

LAYOUT \_\_\_\_\_ INSP 4 \_\_\_\_\_  
INSP 2 \_\_\_\_\_ INSP 5 \_\_\_\_\_  
INSP 3 \_\_\_\_\_ INSP 6 \_\_\_\_\_

ISSUE DATE: 3/21/06

P 524361

APPROVAL DATE:

6/20/06

A 522072

# PERMIT

## SANDMOUND SYSTEM

TAX ID #05-366224

ON-SITE SEWAGE DISPOSAL SYSTEM

HOWARD COUNTY HEALTH DEPARTMENT

BUREAU OF ENVIRONMENTAL HEALTH

Farm & Home Excavating, Inc IS PERMITTED TO INSTALL ☒ ALTER ☐  
ADDRESS: 901 Driver Road PHONE NUMBER: 410-442-2139  
SUBDIVISION: Highland Acres LOT NUMBER: 16  
ADDRESS: 12497 West Nugget <sup>Count</sup> Drive PROPERTY OWNER: Mark Bilohlavek  
SEPTIC TANK CAPACITY (GALLONS): 1250 OUTLET BAFFLE FILTER REQUIRED ☒  
PUMP CHAMBER CAPACITY (GALLONS): 1250 COMPARTMENTED TANK REQUIRED ☒  
NUMBER OF BEDROOMS: 4

	Sandmound pressure dosed system to be installed.
LOCATION:	Sandmound area must be staked to prevent large equipment driving on soil. Do not install sandmound unless 32 degrees and dry ground. Present sand order receipt.
NOTES:	See attached sandmound plans.

PLANS APPROVED: Kacie Noonan Reviewed by: \_\_\_\_\_ DATE: 11/14/05

NOTES: PERMIT VOID AFTER 2 YEARS

CONTRACTOR IS RESPONSIBLE FOR SCHEDULING A PRE-CONSTRUCTION INSPECTION FOR ALL INSTALLATIONS  
WATERTIGHT SEPTIC TANKS REQUIRED

ALL PARTS OF SEPTIC SYSTEM SHALL BE 100 FEET FROM ANY WATER WELL UNLESS SPECIFICALLY AUTHORIZED

MANHOLE RISERS REQUIRED ON ALL SEPTIC TANKS AND PUMP CHAMBERS UNLESS SPECIFICALLY AUTHORIZED

CONTRACTOR RESPONSIBLE FOR COMPLIANCE WITH APPLICABLE REGULATIONS, GUIDELINES AND THE TERMS OF THIS PERMIT

**NEITHER THE HOWARD COUNTY COUNCIL NOR THE HEALTH DEPARTMENT IS  
RESPONSIBLE FOR THE SUCCESSFUL OPERATION OF ANY SYSTEM  
PERMITTEE RESPONSIBLE FOR OBTAINING FINAL APPROVAL ON THIS PERMIT  
CALL 410-313-1771 FOR INSPECTION OF SEPTIC SYSTEM**

H0-95-0118

NOT TO SCALE

50'

45'

~135'

25'

125'

10'

24'

45'

3'

7'

7.5'

3" Force  
Main

1 1/4" Laterals

Gravel  
Bed

60'

ROAD

~8'

1'8"

3'4" dia.

1'8"±

3'4"

3'4"

1'8"±

TRENCH/DRAINFIELD DATA		
WIDTH	INLET	BOTTOM
NUMBER OF TRENCHES		
TOTAL LENGTH		
ABSORPTION AREA		
DISTRIBUTION BOX LEVEL		
DISTRIBUTION BOX BAFFLE		
DISTRIBUTION BOX PORT		

## SEPTIC TANK DATA

SEPTIC TANK 1 LEVEL	Yes
CAPACITY	1500 GAL
SEAM LOC	Top
TANK LID DEPTH	0.5'-1.5'
BAFFLES	Yes
BAFFLE FILTER	Yes
MANHOLE LOC	Front+Rear
6" PORT LOC	None
WATERTIGHT TEST	No
SEPTIC TANK 2 LEVEL	Yes
CAPACITY	1250 GAL
SEAM LOC	Top
TANK LID DEPTH	0.5'-1.5'
BAFFLES	Front Tee
BAFFLE FILTER	None
MANHOLE LOC	Middle
6" PORT LOC	None
WATERTIGHT TEST	No

PRE-CONSTRUCTION 4/27/06 Tanks set and house connection made.  
 Mound location checked. To check to see if soils are ready  
 INSTALLATION for plowing tomorrow. Need to do sand analyses.  
 O.K. to install force main. (BB) 4/29/06 Contractor started  
 loosening soil with backhoe. Told him to wait until  
 Sunday to finish. Some areas still damp. Should be O.K.  
 to start covering with sand on Monday. (BB) 5/8/06 Bed and  
 laterals installed and look good. Need to smooth out and better  
 distribute sand around bed. Turn-ups at end of each lateral (BB)  
 5/18/06 Pump delivering 2'-2.5' of head to far turnups. (BB)  
 FINAL INSPECTOR B. Baker DATE OF APPROVAL 6/20/06  
 6/20/06 Final grading looks O.K. Need vegetation on mound yet (BB)



BY THE ENGINEER  
I CERTIFY THAT THIS PLAN FOR EROSION AND SEDIMENT CONTROL REPRESENTS A PRACTICAL AND WORKABLE PLAN BASED ON MY PERSONAL KNOWLEDGE OF THE SITE CONDITIONS. THIS PLAN WAS PREPARED IN ACCORDANCE WITH THE REQUIREMENTS OF THE HOWARD SOIL CONSERVATION DISTRICT.

*Shawn Bilohlavak* 9/16/05  
SIGNATURE OF ENGINEER DATE

DEVELOPER'S CERTIFICATE  
I CERTIFY THAT ALL PLANNING AND CONSTRUCTION WILL BE DONE ACCORDING TO THIS PLAN AND THAT ANY RESPONSIBLE PERSONNEL INVOLVED IN THE CONSTRUCTION PROJECT WILL HAVE A CERTIFICATE OF ATTENDANCE AT A DEPARTMENT OF THE ENVIRONMENT APPROVED TRAINING PROGRAM FOR THE CONTROL OF EROSION AND SEDIMENT BEFORE BEGINNING THE PROJECT. I ALSO AUTHORIZE PERIODIC ON-SITE INSPECTION BY THE HOWARD SOIL CONSERVATION DISTRICT OR THEIR AUTHORIZED AGENTS, AS ARE DEEMED NECESSARY.

*Shawn Bilohlavak* 9/16/05  
SIGNATURE OF DEVELOPER DATE

THESE PLANS HAVE BEEN REVIEWED FOR THE HOWARD SOIL CONSERVATION DISTRICT AND MEETS TECHNICAL REQUIREMENTS.

USDA - NATURAL RESOURCE CONSERVATION SERVICE DATE

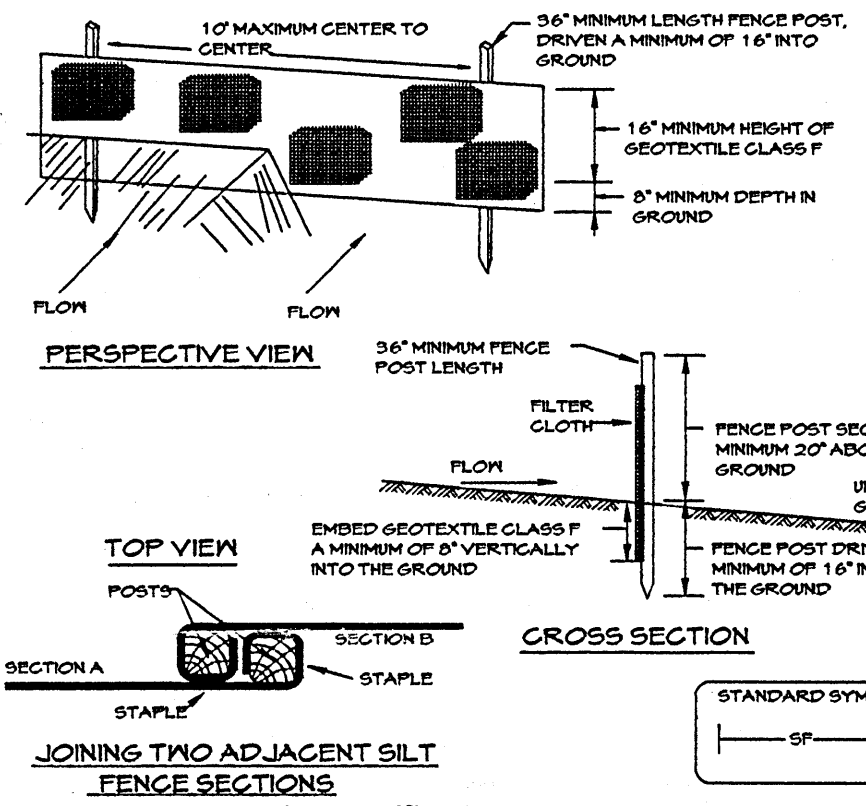
THIS DEVELOPMENT PLAN IS APPROVED FOR SOIL EROSION AND SEDIMENT CONTROL BY THE HOWARD SOIL CONSERVATION DISTRICT.

HOWARD SOIL CONSERVATION DISTRICT DATE

### Standard Sediment Control Notes

- A minimum of 48 hours notice must be given to the Howard County Department of Inspections, Licenses and Permits, Sediment Control Division prior to the start of any construction (313-1855).
- All vegetative and structural practices are to be installed according to the provisions of this plan and are to be in conformance with the most current MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL and revisions thereto.
- Following initial soil disturbance or re-disturbance, permanent or temporary stabilization shall be completed within 7 calendar days for all perimeter sediment control structures, dikes, perimeter slopes and all slopes greater than 3:1. 1/4 day as to all other disturbed or graded areas on the project site.
- All sediment traps/basins shown must be fenced and warning signs posted around their perimeter in accordance with Vol. 1, Chapter 12 of the HOWARD COUNTY DESIGN MANUAL, Storm Drainage.
- All disturbed areas must be stabilized within the time period specified above in accordance with the 1483 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL, for permanent sediment control structures, dikes, perimeter slopes and all slopes greater than 3:1. 1/4 day as to all other disturbed or graded areas on the project site.
- Any sediment control practice, which is disturbed by grading activity for placement of utilities, must be repaired on the same day of disturbance.
- Temporary stabilization with mulch alone can only be done when recommended seeding dates do not allow for proper germination and establishment of grasses.
- Site Analysis:  
Total Area of Site: 1,234.6 Acres  
Area Disturbed: 0.442 Acres  
Area to be vegetatively stabilized: 0.113 Acres / 4,425 S.F.  
Total Cut: 500 CU YDS.  
Total Fill: 500 CU YDS.  
Offsite waste/borrow area location
- Any sediment control practice, which is disturbed by grading activity for placement of utilities, must be repaired on the same day of disturbance.
- Additional sediment control must be provided, if deemed necessary by the Howard County Sediment Control Inspector.
- On all sites with disturbed areas in excess of 2 acres, approval of the Inspection Agency shall be requested upon completion of installation of perimeter erosion and sediment controls, but before proceeding with any other earth disturbance or grading. Other building or grading inspection approvals may not be authorized until this initial approval by the Inspection Agency is made.
- Trenches for the construction of utilities is limited to three pipe lengths or that which shall be back-filled and stabilized by the end of each workday, whichever is shorter.

DETAIL 22 - SILT FENCE



Construction Specifications

- Fence posts shall be a minimum of 3/4" long driven 16" minimum into the ground. Wood posts shall be 1 1/2" x 1 1/2" square minimum cut or 1 1/2" diameter (minimum) round and shall be of sound quality hardwood. Steel posts will be standard T or U section weighing not less than 100 pound per linear foot.
- Geotextile shall be fastened securely to each fence post with wire ties or staples at top and mid-section and shall meet the following requirements for geotextile class F:  
TENSILE STRENGTH: 50 LBS/IN (MIN) TEST: MSMT 504  
TENSILE MODULUS: 20 LBS/IN (MIN) TEST: MSMT 504  
FLOW RATE: 0.3 GAL/FT<sup>2</sup>/MINUTE (MAX) TEST: MSMT 322  
FILTERING EFFICIENCY: 75% (MIN) TEST: MSMT 322
- Where ends of geotextile fabric come together, they shall be overlapped, folded and stapled to prevent sediment bypass.
- A silt fence shall be inspected after each rainfall event and maintained when bulges occur or when sediment accumulation reaches 50% of the fabric height.

Silt Fence Design Criteria

Slope Steepness	(Maximum) Slope Length	(Maximum) Silt Fence Length
Flatter than 50:1	unlimited	unlimited
50:1 to 10:1	125 feet	1,000 feet
10:1 to 5:1	100 feet	750 feet
5:1 to 3:1	60 feet	500 feet
3:1 to 2:1	40 feet	250 feet
2:1 and steeper	20 feet	125 feet

NOTE: IN AREAS OF LESS THAN 2% SLOPE AND SANDY SOILS (BROOK GENERAL CLASSIFICATION SYSTEM SOIL CLASS A) A MAXIMUM SLOPE LENGTH AND SILT FENCE LENGTH WILL BE UNLIMITED. IN THESE AREAS A SILT FENCE MAY BE THE ONLY PERIMETER CONTROL REQUIRED.

### STANDARDS AND SPECIFICATIONS FOR TOPSOIL CONSTRUCTION AND MATERIAL SPECIFICATIONS

- Topsoil salvaged from the existing site may be used provided that it meets the standards as set forth in these specifications. Typically, the depth of topsoil to be salvaged for a given soil type can be found in the representative soil profile section in the soil survey published by USDA-SCS in cooperation with Maryland Agricultural Experimental Station.
- Topsoil specifications - Soil to be used as topsoil must meet the following:
  - Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the appropriate approval authority. Regardless, topsoil shall not be a mixture of contrasting textures and shall contain less than 5% by volume of chert, stones, slag, coarse fragments, gravel, sticks, roots, trees or other materials larger than 1" diameter.
  - Topsoil must be free of plants or plant parts such as bermuda grass, quack grass, Johnson grass, nutgrass, poison ivy, thistle, or others as specified.
  - Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 pounds per 1,000 square feet) prior to the placement of topsoil. Lime shall be distributed uniformly over designated areas and worked into the soil in conjunction with tillage operations as described in the following procedures.
  - For sites having disturbed areas under 5 acres:
    - Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials.
    - For sites having disturbed areas over 5 acres:
      - On soil meeting Topsoil specifications, obtain test results dictating fertilizer and lime amendments required to bring the soil into compliance with the following:
        - pH for topsoil shall be between 6.0 and 7.5. If the tested soil demonstrates a pH of less than 6.0, sufficient lime shall be prescribed to raise the pH to 6.5 or higher.
        - Organic content of topsoil shall be not less than 1.5 percent by weight.
        - Topsoil having soluble salt content greater than 500 parts per million shall not be used.
        - No sod or seed shall be placed on soil which has been treated with soil sterilants or chemicals used for weed control until sufficient time has elapsed (14 days min) to permit dissipation of phytotoxic materials.
      - Note: Topsoil substitutes or amendments, as recommended by a qualified agronomist or soil scientist and approved by the appropriate approval authority, may be used in lieu of natural topsoil.
    - Place topsoil (if required) and apply soil amendments as specified in 20.0 Vegetative Stabilization - Section I - Vegetative Stabilization Methods and Materials.
  - Topsoil Application
    - When topsoiling, maintain needed erosion and sediment control practices such as diversions, grade stabilization structures, earth dikes, slope silt fence and sediment traps and basins.
    - Grades on the areas to be topsoiled, which have been previously established, shall be maintained, albeit 4"-8" higher in elevation.
    - Topsoil shall be uniformly distributed in a 4"-8" layer and lightly compacted to a minimum thickness of 4". Spreading shall be performed in such a manner that sodding or seeding can proceed with a minimum of additional soil.
    - Preparation and tillage. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.
    - Topsoil shall not be placed while the topsoil or subsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.
    - Alternative for Permanent Seeding - Instead of applying the full amounts of lime and commercial fertilizer, composted sludge and amendments may be applied as specified below:
      - Composted sludge material for use as a soil conditioner for sites having disturbed areas over 5 acres shall be tested to prescribe amendments and for sites having disturbed areas under 5 acres shall conform to the following requirements:
        - Composted sludge shall be supplied by, or originate from, a person or persons that are permitted (at the time of acquisition of the compost) by the Maryland Department of the Environment under COMAR 26.04.06.
        - Composted sludge shall contain at least 1 percent nitrogen, 1.5 percent phosphorus, and 0.2 percent potassium and have a pH of 7.0 to 9.0. If composted sludge is used, these requirements, the appropriate constituents must be added to meet the requirements prior to use.
        - Composted sludge shall be applied at a rate of 1 ton/1,000 square feet.
      - Composted sludge shall be amended with a potassium fertilizer applied at the rate of 4 lb/1,000 square feet, and 1/3 the normal lime application rate.

### HOWARD SOIL CONSERVATION DISTRICT PERMANENT SEEDING NOTES

APPLY TO GRADED OR CLEARED AREAS NOT SUBJECT TO IMMEDIATE FURTHER DISTURBANCE WHERE A PERMANENT LONGLIVED VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING, IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS IN LBS OF SOIL TEST RECOMMENDATIONS, USE ONE OF THE FOLLOWING SCHEDULES:

- PREFERRED - APPLY 2 TONS PER ACRE POLYCLONIC LIMESTONE (2 LBS/1,000 SQ. FT.) AND 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1,000 SQ. FT.) BEFORE SEEDING. HARKON OR DISK INTO UPPER THREE INCHES OF SOIL. AT THE END OF SEEDING, APPLY 600 LBS PER ACRE 30-0-0 UREAFORM FERTILIZER (4 LBS/1,000 SQ. FT.)
- ACCEPTABLE - APPLY 2 TONS PER ACRE POLYCLONIC LIMESTONE (2 LBS/1,000 SQ. FT.) AND 1,000 LBS PER ACRE 10-10-10 FERTILIZER (23 LBS/1,000 SQ. FT.) BEFORE SEEDING. HARKON OR DISK INTO UPPER THREE INCHES OF SOIL.

SEEDING: FOR PERIODS MARCH 1 THROUGH APRIL 30, AND AUGUST 1 THROUGH OCTOBER 15, SEED WITH 50 LBS/1,000 SQ. FT. OF KENTUCKY 311 TALL FESCUE FOR THE PERIOD MAY 1 THROUGH JULY 31, SEED WITH 60 LBS/1,000 SQ. FT. TALL FESCUE PER ACRE AND 2 LBS PER ACRE (0.5 LBS/1,000 SQ. FT.) OF KEEPING LOVEGRASS. DURING THE PERIOD OF OCTOBER 16 THROUGH FEBRUARY 29, PROTECT SITE BY: OPTION (1) 2 TONS PER ACRE OF WELL-ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING. OPTION (2) - USE SOD. OPTION (3) - SEED WITH 60 LBS/1,000 SQ. FT. TALL FESCUE AND MULCH WITH 2 TON/ACRE WELL-ANCHORED STRAW.

MULCHING: APPLY 1 1/2 TO 2 TONS PER ACRE (70 TO 40 LBS/1,000 SQ. FT.) OF UNKNOTTED FREE FREE SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING A MULCH ANCHORING TOOL OR 1/2 GALLONS PER ACRE (5 GALS/1,000 SQ. FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS OR SLOPES OF 5 FEET OR HIGHER, USE 3/4 GALLONS PER ACRE (6 GALS/1,000 SQ. FT.) FOR ANCHORING.

MAINTENANCE: INSPECT ALL SEEDING AREAS AND MAKE NEEDED REPAIRS, REPLACEMENTS AND RESEEDINGS.

### TEMPORARY SEEDING NOTES

APPLY TO GRADED OR CLEARED AREAS LIKELY TO BE REDISTURBED WHERE A SHORT TERM VEGETATIVE COVER IS NEEDED.

SEEDBED PREPARATION: LOOSEN UPPER THREE INCHES OF SOIL BY RAKING, DISKING OR OTHER ACCEPTABLE MEANS BEFORE SEEDING IF NOT PREVIOUSLY LOOSENED.

SOIL AMENDMENTS: APPLY 600 LBS PER ACRE 10-10-10 FERTILIZER (14 LBS/1,000 SQ. FT.)

SEEDING: FOR PERIODS MARCH 1 THROUGH APRIL 30 AND AUGUST 1 THROUGH OCTOBER 15, SEED WITH 2 1/2 BUSHEL PER ACRE OF ANNUAL RYE (3.2 LBS/1,000 SQ. FT.) FOR THE PERIOD MAY 1 THROUGH AUGUST 14, SEED WITH 3 BUSHEL PER ACRE OF ANNUAL RYE (3.2 LBS/1,000 SQ. FT.) FOR THE PERIOD OF NOVEMBER 16 THROUGH NOVEMBER 29, PROTECT SITE BY: OPTION (1) 2 TONS PER ACRE OF WELL-ANCHORED STRAW MULCH AND SEED AS SOON AS POSSIBLE IN THE SPRING, OR USE SOD.

MULCHING: APPLY 1 1/2 TO 2 TONS PER ACRE (70 TO 40 LBS/1,000 SQ. FT.) OF UNKNOTTED FREE FREE SMALL GRAIN STRAW IMMEDIATELY AFTER SEEDING. ANCHOR MULCH IMMEDIATELY AFTER APPLICATION USING MULCH ANCHORING TOOL OR 1/2 GALLONS PER ACRE (5 GALS/1,000 SQ. FT.) OF EMULSIFIED ASPHALT ON FLAT AREAS OR SLOPES OF 5 FEET OR HIGHER, USE 3/4 GALLONS PER ACRE (6 GALS/1,000 SQ. FT.) FOR ANCHORING.

REFER TO THE 1483 MARYLAND STANDARDS AND SPECIFICATIONS FOR SOIL EROSION AND SEDIMENT CONTROL FOR ADDITIONAL RATES AND METHODS NOT COVERED.

### SEPTIC SYSTEM NOTES

- SEPTIC EASEMENT SUBJECT TO HOWARD COUNTY HEALTH DEPARTMENT NO. 1. PROPOSED 1500 GALLON SEPTIC TANK.
  - A FIRST FLOOR ELEVATION: 609.00
  - B. BASEMENT ELEVATION: 148.00
  - C. INVERT OF SEPTIC SYSTEM AT HOUSE: 599.60
  - D. INVERT AT SEPTIC TANK: SEE SAND MOUND DESIGN
  - E. INVERT OUT AT SEPTIC TANK: SEE SAND MOUND DESIGN
  - F. PROPOSED GRADE OVER SEPTIC TANK:
  - CONTRACTOR / BUILDER TO VERIFY ELEVATIONS IN FIELD BEFORE BEGINNING ANY CONSTRUCTION.
- BUILDER TO VERIFY AVAILABILITY OF BASEMENT SEWER SERVICE PRIOR TO DYING LAYOUT.

### SEQUENCE OF CONSTRUCTION

- OBTAIN GRADING PERMIT.
- INSTALL SEDIMENT CONTROLS AS SHOWN ON PLAN. (1 DAY)
- PERFORM NECESSARY GRADING AND STABILIZE THE SITE. BUILD HOUSE (6 MOS.)
- AFTER THE SITE IS STABILIZED AND PERMISSION IS GRANTED FROM THE SEDIMENT CONTROL INSPECTOR, REMOVE SEDIMENT CONTROLS AND STABILIZE ANY REMAINING DISTURBED AREAS. (2 DAYS)

HOUSE DETAIL SCALE: 1"=30'

HOUSE DETAIL SCALE: 1"=30'

HOUSE GRADING & SEPTIC DESIGN LAYOUT SCALE: 1"=30'

### GENERAL NOTES

THIS AREA DESIGNATES A PRIVATE SEWERAGE EASEMENT AT LEAST 10,000 SQUARE FEET AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT FOR INDIVIDUAL SEWERAGE DISPOSAL IMPROVEMENTS OF ANY NATURE IN THIS AREA ARE RESTRICTED UNTIL PUBLIC SEWERAGE IS AVAILABLE. THESE EASEMENTS SHALL BECOME NULL AND VOID UPON CONNECTION TO A PUBLIC SEWERAGE SYSTEM. THE COUNTY HEALTH OFFICER SHALL HAVE THE AUTHORITY TO GRANT ADJUSTMENTS TO THE PRIVATE SEWERAGE EASEMENT. RECORDATION OF A MODIFIED SEWERAGE EASEMENT SHALL NOT BE NECESSARY.

- THE PROPERTY SHOWN HEREON COMPLIES WITH THE MINIMUM OWNERSHIP WIDTH AND LOT AREA AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT.
- ALL WELLS AND SEPTIC SYSTEMS WITHIN 100 FEET OF PROPERTY BOUNDARY HAVE BEEN SHOWN.
- PERCOLATION TEST HOLES HAVE BEEN FIELD LOCATED.
- THIS SURVEY HORIZONTALLY AND VERTICALLY IS TIED TO HOWARD COUNTY CONTROL MONUMENTS (NAD 83 HORIZONTAL AND NGVD 29 VERTICAL DATUM).
- A MINIMUM FOR FOUR (4) BEDROOM HOUSE IS TO BE BUILT ON THIS PROPERTY.

PERCOLATION CERTIFICATION PLAT AND PLAN TO ACCOMPANY APPLICATION FOR BUILDING PERMIT

LOT 16  
SECTION THREE  
A.K.A. #12447 WEST  
NUGGET COURT

## HIGHLAND ACRES

5th ELECTION DISTRICT HOWARD COUNTY, MD.  
PLATBOOK: 1 PAGE 42  
TAX MAP: 40 GRID 15 PARCEL: 241

APPROVED FOR PRIVATE WATER AND PRIVATE SEWERAGE SYSTEMS, HOWARD COUNTY HEALTH DEPARTMENT

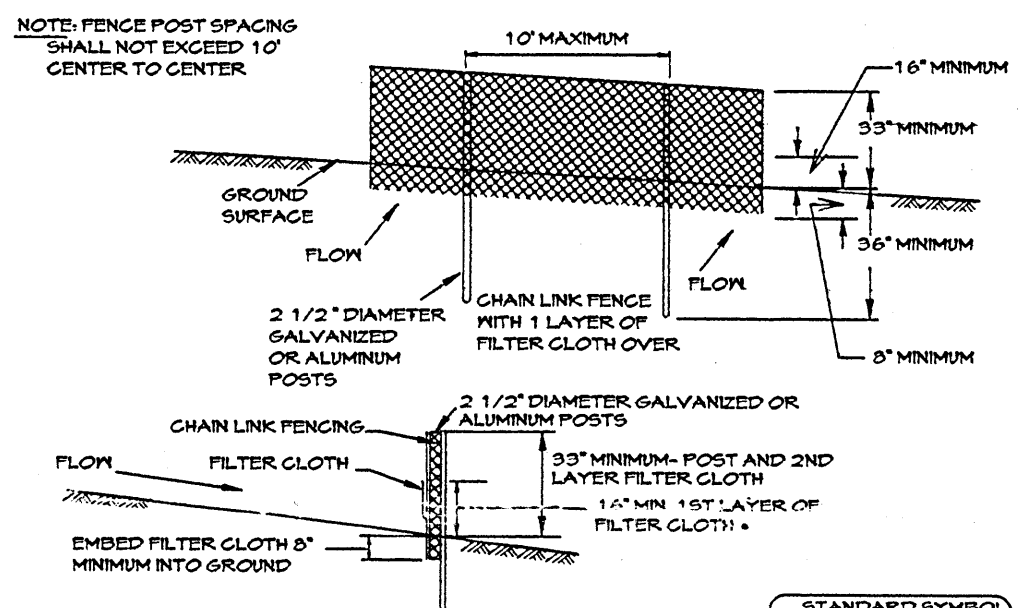
*Robert White*  
COUNTY HEALTH OFFICER

9/16/05  
DATE

BUILDING SETBACKS  
FRONT 75'  
SIDE 10'  
REAR 30'

VICINITY MAP SCALE 1" = 2,000'

DETAIL 33 - SUPER SILT FENCE



CONSTRUCTION SPECIFICATIONS

FENCING SHALL BE 42" IN HEIGHT AND CONSTRUCTED IN ACCORDANCE WITH THE LATEST MARYLAND STATE HIGHWAY DETAILS FOR CHAIN LINK FENCING. THE SPECIFICATION FOR A 6' FENCE SHALL BE USED, SUBSTITUTING 42" FABRIC AND 6' LENGTH POSTS.

- THE POLES DO NOT NEED TO SET IN CONCRETE.
- CHAIN LINK FENCE SHALL BE FASTENED SECURELY TO THE FENCE POSTS WITH WIRE TIES. THE LOWER TENSION WIRE BRACE AND TRUSS RODS, DRIVE ANCHORS AND POST CAPS ARE NOT REQUIRED EXCEPT ON THE ENDS OF THE FENCE.
- FILTER CLOTH SHALL BE FASTENED SECURELY TO THE CHAIN LINK FENCE WITH TIES SPACED EVERY 24" AT THE TOP AND MID SECTION.
- FILTER CLOTH SHALL BE EMBEDDED A MINIMUM OF 8" INTO THE GROUND.
- WHEN TWO SECTIONS OF FILTER CLOTH ADJOIN EACH OTHER, THEY SHALL BE OVERLAPPED BY 6" AND FOLDED.
- MAINTENANCE SHALL BE PERFORMED AS NEEDED AND SILT BUILDUPS REMOVED WHEN 'BULGES' DEVELOP IN THE SILT FENCE, OR WHEN SILT REACHES 50% OF FENCE HEIGHT.
- FILTER CLOTH SHALL BE FASTENED SECURELY TO EACH FENCE POST WITH WIRE TIES OR STAPLES AT TOP AND MID SECTION AND SHALL MEET THE FOLLOWING REQUIREMENTS FOR GEOTEXTILE CLASS F:  
TENSILE STRENGTH: 50 LBS/IN (MIN) TEST: MSMT 504  
TENSILE MODULUS: 20 LBS/IN (MIN) TEST: MSMT 504  
FLOW RATE: 0.3 GAL/FT<sup>2</sup>/MINUTE (MAX) TEST: MSMT 322  
FILTERING EFFICIENCY: 75% (MIN) TEST: MSMT 322

### DESIGN CRITERIA

SLOPE	SLOPE STEEPNESS	SLOPE LENGTH (MAXIMUM)	SILT FENCE LENGTH (MAXIMUM)
0 - 10%	0 - 10:1	UNLIMITED	UNLIMITED
10 - 20%	10:1 - 5:1	200 FEET	1,500 FEET
20 - 30%	5:1 - 3:1	100 FEET	1,000 FEET
30 - 50%	3:1 - 2:1	100 FEET	500 FEET
50% +	2:1 +	50 FEET	250 FEET

### OWNER/DEVELOPER

MARK SHARON BILOHLAYEK  
6917 TIMBER CREEK CT.  
CLARKSVILLE, MARYLAND 21029-1748

### SOIL TYPE

GBM-DENOTES GLADSTONE-BANNERTOWN-MANOR

### REVISIONS

DATE	REVISIONS



FREDERICK OFFICE: 5111 Pegasus Court, Suite B Frederick, MD 21704-8318 (410) 662-1799 FAX (410) 662-8004	WESTMINSTER OFFICE: 439 East Main Street Westminster, MD 21157-5539 (410) 848-1799 FAX (410) 848-1791
Surveyed By: _____	Drawn By: HSC
Computed By: _____	Checked By: _____



Drawing No: 2005064	County File No: _____
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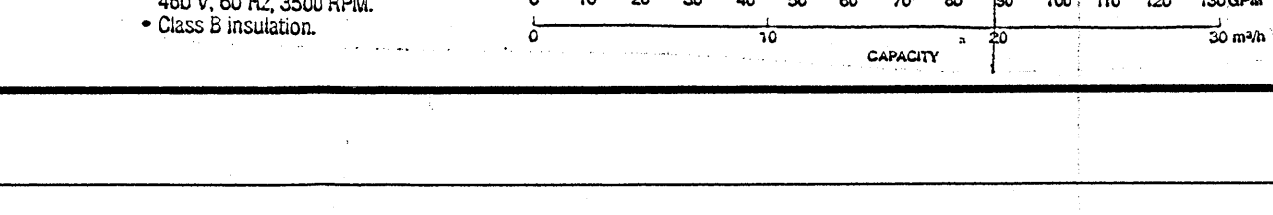
County File No. F- -







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The diagram illustrates the float switch assembly. A cable weight is attached to the end of a cable. The cable is connected to a float switch unit. The float switch unit is shown in two states: 'On' and 'Off'. The 'On' state shows the float switch unit submerged in water, with the cable weight pulling it down. The 'Off' state shows the float switch unit floating on the water surface, with the cable weight pulling it up. The cable is labeled 'Cable Weight' and 'Cable'. The float switch unit is labeled 'Float Switch'.

4. Wire cable leads directly into control device.  
5. Suspend unit at desired activation level. See Figure 6.

**Float Switch Specifications:**  
 Sensor float: ethereal switch. HOUSING: 3.3 in. (8.54 cm) diameter x 4.53 in. (11.68 cm) high. High impact resistant, non-corrosive PVC plastic for use in liquids up to 140°F (60°C). CABLE: 15 gauge, 2 conductor, 3.0W-A (UL), SJOW (CSA) water resistant/Non-halogen.

10-05	ADDRESS COUNTY COMMENTS	Reviewed By: DEM
		Date: 6-2-05
		Scale: AS-SHOWN
		Job No: 2005064
		Sheet: 1 OF 2

County File No.

160'

\_\_\_\_\_



## CONSTRUCTION PROCEDURES

### 5.1. GENERAL

Proper construction is extremely important if the sand mound is to function as designed. Installation of a sand mound system is prohibited when soils are frozen. Construction of the mound should not occur if the soil is too wet. Compaction and puddling of the soil in the location of the mound and downslope should be avoided. Soil is too wet for construction of the mound if a sample, taken anywhere within the upper eight inches, when rolled between the hands forms a wire. If the sample crumbles, the soil is dry enough for construction to proceed.

### 5.2. EQUIPMENT

The following special equipment is recommended:

1. A small track-type tractor with blade for placing and spreading the sand fill.
2. A cordless drill for drilling holes in the pipe on-site.
3. A moldboard or chisel plow for plowing the soil within the perimeter of the mound. A rototiller may be used on structureless soils with USDA sand textures.
4. A rod and level for determining bed elevations, slope on pipes, outlet elevation of septic tank, slope of site, etc.

### 5.3. MATERIALS

The following specifications are required:

1. Sand fill material must be approved by the local Approving Authority prior to hauling to the site. Submit a sample to the local Authority for analyses at least three weeks in advance of construction or select a sand fill from the list of potential sand suppliers. If a sample is submitted for analyses a fee will be charged. Sand fill shall have an effective size between 0.25 mm and 0.5 mm with a uniformity coefficient of 3.5 or less. A copy of the receipt from the sand supplier showing the company name, address, phone number, date and product name will be required.
2. Aggregate shall be clean aggregate free of fines and between 3/4 to 2 inches in diameter.
3. Geotextile fabric shall be of a type approved by the Approving Authority.
4. Cap material shall be soil relatively free of coarse fragments and preferably a clay loam or silt loam texture.

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### 5.4. TANK INSTALLATION AND SITE PREPARATION

- 5.4.1 Locate and rope-off the entire sewage disposal area to prevent area during other construction activity on the site. Vehicular disposal area should be prohibited to avoid soil compaction.
- 5.4.2 Install septic tank(s) and pumping chamber(s) and pump drawings. Call for inspection.
- 5.4.3 Stake out the initial and recovery mound penimeters in as shown in the drawings. Reference stakes offset from as recommended. Locate the upslope edge of the mound and determine the ground elevation at the mound. This elevation to a benchmark for future use. This is bottom elevation of the absorption bed.
- 5.4.4 Excess vegetation should be cut and removed. The level and stumps left in place.
- 5.4.5 Determine the location where the force main from the connection to the distribution network manifold will connect to the pumping chamber.
- 5.4.6 Install the force main from the pumping chamber to the mound. Pipe should be laid with uniform slope. It drains after dosing. Cut and stub off pipe or the proposed perimeter of the initial mound. prevent seepage along the trench.
- 5.4.7 Plow the soil within the perimeter of the mound, if the soil is not too wet. Moldboard plowing should be done along the contour bottom or larger moldboard plow. In wet the surface to a depth of four to six inches satisfactory. However, all work should be mound if at all possible. Rototilling may sand. After plowing, all foot and vehicle area.

### 5.5. FILL PLACEMENT

- 5.5.1 Relocate and extend the force main
  - 5.5.2 Place the approved sand fill material
- Keep delivery trucks off the plowed a side. Fill should be placed and spread it.

42

material into place using a small track-type tractor with a blade. Work from the end and upslope side. Always keep a minimum of six inches of material beneath the tracks of the tractor to minimize compaction of the natural soil. The fill material should be worked in this manner until the height of the fill reaches the elevation of the top of the absorption bed.

- 5.5.3 With the blade of the tractor, form the absorption bed. Hand level the bottom of the bed and check it for proper elevation. The bed should be level for proper functioning of the mound. Call for inspection.
- 5.5.4 Shape the sides of the sand fill to design slope (ie., 3:1 or flatter).

### 5.6. BED AND DISTRIBUTION NETWORK

- 5.6.1 Carefully place the coarse aggregate in the bed. Do not create ruts in the bottom of the bed. Level the aggregate to a minimum depth of six inches.
- 5.6.2 The distribution network is assembled in place setting the manifold to ensure draining the laterals between doses. The laterals should be laid level with the holes directed downward. Call for inspection. Test the pumping chamber and distribution network with clean water.
- 5.6.3 Place additional aggregate to a depth of at least two inches over the crown of the pipe.
- 5.6.4 Place the approved geotextile fabric over the aggregate bed. The fabric may extend beyond the bed over the sand fill.

### 5.7. COVER MATERIAL

- 5.7.1 Place a finer textured soil material such as sandy clay loam, clay loam, or silt loam on top of the fabric over the bed. The minimum depth of this cap shall be six inches at the outer edges of the bed and 12 inches along the center.
- 5.7.2 Place a minimum of six inches of good quality topsoil over the entire mound surface including the sideslopes. Call for final inspection.

### 5.8. VEGETATION

- 5.8.1 Fertilize, lime, seed and mulch the entire surface of the mound. Grass mixtures adapted to the area should be used.
- 5.8.2 Consult the county extension agent or Soil Conservation Service for recommendations.

ALTERNATIVE SAND MOUND DISPOSAL - LOT #16, NUGGET COURT  
4 BED ROOM - 600 GFI  
4.0% SLOPE  
TABLE 3.1 (HOWARD COUNTY)  
EQUATIONS FOR CALCULATING SAND MOUND DIMENSIONS

$$\text{Absorption bed ft. (A x B)} = \frac{\text{Design flow} \times \text{INITIAL SM}}{1.0 \text{ (ALTERNATIVE SAND MEDIA)}}$$

$$\text{Bed length (B)} = \frac{600}{1.0} \text{ ft. (21 ft. to 101 ft. dependent on site)}$$

$$\text{Bed width (A)} = \frac{\text{Bed length (B)}}{4} = \frac{600}{4} = 150 \text{ ft. (12 ft. or less ALTERNATIVE MEDIA)}$$

$$\text{Upslope sand fill depth (D)} = 48 \text{ in.} - 2 \text{ in.} = 46 \text{ in. (12 in. min.)}$$

$$\text{Downslope sand fill depth (E)} = (12 \text{ A} \times \text{slope}) + D \text{ in.} = 16.8 \text{ in.}$$

$$\text{Cap + topsoil at bed center (F)} = 18 \text{ in. OVERALL HEIGHT REQUIRED: 42.4"$$

$$\text{Cap + topsoil at bed edge (G)} = 12 \text{ in.}$$

$$\text{Total Bed Depth (F)} = 10 \text{ in.}$$

$$\text{Sideslope setback (H)} = (D + E) + 25 \text{ in.} \times 3 = 130.8 \text{ in. } 10' 11"$$

$$\text{Upslope setback (J)} = (22 \text{ in.} + D) \times 3 \times \text{upslope corr. factor} = 92.78 \text{ in. } 7' 7"$$

$$\text{Downslope setback (I)} = (22 \text{ in.} + E) \times 3 \times \text{downslope corr. factor} = 132.69 \text{ in. } 11' 1"$$

$$\text{Total Width of Mound (W)} = 12A + J + I = 343.47 \text{ in. } 28' 7"$$

$$\text{Total Length of Mound (L)} = 12B + K + K = 981.6 \text{ in. } 81' 10"$$

$$\text{Base Area provided: } (60' \times 120') = 7200 \text{ sq. ft.}$$

$$\text{V Slope: } (60' \times 120') = 7200 \text{ sq. ft.}$$

$$\text{Level: Mound length X width}$$

$$\text{Level: Mound length X width}$$

$$\text{Level: Mound length X width}$$

$$\text{Level: Mound length X width}$$

$$\text{Level: Mound length X width}$$

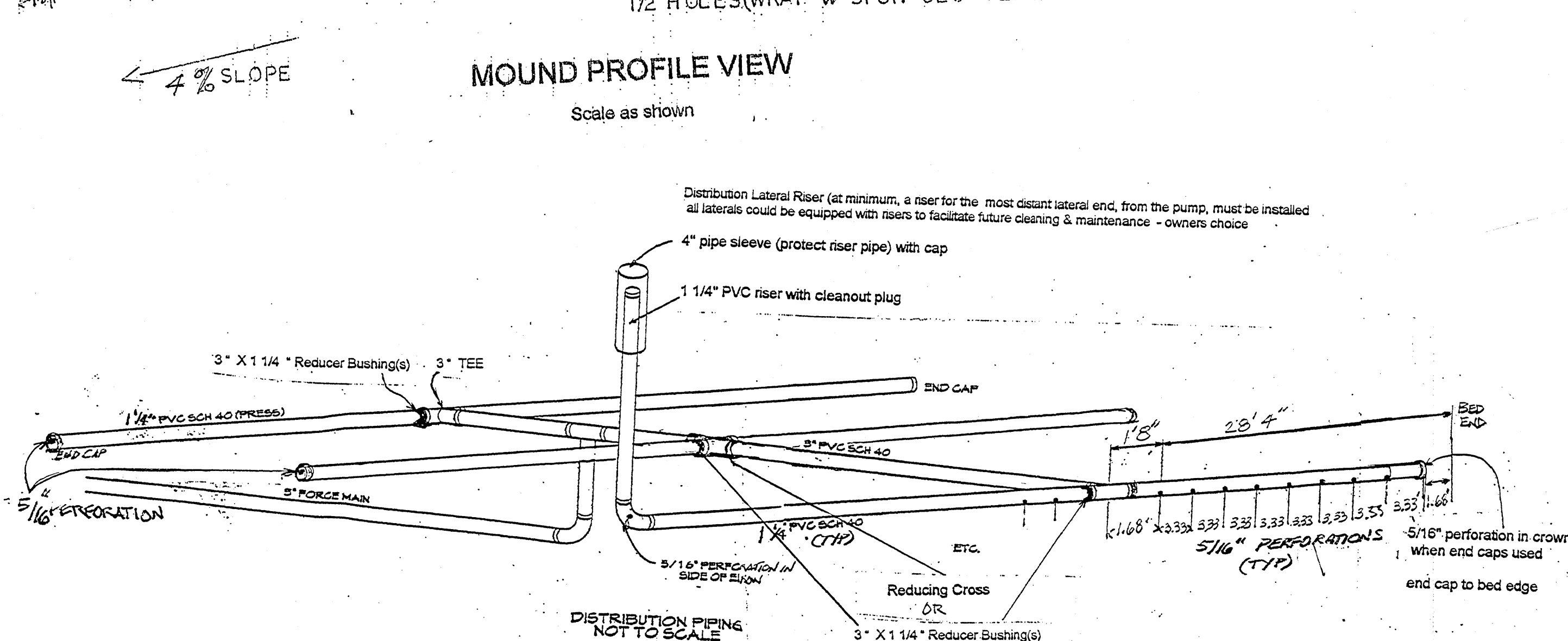
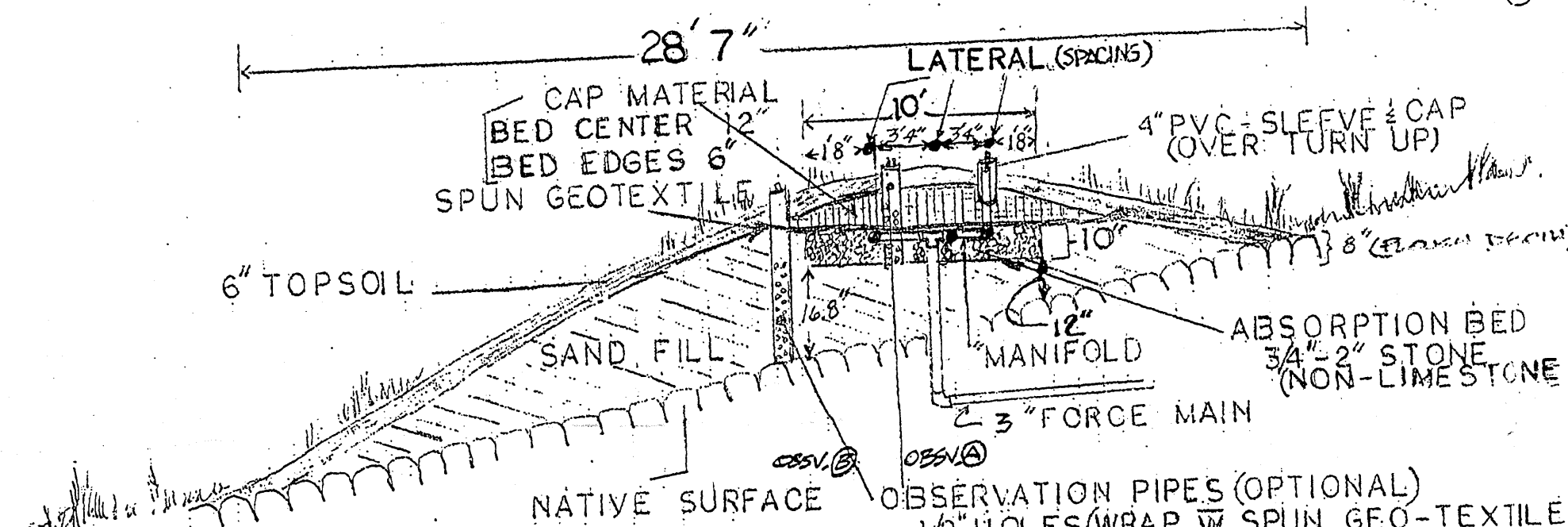
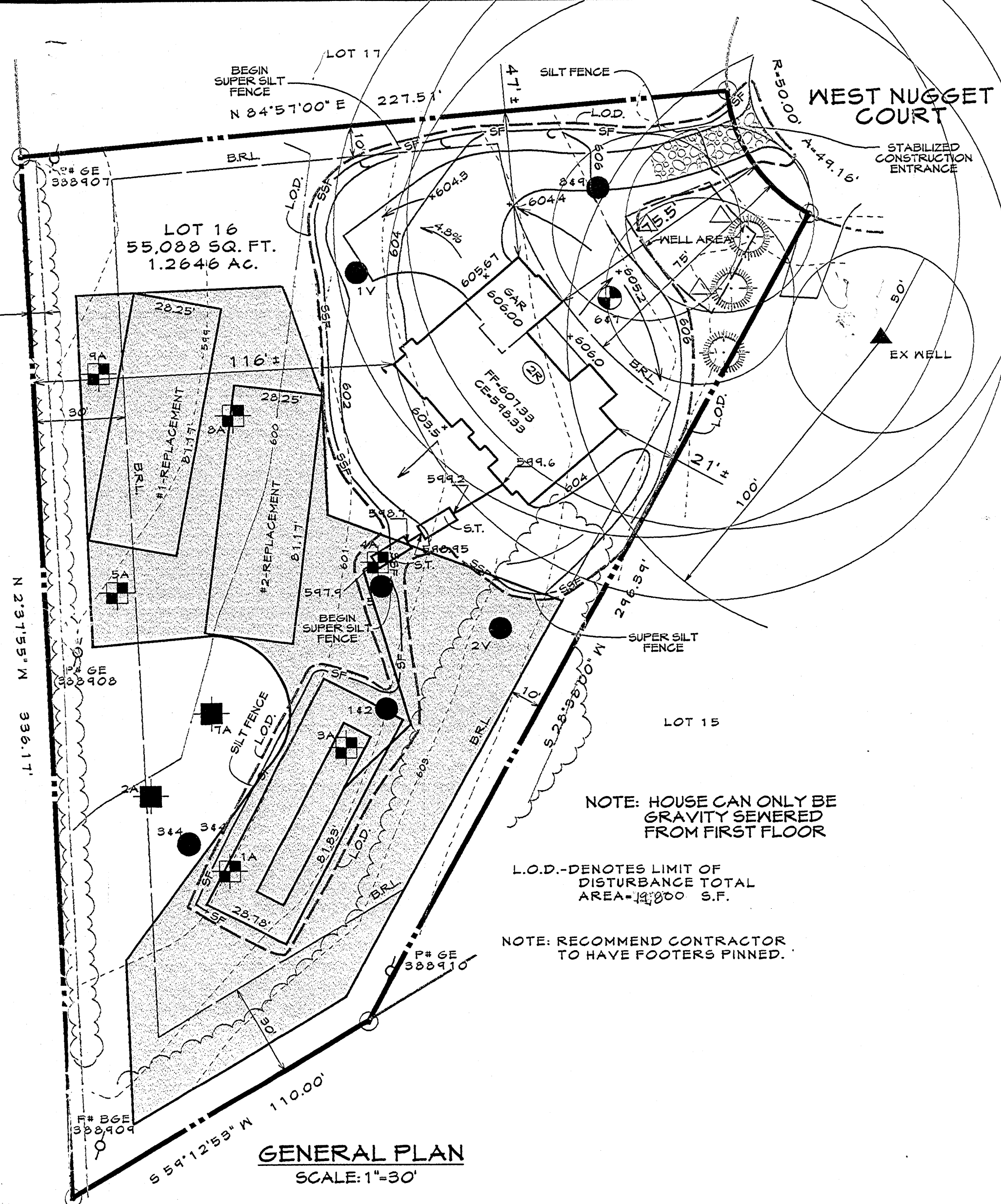
$$\text{Level: Mound length X width}$$

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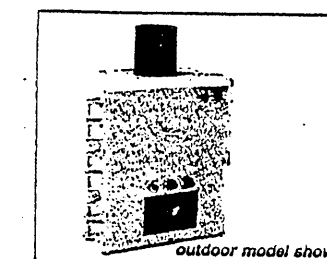
$$\text{Level: Mound length X width}$$

$$\text{Level: Mound length X width}$$



## MODEL 112 control panels

Single-phase, simplex motor contactor control.



Outdoor model shown

### FEATURES

- Entire control system (panels and switches) is UL Listed to meet and/or exceed industry safety standards
- Dual safety certification for the United States and Canada
- Package includes float switches (optional)
- Complete, step-by-step installation instructions included
- Two-year limited warranty
- Enclosure measures 16 x 8 x 4 inches (25.4 X 20.3 X 10.2 in.) with removable mounting flange. Choice of NEMA 1 (ungrounded thermoplastic for indoor use), or NEMA 4X (ungrounded cast aluminum thermoplastic for outdoor use).
- Magnetic Motor Contactor controls pump by switching both electrical lines
- HOA Switch for manual pump control
- Green Pump Run Indicator Light
- Float Switch Terminal Block
- Control ON/OFF Switch
- Control and Alarm Fuses
- Circuit Breaker (optional) provides pump disconnect (not shown)
- Type Power Terminal Block
- Ground Lug

### APPLICATIONS

The Model 112 control panel provides residential and commercial customers with a reliable means of controlling one 120, 208, or 230 VAC single-phase pump in water and sewage installations. Two control switches activate a magnetic motor contactor to turn the pump on and off. If an alarm condition occurs, an additional alarm switch activates the audiovisual alarm system. Common applications include pump chambers, sump pump basins, irrigation systems, and lift stations.

### ALARM PACKAGE (OPTIONAL)

- Red Alarm Beacon provides 360° visual check of alarm condition
- Alarm Horn provides audio warning of alarm condition (92 to 95 decibel rating)
- Exterior Horn Silence Switch allows alarm horn to be silenced
- Horn Silence Relay automatically resets alarm after alarm condition has been resolved
- Exterior Alarm Test Switch allows for testing of horn and light to ensure proper operation of alarm system

Approved Septic System Plan  
Howard County Health Department  
Signature: *[Signature]* Date: 11-16-05

SAND MOUND  
OF 16  
SECTION THREE  
HIGHLAND ACRES  
5th ELECTION DISTRICT HOWARD COUNTY, MD.  
PLATBOOK 9 PAGE 92.  
TAX MAP: 40 GRID: 18 PARCEL: 241  
A.K.A. #12497 WEST NUGGET COURT



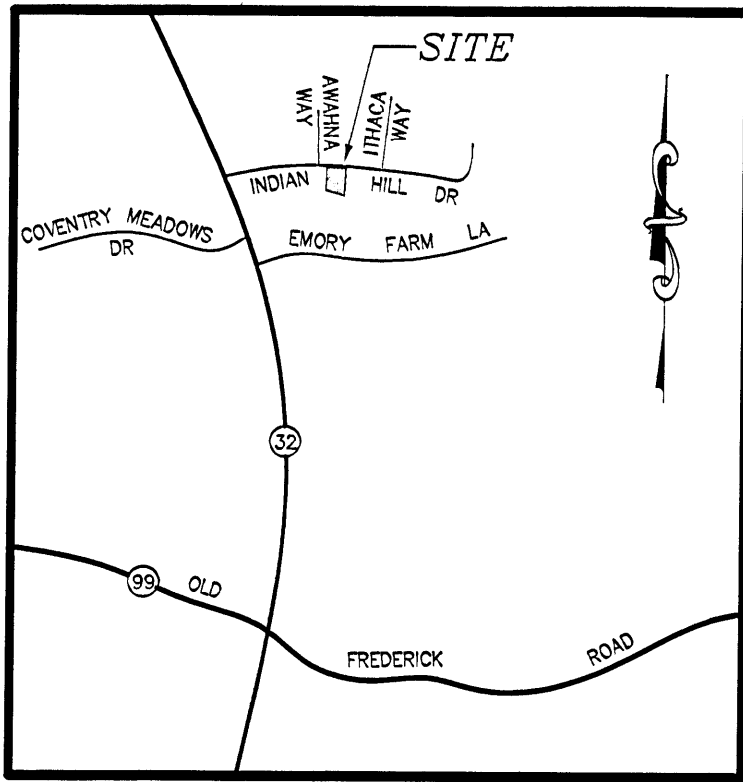
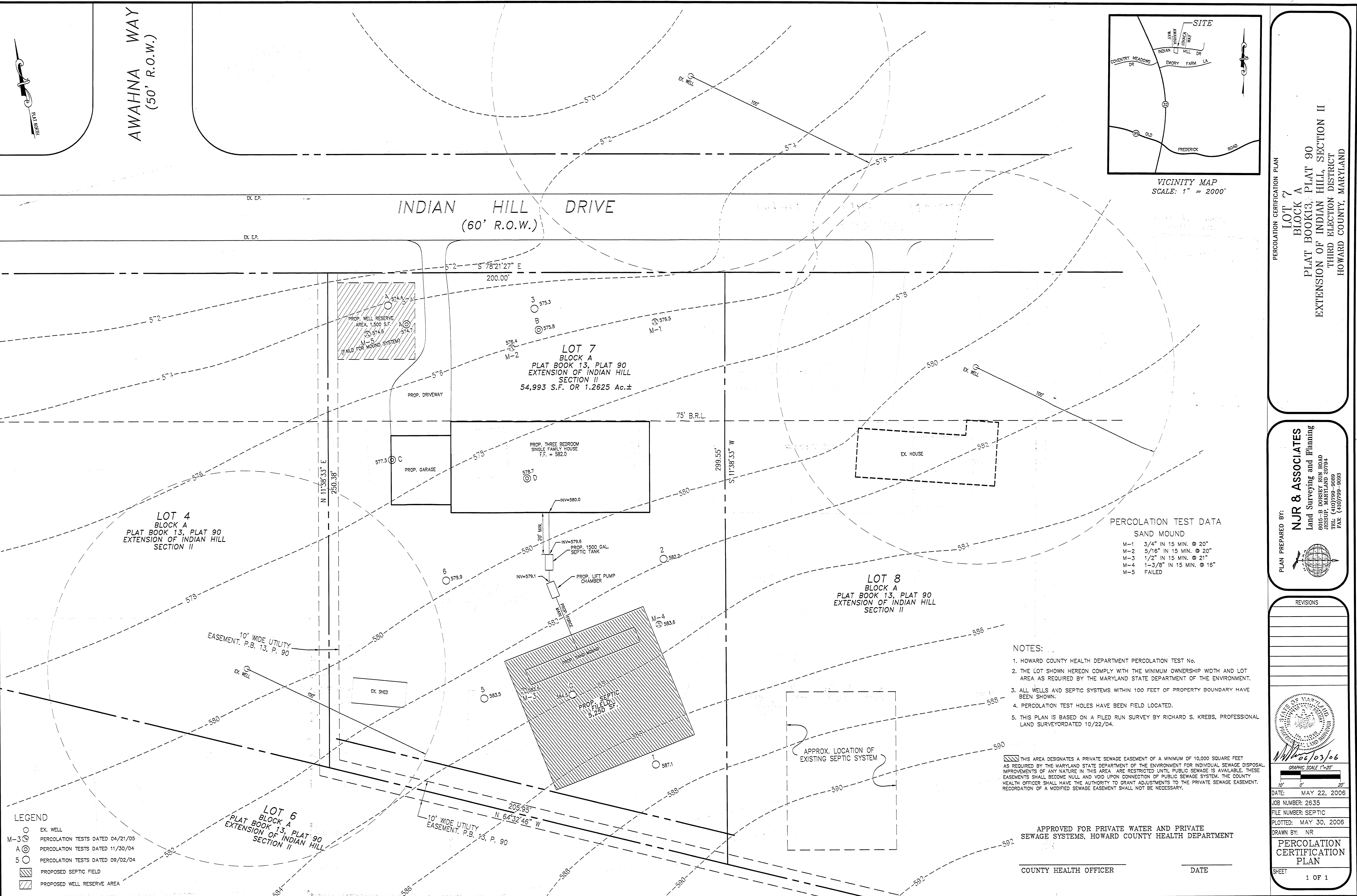
FREDERICK OFFICE:  
5517 Regency Court, Suite B  
Frederick, MD 21704-8318  
(301) 662-1790  
FAX (301) 662-8004

WESTMINSTER OFFICE:  
439 East Main Street  
Westminster, MD 21737-5539  
(410) 848-1790  
FAX (410) 848-1791

Date	Revisions	Drawn By:
7-20-05	ADDRESS COUNTY COMMENTS	CDD
8-10-05	ADDRESS COUNTY COMMENTS	Reviewed By: DEM
		Date: 6-2-05
		Scale: AS-SHOWN
		Job No: 2005064
		Sheet: 2 OF 2

County File No.





VICINITY MAP  
SCALE: 1" = 2000'

PERCOLATION TEST DATA  
SAND MOUND

M-1	3/4" IN 15 MIN. @ 20"
M-2	5/16" IN 15 MIN. @ 20"
M-3	1/2" IN 15 MIN. @ 21"
M-4	1-3/8" IN 15 MIN. @ 16"
M-5	FAILED

- NOTES:
1. HOWARD COUNTY HEALTH DEPARTMENT PERCOLATION TEST No.
  2. THE LOT SHOWN HEREON COMPLY WITH THE MINIMUM OWNERSHIP WIDTH AND LOT AREA AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT.
  3. ALL WELLS AND SEPTIC SYSTEMS WITHIN 100 FEET OF PROPERTY BOUNDARY HAVE BEEN SHOWN.
  4. PERCOLATION TEST HOLES HAVE BEEN FIELD LOCATED.
  5. THIS PLAN IS BASED ON A FILED RUN SURVEY BY RICHARD S. KREBS, PROFESSIONAL LAND SURVEYOR DATED 10/22/04.

THIS AREA DESIGNATES A PRIVATE SEWAGE EASEMENT OF A MINIMUM OF 10,000 SQUARE FEET AS REQUIRED BY THE MARYLAND STATE DEPARTMENT OF THE ENVIRONMENT FOR INDIVIDUAL SEWAGE DISPOSAL. IMPROVEMENTS OF ANY NATURE IN THIS AREA ARE RESTRICTED UNTIL PUBLIC SEWAGE IS AVAILABLE. THESE EASEMENTS SHALL BECOME NULL AND VOID UPON CONNECTION OF PUBLIC SEWAGE SYSTEM. THE COUNTY HEALTH OFFICER SHALL HAVE THE AUTHORITY TO GRANT ADJUSTMENTS TO THE PRIVATE SEWAGE EASEMENT. RECORDATION OF A MODIFIED SEWAGE EASEMENT SHALL NOT BE NECESSARY.

APPROVED FOR PRIVATE WATER AND PRIVATE  
SEWAGE SYSTEMS, HOWARD COUNTY HEALTH DEPARTMENT

COUNTY HEALTH OFFICER

DATE

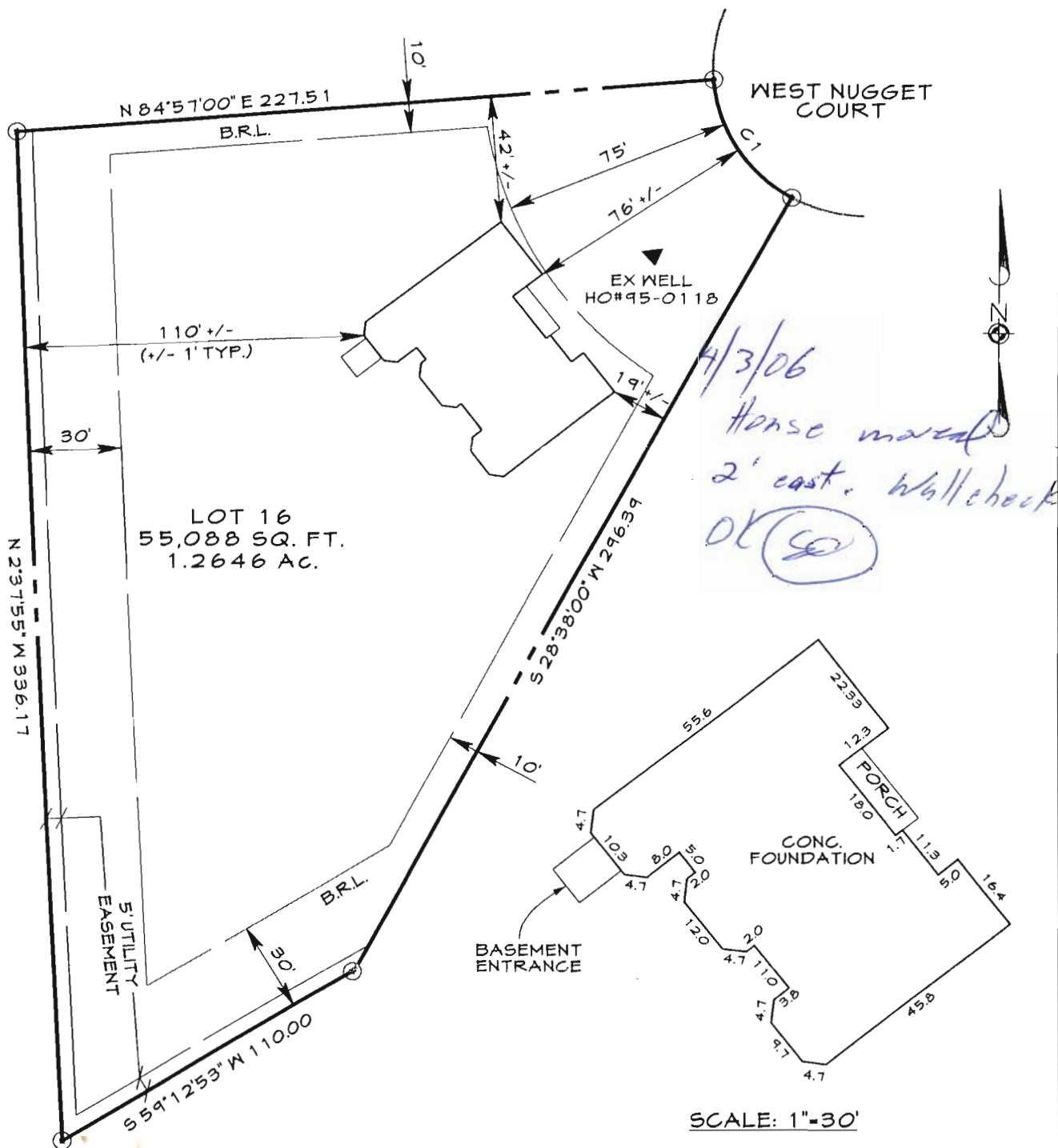
PERCOLATION CERTIFICATION PLAN  
LOT 7  
BLOCK A  
PLAT BOOK 13, PLAT 90  
EXTENSION OF INDIAN HILL, SECTION II  
THIRD ELECTION DISTRICT  
HOWARD COUNTY, MARYLAND

PLAN PREPARED BY:  
**NJR & ASSOCIATES**  
Land Surveying and Planning  
8015-B DORSEY RUN ROAD  
JESSUP, MARYLAND 20794  
TEL: (410)799-9069  
FAX: (410)799-9093

REVISIONS


DATE: MAY 22, 2006  
JOB NUMBER: 2635  
FILE NUMBER: SEPTIC  
PLOTTED: MAY 30, 2006  
DRAWN BY: NR

PERCOLATION CERTIFICATION PLAN  
SHEET 1 OF 1



Ref #	Arc Length	Delta	Radius	Chord Length	Chord Bearing	Tangent Length
C1	49.16	56°19'42"	50.00	47.20	S33°12'31"E	26.77



TOP OF WALL ELEVATION: 608.08'

I hereby certify that I have surveyed the property shown hereon for the sole purpose of locating the improvements. This plan is a benefit to the consumer only in so far as it is required by a lender or a title insurance company or its agent in connection with contemplated transfer, financing or refinancing. It is not to be relied upon for the establishment of boundary, easement or right-of-way lines for any reason, such as the location of fences, garages, buildings, or other existing or future improvements.

By Keith A. Heindel Date 1-9-05  
Keith A. Heindel Professional Land Surveyor No. 21189

# WALL CHECK LOT 16 SECTION THREE A.K.A. #12497 WEST NUGGET COURT **HIGHLAND ACRES**

5th ELECTION DISTRICT HOWARD COUNTY, MD.  
PLATBOOK 9 PAGE 92.  
TAX MAP: 40 GRID: 18 PARCEL: 241



439 East Main Street Westminster, MD 21157-5539  
(410) 848-1790 FAX (410) 848-1791  
5111 Pegasus Court, Suite B Frederick, MD 21704-8318  
(301) 662-1799 FAX (301) 662-8004

DRAWN BY: VAF
DESIGN BY: VAF
REVIEW BY:
DATE: 12/27/05
SCALE: 1"=50'
JOB NO: 2005064
SHEET: 1 OF 1



7/14/05  
received  
to KC

**SAND MOUND DESIGN**  
**WASTEWATER SYSTEM DISPOSAL**  
Lot # 16, Highland Acres, Howard County, MD

Design for: **Carroll Land Services Inc. client**

Design by: **INNOVA, LTD., New Windsor, Md.**

**Basis:** 4 Bedroom Residential Dwelling (new construction) Howard County, Maryland  
DISPOSAL AREA, as tested by the Howard County Bureau of Environmental Health (HCBE) for Sand  
Mound disposal. Initial Sand Mound area percolation infiltration test was 48 minutes. The two  
Replacement areas show an arithmetic average of 24 minute/inch. 48 minutes was design basis for the  
Initial Mound design.

DESIGN FLOW: 4 Bedrooms X 150 gal/day = **600 Gallons per Day**

CCHD SDA site requirement: original sand mound and two replacement sand mound areas, in the SDA

**DISPOSAL - SAND MOUND** [see sand mound calculation work sheet]

**DISTRIBUTION:**

(In accordance with MDE Construction and Design Manual for Sand Mound Systems, June 1991)

Distribution of effluent to the sand mound will be accomplished with low pressure piping (LPP) system.

**SEPTIC SYSTEM COMPONENTS:**

the proposed dwelling will require a minimum *Septic Tank* size of 1,500 gal. A top-seam, two-compartment concrete tank with a 1500 gpd capacity, and an effluent wastewater screen (filter) at the discharge. The Zabel (residential) model A1800, 4X18 with 1/16" slots is recommended.

A *Pump Chamber* of 1,500 gal capacity provides dose storage and will act as a flow equalizer/modulator. The chamber will contain the dosing pump and system control floats. A simplex control panel with a magnetic, motor contactor relay, using three float switches (on, off, and alarm) will manage dose control, and operate the system. Installed elapsed time /event registers will record pump operation and permit analysis of system function. The effluent is discharged to the *Sand Mound* absorption bed through a three (3") inch diameter force main (PVC-Shd 40, pressure) and distributing effluent over the absorption bed with six (6) - 1 1/4" PVC Laterals. The Mound distribution piping lengths and layout are shown on the plans.

**Number and spacing of laterals:** selected absorption bed width: 10' with 3.3' pipe separation, three (3) pipe runs will fit (lateral rows). Laterals are setback 1.7' from the upslope/downslope bed edges.

**Piping supply method:** Bed length, 60' exceeds the customary 50', and thus requires a center feed manifold supply. Six laterals are produced, initially [60' X 50%] 30' per lateral length. The laterals are shortened 20" to 28' 4", keeping pipe distribution holes within the absorption bed to prevent scouring of the sand fill material.

**Perforation size:** 5/16" diameter used [preferred by County Health Dept.]

**Preferred Perforation spacing:** 42" (3.5'), used 40" (3.33') to achieve balance in design

**Lateral size:** 1 1/4" [MDE Design Manual, June 1991, table 4.1] based on pipe length/hole spacing

**Total Perforations required** (Three runs  $(260' = 180' \div 3.33' \text{ spacing}) = 54$  perforations

**Perforations/Lateral:**  $54 \div 6 = 9$  perforations/Lateral

The first perforation, from the manifold, 1.68' (20") [MDE Design Manual, June 1991, pg 29, Fig.4.2.5 :[(60' X 50%) - (9 perf. - 1 X 3.33' spacing)] + 2 = 1.68' (20")

The last perforation, located in the end cap/ turn-up elbow of each lateral is 1.68' from bed -end.

Force main and manifold diameter: 3" diameter selected [preferred by Health Dept.]

Plate 1

K. J. Monahan  
11/16/05



## SAND MOUND DESIGN

### WASTEWATER SYSTEM DISPOSAL

Lot # 16, Highland Acres, Howard County, MD

#### DISTRIBUTION (continued)

#### PUMPING

The preferred operating head (distal) pressure of 2.0' is used to stabilize flow rate at 1.63 g.p.m. when using 5/16" diameter perforations. The distal measurement is taken at the turn up of the most distant lateral riser. [Preferred by Health Dept.]

**Field flow rate:** simultaneous flow of all perforations [  $54 \times 1.63 \text{ gpm} = 88.02 \text{ gal. Per min.}$  ]

**DOSE** [system will be Demand Dose type, based on accumulation of water from home]

Dose determination: largest of, 1/6 of the Design Flow (600 gal/day), or total volume of the force main & manifold (FM/M) + five (5) X storage volume of all laterals.

[Volume of 3" PVC pipe @ 38.4 gal./100', 1 1/4" PVC @ 7.8 gal./100']

$1/6 = 600 \text{ gpd} \div 6 = 100 \text{ gallons}$

Volume = 105' FM/M = 40.3 gallons + 5X laterals (14.4 gal.), or 70.2 gal) = 112.3 gallons

Compare 100 gallons and 112.3 gallons. Use: 112.3 gallons as the dose volume

#### PUMP SIZING

Field Flow (88.02 gpm), and Total Dynamic Head provide the parameters for pump selection.

Total Dynamic Head = Static Lift + Friction Head + Field Operating Pressure (Distal Head)

Static Lift = elev. difference between highest lateral and pump off, float elevation  
 $603.33' - 596.45' = 6.88'$  6.88'

Friction Head: 3" pipe (@ 88 gpm) = 1.8' / 100 linear ft.

105', 3" force main/manfld [1.05 X 1.8] = 1.89'

3" fittings

(1) 90° ell, (5) cplng, (1) tee: (equiv. total, 40') .40 X 1.8 = .72'

(1) 2" high pressure gate valve (equiv. total, 80') .80 X 1.8 = 1.44'  
4.05 4.05

Distal Head/ Field operating pressure 2.00'

TDH [Total Dynamic Head] 12.93'

See attached pump curves, at 12.93' TDH, and Field Flow of 88 gpm

Pump selected: Gould model 3885, 1 HP, 230V, 1Ø, order no. WE1012H

Dosing Schedule:  $600 \text{ gpd} \div 112.3 \text{ Dose} = 5.34$ , or five events in 24 hrs.

Pump Run Time:  $112.3 \times 5 = 561.5 \text{ gal.} \div 88 \text{ gpm flow rate} = 6.3 \text{ minutes/day}$ , or approx.

1 minute / 18 seconds ea. event



## SAND MOUND DESIGN

Design for: **CLSI**

**Lot # 16, Highland Acres Howard County, Md.**

### **DISPOSAL**

### **BASED ON ALTERNATIVE MOUND PARAMETERS**

**SAND MOUND CALCULATIONS:** The Initial Mound of the SDA was confirmed by SM tests 1A [48 min. @15"], and 3A [48min. @15"]. The First and Second Replacement Sand Mound areas were confirmed by sandmound tests: SM 8A and 9A [34.3 min.@ 20"], SM 5A [13.3 min.@ 16"], and SM 4A [15 min.@ 21"]. Average infiltration test time of 48 minutes was the basis for the Initial Mound basal area requirement. The average infiltration time of 24.2 minutes/inch was noted as the basal area loading rate time for the Replacement Sand Mound areas.

Sand, conforming to the Maryland Department of the Environment [MDE] specifications, has been found to be in short supply. Policy, to deal with the problem was published (memo) April 7, 2004. The policy is based on studies concerning supplies of sand that fall short of MDE certification standards. Use of sand that is somewhat coarser, and not quite so uniform in grain size has been accepted, with provisions. For this design, the **alternative sand media category** [bed loading rate 1.0 gpd/ft<sup>2</sup> and a linear loading rate of less than 10 gpd/ln. ft., was applied. As an added check, the basal area footprint of the mound [excluding the upslope set-back] was checked against soil loading rates found (table 3.3, 1991 below). The basal area provided meets the requirement (MDE Design and Construction Manual for Sand Mound Systems, June 1991).

### **SAND MOUND CALCULATIONS**

**ABSORPTION BED:** 4/bedroom 600 gal/1.0 gpd per ft<sup>2</sup> (alternative sand loading rate) = 600 ft<sup>2</sup>

**Linear loading Rate, minimum is  $\leq 10$  gpd/ft** -  $600 \text{ gpd} \div 60 \text{ ft bed} = 10 \text{ gal./ft/day}$  :adequate thus:

**BED WIDTH (A) =  $600/B = 10.0$  feet**      **BED LENGTH (B) = 60 Feet**

**UPSLOPE FILL (D) = 12 inches (1 foot)(minimum)**

**4% slope**

*tests pits demonstrated adequate soil depths for sand mound application (no groundwater and/or excessive rock fragments at less than 4' depth).*

**DOWNSLOPE FILL (E) = 16.8 inches (1foot 5 inches)**

**CAP + TOPSOIL FILL (at Bed Center) (H) 18 inches<sup>h</sup>**

**CAP + TOPSOIL FILL (at Bed Edge) (G) 12 inches**

**(Sand Fill depth, under Bed Center about 14 inches<sup>h</sup>**

**TOTAL BED DEPTH (F) 10 inches<sup>h</sup>**

<sup>h</sup> approximate **MOUND HEIGHT = 42 inches** (above native surface)

**SIDE SLOPE SETBACK**

**(K) = 130.8 inches (10 feet 11in. )**

**UPSLOPE SETBACK, 4% slope (.89 corr. Factor)**

**(J) = 90.78 inches (7 feet 7 inches)**



## **SAND MOUND DESIGN**

Design for: CLSI

Lot # 16, Highland Acres Howard County, Md.

DISPOSAL

**SAND MOUND CALCULATIONS:** (continued)

**DOWNSLOPE SETBACK** 4% slope (1.14 corr. Factor) (I) = 132.69 inches (11 feet 1 inches)

**TOTAL WIDTH:** (W) = 342.47 inches    **TOTAL LENGTH (L)** = 981.6 inches  
(W) = 28 feet, 7 inches    X    (L) = 81 feet 10 inches

**Basal Area required:**  $\frac{600 \text{ gpd Design Flow}}{0.5 \text{ gpd/ft}^2 \text{ [soil Loading Rate (Manual, table 3.3, silty clay loams)]}} = 1200 \text{ ft}^2$

**Basal Area provided (initial dimensions) :** [(A+I) X B] = 1264 ft<sup>2</sup> (Adequate)

**ALTERNATIVE SAND MEDIA** - a recent sieve analysis of the sand media used will document the material. The Maryland Department of the Environment (MDE) requires material with an effective grain size of 0.25 - 0.5 mm and a uniformity coefficient of no less than 3.5.

Alternative (Wisconsin Standards) material guidelines prefer material with an effective diameter close to 0.30 mm and uniformity coefficient of 4.0 and endorse coarser material rather than fine (0-2% passing 100 mesh sieve). This mound system has been designed for that material quality level. Material meeting regular MDE sand media standards does not require a design change for this plan. Contractor, the Health Department may request a quarry sieve analysis. We, recommend when you order, you ask the Dispatcher to send a current analysis copy with the delivery.

### **INSTALLATION:**

Follow the recommended installation schedule as found in Section 5, "Construction Procedures" in the *DESIGN AND CONSTRUCTION MANUAL FOR SAND MOUND SYSTEMS* (June 1991) and in this submittal.

11-14-05

Calc.  
OK

KN

## SAND MOUND DESIGN

### WASTEWATER SYSTEM DISPOSAL

Lot # 16, Highland Acres, Howard County, MD

#### DISTRIBUTION (continued)

#### PUMPING

The preferred operating head (distal) pressure of 2.0' is used to stabilize flow rate at 1.63 g.p.m. when using 5/16" diameter perforations. The distal measurement is taken at the turn up of the most distant lateral riser. [Preferred by Health Dept.]

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3" fittings

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(1) 2" high pressure gate valve (equiv. total, 80') .80 X 1.8 = 1.44' ✓  
4.05 4.05

Distal Head/ Field operating pressure

2.00'

TDH [Total Dynamic Head] 12.93'

See attached pump curves, at 12.93' TDH, and Field Flow of 88 gpm

Pump selected: Gould model 3885, 1 HP, 230V, 1Ø, order no. WE1012H

Dosing Schedule: 600 gpd ÷ 112.3 Dose = 5.34, or five events in 24 hrs.

Pump Run Time: 112.3 X 5 = 561.5 gal ÷ 88 gpm flow rate = 6.3 minutes/day, or approx.

1 minute / 18 seconds ea. event

Plate 2

Post-it® Fax Note	7671	Date	11/11/05	# of pages	1
To	DENNIS MECKLEY	From	DALE GRAY		
Co./Dept.	CLSI	Co.	INNOVA LTD		
Phone	(410) 848-1790	Phone	(410) 875-9370		
Fax	(410) 848-1791	Fax			



# MOUND TEST DATA SHEETS

Property I.D. Highland Acres Lot # 16 Date 4/26/05  
 Sanitarian Kace Landscape Position Flat  
 % Slope 2-3 Soil Type WET SEASON Contractor Fogles

HOLE # 8 DEPTH OF TEST 20" START TIME 3:00

(8) (9)  
 ybrn  
 sil - packets  
 si CL 95 sbk  
 14"  
 packets ybrn  
 (si CL sil)  
 w.c.sq. &  
 wk sbk struct.  
 Rx ~ 10% Qtz  
 26"  
 ↓ NO  
 water  
 til ~ 8'

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate(ET/MD)	% Change
916/14	0			
93/14	15	8/14		
815/14	↓	9/14		
87/14	↓	8/14		
715/14	↓	8/14		
72/14		8/14	2" per hour	

TEST HOLE #9 Visual

HOLE # \_\_\_\_\_ DEPTH OF TEST \_\_\_\_\_ START TIME \_\_\_\_\_

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate(ET/MD)	% Change

NOTES

Hole #7 - SEE HOLE #2 FAILS  
 Hole #6 - SEE HOLE #5 PASSES  
 HOLE #9 - SEE HOLE #8 PASSES

# MOUND TEST DATA SHEETS

Property I.D. Highland Acres Lot # 16 Date 4/26/05

Sanitarian Kacie Landscape Position Flat

% Slope 2-3% Soil Type WET SEASON Contractor Fglos

HOLE # 3 DEPTH OF TEST 15" START TIME 1:29

③  
str brn  
scl  
with  
gr s bk  
12"  
str rd  
micac (20%)  
sil  
BLK STRUCTURE  
Rx < 5%  
4 1/2"

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate(ET/MD)	% Change
9 16/16	1:29			
9 10/16	1:44	6/16		
9 5/16	2:01	5/16		
8 16/16	2:16	5/16		
8 11/16	2:31	5/16	1 1/4" per hr	

HOLE # 2 & 1 DEPTH OF TEST 20"-hole 2 START TIME 15" hole 1

①  
DK brn  
L-sil  
sbk, bk  
15"  
str org  
scl  
gr s bk  
mostly granular  
4 1/4"

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate(ET/MD)	% Change
#2 Perc	1:49	FAILS 1/4" in 30 minutes		
#1 9 16/16	2:44			
9 8/16	3:01	3/16		
9 2/16	3:16	6/16 = 3/8		
8 12/16	3:31	6/16 = 3/8		
8 6/16	3:46	6/16 = 3/8		

#2 FAILS  
#1 passes

HOLE #7 like Hole #2

1 1/4" per hour



# MOUND TEST DATA SHEETS

Property I.D. Highland Acres Lot # 16 Date 4/26/05  
 Sanitarian Kacie Landscape Position Flat 2-3% slope  
 % Slope 2-3 Soil Type WET SEASON Contractor Fogles

HOLE # 4 DEPTH OF TEST 21" START TIME \_\_\_\_\_

4  
 DK brn  
 SCL  
 org brn  
 CL  
 lg sbk  
 struct  
 cave-in  
 @ 8'  
 water @ 10'  
 distinct  
 mottles  
 med gr sand  
 white  
 yellow

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate(ET/MD)	% Change
9 <sup>16</sup> / <sub>16</sub>	1:12			
8 <sup>17</sup> / <sub>16</sub>	1:27			
7 <sup>15</sup> / <sub>16</sub>	1:42			
6 <sup>14</sup> / <sub>16</sub>	1:57			
5 <sup>14</sup> / <sub>16</sub>	2:12			
4 <sup>16</sup> / <sub>16</sub>	2:27			
3 <sup>16</sup> / <sub>16</sub>	2:42			
		4" in 1 hr		

approx prop line

HOLE # 5 DEPTH OF TEST 14" START TIME \_\_\_\_\_

12-16  
 (5)  
 DK brn & SCL  
 wk sm sbk peels  
 SCL  
 lg sbk peels  
 v. dense  
 grtz frags  
 ~ 10-15%  
 7 1/2"  
 Bottom 8 1/2"

Hook Gauge Reading	Elapsed Time (min)	Measured Drop	Estimated Rate(ET/MD)	% Change
1:03	0	9 <sup>16</sup> / <sub>16</sub>		
1:18	15	7 <sup>10</sup> / <sub>16</sub>		
1:33	15	6 <sup>2</sup> / <sub>16</sub>		
1:48	15	4 <sup>16</sup> / <sub>16</sub>		
2:03	15	3 <sup>14</sup> / <sub>16</sub>		
2:18	15	2 <sup>14</sup> / <sub>16</sub>		
2:33	15	1 <sup>12</sup> / <sub>16</sub>		

HOLE 6 Visual

LAUREL SAND & GRAVEL, INC. T/A  
**S.W. Barrick & Sons****Barrick Quarry**Address: P.O. Box 86  
Woodsboro, MD 21798

Sales Office: (301) 845-8341

Fax Number: (301) 845-2396

Orders &amp; Dispatch: (301) 845-8343

Toll Free: (800) 546-8343

**Finksburg Terminal**

Address: 2700 Emory Road

Finksburg, MD 21048

Sales /Dispatch: (410) 833-4400

Fax Number: (410) 833-4909

April 20, 2006

Farm & Home Excavating, Inc.  
901 Driver Road  
Marriottsville, Maryland 21104

Attn: Mr. Bill Ingram

Re: Howard County  
Conventional Sand Mound Sand

Gentlemen:

This letter is to certify that the Concrete Sand, shipped by S.W. Barrick & Sons through our Woodsboro facility, meets the material specifications for ASTM C-33 and the Maryland Department of Transportation - State Highway Administration - Standard Specifications For Construction And Materials - Section 901, and the requirements for Conventional Sand Mounds.

Sieve Size	Percent Passing	ASTM C-33 Specifications
3/8"	100.0	100
No. 4	97.6	95-100
No. 8	83.5	80-100
No. 16	68.1	50-85
No. 30	43.9	25-60
No. 50	17.3	5-30
No. 100	2.3	0-10
No. 200	0.7	

Cu = 3.46

Eff. Size = 0.26 mm

Thank you for your interest in our products. Should you have any questions or require additional information, please contact the lab at 301-845-6302, or Jerry Blank at 301-845-6341.

Sincerely,

Robert Golden  
Quality Control Manager





# Bulletin

Extension

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## Mound Systems for On-site Wastewater Treatment

### Siting, Design and Construction in Ohio

Bulletin 813

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#### Mound System Design Example

##### Step 4. Select the Sand Fill Loading Rate.

The selection of sand fill material is critical to long-term performance of the mound system. The purpose of the sand fill is to accept effluent from the distribution system and partially treat the wastewater before infiltration into the natural soil. A suitable sand is one that can be loaded at a reasonable rate and will provide satisfactory treatment. Generally, the finer the sand the better the treatment and the slower the wastewater infiltration into the absorption bed. Too coarse a sand will allow effluent to pass through the mound with little removal of impurities. Too fine a sand cannot be loaded at an acceptable rate and may cause severe clogging of the sand, which results in failure of the mound system.

Following the USDA Soil Textural Classification, a coarse sand is suitable. However, this is subject to the following two conditions: (1) no more than 20% by weight is gravel ( $> 2$  mm), and (2) no more than 5% by weight is silt and clay ( $< 0.053$  mm). (Note: Request a sieve analysis report on a proposed sand from the aggregate supplier to check these criteria.)

Concrete sand is produced by many sand and gravel quarries in Ohio and generally meets the criteria for the very coarse and very fine fractions. The fine aggregate specified by the Ohio Department of Transportation will meet the mound sand requirements. The specification is detailed in Section 703.02 of Aggregate for Portland Cement Concrete, Office of Construction Administration, 2002 Construction and Material Specifications. Although mason sand is also commonly available, it is a finer sand than concrete sand and is not recommended. Limestone sand is not suited although it may meet size requirements. Limestone sand can dissolve over time, reducing the system's useful life.

Sand specifications are also given in terms of effective size and uniformity coefficient. When using these criteria, select a sand with an effective size in the range of 0.15-0.30 mm, and with a uniformity coefficient in the range of 4-6.

When using a sand that meets the guidelines above, the recommended design sand fill loading rate is 1.0 gpd/ft<sup>2</sup> if the wastewater is typical domestic septic tank effluent. If the effluent is from a commercial establishment, the wastewater quality should be evaluated and the sand fill loading rate should be adjusted accordingly. When treating higher strength wastewater, the sand fill loading rate should be reduced, or there may need to be additional pretreatment to achieve a waste strength comparable to domestic effluent prior to distribution to the sand fill material.

**Sand Fill Loading Rate:**

Sand Fill Loading Rate = 1.0 gpd/ft<sup>2</sup>

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