Proposal number:	E/1331/19
Date:	01/07/2019

Job Name:	Burndell Road
Author:	AC

Site Elevations (m)		
Ground Level AOD	Max	6.700
	Min	6.520
Tank Level	Top	6.000
	Bottom	5.000
Cover Depth, z	Max, z_{max}	0.700
	Min, z_{min}	0.520
Ground water table depth AOD	z_w	5.700

Soil/Fill Characteristics	
γ (kNm^{-3})	19.00
ϕ (°)	38.00

VERTICAL

Area Due To Spread Of Point Load, A (m^2)		
Spread angle (degrees)		26.00
A (z_{max})		1.13
A (z_{min})		0.78

Load Area (m.m)	
0.20	0.60

Loading Case (Din 1072)		60/30.
Surcharge, q	10.00	kNm^{-2}
Cover Fill, c Max/Min [γ.z]	13.30	kNm^{-2}
	9.88	kNm^{-2}
Point, w	100.00	kN

Factors, λ	
Surcharge	1.50
Cover	1.35
Point	1.50

Factored Vertical Loading, (kNm^{-2})	
Surcharge [q_d=q.λ]	15.00
Cover [c_d=c.λ]	17.96
	13.34
Point [w_d=(w/A).λ]	132.45
	191.55

Design Vertical Loading, $\sigma_{v,d}$		
$\sigma_{v,d,}(z_{max})$	165.4	kNm^{-2}
$\sigma_{v,d,}(z_{min})$	219.9	

LATERAL (no ground water included)

Reference Depth	
h (m)	1.50

ϕ (rad)	0.66
k_a [1-sinϕ/ 1+sinϕ]	0.24

Loading Case (Din 1072)		60/30.
Surcharge, q	10.00	kNm^{-2}
Cover, c [γ.h]	28.50	kNm^{-2}

Factors, λ	
Permanent	1.35
Variable	1.50

Factored Lateral Loading, (kNm^{-2})	
Surcharge [$q_d=k_a.q.\lambda$]	3.57
Cover Fill [$c_d=k_a.c.\lambda$]	9.15

Design Lateral Loading, $\sigma_{l,d}$		
$\sigma_{l,d,}(z_{max})$	12.7	kNm^{-2}

UPLIFT

Water table elevation (m)	5.70
Water displaced D_{dw} (m)	0.70

Depth of tank D_T (m)	1.00

Factors λ	
Permanent Uplift	1.0
Permanent Resist press.	0.9

Case 1 $D_{dw}<D_T$	TRUE

Design Uplift kNm^{-2}	
U_d [$D_{dw}.\gamma_w.\lambda$]	7.00

Satisfactory:	TRUE

Design Resisting Pressure $\sigma_{r,d}$	
Cover Fill c_d [$\gamma.z.\lambda$]	8.89

Case 2 $D_{dw}>D_T$	FALSE

Submerged Cover z_s (m)	-0.30
Unsubmerged cover z_u (m)	0.82

Design Uplift (kNm^{-2})	
U_d [$D_T.\gamma_w.\lambda$]	10.00

Satisfactory:	TRUE

Design Resisting Pressure (kNm^{-2})	
Submerge cover $c_{d,s}$ [$\gamma'.z_s.\lambda$]	-2.43
Cover $c_{d,u}$ [$\gamma.z_u.\lambda$]	14.02
TOTAL	11.59