

Portage Septic  
3640 Robin-Town Road SW  
Warren, OH 44481

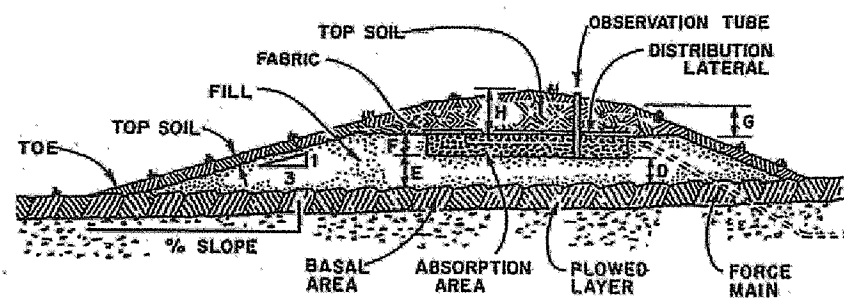
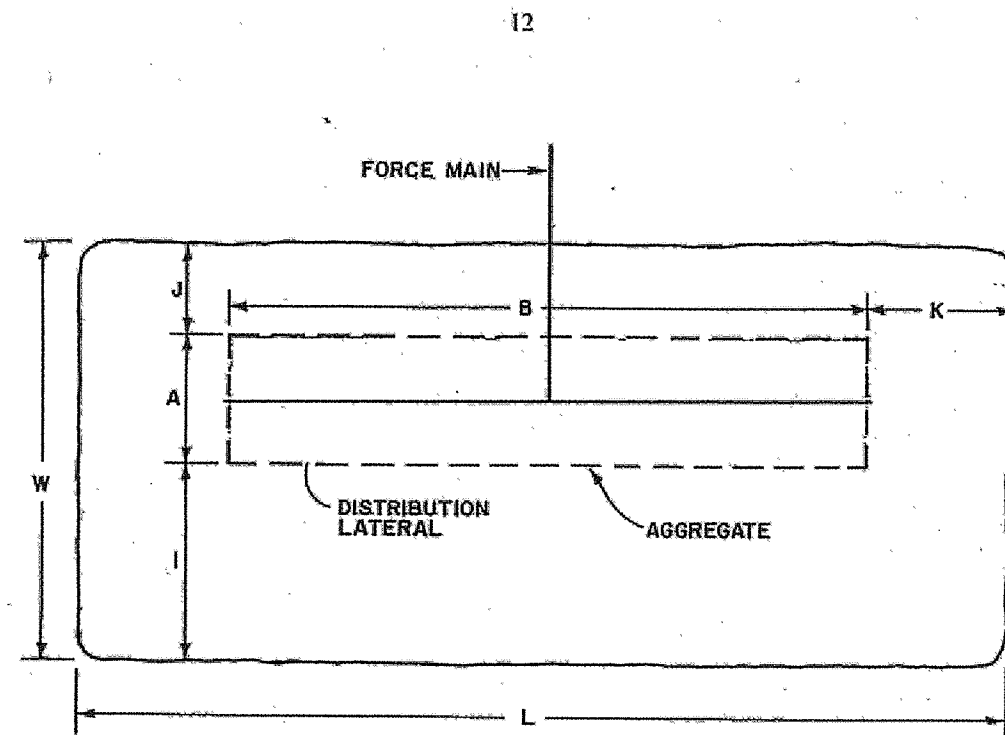
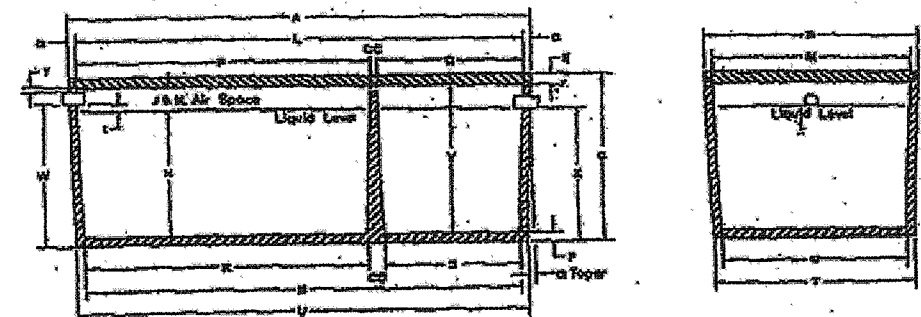
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1000 Gallon Single & 2 compartment (w/ 2" Straight Divider Wall)

*** Tank Dimensions in Inches ***			
Tank Length = A = 30.00	(Circ. Based on 1/2" / 2")	Round off to:	85
Tank Width = B = 40.00	Length of 1st Comp = 54.67		
Tank Height = C = 67.00	Length of 2nd Comp = 27.33		
Wall Thickness = D = 3.00	*** Slope of Overall Component Dimensions ***		
Lid Thickness = E = 4.00	Length of 1st Comp = 41		
Floor Thickness = F = 3.00	Length of 2nd Comp = 41		
Whit Taper = G = 60.00	Total = 82		
Liquid Level = H = 60.00			
Distance to Duct = I = 0.00			

(Total must equal 85" dimension)

*** Air Space ***	J = 10.00	*** Tank Operations ***	
% of Air Space = K = 30%		Total Gal. - Single Comp = 1854	
Lengths & Weights		Gallons of 1st Comp. = 514	
Inside Length @ Top = L = 94.00		Gallons of 2nd Comp. = 514	
Inside Width @ Top = M = 63.00		Gal. of 1st & 2nd Comp. = 1028	
Inside Length @ Side = N = 79.00		Total Gallons (Full to Lid) = 1281	
Inside Width @ Side = O = 40.00			
Inside Length of 1st Comp = P = 41.00		Griffin (Single) = 21.1	
Inside Length of 2nd Comp = Q = 41.00		Griffin (1st Comp) = 10.3	
Length @ Side of 1st Comp = R = 36.00		Griffin (2nd Comp) = 10.3	
Length @ Side of 2nd Comp = S = 36.00		Weight of Tank = 6218.9	
Width @ Bottom of Tank = T = 64.00		Weight of Lid = 2076.6	
Length @ Bottom of Tank = U = 65.00		Total Weight of Tank = 8295.5	
Inside Height = V = 60.00		Volume of Concrete = 2000	
Inside Height = W = 60.00		Weight of Tank = 6218.9	
Outside Height = X = 63.00		Tank - Cubic Yards = 1.69	
Space above Lid = Y = 6.00		Lid - Cubic Yards = 0.53	
		Total Cubic Yards = 2.22	



Cross section and plan view of a mound system on a sloping site.

MOUND DIMENSIONS ( FT. )					
A	2.7'	F	0.75'	J	5'
B	12.0'	G	1.0'	K	6'
D	0.5'	H	1.5'	L	13.2'
E	0.5'	I	7'	W	14.7'

TOTAL HEIGHT = 23'

#### PRESSURE DISTRIBUTION PIPING & PUMP DESIGN

- MOUND CONFIGURATION CHOSEN - SINGLE MOUND W/CENTER FEED/CENTER MANIFOLD
- NUMBER OF LATERALS CHOSEN - 2
- LENGTH OF LATERALS LL - LL = B / # LATERALS
- B = 120' LL = 60 FEET (EA)
- PERFORATION SIZE AND SPACING
- DOSAGE AREA CHOSEN - 65'
- ABSORPTION AREA WITH - 2.7 FT.
- REQUIRED SPACING - 2.2 FT (CENTER TO CENTER)
- PERFORATION SIZE CHOSEN - 3/16" DIAMETER
- LATERAL DIAMETER - USING FIG. A-2A - 1 1/2" DIAMETER
- PERFORATIONS PER LATERAL - # - LL / REQUIRED SPACING
- LL = 60 FEET (EA)
- REQUIRED SPACING - 2.119 FEET (CENTER TO CENTER)
- # OF PERFORATIONS PER LATERAL - 28
- LATERAL DISCHARGE RATE (LDR) - # OF LATERALS x GPM / PERFORATION SIZE
- GPM / PERFORATION - 0.780 GPM / PERFORATION
- # OF PERFORATION - 28
- LDR = 22.08 GPM
- FORCE MAIN MANIFOLD CHOSEN - 2" DIAMETER
- NET WORK DISCHARGE RATE (NDR) - # LATERALS x LDR
- # OF LATERALS - 2
- LDR = 22.08 GPM
- NDR = 44.16 GPM PSI CONVERSION = 14.4 PSI

#### NOTE

- LATERAL SIZE = 1 1/2"
- HOLE SPACING = 2.119"
- HOLE DIAMETER = 3/16"

#### MAIN LENGTH AND FITTINGS FROM DOSE TANK TO MOUND

- MAIN PIPE LENGTH = 145' + 10.9' + 10' = 165.9 FT.
- EQUIVALENT LENGTH OF PIPE FOR 1-90° ELBOW = 3 ELBOW x 9 FT/ELBOW = 27 FT.
- EQUIVALENT LENGTH OF PIPE FOR TEE = 11 FT.
- TOTAL EQUIVALENT LENGTH OF PIPE = 165.9' + 27' + 11' = 203.9 FT.

#### PUMP DESIGN

- DISTAL HEAD - 3.5 FT.
- SYSTEM HEAD - 4.6 FT. (1.3 x DISTAL HEAD)
- STATIC HEAD - 10.9 FT. ± ELEV. FROM DOSE PUMP TO INVERT OF MOUND LATERAL
- FORCE MAIN - 2"
- 3 - 2" 90° ELBOWS FITTINGS EQUIVALENT PIPE LENGTH - 27 FT.
- FORCE MAIN LENGTH - 145 FT.
- EQUIVALENT PIPE LENGTH - 203.9 FT.
- TOTAL HEAD LOSS IN 203.9 FT. OF 2" PIPE = 203.9/100 x 2.284 = 4.7 FT.
- TDH - 10.9' + 4.7' + 4.6' = 20.2 FT.
- PUMP CHOSEN - FLOW - 44.16 GPM (MIN.)
- TDH - 20.2 TDH (MIN.)

#### DOSE TIMING DESIGN

- NET DOSE VOL - 41 GAL
- FLOW BACK IN FORCE MAIN - LATERAL + FORCE = (0.10 x 120) + (165.9 x 0.17) = 40
- TOTAL - 40 GAL
- TOTAL DOSE (5 x 8) + 40 = 85 GAL
- TIMER DOSE DURATION - 4.3 MIN.
- PDF - 360 GPD
- NET DOSE - 41 GAL
- TOTAL # OF DOSED - 5.9 (MIDNIGHT TO MIDNIGHT)
- DOSE FREQUENCY - 24 HRS (DAY) / # OF DOSED
- 24 / 5.9 = 4.0 HOURS / TIMER DOSE FREQUENCY

#### DOSING CHAMBER DESIGN

- DOSE VOLUME - 25% MAX.
- PDF - 360 GPD
- TOTAL DOSE VOL. ALLOWANCE - 120 GAL
- NET DOSE VOLUME - VOID MULT. x LAT. LEN. x # OF LATERALS x VOID
- LATERAL VOID MULTIPLIER USED - 5
- LATERAL LENGTH - 60 FT.
- LATERAL DIA. - 1 1/2"
- # OF LATERALS - 2
- LATERAL VOID VOLUME 0.092 GAL / FT.
- NET DOSE VOL. CHOSED = 8.2 x 5 = 41 GAL
- SIZE OF DOSING CHAMBER
- WORKING STORAGE MIN. - NET DOSE VOL. 6" BLOCK + 0.5 + 1.5(PDF-240) + FM.FLOW/RT
- FORCE MAIN CHOSEN - 2"
- FORCE MAIN LENGTH - 165.9 FT.
- FORCE MAIN VOID VOL. - 0.17 GAL/FT.
- WATER VOL. IN FORCE MAIN - 40 GAL
- TOTAL WORKING VOL. REQUIRED
- DOSING TANK CHOSEN - 1000 GAL
- W WORKING STORAGE OF 635 GAL

#### SEPTIC MOUND CONSTRUCTION NOTES:

MOUND SHALL BE INSTALLED ALONG CONTOURS.

INSTALLER SHALL CONTACT DESIGN ENGINEER IN THE EVENT THAT ANY PORTION OF THE SYSTEM IS CHANGED DUE TO SITE CONDITIONS. DESIGN ENGINEER SHALL APPROVE OF ANY CHANGES.

THE INSTALLER SHALL SCHEDULE A SYSTEM STARTUP WHERE THE INSTALLER, EQUIPMENT SUPPLIER, LOCAL HEALTH DEPARTMENT, AND DESIGN ENGINEER ARE ALL PRESENT. THE TANKS SHALL BE FULL OF WATER SO THAT PUMP TESTS CAN BE PERFORMED. THE START UP SHALL INCLUDE DRAW DOWN TESTS, PUMP CYCLING TESTS, AND MOUND PRESSURE TESTS. THE INSTALLER SHALL PROVIDE 5 FT. LONG CLEAR PLASTIC PIPE THAT CAN BE SCREWED INTO THE FLUSH VALVES. THE WATER LEVEL SHALL BE CHECKED IN EACH TUBE AND SHALL BE EQUAL IN THE EVENT THAT THE WATER LEVEL IS NOT EQUAL, ADJUSTMENTS SHALL BE MADE IN THE LATERALS, AND/OR PIPING SO THAT THE PRESSURE WITHIN THE LATERALS IS EQUAL THROUGHOUT.

THE LOCATION OF THE MOUND IS TO BE STAKED BY CONTRACTOR PRIOR TO BEGINNING CONSTRUCTION.

DETERMINE WHERE THE PIPE FROM THE PUMPING CHAMBER CONNECTS TO THE DISTRIBUTION SYSTEM IN THE MOUND.

TRENCH AND LAY THE EFFLUENT PIPE FROM THE PUMPING CHAMBER TO THE MOUND. CUT AND CAP THE PIPE ONE FOOT BENEATH THE GROUND SURFACE. LAY THE PIPE. SLOPE THE PIPE UNIFORMLY BACK TO THE PUMPING CHAMBER SO THAT THE LINE DRAINS AFTER DOSING. BACKFILL AND COMPACT THE SOIL AROUND THE PIPE TO PREVENT BACK SEEPAGE OF EFFLUENT ALONG THE PIPE.

CHECK THE MOISTURE CONTENT OF THE SOIL AT 7 TO 8 INCHES DEEP. IF IT IS TOO WET, SMearing AND COMPACTION WILL RESULT. SOIL MOISTURE CAN BE DETERMINED BY ROLLING A SOIL SAMPLE BETWEEN THE HANDS. IF IT ROLLS INTO A RIBBON, THE SITE IS TO WET TO PREPARE. IF THE SOIL CRUMBLES, SOIL PREPARATION CAN PROCEED.

CUT THE TREES TO GROUND LEVEL. REMOVE EXCESS VEGETATION BY MOWING. PREPARE THE SITE USING A MOLDBOARD OR CHISEL PLOW BY PLOWING ALONG THE CONTOUR. ROTOTILLING THE SITE IS NOT PERMITTED. CONSTRUCTION OF THE MOUND SHALL BEGIN AS SOON AS THE BASE AREA HAS BEEN PLOWED. THE CONTRACTOR SHALL AVOID RUTTING OF THE PLOWED AREA WITH VEHICULAR TRAFFIC.

EXTEND THE EFFLUENT PIPE TO SEVERAL FEET ABOVE THE GROUND SURFACE.

PLACE THE SAND FILL MATERIAL WHICH HAS BEEN PROPERLY SELECTED AROUND THE EDGE OF THE PLOWED AREA. KEEP THE WHEELS OF THE TRUCKS OFF PLOWED AREAS. MINIMIZE TRAFFIC ON THE DOWN SLOPE SIDE OF THE MOUND. WORK FROM THE END AND UPSLOPE SIDE.

SAND FILL MATERIAL SHALL BE CLEAN CONCRETE SAND (C-33) WITH EFFECTIVE SIZE WITHIN 0.14-0.30MM AND UNIFORMITY COEFFICIENT WITHIN 4-6.

PLACE THE SAND FILL MATERIAL TO THE REQUIRED DEPTH. SHAPE SIDES TO THE DESIRED SLOPE.

HAND LEVEL THE BOTTOM OF THE DISTRIBUTION AREA. THE BOTTOMS SHALL BE AT THE SAME ELEVATION AND LEVEL.

PLACE THE COARSE AGGREGATE IN THE DISTRIBUTION AREA (8" TOTAL WITH 6" MINIMUM BENEATH DISTRIBUTION PIPE AND AT LEAST 1" OVER DISTRIBUTION PIPE). AGGREGATE SHALL BE #57 WASHED GRAVEL.

PLACE THE DISTRIBUTION SYSTEM ON THE AGGREGATE. CONNECT THE MANIFOLD TO THE PIPE FROM THE PUMPING CHAMBER. SLOPE THE MANIFOLD TO THE EFFLUENT PIPE. LAY LATERALS LEVEL, REMOVING DIPS AND RISES.

PLACE 2 INCHES OF AGGREGATE OVER THE DISTRIBUTION PIPES. (TOTAL OF 8" AGGREGATE MINIMUM)

INSPECTION TO BE CONDUCTED BY THE AT FOLLOWING PHASES OF CONSTRUCTION BY THE COUNTY HEALTH DEPARTMENT:

1. AFTER PREPARATION OF THE BASAL AREA.
2. AFTER PLACEMENT OF THE MOUND FILL MATERIAL AND MOUND DISTRIBUTION LATERALS.
3. AFTER PLACEMENT OF REMAINING FILL, TOPSOIL AND SEEDING.

PLACE 4 TO 5 INCHES OF NON-COMPACTED STRAW OR GEOTEXTILE FABRIC OR OTHER EQUIVALENT PRODUCT OVER THE AGGREGATE.

PLACE TOPSOIL ON TOP OF THE DISTRIBUTION AREA TO A DEPTH OF 12 INCHES IN THE CENTER AND 6 INCHES AT THE OUTER EDGE OF THE DISTRIBUTION AREA. PLACE 6 INCHES OF GOOD QUALITY TOPSOIL OVER THE ENTIRE MOUND SURFACE. THIS WILL RAISE THE ELEVATION AT THE CENTER OF THE MOUND TO A MINIMUM OF 1.5 FEET AND (EVERYWHERE ELSE) TO 1 FOOT.

LANDSCAPE THE MOUND BY SEEDING AND MULCHING. A MIXTURE OF 90% BIRDSFOOT TREFOIL AND 10% TIMOTHY MAY BE USED IF THE MOUND WILL NOT BE MANICURED. IF MANICURING IS DESIRED, A COMBINATION OF 60% BLUEGRASS, 30% CREEPING RED FESCUE AND 10% ANNUAL RYE GRASS MAY BE USED. SHRUBS CAN BE PLANTED AROUND THE BASE AND UP THE SIDE SLOPES. THEY SHOULD BE SOMEWHAT MOISTURE TOLERANT SINCE THE TOW OF THE MOUND MAY BE SOMEWHAT MOIST DURING VARIOUS TIMES OF THE YEAR. ALL LAWS AND RULES OF THE LOCAL HEALTH DISTRICT AND THE OHIO DEPARTMENT OF HEALTH PERTAINING TO INDIVIDUAL SEWAGE DISPOSAL AND WATER SUPPLY SYSTEMS SHALL BE FOLLOWED.

RESIDENCE MUST UTILIZE WATER SAVING TOILETS, SHOWERHEADS AND FAUCETS.

DRAINAGE IMPROVEMENTS OR CHANGES FROM THE EXISTING GRADE NOTED ON THE APPROVED PLAN SHALL BE INSTALLED PRIOR TO SEWAGE DISPOSAL SYSTEM CONSTRUCTION.

NO OPEN BURNING WILL OCCUR DURING CONSTRUCTION.

SURFACE WATER SHALL BE DIVERTED AWAY FROM THE MOUND AREA BY THE USE OF SWALES AND INTERCEPTOR DRAIN, FITTED WITH AN ANIMAL GUARD.

SEWAGE LIFT PUMP SHALL CONFORM WITH THE CURRENT EDITION OF THE NATIONAL ELECTRICAL CODE.

ALL ELECTRICAL CONDUIT SHALL BE PVC.

MECHANICAL COMPONENTS SHALL BE INSTALLED IN A PROPERLY VENTED LOCATION AND ALL VENTS, AIR INTAKES AND AIR HOSES SHALL BE PROTECTED FROM SNOW, ICE OR WATER VAPOR ACCUMULATIONS. INSTALLATION SHALL BE MADE TO MINIMIZE RELEASE OF ODORS OR AEROSOLS.

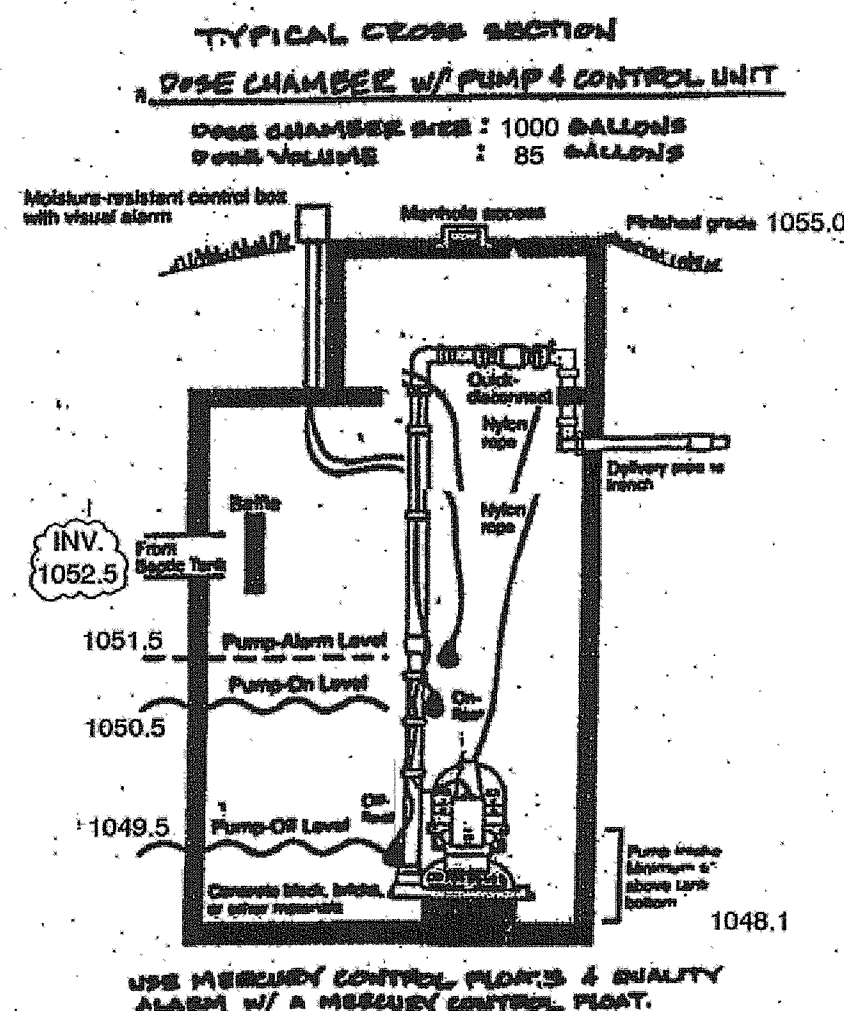
MECHANICAL COMPONENTS INSTALLED IN OR AT THE SEWAGE TANK SHALL BE PROTECTED AGAINST DAMAGE OR IMPAIRMENT OR EFFICIENCY BY FLOODING, FOAMING OR SURCHARGING. PUMPS MUST BE READILY REMOVABLE FROM THE MANHOLE IN CASE OF PUMP FAILURE.

#### SAND FILL

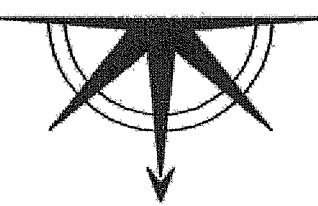
- THE MOUND SAND FILL DEPTH SHALL BE DETERMINED BASED ON THE DEPTH TO THE LIMITING CONDITIONS. THE SAND FILL DEPTH SHALL NOT EXCEED TWO FEET AND SHALL NOT BE LESS THAN FOUR INCHES. THE LOADING RATE FOR THE SAND FILL MATERIAL SHALL NOT EXCEED 1.0 GPD/FT. FOR THE PURPOSE OF THIS RULE, NATURAL SAND IS DEFINED AS NATURALLY DEPOSITED SILICA BASED SAND NOT MANUFACTURED BY MECHANICAL PROCESSING SUCH AS THE CRUSHING OF ROCK OR COARSE AGGREGATES. THE MOUND SAND FILL SHALL BE A NATURAL SAND MEETING ONE OF THE FOLLOWING:

- 1) SAND SPECIFICATIONS IN WISCONSIN MOUND SOIL ABSORPTION SYSTEM SYSTEM: SITING, DESIGN AND CONSTRUCTION MANUAL (CONVERSE & TYLER, 2000). RECOGNIZING IT IS BEST TO STAY ON THE COARSE SIDE WITH EFFECTIVE SIZE (D10) CLOSE TO 0.30 MM AND UNIFORMITY COEFFICIENT (D60/D10) OF 4.0 (AS STATED IN THE REFERENCED RESOURCE ON PAGE 13).
- 2) CONCRETE SAND MEETING THE GRADATION REQUIREMENT OF ASTM C33 PROVIDED NOT MORE THAN 5% PASSED THE NO. 200 (75 UM) SIEVE AS DETERMINED BY ASTM C117. TEST METHOD FOR MATERIAL FINER THAN 75-UM (NO. 200) SIEVE IN MINERAL AGGREGATES BY WASHING. IN ORDER TO ALLOW FOR GREATER VOID SPACE AND WATER MOVEMENT, AND TO HELP DETER. PREMATURE CLOGGING, IT IS BEST TO ERR ON THE COARSE SIDE OF THE ASTM C33 STANDARD WITH A RECOMMENDED EFFECTIVE SIZE CLOSE TO 0.30 MM AND A UNIFORMITY COEFFICIENT CLOSE TO 4.0.
- 3) HAVING AN EFFECTIVE SIZE BETWEEN 0.20 TO 0.35 MM, A UNIFORMITY COEFFICIENT OF 5.0 OR LESS WITH NOT MORE THAN 5% PASSING THE NO. 200 (75UM) SIEVE AS DETERMINED BY ASTM C117. TEST METHOD FOR MATERIAL FINER THAN 75-UM (NO. 200) SIEVE IN MINERAL AGGREGATES BY WASHING. AND SHALL BE DURABLE WITH A HARDNESS OF 3 OR GREATER ON MOHS SCALE OF HARDNESS. PLANS MAY SPECIFY THE USE OF OTHER DISTRIBUTION AREA PRODUCTS OR MATERIAL SUCH AS GRAVELLESS AND CHAMBER PRODUCTS.

DISTRIBUTION AREA OVER SAND FILL. THE DESIGN PLAN SHALL SPECIFY THE DEPTH OF THE DISTRIBUTION AREA, IF USING COARSE AGGREGATE, IT SHALL BE WASHED WITH NOT MORE THAN 5% PASSING THE NO. 200 (75UM) SIEVE AS DETERMINED BY ASTM C117. TEST METHOD FOR MATERIAL FINER THAN 75-UM (NO. 200) SIEVE IN MINERAL AGGREGATES BY WASHING. AND SHALL BE DURABLE WITH A HARDNESS OF 3 OR GREATER ON MOHS SCALE OF HARDNESS. PLANS MAY SPECIFY THE USE OF OTHER DISTRIBUTION AREA PRODUCTS OR MATERIAL SUCH AS GRAVELLESS AND CHAMBER PRODUCTS.



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DETAILS  
BILL DEITMEN  
CONCORD TOWNSHIP - LAKE COUNTY - OHIO

Sheet 2 of 2  
Contract No. 14-046