Spread Footing Analysis

Spread Footing Data Input

Footing Footprint Data: Footing width is in plane of load, Length is perpendicular to plane of load

Footing Footprint Data				Rectangular Bars Dimensional Data				Footing Bar Cover Data		
Width	Length	Depth	Width	Length	X Angle	Y Angle	Z Angle	Top Bars	Bot Bars	
12.00	18.00	2.00	2.00	2.00	0.00	0.00	0.00	3.00	3.00	

Footing Footprint Data: Footing Footprint Data is in the Global Coordinate System

Global Bars Dimensional Data			Cover
X Angle	Y Angle	Z Angle	
0.00	0.00	0.00	3.00

Analysis Results

Bar Dimensions			F X FOR	F Y FOR	F Z FOR	Group Bars Reinforcing			
Bars Bot	Bars Bot	Bars Bot	Overturning	Overturning	Sliding	Bars Bot	Bars Bot	Bars Bot	Bars Bot
Footprint Perpendicular			Bars Bot	Bars Bot					
Dir	Dir	Dir	Dir	Dir	Dir				
15.00	15.00	15.00	15.00	15.00	15.00				
OK	OK	OK	OK	OK	OK				

Concrete Bar Reinforcing Bars (Note: Footing is CIRCULAR FTING PROFILE)

Footprint Bar Dimensions			Footing Bar Dimensions			Footing Bar Dimensions			Group Bars Reinforcing			
Footprint Bar	Footing Bars		Footing Bars			Footing Bars Footprint Bars Intersection			Group Cover	Bars	Bars	Bars Length
Strength (Fc)	Cover Bot Cover (cc)	Bar Dia	Bar Dia	Bars	Bars	Bars	Bars	Bars	Bars	Bars	Bars	as Isolated
3000	3.00	0.50	0.50	0	0	0	0	0	0	0	0	0.75

Analysis Results

	Bar Diameter	Bar Area	Number of Bars	Bar Spacing	Bar Length
	Bar Diameter	Bar Area	Number of Bars	Bar Spacing	Bar Length
Footing Bars	0.50	0.196	15.00	1.00	15.00
Footprint Bar	0.50	0.196	15.00	1.00	15.00
Footing Bars Footprint Bars Intersection	0.00	0.000	0.00	0.00	0.00
Group Bars	0.00	0.000	0.00	0.00	0.00

Footing Bars	2	28.00	30.0	Footing	Bot
Footprint Bar	Max Strength	60.00	60.0	Footprint	Bot
Footing Bar	Max Strength	60.00	60.0	Footing	Bot
				Footprint	Bot

Assumed Unit Weight of Soil

Soil Bearing of Water Dam Foundations	20.00	kips
Allow Volume of Concrete Dam Foundations	47.0000	

		Factor Combines
Group 1	DL	WL = WIND FORCES PERPENDICULAR TO WORK
Group 2 Case 1	DL + WL + PW	1.00
Group 2 Case 2	DL + PW + WL	1.00
Group 2 Case 3	DL + PW + 0.5 * WL	1.00
Group 2 Case 4	DL + LE + WL	1.00
Group 2 Case 5	DL + LE + 0.5 * WL	1.00

WL = WIND FORCES PERPENDICULAR TO WORK
WL = WIND FORCES TRANSVERSE (PARALLEL) TO WORK
Minimum and pressure of 20 psf
Minimum and pressure of 20 psf

LOAD COMBINATION RESULTS Loads and Moments are for both (each)

Loads include overtrained

		Footing Dimensions				Footprint Bearing Pressure				Resultant at Base of Footing				F X FOR	F Y FOR	F Z FOR
Resultant		Bearing	Width	Length	Depth	Center	Area	Bearing	Total	Moment X	Moment Y	Moment Z	Total	Sliding Kip	Sliding Kip	Sliding Kip
Left Support		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			
Left Support	WL1	12.00	2.00	2.00	1.00	1.00	4.00	12.00	12.00	0.00	0.00	0.00	0.00	N/A	N/A	N/A
Right Support		12.00	2.00	2.00	1.00	1.00	4.00	12.00	12.00	147.00	0.00	0.00	147.00	27.00	7.00	10.00
Left Support	WL2	12.00	2.00	2.00	1.00	1.00	4.00	12.00	12.00	0.00	0.00	0.00	0.00	10.00	10.00	10.00
Right Support		12.00	2.00	2.00	1.00	1.00	4.00	12.00	12.00	147.00	0.00	0.00	147.00	27.00	7.00	10.00
Left Support	WL3	12.00	2.00	2.00	1.00	1.00	4.00	12.00	12.00	0.00	0.00	0.00	0.00	10.00	10.00	10.00
Right Support		12.00	2.00	2.00	1.00	1.00	4.00	12.00	12.00	147.00	0.00	0.00	147.00	27.00	7.00	10.00
Left Support	WL4	12.00	2.00	2.00	1.00	1.00	4.00	12.00	12.00	0.00	0.00	0.00	0.00	10.00	10.00	10.00
Right Support		12.00	2.00	2.00	1.00	1.00	4.00	12.00	12.00	147.00	0.00	0.00	147.00	27.00	7.00	10.00
Left Support	WL5	12.00	2.00	2.00	1.00	1.00	4.00	12.00	12.00	0.00	0.00	0.00	0.00	10.00	10.00	10.00
Right Support		12.00	2.00	2.00	1.00	1.00	4.00	12.00	12.00	147.00	0.00	0.00	147.00	27.00	7.00	10.00
Left Support	WL6	12.00	2.00	2.00	1.00	1.00	4.00	12.00	12.00	0.00	0.00	0.00	0.00	10.00	10.00	10.00
Right Support		12.00	2.00	2.00	1.00	1.00	4.00	12.00	12.00	147.00	0.00	0.00	147.00	27.00	7.00	10.00
Max Check		12.00	2.00	2.00	1.00	1.00	4.00	12.00	12.00	147.00	0.00	0.00	147.00	27.00	7.00	10.00

Assumed Primary Factor for Sliding is

Uplift and Bearing Checks (Article 13.7.5)

Loads include overtrained

		Max Pressure			
Resultant		Bot Left	Bot Right	Top Left	Top Right
Left Support		0.00	0.00	0.00	0.00
Right Support	WL1	0.07	0.07	0.07	0.07
Left Support		0.00	0.00	0.00	0.00
Right Support	WL2	0.07	0.07	0.09	0.21
Left Support		0.00	0.00	0.00	0.00
Right Support	WL3	0.07	0.07	0.09	0.21
Left Support		0.00	0.00	0.00	0.00
Right Support	WL4	0.07	0.07	0.09	0.21
Left Support		0.00	0.00	0.00	0.00
Right Support	WL5	0.07	0.07	0.09	0.21
Left Support		0.00	0.00	0.00	0.00
Right Support	WL6	0.07	0.07	0.09	0.21
	Max *	0.07	0.07	0.09	0.21
	Min *	0.00	0.00	0.00	0.00

Longitudinal Footing Reinforcing

Footprint Length	Footprint Width	Footing Thickness	Cover (cc)	Bar Dia	Bar Area	Bar Area Dia	Bar Weight	d
2.00	2.00	2.00	3	0.50	0.196	0.196	0.668	1.75

Moment = 2809.80 (kips-kips)
ϕ = 0.9000
As req. = 7.82 (in/ft-in^2)

Number of Bars 15 (based on design)
Bar Spacing 7.470 inches (based on design)
Max Spacing = 18.00 inches
Number of Bars 12 (based on max-spacing)
Number of Bars 24 (top and bottom)
Bar Length 15.000 feet
Bar Length 17.000 feet

Shear = 17.44 (kips)
Shear Allow = 19.60 (psi)
Allow vc = 52.53 (psi)
OK

Transverse Footing Reinforcing

Footprint Length	Footprint Width	Footing Thickness	Cover (cc)	Bar Dia	Bar Area	Bar Area Dia	Bar Weight	d
2.00	2.00	2.00	3	0.50	0.196	0.196	0.668	1.75

Moment = 2809.80 (kips-kips)
ϕ = 0.9000
As req. = 8.89 (in/ft-in^2)

Number of Bars 30 (based on design)
Bar Spacing 6.944 inches (based on design)
Max Spacing = 18.00 inches
Number of Bars 12 (based on max-spacing)
Number of Bars 24 (top and bottom)
Bar Length 15.000 feet
Bar Length 17.000 feet

Shear = 19.50 (kips)
Shear Allow = 19.60 (psi)
Allow vc = 52.53 (psi)
OK

Rectangular Stem Reinforcing (side Face) NOT APPLICABLE SEE CIRCULAR STEM

Footprint Length	Footprint Width	Stem Thickness	Cover (cc)	Bar Dia	Bar Area	Bar Area Dia	Bar Weight	d
2.00	2.00	2.00	3	0.50	0.196	0.196	0.668	1.75

Moment = 436.35 (kips-kips)
ϕ = 0.900
As req. = 0.00 (in/ft-in^2)

Number of Bars 1 (based on design)
Bar Spacing 18.000 inches (based on design)
Max Spacing = 18.00 inches
Number of Bars 1 (based on max-spacing)
Number of Bars 2 (both face)
Bar Length 9.000 feet
Bar Length 9.000 feet

Shear = 1.25 (kips)
Shear Allow = 0.00 (psi)
Allow vc = 52.53 (psi)
OK

Rectangular Stem Reinforcing (end Face) NOT APPLICABLE SEE CIRCULAR STEM

Footprint Length	Footprint Width	Stem Thickness	Cover (cc)	Bar Dia	Bar Area	Bar Area Dia	Bar Weight	d
2.00	2.00	2.00	3	0.50	0.196	0.196	0.668	1.75

Moment = 1723.24 (kips-kips)
ϕ = 0.900
As req. = 2.04 (in/ft-in^2)

Number of Bars 1 (based on design)
Bar Spacing 9.000 inches (based on design)
Max Spacing = 18.00 inches
Number of Bars 2 (based on max-spacing)
Number of Bars 4 (both face)
Bar Length 9.000 feet
Bar Length 9.363 feet

Shear = 5.10 (kips)
Shear Allow = 0.00 (psi)
Allow vc = 52.53 (psi)
OK

Stem Reinforcing (horizontal) Use Rb face at "d" NOT APPLICABLE SEE CIRCULAR STEM

Max Spacing = 12.00 inches
Number of Bars 2 (based on max-spacing)
Bar Length 11.000 (inches)
Bar Length 3.167 feet

Factoring for Projection

Sq Root	Factor	Factor Squared
1	0.70	0.500
2	0.85	0.707
3	0.93	0.866
4	1.00	1.000
5	1.06	1.118
6	1.10	1.225
7	1.14	1.323
8	1.17	1.414
9	1.20	1.500
10	1.22	1.581
11	1.24	1.658
12	1.26	1.732
13	1.28	1.803
14	1.30	1.871
15	1.32	1.936
16	1.33	2.000

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