.5'-13' (clayey sand with pockets of weathered rock, medium compaction)

Ground Water: Yes No Depth: _____ Bedrock: Yes No Depth: _____

Fractured Rock: Yes No Depth/Range: _____

Standard Septic System Allowed

Soil not Suitable for Standard System

A 1-3 bedroom house requires a 1,000 gal. tank with:

- 2 leach line(s); 2 feet wide, by 9 feet deep, by 56 feet long or

A 4 bedroom house requires a 1,200 gal. tank with:

- 2 leach line(s), 2 feet wide, by 9 feet deep, by 68 feet long or

A 5-6 bedroom house requires a 1,500 gal. tank with:

- 2 leach line(s), 2 feet wide, by 9 feet deep, by 84 feet long or

Other: _____

Perforated pipe is to be set at 3 feet below grade.

Comments: All setbacks must be observed during construction.

Inspected by: M. Christensen 792

Date: 8/9/2018

5025 PLEASANT VIEW
DESIGN CALL

11.8.18
RJA

*ASSUMPTIONS:

DESIGN PERL RATE = 45 min/inch

DESIGN LOADING RATE = $\frac{5}{\sqrt{45}} \approx 0.737$ gal/day/ft²

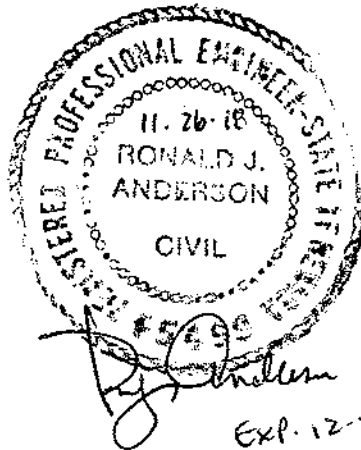
MIN. SIDEWALL AREA = $\frac{1000 \text{ gal}}{0.737} \approx 1357 \text{ ft}^2$

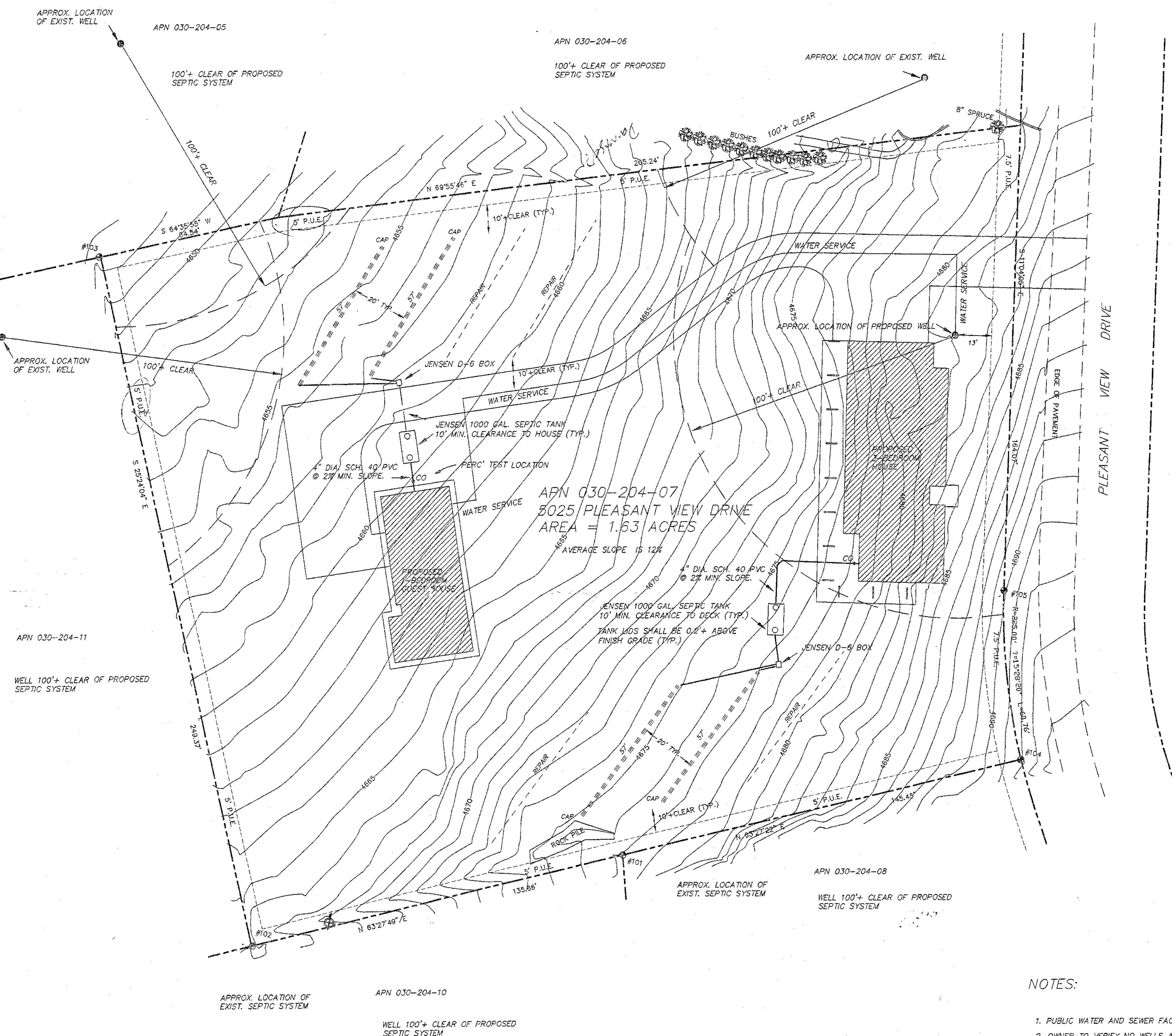
IF TRENCH GRAVEL IS @ 3' TO 9' B.G.S

$\therefore 2 \times 6 = 12 \text{ ft}^2/\text{ft TRENCH}$

THEN $\frac{1357 \text{ ft}^2}{12.0} \approx 113'$ LONG TRENCH

SAY 2 @ 57' EACH





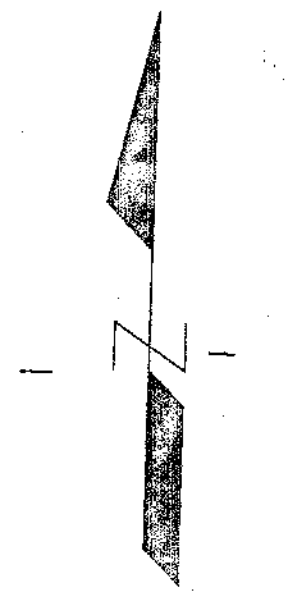
SEPTIC SYSTEM PLAN

1" = 20'

THIS DESIGN SUPPLEMENTS SITE DESIGN PROVIDED BY THE ARCHITECT.

OWNER TO VERIFY PROPOSED WELL
100'+ CLEAR OF EXIST. SEPTIC SYSTEMS

OWNER TO VERIFY PROPOSED WELL
100'+ CLEAR OF EXIST. SEPTIC SYSTEMS



1" = 20'

General Notes

- All work shall be done in conformance with these plans, specifications and design details including Washoe County District Health Department Regulations governing sewage, wastewater, and sanitation and recommendations contained in EPA Design Manual (625/1-80-012 "Purple Book") For On Site Waste Water Disposal Systems.
- Good construction techniques are essential if the system is to function properly. The following techniques must be followed. A contract for testing and inspection services is required.

SITE PREPARATION

- All truck & backhoe traffic over the completed trench area is prohibited to avoid native soil compaction.
- Reference stakes will be offset from the grading operations for proper orientation of the trenches and inspection purposes.
- Surface soils will be raked to a level surface at the grades indicated. Excavation must be witnessed and approved by a soils engineer.

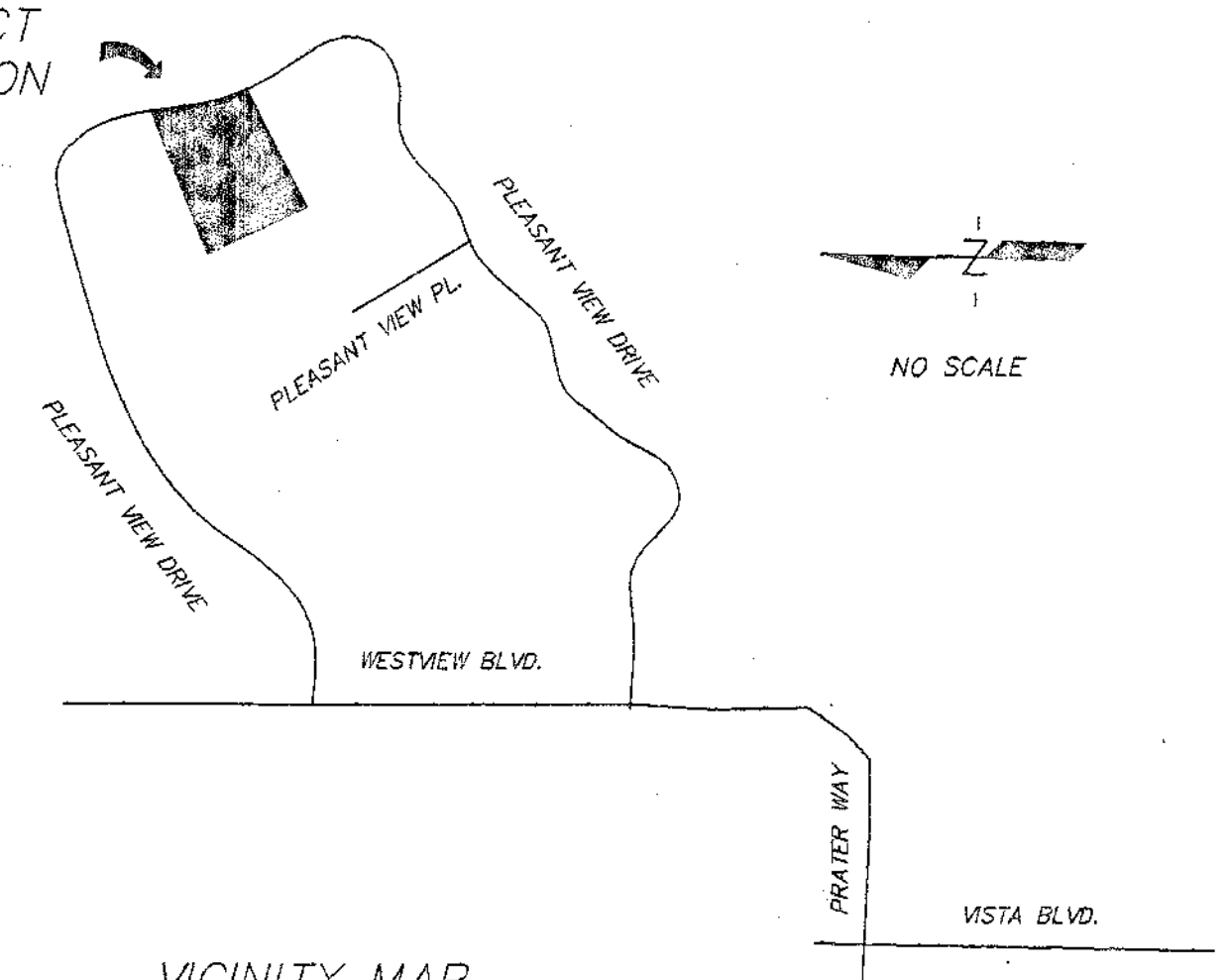
DISTRIBUTION NETWORK PLACEMENT

- Careful placement of the coarse aggregate is required.
- The distribution box must be placed so it will drain between doses. Laterals must be laid level.
- At least 4" of aggregate will be placed over the crown of the pipe. A suitable backfill barrier covers the aggregate (see section).

COVERING

- Native soils can be placed over the top of the bed.
- Shrubs can be planted around the base and up the side slopes. Shrubs should be somewhat moisture tolerant since the downslope perimeter may become somewhat moist during early spring and late fall.

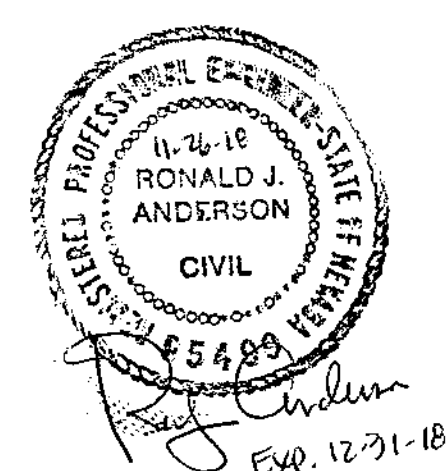
PROJECT LOCATION



VICINITY MAP
NO SCALE

NOTES:

- PUBLIC WATER AND SEWER FACILITIES ARE NOT AVAILABLE
- OWNER TO VERIFY NO WELLS ARE LOCATED WITHIN 100' OF THE PROPOSED SEPTIC SYSTEMS.
- OWNER WILL USE COUNTY SEWER & WATER WHEN IT IS AVAILABLE
- NO WATER FILTER BACKWASH IS ALLOWED IN THE PROPOSED INFILTRATION SYSTEMS.
- THE PROPOSED RESIDENCE HAS 3 BEDROOMS MAXIMUM.
- NO 100 YEAR FEMA FLOOD PLAIN AT SEPTIC SYSTEM.
- NO PUBLIC SEWER SYSTEMS WITHIN 400' OF PROPERTY
- PROPOSED & EXISTING WELL LOCATIONS SHALL BE VERIFIED BY THE OWNER.
- THIS DESIGN SUPPLEMENTS THE SITE DESIGN PROVIDED BY THE ARCHITECT.



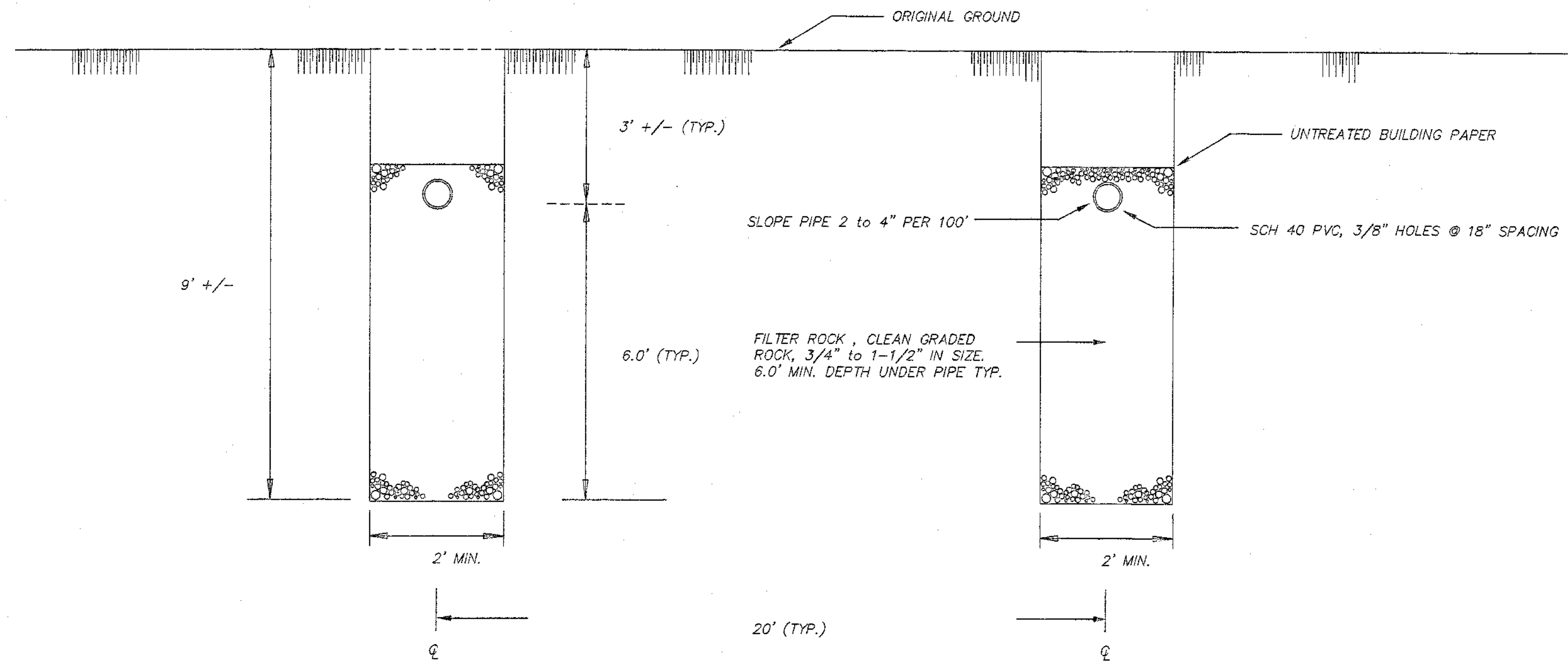
SEPTIC SYSTEM DESIGN
for
MARK & KATHLEEN OLSEN

PROPERTY
5025 PLEASANT VIEW DRIVE
SPARKS, NEVADA
APN: 030-204-07

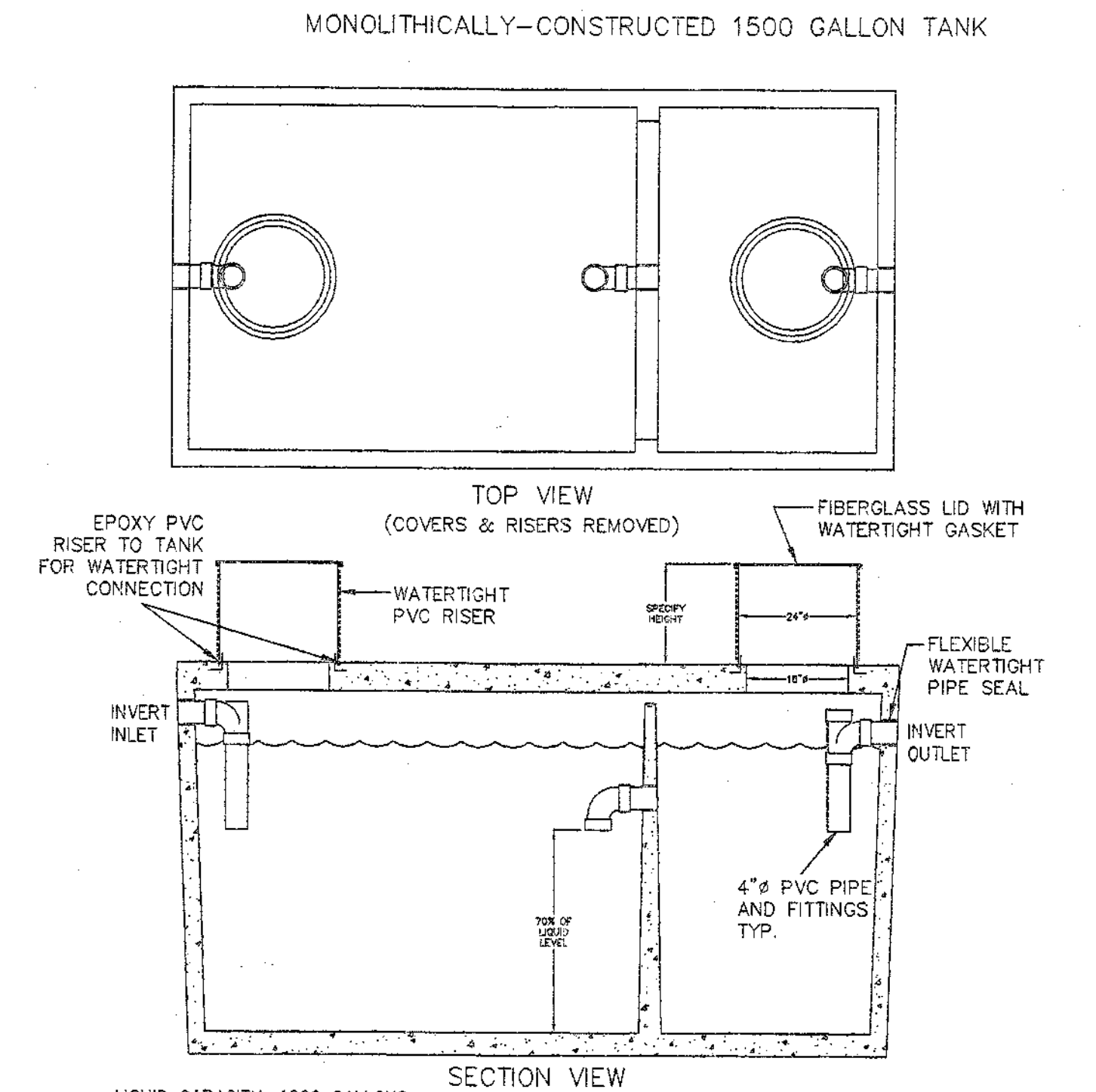
CONTACT
MARK OLSEN
1895 PRINCE
RENO, NEVADA
310-617-84

ANDERSON & ASSOCIATES
ENGINEERING

1255 JOY LAKE RD.
RENO, NV 89511
(775) 846-4163



INFILTRATION TRENCH DETAIL
NOT TO SCALE

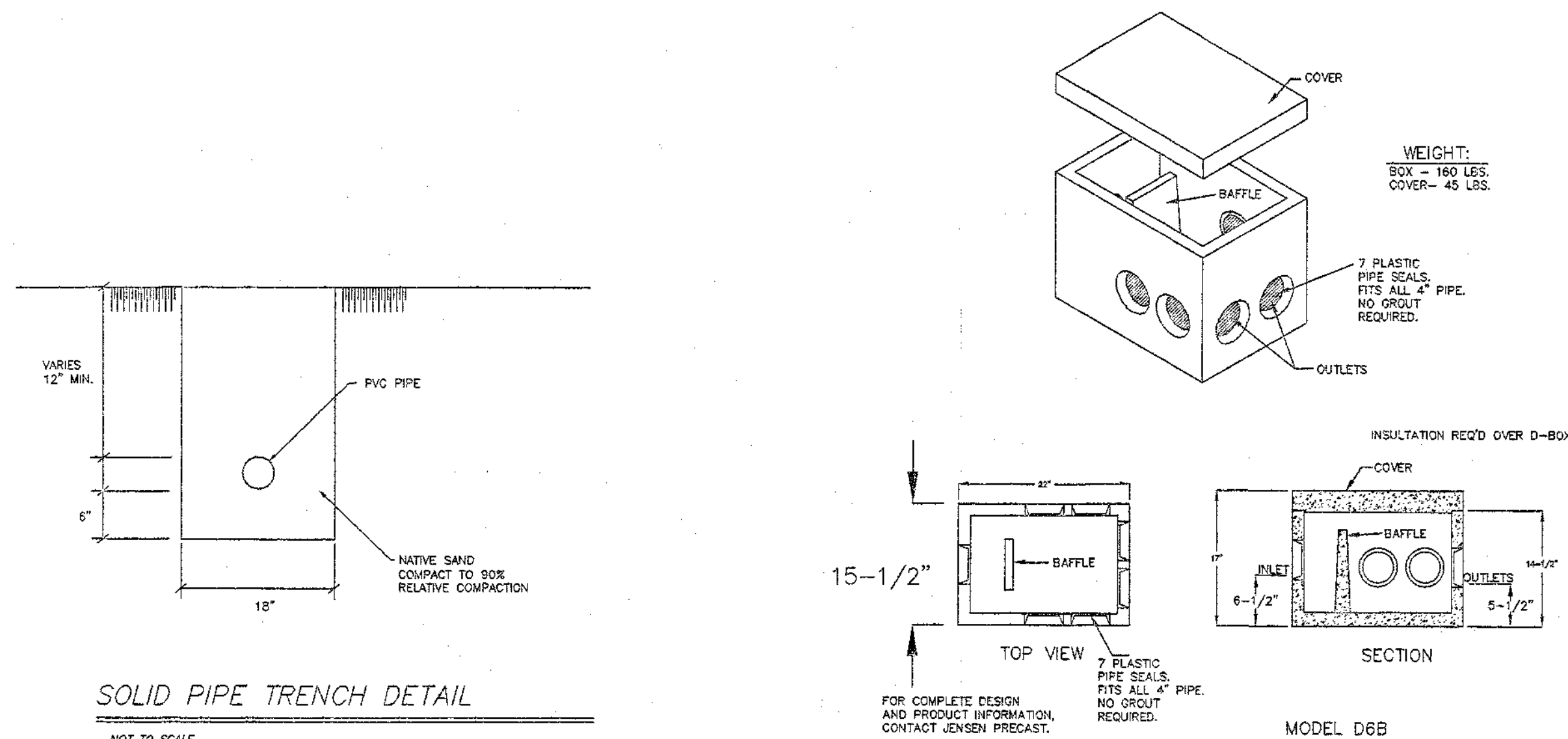


SECTION VIEW
LIQUID CAPACITY: 1000 GALLONS
BOX DESIGN LOAD: 4' OF SOIL COVER + 200 LBS./SQ. FT. SURCHARGE AND 2,500 LB. WHEEL LOAD WITH 4' OF SOIL COVER.
CONFORMS TO ASTM C1227, OSI "STEP" TANK SPECIFICATION, AND NPCA BEST PRACTICE MANUAL.
FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN PRECAST.

1000 GALLON SEPTIC TANK

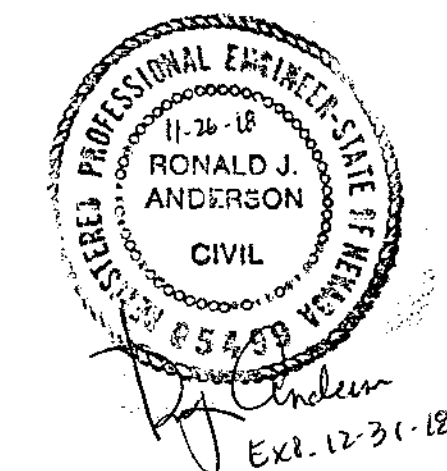
NOT TO SCALE

SEAL TANKS PER OWNERS SPEC'S



D-6 DISTRIBUTION BOX DETAIL
NOT TO SCALE

SOLID PIPE TRENCH DETAIL
NOT TO SCALE



SEPTIC SYSTEM DESIGN
for
MARK & KATHLEEN OLSEN

PROPERTY
5025 PLEASANT VIEW DRIVE
SPARKS, NEVADA
APN: 030-204-07

CONTACT
MARK OLSEN
1885 PRINCE WAY
RENO, NEVADA 89503
310-617-8420

ANDERSON & ASSOCIATES
ENGINEERING
1255 JOY LAKE RD.
RENO, NV 89511
(775) 846-4163

STAFF REPORT

BOARD MEETING DATE: January 30, 2019

TO: Sewage, Wastewater, and Sanitation Hearing Advisory Board
FROM: James English, EHS Supervisor
775-328-2610, jenglish@washoecounty.us
SUBJECT: Request for Standing Meeting for SWS Board

SUMMARY

Environmental Health Services (EHS) is requesting a return to a standing meeting date for the Sewage, Wastewater, and Sanitation Board (SWS) due to the increased amount of activity and difficulty obtaining a quorum.

Previous Action

There has been no previous action on this item since the original change to move from a standing meeting date.

Background

The Washoe County Health District Regulations Governing Sewage, Wastewater, and Sanitation (regulations) section 170.030 require that the SWS meet once a month unless there are no pressing matters to attend to. Until recently, a date was set each month and the meeting was scheduled to attend. Each month, the Board was contacted and asked if they would like to cancel the meeting if no items for consideration presented themselves. Due to the lack of activity, about three (3) years ago, the standing meeting was cancelled and the Board was only contacted when agenda items arose.

As activity has increased, including increased use of the SWS, this has presented problems. There is difficulty in finding a day that works for all five (5) Board members' schedules. This has resulted in delays to customer appeals and variance requests. EHS staff feels that returning to a standing meeting date that can be cancelled if there are no issues to be heard would benefit the expedient hearing of issues. The SWS could set a date that works for all Board members and then members could expect to attend unless notified otherwise.

If the Board chooses to set the meeting sometime during the first week of the month, it would be conducive to getting their recommendations to the Board of Health as quickly as possible to resolve any issues for clients.

Recommendation

Staff recommends the (SWS) Hearing Board vote to set a specific date each month that will act as the standing date for Board meetings. Staff recommendation is that it be held during the first week of each month to allow recommendations to get to the Board of Health in a timely manner.



Possible Motion

Should the SWS Hearing Board wish to vote to set a standing meeting date, a possible motion would be:

1. “Move to set the XX (date, specific day such as first Tuesday) of each month as a set date for the SWS Board meetings. Meetings to be cancelled if not needed.”

The SWS Board may also formulate their own motion or request additional information if desired.

STAFF REPORT

BOARD MEETING DATE: January 30, 2019

TO: Sewage, Wastewater, and Sanitation Hearing Advisory Board

FROM: James English, EHS Supervisor
775-328-2610, jenglish@washoecounty.us

SUBJECT: Proposed Change in Section 120.075 of the Washoe County Health District Regulations Governing Sewage, Wastewater, and Sanitation regarding the minimum acreage for second dwellings.

SUMMARY

Environmental Health Services Division (EHS) is proposing a change in the Washoe County Health District Regulations Governing Sewage, Wastewater, and Sanitation (regulations) regarding the minimum acreage for second dwellings. Specifically, the proposal modifies section 120.075, which addresses the septic requirements for second dwellings and guest quarters.

Previous Action

There has been no previous action with this proposal.

Background

Sections 040.005 – 040.030 are used to determine the minimum requirements for creating parcels to be served by septic. The section requiring a minimum of one (1) acre has been in place since March of 1991 (section 040.015) and the most recent parceling requirements require a minimum of one (1) acre, with an increase to five (5) acres after the creation of the first four (4) lots from existing lots. For many years, EHS has applied in practice the current parceling requirements of a minimum of one (1) acre per septic (section 040.030) to second dwelling requests, meaning that second dwellings were not allowed on parcels smaller than two (2) acres.

An appeal regarding this practice was heard by the Sewage, Wastewater and Sanitation Board (SWS) on October 10, 2018. EHS argued that the specific section in question was at best an oversight during the re-writing of the regulations and that the intent was to move to a one (1) acre minimum; the argument was made that many regulations include historic references but current code is what is applied to all new construction. The SWS Board disagreed and felt that the language within the regulations was clear and the practice of requiring the one (1) acre minimum was not a correct interpretation. The SWS Board recommended to the Board of Health that EHS discontinue the practice and apply the minimum lot size per dwelling that was required when the parcel was created. The Board of Health agreed with the SWS Board recommendation, and EHS has subsequently changed its practice.

The purpose of the steadily increasing minimum required acreage for parcels served by septic systems over time is to ensure that on-site sewage systems are able to adequately treat released sewage prior to

impacting groundwater and have space for repair area in the event of failure of the main system. As population concentration increases, the amount of sewage released per acre increases, and the risk of contaminated groundwater is elevated.

In addition, while basic septic technology has not changed dramatically, old style septic systems such as seepage pits are not considered adequate treatment and are no longer allowed. New style trench systems require a lot more area, which means that properties need more space to be able to meet setbacks and provide for adequate sewage disposal. EHS is more frequently seeing older parcels without a lot of space unable to meet the basic septic requirements when their original system goes into failure. This can lead to properties being forced into variance situations, and increases risk of repair system installation that could cause risks to both water resources and/or public exposure.

Based on the public health concerns and needs for adequate space for sewage disposal, EHS is proposing to amend the section of regulation that led to the confusion to return to the original intent since 1991 of requiring a minimum of one (1) acre per septic system/dwelling. The attached proposed regulation update institutes that minimum requirement. It also cleans up the section in its entirety, addressing some other items that needed updating to current practices, including:

- Getting EHS out of determining what structures are by eliminating the definition of a dwelling and/or structure. As a matter of practice, we have already eliminated this and defer to the Planning department, which has been a relief for customers who are not fighting two potentially disagreeing agencies and also simplifies the plan review process. The proposed edits codifies that Health will accept the Planning Department's designation.
- Cleaning up the terminology used to match Planning. The term of guest quarters is something that was essentially exclusive to EHS regulations and again caused confusion from customers. Planning simply designates buildings as structures or dwellings and these proposed edits capture that.
- Eliminating language that specifies the minimum size of a septic system as 1,000 gallons for second dwellings as it is redundant to section 060.005 which requires that the minimum sizing for any dwelling is 1,000 gallons. By replacing the specific sizing language in this section and simply referring back to the required minimum sizing, it eliminates the need to modify multiple sections in the event that our sizing requirements change in the future.

EHS feels that these proposed changes will codify the original intent and also make this particular section much simpler for customers to understand.

Recommendation

Staff recommends the Sewage, Wastewater and Sanitation (SWS) Hearing Board recommend approval to the District Board of Health of the proposed change in Section 120.075 of the Washoe County Health District Regulations Governing Sewage, Wastewater, and Sanitation regarding the minimum acreage for second dwellings.

Possible Motion

Should the SWS Hearing Board wish to recommend approval to the Board of Health, three possible motions would be:

1. “Move to present to the District Board of Health a recommendation for approval of the proposed change in Section 120.075 of the Washoe County Health District Regulations Governing Sewage, Wastewater, and Sanitation regarding the minimum acreage for second dwellings”, as presented; OR
2. “Move to present to the District Board of Health a recommendation for approval of the proposed change in Section 120.075 of the Washoe County Health District Regulations Governing Sewage, Wastewater, and Sanitation regarding the minimum acreage for second dwellings”, with the following conditions (list conditions) ; OR
3. “Move to present to the District Board of Health a recommendation for denial of the proposed change in Section 120.075 of the Washoe County Health District Regulations Governing Sewage, Wastewater, and Sanitation regarding the minimum acreage for second dwellings.

The SWS Board may also formulate their own motion or request additional information from EHS if desired.

The construction of additional ~~buildings to be used as living quarters as permitted by building and zoning codes may be served by an on-site sewage disposal system according to the following:~~

1. ~~If the additional building is designated as a separate single family dwelling, an individual septic tank, in addition to the one for the existing single family dwelling is required. This separate dwelling can have its own individual disposal field or it can use a disposal field in common with the existing dwelling as long as the combined field is sized according to the total volume of the tanks. An additional building shall be defined as a "dwelling" if it has a bathroom(s) and/or toilets, living area, and a kitchen. A "kitchen" is defined as an area that may be used for food preparation and which includes any combination of four (4) of the following items unless otherwise determined by the Health Authority:~~

- ~~a. A large or compartmental sink.~~
- ~~b. Counters and cabinets suitable for food preparation and storage.~~
- ~~c. Electrical connection and adequate space for a refrigerator.~~
- ~~d. Hood or venting apparatus.~~
- ~~e. Natural gas stub and/or 220 volt outlet.~~
- ~~f. Stubbed in plumbing for a future kitchen.~~

dwelling, as designated by the appropriate Planning Department are required to be served by their own septic system. The system must be designed to the minimum size required by these regulations.

Separate dwellings may occupy one parcel of land provided that the lot size ~~is at least equal to the number of dwellings times the minimum lot size required by sections 040.005 through 040.020~~ contains a minimum of 1 acre per dwelling. For example, two dwellings ~~utilizing an onsite well~~ require a minimum of two (2) acres ~~if located in an area where ground slope is less than 5%.~~

2. ~~An~~ Additional structures, as designated by the appropriate Planning Department, ~~building without a kitchen is designated as "guest quarters" and~~ may be served by an on-site septic system according to the following guidelines:
- a. ~~Guest quarters~~ Structures can connect to the septic tank and disposal field serving the main dwelling provided that the tank and disposal field is sized for the total number of bedrooms ~~between both structures.~~
 - b. ~~Guest quarters~~ Structures can have their own septic system provided that the lot size contains a minimum of 1 acre per septic system. ~~The minimum size of the septic tank is one thousand (1,000) gallons and the disposal field is sized according to the tank volume and number of bedrooms.~~ The system must be designed to the minimum size required by these regulations.

~~The addition of guest quarters will require conformance with sections 040.005 through 040.020 for only one (1) dwelling. In the above example, if the second living area did not have a kitchen, only a one (1) acre parcel would be required.~~