Adjacent Landowners (property owners across a public or private road, easement, or waterway are considered adjacent landowners)

Legal notices are mailed to these owners, please type or write neatly.

- (1) Joan Council Spencer (Parcel ID 67590) 7 Misty Creek Court Durham NC 27705
- (3) M & W Landfill (Parcel ID 19483) 64 Willow Way Chapel Hill, NC 27516
- (5) Walter L. Couch (Parcel ID 81214) 1917 Lystra Road Chapel Hill, NC 27517
- (7)

(17)

- \_\_\_\_\_ (9) \_\_\_\_\_
- (11)\_\_\_\_\_
- (13)\_\_\_\_\_ (15)
- \_\_\_\_\_ (19) \_\_\_\_\_
- (21)\_\_\_\_\_ (23)\_\_\_\_\_
- \_\_\_\_\_ (25) \_\_\_\_\_

- (2) Heather Ross (Parcel ID 20100) 1971 Lystra Road Chapel Hill NC 27516
- (4) Brenda Couch Thompson (Parcel ID 67591) 1915 Lystra Road Chapel Hill NC 27516
- (6) Mildred Council (Parcel ID 67589) 1855 Lystra Road Chapel Hill, NC 27514
- (8) \_\_\_\_\_
- (10)\_\_\_\_\_ (12)\_\_\_\_\_ (14) (16)\_\_\_\_\_ (18)\_\_\_\_\_ (20)\_\_\_\_\_ • (22)\_\_\_\_\_
- (24)\_\_\_\_\_ (26)

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ASSOCIATES	S

#### Moldenhauer Mulch Grinding Facility Lot 6 – Estate of Ethel Council

Description of Land

All that certain parcel of land situated in Williams Township, Chatham County, North Carolina and being more particularly described as follows:

Beginning at an existing iron pipe and running thence N 59°09'36" E, 658.26' to an existing iron pipe;

thence S 89°13'08" E, 311.85' to an existing iron pipe;

thence S 00°37'07" W, 230.32' to an existing iron pipe;

thence S 70°26'37" W, 414.91' to an existing iron pipe;

thence S 42°34'52" W, 213.93' to an existing iron pipe;

thence N 83°06'46" W, 69.87' to an existing iron pipe;

thence N 07°11'24" E, 150.08' to an existing iron pipe;

thence N 82°50'06" W, 290.48' to the Point and Place of Beginning, containing 5.032 acres and being all of Lot #6 of the "Estate of Ethel Council" as noted on Recorded Plat 91-266, Chatham County Registry.



Track Mounted Heavy-Duty Horizontal Grinder

# **2710C Tracked**

High Production Waste Wood Grinding with the Flexibility of Tracks The 2710C is Peterson's latest generation of high production track grinders. Powered by the Caterpillar C13 engine at 475 horsepower (354 kW) or a C15 at 580 (433 kW) horsepower, this model provides plenty of power in a compact grinder. At 59,000 pounds (27000 kg) the 2710C was designed for operations requiring high

production and frequent moves between jobs. With a feed opening of  $60\frac{3}{4} \times 32$  inches (1534 x 813 mm) combined with Peterson's high lift feed roll for an optional opening of up to 44 inches (1118 mm) high, the 2710C can readily reduce a wide range of material.

The 2710C utilizes Peterson's new generation of Impact Release System that can be set in the detent mode to provide consistent product sizing or switched to the floating anvil mode for a primary reduction where accurate sizing is less critical. The floating anvil mode provides a high production primary reduction with more protection from contaminated feedstocks and reduced fuel consumption.

The 2710C's new generation of controls includes Peterson's high production Adaptive Control System and a fully adjustable feed system that is optimized for a wide range of materials. The new control panel provides self-diagnostics for faulty sensors and open circuits. Fault indicators make trouble shooting easy. The 2710C control



The drum rotor is ideal for land clearing, logging slash, green waste, scrap board



The 2710C makes grinding more efficient

panel features a large LCD display that provides the operator with complete engine and system parameters to simplify set up and efficiently operate the unit.

The 2710C features a large grate area that enables the 2710C to produce materials to exact specifications. Our quick-change multiple grate system makes it easy to customize grate configurations to produce a wide variety of finished materials. Grates are removed through an access door on the side wall of the 2710C.

Another major innovation included on the 2710C is Peterson's Impact Cushion System. Urethane cushions allow movement of the compression roll/ anvil housing pivot shaft, cushioning impacts due to contaminants in the feed material. Shear pins above the cushion and a sensing circuit that stop the engine help protect the shaft from catastrophic damage in the event of a severe impact.

Peterson specializes in developing delivery and processing equipment that turns low-grade organic materials into high value products.



The pinned style rotor is ideal for grinding in tough, demanding applications





### **2710C Horizontal Grinder Specifications**



## 

#### **General Dimensions**

Operating Length Travel Length Operating Width Travel Width Operating Height Travel Height Weight\* \*depending on options selected

#### Tracks

Ground Clearance18¾" (476 mm)UndercarriageHitachi ZX200-3Track TypeTriple Grouser, 19¾" (500 mm) wideTravel Speed1 / 1.5 mph (1.6 / 2.4 kph)Ground Pressure11.0 lbs/in2 (75.8 kPa)

#### Powertrain

EngineCaterpillar C13 or C15Horsepower475 hp (354 kW) or 580 hp (433 kW) @ 2100 rpmClutchPT Tech HPTOFuel Tank Capacity230 U.S. gal (871 L)Main Hydraulic Tank Capacity60 U.S. gal (227 L)

#### Feed System

Total Hopper Capacity 7 yd<sup>3</sup> (5.35 m<sup>3</sup>) Hopper Width 58" (1473 mm) Hopper Length 12'-10" (3912 mm) Infeed Chain 4 sections, full hopper width Hopper Loading Height 7'-10" (2388 mm) Feed Opening (width x height) 60¾" x 32" (1534 x 813 mm) Optional Feed Opening height 44" (1118 mm) Compression Roll dia (tip to tip) 28" (711 mm)

#### Drum Rotor

 Rotor Shaft Size
 47/16" (113 mm) @ bearing, 534" (146 mm) @ center

 Rotor Width
 5934" (1518 mm)

 Rotor Speed
 10,362 fpm (3158 mpm) @ 2100 rpm (engine)

 Rotor Diameter
 32" (813 mm)

Number of Bits Bit Size (width x height) 20 2¾" x 5" (70mm x 127mm)

#### **Pinned Rotor**

49'-9¼" (15.17 m)

15'-10<sup>1</sup>/<sub>8</sub>" (4.83 m)

10'-5¾" (3.19 m)

59,000 lbs (27000 kg)

37'-2" (11.33 m)

8'-6" (2.59 m)

8'-6" (2.59 m)

 Rotor Shaft Size
 47/16" (113 mm) @ bearing, 61/2" (165 mm) @ center

 Rotor Width
 593/4" (1518 mm)

 Rotor Speed
 10,362 fpm (3158 mpm) @ 2100 rpm (engine)

 Rotor Diameter
 32" (813 mm)

 Number of Bits
 18

 Bit Size (width x height)
 23/4" x 5" (70 mm x 127 mm)

#### **Grate Data**

Number of Grate Sections	2
Total Grate Area	3024 in <sup>2</sup> (19509 cm <sup>2</sup> )
Grate Coverage	180 degrees
Grate Thickness	1" (25 mm)

#### **Discharge System**

 Discharge Conveyor Width
 48" (1219 mm)

 Conveyor Speed
 500, 600, or 700 fpm (152, 183, or 213 mpm)

 Discharge Height (top of head pulley)
 15'-101/8" (4829 mm)

#### **Optional Equipment**

Feed Chain Return Pan Feed Endgate Magnetic Cross Belt Conveyor Scrap Metal Collection Box (requires cross belt magnet) Spiral Stump Splitter

#### Production – C13 475 hp

Greenwaste214 yd³/62 US tons (164 m³/56 metric tons) per hourScrap board262 yd³/24 US tons (200 m³/22 metric tons) per hour

#### Production – C15 580 hp

Greenwaste 264 yd<sup>3</sup>/77 US tons (201 m<sup>3</sup>/70 metric tons) per hour Scrap Board 323 yd<sup>3</sup>/55 US tons (247 m<sup>3</sup>/50 metric tons) per hour (Actual output may vary due to moisture content, material density, material size, support equipment, and grate size. Production rates are based on grinding 50 minutes per hour.)



400802EX07

#### Anticipated Equipment Noise Levels

Year	Make of Equipment	Model	Type of Machine	Sound level in dB(A)
2006	Caterpillar	315	Excavator	76
1980-2008	Varies	Varies	Dump Trucks 72-81	
2000's	Caterpillar	953	Track Loader	83
2000's	Peterson Grinding Machine	2710C	Horizontal Grinder	94

Subject: RE: Moldenhauer Mulching Site From: Anne Lowry <Anne.Lowry@chathamnc.org> Date: Tue, 12 Apr 2011 11:53:13 -0400 To: Tim Smith <tsmith@ppaengineering.com>, Ron Thomas <Ron.Thomas@chathamnc.org>

Tim,

Employee restroom requirements fall under Building Inspections with guidance from the Department of Insurance. If it is determined that restrooms will be required then Mr. Moldenhauer will need to submit an Improvement Permit application to Environmental Health to determine soil suitability for a septic system.

If you have any questions about the application process please let me know.

Thank you,

Anne 919-545-8310

From: Tim Smith [mailto:tsmith@ppaengineering.com]
Sent: Monday, April 11, 2011 5:04 PM
To: Ron Thomas; Anne Lowry
Subject: Re: Moldenhauer Mulching Site

Ron and Anne,

Good afternoon. I am working on our submittal documents for Mark Moldenhauer's proposed mulch grinding site that Patrick Morrow from our office met with on a few weeks ago. After discussing the proposed use and requirements with Ron, we have decided to submit our application as a temporary use for the facility, and would only be open 3-days a week. (Mon., Wed., & Fri.) This would be for hauling in material to mulched, and the grinding of the material would actually only take place about once per month.

Would you please provide a statement to include with our documents indicating that if the use is temporary (180 days or less per/yr.) that a restroom would not be required.

Thank you for your assistance, and please let me know if you need any additional information in order to provide your statement for us.

#### Timothy A. Smith, PLS, PE

Philip Post & Associates 401 Providence Road Chapel Hill, NC 27514 (919) 929-1173; (Ext. 124) (919) 493-6548 (fax) (919) 616-6491 (cell) email: tsmith@ppaengineering.com

www.ppaengineering.com

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Chapel Hill, North Carol	na 27517	-			
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Mark Moldenhauer				-	
Moldenhauer Landscapi	ig, Inc.		`	· ·	3-28-11
(919) 929-3740	6,				24T
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FACILITY CONTACT	ADDRESSES:				
Moldenhauer Landscapi	g, Inc.	•			JOB # 400802
611 Lystra Estates Drive					FILE permit
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AUDIT PARTICIPAN	<u>rs:</u>				
Mark Moldenhauer, Mo	denhauer Landsc	aping, Inc.	·		
Robert Hearn, Solid Wa	te Section				
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PURPOSE OF AUDIT	¥.			• • • • • • • • • • • • • • • • • • • •	
Comprehensive audit					
NOTICE OF VIOLAT					
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You are hereby advised that, i violation of the Solid Waste St including penalties, injunction further relief as may be neces	ursuant to N.C.G.S. 1 atute or Regulations. from operation of a sary to achieve com	130A-22, an a If the violati solid waste pliance with 1	administrative on(s) noted he management the North Care	penalty of up to \$5,000 ere continue, you may facility or a solid wast blina Solid Waste Mana	D per day may be assessed for each be subject to enforcement actions re collection service and any such agement Act and Rules.

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#### ID:9199330024 MAR FACILITY COMPLIANCE AUDIS Division of Waste Management Solid Waste Section

8 <u>'11</u>	9:19 No	.003 P.01
ASCOJATES, INC.	3-30-11 CVT0 7755	JOB + 400 X03

#### Page 2 of 3 STATUS OF PAST NOTED VIOLATIONS:

(None)

AREAS OF CONCERN AND COMMENTS: 1. This facility is operated by Mark Moldenhauer, and the property owners of record are Etta M. Council Couch, et al. Mr. Moldenhauer was present during the inspection. This landfill is not open to the public. and thus does not keep regulat operating hours. Moldenhauer Landscaping also has submitted a Yard Waste Treatment & Processing (T&P) Notification for this site, and an approval letter was issued by the Solid Waste Section on January 31, 2011. Mr. Moldenhauer explained that he is awaiting zoning approval from the Chatham County Planning Department for such activities on the property, and thus has not commenced T&P operations.

2. The disposal area of a LCD landfill operating under LCID Notification is limited to two (2) acres in size, as required by 15A N.C. Admin. Code 13B .0563(1)(b). Observed that the limits of the landfill disposal area are not readily identifiable.

Mr. Moldenhauer explained that beneficial filling with clean, inert debris has been conducted adjacent to the northern limits of the landfill disposal area, and that fill material was deposited against the landfill slope. He also indicated that some beneficial materials have been placed adjacent to the castern limits of the disposal arca.

Take actions to mark the limits of the two-acre disposal area using substantial, permanent or semipermanent markers that are easily visible to site operators, agency representatives, or others that visiting the facility.

3. Observed appropriate waste types at the facility. Also observed that clean soil is stockpiled over a portion of the landfill disposal area.

4. Observed an uncovered, windrowed pile of land-clearing debris and yard waste at the west end of the site. Mr. Moldenhauer explained that this waste has been staged there for several months, but has not been covered with soil because he plans to grind this waste upon obtaining approval for T&P operations from the County. He also explained that this waste is not situated over the landfill disposal area, but sits several feet west of the western limits of the disposal area.

Discussed this situation with Mr. Moldenhauer, and reminded him that Rule 15A N.C. Admin. Code 13B .0566(4) requires that adequate soil cover be applied to exposed waste on monthly basis, or when the active area reaches one acre in size. Mr. Moldenhauer strongly expressed his desire to grind this waste to produce mulch for sale by his landscaping business rather than dispose of it in the landfill disposal area. Mr. Moldenhauer said that he would contact the Chatham County Planning Department regarding the status of his zoning application.

If approval to proceed with T&P operations is not granted by the County in the next thirty (30) days, take actions to move this waste into the disposal area, compact as densely as practical, and apply soil to cover all exposed waste, as required.

#### FACILITY COMPLIANCE AUDIT REPORT Division of Waste Management Solid Waste Section

MAR 28'11

Page 3 of 3

5. Observed that the landfill appeared to have adequate soil cover; observed no exposed, uncovered waste in the disposal area during the inspection .

6. Observed that landfill surfaces area appear to be satisfactorily graded to divert surface runoff from the active disposal area.

7. Observed that most of the inactive portion of the landfill lacks vegetative cover. Take prompt actions to establish ground cover sufficient to restrain erosion over inactive, un-vegetated areas of the landfill, as required by 15A N.C. Admin. Code 13B .0566(7).

8. Observed no severe eposion problems at the site during the inspection. Mr. Moldenhauer explained the he holds an approved erosion control plan for activities at the site, and has been working under direction of the NCIDENR Land Quality Section to meet applicable requirements.

9. Observed that facility access and service roads are well maintained.

10. Observed that a steel-bar gate with lock exists at the facility entrance to prevent unauthorized access to the site.

11. Observed that a sign with the facility contact name and phone number is in place at the facility entrance, as required.

Please contact me if you have any questions or concerns regarding this report.

Robert Nearn

Phone: (919) 508-8525

Robert Hearn Waste Management Specialist Regional Representative

Mark Poindexter Field Operations Branch Head cc: Jason Watkins, Central District Supervisor Shawn McKee, Compliance Officer

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Delivered on: 3/21/11 by	Hund dolivery	x	US Mail		
I Faxed Copies of the Tim Smith - Phil Post	is Letter to: + Assoc. 493-6	548			
Ansela Birchett - Chetha P.S. Have 9 17ime G	m 6. 542-26	98 Thuc	s. <i>3</i> /3	1] 11 Mark	, •



North Carolina Department of Environment and Natural Resources

Division of Waste Management

Beverly Eaves Perdue Governor

Dexter R. Matthews Director

January 31, 2011

Mr. Mark Moldenhauer Mark Moldenhauer Land Clearing Facility 611 Lystra Estates Drive Chapel Hill, NC 27705

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Re: Land Clearing Debris Treatment and Processing Notification – Chatham County Mark Moldenhauer Land Clearing Facility – T&PN-19-009

Dear Mr. Moldenhauer:

The Solid Waste Section has reviewed your Land Clearing Debris Treatment and Processing notification. The facility shall operate in accordance with 15 NCAC 13B .0300, the enclosed siting and operational requirements and the information provided on the site plan and on the notification form. You can continue to operate by notifying the Section on an <u>annual</u> basis by June 1<sup>st</sup> of each year.

Facilities operating under a treatment and processing notification are allowed to receive:

- a) Land clearing waste: to include stumps, tree trunks, limbs and leaves.
- b) High carbon nitrogen ratio yard trash that results from landscaping and yard maintenance such as brush and tree limbs. Grass clippings or similar materials with low carbon nitrogen ratios may not be received.

If the amount of material that is being processed per quarter or stored at any one time exceeds 6,000 cubic yards or if the land area involved exceeds two acres, you must cease receiving waste until you obtain a permit. If heat is generated through composting in piles of materials you must obtain a permit to operate a solid waste compost facility or alter your process. If odors or vector problems are created by the operation of this facility, prompt, successful corrective actions shall be taken.

If you have questions, or if we can be of further assistance, please do not hesitate to contact the Regional Environmental Senior Specialist, Robert Hearn, at 919-508-8525.

Sincerely, Michael E. fort

Michael Scott, Environmental Supervisor Composting & Land Application Branch

cc: Robert Hearn, Environmental Senior Specialist, Raleigh Central Office Jason Watkins, Central District Supervisor, Winston-Salem Regional Office Central File, Solid Waste Section, Div. of Waste Management

S:/Solid\_Waste/CLA/treat&pr/Notifications/19-Chatham/Mark Moldenhauer T&PN-19-009 1-31-2011

1646 Mail Service Center, Raleigh, North Carolina 27699-1646 Phone: 919-508-8400 \ FAX: 919-733-4810 \ Internet: www.wastenotnc.org





APPLICATION IDENTIFICATION	N.C. DEPARTMENT OF TRANSPORTATION
Driveway Date of 3/23/11 Permit No. Application	STREET AND DRIVEWAY ACCESS
County: Chatham	PERMIT APPLICATION
Development Name: Moldenhauer Mulch Grinding Facility	
LOCATION OF PROP	ERTY:
Route/Road: Lystra Road	
Exact Distance 4128	
From the Intersection of Route No. <u>1721</u> and Route No.	1723 Toward Farrington
Property Will Be Used For:	cational Facilities  TND  Emergency Services  Other City Zoning Area.
AGREEMENT	
<ul> <li>I, the undersigned property owner, request access and permission of way at the above location</li> </ul>	to construct driveway(s) or street(s) on public right-
<ul> <li>I agree to construct and maintain driveway(s) or street entrance(s) i</li> </ul>	in absolute conformance with the current "Policy on
Street and Driveway Access to North Carolina Highways" as adopte Transportation	ed by the North Carolina Department of
• I agree that no signs or objects will be placed on or over the public	right-of-way other than those approved by NCDOT.
<ul> <li>I agree that the driveway(s) or street(s) will be constructed as show</li> <li>I agree that that driveway(s) or street(s) as used in this agreement is</li> </ul>	n on the attached plans. include any approach tapers, storage lanes or
speed change lanes as deemed necessary.	
<ul> <li>I agree that if any future improvements to the roadway become nec located on public right-of-way will be considered the property of the</li> </ul>	essary, the portion of driveway(s) or street(s) North Carolina Department of Transportation, and
I will not be entitled to reimbursement or have any claim for present	t expenditures for driveway or street construction.
<ul> <li>I agree that this permit becomes void if construction of driveway(s) specified by the "Policy on Street and Driveway Access to North Ca</li> </ul>	or street(s) is not completed within the time arolina Highways".
<ul> <li>I agree to pay a \$50 construction inspection fee. Make checks pay application is depied</li> </ul>	able to NCDOT. This fee will be reimbursed if
<ul> <li>I agree to construct and maintain the driveway(s) or street(s) in a sa the public travel.</li> </ul>	afe manner so as not to interfere with or endanger
<ul> <li>I agree to provide during construction proper signs, signal lights, fla of traffic in conformance with the current "Manual on Uniform Traffic Amendments or Supplements thereto. Information as to the above District Engineer.</li> </ul>	nggers and other warning devices for the protection c Control Devices for Streets and Highways" and rules and regulations may be obtained from the
<ul> <li>I agree to indemnify and save harmless the North Carolina Departm for damage that may arise by reason of this construction</li> </ul>	nent of Transportation from all damages and claims
<ul> <li>I agree that the North Carolina Department of Transportation will as be caused to such facilities, within the highway right-of-way limits, i</li> </ul>	ssume no responsibility for any damages that may n carrying out its construction.
<ul> <li>I agree to provide a Performance and Indemnity Bond in the amour construction proposed on the State Highway system</li> </ul>	nt specified by the Division of Highways for any
<ul> <li>The granting of this permit is subject to the regulatory powers of the</li> </ul>	NC Department of Transportation as provided by
<ul> <li>I AGREE TO NOTIFY THE DISTRICT ENGINEER WHEN THE PR</li> </ul>	e construed as a contract access point. OPOSED WORK BEGINS AND WHEN IT IS
COMPLETED.	
2004-01 NOTE: Submit Four Copies of Application to Local District Engin 61-03419	eer, N.C. Department of Transportation TEB 65-04rev.

4 <sup>1</sup>	SI	GNATURES OF APPLICA	NT	
COMPANY SIGNATURE ADDRESS	PROPERTY OWNER (APPLICANT)	NAME SIGNATURE ADDRESS	WITNESS	. : 
COMPANY SIGNATURE ADDRESS	AUTHORIZED AGENT Moldenhauer Landscaping, Inc. Multimediate 611 <sup>1</sup> Lystra Estates Drive Chapel Hill, NC 27517 Phone No.	NAME SIGNATURE ADDRESS 614-1458	WITNESS Kelly D. Ardoin, Philip Post & Assoc. Inc. Kelly D. (Indom 401 Providence Road, Suite 200 Chapel Hill, NC 27514	
APPLICATION	RECEIVED BY DISTRICT ENGINEER			
APPLICATION	SIGNATURE	AUTHORITY (when required)	DATE	
	SIGNATURE	TITLE	DATE	
APPLICATION /	APPROVED BY DISTRICT ENGINEER SIGNATURE		DATE	
INSPECTION B	YNCDOT			
<u> </u>	SIGNATURE	TITLE	DATE	<u>.</u> ,
COMMENTS:				

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ASSOCIATES

#### MOLDENHAUER LAND CLEARING FACILITY Grinding Permit Site



#### STORMWATER DRAINAGE & WATER QUALITY CALCULATIONS

#### Chatham County, North Carolina

Prepared By: Philip Post and Associates, Inc. ENGINEERS/PLANNERS/SURVEYORS 401 Providence Road Chapel Hill, NC 27514 919-929-1173

#400802 April 15, 2011

#### FIRM LICENSE C-0347

(919) 929-1173

04/15/2011

#### SUMMARY Moldenhauer Land Clearing Facility Grinding Permit Site

This project consists of requesting permitting for placement of a mulch grinding operation on a site that has been previously permitted as an LCID landfill. The total parcel size is 5.032 acres. The portion of the site proposed to be used for the grinding operation is currently cleared and has an area of 0.86 acres. The site is located on the north side of Lystra Road east of the easternmost intersection with Lystra Estates Drive.

The proposed BMP design for treatment and control of stormwater is with the use of a wet detention basin. For the purpose of calculation, the drainage area to the basin was conservatively assumed to be 20% impervious. The basin was designed to have a forebay to collect debris which may wash into the basin and to have a permanent pool depth of three (3) feet to facilitate settling of total suspended solids. Removal of TSS at the 85% level is required. The calculations were done using a 90% TSS removal rate. The minimum surface area for the basin was calculated to be 562 square feet with a minimum forebay of 113 sf (20% of the surface area). The basin, as designed, provides 385 sf of surface area in the forebay and 980 sf of surface area in the main pool. A riser is provided in the basin which will maintain the permanent pool level at three feet deep and allow storage of the 1.4" rainfall event above the permanent pool as required. A 0.5" orifice at the permanent pool level will drain the 1.4" rainfall event over a period of 48, or more, hours. The top of the riser is set at 6 inches above the expected level of the 1.4" rainfall event storage level. All larger storm events will flow over the riser and out through pipes. Diversion swales are located around the east, west and south sides of the site to allow clean offsite runoff to bypass the basin

Design calculations are attached for the features outlined above.



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DECENTION & Charle Charles and A IR. 21. IN

PHILIP POST & ASSO Engineers/Planners/ 401 Providence Road	CIATES, INC. /Surveyors Suite 200 AROLINA 27514	JOB 4	of 8
(919) 929-1173 (91 (919) 850-9662 (33	9) 493-2600 6) 273-7711	CHECKED BY	DATE
SOUTH AND WEST S	IDE DIVERSION S	SWALE :	
DRAINAGE ARE	EA = 1.78 ACRES	s = 775405F	
COVER CONDI	TIONS: 160005	SE VICODED CEO	40
COMPOSITE C	<u>- 16000 (0.</u>	$(0) + \frac{61340}{77640} (0.25)$	- 0.28
	77540		
$Q_{0} = 0.28(7)$	22 1/ 12 ( 1.78 AC	) = 3.60 cfs	
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SEE ATTACHED	FLOWMASTER' 4	INALYSIS FOR EWALE AN	JO PIFE
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FROM DIV	ERSION JUSLE	: Q2 = 4.08 cfs	
FROM WE	T DETENTION PASI	$1: Q_{25} = 3.52 \text{ efs}$	
	Tot	a Q25 = 7.60 cfs	

Project Description	 I
Project File	c:\haestad\fmw\c499swal.fm2
Worksheet	Clean water diversion swale
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data	
Mannings Coefficient	0.045
Channel Slope	0.100000 ft/ft
Left Side Slope	3.000000 H : V
Right Side Slope	3.000000 H : V
Discharge	4.08 cfs

Results		
Depth	0.56	ft
Flow Area	0.94	ft²
Wetted Perimeter	3.55	ft
Top Width	3.37	ft
Critical Depth	0.65	ft
Critical Slope	0.0460	68 ft/ft
Velocity	4.32	ft/s
Velocity Head	0.29	ft
Specific Energy	0.85	ft
Froude Number	1.44	
Flow is supercritical.		

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#### Cross Section Cross Section for Triangular Channel

Project Description	
Project File	c:\haestad\fmw\c499swal.fm2
Worksheet	Clean water diversion swale
Flow Element	Triangular Channel
Method	Manning's Formula
Solve For	Channel Depth

Section Data	
Mannings Coefficient	0.045
Channel Slope	0.100000 ft/ft
Depth	0.56 ft
Left Side Slope	3.000000 H : V
Right Side Slope	3.000000 H : V
Discharge	4.08 cfs



Project Description	
Project File	c:\haestad\fmw\c499swal.fm2
Worksheet	Pipe under haul road
Flow Element	Circular Channel
Method	Manning's Formula
Solve For	Channel Depth

Input Data		
Mannings Coefficient	0.013	
Channel Slope	0.010000 ft/ft	
Diameter	18.00	in
Discharge	7.60	cfs

Results			
Depth	0.95	ft	
Flow Area	1.17	ft²	
Wetted Perimeter	2.75	ft	
Top Width	1.45	ft	
Critical Depth	1.07	ft	
Percent Full	63.04		
Critical Slope	0.0071	46 ft/ft	
Velocity	6.48	ft/s	
Velocity Head	0.65	ft	
Specific Energy	1.60	ft	
Froude Number	1.27		
Maximum Discharge	11.30	cfs	
Full Flow Capacity	10.50	cfs	
Full Flow Slope	0.005235 ft/ft		
Flow is supercritical.			





NC DWQ Stream Identification Form Version 4.11							
Date: 4	12	Ŋ	Project/Site:	NOLDENHAUER	Latitude:		
Evaluator:	Fr	en Royn	County:	ATHAN CO	Longitude:	Longitude:	
Total Points: Stream is at least in if $\geq$ 19 or perennial	ntermitte if ≥ 30*	unt 23.5	Stream Determination (circle one) Ephemeral Intermittent Perennial		Other e.g. Quad Name:		
A Geomorphology (Subtotal - 17) Absent Weak Moderate Strong						Strong	
1 <sup>a</sup> Continuity of c	A. Geomorphology (Subtotal = 1)			1	0	3	
2 Sinuosity of ch	2 Sinuasity of channel along thatwar			a	2	3	
3. In-channel stru ripple-pool seg	icture: e	ex. riffle-pool, step-pool,	0	1	2	3	
4. Particle size of	stream	substrate	8	1	(2)	3	
5. Active/relict floo	odplain		0	1	2	3	
6. Depositional ba	ars or b	enches	0	Ū.	2	3	
7. Recent alluvial	deposi	ts	0	P	2	3	
8. Headcuts			0	1	(2)	3	
9. Grade control			0	0.5	1	(1.5)	
10. Natural valley			0	0.5	1	(1.5)	
11. Second or gre	eater or	der channel	N	o = 0	(Yes =	= 3	
<sup>a</sup> artificial ditches are	e not rat	ed; see discussions in manual					
B. Hydrology	(Subto	tal = <u>3,5</u> )					
12. Presence of B	aseflow	v	0	1	(2)	3	
13. Iron oxidizing	bacteri	a	$(\mathbf{b})$	1	2	3	
14. Leaf litter			1.5	()	0.5	0	
15. Sediment on p	plants c	r debris	2	0.5	1	1.5	
16. Organic debris lines or piles			0.5		1	1.5	
17. Soil-based evi	idence	of high water table?		o=0	Yes =	: 3	
C. Biology (Su	ibtotal	=)					
18. Fibrous roots i	in strea	mbed	3	Ø	1	0	
19. Rooted upland	d plants	in streambed	3	2	(T)	0	
20. Macrobenthos	(note d	iversity and abundance)	0	1	2	3	
21. Aquatic Mollus	sks		0	1	2	3	
22. Fish			0	0.5	1	1.5	
23. Crayfish			0	0.5	1	1.5	
24. Amphibians			0	0.5	1	1.5	
25. Algae				0.5	1	1.5	
26. Wetland plants	s in stre	ambed		FACW = 0.75; OB	L = 1.5 Other = 0		
*perennial streams may also be identified using other methods. See p. 35 of manual.							
Notes:							
Sketch:	Ir	TERMITIEN	STRE	AM			

2). Tracts or parcels that are exempt from the definition of subdivision as listed below, provided that they are required to the meet the riparian buffer requirements set forth in the Watershed Protection Ordinance in effect from January 1, 1994 up to the date immediately prior to the adoption of these amendments:

a) The combination or recombination of portions of previously subdivided and recorded lots where the total number of lots is not increased and the resultant lots meet or exceed the standards of the subdivision regulations;

b) The public acquisition by purchase of strips of land for the widening or opening of streets;

c) The division of a tract into plots or lots used as a cemetery.

3). Existing Agricultural Activities. (see definition of Agricultural Activities in § 109).

4). Existing Silvicultural Activities. (see definition of Silvicultural Activities in § 109).

(D) Buffers by Surface Waters Classification.

1. *Perennial Streams* - The riparian buffer shall be one hundred (100') feet landward, measured horizontally on a line perpendicular from top of bank; this distance shall be measured on all sides of perennial streams, or shall be the full horizontal extent of the Area of Special Flood Hazard<sup>2</sup> as most recently mapped by the North Carolina Floodplain Mapping Program, NC Division of Emergency Management, whichever is the greater horizontal distance.

2. Intermittent Streams - The riparian buffer shall be fifty (50') feet landward, measured horizontally on a line perpendicular from top of bank; this distance shall be measured on all sides of intermittent streams.

3. *Ephemeral Streams* - The riparian buffer shall be thirty (30') feet landward, measured horizontally on a line perpendicular from top of bank; this distance shall be measured on all sides along all ephemeral streams.

4. *Wetlands* - The riparian buffer shall be fifty (50') feet landward, measured horizontally on a line perpendicular from the delineated boundary, surrounding all features classified as wetlands and linear wetlands.

5. Seeps and Springs - The riparian buffer shall be thirty (30') feet landward surrounding all seeps and springs measured horizontally on a line perpendicular from the delineated boundary.

<sup>&</sup>lt;sup>2</sup> Chatham County Flood Damage Prevention Ordinance (adopted December 18, 2006).

Place one of the statements below on the final plat. Show the type of water feature, (i.e. perennial, ephemeral, etc), and the width of required riparian buffer(s) on the final plat. All riparian buffers are to be measured from top of bank landward.

The water feature(s) shown have been delineated by Chatham County and riparian buffers are measured from the top of bank. Refer to the Chatham County Watershed Protection Ordinance, Section 304 for allowable and prohibited uses within the buffer area. Individual lot owners are subject to said riparian buffer requirements.

The water feature(s) shown have been delineated by, (insert name of certified professional here), and reviewed and approved by Chatham County. Riparian buffers are measured from the top of bank. Refer to the Chatham County Watershed Protection Ordinance, Section 304 for allowable and prohibited uses within the buffer area. Individual lot owners are subject to said riparian buffer requirements.