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November 5, 2015

Bruce McBride

Subject: 4000 Malibu Canyon Road, Malibu Chapel and Memorial Park - Conformance Review

Dear Mr. McBride,

**PART I – SUMMARY TABLE**

**1) General Project information**

<b>Project Title:</b>	Malibu Chapel and Memorial Park
<b>Project Number</b>	444-03
<b>Project Address:</b>	4000 Malibu Canyon Road
<b>Project Engineer:</b>	John N Yaroslaski PE 60149
<b>Description:</b>	AOWTS Grease Interceptor, Equalization, AdvanTex, UV Disinfection, and evapotranspiration field
<b>Approving Agency:</b>	City of Malibu

**2) Project Design Parameters**

a) Flow

<b>Wastewater Flow [1]</b>	
Peak Flow prior to Equalization, gpd	3,500
Average Flow, gpd	1,031
Peak Flow after to Equalization, gpd	1,500
Design Equalized Flow, gpd	1,300
Design Flow, gpd	1,300

b) Constituents

<b>Influent</b>		<b>Effluent</b>	
BOD <sub>5</sub>	<500 mg/L	BOD <sub>5</sub>	20 mg/L
TSS	<500 mg/L	TSS	20 mg/L
TN	<70 mg/L	Nitrate	10 mg/L
		Fecal Coliform	<200 MPN/100mL
		Enterococcus	<104 MPN/100mL

**3) Project Design Summary [1] [2]**

a) Grease Interceptor

Manufacturer	Xerxes
Construction	Fiberglass
Required, gal	7,000



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b) Equalization Tank

Manufacturer	Xerxes
Construction	Fiberglass
Required, gal	10,700
As-Designed, gal	12,000

c) Treatment System Processing Tank (Primary, Recirculation, and Dosing)

Manufacturer	Xerxes
Construction	Fiberglass
As-Designed, gal	12,000

d) Treatment System Stage 1

Manufacturer	Orenco
Model	AX-100
Number of Units	2

e) Treatment System Stage 2

Manufacturer	Orenco
Model	AX-100
Number of Units	2

f) Disinfection System

Manufacturer	Norweco
Model	BK-2000CD
Number of Units	1
Total Capacity, gpd	2,000

g) Dispersal

Type	Subsurface Irrigation/Evapotranspiration			
	Zone No.	Area ft <sup>2</sup>	Application Rate gpsfd	Wastewater Applied gal
	1	59000	0.004536	268
	2	76000	0.004536	345
	3	37000	0.004536	168
	4	6700	0.004536	30
	5	42000	0.004536	191
	6	37000	0.004536	168
	7	40000	0.004536	181
	8	33000	0.004536	150
<b>TOTAL</b>		330700	0.004536	1500



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## **PART 2 – INTRODUCTION**

This report summarizes the results of the geologic investigation and provides engineering design for the onsite wastewater treatment/disposal system for the above noted site. The following work is to be performed on the subject site:

- Construction of a main chapel facility, parking facility, and free standing mausoleum structures.

## **PART 3 – SCOPE OF WORK**

We completed the following work for this study:

- Prepared this written report summarizing the soils engineering investigation.
- Provided engineering design criteria for the proposed onsite wastewater treatment/disposal system.

## **PART 4 – FINDINGS.**

### **I) Wastewater Flow [1]**

Wastewater flow was estimated based on “normal” and “maximum event” weeks. This data was used to determine a wastewater generation.

**Table I Basis of Flow**

	<b>Religious Facility</b>			<b>Total Flow gal/day</b>
	Attendees Per day Unit			
	Unit	Flow gal/day-unit	Flow gal/day	
<b>Normal Week</b>				<b>Average 860</b>
Monday	50	7	350	<b>350</b>
Tuesday	100	7	700	<b>700</b>
Wednesday	50	7	350	<b>350</b>
Thursday	10	7	70	<b>70</b>
Friday	50	7	350	<b>350</b>
Saturday	100	7	700	<b>700</b>
Sunday	500	7	3500	<b>3500</b>
<b>Max Event Week</b>				<b>Average 1800</b>
Monday	100	7	700	<b>700</b>
Tuesday	250	7	1750	<b>1750</b>
Wednesday	100	7	700	<b>700</b>
Thursday	250	7	1750	<b>1750</b>
Friday	100	7	700	<b>700</b>
Saturday	500	7	3500	<b>3500</b>
Sunday	500	7	3500	<b>3500</b>



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EEl assumed during a normal ten week period there would be a worst case flow of two consecutive max event weeks. An equalization tank was designed to allow a design equalized discharge of 1300 gallons per day.

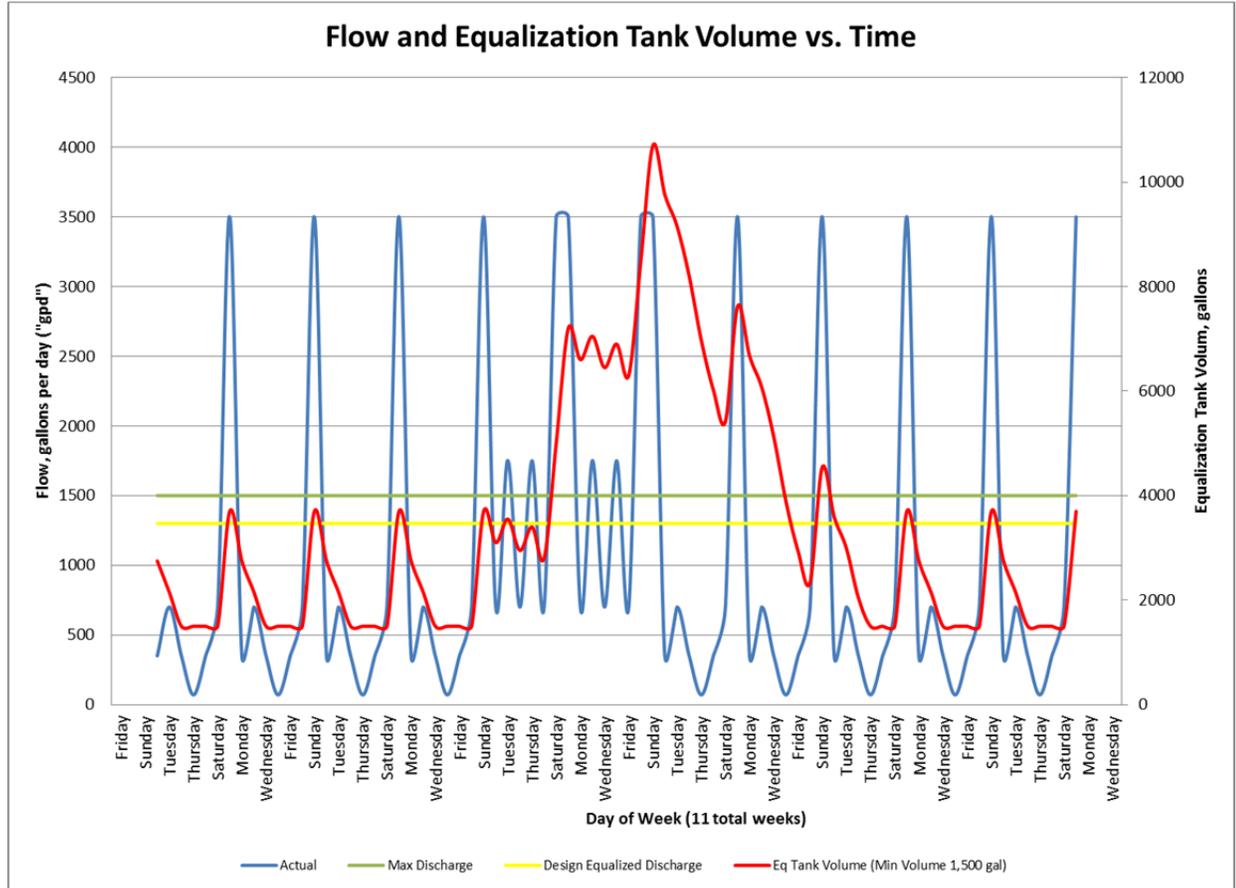


Figure 1 Flow and Equalization Tank Volume vs. Time

## PART 5 – PROPOSED DESIGN [1] [2]

### I) Treatment

Treatment shall be performed using AdvanTex Treatment Systems by Orenco Systems. AdvanTex Treatment Systems work like recirculating sand/gravel filters, which treat wastewater through a combination of physical, chemical, and biological processes. AdvanTex Treatment Systems use an inert nonwoven textile material to treat wastewater.

Three (3) AdvanTex AX20 Treatment units shall be used in the onsite wastewater treatment system design for the subject site. Two shall be Stage 1 filters and one shall be a Stage 2 filter.



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## 2) Disinfection

Disinfection shall be performed using a Bio-Kinetic Model BK-2000CD Wastewater Management System by Norweco. Treated wastewater shall flow from the recirculating splitter valve to the BK-2000CD by gravity.

Once inside the BK-2000CD the treated water is clarified, disinfected using Blue Crystal Chlorination System by Norweco, and dechlorinated using Bio-Neutralizer Dechlorination System by Norweco. The treated and disinfected wastewater shall flow by gravity from the BK-2000CD Treatment System to the dosing tank.

## 3) Disposal

Dispersal shall be performed using a subsurface drip irrigation system.

The subsurface drip dispersal system shall use Geoflow Wasteflow Subsurface Drip Systems. The Wasteflow drip system disperses of effluent below the ground surface through ½ inch pressure compensating tubing. The treated wastewater shall be pumped from the dosing compartment to the dispersal area shown on the site plan.

It is our option based on the loading rate of 0.004536 gallons per square foot per day infiltration testing would be difficult to perform and unnecessary. A passing rate for a loading rate of 0004536 gallons per square foot per day is 0.045 gallons per square foot per day. In our experience we have never experienced a soil type that would not accept an application rate that low.

**Table 2 Drip Irrigation System Sizing**

Type	Subsurface Irrigation/Evapotranspiration			
	Zone No.	Area ft <sup>2</sup>	Application Rate gpsfd	Wastewater Applied gal
	1	59000	0.004536	268
	2	76000	0.004536	345
	3	37000	0.004536	168
	4	6700	0.004536	30
	5	42000	0.004536	191
	6	37000	0.004536	168
	7	40000	0.004536	181
	8	33000	0.004536	150
<b>TOTAL</b>		330700	0.004536	1500

## PART 6 – DISTRIBUTION

This report should be sent to all the design consultants for the above project including: architect; structural engineer; geologist; geotechnical engineer; coastal engineer; civil engineer; and others.



## **PART 7 – WORK CITED**

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- [1] Ensitu Engineering Inc., "Design Calculations AOWTS Conformance Review," Ensitu Engineering Inc, Morro Bay, CA, 10/2015.
- [2] Ensitu Engineering Inc., "Malibu Chapel and Memorial Park, AOWTS Conformance Review Site Plan," Ensitu Engineering Inc., Morro Bay, CA, 11/02/2015.

Thank you for the opportunity to have been of service. If you have any questions, or require additional assistance please feel free to contact me at (805) 772-0150.

Sincerely,

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John N. Yaroslaski PE 60149  
Ensitu Engineering Inc.  
Project Engineer