

**City of Portland, Maine – Building or Use Permit Application** 389 Congress Street, 04101, Tel: (207) 874-8703, FAX: 874-8716

Location of Construction: 601 Danforth St		Owner: Merrill Industries		Phone:		Permit No:	
Owner Address:		Lessee/Buyer's Name:		Phone:		Business Name:	
Contractor Name: Merrill Industries		Address: 604A Danforth St Bldg, ME 04102		Phone: 772-3254		<div style="border: 2px solid black; padding: 5px; text-align: center;"> <b>971264</b>                  PERMIT ISSUED                  NOV 21 1997                  CITY OF PORTLAND             </div>	
Past Use: Marine Terminal		Proposed Use: Same		COST OF WORK: \$ 98,500.00		PERMIT FEE: \$ 515.00	
Proposed Project Description: Construct Stockpile Pad				FIRE DEPT. <input checked="" type="checkbox"/> Approved <input type="checkbox"/> Denied		INSPECTION: Use Group: Type:	
				Signature: <i>[Signature]</i>		Signature: <i>[Signature]</i>	
PEDESTRIAN ACTIVITIES DISTRICT (P.A.D.) Action: <input type="checkbox"/> Approved <input type="checkbox"/> Approved with Conditions <input type="checkbox"/> Denied				Signature: _____ Date: _____		Zoning Approval: Special Zone or Reviews: <input type="checkbox"/> Shoreland <input type="checkbox"/> Wetland <input type="checkbox"/> Flood Zone <input type="checkbox"/> Subdivision <input type="checkbox"/> Site Plan maj <input type="checkbox"/> minor <input type="checkbox"/> mm <input type="checkbox"/>	
Permit Taken By: Mary Gresiak		Date Applied For: 13 November 1997				Zoning Appeal <input type="checkbox"/> Variance <input type="checkbox"/> Miscellaneous <input type="checkbox"/> Conditional Use <input type="checkbox"/> Interpretation <input type="checkbox"/> Approved <input type="checkbox"/> Denied	

1. This permit application does not preclude the Applicant(s) from meeting applicable State and Federal rules.
2. Building permits do not include plumbing, septic or electrical work.
3. Building permits are void if work is not started within six (6) months of the date of issuance. False information may invalidate a building permit and stop all work..

**CERTIFICATION**

I hereby certify that I am the owner of record of the named property, or that the proposed work is authorized by the owner of record and that I have been authorized by the owner to make this application as his authorized agent and I agree to conform to all applicable laws of this jurisdiction. In addition, if a permit for work described in the application is issued, I certify that the code official's authorized representative shall have the authority to enter all areas covered by such permit at any reasonable hour to enforce the provisions of the code(s) applicable to such permit

*[Signature]* 13 November 1997 *[Signature]*  
 SIGNATURE OF APPLICANT P.D. Merrill ADDRESS: DATE: PHONE:

RESPONSIBLE PERSON IN CHARGE OF WORK, TITLE PHONE:

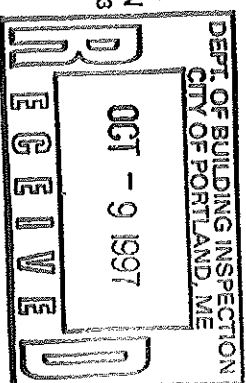
White-Permit Desk Green-Assessor's Canary-D.P.W. Pink-Public File Ivory Card-Inspector

CEO DISTRICT **3**  
*[Signature]*



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION  
STATE HOUSE STATION 17  
AUGUSTA, MAINE 04333

DEPARTMENT ORDER  
IN THE MATTER OF



MERRILL INDUSTRIES INC.  
Portland, Cumberland County  
MERRILL MARINE TERMINAL PAVING  
L-006592-26-J-M  
L-006592-4D-K-M (APPROVAL)

) SITE LOCATION OF DEVELOPMENT  
) NATURAL RESOURCE PROTECTION  
) WATER QUALITY CERTIFICATION  
) MODIFICATION  
) FINDINGS OF FACT AND ORDER

Pursuant to the provisions of Title 38 M.R.S.A. Sections 481 et seq., 480-A et seq., and Section 401 of the Federal Water Pollution Control Act, the Department of Environmental Protection has considered the application of MERRILL INDUSTRIES INC. with its supportive data, agency review comments, and other related materials on file and FINDS THE FOLLOWING FACTS:

1. In Board Order #03/44-6592-05170, dated February 11, 1981, the Department approved the construction of a multi-purpose marine terminal on the Fore River in Portland. Subsequent Department Orders have approved various modifications to the original marine terminal. The terminal is located on Danforth Street in the City of Portland.
2. The applicant proposes to pave the existing metal recycling storage pad area. The area to be paved is approximately 2 acres in size and is currently compacted soil. Currently runoff from the site runs unabated into the Fore River via sheet and shallow flows. Paving the site will provide a more stable work area, discourage erosion and sedimentation, decrease the runoff rate, and enhance the quality of stormwater leaving the project site. The applicant has applied for a Natural Resource Protection Act permit because a portion of the project is within 25 feet of a coastal wetland.
3. The site will be graded to direct the on-site surface water into a channel. The channel will divert the runoff to a catchbasin and a stormwater quality treatment system. Treatment will be provided by vortex flow technology. The treated stormwater will discharge to the Fore River through a pipe and riprap outlet apron. Off-site stormwater will be diverted into a constructed drainage swale. This swale will be a combination of vegetation with erosion control mesh at the upper end and stone riprap at the outlet end. All swales and stabilization construction will be completed prior to October 1st to provide an adequate period to establish vegetation. The project has been reviewed by the Division of Watershed Management of the Bureau of Land and Water Quality which has determined that it meets Department standards for stormwater quality.
4. Based on its review of the application the Department finds the requested modification to be in accordance with all relevant Departmental standards. All other findings of fact, conclusions and conditions remain as approved in Board Order #03/44-6592-05170, and subsequent orders.

601 Danforth St

BASED on the above findings of fact, and subject to the Conditions listed below, the Department makes the following conclusions pursuant to 38 M.R.S.A. Section 480-A et seq. and Section 401 of the Federal Water Pollution Control Act:

- A. The proposed activity will not unreasonably interfere with existing scenic, aesthetic, recreational or navigational uses.
- B. The proposed activity will not cause unreasonable erosion of soil or sediment.
- C. The proposed activity will not unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.
- D. The proposed activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat; aquatic habitat, travel corridor, freshwater, estuarine or marine fisheries or other aquatic life.
- E. The proposed activity will not unreasonably interfere with the natural flow of any surface or subsurface waters.
- F. The proposed activity will not violate any state water quality law, including those governing the classifications of the State's waters.
- G. The proposed activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties.
- H. The proposed activity is not within a sand dune system.
- I. The activity is not on an outstanding river segment as noted in Title 38 M.R.S.A. Section 480-P.

BASED on the above findings of fact, and subject to the Conditions listed below, the Department makes the following conclusions in relation to the proposed modification pursuant to 38 M.R.S.A. Section 481 et seq.:

- A. The applicant has provided adequate evidence of financial capacity and technical ability to develop the project in a manner consistent with state environmental standards.
- B. The applicant has made adequate provision for traffic movement of all types into, out of or within the development area and any traffic increase attributable to the proposed development will not result in unreasonable congestion or unsafe conditions on a road in the vicinity of the proposed development.
- C. The applicant has made adequate provision for fitting the development harmoniously into the existing natural environment and the development will not adversely affect existing uses, scenic character, air quality, water quality or other natural resources in the municipality or in neighboring municipalities.

D. The proposed development will be built on soil types which are suitable to the nature of the undertaking and will not cause unreasonable erosion of soil or sediment nor inhibit the natural transfer of soil.

E. The proposed development will not pose an unreasonable risk that a discharge to a significant groundwater aquifer will occur.

F. The applicant has made adequate provision of utilities, including water supplies, sewerage facilities, solid waste disposal and roadways required for the development and the development will not have an unreasonable adverse effect on the existing or proposed utilities and roadways in the municipality or area served by those services.

G. The activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties nor create an unreasonable flood hazard to any structure.

THEREFORE, the Department APPROVES the application of MERRILL INDUSTRIES INC. to pave the existing metal recycling storage pad area, SUBJECT TO THE FOLLOWING CONDITIONS and all applicable standards and regulations:

1. The Standard Conditions of Approval, a copy attached.
2. In addition to any specific erosion control measures described in this or previous orders, the applicant shall take all necessary actions to ensure that its activities or those of its agents do not result in noticeable erosion of soils or fugitive dust emissions on the site during the construction and operation of the project covered by this approval.

3. All other Findings of Fact, Conclusions, and Conditions remain as approved in Board Order #03/44-6592-05170, and subsequent orders, and are incorporated herein.

DONE AND DATED AT AUGUSTA, MAINE, THIS 4<sup>th</sup> DAY OF September 1997.

DEPARTMENT OF ENVIRONMENTAL PROTECTION

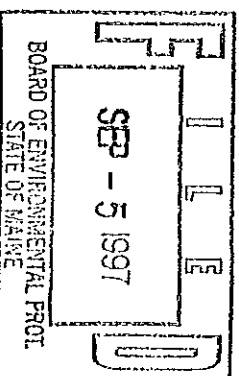
BY: [Signature]  
EDWARD O. SULLIVAN  
COMMISSIONER

PLEASE NOTE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES

Date of initial receipt of application 06/13/97

Date application accepted for processing 06/13/97

Date filed with Board of Environmental Protection  
DV/L6592JM



**CITY OF PORTLAND, MAINE  
DEVELOPMENT REVIEW APPLICATION  
PLANNING DEPARTMENT PROCESSING FORM**

I. D. Number \_\_\_\_\_

Merrill Industries

10/9/97

Applicant \_\_\_\_\_

Application Date

604A Danforth St, Portland, ME 04102

Merrill Industries

Applicant's Mailing Address

Project Name/Description

P.D. Merrill

601 Danforth St

Consultant/Agent

Address of Proposed Site

772-3254 761-3782

272-A-003

Applicant or Agent Daytime Telephone, Fax

Assessor's Reference: Chart-Block-Lot

Proposed Development (check all that apply):  
 Office  Retail  Manufacturing  Warehouse/Distribution  Parking Lot  Other (specify) Stockpile Pad Paving

Proposed Building square Feet or # of Units \_\_\_\_\_

Acres of Site \_\_\_\_\_

Zoning \_\_\_\_\_

**Check Review Required:**


- Site Plan (major/minor)  Subdivision # of lots \_\_\_\_\_  PAD Review  14-403 Streets Review
- Flood Hazard  Shoreland  Historic-Preservation  DEP Local Certification
- Zoning Conditional Use (ZBA/PB)  Zoning Variance  Other \_\_\_\_\_

Fees Paid: Site Plan \$300.00 Subdivision \_\_\_\_\_ Engineer Review \_\_\_\_\_ Date: 10/9/97

**Fire Approval Status:**

Reviewer Lt. Mc Dougall

- Approved  Approved w/Conditions see attached  Denied

Approval Date 10/9/97 Approval Expiration \_\_\_\_\_ Extension to \_\_\_\_\_ Additional Sheets Attached   
 Condition Compliance Lt. Mc Dougall signature  date 10/9/97 date \_\_\_\_\_

**Performance Guarantee**

Required\*

Not Required

\* No building permit may be issued until a performance guarantee has been submitted as indicated below

- Performance Guarantee Accepted \_\_\_\_\_ date \_\_\_\_\_ amount \_\_\_\_\_ expiration date \_\_\_\_\_
- Inspection Fee Paid \_\_\_\_\_ date \_\_\_\_\_ amount \_\_\_\_\_ expiration date \_\_\_\_\_
- Building Permit Issued \_\_\_\_\_ date \_\_\_\_\_ amount \_\_\_\_\_
- Performance Guarantee Reduced \_\_\_\_\_ date \_\_\_\_\_ remaining balance \_\_\_\_\_ signature \_\_\_\_\_
- Temporary Certificate of Occupancy \_\_\_\_\_ date \_\_\_\_\_  Conditions (See Attached) \_\_\_\_\_ signature \_\_\_\_\_
- Final Inspection \_\_\_\_\_ date \_\_\_\_\_ signature \_\_\_\_\_
- Certificate of Occupancy \_\_\_\_\_ date \_\_\_\_\_ signature \_\_\_\_\_
- Performance Guarantee Released \_\_\_\_\_ date \_\_\_\_\_ signature \_\_\_\_\_
- Defect Guarantee Submitted \_\_\_\_\_ date \_\_\_\_\_ amount \_\_\_\_\_ expiration date \_\_\_\_\_
- Defect Guarantee Released \_\_\_\_\_ date \_\_\_\_\_ signature \_\_\_\_\_

**CITY OF PORTLAND, MAINE  
DEVELOPMENT REVIEW APPLICATION  
PLANNING DEPARTMENT PROCESSING FORM**

19970082  
I. D. Number

Merrill Industries

Applicant

10/9/97

604A Danforth St, Portland, ME 04102

Applicant's Mailing Address

Application Date

P.D. Merrill

601 Danforth St

Merrill Industries

Consultant/Agent

761-3782

Address of Proposed Site

Project Name/Description

Applicant or Agent Daytime Telephone, Fax

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Proposed Building square Feet or # of Units

Acreege of Site

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Check Review Required:

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 Zoning Conditional Use (ZBA/PB)  Zoning Variance  Other \_\_\_\_\_

Fees Paid: Site Plan \$300.00 Subdivision \_\_\_\_\_ Engineer Review \_\_\_\_\_ Date: 10/9/97

DRC Approval Status:

Reviewer Jim Wendel

Approved  Approved w/Conditions see attache  Denied

Approval Date 10/21/97 Approval Expiration 10/21/98 Extension to 11/6/97  Additional Sheets Attached  
 Condition Compliance Jim Wendel signature date

Performance Guarantee  Required  Not Required  
 \* No building permit may be issued until a performance guarantee has been submitted as indicated below

Performance Guarantee Accepted

date amount expiration date

Inspection Fee Paid

date amount

Building Permit

date

Performance Guarantee Reduced

date

Temporary Certificate Of Occupancy

date

Final Inspection

date

Certificate Of Occupancy

date

Performance Guarantee Released

date

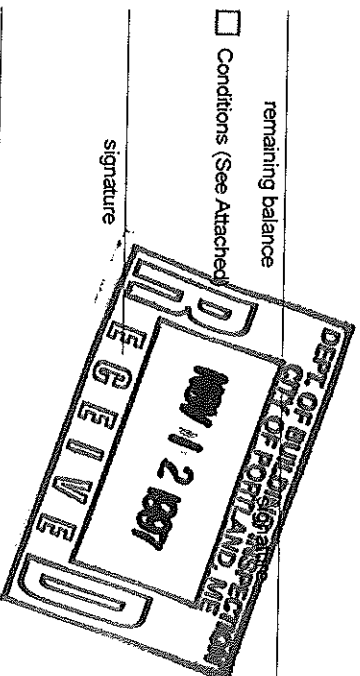
Defect Guarantee Submitted

submitted date

Defect Guarantee Released

amount

expiration date



**CITY OF PORTLAND, MAINE  
DEVELOPMENT REVIEW APPLICATION  
PLANNING DEPARTMENT PROCESSING FORM**

19970082  
I. D. Number

Merrill Industries

10/9/97

Applicant

Application Date

604A Danforth St, Portland, ME 04102

Merrill Industries

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P. D. Merrill

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772-3254

272-A-003

761-3782

Applicant or Agent Daytime Telephone, Fax

Assessor's Reference: Chart-Block-Lot

Proposed Development (check all that apply):  
 Office  Retail  Manufacturing  Warehouse/Distribution  Parking Lot  Other (specify)  Stockpile Pad Paving  
 New Building  Building Addition  Change Of Use  Residential

Proposed Building square Feet or # of Units

Acreeage of Site

Zoning

Check Review Required:

Site Plan (major/minor)  Subdivision # of lots  PAD Review  14-403 Streets Review  
 Flood Hazard  Shoreland  Historic Preservation  DEP Local Certification  
 Zoning Conditional Use (ZBA/PB)  Zoning Variance  Other \_\_\_\_\_

Fees Paid: Site Plan \$300.00 Subdivision \_\_\_\_\_ Engineer Review \_\_\_\_\_ Date 10/9/97

Planning Approval Status:

Reviewer Kandl Talbot

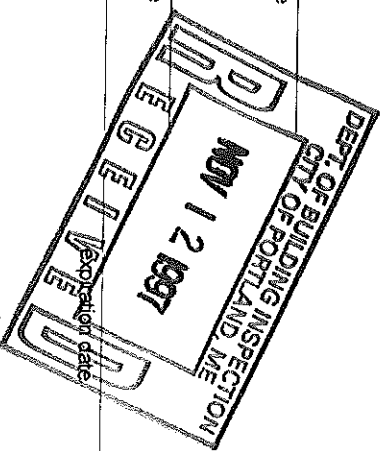
Approved  Approved w/Conditions See Attached  Denied

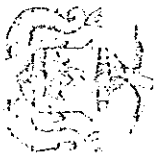
Approval Date 10/31/97 Approval Expiration 10/31/98 Extension to \_\_\_\_\_ date 11/6/97  Additional Sheets Attached  
 OK to Issue Building Permit Kandice Talbot signature \_\_\_\_\_ date \_\_\_\_\_

Performance Guarantee  Required\*  Not Required

\* No building permit may be issued until a performance guarantee has been submitted as indicated below

<input type="checkbox"/> Performance Guarantee Accepted	_____	date	_____	amount	_____	expiration date	_____
<input type="checkbox"/> Inspection Fee Paid	_____	date	_____	amount	_____		
<input type="checkbox"/> Building Permit Issued	_____	date	_____	amount	_____		
<input type="checkbox"/> Performance Guarantee Reduced	_____	date	_____	remaining balance	_____	signature	_____
<input type="checkbox"/> Temporary Certificate of Occupancy	_____	date	_____	<input type="checkbox"/> Conditions (See Attached)	_____	signature	_____
<input type="checkbox"/> Final Inspection	_____	date	_____	signature	_____		
<input type="checkbox"/> Certificate Of Occupancy	_____	date	_____	signature	_____		
<input type="checkbox"/> Performance Guarantee Released	_____	date	_____	signature	_____		
<input type="checkbox"/> Defect Guarantee Submitted	_____	date	_____	signature	_____		
<input type="checkbox"/> Defect Guarantee Released	_____	submitted date	_____	amount	_____	expiration date	_____





Joseph E. Gray Jr.  
Director

## CITY OF PORTLAND

November 12, 1997

P.D. Merrill  
Merrill Industries  
604A Danforth Street  
Portland, ME 04102

Re: 601 Danforth Street, Stockpile Pad Paving

Dear Mr. Merrill:

On October 31, 1997 the Portland Planning Authority granted minor site plan approval for a stockpile pad paving area at 601 Danforth Street.

The approval is based on the submitted site plan. If you need to make any modifications to the approved site plan, you must submit a revised site plan for staff review and approval.

Please note the following provisions and requirements for all site plan approvals:

1. The site plan approval will be deemed to have expired unless work in the development has commenced within one (1) year of the approval or within a time period agreed upon in writing by the City and the applicant. A one year extension may be granted by this department if requested by the applicant in writing prior to the expiration date of the site plan.
2. A performance guarantee in a form acceptable to the City of Portland and an inspection fee equal to 1.7% of the performance guarantee will have to be posted before beginning any site construction or issuance of a building permit.
3. A defect guarantee, consisting of 10% of the performance guarantee, must be posted before the performance guarantee will be released.
4. Prior to construction, a preconstruction meeting shall be held at the project site with the contractor, development review coordinator, Public Work's representative and owner to review the construction schedule and critical aspects of the site work. At that time, the site/building contractor shall provide three (3) copies of a detailed construction schedule to the attending City representatives. It shall be the contractor's responsibility to arrange a mutually agreeable time for the preconstruction meeting.

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## STORMWATER MANAGEMENT PLAN

### Recycled Metal Handling and Storage Area

Merrill's Marine Technical

Portland, Maine

#### Introduction

The Stormwater Management Plan has been prepared to evaluate the pre and post-development conditions associated with the construction of a paved pad surface of the Merrill Marine Terminals Recycled Metal Handling and Storage Area.

The project site will entail construction of approximately 2 acres of paved surface, with installation of a catchbasin and stormwater treatment system. Currently Merrill Marine Terminal operates a metal recycling handling area on the project site. The piles of recycled metal are stored on a bare compacted soil surface. The operation activities with heavy equipment continuously disturb the surface and also soil the metal. The owner proposes to stabilize the work area to promote cleaner metal and provide a cleaner, more stabilized work area. In addition the owner has proposed proactive measures to pre-treat the site runoff prior to running off the site. Currently the runoff from the site runs unabated to the Fore River via sheet and shallow flows.

#### Methodology

The stormwater runoff analysis has been developed in accordance with methodology outlined in "Urban Hydrology for Small Watersheds", Technical Release No. 55, USDA Soil Conservation Service and HydroCAD Stormwater Modeling System, Version #4. From these methods, the 2, 10 and 25-year storm event was used to calculate peak rates of runoff.

#### Soils

Soils information used for the stormwater evaluation were obtained from observations made at the site. It appears that the current operation has compacted the topsoil and metal residue to a near impervious condition. Based on the Cumberland County Medium Intensity Soil Survey Manual the underlying soils on the site are Scanitic silty loam. The recommended Hydrologic classification for Scanitic soils and for highly compacted soils is "D" soil class.

#### Watersheds (Pre and Post-Conditions)

The pre and post-development watershed areas will remain the same in size and direction in which they flow. The only change to occur is that the existing surface is compacted metal debris and gravelly sands, while the proposed surface will be bituminous pavement.

The pre-developed condition consists of a 2.4 acre area of existing scrap metal piles, gravel access, paved access, and a portion of a salt storage building. The sites topography is sloped at 1% to 3% toward the shoreline of the Fore River. Runoff is through sheet flows and shallow concentrated flows to the lower sections of the site and are eventually discharged into the Fore River. A swale along the western property line which has no defined banks, travels parallel to the property toward the Fore River. This swale diverts offsite flows generated from the Maine Central Railroad tracks and Veterans Bridge area toward the shore. Current the upper reaches located on the site are not protected or vegetated.

The post-developed watershed is the same area as the pre-developed watershed but has been graded to separate on-site generated runoff from offsite runoff. In addition the offsite generated runoff will be diverted to a constructed swale consisting of a combination of vegetation with erosion control mesh and stone riprap. This will provide stabilization and promote erosion and sedimentation control.

The on-site runoff will be collected via a paved swale and proposed catchbasin located at the bottom of the site next to the shoreline bank. There, the runoff will be directed to either a Vortechs Stormwater Treatment System manufactured by Vortechs, Inc. or a Downstream Defender as manufactured by H.I.L. Technology, Inc. The owner has proposed this protective measure of collection and treatment of the scrap/recycled metal pile runoff for the probability of grease/oil and metal debris/sediment. Based on the data available it is apparent that vortex flow technology can provide excellent removal of both materials in a space effective manner.

#### Stormwater Management

The following summary table presents the results of the stormwater calculations for the peak runoff rate in the 2, 10, and 25-year storm event:

<b>Stormwater Runoff Summary Table</b>			
<b>Storm Event</b>	<b>Watershed Ac.</b>	<b>Avg. CN Value</b>	<b>Peak Runoff Rates 25-Year Storm</b>
<b>Pre-Developed Condition</b>			
2-Yr	2.4	95	6.5 cfs
10-Yr	2.4	95	10.6 cfs
25-Yr	2.4	95	12.5 cfs
<b>Post-Developed Condition</b>			
2-Yr	2.10	985	6.5 cfs
10-Yr	10.70	98	7.7 cfs
25-Yr	4.25	98	8.2 cfs

The stormwater calculations were performed to determine if any increase in the peak runoff rates associated with the development of this project were observed. As illustrated in the tables, calculations for the peak rates of runoff at the watershed boundary suggests a slight decrease in the runoff rate from the pre to post-development condition. The proposed treatment system will cause a temporary backup on the site which will decrease the discharge rate from the system. The treatment system will be designed to treat runoff rates up to the 10-year storm event. Rates greater than the 10-year event will exceed the tanks capacity, backup the system, overflow the channel area near the shoreline and flow over the riprap embankment to the waterline. Following the peak of the 10-year storm the system will continue to operate and eventually drop the ponding elevations.

In the event of a large storm the tank will treat up to 10-year storm capacity and we believe the remainder of stormwater will overflow into the Fore River. This design is more conservative than most measures accepted to treat the first 1/2" to 1" of "first flush" runoff.

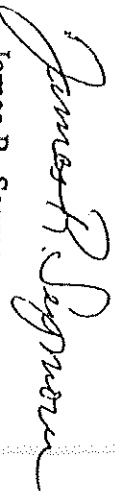
### Summary

Due to the implementation of a catchbasin and stormwater treatment system, the runoff rate impact will be decreased and the quality will be enhanced greatly. The on-site surface water as proposed will be directed into a designed channel to be treated. The off-site water will be directed into a constructed swale protected from erosion. In the pre-developed condition both cases did not have either adequate erosion control or direction. In addition to the erosion and stabilization measures, the owner has provided means to treat stormwater prior to discharging into the Fore River.

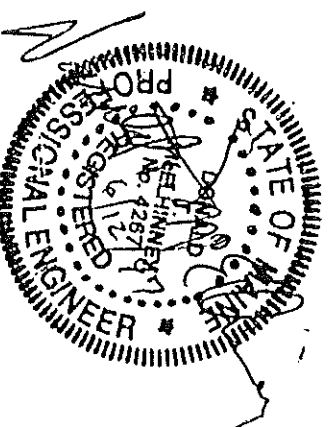
The site will be graded such that runoff will be directed in the same general area as the pre-developed condition. However, the paved surface and treatment system will provide a more stable work area, discourage erosion and sedimentation, provide a cleaner product for the owner, and enhance the quality of stormwater leaving the project site. The improvements of this site not only improve runoff rates but also improve the water quality of the surrounding environment and Fore River system.

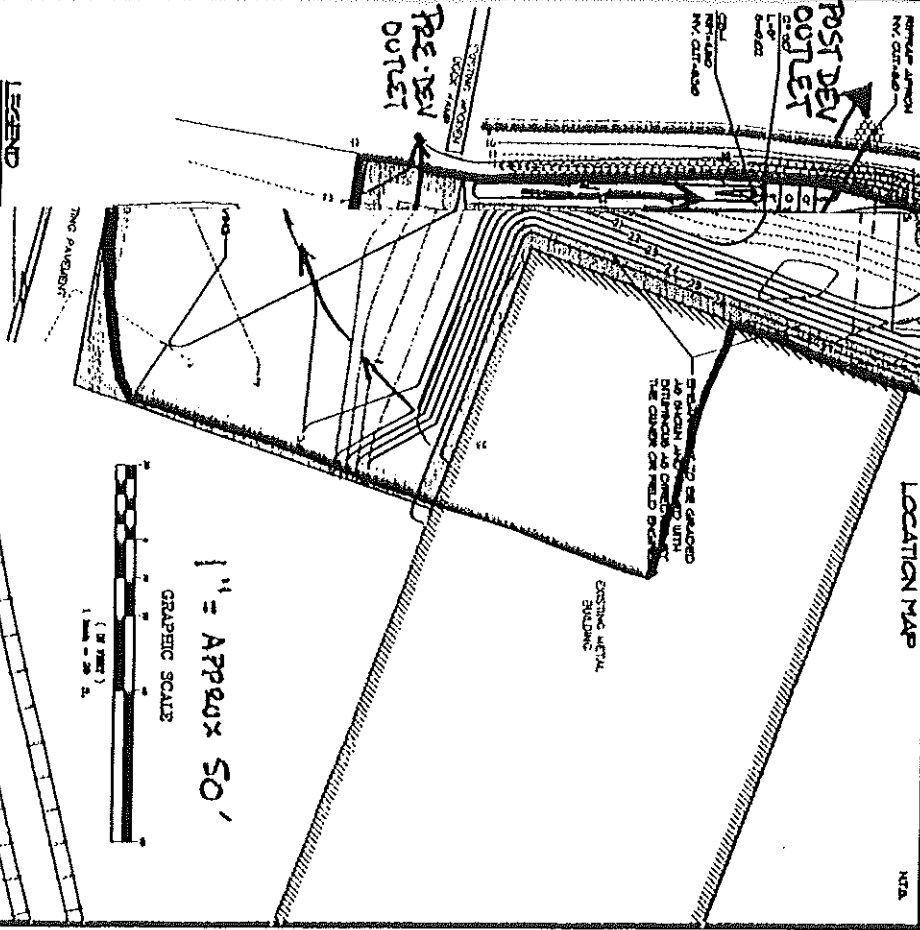
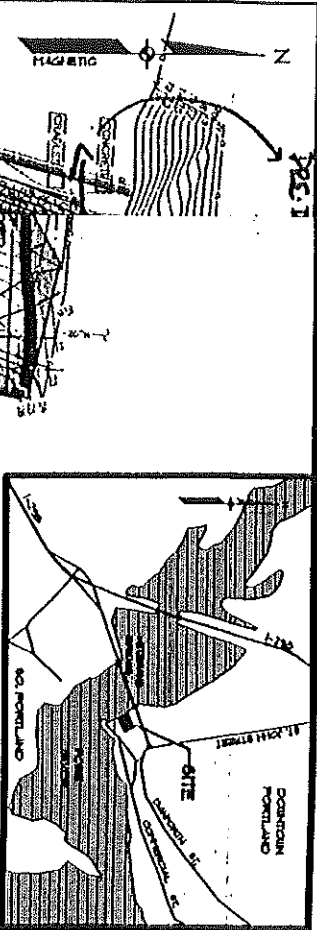
Prepared by:

SEBAGO TECHNICS, INC.

  
James R. Seymour  
Project Engineer

JRS:dif  
June 12, 1997





# WATERSHED MAP

**LEGEND**

STAINING	STAINING
1" = 1" (1" = 1")	1" = 1" (1" = 1")
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**DRAINAGE & GRADING PLAN**  
**OF**  
**MERRILL'S MARINE TERMINAL**  
 PORTLAND, OREGON

PREPARED BY  
**MERRILL INDUSTRIES, INC.**  
 1014 UNIVERSITY STREET  
 PORTLAND, OREGON 97202

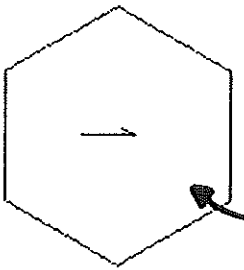
**Sebago Technics**  
 Engineering & Planning, Inc. for Merrill Industries, Inc.  
 12 WESTBROOK COMMON  
 WESTBROOK, NEW HAMPSHIRE  
 03091

DESIGN BY	JAS
DRAWN BY	KAV
CHECKED BY	
DATE	5-11-87
SCALE	1" = 50'
PLOT NO.	43 & 201
PROJ. NO.	1722
DRAWING	1722-2

**SHEET 1 OF 2**

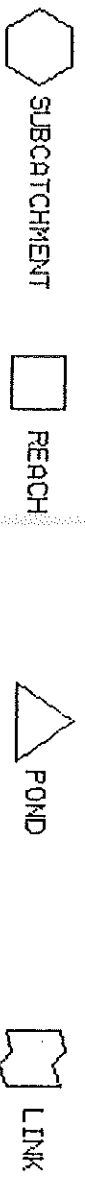
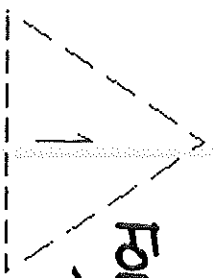
WATERSHED ROUTING =====

EXISTING METAL PILE  
AND HANDUNG AREA



$Q$   
2yr = 6.5 cfs  
10yr = 10.6 cfs  
25yr = 12.5 cfs

FORE RIVER SHORELINE



SUBCATCHMENT 1 PILE AREA

PEAK = 6.5 CFS @ 12.01 HRS, VOLUME = .42 AF

ACRES	CN	Comment
2.40	95	compacted surface and paving

SCS TR-20 METHOD  
 TYPE III 24-HOUR  
 RAINFALL = 3.0 IN  
 SPAN = 10-20 HRS, dt=.1 HRE

Method	Comment	Tc (min)
TR-55 SHEET FLOW		
Smooth surfaces	n=.011 L=200'	2.4
SHALLOW CONCENTRATED/UPLAND FLOW	P2=3 in s=.015 '/'	
	Kv=18 L=230' s=.02 '/'	1.5
	V=2.55 fps	

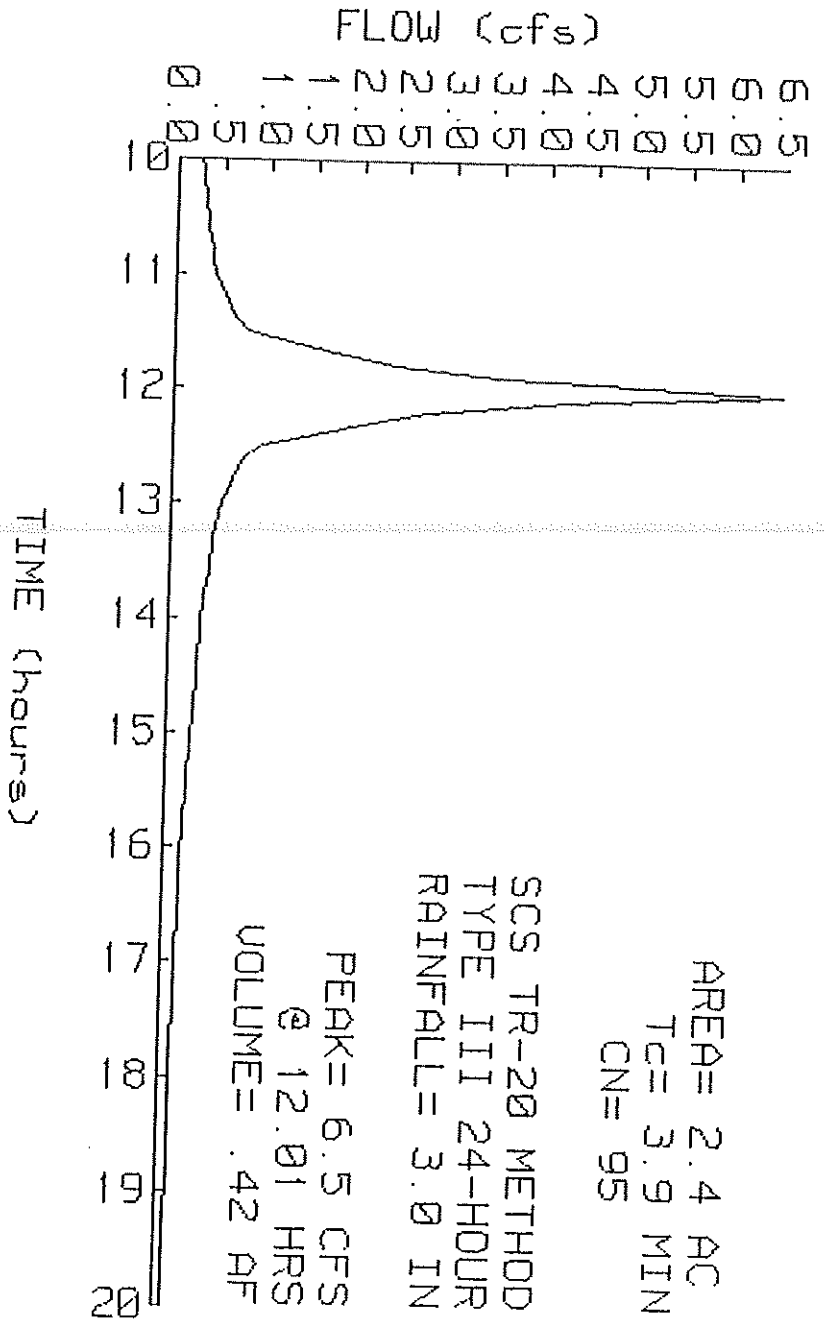
Total Length = 430 ft Total Tc = 3.9

SUBCATCHMENT 1 RUNOFF  
 PILE AREA

AREA = 2.4 AC  
 Tc = 3.9 MIN  
 CN = 95

SCS TR-20 METHOD  
 TYPE III 24-HOUR  
 RAINFALL = 3.0 IN

PEAK = 6.5 CFS  
 @ 12.01 HRS  
 VOLUME = .42 AF



TYPE III 24-HOUR RAINFALL = 4.7 IN  
 Prepared by SEBAGO TECHNICS, INC.  
 HydroCAD 4.00 000509 (c) 1986-1995 Applied Microcomputer Systems

SUBCATCHMENT 1 PILE AREA

PEAK = 10.6 CFS @ 12.01 HRS, VOLUME = .69 AF

ACRES CN  
 2.40 95 compacted surface and paving

SCS TR-20 METHOD  
 TYPE III 24-HOUR  
 RAINFALL = 4.7 IN  
 SPAN = 10-20 HRS, dt = .1 HRS

Method	Comment	Tc (min)
TR-SS SHEET FLOW		2.4
Smooth surfaces n=.011 L=200'	SHEET FLOW P2=3 in s=.015 '/'	
SHALLOW CONCENTRATED/UPLAND FLOW	SHALLOW FLOW	1.5
Kv=18 L=230' s=.02 '/'	V=2.55 fps	

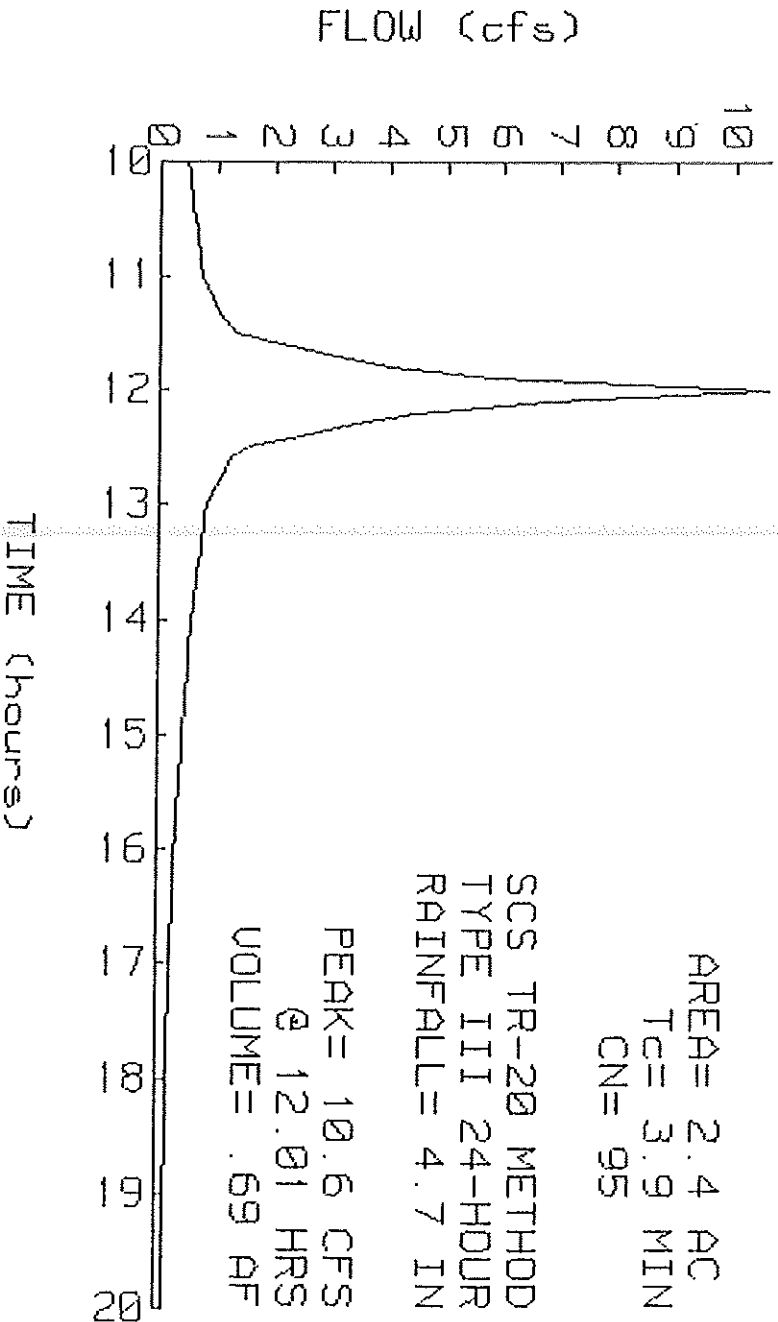
Total Length = 430 ft Total Tc = 3.9

SUBCATCHMENT 1 RUNOFF  
 PILE AREA

AREA = 2.4 AC  
 Tc = 3.9 MIN  
 CN = 95

SCS TR-20 METHOD  
 TYPE III 24-HOUR  
 RAINFALL = 4.7 IN

PEAK = 10.6 CFS  
 @ 12.01 HRS  
 VOLUME = .69 AF



Prepared by SEBAGO TECHNICS, INC.

HydroCAD 4.00 000509 (C) 1986-1995 Applied Microcomputer Systems

SUBCATCHMENT 1 PILE AREA

PEAK = 12.5 CFS @ 12.01 HRS, VOLUME = .82 AF

ACRES	CN	comment
2.40	95	compacted surface and paving

SCS TR-20 METHOD  
 TYPE III 24-HOUR  
 RAINFALL = 5.5 IN  
 SPAN = 10-20 HRS, dt = .1 HRS

Method	Comment	Tc (min)
TR-SS SHEET FLOW		2.4
Smooth surfaces n=.011 L=200'	SHEET FLOW	
SHALLOW CONCENTRATED/UPLAND FLOW	P2=3 in s=.015 '/'	1.5
Kv=18 L=230' s=.02 '/'	SHALLOW FLOW	
	V=2.55 fps	

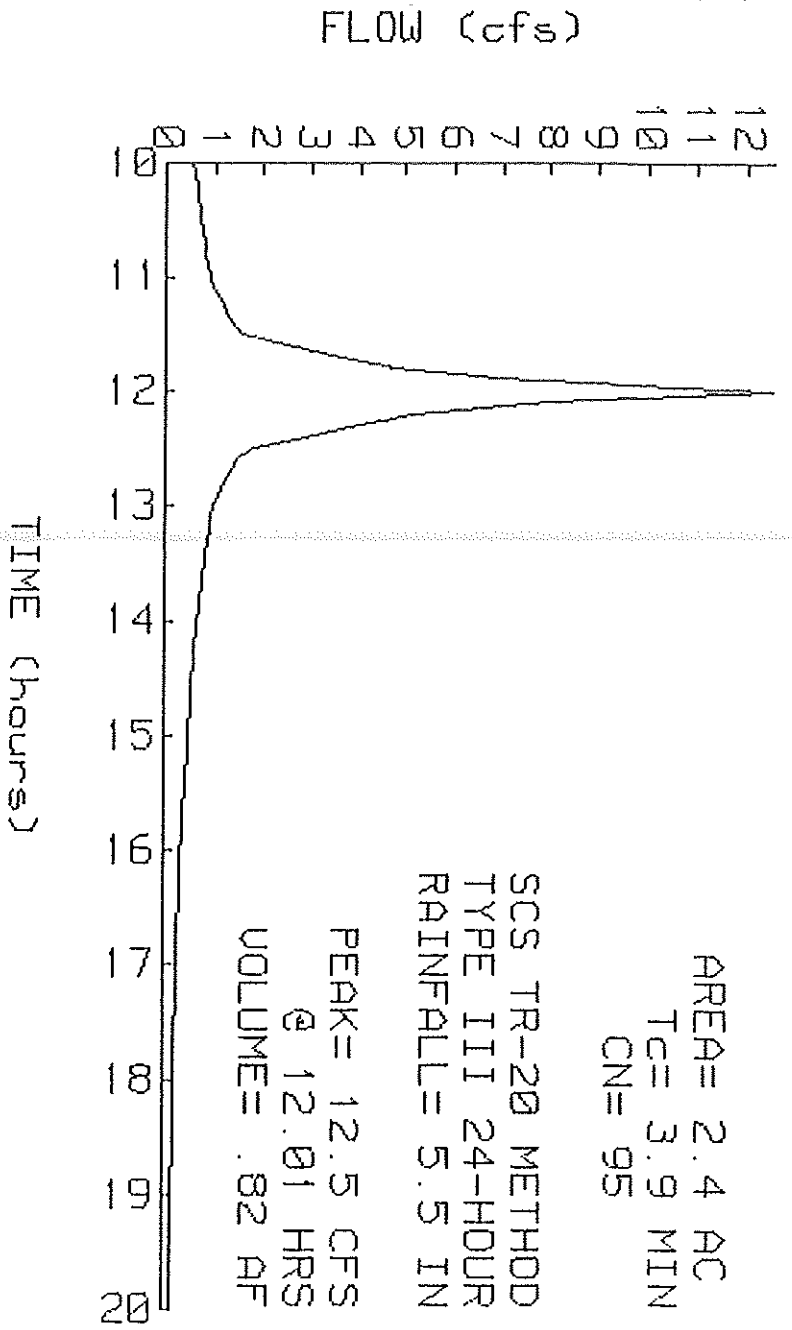
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SUBCATCHMENT 1 RUNOFF  
 PILE AREA

AREA = 2.4 AC  
 Tc = 3.9 MIN  
 CN = 95

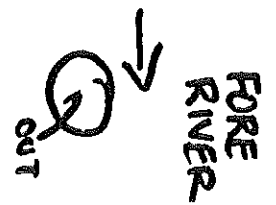
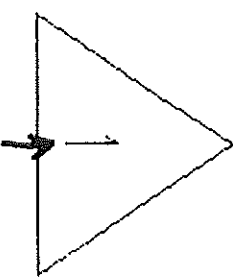
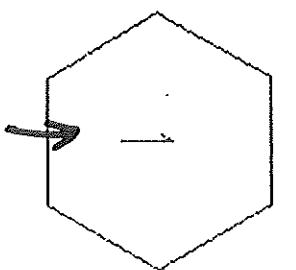
SCS TR-20 METHOD  
 TYPE III 24-HOUR  
 RAINFALL = 5.5 IN

PEAK = 12.5 CFS  
 @ 12.01 HRS  
 VOLUME = .82 AF





WATERSHED ROUTING =====



CB-1

to  
STORMWATER  
TREATMENT  
SYSTEM

Proposed Recycled Metal  
HANDLING & STORAGE AREA



SUBCATCHMENT



REACH

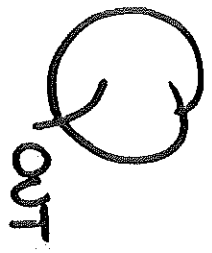


POND



LINK

2 yr = 6.5 cfs  
10 yr = 7.7 cfs  
25 yr = 8.2 cfs



out

2 YR

SUBCATCHMENT 1

PILE AREA

PEAK = 6.7 CFS @ 12.01 HRS, VOLUME = .45 AF

ACRES 2.40  
 CN 98  
 PAVED

SCS TR-20 METHOD  
 TYPE III 24-HOUR  
 RAINFALL = 3.0 IN  
 SPAN = 10-20 HRS, dt = .1 HRS

Method	Comment	Tc (min)
TR-55 SHEET FLOW		2.6
Smooth surfaces n=.011 L=200'	SHEET FLOW P2=3 in s=.0125 '/'	
SHALLOW CONCENTRATED/UPLAND FLOW	SHALLOW FLOW	2.1
Paved Kv=20.3282 L=280' s=.0125 '/'	V=2.27 fps	

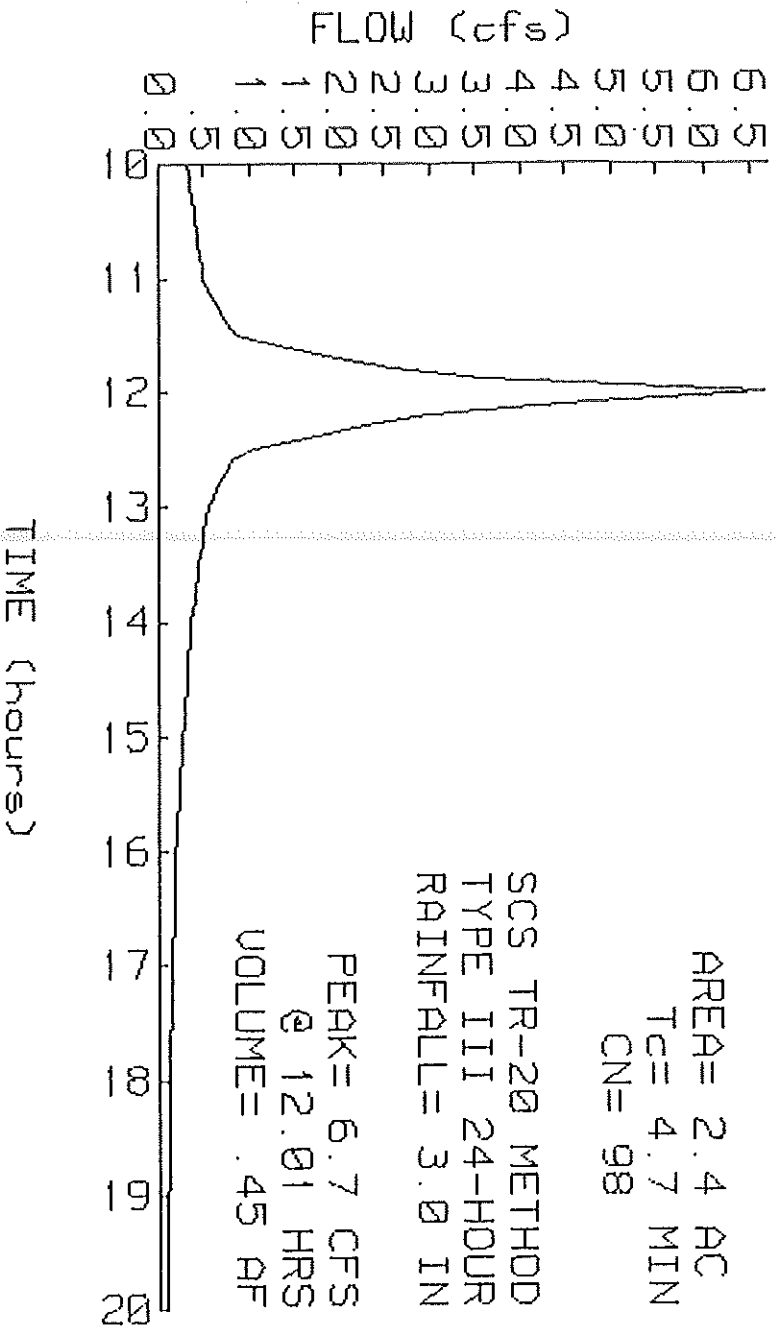
Total Length = 480 ft Total Tc = 4.7

SUBCATCHMENT 1 RUNOFF  
 PILE AREA

AREA = 2.4 AC  
 Tc = 4.7 MIN  
 CN = 98

SCS TR-20 METHOD  
 TYPE III 24-HOUR  
 RAINFALL = 3.0 IN

PEAK = 6.7 CFS  
 @ 12.01 HRS  
 VOLUME = .45 AF



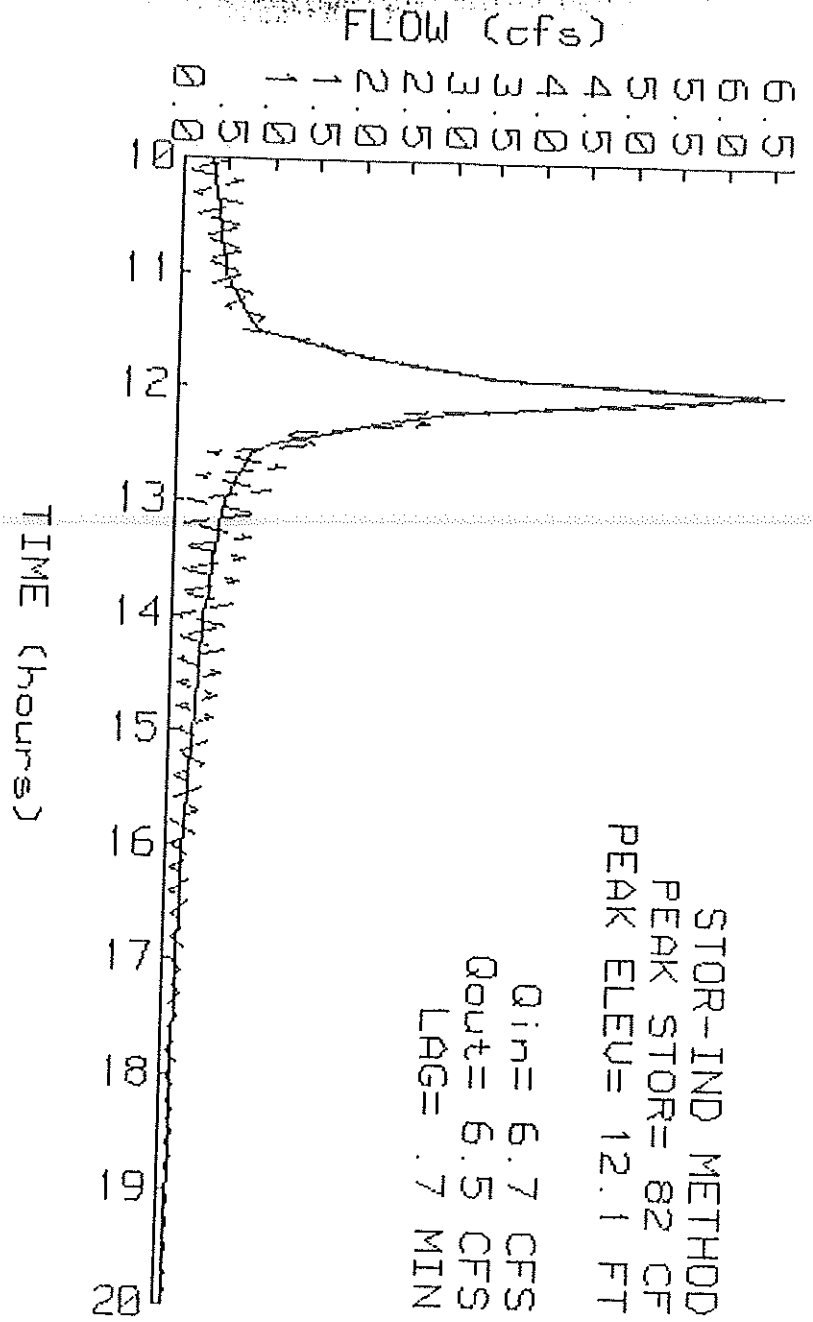
POND 1 SWALE CATCH BASIN

Qin = 6.7 CFS @ 12.01 HRS, VOLUME = .45 AF, ATTEN = 2%, LAG = .7 MIN  
 Qout = 6.5 CFS @ 12.02 HRS, VOLUME = .46 AF, LAG = .7 MIN

ELEVATION (FT)	AREA (SF)	INC.STOR (CF)	CUM.STOR (CF)	STOR-IND METHOD
8.0	0	0	0	PEAK STORAGE = 82 C
11.0	13	19	19	PEAK ELEVATION = 12.1 F
12.0	40	26	45	FLOOD ELEVATION = 13.6 F
13.0	630	335	380	START ELEVATION = 8.0 F
13.8	2000	1052	1432	SPAN = 10-20 HRS, dt=.1 HR

#	ROUTE	INVERT	OUTLET DEVICES
1	P	8.3'	12" CULVERT
		n=.011	L=5' S=.02'/' Ke=.6 Cc=.9 Cd=.56

POND 1 INFLOW & OUTFLOW  
 SWALE CATCH BASIN



STOR-IND METHOD  
 PEAK STOR= 82 CF  
 PEAK ELEV= 12.1 FT  
 Qin= 6.7 CFS  
 Qout= 6.5 CFS  
 LAG= .7 MIN

TYPE III 24-HOUR RAINFALL = 4.7 IN  
 Prepared by SEBAGO TECHNICS, INC.

HydroCAD 4.00 000509 (c) 1986-1995 Applied Microcomputer Systems

SUBCATCHMENT 1 PILE AREA

PEAK = 10.6 CFS @ 12.01 HRS, VOLUME = .72 AF

ACRES 2.40 CN 98 PAVED

SCS TR-20 METHOD  
 TYPE III 24-HOUR  
 RAINFALL = 4.7 IN  
 SPAN = 10-20 HRS, dt=.1 HRS

Method	Comment	Tc (min)
TR-SS SHEET FLOW		2.6
Smooth surfaces	n=.011 L=200' P2=3 in s=.0125 '/'	
SHALLOW CONCENTRATED/UPLAND FLOW		2.1
Paved	Kv=20.3282 L=280' s=.0125 '/' V=2.27 fps	

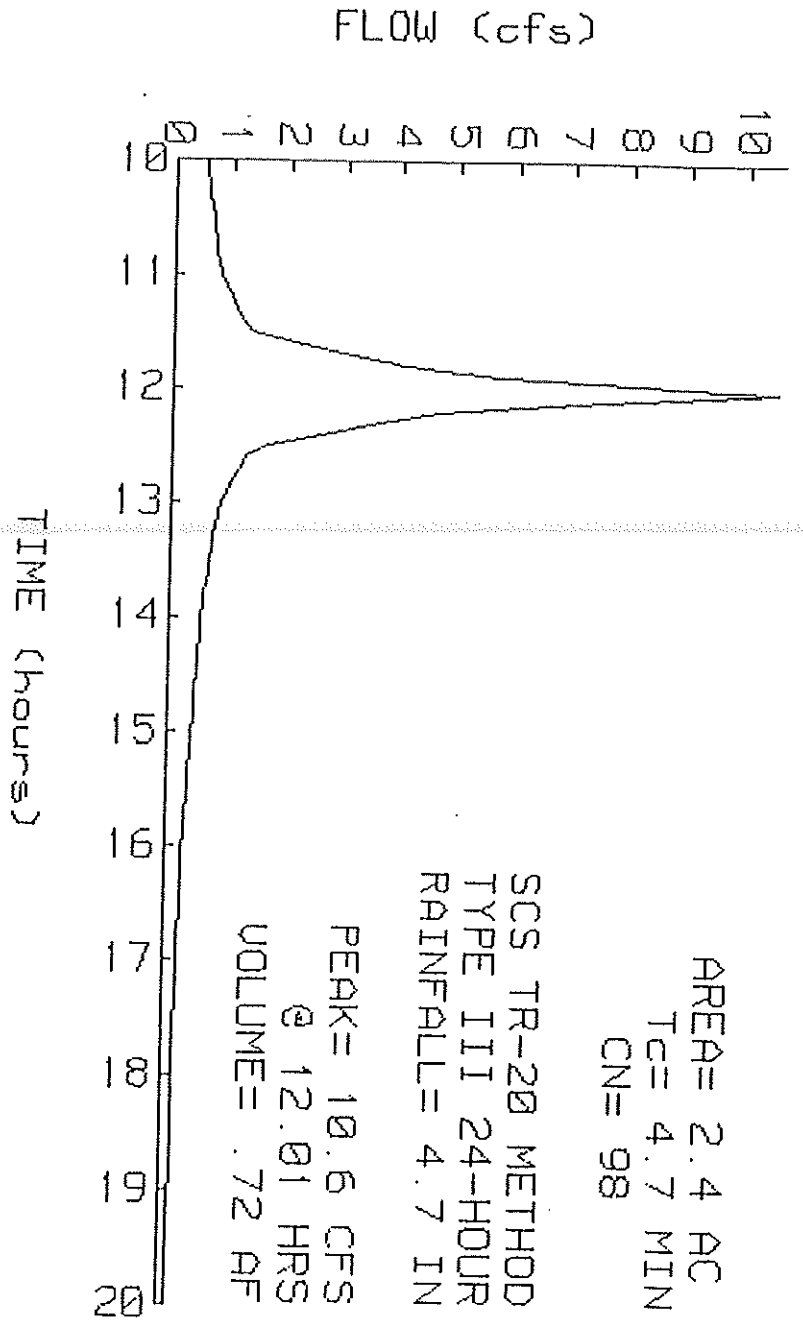
Total Length = 480 ft Total Tc = 4.7

SUBCATCHMENT 1 RUNOFF  
 PILE AREA

AREA = 2.4 AC  
 Tc = 4.7 MIN  
 CN = 98

SCS TR-20 METHOD  
 TYPE III 24-HOUR  
 RAINFALL = 4.7 IN

PEAK = 10.6 CFS  
 @ 12.01 HRS  
 VOLUME = .72 AF



10 yr

Data for MERRILL'S MAR. TERM - METAL RECYCLING AREA  
TYPE III 24-HOUR RAINFALL = 4.7 IN  
Prepared by SEBAGO TECHNICS, INC.  
HydroCAD 4.00 000509 (c) 1986-1995 Applied Microcomputer Systems

11 Jun 9'

POND 1 SWALE CATCH BASIN

Qin = 10.6 CFS @ 12.01 HRS, VOLUME = .72 AF, ATTEN = 27%, LAG = 5.3 MIN  
Qout = 7.7 CFS @ 12.10 HRS, VOLUME = .72 AF, LAG = 5.3 MIN

ELEVATION (FT)	AREA (SF)	INC.STOR (CF)	CUM.STOR (CF)	STOR-IND METHOD
8.0	0	0	0	PEAK STORAGE =
11.0	13	19	19	PEAK ELEVATION =
12.0	40	26	45	FLOOD ELEVATION =
13.0	630	335	380	START ELEVATION =
13.8	2000	1052	1432	SPAN = 10-20 HRS, dt=.1 HRS

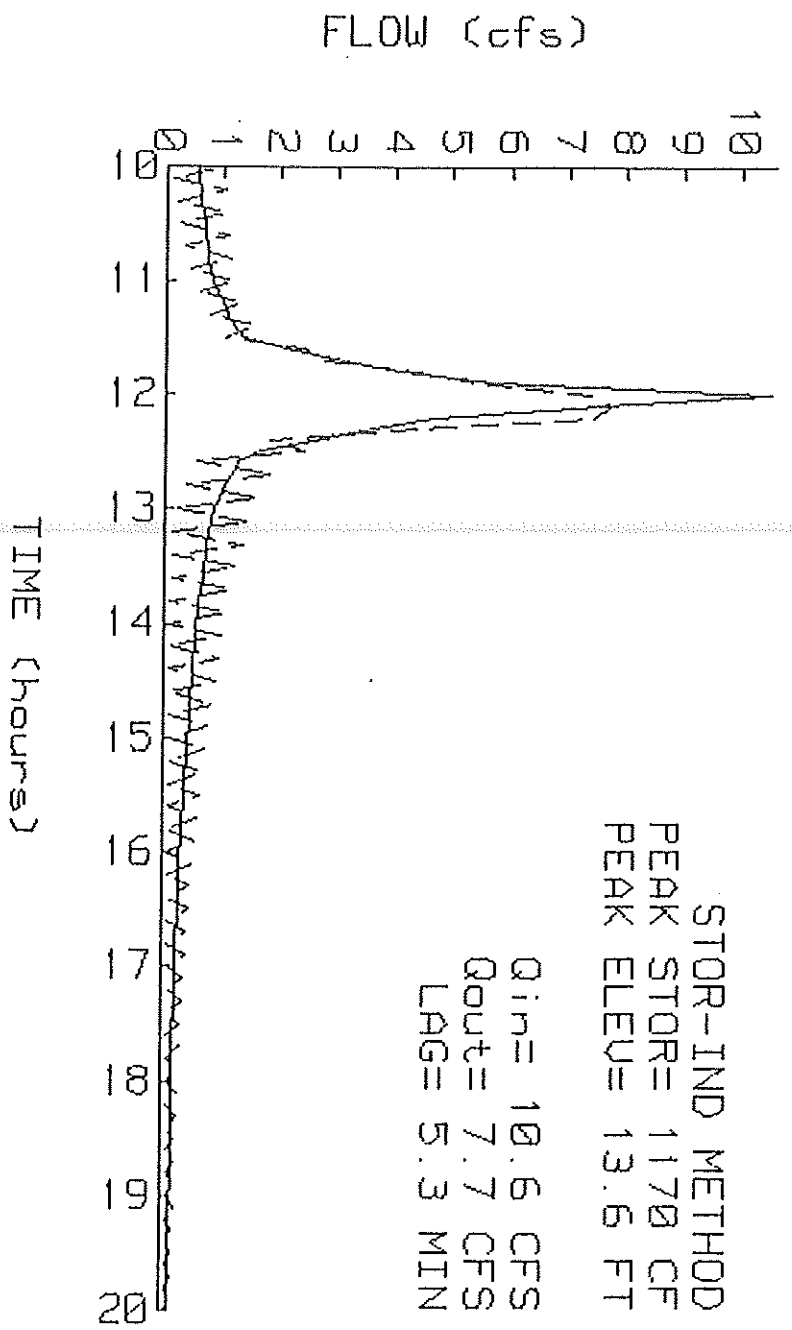
#	ROUTE	INVERT	OUTLET DEVICES
1	P	8.3'	12" CULVERT

n=.011 L=5' S=.02'/1' Ka=.6 Cc=.9 Cd=.56

POND 1 INFLOW & OUTFLOW  
SWALE CATCH BASIN

STOR-IND METHOD  
PEAK STOR= 1170 CF  
PEAK ELEV= 13.6 FT

Qin= 10.6 CFS  
Qout= 7.7 CFS  
LAG= 5.3 MIN



25 yr

SUBCATCHMENT 1 PILE AREA

PEAK = 12.4 CFS @ 12.01 HRS, VOLUME = .84 AF

ACRES	CN	PAVED
2.40	98	

SCS TR-20 METHOD  
 TYPE III 24-HOUR  
 RAINFALL = 5.5 IN  
 SPAN = 10-20 HRS, dt = .1 HRS

Method	Comment	Tc (min)
TR-55 SHEET FLOW		2.6
Smooth surfaces	n=.011 L=200' P2=3 in s=.0125 '/'	
SHALLOW CONCENTRATED/UPLAND FLOW		2.1
Paved	Kv=20.3282 L=280' s=.0125 '/' V=2.27 fps	

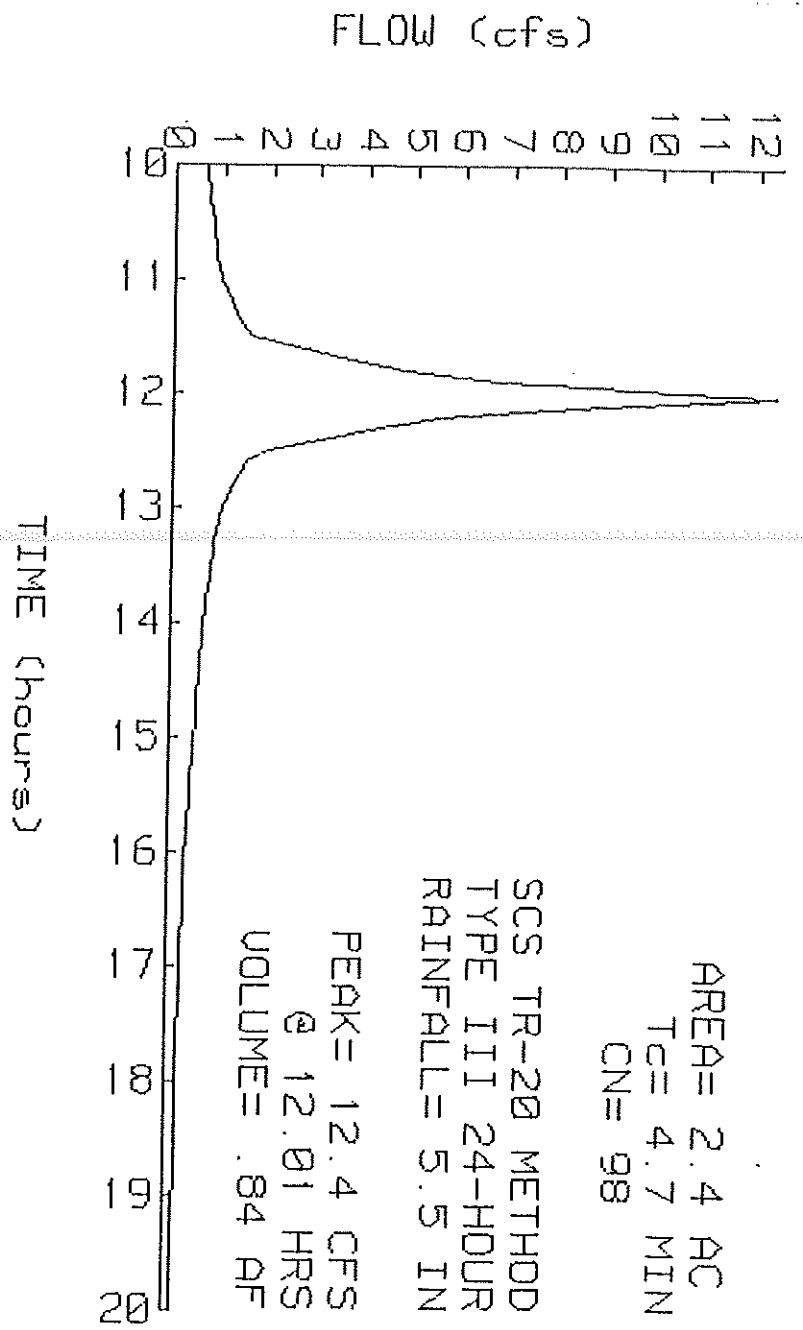
Total Length = 480 ft Total Tc = 4.7

SUBCATCHMENT 1 RUNOFF  
 PILE AREA

AREA = 2.4 AC  
 Tc = 4.7 MIN  
 CN = 98

SCS TR-20 METHOD  
 TYPE III 24-HOUR  
 RAINFALL = 5.5 IN

PEAK = 12.4 CFS  
 @ 12.01 HRS  
 VOLUME = .84 AF



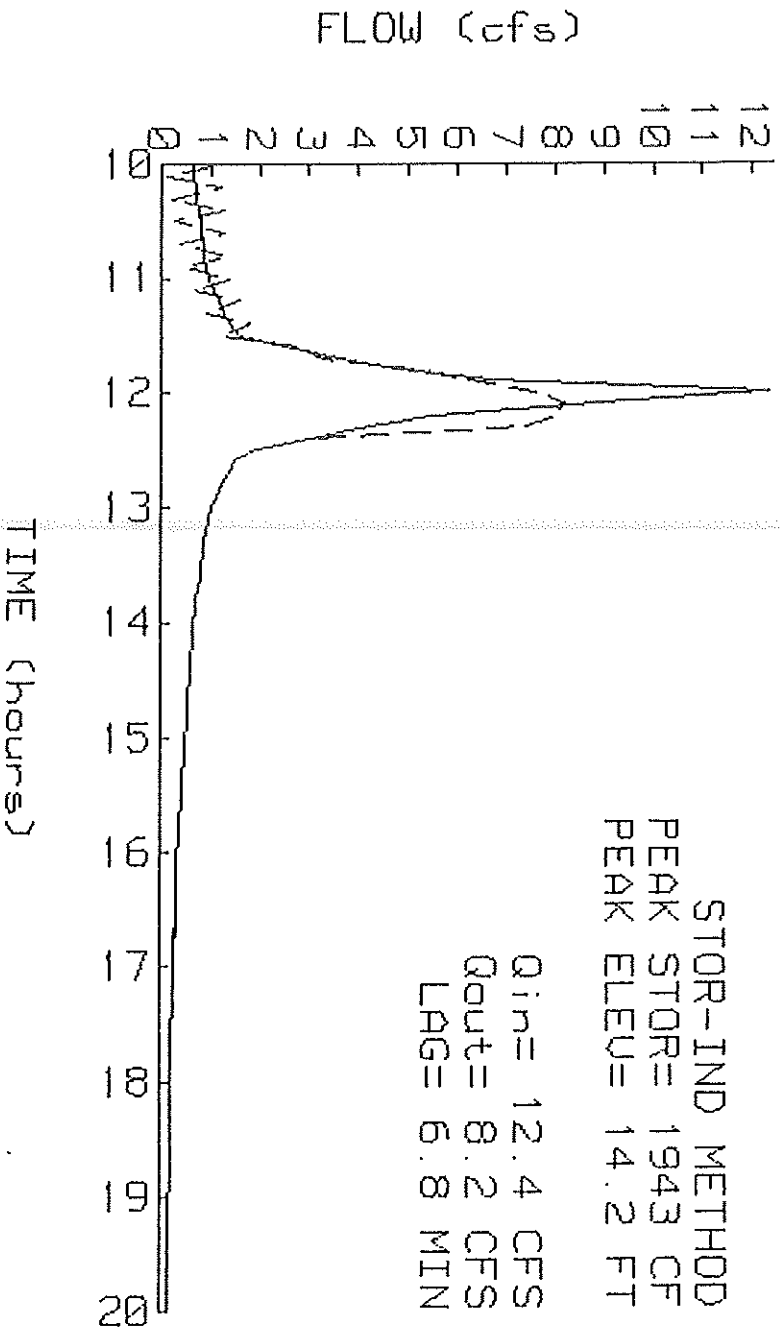
POND 1 SWALE CATCH BASIN

Q<sub>in</sub> = 12.4 CFS @ 12.01 HRS, VOLUME = .84 AF, ATTEN = 34%, LAG = 6.8 MIN  
 Q<sub>out</sub> = 8.2 CFS @ 12.12 HRS, VOLUME = .85 AF, LAG = 6.8 MIN

ELEVATION (FT)	AREA (S <sup>2</sup> )	INC. STOR (CF)	CUM. STOR (CF)	STOR-IND METHOD
8.0	0	0	0	PEAK STORAGE = 1943 CF
11.0	13	19	19	PEAK ELEVATION = 14.2 FT
12.0	40	26	45	FLOOD ELEVATION = 13.6 FT
13.0	630	335	380	START ELEVATION = 8.0 FT
13.8	2000	1052	1432	SPAN = 10-20 HRS, dt = .1 HRS

#	ROUTE	INVERT	OUTLET DEVICES
1	P	8.3'	12" CULVERT
			n=.011 L=5' S=.021/' Ke=.6 Cc=.9 Cd=.56

POND 1 INFLOW & OUTFLOW  
 SWALE CATCH BASIN





*Tom Adams*

## VORTECHS™ STORMWATER TREATMENT SYSTEM SPECIFICATIONS

*Note:* All information provided below is representative of typical and approximate sizes and construction details. Specific applications may deviate; Vortech can make alterations for shop drawing submittals on specific projects.

Vortechs™	CFS / GPM Flow Rate	C.Y. Sediment Storage	GALLONS Oil Storage	Weight (tons)	Size (LxWxH, ft)	
2000	2.8 / 1,300	1.5	350	17	10 x 4 x 8.25	- 10.5 K
3000	4.5 / 2,000	2.0	500	20	11 x 5 x 8.25	- 12.5 K
4000	6.0 / 2,800	3.0	700	25	12 x 6 x 8.25	- 15 K
5000	8.5 / 3,800	5.0	900	29	13 x 7 x 8.25	- 16 K
7000	11.0 / 5,000	6.0	1,200	33	14 x 8 x 8.25	- 18 K
9000	14.0 / 6,300	8.0	1,480	37	15 x 9 x 8.25	- 21 K
11000	17.5 / 7,800	10.0	2,400	42	16 x 10 x 8.25	- 24 K
16000	25.0 / 11,200	14.0	2,500	47	18 x 12 x 8.25	

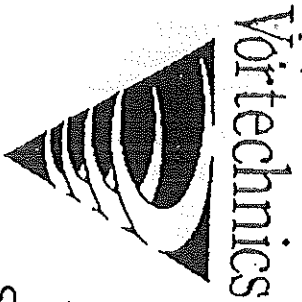
**MAINTENANCE:** Inspect once every three months, or more often if conditions warrant, especially during the first year or when winter sanding is unusually heavy. Inspection consists of measuring depth of sediment in the sump and thickness of the layer of floating material. A record of the measurements should always be kept. Clean by pumping out just the swirl chamber whenever the sediment accumulates to within 6"-12" of the water surface or the floating layer reaches a thickness of 6" or more.

**STRUCTURAL CHARACTERISTICS:** Materials and structural calculations to be in accordance with ASTM C857 "Recommended Practice for Minimum Structural Design Loading for Underground Precast Concrete Utility Structures" and ASTM C858 "Specification for Underground Precast Utility Structures".

**METAL COMPONENTS:** Internal components: Grade 3031 aluminum with a minimum thickness of 1/4-inch. Covers and supporting frames: ASTM specification A-48-83, Class 35B gray iron.

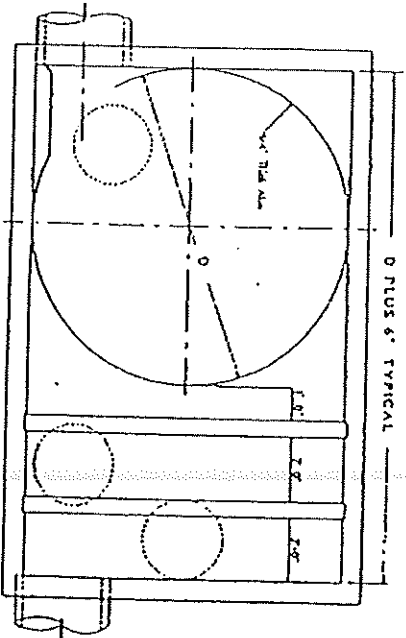
Vortech sizing criteria are based on 100 gpm/s.f. for peak flow or, in the case of installations which bypass peak flows, 24 gpm/s.f. for the 2-month storm. For very infrequent storms, (e.g. 25-year, 100-year), of short duration, a service factor of up to 1.4 may be applied to the peak flow rating.



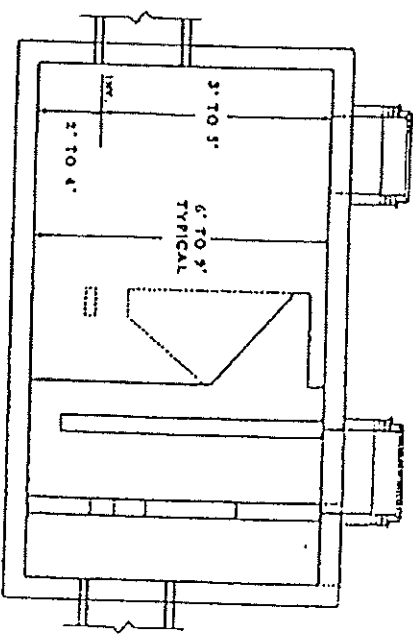


Vortech

# STORMWATER TREATMENT SYSTEM



PLAN VIEW



ELEVATION VIEW

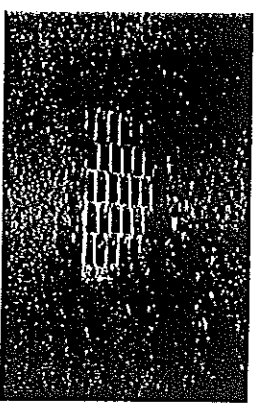
MODEL	FLOW RATE cfs	MAX PIPE INLET INCHES	SEDIMENT CHAMBER DIAMETER feet	TOTAL VOLUME gallons	SEDIMENT STORAGE cfs/ft	CLEAR OUT VOLUME gallons
2000	3.0	18	4	2,100	1.5	360
3000	4.5	24	5	2,900	2.0	500
4000	6.0	30	6	3,800	3.0	900
5000	8.5	36	7	4,800	5.0	1,100
7000	11.0	42	8	7,500	6.0	1,400
9000	14.0	48	9	9,100	8.0	1,800
11000	17.0	54	10	11,000	10.0	2,100

# EFFECTIVE

## Performance

The Downstream Defender regulates both the quality and quantity of stormwater runoff for more effective pollution control. Each installation is designed to achieve the performance objectives set forth in the U.S. EPA's National Pollutant Discharge Elimination System (NPDES) requirements.

- Typical results show overall removal efficiencies in excess of 90% of particles greater than 150 microns.
- Retains floatables, oils and grease.
- Interception of the first flush - a bypass is available.
- Headloss across the Downstream Defender is typically less than 12".
- Used with the Reg-Flo® Valve Valve to maximize storage in the collection system. It provides an effective control of quantity and improves the quality of stormwater discharges.



According to the 1992 U.S. EPA Needs Survey, stormwater runoff from urban areas significantly impairs the Nation's surface water quality.

## Design

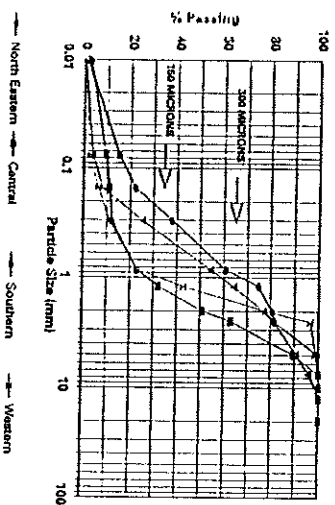
### Preliminary Sizing Chart

Unit Diameter (feet)	Approximate Flow Range* (cfs)
4	0 - 0.75
6	0.75 - 3
8	3 - 7
10	7 - 13

\* Based on 90% removal of all particles with a specific gravity of 2.65 down to 150 microns.

### GRIT CHARACTERISTICS

North American Influent Solids Grading



### Design Procedure

On receipt of:

- Design Flow
- Peak Flow
- Required particle removal efficiency
- Available grit gradation information
- Site plan and elevations

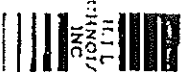
We provide free of charge:

- Recommended size of Downstream Defender
- Proposals and Specifications
- Installation Drawings
- Orientation for the design and supply of the Downstream Defender

C O V E R

S H E E T

FAX



ILL  
TECHNOLOGY  
INC

To: Jim Seymour of Sebago Tech

Fax #: 856 2206

Subject: Downstream Defender Krisway, South Portland ILL Ref 02\196\00345.001

Date: October 24, 1996

Pages: 1, including this cover sheet.

Jim,

I apologize for the delay in getting this information off to you. The wet weather got the best of me. Listed below is a table showing the solids collection facility and floatables capacity of each of the standard Downstream Defenders as requested.

DOWNSTREAM DEFENDER DIAMETER (FT)	4	6	8	10
SOLIDS COLLECTION FACILITY CAPACITY (CUBIC YARDS)	0.07	0.24	0.58	1.16
FLOATABLES STORAGE CAPACITY (GALLONS)	100	344	820	1615

The solids collection facility can be increased by extending its depth if site criteria suggests the need.

Please call if you have any questions or need additional information

*Steve R. Stelfox*

From the desk of

Audrey B Knight

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