**边坡稳定性分析**

**输入数据**

**项目信息**

|  |  |
| --- | --- |
| 日期 : | 2024-10-11 |

**分析设置**

中国 - 国家标准（GB）

**稳定性分析**

|  |  |
| --- | --- |
| 验算方法 : | 中国规范 |
| 地震荷载分析 : | GB 50330-2013中国建筑边坡工程技术规范 |

| **安全系数** |
| --- |
| **持久设计状况** |
| 折线滑面的安全系数 : | SFpolyg = | 1.35 | [–] |
| 圆弧滑面的安全系数 : | SFcirc = | 1.35 | [–] |

**多段线**

| **编号** | **多段线位置** | **多段线上点坐标 [m]** |
| --- | --- | --- |
| **x** | **z** | **x** | **z** | **x** | **z** |
| 1 |  | -20.00 | 3.33 | 0.00 | 3.33 | 1.58 | 2.48 |
|  | 2.70 | 1.88 | 4.00 | 1.20 | 4.72 | 0.78 |
|  | 5.20 | 0.50 | 5.92 | 0.08 | 14.10 | 0.08 |
|  | 14.66 | 0.10 | 14.68 | 0.78 | 14.69 | 1.65 |
|  | 14.70 | 3.68 | 18.10 | 4.12 | 19.10 | 4.15 |
|  | 60.00 | 4.15 |  |  |  |  |
|  |  |  |  |  |  |  |  |
| 2 |  | -20.00 | 2.48 | -0.07 | 2.48 | 1.58 | 2.48 |
|  |  |  |  |  |  |  |
| 3 |  | 14.69 | 1.65 | 15.60 | 1.65 | 60.00 | 1.65 |
|  |  |  |  |  |  |  |
| 4 |  | -20.00 | 0.78 | 1.06 | 0.78 | 4.72 | 0.78 |
|  |  |  |  |  |  |  |
| 5 |  | 14.68 | 0.78 | 15.32 | 0.78 | 60.00 | 0.78 |
|  |  |  |  |  |  |  |
| 6 |  | -20.00 | -8.92 | 60.00 | -8.92 |  |  |
|  |  |  |  |  |  |  |

**岩土材料参数 - 总应力状态 φcu, ccu**

| **编号** | **名称** | **图例** | **φcu** | **ccu** | **γ** |
| --- | --- | --- | --- | --- | --- |
| **[°]** | **[kPa]** | **[kN/m3]** |
| 1 | 道路部分 |  | 20.00 | 30.00 | 22.00 |
| 2 | 2-2层淤泥质粉质黏土 |  | 8.40 | 13.90 | 18.00 |
| 3 | 3-3层粉质黏土 |  | 12.70 | 30.40 | 18.00 |
| 4 | 4-3层硬塑粉质黏土 |  | 12.30 | 56.90 | 18.00 |
| 5 | 1-1层杂填土 |  | 12.00 | 10.00 | 19.50 |
| 6 | 2-1层粉质粘土 |  | 11.90 | 20.90 | 19.30 |

**岩土材料参数**

|  |
| --- |
| **道路部分** |
| 天然重度 : | γ | = | 22.00 | kN/m3 |  |
| 应力状态 : | 总应力 φcu, ccu |  |
| 内摩擦角 : | φcu | = | 20.00 | ° |  |
| 黏聚力 : | ccu | = | 30.00 | kPa |  |

|  |
| --- |
| **2-2层淤泥质粉质黏土** |
| 天然重度 : | γ | = | 18.00 | kN/m3 |  |
| 应力状态 : | 总应力 φcu, ccu |  |
| 内摩擦角 : | φcu | = | 8.40 | ° |  |
| 黏聚力 : | ccu | = | 13.90 | kPa |  |

|  |
| --- |
| **3-3层粉质黏土** |
| 天然重度 : | γ | = | 18.00 | kN/m3 |  |
| 应力状态 : | 总应力 φcu, ccu |  |
| 内摩擦角 : | φcu | = | 12.70 | ° |  |
| 黏聚力 : | ccu | = | 30.40 | kPa |  |

|  |
| --- |
| **4-3层硬塑粉质黏土** |
| 天然重度 : | γ | = | 18.00 | kN/m3 |  |
| 应力状态 : | 总应力 φcu, ccu |  |
| 内摩擦角 : | φcu | = | 12.30 | ° |  |
| 黏聚力 : | ccu | = | 56.90 | kPa |  |

|  |
| --- |
| **1-1层杂填土** |
| 天然重度 : | γ | = | 19.50 | kN/m3 |  |
| 应力状态 : | 总应力 φcu, ccu |  |
| 内摩擦角 : | φcu | = | 12.00 | ° |  |
| 黏聚力 : | ccu | = | 10.00 | kPa |  |

|  |
| --- |
| **2-1层粉质粘土** |
| 天然重度 : | γ | = | 19.30 | kN/m3 |  |
| 应力状态 : | 总应力 φcu, ccu |  |
| 内摩擦角 : | φcu | = | 11.90 | ° |  |
| 黏聚力 : | ccu | = | 20.90 | kPa |  |

**指定材料和分区**

| **编号** | **分区位置** | **分区点坐标 [m]** | **指定** |
| --- | --- | --- | --- |
| **x** | **z** | **x** | **z** | **材料** |
| 1 |  | -0.07 | 2.48 | 1.58 | 2.48 | 1-1层杂填土 |
|  | 0.00 | 3.33 | -20.00 | 3.33 |
|  | -20.00 | 2.48 |  |  |  |
|  |  |  |  |  |
| 2 |  | 15.60 | 1.65 | 60.00 | 1.65 | 道路部分 |
|  | 60.00 | 4.15 | 19.10 | 4.15 |
|  | 18.10 | 4.12 | 14.70 | 3.68 |  |
|  | 14.69 | 1.65 |  |  |
|  |  |  |  |  |
| 3 |  | 1.06 | 0.78 | 4.72 | 0.78 | 2-1层粉质粘土 |
|  | 4.00 | 1.20 | 2.70 | 1.88 |
|  | 1.58 | 2.48 | -0.07 | 2.48 |  |
|  | -20.00 | 2.48 | -20.00 | 0.78 |
|  |  |  |  |  |
| 4 |  | 15.32 | 0.78 | 60.00 | 0.78 | 2-1层粉质粘土 |
|  | 60.00 | 1.65 | 15.60 | 1.65 |
|  | 14.69 | 1.65 | 14.68 | 0.78 |  |
|  |  |  |  |  |
| 5 |  | 60.00 | -8.92 | 60.00 | 0.78 | 2-2层淤泥质粉质黏土 |
|  | 15.32 | 0.78 | 14.68 | 0.78 |
|  | 14.66 | 0.10 | 14.10 | 0.08 |  |
|  | 5.92 | 0.08 | 5.20 | 0.50 |
|  | 4.72 | 0.78 | 1.06 | 0.78 |
|  |  | -20.00 | 0.78 | -20.00 | -8.92 |
|  |  |  |  |  |  |
| 6 |  | -20.00 | -8.92 | -20.00 | -13.92 | 3-3层粉质黏土 |
|  | 60.00 | -13.92 | 60.00 | -8.92 |
|  |  |  |  |  |  |
|  |  |  |  |  |

**锚杆**

| **编号** | **锚头** | **自由段长度** | **锚固段长度** | **倾角** | **水平间距** | **锚固力** |
| --- | --- | --- | --- | --- | --- | --- |
| **x [m]** | **z [m]** | **l [m]** | **lk [m]** | **α [°]** | **b [m]** | **F [kN]** |
| 1 | 14.70 | 3.68 | 3.00 | 12.00 | 10.00 | 1.00 | 200.00 |

**抗滑桩**

| **编号** | **桩顶坐标** | **桩长** | **工程类型** | **连梁深度** | **连梁长度** | **桩水平间距** |
| --- | --- | --- | --- | --- | --- | --- |
| **x [m]** | **z [m]** | **l [m]** | **h [m]** | **lb [m]** | **bf [m]** | **b/bb [m]** |
| 1 | 14.70 | 3.68 | 9.00 | 单排桩 |  |  |  | 0.40 |

| **编号** | **桩身截面** | **桩身抗滑承载力** |
| --- | --- | --- |
| **[m]** | **抗滑承载力沿桩身分布** | **最大抗滑承载力 Vu [kN]** | **最大承载力桩长比 K [–]** | **桩身抗滑力方向** |
| 1 | sx = 0.40; sy = 0.40 | 线性分布 | 220.00 | 0.30 | 平行滑面 |

**超载**

| **编号** | **类型** | **作用类型** | **位置** | **起点** | **长度** | **宽度** | **倾角** | **大小** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **z [m]** | **x [m]** | **l [m]** | **b [m]** | **α [°]** | **q, q1, f, F, x** | **q2, z** | **单位** |
| 1 | 条形超载 | 永久作用 | 坡面 | x = 19.10 | l = 4.50 |  | 0.00 | 15.00 |  | kN/m2 |
| 2 | 条形超载 | 永久作用 | 坡面 | x = 38.60 | l = 4.50 |  | 0.00 | 15.00 |  | kN/m2 |
| 3 | 条形超载 | 永久作用 | 坡面 | x = 23.60 | l = 15.00 |  | 0.00 | 72.90 |  | kN/m2 |

**超载**

| **编号** | **名称** |
| --- | --- |
|
| 1 | 左侧人行道 |
| 2 | 右侧人行道 |
| 3 | 行车道 |

**地下水**

|  |  |
| --- | --- |
| 地下水类型 : | 地下水位 |

| **编号** | **地下水位位置** | **地下水位点坐标 [m]** |
| --- | --- | --- |
| **x** | **z** | **x** | **z** | **x** | **z** |
| 1 |  | -20.00 | 2.10 | 60.00 | 2.10 |  |  |
|  |  |  |  |  |  |

**张裂缝**

|  |  |  |
| --- | --- | --- |
| 未输入张裂缝。 |  |  |

**地震荷载**

|  |  |  |  |
| --- | --- | --- | --- |
| 不考虑地震 |  |  |  |

**工况阶段设置**

|  |  |
| --- | --- |
| 设计状况 : | 持久设计状况 |

**结果(工况阶段1)**

**分析 1**

**圆弧滑动面**

| **滑动面参数** |
| --- |
| 圆心 : | x = | 17.69 | [m] | 角度 : | α1 = | -51.78 | [°] |
| z = | 9.38 | [m] | α2 = | 69.61 | [°] |
| 半径 : | R = | 15.01 | [m] |  |
| 自动搜索后的滑动面 |

**作用在桩上的力**

编号1抗滑桩（14.70; 3.68 [m]）

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | 桩后滑坡推力： | 665.00 | kN/m |  |
|  | 桩前滑体抗力： | 665.00 | kN/m |  |
|  | 滑面深度： | 9.00 | m |  |
|  | 地表以下桩长： | 9.00 | m |  |

**边坡稳定性验算 (简布法(Janbu))**

安全系数 = 1.50 > 1.35

**边坡稳定性 满足要求**

**力 (详细结果)**



推力 - 极限状态:

0.00 kN/m, 0.00 °; 88.31 kN/m, 0.28 °; 191.68 kN/m, 1.08 °; 300.09 kN/m, 2.33 °; 407.28 kN/m, 3.91 °; 508.24 kN/m, 5.66 °; 598.64 kN/m, 7.41 °; 701.12 kN/m, 8.99 °; 779.68 kN/m, 10.24 °; 833.93 kN/m, 11.04 °; 863.49 kN/m, 11.32 °; 869.36 kN/m, 11.04 °; 852.96 kN/m, 10.24 °; 817.56 kN/m, 8.99 °; 759.16 kN/m, 7.41 °; 663.80 kN/m, 5.66 °; 546.19 kN/m, 3.91 °; 405.56 kN/m, 2.33 °; 242.25 kN/m, 1.08 °; 74.05 kN/m, 0.28 °; 0.00 kN/m, 0.00 °

稳定性系数 Fs = 1.504

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 条块 1: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L1 | = | 1.94 m |  | α1 | = | -48.08 ° |  | c1 | = | 13.90 kPa |  | φ1 | = | 8.40 ° |
|  | W1 | = | 16.46 kN/m |  | U1 | = | 0.00 kN/m |  | PW0 | = | 0.00 kN/m |  | PW1 | = | 0.00 kN/m |
|  | FX1,water | = | -0.26 kN/m |  | FY1,water | = | 26.12 kN/m |  | M1,water | = | 0.18 kNm/m |  |  |  |  |
|  | FX1,surch | = | 0.00 kN/m |  | FY1,surch | = | 0.00 kN/m |  | M1,surch | = | 0.00 kNm/m |  | FYG,1 | = | 0.00 kN/m |
|  | FX1,ASPile | = | 0.00 kN/m |  | FY1,ASPile | = | 0.00 kN/m |  | M1,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N1 | = | 94.64 kN/m |  | T1 | = | 27.17 kN/m |  |  |  |  |  |  |  |  |
|  | E0 | = | 0.00 kN/m |  | δ0 | = | 0.00 ° |  | E1 | = | 88.31 kN/m |  | δ1 | = | 0.28 ° |
| 条块 2: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L2 | = | 1.72 m |  | α2 | = | -41.11 ° |  | c2 | = | 13.90 kPa |  | φ2 | = | 8.40 ° |
|  | W2 | = | 46.35 kN/m |  | U2 | = | 0.00 kN/m |  | PW1 | = | 0.00 kN/m |  | PW2 | = | 0.00 kN/m |
|  | FX2,water | = | 0.00 kN/m |  | FY2,water | = | 26.12 kN/m |  | M2,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX2,surch | = | 0.00 kN/m |  | FY2,surch | = | 0.00 kN/m |  | M2,surch | = | 0.00 kNm/m |  | FYG,2 | = | 0.00 kN/m |
|  | FX2,ASPile | = | 0.00 kN/m |  | FY2,ASPile | = | 0.00 kN/m |  | M2,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N2 | = | 124.95 kN/m |  | T2 | = | 28.12 kN/m |  |  |  |  |  |  |  |  |
|  | E1 | = | 88.31 kN/m |  | δ1 | = | 0.28 ° |  | E2 | = | 191.68 kN/m |  | δ2 | = | 1.08 ° |
| 条块 3: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L3 | = | 1.58 m |  | α3 | = | -34.82 ° |  | c3 | = | 13.90 kPa |  | φ3 | = | 8.40 ° |
|  | W3 | = | 69.95 kN/m |  | U3 | = | 0.00 kN/m |  | PW2 | = | 0.00 kN/m |  | PW3 | = | 0.00 kN/m |
|  | FX3,water | = | 0.00 kN/m |  | FY3,water | = | 26.12 kN/m |  | M3,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX3,surch | = | 0.00 kN/m |  | FY3,surch | = | 0.00 kN/m |  | M3,surch | = | 0.00 kNm/m |  | FYG,3 | = | 0.00 kN/m |
|  | FX3,ASPile | = | 0.00 kN/m |  | FY3,ASPile | = | 0.00 kN/m |  | M3,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N3 | = | 147.71 kN/m |  | T3 | = | 29.05 kN/m |  |  |  |  |  |  |  |  |
|  | E2 | = | 191.68 kN/m |  | δ2 | = | 1.08 ° |  | E3 | = | 300.09 kN/m |  | δ3 | = | 2.33 ° |
| 条块 4: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L4 | = | 1.48 m |  | α4 | = | -28.99 ° |  | c4 | = | 13.90 kPa |  | φ4 | = | 8.40 ° |
|  | W4 | = | 88.75 kN/m |  | U4 | = | 0.00 kN/m |  | PW3 | = | 0.00 kN/m |  | PW4 | = | 0.00 kN/m |
|  | FX4,water | = | 0.00 kN/m |  | FY4,water | = | 26.12 kN/m |  | M4,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX4,surch | = | 0.00 kN/m |  | FY4,surch | = | 0.00 kN/m |  | M4,surch | = | 0.00 kNm/m |  | FYG,4 | = | 0.00 kN/m |
|  | FX4,ASPile | = | 0.00 kN/m |  | FY4,ASPile | = | 0.00 kN/m |  | M4,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N4 | = | 165.71 kN/m |  | T4 | = | 29.92 kN/m |  |  |  |  |  |  |  |  |
|  | E3 | = | 300.09 kN/m |  | δ3 | = | 2.33 ° |  | E4 | = | 407.28 kN/m |  | δ4 | = | 3.91 ° |
| 条块 5: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L5 | = | 1.41 m |  | α5 | = | -23.48 ° |  | c5 | = | 13.90 kPa |  | φ5 | = | 8.40 ° |
|  | W5 | = | 103.63 kN/m |  | U5 | = | 0.00 kN/m |  | PW4 | = | 0.00 kN/m |  | PW5 | = | 0.00 kN/m |
|  | FX5,water | = | 0.00 kN/m |  | FY5,water | = | 26.12 kN/m |  | M5,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX5,surch | = | 0.00 kN/m |  | FY5,surch | = | 0.00 kN/m |  | M5,surch | = | 0.00 kNm/m |  | FYG,5 | = | 0.00 kN/m |
|  | FX5,ASPile | = | 0.00 kN/m |  | FY5,ASPile | = | 0.00 kN/m |  | M5,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N5 | = | 179.12 kN/m |  | T5 | = | 30.61 kN/m |  |  |  |  |  |  |  |  |
|  | E4 | = | 407.28 kN/m |  | δ4 | = | 3.91 ° |  | E5 | = | 508.24 kN/m |  | δ5 | = | 5.66 ° |
| 条块 6: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L6 | = | 1.36 m |  | α6 | = | -18.19 ° |  | c6 | = | 13.90 kPa |  | φ6 | = | 8.40 ° |
|  | W6 | = | 115.11 kN/m |  | U6 | = | 0.00 kN/m |  | PW5 | = | 0.00 kN/m |  | PW6 | = | 0.00 kN/m |
|  | FX6,water | = | 0.00 kN/m |  | FY6,water | = | 26.12 kN/m |  | M6,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX6,surch | = | 0.00 kN/m |  | FY6,surch | = | 0.00 kN/m |  | M6,surch | = | 0.00 kNm/m |  | FYG,6 | = | 0.00 kN/m |
|  | FX6,ASPile | = | 0.00 kN/m |  | FY6,ASPile | = | 0.00 kN/m |  | M6,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N6 | = | 187.32 kN/m |  | T6 | = | 30.96 kN/m |  |  |  |  |  |  |  |  |
|  | E5 | = | 508.24 kN/m |  | δ5 | = | 5.66 ° |  | E6 | = | 598.64 kN/m |  | δ6 | = | 7.41 ° |
| 条块 7: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L7 | = | 1.33 m |  | α7 | = | -13.05 ° |  | c7 | = | 13.90 kPa |  | φ7 | = | 8.40 ° |
|  | W7 | = | 141.14 kN/m |  | U7 | = | 0.00 kN/m |  | PW6 | = | 0.00 kN/m |  | PW7 | = | 0.00 kN/m |
|  | FX7,water | = | 20.40 kN/m |  | FY7,water | = | 20.64 kN/m |  | M7,water | = | -119.24 kNm/m |  |  |  |  |
|  | FX7,surch | = | 0.00 kN/m |  | FY7,surch | = | 0.00 kN/m |  | M7,surch | = | 0.00 kNm/m |  | FYG,7 | = | 0.00 kN/m |
|  | FX7,ASPile | = | 0.03 kN/m |  | FY7,ASPile | = | 0.01 kN/m |  | M7,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N7 | = | 206.81 kN/m |  | T7 | = | 32.56 kN/m |  |  |  |  |  |  |  |  |
|  | E6 | = | 598.64 kN/m |  | δ6 | = | 7.41 ° |  | E7 | = | 701.12 kN/m |  | δ7 | = | 8.99 ° |
| 条块 8: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L8 | = | 1.31 m |  | α8 | = | -8.03 ° |  | c8 | = | 13.90 kPa |  | φ8 | = | 8.40 ° |
|  | W8 | = | 228.19 kN/m |  | U8 | = | 0.00 kN/m |  | PW7 | = | 0.00 kN/m |  | PW8 | = | 0.00 kN/m |
|  | FX8,water | = | 0.00 kN/m |  | FY8,water | = | 0.00 kN/m |  | M8,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX8,surch | = | 0.00 kN/m |  | FY8,surch | = | 0.00 kN/m |  | M8,surch | = | 0.00 kNm/m |  | FYG,8 | = | 0.00 kN/m |
|  | FX8,ASPile | = | 0.00 kN/m |  | FY8,ASPile | = | 0.00 kN/m |  | M8,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N8 | = | 265.18 kN/m |  | T8 | = | 38.10 kN/m |  |  |  |  |  |  |  |  |
|  | E7 | = | 701.12 kN/m |  | δ7 | = | 8.99 ° |  | E8 | = | 779.68 kN/m |  | δ8 | = | 10.24 ° |
| 条块 9: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L9 | = | 1.29 m |  | α9 | = | -3.06 ° |  | c9 | = | 13.90 kPa |  | φ9 | = | 8.40 ° |
|  | W9 | = | 235.85 kN/m |  | U9 | = | 0.00 kN/m |  | PW8 | = | 0.00 kN/m |  | PW9 | = | 0.00 kN/m |
|  | FX9,water | = | 0.00 kN/m |  | FY9,water | = | 0.00 kN/m |  | M9,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX9,surch | = | 0.00 kN/m |  | FY9,surch | = | 0.00 kN/m |  | M9,surch | = | 0.00 kNm/m |  | FYG,9 | = | 0.00 kN/m |
|  | FX9,ASPile | = | 0.00 kN/m |  | FY9,ASPile | = | 0.00 kN/m |  | M9,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N9 | = | 259.36 kN/m |  | T9 | = | 37.42 kN/m |  |  |  |  |  |  |  |  |
|  | E8 | = | 779.68 kN/m |  | δ8 | = | 10.24 ° |  | E9 | = | 833.93 kN/m |  | δ9 | = | 11.04 ° |
| 条块 10: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L10 | = | 1.29 m |  | α10 | = | 1.88 ° |  | c10 | = | 13.90 kPa |  | φ10 | = | 8.40 ° |
|  | W10 | = | 240.36 kN/m |  | U10 | = | 0.00 kN/m |  | PW9 | = | 0.00 kN/m |  | PW10 | = | 0.00 kN/m |
|  | FX10,water | = | 0.00 kN/m |  | FY10,water | = | 0.00 kN/m |  | M10,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX10,surch | = | 0.00 kN/m |  | FY10,surch | = | 0.00 kN/m |  | M10,surch | = | 0.00 kNm/m |  | FYG,10 | = | 0.00 kN/m |
|  | FX10,ASPile | = | 0.00 kN/m |  | FY10,ASPile | = | 0.00 kN/m |  | M10,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N10 | = | 249.05 kN/m |  | T10 | = | 36.40 kN/m |  |  |  |  |  |  |  |  |
|  | E9 | = | 833.93 kN/m |  | δ9 | = | 11.04 ° |  | E10 | = | 863.49 kN/m |  | δ10 | = | 11.32 ° |
| 条块 11: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L11 | = | 1.30 m |  | α11 | = | 6.84 ° |  | c11 | = | 13.90 kPa |  | φ11 | = | 8.40 ° |
|  | W11 | = | 239.18 kN/m |  | U11 | = | 0.00 kN/m |  | PW10 | = | 0.00 kN/m |  | PW11 | = | 0.00 kN/m |
|  | FX11,water | = | 0.00 kN/m |  | FY11,water | = | 0.00 kN/m |  | M11,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX11,surch | = | 0.00 kN/m |  | FY11,surch | = | 0.00 kN/m |  | M11,surch | = | 0.00 kNm/m |  | FYG,11 | = | 15.33 kN/m |
|  | FX11,ASPile | = | 0.00 kN/m |  | FY11,ASPile | = | 0.00 kN/m |  | M11,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N11 | = | 248.96 kN/m |  | T11 | = | 36.47 kN/m |  |  |  |  |  |  |  |  |
|  | E10 | = | 863.49 kN/m |  | δ10 | = | 11.32 ° |  | E11 | = | 869.36 kN/m |  | δ11 | = | 11.04 ° |
| 条块 12: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L12 | = | 1.32 m |  | α12 | = | 11.85 ° |  | c12 | = | 13.90 kPa |  | φ12 | = | 8.40 ° |
|  | W12 | = | 234.25 kN/m |  | U12 | = | 0.00 kN/m |  | PW11 | = | 0.00 kN/m |  | PW12 | = | 0.00 kN/m |
|  | FX12,water | = | 0.00 kN/m |  | FY12,water | = | 0.00 kN/m |  | M12,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX12,surch | = | 0.00 kN/m |  | FY12,surch | = | 0.00 kN/m |  | M12,surch | = | 0.00 kNm/m |  | FYG,12 | = | 19.40 kN/m |
|  | FX12,ASPile | = | 0.00 kN/m |  | FY12,ASPile | = | 0.00 kN/m |  | M12,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N12 | = | 236.51 kN/m |  | T12 | = | 35.42 kN/m |  |  |  |  |  |  |  |  |
|  | E11 | = | 869.36 kN/m |  | δ11 | = | 11.04 ° |  | E12 | = | 852.96 kN/m |  | δ12 | = | 10.24 ° |
| 条块 13: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L13 | = | 1.35 m |  | α13 | = | 16.95 ° |  | c13 | = | 13.90 kPa |  | φ13 | = | 8.40 ° |
|  | W13 | = | 226.51 kN/m |  | U13 | = | 0.00 kN/m |  | PW12 | = | 0.00 kN/m |  | PW13 | = | 0.00 kN/m |
|  | FX13,water | = | 0.00 kN/m |  | FY13,water | = | 0.00 kN/m |  | M13,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX13,surch | = | 0.00 kN/m |  | FY13,surch | = | 0.00 kN/m |  | M13,surch | = | 0.00 kNm/m |  | FYG,13 | = | 19.40 kN/m |
|  | FX13,ASPile | = | 0.00 kN/m |  | FY13,ASPile | = | 0.00 kN/m |  | M13,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N13 | = | 221.64 kN/m |  | T13 | = | 34.25 kN/m |  |  |  |  |  |  |  |  |
|  | E12 | = | 852.96 kN/m |  | δ12 | = | 10.24 ° |  | E13 | = | 817.56 kN/m |  | δ13 | = | 8.99 ° |
| 条块 14: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L14 | = | 1.40 m |  | α14 | = | 22.20 ° |  | c14 | = | 13.90 kPa |  | φ14 | = | 8.40 ° |
|  | W14 | = | 215.78 kN/m |  | U14 | = | 0.00 kN/m |  | PW13 | = | 0.00 kN/m |  | PW14 | = | 0.00 kN/m |
|  | FX14,water | = | 0.00 kN/m |  | FY14,water | = | 0.00 kN/m |  | M14,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX14,surch | = | 0.00 kN/m |  | FY14,surch | = | 0.00 kN/m |  | M14,surch | = | 0.00 kNm/m |  | FYG,14 | = | 42.62 kN/m |
|  | FX14,ASPile | = | 0.00 kN/m |  | FY14,ASPile | = | 0.00 kN/m |  | M14,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N14 | = | 232.30 kN/m |  | T14 | = | 35.71 kN/m |  |  |  |  |  |  |  |  |
|  | E13 | = | 817.56 kN/m |  | δ13 | = | 8.99 ° |  | E14 | = | 759.16 kN/m |  | δ14 | = | 7.41 ° |
| 条块 15: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L15 | = | 1.46 m |  | α15 | = | 27.65 ° |  | c15 | = | 13.90 kPa |  | φ15 | = | 8.40 ° |
|  | W15 | = | 201.76 kN/m |  | U15 | = | 0.00 kN/m |  | PW14 | = | 0.00 kN/m |  | PW15 | = | 0.00 kN/m |
|  | FX15,water | = | 0.00 kN/m |  | FY15,water | = | 0.00 kN/m |  | M15,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX15,surch | = | 0.00 kN/m |  | FY15,surch | = | 0.00 kN/m |  | M15,surch | = | 0.00 kNm/m |  | FYG,15 | = | 94.26 kN/m |
|  | FX15,ASPile | = | 0.00 kN/m |  | FY15,ASPile | = | 0.00 kN/m |  | M15,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N15 | = | 276.30 kN/m |  | T15 | = | 40.61 kN/m |  |  |  |  |  |  |  |  |
|  | E14 | = | 759.16 kN/m |  | δ14 | = | 7.41 ° |  | E15 | = | 663.80 kN/m |  | δ15 | = | 5.66 ° |
| 条块 16: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L16 | = | 1.55 m |  | α16 | = | 33.39 ° |  | c16 | = | 13.90 kPa |  | φ16 | = | 8.40 ° |
|  | W16 | = | 183.95 kN/m |  | U16 | = | 0.00 kN/m |  | PW15 | = | 0.00 kN/m |  | PW16 | = | 0.00 kN/m |
|  | FX16,water | = | 0.00 kN/m |  | FY16,water | = | 0.00 kN/m |  | M16,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX16,surch | = | 0.00 kN/m |  | FY16,surch | = | 0.00 kN/m |  | M16,surch | = | 0.00 kNm/m |  | FYG,16 | = | 94.26 kN/m |
|  | FX16,ASPile | = | 0.00 kN/m |  | FY16,ASPile | = | 0.00 kN/m |  | M16,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N16 | = | 272.38 kN/m |  | T16 | = | 41.05 kN/m |  |  |  |  |  |  |  |  |
|  | E15 | = | 663.80 kN/m |  | δ15 | = | 5.66 ° |  | E16 | = | 546.19 kN/m |  | δ16 | = | 3.91 ° |
| 条块 17: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L17 | = | 1.68 m |  | α17 | = | 39.55 ° |  | c17 | = | 13.90 kPa |  | φ17 | = | 8.40 ° |
|  | W17 | = | 161.61 kN/m |  | U17 | = | 0.00 kN/m |  | PW16 | = | 0.00 kN/m |  | PW17 | = | 0.00 kN/m |
|  | FX17,water | = | 0.00 kN/m |  | FY17,water | = | 0.00 kN/m |  | M17,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX17,surch | = | 0.00 kN/m |  | FY17,surch | = | 0.00 kN/m |  | M17,surch | = | 0.00 kNm/m |  | FYG,17 | = | 94.26 kN/m |
|  | FX17,ASPile | = | 0.00 kN/m |  | FY17,ASPile | = | 0.00 kN/m |  | M17,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N17 | = | 270.24 kN/m |  | T17 | = | 42.02 kN/m |  |  |  |  |  |  |  |  |
|  | E16 | = | 546.19 kN/m |  | δ16 | = | 3.91 ° |  | E17 | = | 405.56 kN/m |  | δ17 | = | 2.33 ° |
| 条块 18: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L18 | = | 1.87 m |  | α18 | = | 46.33 ° |  | c18 | = | 13.90 kPa |  | φ18 | = | 8.40 ° |
|  | W18 | = | 133.41 kN/m |  | U18 | = | 0.00 kN/m |  | PW17 | = | 0.00 kN/m |  | PW18 | = | 0.00 kN/m |
|  | FX18,water | = | 0.00 kN/m |  | FY18,water | = | 0.00 kN/m |  | M18,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX18,surch | = | 0.00 kN/m |  | FY18,surch | = | 0.00 kN/m |  | M18,surch | = | 0.00 kNm/m |  | FYG,18 | = | 94.26 kN/m |
|  | FX18,ASPile | = | 0.00 kN/m |  | FY18,ASPile | = | 0.00 kN/m |  | M18,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N18 | = | 266.88 kN/m |  | T18 | = | 43.50 kN/m |  |  |  |  |  |  |  |  |
|  | E17 | = | 405.56 kN/m |  | δ17 | = | 2.33 ° |  | E18 | = | 242.25 kN/m |  | δ18 | = | 1.08 ° |
| 条块 19: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L19 | = | 2.21 m |  | α19 | = | 54.13 ° |  | c19 | = | 16.70 kPa |  | φ19 | = | 9.80 ° |
|  | W19 | = | 96.59 kN/m |  | U19 | = | 0.00 kN/m |  | PW18 | = | 0.00 kN/m |  | PW19 | = | 0.00 kN/m |
|  | FX19,water | = | 0.00 kN/m |  | FY19,water | = | 0.00 kN/m |  | M19,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX19,surch | = | 0.00 kN/m |  | FY19,surch | = | 0.00 kN/m |  | M19,surch | = | 0.00 kNm/m |  | FYG,19 | = | 94.26 kN/m |
|  | FX19,ASPile | = | 0.00 kN/m |  | FY19,ASPile | = | 0.00 kN/m |  | M19,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N19 | = | 245.63 kN/m |  | T19 | = | 52.70 kN/m |  |  |  |  |  |  |  |  |
|  | E18 | = | 242.25 kN/m |  | δ18 | = | 1.08 ° |  | E19 | = | 74.05 kN/m |  | δ19 | = | 0.28 ° |
| 条块 20: |  |  |  |  |  |  |  |  |  |  |  |  |
|  | L20 | = | 2.95 m |  | α20 | = | 63.97 ° |  | c20 | = | 29.09 kPa |  | φ20 | = | 19.19 ° |
|  | W20 | = | 37.66 kN/m |  | U20 | = | 0.00 kN/m |  | PW19 | = | 0.00 kN/m |  | PW20 | = | 0.00 kN/m |
|  | FX20,water | = | 0.00 kN/m |  | FY20,water | = | 0.00 kN/m |  | M20,water | = | 0.00 kNm/m |  |  |  |  |
|  | FX20,surch | = | 0.00 kN/m |  | FY20,surch | = | 0.00 kN/m |  | M20,surch | = | 0.00 kNm/m |  | FYG,20 | = | 94.26 kN/m |
|  | FX20,ASPile | = | 0.00 kN/m |  | FY20,ASPile | = | 0.00 kN/m |  | M20,ASPile | = | 0.00 kNm/m |  |  |  |  |
|  | N20 | = | 124.27 kN/m |  | T20 | = | 85.74 kN/m |  |  |  |  |  |  |  |  |
|  | E19 | = | 74.05 kN/m |  | δ19 | = | 0.28 ° |  | E20 | = | 0.00 kN/m |  | δ20 | = | 0.00 ° |

**圆弧滑动面优化 (简布法(Janbu))**

| **编号** | **圆心** | **半径** | **FS** | **验算** |
| --- | --- | --- | --- | --- |
| **x [m]** | **z [m]** | **R [m]** |  |
| 1 | 17.64 | 10.08 | 15.12 | 1.78 | **满足要求** |
| 2 | 17.64 | 10.08 | 15.12 | 1.78 | **满足要求** |
| 3 | 17.64 | 10.08 | 15.12 | 1.78 | **满足要求** |
| 4 | 18.51 | 32.30 | 40.39 | 3.41 | **满足要求** |
| 5 | 18.53 | 30.84 | 39.37 | 3.41 | **满足要求** |
| 6 | 18.86 | 7.95 | 28.86 | 7.43 | **满足要求** |
| 7 | 18.32 | 46.08 | 51.07 | 4.37 | **满足要求** |
| 8 | 17.64 | 10.08 | 15.12 | 1.78 | **满足要求** |
| 9 | 18.56 | 24.32 | 31.04 | 2.34 | **满足要求** |
| 10 | 18.58 | 23.45 | 30.48 | 2.35 | **满足要求** |
| 11 | 29.51 | 8.35 | 13.33 | 10.24 | **满足要求** |
| 12 | 18.85 | 8.04 | 23.64 | 4.50 | **满足要求** |
| 13 | 18.46 | 30.33 | 35.32 | 2.85 | **满足要求** |
| 14 | 17.64 | 10.08 | 15.12 | 1.78 | **满足要求** |
| 15 | 18.61 | 19.02 | 24.93 | 1.82 | **满足要求** |
| 16 | 18.62 | 18.51 | 24.63 | 1.82 | **满足要求** |
| 17 | 24.72 | 10.08 | 15.12 | 26.36 | **满足要求** |
| 18 | 18.83 | 8.13 | 20.19 | 3.02 | **满足要求** |
| 19 | 11.69 | 8.52 | 13.51 | 5.84 | **满足要求** |
| 20 | 11.79 | 5.60 | 12.77 | 3.54 | **满足要求** |
| 21 | 18.55 | 21.63 | 26.61 | 2.15 | **满足要求** |
| 22 | 25.15 | 7.40 | 13.86 | 38.37 | **满足要求** |
| 23 | 17.64 | 10.08 | 15.12 | 1.78 | **满足要求** |
| 24 | 23.29 | 4.28 | 12.97 | 2.37 | **满足要求** |
| 25 | 18.30 | 16.34 | 21.71 | 1.78 | **满足要求** |
| 26 | 22.18 | 14.65 | 21.54 | 1.88 | **满足要求** |
| 27 | 18.54 | 24.89 | 30.56 | 2.18 | **满足要求** |
| 28 | 22.97 | 7.86 | 18.39 | 2.94 | **满足要求** |
| 29 | 18.55 | 24.49 | 30.28 | 2.17 | **满足要求** |
| 30 | 21.70 | 18.75 | 24.19 | 2.41 | **满足要求** |
| 31 | 18.73 | 14.43 | 24.51 | 2.85 | **满足要求** |
| 32 | 17.91 | 8.46 | 14.30 | 1.54 | **满足要求** |
| 33 | 18.40 | 14.32 | 20.56 | 1.67 | **满足要求** |
| 34 | 18.42 | 13.78 | 20.27 | 1.68 | **满足要求** |
| 35 | 22.63 | 8.46 | 14.30 | 4.21 | **满足要求** |
| 36 | 18.74 | 7.28 | 17.80 | 2.54 | **满足要求** |
| 37 | 13.94 | 7.52 | 13.33 | 2.04 | **满足要求** |
| 38 | 14.02 | 6.20 | 12.97 | 2.16 | **满足要求** |
| 39 | 18.35 | 15.27 | 21.08 | 1.66 | **满足要求** |
| 40 | 22.77 | 7.58 | 13.92 | 3.60 | **满足要求** |
| 41 | 17.91 | 8.46 | 14.30 | 1.54 | **满足要求** |
| 42 | 21.37 | 6.53 | 13.53 | 1.85 | **满足要求** |
| 43 | 17.73 | 7.72 | 11.25 | 13.65 | **满足要求** |
| 44 | 17.36 | 22.63 | 25.34 | 9.35 | **满足要求** |
| 45 | 19.71 | 16.82 | 19.62 | 10.65 | **满足要求** |
| 46 | 18.16 | 12.63 | 18.58 | 1.59 | **满足要求** |
| 47 | 18.20 | 12.08 | 18.30 | 1.60 | **满足要求** |
| 48 | 21.05 | 8.46 | 14.30 | 2.31 | **满足要求** |
| 49 | 18.56 | 7.52 | 16.48 | 1.89 | **满足要求** |
| 50 | 14.77 | 13.12 | 16.32 | 9.68 | **满足要求** |
| 51 | 15.30 | 7.78 | 13.59 | 1.74 | **满足要求** |
| 52 | 15.55 | 5.33 | 12.91 | 1.97 | **满足要求** |
| 53 | 15.37 | 7.06 | 13.35 | 1.79 | **满足要求** |
| 54 | 18.13 | 12.91 | 18.73 | 1.59 | **满足要求** |
| 55 | 21.09 | 8.23 | 14.20 | 2.24 | **满足要求** |
| 56 | 17.91 | 8.46 | 14.30 | 1.54 | **满足要求** |
| 57 | 20.11 | 7.84 | 14.03 | 1.73 | **满足要求** |
| 58 | 17.75 | 8.25 | 12.40 | 3.36 | **满足要求** |
| 59 | 17.45 | 16.76 | 20.52 | 3.06 | **满足要求** |
| 60 | 19.24 | 13.22 | 17.02 | 4.10 | **满足要求** |
| 61 | 18.02 | 11.37 | 17.21 | 1.55 | **满足要求** |
| 62 | 20.54 | 5.14 | 13.14 | 1.89 | **满足要求** |
| 63 | 18.06 | 10.92 | 16.99 | 1.56 | **满足要求** |
| 64 | 20.01 | 8.46 | 14.30 | 1.86 | **满足要求** |
| 65 | 18.39 | 7.76 | 15.67 | 1.71 | **满足要求** |
| 66 | 18.32 | 5.28 | 11.19 | 1.69 | **满足要求** |
| 67 | 15.75 | 11.52 | 15.56 | 2.83 | **满足要求** |
| 68 | 17.59 | 9.05 | 12.83 | 4.54 | **满足要求** |
| 69 | 16.18 | 8.00 | 13.82 | 1.63 | **满足要求** |
| 70 | 16.34 | 6.70 | 13.36 | 1.71 | **满足要求** |
| 71 | 18.38 | 4.97 | 11.10 | 1.72 | **满足要求** |
| 72 | 16.57 | 4.77 | 12.89 | 1.93 | **满足要求** |
| 73 | 16.23 | 7.58 | 13.66 | 1.65 | **满足要求** |
| 74 | 18.30 | 5.40 | 11.22 | 1.73 | **满足要求** |
| 75 | 18.01 | 11.40 | 17.23 | 1.55 | **满足要求** |
| 76 | 20.01 | 8.45 | 14.30 | 1.85 | **满足要求** |
| 77 | 17.91 | 8.46 | 14.30 | 1.54 | **满足要求** |
| 78 | 19.33 | 8.32 | 14.24 | 1.66 | **满足要求** |
| 79 | 17.79 | 8.42 | 13.07 | 2.29 | **满足要求** |
| 80 | 17.54 | 13.63 | 18.09 | 2.14 | **满足要求** |
| 81 | 18.84 | 11.37 | 15.84 | 2.52 | **满足要求** |
| 82 | 17.93 | 10.49 | 16.30 | 1.53 | **满足要求** |
| 83 | 19.07 | 10.81 | 16.66 | 1.55 | **满足要求** |
| 84 | 17.51 | 10.97 | 15.61 | 2.03 | **满足要求** |
| 85 | 17.79 | 15.87 | 20.28 | 2.25 | **满足要求** |
| 86 | 18.57 | 14.29 | 18.75 | 2.27 | **满足要求** |
| 87 | 18.09 | 12.48 | 18.27 | 1.57 | **满足要求** |
| 88 | 19.44 | 8.28 | 15.47 | 1.63 | **满足要求** |
| 89 | 18.11 | 12.21 | 18.12 | 1.58 | **满足要求** |
| 90 | 19.07 | 10.86 | 16.69 | 1.56 | **满足要求** |
| 91 | 18.32 | 9.80 | 16.99 | 1.65 | **满足要求** |
| 92 | 17.90 | 8.56 | 14.35 | 1.53 | **满足要求** |
| 93 | 19.32 | 8.43 | 14.29 | 1.68 | **满足要求** |
| 94 | 17.78 | 8.52 | 13.13 | 2.32 | **满足要求** |
| 95 | 17.52 | 13.78 | 18.19 | 2.18 | **满足要求** |
| 96 | 18.82 | 11.50 | 15.93 | 2.56 | **满足要求** |
| 97 | 17.92 | 10.61 | 16.36 | 1.52 | **满足要求** |
| 98 | 19.06 | 10.94 | 16.73 | 1.57 | **满足要求** |
| 99 | 17.49 | 11.10 | 15.68 | 2.08 | **满足要求** |
| 100 | 17.78 | 16.04 | 20.39 | 2.31 | **满足要求** |
| 101 | 18.55 | 14.46 | 18.87 | 2.32 | **满足要求** |
| 102 | 18.08 | 12.61 | 18.33 | 1.57 | **满足要求** |
| 103 | 19.43 | 8.38 | 15.50 | 1.63 | **满足要求** |
| 104 | 18.11 | 12.33 | 18.19 | 1.57 | **满足要求** |
| 105 | 19.05 | 10.98 | 16.75 | 1.58 | **满足要求** |
| 106 | 18.32 | 9.90 | 17.03 | 1.64 | **满足要求** |
| 107 | 17.89 | 8.67 | 14.40 | 1.52 | **满足要求** |
| 108 | 19.31 | 8.54 | 14.34 | 1.70 | **满足要求** |
| 109 | 17.76 | 8.64 | 13.19 | 2.38 | **满足要求** |
| 110 | 17.51 | 13.94 | 18.29 | 2.24 | **满足要求** |
| 111 | 18.81 | 11.65 | 16.02 | 2.64 | **满足要求** |
| 112 | 17.91 | 10.73 | 16.43 | 1.52 | **满足要求** |
| 113 | 19.66 | 6.38 | 13.49 | 1.71 | **满足要求** |
| 114 | 17.95 | 10.38 | 16.25 | 1.53 | **满足要求** |
| 115 | 19.29 | 8.67 | 14.40 | 1.73 | **满足要求** |
| 116 | 18.23 | 8.16 | 15.27 | 1.62 | **满足要求** |
| 117 | 18.14 | 6.56 | 12.26 | 1.65 | **满足要求** |
| 118 | 16.39 | 10.78 | 15.29 | 2.13 | **满足要求** |
| 119 | 17.69 | 9.05 | 13.40 | 2.62 | **满足要求** |
| 120 | 16.72 | 8.38 | 14.09 | 1.57 | **满足要求** |
| 121 | 17.69 | 5.38 | 12.53 | 1.74 | **满足要求** |
| 122 | 18.50 | 4.57 | 11.67 | 1.80 | **满足要求** |
| 123 | 16.82 | 7.64 | 13.79 | 1.60 | **满足要求** |
| 124 | 18.19 | 6.28 | 12.16 | 1.60 | **满足要求** |
| 125 | 17.05 | 6.02 | 13.25 | 1.73 | **满足要求** |
| 126 | 16.76 | 8.12 | 13.98 | 1.58 | **满足要求** |
| 127 | 18.15 | 6.54 | 12.25 | 1.65 | **满足要求** |
| 128 | 17.92 | 10.67 | 16.40 | 1.52 | **满足要求** |
| 129 | 19.28 | 8.74 | 14.43 | 1.74 | **满足要求** |
| 130 | 17.89 | 8.67 | 14.40 | 1.52 | **满足要求** |
| 131 | 18.82 | 8.70 | 14.41 | 1.64 | **满足要求** |
| 132 | 17.80 | 8.69 | 13.61 | 1.96 | **满足要求** |
| 133 | 17.58 | 12.07 | 16.88 | 1.88 | **满足要求** |
| 134 | 18.52 | 10.55 | 15.37 | 2.08 | **满足要求** |
| 135 | 17.86 | 10.11 | 15.81 | 1.52 | **满足要求** |
| 136 | 18.64 | 10.38 | 16.05 | 1.57 | **满足要求** |
| 137 | 17.61 | 10.39 | 15.29 | 1.87 | **满足要求** |
| 138 | 17.73 | 13.51 | 18.29 | 1.92 | **满足要求** |
| 139 | 18.33 | 12.42 | 17.22 | 1.97 | **满足要求** |
| 140 | 17.96 | 11.45 | 17.11 | 1.53 | **满足要求** |
| 141 | 18.91 | 8.60 | 15.20 | 1.58 | **满足要求** |
| 142 | 17.98 | 11.23 | 17.00 | 1.54 | **满足要求** |
| 143 | 18.65 | 10.31 | 16.01 | 1.57 | **满足要求** |
| 144 | 18.16 | 9.60 | 16.22 | 1.59 | **满足要求** |
| 145 | 17.87 | 8.81 | 14.47 | 1.53 | **满足要求** |
| 146 | 16.95 | 11.52 | 16.37 | 1.85 | **满足要求** |
| 147 | 17.57 | 10.63 | 15.43 | 1.93 | **满足要求** |
| 148 | 17.15 | 9.80 | 15.48 | 1.54 | **满足要求** |
| 149 | 17.71 | 7.65 | 14.30 | 1.60 | **满足要求** |
| 150 | 18.14 | 7.15 | 13.76 | 1.61 | **满足要求** |
| 151 | 17.20 | 9.40 | 15.30 | 1.56 | **满足要求** |
| 152 | 17.91 | 8.56 | 14.36 | 1.53 | **满足要求** |
| 153 | 17.36 | 8.06 | 14.74 | 1.62 | **满足要求** |
| 154 | 17.17 | 9.65 | 15.41 | 1.55 | **满足要求** |
| 155 | 17.88 | 8.74 | 14.44 | 1.52 | **满足要求** |
| 156 | 18.81 | 8.77 | 14.46 | 1.64 | **满足要求** |
| 157 | 17.79 | 8.76 | 13.65 | 1.98 | **满足要求** |
| 158 | 17.58 | 12.15 | 16.94 | 1.90 | **满足要求** |
| 159 | 18.51 | 10.64 | 15.43 | 2.09 | **满足要求** |
| 160 | 17.85 | 10.19 | 15.85 | 1.52 | **满足要求** |
| 161 | 18.63 | 10.46 | 16.10 | 1.58 | **满足要求** |
| 162 | 17.60 | 10.47 | 15.33 | 1.89 | **满足要求** |
| 163 | 17.72 | 13.62 | 18.35 | 1.95 | **满足要求** |
| 164 | 18.32 | 12.51 | 17.28 | 1.99 | **满足要求** |
| 165 | 17.95 | 11.53 | 17.16 | 1.53 | **满足要求** |
| 166 | 18.90 | 8.67 | 15.23 | 1.58 | **满足要求** |
| 167 | 17.98 | 11.31 | 17.04 | 1.54 | **满足要求** |
| 168 | 18.64 | 10.39 | 16.06 | 1.58 | **满足要求** |
| 169 | 18.16 | 9.67 | 16.25 | 1.58 | **满足要求** |
| 170 | 17.86 | 8.89 | 14.51 | 1.54 | **满足要求** |
| 171 | 16.94 | 11.61 | 16.42 | 1.87 | **满足要求** |
| 172 | 17.56 | 10.72 | 15.48 | 1.95 | **满足要求** |
| 173 | 17.15 | 9.87 | 15.52 | 1.54 | **满足要求** |
| 174 | 17.70 | 7.71 | 14.32 | 1.59 | **满足要求** |
| 175 | 18.13 | 7.21 | 13.79 | 1.60 | **满足要求** |
| 176 | 17.19 | 9.47 | 15.33 | 1.56 | **满足要求** |
| 177 | 17.90 | 8.63 | 14.39 | 1.53 | **满足要求** |
| 178 | 17.36 | 8.12 | 14.76 | 1.62 | **满足要求** |
| 179 | 17.16 | 9.72 | 15.45 | 1.54 | **满足要求** |
| 180 | 17.87 | 8.81 | 14.47 | 1.53 | **满足要求** |
| 181 | 17.96 | 11.47 | 17.12 | 1.53 | **满足要求** |
| 182 | 18.63 | 10.48 | 16.11 | 1.59 | **满足要求** |
| 183 | 17.85 | 10.19 | 15.85 | 1.52 | **满足要求** |
| 184 | 18.31 | 10.49 | 16.11 | 1.56 | **满足要求** |
| 185 | 17.64 | 10.46 | 15.58 | 1.72 | **满足要求** |
| 186 | 17.76 | 12.40 | 17.45 | 1.76 | **满足要求** |
| 187 | 18.12 | 11.76 | 16.82 | 1.79 | **满足要求** |
| 188 | 17.91 | 11.10 | 16.72 | 1.52 | **满足要求** |
| 189 | 18.50 | 9.23 | 15.48 | 1.55 | **满足要求** |
| 190 | 17.93 | 10.94 | 16.64 | 1.53 | **满足要求** |
| 191 | 18.33 | 10.39 | 16.06 | 1.54 | **满足要求** |
| 192 | 18.06 | 9.83 | 16.10 | 1.56 | **满足要求** |
| 193 | 17.81 | 9.39 | 15.02 | 1.52 | **满足要求** |
| 194 | 18.42 | 9.48 | 15.06 | 1.61 | **满足要求** |
| 195 | 17.74 | 9.44 | 14.52 | 1.79 | **满足要求** |
| 196 | 17.66 | 11.60 | 16.61 | 1.78 | **满足要求** |
| 197 | 18.23 | 10.68 | 15.70 | 1.85 | **满足要求** |
| 198 | 17.83 | 10.33 | 15.92 | 1.53 | **满足要求** |
| 199 | 18.60 | 8.30 | 14.51 | 1.56 | **满足要求** |
| 200 | 17.86 | 10.15 | 15.83 | 1.52 | **满足要求** |
| 201 | 18.43 | 9.39 | 15.02 | 1.59 | **满足要求** |
| 202 | 18.01 | 9.08 | 15.31 | 1.55 | **满足要求** |
| 203 | 17.91 | 8.43 | 14.02 | 1.58 | **满足要求** |
| 204 | 17.16 | 10.33 | 15.40 | 1.71 | **满足要求** |
| 205 | 17.72 | 9.57 | 14.59 | 1.82 | **满足要求** |
| 206 | 17.32 | 9.21 | 14.83 | 1.51 | **满足要求** |
| 207 | 17.80 | 9.47 | 15.06 | 1.54 | **满足要求** |
| 208 | 17.12 | 9.43 | 14.51 | 1.72 | **满足要求** |
| 209 | 17.22 | 11.32 | 16.32 | 1.76 | **满足要求** |
| 210 | 17.61 | 10.67 | 15.69 | 1.77 | **满足要求** |
| 211 | 17.37 | 10.09 | 15.68 | 1.52 | **满足要求** |
| 212 | 17.98 | 8.29 | 14.50 | 1.55 | **满足要求** |
| 213 | 17.39 | 9.94 | 15.61 | 1.52 | **满足要求** |
| 214 | 17.81 | 9.39 | 15.01 | 1.52 | **满足要求** |
| 215 | 17.52 | 8.89 | 15.12 | 1.56 | **满足要求** |
| 216 | 17.29 | 8.43 | 14.02 | 1.52 | **满足要求** |
| 217 | 16.70 | 10.10 | 15.15 | 1.74 | **满足要求** |
| 218 | 17.10 | 9.56 | 14.58 | 1.76 | **满足要求** |
| 219 | 16.85 | 9.01 | 14.63 | 1.55 | **满足要求** |
| 220 | 17.23 | 7.60 | 13.85 | 1.58 | **满足要求** |
| 221 | 17.47 | 7.30 | 13.54 | 1.58 | **满足要求** |
| 222 | 16.88 | 8.79 | 14.52 | 1.55 | **满足要求** |
| 223 | 17.32 | 8.26 | 13.94 | 1.53 | **满足要求** |
| 224 | 17.00 | 7.87 | 14.14 | 1.60 | **满足要求** |
| 225 | 16.86 | 8.92 | 14.59 | 1.55 | **满足要求** |
| 226 | 17.30 | 8.37 | 13.99 | 1.52 | **满足要求** |
| 227 | 17.38 | 10.04 | 15.65 | 1.53 | **满足要求** |
| 228 | 17.80 | 9.45 | 15.05 | 1.53 | **满足要求** |
| 229 | 17.32 | 9.21 | 14.83 | 1.51 | **满足要求** |
| 230 | 17.62 | 9.43 | 15.01 | 1.52 | **满足要求** |
| 231 | 17.17 | 9.39 | 14.64 | 1.63 | **满足要求** |
| 232 | 17.25 | 10.59 | 15.80 | 1.66 | **满足要求** |
| 233 | 17.50 | 10.18 | 15.41 | 1.66 | **满足要求** |
| 234 | 17.35 | 9.80 | 15.40 | 1.52 | **满足要求** |
| 235 | 17.74 | 8.62 | 14.63 | 1.54 | **满足要求** |
| 236 | 17.37 | 9.70 | 15.35 | 1.52 | **满足要求** |
| 237 | 17.63 | 9.35 | 14.98 | 1.50 | **满足要求** |
| 238 | 18.00 | 9.47 | 15.06 | 1.56 | **满足要求** |
| 239 | 17.56 | 9.42 | 14.69 | 1.66 | **满足要求** |
| 240 | 17.55 | 10.75 | 15.97 | 1.66 | **满足要求** |
| 241 | 17.88 | 10.23 | 15.45 | 1.71 | **满足要求** |
| 242 | 17.66 | 9.95 | 15.55 | 1.51 | **满足要求** |
| 243 | 18.13 | 8.65 | 14.67 | 1.54 | **满足要求** |
| 244 | 17.68 | 9.84 | 15.50 | 1.52 | **满足要求** |
| 245 | 18.02 | 9.39 | 15.02 | 1.54 | **满足要求** |
| 246 | 17.78 | 9.12 | 15.15 | 1.54 | **满足要求** |
| 247 | 17.67 | 8.75 | 14.35 | 1.53 | **满足要求** |
| 248 | 17.21 | 9.95 | 15.20 | 1.63 | **满足要求** |
| 249 | 17.55 | 9.50 | 14.73 | 1.67 | **满足要求** |
| 250 | 17.32 | 9.21 | 14.83 | 1.51 | **满足要求** |
| 251 | 17.58 | 8.23 | 14.28 | 1.54 | **满足要求** |
| 252 | 17.80 | 7.96 | 14.00 | 1.55 | **满足要求** |
| 253 | 17.34 | 9.06 | 14.76 | 1.52 | **满足要求** |
| 254 | 17.69 | 8.63 | 14.30 | 1.52 | **满足要求** |
| 255 | 17.44 | 8.40 | 14.47 | 1.55 | **满足要求** |
| 256 | 17.33 | 9.15 | 14.80 | 1.52 | **满足要求** |
| 257 | 17.68 | 8.70 | 14.33 | 1.52 | **满足要求** |
| 258 | 17.67 | 9.90 | 15.53 | 1.51 | **满足要求** |
| 259 | 18.01 | 9.44 | 15.04 | 1.56 | **满足要求** |
| 260 | 17.63 | 9.35 | 14.98 | 1.50 | **满足要求** |
| 261 | 17.87 | 9.45 | 15.05 | 1.54 | **满足要求** |
| 262 | 17.57 | 9.41 | 14.80 | 1.60 | **满足要求** |
| 263 | 17.57 | 10.27 | 15.63 | 1.60 | **满足要求** |
| 264 | 17.79 | 9.94 | 15.30 | 1.62 | **满足要求** |
| 265 | 17.65 | 9.75 | 15.36 | 1.51 | **满足要求** |
| 266 | 17.96 | 8.90 | 14.78 | 1.53 | **满足要求** |
| 267 | 17.66 | 9.67 | 15.32 | 1.52 | **满足要求** |
| 268 | 17.88 | 9.39 | 15.02 | 1.53 | **满足要求** |
| 269 | 17.73 | 9.19 | 15.09 | 1.53 | **满足要求** |
| 270 | 17.65 | 8.96 | 14.57 | 1.52 | **满足要求** |
| 271 | 17.35 | 9.75 | 15.13 | 1.58 | **满足要求** |
| 272 | 17.57 | 9.46 | 14.82 | 1.61 | **满足要求** |
| 273 | 17.42 | 9.26 | 14.88 | 1.51 | **满足要求** |
| 274 | 17.60 | 8.59 | 14.50 | 1.54 | **满足要求** |
| 275 | 17.73 | 8.42 | 14.32 | 1.54 | **满足要求** |
| 276 | 17.44 | 9.16 | 14.84 | 1.52 | **满足要求** |
| 277 | 17.66 | 8.88 | 14.54 | 1.51 | **满足要求** |
| 278 | 17.51 | 8.71 | 14.62 | 1.53 | **满足要求** |
| 279 | 17.43 | 9.21 | 14.86 | 1.51 | **满足要求** |
| 280 | 17.65 | 8.93 | 14.56 | 1.51 | **满足要求** |
| 281 | 17.66 | 9.72 | 15.34 | 1.51 | **满足要求** |
| 282 | 17.87 | 9.42 | 15.04 | 1.53 | **满足要求** |
| 283 | 17.63 | 9.35 | 14.98 | 1.50 | **满足要求** |
| 284 | 17.78 | 9.43 | 15.04 | 1.53 | **满足要求** |
| 285 | 17.58 | 9.41 | 14.87 | 1.57 | **满足要求** |
| 286 | 17.59 | 9.96 | 15.41 | 1.57 | **满足要求** |
| 287 | 17.73 | 9.75 | 15.20 | 1.58 | **满足要求** |
| 288 | 17.64 | 9.62 | 15.23 | 1.51 | **满足要求** |
| 289 | 17.84 | 9.06 | 14.86 | 1.52 | **满足要求** |
| 290 | 17.65 | 9.57 | 15.21 | 1.51 | **满足要求** |
| 291 | 17.79 | 9.39 | 15.02 | 1.51 | **满足要求** |
| 292 | 17.70 | 9.24 | 15.05 | 1.52 | **满足要求** |
| 293 | 17.63 | 9.10 | 14.72 | 1.51 | **满足要求** |
| 294 | 17.44 | 9.62 | 15.08 | 1.55 | **满足要求** |
| 295 | 17.58 | 9.44 | 14.89 | 1.57 | **满足要求** |
| 296 | 17.49 | 9.29 | 14.91 | 1.51 | **满足要求** |
| 297 | 17.61 | 8.84 | 14.65 | 1.52 | **满足要求** |
| 298 | 17.69 | 8.74 | 14.55 | 1.53 | **满足要求** |
| 299 | 17.50 | 9.23 | 14.89 | 1.51 | **满足要求** |
| 300 | 17.64 | 9.05 | 14.70 | 1.51 | **满足要求** |
| 301 | 17.55 | 8.92 | 14.74 | 1.53 | **满足要求** |
| 302 | 17.50 | 9.26 | 14.90 | 1.51 | **满足要求** |
| 303 | 17.63 | 9.08 | 14.71 | 1.51 | **满足要求** |
| 304 | 17.65 | 9.59 | 15.22 | 1.51 | **满足要求** |
| 305 | 17.78 | 9.41 | 15.03 | 1.52 | **满足要求** |
| 306 | 17.63 | 9.35 | 14.98 | 1.50 | **满足要求** |
| 307 | 17.72 | 9.42 | 15.04 | 1.51 | **满足要求** |
| 308 | 17.59 | 9.40 | 14.92 | 1.55 | **满足要求** |
| 309 | 17.60 | 9.75 | 15.26 | 1.54 | **满足要求** |
| 310 | 17.69 | 9.63 | 15.14 | 1.56 | **满足要求** |
| 311 | 17.64 | 9.53 | 15.15 | 1.51 | **满足要求** |
| 312 | 17.76 | 9.17 | 14.91 | 1.52 | **满足要求** |
| 313 | 17.64 | 9.49 | 15.13 | 1.51 | **满足要求** |
| 314 | 17.72 | 9.39 | 15.02 | 1.51 | **满足要求** |
| 315 | 17.68 | 9.28 | 15.03 | 1.52 | **满足要求** |
| 316 | 17.62 | 9.20 | 14.82 | 1.51 | **满足要求** |
| 317 | 17.51 | 9.53 | 15.04 | 1.54 | **满足要求** |
| 318 | 17.59 | 9.42 | 14.93 | 1.55 | **满足要求** |
| 319 | 17.54 | 9.31 | 14.94 | 1.51 | **满足要求** |
| 320 | 17.62 | 9.01 | 14.76 | 1.52 | **满足要求** |
| 321 | 17.66 | 8.95 | 14.70 | 1.52 | **满足要求** |
| 322 | 17.54 | 9.27 | 14.92 | 1.51 | **满足要求** |
| 323 | 17.63 | 9.16 | 14.80 | 1.51 | **满足要求** |
| 324 | 17.58 | 9.06 | 14.82 | 1.52 | **满足要求** |
| 325 | 17.54 | 9.29 | 14.93 | 1.51 | **满足要求** |
| 326 | 17.62 | 9.18 | 14.81 | 1.51 | **满足要求** |
| 327 | 17.64 | 9.51 | 15.14 | 1.51 | **满足要求** |
| 328 | 17.72 | 9.40 | 15.03 | 1.51 | **满足要求** |
| 329 | 17.63 | 9.35 | 14.98 | 1.50 | **满足要求** |
| 330 | 17.69 | 9.40 | 15.02 | 1.51 | **满足要求** |
| 331 | 17.60 | 9.39 | 14.94 | 1.53 | **满足要求** |
| 332 | 17.61 | 9.62 | 15.17 | 1.53 | **满足要求** |
| 333 | 17.67 | 9.54 | 15.09 | 1.53 | **满足要求** |
| 334 | 17.64 | 9.47 | 15.09 | 1.51 | **满足要求** |
| 335 | 17.71 | 9.23 | 14.94 | 1.51 | **满足要求** |
| 336 | 17.64 | 9.45 | 15.08 | 1.50 | **满足要求** |
| 337 | 17.69 | 9.38 | 15.01 | 1.50 | **满足要求** |
| 338 | 17.76 | 9.41 | 15.03 | 1.52 | **满足要求** |
| 339 | 17.68 | 9.40 | 14.95 | 1.54 | **满足要求** |
| 340 | 17.67 | 9.65 | 15.20 | 1.54 | **满足要求** |
| 341 | 17.74 | 9.55 | 15.10 | 1.54 | **满足要求** |
| 342 | 17.70 | 9.50 | 15.12 | 1.52 | **满足要求** |
| 343 | 17.79 | 9.24 | 14.95 | 1.52 | **满足要求** |
| 344 | 17.70 | 9.48 | 15.11 | 1.51 | **满足要求** |
| 345 | 17.77 | 9.39 | 15.02 | 1.51 | **满足要求** |
| 346 | 17.72 | 9.33 | 15.04 | 1.52 | **满足要求** |
| 347 | 17.70 | 9.26 | 14.89 | 1.51 | **满足要求** |
| 348 | 17.61 | 9.50 | 15.05 | 1.54 | **满足要求** |
| 349 | 17.67 | 9.41 | 14.96 | 1.54 | **满足要求** |
| 350 | 17.63 | 9.35 | 14.98 | 1.50 | **满足要求** |
| 351 | 17.68 | 9.15 | 14.86 | 1.51 | **满足要求** |
| 352 | 17.72 | 9.09 | 14.80 | 1.51 | **满足要求** |
| 353 | 17.63 | 9.33 | 14.97 | 1.51 | **满足要求** |
| 354 | 17.70 | 9.24 | 14.87 | 1.51 | **满足要求** |
| 355 | 17.66 | 9.18 | 14.90 | 1.51 | **满足要求** |
| 356 | 17.63 | 9.34 | 14.97 | 1.51 | **满足要求** |
| 357 | 17.70 | 9.25 | 14.88 | 1.51 | **满足要求** |
| 358 | 17.70 | 9.49 | 15.12 | 1.51 | **满足要求** |
| 359 | 17.76 | 9.40 | 15.02 | 1.52 | **满足要求** |
| 360 | 17.69 | 9.38 | 15.01 | 1.50 | **满足要求** |
| 361 | 17.74 | 9.40 | 15.03 | 1.51 | **满足要求** |
| 362 | 17.68 | 9.39 | 14.97 | 1.52 | **满足要求** |
| 363 | 17.68 | 9.56 | 15.14 | 1.53 | **满足要求** |
| 364 | 17.72 | 9.49 | 15.07 | 1.53 | **满足要求** |
| 365 | 17.69 | 9.46 | 15.09 | 1.51 | **满足要求** |
| 366 | 17.75 | 9.29 | 14.97 | 1.51 | **满足要求** |
| 367 | 17.70 | 9.44 | 15.08 | 1.51 | **满足要求** |
| 368 | 17.74 | 9.39 | 15.02 | 1.51 | **满足要求** |
| 369 | 17.71 | 9.35 | 15.03 | 1.51 | **满足要求** |
| 370 | 17.69 | 9.30 | 14.93 | 1.51 | **满足要求** |
| 371 | 17.63 | 9.46 | 15.04 | 1.53 | **满足要求** |
| 372 | 17.68 | 9.40 | 14.98 | 1.52 | **满足要求** |
| 373 | 17.65 | 9.36 | 14.99 | 1.51 | **满足要求** |
| 374 | 17.68 | 9.23 | 14.91 | 1.51 | **满足要求** |
| 375 | 17.71 | 9.19 | 14.87 | 1.51 | **满足要求** |
| 376 | 17.65 | 9.34 | 14.98 | 1.51 | **满足要求** |
| 377 | 17.70 | 9.29 | 14.92 | 1.51 | **满足要求** |
| 378 | 17.67 | 9.25 | 14.93 | 1.51 | **满足要求** |
| 379 | 17.65 | 9.35 | 14.99 | 1.51 | **满足要求** |
| 380 | 17.69 | 9.30 | 14.93 | 1.51 | **满足要求** |
| 381 | 17.69 | 9.45 | 15.08 | 1.51 | **满足要求** |
| 382 | 17.74 | 9.40 | 15.02 | 1.52 | **满足要求** |
| 383 | 18.44 | 30.78 | 39.54 | 3.46 | **满足要求** |
| 384 | 30.77 | 29.72 | 38.69 | 6.24 | **满足要求** |
| 385 | 19.86 | 17.39 | 42.08 | 12.12 | **满足要求** |
| 386 | 5.76 | 17.25 | 29.10 | 5.79 | **满足要求** |
| 387 | 18.44 | 4.55 | 13.31 | 1.91 | **满足要求** |
| 388 | 18.58 | 20.96 | 33.60 | 5.07 | **满足要求** |
| 389 | 18.59 | 20.35 | 33.29 | 5.16 | **满足要求** |
| 390 | 18.82 | 4.17 | 28.85 | 9.01 | **满足要求** |
| 391 | 18.44 | 30.79 | 39.55 | 3.46 | **满足要求** |
| 392 | 18.44 | 4.55 | 13.31 | 1.91 | **满足要求** |
| 393 | 29.09 | 41.37 | 39.51 | 25.83 | **满足要求** |
| 394 | 18.62 | 15.33 | 26.24 | 3.34 | **满足要求** |
| 395 | 18.63 | 14.99 | 26.09 | 3.39 | **满足要求** |
| 396 | 29.43 | 4.17 | 12.92 | 12.50 | **满足要求** |
| 397 | 18.81 | 4.18 | 23.54 | 5.76 | **满足要求** |
| 398 | 18.81 | 4.18 | 2.32 | 15.00 | **满足要求** |
| 399 | 8.19 | 4.18 | 12.94 | 12.39 | **满足要求** |
| 400 | 18.54 | 19.67 | 28.42 | 2.43 | **满足要求** |
| 401 | 18.44 | 4.55 | 13.31 | 1.91 | **满足要求** |
| 402 | 18.12 | 37.95 | 39.63 | 20.12 | **满足要求** |
| 403 | 18.66 | 11.59 | 21.49 | 2.48 | **满足要求** |
| 404 | 18.66 | 11.41 | 21.42 | 2.52 | **满足要求** |
| 405 | 25.51 | 4.55 | 13.31 | 14.77 | **满足要求** |
| 406 | 11.73 | 4.18 | 12.94 | 3.95 | **满足要求** |
| 407 | 18.62 | 13.50 | 22.26 | 1.96 | **满足要求** |
| 408 | 18.44 | 4.55 | 13.31 | 1.91 | **满足要求** |
| 409 | 18.11 | 20.58 | 24.63 | 2.85 | **满足要求** |
| 410 | 21.83 | 12.95 | 17.07 | 8.14 | **满足要求** |
| 411 | 18.58 | 9.31 | 18.61 | 2.15 | **满足要求** |
| 412 | 18.59 | 9.13 | 18.56 | 2.21 | **满足要求** |
| 413 | 23.15 | 4.55 | 13.31 | 2.28 | **满足要求** |
| 414 | 18.79 | 4.20 | 17.67 | 3.42 | **满足要求** |
| 415 | 13.78 | 9.22 | 14.19 | 2.36 | **满足要求** |
| 416 | 18.14 | 4.85 | 8.91 | 27.68 | **满足要求** |
| 417 | 14.06 | 4.21 | 12.97 | 2.51 | **满足要求** |
| 418 | 18.54 | 10.13 | 18.89 | 1.83 | **满足要求** |
| 419 | 22.90 | 7.63 | 18.60 | 3.06 | **满足要求** |
| 420 | 17.56 | 10.16 | 15.40 | 1.65 | **满足要求** |
| 421 | 23.16 | 4.57 | 13.31 | 2.29 | **满足要求** |
| 422 | 18.30 | 16.20 | 21.80 | 1.70 | **满足要求** |
| 423 | 18.32 | 15.63 | 21.47 | 1.68 | **满足要求** |
| 424 | 22.28 | 10.16 | 15.40 | 4.38 | **满足要求** |
| 425 | 18.62 | 8.44 | 18.35 | 2.37 | **满足要求** |
| 426 | 13.80 | 8.83 | 14.02 | 2.15 | **满足要求** |
| 427 | 13.88 | 7.42 | 13.54 | 2.08 | **满足要求** |
| 428 | 18.25 | 17.20 | 22.40 | 1.87 | **满足要求** |
| 429 | 22.40 | 9.38 | 15.00 | 3.78 | **满足要求** |
| 430 | 17.56 | 10.16 | 15.40 | 1.65 | **满足要求** |
| 431 | 21.00 | 8.29 | 14.49 | 1.99 | **满足要求** |
| 432 | 17.16 | 26.19 | 28.28 | 14.50 | **满足要求** |
| 433 | 19.06 | 20.58 | 22.81 | 14.86 | **满足要求** |
| 434 | 18.00 | 14.45 | 19.77 | 1.72 | **满足要求** |
| 435 | 21.56 | 4.72 | 13.33 | 2.04 | **满足要求** |
| 436 | 18.05 | 13.83 | 19.42 | 1.61 | **满足要求** |
| 437 | 20.47 | 13.96 | 20.11 | 1.61 | **满足要求** |
| 438 | 23.79 | 12.57 | 19.31 | 2.75 | **满足要求** |
| 439 | 20.05 | 14.28 | 17.96 | 5.61 | **满足要求** |
| 440 | 20.28 | 31.13 | 34.13 | 11.39 | **满足要求** |
| 441 | 22.16 | 25.44 | 28.54 | 16.33 | **满足要求** |
| 442 | 21.03 | 18.58 | 24.77 | 1.90 | **满足要求** |
| 443 | 24.40 | 7.73 | 17.15 | 2.89 | **满足要求** |
| 444 | 21.07 | 17.94 | 24.38 | 1.90 | **满足要求** |
| 445 | 23.61 | 13.96 | 20.11 | 3.15 | **满足要求** |
| 446 | 21.43 | 12.00 | 21.24 | 2.32 | **满足要求** |
| 447 | 21.01 | 8.18 | 14.44 | 1.96 | **满足要求** |
| 448 | 17.58 | 20.32 | 23.68 | 4.22 | **满足要求** |
| 449 | 19.71 | 16.45 | 19.53 | 8.80 | **满足要求** |
| 450 | 18.13 | 12.70 | 18.81 | 1.61 | **满足要求** |
| 451 | 19.90 | 5.68 | 15.06 | 2.20 | **满足要求** |
| 452 | 18.31 | 10.17 | 17.63 | 1.68 | **满足要求** |
| 453 | 21.12 | 7.49 | 14.16 | 1.82 | **满足要求** |
| 454 | 18.54 | 6.99 | 16.59 | 2.26 | **满足要求** |
| 455 | 18.18 | 11.94 | 18.42 | 1.63 | **满足要求** |
| 456 | 20.98 | 8.41 | 14.54 | 2.01 | **满足要求** |
| 457 | 21.02 | 18.80 | 24.91 | 1.92 | **满足要求** |
| 458 | 23.62 | 13.93 | 20.10 | 3.15 | **满足要求** |
| 459 | 20.47 | 13.96 | 20.11 | 1.61 | **满足要求** |
| 460 | 22.61 | 13.64 | 19.92 | 2.22 | **满足要求** |
| 461 | 20.18 | 14.36 | 18.77 | 2.94 | **满足要求** |
| 462 | 20.29 | 24.03 | 28.08 | 3.59 | **满足要求** |
| 463 | 21.74 | 20.48 | 24.59 | 4.87 | **满足要求** |
| 464 | 20.84 | 17.14 | 23.25 | 1.79 | **满足要求** |
| 465 | 23.11 | 9.65 | 17.88 | 2.00 | **满足要求** |
| 466 | 20.88 | 16.61 | 22.92 | 1.77 | **满足要求** |
| 467 | 22.57 | 13.96 | 20.11 | 2.28 | **满足要求** |
| 468 | 21.20 | 12.45 | 20.66 | 1.86 | **满足要求** |
| 469 | 20.80 | 10.16 | 16.28 | 1.80 | **满足要求** |
| 470 | 18.52 | 17.94 | 22.21 | 2.50 | **满足要求** |
| 471 | 20.04 | 15.33 | 19.43 | 3.41 | **满足要求** |
| 472 | 18.96 | 13.05 | 19.16 | 1.60 | **满足要求** |
| 473 | 20.52 | 13.63 | 19.91 | 1.60 | **满足要求** |
| 474 | 18.10 | 14.36 | 18.76 | 2.24 | **满足要求** |
| 475 | 18.96 | 22.35 | 26.36 | 3.03 | **满足要求** |
| 476 | 19.65 | 20.48 | 24.58 | 2.89 | **满足要求** |
| 477 | 19.26 | 16.12 | 22.26 | 1.69 | **满足要求** |
| 478 | 21.02 | 9.65 | 17.87 | 1.73 | **满足要求** |
| 479 | 19.27 | 15.84 | 22.10 | 1.69 | **满足要求** |
| 480 | 20.48 | 13.96 | 20.10 | 1.61 | **满足要求** |
| 481 | 19.46 | 11.94 | 20.13 | 1.77 | **满足要求** |
| 482 | 18.71 | 10.16 | 16.27 | 1.53 | **满足要求** |
| 483 | 20.88 | 9.65 | 16.02 | 1.73 | **满足要求** |
| 484 | 18.51 | 10.11 | 14.50 | 2.67 | **满足要求** |
| 485 | 18.45 | 18.77 | 22.78 | 2.82 | **满足要求** |
| 486 | 20.04 | 15.39 | 19.46 | 3.48 | **满足要求** |
| 487 | 18.96 | 13.06 | 19.16 | 1.59 | **满足要求** |
| 488 | 21.33 | 6.55 | 14.79 | 1.86 | **满足要求** |
| 489 | 19.00 | 12.63 | 18.93 | 1.60 | **满足要求** |
| 490 | 20.81 | 10.16 | 16.27 | 1.81 | **满足要求** |
| 491 | 19.30 | 9.20 | 17.37 | 1.73 | **满足要求** |
| 492 | 19.08 | 6.79 | 12.93 | 1.61 | **满足要求** |
| 493 | 16.69 | 13.39 | 17.66 | 2.32 | **满足要求** |
| 494 | 18.37 | 10.95 | 14.99 | 3.21 | **满足要求** |
| 495 | 17.09 | 9.51 | 15.59 | 1.59 | **满足要求** |
| 496 | 18.35 | 5.17 | 13.42 | 1.82 | **满足要求** |
| 497 | 17.22 | 8.24 | 15.08 | 1.64 | **满足要求** |
| 498 | 19.15 | 6.40 | 12.78 | 1.65 | **满足要求** |
| 499 | 17.45 | 6.04 | 14.41 | 1.83 | **满足要求** |
| 500 | 17.13 | 9.10 | 15.42 | 1.60 | **满足要求** |
| 501 | 19.07 | 6.86 | 12.95 | 1.61 | **满足要求** |
| 502 | 18.96 | 13.09 | 19.18 | 1.59 | **满足要求** |
| 503 | 20.80 | 10.19 | 16.29 | 1.81 | **满足要求** |
| 504 | 18.71 | 10.16 | 16.27 | 1.53 | **满足要求** |
| 505 | 20.12 | 10.08 | 16.23 | 1.63 | **满足要求** |
| 506 | 18.57 | 10.22 | 15.13 | 2.02 | **满足要求** |
| 507 | 18.50 | 15.49 | 20.20 | 2.07 | **满足要求** |
| 508 | 19.64 | 13.36 | 18.10 | 2.31 | **满足要求** |
| 509 | 18.86 | 12.14 | 18.22 | 1.57 | **满足要求** |
| 510 | 20.47 | 7.71 | 15.18 | 1.71 | **满足要求** |
| 511 | 18.89 | 11.82 | 18.04 | 1.57 | **满足要求** |
| 512 | 20.11 | 10.16 | 16.27 | 1.64 | **满足要求** |
| 513 | 19.15 | 9.45 | 16.93 | 1.65 | **满足要求** |
| 514 | 18.94 | 7.94 | 14.01 | 1.57 | **满足要求** |
| 515 | 17.34 | 12.28 | 17.14 | 1.85 | **满足要求** |
| 516 | 18.50 | 10.63 | 15.36 | 2.15 | **满足要求** |
| 517 | 17.64 | 9.71 | 15.80 | 1.56 | **满足要求** |
| 518 | 18.49 | 6.62 | 14.16 | 1.69 | **满足要求** |
| 519 | 19.29 | 5.76 | 13.24 | 1.75 | **满足要求** |
| 520 | 17.73 | 9.00 | 15.49 | 1.59 | **满足要求** |
| 521 | 18.99 | 7.63 | 13.88 | 1.58 | **满足要求** |
| 522 | 17.94 | 7.23 | 14.82 | 1.69 | **满足要求** |
| 523 | 17.67 | 9.46 | 15.68 | 1.57 | **满足要求** |
| 524 | 18.95 | 7.90 | 14.00 | 1.57 | **满足要求** |
| 525 | 18.87 | 12.09 | 18.19 | 1.57 | **满足要求** |
| 526 | 20.10 | 10.24 | 16.31 | 1.65 | **满足要求** |
| 527 | 18.71 | 10.16 | 16.27 | 1.53 | **满足要求** |
| 528 | 19.63 | 10.22 | 16.30 | 1.57 | **满足要求** |
| 529 | 18.61 | 10.23 | 15.52 | 1.76 | **满足要求** |
| 530 | 18.56 | 13.55 | 18.74 | 1.77 | **满足要求** |
| 531 | 19.35 | 12.19 | 17.38 | 1.91 | **满足要求** |
| 532 | 18.80 | 11.51 | 17.58 | 1.55 | **满足要求** |
| 533 | 19.88 | 8.50 | 15.50 | 1.64 | **满足要求** |
| 534 | 18.83 | 11.27 | 17.45 | 1.56 | **满足要求** |
| 535 | 19.64 | 10.16 | 16.27 | 1.56 | **满足要求** |
| 536 | 19.02 | 9.65 | 16.68 | 1.61 | **满足要求** |
| 537 | 18.86 | 8.69 | 14.76 | 1.55 | **满足要求** |
| 538 | 17.79 | 11.56 | 16.83 | 1.66 | **满足要求** |
| 539 | 18.58 | 10.45 | 15.64 | 1.81 | **满足要求** |
| 540 | 18.00 | 9.85 | 15.95 | 1.55 | **满足要求** |
| 541 | 18.58 | 7.70 | 14.76 | 1.62 | **满足要求** |
| 542 | 19.11 | 7.08 | 14.10 | 1.65 | **满足要求** |
| 543 | 18.06 | 9.45 | 15.76 | 1.56 | **满足要求** |
| 544 | 18.89 | 8.46 | 14.65 | 1.56 | **满足要求** |
| 545 | 18.23 | 8.10 | 15.19 | 1.63 | **满足要求** |
| 546 | 18.02 | 9.70 | 15.87 | 1.55 | **满足要求** |
| 547 | 18.87 | 8.63 | 14.73 | 1.55 | **满足要求** |
| 548 | 18.81 | 11.44 | 17.54 | 1.55 | **满足要求** |
| 549 | 19.63 | 10.24 | 16.31 | 1.57 | **满足要求** |
| 550 | 18.71 | 10.16 | 16.27 | 1.53 | **满足要求** |
| 551 | 19.32 | 10.25 | 16.31 | 1.55 | **满足要求** |
| 552 | 18.65 | 10.22 | 15.78 | 1.63 | **满足要求** |
| 553 | 18.60 | 12.36 | 17.85 | 1.64 | **满足要求** |
| 554 | 19.14 | 11.47 | 16.97 | 1.71 | **满足要求** |
| 555 | 18.76 | 11.07 | 17.15 | 1.54 | **满足要求** |
| 556 | 19.49 | 9.04 | 15.74 | 1.60 | **满足要求** |
| 557 | 18.78 | 10.91 | 17.06 | 1.55 | **满足要求** |
| 558 | 19.33 | 10.16 | 16.27 | 1.55 | **满足要求** |
| 559 | 18.92 | 9.81 | 16.52 | 1.58 | **满足要求** |
| 560 | 18.80 | 9.18 | 15.26 | 1.54 | **满足要求** |
| 561 | 18.09 | 11.09 | 16.64 | 1.56 | **满足要求** |
| 562 | 18.63 | 10.35 | 15.84 | 1.65 | **满足要求** |
| 563 | 18.24 | 9.95 | 16.05 | 1.54 | **满足要求** |
| 564 | 18.63 | 8.47 | 15.21 | 1.59 | **满足要求** |
| 565 | 18.98 | 8.03 | 14.75 | 1.60 | **满足要求** |
| 566 | 18.27 | 9.71 | 15.94 | 1.55 | **满足要求** |
| 567 | 18.83 | 9.02 | 15.18 | 1.55 | **满足要求** |
| 568 | 18.40 | 8.74 | 15.50 | 1.60 | **满足要求** |
| 569 | 18.25 | 9.85 | 16.00 | 1.54 | **满足要求** |
| 570 | 18.81 | 9.12 | 15.23 | 1.55 | **满足要求** |
| 571 | 18.77 | 11.01 | 17.12 | 1.55 | **满足要求** |
| 572 | 19.32 | 10.23 | 16.30 | 1.55 | **满足要求** |
| 573 | 18.71 | 10.16 | 16.27 | 1.53 | **满足要求** |
| 574 | 19.11 | 10.24 | 16.31 | 1.54 | **满足要求** |
| 575 | 18.67 | 10.21 | 15.94 | 1.56 | **满足要求** |
| 576 | 18.63 | 11.60 | 17.30 | 1.55 | **满足要求** |
| 577 | 19.00 | 11.01 | 16.72 | 1.59 | **满足要求** |
| 578 | 18.74 | 10.77 | 16.86 | 1.54 | **满足要求** |
| 579 | 19.23 | 9.41 | 15.90 | 1.57 | **满足要求** |
| 580 | 18.76 | 10.66 | 16.80 | 1.54 | **满足要求** |
| 581 | 19.12 | 10.16 | 16.27 | 1.54 | **满足要求** |
| 582 | 18.86 | 9.92 | 16.43 | 1.57 | **满足要求** |
| 583 | 18.77 | 9.51 | 15.59 | 1.54 | **满足要求** |
| 584 | 18.29 | 10.78 | 16.51 | 1.52 | **满足要求** |
| 585 | 18.58 | 11.03 | 16.73 | 1.55 | **满足要求** |
| 586 | 18.13 | 11.00 | 16.37 | 1.64 | **满足要求** |
| 587 | 18.22 | 12.27 | 17.59 | 1.67 | **满足要求** |
| 588 | 18.46 | 11.86 | 17.19 | 1.68 | **满足要求** |
| 589 | 18.33 | 11.40 | 17.10 | 1.53 | **满足要求** |
| 590 | 18.71 | 10.14 | 16.26 | 1.54 | **满足要求** |
| 591 | 18.35 | 11.29 | 17.04 | 1.53 | **满足要求** |
| 592 | 18.59 | 10.94 | 16.67 | 1.54 | **满足要求** |
| 593 | 18.45 | 10.51 | 16.64 | 1.55 | **满足要求** |
| 594 | 18.24 | 10.26 | 15.97 | 1.51 | **满足要求** |
| 595 | 18.64 | 10.35 | 16.02 | 1.58 | **满足要求** |
| 596 | 18.19 | 10.31 | 15.65 | 1.67 | **满足要求** |
| 597 | 18.16 | 11.73 | 17.03 | 1.67 | **满足要求** |
| 598 | 18.52 | 11.14 | 16.45 | 1.71 | **满足要求** |
| 599 | 18.27 | 10.88 | 16.57 | 1.53 | **满足要求** |
| 600 | 18.77 | 9.49 | 15.58 | 1.54 | **满足要求** |
| 601 | 18.29 | 10.76 | 16.50 | 1.52 | **满足要求** |
| 602 | 18.65 | 10.26 | 15.97 | 1.56 | **满足要求** |
| 603 | 18.40 | 10.00 | 16.11 | 1.54 | **满足要求** |
| 604 | 18.30 | 9.60 | 15.28 | 1.54 | **满足要求** |
| 605 | 17.82 | 10.89 | 16.23 | 1.63 | **满足要求** |
| 606 | 18.18 | 10.39 | 15.70 | 1.68 | **满足要求** |
| 607 | 17.93 | 10.11 | 15.81 | 1.52 | **满足要求** |
| 608 | 18.19 | 9.08 | 15.21 | 1.54 | **满足要求** |
| 609 | 18.43 | 8.77 | 14.88 | 1.54 | **满足要求** |
| 610 | 17.96 | 9.95 | 15.73 | 1.52 | **满足要求** |
| 611 | 18.32 | 9.48 | 15.22 | 1.53 | **满足要求** |
| 612 | 18.05 | 9.26 | 15.40 | 1.54 | **满足要求** |
| 613 | 17.94 | 10.04 | 15.78 | 1.52 | **满足要求** |
| 614 | 18.31 | 9.55 | 15.26 | 1.53 | **满足要求** |
| 615 | 18.28 | 10.83 | 16.54 | 1.53 | **满足要求** |
| 616 | 18.65 | 10.31 | 16.00 | 1.57 | **满足要求** |
| 617 | 18.24 | 10.26 | 15.97 | 1.51 | **满足要求** |
| 618 | 18.51 | 10.33 | 16.01 | 1.56 | **满足要求** |
| 619 | 18.21 | 10.30 | 15.76 | 1.61 | **满足要求** |
| 620 | 18.18 | 11.23 | 16.67 | 1.62 | **满足要求** |
| 621 | 18.43 | 10.84 | 16.28 | 1.64 | **满足要求** |
| 622 | 18.26 | 10.68 | 16.37 | 1.53 | **满足要求** |
| 623 | 18.59 | 9.74 | 15.71 | 1.53 | **满足要求** |
| 624 | 18.27 | 10.60 | 16.32 | 1.52 | **满足要求** |
| 625 | 18.52 | 10.26 | 15.97 | 1.54 | **满足要求** |
| 626 | 18.35 | 10.08 | 16.06 | 1.53 | **满足要求** |
| 627 | 18.28 | 9.82 | 15.51 | 1.54 | **满足要求** |
| 628 | 17.96 | 10.68 | 16.14 | 1.58 | **满足要求** |
| 629 | 18.20 | 10.35 | 15.79 | 1.62 | **满足要求** |
| 630 | 18.03 | 10.16 | 15.87 | 1.51 | **满足要求** |
| 631 | 18.21 | 9.46 | 15.45 | 1.53 | **满足要求** |
| 632 | 18.37 | 9.25 | 15.23 | 1.53 | **满足要求** |
| 633 | 18.05 | 10.06 | 15.82 | 1.52 | **满足要求** |
| 634 | 18.29 | 9.74 | 15.47 | 1.52 | **满足要求** |
| 635 | 18.12 | 9.58 | 15.58 | 1.53 | **满足要求** |
| 636 | 18.04 | 10.12 | 15.84 | 1.52 | **满足要求** |
| 637 | 18.29 | 9.78 | 15.49 | 1.53 | **满足要求** |
| 638 | 18.27 | 10.64 | 16.35 | 1.53 | **满足要求** |
| 639 | 18.51 | 10.30 | 15.99 | 1.56 | **满足要求** |
| 640 | 18.24 | 10.26 | 15.97 | 1.51 | **满足要求** |
| 641 | 18.42 | 10.31 | 16.00 | 1.54 | **满足要求** |
| 642 | 18.22 | 10.29 | 15.83 | 1.58 | **满足要求** |
| 643 | 18.20 | 10.90 | 16.43 | 1.58 | **满足要求** |
| 644 | 18.37 | 10.64 | 16.17 | 1.60 | **满足要求** |
| 645 | 18.25 | 10.54 | 16.24 | 1.52 | **满足要求** |
| 646 | 18.48 | 9.91 | 15.79 | 1.52 | **满足要求** |
| 647 | 18.26 | 10.49 | 16.21 | 1.52 | **满足要求** |
| 648 | 18.42 | 10.26 | 15.97 | 1.54 | **满足要求** |
| 649 | 18.31 | 10.14 | 16.03 | 1.52 | **满足要求** |
| 650 | 18.27 | 9.97 | 15.66 | 1.53 | **满足要求** |
| 651 | 18.05 | 10.54 | 16.09 | 1.56 | **满足要求** |
| 652 | 18.21 | 10.32 | 15.85 | 1.58 | **满足要求** |
| 653 | 18.10 | 10.20 | 15.90 | 1.51 | **满足要求** |
| 654 | 18.22 | 9.72 | 15.62 | 1.52 | **满足要求** |
| 655 | 18.33 | 9.58 | 15.47 | 1.52 | **满足要求** |
| 656 | 18.11 | 10.13 | 15.87 | 1.51 | **满足要求** |
| 657 | 18.24 | 10.24 | 15.96 | 1.51 | **满足要求** |
| 658 | 18.04 | 10.22 | 15.80 | 1.55 | **满足要求** |
| 659 | 18.08 | 10.76 | 16.32 | 1.56 | **满足要求** |
| 660 | 18.19 | 10.58 | 16.14 | 1.57 | **满足要求** |
| 661 | 18.13 | 10.40 | 16.13 | 1.51 | **满足要求** |
| 662 | 18.30 | 9.85 | 15.76 | 1.52 | **满足要求** |
| 663 | 18.13 | 10.35 | 16.10 | 1.52 | **满足要求** |
| 664 | 18.25 | 10.20 | 15.94 | 1.51 | **满足要求** |
| 665 | 18.43 | 10.25 | 15.97 | 1.53 | **满足要求** |
| 666 | 18.23 | 10.22 | 15.80 | 1.57 | **满足要求** |
| 667 | 18.21 | 10.84 | 16.40 | 1.57 | **满足要求** |
| 668 | 18.38 | 10.58 | 16.14 | 1.59 | **满足要求** |
| 669 | 18.26 | 10.48 | 16.21 | 1.51 | **满足要求** |
| 670 | 18.49 | 9.86 | 15.76 | 1.52 | **满足要求** |
| 671 | 18.27 | 10.43 | 16.18 | 1.51 | **满足要求** |
| 672 | 18.43 | 10.20 | 15.94 | 1.53 | **满足要求** |
| 673 | 18.32 | 10.08 | 16.00 | 1.52 | **满足要求** |
| 674 | 18.28 | 9.91 | 15.63 | 1.53 | **满足要求** |
| 675 | 18.06 | 10.48 | 16.05 | 1.55 | **满足要求** |
| 676 | 18.22 | 10.26 | 15.82 | 1.57 | **满足要求** |
| 677 | 18.11 | 10.14 | 15.87 | 1.52 | **满足要求** |
| 678 | 18.23 | 9.66 | 15.59 | 1.52 | **满足要求** |
| 679 | 18.34 | 9.52 | 15.44 | 1.52 | **满足要求** |
| 680 | 18.12 | 10.07 | 15.84 | 1.52 | **满足要求** |
| 681 | 18.29 | 9.85 | 15.61 | 1.51 | **满足要求** |
| 682 | 18.47 | 9.90 | 15.63 | 1.54 | **满足要求** |
| 683 | 18.27 | 9.87 | 15.47 | 1.57 | **满足要求** |
| 684 | 18.20 | 10.55 | 16.13 | 1.56 | **满足要求** |
| 685 | 18.42 | 10.22 | 15.80 | 1.59 | **满足要求** |
| 686 | 18.25 | 10.19 | 15.94 | 1.51 | **满足要求** |
| 687 | 18.43 | 10.24 | 15.97 | 1.53 | **满足要求** |
| 688 | 18.23 | 10.21 | 15.80 | 1.57 | **满足要求** |
| 689 | 18.21 | 10.83 | 16.39 | 1.57 | **满足要求** |
| 690 | 18.38 | 10.57 | 16.14 | 1.58 | **满足要求** |
| 691 | 18.26 | 10.47 | 16.20 | 1.51 | **满足要求** |
| 692 | 18.49 | 9.85 | 15.77 | 1.52 | **满足要求** |
| 693 | 18.27 | 10.41 | 16.17 | 1.51 | **满足要求** |
| 694 | 18.43 | 10.19 | 15.94 | 1.53 | **满足要求** |
| 695 | 18.32 | 10.07 | 16.00 | 1.53 | **满足要求** |
| 696 | 18.28 | 9.90 | 15.64 | 1.51 | **满足要求** |
| 697 | 18.06 | 10.47 | 16.05 | 1.55 | **满足要求** |
| 698 | 18.22 | 10.25 | 15.82 | 1.57 | **满足要求** |
| 699 | 18.11 | 10.12 | 15.87 | 1.52 | **满足要求** |
| 700 | 18.23 | 9.65 | 15.59 | 1.53 | **满足要求** |
| 701 | 18.34 | 9.51 | 15.44 | 1.52 | **满足要求** |
| 702 | 18.12 | 10.06 | 15.84 | 1.52 | **满足要求** |
| 703 | 18.29 | 9.84 | 15.61 | 1.51 | **满足要求** |
| 704 | 18.17 | 9.73 | 15.67 | 1.53 | **满足要求** |
| 705 | 18.12 | 10.09 | 15.86 | 1.52 | **满足要求** |
| 706 | 18.28 | 9.87 | 15.62 | 1.51 | **满足要求** |
| 707 | 18.27 | 10.44 | 16.19 | 1.51 | **满足要求** |
| 708 | 18.43 | 10.22 | 15.95 | 1.53 | **满足要求** |
| 709 | 18.25 | 10.19 | 15.94 | 1.51 | **满足要求** |
| 710 | 18.37 | 10.22 | 15.96 | 1.52 | **满足要求** |
| 711 | 18.24 | 10.21 | 15.85 | 1.55 | **满足要求** |
| 712 | 18.22 | 10.61 | 16.24 | 1.54 | **满足要求** |
| 713 | 18.33 | 10.44 | 16.07 | 1.55 | **满足要求** |
| 714 | 18.26 | 10.38 | 16.12 | 1.51 | **满足要求** |
| 715 | 18.41 | 9.96 | 15.82 | 1.52 | **满足要求** |
| 716 | 18.26 | 10.34 | 16.10 | 1.52 | **满足要求** |
| 717 | 18.37 | 10.19 | 15.94 | 1.52 | **满足要求** |
| 718 | 18.30 | 10.11 | 15.98 | 1.52 | **满足要求** |
| 719 | 18.27 | 10.00 | 15.74 | 1.51 | **满足要求** |
| 720 | 18.12 | 10.38 | 16.01 | 1.54 | **满足要求** |
| 721 | 18.23 | 10.23 | 15.86 | 1.55 | **满足要求** |
| 722 | 18.16 | 10.15 | 15.89 | 1.51 | **满足要求** |
| 723 | 18.24 | 9.83 | 15.70 | 1.51 | **满足要求** |
| 724 | 18.31 | 9.74 | 15.60 | 1.52 | **满足要求** |
| 725 | 18.16 | 10.11 | 15.87 | 1.52 | **满足要求** |
| 726 | 18.27 | 9.96 | 15.72 | 1.51 | **满足要求** |
| 727 | 18.20 | 9.88 | 15.76 | 1.52 | **满足要求** |
| 728 | 18.16 | 10.13 | 15.88 | 1.52 | **满足要求** |
| 729 | 18.27 | 9.98 | 15.73 | 1.51 | **满足要求** |
| 730 | 18.26 | 10.36 | 16.11 | 1.51 | **满足要求** |
| 731 | 18.37 | 10.21 | 15.95 | 1.52 | **满足要求** |
| 732 | 18.25 | 10.19 | 15.94 | 1.51 | **满足要求** |
| 733 | 18.33 | 10.21 | 15.95 | 1.52 | **满足要求** |
| 734 | 18.24 | 10.20 | 15.88 | 1.53 | **满足要求** |
| 735 | 18.23 | 10.47 | 16.14 | 1.53 | **满足要求** |
| 736 | 18.31 | 10.36 | 16.03 | 1.54 | **满足要求** |
| 737 | 18.26 | 10.32 | 16.06 | 1.51 | **满足要求** |
| 738 | 18.35 | 10.04 | 15.86 | 1.51 | **满足要求** |
| 739 | 18.26 | 10.29 | 16.05 | 1.51 | **满足要求** |
| 740 | 18.33 | 10.19 | 15.94 | 1.51 | **满足要求** |
| 741 | 18.28 | 10.14 | 15.97 | 1.52 | **满足要求** |
| 742 | 18.26 | 10.06 | 15.80 | 1.51 | **满足要求** |
| 743 | 18.17 | 10.32 | 15.99 | 1.53 | **满足要求** |
| 744 | 18.24 | 10.21 | 15.88 | 1.53 | **满足要求** |
| 745 | 18.19 | 10.16 | 15.91 | 1.52 | **满足要求** |
| 746 | 18.24 | 9.95 | 15.78 | 1.51 | **满足要求** |
| 747 | 18.29 | 9.89 | 15.71 | 1.51 | **满足要求** |
| 748 | 18.19 | 10.14 | 15.90 | 1.52 | **满足要求** |
| 749 | 18.27 | 10.04 | 15.79 | 1.51 | **满足要求** |
| 750 | 18.22 | 9.98 | 15.82 | 1.51 | **满足要求** |
| 751 | 18.19 | 10.15 | 15.90 | 1.52 | **满足要求** |
| 752 | 18.26 | 10.05 | 15.80 | 1.51 | **满足要求** |
| 753 | 18.26 | 10.30 | 16.05 | 1.51 | **满足要求** |
| 754 | 18.33 | 10.20 | 15.95 | 1.51 | **满足要求** |
| 755 | 18.25 | 10.19 | 15.94 | 1.51 | **满足要求** |
| 756 | 18.30 | 10.21 | 15.95 | 1.52 | **满足要求** |
| 757 | 18.24 | 10.20 | 15.90 | 1.52 | **满足要求** |
| 758 | 18.24 | 10.38 | 16.07 | 1.52 | **满足要求** |
| 759 | 18.29 | 10.30 | 16.00 | 1.52 | **满足要求** |
| 760 | 18.25 | 10.27 | 16.02 | 1.51 | **满足要求** |
| 761 | 18.32 | 10.09 | 15.89 | 1.51 | **满足要求** |
| 762 | 18.26 | 10.26 | 16.01 | 1.51 | **满足要求** |
| 763 | 18.30 | 10.19 | 15.94 | 1.51 | **满足要求** |
| 764 | 18.27 | 10.16 | 15.96 | 1.51 | **满足要求** |
| 765 | 18.26 | 10.10 | 15.85 | 1.51 | **满足要求** |
| 766 | 18.19 | 10.27 | 15.97 | 1.52 | **满足要求** |
| 767 | 18.24 | 10.21 | 15.90 | 1.52 | **满足要求** |
| 768 | 18.21 | 10.17 | 15.92 | 1.51 | **满足要求** |
| 769 | 18.24 | 10.03 | 15.83 | 1.51 | **满足要求** |
| 770 | 18.28 | 9.99 | 15.79 | 1.51 | **满足要求** |
| 771 | 18.21 | 10.15 | 15.91 | 1.51 | **满足要求** |
| 772 | 18.26 | 10.09 | 15.84 | 1.51 | **满足要求** |
| 773 | 18.23 | 10.05 | 15.86 | 1.51 | **满足要求** |
| 774 | 18.21 | 10.16 | 15.92 | 1.51 | **满足要求** |
| 775 | 18.26 | 10.10 | 15.85 | 1.51 | **满足要求** |
| 776 | 18.25 | 10.27 | 16.02 | 1.51 | **满足要求** |
| 777 | 18.30 | 10.20 | 15.94 | 1.51 | **满足要求** |
| 778 | 17.69 | 9.38 | 15.01 | 1.50 | **满足要求** |

| **名称 : 分析** | **工况阶段 - 分析工况 : 1 - 1** |
| --- | --- |
| |  | | --- | |  | |

| **名称 : 分析** | **工况阶段 - 分析工况 : 1 - 1** |
| --- | --- |
| |  | | --- | |  | |

**抗滑桩验算 1**

|  |  |
| --- | --- |
| 抗滑桩 : | 编号1抗滑桩（14.70; 3.68 [m]） |
| 分析 : | 计算 1 (滑面 圆弧) |
| 计算方法 : | 简布法(Janbu) |

**抗滑桩分析**

**输入数据**

**分析设置**

中国 - 国家标准（GB）

**材料和规范**

|  |  |
| --- | --- |
| 混凝土结构设计 : | 中国规范GB 50010-2010 |
| 钢结构设计 : | 中国规范GB 50017-2003 |

**开挖分析**

|  |  |
| --- | --- |
| 验算方法 : | 中国规范 |
| 主动土压力计算方法 : | Coulomb理论 |
| 被动土压力计算方法 : | Mazindrani(Rankine)理论 |
| 地震荷载分析 : | GB 50330-2013中国建筑边坡工程技术规范 |
| 土的水平反力系数计算 : | 中国规范 |
| 滑面以下压力计算 : | 中国规范-弹性 |

**锚杆验算**

|  |  |
| --- | --- |
| 验算方法 : | 安全系数法（ASD） |

| **安全系数** |
| --- |
| 抗拉承载力安全系数 : | SFt = | 2.20 | [–] |
| 抗拔承载力(岩土与锚固体)安全系数 : | SFe = | 2.60 | [–] |
| 抗拔承载力(钢筋与砂浆)安全系数 : | SFc = | 2.60 | [–] |

**截面尺寸**

结构长度= 9.00 m

截面名称 : 排桩 a = 0.40 m; b = 0.40 m; h = 0.40 m

桩身材料 : 混凝土

自动计算的嵌固段计算宽度折减系数 = 1.00

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 截面面积 | A | = | 4.00E-01 | m2/m |
| 惯性矩 | I | = | 5.33E-03 | m4/m |
| 弹性模量 | E | = | 30000.00 | MPa |
| 剪切模量 | G | = | 12000.00 | MPa |

**滑面以上作用力**

滑面深度 hs1 = 9.00 m

|  |  |  |
| --- | --- | --- |
| 桩后滑坡推力类型 | : | 剩余下滑力 |
| 桩前滑体抗力类型 | : | 剩余抗滑力 |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 桩后滑坡推力 | T | = | 665.00 | kN/m |
| 桩前滑体抗力 | P | = | 665.00 | kN/m |

滑坡推力分布图形 : 三角形

滑体抗力分布图形 : 三角形

**结构材料**

依据规范对钢筋混凝土结构进行分析 中国规范GB 50010-2010.

**混凝土: C30**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 抗压强度标准值 | fck | = | 20.10 | MPa |
| 抗拉强度标准值 | ftk | = | 2.01 | MPa |
| 弹性模量 | Ec | = | 30000.00 | MPa |
| 剪切模量 | G | = | 12000.00 | MPa |

**纵向钢筋: HRB400**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 屈服强度 | fyk | = | 400.00 | MPa |

**横向钢筋: HRB335**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 屈服强度 | fyk | = | 335.00 | MPa |

**水平反力系数**

**水平反力系数**

采用m法计算土的水平反力系数。

结构在嵌固(坑底)处的水平位移量 vb = 0.00 mm

**岩土材料基本参数 - (总应力状态) φcu, ccu**

| **编号** | **名称** | **图例** | **φcu** | **ccu** | **γ** | **δ** |
| --- | --- | --- | --- | --- | --- | --- |
| **[°]** | **[kPa]** | **[kN/m3]** | **[°]** |
|  |  |  |  |  |  |  |

**计算静止土压力的土层参数**

| **编号** | **名称** | **图例** | **类型** | **φef** | **ν** | **OCR** | **Kr** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **计算** | **[°]** | **[–]** | **[–]** | **[–]** |
| 1 | 道路部分 |  | 黏性土 | - | 0.40 | - | - |
| 2 | 2-2层淤泥质粉质黏土 |  | 黏性土 | - | 0.40 | - | - |
| 3 | 3-3层粉质黏土 |  | 黏性土 | - | 0.40 | - | - |
| 4 | 4-3层硬塑粉质黏土 |  | 黏性土 | - | 0.40 | - | - |
| 5 | 1-1层杂填土 |  | 无黏性土 | 0.00 | - | - | - |
| 6 | 2-1层粉质粘土 |  | 黏性土 | - | 0.40 | - | - |

**岩土材料参数**

|  |
| --- |
| **道路部分** |
| 天然重度 : | γ | = | 22.00 | kN/m3 |  |
| 应力状态 : | 总应力 φcu, ccu |  |
| 结构与岩土间摩擦角 : | δ | = | 10.00 | ° |  |
| 内摩擦角 : | φcu | = | 20.00 | ° |  |
| 黏聚力 : | ccu | = | 30.00 | kPa |  |
| 岩土材料 : | 黏性土 |  |
| 泊松比 : | ν | = | 0.40 |  |  |

|  |
| --- |
| **2-2层淤泥质粉质黏土** |
| 天然重度 : | γ | = | 18.00 | kN/m3 |  |
| 应力状态 : | 总应力 φcu, ccu |  |
| 结构与岩土间摩擦角 : | δ | = | 4.50 | ° |  |
| 内摩擦角 : | φcu | = | 8.40 | ° |  |
| 黏聚力 : | ccu | = | 13.90 | kPa |  |
| 岩土材料 : | 黏性土 |  |
| 泊松比 : | ν | = | 0.40 |  |  |

|  |
| --- |
| **3-3层粉质黏土** |
| 天然重度 : | γ | = | 18.00 | kN/m3 |  |
| 应力状态 : | 总应力 φcu, ccu |  |
| 结构与岩土间摩擦角 : | δ | = | 6.50 | ° |  |
| 内摩擦角 : | φcu | = | 12.70 | ° |  |
| 黏聚力 : | ccu | = | 30.40 | kPa |  |
| 岩土材料 : | 黏性土 |  |
| 泊松比 : | ν | = | 0.40 |  |  |

|  |
| --- |
| **4-3层硬塑粉质黏土** |
| 天然重度 : | γ | = | 18.00 | kN/m3 |  |
| 应力状态 : | 总应力 φcu, ccu |  |
| 结构与岩土间摩擦角 : | δ | = | 6.10 | ° |  |
| 内摩擦角 : | φcu | = | 12.30 | ° |  |
| 黏聚力 : | ccu | = | 56.90 | kPa |  |
| 岩土材料 : | 黏性土 |  |
| 泊松比 : | ν | = | 0.40 |  |  |

|  |
| --- |
| **1-1层杂填土** |
| 天然重度 : | γ | = | 19.50 | kN/m3 |  |
| 应力状态 : | 总应力 φcu, ccu |  |
| 结构与岩土间摩擦角 : | δ | = | 6.00 | ° |  |
| 内摩擦角 : | φcu | = | 12.00 | ° |  |
| 黏聚力 : | ccu | = | 10.00 | kPa |  |
| 岩土材料 : | 无黏性土 |  |

|  |
| --- |
| **2-1层粉质粘土** |
| 天然重度 : | γ | = | 19.30 | kN/m3 |  |
| 应力状态 : | 总应力 φcu, ccu |  |
| 结构与岩土间摩擦角 : | δ | = | 6.00 | ° |  |
| 内摩擦角 : | φcu | = | 11.90 | ° |  |
| 黏聚力 : | ccu | = | 20.90 | kPa |  |
| 岩土材料 : | 黏性土 |  |
| 泊松比 : | ν | = | 0.40 |  |  |

**剖面土层和指定材料**

**位置信息**

地表标高 = 3.68 m

**剖面土层和指定材料**

| **编号** | **地层厚度** | **深度** | **高程** | **岩土材料** | **图例** |
| --- | --- | --- | --- | --- | --- |
| **t [m]** | **z [m]** | **[m]** |
| 1 | 2.06 | 0.00 .. 2.06 | 3.68 .. 1.62 | 道路部分 |  |
| 2 | 0.87 | 2.06 .. 2.93 | 1.62 .. 0.75 | 2-1层粉质粘土 |  |
| 3 | 9.70 | 2.93 .. 12.63 | 0.75 .. -8.95 | 2-2层淤泥质粉质黏土 |  |
| 4 | - | 12.63 ..  | -8.95 .. - | 3-3层粉质黏土 |  |

**开挖**

墙体前面土层开挖到深度3.59 m.

**坑底形状**

| **编号** | **坐标** | **深度** |
| --- | --- | --- |
| **x [m]** | **z [m]** |
| 1 | 0.00 | 0.00 |
| 2 | -0.40 | 0.01 |
| 3 | -8.58 | 0.01 |
| 4 | -9.30 | -0.41 |
| 5 | -9.78 | -0.69 |
| 6 | -10.50 | -1.11 |
| 7 | -11.80 | -1.79 |
| 8 | -12.92 | -2.39 |
| 9 | -14.50 | -3.24 |
| 10 | -34.50 | -3.24 |
| 11 | -35.50 | -3.24 |

起点 [0,0] 位于坑底。

z轴正方向竖直向下。

**墙后坡面**

| **编号** | **坐标** | **深度** |
| --- | --- | --- |
| **x [m]** | **z [m]** |
| 1 | 0.00 | 0.00 |
| 2 | 0.10 | -0.04 |
| 3 | 3.20 | -0.44 |
| 4 | 4.20 | -0.47 |
| 5 | 5.20 | -0.47 |

起点 [0,0]位于结构右上边角点

正坐标 +z 为竖直向下

**地下水作用**

结构外侧的地下水位所在深度为 1.58 m

结构内侧的地下水位所在深度为 1.58 m

结构底部岩土体不透水。

**输入均布面超载**

| **编号** | **超载** | **作用** | **超载1** | **超载2** | **起点x坐标** | **长度** | **深度** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **新建** | **修改** | **[kN/m2]** | **[kN/m2]** | **x [m]** | **l [m]** | **z [m]** |
| 1 | 是 |  | 永久作用 | 15.00 |  | 4.20 | 4.50 | 坡面 |
| 2 | 是 |  | 永久作用 | 15.00 |  | 23.70 | 4.50 | 坡面 |
| 3 | 是 |  | 永久作用 | 72.90 |  | 8.70 | 15.00 | 坡面 |

| **编号** | **名称** |
| --- | --- |
| 1 | 左侧人行道 |
| 2 | 右侧人行道 |
| 3 | 行车道 |

**输入锚杆**

| **编号** | **添加** | **深度** | **名称** | **补张拉** | **锚固力** |
| --- | --- | --- | --- | --- | --- |
| **锚杆** | **z [m]** | **F [kN]** |
| 1 | 是 | 0.00 | 锚杆编号 : 1 |  | 95.90 |

**新建锚杆列表**

**锚杆编号 : 1**

锚杆类型 : 土钉或非预应力锚杆

规格型号 : 自定义

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 深度 : | z | = | 0.00 | m |
| 总长 : | l | = | 15.00 | m |
| 倾角 : | α | = | 10.00 | ° |
| 水平间距 : | b | = | 1.00 | m |
| 直径 : | ds | = | 28.00 | mm |
| 弹性模量 : | E | = | 200000.00 | MPa |
| 材料强度设计值 : | fu | = | 360.00 | MPa |
| 抗拔强度(岩土与锚固体) : 采用粘结强度计算 |
| 锚固段直径 : | d | = | 110.0 | mm |
| 岩土层与锚固体粘结强度 : | f | = | 100.00 | kPa |

**全局设置**

结构的离散数量 = 100

土压力分析 : 根据分析设置进行折减

截面最小压力被认为是 σa,min = 0.20σz

结构重要性系数 γ0 = 1.00

**工况阶段设置**

设计状况 : 持久设计状况

**分析结果**

**滑面以上作用在桩上的力**

| **深度** | **被动土压力** | **主动土压力** |
| --- | --- | --- |
| **[m]** | **[kPa]** | **[kPa]** |
| 0 | 0.00 | 0.00 |
| 3.59 | 0.00 | 58.95 |
| 3.59 | 0.00 | 58.95 |
| 9.00 | 245.85 | 147.78 |

**土的水平反力系数和结构内力的分布**

| **深度** | **结构前kh,p** | **结构后kh,z** | **位移** | **土压力** | **剪力** | **弯矩** |
| --- | --- | --- | --- | --- | --- | --- |
| **[m]** | **[MN/m3]** | **[MN/m3]** | **[mm]** | **[kPa]** | **[kN/m]** | **[kNm/m]** |
| 0.00 | 0.00 | 0.00 | -11.68 | 0.00 | 94.44 | 0.00 |
| 0.45 | 0.00 | 0.00 | -12.33 | 7.39 | 92.78 | -42.25 |
| 0.90 | 0.00 | 0.00 | -12.92 | 14.78 | 87.79 | -83.00 |
| 1.35 | 0.00 | 0.00 | -13.40 | 22.17 | 79.48 | -120.76 |
| 1.80 | 0.00 | 0.00 | -13.74 | 29.56 | 67.84 | -154.03 |
| 2.25 | 0.00 | 0.00 | -13.88 | 36.95 | 52.87 | -181.31 |
| 2.70 | 0.00 | 0.00 | -13.79 | 44.34 | 34.59 | -201.12 |
| 3.15 | 0.00 | 0.00 | -13.45 | 51.72 | 12.97 | -211.94 |
| 3.59 | 0.00 | 0.00 | -12.86 | 58.88 | -11.14 | -212.46 |
| 3.60 | 0.00 | 0.00 | -12.84 | 58.66 | -11.96 | -212.29 |
| 4.05 | 0.00 | 0.00 | -11.96 | 45.60 | -35.42 | -201.41 |
| 4.50 | 0.00 | 0.00 | -10.83 | 32.54 | -53.00 | -181.30 |
| 4.95 | 0.00 | 0.00 | -9.47 | 19.48 | -64.70 | -154.59 |
| 5.40 | 0.00 | 0.00 | -7.92 | 6.42 | -70.53 | -123.94 |
| 5.85 | 0.00 | 0.00 | -6.20 | -6.65 | -70.48 | -92.00 |
| 6.30 | 0.00 | 0.00 | -4.38 | -19.71 | -64.55 | -61.40 |
| 6.75 | 0.00 | 0.00 | -2.47 | -32.77 | -52.74 | -34.79 |
| 7.20 | 0.00 | 0.00 | -0.52 | -45.83 | -35.06 | -14.81 |
| 7.65 | 0.00 | 15.00 | 1.45 | -37.12 | -14.97 | -3.75 |
| 8.10 | 0.00 | 15.89 | 3.43 | -17.51 | -2.55 | -0.13 |
| 8.55 | 0.00 | 0.00 | 5.40 | 0.10 | 0.05 | 0.01 |
| 9.00 | 0.00 | 0.00 | 7.36 | 0.10 | 0.00 | 0.00 |
| 9.00 | 0.00 | 17.66 | - | 0.00 | - | - |

**土的水平反力系数和结构内力的分布 - 详细结果**

| **深度** | **结构前kh,p** | **结构后kh,z** | **位移** | **土压力** | **剪力** | **弯矩** |
| --- | --- | --- | --- | --- | --- | --- |
| **[m]** | **[MN/m3]** | **[MN/m3]** | **[mm]** | **[kPa]** | **[kN/m]** | **[kNm/m]** |
| 0.00 | 0.00 | 0.00 | -11.68 | 0.00 | 94.44 | 0.00 |
| 0.09 | 0.00 | 0.00 | -11.81 | 1.48 | 94.37 | -8.50 |
| 0.18 | 0.00 | 0.00 | -11.94 | 2.96 | 94.17 | -16.98 |
| 0.27 | 0.00 | 0.00 | -12.07 | 4.43 | 93.84 | -25.44 |
| 0.36 | 0.00 | 0.00 | -12.20 | 5.91 | 93.37 | -33.87 |
| 0.45 | 0.00 | 0.00 | -12.33 | 7.39 | 92.78 | -42.25 |
| 0.54 | 0.00 | 0.00 | -12.45 | 8.87 | 92.04 | -50.57 |
| 0.63 | 0.00 | 0.00 | -12.57 | 10.34 | 91.18 | -58.81 |
| 0.72 | 0.00 | 0.00 | -12.69 | 11.82 | 90.18 | -66.97 |
| 0.81 | 0.00 | 0.00 | -12.81 | 13.30 | 89.05 | -75.04 |
| 0.90 | 0.00 | 0.00 | -12.92 | 14.78 | 87.79 | -83.00 |
| 0.99 | 0.00 | 0.00 | -13.02 | 16.26 | 86.39 | -90.84 |
| 1.08 | 0.00 | 0.00 | -13.13 | 17.73 | 84.86 | -98.55 |
| 1.17 | 0.00 | 0.00 | -13.22 | 19.21 | 83.20 | -106.11 |
| 1.26 | 0.00 | 0.00 | -13.32 | 20.69 | 81.40 | -113.52 |
| 1.35 | 0.00 | 0.00 | -13.40 | 22.17 | 79.48 | -120.76 |
| 1.44 | 0.00 | 0.00 | -13.48 | 23.65 | 77.41 | -127.82 |
| 1.53 | 0.00 | 0.00 | -13.56 | 25.12 | 75.22 | -134.69 |
| 1.62 | 0.00 | 0.00 | -13.63 | 26.60 | 72.89 | -141.35 |
| 1.71 | 0.00 | 0.00 | -13.69 | 28.08 | 70.43 | -147.81 |
| 1.80 | 0.00 | 0.00 | -13.74 | 29.56 | 67.84 | -154.03 |
| 1.89 | 0.00 | 0.00 | -13.78 | 31.03 | 65.11 | -160.01 |
| 1.98 | 0.00 | 0.00 | -13.82 | 32.51 | 62.25 | -165.74 |
| 2.07 | 0.00 | 0.00 | -13.85 | 33.99 | 59.26 | -171.21 |
| 2.16 | 0.00 | 0.00 | -13.87 | 35.47 | 56.13 | -176.41 |
| 2.25 | 0.00 | 0.00 | -13.88 | 36.95 | 52.87 | -181.31 |
| 2.34 | 0.00 | 0.00 | -13.88 | 38.42 | 49.48 | -185.92 |
| 2.43 | 0.00 | 0.00 | -13.87 | 39.90 | 45.96 | -190.22 |
| 2.52 | 0.00 | 0.00 | -13.85 | 41.38 | 42.30 | -194.19 |
| 2.61 | 0.00 | 0.00 | -13.83 | 42.86 | 38.51 | -197.83 |
| 2.70 | 0.00 | 0.00 | -13.79 | 44.34 | 34.59 | -201.12 |
| 2.79 | 0.00 | 0.00 | -13.74 | 45.81 | 30.53 | -204.05 |
| 2.88 | 0.00 | 0.00 | -13.68 | 47.29 | 26.34 | -206.61 |
| 2.97 | 0.00 | 0.00 | -13.62 | 48.77 | 22.02 | -208.79 |
| 3.06 | 0.00 | 0.00 | -13.54 | 50.25 | 17.56 | -210.57 |
| 3.15 | 0.00 | 0.00 | -13.45 | 51.72 | 12.97 | -211.94 |
| 3.24 | 0.00 | 0.00 | -13.35 | 53.20 | 8.25 | -212.90 |
| 3.33 | 0.00 | 0.00 | -13.24 | 54.68 | 3.40 | -213.42 |
| 3.42 | 0.00 | 0.00 | -13.11 | 56.16 | -1.59 | -213.51 |
| 3.51 | 0.00 | 0.00 | -12.98 | 57.64 | -6.71 | -213.13 |
| 3.59 | 0.00 | 0.00 | -12.86 | 58.88 | -11.14 | -212.46 |
| 3.60 | 0.00 | 0.00 | -12.84 | 58.66 | -11.96 | -212.29 |
| 3.69 | 0.00 | 0.00 | -12.68 | 56.05 | -17.12 | -210.98 |
| 3.78 | 0.00 | 0.00 | -12.52 | 53.43 | -22.05 | -209.22 |
| 3.87 | 0.00 | 0.00 | -12.34 | 50.82 | -26.74 | -207.02 |
| 3.96 | 0.00 | 0.00 | -12.16 | 48.21 | -31.20 | -204.41 |
| 4.05 | 0.00 | 0.00 | -11.96 | 45.60 | -35.42 | -201.41 |
| 4.14 | 0.00 | 0.00 | -11.75 | 42.99 | -39.41 | -198.04 |
| 4.23 | 0.00 | 0.00 | -11.54 | 40.37 | -43.16 | -194.33 |
| 4.32 | 0.00 | 0.00 | -11.31 | 37.76 | -46.67 | -190.28 |
| 4.41 | 0.00 | 0.00 | -11.08 | 35.15 | -49.96 | -185.93 |
| 4.50 | 0.00 | 0.00 | -10.83 | 32.54 | -53.00 | -181.30 |
| 4.59 | 0.00 | 0.00 | -10.58 | 29.92 | -55.81 | -176.40 |
| 4.68 | 0.00 | 0.00 | -10.31 | 27.31 | -58.39 | -171.26 |
| 4.77 | 0.00 | 0.00 | -10.04 | 24.70 | -60.73 | -165.90 |
| 4.86 | 0.00 | 0.00 | -9.76 | 22.09 | -62.83 | -160.33 |
| 4.95 | 0.00 | 0.00 | -9.47 | 19.48 | -64.70 | -154.59 |
| 5.04 | 0.00 | 0.00 | -9.17 | 16.86 | -66.34 | -148.69 |
| 5.13 | 0.00 | 0.00 | -8.87 | 14.25 | -67.74 | -142.66 |
| 5.22 | 0.00 | 0.00 | -8.56 | 11.64 | -68.90 | -136.51 |
| 5.31 | 0.00 | 0.00 | -8.24 | 9.03 | -69.83 | -130.26 |
| 5.40 | 0.00 | 0.00 | -7.92 | 6.42 | -70.53 | -123.94 |
| 5.49 | 0.00 | 0.00 | -7.59 | 3.80 | -70.99 | -117.57 |
| 5.58 | 0.00 | 0.00 | -7.25 | 1.19 | -71.21 | -111.17 |
| 5.67 | 0.00 | 0.00 | -6.91 | -1.42 | -71.20 | -104.76 |
| 5.76 | 0.00 | 0.00 | -6.56 | -4.03 | -70.96 | -98.36 |
| 5.85 | 0.00 | 0.00 | -6.20 | -6.65 | -70.48 | -92.00 |
| 5.94 | 0.00 | 0.00 | -5.85 | -9.26 | -69.76 | -85.69 |
| 6.03 | 0.00 | 0.00 | -5.49 | -11.87 | -68.81 | -79.45 |
| 6.12 | 0.00 | 0.00 | -5.12 | -14.48 | -67.63 | -73.31 |
| 6.21 | 0.00 | 0.00 | -4.75 | -17.09 | -66.20 | -67.28 |
| 6.30 | 0.00 | 0.00 | -4.38 | -19.71 | -64.55 | -61.40 |
| 6.39 | 0.00 | 0.00 | -4.00 | -22.32 | -62.66 | -55.67 |
| 6.48 | 0.00 | 0.00 | -3.62 | -24.93 | -60.53 | -50.13 |
| 6.57 | 0.00 | 0.00 | -3.24 | -27.54 | -58.17 | -44.78 |
| 6.66 | 0.00 | 0.00 | -2.86 | -30.16 | -55.57 | -39.66 |
| 6.75 | 0.00 | 0.00 | -2.47 | -32.77 | -52.74 | -34.79 |
| 6.84 | 0.00 | 0.00 | -2.08 | -35.38 | -49.67 | -30.18 |
| 6.93 | 0.00 | 0.00 | -1.69 | -37.99 | -46.37 | -25.85 |
| 7.02 | 0.00 | 0.00 | -1.30 | -40.60 | -42.84 | -21.84 |
| 7.11 | 0.00 | 0.00 | -0.91 | -43.22 | -39.06 | -18.15 |
| 7.20 | 0.00 | 0.00 | -0.52 | -45.83 | -35.06 | -14.81 |
| 7.29 | 0.00 | 0.00 | -0.13 | -48.44 | -30.82 | -11.84 |
| 7.38 | 0.00 | 14.47 | 0.27 | -47.19 | -26.38 | -9.27 |
| 7.47 | 0.00 | 14.65 | 0.66 | -43.97 | -22.28 | -7.08 |
| 7.56 | 0.00 | 14.83 | 1.06 | -40.62 | -18.47 | -5.25 |
| 7.65 | 0.00 | 15.00 | 1.45 | -37.12 | -14.97 | -3.75 |
| 7.74 | 0.00 | 15.18 | 1.85 | -33.48 | -11.79 | -2.54 |
| 7.83 | 0.00 | 15.36 | 2.24 | -29.70 | -8.95 | -1.61 |
| 7.92 | 0.00 | 15.53 | 2.64 | -25.78 | -6.45 | -0.92 |
| 8.01 | 0.00 | 15.71 | 3.03 | -21.71 | -4.31 | -0.44 |
| 8.10 | 0.00 | 15.89 | 3.43 | -17.51 | -2.55 | -0.13 |
| 8.19 | 0.00 | 16.06 | 3.82 | -13.17 | -1.16 | 0.04 |
| 8.28 | 0.00 | 16.24 | 4.22 | -8.68 | -0.18 | 0.10 |
| 8.37 | 0.00 | 0.00 | 4.61 | 0.10 | 0.06 | 0.02 |
| 8.46 | 0.00 | 0.00 | 5.01 | 0.10 | 0.05 | 0.01 |
| 8.55 | 0.00 | 0.00 | 5.40 | 0.10 | 0.05 | 0.01 |
| 8.64 | 0.00 | 0.00 | 5.80 | 0.10 | 0.04 | 0.01 |
| 8.73 | 0.00 | 0.00 | 6.19 | 0.10 | 0.03 | 0.00 |
| 8.82 | 0.00 | 0.00 | 6.59 | 0.10 | 0.02 | 0.00 |
| 8.91 | 0.00 | 0.00 | 6.99 | 0.10 | 0.01 | 0.00 |
| 9.00 | 0.00 | 0.00 | 7.36 | 0.10 | 0.00 | 0.00 |
| 9.00 | 0.00 | 17.66 | - | 0.00 | - | - |

|  |  |  |  |
| --- | --- | --- | --- |
| 剪力最大值 | = | 94.44 | kN/m |
| 弯矩最大值 | = | 213.51 | kNm/m |
| 位移最大值 | = | 13.9 | mm |
| 滑面处的结构位移 | = | 7.4 | mm |

**按深度验算土体承载力 9.00 m**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 结构后主动土压力 |  | = | 136.31 | kPa |
| 结构前的被动土压力 |  | = | 0.00 | kPa |
| 桩的最大横向压应力 | σ | = | 0.10 | kPa |
| 土体承载力设计值 | Rd | = | -136.31 | kPa |

**岩石地基横向承载力 不满足要求**

**按深度验算土体承载力 9.00 m**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 结构后主动土压力 |  | = | 0.00 | kPa |
| 结构前的被动土压力 |  | = | 0.00 | kPa |
| 桩的最大横向压应力 | σ | = | 0.10 | kPa |
| 土体承载力设计值 | Rd | = | 0.00 | kPa |

**岩石地基横向承载力 不满足要求**

**锚固力**

| **编号** | **深度** | **位移** | **锚固力** |
| --- | --- | --- | --- |
| **[m]** | **[mm]** | **[kN]** |
| 1 | 0.00 | -11.7 | 95.90 |

| **名称 : 分析** | **工况阶段 - 分析工况 : 1 - -1** |
| --- | --- |
| |  | | --- | |  | |

**编号1截面**

**结构上作用力的分布**

|  | **位移最小值** | **位移最大值** | **剪力最小值** | **剪力最大值** | **弯矩最小值** | **弯矩最大值** | **Areq** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **[mm]** | **[mm]** | **[kN/m]** | **[kN/m]** | **[kNm/m]** | **[kNm/m]** | **[mm2]** |
| 0.00 | -11.68 | -11.68 | 94.44 | 94.44 | 0.00 | 0.00 | 0.00 |
| 0.45 | -12.33 | -12.33 | 92.78 | 92.78 | -42.25 | -42.25 | 290.96 |
| 0.90 | -12.92 | -12.92 | 87.79 | 87.79 | -83.00 | -83.00 | 290.96 |
| 1.35 | -13.40 | -13.40 | 79.48 | 79.48 | -120.76 | -120.76 | 381.46 |
| 1.80 | -13.74 | -13.74 | 67.84 | 67.84 | -154.03 | -154.03 | 491.37 |
| 2.25 | -13.88 | -13.88 | 52.87 | 52.87 | -181.31 | -181.31 | 583.23 |
| 2.70 | -13.79 | -13.79 | 34.59 | 34.59 | -201.12 | -201.12 | 650.93 |
| 3.15 | -13.45 | -13.45 | 12.97 | 12.97 | -211.94 | -211.94 | 688.32 |
| 3.59 | -12.86 | -12.86 | -11.14 | -11.14 | -212.46 | -212.46 | 690.10 |
| 3.59 | -12.86 | -12.86 | -11.14 | -11.14 | -212.46 | -212.46 | 690.10 |
| 3.59 | -12.85 | -12.85 | -11.61 | -11.61 | -212.36 | -212.36 | 689.78 |
| 3.59 | -12.85 | -12.85 | -11.61 | -11.61 | -212.36 | -212.36 | 689.78 |
| 3.60 | -12.84 | -12.84 | -11.96 | -11.96 | -212.29 | -212.29 | 689.54 |
| 3.60 | -12.84 | -12.84 | -11.96 | -11.96 | -212.29 | -212.29 | 689.54 |
| 4.05 | -11.96 | -11.96 | -35.42 | -35.42 | -201.41 | -201.41 | 651.95 |
| 4.50 | -10.83 | -10.83 | -53.00 | -53.00 | -181.30 | -181.30 | 583.17 |
| 4.95 | -9.47 | -9.47 | -64.70 | -64.70 | -154.59 | -154.59 | 493.25 |
| 5.40 | -7.92 | -7.92 | -70.53 | -70.53 | -123.94 | -123.94 | 391.89 |
| 5.85 | -6.20 | -6.20 | -70.48 | -70.48 | -92.00 | -92.00 | 290.96 |
| 6.30 | -4.38 | -4.38 | -64.55 | -64.55 | -61.40 | -61.40 | 290.96 |
| 6.75 | -2.47 | -2.47 | -52.74 | -52.74 | -34.79 | -34.79 | 290.96 |
| 7.20 | -0.52 | -0.52 | -35.06 | -35.06 | -14.81 | -14.81 | 290.96 |
| 7.65 | 1.45 | 1.45 | -14.97 | -14.97 | -3.75 | -3.75 | 290.96 |
| 8.10 | 3.43 | 3.43 | -2.55 | -2.55 | -0.13 | -0.13 | 290.96 |
| 8.55 | 5.40 | 5.40 | 0.05 | 0.05 | 0.01 | 0.01 | 290.96 |
| 9.00 | 7.38 | 7.38 | -0.00 | -0.00 | -0.00 | -0.00 | 0.00 |

**结构上作用力的分布 - 详细结果**

|  | **位移最小值** | **位移最大值** | **剪力最小值** | **剪力最大值** | **弯矩最小值** | **弯矩最大值** | **Areq** |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | **[mm]** | **[mm]** | **[kN/m]** | **[kN/m]** | **[kNm/m]** | **[kNm/m]** | **[mm2]** |
| 0.00 | -11.68 | -11.68 | 94.44 | 94.44 | 0.00 | 0.00 | 0.00 |
| 0.09 | -11.81 | -11.81 | 94.37 | 94.37 | -8.50 | -8.50 | 290.96 |
| 0.18 | -11.94 | -11.94 | 94.17 | 94.17 | -16.98 | -16.98 | 290.96 |
| 0.27 | -12.07 | -12.07 | 93.84 | 93.84 | -25.44 | -25.44 | 290.96 |
| 0.36 | -12.20 | -12.20 | 93.37 | 93.37 | -33.87 | -33.87 | 290.96 |
| 0.45 | -12.33 | -12.33 | 92.78 | 92.78 | -42.25 | -42.25 | 290.96 |
| 0.54 | -12.45 | -12.45 | 92.04 | 92.04 | -50.57 | -50.57 | 290.96 |
| 0.63 | -12.57 | -12.57 | 91.18 | 91.18 | -58.81 | -58.81 | 290.96 |
| 0.72 | -12.69 | -12.69 | 90.18 | 90.18 | -66.97 | -66.97 | 290.96 |
| 0.81 | -12.81 | -12.81 | 89.05 | 89.05 | -75.04 | -75.04 | 290.96 |
| 0.90 | -12.92 | -12.92 | 87.79 | 87.79 | -83.00 | -83.00 | 290.96 |
| 0.99 | -13.02 | -13.02 | 86.39 | 86.39 | -90.84 | -90.84 | 290.96 |
| 1.08 | -13.13 | -13.13 | 84.86 | 84.86 | -98.55 | -98.55 | 309.30 |
| 1.17 | -13.22 | -13.22 | 83.20 | 83.20 | -106.11 | -106.11 | 333.77 |
| 1.26 | -13.32 | -13.32 | 81.40 | 81.40 | -113.52 | -113.52 | 357.83 |
| 1.35 | -13.40 | -13.40 | 79.48 | 79.48 | -120.76 | -120.76 | 381.46 |
| 1.44 | -13.48 | -13.48 | 77.41 | 77.41 | -127.82 | -127.82 | 404.60 |
| 1.53 | -13.56 | -13.56 | 75.22 | 75.22 | -134.69 | -134.69 | 427.21 |
| 1.62 | -13.63 | -13.63 | 72.89 | 72.89 | -141.35 | -141.35 | 449.23 |
| 1.71 | -13.69 | -13.69 | 70.43 | 70.43 | -147.81 | -147.81 | 470.64 |
| 1.80 | -13.74 | -13.74 | 67.84 | 67.84 | -154.03 | -154.03 | 491.37 |
| 1.89 | -13.78 | -13.78 | 65.11 | 65.11 | -160.01 | -160.01 | 511.38 |
| 1.98 | -13.82 | -13.82 | 62.25 | 62.25 | -165.74 | -165.74 | 530.62 |
| 2.07 | -13.85 | -13.85 | 59.26 | 59.26 | -171.21 | -171.21 | 549.04 |
| 2.16 | -13.87 | -13.87 | 56.13 | 56.13 | -176.41 | -176.41 | 566.59 |
| 2.25 | -13.88 | -13.88 | 52.87 | 52.87 | -181.31 | -181.31 | 583.23 |
| 2.34 | -13.88 | -13.88 | 49.48 | 49.48 | -185.92 | -185.92 | 598.90 |
| 2.43 | -13.87 | -13.87 | 45.96 | 45.96 | -190.22 | -190.22 | 613.56 |
| 2.52 | -13.85 | -13.85 | 42.30 | 42.30 | -194.19 | -194.19 | 627.15 |
| 2.61 | -13.83 | -13.83 | 38.51 | 38.51 | -197.83 | -197.83 | 639.62 |
| 2.70 | -13.79 | -13.79 | 34.59 | 34.59 | -201.12 | -201.12 | 650.93 |
| 2.79 | -13.74 | -13.74 | 30.53 | 30.53 | -204.05 | -204.05 | 661.03 |
| 2.88 | -13.68 | -13.68 | 26.34 | 26.34 | -206.61 | -206.61 | 669.86 |
| 2.97 | -13.62 | -13.62 | 22.02 | 22.02 | -208.79 | -208.79 | 677.39 |
| 3.06 | -13.54 | -13.54 | 17.56 | 17.56 | -210.57 | -210.57 | 683.55 |
| 3.15 | -13.45 | -13.45 | 12.97 | 12.97 | -211.94 | -211.94 | 688.32 |
| 3.24 | -13.35 | -13.35 | 8.25 | 8.25 | -212.90 | -212.90 | 691.63 |
| 3.33 | -13.24 | -13.24 | 3.40 | 3.40 | -213.42 | -213.42 | 693.45 |
| 3.42 | -13.11 | -13.11 | -1.59 | -1.59 | -213.51 | -213.51 | 693.74 |
| 3.51 | -12.98 | -12.98 | -6.71 | -6.71 | -213.13 | -213.13 | 692.45 |
| 3.59 | -12.86 | -12.86 | -11.14 | -11.14 | -212.46 | -212.46 | 690.10 |
| 3.59 | -12.86 | -12.86 | -11.14 | -11.14 | -212.46 | -212.46 | 690.10 |
| 3.59 | -12.85 | -12.85 | -11.61 | -11.61 | -212.36 | -212.36 | 689.78 |
| 3.59 | -12.85 | -12.85 | -11.61 | -11.61 | -212.36 | -212.36 | 689.78 |
| 3.60 | -12.84 | -12.84 | -11.96 | -11.96 | -212.29 | -212.29 | 689.54 |
| 3.60 | -12.84 | -12.84 | -11.96 | -11.96 | -212.29 | -212.29 | 689.54 |
| 3.69 | -12.68 | -12.68 | -17.12 | -17.12 | -210.98 | -210.98 | 684.99 |
| 3.78 | -12.52 | -12.52 | -22.05 | -22.05 | -209.22 | -209.22 | 678.88 |
| 3.87 | -12.34 | -12.34 | -26.74 | -26.74 | -207.02 | -207.02 | 671.29 |
| 3.96 | -12.16 | -12.16 | -31.20 | -31.20 | -204.41 | -204.41 | 662.28 |
| 4.05 | -11.96 | -11.96 | -35.42 | -35.42 | -201.41 | -201.41 | 651.95 |
| 4.14 | -11.75 | -11.75 | -39.41 | -39.41 | -198.04 | -198.04 | 640.36 |
| 4.23 | -11.54 | -11.54 | -43.16 | -43.16 | -194.33 | -194.33 | 627.61 |
| 4.32 | -11.31 | -11.31 | -46.67 | -46.67 | -190.28 | -190.28 | 613.78 |
| 4.41 | -11.08 | -11.08 | -49.96 | -49.96 | -185.93 | -185.93 | 598.94 |
| 4.50 | -10.83 | -10.83 | -53.00 | -53.00 | -181.30 | -181.30 | 583.17 |
| 4.59 | -10.58 | -10.58 | -55.81 | -55.81 | -176.40 | -176.40 | 566.56 |
| 4.68 | -10.31 | -10.31 | -58.39 | -58.39 | -171.26 | -171.26 | 549.19 |
| 4.77 | -10.04 | -10.04 | -60.73 | -60.73 | -165.90 | -165.90 | 531.12 |
| 4.86 | -9.76 | -9.76 | -62.83 | -62.83 | -160.33 | -160.33 | 512.45 |
| 4.95 | -9.47 | -9.47 | -64.70 | -64.70 | -154.59 | -154.59 | 493.25 |
| 5.04 | -9.17 | -9.17 | -66.34 | -66.34 | -148.69 | -148.69 | 473.59 |
| 5.13 | -8.87 | -8.87 | -67.74 | -67.74 | -142.66 | -142.66 | 453.55 |
| 5.22 | -8.56 | -8.56 | -68.90 | -68.90 | -136.51 | -136.51 | 433.21 |
| 5.31 | -8.24 | -8.24 | -69.83 | -69.83 | -130.26 | -130.26 | 412.63 |
| 5.40 | -7.92 | -7.92 | -70.53 | -70.53 | -123.94 | -123.94 | 391.89 |
| 5.49 | -7.59 | -7.59 | -70.99 | -70.99 | -117.57 | -117.57 | 371.06 |
| 5.58 | -7.25 | -7.25 | -71.21 | -71.21 | -111.17 | -111.17 | 350.21 |
| 5.67 | -6.91 | -6.91 | -71.20 | -71.20 | -104.76 | -104.76 | 329.40 |
| 5.76 | -6.56 | -6.56 | -70.96 | -70.96 | -98.36 | -98.36 | 308.72 |
| 5.85 | -6.20 | -6.20 | -70.48 | -70.48 | -92.00 | -92.00 | 290.96 |
| 5.94 | -5.85 | -5.85 | -69.76 | -69.76 | -85.69 | -85.69 | 290.96 |
| 6.03 | -5.49 | -5.49 | -68.81 | -68.81 | -79.45 | -79.45 | 290.96 |
| 6.12 | -5.12 | -5.12 | -67.63 | -67.63 | -73.31 | -73.31 | 290.96 |
| 6.21 | -4.75 | -4.75 | -66.20 | -66.20 | -67.28 | -67.28 | 290.96 |
| 6.30 | -4.38 | -4.38 | -64.55 | -64.55 | -61.40 | -61.40 | 290.96 |
| 6.39 | -4.00 | -4.00 | -62.66 | -62.66 | -55.67 | -55.67 | 290.96 |
| 6.48 | -3.62 | -3.62 | -60.53 | -60.53 | -50.13 | -50.13 | 290.96 |
| 6.57 | -3.24 | -3.24 | -58.17 | -58.17 | -44.78 | -44.78 | 290.96 |
| 6.66 | -2.86 | -2.86 | -55.57 | -55.57 | -39.66 | -39.66 | 290.96 |
| 6.75 | -2.47 | -2.47 | -52.74 | -52.74 | -34.79 | -34.79 | 290.96 |
| 6.84 | -2.08 | -2.08 | -49.67 | -49.67 | -30.18 | -30.18 | 290.96 |
| 6.93 | -1.69 | -1.69 | -46.37 | -46.37 | -25.85 | -25.85 | 290.96 |
| 7.02 | -1.30 | -1.30 | -42.84 | -42.84 | -21.84 | -21.84 | 290.96 |
| 7.11 | -0.91 | -0.91 | -39.06 | -39.06 | -18.15 | -18.15 | 290.96 |
| 7.20 | -0.52 | -0.52 | -35.06 | -35.06 | -14.81 | -14.81 | 290.96 |
| 7.29 | -0.13 | -0.13 | -30.82 | -30.82 | -11.84 | -11.84 | 290.96 |
| 7.38 | 0.27 | 0.27 | -26.38 | -26.38 | -9.27 | -9.27 | 290.96 |
| 7.47 | 0.66 | 0.66 | -22.28 | -22.28 | -7.08 | -7.08 | 290.96 |
| 7.56 | 1.06 | 1.06 | -18.47 | -18.47 | -5.25 | -5.25 | 290.96 |
| 7.65 | 1.45 | 1.45 | -14.97 | -14.97 | -3.75 | -3.75 | 290.96 |
| 7.74 | 1.85 | 1.85 | -11.79 | -11.79 | -2.54 | -2.54 | 290.96 |
| 7.83 | 2.24 | 2.24 | -8.95 | -8.95 | -1.61 | -1.61 | 290.96 |
| 7.92 | 2.64 | 2.64 | -6.45 | -6.45 | -0.92 | -0.92 | 290.96 |
| 8.01 | 3.03 | 3.03 | -4.31 | -4.31 | -0.44 | -0.44 | 290.96 |
| 8.10 | 3.43 | 3.43 | -2.55 | -2.55 | -0.13 | -0.13 | 290.96 |
| 8.19 | 3.82 | 3.82 | -1.16 | -1.16 | 0.04 | 0.04 | 290.96 |
| 8.28 | 4.22 | 4.22 | -0.18 | -0.18 | 0.10 | 0.10 | 290.96 |
| 8.37 | 4.61 | 4.61 | 0.06 | 0.06 | 0.02 | 0.02 | 290.96 |
| 8.46 | 5.01 | 5.01 | 0.05 | 0.05 | 0.01 | 0.01 | 290.96 |
| 8.55 | 5.40 | 5.40 | 0.05 | 0.05 | 0.01 | 0.01 | 290.96 |
| 8.64 | 5.80 | 5.80 | 0.04 | 0.04 | 0.01 | 0.01 | 290.96 |
| 8.73 | 6.19 | 6.19 | 0.03 | 0.03 | 0.00 | 0.00 | 290.96 |
| 8.82 | 6.59 | 6.59 | 0.02 | 0.02 | 0.00 | 0.00 | 290.96 |
| 8.91 | 6.99 | 6.99 | 0.01 | 0.01 | 0.00 | 0.00 | 0.00 |
| 9.00 | 7.38 | 7.38 | -0.00 | -0.00 | -0.00 | -0.00 | 0.00 |

**结构内力最大值**

|  |  |  |  |
| --- | --- | --- | --- |
| 位移最大值 | = | -13.9 | mm |
| 位移最小值 | = | 7.4 | mm |
| 弯矩最大值 | = | 0.10 | kNm/m |
| 弯矩最小值 | = | -213.51 | kNm/m |
| 剪力最大值 | = | 94.44 | kN/m |

**验算钢筋混凝土结构截面 (排桩 a = 0.40 m; b = 0.40 m; h = 0.40 m)**

对所有工况阶段进行分析。

荷载分项系数 = 1.00

钢筋 - 8根, 直径12.6mm; 保护层30.0mm

抗剪钢筋 - 2根 (双肢箍), 直径5.0mm; 间距45.0mm

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 配筋率 | ρ | = | 0.69 | % | > | 0.20 | % | = | ρmin |
| 中和轴位置 | x/β1 | = | 0.08 | m | < | 0.24 | m | = | ξbh0/β1 |
| 截面受剪承载力设计值 | Vu | = | 241.42 | kN | > | 37.78 | kN | = | V |
| 截面受弯承载力设计值 | Mu | = | 119.38 | kNm | > | 85.40 | kNm | = | M |

**截面满足要求。**

| **名称 : 截面强度验算** | **工况阶段 - 分析工况 : 1 - 1** |
| --- | --- |
| |  | | --- | |  | |

**锚杆(索)验算**

| **锚杆** | **工况阶段** | **深度** | **轴力最大值** | **锚杆强度** | **抗拔强度(岩土与锚固体)** | **抗拔强度(钢筋与砂浆)** | **验算** |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **z [m]** | **F [kN]** | **Rt [kN]** | **Re [kN]** | **Rc [kN]** |  |
| 1 | 1 | 0.00 | 95.90 | 100.76 | 199.37 | - | **满足要求 (95.17 %)** |

利用率最大的锚杆(索) - 编号1 (工况阶段 1; z = 0.00 m)

利用率 95.17 %

**锚杆(索)承载力 满足要求**

**附录**

| **名称 : 抗滑桩验算** | **工况阶段 - 分析工况 : 1 - 1** |
| --- | --- |
| |  | | --- | |  | |

| **名称 : 抗滑桩验算** | **工况阶段 - 分析工况 : 1 - 1** |
| --- | --- |
| |  | | --- | |  | |

**附录**