Bart

Pine Tree Engineering, Inc.

53 Front Street
Bath, Maine 04530
(207) 443-1508
Fax (207) 442-7029

June 15, 2001

RECEIVED
JUN 18 2001
By

4572

Mr. James A. Jacobsen, Manager
Division of Health Engineering
Wastewater & Plumbing Control Program
Division of Human Services
10 State House Station
Augusta, ME 04333-0010

Subject: **576 Riverside Drive** **#00039**
Replacement Wastewater Disposal System
Augusta, Maine

Dear Mr. Jacobsen:

In accordance with the Department's letter of December 18, 2000, we are submitting the following information regarding the subject property:

Construction Inspection Report
The following site inspections were completed:

ystem layout and elevations set.
nal system inspection

wing modifications to the design plans and specifications were made:

; manifolds were eliminated.
s run to the septic tank.
as advised to have a new septic tank outlet baffle (Zabel A-100 or
l.

e
l with all information necessary to operate and maintain the disposal
:ting and reporting water use data were reviewed.

While You Were Out

Date: 12-28 Time: 10:02
For: Gary
From: Cindy Ingalls
Phone #: 774-1600

- [ ] Telephoned
- [x] Please call
- [ ] Wants to see you
- [ ] Will call again
- [ ] Returned your call
- [ ] URGENT
- [ ] Was here to see you

Message: re: 576 Riverside Dr

Post-it® 7660 ©3M 1993 Taken by:

Printed on Recycled Paper

We believe that this letter satisfies all requirements outlined in the Department's approval letters of December 18, 2000 and January 8, 2001.

Sincerely,

PINE TREE ENGINEERING, INC.

Russell G. Martin, P.E.
Project Manager

RGM/szd

c: Joseph Cooper
Randy Clark, Gardiner Savings
Gary Fuller, LPI

D:\Corres\00039\Jacobsen3-rgm.wpd

Map 51 Lot 11 Called 1-5 9:50

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Department of Human Services
Division of Health Engineering
(207) 287-5672 FAX (207) 287-4172

AUGUSTA 4572 TOWN COPY

Date Permit Issued: 1 4 00 $ 150.00 ☐ If Double Fee Charged FEE

Local Plumbing Inspector Signature L.P.I. # 850

PROPERTY LOCATION

Town or Plantation	AUGUSTA
Street Subdivision Lot •	576 RIVERSIDE DRIVE

PROPERTY OWNER'S NAME

Last: COOPER	First: JOSEPH
Applicant's Name	COOPER PROPERTIES
Mailing Address of Owner	PO BOX 491 PORTLAND ME 04112
Daytime Tel. •	207 871-7084

Municipal Tax Map • #51 Lot • #11

Owner Statement

I state that the information submitted is correct to the best of my knowledge and understand that any falsification is reason for the Department and/or Local Plumbing Inspector to deny a permit

President 1/8/01

Signature of Owner/Applicant Date

Caution: Inspection Required

I have inspected the installation authorized above and found it to be in compliance with the Subsurface Wastewater Disposal Rules Application

Local Plumbing Inspector Signature 6/18/01 Date Approved

PERMIT INFORMATION

TYPE OF APPLICATION:

1. ☐ First Time System
2. ☒ Replacement System
   Type Replaced TRENCH
   Year Installed ?
3. ☐ Expanded System
   ☐ a. one time exempted
   ☐ b. non exempted
4. ☐ Experimental System
5. ☐ Seasonal Conversion

THIS APPLICATION REQUIRES:

1. ☒ No Rule Variance
2. ☐ First Time System Variance
   ☐ a. Local Plumbing Inspector approval
   ☐ b. State & Local Plumbing Inspector approval
3. ☐ Replacement System Variance
   ☐ a. Local Plumbing Inspector approval
   ☐ b. State & Local Plumbing Inspector approval
4. ☐ Minimum Lot Size Variance
5. ☐ Seasonal Conversion Approval

DISPOSAL SYSTEM COMPONENT(S)

1. ☐ Non-Engineered System
2. ☐ Primitive System(graywater & alt toilet)
3. ☐ Alternative Toilet _____
4. ☐ Non-Engineered Treatment Tank
5. ☐ Holding Tank _____ Gallons
6. ☐ Non-Engineered Disposal Area (only)
7. ☐ Separated Laundry System
8. ☐ Engineered System (-2000 gpd)
9. ☐ Engineered Treatment Tank (only)
10. ☒ Engineered Disposal Area (only)
11. ☐ Pretreatment

SIZE OF PROPERTY

19.2 Ac ±

SHORELAND ZONING

☐ Yes ☒ No

DISPOSAL SYSTEM TO SERVE:

1. ☐ Single Family Dwelling Unit
2. ☒ Multiple Family Dwelling: Number of Units 24 - 12-1BDRM
3. ☐ Other 12-2BDRM

TYPE OF WATER SUPPLY

PUBLIC

DESIGN DETAILS (SYSTEM LAYOUT SHOWN ON PAGE 3)

TREATMENT TANK

1. ☐ Concrete
   ☐ a. Regular
   ☐ b. Low Profile
2. ☐ Plastic
3. ☐ Other _____

SIZE N/A Gallons

DISPOSAL AREA TYPE / SIZE

1. ☐ Bed _____ Sq. Ft.
2. ☒ Proprietary Device 9,2K Sq. Ft.
   ☐ Cluster ☐ Linear
   ☐ Regular ☐ H-20
3. ☐ Trench
4. ☐ Other _____

GARBAGE DISPOSAL UNIT

1. ☐ No
2. ☐ Yes
   ☐ Multi-compartment tank
   ☐ Tank in series
   ☐ Increase in tank capacity
   ☐ Filter on tank outlet

CRITERIA USED FOR DESIGN FLOW (Show Calculations)

FROM 1 YR WATER RECORDS 80TH PCTLE

DESIGN FLOW: 2,800 (Gallons/Day)

PROFILE & DESIGN CLASS

PROFILE	DESIGN
7	C

DEPTH TO MOST LIMITING FACTOR 20"

DISPOSAL AREA SIZING

1. ☐ Small - 2.00
2. ☐ Medium - 2.60
3. ☒ Medium-Large - 3.30
4. ☐ Large - 4.10
5. ☐ Extra-Large - 5.20

PUMPING

1. ☐ Not required
2. ☐ May be required
3. ☐ Required

DOSE _____ Gallons

SITE EVALUATOR'S STATEMENT

On 10/26/00 (date) I completed a site evaluation on this property and state that the data reported is accurate and that the proposed sytem is in compliance with the Subsurface Wastewater Disposal Rules.

Site Evaluator Signature 99 SE • 11/10/00 Date

KUSSELL G. MARTIN Site Evaluator Name Printed 207 443-1508 Telephone

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Department of Human Services
Division of Health Engineering
(207) 287-5672 FAX (207) 287-4172

Town, City, Plantation: AUGUSTA
Street, Road, Subdivision: 576 RIVERSIDE DR
Owner's Name: COOPER PROPERTIES

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole 1 ☒ Test Pit ☐ Boring
1 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (inches)

Depth	Texture	Consistency	Color	Mottling
0–10	FINE SANDY LOAM TO SANDY LOAM (OLD FILL)	FRIABLE	DARK BROWN / YELLOW BROWN	
20–30	FINE SILTY SAND	SOMEWHAT FIRM	OLIVE GRAY	COMMON
40–50	SILTY CLAY LOAM	FIRM	GRAY	

Soil Classification: 7 (Profile) C (Condition) — Slope: 7 % — Limiting Factor: 22" — ☒ Ground Water ☐ Restrictive Layer ☐ Bedrock ☐ Pit Depth

Observation Hole 2 ☒ Test Pit ☐ Boring
1 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (inches)

Depth	Texture	Consistency	Color	Mottling
0–10	FINE SANDY LOAM TO SANDY LOAM (OLD FILL)	FRIABLE	DARK BROWN / REDDISH BROWN	
20–30	FINE SILTY SAND	SOMEWHAT FIRM	OLIVE GRAY	COMMON
40–50	MIX SILTY CLAY LOAM - TILL	FIRM	GRAY-BROWN	

Soil Classification: 7 (Profile) C (Condition) — Slope: 6 % — Limiting Factor: 21" — ☒ Ground Water ☐ Restrictive Layer ☐ Bedrock ☐ Pit Depth

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole 3 ☒ Test Pit ☐ Boring
1 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (inches)

Depth	Texture	Consistency	Color	Mottling
0–10	FINE SANDY LOAM (OLD FILL)	FRIABLE	BROWN	
20–30	FINE SILTY SAND	SOMEWHAT FIRM	LIGHT BROWN	COMMON
30–40	MIXTURE SANDY LOAM	FIRM	OLIVE GRAY TO GRAY	
40–50	TILL - SILTY CLAY LOAM			

Soil Classification: 7 (Profile) C (Condition) — Slope: 3 % — Limiting Factor: 16" — ☒ Ground Water ☐ Restrictive Layer ☐ Bedrock ☐ Pit Depth

Observation Hole 4 ☒ Test Pit ☐ Boring
1 " Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (inches)

Depth	Texture	Consistency	Color	Mottling
0–10	FINE SANDY LOAM TO SANDY LOAM (OLD FILL)	FRIABLE	DARK BROWN / YELLOW BROWN	
20–30	FINE SILTY SAND	SOMEWHAT FIRM	OLIVE GRAY	COMMON
40–50	SILTY CLAY LOAM	FIRM	GRAY	

Soil Classification: 7 (Profile) C (Condition) — Slope: 7 % — Limiting Factor: 20" — ☒ Ground Water ☐ Restrictive Layer ☐ Bedrock ☐ Pit Depth

[signature] — Site Evaluator Signature
99 — SE #
11/10/00 — Date

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Department of Human Services
Division of Health Engineering
(207) 287-5672 FAX (207) 287-4172

Town, City, Plantation: AUGUSTA
Street, Road, Subdivision: 576 RIVERSIDE DR
Owner's Name: COOPER PROPERTIES

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole 5 ☒ Test Pit ☐ Boring
_____" Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (inches)

Texture	Consistency	Color	Mottling
FINE SANDY LOAM	FRIABLE	DARK BROWN	
VERY FINE SAND		OLIVE BROWN	COMMON
SILTY CLAY LOAM	FIRM	GRAY BROWN	
STONY TILL		REDDISH BROWN	

Soil Classification: Profile 8, Condition D
Slope: 2 %
Limiting Factor: 8"
☒ Ground Water ☐ Restrictive Layer ☐ Bedrock ☐ Pit Depth

Observation Hole 6 ☒ Test Pit ☐ Boring
_____" Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (inches)

Texture	Consistency	Color	Mottling
FINE SANDY LOAM	FRIABLE	DARK BROWN	
		REDDISH BROWN	
FINE SILTY SAND	SOMEWHAT FIRM	LIGHT BROWN	COMMON
		OLIVE BROWN	
SILTY CLAY LOAM	FIRM	GRAY-BROWN	

Soil Classification: Profile 7, Condition C
Slope: 4 %
Limiting Factor: 19"
☒ Ground Water ☐ Restrictive Layer ☐ Bedrock ☐ Pit Depth

SOIL DESCRIPTION AND CLASSIFICATION (Location of Observation Holes Shown Above)

Observation Hole _____ ☐ Test Pit ☐ Boring
_____" Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (inches)

Texture	Consistency	Color	Mottling

Soil Classification: Profile _____, Condition _____
Slope: _____ %
Limiting Factor: _____"
☐ Ground Water ☐ Restrictive Layer ☐ Bedrock ☐ Pit Depth

Observation Hole _____ ☐ Test Pit ☐ Boring
_____" Depth of Organic Horizon Above Mineral Soil

DEPTH BELOW MINERAL SOIL SURFACE (inches)

Texture	Consistency	Color	Mottling

Soil Classification: Profile _____, Condition _____
Slope: _____ %
Limiting Factor: _____"
☐ Ground Water ☐ Restrictive Layer ☐ Bedrock ☐ Pit Depth

Site Evaluator Signature: [signature] SE# 99 Date: 11/10/00

SUBSURFACE WASTEWATER DISPOSAL SYSTEM APPLICATION

Department of Human Services
Division of Health Engineering
(207) 287-5672 FAX (207) 287-4172

Town, City, Plantation	Street, Road, Subdivision	Owner's Name
AUGUSTA	576 RIVERSIDE DRIVE	COOPER PROPERTIES

SUBSURFACE WASTEWATER DISPOSAL PLAN

SCALE 1" = ____ FT.

REFER TO PLAN TITLED
"576 RIVERSIDE DRIVE - SITE PLAN"
BY PINE TREE ENGINEERING, INC
SHEET 1 OF 2 DATED

FILL REQUIREMENTS		CONSTRUCTION ELEVATIONS		ELEVATION REFERENCE POINT
Depth of Fill (Upslope)	____	Finished Grade Elevation	____	Location & Description
Depth of Fill (Downslope)	____	Top of Distribution Pipe or Proprietary Device	____	
		Bottom of Disposal Area	____	Reference Elevation

DISPOSAL AREA CROSS SECTION

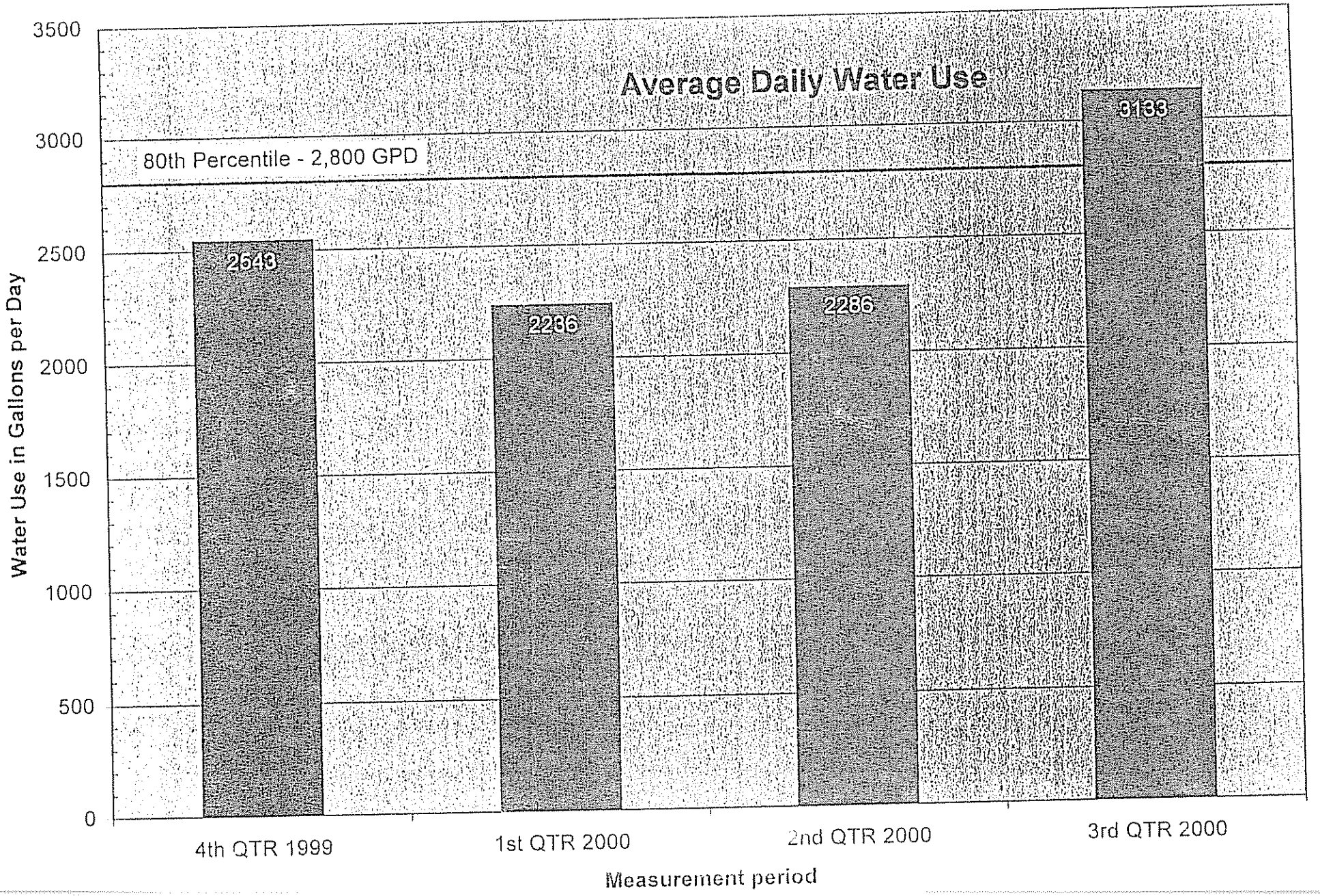
SCALE:
VERTICAL: 1" =
HORIZONTAL: 1" =

REFER TO PLAN TITLED
"576 RIVERSIDE DRIVE - CROSS SECTIONS"
BY PINE TREE ENGINEERING, INC
SHEET 2 OF 2 DATED

[signature] 99 11/10/00

Site Evaluator Signature SE # Date

COOPER PROPERTIES - 576 RIVERSIDE DRIVE, AUGUSTA MAINE



Water Use Records - 11/10/2000

PINE TREE ENGINEERI INC.

576 RIVERSIDE DRIVE - AUGUSTA

GROUNDWATER MOUNDING CALCULATION - HANTUSH METHOD

X_m = **1.50** Y_m = **24** F_1 = **0.0052** F_2 = **7.27**

1st Calculation

X = 0 Y = 0

α_1 =	0.0079	$\omega(\alpha_1,\beta_1)$ =	0.0069
α_2 =	0.0079	$\omega(\alpha_2,\beta_1)$ =	0.0069
β_1 =	0.1256	$\omega(\alpha_1,\beta_2)$ =	0.0069
β_2 =	0.1256	$\omega(\alpha_2,\beta_2)$ =	0.0069
		$\Sigma\omega(\alpha,\beta)$ =	0.0275

xF_2 = **0.20** Ft.

	β_1		
	0.1200	0.1256	0.1300
α_1 0.0050	0.0043	0.0045	0.0046
0.0079		0.0069	
0.0100	0.0083	0.0087	0.0090

	β_2		
	0.1200	0.1256	0.1300
α_2 0.0050	0.0043	0.0045	0.0046
0.0079		0.0069	
0.0100	0.0083	0.0087	0.0090

2nd Calculation

X = 4 Y = 0

α_1 =	0.0288	$\omega(\alpha_1,\beta_1)$ =	0.0238
α_2 =	-0.0131	$\omega(\alpha_2,\beta_1)$ =	-0.0108
β_1 =	0.1256	$\omega(\alpha_1,\beta_2)$ =	0.0238
β_2 =	0.1256	$\omega(\alpha_2,\beta_2)$ =	-0.0108
		$\Sigma\omega(\alpha,\beta)$ =	0.0261

xF_2 = **0.19** Ft.

	β_1		
	0.1200	0.1256	0.1300
α_1 0.0200	0.0162	0.0169	0.0174
0.0288		0.0238	
0.0300	0.0239	0.0248	0.0255

	β_2		
	0.1200	0.1256	0.1300
α_2 0.0100	0.0083	0.0087	0.0090
0.0131		0.0108	
0.0200	0.0132	0.0156	0.0174

3rd Calculation

X = 8 Y = 0

α_1 =	0.0497	$\omega(\alpha_1,\beta_1)$ =	0.0394
α_2 =	-0.0340	$\omega(\alpha_2,\beta_1)$ =	-0.0278
β_1 =	0.1256	$\omega(\alpha_1,\beta_2)$ =	0.0394
β_2 =	0.1256	$\omega(\alpha_2,\beta_2)$ =	-0.0278
		$\Sigma\omega(\alpha,\beta)$ =	0.0231

xF_2 = **0.17** Ft.

	β_1		
	0.1200	0.1256	0.1300
α_1 0.0400	0.0312	0.0324	0.0333
0.0497		0.0394	
0.0500	0.0383	0.0396	0.0406

	β_2		
	0.1200	0.1256	0.1300
α_2 0.0300	0.0239	0.0248	0.0255
0.0340		0.0278	
0.0400	0.0312	0.0324	0.0333

4th Calculation

X = 12 Y = 0

α_1 =	0.0707	$\omega(\alpha_1,\beta_1)$ =	0.0540
α_2 =	-0.0550	$\omega(\alpha_2,\beta_1)$ =	-0.0431
β_1 =	0.1256	$\omega(\alpha_1,\beta_2)$ =	0.0540
β_2 =	0.1256	$\omega(\alpha_2,\beta_2)$ =	-0.0431
		$\Sigma\omega(\alpha,\beta)$ =	0.0217

xF_2 = **0.16** Ft.

	β_1		
	0.1200	0.1256	0.1300
α_1 0.0700	0.0517	0.0536	0.0550
0.0707		0.0540	
0.0800	0.0575	0.0598	0.0616

	β_2		
	0.1200	0.1256	0.1300
α_2 0.0500	0.0383	0.0396	0.0406
0.0550		0.0431	
0.0600	0.0451	0.0467	0.0480

576 RIVERSIDE DRIVE - AUGUSTA

GROUNDWATER MOUNDING CALCULATION - HANTUSH METHOD

5th Calculation X = 18 Y = 0

$\alpha_1 =$	0.1021	$\omega(\alpha_1,\beta_1) =$	0.0733
$\alpha_2 =$	-0.0864	$\omega(\alpha_2,\beta_1) =$	-0.0639
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.0733
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.0639
		$\Sigma\omega(\alpha,\beta) =$	0.0189

$xF_2 =$ **0.14** Ft.

β_1

		0.1200	0.1256	0.1300
	0.1000	0.0697	0.0722	0.0741
α_1	0.1021		0.0733	
	0.1100	0.0751	0.0778	0.0799

β_2

		0.1200	0.1256	0.1300
	0.0800	0.0575	0.0598	0.0616
α_2	0.0864		0.0639	
	0.0900	0.0639	0.0662	0.0680

6th Calculation X = 22 Y = 0

$\alpha_1 =$	0.1230	$\omega(\alpha_1,\beta_1) =$	0.0849
$\alpha_2 =$	-0.1073	$\omega(\alpha_2,\beta_1) =$	-0.0763
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.0849
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.0763
		$\Sigma\omega(\alpha,\beta) =$	0.0172

$xF_2 =$ **0.12** Ft.

β_1

		0.1200	0.1256	0.1300
	0.1200	0.0804	0.0833	0.0855
α_1	0.1230		0.0849	
	0.1300	0.0855	0.0886	0.0910

β_2

		0.1200	0.1256	0.1300
	0.1000	0.0697	0.0722	0.0741
α_2	0.1073		0.0763	
	0.1100	0.0751	0.0778	0.0799

7th Calculation X = 26 Y = 0

$\alpha_1 =$	0.1439	$\omega(\alpha_1,\beta_1) =$	0.0957
$\alpha_2 =$	-0.1282	$\omega(\alpha_2,\beta_1) =$	-0.0875
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.0957
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.0875
		$\Sigma\omega(\alpha,\beta) =$	0.0165

$xF_2 =$ **0.12** Ft.

β_1

		0.1200	0.1256	0.1300
	0.1400	0.0905	0.0938	0.0963
α_1	0.1439		0.0957	
	0.1500	0.0953	0.0988	0.1015

β_2

		0.1200	0.1256	0.1300
	0.1200	0.0804	0.0833	0.0855
α_2	0.1282		0.0875	
	0.1300	0.0850	0.0884	0.0910

8th Calculation X = 30 Y = 0

$\alpha_1 =$	0.1649	$\omega(\alpha_1,\beta_1) =$	0.1059
$\alpha_2 =$	-0.1492	$\omega(\alpha_2,\beta_1) =$	-0.0984
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.1059
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.0984
		$\Sigma\omega(\alpha,\beta) =$	0.0151

$xF_2 =$ **0.11** Ft.

β_1

		0.1200	0.1256	0.1300
	0.1600	0.1000	0.1036	0.1065
α_1	0.1649		0.1059	
	0.1700	0.1045	0.1083	0.1113

β_2

		0.1200	0.1256	0.1300
	0.1400	0.0905	0.0938	0.0963
α_2	0.1492		0.0984	
	0.1500	0.0953	0.0988	0.1015

576 RIVERSIDE DRIVE - AUGUSTA

GROUNDWATER MOUNDING CALCULATION - HANTUSH METHOD

9th Calculation X = 34 Y = 0

$\alpha_1 =$	0.1858	$\omega(\alpha_1,\beta_1) =$	0.1154
$\alpha_2 =$	-0.1701	$\omega(\alpha_2,\beta_1) =$	-0.1084
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.1154
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.1084
		$\Sigma\omega(\alpha,\beta) =$	0.0141

$xF_2 =$ **0.10** Ft.

	β_1			
		0.1200	0.1256	0.1300
α_1	0.1800	0.1089	0.1129	0.1160
	0.1858		0.1154	
	0.1900	0.1131	0.1173	0.1205

	β_2			
		0.1200	0.1256	0.1300
α_2	0.1700	0.1045	0.1083	0.1113
	0.1701		0.1084	
	0.1800	0.1089	0.1129	0.1160

10th Calculation X = 38 Y = 0

$\alpha_1 =$	0.2067	$\omega(\alpha_1,\beta_1) =$	0.1243
$\alpha_2 =$	-0.1910	$\omega(\alpha_2,\beta_1) =$	-0.1177
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.1243
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.1177
		$\Sigma\omega(\alpha,\beta) =$	0.0131

$xF_2 =$ **0.10** Ft.

	β_1			
		0.1200	0.1256	0.1300
α_1	0.2000	0.1172	0.1215	0.1249
	0.2067		0.1243	
	0.2100	0.1211	0.1256	0.1291

	β_2			
		0.1200	0.1256	0.1300
α_2	0.1900	0.1131	0.1173	0.1205
	0.1910		0.1177	
	0.2000	0.1172	0.1215	0.1249

11th Calculation X = 42 Y = 0

$\alpha_1 =$	0.2277	$\omega(\alpha_1,\beta_1) =$	0.1324
$\alpha_2 =$	-0.2120	$\omega(\alpha_2,\beta_1) =$	-0.1264
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.1324
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.1264
		$\Sigma\omega(\alpha,\beta) =$	0.0121

$xF_2 =$ **0.09** Ft.

	β_1			
		0.1200	0.1256	0.1300
α_1	0.2200	0.1249	0.1295	0.1331
	0.2277		0.1324	
	0.2300	0.1285	0.1333	0.1370

	β_2			
		0.1200	0.1256	0.1300
α_2	0.2100	0.1211	0.1256	0.1291
	0.2120		0.1264	
	0.2200	0.1249	0.1295	0.1331

12th Calculation X = 48 Y = 0

$\alpha_1 =$	0.2591	$\omega(\alpha_1,\beta_1) =$	0.1434
$\alpha_2 =$	-0.2434	$\omega(\alpha_2,\beta_1) =$	-0.1381
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.1434
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.1381
		$\Sigma\omega(\alpha,\beta) =$	0.0107

$xF_2 =$ **0.08** Ft.

	β_1			
		0.1200	0.1256	0.1300
α_1	0.2500	0.1352	0.1403	0.1443
	0.2591		0.1434	
	0.2600	0.1385	0.1437	0.1478

	β_2			
		0.1200	0.1256	0.1300
α_2	0.2400	0.1320	0.1369	0.1408
	0.2434		0.1381	
	0.2500	0.1352	0.1403	0.1443

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GROUNDWATER MOUNDING CALCULATION - HANTUSH METHOD

13th Calculation X = 52 Y = 0

$\alpha_1 =$	0.2800	$\omega(\alpha_1,\beta_1) =$	0.1502
$\alpha_2 =$	-0.2643	$\omega(\alpha_2,\beta_1) =$	-0.1451
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.1502
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.1451
		$\Sigma\omega(\alpha,\beta) =$	0.0102

$xF_2 =$ **0.07** Ft.

β_1

		0.1200	0.1256	0.1300
	0.2800	0.1447	0.1502	0.1545
α_1	0.2800		0.1502	
	0.2900	0.1477	0.1533	0.1577

β_2

		0.1200	0.1256	0.1300
	0.2600	0.1385	0.1437	0.1478
α_2	0.2643		0.1451	
	0.2700	0.1416	0.1470	0.1512

14th Calculation X = 56 Y = 0

$\alpha_1 =$	0.3009	$\omega(\alpha_1,\beta_1) =$	0.1567
$\alpha_2 =$	-0.2852	$\omega(\alpha_2,\beta_1) =$	-0.1518
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.1567
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.1518
		$\Sigma\omega(\alpha,\beta) =$	0.0097

$xF_2 =$ **0.07** Ft.

β_1

		0.1200	0.1256	0.1300
	0.3000	0.1506	0.1564	0.1609
α_1	0.3009		0.1567	
	0.3100	0.1534	0.1593	0.1640

β_2

		0.1200	0.1256	0.1300
	0.2800	0.1447	0.1502	0.1545
α_2	0.2852		0.1518	
	0.2900	0.1477	0.1533	0.1577

15th Calculation X = 60 Y = 0

$\alpha_1 =$	0.3219	$\omega(\alpha_1,\beta_1) =$	0.1627
$\alpha_2 =$	-0.3062	$\omega(\alpha_2,\beta_1) =$	-0.1582
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.1627
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.1582
		$\Sigma\omega(\alpha,\beta) =$	0.0090

$xF_2 =$ **0.07** Ft.

β_1

		0.1200	0.1256	0.1300
	0.3200	0.1562	0.1622	0.1669
α_1	0.3219		0.1627	
	0.3300	0.1589	0.1650	0.1698

β_2

		0.1200	0.1256	0.1300
	0.3000	0.1506	0.1564	0.1609
α_2	0.3062		0.1582	
	0.3100	0.1534	0.1593	0.1640

16th Calculation X = 64 Y = 0

$\alpha_1 =$	0.3428	$\omega(\alpha_1,\beta_1) =$	0.1685
$\alpha_2 =$	-0.3271	$\omega(\alpha_2,\beta_1) =$	-0.1642
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.1685
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.1642
		$\Sigma\omega(\alpha,\beta) =$	0.0086

$xF_2 =$ **0.06** Ft.

β_1

		0.1200	0.1256	0.1300
	0.3400	0.1615	0.1677	0.1726
α_1	0.3428		0.1685	
	0.3500	0.1640	0.1704	0.1754

β_2

		0.1200	0.1256	0.1300
	0.3200	0.1562	0.1622	0.1669
α_2	0.3271		0.1642	
	0.3300	0.1589	0.1650	0.1698

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GROUNDWATER MOUNDING CALCULATION - HANTUSH METHOD

17th Calculation X = 68 Y = 0

$\alpha_1 =$	0.3637	$\omega(\alpha_1,\beta_1) =$	0.1739
$\alpha_2 =$	-0.3480	$\omega(\alpha_2,\beta_1) =$	-0.1699
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.1739
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.1699
		$\Sigma\omega(\alpha,\beta) =$	0.0080

$xF_2 =$ **0.06** Ft.

β_1

		0.1200	0.1256	0.1300
	0.3600	0.1665	0.1730	0.1780
α_1	0.3637		0.1739	
	0.3700	0.1688	0.1754	0.1806

β_2

		0.1200	0.1256	0.1300
	0.3400	0.1615	0.1677	0.1726
α_2	0.3480		0.1699	
	0.3500	0.1640	0.1704	0.1754

18th Calculation X = 72 Y = 0

$\alpha_1 =$	0.3847	$\omega(\alpha_1,\beta_1) =$	0.1800
$\alpha_2 =$	-0.3690	$\omega(\alpha_2,\beta_1) =$	-0.1752
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.1800
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.1752
		$\Sigma\omega(\alpha,\beta) =$	0.0098

$xF_2 =$ **0.07** Ft.

β_1

		0.1200	0.1256	0.1300
	0.3800	0.1725	0.1792	0.1844
α_1	0.3847		0.1800	
	0.3900	0.1742	0.1810	0.1864

β_2

		0.1200	0.1256	0.1300
	0.3600	0.1665	0.1730	0.1780
α_2	0.3690		0.1752	
	0.3700	0.1688	0.1754	0.1806

19th Calculation X = 78 Y = 0

$\alpha_1 =$	0.4161	$\omega(\alpha_1,\beta_1) =$	0.1858
$\alpha_2 =$	-0.4004	$\omega(\alpha_2,\beta_1) =$	-0.1830
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.1858
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.1830
		$\Sigma\omega(\alpha,\beta) =$	0.0057

$xF_2 =$ **0.04** Ft.

β_1

		0.1200	0.1256	0.1300
	0.4100	0.1777	0.1847	0.1902
α_1	0.4161		0.1858	
	0.4200	0.1795	0.1866	0.1921

β_2

		0.1200	0.1256	0.1300
	0.4000	0.1760	0.1829	0.1883
α_2	0.4004		0.1830	
	0.4100	0.1777	0.1847	0.1902

20th Calculation X = 82 Y = 0

$\alpha_1 =$	0.4370	$\omega(\alpha_1,\beta_1) =$	0.1895
$\alpha_2 =$	-0.4213	$\omega(\alpha_2,\beta_1) =$	-0.1868
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.1895
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.1868
		$\Sigma\omega(\alpha,\beta) =$	0.0054

$xF_2 =$ **0.04** Ft.

β_1

		0.1200	0.1256	0.1300
	0.4300	0.1812	0.1884	0.1940
α_1	0.4370		0.1895	
	0.4400	0.1830	0.1900	0.1955

β_2

		0.1200	0.1256	0.1300
	0.4200	0.1795	0.1866	0.1921
α_2	0.4213		0.1868	
	0.4300	0.1812	0.1884	0.1940

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GROUNDWATER MOUNDING CALCULATION - HANTUSH METHOD

21st Calculation X = 86 Y = 0

$\alpha_1 =$	0.4580	$\omega(\alpha_1,\beta_1) =$	0.1936
$\alpha_2 =$	-0.4423	$\omega(\alpha_2,\beta_1) =$	-0.1906
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.1936
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.1906
		$\Sigma\omega(\alpha,\beta) =$	0.0058

$xF_2 =$ **0.04** Ft.

		β_1		
		0.1200	0.1256	0.1300
α_1	0.4500	0.1847	0.1920	0.1978
	0.4580		0.1936	
	0.4600	0.1865	0.1940	0.1998

		β_2		
		0.1200	0.1256	0.1300
α_2	0.4400	0.1830	0.1902	0.1959
	0.4423		0.1906	
	0.4500	0.1847	0.1920	0.1978

22nd Calculation X = 90 Y = 0

$\alpha_1 =$	0.4789	$\omega(\alpha_1,\beta_1) =$	0.1974
$\alpha_2 =$	-0.4632	$\omega(\alpha_2,\beta_1) =$	-0.1945
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.1974
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.1945
		$\Sigma\omega(\alpha,\beta) =$	0.0058

$xF_2 =$ **0.04** Ft.

		β_1		
		0.1200	0.1256	0.1300
α_1	0.4700	0.1882	0.1958	0.2017
	0.4789		0.1974	
	0.4800	0.1900	0.1976	0.2036

		β_2		
		0.1200	0.1256	0.1300
α_2	0.4600	0.1865	0.1940	0.1998
	0.4632		0.1945	
	0.4700	0.1882	0.1958	0.2017

23rd Calculation X = 94 Y = 0

$\alpha_1 =$	0.4998	$\omega(\alpha_1,\beta_1) =$	0.2013
$\alpha_2 =$	-0.4841	$\omega(\alpha_2,\beta_1) =$	-0.1984
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.2013
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.1984
		$\Sigma\omega(\alpha,\beta) =$	0.0058

$xF_2 =$ **0.04** Ft.

		β_1		
		0.1200	0.1256	0.1300
α_1	0.4900	0.1917	0.1994	0.2055
	0.4998		0.2013	
	0.5000	0.1935	0.2013	0.2074

		β_2		
		0.1200	0.1256	0.1300
α_2	0.4800	0.1900	0.1976	0.2036
	0.4841		0.1984	
	0.4900	0.1917	0.1994	0.2055

24th Calculation X = 98 Y = 0

$\alpha_1 =$	0.5208	$\omega(\alpha_1,\beta_1) =$	0.2050
$\alpha_2 =$	-0.5051	$\omega(\alpha_2,\beta_1) =$	-0.2022
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.2050
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.2022
		$\Sigma\omega(\alpha,\beta) =$	0.0056

$xF_2 =$ **0.04** Ft.

		β_1		
		0.1200	0.1256	0.1300
α_1	0.5200	0.1970	0.2049	0.2111
	0.5208		0.2050	
	0.5400	0.1998	0.2078	0.2141

		β_2		
		0.1200	0.1256	0.1300
α_2	0.5000	0.1935	0.2013	0.2074
	0.5051		0.2022	
	0.5200	0.1970	0.2049	0.2111

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GROUNDWATER MOUNDING CALCULATION - HANTUSH METHOD

25th Calculation X = 102 Y = 0

$\alpha_1 =$	0.5417	$\omega(\alpha_1,\beta_1) =$	0.2079
$\alpha_2 =$	-0.5260	$\omega(\alpha_2,\beta_1) =$	-0.2058
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.2079
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.2058
		$\Sigma\omega(\alpha,\beta) =$	0.0042

$xF_2 =$ **0.03** Ft.

		β_1		
		0.1200	0.1256	0.1300
	0.5400	0.1998	0.2078	0.2141
α_1	0.5417		0.2079	
	0.5600	0.2023	0.2088	0.2139

		β_2		
		0.1200	0.1256	0.1300
	0.5200	0.1970	0.2049	0.2111
α_2	0.5260		0.2058	
	0.5400	0.1998	0.2078	0.2141

26th Calculation X = 140 Y = 0

$\alpha_1 =$	0.7406	$\omega(\alpha_1,\beta_1) =$	0.2295
$\alpha_2 =$	-0.7249	$\omega(\alpha_2,\beta_1) =$	-0.2283
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.2295
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.2283
		$\Sigma\omega(\alpha,\beta) =$	0.0024

$xF_2 =$ **0.02** Ft.

		β_1		
		0.1200	0.1256	0.1300
	0.7400	0.2203	0.2294	0.2366
α_1	0.7406		0.2295	
	0.7600	0.2220	0.2311	0.2382

		β_2		
		0.1200	0.1256	0.1300
	0.7200	0.2190	0.2279	0.2349
α_2	0.7249		0.2283	
	0.7400	0.2203	0.2294	0.2366

27th Calculation X = 144 Y = 0

$\alpha_1 =$	0.7615	$\omega(\alpha_1,\beta_1) =$	0.2312
$\alpha_2 =$	-0.7458	$\omega(\alpha_2,\beta_1) =$	-0.2299
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.2312
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.2299
		$\Sigma\omega(\alpha,\beta) =$	0.0025

$xF_2 =$ **0.02** Ft.

		β_1		
		0.1200	0.1256	0.1300
	0.7600	0.2220	0.2311	0.2382
α_1	0.7615		0.2312	
	0.7800	0.2231	0.2324	0.2396

		β_2		
		0.1200	0.1256	0.1300
	0.7400	0.2203	0.2294	0.2366
α_2	0.7458		0.2299	
	0.7600	0.2220	0.2311	0.2382

28th Calculation X = 148 Y = 0

$\alpha_1 =$	0.7824	$\omega(\alpha_1,\beta_1) =$	0.2325
$\alpha_2 =$	-0.7667	$\omega(\alpha_2,\beta_1) =$	-0.2315
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.2325
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.2315
		$\Sigma\omega(\alpha,\beta) =$	0.0020

$xF_2 =$ **0.01** Ft.

		β_1		
		0.1200	0.1256	0.1300
	0.7800	0.2231	0.2324	0.2396
α_1	0.7824		0.2325	
	0.8000	0.2246	0.2339	0.2411

		β_2		
		0.1200	0.1256	0.1300
	0.7600	0.2220	0.2311	0.2382
α_2	0.7667		0.2315	
	0.7800	0.2231	0.2324	0.2396

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GROUNDWATER MOUNDING CALCULATION - HANTUSH METHOD

29th Calculation X = 152 Y = 0

$\alpha_1 =$	0.8034	$\omega(\alpha_1,\beta_1) =$	0.2341
$\alpha_2 =$	-0.7877	$\omega(\alpha_2,\beta_1) =$	-0.2329
$\beta_1 =$	0.1256	$\omega(\alpha_1,\beta_2) =$	0.2341
$\beta_2 =$	0.1256	$\omega(\alpha_2,\beta_2) =$	-0.2329
		$\Sigma\omega(\alpha,\beta) =$	0.0023

$xF_2 =$ **0.02** Ft.

		β_1		
		0.1200	0.1256	0.1300
α_1	0.8000	0.2246	0.2339	0.2411
	0.8034		0.2341	
	0.8200	0.2260	0.2353	0.2425

		β_2		
		0.1200	0.1256	0.1300
α_2	0.7800	0.2231	0.2324	0.2396
	0.7877		0.2329	
	0.8000	0.2246	0.2339	0.2411

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GROUNDWATER MOUNDING CALCULATION - MEDIUM-LARGE CATAGORY SOILS

x Coordinate (Feet)	α_1	α_2	β_1	β_2	$\omega(\alpha_1,\beta_1)$	$\omega(\alpha_2,\beta_1)$	$\omega(\alpha_1,\beta_2)$	$\omega(\alpha_2,\beta_2)$	Groundwater Rise (Feet)
0	0.0079	0.0079	0.1256	0.1256	0.0069	0.0069	0.0069	0.0069	0.20
4	0.0288	-0.0131	0.1256	0.1256	0.0238	-0.0108	0.0238	-0.0108	0.19
8	0.0497	-0.0340	0.1256	0.1256	0.0394	-0.0278	0.0394	-0.0278	0.17
12	0.0707	-0.0550	0.1256	0.1256	0.0540	-0.0431	0.0540	-0.0431	0.16
30	0.1649	-0.1492	0.1256	0.1256	0.1059	-0.0984	0.1059	-0.0984	0.11
34	0.1858	-0.1701	0.1256	0.1256	0.1154	-0.1084	0.1154	-0.1084	0.10
38	0.2067	-0.1910	0.1256	0.1256	0.1243	-0.1177	0.1243	-0.1177	0.10
42	0.2277	-0.2120	0.1256	0.1256	0.1324	-0.1264	0.1324	-0.1264	0.09
60	0.3219	-0.3062	0.1256	0.1256	0.1627	-0.1582	0.1627	-0.1582	0.07
64	0.3428	-0.3271	0.1256	0.1256	0.1685	-0.1642	0.1685	-0.1642	0.06
68	0.3637	-0.3480	0.1256	0.1256	0.1739	-0.1699	0.1739	-0.1699	0.06
72	0.3847	-0.3690	0.1256	0.1256	0.1800	-0.1752	0.1800	-0.1752	0.07
90	0.4789	-0.4632	0.1256	0.1256	0.1974	-0.1945	0.1974	-0.1945	0.04
94	0.4998	-0.4841	0.1256	0.1256	0.2013	-0.1984	0.2013	-0.1984	0.04
98	0.5208	-0.5051	0.1256	0.1256	0.2050	-0.2022	0.2050	-0.2022	0.04
102	0.5417	-0.5260	0.1256	0.1256	0.2079	-0.2058	0.2079	-0.2058	0.03
152	0.8034	-0.7877	0.1256	0.1256	0.2341	-0.2329	0.2341	-0.2329	0.02

Recharge Rate (W_m)	**1.09** GPD/Ft^2	$1.37SQRT(S_y/Tt)$ =	**0.0052** $=F_1$
Time after recharge (t)	**30** days		
Specific Yield (S_y)	**0.15**	$W_m t/30S_y$ =	**7.27** $=F_2$
1/2 width of recharge area (x_m)	**1.50** Ft.		
1/2 length of recharge area (y_m)	**24** Ft.		
Hydraulic conductivity (K)	**68.5** GPD/Ft^2		
Aquifer thickness (h)	**5** Ft.		
Transmissibility (T)	**342.6** GPD/Ft		
y coordinate	**0** Ft.		
x coordinate	**0-152** Ft.		

TABLE 1

PINE TREE ENGINERING INC.

567 RIVERSIDE DRIVE - AUGUSTA
GROUNDWATER MOUNDING TABULATION

X Coordinate (Ft.)		Row No.	Soil Rating	System Bottom Elevation (Ft.)[1]	Estimated SHWT Elevation (Ft.)	Cumulative Groundwater Rise (Ft.)	Bottom - SHWT Separation (Ft.)[1]
0	Cluster A	1	Med-Large	98.50	96.83	0.20	1.47
4		2	Med-Large	98.15	96.48	0.39	1.28
8		3	Med-Large	97.88	96.21	0.56	1.11
12		4	Med-Large	97.62	95.95	0.71	0.96
30	Cluster B	5	Med-Large	96.52	94.27	0.69	1.56
34		6	Med-Large	96.30	94.05	0.85	1.40
38		7	Med-Large	96.08	93.83	0.98	1.27
42		8	Med-Large	95.87	93.62	1.11	1.14
60	Cluster C	9	Med-Large	94.71	92.46	0.98	1.27
64		10	Med-Large	94.51	92.26	1.12	1.13
68		11	Med-Large	94.31	92.06	1.24	1.01
72		12	Med-Large	93.96	91.71	1.37	0.88
90	Cluster D	13	Med-Large	93.10	90.77	1.22	1.11
94		14	Med-Large	92.89	90.56	1.28	1.05
98		15	Med-Large	92.66	90.33	1.41	0.92
102		16	Med-Large	92.56	90.23	1.52	0.81
152	50 Ft Downgradient		Med-Large	89.48	87.98	0.58	0.92

TABLE 2
PINE TREE ENGINEERING. INC.

576 RIVERSIDE DRIVE - AUGUSTA
SITE TRANSMISSION ANALYSIS

Cluster	Average Hydraulic Conductivity (GPD/Ft^2)	Hydraulic Gradient (Ft/Ft)	Cross-Sectional Area (Ft^2)	Maximum Transmittable Flow (GPD)	Design Flow (GPD)	Excess Capacity (GPD)
A	68.52	0.069	240	1,135	700	435
B	68.52	0.053	240	872	700	172
C	68.52	0.074	240	1,217	700	517
D	68.52	0.057	240	937	700	237

Darcey's Law $Q = -KA\,dh/dl$

Q	Maximum Transmittable Flow in Gallons per Day
-K	Hydraulic Conductivity in Gallons per Day per Square Foot
A	Cross-sectional Area in Square Feet
dh/dl	Hydraulic Gradient in Feet per Feet

TABLE 3

RECEIVED

DEC 2 9 2000

STATE OF MAINE
DEPARTMENT OF HUMAN SERVICES
DIVISION OF HEALTH ENGINEERING
10 STATE HOUSE STATION
AUGUSTA, MAINE
04333-0010

ANGUS S. KING, JR.
GOVERNOR

KEVIN W. CONCANNON
COMMISSIONER

December 18, 2000

Cooper Properties
Attn.: Joseph Cooper
P. O. Box 491
Portland, Maine 04112

Subject: Approval, 576 Riverside Drive Apartments, Augusta

Dear Mr. Cooper:

The Division of Health Engineering has completed a review of a design for an engineered subsurface sewage disposal system design, to serve 576 Riverside Drive Apartments. The HHE-200 Form dated November 10, 2000 was prepared by Russell G. Martin, P.E./S.E. The system was designed by Pine Tree Engineering, Inc., with plans signed and stamped by Russell G. Martin, P.E./S.E.

Hereafter, the term "design engineer" shall refer collectively to Pine Tree Engineering, Inc., its staff, and its representatives unless otherwise specified; and the term "owner" shall refer collectively to Cooper Properties, its staff, and its representatives unless otherwise specified.

Design Flow

The design flow is 2,700 gallons per day (gpd), based upon historic water use records. The design flow of 2,700 gpd is approved with the notation that the suitability of the design flow is the responsibility of the design engineer.

Treatment Tank(s)

The design includes an existing septic tank of unspecified capacity.

Disposal Areas

The proposed disposal area consists of four groups of Eljen In-Drains. Each group would consist of four rows of 12 In-Drains, each.

Soils

The soils are shown as 7-C and 8-D per the Rules on the HHE-200 Form prepared by Mr. Martin.

Well Setback

There are no potable water supply wells reported within 300 feet of the proposal.

Post-It® Fax Note 7671	Date 12/29/00	# of pages ▸ 3
To Andrew Eagles	From Jim Jacobsen	
Co./Dept.	Co. DHS / DHE	
Phone #	Phone # 287-5685	
Fax # 774-4189	Fax # 287-3165	

Miscellaneous

The Maine Department of Environmental Protection has reviewed the application and stated that no reason was found to believe that normal operation of the disposal system will result in unreasonable adverse impact on the natural environment or other uses of groundwater and surface water.

Findings

The system appears to meet and/or exceed the Rules, except as noted, therefore the design is approved with the following conditions and comments:

1. Prior to being issued a permit by the LPI, the design engineer shall provide the LPI with written confirmation that the existing septic tank is in good working order and that the existing septic tank meets or exceeds the size and volume requirements of Chapter 9 of the Maine State Plumbing Code, Subsurface Wastewater Disposal Rules. Absent such written confirmation, one or more septic tanks meeting these requirements shall be installed, and the design revised accordingly.

2. The owner must retain the design engineer to oversee construction. The constructed system may not be used unless all pertinent requirements of the Rules have been met.

3. The design engineer shall provide sufficient supervision to assure that the system is constructed as designed and in accordance with the code and other regulations. Attention shall be given to site preparation, fill selection and placement, installation of pipes, mechanical and electrical systems.

4. The design engineer shall provide the owner and this office with a brief report on the construction including any unexpected conditions encountered and any changes made from the approved drawings. The Local Plumbing Inspector (LPI) must not issue the Certificate of Approval until the LPI has received the aforementioned report from the design engineer.

5. The design engineer shall test all systems prior to acceptance by the owner. The testing shall determine whether the components were correctly installed and whether they function as designed. This includes confirmation that flow dividing devices or configurations function as intended.

6. Construction shall not commence unless the owner has obtained the necessary plumbing permit from the LPI.

7. The design engineer, with the concurrence of the LPI shall determine when the site conditions are suitable for construction.

8. Construction shall cease whenever the design engineer determines that the site conditions, or workmanship, or materials are unacceptable.

9. The owner and design engineer shall inform the LPI of the proposed construction schedule and shall also inform the LPI of the progress of construction. They shall cooperate fully with the LPI in scheduling any inspections and providing any equipment necessary for the inspection.

Pine Tree Engineering, Inc.

53 Front Street
Bath, Maine 04530
(207) 443-1508
Fax (207) 442-7029

November 15, 2000

Mr. James A. Jacobsen, Manager
Wastewater & Plumbing Control Program
Division of Health Engineering
10 State House Station
Augusta, Maine 04333-0010

Subject: **Replacement Subsurface Wastewater Disposal System**
576 Riverside Drive
Augusta, Maine

#00039

Dear Mr. Jacobsen:

On behalf of our client, Cooper Properties, we are pleased to submit the enclosed replacement engineered system for review, along with a check for $100.00, as required by Section 1102.0 of the Subsurface Wastewater Disposal Rules. This system will serve an existing 24 unit (12 one bedroom and 12 two bedroom) apartment building.

Our design utilizes the Elgin In-drain leaching system and is sized for a wastewater flow of 2,700 gallons per day (gpd) based on metered water usage for the past year. The proposed system complies fully with all requirements of the rules.

Site Conditions

A total of six backhoe test pits were evaluated on October 26, 2000. Pits 1 to 4 are located in the area to be used for the replacement system. Soils consist of 1 to 2 feet of sandy fill material over a finer silty sand and a restrictive silty clay strata. For design purposes these soils are best classified as 7C or medium-large.

Design Conditions

Water meter readings were obtained for the last four quarters and are presented graphically. A design value of 2,700 gallons per day, representing the 80th percentile for the previous year, was selected. We believe this value represents a reasonable design number and will provide an efficient and economical wastewater disposal system.

Groundwater Mounding Analysis

A groundwater mounding analysis for the system was completed using the Hantush Analytical Model as described in "Septic Tank System Effects on Groundwater Quality", Canter and Knox - 1985. The groundwater rise from each row of Elgin In-drains was calculated and the down gradient value totaled and added to the estimated seasonal high water table to predict the minimum separation between the bottom of the disposal system and the new seasonal high water table.

One soil condition predominates, 7C (medium-large). Using permeability data from the Soil Conservation Service, an average hydraulic conductivity value of 68.52 gpd/ft^2 was calculated. An aquifer thickness of 5 feet, corresponding to the average depth of the test pits was utilized.

Table 1 summarizes the calculated data for a single row assuming medium-large soil conditions. Table 2 summarizes the cumulative groundwater impact for each system cluster. This conservative analysis indicates that the system will function hydraulically under adverse conditions. The mounding analysis was projected 50 feet down gradient from the last Elgin In-drain row to help document that no effluent outbreaks will occur.

Site Transmission Analysis

Darcey's Law was utilized to calculate the site's capacity for lateral movement of wastewater down gradient of the individual clusters. Table 3 summarizes the results for each cluster. The average hydraulic conductivity calculated for the mounding analysis was utilized. This method is extremely conservative in that all flow is assumed to travel laterally through a 5 foot strata.

We would be happy to answer any questions or provide additional information, if necessary. Your prompt attention to this project review is appreciated.

Sincerely,

PINE TREE ENGINEERING, INC.

Russell G. Martin, P.E.
Senior Environmental Engineer

RGM/szd
Enclosures

c: Joseph Cooper
Richard A. Dolby, Code Enforcement

TELEFAX

PINE TREE
Engineering

53 Front Street
Bath, Maine 04530
Tel: (207) 443-1508
Fax: (207) 442-7029
E-mail: pte@pte-maine.com

To: GARY FULLER
CITY OF AUGUSTA - 16 CONY ST.
AUGUSTA, ME 04330
Fax No.: ( ) 626 - 2520

From: SUE DOUGLAS

Date: 1/3/01

SUBJECT: 576 RIVERSIDE DR.

Project Number: 00039

Total Number of Pages (Including Cover): 2

SPECIAL INSTRUCTIONS/MESSAGE: PLEASE SEE ATTACHED LETTER AND CALL RUSS MARTIN IF YOU HAVE ANY QUESTIONS

Please call us immediately if any of the copies are missing or are not legible.

Pine Tree Engineering, Inc.

53 Front Street
Bath, Maine 04530
(207) 443-1508
Fax (207) 442-7029

January 3, 2001

Mr. James A. Jacobsen, Manager
Wastewater & Plumbing Control Program
Division of Health Engineering
10 State House Station
Augusta, Maine 04333-0010

Subject: **Existing Septic Tank Capacity**
Replacement Subsurface Wastewater Disposal System
576 Riverside Drive **#00039**
Augusta, Maine

Dear Mr. Jacobsen:

The following information is provided pursuant to Finding #1 of your approval letter of December 18, 2000. This building is served by an existing cast-in-place septic tank with an estimated working volume of 5,000-6,000 gallons. The tank was inspected by Pat Jackson, Inc. and found to be in working order prior to the design of the replacement disposal field. The existing septic tank meets or exceeds all requirements of Chapter 9 of the *Maine Subsurface Wastewater Disposal Rules*, 144A CMR 241.

We have advised our client not to proceed with the replacement system installation until favorable weather conditions in the spring. At that time, Pine Tree Engineering will complete the field layout and, after construction, issue a final inspection letter.

Yours very truly,

PINE TREE ENGINEERING, INC.

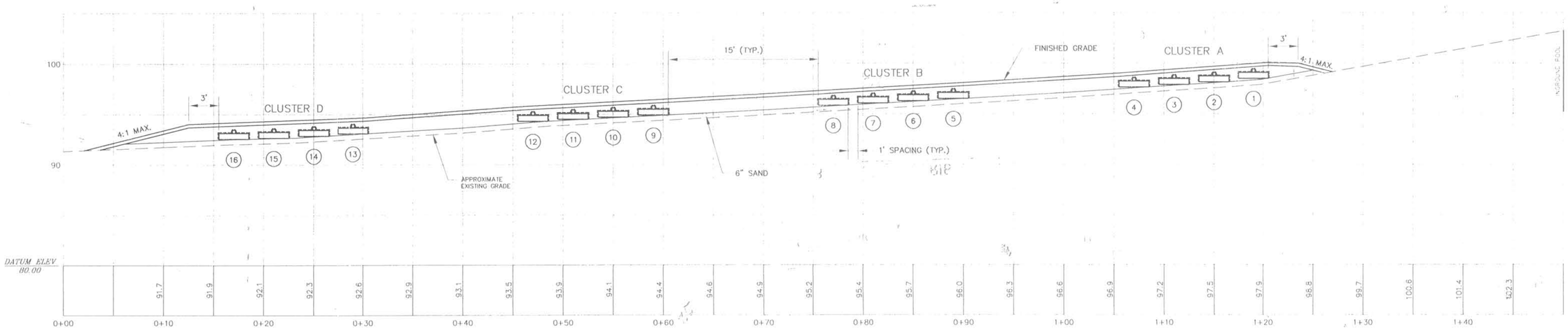
Russell G. Martin, P.E.
Senior Environmental Engineer

RGM/szd
Enclosures

c: Joseph Cooper
Richard A. Dolby, Code Enforcement, City of Augusta
Andrew Ingalls, Ingalls Commercial Brokerage

D:\Corres\00039\Jacobsen2-rgm.wpd

Printed on Recycled Paper



CROSS SECTION (A)

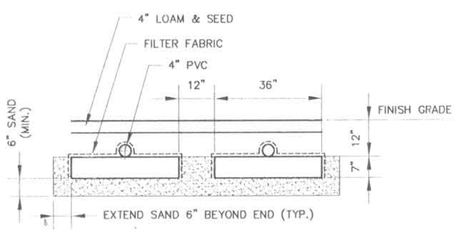
SCALE: 1" = 5'

ELEVATION TABLE

CLUSTER	A				B				C				D			
ROW	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
FINISHED GRADE	100.08	99.73	99.46	99.20	98.10	97.88	97.66	97.45	96.29	96.09	95.89	96.54	94.68	94.45	94.24	94.14
TOP	99.08	98.73	98.46	98.20	97.10	96.88	96.66	96.45	95.29	95.09	94.89	95.54	93.68	93.45	93.24	93.14
BOTTOM	98.50	98.15	97.88	97.62	96.52	96.30	96.08	95.87	94.71	94.51	94.31	94.96	93.10	92.87	92.66	92.56

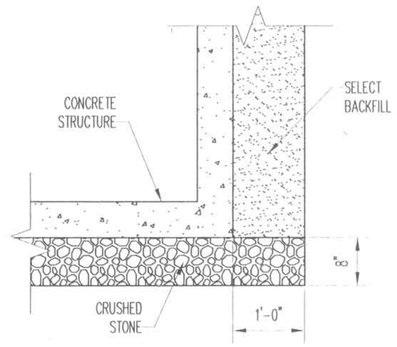
NOTE: BOTTOM & TOP ELEVATIONS REFER TO THE ELJEN IN-DRAIN.

NOTE: SYSTEM CORNERS TO BE ESTABLISHED IN THE FIELD PRIOR TO CONSTRUCTION.



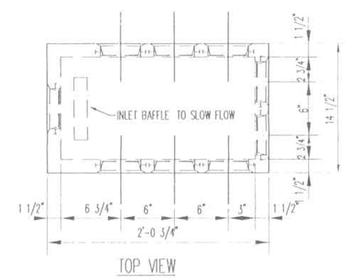
ELJEN IN-DRAIN DETAIL

SCALE: 1" = 5'

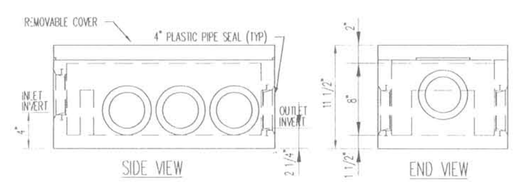


CONCRETE STRUCTURE BACKFILL DETAIL

N.T.S.



TOP VIEW



SIDE VIEW END VIEW

1 INLET & 8 OUTLET KNOCKOUT PLUGS

NOTES:
1. CONCRETE: 4,000 PSI AFTER 28 DAYS.
2. REINFORCING: 6X6/10X10 W.W.M.
3. AVAILABLE W/2" HOLE IN BOTTOM FOR PUMPING SYSTEMS.

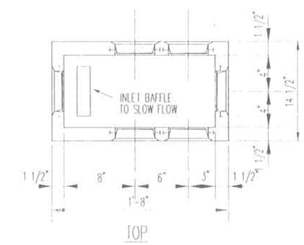
ITEM NO. 2130C

SUPERIOR CONCRETE CO, INC. AUBURN, ME.

OR EQUAL

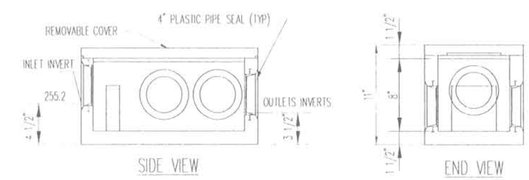
8 OUTLET DISTRIBUTION BOX

APPROX. SCALE: 1/8" = 1'-0"



TOP

1 INLET & 5 OUTLET KNOCKOUT PLUGS



SIDE VIEW END VIEW

NOTES:
1. CONCRETE: 4,000 PSI AFTER 28 DAYS.
2. REINFORCING: 6X6/10X10 W.W.M.
3. AVAILABLE W/ 2" HOLE IN BOTTOM FOR PUMP SYSTEMS.

ITEM NO. 2130B

SUPERIOR CONCRETE CO, INC. AUBURN, ME.

OR EQUAL

5 OUTLET DISTRIBUTION BOX

APPROX. SCALE: 1/8" = 1'-0"

REV	DATE	STATUS	BY	CHKD	APPD
0	11/15/00	ISSUED FOR BIDDING	JET	RSB	RGM

STATE OF MAINE RUSSELL S. MARTIN 6126 REGISTERED PROFESSIONAL ENGINEER

DESIGNED BY: RGM
DRAWN BY: JET
CHECKED BY: RSB
APPROVED BY: RGM
DATE: 11/15/00

Pine Tree Engineering
53 Front Street
Bath, Maine 04530
Tel: (207) 443-1508
Fax: (207) 442-7029
Civil/Environmental Engineering • Surveying

CLIENT
COOPER PROPERTIES
P.O. BOX 491
PORTLAND, ME 04112

PROJECT
576 RIVERSIDE DRIVE
SUBSURFACE WASSTEWATER SYSTEM

TITLE
DETAILS

SCALE: AS SHOWN
PROJECT NO. 00039
DRAWING NO. 00039-DET
SHT. 2 of 2
REV. 0

GENERAL NOTES:

DESIGN FLOW –	2,800 GALLONS PER DAY
SOILS –	7C – MEDIUM LARGE – 3.3 S.F./CPD
DISPOSAL AREA–	192 ELJEN IN-DRAINS INSTALLED AS FOUR CLUSTERS, EACH CLUSTER CONSIST OF 4 ROWS OF 12 UNITS.

TEMPORARY BENCHMARK

ELEV. 103.63 NORTHWEST CORNER OF SWIMMING POOL

LEGEND

EXISTING	DESCRIPTION	PROPOSED
	EDGE OF PAVEMENT	
	EDGE OF GRAVEL	
	FENCE	
	SILT FENCE	
102	CONTOUR (2' INT.)	102
100	CONTOUR (10' INT.)	
×100	SPOT ELEV	×100
TP-2	TEST PIT	TP-2
D	STORM DRAIN	SD
S	GRAVITY SEWER MAIN	S
	LIGHT POST	
	BUILDING/STRUCTURE	

GRAPHIC SCALE

10 0 5 10 20 40

(IN FEET)
1 inch = 10 ft.

REV	DATE	STATUS	BY	CHKD	APPD
0	11/15/00	ISSUED FOR BIDDING	JET	RSB	RGM

STATE OF MAINE RUSSELL G. MARTIN 7729 REGISTERED PROFESSIONAL ENGINEER

DESIGNED BY: RGM
DRAWN BY: RSB/JET
CHECKED BY: RSB
APPROVED BY: RGM
DATE:

Pine Tree Engineering
53 Front Street
Bath, Maine 04530
Tel: (207) 443-1508
Fax: (207) 442-7029
Civil/Environmental Engineering • Surveying

CLIENT
COOPER PROPERTIES
P.O. BOX 491
PORTLAND, ME 04112

PROJECT
576 RIVERSIDE DRIVE
SUBSURFACE WASTEWATER SYSTEM

TITLE
SITE PLAN

RECEIVED
NOV 15 2000

SCALE 1" = 10'
PROJECT NO. 00039
DRAWING NO. 00039SITE.DWG
SHT. 1 of 2
REV. 0