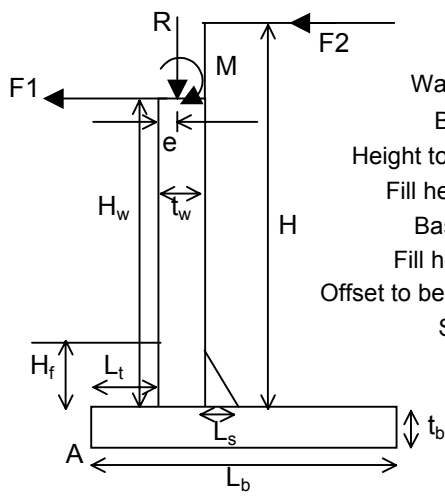


**Fixed Abutment - CASE 1 B/Fill + Construction Surcharge**



metres

Toe Length  $L_t = 1.100$

Wall Thickness  $t_w = 1.000$

Base Length  $L_b = 6.400$

Height to deck soffit  $H_w = 6.500$

Fill height on heel  $H = 6.500$

Base thickness  $t_b = 1.000$

Fill height on toe  $H_f = 0.000$

Offset to bearing centre  $e = 0.500$

Splay length  $L_s = 0.000$

$L_h = 4.300$

$K_a = 0.271$

$K_o = 0.426$

$\phi_{\text{backfill}} = 35$  degrees

$\phi_{\text{sliding}} = 30$  degrees

Surcharge = 12  $\text{kN/m}^2$

$R_{\text{dead}} = 0$   $\text{kN}$  (+ve downwards)

$R_{\text{live}} = 0$   $\text{kN}$  (+ve downwards)

$M = 0$   $\text{kNm}$  (+ve clockwise)

$F1 = 0$   $\text{kN}$  (+ve to left)

$F2 = 0$   $\text{kN}$  (+ve to left)

$\gamma_{\text{backfill}} = 19$   $\text{kN/m}^3$

$\gamma_{\text{conc}} = 25$   $\text{kN/m}^3$

**STABILITY**

	W	$M_A$	
Base	160.00	512.00	
Wall	162.50	260.00	
B/fill	531.05	2256.96	
S/charge	51.6	219.3	
R	0.00	0.00	
M		0.00	
$\Sigma$	<u>905.15</u>	<u>3248.26</u>	$W \tan \phi = 522.59$
H		$M_A$	
F1	0	0	
F2	0	0	
B/fill	144.81	-362.0258	
S/charge	24.39	-91.45914	
$\Sigma$	<u>169.20</u>	<u>-453.4849</u>	

**Factors of Safety**

Overturning = **7.16**

Sliding = **3.09**

**BEARING PRESSURES (Using  $K_a$ )**

$\Sigma P = 905.15$

$\Sigma M_{CL} = -101.70$

Pressure at toe = **156.33**

Pressure at heel = **126.53**

Pressure at front of wall = 151.21

Pressure at back of wall = 146.55

**WALL MOMENTS AND SHEARS (Using  $K_o$ )**

( $\gamma_{f3} = 1.1$  included for ULS)

Section	Depth (m)	ULS Shear	SLS Moment	S/charg	F & M	SLS Moment	ULS Moment
H/8	0.813	11.27	0.72	1.69	0.00	2.41	3.98
H/4	1.625	31.37	5.79	6.76	0.00	12.55	20.71
3H/8	2.438	60.29	19.56	15.20	0.00	34.76	57.35
H/2	3.250	98.04	46.35	27.02	0.00	73.38	121.08
5H/8	4.063	144.62	90.54	42.23	0.00	132.76	219.06
3H/4	4.875	200.01	156.45	60.81	0.00	217.25	358.47
7H/8	5.688	264.24	248.43	82.76	0.00	331.19	546.47
Splay top	6.500	337.29	370.84	108.10	0.00	478.94	790.24
H	6.5	337.29	370.84	108.10	0.00	478.94	790.24

Estimated effective depth  $d = 924$  mm

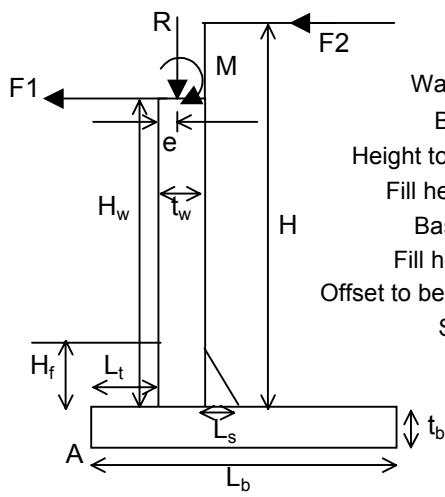
**BASE MOMENTS AND SHEARS (Using  $K_o$ )**

	ULS Shear	SLS Moment	ULS Moment
At $d$ from front of wall	44.32	2.61	3.91
At front of wall	260.76	98.83	146.97
At back of wall	258.67	446.82	768.08
At bottom of splay	258.67	446.82	768.08

**Bearing Pressures (Using  $K_o$ )**

	At Toe	At Heel
SLS	194.43	88.43
ULS	260.25	74.14

**Fixed Abutment - CASE 2 (Elastomeric Brng) B/Fill + HA Surchage + Deck Dead Load + Contraction**



- metres
- Toe Length  $L_t = 1.100$
  - Wall Thickness  $t_w = 1.000$
  - Base Length  $L_b = 6.400$
  - Height to deck soffit  $H_w = 6.500$
  - Fill height on heel  $H = 8.500$
  - Base thickness  $t_b = 1.000$
  - Fill height on toe  $H_f = 0.000$
  - Offset to bearing centre  $e = 0.500$
  - Splay length  $L_s = 0.000$
  - $L_h = 4.300$
  - $K_a = 0.271$
  - $K_o = 0.426$
- $\phi_{backfill} = 35$  degrees
  - $\phi_{sliding} = 30$  degrees
  - Surcharge = 10  $\text{kN/m}^2$
  - $R_{dead} = 191$   $\text{kN}$  (+ve downwards)
  - $R_{live} = 0$   $\text{kN}$  (+ve downwards)
  - $M = 0$   $\text{kNm}$  (+ve clockwise)
  - $F1 = 81$   $\text{kN}$  (+ve to left)
  - $F2 = 0$   $\text{kN}$  (+ve to left)
  - $\gamma_{backfill} = 19$   $\text{kN/m}^3$
  - $\gamma_{conc} = 25$   $\text{kN/m}^3$

**STABILITY**

	W	$M_A$	
Base	160.00	512.00	
Wall	162.50	260.00	
B/fill	694.45	2951.41	
S/chrg	43	182.75	
R	191.00	305.60	
M		0.00	
$\Sigma$	<u>1250.95</u>	<u>4211.76</u>	$W \tan\phi = 722.24$
	H	$M_A$	
F1	81	-607.5	
F2	0	0	
B/fill	232.34	-735.7436	
S/chrg	25.74	-122.2843	
$\Sigma$	<u>339.08</u>	<u>-1465.528</u>	

**Factors of Safety**

Overturning = **2.87**  
Sliding = **2.13**

**BEARING PRESSURES (Using  $K_a$ )**

$\Sigma P = 1250.95$   
 $\Sigma M_{CL} = -1301.96$

Pressure at toe = **386.18**  
Pressure at heel = **4.74**  
Pressure at front of wall = 320.62  
Pressure at back of wall = 261.02

**WALL MOMENTS AND SHEARS (Using  $K_o$ )**

( $\gamma_{f3} = 1.1$  included for ULS)

Section	Depth (m)	ULS Shear	SLS Moment	S/chrg	F & M	SLS Moment	ULS Moment
H/8	1.063	130.85	1.62	2.41	0.00	4.03	6.64
H/4	2.125	160.96	12.96	9.63	10.13	32.71	51.74
3H/8	3.188	206.17	43.73	21.66	96.19	161.58	245.45
H/2	4.250	266.47	103.66	38.51	182.25	324.42	495.20
5H/8	5.313	341.85	202.46	60.17	268.31	530.95	817.03
3H/4	6.375	432.33	349.85	86.65	354.38	790.88	1226.99
7H/8	7.438	537.91	555.55	117.94	440.44	1113.93	1741.09
Splay top	8.500	658.57	829.28	154.05	526.50	1509.82	2375.38
H	8.5	658.57	829.28	154.05	526.50	1509.82	2375.38

Estimated effective depth  $d = 924$  mm

**BASE MOMENTS AND SHEARS (Using  $K_o$ )**

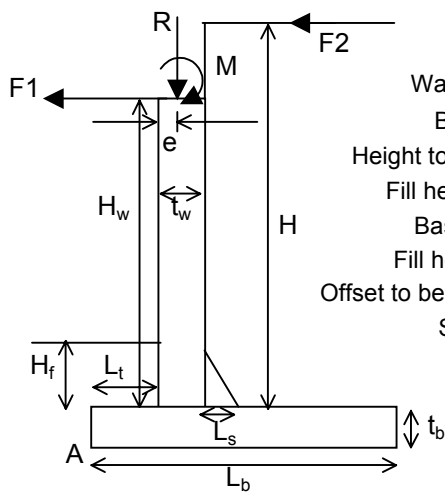
	ULS Shear	SLS Moment	ULS Moment
At $d$ from front of wall	120.47	7.34	10.68
At front of wall	669.36	272.06	386.39
At back of wall	658.05	1352.64	2032.71
At bottom of splay	658.05	1352.64	2032.71

**Bearing Pressures (Using  $K_o$ )**

	At Toe	At Heel	**
SLS	503.54	0.00	4.969
ULS	664.16	0.00	4.443

\*\* = adjusted base length for uplift

**Fixed Abutment - CASE 2a (Sliding Bearing) B/Fill + HA Surcharge + Deck Dead Load + Contraction**



Toe Length $L_t = 1.100$	$\phi_{backfill} = 35$	degrees
Wall Thickness $t_w = 1.000$	$\phi_{sliding} = 30$	degrees
Base Length $L_b = 6.400$	Surcharge = 10	$\text{kN/m}^2$
Height to deck soffit $H_w = 6.500$	$R_{dead} = 191$	$\text{kN}$ (+ve downwards)
Fill height on heel $H = 8.500$	$R_{live} = 0$	$\text{kN}$ (+ve downwards)
Base thickness $t_b = 1.000$	$M = 0$	$\text{kNm}$ (+ve clockwise)
Fill height on toe $H_f = 0.000$	$F1 = 16$	$\text{kN}$ (+ve to left)
Offset to bearing centre $e = 0.500$	$F2 = 0$	$\text{kN}$ (+ve to left)
Splay length $L_s = 0.000$	$\gamma_{backfill} = 19$	$\text{kN/m}^3$
$L_h = 4.300$	$\gamma_{conc} = 25$	$\text{kN/m}^3$
	$K_a = 0.271$	
	$K_o = 0.426$	

**STABILITY**

	W	$M_A$	
Base	160.00	512.00	
Wall	162.50	260.00	
B/fill	694.45	2951.41	
S/charge	43	182.75	
R	191.00	305.60	
M		0.00	
$\Sigma =$	<u>1250.95</u>	<u>4211.76</u>	$W \tan\phi = 722.24$
	H	$M_A$	
F1	16	-120	
F2	0	0	
B/fill	232.34	-735.7436	
S/charge	25.74	-122.2843	
$\Sigma =$	<u>274.08</u>	<u>-978.0279</u>	

**Factors of Safety**

Overturning = **4.31**  
Sliding = **2.64**

**BEARING PRESSURES (Using  $K_a$ )**

$\Sigma P = 1250.95$	Pressure at toe = <b>314.77</b>
$\Sigma M_{CL} = -814.46$	Pressure at heel = <b>76.16</b>
	Pressure at front of wall = 273.75
	Pressure at back of wall = 236.47

**WALL MOMENTS AND SHEARS (Using  $K_o$ )**

( $\gamma_{f3} = 1.1$  included for ULS)

Section	Depth (m)	ULS Shear	SLS Moment	S/charg	F & M	SLS Moment	ULS Moment
H/8	1.063	37.90	1.62	2.41	0.00	4.03	6.64
H/4	2.125	68.01	12.96	9.63	2.00	24.59	40.13
3H/8	3.188	113.22	43.73	21.66	19.00	84.39	135.07
H/2	4.250	173.52	103.66	38.51	36.00	178.17	286.06
5H/8	5.313	248.90	202.46	60.17	53.00	315.63	509.14
3H/4	6.375	339.38	349.85	86.65	70.00	506.50	820.33
7H/8	7.438	444.96	555.55	117.94	87.00	760.49	1235.67
Splay top	8.500	565.62	829.28	154.05	104.00	1087.32	1771.20
H	8.5	565.62	829.28	154.05	104.00	1087.32	1771.20

Estimated effective depth  $d = 924$  mm

**BASE MOMENTS AND SHEARS (Using  $K_o$ )**

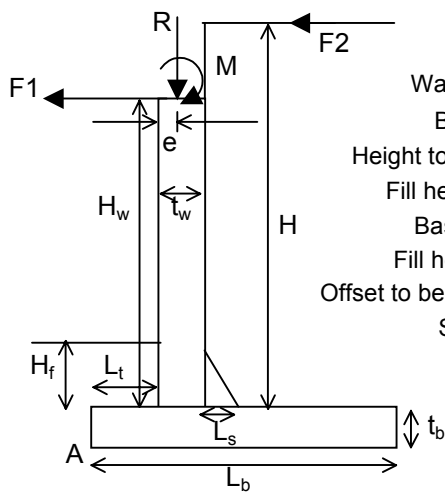
	ULS Shear	SLS Moment	ULS Moment
At $d$ from front of wall	92.58	5.53	8.19
At front of wall	528.40	204.94	301.58
At back of wall	457.83	979.65	1596.46
At bottom of splay	457.83	979.65	1596.46

**Bearing Pressures (Using  $K_o$ )**

	At Toe	At Heel	**
SLS	385.52	5.40	
ULS	514.84	0.00	5.732

\*\* = adjusted base length for uplift

**Fixed Abutment - CASE 3 B/Fill + HA Surcharge & Braking behind Abutment + Deck Dead Load**



metres  
 Toe Length  $L_t = 1.100$   
 Wall Thickness  $t_w = 1.000$   
 Base Length  $L_b = 6.400$   
 Height to deck soffit  $H_w = 6.500$   
 Fill height on heel  $H = 8.500$   
 Base thickness  $t_b = 1.000$   
 Fill height on toe  $H_f = 0.000$   
 Offset to bearing centre  $e = 0.500$   
 Splay length  $L_s = 0.000$   
 $L_h = 4.300$   
 $K_a = 0.271$   
 $K_o = 0.426$

$\phi_{\text{backfill}} = 35$  degrees  
 $\phi_{\text{sliding}} = 30$  degrees  
 Surcharge = 10  $\text{kN/m}^2$   
 $R_{\text{dead}} = 191$   $\text{kN}$  (+ve downwards)  
 $R_{\text{live}} = 0$   $\text{kN}$  (+ve downwards)  
 $M = 0$   $\text{kNm}$  (+ve clockwise)  
 $F1 = 0$   $\text{kN}$  (+ve to left)  
 $F2 = 39$   $\text{kN}$  (+ve to left)  
 $\gamma_{\text{backfill}} = 19$   $\text{kN/m}^3$   
 $\gamma_{\text{conc}} = 25$   $\text{kN/m}^3$

**STABILITY**

	W	$M_A$	
Base	160.00	512.00	
Wall	162.50	260.00	
B/fill	694.45	2951.41	
S/charge	43	182.75	
R	191.00	305.60	
M		0.00	
$\Sigma =$	1250.95	4211.76	$W \tan\phi = 722.24$
H		$M_A$	
F1	0	0	
F2	39	-370.5	
B/fill	232.34	-735.7436	
S/charge	25.74	-122.2843	
$\Sigma =$	297.08	-1228.528	

**Factors of Safety**

Overturning = **3.43**  
 Sliding = **2.43**

**BEARING PRESSURES (Using  $K_a$ )**

$\Sigma P = 1250.95$   
 $\Sigma M_{CL} = -1064.96$   
 Pressure at toe = **351.46**  
 Pressure at heel = **39.46**  
 Pressure at front of wall = 297.84  
 Pressure at back of wall = 249.09

**WALL MOMENTS AND SHEARS (Using  $K_o$ )**

( $\gamma_{f3} = 1.1$  included for ULS)

Section	Depth (m)	ULS Shear	SLS Moment	S/charg	F & M	SLS Moment	ULS Moment
H/8	1.063	68.65	1.62	2.41	41.44	45.46	65.90
H/4	2.125	98.76	12.96	9.63	82.88	105.46	155.78
3H/8	3.188	143.96	43.73	21.66	124.31	189.71	285.67
H/2	4.250	204.26	103.66	38.51	165.75	307.92	471.60
5H/8	5.313	279.65	202.46	60.17	207.19	469.82	729.63
3H/4	6.375	370.13	349.85	86.65	248.63	685.13	1075.76
7H/8	7.438	475.70	555.55	117.94	290.06	963.56	1526.05
Splay top	8.500	596.36	829.28	154.05	331.50	1314.82	2096.53
H	8.5	596.36	829.28	154.05	331.50	1314.82	2096.53

Estimated effective depth  $d = 924$  mm

**BASE MOMENTS AND SHEARS (Using  $K_o$ )**

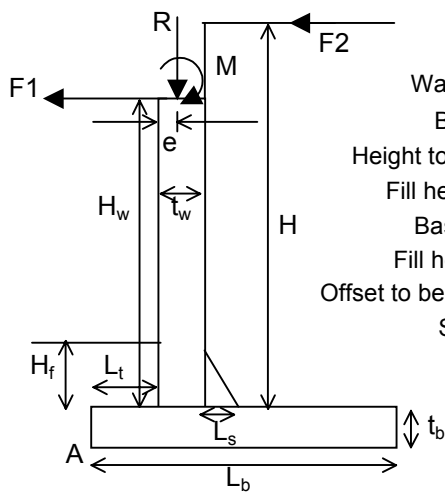
	ULS Shear	SLS Moment	ULS Moment
At $d$ from front of wall	105.17	6.34	9.31
At front of wall	593.12	234.88	340.23
At back of wall	552.53	1177.82	1834.02
At bottom of splay	552.53	1177.82	1834.02

**Bearing Pressures (Using  $K_o$ )**

	At Toe	At Heel	**
SLS	438.35	0.00	5.708
ULS	582.09	0.00	5.070

\*\* = adjusted base length for uplift

**Fixed Abutment - CASE 4 B/Fill + HB Surcharge + Deck Dead Load**



metres  
 Toe Length  $L_t = 1.100$   
 Wall Thickness  $t_w = 1.000$   
 Base Length  $L_b = 6.400$   
 Height to deck soffit  $H_w = 6.500$   
 Fill height on heel  $H = 8.500$   
 Base thickness  $t_b = 1.000$   
 Fill height on toe  $H_f = 0.000$   
 Offset to bearing centre  $e = 0.500$   
 Splay length  $L_s = 0.000$   
 $L_h = 4.300$

$\phi_{\text{backfill}} = 35$  degrees  
 $\phi_{\text{sliding}} = 30$  degrees  
 Surcharge = 20  $\text{kN/m}^2$   
 $R_{\text{dead}} = 191$   $\text{kN}$  (+ve downwards)  
 $R_{\text{live}} = 0$   $\text{kN}$  (+ve downwards)  
 $M = 0$   $\text{kNm}$  (+ve clockwise)  
 $F_1 = 0$   $\text{kN}$  (+ve to left)  
 $F_2 = 0$   $\text{kN}$  (+ve to left)  
 $\gamma_{\text{backfill}} = 19$   $\text{kN/m}^3$   
 $\gamma_{\text{conc}} = 25$   $\text{kN/m}^3$

$K_a = 0.271$   
 $K_o = 0.426$

**STABILITY**

	W	$M_A$	
Base	160.00	512.00	
Wall	162.50	260.00	
B/fill	694.45	2951.41	
S/charge	86	365.5	
R	191.00	305.60	
M		0.00	
$\Sigma$	<u>1293.95</u>	<u>4394.51</u>	$W \tan \phi = 747.06$
H		$M_A$	
F1	0	0	
F2	0	0	
B/fill	232.34	-735.7436	
S/charge	51.49	-244.5685	
$\Sigma$	<u>283.83</u>	<u>-980.3122</u>	

**Factors of Safety**

Overturning = **4.48**  
 Sliding = **2.63**

**BEARING PRESSURES (Using  $K_a$ )**

$\Sigma P = 1293.95$   
 $\Sigma M_{CL} = -816.74$   
 Pressure at toe = **321.82**  
 Pressure at heel = **82.54**  
 Pressure at front of wall = 280.69  
 Pressure at back of wall = 243.31

**WALL MOMENTS AND SHEARS (Using  $K_o$ )**

( $\gamma_{f3} = 1.1$  included for ULS)

Section	Depth (m)	ULS Shear	SLS Moment	S/charg	F & M	SLS Moment	ULS Moment
H/8	1.063	22.50	1.62	4.81	0.00	6.43	10.62
H/4	2.125	60.09	12.96	19.26	0.00	32.21	53.15
3H/8	3.188	112.77	43.73	43.33	0.00	87.06	143.64
H/2	4.250	180.54	103.66	77.02	0.00	180.68	298.13
5H/8	5.313	263.40	202.46	120.35	0.00	322.81	532.63
3H/4	6.375	361.36	349.85	173.30	0.00	523.15	863.20
7H/8	7.438	474.41	555.55	235.88	0.00	791.43	1305.87
Splay top	8.500	602.54	829.28	308.09	0.00	1137.37	1876.66
H	8.5	602.54	829.28	308.09	0.00	1137.37	1876.66

Estimated effective depth  $d = 924$  mm

**BASE MOMENTS AND SHEARS (Using  $K_o$ )**

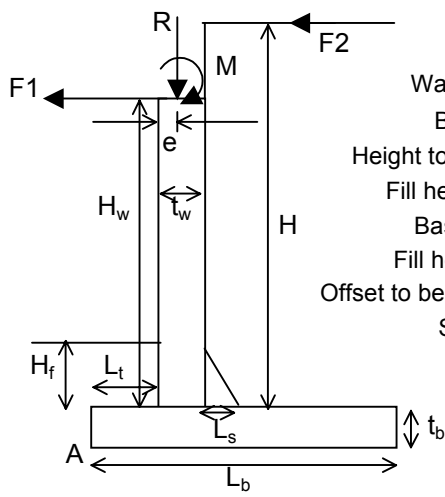
	ULS Shear	SLS Moment	ULS Moment
At $d$ from front of wall	96.42	5.61	8.53
At front of wall	550.23	208.32	314.06
At back of wall	495.00	1003.47	1700.02
At bottom of splay	495.00	1003.47	1700.02

**Bearing Pressures (Using  $K_o$ )**

	At Toe	At Heel	**
SLS	390.96	13.40	
ULS	535.03	0.00	5.708

\*\* = adjusted base length for uplift

**Fixed Abutment - CASE 5 B/Fill + HA Surcharge + Dead & HB on Deck**



metres  
 Toe Length  $L_t = 1.100$   
 Wall Thickness  $t_w = 1.000$   
 Base Length  $L_b = 6.400$   
 Height to deck soffit  $H_w = 6.500$   
 Fill height on heel  $H = 8.500$   
 Base thickness  $t_b = 1.000$   
 Fill height on toe  $H_f = 0.000$   
 Offset to bearing centre  $e = 0.500$   
 Splay length  $L_s = 0.000$   
 $L_h = 4.300$

$\phi_{\text{backfill}} = 35$  degrees  
 $\phi_{\text{sliding}} = 30$  degrees  
 Surcharge = 10  $\text{kN/m}^2$   
 $R_{\text{dead}} = 191$   $\text{kN}$  (+ve downwards)  
 $R_{\text{live}} = 167$   $\text{kN}$  (+ve downwards)  
 $M = 0$   $\text{kNm}$  (+ve clockwise)  
 $F1 = 0$   $\text{kN}$  (+ve to left)  
 $F2 = 0$   $\text{kN}$  (+ve to left)  
 $\gamma_{\text{backfill}} = 19$   $\text{kN/m}^3$   
 $\gamma_{\text{conc}} = 25$   $\text{kN/m}^3$

$K_a = 0.271$   
 $K_o = 0.426$

**STABILITY**

	W	$M_A$
Base	160.00	512.00
Wall	162.50	260.00
B/fill	694.45	2951.41
S/charge	43	182.75
R	358.00	572.80
M		0.00
$\Sigma =$	<u>1417.95</u>	<u>4478.96</u>
H		$M_A$
F1	0	0
F2	0	0
B/fill	232.34	-735.7436
S/charge	25.74	-122.2843
$\Sigma =$	<u>258.08</u>	<u>-858.0279</u>

$W \tan \phi = 818.65$

**Factors of Safety**

Overturning = **5.22**  
 Sliding = **3.17**

**BEARING PRESSURES (Using  $K_a$ )**

$\Sigma P = 1417.95$   
 $\Sigma M_{CL} = -961.66$

Pressure at toe = **362.42**  
 Pressure at heel = **80.69**  
 Pressure at front of wall = 314.00  
 Pressure at back of wall = 269.98

**WALL MOMENTS AND SHEARS (Using  $K_o$ )**

( $\gamma_{f3} = 1.1$  included for ULS)

Section	Depth (m)	ULS Shear	SLS Moment	S/charg	F & M	SLS Moment	ULS Moment
H/8	1.063	15.02	1.62	2.41	0.00	4.03	6.64
H/4	2.125	45.13	12.96	9.63	0.00	22.59	37.27
3H/8	3.188	90.34	43.73	21.66	0.00	65.39	107.90
H/2	4.250	150.64	103.66	38.51	0.00	142.17	234.58
5H/8	5.313	226.02	202.46	60.17	0.00	262.63	433.35
3H/4	6.375	316.50	349.85	86.65	0.00	436.50	720.23
7H/8	7.438	422.08	555.55	117.94	0.00	673.49	1111.26
Splay top	8.500	542.74	829.28	154.05	0.00	983.32	1622.48
H	8.5	542.74	829.28	154.05	0.00	983.32	1622.48

Estimated effective depth  $d = 924$  mm

**BASE MOMENTS AND SHEARS (Using  $K_o$ )**

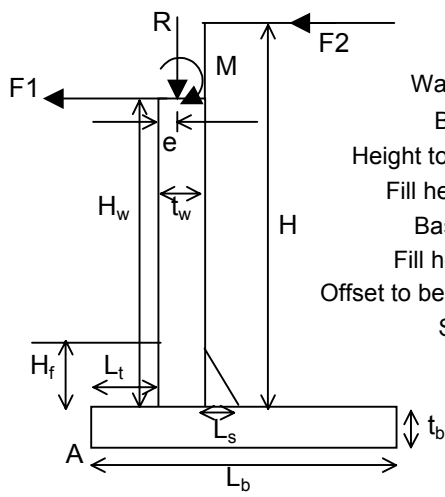
	ULS Shear	SLS Moment	ULS Moment
At $d$ from front of wall	106.62	6.50	9.43
At front of wall	610.33	240.99	347.92
At back of wall	326.65	853.22	1402.19
At bottom of splay	326.65	853.22	1402.19

**Bearing Pressures (Using  $K_o$ )**

	At Toe	At Heel	**
SLS	448.77	4.77	
ULS	588.30	0.00	5.868

\*\* = adjusted base length for uplift

**Fixed Abutment - CASE 6 B/Fill + HA Surcharge + Dead & HA & Braking on Deck**



metres			
Toe Length $L_t = 1.100$	$\phi_{backfill} = 35$	degrees	
Wall Thickness $t_w = 1.000$	$\phi_{sliding} = 30$	degrees	
Base Length $L_b = 6.400$	Surcharge = 10	$\text{kN/m}^2$	
Height to deck soffit $H_w = 6.500$	$R_{dead} = 191$	$\text{kN (+ve downwards)}$	
Fill height on heel $H = 8.500$	$R_{live} = 98$	$\text{kN (+ve downwards)}$	
Base thickness $t_b = 1.000$	$M = 0$	$\text{kNm (+ve clockwise)}$	
Fill height on toe $H_f = 0.000$	$F1 = 39$	$\text{kN (+ve to left)}$	
Offset to bearing centre $e = 0.500$	$F2 = 0$	$\text{kN (+ve to left)}$	
Splay length $L_s = 0.000$	$\gamma_{backfill} = 19$	$\text{kN/m}^3$	
$L_h = 4.300$	$\gamma_{conc} = 25$	$\text{kN/m}^3$	
	$K_a = 0.271$		
	$K_o = 0.426$		

**STABILITY**

	W	$M_A$	
Base	160.00	512.00	
Wall	162.50	260.00	
B/fill	694.45	2951.41	
S/charge	43	182.75	
R	289.00	462.40	
M		0.00	
$\Sigma =$	<u>1348.95</u>	<u>4368.56</u>	$W \tan\phi = 778.82$
	H	$M_A$	
F1	39	-292.5	
F2	0	0	
B/fill	232.34	-735.7436	
S/charge	25.74	-122.2843	
$\Sigma =$	<u>297.08</u>	<u>-1150.528</u>	

**Factors of Safety**

Overturning = **3.80**  
Sliding = **2.62**

**BEARING PRESSURES (Using  $K_a$ )**

$\Sigma P = 1348.95$	Pressure at toe = <b>378.32</b>
$\Sigma M_{CL} = -1143.76$	Pressure at heel = <b>43.23</b>
	Pressure at front of wall = 320.72
	Pressure at back of wall = 268.37

**WALL MOMENTS AND SHEARS (Using  $K_o$ )**

( $\gamma_{f3} = 1.1$  included for ULS)

Section	Depth (m)	ULS Shear	SLS Moment	S/charg	F & M	SLS Moment	ULS Moment
H/8	1.063	70.79	1.62	2.41	0.00	4.03	6.64
H/4	2.125	100.90	12.96	9.63	4.88	27.46	44.24
3H/8	3.188	146.11	43.73	21.66	46.31	111.71	174.13
H/2	4.250	206.41	103.66	38.51	87.75	229.92	360.06
5H/8	5.313	281.79	202.46	60.17	129.19	391.82	618.09
3H/4	6.375	372.27	349.85	86.65	170.63	607.13	964.22
7H/8	7.438	477.85	555.55	117.94	212.06	885.56	1414.51
Splay top	8.500	598.51	829.28	154.05	253.50	1236.82	1984.99
H	8.5	598.51	829.28	154.05	253.50	1236.82	1984.99

Estimated effective depth  $d = 924$  mm

**BASE MOMENTS AND SHEARS (Using  $K_o$ )**

	ULS Shear	SLS Moment	ULS Moment
At $d$ from front of wall	112.47	6.88	9.96
At front of wall	636.70	254.81	364.65
At back of wall	469.76	1097.71	1717.32
At bottom of splay	469.76	1097.71	1717.32

**Bearing Pressures (Using  $K_o$ )**

	At Toe	At Heel	**
SLS	473.30	0.00	5.783
ULS	620.13	0.00	5.233

\*\* = adjusted base length for uplift