

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

**Tuesday November 20, 2018
6:00 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.
6:00 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)**
November 20, 2018
- 5. Approval of Draft Minutes – (For possible action)**
October 10, 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. – (**For possible action**)
Staff Representative: Latricia Lord

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 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. – (**For possible action**)
Staff Representative: David Kelly

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

- 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. – **(For possible action)**

Staff Representative: Dave Kelly

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

9. *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.

10. Adjournment – (For possible action)

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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
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Washoe County Health District Website www.washoecounty.us/health
State of Nevada Website: <https://notice.nv.gov>

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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

Wednesday, October 10, 2018

6:00 p.m.

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

1. *Roll Call and Determination of Quorum

Chair Anderson called the meeting to order at 6:01 p.m.

The following members and staff were present:

Members present: Ronald J. Anderson, P.E., Chair
Vonnie Fundin
Nick Vestbie, P.E.

Members absent: Matthew Buehler
Matt Smith - Alternate
Ray Pezonella, P.E - Alternate

Ms. Rogers verified a quorum was present.

2. *Pledge of Allegiance

Mr. Vestbie led the pledge of 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

October 10, 2018

Mr. Fundin moved to accept the agenda for the October 10, 2018, Sewage, Wastewater and Sanitation Hearing Board meeting. Mr. Vestbie seconded the motion which was approved three in favor and none against.

5. Approval of Draft Minutes

May 7, 2018

Mr. Vestbie moved to accept the minutes of the May 7, 2018 Sewage, Wastewater, & Sanitation Board meeting as written. Mr. Fundin seconded the motion which was approved three in favor and none against.

- 6. Public Hearing to consider an appeal to the Health District's decision to not allow a reduced setback to a public utility easement, Section 040.095 of the Regulations of the Washoe County District Board of Health Governing Sewage, Wastewater, and Sanitation..**
Staff Representative: David Kelly

Jeff and Penelope Filce
330 Ember Drive
Sparks, NV 89436
Assessor's Parcel Number 089-523-08

Chair Anderson opened the Public Hearing.

Mr. Kelly summarized the staff report, informing that Washoe County Code requires the septic system to have a setback to any new buildings and that the property maintains room for a second area for a septic system that also meets setback requirements should the first fail. He informed that, upon inspection, a second area that would meet setbacks could not be found on the property.

Mr. Kelly informed they did find a location that would be slightly less than the ten foot required setback to the utility easement. The property is also within 200' of the sewer system, and by regulation, they would be required to hook into the sewer system rather than place a repair system on their property. However, because there are variances and other reasons why a property owner might not connect to sewer, EHS requires they maintain sufficient repair area until connection to sewer is completed.

Mr. Kelly stated that the property owner's appeal is regarding the decision of EHS to disallow a reduced setback to the utility easement per Code, but, due to the proximity of the property to sewer, the minimal reduction requested in the setback and the willingness of the appellant to record a mandatory connection to the sewer, EHS would support the appeal.

After the Board's discussion, Mr. Vestbie opined that the Board should support the appeal.

Mr. Vestbie moved to support the appeal to the Health District's decision to not allow a reduced setback to a public utility easement, Section 040.095 of the Regulations of the Washoe County District Board of Health Governing Sewage, Wastewater, and Sanitation, based on the agreement to connect to the sewer if the septic system fails. Mr. Fundin seconded the motion which was approved three in favor and none against.

Chair Anderson closed the Public Hearing.

- 7. Public Hearing to consider an appeal of the Health District's interpretation of Sections 040.005-040.030 regarding minimum acreage required per septic system and related Section 120.075 regarding second dwellings of the Regulations of the Washoe County District Board of Health Governing Sewage, Wastewater, and Sanitation**
Staff Representative: David Kelly

Linda and Allen Eisele
15540 Cherrywood Drive
Reno, Nevada 89511
Assessor's Parcel Number 045-583-01
Mountain Meadows Subdivision 1
Lot 40 Block 1

Chair Anderson opened the Public Hearing.

Mr. Kelly informed the Health District's interpretation of regulations is being questioned in regards to the minimum acreage required for a septic system in relation to an addition of a second dwelling. He stated the property involved in this appeal is .92 acres, and that the regulations have been interpreted to require a minimum of one acre per septic system for current construction standards since 1991. He stated that; for a second dwelling to be added, a separate septic system would be required but would not be allowed if the property was less than two acres.

Mr. Kelly informed discussions with the property owners began in January 2018 and the regulations and the Health District's stance were outlined for the owner at that time. In August 2018, an application was received by the Health District for an accessory structure, and that the plan included bedrooms. Mr. Kelly informed that the Health District's practice is to involve Washoe County Planning Department to designate whether the proposed build is a structure or a dwelling for a uniform determination of the project. In this instance, Planning determined the structure as proposed would be a dwelling and could be allowed under the condition the bedrooms be removed and the property owner file a deed restriction that the structure would not be used as living quarters.

Mr. Kelly stated that option was not the desire of the property owner, and the contractor on the project, Mr. Perkins, disagreed with the Health District's interpretation of the regulations.

Mr. Kelly highlighted the section of the regulations that outlines parcel size requirements, and informed the Health District's interpretation of these regulations is that they pertain to the creation of parcels; this is supported by later regulations that require parcel sizes to be increasingly larger. He stated the application of the regulations by EHS in practice is that, a parcel created in the time of the earlier regulation would allow for a dwelling to be built on it; however, all current construction requires a minimum of one acre.

Mr. Kelly informed that this practice aligns with other building codes in that existing construction prior to regulation change would be 'grandfathered' in, but all new construction would be required to meet current construction practices.

Mr. Kelly stated that EHS has offered the appellant the variance process to address this issue, and, depending on the Board's decision, may return to apply for a variance. He stated that the current request before the Board is a review of the Health District's interpretation of the regulations and their application. The appellant's stance is that, because the parcel was created in 1973, they shouldn't be required to adhere to the newer requirement of one acre per septic system.

Mr. Vestbie inquired what staff's recommendation is. Mr. Kelly stated that, based on EHS practices dating from 1991 and that of current construction being required to meet current construction standards; staff recommends denial of this appeal.

Chair Anderson stated the most important point is that there is a path forward for the owners to request a variance; an option for fair hearing of their request for possible approval.

Mr. Carl Perkins informed his company is Grizzly Construction and introduced himself as a General Contractor. He stated he is representing the Eisele family.

Mr. Perkins informed that regulation 120.075 refers back to a table and regulation stating that if your lot was created during a certain time frame, that one should apply that time frame and whether or not the property is on municipal water or well to calculate the acreage per dwelling. He informed that, based on the regulations and his interpretation, the determining factor is not when construction will begin, but when the lot was created.

Mr. Perkins informed he had provided evidence that the lot was created in 1973, and using the prescribed calculation with the property as being connected to municipal water, the

requirement is one third acre per dwelling. Mr. Perkins stated the lot is .93 acres so would accommodate two dwellings at the required one third acre each.

Mr. Vestbie inquired if Mr. Perkins had written the draft for this appeal; Mr. Perkins confirmed that he had. After review of regulations, Mr. Vestbie opined that the property in question meets the requirements for one third acre per dwelling and so would accommodate two dwellings. Mr. Perkins agreed.

Mr. Vestbie stated his decision was based on there being no date parameters referenced for lot creation in regulation 120.075, but if there had, it could be reason to deny the appeal.

Chair Anderson inquired if this is the current regulation. Mr. Vestbie said it was.

Chair Anderson stated that Mr. Vestbie's is one interpretation. He stated that had not been the interpretation previously. Mr. Vestbie stated it is not an interpretation but a fact, written in the regulations.

Chair Anderson stated this issue has come before the Board and the Planning Department before and that the interpretation of one acre per septic has been used by the County for a number of years. Mr. Kelly agreed that a one acre minimum was applied in all instances he has seen. Mr. Kelly stated that the Dwellings section of the regulations was being considered as the appellant's argument which refers back to the section covering Parcels. Chair Anderson requested Mr. Kelly expand on that concept.

Mr. Kelly stated that the 040 sections referenced are the historical processes that has changed over time, informing there had once been no required lot size, then a minimum lot size was required with size dependent on whether the parcel was on community or well water. He informed that the distinction of water source was then removed. Now, he informed that the minimum per dwelling is one acre, but if parceling a large plot of land such as in Palomino Valley, the lot size is five acres. He stated that there has been a historical progression of how parcel sizes are applied in the Health District's approval of parcel maps. Why the Dwelling section was not changed, he was not clear, but that the interpretation has always been current construction must meet current code, and the current code is a minimum of an acre per septic system.

Mr. Vestbie stated that in his opinion, the interpretation should be changed; that because a misinterpretation has occurred in the past is no reason to continue with the interpretation.

Chair Anderson stated the current regulations were considered in previous instances of the one acre minimum being applied. Mr. Vestbie stated the regulations under consideration are current.

Mr. Perkins inquired if the Board had any questions for him and thanked them for their time.

Chair Anderson stated the regulations have become more strict over time and the interpretation is one acre per septic system. He inquired if Mr. Vestbie opined there to be a flaw in the regulations; that it's possible the regulations need to be changed to be consistent.

Mr. Vestbie stated it is not a flaw, it is the regulation.

Ms. Admirand stated she had reviewed some related history and the reason some of those provisions still exist in the regulations are to provide for non-conformance issues; these allow for conditions to be grandfathered in that were lawful at the time but would not meet current standards. She stated that is part of the reason the provisions still exist within the regulations.

Ms. Admirand stated she wanted to bring another provision to the Board's attention regarding interpretation of the regulations that state, if there are more than one interpretation and it is the Board's decision to determine if there is, the stricter interpretation prevails. She then read the provision verbatim. Chair Anderson inquired if that provision was to be applied across the board, Ms. Admirand confirmed it was.

Mr. Vestbie stated that would mean that they cannot disagree with current interpretation. Ms. Admirand stated that would be the Board's decision.

Mr. Vestbie inquired why the Board was hearing this appeal if they could not decide the outcome.

Chair Anderson agreed he had a good point, but the process is that if you cannot meet the current regulations as interpreted, you can request a variance, provide information and present your case. He stated he sympathized with the appellant and that the Board was there to help them, but that it appeared that staff had done a good job. He stated the variance process is available to them.

Mr. Perkins agreed and stated if the appeal isn't approved, they would go forward with the variance process. He inquired, if current standards are being followed and code states that an acre minimum lot size is required for lots created from 1992 – 2001, why would a parcel created in 1973 be interpreted as being within the scope of that regulation and not the one he cited in his appeal?

Mr. Vestbie moved to approve the variance to allow another house be built on the 0.929 acre parcel.

Ms. Admirand requested the motion to be changed to approve the appeal versus the variance for the record.

Mr. Vestbie moved to approve the appeal to allow another house to be built on the 0.929 acre parcel. Mr. Fundin seconded the motion, which was passed two in favor and one against.

Chair Anderson closed the Public Hearing.

8. Discussion topic for possible direction to staff regarding use of sand as a substitute for soil in Onsite Sewage Disposal Systems (OSDS).

Staff Representative: Dave Kelly

Mr. Kelly stated that current septic regulations require a vertical separation from groundwater. Situations with high ground water can make it difficult to achieve setback margins. He informed that sand filters could be installed and the vertical setback would be reduced to two feet.

He informed there are times when the ground water is higher it has been practice to require an engineered soil to be put in place designed, certified and tested to meet the capabilities of native soils to treat sewage.

Mr. Kelly informed engineers have occasionally suggested using more sand in the filter to satisfy the requirement, but this has not been allowed to date. He stated EHS is seeking feedback from the Board on the questions within the staff report to determine if the Board feels sand could be a suitable alternative to soil.

Chair Anderson covered variables, and inquired if perhaps regulations needed to be modified to better allow for application.

Mr. Kelly stated that he would like to the Board to consider the questions to determine if the use of sand as a substitute for soil is a viable option, ie: can sand be compacted, tested, designed and certified to meet the needs of sewage treatment. He stated the goal is to have consistent standards set for application.

Mr. Vestbie opined regulations will have to be changed to provide for the use of sand in applications apart from those already detailed.

After discussion, Mr. Kelly stated the takeaway he had from the Board is that they would consider the use of additional sand in lieu of engineered soils in certain situations. The sand

would need to be the same sand type as required for sand filter systems and the percolation rate of the soil interface needed to be taken into account. Chair Anderson stated he agreed with Mr. Kelly's understanding of their discussion.

Mr. Kelly informed the reason these types of issues are brought before the Board is to provide consistency and build procedures in a way works for industry and the public.

Chair Anderson stated it is important to have a uniform policy being applied. Mr. Kelly informed that he will take information back to the team to discuss how it will be applied in the field. He opined that the better way to address these issues is through regulation but that this direction gives them a way forward until those can be amended.

Mr. English inquired if the Board would agree that the information paraphrased by Mr. Kelly regarding the subject of sand usage could be taken from the minutes of this meeting as future direction for staff. Chair Anderson stated the minutes would be reviewed at the next meeting and would be discussed as necessary to possibly agree on a policy statement. Mr. English suggested staff create a policy statement that could be brought back to the Board if they wanted to review and approve it, but requested the ability to utilize the staff policy until a formal motion would be made by the Board. Chair Anderson requested the item to be brought back to the Board at a future meeting.

Ms. Admirand inquired of Chair Anderson, in order for the record to be clear, that the Board is not taking any action or making any direction to staff to implement any of the measures, but are requesting that more information be provided and be presented at the next SWS Hearing Board Meeting. Chair Anderson agreed her statement to be correct and that this discussion will be continued at a future meeting as an agenda item.

9. Discussion topic for possible direction to staff regarding standard variance package for the installation of domestic drinking water wells where the lots are too small to meet current setbacks.

Staff Representative: James English

Mr. English informed there are parcels that don't meet any of the required setbacks for placement of a well as determined by regulation, and that many of these issues come to light in an emergency situation when the existing well has failed.

Mr. English stated staff are proposing a standard variance package to include provisions staff could apply in situations similar to circumstances previously approved in individual variance hearings without having to go through the individual variance hearing process. He informed that, if the Board would consider a standard variance package, staff is requesting Board's direction regarding the types of provisions the package variance would entail.

Mr. English stated EHS doesn't monitor residential groundwater quality, but does insure the well is properly drilled to be the most protective of groundwater.

Chair Anderson stated there is always an option to retrofit a septic system with a denitrifying unit and a disinfection unit to prevent E.coli and nitrate contamination.

Mr. Fundin stated regulations require a well to be set back one hundred feet from a pond, stream or septic system, and opined it didn't make a difference if the setback was vertical or horizontal if the sanitation seal is installed properly.

Mr. Kelly informed EHS is beginning to see well failures in Verdi and Wadsworth and some of the properties would not meet setback regulations. He stated he appreciated the Board's comments, but directed them to the intent of this item which is not to address regulations at this meeting, but to ascertain if they feel a variance package to be an appropriate process. If so, staff would design a draft based on conditions previously allowed in individual variance hearings to be brought back to the Board as if it were a variance for their direction and possible approval. If it were approved, such a variance package would

allow staff to apply the variance package as appropriate without having property owners apply for individual variance from the regulations. In the situations where required setbacks cannot be met, this package would alleviate the excessive costs to the property owners of these very small lots.

Mr. English informed the intent is to bring the draft of the variance package before the Board at the next SWS Hearing Board Meeting for review and possible approval. He informed it is often an emergency situation where the existing well has failed or the water supply is a questionable source, and stated staff are looking to develop a framework that would be most protective of the environment, ground water and the property owner.

Mr. English opined that staff could develop a variance package that would be acceptable to the Board, which, when approved, would allow these situations to be resolved without the six to eight weeks the variance process takes.

The Board recommended a chart to represent situations that could be approved by staff should the conditions fall within the allowed parameters.

Mr. Kelly stated that if the Board agrees this to be an appropriate mechanism and if it is approved by legal counsel, he would work to develop the variance package. Chair Anderson agreed that they would review the proposal at the next SWS Hearing Board Meeting, with the intent that regulations would be updated to align with the package in the future.

Ms. Admirand confirmed the Board was taking no action on this item and the understanding is that staff will bring back the draft variance package to be reviewed at the next SWS Hearing Board Meeting.

Mr. English stated that he would work to set a meeting in November, possibly on the 20th, for review of this information and to address another appeal that has been filed.

10. *Public Comment

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

11. Adjournment

At 7:13 p.m., Chair Anderson adjourned the meeting.

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DD	_____
DHO	_____
DA	_____
Risk	_____

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. The signature on the left is 'Ron Jahn' and the signature on the right is 'Denise Jahn'.

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: 3/6/14	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 Battersby Rd. Reno, NV 89513
Copyright © 2014 Waters Excavation, Inc. All rights reserved.
TERMS: Payment is due within 15 days of invoice date. Late payment charges 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

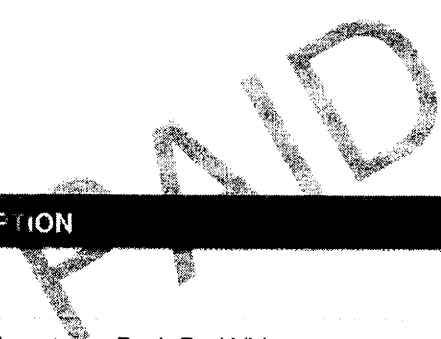
SERVICE ADDRESS:

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*



* 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



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775-825-1595 | www.watersvacuum.com



RECIPIENT:

Ron Jahn
1540 Butterfly Drive
Reno, Nevada 89523

Phone: 775-746-0223

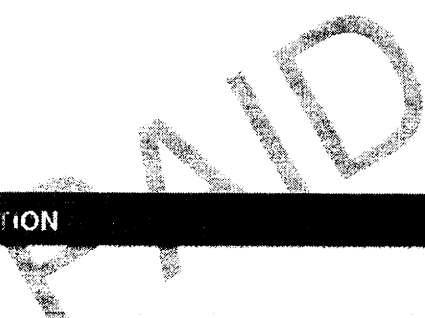
SERVICE ADDRESS:

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

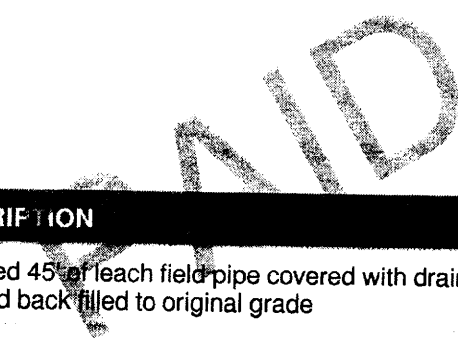
SERVICE ADDRESS:

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:

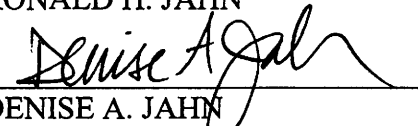
SEE ATTACHED EXHIBIT "A"

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.



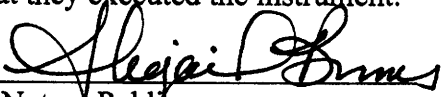
RONALD H. JAHN



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

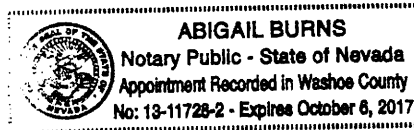


EXHIBIT "A"
Legal Description

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.

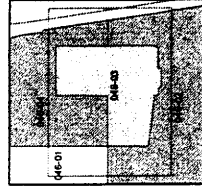
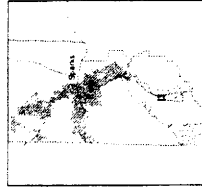
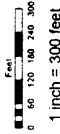
Subject to easements 10 feet in width for underground power and sewer lines and 25 feet in width for ingress and egress to and from Parcel E, all as shown on said Parcel Map No. 607.

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

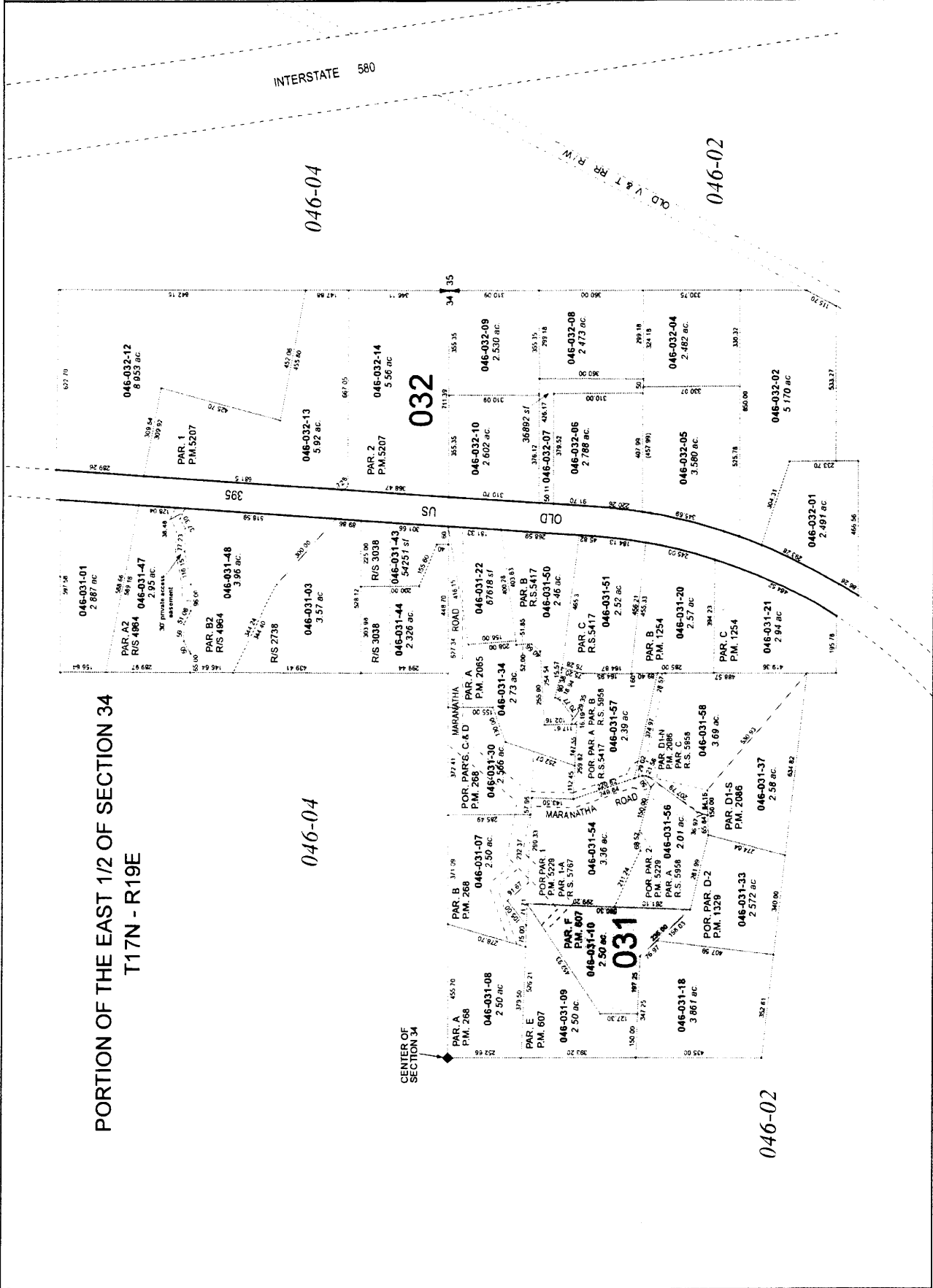


created by CFB 3/19/2012
last updated SR 9/26/16 JKF 5/20/18

area previously shown on maps

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 furnished herein.

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



046-02

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 ASSISTANTS LAWRENCE G. BROWN AND BETSY T. BROWN ON THE 11th DAY OF MAY, 1978. THE INFORMATION CONTAINED HEREON IS THE CHARACTER AND OCCUPY THE PORTIONS INDICATED HEREON, AND THE INFORMATION CONTAINED HEREON IS THE PROPERTY OF THE SURVEYORS AND SHALL BE KEPT IN THE OFFICE OF THE SURVEYORS AND SHALL BE AVAILABLE FOR THIS SURVEY TO BE REPRODUCED.



ROBERT L. FULLER, METRELS. 2006

OWNERS CERTIFICATE

WE, THE UNDERSIGNED, LAWRENCE G. BROWN AND BETSY T. BROWN, IN ACCORDANCE WITH N.E.S. 278, AND THE REQUIREMENTS OF WASHOE COUNTY, HAVE HEREBY AGREED TO ALL UTILITY AND RECORDING INSTRUMENTS TO BE RECORDED.

LAWRENCE G. BROWN
BETSY T. BROWN

**STATE OF NEVADA S.S.
CARSON CITY**

ON THIS 11th DAY OF MAY, 1978, LAWRENCE G. BROWN AND BETSY T. BROWN DID ORIGINALLY MAKE SAID PLAT AND RECORDING INSTRUMENTS AND THEY SAY THAT THEY EXECUTED THE FOREGOING CERTIFICATE FREELY AND VOLUNTARILY FOR THE USES AND PURPOSES STATED THEREIN.

LAWRENCE G. BROWN
BETSY T. BROWN

COUNTY COMMISSIONERS CERTIFICATE

APPROVED AND ACCEPTED BY THE WASHOE COUNTY COMMISSIONERS AT THEIR REGULAR MEETING HELD AT CARSON CITY, NEVADA, ON THIS 11th DAY OF MAY, 1978.

ATTEST: *[Signature]*
COUNTY CLERK

UTILITY COMPANIES CERTIFICATE

THE UTILITY EASEMENTS SHOWN ON THIS PLAT HAVE BEEN REVIEWED IN CONNECTION WITH N.E.S. 278 AND ARE HEREBY APPROVED AND ACCEPTED BY:

WASHOE COUNTY PUBLIC UTILITY DEPARTMENT
BELL TELEPHONE CO. OF NEV. AND SIERRA PACIFIC POWER CO.
ON THIS 11th DAY OF JUNE, 1978.

BASIS OF BEARING

THE BASIS OF BEARING FOR THIS SURVEY IS THE MERIDIAN OF WASHINGTON, 1978, 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 11th DAY OF MAY, 1978, AT 10:00 AM. BY CLERK OF WASHOE COUNTY, NEVADA.

[Signature]
CLERK OF WASHOE COUNTY

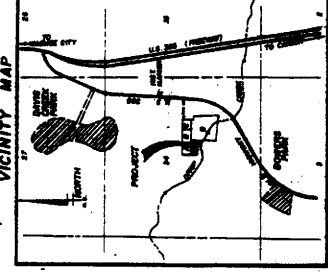
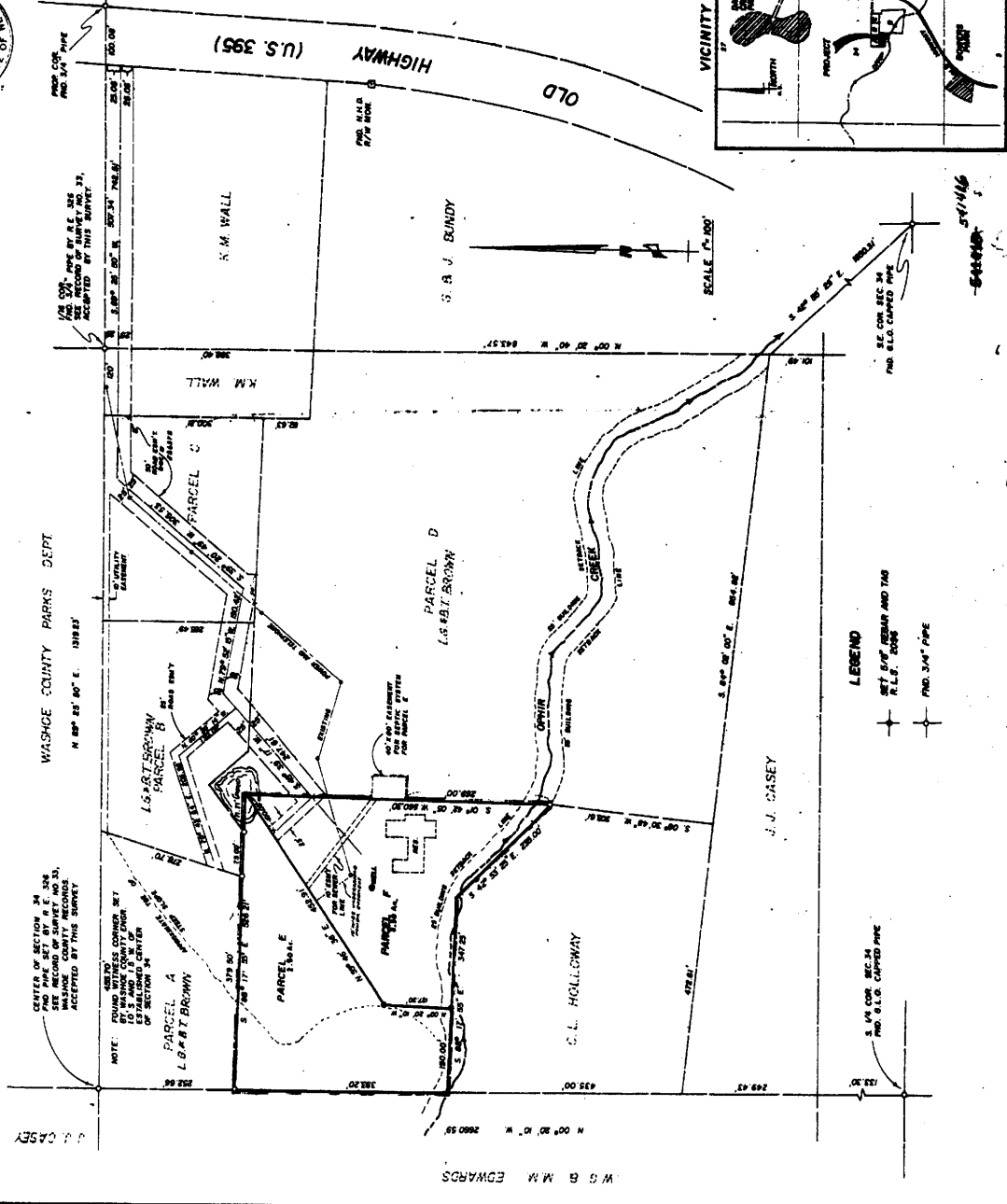
[Signature]
DEPUTY CLERK

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
A CORPORATION
CARSON CITY, NEVADA
SHEET 1 OF 1
MAY 4, 1978

PARCEL MAP NO. 602



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

607

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 COURTS OF SAID STATE AND THAT THE ADJUSTMENTS SHOWN ARE OF THE CHARACTER AND OCCUPY 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

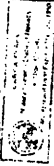
THIS IS TO CERTIFY THAT THE UNDERSIGNED, LAWRENCE G. & BETSY T. BROWN, HAVE READ AND UNDERSTOOD THE FOREGOING CERTIFICATE AND THE ADJUSTMENTS HEREON AND WE HEREBY CERTIFY THAT WE HAVE RECEIVED ALL UTILITY AND ACCESS EASEMENTS TO BE USED THEREON.

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 AND INSTRUMENT, and they used STATED THEREON.

Witness my hand for the STATE OF NEVADA



COUNTY COMMISSIONERS CERTIFICATE

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

ATTEST: J. J. S. DEAN, COUNTY CLERK AND 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 BELL TELEPHONE COMPANY OF NEVADA AND SERRA POWER 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 OWNERS OF RECORD 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. DEAN
WASHOE COUNTY RECORDER

DEPUTY

FEES: \$10.00

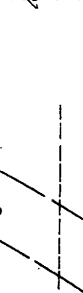
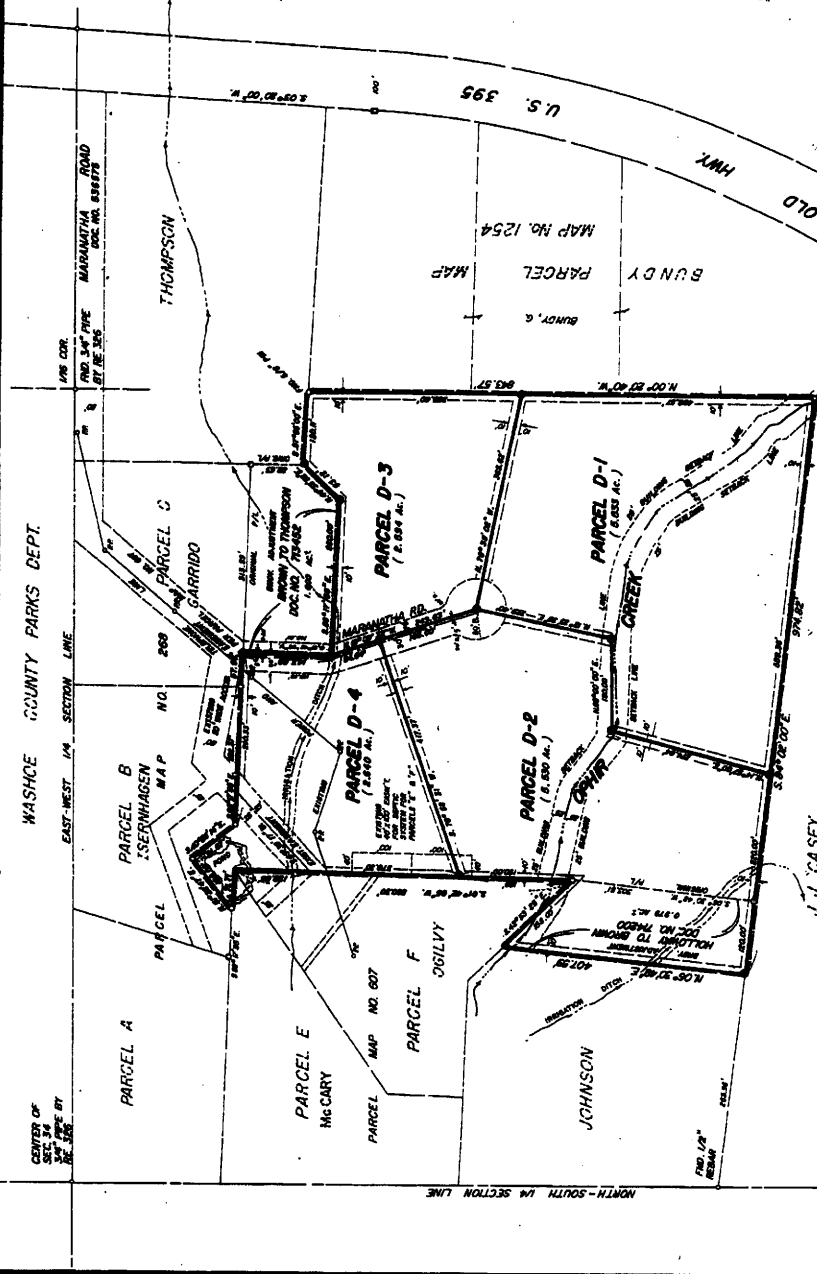
3RD PARCEL MAP FOR LAWRENCE G. BROWN and BETSY T. BROWN

A PORTION OF PARCEL D, AS SHOWN ON PARCEL MAP NO. 8315, IS LOCATED WITHIN THE MAP OF THE SE 1/4 OF SECTION 34, T.17N., R.95E., S.40R.2, W.8E., WASHOE COUNTY, NEVADA.

R. L. FULLER ENGINEERING
P.O. BOX 507
CARSON CITY, NEVADA

SHEET 1 OF 1 SHEET AUG. 1961

Parcel Map # 1329



NOTE
Parcels D-1 and D-2 as shown herein may be adjusted by the 80' wide access easement established in Document No. 74850, recorded December 21, 1960, in the official records of Washoe County, Nevada.

LEGEND

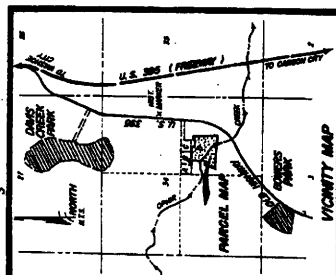
- FOUND ANCHOR
- ⊕ SET 8" x 8" REBAR W/ THE R.L.S. IN 8088

BASIS OF BEARINGS

THE BASIS OF BEARINGS FOR THIS SURVEY IS TAKEN FROM ANCHOR POINT ACCORDING TO OLD U.S. 208 (1:62,500 G.T.M.).

- REMARKS:**
- THIS SURVEY WAS CONDUCTED BY THE SURVEYOR.
 - ALL ADJUSTMENTS ARE SHOWN AS A RESULT OF THE SURVEY AND ARE NOT NECESSARILY NECESSARY.

REVISED: APRIL 27, 1962



1329

1329

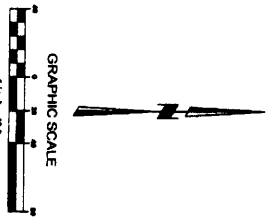
See Certificate of Amendment see 24 1747 B 760

5767A

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

BASIS OF BEARINGS
 FOR THIS SURVEY IS
 THE NEVADA STATE PLANE COORDINATE SYSTEM, WEST
 ZONE 10N, NAD83/11N, PER WYOMING COUNTY
 COORDINATES SHOWN AND ADJUSTED BY A
 GEOIDAL SURVEY. ALL DIMENSIONS ARE GROUND
 DISTANCES.

TOTAL AREA
 5.80 ACRES ±

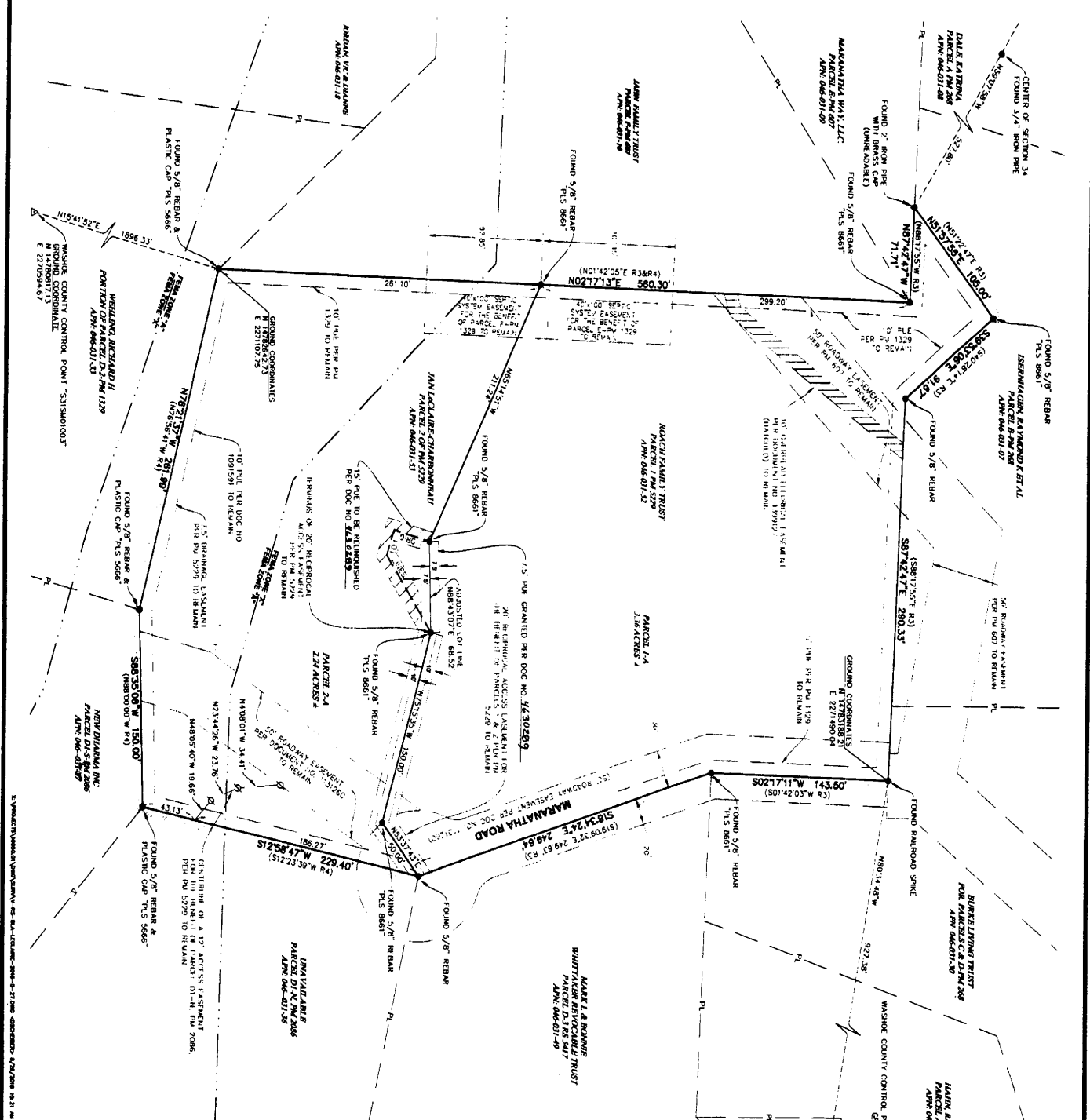


RECORD OF SURVEY IN SUPPORT OF A BOUNDARY LINE ADJUSTMENT
 FOR
JAN LECCLAIRE-CHARBONNEAU
 AN ADJUSTMENT OF PARCELS 1 AND PARCELS 2 OF PARCEL MAP 1229
 WASHINGTON COUNTY
 WASHINGTON COUNTY
 WASHINGTON COUNTY

DATE	2/2/2018
BY	ROBERT L. BROUNE
CHECKED BY	ROBERT L. BROUNE
DATE	2/2/2018

Record of Survey Map 5767A

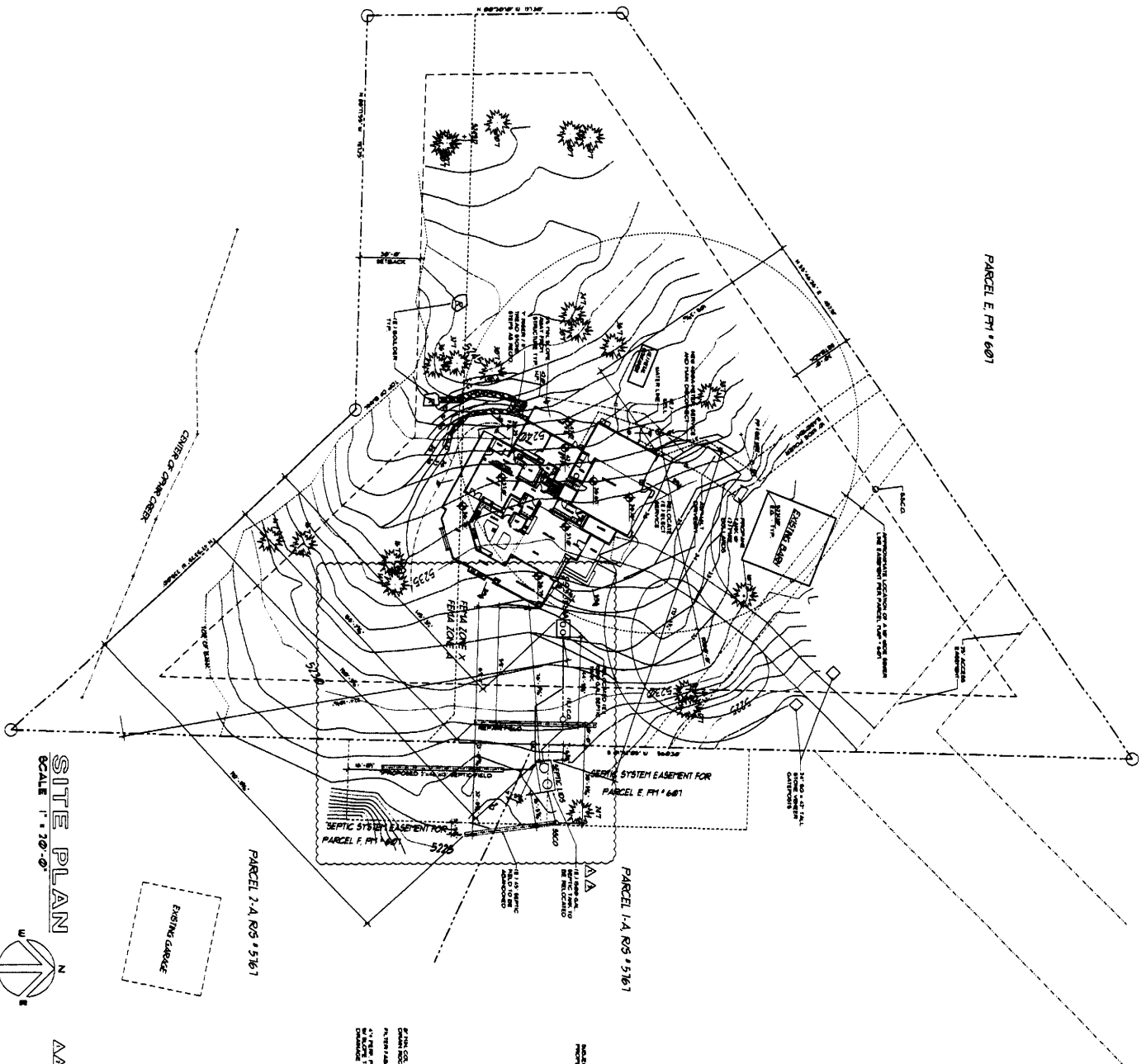
44-38970



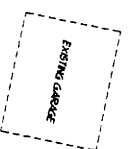
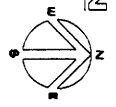
CUMULATIVE INDEXES
 SHOULD BE EXAMINED
 FOR ANY SUBSEQUENT
 CHANGES TO THIS MAP

5767A

PARCEL E, P11 # 601



SITE PLAN
SCALE 1" = 10'-0"

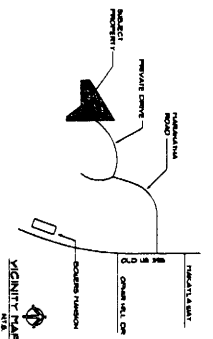


GENERAL NOTES:

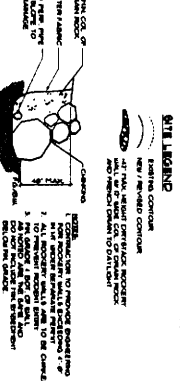
1. EXISTING WALL TO BE RECONSTRUCTED.
2. EXISTING WALL TO BE DEMOLISHED.
3. ALL WORK SHALL COMPLY WITH LOCAL, STATE AND FEDERAL CODES AND REGULATIONS.
4. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE PERMITS OBTAINED FROM THE APPLICABLE AGENCIES.
5. ALL EXISTING UTILITIES SHALL BE PROTECTED AND MAINTAINED.
6. ALL EXISTING UTILITIES SHALL BE RECONSTRUCTED AS NECESSARY.
7. ALL EXISTING UTILITIES SHALL BE RECONSTRUCTED AS NECESSARY.
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20. ALL EXISTING UTILITIES SHALL BE RECONSTRUCTED AS NECESSARY.

WALL INFORMATION

1. EXISTING WALL TO BE RECONSTRUCTED.
2. EXISTING WALL TO BE DEMOLISHED.
3. ALL WORK SHALL COMPLY WITH LOCAL, STATE AND FEDERAL CODES AND REGULATIONS.
4. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE PERMITS OBTAINED FROM THE APPLICABLE AGENCIES.
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18. ALL EXISTING UTILITIES SHALL BE RECONSTRUCTED AS NECESSARY.
19. ALL EXISTING UTILITIES SHALL BE RECONSTRUCTED AS NECESSARY.
20. ALL EXISTING UTILITIES SHALL BE RECONSTRUCTED AS NECESSARY.



TYPICAL ROCKERY WALL SECTION



SOIL ANALYSIS

SOIL ANALYSIS REPORT
DATE: 10/15/10
PROJECT: 101 AND LOCAL PERMITS
CONTRACT: 101-1010
DESIGN CRITERIA:
1. ALL EXISTING UTILITIES SHALL BE PROTECTED AND MAINTAINED.
2. ALL EXISTING UTILITIES SHALL BE RECONSTRUCTED AS NECESSARY.
3. ALL EXISTING UTILITIES SHALL BE RECONSTRUCTED AS NECESSARY.
4. ALL EXISTING UTILITIES SHALL BE RECONSTRUCTED AS NECESSARY.
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19. ALL EXISTING UTILITIES SHALL BE RECONSTRUCTED AS NECESSARY.
20. ALL EXISTING UTILITIES SHALL BE RECONSTRUCTED AS NECESSARY.

▲▲ A MONITORED FILL AREA TO BE PROVIDED
▲ GRADING QUANTITIES
CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE PERMITS OBTAINED FROM THE APPLICABLE AGENCIES.

A1.0
1-25-10

LAHN RESIDENCE
NEW RESIDENCE
3285 MARAMATHA DRIVE
WASHOE COUNTY, NEVADA

JASON WARFIELD
RESIDENTIAL DESIGN L.L.C.
LICENSE # 585-RD
842 LANDER STREET
RENO, NV 89508
775-854-8870 O. 775-748-8868 F.

DD	_____
DHO	_____
DA	_____
Risk	_____

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 #1-18W; Reduced Setback to Septic, Parcel 084-200-80, 240 School Street, Washoe County, NV

Recommendation

Staff recommends the Sewage, Wastewater and Sanitation (SWS) Hearing Board support the presented Variance Case #1-18W (Jerry Turley) to allow the approval of the well permit H18-0228WELL with less than the required 100 foot setback to proposed well location. Upon SWS Hearing Board review, staff recommends the Variance Case #1-16S be presented to the District Board of Health for approval.

Background

Approximately 3 months ago, Mr. Turley of 240 School Street in Wadsworth came in to get information on applying to place a new domestic well on his property. Mr. Turley had historically been connected to a well on the neighboring property (084-200-81) which feeds a few surrounding properties. The well has gone dry and the owner of the well was not inclined to refurbish it. During the discussions and in office review, it was determined that it might not be possible to meet all required setbacks due to the proximity of the septic system within the lot.

A staff member was sent to the property to investigate the possibilities. Fortunately, Environmental Health Services (EHS) has specific knowledge as to the location of the septic system due to having it located during the fire rebuild that occurred within the last two years. Staff determined that it was too close to call due to having to measure through the building and because fences and property lines don't always match; this area in particular does not appear to have been constructed with regards to property lines.

Mr. Turley was instructed to get his property surveyed and staff returned to re-evaluate. It was determined that the only location on the property that would meet setbacks to the septic system and the required repair area was directly under the power lines. Mr. Turley consulted with his driller and the power company and it was determined that drilling in that location was not feasible.

The drilling company determined that the farthest location that was feasible was located only 95' from the septic tank, and will be even less from any future repair. Section 040.007, Table 1 of the Washoe County Health District Regulations of the Washoe County District Board of Health Governing Well Construction (regulations) requires a minimum of 100' setback from septic



tanks and leach fields. EHS also considers future septic repair leach fields with respect to setbacks as they will be needed at some point in the future. As the only available location to place a new domestic well on the property cannot meet setbacks, a variance was required.

At this time, the property is without water. During the summer months, the property had access to a non-potable water hydrant in the area but that water was turned off as winter approached and the property owner currently has to haul in water for consumption and sanitation needs.

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: No, there are no effects on groundwater quality by the drilling of a new domestic well.

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

Reply: Septic systems located within close proximity to domestic wells can be considered a risk to contamination of groundwater, however, there are precautions that can be taken to minimize that risk. The recommended conditions of approval will create greater than the required 100' of separation by utilizing a deeper sanitary seal. Section 010.235 of the regulations defines a seal as "the watertight seal established in a well bore or the annular space between the well casings or a well casing and the well bore to prevent the inflow or vertical movement of surface water or shallow groundwater..." Staff feels that the deeper sanitary seal will protect from the public health threat of locating a septic system too close to a well. A review of the surrounding parcels and on-site evaluation does not indicate the presence of any other septic systems within 100 feet of the proposed well location.

3. Are there other reasonable alternatives?

Reply: Staff was unable to locate any place on the property that met the required setback and was feasible for the driller to place their rig. Without allowing for this variance, the property will likely have to haul water in to provide for water needs.

Conditions of Approval

- The well will be placed as far as possible from the current septic system and future repair area.
- The well will already require a minimum of a 100 foot seal due to the proximity of a watercourse within ¼ of a mile. The seal depth shall be increased by 1 foot for each foot of setback that cannot be met from either the current or future repair area; for example, if the well is located 95 feet from the existing septic system and 80feet from the repair area, the seal shall be increased to 120 feet.

Possible Motion

Should the SWS Hearing Board agree with staff's recommendation, a possible motion would be "Move to support staff to 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

Subject: Public Hearing, SWS Board

Date: November 20, 2018

Page 3 of 3

100 foot setback to proposed well location, subject to the conditions of approval indicated in the staff report.

If the Board disagrees with staff's recommendation, the SWS Board may formulate their own motion.

H18-0002Van

<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) 328-8176 www.washoecounty.us/health</p> <p>APPLICATION FOR VARIANCE</p>	<p>Office Use Only</p> <p>Fee Paid <u>1,579.00</u></p> <p>Date Paid <u>11-8-18</u></p> <p>Cash <input checked="" type="checkbox"/> Check <input type="checkbox"/></p> <p>Receipt No. <u>LE1313LP</u></p>
---	---	---

DATE 11/01/18

NAME OF APPLICANT Augie Mariezcurrena/Welsco For Jerry Turley

ADDRESS P.O. Box 5245 240 School St Wadsworth

CITY Fallon STATE NV ZIP 89406

PHONE 775-423-6619 FAX 775-423-7175

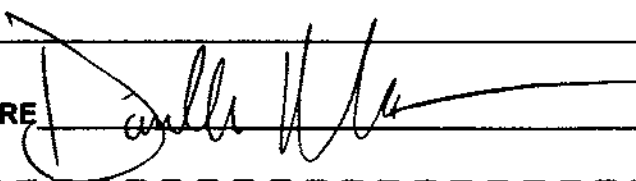
EMAIL ADDRESS Awelscodilling@gmail.com

TITLE OF REGULATIONS Washoe County District Board of Health Governing Well Construction

SECTION(S) OF REGULATIONS TO BE VARIED 040.007

REASON FOR VARIANCE REQUEST _____

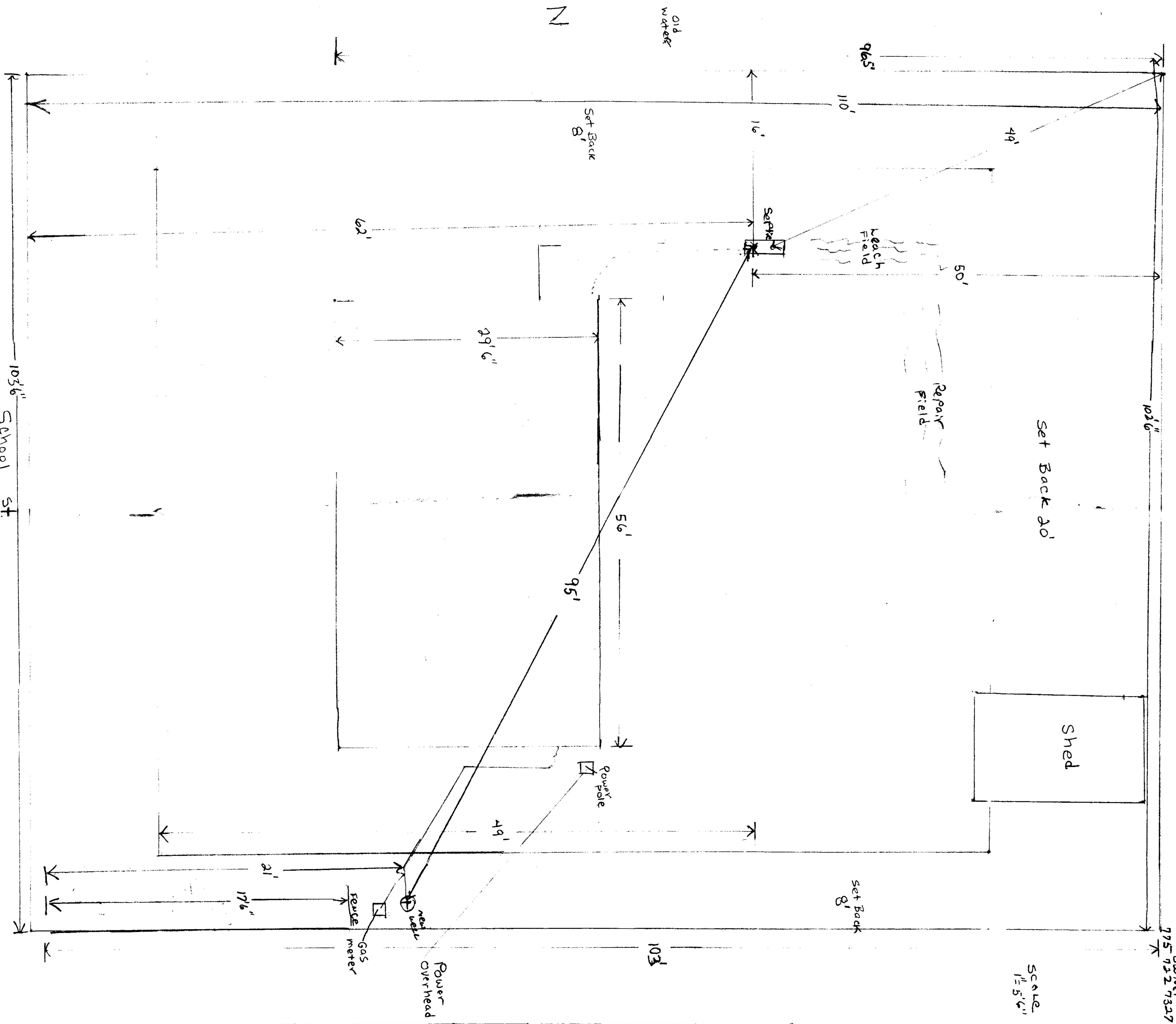
Septic is less than 100' from proposed well

SIGNATURE  DATE 11/1/18

(Office Use Only)

DATE RECEIVED _____ CATEGORY TYPE _____

VARIANCE FEE _____ PUBLIC NOTICE DATES _____



APN 084-200-80
 240 School St
 Wadsworth, N.Y. 89442
 Contact Person = Jerry Turley
 775-932-7327
 OWNER

SCALE
 1" = 5'4"

103'

N
 Old
 Water

103'6" School St

DD	_____
DHO	_____
DA	_____
Risk	_____

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

Serving Reno, Sparks and all of Washoe County, Nevada. Washoe County is an Equal Opportunity Employer.



Public Health
Prevent. Promote. Protect.

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

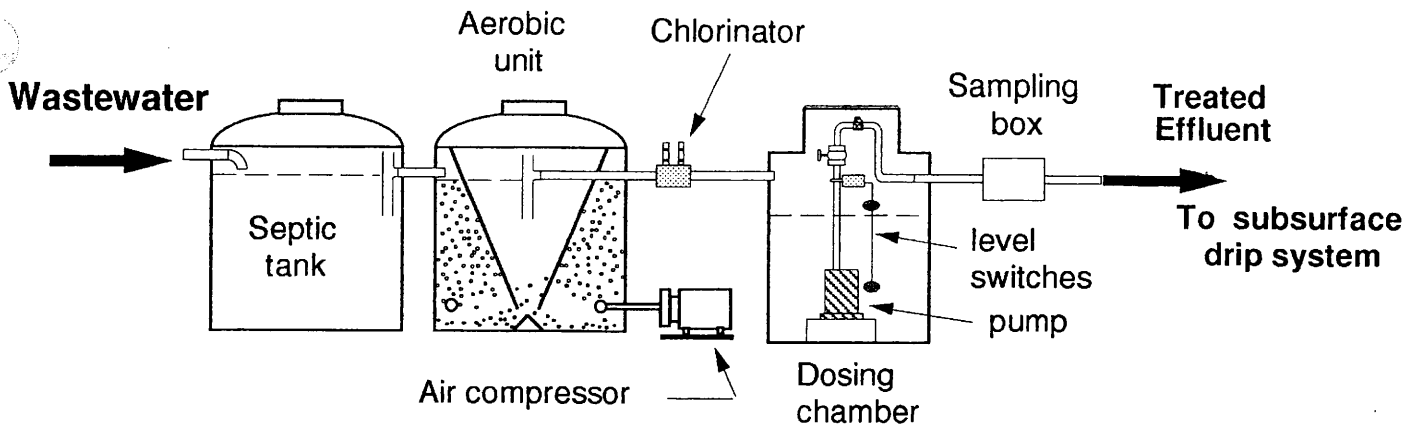
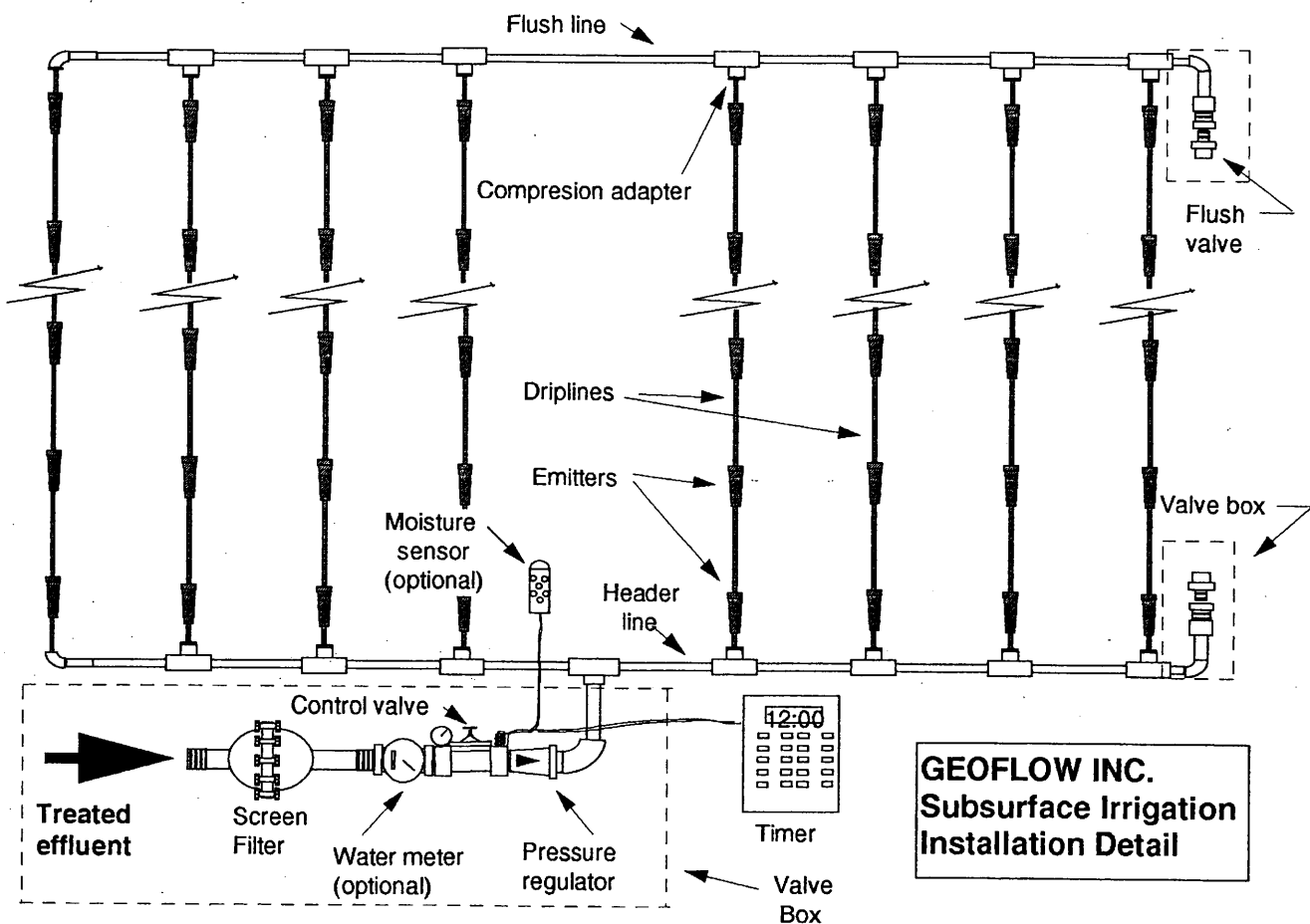


Figure 1. Pretreatment System



GEOFLOW INC.
Subsurface Irrigation
Installation Detail

Figure 2. Subsurface irrigation system

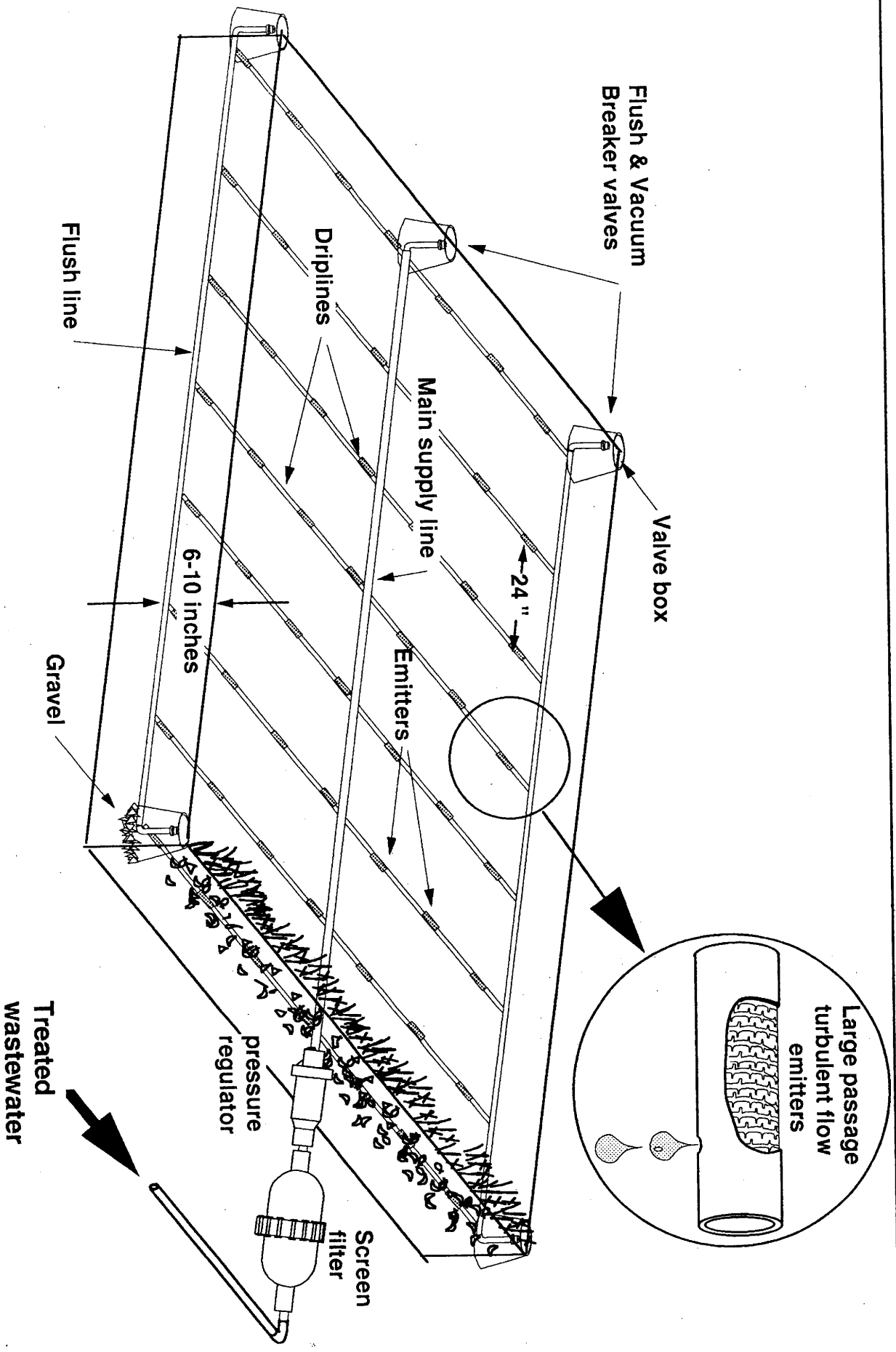


Figure 3. Subsurface drip installation diagram.

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

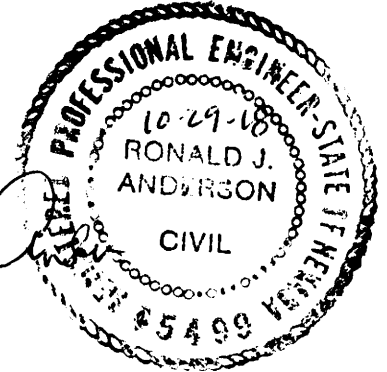
- 1) Portions of the existing system should be uncovered and evaluated for potential causes of failure. Possible causes can be crushed pipe, broken distribution box, pump station malfunction, root intrusion, etc. The existing system should be left in an operational condition as a alternating backup to 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

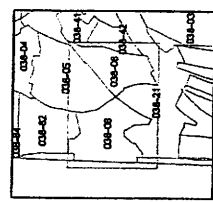
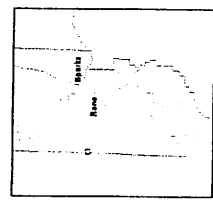
attachments: parcel map, field notes, Geo-Flow design calc', Washoe Co. Inspection

Assessor's Map Number
038-08

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



0 50 100 150 200
Feet
1 Inch = 200 feet



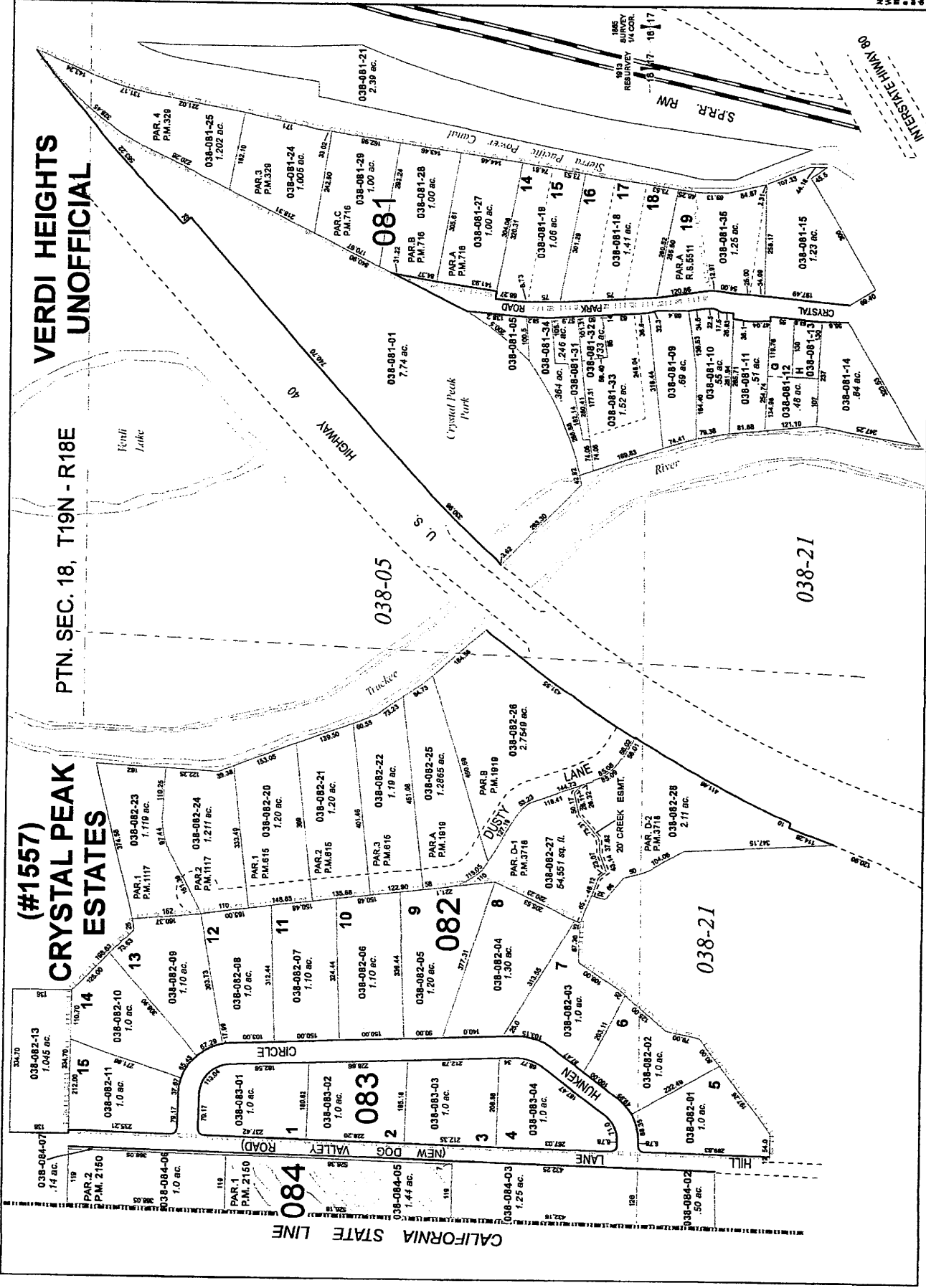
created by: **CFB 09/25/2013**
last updated:
area previously shown on maps)

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. 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

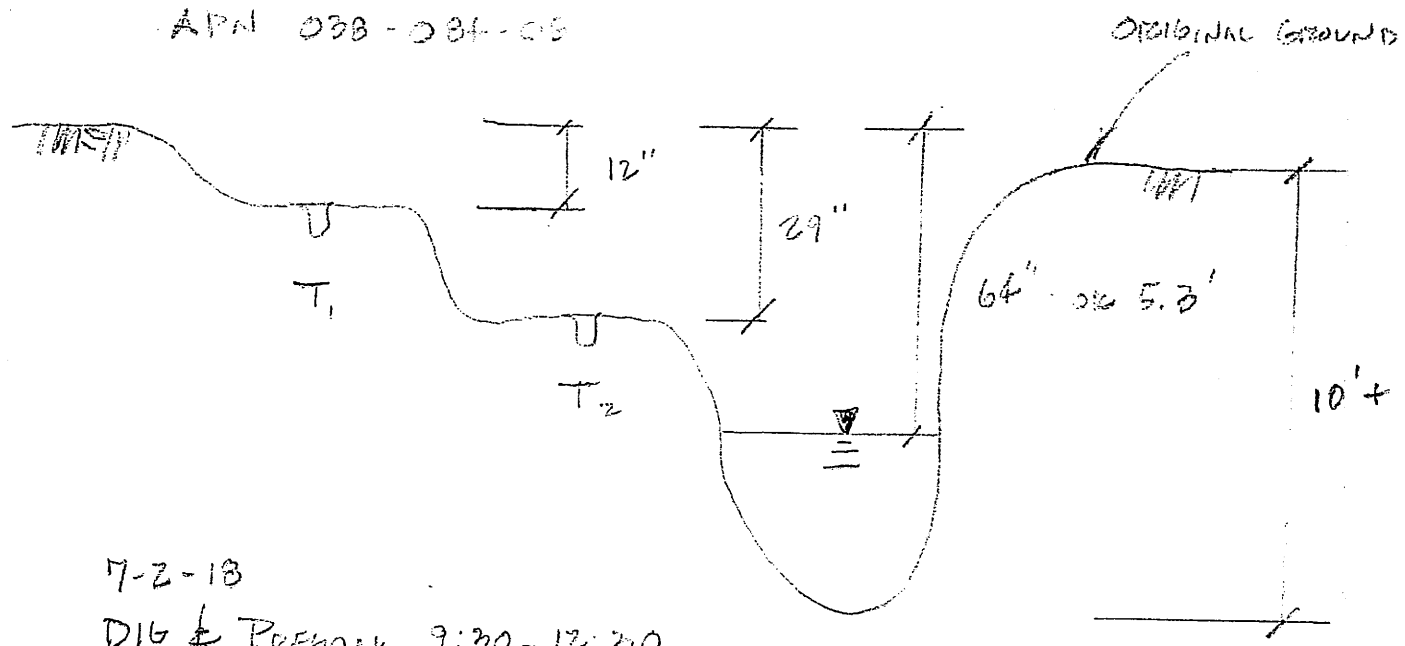
PERCOLATION TESTS

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/>
MERKUR PERC (MIN./INCH)	480	370

PERCOLATION TENT

7-4-18
Z>A

630 HILL LANE, VEED

APN 038-084-05

SOIL LOG:

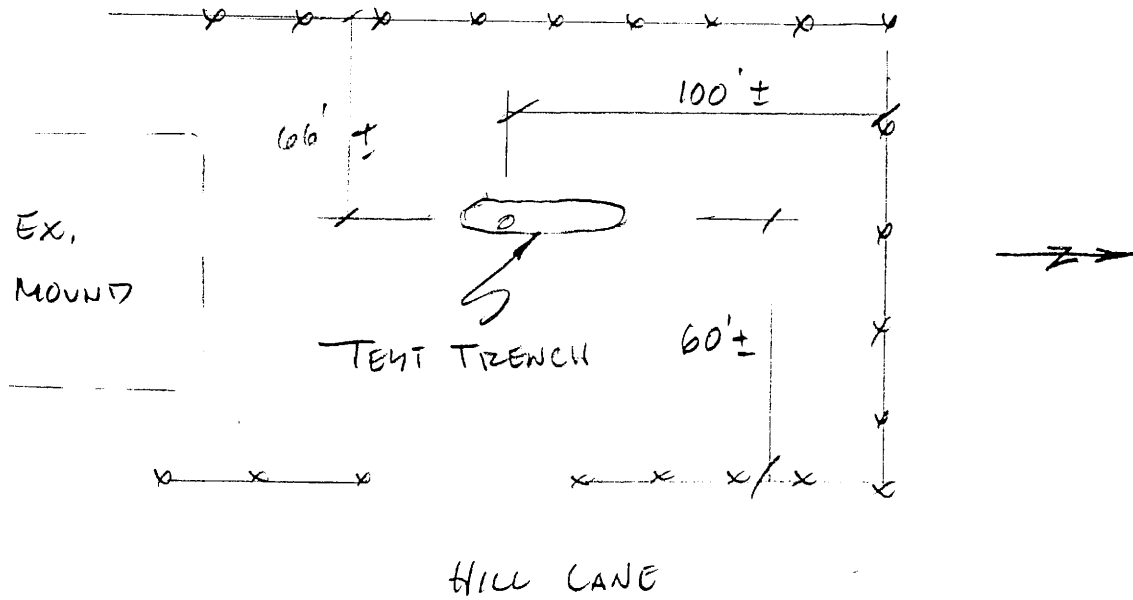
0-16" GRAY COLORED CLAYEY - SAND < 5% GRAVEL

16"-4' TRANSITION TO A TAN COLORED
SANDY - CLAY w/ SMEAR 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" BGS)

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

$\frac{450}{0.228} = 1972 \text{ ft}^2$ 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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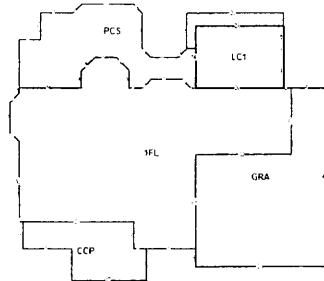
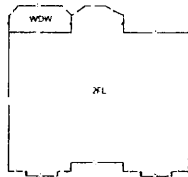
APN: 038-084-05 Card 1 of 1

<p>Owner Information & Legal Description</p> <p>Situs: 630 HILL LN, WASHOE COUNTY 89439</p> <p>Owner 1: CASCI, BRIAN V & LINDSAY C</p> <p>Mail Address: PO BOX 235 VERDI NV 89439</p> <p>Rec Doc No: 4427716 Rec Date: 06/29/2018</p> <p>Prior Owner: FRASCA TRUST, DANTE A & JONIECE J</p> <p>Prior Doc: 2302191</p> <p>Keyline Desc: PM 2150 LT 1</p> <p>Subdivision: UNSPECIFIED</p> <p>Lot: 1 Block: Sub Map#</p> <p>Record of Survey Map: Parcel Map# 2150</p> <p>Section: Township: 19 Range: 18 SPC</p> <p>Tax Dist: 4011 Add'l Tax info: Prior APN</p> <p>Tax Cap Status: 2019 Sales Letter Mailed, High Cap Applied</p>	<p>Building Information</p> <p>Quality: R45 Good-Very Good Bldg Type: Sgl Fam Res</p> <p>Stories: TWO STORY Square Feet: 3,044</p> <p>Year Built: 1992 Square Feet does not include Basement or Garage Conversion Area.</p> <p>W.A.Y.: 1992 Finished Bsmt: 0</p> <p>Bedrooms: 3 Unfin Bsmt: 0</p> <p>Full Baths: 3 Bsmt Type:</p> <p>Half Baths: 0 Gar Conv Sq Foot: 0</p> <p>Fixtures: 14 Total Gar Area: 870</p> <p>Fireplaces: 1 Gar Type: ATTACHED</p> <p>Heat Type: FA Det Garage: 0</p> <p>Sec Heat Type: Bsmt Gar Door: 0</p> <p>Ext Walls: SIDING/FR Sub Floor: WOOD</p> <p>Sec Ext Walls: BR VENEER/FR Frame: FRAME</p> <p>Roof Cover: COMP SHINGLE Construction Mod: 0</p> <p>Obsr/Bldg Adj: 0 Units/Bldg: 1</p> <p>% Complete: 100% Units/Parcel: 1</p>																																																															
<p>Land Information</p> <p>Land Use: 200</p> <p>Size: 62,726 SqFt or ~ 1.44 Acre</p> <p>Zoning: LDS Sewer: Septic NBC: FCCF</p> <p>Water: Well Street: Paved NBC Map: FC NBC Map</p>	<p>Sales/Transfer Information/Recorded Document</p> <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th>Valuation History</th> <th>2017/18 FV</th> <th>2018/19 FV</th> <th>V-Code</th> <th>DOR</th> <th>Doc Date</th> <th>Value/Sale Price</th> <th>Grantor</th> <th>Grantee</th> </tr> </thead> <tbody> <tr> <td>Taxable Land Value</td> <td>140,000</td> <td>180,000</td> <td>2D</td> <td>200</td> <td>06-29-2018</td> <td>800,000</td> <td>FRASCA TRUST, DANTE A & JONIECE J</td> <td>CASCI BRIAN V & LINDSAY C</td> </tr> <tr> <td>Taxable Improvement Value</td> <td>278,267</td> <td>277,615</td> <td>3B</td> <td>200</td> <td>02-01-1999</td> <td>300,000</td> <td></td> <td>FRASCA TRUST, DANTE A & JONIECE J</td> </tr> <tr> <td>Taxable Total</td> <td>418,267</td> <td>457,615</td> <td>1G</td> <td>100</td> <td>12-01-1987</td> <td>67,500</td> <td></td> <td></td> </tr> <tr> <td>Assessed Land Value</td> <td>49,000</td> <td>63,000</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Assessed Improvement Value</td> <td>97,393</td> <td>97,165</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Total Assessed</td> <td>146,393</td> <td>160,165</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	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						
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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:

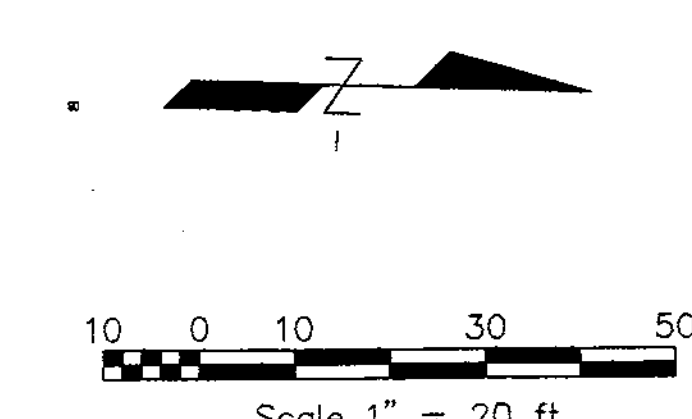
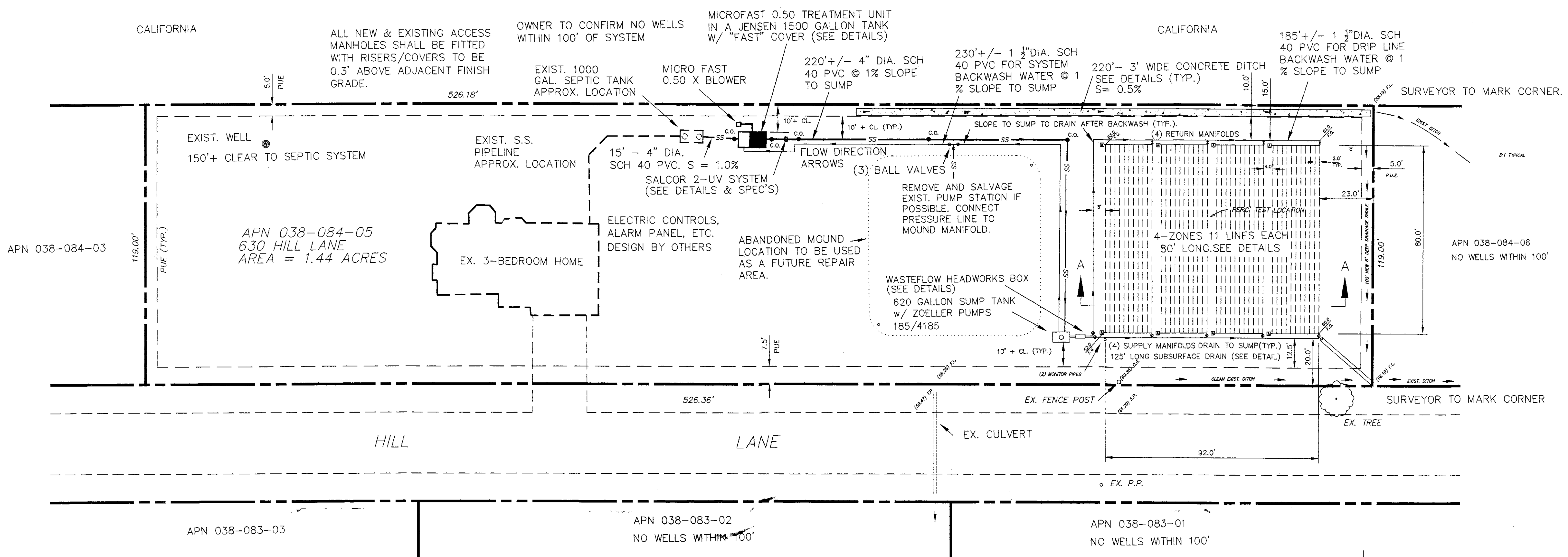
- _____ leach line(s), _____ feet wide, by _____ feet deep, by _____ feet long or

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

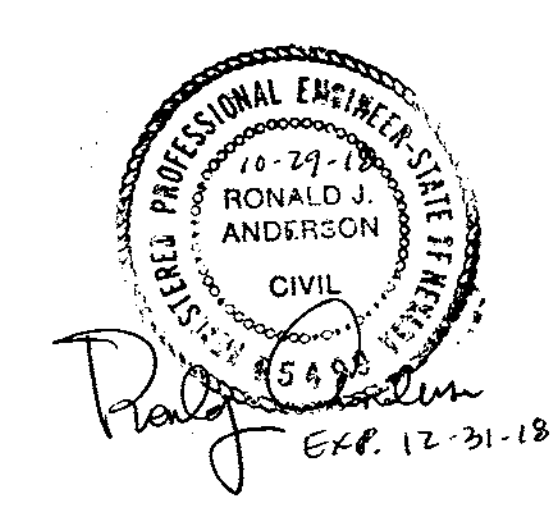
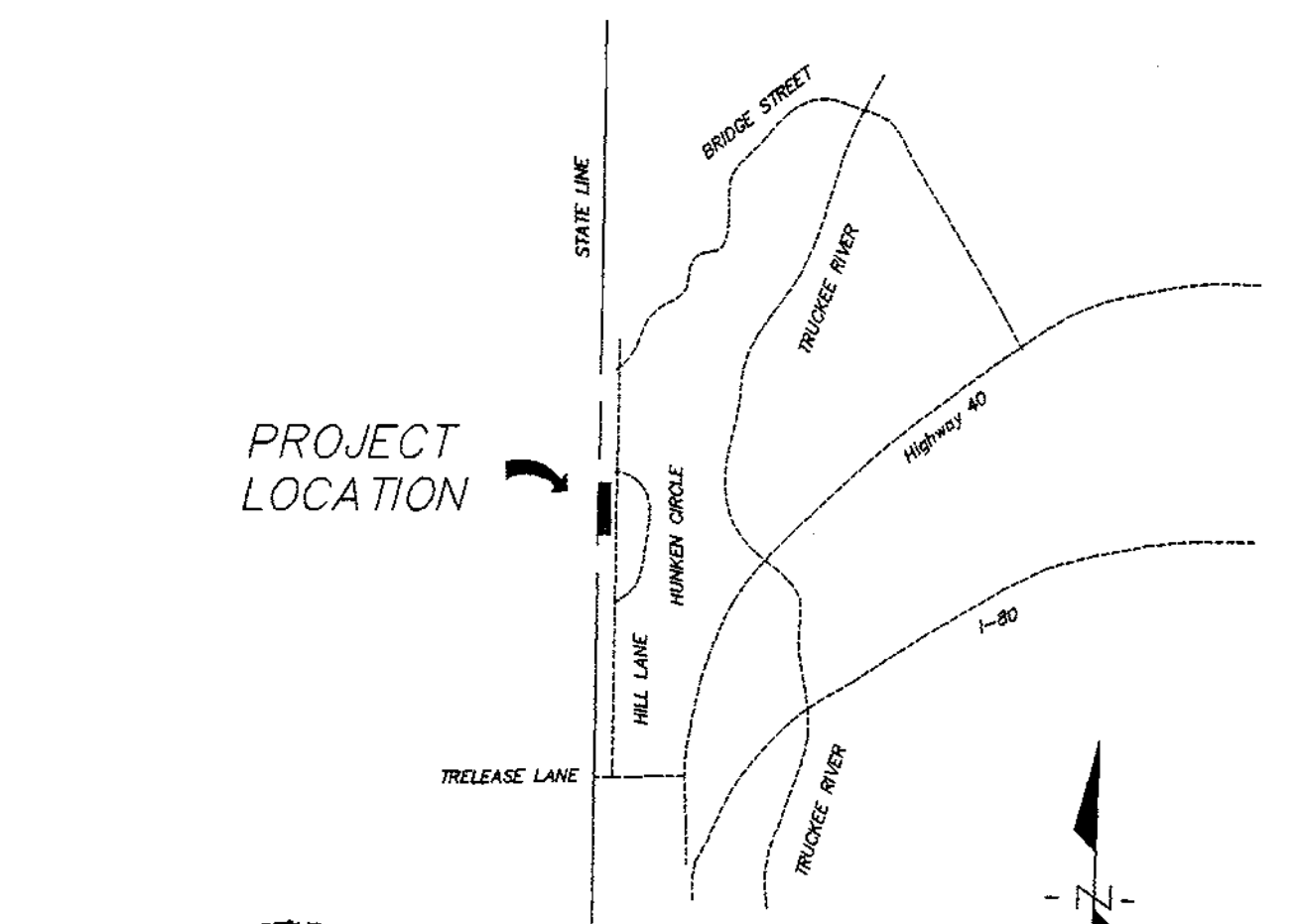
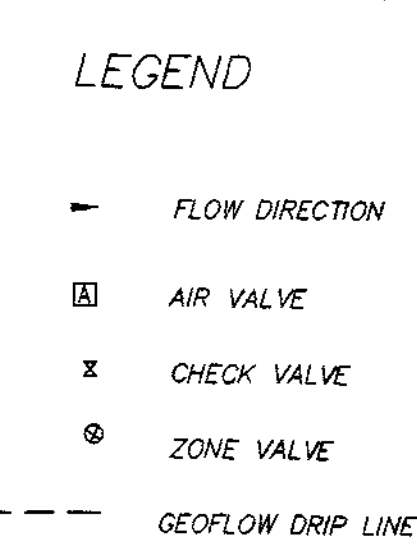


SEPTIC SYSTEM REPAIR PLAN
1" = 20'

- 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.

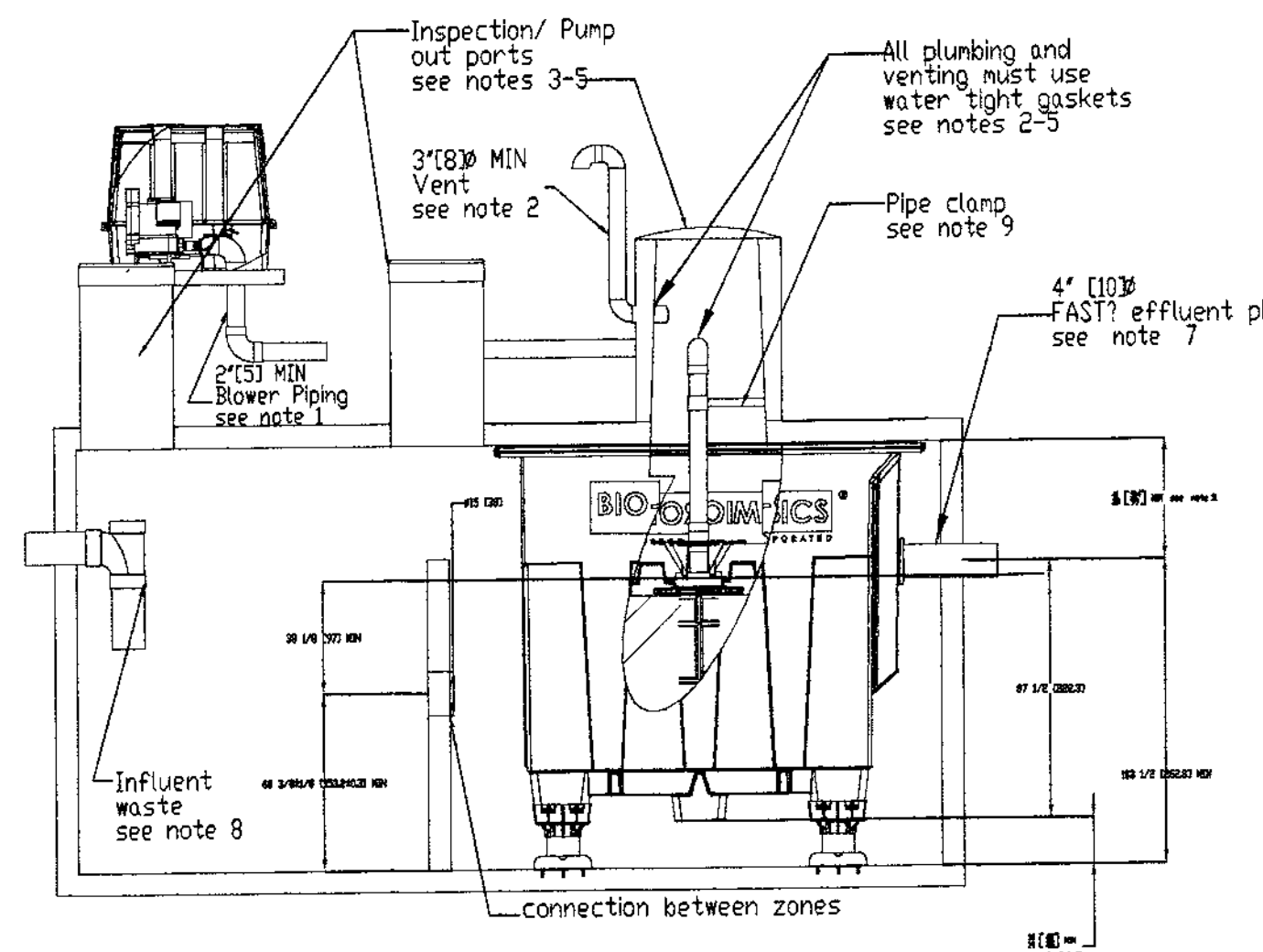


SEPTIC SYSTEM REPAIR DESIGN
for
FRASCA TRUST, DANTE & JOINICE

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

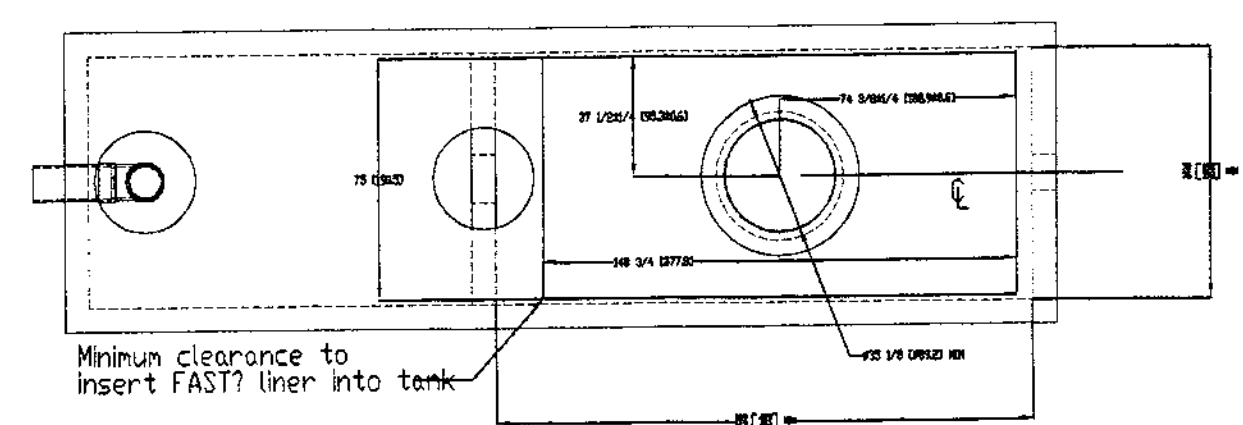
CONTACT: FRASCA TRUSTEE, DANTE & JOINICE, 630 HILL LANE, VERDI, NEVADA, 89439, 775-691-7866

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



Settling Zone
350 Gallon MIN (1300 L MIN)

Treatment Zone
450 Gallon MIN (1700 L MIN)



MicroFAST 0.50 L TREATMENT SYSTEM

BIO-MICROBICS ? 2014

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) MicroFAST050 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 050 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 050 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 050 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 on electrical systems 110/220VAC, 1Ø, 35/17 FLA, on 5Ø 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 050 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

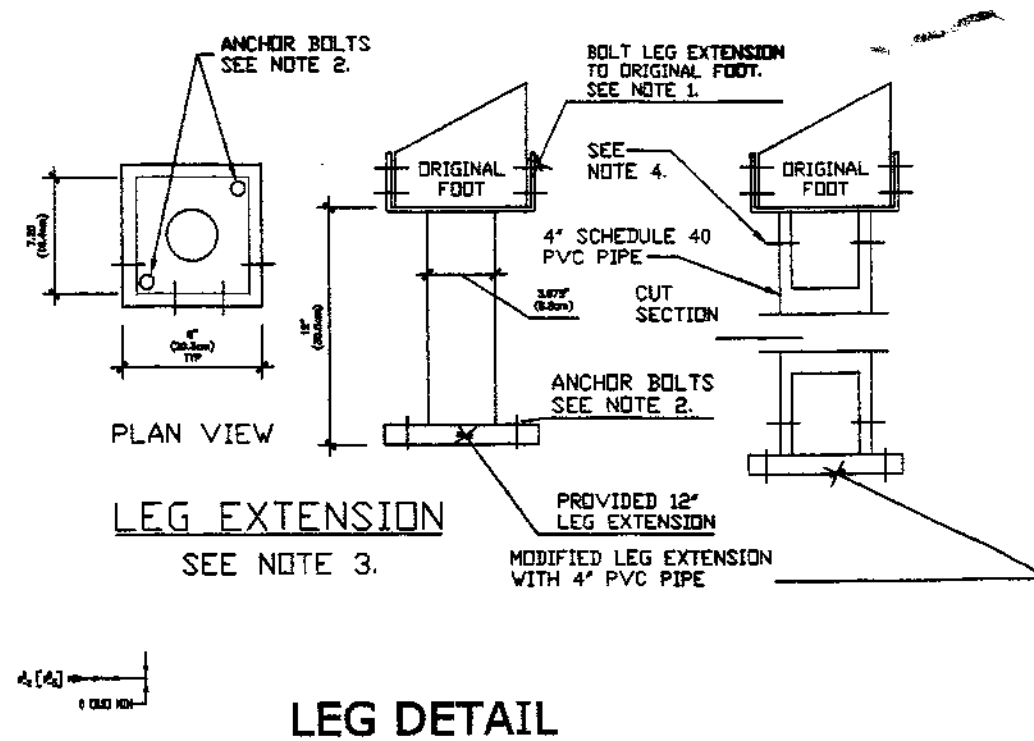
Bio-Microbics, Inc. warrants all new residential FAST? models (MicroFAST? 050, 0625, 075, 090, and 15) against defects in materials and workmanship for a period of two years after installation or three years from date of shipment which ever occurs first. All other FAST? system models are warranted for 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



LEG DETAIL

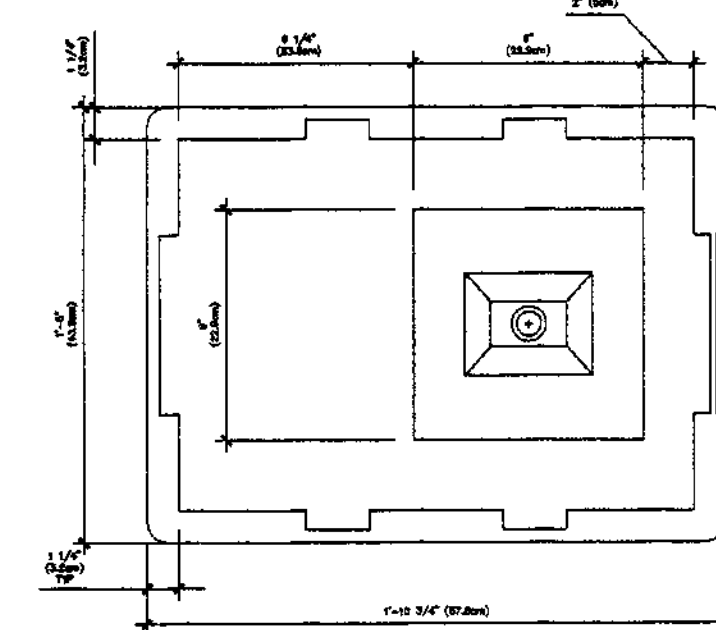
NOTES

- 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" 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 075 L DWG).

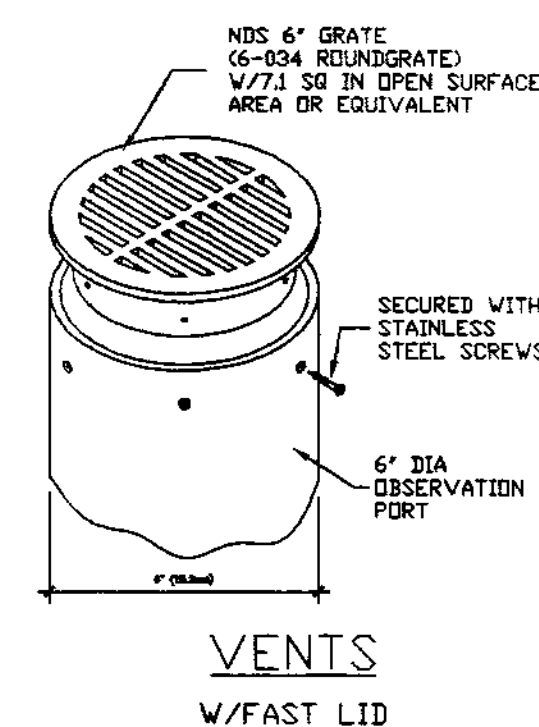
OR:
RUN VENT TO DESIRED LOCATION AND COVER OPENING WITH 3" VENT GRATE W/AT LEAST 7.1 SQ. IN. OPEN SURFACE AREA. SECURE WITH STAINLESS STEEL SCREWS. VENT MUST NOT ALLOW EXCESS MOISTURE BUILDUP OR BACK PRESSURE.
IN THE INTEREST OF TECHNOLOGICAL PROGRESS, ALL PRODUCTS ARE SUBJECT TO DESIGN AND/OR MATERIAL CHANGE WITHOUT NOTICE.
01-03-05

BIO-MICROBICS INCORPORATED MicroFAST@0.50 X

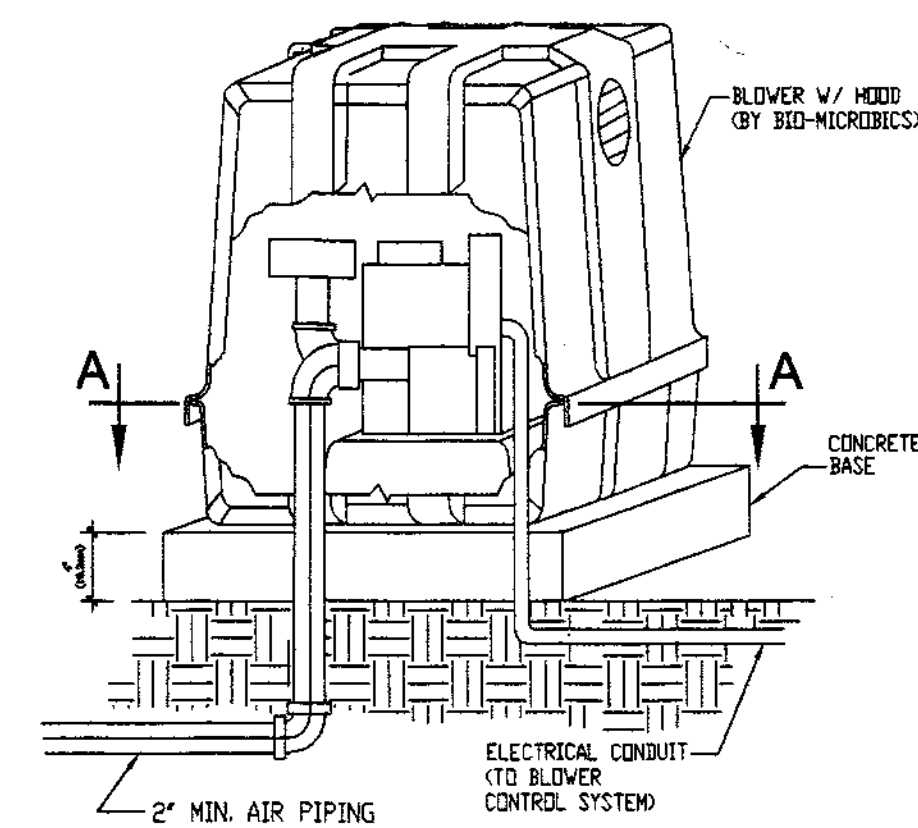
1-800-753-FAST(3278)



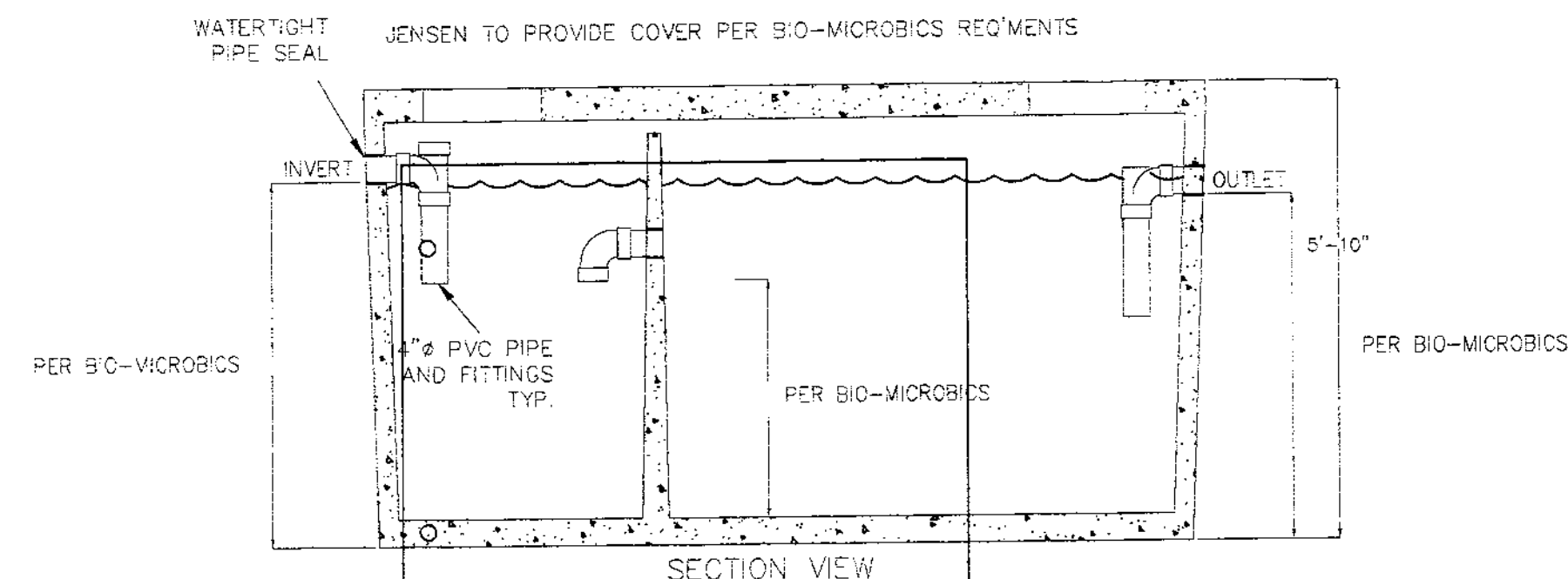
BLOWER HOUSING BASE DIMENSIONS (SECTION A-A)



VENTS W/FAST LID



BLOWER HOUSING DIMENSIONS



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.

FOR COMPLETE DESIGN AND PRODUCT INFORMATION, CONTACT JENSEN PRECAST.

JENSEN MONOLITHIC 1500 GALLON SEPTIC TANK

SHOP DRAWING REVIEW AND APPROVAL REQUIRED BY BIO-MICROBICS

APP'D	REVISITONS	DATE

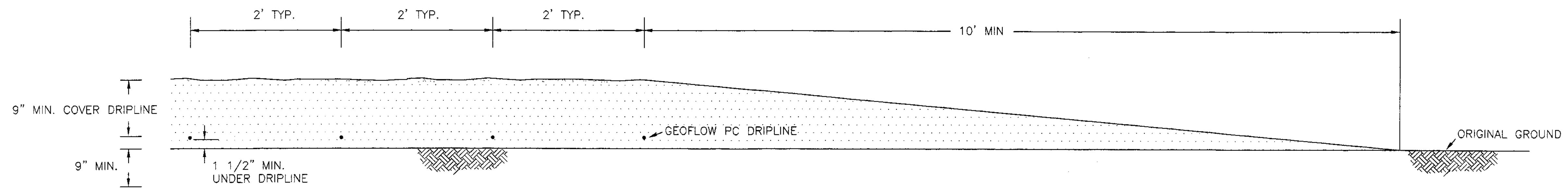
Anderson & Associates Engineering
1255 Jay Lake Road
Reno, NV 89511
(775) 848-4163

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.

MicroFAST 0.50 X BLOWER ASSEMBLY



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.

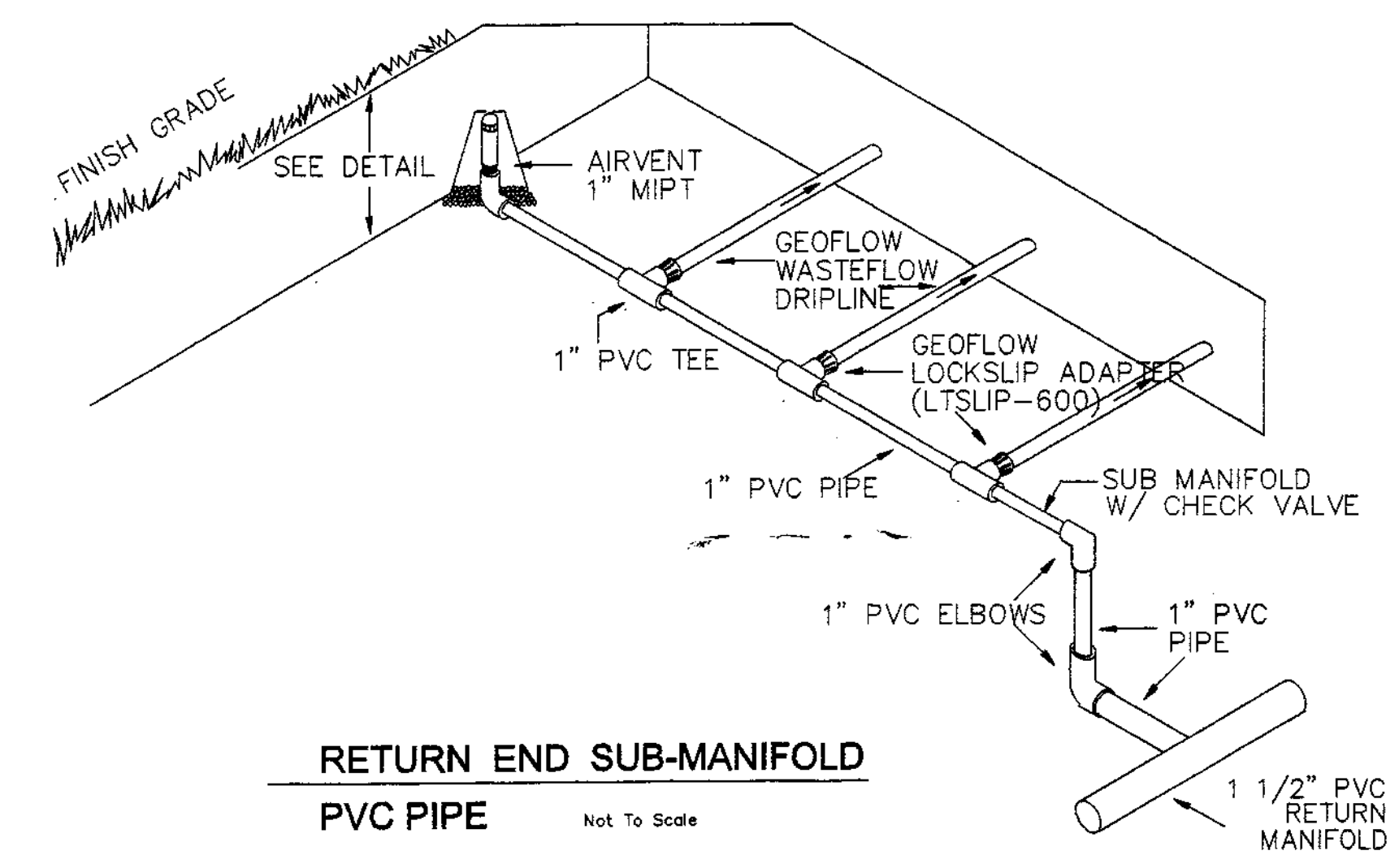
ALL IMPORT SOILS SHALL BE APPROVED BY THE DESIGN ENGINEER AND LANDSCAPE ARCHITECT. THE INITIAL 6-INCH LAYER OF IMPORT SOIL SHALL BE DECOMPOSED GRANITE (D.G.) OR PIT RUN TYPE MATERIAL APPROVED BY THE ENGINEER. THE BALANCE OF IMPORT SOIL SHALL BE APPROVED BY A LANDSCAPE ARCHITECT THAT IS

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

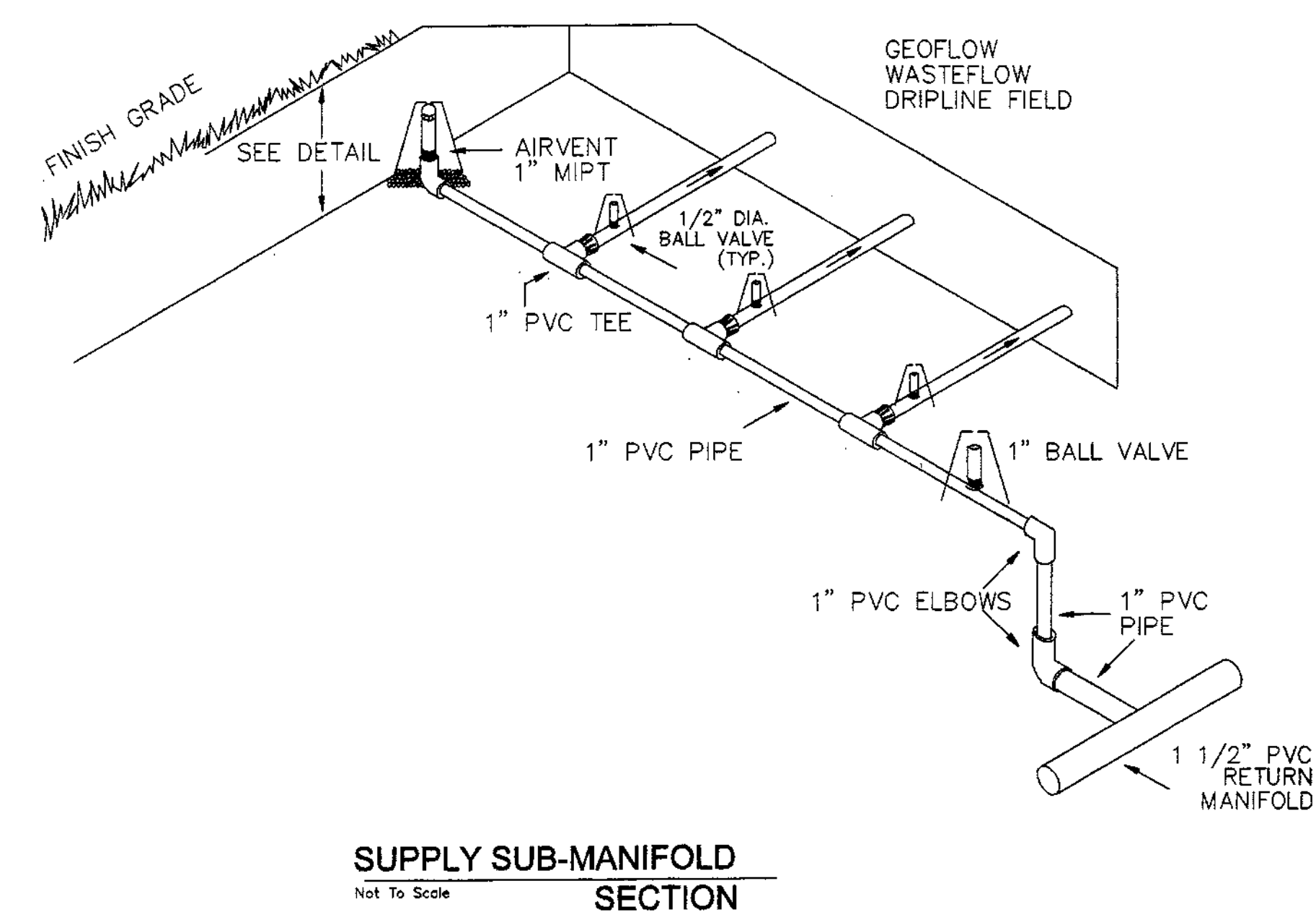
ALL FINISH GRADED SURFACE SOILS AND DISTURBED AREAS SHALL HAVE EROSION CONTROL PER STATE OF NEVADA NDOT SPECIFICATION SECTION 211 AND AS APPROVED BY A LANDSCAPE ARCHITECT

SECTION A-A

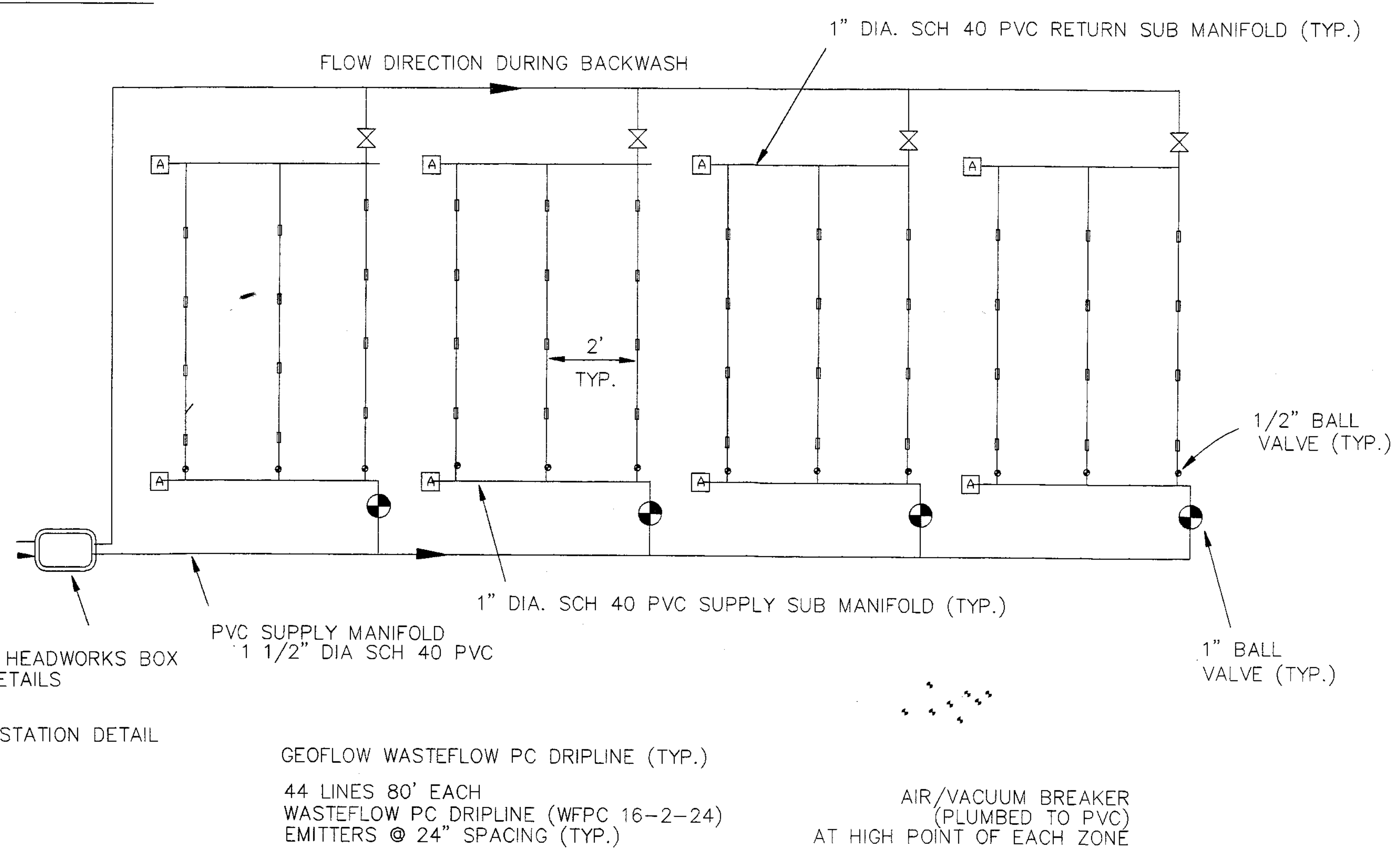
Not To Scale



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

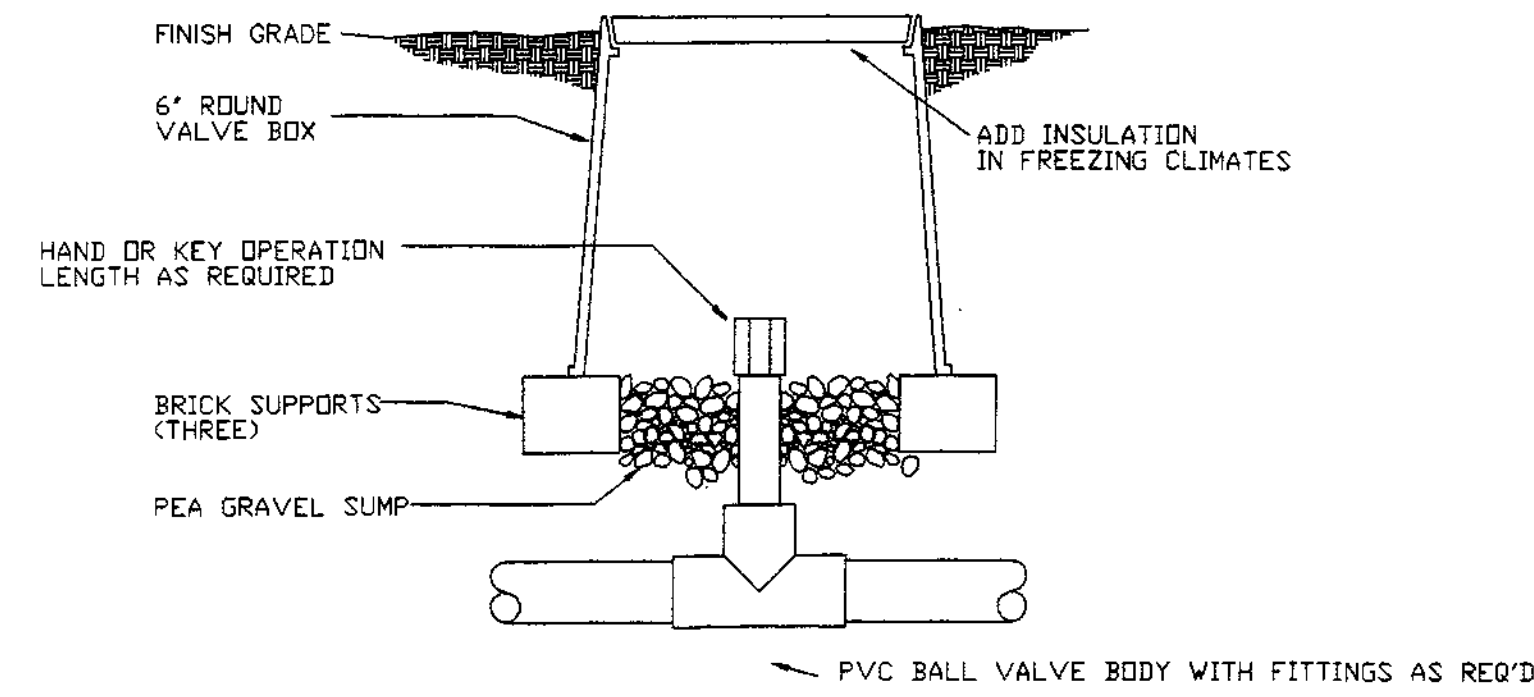
Anderson & Associates Engineering
1855 J. Lee Blvd
Reno, NV 89501
(775) 846-4163

NEVADA

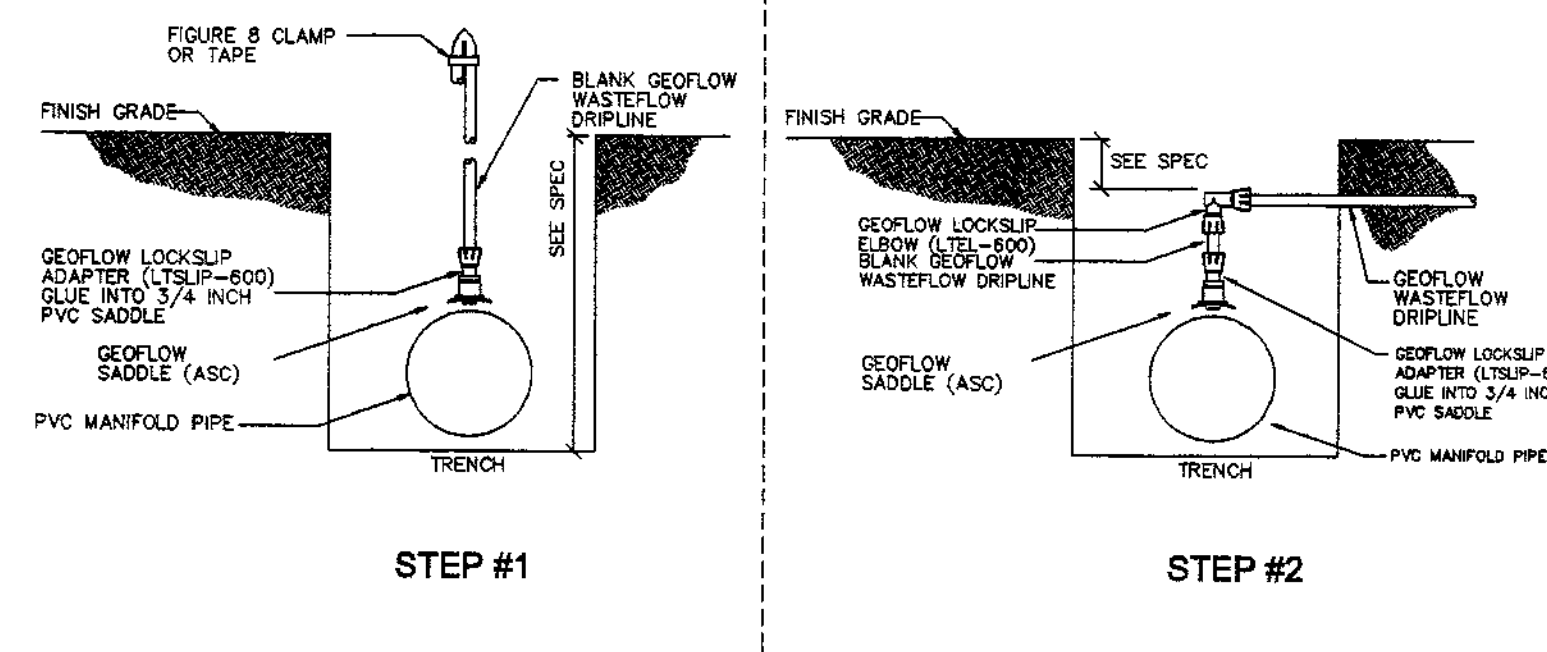
ONSITE EFFLUENT TREATMENT
630 HILL LANE

SCALE

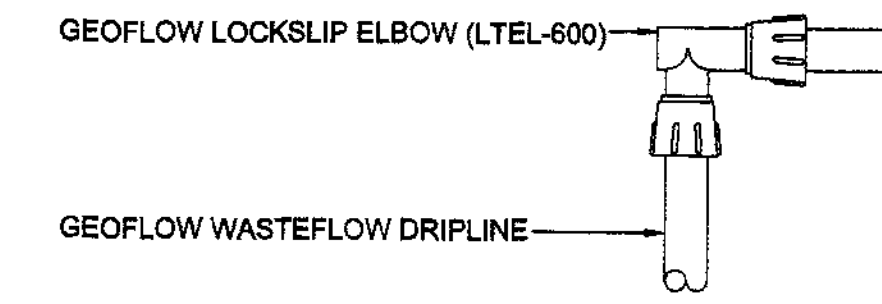
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COMP.:
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DATE:
SHEET NO. D-2
3 OF 5 SHEETS
JOB NO.



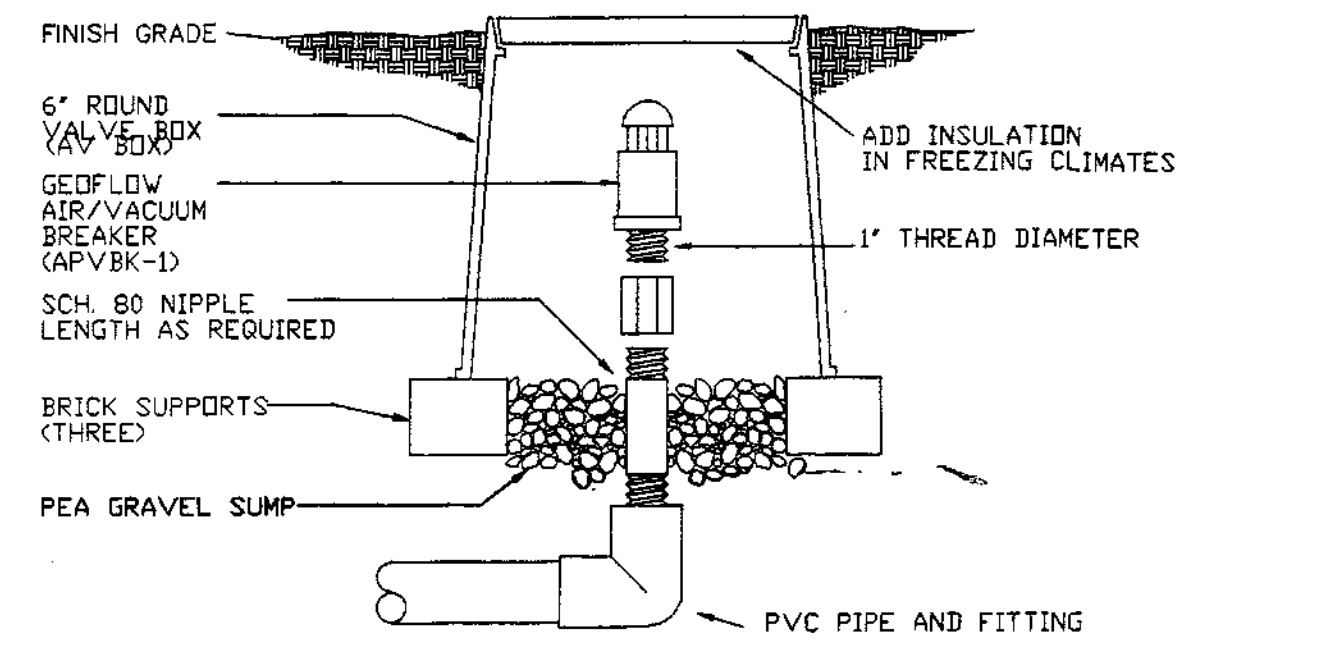
BALL VALVE ASSEMBLY
(PLUMBED TO PVC OR DIPLINE)
Not To Scale



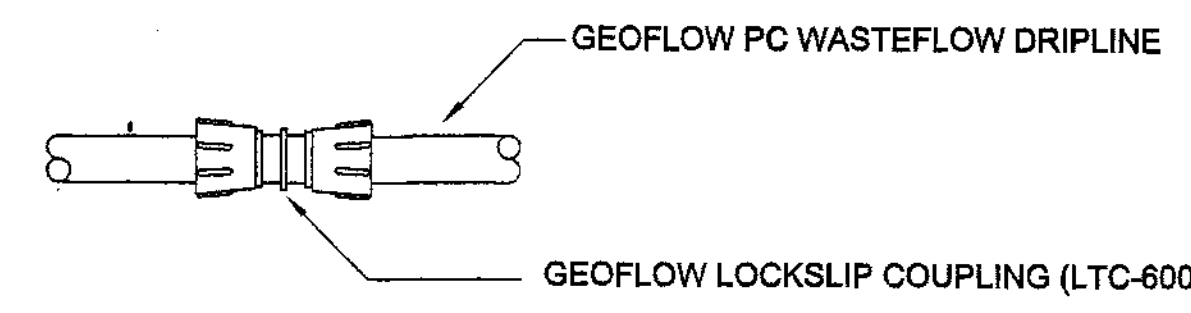
SADDLE MANIFOLD
Not To Scale



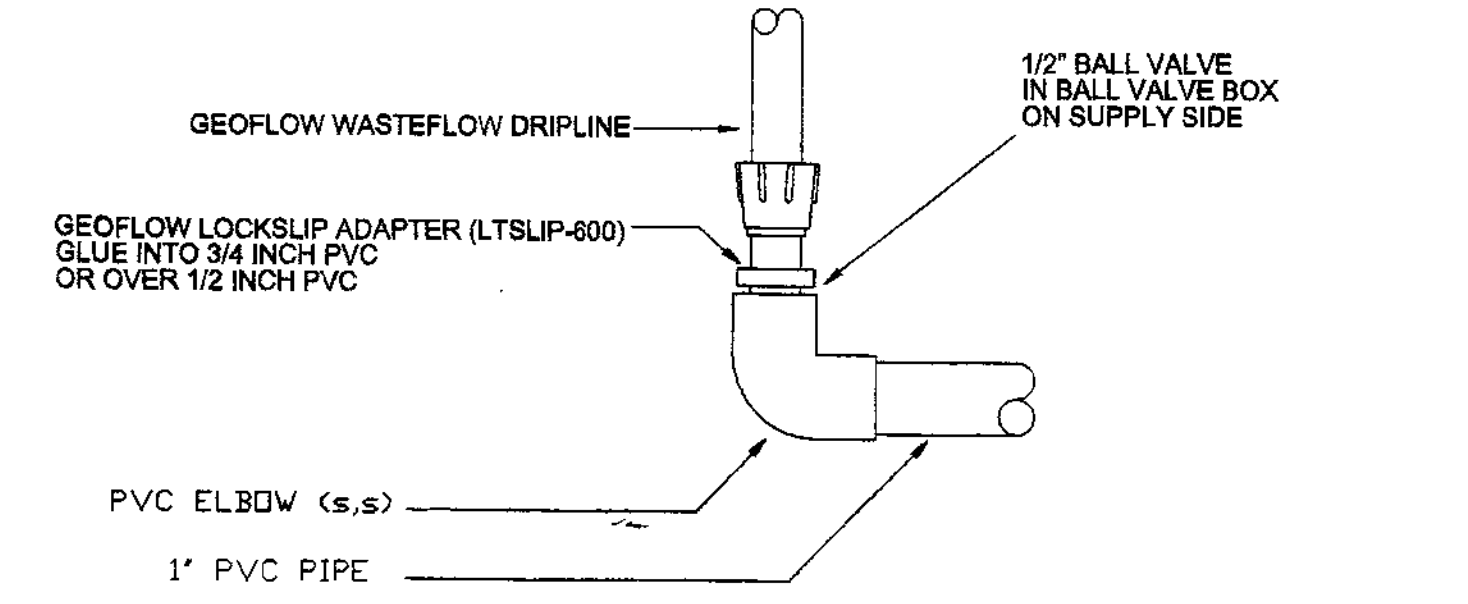
LOCKSLIP ELBOW (LTEL-600)
Not To Scale



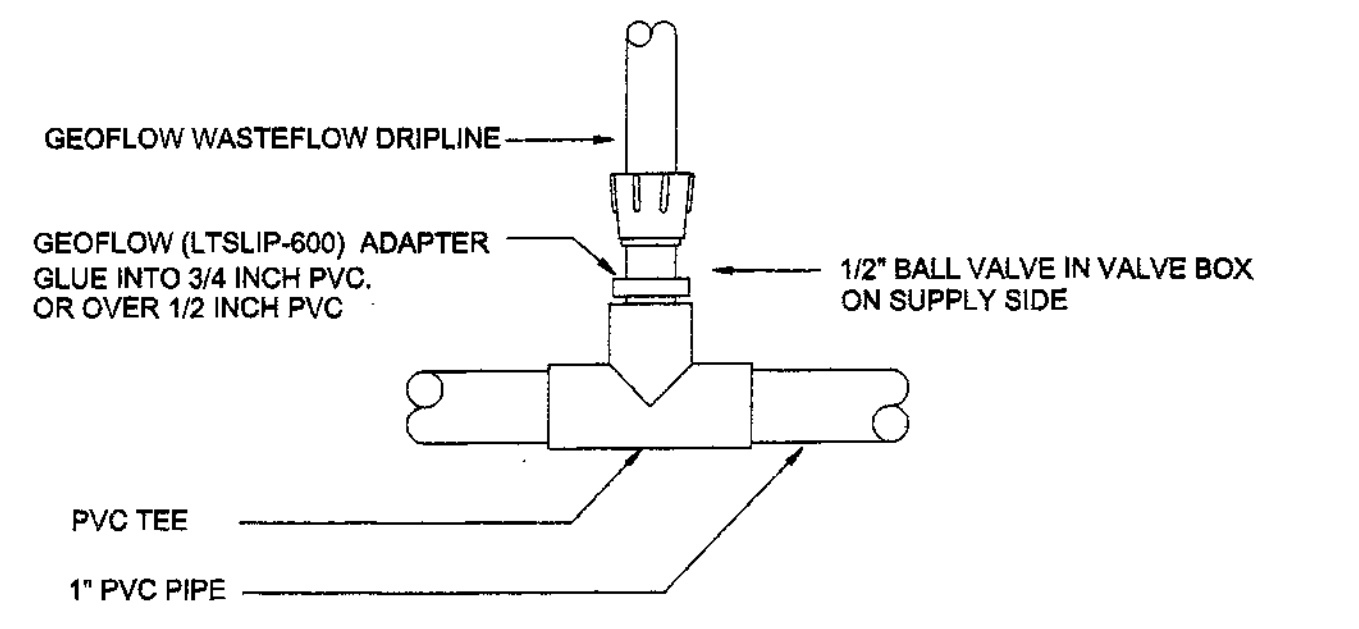
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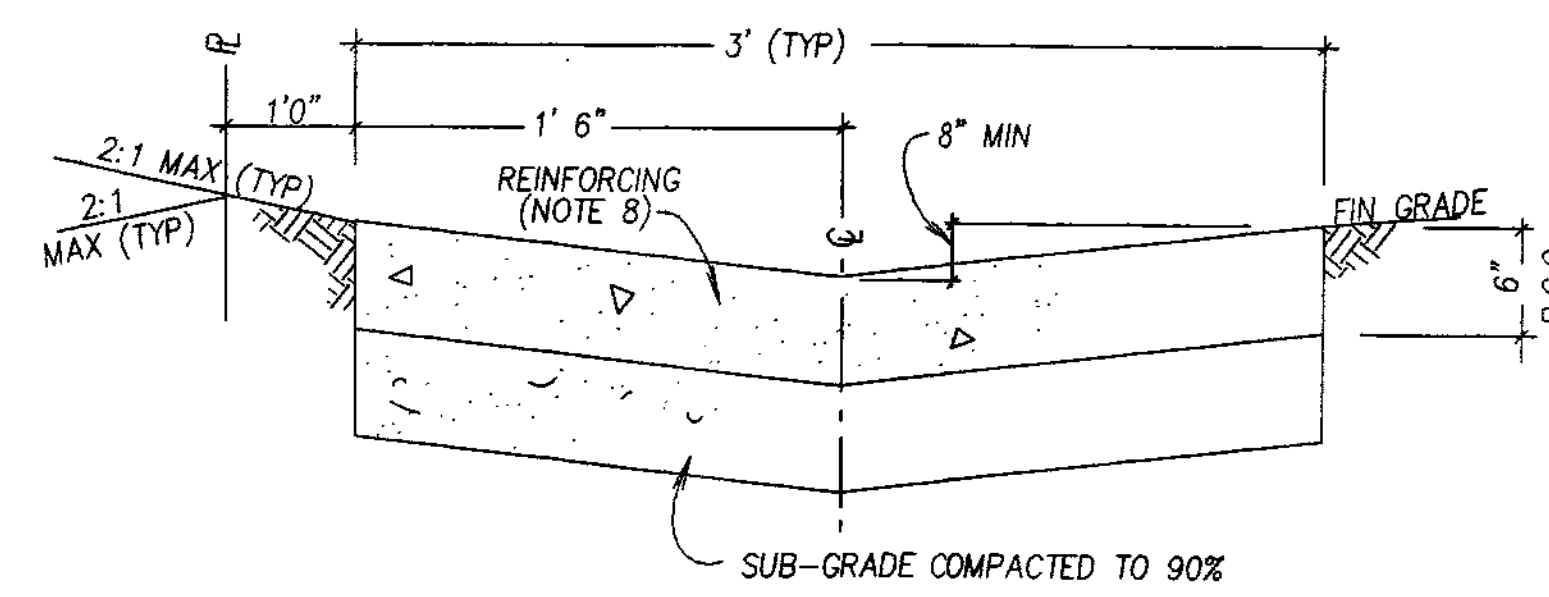
LOCKSLIP COUPLING (LTC-600)
Not To Scale



MANIFOLD CONNECTION (PVC TO ADAPTER)
Not To Scale



MANIFOLD CONNECTION (PVC TO ADAPTER)
Not To Scale



CONCRETE DRAINAGE SWALE
Not To Scale

- NOTES**
- SEE SHEET 1 OF 5.
 - 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" TO 4". ALL MATERIALS SHALL CONFORM TO SSPWC SECTION 202
 - MAX FLOWLINE GRADE SHALL BE 10% ON DETAIL A. USE DETAIL B ON GRADES IN EXCESS OF 10%.
 - MAX CHANGE IN HORIZ ALIGNMENT SHALL BE 10 DEGREES.
 - P.C.C. DRAINAGE SWALES SHALL HAVE WEAKENED PLANE JOINTS EVERY 10 FT.
 - NOT APPROVED FOR TRAFFIC USE.
 - POINT OF DISCHARGE SHALL BE DIRECTLY INTO AN EXISTING DRAINAGE DITCH.
 - REINFORCING SHALL CONSIST OF COLLATED, FIBRILLATED, POLYPROPYLENE FIBERS AS MFD. BY FIBERMESH OR APPROVED EQUAL. USE 1-1/2 LBS PER CU.YD. OF CONCRETE.
 - CONC CURB SHALL BE REQ'D AT ALL LOCATIONS WHERE CHANGES IN HORIZ ALIGNMENT EXCEED 10 DEGREES.

REV	DATE	REVISIONS

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

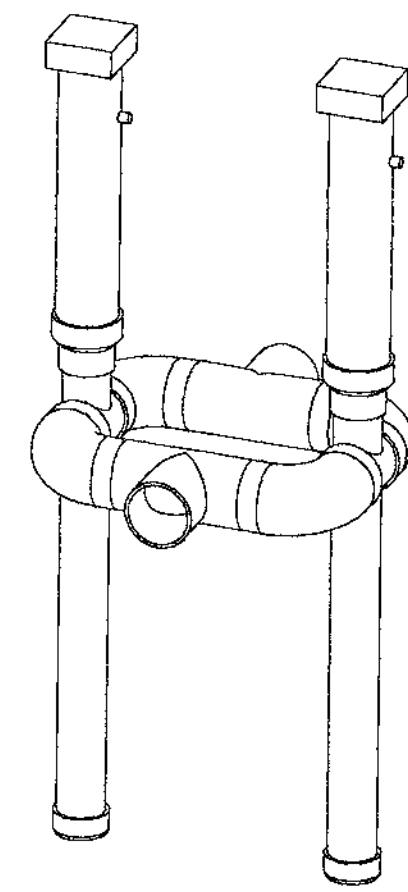
NEVADA

ONSITE EFFLUENT TREATMENT
630 HILL LANE

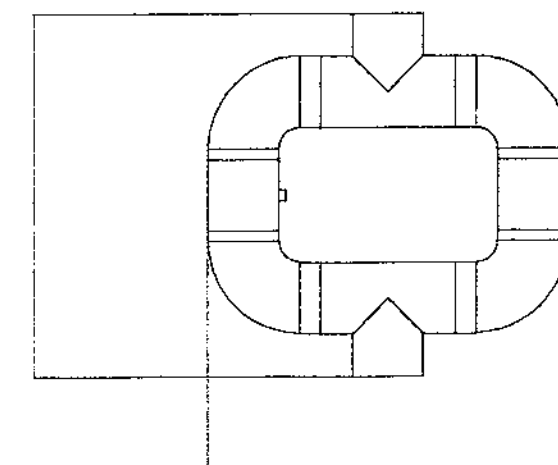
VERDI

SCALE

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



2-UP PARALLEL

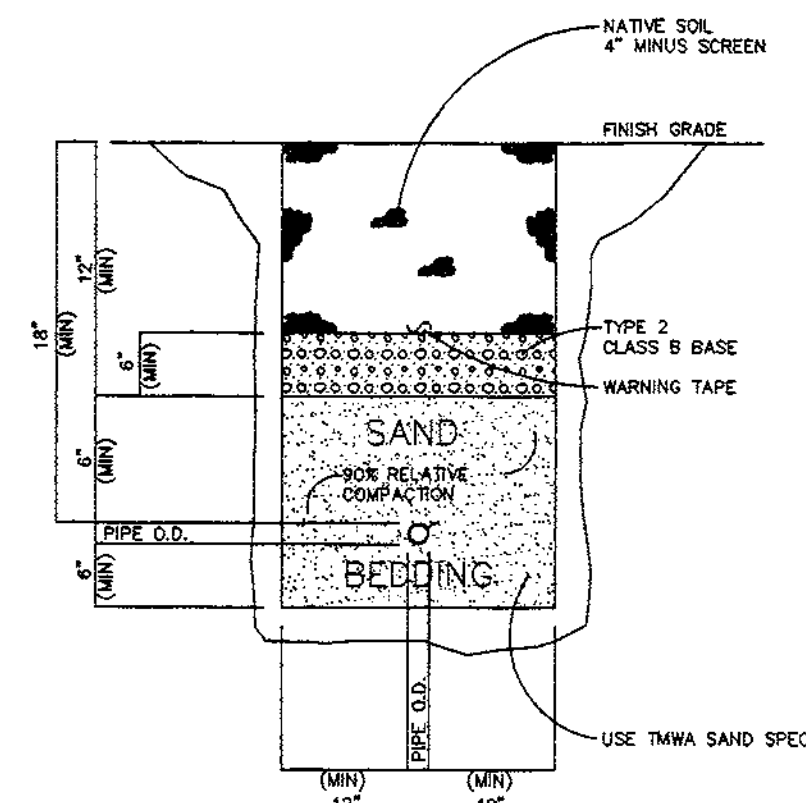


NOTES: UNLESS OTHERWISE SPECIFIED:
 1. FLOW: 12 GPM
 2. INLET AND OUTLET PORTS 4" SCHEDULE 40 PIPE
 INLET AND OUTLET PORTS 4" SCHEDULE 40 PIPE
 INLET AND OUTLET PORTS 4" SCHEDULE 40 PIPE

SALCOR INC. UV DISINFECTION SYSTEM

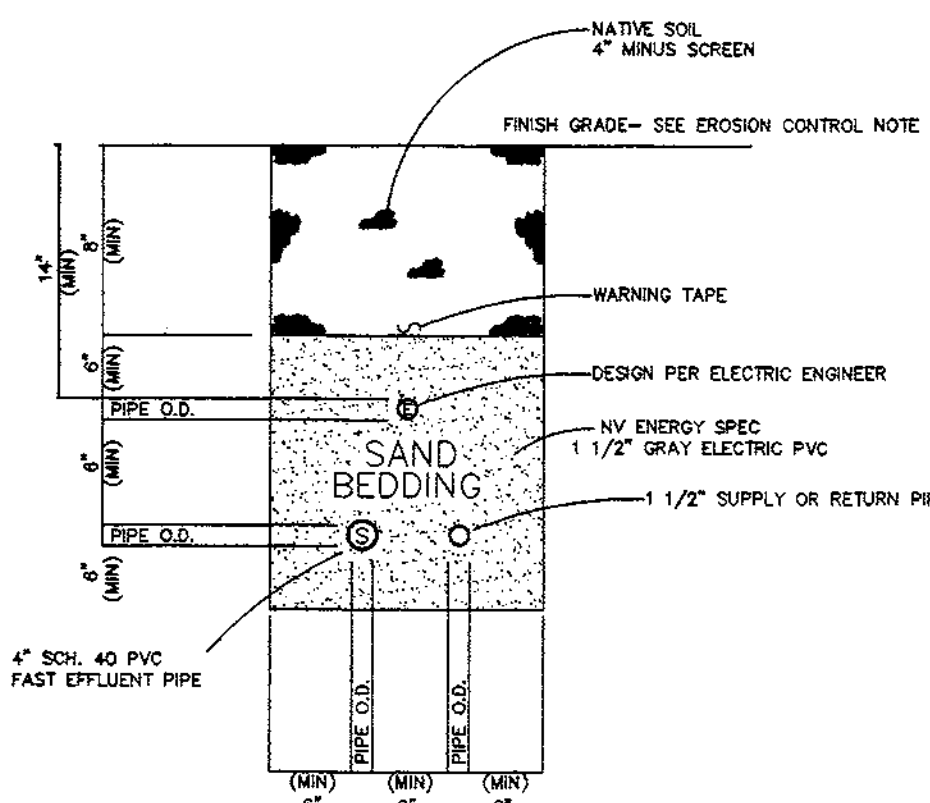
NOT TO SCALE

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



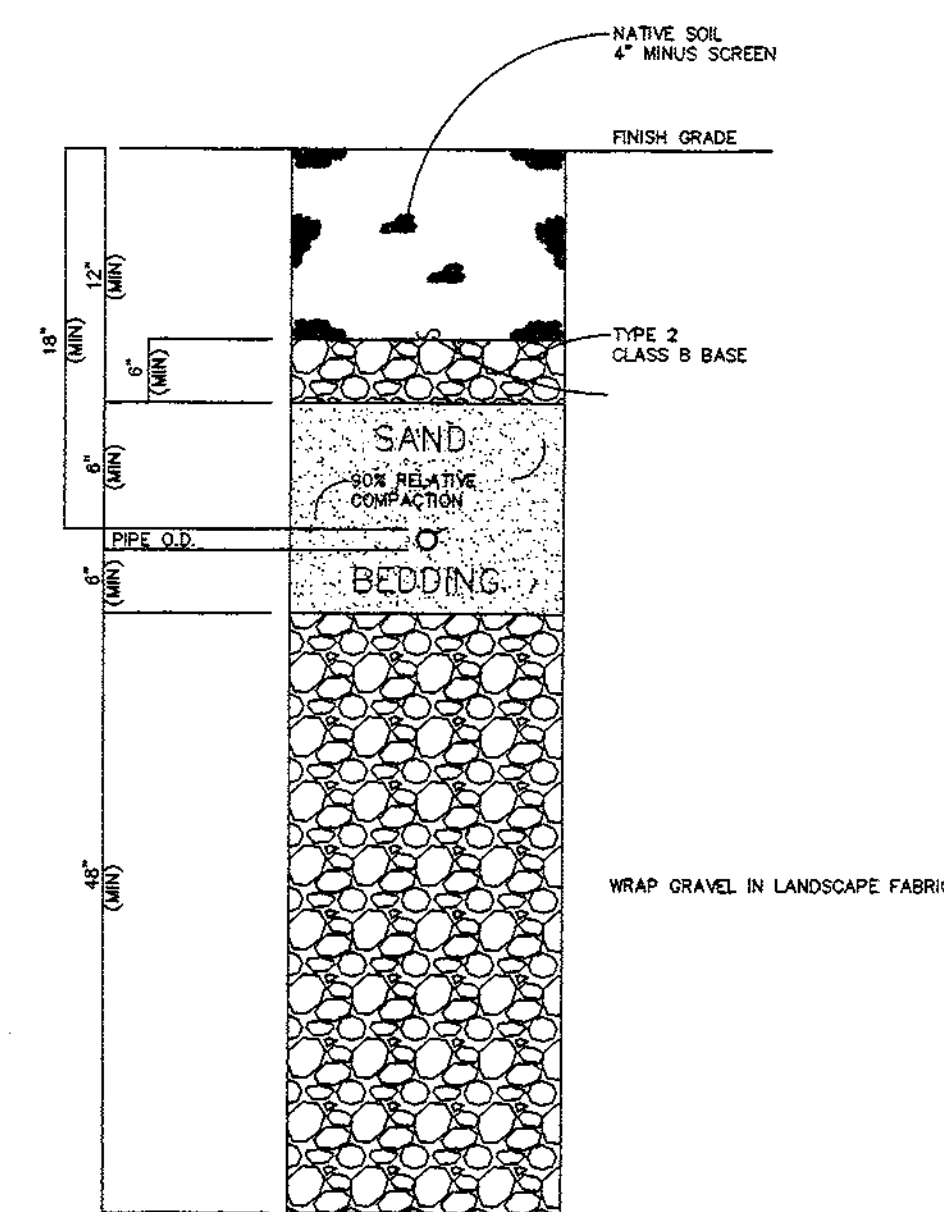
TRENCH DETAIL

NOT TO SCALE
 BLOWER PIPE & HOUSE SERVICE



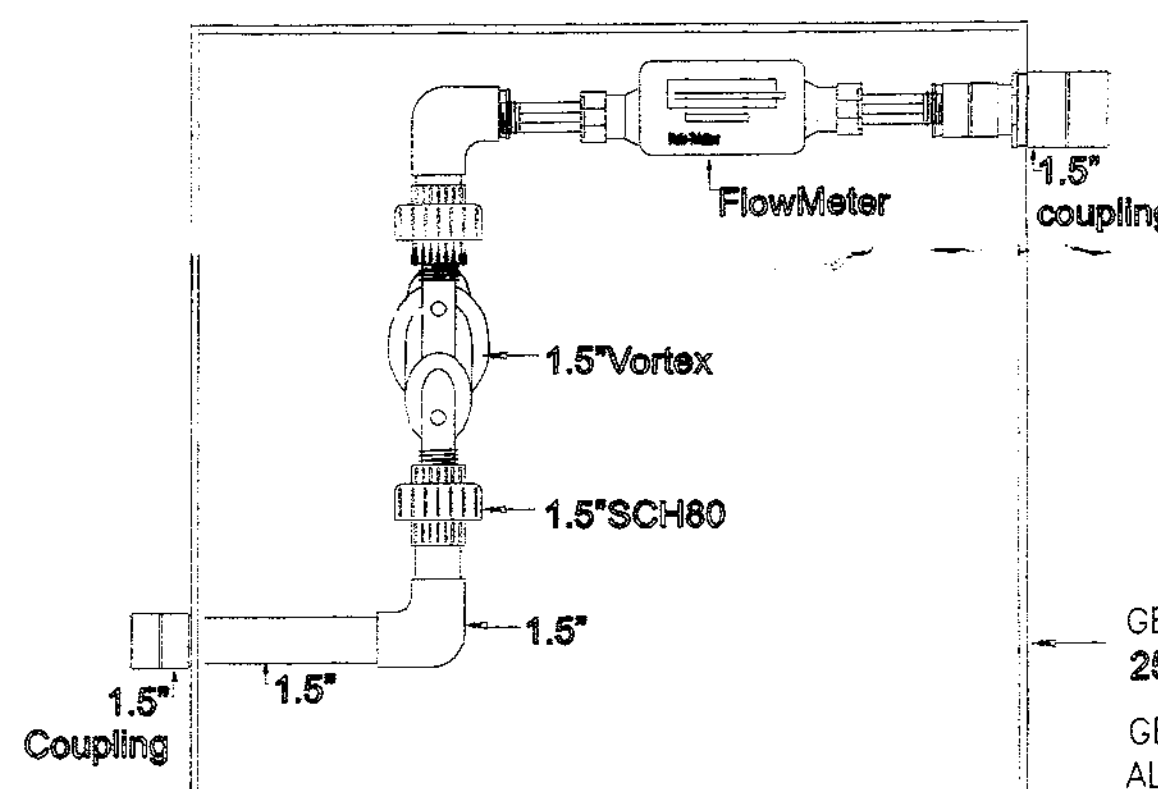
EFFLUENT SERVICE TRENCH

NOT TO SCALE



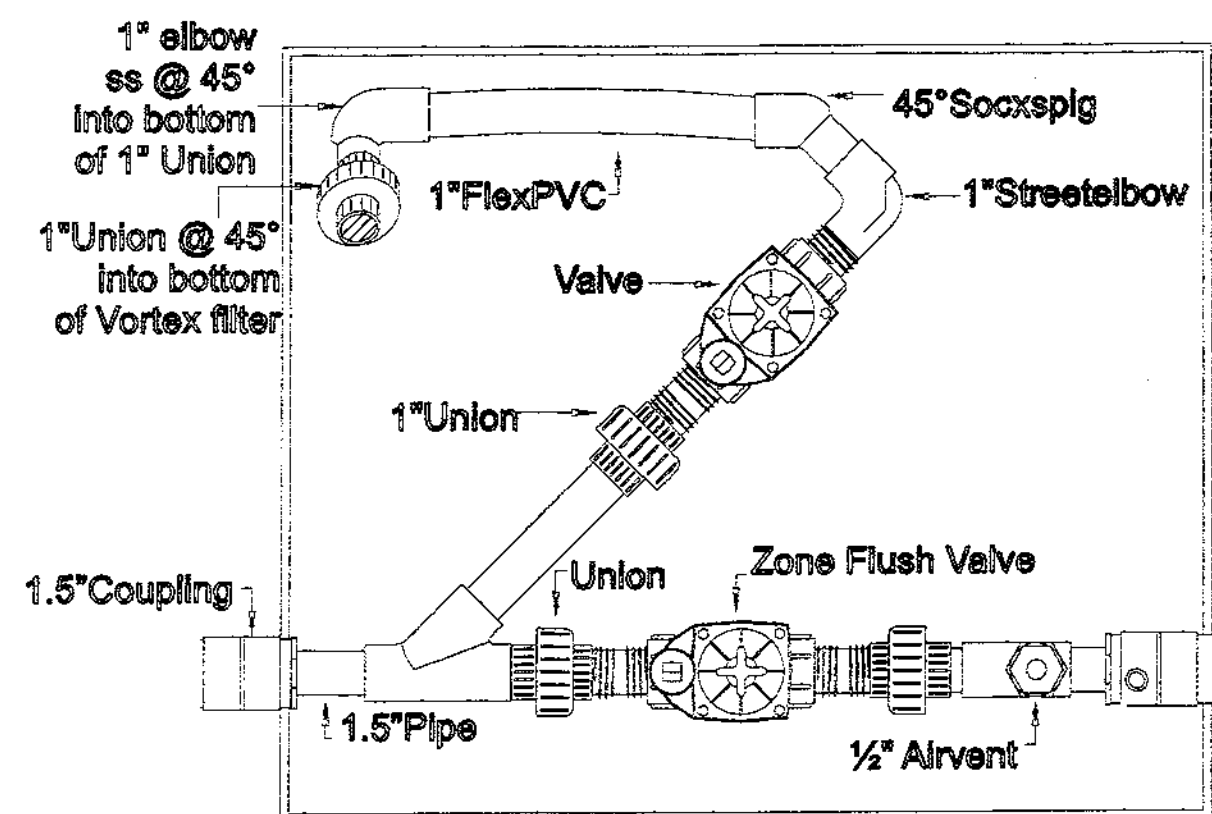
SUPPLY TRENCH DETAIL

NOT TO SCALE
 SEE SHEET 1 OF 5

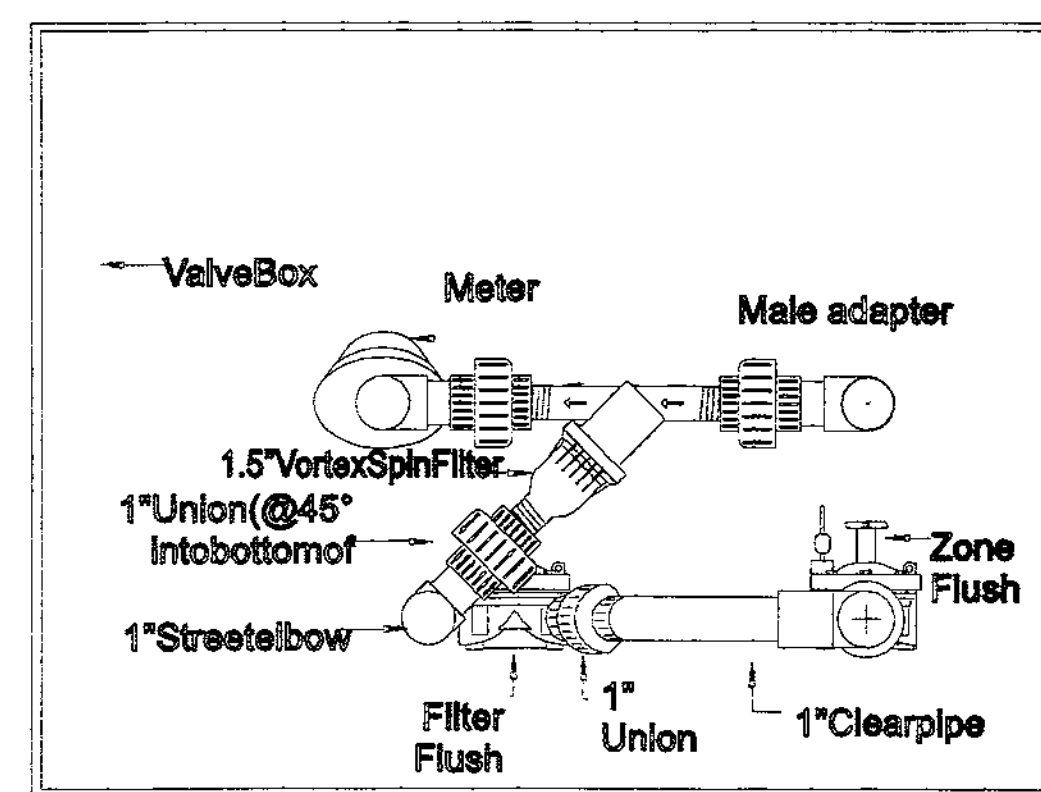


TOPVIEW
 TopLayer

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
 Bottomlayer

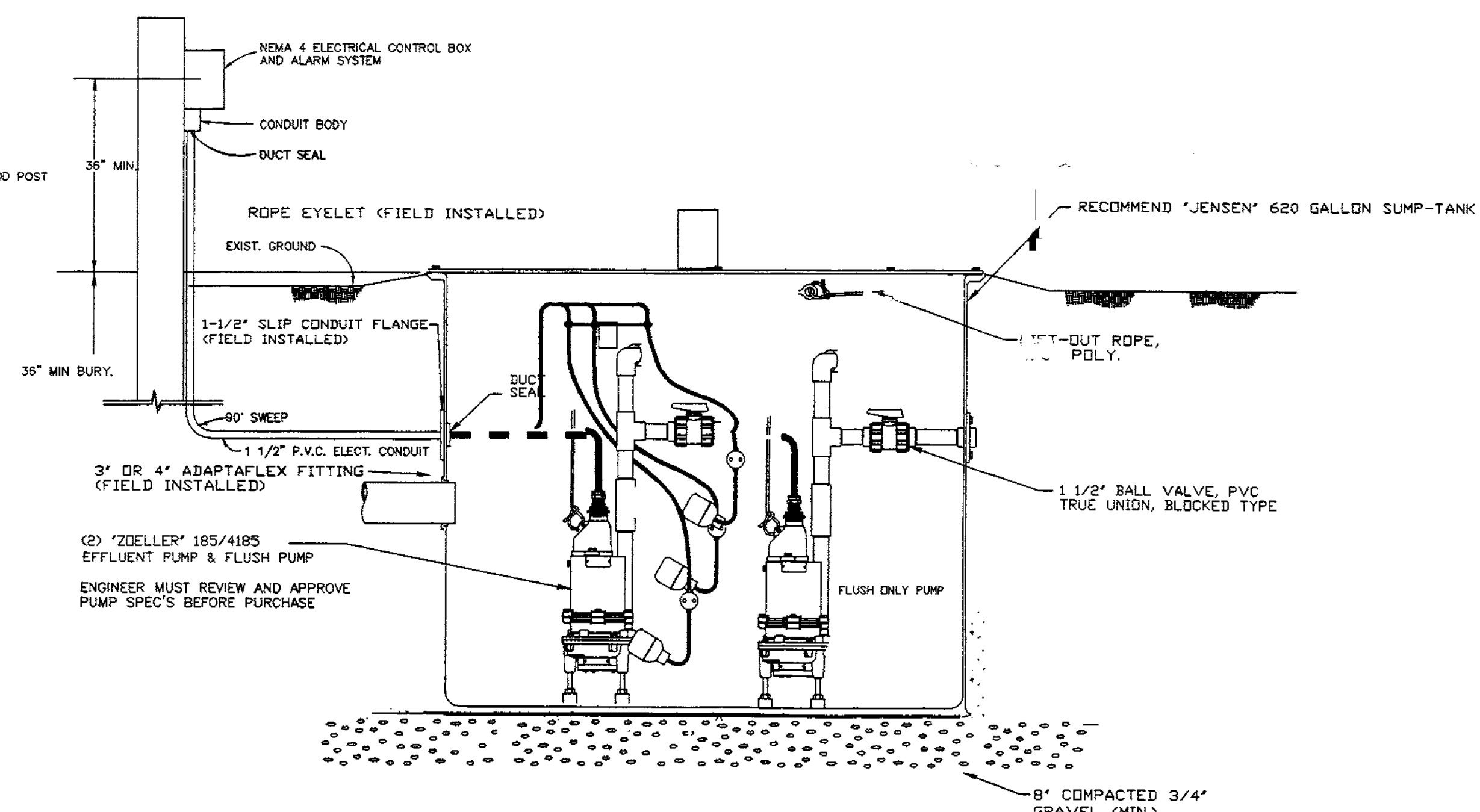


SIDEVIEW

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:
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CHECKED:
DATE:
SHEET NO.

D-4
 5 OF 5 SHEETS
 JOB NO.