# DESIGN SPECIFICATIONS
# OAK SPRING GIRL SCOUT CAMP
# SEASONAL VILLAGE #2
# IREDELL COUNTY, NORTH CAROLINA

As Built 9/20/2010

## SYSTEM TREATMENT

| | |
|---|---|
| Design Flow: | 1,920 G/D (Unreduced Flow)<br>512 G/D (Reduced Flow for Field) |
| Septic Tank Size: | 3,000 Gallon Precast Concrete with Baffled Wall |
| Effluent Filter: | ZABEL A-100 8x32 (Rated for 2,400 G/D or less) |
| Field Pumping Tank Size: | 3,000 Gallon Precast Concrete Tank (No Baffle) |

## NITRIFICATION FIELD

| | |
|---|---|
| Effluent Loading Rate: | 0.30 G/D/SF (Primary & Repair) |
| Supply Force Main Length: | 285 ~~260~~ LF |
| Supply Force Main Size: | 2" Diameter SCH 40 PVC Pressure-Rated Pipe |
| Total Linear Feet of Laterals: | 432 LF Total (25% Reduction), 6 Lines at 72 LF Ea.<br>9' Centers Minimum |
| Number of Chambers: | 18 Infiltrator Quick 4 Chambers/Lateral<br>108 Infiltrator Quick 4 Chambers Total |
| Pressure Manifolds: | 4" SCH 80 PVC W/ 6-½" Dia. SCH 80 PVC Taps |
| Manifold Placement: | Above Field |
| Flow Rate thru System: | 32.88 G/M |

## SYSTEM HEAD

| | |
|---|---|
| Elevation Head: | 18.99 Ft. |
| Operation Head: | 2.00 Ft. |
| Friction Head: | 6.36 ~~5.81~~ Ft. *(Includes minor losses)* |
| Total Dynamic Head (TDH): | 27.36 ~~26.80~~ Ft. |
| Pump Requirements: | 32.88 GPM @ ~~26.80~~ 27.36 Ft. TDH; Use Zoeller Model 140<br>1 HP–230V–1 PH *(Contractor to Verify)* |
| Control Panel: | SJE Rhombus Simplex Panel or Approved Equal |

## DOSING REQUIREMENTS

| | |
|---|---|
| Dosing Volume: | 205 Gallons |
| Depth of Water Pumped Per Dose: | 4.79 Inches |
| Pump Run Time per Dose: | 6.23 Minutes per Dose |
| Check Valve: | 2 Inch Diameter |
| Siphon Break Hole: | 5/32 Inch Diameter |

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Engineering
Surveying
Planning

**Project:** **Oak Springs Girl Scout Camp**
**Seasonal Village No. 2 (Flow Reduction)**

Job No. 08-04-08-EC

Date: 07/08/2010 Rev. Date: 07/08/2010

Seasonal Village #1 Sizing

**Design Flow**

| | | | |
|---|---|---|---|
| No. of Campers | 64 | Campers (inc. Supervisors) | (per Greg Copeland) |
| G/D/Camper | 8 | G/D/Camper | (per Flow Reduction request letter dated 5/3/2010) |
| DDF | 512 | G/D | Based on 8 G/D/Camper |
| LTAR | 0.30 | G/D/Sq. Ft. | Per Steve Hedrick, RS with ICHD |
| SF Trench Bottom | 1,706.67 | Sq. Ft. | |
| LF Drain Line | 568.89 | LF | |
| LF 25% Reduction | 426.67 | LF | |
| Length of Lines: | 71.11 | LF Ea. | *Site Plan* |
| # of Lines: | 6 | Lines | *Site Plan* |
| Drainline Check: | 426.67 | LF | *Length of Lines x # of Lines* |

*Use Infiltrator Quick 4 Chambers*

| | | |
|---|---|---|
| Chamber Length | 4 | LF Ea. |
| Chambers/Lateral | 18 | Chambers |
| Total # of Chambers | 108 | Chambers |

* Note: LF Required Based on Initial and repair. Repair area does not have to be installed at this time however, it does need to be remain undisturbed area set aside in case of initial system field failure.

**REPAIR**

| | | | |
|---|---|---|---|
| No. of Campers | 64 | Campers (inc. Supervisors) | (per Greg Copeland) |
| G/D/Camper | 8 | G/D/Camper | |
| DDF | 512 | G/D | Based on 8 G/D/Camper |
| LTAR | 0.30 | G/D/Sq. Ft. | Per Steve Hedrick, RS with ICHD |
| SF Trench Bottom | 1,706.67 | Sq. Ft. | |
| LF Drain Line | 568.89 | LF | |
| LF 25% Reduction | 426.67 | LF | |
| Length of Lines: | 71.11 | LF Ea. | *Site Plan* |
| # of Lines: | 6 | Lines | *Site Plan* |
| Drainline Check: | 426.67 | LF | *Length of Lines x # of Lines* |

*Use Infiltrator Quick 4 Chambers*

| | | |
|---|---|---|
| Chamber Length | 4 | LF Ea. |
| Chambers/Lateral | 18 | Chambers |
| Total # of Chambers | 108 | Chambers |

*Max Trench Depth for Initial and Repair Shall Be 30" per Steve Hedrick, RS with ICHD*

**Manifold Sizing**

Pressure Manifold: 4" Dia. Sch 80 w/ 6-1/2" Dia Sch 80 Orifices

| | | | |
|---|---|---|---|
| Determine Flow: | 32.88 | G/M | *# of Lines x 5.48* |
| Length of FM: | 260 | Ft. | *Site Plan* |
| Elev Head: | 19.0 | Ft. | *HI from pump to Manifold* |
| Operation Head: | 2.00 | Ft. | *Set by OSWW* |
| Friction Head: | ~~5.81~~ 6.36 | Ft. | *Friction Loss times length of FM* |
| Total Dynamic Head: | ~~25.80~~ 27.34 | Ft. | *Elev. HD + Oper. Head + Friction Head* |
| Pump Req'd: | 32.88 | G/M @ | ~~25.80~~ 27.36 TDH |

Use Zoeller Model 140
1 HP - 230 Volt - 1 Phase
*(Contractor to Verify Phase & Voltage Available)*

**Site Tank Sizing**

| | | | |
|---|---|---|---|
| Septic Tank: | 2,565 | Gallons | (∴ Use 3,000 Gallon Septic Tank) |
| Pump Tank: | 2,565 | Gallons | Pump Tank V = Septic Tank V |

| | |
|---|---|
| Pump Set Elev: | 808.51 |
| Pressure Manifold Elev: | 827.50 |

**Interpolation Calcs Friction Head in PVC Pipe**

*Friction Head 2" Dia. SCH 40 PVC*

| | |
|---|---|
| gpmX | 32.88 |
| p1 | 0.68 |
| p2 | 0.90 |
| gpm1 | 30 |
| gpm2 | 35 |
| hX(ft.) | 1.86 |

= Fill in Shaded Boxes

**Tank Sizing Calculations**

600 G/D to 1,500 G/D
$V = 1.17Q + 500$
1,500 G/D to 4,500 G/D
$V = 0.75Q + 1,125$
4,500 G/D and up
$V = Q$

V = Tank Volume
Q = Design Flow

(Note tanks are sized at 30 G/D/Person per T Angoli at NCDENR-DEH-OSWP Section)