

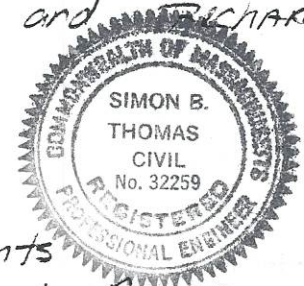
PURPOSE: Design a stormwater drainage system consisting of catch basin, manholes, culverts, LEACH PITS and RECHARGE AREA

METHOD:

- 1) Calculating flow using the Rational Method
- 2) To control flow by the use of catchbasins, manholes, and culverts which will be piped to discharge into leach pits and RECHARGE AREAS

Design Parameter:

- 1) Runoff Coefficients
Undeveloped Area = .45
Paved Surface = .90
- 2) Percolation Rate = 4 in/in
- 3) Infiltration Rate = 1.033 ft³/min/ft²



WILSON HILL ASSOCIATES

39 PLEASANT STREET P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB 361.01
SHEET NO. 1 OF _____
CALCULATED BY RJT DATE 12/16/86
CHECKED BY J.M.Y. DATE 2/5/87
SCALE DRAINAGE

CATCHMENT AREA 1 (CB STA 28+25 LT OCEAN PINES DR)

PAVEMENT .13
OPEN SPACE .56
 .69 AC

$$C_{adj} = \frac{.13(.90) + .56(.45)}{.69}$$
$$C_{adj} = .53$$

$$Q = .53 (2.0) (.69) = .73 \text{ cfs} = 44.25 \text{ CFM}$$

CATCHMENT AREA 2 (CB STA 28+25 RT OCEAN PINES DR)

PAVEMENT .13
OPEN SPACE .02
 .15 AC

$$C_{adj} = \frac{.13(.90) + .02(.45)}{.15}$$
$$C_{adj} = .84$$

$$Q = .84 (2.0) (.15) = .25 \text{ cfs} = 15.25 \text{ CFM}$$

CATCHMENT AREA 3 (CB STA 25+00 LT OCEAN PINES DR)

PAVEMENT .12
OPEN SPACE .82
 .94 AC

$$C_{adj} = \frac{.12(.90) + .82(.45)}{.94}$$
$$C_{adj} = .51$$

$$Q = .51 (2.0) (.94) = .96 \text{ cfs} = 58.0 \text{ CFM}$$

CATCHMENT AREA 4 (CB STA 25+00 RT OCEAN PINES DR)

PAVEMENT .12
OPEN SPACE .08
 .20 AC

$$C_{adj} = \frac{.12(.90) + .08(.45)}{.20}$$
$$C_{adj} = .72$$

$$Q = .72 (2.0) (.20) = .29 \text{ cfs} = 17.4 \text{ CFM}$$



WILSON HILL ASSOCIATES

39 PLEASANT STREET P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB 361.01 NUOVO
SHEET NO. 2 OF _____
CALCULATED BY RST DATE 12/16/86
CHECKED BY JMY DATE 2/5/87
SCALE DRAINAGE

CATCHMENT AREA 5 (CB STA 20+17 LT OCEAN PINES DR)

Pavement .12
Open Space .33
.45 AC.

$$C_{adj} = \frac{.12 (.90) + .33 (.45)}{.45}$$
$$C_{adj} = .57$$

$$Q = .57 (2.0) (.45) = .51 cfs = 31.0 CFM$$

CATCHMENT AREA 6 (CB STA 20+17 RT OCEAN PINES DR)

Pavement .20
Open Space .04
.24 AC

$$C_{adj} = \frac{.20 (.90) + .04 (.45)}{.24}$$
$$C_{adj} = .83$$

$$Q = .83 (2.0) (.24) = .40 cfs = 24.1 CFM$$

CATCHMENT AREA 7 (CB STA 19+15 LT OCEAN PINES DR)

Pavement .09
Open Space .09
.18 AC

$$C_{adj} = \frac{.09 (.90) + .09 (.45)}{.18}$$
$$C_{adj} = .68$$

$$Q = .68 (2.0) (.18) = .24 cfs = 14.7 CFM$$

CATCHMENT AREA 8 (CB STA 17+00 LT OCEAN PINES DR)

Pavement .14
Open Space .54
.68 AC

$$C_{adj} = \frac{.14 (.90) + .54 (.45)}{.68}$$
$$C_{adj} = .54$$

$$Q = .54 (2.0) (.68) = .73 cfs = 44.4 CFM$$

Catchment Area 9 (CB Sta 17+50 RT OCEAN PINES DR)

| | | |
|------------|------------|--|
| PAVEMENT | .14 | |
| Open Space | <u>.02</u> | |
| | .16 | |

$$C_{adj} = .14 (.90) + .02 (.45)$$

$$.16$$

$$C_{adj} = .84$$

$$Q = .84 (2.0) (.16) = .27 \text{ cfs} = 16.3 \text{ CFM}$$

CATCHMENT AREA 10 (CB Sta 11+28 Lt OCEAN PINES DR)

| | | |
|------------|-------------|--|
| PAVEMENT | .18 | |
| Open Space | <u>1.98</u> | |
| | 2.16 AC | |

$$C_{adj} = .18 (.90) + 1.98 (.45)$$

$$2.16$$

$$C_{adj} = .49$$

$$Q = .49 (2.0) (2.16) = 2.1 \text{ cfs} = 128.1 \text{ CFM}$$

CATCHMENT AREA 11 (CB Sta 11+28 RT OCEAN PINES DR)

| | | |
|------------|------------|--|
| PAVEMENT | .18 | |
| Open Space | <u>.02</u> | |
| | .20 AC | |

$$C_{adj} = .18 (.90) + .02 (.45)$$

$$.20$$

$$C_{adj} = .86$$

$$Q = .86 (2.0) (.20) = .34 \text{ cfs} = 20.8 \text{ CFM}$$

CATCHMENT AREA 12 (CB Sta 8+75 Lt OCEAN PINES DR)

| | | |
|------------|------------|--|
| PAVEMENT | .10 | |
| Open Space | <u>.74</u> | |
| | .84 AC | |

$$C_{adj} = .10 (.90) + .74 (.45)$$

$$.84$$

$$C_{adj} = .50$$

$$Q = .50 (2.0) (.84) = .84 \text{ cfs} = 50.82 \text{ CFM}$$

WILSON HILL ASSOCIATES

39 PLEASANT STREET P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB 361.01 NUOVO
SHEET NO. 4 OF _____
CALCULATED BY RJT DATE _____
CHECKED BY Jmy DATE 2/5/87
SCALE DRAINAGE

CATCHMENT AREA 13 (CB Sta 8+75 RT OCEAN PINES DR)

Pavement .10

Open Space .02

.12 AC

$$C_{adj} = .10(.90) + .02(.45)$$

.12

$$C_{adj} = .83$$

$$Q = .83 (2.0) (.12) = .20 cfs = 12.1 CFM$$

CATCHMENT AREA 14 (CB Sta 6+25 LT OCEAN PINES DR)

Pavement .12

Open Space .49

.61 AC

$$C_{adj} = .12(.90) + .49(.45)$$

.61

$$C_{adj} = .54$$

$$Q = .54 (2.0) (.61) = .66 cfs = 39.9 CFM$$

CATCHMENT AREA 15 (CB Sta 6+25 RT OCEAN PINES DR)

Pavement .12

Open Space .04

.16 AC

$$C_{adj} = .12(.90) + .04(.45)$$

.16

$$C_{adj} = .79$$

$$Q = .79 (2.0) (.16) = .25 cfs = 15.2 CFM$$

CATCHMENT AREA 16 (CB Sta 0+65 LT OCEAN PINES DR)

Pavement .12

Open Space .19

.31 AC

$$C_{adj} = .12(.90) + .19(.45)$$

.31

$$C_{adj} = .62$$

$$Q = .62 (2.0) (.31) = .38 cfs = 23.2 CFM$$

WILSON HILL ASSOCIATES

39 PLEASANT STREET P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB 361.01 NUOVO
SHEET NO. 5 OF _____
CALCULATED BY RST DATE 12/16/86
CHECKED BY Jmy DATE 2/5/87
SCALE DRAINAGE

CATCHMENT AREA 17 (CB Sta 0+65 RT OCEAN PINES DR)

| | | | |
|------------|------------|--|---------------------------------|
| Pavement | .12 | | $C_{adj} = .12(.90) + .29(.45)$ |
| Open Space | <u>.29</u> | | <u>.41</u> |
| | .41 AC | | $C_{adj} = .58$ |

$$Q = .58(2.0)(.41) = .48 \text{ cfs} = 29.0 \text{ CFM}$$

CATCHMENT AREA 18 (CB Sta 0+60 LT SANDPIPER LANE)

| | | | |
|------------|------------|--|---------------------------------|
| Pavement | .09 | | $C_{adj} = .09(.90) + .12(.45)$ |
| Open Space | <u>.12</u> | | <u>.21</u> |
| | .21 AC | | $C_{adj} = .64$ |

$$Q = .64(2.0)(.21) = .27 \text{ cfs} = 16.3 \text{ CFM}$$

CATCHMENT AREA 19 (CB Sta 0+60 RT SANDPIPER LANE)

| | | | |
|------------|------------|--|---------------------------------|
| Pavement | .09 | | $C_{adj} = .09(.90) + .03(.45)$ |
| Open Space | <u>.03</u> | | <u>.12</u> |
| | .12 AC | | $C_{adj} = .79$ |

$$Q = .79(2.0)(.12) = .19 \text{ cfs} = 11.5 \text{ CFM}$$

CATCHMENT AREA 20 (CB Sta 3+00 LT SANDPIPER LANE)

| | | | |
|------------|------------|--|---------------------------------|
| Pavement | .11 | | $C_{adj} = .11(.90) + .68(.45)$ |
| Open Space | <u>.68</u> | | <u>.79</u> |
| | .79 AC | | $C_{adj} = .51$ |

$$Q = .51(2.0)(.79) = .81 \text{ cfs} = 49.0 \text{ CFM}$$

WILSON HILL ASSOCIATES

39 PLEASANT STREET P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB 361.01 NUOVO
SHEET NO. 6 OF _____
CALCULATED BY RJT DATE 12/17/86
CHECKED BY JMY DATE 2/5/87
SCALE DRAINAGE

CATCHMENT AREA 21 (CB STA 3+00 RT SANDPIPER LAKE)

Pavement .11
Open Space .02
.13 AC

$$C_{adj} = \frac{.11(.90) + .02(.45)}{.13}$$

$$C_{adj} = .83$$

$$Q = .83(2.0)(.13) = .22 \text{ cfs} = 13.1 \text{ CFM}$$

CATCHMENT AREA 22 (CB STA 5+75 LT SANDPIPER LAKE)

Pavement .18
Open Space 1.84
2.02 AC

$$C_{adj} = \frac{.18(.90) + 1.84(.45)}{2.02}$$

$$C_{adj} = .49$$

$$Q_{10} = .49(2.0)(2.02) = 1.98 \text{ cfs} = 119.3 \text{ CFM}$$

CATCHMENT AREA 23 (CB STA 5+75 RT SANDPIPER LAKE)

Pavement .18
Open Space .04
.22 AC

$$C_{adj} = \frac{.18(.90) + .04(.45)}{.22}$$

$$C_{adj} = .82$$

$$Q = .82(2.0)(.22) = .36 \text{ cfs} = 21.6 \text{ CFM}$$

CATCHMENT AREA 24 (CB STA 2+50 RT EVINGRILL DR.)

Pavement .12
Open Space .72
.84 AC

$$C_{adj} = \frac{.12(.90) + .72(.45)}{.84}$$

$$C_{adj} = .51$$

$$Q = .51(2.0)(.84) = .86 \text{ cfs} = 52.3 \text{ CFM}$$

WILSON HILL ASSOCIATES

39 PLEASANT STREET P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB 361.01 Nuovo
SHEET NO. 7 OF _____
CALCULATED BY RST DATE 12/17/86
CHECKED BY JMY DATE 2/5/87
SCALE DRAINAGE

CATCHMENT AREA 25 (CB STA 2+50 LT EVERGREEN DR)

$$\begin{array}{l} \text{Pavement} \quad .12 \\ \text{Open Space} \quad .07 \\ \quad \quad \quad .19 \text{ AC} \end{array} \quad \begin{array}{l} C_{adj} = \frac{.12(.90) + .07(.45)}{.19} \\ C_{adj} = .73 \end{array}$$

$$Q = .73(2.0)(.19) = .28 \text{ cfs} = 16.8 \text{ CFM}$$

CATCHMENT AREA 26 (CB STA 4+90 RT EVERGREEN DR)

$$\begin{array}{l} \text{Pavement} \quad .13 \\ \text{Open Space} \quad .70 \\ \quad \quad \quad .83 \text{ AC} \end{array} \quad \begin{array}{l} C_{adj} = \frac{.13(.90) + .70(.45)}{.83} \\ C_{adj} = .52 \end{array}$$

$$Q = .52(2.0)(.83) = .86 \text{ cfs} = 52.3 \text{ CFM}$$

CATCHMENT AREA 27 (CB STA 4+90 LT EVERGREEN DR)

$$\begin{array}{l} \text{Pavement} \quad .09 \\ \text{Open Space} \quad .04 \\ \quad \quad \quad .13 \text{ AC} \end{array} \quad \begin{array}{l} C_{adj} = \frac{.09(.90) + .04(.45)}{.13} \\ C_{adj} = .76 \end{array}$$

$$Q = .76(2.0)(.13) = .20 \text{ cfs} = 12.0 \text{ CFM}$$

CATCHMENT AREA 28 (CB STA 7+24 RT EVERGREEN DR)

$$\begin{array}{l} \text{Pavement} \quad .18 \\ \text{Open Space} \quad .04 \\ \quad \quad \quad .22 \text{ AC} \end{array} \quad \begin{array}{l} C_{adj} = \frac{.18(.90) + .04(.45)}{.22} \\ C_{adj} = .82 \end{array}$$

$$Q = .82(2.0)(.22) = .36 \text{ cfs} = 21.8 \text{ CFM}$$

CATCHMENT AREA 29 (CB STA 7+24 LT EVERGREEN DR)

| | | |
|------------|------------|---------------------------------------------|
| Pavement | .15 | $C_{adj} = \frac{.15(.90) + .03(.45)}{.21}$ |
| Open Space | <u>.03</u> | |
| | .21 AC | $C_{adj} = .84$ |

$$Q = .84 (2.0) (.21) = .35 \text{ cfs} = 21.34 \text{ CFM}$$

CATCHMENT AREA 30 (CB STA 9+50 RT EVERGREEN DR)

| | | |
|------------|------------|---------------------------------------------|
| Pavement | .08 | $C_{adj} = \frac{.08(.90) + .33(.45)}{.41}$ |
| Open Space | <u>.33</u> | |
| | .41 AC | $C_{adj} = .54$ |

$$Q = .54 (2.0) (.41) = .44 \text{ cfs} = 26.8 \text{ CFM}$$

CATCHMENT AREA 31 (CB STA 9+50 LT EVERGREEN DR)

| | | |
|------------|------------|---------------------------------------------|
| Pavement | .05 | $C_{adj} = \frac{.05(.90) + .02(.45)}{.10}$ |
| Open Space | <u>.02</u> | |
| | .10 AC | $C_{adj} = .81$ |

$$Q = .81 (2.0) (.10) = .16 \text{ cfs} = 9.8 \text{ CFM}$$

CATCHMENT AREA 32 (CB STA 11+50 RT EVERGREEN DR)

| | | |
|------------|------------|---------------------------------------------|
| Pavement | .12 | $C_{adj} = \frac{.12(.90) + .39(.45)}{.51}$ |
| Open Space | <u>.39</u> | |
| | .51 AC | $C_{adj} = .56$ |

$$Q = .56 (2.0) (.51) = 1.0 \text{ cfs} = 61.3 \text{ CFM}$$

CATCHMENT AREA 33 (CB Sta 11+50 LT Evergreen Dr)

Pavement .12
 Open Space .19
 .31 AC

$$C_{adj} = \frac{.12(.90) + .19(.45)}{.31}$$

$$C_{adj} = .62$$

$$Q = .62(2.0)(.31) = .39 \text{ cfs} = 23.4 \text{ CFM}$$

CATCHMENT AREA 34 (CB Sta 17+00 RT Evergreen Dr)

Pavement .10
 Open Space .33
 .43 AC

$$C_{adj} = \frac{.10(.90) + .33(.45)}{.43}$$

$$C_{adj} = .55$$

$$Q = .55(2.0)(.43) = .48 \text{ cfs} = 28.8 \text{ CFM}$$

CATCHMENT AREA 35 (CB Sta 17+00 LT Evergreen Dr)

Pavement .13
 Open Space .19
 .32 AC

$$C_{adj} = \frac{.13(.90) + .19(.45)}{.32}$$

$$C_{adj} = .63$$

$$Q = .63(2.0)(.32) = .40 \text{ cfs} = 24.4 \text{ CFM}$$

CATCHMENT AREA 36 (CB Sta 19+50 RT Evergreen Dr)

Pavement .10
 Open Space .15
 .25 AC

$$C_{adj} = \frac{.10(.90) + .15(.45)}{.25}$$

$$C_{adj} = .63$$

$$Q = .63(2.0)(.25) = .31 \text{ cfs} = 19.1 \text{ CFM}$$

CATCHMENT AREA 37 (CB Sta. 19-50 L+ Evergreen Dr)

| | | |
|------------|------------|--|
| Pavement | .10 | |
| Open Space | <u>.04</u> | |
| | .14 AC | |

$$C_{adj} = \frac{.10(.90) + .04(.45)}{.14}$$

$$C_{adj} = .77$$

$$Q = .77(2.0)(.14) = .22 \text{ cfs} = 13.1 \text{ CFM}$$

CATCHMENT AREA 38 (CB Sta 21-83 R+ Evergreen Dr)

| | | |
|------------|------------|--|
| Pavement | .22 | |
| Open Space | <u>.02</u> | |
| | .24 | |

$$C_{adj} = \frac{.22(.90) + .02(.45)}{.24}$$

$$C_{adj} = .86$$

$$Q = .86(2.0)(.24) = .41 \text{ cfs} = 25.0 \text{ CFM}$$

CATCHMENT AREA 39 (CB Sta 21-83 Evergreen Dr)

| | | |
|------------|------------|--|
| Pavement | .22 | |
| Open Space | <u>.02</u> | |
| | .24 | |

$$C_{adj} = \frac{.22(.90) + .02(.45)}{.24}$$

$$C_{adj} = .86$$

$$Q = .86(2.0)(.24) = .41 \text{ cfs} = 25.0 \text{ CFM}$$

CATCHMENT AREA 40 (AREA OFF Evergreen DR and Pinckney Ave)

Open Space = 2.70 AC C = .45

$$Q = .45(2.0)(2.7) = 2.43 \text{ cfs} = 147.0 \text{ CFM}$$

CATCHMENT AREA 41 (CG Sta 0+60 RT Pinecrest Ave)

| | | |
|------------|------------|---------------------------------------------|
| Pavement | .07 | $C_{adj} = \frac{.07(.90) + .19(.45)}{.26}$ |
| Open Space | <u>.19</u> | |
| | .26 AC | $C_{adj} = .63$ |

$Q = .63(2.0)(.26) = .32 \text{ cfs} = 19.8 \text{ CFM}$

CATCHMENT AREA 42 (CG Sta 0+60 LT Pinecrest Ave)

| | | |
|------------|------------|---------------------------------------------|
| Pavement | .07 | $C_{adj} = \frac{.07(.90) + .09(.45)}{.16}$ |
| Open Space | <u>.09</u> | |
| | .16 AC | $C_{adj} = .65$ |

$Q = .65(2.0)(.16) = .21 \text{ cfs} = 12.6 \text{ CFM}$

CATCHMENT AREA 43 (CG Sta 2+50 RT Pinecrest Ave)

| | | |
|------------|------------|---------------------------------------------|
| Pavement | .09 | $C_{adj} = \frac{.09(.90) + .23(.45)}{.32}$ |
| Open Space | <u>.23</u> | |
| | .32 AC | $C_{adj} = .58$ |

$Q = .58(2.0)(.32) = .37 \text{ cfs} = 22.5 \text{ CFM}$

CATCHMENT AREA 44 (CG Sta 2+50 LT Pinecrest Ave)

| | | |
|------------|------------|---------------------------------------------|
| Pavement | .09 | $C_{adj} = \frac{.09(.90) + .49(.45)}{.58}$ |
| Open Space | <u>.49</u> | |
| | .58 | $C_{adj} = .52$ |

$Q = .52(2.0)(.58) = .60 \text{ cfs} = 36.5 \text{ CFM}$

CATCHMENT AREA 45 (CB STA 6+55 RT Pinecrest Ave)

Pavement .07
 Open Space .32
 .39 AC

$$C_{adj} = \frac{.07(.90) + .32(.45)}{.39}$$

$$C_{adj} = .53$$

$$Q = .53(2.0)(.39) = .41 cfs = 25.0 CFM$$

CATCHMENT AREA 46 (CB STA 6+55 LT Pinecrest Ave)

Pavement .07
 Open Space .16
 .23 AC

$$C_{adj} = \frac{.07(.90) + .16(.45)}{.23}$$

$$C_{adj} = .59$$

$$Q = .59(2.0)(.23) = .27 cfs = 16.3 CFM$$

CATCHMENT AREA 47 (CB STA 2+00 LT Briar Cliff Lane)

Pavement .08
 Open Space .07
 .15 AC

$$C_{adj} = \frac{.08(.90) + .07(.45)}{.15}$$

$$C_{adj} = .69$$

$$Q = .69(2.0)(.15) = .21 cfs = 12.5 CFM$$

CATCHMENT AREA 48 (CB STA 2+00 RT Briar Cliff Ln)

Pavement .08
 Open Space .03
 .11 AC

$$C_{adj} = \frac{.08(.90) + .03(.45)}{.11}$$

$$C_{adj} = .78$$

$$Q = .78(2.0)(.11) = .17 cfs = 10.3 CFM$$

WILSON HILL ASSOCIATES

39 PLEASANT STREET P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB 361.01 NUGUO
SHEET NO. 12 OF _____
CALCULATED BY ZRT DATE 12/17/86
CHECKED BY JMY DATE 2/5/87
SCALE Drainage

CATCHMENT AREA 49 (CB STA 3+99 LT BRIAR CLIFF LN)

| | | |
|------------|------------|---------------------------------------------|
| Pavement | .08 | $C_{adj} = \frac{.08(.90) + .02(.45)}{.10}$ |
| Open Space | <u>.02</u> | |
| | .10 AC | $C_{adj} = .81$ |

$$Q = .81(2.0)(.10) = .16 \text{ cfs} = 9.9 \text{ CFM}$$

CATCHMENT AREA 50 (CB STA 3+99 R- BRIAR CLIFF)

| | | |
|------------|------------|---------------------------------------------|
| Pavement | .08 | $C_{adj} = \frac{.08(.90) + .02(.45)}{.10}$ |
| Open Space | <u>.02</u> | |
| | .10 | $C_{adj} = .81$ |

$$Q = .81(2.0)(.10) = .16 \text{ cfs} = 9.8 \text{ CFM}$$

CATCHMENT AREA 51 (AREA EAST OF BRIAR CLIFF LANE)

| | | |
|------------|---------------------------|-----------|
| Open Space | $\approx 2.55 \text{ AC}$ | $C = .45$ |
|------------|---------------------------|-----------|

$$Q = .45(2.0)(2.55) = 2.3 \text{ cfs} = 139.1 \text{ CFM}$$

WILSON HILL ASSOCIATES

39 PLEASANT STREET P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB 361.01 NUOVO
SHEET NO. 13 OF _____
CALCULATED BY RJT DATE 12/17/96
CHECKED BY JMY DATE 2/5/97
SCALE DRAINAGE

- 1) Culvert Design from CB Sta 2+50 RT to CB Sta 3+50 Lt EVERGREEN DR.

$$Q = .86 \text{ cfs} = 52.3 \text{ CFM}$$

Culvert Size

TRY 12" RCP $n = .015$ SLOPE = 1.0%
VEL = 3.4 ft/s Depth of flow = .36 ft

- 2) Culvert Design from CB Sta 2+50 Lt to MH Sta 4+45 Lt EVERGREEN DR.

$$Q = 1.14 \text{ cfs} = 69.1 \text{ CFM}$$

Culvert Size

TRY 12" RCP $n = .015$ SLOPE = 4.0%
VEL = 6.0 ft/s Depth of flow = .28 ft

- 3) Culvert Design from CB Sta 2+50 RT to CB Sta 2+50 Lt PINECROST AVE

$$Q = .37 \text{ cfs} = 22.5 \text{ CFM}$$

Culvert Size

TRY 12" RCP $n = .015$ SLOPE = 1.0%
VEL = 2.7 ft/s Depth of flow = .24 ft

- 4) Culvert Design from CB Sta 2+50 Lt to CB Sta 0+60 Lt PINECROST AVE

$$Q = .97 \text{ cfs} = 59.0 \text{ CFM}$$

Culvert Size

TRY 12" RCP $n = .015$ SLOPE = 2.0%
VEL = 4.5 ft/s Depth of flow = .33 ft

WILSON HILL ASSOCIATES

39 PLEASANT STREET P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB 361.01 NUOVO
SHEET NO. 14 OF _____
CALCULATED BY RST DATE _____
CHECKED BY JMY DATE 2/5/07
SCALE DRAINAGE

5) Culvert Design from CB Sta 0+60 RT to
CB Sta 0+60 Lt Pinecrest Ave.

$$Q = .32 \text{ cfs} = 19.8 \text{ CFM}$$

CULVERT SIZE

TRY 12" RCP $n = .015$ $s = 1.0\%$
VEL = 2.5 f/s Depth of flow = .22 ft

6) Culvert Design from CB Sta 0+60 RT Pinecrest
Ave to MH Sta 4+45 Lt Evergreen Dr.

$$Q = 1.5 \text{ cfs} = 91.4 \text{ CFM}$$

CULVERT SIZE

TRY 12" RCP $n = .015$ $s = 3.5\%$
VEL = 6.1 f/s Depth of flow = .35 ft

7) Culvert Design from MH Sta 4+45 Lt to CB
Sta 4+90 Lt Evergreen Dr.

$$Q = 2.64 \text{ cfs} = 160.5 \text{ CFM}$$

CULVERT SIZE

TRY 12" RCP $n = .015$ $s = 4.0\%$
VEL = 7.7 f/s Depth of flow = .45 ft

8) Culvert Design from CB Sta 4+90 R to CB Sta
4+90 Lt Evergreen Dr.

$$Q = .86 \text{ cfs} = 52.3 \text{ CFM}$$

CULVERT SIZE

TRY 12" RCP $n = .015$ $s = 1.0\%$
VEL = 3.4 f/s Depth of flow = .37 ft

WILSON HILL ASSOCIATES

39 PLEASANT STREET · P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB 361.01 NUOVO
SHEET NO. 15 OF _____
CALCULATED BY RST DATE 12/17/86
CHECKED BY JMY DATE 2/5/87
SCALE DRAINAGE

9) Culvert Design from CB Sta 4+90 Lt to MH Sta 5+75 Lt Evergreen Dr.

$$Q = 3.5 \text{ cfs} = 212.8 \text{ CFM}$$

Culvert Size

TRY 18" RCP $n = .015$ $s = 2.0\%$
Vel = 6.1 f/s Depth of flow = .54 ft

10) Culvert Design from CB Sta 11+50 Rt to CB Sta 11+50 Lt Evergreen Dr

$$Q = 1.0 \text{ cfs} = 61.3 \text{ CFM}$$

Culvert Size

TRY 12" RCP $n = .015$ $s = 1.0\%$
Vel = 3.5 f/s Depth of flow = .40 ft

11) Culvert Design from CB Sta 11+50 Lt to MH Sta 10+40 Lt Evergreen Dr.

$$Q = 1.39 \text{ cfs} = 84.7 \text{ CFM}$$

Culvert Size

TRY 12" RCP $n = .015$ $s = 3.0\%$
Vel = 5.8 f/s Depth of flow = .34 ft

12) Culvert Design from MH Sta 10+40 Lt to CB Sta 9+50 Lt Evergreen Dr.

$$Q = 1.39 \text{ cfs} = 84.7 \text{ CFM}$$

Culvert Size

TRY 12" RCP $n = .015$ $s = 3.0\%$
Vel = 5.8 f/s Depth of flow = .34 ft

WILSON HILL ASSOCIATES

39 PLEASANT STREET P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB 361.01 NUOVO
SHEET NO. 16 OF _____
CALCULATED BY RJT DATE 12/17/86
CHECKED BY JMY DATE 2/5/87
SCALE DRAINAGE

13) CULVERT DESIGN FROM CB STA 9+50 RT TO
CB STA 9+50 LT EVERGREEN DR.

$$Q = .44 \text{ cfs} = 26.8 \text{ CFM}$$

CULVERT SIZE

TRY 12" RCP

$$n = .015 \quad S = 1\%$$

$$VEL = 2.8 \text{ ft/s}$$

$$\text{DEPTH OF FLOW} = .27 \text{ ft}$$

14) CULVERT DESIGN FROM CB STA 9+50 LT TO
MH STA 8+25 LT EVERGREEN DR.

$$Q = 1.99 \text{ cfs} = 121.3 \text{ CFM}$$

CULVERT SIZE

TRY 12" RCP

$$n = .015 \quad S = 2.0\%$$

$$VEL = 5.6 \text{ ft/s}$$

$$\text{DEPTH OF FLOW} = .47 \text{ ft}$$

15) CULVERT DESIGN FROM MH STA 8+25 LT TO
CB STA 7+24 LT EVERGREEN DR.

$$Q = 1.99 \text{ cfs} = 121.3 \text{ CFM}$$

CULVERT SIZE

TRY 12" RCP

$$n = .015 \quad S = 1.0\%$$

$$VEL = 4.0 \text{ ft/s}$$

$$\text{DEPTH OF FLOW} = .59 \text{ ft}$$

16) CULVERT DESIGN FROM CB STA 7+24 LT TO CB
STA 7+24 RT EVERGREEN DR.

$$Q = 2.34 \text{ cfs} = 142.64 \text{ CFM}$$

CULVERT SIZE

TRY 12" RCP

$$n = .015 \quad S = 1.0\%$$

$$VEL = 4.3 \text{ ft/s}$$

$$\text{DEPTH OF FLOW} = .65 \text{ ft}$$

WILSON HILL ASSOCIATES

39 PLEASANT STREET P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB 361.01 NUOVO
SHEET NO. 17 OF _____
CALCULATED BY RST DATE 12/17/86
CHECKED BY JMY DATE 2/5/87
SCALE DRAINED

17) Culvert Design from CB Sta 7+24 Rt to MH
Sta 5+75 Lt Evergreen Dr

$$Q = 2.70 \text{ cfs} = 163.4 \text{ cfm}$$

CULVERT SIZE

TRY 18" RCP
VEL = 3.5 ft/s

$$n = .015 \quad S = 0.5\%$$

$$\text{DEPTH OF FLOW} = .65 \text{ ft}$$

20) Culvert Design from CB Sta 6+55 Lt to CB Sta 6+55 Rt Pinecrest Ave.

$$Q = .27 \text{ cfs} = 16.3 \text{ CFM}$$

Culvert Size

Try 12" RCP

$$Vel = 2.6 \text{ ft/s}$$

$$n = .015 \quad S = 1.0\%$$

$$\text{Depth of flow} = .24 \text{ ft}$$

21) Culvert Design from CB Sta 6+55 Rt Pinecrest Ave to MH Sta 15+90 Rt Evergreen Dr

$$Q = .68 \text{ cfs} = 41.3 \text{ CFM}$$

Culvert Size

Try 12" RCP

$$Vel = 3.2 \text{ ft/s}$$

$$n = .015 \quad S = 1.0\%$$

$$\text{Depth of flow} = .32 \text{ ft}$$

22) Culvert Design From MH Sta 15+90 Rt to CB Sta 17+00 Rt Evergreen Dr.

$$Q = .68 \text{ cfs} = 41.3 \text{ CFM}$$

Culvert Size

Try 12" RCP

$$Vel = 3.2 \text{ ft/s}$$

$$n = .015 \quad S = 1.5\%$$

$$\text{Depth of flow} = .32 \text{ ft}$$

23) Culvert Design from CB Sta 17+00 Lt to CB Sta 17+00 Rt Evergreen Dr.

$$Q = .40 \text{ cfs} = 24.4 \text{ CFM}$$

Culvert Size

Try 12" RCP

$$Vel = 2.7 \text{ ft/s}$$

$$n = .015 \quad S = 1\%$$

$$\text{Depth of flow} = .25 \text{ ft}$$

WILSON HILL ASSOCIATES

39 PLEASANT STREET P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB 361.01 NUOVO
SHEET NO. 19 OF _____
CALCULATED BY RST DATE 12/17/86
CHECKED BY SMY DATE 2/5/87
SCALE DESIGN

24) Culvert Design from CB Sta 17+00 RT to MH
Sta 17+00 RT Evergreen Dr.

$$Q = 1.08 \text{ cfs} = 65.34 \text{ CFM}$$

Culvert Size

TRY 12" RCP $n = .015$

$S = 3.0\%$

Vel = 5.2 ft/s

Depth of flow = .28 CFM

25) Culvert Design from MH Sta 18+00 RT to CB
Sta 19+50 RT Evergreen Dr.

$$Q = 1.08 \text{ cfs} = 65.34 \text{ CFM}$$

Culvert Size

TRY 12" RCP $n = .015$

$S = 3.0\%$

Vel = 5.2 ft/s

Depth of flow = .28 ft

26) Culvert Design from CB 19+50 RT to CB
Sta 19+50 LT Evergreen Dr.

$$Q = 1.39 \text{ cfs} = 84.44 \text{ CFM}$$

Culvert Size

TRY 12" RCP $n = .015$

$S = 1.0\%$

Vel = 3.8 ft/s

Depth of flow = .33 ft

27) Culvert Design from CB Sta 19+50 L- to
MH Sta 20+60 LT Evergreen Dr.

$$Q = 1.61 \text{ cfs} = 99.15 \text{ CFM}$$

Culvert Size

TRY 12" RCP $n = .015$

$S = 2.0\%$

Vel = 5.1 ft/s

Depth of flow = .41 ft

28) Design Culvert from CB Sta 21+83 Rt to
 CB Sta 21+83 Lt Evergreen Dr.

$$Q = .41 \text{ cfs} = 2510 \text{ CFM}$$

Culvert Size

TRY 12" RCP
 Vel = 2.7 ft/s

$n = .015$ $s = 1.0\%$
 Depth of flow = .25'

29) Design Culvert from CB Sta 21+83 Lt to MH
 Sta 20+60 Lt Evergreen Dr

$$Q = .82 \text{ cfs} = 50 \text{ CFM}$$

CULVERT SIZE

TRY 12" RCP
 Vel = 2.6 ft/s

$n = .015$ $s = 0.5\%$
 Depth of flow = .42 ft

30) Design Culvert from MH Sta 20+60 to
 Recharge Pond East of Evergreen Drive

$$Q = 243 \text{ cfs} = 149.15 \text{ CFM}$$

CULVERT SIZE

TRY 18" RCP
 Vel = 5.7 ft/s

$n = .015$ $s = 2.0\%$
 Depth of flow = .45 ft.

31) Culvert Design from CB Sta 0+65 RT to
 CB Sta 0+65 LT OCEAN PINES DR.

$Q = .48 \text{ cfs} = 29.0 \text{ CFM}$

Culvert Size

TRY 12" RCP $n = .015$ $s = 1.0\%$
 Vel = 2.7 ft/s Depth of flow = .28 ft

32) Culvert Design from CB Sta 6+25 LT to
 CB Sta 6+25 RT OCEAN PINES DR.

$Q = .66 \text{ cfs} = 39.9 \text{ CFM}$

Culvert Size

TRY 12" RCP $n = .015$ $s = 1.0\%$
 Vel = 3.2 ft/s Depth of flow = .33 ft

33) Culvert Design from CB Sta 6+25 to
 CB Sta 8+75 RT OCEAN PINES DR.

$Q = .91 \text{ cfs} = 55.1 \text{ CFM}$

Culvert Size

TRY 12" RCP $n = .015$ $s = 3.0\%$
 Vel = 5.1 ft/s Depth of flow = .38 ft

34) Culvert Design from CB Sta 8+75 LT to
 CB Sta 8+75 RT OCEAN PINES DR.

$Q = .84 \text{ cfs} = 50.82 \text{ CFM}$

Culvert Size

TRY 12" RCP $n = .015$ $s = 1.0\%$
 Vel = 3.4 ft/s Depth of flow = .37 ft

35) CULVERT DESIGN FROM CE. STA 8+75 R- TO
 MH STA 10+58 R+ OCEAN PINES DR

$$Q = 1.95 \text{ cfs} = 118.02 \text{ CFM}$$

CULVERT SIZE

TRY 12" RCP $n = .015$ $s = 1.5\%$
 $Vel = 4.9 \text{ ft/s}$ Depth of flow = .51 ft

36) CULVERT DESIGN FROM MH STA 10+58 R+ TO
 CB STA 11+28 R+ OCEAN PINES DR

$$Q = 1.95 \text{ cfs} = 118.02 \text{ CFM}$$

CULVERT SIZE

TRY 18" RCP $n = .015$ $s = 0.5\%$
 $Vel = 3.3 \text{ ft/s}$ Depth of flow = .58 ft

37) CULVERT DESIGN FROM CB STA 11+28 ~~R+~~ TO
 CB STA 11+28 R+ OCEAN PINES DR.

$$Q = 2.1 \text{ cfs} = 125.1 \text{ CFM}$$

CULVERT SIZE

TRY 12" RCP $n = .015$ $s = 1.0\%$
 $Vel = 4.2 \text{ ft/s}$ Depth of flow = .56 ft

38) CULVERT DESIGN FROM CB STA 11+28 R+ TO
 MH STA 12+25 R- OCEAN PINES DR.

$$Q = 4.39 \text{ cfs} = 265.6 \text{ CFM}$$

CULVERT SIZE

TRY 18" RCP $n = .015$ $s = 0.5\%$
 $Vel = 3.9 \text{ ft/s}$ Depth of flow = .85 ft

39) Culvert Design from MH Sta 12+25 R+ OCEAN PINES DR. to Recharge AREA West of Ocean Pines DR.

$$Q = 4.39 \text{ cfs} = 265.6 \text{ CFM}$$

Culvert Size

Try 24" RCP $n = .015$ $S = 1.0\%$
 Vel 4.9 ft/s Depth of flow = .62

40) Culvert Design from CB Sta 17+00 R+ to CB Sta 17+00 Lt OCEAN PINES DR

$$Q = .27 \text{ cfs} = 16.3 \text{ CFM}$$

Culvert Size

Try 12" RCP $n = .015$ $S = 1.0\%$
 Vel = 2.4 ft/s Depth of flow = .20 ft

41) Culvert Design from CB Sta 17-00 Lt to CB Sta 19+15 Lt OCEAN PINES DRIVE

$$Q = 1.0 \text{ cfs} = 60.7 \text{ CFM}$$

Culvert Size

Try 12" RCP $n = .015$ $S = 1.5\%$
 Vel = 4.1 ft/s Depth of flow = .35 ft

42) Culvert Design from CB Sta 19-15 Lt to MH Sta 19-60 R+ OCEAN PINES DR.

$$Q = 1.24 \text{ cfs} = 75.4 \text{ CFM}$$

Culvert Size

Try 12" RCP $n = .015$ $S = 1.0\%$
 Vel = 3.6 ft/s Depth of flow = .41 ft

43) Culvert Design from CB Sta 0+60 RT to
 CB Sta 0+60 LT Sandpiper Lane

$$Q = .19 \text{ cfs} = 11.5 \text{ cfm}$$

Culvert Size

TRY 12" RCP $n = .015$ $S = 1.0\%$
 $Vel = 2.2 \text{ ft/s}$ Depth of flow = .18 ft

44) Culvert Design from CB Sta 0+60 LT Sandpiper Ln.
 to MH Sta 19+60 RT Ocean Pines Dr.

$$Q = .46 \text{ cfs} = 27.8 \text{ cfm}$$

Culvert Size

TRY 12" RCP $n = .015$ $S = 2.0\%$
 $Vel = 3.2 \text{ ft/s}$ Depth of flow = .22 ft

45) Culvert Design from MH Sta 19+60 RT to
 CB Sta 20+17 RT Ocean Pines Dr.

$$Q = 1.7 \text{ cfs} = 103.2$$

Culvert Size

TRY 12" RCP $n = .015$ $S = 0.5\%$
 $Vel = 3.0 \text{ ft/s}$ Depth of flow = .65 ft

46) Culvert Design from CB Sta 20+17 LT to CB
 Sta 20+17 RT Ocean Pines Drive

$$Q = .51 \text{ cfs} = 31 \text{ cfm}$$

Culvert Size

TRY 12" RCP $n = .015$ $S = 1.0\%$
 $Vel = 2.7 \text{ ft/s}$ Depth of flow = .29 ft

WILSON HILL ASSOCIATES

39 PLEASANT STREET P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB 361.51 NUOVO
SHEET NO. 25 OF _____
CALCULATED BY RJT DATE 12/18/86
CHECKED BY Jmy DATE 2/5/87
SCALE DRAINAGE

47) Culvert Design from CB Sta 20+17 RT to MH Sta 21+25 RT OCEAN PINES DR.

$$Q = 2.61 \text{ cfs} = 158.3 \text{ CFM}$$

Culvert Size

TRY 18" RCP $n = .015$ $S = 0.5\%$
Vel = 3.5 ft/s Depth of flow = .65 ft

48) Culvert Design from MH Sta 21+25 RT to MH Sta 22+70 RT OCEAN PINES DR.

$$Q = 2.61 \text{ cfs} = 158.3 \text{ CFM}$$

Culvert Size

TRY 18" RCP $n = .015$ $S = 0.5\%$
Vel = 3.5 ft/s Depth of flow = .65 ft

49) Culvert Design from MH Sta 22+70 RT to MH Sta 24+00 RT OCEAN PINES DR.

$$Q = 2.61 \text{ cfs} = 158.3 \text{ CFM}$$

Culvert Size

TRY 18" RCP $n = .015$ $S = 1.5\%$
Vel = 4.5 ft/s Depth of flow = .55 ft

50) Culvert Design from MH Sta 24+00 RT to CB Sta 25+00 RT OCEAN PINES DR.

$$Q = 2.61 \text{ cfs} = 158.3 \text{ CFM}$$

Culvert Size

TRY 18" RCP $n = .015$ $S = 2.0\%$
Vel = 5.8 ft/s Depth of flow = .46 ft

WILSON HILL ASSOCIATES

39 PLEASANT STREET P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB 361.01 NUOVO
SHEET NO. 26 OF _____
CALCULATED BY RJT DATE 12/18/86
CHECKED BY JMY DATE 2/5/87
SCALE AS SHOWN

51) Culvert Design from CB Sta 25+00 Lt to
CB Sta 25+00 Rt Ocean Pines Dr.

$$Q = .96 \text{ cfs} = 59.0 \text{ CFM}$$

Culvert Size

Try 12" RCP

$$n = .015$$

$$S = 1.0\%$$

$$Vel = 3.5 \text{ ft/s}$$

$$\text{Depth of flow} = .39 \text{ ft}$$

52) Culvert Design from CB Sta 25+00 Rt to
MH Sta 26+15 Rt Ocean Pines Dr.

$$Q = 3.86 \text{ cfs} = 233.7 \text{ CFM}$$

Culvert Size

Try 18" RCP

$$n = .015$$

$$S = 2.5\%$$

$$Vel = 6.9 \text{ ft/s}$$

$$\text{Depth of flow} = .52 \text{ ft}$$

53) Culvert Design from MH Sta 26+15 Rt to
CB Sta 28+25 Rt Ocean Pines Dr.

$$Q = 3.86 \text{ cfs} = 233.7 \text{ CFM}$$

Culvert Size

Try 18" RCP

$$n = .015$$

$$S = 4.0\%$$

$$Vel = 8.1 \text{ ft/s}$$

$$\text{Depth of flow} = .50 \text{ ft}$$

54) Culvert Design from CB Sta 28+25 Lt to
CB Sta 28+25 Rt Ocean Pines Dr.

$$Q = .73 \text{ cfs} = 44.25 \text{ CFM}$$

Culvert Size

Try 12" RCP

$$n = .015$$

$$S = 1.0\%$$

$$Vel = 3.3 \text{ ft/s}$$

$$\text{Depth of flow} = .35 \text{ ft}$$

55) Design Culvert from CB Sta 28+25 RT Ocean Pines Dr. to Recharge Area North of Ocean Pines Dr. and West of Rt 3A.

$$Q = 4.84 \text{ cfs} = 292.2 \text{ CFM}$$

Culvert Size

TRY 24" RCP $n = .015$ $S = 0.5\%$
 $Vel = 4.0 \text{ ft/s}$ Depth of flow = .81 ft.

56) Design Culvert from CB Sta 5+55 LT to CB Sta 5+75 RT Sandpiper Ln.

Culvert Size

$$Q = 1.98 \text{ cfs} = 119.8 \text{ CFM}$$

TRY 12" RCP $n = .015$ $S = 1.0\%$
 $Vel = 4.1 \text{ ft/s}$ Depth of flow = .59 ft.

57) Design Culvert from CB Sta 5+75 RT to CB Sta 3+00 RT Sandpiper Ln.

$$Q = 2.34 \text{ cfs} = 141.57 \text{ CFM}$$

Culvert Size

TRY 12" RCP $n = .015$ $S = 3.0\%$
 $Vel = 6.8 \text{ ft/s}$ Depth of flow = .47 ft.

58) Design Culvert from CB Sta 3+00 LT to CB Sta 3+00 RT Sandpiper Ln.

$$Q = .81 \text{ cfs} = 49.0 \text{ CFM}$$

Culvert Size

TRY 12" RCP $n = .015$ $S = 1.0\%$
 $Vel = 3.3 \text{ ft/s}$ Depth of flow = .36 ft.

59) Design Culvert from CB Sta 3+00 Sharp PER LN to Recharge AREA.

$$Q = 3.37 \text{ cfs} = 203.88$$

Culvert Size

Try 18" RCD $n = .015$ $S = 2.0\%$
 $V_L = 6.1 \text{ ft/s}$ Depth of flow = .52 ft.

60) Design Culvert from CB Sta 2+00 RT to CB Sta 2+00 L+ BRIAR CLIFF LN.

$$Q = .17 \text{ cfs} = 10.3 \text{ CFM}$$

Culvert Size

Try 12" RCD $n = .015$ $S = 1.0\%$
 $V_L =$ Depth of flow =

61) Design Culvert from CB Sta 3+99 RT to CB Sta 3+99 L+ BRIAR CLIFF LN.

$$Q = .16 \text{ cfs} = 9.7 \text{ CFM}$$

CULVERT SIZE

Try 12" RCD $n = .015$ $S = 1.0\%$
 $V_L = 2.1 \text{ ft/s}$ Depth of flow = .16 ft

WILSON HILL ASSOCIATES

39 PLEASANT STREET P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB 361.01 NUOVO
SHEET NO. 29 OF _____
CALCULATED BY RPT DATE 12/18/86
CHECKED BY JMY DATE 2/5/87
SCALE DRAINAGE

Design LEACH PIT for Drainage from CB's @
Sta 0+60 (R+L) OCEAN PINES DR.

$$Q = .86 \text{ cfs} = 52.03 \text{ CFM}$$

Required Area

$$52.03 / .033 = 1576.7 \text{ SF.}$$

TRY 2- 16' DIA X 10' DEPTH PITS

$$\text{AREA} = 2(704) \\ = 1408 \text{ SF}$$

$$\text{VOL} = 2(1,060) \\ = 2120 \text{ CF.}$$

Check for EXCESS RUNOFF

1) Time to fill AREA

$$1408 (.033) = 46.46 \text{ CFM}$$

$$[52.03 - .5(46.46)] T = 2120$$

$$T = 73.61$$

2) ∴ AREA WILL NOT FILL.

Therefore: USE TWO 16' DIAMETER BY
10' DEPTH LEACH PITS

Design LEACH PIT @ STA 2+00 BRICK
 CLIM Rd.

$$Q = .58 \text{ cfs} = 22.9 \text{ CFM}$$

Required Area

$$22.8 / .033 = 690 \text{ S.F.}$$

TRY 10' DEPTH x 14' DIA

$$\text{AREA} = 594 \text{ S.F.}$$

$$\text{VOL} = 848 \text{ CF.}$$

Check for Excess Runoff

1) Time To Fill

$$594 (.033) = 19.60$$

$$[22.8 - .5(19.6)] T = 848$$

$$T = 65.23 \text{ min}$$

∴ AREA will not fill
 O.K.

WILSON HILL ASSOCIATES

39 PLEASANT STREET P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB 361.01 NUOVO
SHEET NO. 31 OF _____
CALCULATED BY RST DATE 12/18/86
CHECKED BY JMY DATE 2/5/87
SCALE DRAINAGE

Design Leach Pit @ STA 3+99 BRIAR
CH/RT Rd

$$Q = .32 \text{ cfs} = 19.36 \text{ CFM}$$

REQUIRED AREA

$$19.36 / .033 = 587 \text{ S.F.}$$

TRY 10' Depth x 14' DIA

$$\text{AREA} = 594 \text{ S.F.}$$

$$\text{Vol} = 848 \text{ CF}$$

Check for EXCESS RUNOFF

1) Time to Fill

$$594 (.033) = 19.6 \text{ CFM}$$

$$[19.36 - 1.5(19.6)] T = 848$$

$$T = 98.71 \text{ min}$$

EXCESS RUNOFF NOT S.F.
O.K.

Design RECHARGE AREA North of OCEAN PINES
DR No 2000

Runoff Rate = $4.84 \text{ cfs} = 292.2 \text{ cfm}$

Required Area = $292.2 / .033 = 8854.5 \text{ s.f.}$

| <u>Volume of RECHARGE AREA</u> | | | | | <u>TOTAL STORAGE VOL</u> |
|--------------------------------|-------------|------------|--------------|------------|--------------------------|
| <u>ELEV</u> | <u>AREA</u> | <u>AVG</u> | <u>DEPTH</u> | <u>VOL</u> | |
| 60 | 3352 | | - | - | - |
| 62 | 5320 | 4336 | 2 | 8672 | 8672 |
| 63 | 6328 s.f. | 5824 s.f. | 1 | 5824 c.f. | 14496 c.f. |

AREA of RECHARGE

$3352 + (6.32)(265') = 5026 \text{ s.f.}$

Time to Fill AREA

$5026 (.033) = 165.9$

$[292.2 - .5(165.9)] T = 14496$

$T = 69.27 \text{ min}$

∴ AREA will not fill.

DESIGN RECHARGE AREA SOUTH OF SANDPIPER
LANE Sta 3+00

Runoff Rate = 3.37 cfs = 203.89

Required AREA = 203.89 / .033
 = 6178 S.F.

VOLUME OF RECHARGE AREA

| <u>ELEV</u> | <u>AREA</u> | <u>AVG</u> | <u>DEPTH</u> | <u>VOL</u> | <u>TOTAL STORAGE</u> |
|-------------|-------------|------------|--------------|------------|----------------------|
| 82 | 1200 S.F. | - | - | - | - |
| 84 | 2216 S.F. | 1708 S.F. | 2 | 3416 C.F. | 3416 C.F. |
| 86 | 3768 S.F. | | 2 | 5984 C.F. | 9400 C.F. |

RECHARGE AREA

1200 + 6.32(150) + 6.32(180) = 3285.6 S.F.

Time to fill AREA

3285.6 (.033) = 108.42

[203.89 - .5(108.4)] T = 9400

T = 62.0 min

∴ AREA will not fill

Design Recharge Area West of Ocean Pines Dr
Sta 13+50

Runoff Rate = 6.82 cfs = 414.8 CFM

Required Area = $414.8 / (.033) = 12570 \text{ S.F.}$

| <u>Volume Recharge Area</u> | | | | | <u>TOTAL STORAGE</u> |
|-----------------------------|-------------|------------|--------------|------------|----------------------|
| <u>ELEV</u> | <u>AREA</u> | <u>Avg</u> | <u>DEPTH</u> | <u>VOL</u> | |
| 74 | 3384 | - | - | - | - |
| 76 | 10312 | 6848 | 2 | 13696 | 13696 |
| 78 | 17448 | 13880 | 2 | 27760 | 41456 C.F. |

Recharge Area = 3384

Time to fill Area

$3384 \times (.033) = 111.7$

$[414.8 - .5(111.7)] T = 41456$

$T = 115 \text{ min}$

∴ AREA will not fill

WILSON HILL ASSOCIATES

39 PLEASANT STREET P.O. BOX 602
SAGAMORE, MASSACHUSETTS 02561

JOB _____ OF _____
SHEET NO. 21 CALCULATED BY _____ DATE _____
CHECKED BY _____ DATE _____
SCALE _____

WITH 6' DIAMETER LEACH PIT
LEACHING PIT AREA

Bottom + SIDEWALL

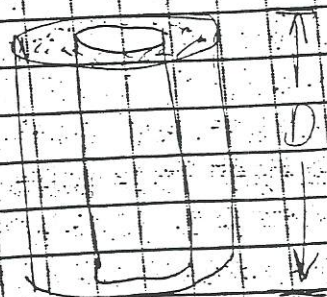
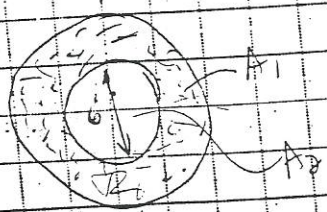
DRAFT

Outer Dia A₁ D
Inner Dia A₂ D
+ Inner Dia A₂ D

11.2
15.0

| DEPTH | DIA | AREA $\pi r^2 + \pi dh$ | VOLUME |
|-------|-----|-------------------------|----------|
| 10' | 10' | 393 sf | 509 cf |
| | 12' | 490 sf | 664 cf |
| | 14' | 594 sf | 848 cf |
| | 16' | 704 sf | 1,060 |
| | 18' | 820 sf | 1,300 cf |
| | 20' | 942 sf | 1,569 cf |
| 6' | 10' | 267 | |
| 6' | 12' | 339 | 664 cf |

357
66
449



449