桩承台计算\_序号19

# 一、设计资料

1、承台信息

承台底标高：-4.50m

承台上段高：600mm

承台下段高：700mm

承台x方向移心：0mm

承台y方向移心：0mm

2、桩截面信息

桩截面宽：500mm

桩截面高：0mm

单桩承载力：2500.00kN

3、承台混凝土信息

承台混凝土等级：C30

4.桩位坐标:

桩位表

| 桩序号 | 桩X坐标 | 桩Y坐标 |
| --- | --- | --- |
| 1 | -1500 | -1500 |
| 2 | -1500 | 1500 |
| 3 | 0 | -3000 |
| 4 | 0 | 0 |
| 5 | 0 | 3000 |
| 6 | 1500 | -1500 |
| 7 | 1500 | 1500 |

5.柱信息:

柱信息表

| 序号 | 截面宽 | 截面高 | 沿轴偏心 | 偏轴偏心 | 相对转角 |
| --- | --- | --- | --- | --- | --- |
| 柱1 | 700 | 700 | 0 | 1575 | 0 |
| 柱2 | 2 | 300 | -1925 | -0 | 90 |
| 柱3 | 100 | 100 | 0 | -1125 | 0 |
| 外接柱 | 700 | 3851 | 0 | 0 | 0 |

6.设计时执行的规范：

《建筑桩基技术规范》 （JGJ 94－2008） 以下简称 桩基规范

《混凝土结构设计规范》 （GB 50010－2010） 以下简称 混凝土规范

# 二、计算结果

1、桩承载力验算

承台及覆土重:

采用公式：

=±±

= Area×H×γ

= 28.0× 24.0

= 672.0 kN

∑ = 9000000.0 ∑ = 27000000.0

当前荷载组合

| 【4】SATWE标准组合:1.00\*恒+1.00\*风y |
| --- |

承台底面荷载 :（考虑柱底剪力的影响）

N=11447.9kN =-5823.1kN.m =37.1kN.m =113.3kN =114.4kN

桩反力表

| 桩号 | X | Y | 桩净反力Qn(kN) | 桩反力Q(kN) | 是否满足 |
| --- | --- | --- | --- | --- | --- |
| 1 | -1500.0 | -1500.0 | 1305.73 | 1401.73 | 满足 |
| 2 | -1500.0 | 1500.0 | 1952.74 | 2048.74 | 满足 |
| 3 | 0.0 | -3000.0 | 988.41 | 1084.41 | 满足 |
| 4 | 0.0 | 0.0 | 1635.42 | 1731.42 | 满足 |
| 5 | 0.0 | 3000.0 | 2282.43 | 2378.43 | 满足 |
| 6 | 1500.0 | -1500.0 | 1318.10 | 1414.10 | 满足 |
| 7 | 1500.0 | 1500.0 | 1965.11 | 2061.11 | 满足 |

桩总反力= 12119.9 kN; 桩均反力= 1731.4 kN

当前荷载组合

| 【5】SATWE标准组合:1.00\*恒-1.00\*风y |
| --- |

承台底面荷载 :（考虑柱底剪力的影响）

N=11164.3kN =-2096.7kN.m =40.7kN.m =124.2kN =71.0kN

桩反力表

| 桩号 | X | Y | 桩净反力Qn(kN) | 桩反力Q(kN) | 是否满足 |
| --- | --- | --- | --- | --- | --- |
| 1 | -1500.0 | -1500.0 | 1471.64 | 1567.64 | 满足 |
| 2 | -1500.0 | 1500.0 | 1704.61 | 1800.61 | 满足 |
| 3 | 0.0 | -3000.0 | 1361.93 | 1457.93 | 满足 |
| 4 | 0.0 | 0.0 | 1594.90 | 1690.90 | 满足 |
| 5 | 0.0 | 3000.0 | 1827.88 | 1923.88 | 满足 |
| 6 | 1500.0 | -1500.0 | 1485.20 | 1581.20 | 满足 |
| 7 | 1500.0 | 1500.0 | 1718.17 | 1814.17 | 满足 |

桩总反力= 11836.3 kN; 桩均反力= 1690.9 kN

当前荷载组合

| 【18】SATWE标准组合:1.00\*恒+1.00\*活+0.60\*风y |
| --- |

承台底面荷载 :（考虑柱底剪力的影响）

N=14342.5kN =-6067.2kN.m =42.8kN.m =131.0kN =134.0kN

桩反力表

| 桩号 | X | Y | 桩净反力Qn(kN) | 桩反力Q(kN) | 是否满足 |
| --- | --- | --- | --- | --- | --- |
| 1 | -1500.0 | -1500.0 | 1704.73 | 1800.73 | 满足 |
| 2 | -1500.0 | 1500.0 | 2378.87 | 2474.87 | 满足 |
| 3 | 0.0 | -3000.0 | 1374.79 | 1470.79 | 满足 |
| 4 | 0.0 | 0.0 | 2048.92 | 2144.92 | 满足 |
| 5 | 0.0 | 3000.0 | 2723.06 | 2819.06 | 满足 |
| 6 | 1500.0 | -1500.0 | 1718.98 | 1814.98 | 满足 |
| 7 | 1500.0 | 1500.0 | 2393.12 | 2489.12 | 满足 |

桩总反力= 15014.5 kN; 桩均反力= 2144.9 kN

当前荷载组合

| 【19】SATWE标准组合:1.00\*恒+1.00\*活-0.60\*风y |
| --- |

承台底面荷载 :（考虑柱底剪力的影响）

N=14172.3kN =-3831.4kN.m =44.9kN.m =137.5kN =107.9kN

桩反力表

| 桩号 | X | Y | 桩净反力Qn(kN) | 桩反力Q(kN) | 是否满足 |
| --- | --- | --- | --- | --- | --- |
| 1 | -1500.0 | -1500.0 | 1804.27 | 1900.27 | 满足 |
| 2 | -1500.0 | 1500.0 | 2229.99 | 2325.99 | 满足 |
| 3 | 0.0 | -3000.0 | 1598.90 | 1694.90 | 满足 |
| 4 | 0.0 | 0.0 | 2024.61 | 2120.61 | 满足 |
| 5 | 0.0 | 3000.0 | 2450.33 | 2546.33 | 满足 |
| 6 | 1500.0 | -1500.0 | 1819.24 | 1915.24 | 满足 |
| 7 | 1500.0 | 1500.0 | 2244.95 | 2340.95 | 满足 |

桩总反力= 14844.3 kN; 桩均反力= 2120.6 kN

当前荷载组合

| 【44】SATWE标准组合:1.00\*恒+0.50\*活+0.20\*风y+1.00\*地y |
| --- |

承台底面荷载 :（考虑柱底剪力的影响）

N=13121.8kN =-10521.3kN.m =33.5kN.m =108.8kN =181.8kN

桩反力表

| 桩号 | X | Y | 桩净反力Qn(kN) | 桩反力Q(kN) | 是否满足 |
| --- | --- | --- | --- | --- | --- |
| 1 | -1500.0 | -1500.0 | 1284.44 | 1380.44 | 满足 |
| 2 | -1500.0 | 1500.0 | 2453.47 | 2549.47 | 满足 |
| 3 | 0.0 | -3000.0 | 705.50 | 801.50 | 满足 |
| 4 | 0.0 | 0.0 | 1874.54 | 1970.54 | 满足 |
| 5 | 0.0 | 3000.0 | 3043.58 | 3139.58 | 满足 |
| 6 | 1500.0 | -1500.0 | 1295.61 | 1391.61 | 满足 |
| 7 | 1500.0 | 1500.0 | 2464.64 | 2560.64 | 满足 |

桩总反力= 13793.8 kN; 桩均反力= 1970.5 kN

当前荷载组合

| 【45】SATWE标准组合:1.00\*恒+0.50\*活-0.20\*风y-1.00\*地y |
| --- |

承台底面荷载 :（考虑柱底剪力的影响）

N=12441.7kN =1612.1kN.m =49.2kN.m =144.2kN =31.9kN

桩反力表

| 桩号 | X | Y | 桩净反力Qn(kN) | 桩反力Q(kN) | 是否满足 |
| --- | --- | --- | --- | --- | --- |
| 1 | -1500.0 | -1500.0 | 1858.75 | 1954.75 | 满足 |
| 2 | -1500.0 | 1500.0 | 1679.63 | 1775.63 | 满足 |
| 3 | 0.0 | -3000.0 | 1956.51 | 2052.51 | 满足 |
| 4 | 0.0 | 0.0 | 1777.39 | 1873.39 | 满足 |
| 5 | 0.0 | 3000.0 | 1598.27 | 1694.27 | 满足 |
| 6 | 1500.0 | -1500.0 | 1875.15 | 1971.15 | 满足 |
| 7 | 1500.0 | 1500.0 | 1696.03 | 1792.03 | 满足 |

桩总反力= 13113.7 kN; 桩均反力= 1873.4 kN

2、承台内力配筋计算

当前荷载组合

| 【55】SATWE基本组合:1.35\*恒+0.98\*活 |
| --- |

承台底面荷载 :（考虑柱底剪力的影响）

N=18155.5kN =-6315.5kN.m =57.3kN.m =175.5kN =152.8kN

承台及覆土重:

= 672.0×1.35= 907.2

桩反力表

| 桩号 | X | Y | 桩净反力Qn(kN) | 桩反力Q(kN) |
| --- | --- | --- | --- | --- |
| 1 | -1500.0 | -1500.0 | 2233.22 | 2362.82 |
| 2 | -1500.0 | 1500.0 | 2934.95 | 3064.55 |
| 3 | 0.0 | -3000.0 | 1891.92 | 2021.52 |
| 4 | 0.0 | 0.0 | 2593.64 | 2723.24 |
| 5 | 0.0 | 3000.0 | 3295.36 | 3424.96 |
| 6 | 1500.0 | -1500.0 | 2252.34 | 2381.94 |
| 7 | 1500.0 | 1500.0 | 2954.06 | 3083.66 |

桩总反力= 19062.7 kN; 桩均反力= 2723.2 kN

b、柱冲切计算：

采用“桩基规范”5.9.7条,公式如下：

≤2[

=, =

截面净高=1250.mm

X正方向:= 900. =0.720

X负方向:= 900. =0.720

Y正方向:= 825. =0.660

Y负方向:= 825. =0.660

= 800. =3950. = 0.91 = 0.98 = 1.43 =0.958

=2[( + ) + ( + )]

=20667.31 kN > =15561.85 × 1.00 kN

c、承台抗剪计算

采用“桩基规范”5.9.9条,公式如下：

V<=

a=

=()

1、左侧抗剪计算

=1250. =1302. =0.720

= [1.75/(+1.0)]

=0.894\*[1.75/(0.720+1.0)]\*6268.\*1250.\*1.4329\*1.e-3

= 10216.6 kN

> = 5168.17 (\* 1.00) kN

2、右侧抗剪计算

=1250. = 900. =0.720

= [1.75/(+1.0)]

=0.894\*[1.75/(0.720+1.0)]\*6268.\*1250.\*1.4329\*1.e-3

= 10216.6 kN

> = 5206.40 (\* 1.00) kN

3、下侧抗剪计算

=1250. = 825. =0.660

= [1.75/(+1.0)]

=0.894\*[1.75/(0.660+1.0)]\*3232.\*1250.\*1.4329\*1.e-3

= 5458.5 kN

> = 1891.92 (\* 1.00) kN

4、上侧抗剪计算

=1250. = 825. =0.660

= [1.75/(+1.0)]

=0.894\*[1.75/(0.660+1.0)]\*3232.\*1250.\*1.4329\*1.e-3

= 5458.5 kN

> = 3295.36 (\* 1.00) kN

b、柱冲切计算：

截面净高=1250.mm

X正方向:= 950. =0.760

X负方向:= 950. =0.760

Y正方向:= 875. =0.700

Y负方向:= 874. =0.699

= 700. =3851. = 0.88 = 0.93 = 1.43 =0.958

=2[( + ) + ( + )]

=19483.80 kN > =15561.85 × 1.00 kN

c、承台抗剪计算

1、左侧抗剪计算

=1250. =1303. =0.760

= [1.75/(+1.0)]

=0.894\*[1.75/(0.760+1.0)]\*6268.\*1250.\*1.4329\*1.e-3

= 9984.4 kN

> = 5168.17 (\* 1.00) kN

2、右侧抗剪计算

=1250. = 950. =0.760

= [1.75/(+1.0)]

=0.894\*[1.75/(0.760+1.0)]\*6268.\*1250.\*1.4329\*1.e-3

= 9984.4 kN

> = 5206.40 (\* 1.00) kN

3、下侧抗剪计算

=1250. = 875. =0.700

= [1.75/(+1.0)]

=0.894\*[1.75/(0.700+1.0)]\*3232.\*1250.\*1.4329\*1.e-3

= 5330.0 kN

> = 1891.92 (\* 1.00) kN

4、上侧抗剪计算

=1250. = 874. =0.699

= [1.75/(+1.0)]

=0.894\*[1.75/(0.699+1.0)]\*3232.\*1250.\*1.4329\*1.e-3

= 5332.5 kN

> = 3295.36 (\* 1.00) kN

承台阶梯高度：

1阶高： 700mm

2阶高： 600mm

3、承台板抗弯计算

X方向配筋计算：

= 5943.40\*1.00= 5943.40 X = -350. H = 1250.

= /(0.9\*\*)/YS = 5943.40/(0.9\*1250.0\*360.0)/7.0= 2096.4 /m

= 5987.36\*1.00= 5987.36 X = 350. H = 1250.

= /(0.9\*\*)/YS = 5987.36/(0.9\*1250.0\*360.0)/7.0= 2111.9 /m

= 5987.36\*1.00= 5987.36 X = 350. H = 1250.

= /(0.9\*\*)/YS = 5987.36/(0.9\*1250.0\*360.0)/7.0= 2111.9 /m

Y方向配筋计算：

= 2033.81\*1.00= 2033.81 Y =-1925. H = 1250.

= /(0.9\*\*)/XS = 2033.81/(0.9\*1250.0\*360.0)/4.0= 1255.4 /m

= 3539.22\*1.00= 3539.22 Y = 1926. H = 1250.

= /(0.9\*\*)/XS = 3539.22/(0.9\*1250.0\*360.0)/4.0= 2184.7 /m

= 3946.31\*1.00= 3946.31 Y =-1075. H = 1250.

= /(0.9\*\*)/XS = 3946.31/(0.9\*1250.0\*360.0)/4.0= 2436.0 /m

计算的钢筋面积：

= 2112./m = 2436./m

当前荷载组合

| 【72】SATWE基本组合:1.20\*恒+1.40\*活+0.84\*风y |
| --- |

承台底面荷载 :（考虑柱底剪力的影响）

N=17818.2kN =-7702.1kN.m =52.1kN.m =159.6kN =169.0kN

承台及覆土重:

= 672.0×1.20= 806.4

桩反力表

| 桩号 | X | Y | 桩净反力Qn(kN) | 桩反力Q(kN) |
| --- | --- | --- | --- | --- |
| 1 | -1500.0 | -1500.0 | 2108.88 | 2224.08 |
| 2 | -1500.0 | 1500.0 | 2964.68 | 3079.88 |
| 3 | 0.0 | -3000.0 | 1689.67 | 1804.87 |
| 4 | 0.0 | 0.0 | 2545.46 | 2660.66 |
| 5 | 0.0 | 3000.0 | 3401.25 | 3516.45 |
| 6 | 1500.0 | -1500.0 | 2126.24 | 2241.44 |
| 7 | 1500.0 | 1500.0 | 2982.04 | 3097.24 |

桩总反力= 18624.6 kN; 桩均反力= 2660.7 kN

台阶1 H = 700.00 mm

a、角桩冲切计算：

采用“桩基规范”5.9.8条,公式如下：

≤[

=, =

角桩No.=1

= 900. =0.72 = 700.

= 1250. =1.00 = 2200.

= 650. =0.6087 = 0.467 =1.00 = 1.433

=[( +/2)+ (+/2)]

= 3321.17 kN > = 2108.88(×1.00) kN

角桩No.=2

= 1250. =1.00 = 2200.

= 825. =0.66 = 700.

= 650. =0.4667 = 0.651 =1.00 = 1.433

=[( +/2)+ (+/2)]

= 3470.92 kN > = 1689.67(×1.00) kN

角桩No.=3

= 1250. =1.00 = 2200.

= 825. =0.66 = 700.

= 650. =0.4667 = 0.651 =1.00 = 1.433

=[( +/2)+ (+/2)]

= 3470.92 kN > = 3401.25(×1.00) kN

角桩No.=4

= 900. =0.72 = 700.

= 1250. =1.00 = 2200.

= 650. =0.6087 = 0.467 =1.00 = 1.433

=[( +/2)+ (+/2)]

= 3321.17 kN > = 2964.68(×1.00) kN

c、承台抗剪计算

采用“桩基规范”5.9.9条,公式如下：

V<=

a=

=()

1、左侧抗剪计算

=1250. =1302. =0.720

= [1.75/(+1.0)]

=0.894\*[1.75/(0.720+1.0)]\*6268.\*1250.\*1.4329\*1.e-3

= 10216.6 kN

> = 5073.56 (\* 1.00) kN

2、右侧抗剪计算

=1250. = 900. =0.720

= [1.75/(+1.0)]

=0.894\*[1.75/(0.720+1.0)]\*6268.\*1250.\*1.4329\*1.e-3

= 10216.6 kN

> = 5108.28 (\* 1.00) kN

3、下侧抗剪计算

=1250. = 825. =0.660

= [1.75/(+1.0)]

=0.894\*[1.75/(0.660+1.0)]\*3232.\*1250.\*1.4329\*1.e-3

= 5458.5 kN

> = 1689.67 (\* 1.00) kN

4、上侧抗剪计算

=1250. = 825. =0.660

= [1.75/(+1.0)]

=0.894\*[1.75/(0.660+1.0)]\*3232.\*1250.\*1.4329\*1.e-3

= 5458.5 kN

> = 3401.25 (\* 1.00) kN

台阶2 H = 1300.00 mm

c、承台抗剪计算

1、左侧抗剪计算

=1250. =1303. =0.760

= [1.75/(+1.0)]

=0.894\*[1.75/(0.760+1.0)]\*6268.\*1250.\*1.4329\*1.e-3

= 9984.4 kN

> = 5073.56 (\* 1.00) kN

2、右侧抗剪计算

=1250. = 950. =0.760

= [1.75/(+1.0)]

=0.894\*[1.75/(0.760+1.0)]\*6268.\*1250.\*1.4329\*1.e-3

= 9984.4 kN

> = 5108.28 (\* 1.00) kN

3、下侧抗剪计算

=1250. = 875. =0.700

= [1.75/(+1.0)]

=0.894\*[1.75/(0.700+1.0)]\*3232.\*1250.\*1.4329\*1.e-3

= 5330.0 kN

> = 1689.67 (\* 1.00) kN

4、上侧抗剪计算

=1250. = 874. =0.699

= [1.75/(+1.0)]

=0.894\*[1.75/(0.699+1.0)]\*3232.\*1250.\*1.4329\*1.e-3

= 5332.5 kN

> = 3401.25 (\* 1.00) kN

承台阶梯高度：

1阶高： 700mm

2阶高： 600mm

当前荷载组合

| 【73】SATWE基本组合:1.20\*恒+1.40\*活-0.84\*风y |
| --- |

承台底面荷载 :（考虑柱底剪力的影响）

N=17580.0kN =-4572.0kN.m =55.1kN.m =168.7kN =132.5kN

承台及覆土重:

= 672.0×1.20= 806.4

桩反力表

| 桩号 | X | Y | 桩净反力Qn(kN) | 桩反力Q(kN) |
| --- | --- | --- | --- | --- |
| 1 | -1500.0 | -1500.0 | 2248.25 | 2363.45 |
| 2 | -1500.0 | 1500.0 | 2756.25 | 2871.45 |
| 3 | 0.0 | -3000.0 | 2003.43 | 2118.63 |
| 4 | 0.0 | 0.0 | 2511.43 | 2626.63 |
| 5 | 0.0 | 3000.0 | 3019.43 | 3134.63 |
| 6 | 1500.0 | -1500.0 | 2266.61 | 2381.81 |
| 7 | 1500.0 | 1500.0 | 2774.61 | 2889.81 |

桩总反力= 18386.4 kN; 桩均反力= 2626.6 kN

台阶1 H = 700.00 mm

a、角桩冲切计算：

采用“桩基规范”5.9.8条,公式如下：

≤[

=, =

角桩No.=1

= 900. =0.72 = 700.

= 1250. =1.00 = 2200.

= 650. =0.6087 = 0.467 =1.00 = 1.433

=[( +/2)+ (+/2)]

= 3321.17 kN > = 2248.25(×1.00) kN

角桩No.=2

= 1250. =1.00 = 2200.

= 825. =0.66 = 700.

= 650. =0.4667 = 0.651 =1.00 = 1.433

=[( +/2)+ (+/2)]

= 3470.92 kN > = 2003.43(×1.00) kN

角桩No.=3

= 1250. =1.00 = 2200.

= 825. =0.66 = 700.

= 650. =0.4667 = 0.651 =1.00 = 1.433

=[( +/2)+ (+/2)]

= 3470.92 kN > = 3019.43(×1.00) kN

角桩No.=4

= 900. =0.72 = 700.

= 1250. =1.00 = 2200.

= 650. =0.6087 = 0.467 =1.00 = 1.433

=[( +/2)+ (+/2)]

= 3321.17 kN > = 2756.25(×1.00) kN

台阶2 H = 1300.00 mm

3、承台板抗弯计算

X方向配筋计算：

= 5755.17\*1.00= 5755.17 X = -350. H = 1250.

= /(0.9\*\*)/YS = 5755.17/(0.9\*1250.0\*360.0)/7.0= 2030.0 /m

= 5797.40\*1.00= 5797.40 X = 350. H = 1250.

= /(0.9\*\*)/YS = 5797.40/(0.9\*1250.0\*360.0)/7.0= 2044.9 /m

= 5797.40\*1.00= 5797.40 X = 350. H = 1250.

= /(0.9\*\*)/YS = 5797.40/(0.9\*1250.0\*360.0)/7.0= 2044.9 /m

Y方向配筋计算：

= 2153.69\*1.00= 2153.69 Y =-1925. H = 1250.

= /(0.9\*\*)/XS = 2153.69/(0.9\*1250.0\*360.0)/4.0= 1329.4 /m

= 3242.86\*1.00= 3242.86 Y = 1926. H = 1250.

= /(0.9\*\*)/XS = 3242.86/(0.9\*1250.0\*360.0)/4.0= 2001.8 /m

= 4040.42\*1.00= 4040.42 Y =-1075. H = 1250.

= /(0.9\*\*)/XS = 4040.42/(0.9\*1250.0\*360.0)/4.0= 2494.1 /m

计算的钢筋面积：

= 2045./m = 2494./m

当前荷载组合

| 【99】SATWE基本组合:1.20\*恒+0.60\*活-0.20\*风y-1.30\*地y |
| --- |

承台底面荷载 :（考虑柱底剪力的影响）

N=14904.6kN =2429.4kN.m =59.7kN.m =174.4kN =32.0kN

承台及覆土重:

= 672.0×1.20= 806.4

桩反力表

| 桩号 | X | Y | 桩净反力Qn(kN) | 桩反力Q(kN) |
| --- | --- | --- | --- | --- |
| 1 | -1500.0 | -1500.0 | 2254.23 | 2369.43 |
| 2 | -1500.0 | 1500.0 | 1984.30 | 2099.50 |
| 3 | 0.0 | -3000.0 | 2399.16 | 2514.36 |
| 4 | 0.0 | 0.0 | 2129.23 | 2244.43 |
| 5 | 0.0 | 3000.0 | 1859.29 | 1974.49 |
| 6 | 1500.0 | -1500.0 | 2274.15 | 2389.35 |
| 7 | 1500.0 | 1500.0 | 2004.22 | 2119.42 |

桩总反力= 15711.0 kN; 桩均反力= 2244.4 kN

台阶1 H = 700.00 mm

a、角桩冲切计算：

采用“桩基规范”5.9.8条,公式如下：

≤[

=, =

角桩No.=1

= 900. =0.72 = 700.

= 1250. =1.00 = 2200.

= 650. =0.6087 = 0.467 =1.00 = 1.433

=[( +/2)+ (+/2)]

= 3321.17 kN > = 2254.23(×0.85) kN

角桩No.=2

= 1250. =1.00 = 2200.

= 825. =0.66 = 700.

= 650. =0.4667 = 0.651 =1.00 = 1.433

=[( +/2)+ (+/2)]

= 3470.92 kN > = 2399.16(×0.85) kN

角桩No.=3

= 1250. =1.00 = 2200.

= 825. =0.66 = 700.

= 650. =0.4667 = 0.651 =1.00 = 1.433

=[( +/2)+ (+/2)]

= 3470.92 kN > = 1859.29(×0.85) kN

角桩No.=4

= 900. =0.72 = 700.

= 1250. =1.00 = 2200.

= 650. =0.6087 = 0.467 =1.00 = 1.433

=[( +/2)+ (+/2)]

= 3321.17 kN > = 1984.30(×0.85) kN

c、承台抗剪计算

采用“桩基规范”5.9.9条,公式如下：

V<=

a=

=()

1、左侧抗剪计算

=1250. =1302. =0.720

= [1.75/(+1.0)]

=0.894\*[1.75/(0.720+1.0)]\*6268.\*1250.\*1.4329\*1.e-3

= 10216.6 kN

> = 4238.54 (\* 0.85) kN

2、右侧抗剪计算

=1250. = 900. =0.720

= [1.75/(+1.0)]

=0.894\*[1.75/(0.720+1.0)]\*6268.\*1250.\*1.4329\*1.e-3

= 10216.6 kN

> = 4278.37 (\* 0.85) kN

3、下侧抗剪计算

=1250. = 825. =0.660

= [1.75/(+1.0)]

=0.894\*[1.75/(0.660+1.0)]\*3232.\*1250.\*1.4329\*1.e-3

= 5458.5 kN

> = 2399.16 (\* 0.85) kN

4、上侧抗剪计算

=1250. = 825. =0.660

= [1.75/(+1.0)]

=0.894\*[1.75/(0.660+1.0)]\*3232.\*1250.\*1.4329\*1.e-3

= 5458.5 kN

> = 1859.29 (\* 0.85) kN

台阶2 H = 1300.00 mm

c、承台抗剪计算

1、左侧抗剪计算

=1250. =1303. =0.760

= [1.75/(+1.0)]

=0.894\*[1.75/(0.760+1.0)]\*6268.\*1250.\*1.4329\*1.e-3

= 9984.4 kN

> = 4238.54 (\* 0.85) kN

2、右侧抗剪计算

=1250. = 950. =0.760

= [1.75/(+1.0)]

=0.894\*[1.75/(0.760+1.0)]\*6268.\*1250.\*1.4329\*1.e-3

= 9984.4 kN

> = 4278.37 (\* 0.85) kN

3、下侧抗剪计算

=1250. = 875. =0.700

= [1.75/(+1.0)]

=0.894\*[1.75/(0.700+1.0)]\*3232.\*1250.\*1.4329\*1.e-3

= 5330.0 kN

> = 2399.16 (\* 0.85) kN

4、上侧抗剪计算

=1250. = 874. =0.699

= [1.75/(+1.0)]

=0.894\*[1.75/(0.699+1.0)]\*3232.\*1250.\*1.4329\*1.e-3

= 5332.5 kN

> = 1859.29 (\* 0.85) kN

承台阶梯高度：

1阶高： 700mm

2阶高： 600mm

# 三、结果汇总

标准组合下桩反力:

最大最小桩反力及对应的标准组合

| 桩号 | 最大反力（非震）(Load) | 最小反力（非震）(Load) | 最大反力（震）(Load) | 最小反力（震）(Load) |
| --- | --- | --- | --- | --- |
| 1 | 1900.27 (19) | 1401.73 (4) | 1954.75 (45) | 1380.44 (44) |
| 2 | 2474.87 (18) | 1800.61 (5) | 2549.47 (44) | 1775.63 (45) |
| 3 | 1694.90 (19) | 1084.41 (4) | 2052.51 (45) | 801.50 (44) |
| 4 | 2144.92 (18) | 1690.90 (5) | 1970.54 (44) | 1873.39 (45) |
| 5 | 2819.06 (18) | 1923.88 (5) | 3139.58 (44) | 1694.27 (45) |
| 6 | 1915.24 (19) | 1414.10 (4) | 1971.15 (45) | 1391.61 (44) |
| 7 | 2489.12 (18) | 1814.17 (5) | 2560.64 (44) | 1792.03 (45) |

桩平均反力最大值2144.92 (非震)(Load 18)

桩平均反力最小值1690.90 (非震)(Load 5)

桩平均反力最大值1970.54 (震)(Load 44)

桩平均反力最小值1873.39 (震)(Load 45)

基本组合下承台冲切、剪切、配筋计算:

角桩冲切计算：

桩 1: 抗力3321.17 kN 冲切力2248.25 kN ：650 mm (Load:73)

桩 2: 抗力3470.92 kN 冲切力2039.28 kN ：650 mm (Load:99)

桩 3: 抗力3470.92 kN 冲切力3401.25 kN ：650 mm (Load:72)

桩 4: 抗力3321.17 kN 冲切力2964.68 kN ：650 mm (Load:72)

柱冲切计算：

抗力19483.80 kN 冲切力15561.85 kN ：1250 mm Load：55

抗剪计算：

1左边： 抗力9984.41kN 剪力5168.17kN ：1250mm (Load:55)

2右边： 抗力9984.41kN 剪力5206.40kN ：1250mm (Load:55)

3上边： 抗力5330.02kN 剪力2039.28kN ：1250mm (Load:99)

4下边： 抗力5332.53kN 剪力3401.25kN ：1250mm (Load:72)

承台高度：

一阶高700 二阶高600

底板配筋计算：

X方向：弯矩5987.36 kN.m 计算钢筋面积2112 /m Load： 55

Y方向：弯矩4040.42 kN.m 计算钢筋面积2494 /m Load： 73

根据最小配筋率计算承台最小配筋：

= 1754. /m

= 1590. /m

原钢筋x方向配筋量不满足

原钢筋y方向配筋量不满足

计算的配筋方案为：

Agx: HRB400 18@100

Agy: HRB400 18@100