

ENVIRONMENTAL CONCEPTS, LLC

On-Site Sewage Facility Design
Site and Soil Evaluations

OSSF Design For:
Lennon Residence
1101 Windy Hills Rd.
Dripping Springs, TX 78620



OWNER COPY

OWNER COPY

K.B. DeHart
1/30/13

Designed By: Kyle B. DeHart, RS, SE
Registered Professional Sanitarian #4127
Licensed Site Evaluator #OS0022979
Design #W050459

Environmental Concepts, LLC
PO Box 585, Wimberley, TX 78676
Office #512-847-8388 Cell #512-738-2501
Email: enviroconcepts@anvilcom.com

Environmental Concepts, LLC

Kyle B. DeHart, RS, SE * RS#4127 * SE#22979 * 512-847-8388

On-Site Sewage Facility (OSSF) Design and Calculations For: The Lennon Residence, 1101 Windy Hills Rd., Dripping Springs, TX 78620

Site Description

The site is Lot 25 in Glen H. Kothman Properties Subdivision in Hays County. The soil evaluation indicates the suitability for use of an aerobic surface irrigation system. The site is a hilltop. There are native oak and cedar trees with native grasses present. This site is not in the Edwards Aquifer Recharge Zone. Rain water is proposed. No Wells were observed within 100' of spray area.

System Design

The design is for a 3 bedroom 2977sq.ft. residence (4bdr. equivalent). There are water saving fixtures present therefore the projected daily wastewater flow is 300gpd. The site will utilize a NuWater B-550 Aerobic Treatment Unit (ATU) with NSF Standard 46 liquid chlorination. There is a shop/office/pump house present on-site, but no plumbing is planned for that structure.

The ATU is housed in a 3 chamber concrete tank. It consists of a 353 gal. pretreatment/trash chamber that flows by gravity into the 750gal. aerobic treatment and clarifying chamber (600gpd). Once the effluent is processed it gravity flows from the aerobic/clarifying chamber into the 768 gal. pump chamber where it is disinfected by a NSF liquid chlorinator and stored for dispersal. When the pump is activated, by the timer set between midnight and 4AM, the treated effluent is pumped into 1.0" purple schedule 40 PVC pipe where it is then dispersed through low angle spray heads into the spray area.

Design Specifications & Capacities

Wastewater daily flow: 2977sq.ft. 3bdr. = 300gpd. (4bdr. equiv.)

Required spray area: 300gpd/.064gpd/sq.ft. = 4688sq.ft.

Utilized area: 2 spray heads @ 360 degree @ 28' radii = $(28 \times 28 \times 3.14) \times 2 = 4924\text{sq.ft.}$

Spray heads: K-Rain with #3.0 low angle nozzle with built in anti-drain check-valve.

Spray head flow: 2 heads @ 3.0gpm @ 30psi = 6.0gpm total flow.

Total dose: 300gpd/6.0gpm = ~ 50min/day total dose time. Timer set to dose between midnight & 4am.

NuWater Tank Capacities: Pretreatment = 353gal. Aerobic = (600gpd) Pump = 768gal.

Pump Calculations & Pump Tank Float Settings

Friction loss: 120' of 1.0" PVC @ 6.0gpm = $2.13'/100'$ so, $(120' \times 2.13'/100') \times 1.2 \text{ for fittings} = 3.07'$

Elevation: 5' rise from pump to top of tank = 5.0'

Pressure: $2.31'/\text{psi} \times 30\text{psi} = 69.3'$

Total Dynamic Head (TDH) = $3.07' + 5.0' + 69.3' = 77.37'$

Pump: C-Series 1/2hp model pump.

Pump off @ 8.0"

Pump on @ 11.0"

Alarm on @ 32.0"

Daily capacity = 304.29gal.

Reserve capacity = 768.0gal - 463.71gal = 304.29gal. reserve.

Installation & Construction

The installer is to follow all manufacturers guidelines for installation of the Aerobic Treatment Unit (ATU) and the external aerator.

All setbacks as imposed by the TCEQ Chapter 285 and the Regulatory Authority are to be followed at all times.

The wastewater tightline from the dwelling stub-out to the ATU inlet should have 1/8" per foot of fall and have a 2-way cleanout.

The alarm for the ATU should have both audible and visual alarm signals on a circuit separate from the pump.

If the spray heads are downhill from the ATU then anti-drain washers or an inline spring check valve should be used to avoid run-on of spray heads and pooling in the spray area. An anti-siphon hole of 1/4" should also be drilled in the distribution pipe in the pump chamber to avoid siphoning. If the spray heads are uphill from the ATU then a spring or flap type check valve may be needed to avoid back flow to the ATU.

All obstructions within 10' of the spray heads should be removed along with any low hanging limbs that may impede the spray pattern. Spray heads to be 15' from trees with 24" trunk diameters.

Once the ATU hole is dug and level a minimum of 4 inches of sand, sandy loam, or pea gravel must be placed as a pad under the ATU. Backfill for the ATU must not contain rocks or be a Class IV type soil. All chambers of the ATU should be filled with water and the hole is to be left open until the ATU has been leak tested by the Regulatory Authority. Leak test and backfill the ATU as soon as possible.

Tank access lids to have risers and lids to grade with a secondary lid or plug.

Electrical

All electrical wiring shall conform to the most recent guidelines set forth by the National Electric Code. This includes the use of approved, rigid, nonmetallic gray electrical conduit to house all exterior wiring and the use of approved junction boxes and circuit breakers.

The high water alarm for the ATU should contain an audible as well as a visual signal and be on a circuit separate from the pump.

Landscape

The spray area should contain adequate soil to support vegetation. If rocks are present in the spray area they should either be removed or covered with 4" of suitable soil and seeded before the system is put into operation.

Use Rye grass seed in the Fall/Winter (7-9lbs/1000sq.ft.) and Bermuda grass seed in the Spring/Summer (3-4lbs/1000sq.ft.). A 50/50 mix may be used in transitions months (5-6lbs/1000sq.ft.).

All obstructions within 10' of the spray heads are to be removed as well as any low hanging limbs that may obstruct the spray pattern. Spray heads to be 15' from trees with 24" trunk diameters.

Inspections

Inspections shall occur as required by the Regulatory Authority. Call the Regulatory Authority in advance for information on the inspection process and to schedule the inspections.

Maintenance Requirements

As required by the TCEQ Chapter 285 aerobic treatment units are to be maintained by a licensed maintenance provider. The initial maintenance contract is for 2 years and is included with the installation of the system. The maintenance is to occur 3 times per year with no more than 4 months between maintenance visits. A copy of the maintenance report is to be sent to the Regulatory Authority as well as to the homeowner.

Affidavit Requirements

An Affidavit is required. The Affidavit is to be signed, notarized and filed at the County Clerk's Office as an attachment to the property where the system is to be installed. The original notarized and recorded Affidavit is to be presented with the Maintenance contract and appropriate application to the Regulatory Authority prior to an Authorization to Construct (permit) being issued.

Guidelines for system operation

A septic system is not the city sewer. Solids such as grease, food scraps, cigarette butts, scrap paper and feminine products should not be permitted into the septic system. Items such as these can be detrimental to the operation of the septic system and require repair or replacement of certain components of the system.

Water conservation and the use of low flow fixtures are paramount for the prevention of a hydraulic (water) overload on the OSSF. Repair leaks, do not leave the faucets running, take short showers instead of baths and repair any leaking plumbing immediately.

Routine pumping of the chambers of the septic tank is recommended every 3 to 4 years and may need to be done more frequently depending on the accumulation of solids/sludge in these chambers. Clogging of the 100 mesh filters or the spray heads is a good indication of a solids/sludge overload in the system and steps should be taken to reduce the amount of solids entering the system. It is highly recommended to have the system pumped if this situation occurs.

Chemical or biological additives should not be added to the septic system. There is no merit to these products effectiveness and many can harm the living bacteria in the system; causing more harm than good.

Avoid driving over the tank location and building any structures in the area of the tank or the spray area.

Vegetative cover is essential for the operation of any OSSF and must be maintained at all times in the areas that the OSSF occupies, especially in the spray areas.

***Please be aware that though all On-Site Sewage Facility (OSSF) design guidelines have been followed per the TCEQ and the Regulatory Authority, the ultimate functioning of this OSSF is left up to its' correct installation and the proper use by the homeowner. This system is designed for 300gpd. For proper system functioning 300gpd should not be exceeded. Furthermore, it should be understood that neither the designer of this system nor *ENVIRONMENTAL CONCEPTS, LLC* can, in no way, be held liable for a failure that occurs due to exceeding the design flow of 300gpd, negligence by the homeowner or by faulty installation. A failing OSSF must be repaired or replaced as required by the TCEQ and the local Regulatory Authority.**

OSSF SOIL EVALUATION FORM

Owner: Rickye L. Lennon

Address: 1101 Windy Hills Rd., Dripping Springs, TX 78620

Legal Description: Lot 25, Glen H. Kothman Properties Subdivision

Date of Evaluation: 01/21/2016

Evaluation Requirements:

Proposed Excavation Depth: Surface

- A minimum of two soil evaluations is required at the proposed OSSF site. These evaluations should be done at opposite ends of the proposed disposal area. Locations of these evaluation sites should be indicated on the site plan.
- If subsurface disposal is proposed then the depth of the soil evaluation should be 2 feet below the proposed excavation depth. If surface disposal is proposed the soil surface should be evaluated.
- Each soil layer in the evaluation should be identified and any restrictive horizon should be indicated if one exists.

Soil Profile #1

Depth in Feet	Textural Class	Gravel Analysis	Drainage-Mottles, Water Table	Restrictive Horizon	Observations
0 0"-6"	III	N/A	None	Rock	Clay Loam mix with scattered surface and subsurface rock.
1					
2					
3					
4					
5					

Soil Profile #2

Depth in Feet	Textural Class	Gravel Analysis	Drainage-Mottles, Water Table	Restrictive Horizon	Observations
0 0"-6"	III	N/A	None	Rock	Clay Loam mix with scattered surface and subsurface rock.
1					
2					
3					
4					
5					

Features of Site

Presence of 100-year floodplain	No
Presence of adjacent ponds, streams, or water impoundments	No
Existing or proposed water well nearby	No
Organized sewage available	No
Recharge features within 150 feet	No

I certify that the findings of this evaluation are based on my observations in the field and are accurate to the best of my abilities.

Signature of Site Evaluator VCRA, PB, SE OS22979

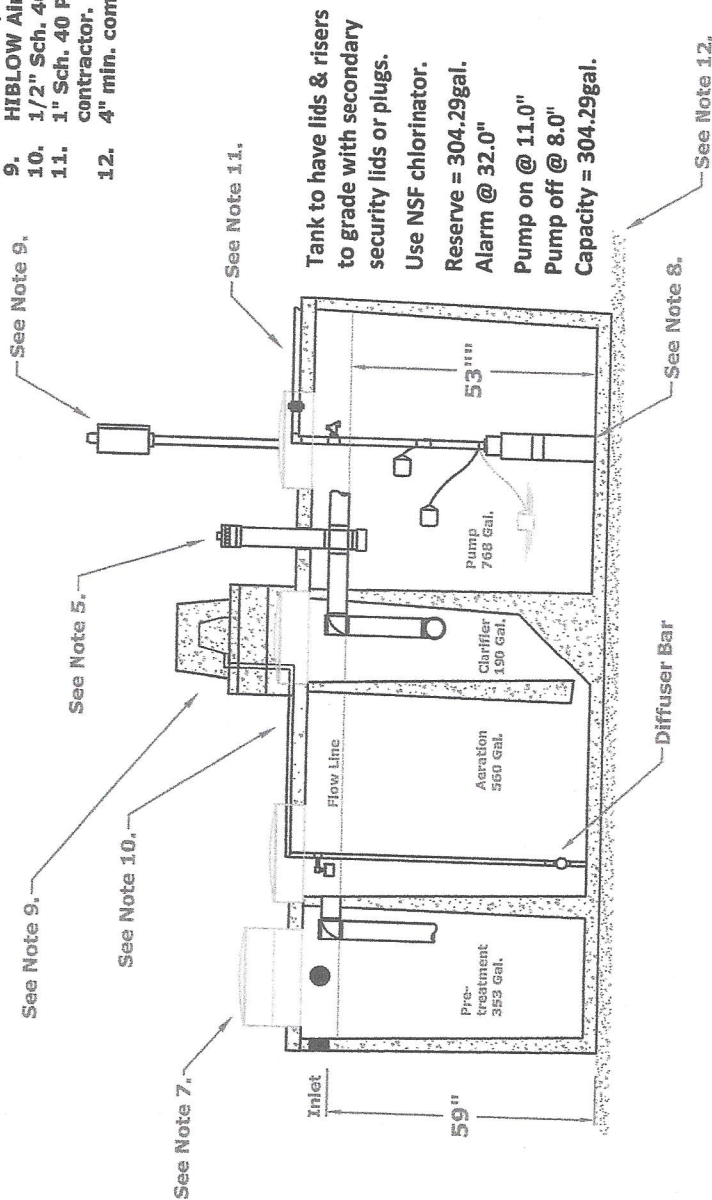
Date 1/30/16

Assembly Details

OSSF

GENERAL NOTES:

1. Plant structure material to be precast concrete and steel.
2. Maximum burial depth is 30" from slab top to grade.
3. Weight = 14,900 lbs.
4. Treatment capacity is 600 GPD. Pump compartment set-up for a 360 GPD Flow Rate (4 beedroom, < 4,000 sq/ft living area). Please specify for additional set-up requirements.
5. BOD Loading = 1.62 lbs. per day.
6. Standard tablet chlorinator or Optional Liquid chlorinator. NSF approved chlorinators (tablet & liquid) available.
7. Bio-Robix B-550 Control Center w/ Timer for night spray application. Optional Micro Dose (min/sec) timer available for drip applications. Electrical Requirement to be 115 Volts, 60 Hz, Single Phase, 30 AMP, Grounded Receptacle.
8. 20" Ø access riser w/ lid (Typical 4). Optional extension risers available.
9. 20 GPM 1/2 HP, high head effluent pump.
10. HIBLOW Air Compressor w/ concrete housing.
11. 1/2" Sch. 40 PVC Air Line (Max. 50 Lft from Plant).
12. 1" Sch. 40 PVC pipe to distribution system provided by contractor.
13. 4" min. compacted sand or gravel pad by Contractor



DIMENSIONS:

Outside Height: 67"
Outside Width: 63"
Outside Length: 164"

MINIMUM EXCAVATION DIMENSIONS:

Width: 76"
Length: 176"

NuWater B-550 (600 GPD) Aerobic Treatment Plant (Assembled)

Model: B-550-PC-400PT

March, 2012 - Rev 1
By: A.S.

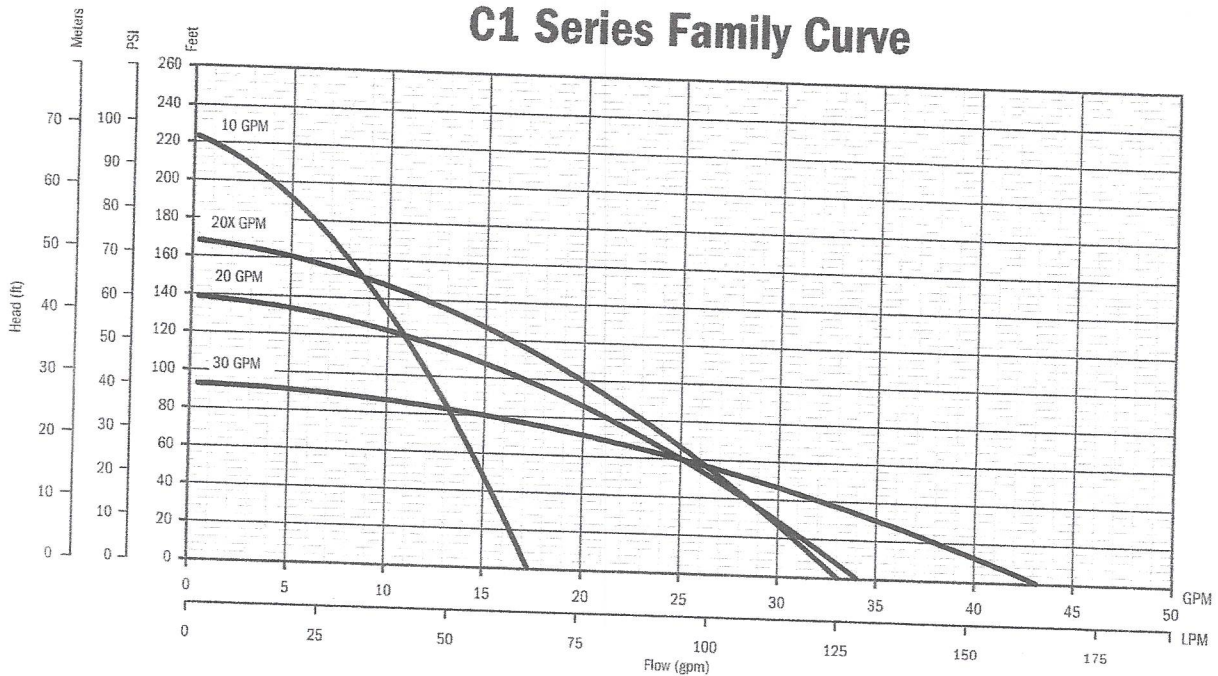
Scale:
* All Dimensions subject to allowable specification tolerance.

Dwg. #: ADV-B550-3

Advantage
Wastewater Solutions Inc.

Advantage Wastewater Solutions Inc.
444 A Old Hwy No 9
Comfort, TX 78013
830-995-3189
fax 830-995-4051

C1 Series Family Curve



FEATURES

- Supplied with a removable 5" base for secure and reliable mounting
- Bottom suction design
- Robust thermoplastic discharge head design resists breakage during installation and operation
- Single shell housing design provides a compact unit while ensuring cool and quiet operation
- Hydraulic components molded from high quality engineered thermoplastics
- Optimized hydraulic design allows for increased performance and decreased power usage
- All metal components are made of high grade stainless steel for corrosion resistance
- Available with a high quality 115 V or 230 V, 1/2 hp motor
- Fluid flows of 10, 20, and 30 gpm, with a max shut-off pressure of over 100 psi
- Heavy duty 600 V 10 foot SJ00W jacketed lead

APPLICATIONS

- Gray water pumping
- Filtered effluent service water pumping
- Water reclamation projects such as pumping from rain catchment basins
- Aeration and other foundation or pond applications
- Agriculture and livestock water pumping

ORDERING INFORMATION

C1 Series Pumps

C1 Series Pumps							
GPM	HP	Volts	Stage	Model No.	Order No.	Length (in)	Weight (lbs)
10	1/2	115	7	10C1-05P4-2W115	90301005	26	17
		230	7	10C1-05P4-2W230	90301010	26	17
20		115	5	20C1-05P4-2W115	90302005	25	16
		230	5	20C1-05P4-2W230	90302010	25	16
20X		115	6	20XC1-05P4-2W115	90302015	26	17
		230	6	20XC1-05P4-2W230	90302020	26	17
30		115	4	30C1-05P4-2W115	90303005	25	16
		230	4	30C1-05P4-2W230	90303010	25	16

Note: All units have 10 foot long SJ00W leads.

Note: All units have 10 foot long SJ00W leads.

K-Rain - ProPlus Gear Drive Technical Info

Low Angle

Metric

Nozzle	Pressure	Radius	Flow	Nozzle	Pressure	Radius	Flow Rate
	PSI	Ft.	GPM		kPa Bars	Meters	L/M M3/H
#1	30	22'	1.5	#1	207 2.04	6.71	5.67 .34
	40	24'	1.7		275 2.72	7.32	6.43 .39
	50	26'	1.8		344 3.40	7.92	6.80 .41
	60	28'	2.0		413 4.08	8.53	7.56 .46
#3	30	29'	3.0	#3	207 2.04	8.84	11.34 .68
	40	32'	3.1		275 2.72	9.75	11.72 .71
	50	35'	3.5		344 3.40	10.67	13.23 .80
	60	37'	3.8		413 4.08	11.28	14.36 .87
#4	30	31'	3.4	#4	207 2.04	9.45	12.85 .78
	40	34'	3.9		275 2.72	10.36	14.74 .89
	50	37'	4.4		344 3.40	11.28	16.63 1.00
	60	38'	4.7		413 4.08	11.58	17.77 1.07
#6	40	38'	6.5	#6	275 2.72	11.58	24.57 1.68
	50	40'	7.3		344 3.40	12.19	27.59 1.66
	60	42'	8.0		413 4.08	12.80	30.24 1.82
	70	44'	8.6		482 4.76	13.41	32.51 1.96

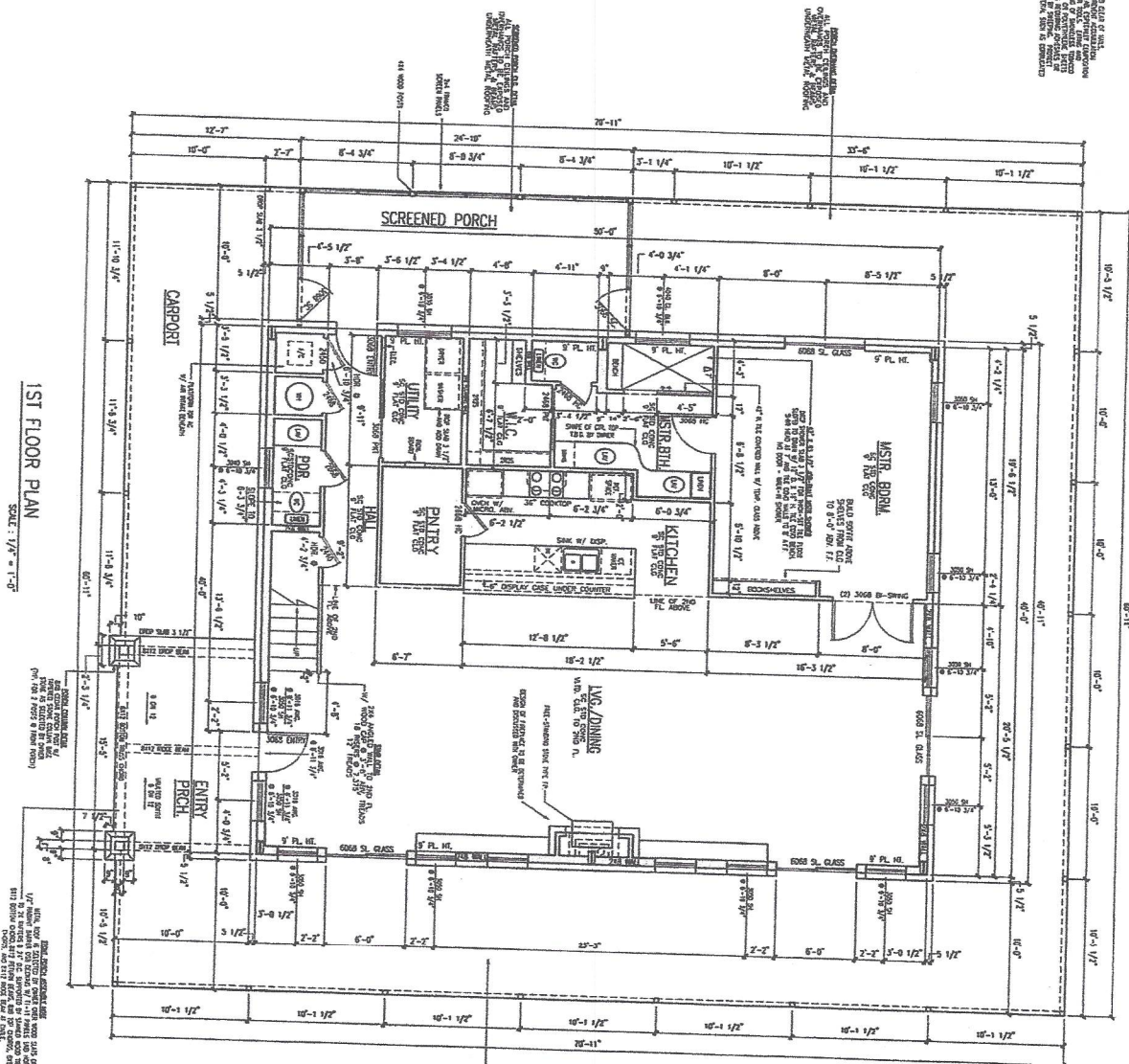
PERFORMANCE

METRIC

Nozzle	Pressure	Radius	Flow	Nozzle	Pressure	Radius	Flow Rate
	PSI	Ft.	GPM		kPa Bars	Meters	L/M M3/H
#1	30	32'	1.3	#1	206 2.0	9.8	4.92 .29
	40	33'	1.5		275 3.0	10.1	5.68 .34
	50	34'	1.6		345 3.5	10.4	6.05 .36
	60	35'	1.8		413 4.0	10.7	6.81 .40
#2	30	37'	2.4	#2	206 2.0	11.3	9.08 .54
	40	40'	2.5		275 3.0	12.2	9.46 .56
	50	42'	3.0		345 3.5	12.8	11.35 .68
	60	43'	3.3		413 4.0	13.1	12.49 .75
#2.5	30	38'	2.5	#2.5	207 2.04	11.6	9.45 .57
	40	39'	2.8		275 2.72	11.9	10.58 .64
	50	40'	3.2		344 3.40	12.2	12.10 .73
	60	41'	3.5		413 4.08	12.5	13.23 .80
#3	30	38'	3.6	#3	206 2.0	11.5	12.49 .75
	40	39'	4.2		275 3.0	11.9	15.89 .95
	50	41'	4.6		345 3.5	12.5	17.41 1.04
	60	42'	5.0		413 4.0	12.8	18.92 1.13
#4	30	43'	4.4	#4	206 2.0	13.1	16.65 .99
	40	44'	5.1		275 3.0	14.3	19.30 1.15
	50	46'	5.6		345 3.5	14.0	21.19 1.27
	60	49'	5.9		413 4.0	14.9	22.33 1.33
#6	40	45'	5.9	#6	275 3.0	13.7	22.33 1.33
	50	46'	6.0		344 3.5	14.0	22.71 1.36
	60	48'	6.3		413 4.0	14.6	23.85 1.43
	70	49'	6.7		482 5.0	14.9	25.35 1.52
#8	40	42'	8.0	#8	275 3.0	12.8	30.28 1.81
	50	45'	8.5		345 3.5	13.7	32.12 1.92
	60	49'	9.5		413 4.0	14.9	35.95 2.15
	70	50'	10.0		482 5.0	15.3	37.85 2.27

Data represents test results in zero wind. Adjust for local conditions.
 Radius may be reduced with nozzle retention screw.
 *PER C.I.T./ASAE standard

SLAB SURFACE PROTECTION NOTE
 1. ALL SLAB SURFACES SHALL BE PROTECTED FROM DAMAGE DURING CONSTRUCTION AND FINISHING.
 2. PROTECTION SHALL BE MAINTAINED THROUGHOUT THE CONSTRUCTION PERIOD.
 3. PROTECTION SHALL BE REMOVED IMMEDIATELY UPON COMPLETION OF THE FINISH WORK.
 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND REMOVAL OF THE PROTECTION.
 5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND REMOVAL OF THE PROTECTION.



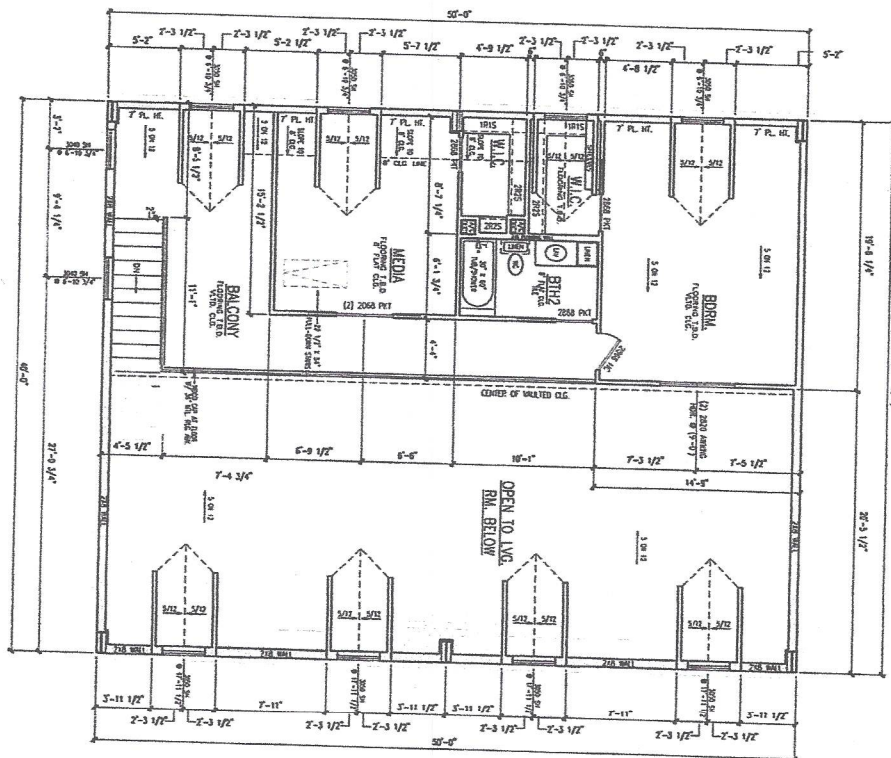
1ST FLOOR PLAN
 SCALE: 1/8" = 1'-0"

SQUARE FOOTAGES

1ST FLOOR AREA	2000 SQ. FT.
2ND FLOOR AREA	1000 SQ. FT.
SCREENED PORCH AREA	1000 SQ. FT.
CARPORT AREA	1000 SQ. FT.
TOTAL AREA	5000 SQ. FT.

RICKYE & PATTY LENNON
 1101 WINDY HILLS RD.
 DRIPPING SPRINGS, TX. 78620

Capstone Design
 Residential Commercial Planning Consultant
 Sheila Jetton
 Ph : 512-775-1419



2ND FLOOR PLAN
SCALE: 1/4" = 1'-0"

RICKYE & PATTY LENNON
1101 WINDY HILLS RD.
DRIPPING SPRINGS, TX. 78620

Capstone Design
Residential Commercial Planning Consultant
Sheila Jetton
Ph : 512-775-1419

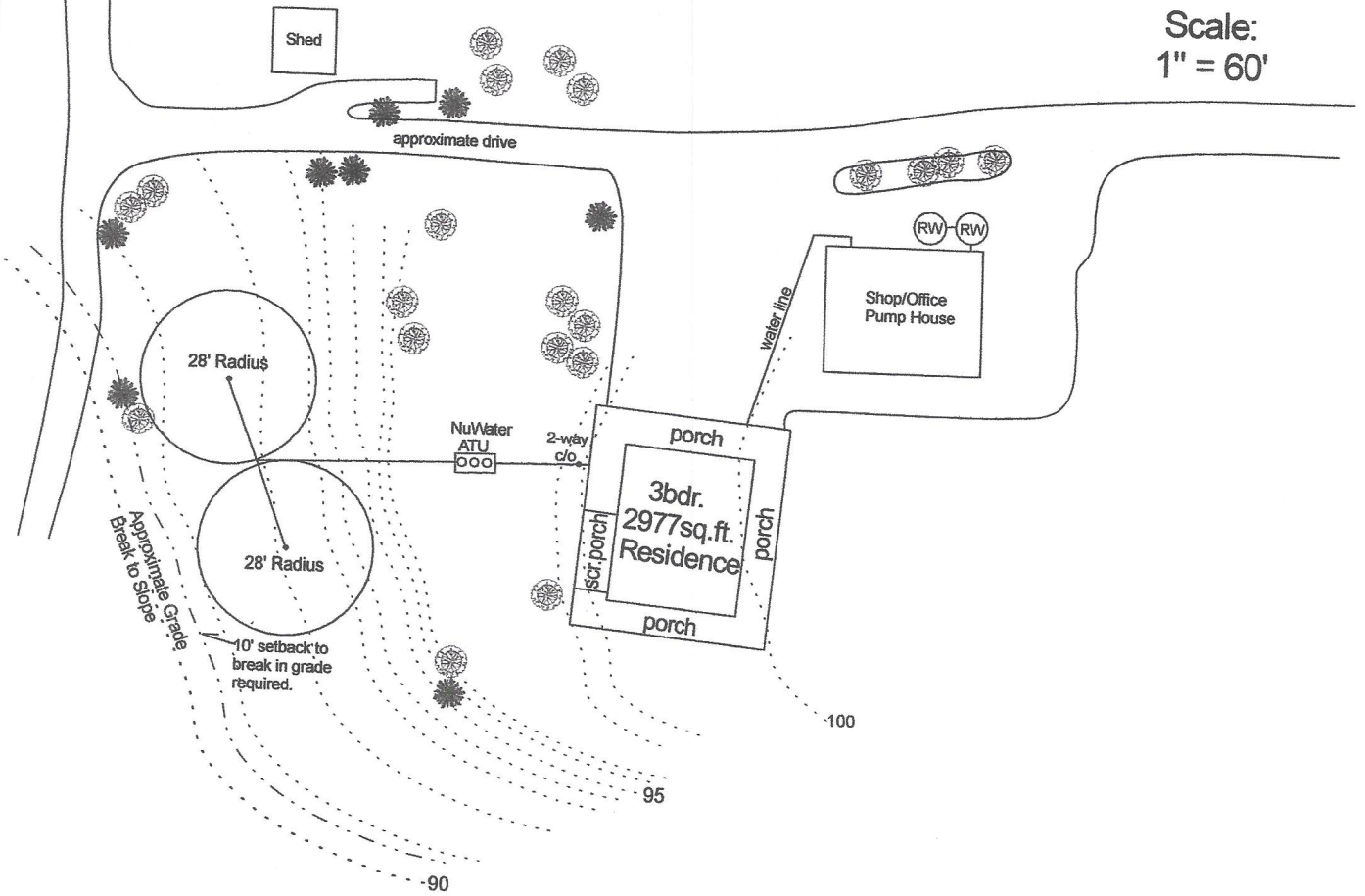
1071.82' Total

1289.27' Total

Lennon Residence 1101 Windy Hills Rd. Dripping Springs, TX 78620



Scale:
1" = 60'



This site plan is not a survey and
should not be used as such.

354.07'

326.91' Total