2-15-2011

Final Report: Appendix E. Innovative Wastewater Disposal at Ted Williams Park, Lakeville – Supporting Information

Horsley Witten Group, Inc.

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APPENDIX E. INNOVATIVE WASTEWATER DISPOSAL AT TED WILLIAMS PARK, LAKEVILLE - SUPPORTING INFORMATION
FLOW FOR 3000 GALLON PER DAY SITE
SEPTIC TANK
1ST COMPARTMENT 200% OF TOTAL DAILY FLOW:
2 X 3000 GPD: 6,000 GPD
2ND COMPARTMENT 100% OF TOTAL DAILY FLOW:
1 X 3000 GPD: 3,000 GPD
TOTAL TANK CAPACITY REQUIRED: 9,000 GPD
USE TWO COMPARTMENT 11,000 GALLON SEPTIC TANK

SOIL ABSORPTION SYSTEM
LEACHING SYSTEM DESIGN CRITERIA
SOIL DESCRIPTION SYSTEM
LEACHING SYSTEM DESIGN CRITERIA
SOIL class: I
DESIGN PERCOLATION RATE: 6 MIN./IN.
TOTAL AREA REQUIRED: 8,572 S.F.
TOTAL LINEAR FEET OF DRIP TUBING REQUIRED: 4,286 L.F.
TOTAL AREA PROPOSED: 9,990 S.F.
TOTAL LINEAR FEET OF DRIP TUBING PROVIDED: 4,320 L.F.
TOTAL ALLOWABLE FLOW: 3,496 GPD
USE 135'L X 74'W DRIP DISPOSAL AREA

LEACHING SYSTEM DESIGN CRITERIA

TREATMENT SYSTEM DESIGN CRITERIA

SCHEDULE OF ELEVATIONS

LEN.$

TOP OF FOUNDATION
BUILDING SERVICE
GREASE TRAP SERVICE
3,000 GALLON GREASE TRAP
TANK VOLUME (CU. FT.) 735
PORTION OF TANK IN WATER AT SEASONAL HIGH GW (EL.=4.0') 29%
EQUIVALENT WEIGHT OF WATER DISPLACED (LB.) 13,236
SOIL COVER VOLUME (CU. FT.) 84
WEIGHT OF SOIL COVER, (LB.) 12,600
TANK WEIGHT (LB.) 36,800
TOTAL BALLAST (TANK + SOIL) (LB.) 49,400
BALLAST REQUIRED (BUOYANCY FORCE - TOTAL BALLAST) (LB.) -36,164
CONCRETE BALLAST REQUIRED (CU. FT.) NONE
BALLAST NOT REQUIRED

11,000 GALLON SEPTIC TANK
TANK VOLUME (CU. FT.) 2,336
PORTION OF TANK IN WATER AT SEASONAL HIGH GW (EL.=4.0') 45%
EQUIVALENT WEIGHT OF WATER DISPLACED (LB.) 65,902
SOIL COVER VOLUME (CU. FT.) 201
WEIGHT OF SOIL COVER, (LB.) 30,150
TANK WEIGHT (LB.) 104,000
TOTAL BALLAST (TANK + SOIL) (LB.) 134,150
BALLAST REQUIRED (BUOYANCY FORCE - TOTAL BALLAST) (LB.) -68,248
CONCRETE BALLAST REQUIRED (CU. FT.) NONE
BALLAST NOT REQUIRED

6,000 GALLON SEPTIC TANK
TANK VOLUME (CU. FT.) 1,346
PORTION OF TANK IN WATER AT SEASONAL HIGH GW (EL.=4.0') 33%
EQUIVALENT WEIGHT OF WATER DISPLACED (LB.) 27,475
SOIL COVER VOLUME (CU. FT.) 249
WEIGHT OF SOIL COVER, (LB.) 37,350
TANK WEIGHT (LB.) 63,000
TOTAL BALLAST (TANK + SOIL) (LB.) 100,350
BALLAST REQUIRED (BUOYANCY FORCE - TOTAL BALLAST) (LB.) -72,875
CONCRETE BALLAST REQUIRED (CU. FT.) NONE
BALLAST NOT REQUIRED

BUOYANCY CALCULATIONS

LOW GALLON GREASE TRAP
PORTION OF TANK IN WATER AT SEASONAL HIGH GW (EL.=4.0') 30%
EQUIVALENT WEIGHT OF WATER DISPLACED (LB.) 19,050
AMOUNT OF SOIL COVER, (LB.) 18,700
TOTAL BALLAST TANK = (LB.) 37,750
BALLAST REQUIRED (CU. FT.) CONCRETE BALLAST REQUIRED (CU. FT.) 73
BALLAST NOT REQUIRED

LOW GALLON GREASE TRAP
PORTION OF TANK IN WATER AT SEASONAL HIGH GW (EL.=4.0') 35%
EQUIVALENT WEIGHT OF WATER DISPLACED (LB.) 20,925
AMOUNT OF SOIL COVER, (LB.) 19,200
TOTAL BALLAST TANK = (LB.) 39,125
BALLAST REQUIRED (CU. FT.) CONCRETE BALLAST REQUIRED (CU. FT.) 81
BALLAST NOT REQUIRED

LOW GALLON GREASE TRAP
PORTION OF TANK IN WATER AT SEASONAL HIGH GW (EL.=4.0') 40%
EQUIVALENT WEIGHT OF WATER DISPLACED (LB.) 22,790
AMOUNT OF SOIL COVER, (LB.) 17,400
TOTAL BALLAST TANK = (LB.) 39,190
BALLAST REQUIRED (CU. FT.) CONCRETE BALLAST REQUIRED (CU. FT.) 94
BALLAST NOT REQUIRED

WASTEWATER DESIGN FLOW CALCULATION

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>NUMBER</th>
<th>UNITS</th>
<th>TYPE OF ESTABLISHMENT</th>
<th>FLOW RATE (GPD)</th>
<th>DESIGN FLOW (GPD)</th>
<th>KITCHEN WASTE (GAL)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FUNCTION HALL 200 SEATS</td>
<td>1</td>
<td>FUNCTION HALL</td>
<td>200 SEATS</td>
<td>3,000</td>
<td>3,000</td>
<td>3,000</td>
</tr>
</tbody>
</table>

WASTEWATER DESIGN FLOW CALCULATION
<table>
<thead>
<tr>
<th>ITEM NUMBER</th>
<th>DESCRIPTION</th>
<th>ESTIMATED QUANTITY</th>
<th>UNIT</th>
<th>UNIT PRICE</th>
<th>TOTAL AMOUNT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0</td>
<td>SEPTIC TANK INSTALLED (11,000 GALLON TWO COMPARTMENT TANK)</td>
<td>11,000</td>
<td>GAL</td>
<td>$1.95</td>
<td>$21,450</td>
</tr>
<tr>
<td>2.0</td>
<td>GREASE TRAP INSTALLED (3,000 GALLON TANK)</td>
<td>3,000</td>
<td>GAL</td>
<td>$1.95</td>
<td>$5,850</td>
</tr>
<tr>
<td>3.0</td>
<td>SYSTEM PIPING INSTALLED (4&quot; Sch 40 PVC)</td>
<td>210</td>
<td>FT</td>
<td>$60.00</td>
<td>$12,600</td>
</tr>
<tr>
<td>4.0</td>
<td>FORCEMAIN (FOUR 1&quot; SUPPLY AND ONE 1&quot; RETURN Sch 40 PVC)</td>
<td>590</td>
<td>FT</td>
<td>$15.00</td>
<td>$8,850</td>
</tr>
<tr>
<td>5.0</td>
<td>DRIP DISPOSAL PUMP CHAMBER (6,000 GALLON TANK)</td>
<td>6,000</td>
<td>GAL</td>
<td>$1.95</td>
<td>$11,700</td>
</tr>
<tr>
<td>6.0</td>
<td>DRIP DISPOSAL SYSTEM (OAKSON, INC.)</td>
<td>1</td>
<td>LS</td>
<td>$17,500.00</td>
<td>$17,500</td>
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<tr>
<td>7.0</td>
<td>DRIP DISPOSAL SYSTEM INSTALLATION (PUMP SYSTEM, HYDRAULIC UNIT, DRIP TUBING)</td>
<td>1</td>
<td>LS</td>
<td>$5,250.00</td>
<td>$5,250</td>
</tr>
<tr>
<td>8.0</td>
<td>ELECTRICAL (DRIP DISPOSAL SYSTEM PUMPS AND CONTROL PANEL)</td>
<td>17,500</td>
<td>40%</td>
<td>$7,000</td>
<td></td>
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<tr>
<td>9.0</td>
<td>ABANDON EXISTING SEPTIC COMPONENTS</td>
<td>1</td>
<td>LS</td>
<td>$2,000.00</td>
<td>$2,000</td>
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<td>10.0</td>
<td>SITE RESTORATION (LOAM AND SEED, PAVEMENT PATCHING)</td>
<td>1</td>
<td>LS</td>
<td>$10,000.00</td>
<td>$10,000</td>
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<tr>
<td>11.0</td>
<td>EROSION/SEDIMENT CONTROL</td>
<td>1</td>
<td>LS</td>
<td>$2,500.00</td>
<td>$2,500</td>
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</tbody>
</table>

SUB TOTAL $104,700

ESTIMATED BID PRICE $105,000
Owner Contingency 30% $32,000

ESTIMATED CONSTRUCTION BUDGET $137,000

NOTES:
CONTINGENCY IS PROVIDED BASED ON 75% DESIGN PLANS REFLECTING THE FACT THAT UNCERTAINTY EXISTS BETWEEN THIS STAGE AND CONSTRUCTION STAGE DRAWINGS. FINAL CONSTRUCTION ESTIMATES WILL BE DEPENDANT ON FACTORS RESOLVED AT THE CONSTRUCTION BIDDING STAGE.