

5. 地盤

5.1 圧密沈下の検討

計画区域では、洪積粘性土層 (Dc1~3) の一部で N 値が 5 未満となっているが、設計 N 値としては 5 以上とみなせる。道路土工盛土工指針 (H22.4 (社) 日本道路協会) によると、軟弱層や液状化の恐れがある地盤以外では、盛土の支持層は N 値が 5 以上の連続した層とされている。また、盛土載荷重法による盛土後の地中応力は、圧密降伏応力 P_c を上回ることはないため、洪積粘性土層 (Dc1~3) で圧密沈下が生じる可能性は低いと考えられる。

したがって、ここでは洪積粘性土層 (Dc1~3) を除く、表土・埋土層 (B)、沖積層 (Ac・Ap)、ローム層 (Lm)、凝灰質粘土層 (Lc) の 5 層を対象として圧密沈下の検討を行った。

5.2 圧密沈下の検討結果

盛土厚ごとの圧密沈下の検討結果は、表-1 に示すとおりである。また、各ケースにおける検討結果の詳細は、次項に示すとおりである。

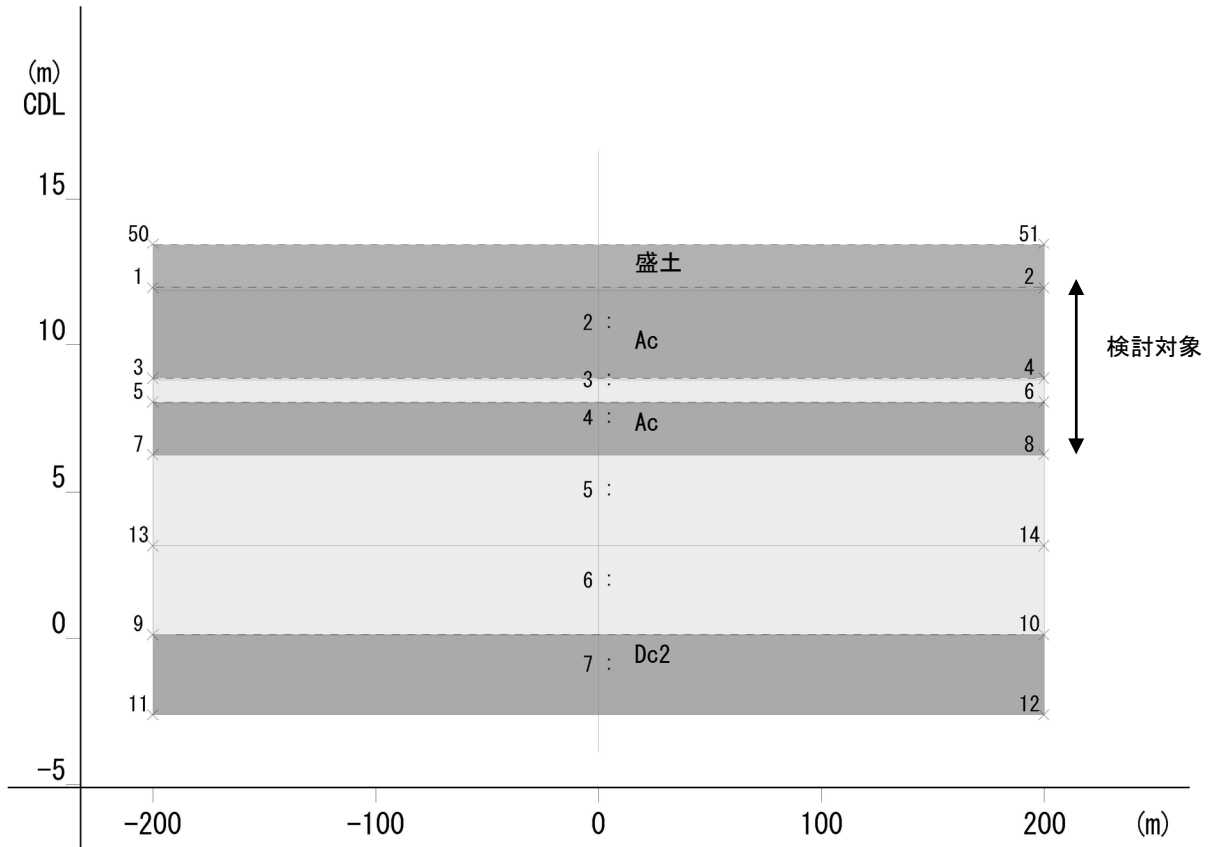
表-1 圧密沈下の検討結果

| 地点 | ケース | 盛土厚 (m) | 沈下量 (m) | 沈下日数 90%沈下 |
|-------|--------|------------|------------|---------------|
| No. 1 | H=1.5m | 1.5 | 0.08 | 15 |
| | H=3.0m | 3.0 | 0.16 | 28 |
| | H=4.0m | 4.0 | 0.23 | 37 |
| No. 2 | H=1.5m | 1.5 | 0.05 | 19 |
| | H=3.0m | 3.0 | 0.12 | 29 |
| | H=4.0m | 4.0 | 0.16 | 37 |
| No. 3 | H=1.5m | 1.5 | 0.16 | 85 |
| | H=3.0m | 3.0 | 0.33 | 95 |
| | H=4.0m | 4.0 | 0.42 | 101 |
| No. 4 | H=1.5m | 1.5 | 0.05 | 19 |
| | H=3.0m | 3.0 | 0.09 | 29 |
| | H=4.0m | 4.0 | 0.11 | 37 |

No. 1 盛土高 H=1.5m

推定盛土断面図 (1000日)

| | |
|-----|-----------|
| 項目 | |
| 地表高 | CDL 13.38 |
| 沈下量 | 0.09m |

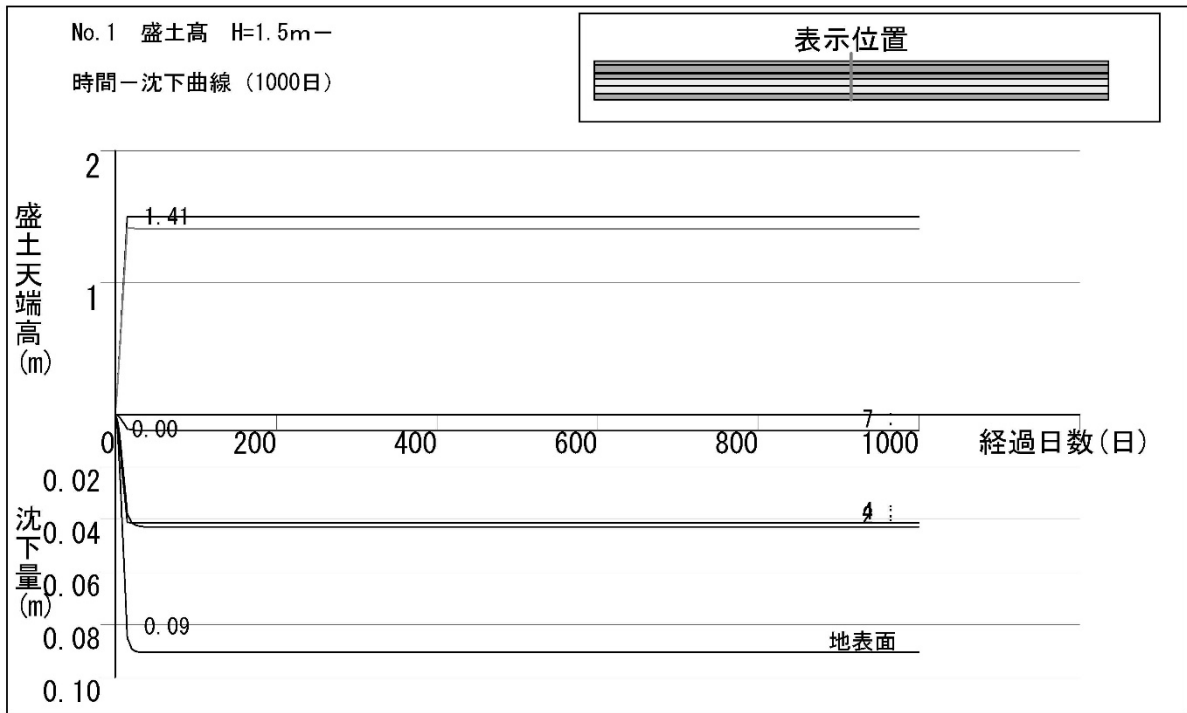


| 層No | 土層名 | 計算方法 | 層厚 (m) | 有効土被り圧 p_0 (kN/m ²) | 増加応力 Δp (kN/m ²) | 先行圧密の増加量 q_0 (kN/m ²) | 沈下量 (cm) |
|-----|-----|--------------|--------|-----------------------------------|--------------------------------------|-------------------------------------|----------|
| 2 | Ac | Δe 法 | 3.100 | 27.28 | 27.00 | 0.00 | 4.285 |
| 3 | | 非圧密層 | 0.810 | --- | --- | --- | --- |
| 4 | Ac | Δe 法 | 1.800 | 85.79 | 27.00 | 0.00 | 4.161 |
| 5 | | 非圧密層 | 3.100 | --- | --- | --- | --- |
| 6 | | 非圧密層 | 3.040 | --- | --- | --- | --- |
| 7 | Dc2 | Δe 法 | 2.750 | 235.70 | 27.00 | 0.00 | 0.608 |

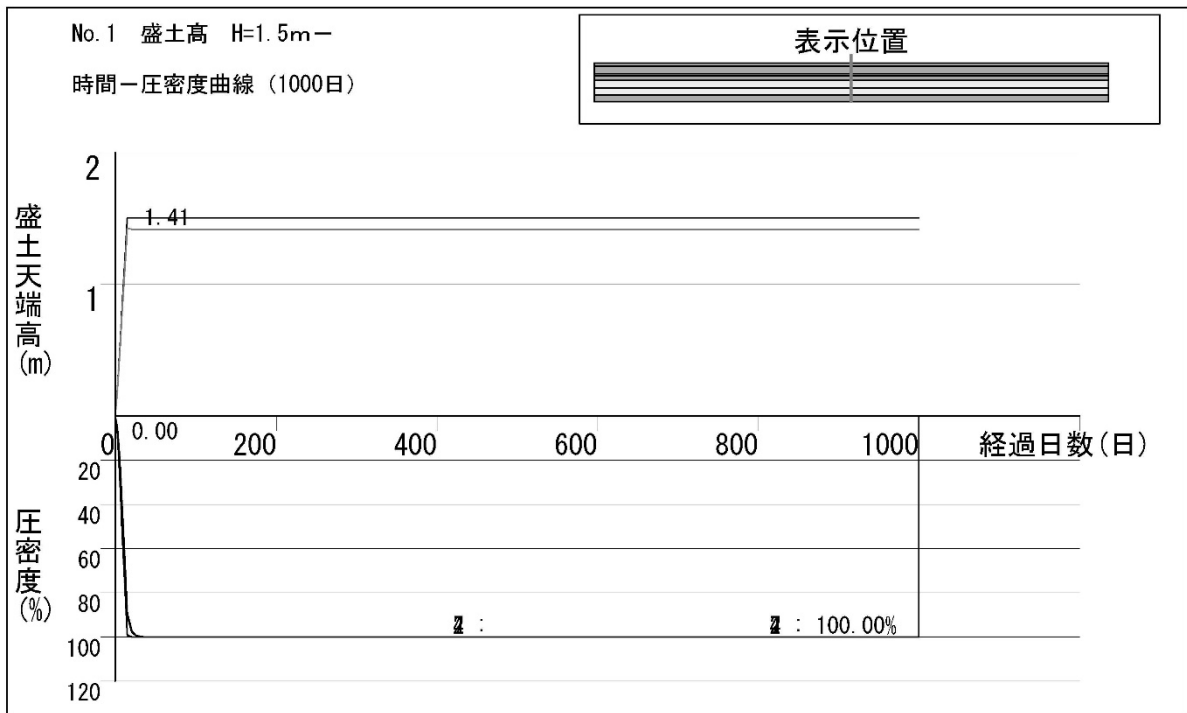
小計 (cm) : 9.054

| 層No | 初期間隙比 e_0 | 間隙比 e_1 | 体積圧縮係数 M_v (m ² /kN) | 圧縮指数 C_{c1} | 膨張指数 C_{c2} | 相乗平均 $\sqrt{p_0(p_0+\Delta p)}$ (kN/m ²) | 相加平均 $p_0+\Delta p/2$ (kN/m ²) | 圧密係数 C_v (cm ² /day) |
|-----|-------------|-----------|-----------------------------------|---------------|---------------|--|--|-----------------------------------|
| 2 | 1.7010 | 1.6637 | --- | --- | --- | 38.48 | --- | 2610.803 |
| 3 | --- | --- | --- | --- | --- | --- | --- | --- |
| 4 | 1.6154 | 1.5549 | --- | --- | --- | 98.37 | --- | 2186.837 |
| 5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | --- | --- | --- | --- | --- | --- | --- | --- |
| 7 | 2.3274 | 2.3201 | --- | --- | --- | 248.84 | --- | 2199.649 |

時間-沈下曲線



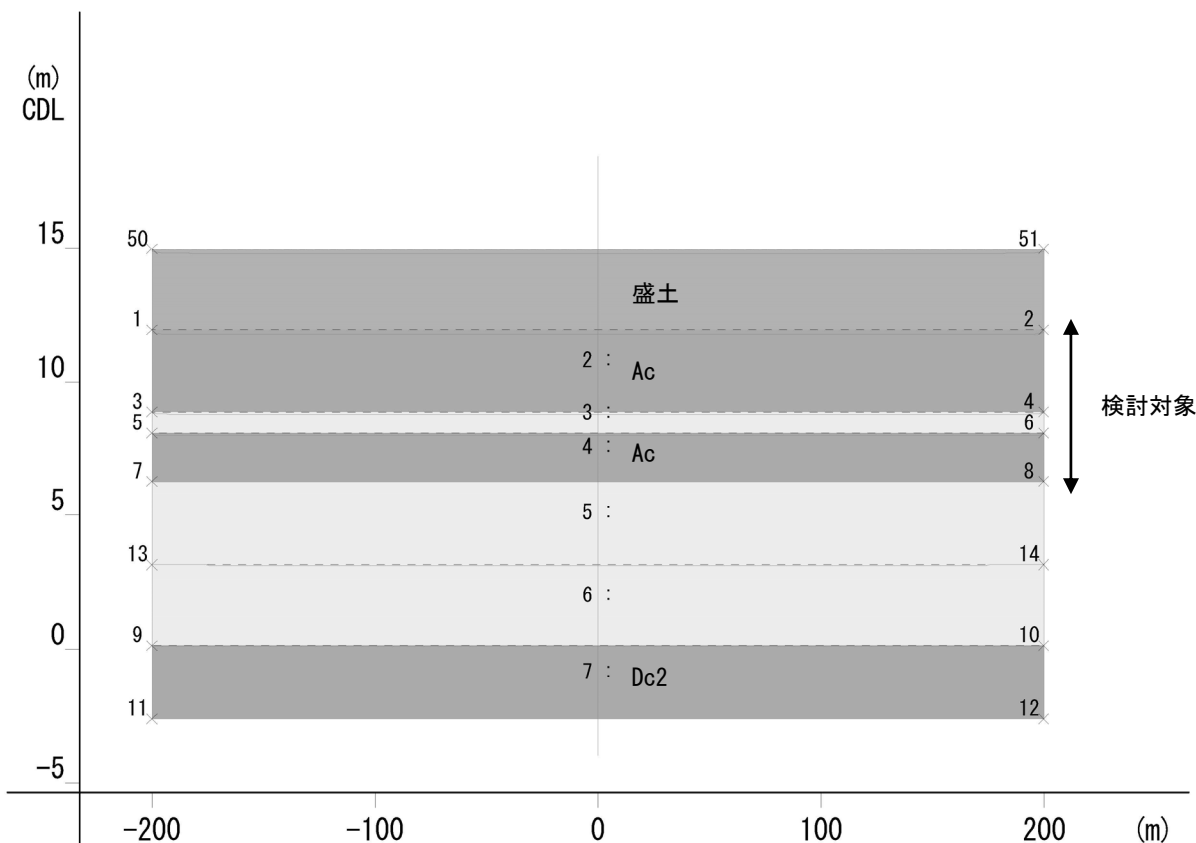
時間-圧密度曲線



No. 1 盛土高 H=3.0m

推定盛土断面図 (1000日)

| | |
|-----|-----------|
| 項目 | |
| 地表高 | CDL 14.80 |
| 沈下量 | 0.17m |

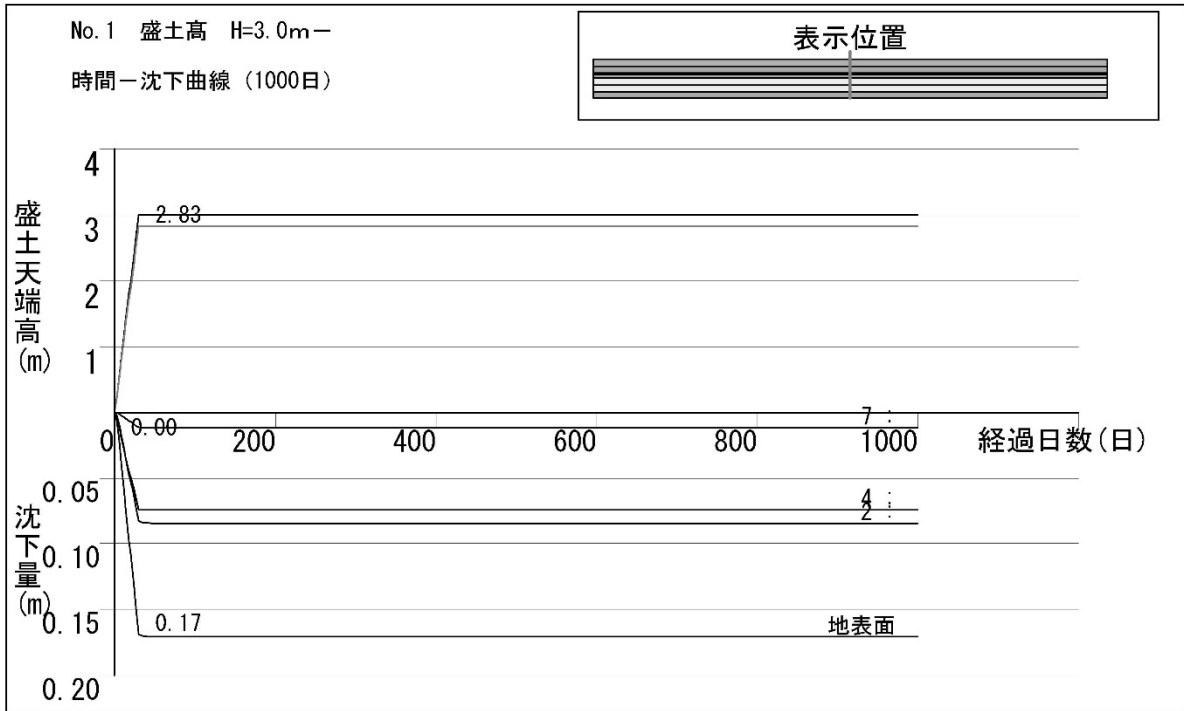


| 層No | 土層名 | 計算方法 | 層厚 (m) | 有効土被り圧 p_0 (kN/m ²) | 増加応力 Δp (kN/m ²) | 先行圧密の増加量 q_0 (kN/m ²) | 沈下量 (cm) |
|-----|-----|--------------|-----------|--------------------------------------|---|--|-------------|
| 2 | Ac | Δe 法 | 3.100 | 27.28 | 54.00 | 0.00 | 8.461 |
| 3 | | 非圧密層 | 0.810 | --- | --- | --- | --- |
| 4 | Ac | Δe 法 | 1.800 | 85.79 | 54.00 | 0.00 | 7.424 |
| 5 | | 非圧密層 | 3.100 | --- | --- | --- | --- |
| 6 | | 非圧密層 | 3.040 | --- | --- | --- | --- |
| 7 | Dc2 | Δe 法 | 2.750 | 235.70 | 53.99 | 0.00 | 1.156 |

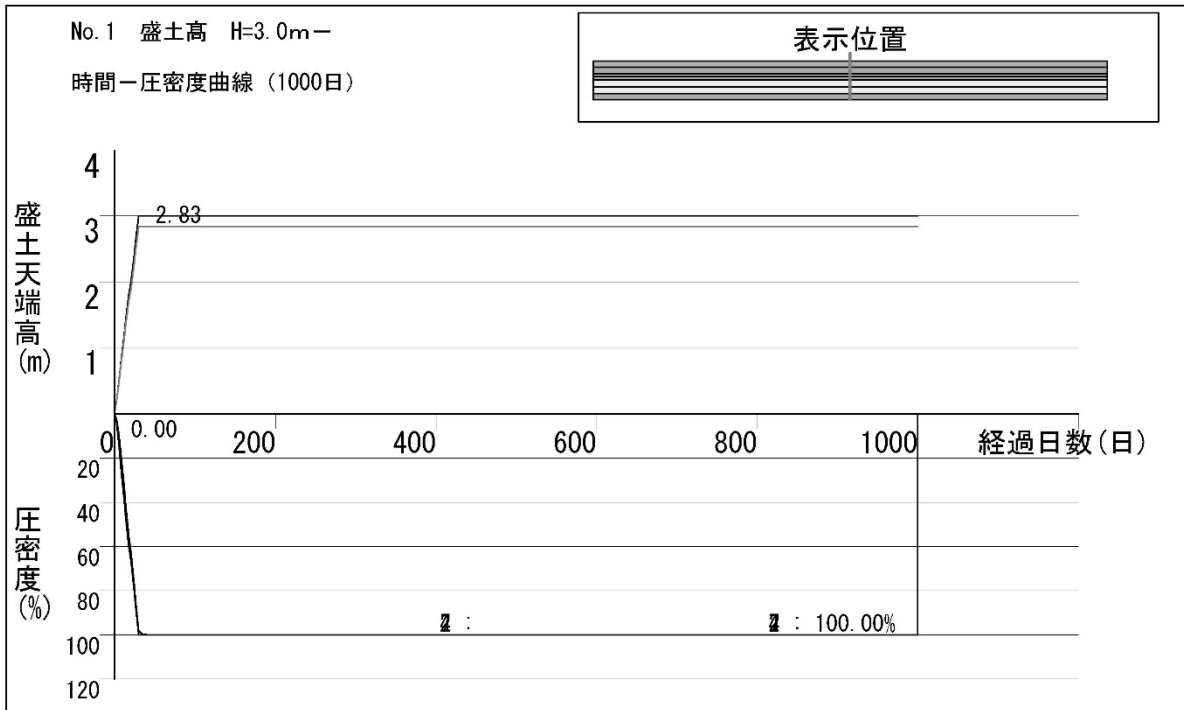
小計 (cm) : 17.041

| 層No | 初期間隙比 e_0 | 間隙比 e_1 | 体積圧縮係数 M_v (m ² /kN) | 圧縮指数 C_{c1} | 膨張指数 C_{c2} | 相乗平均 $\sqrt{p_0(p_0+\Delta p)}$ (kN/m ²) | 相加平均 $p_0+\Delta p/2$ (kN/m ²) | 圧密係数 C_v (cm ² /day) |
|-----|----------------|--------------|---|------------------|------------------|--|--|---|
| 2 | 1.7010 | 1.6273 | --- | --- | --- | 47.09 | --- | 2516.402 |
| 3 | --- | --- | --- | --- | --- | --- | --- | --- |
| 4 | 1.6154 | 1.5075 | --- | --- | --- | 109.51 | --- | 2141.767 |
| 5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | --- | --- | --- | --- | --- | --- | --- | --- |
| 7 | 2.3274 | 2.3134 | --- | --- | --- | 261.31 | --- | 2133.187 |

時間-沈下曲線



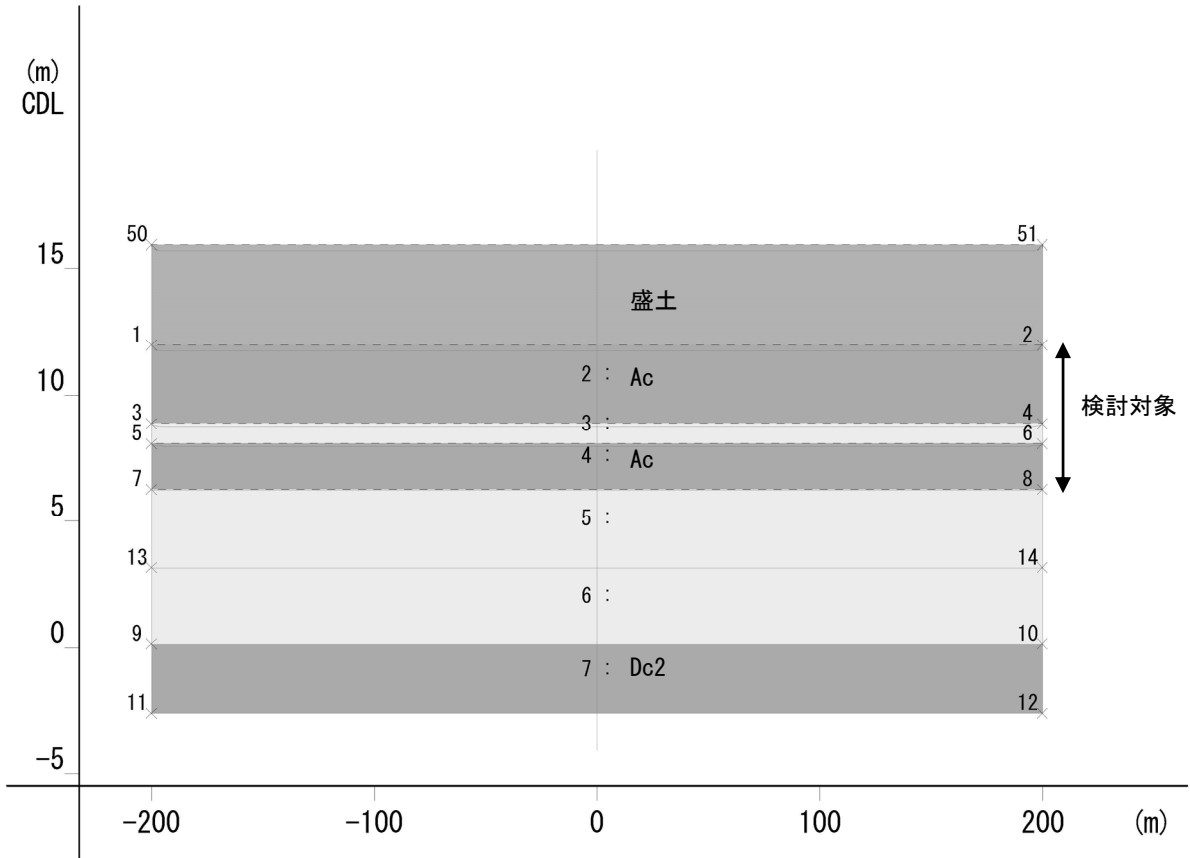
時間-圧密度曲線



No. 1 盛土高 H=4.0m

推定盛土断面図 (1000日)

| | |
|-----|-----------|
| 項目 | |
| 地表高 | CDL 15.73 |
| 沈下量 | 0.24m |

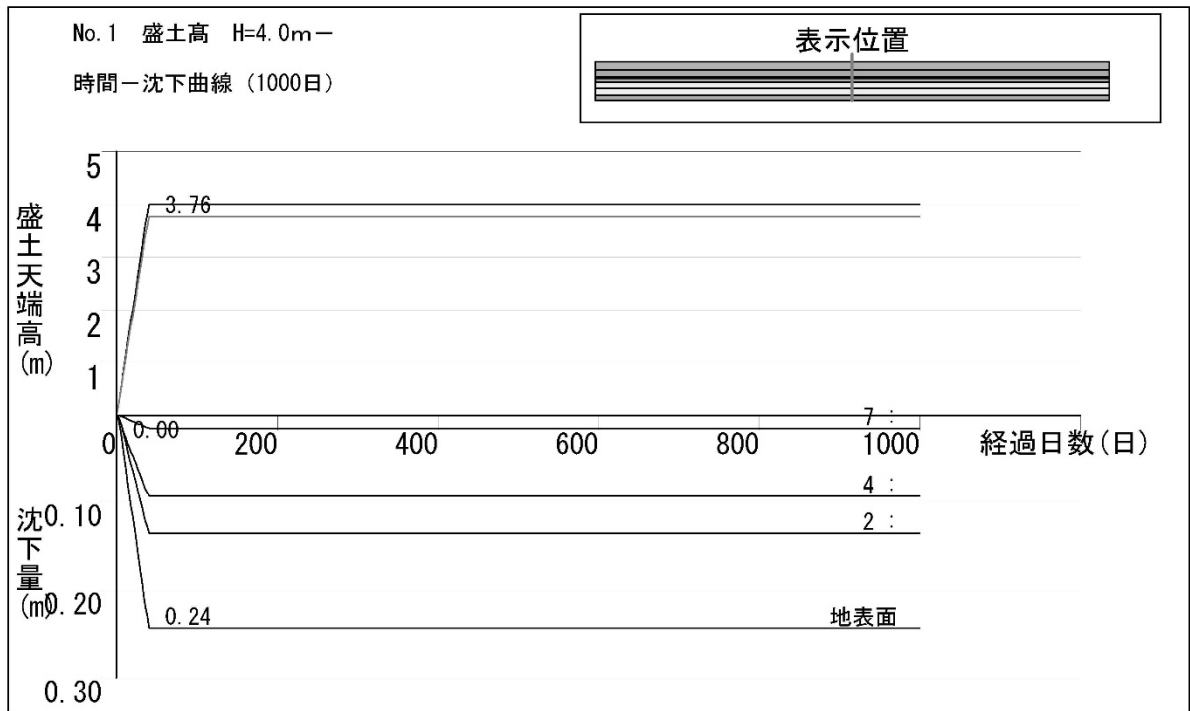


| 層No | 土層名 | 計算方法 | 層厚 (m) | 有効土被り圧 p_0 (kN/m ²) | 増加応力 Δp (kN/m ²) | 先行圧密の増加量 q_0 (kN/m ²) | 沈下量 (cm) |
|-----|-----|--------------|-----------|--------------------------------------|---|--|-------------|
| 2 | Ac | Δe 法 | 3.100 | 27.28 | 72.00 | 0.00 | 13.533 |
| 3 | | 非圧密層 | 0.810 | --- | --- | --- | --- |
| 4 | Ac | Δe 法 | 1.800 | 85.79 | 72.00 | 0.00 | 9.291 |
| 5 | | 非圧密層 | 3.100 | --- | --- | --- | --- |
| 6 | | 非圧密層 | 3.040 | --- | --- | --- | --- |
| 7 | Dc2 | Δe 法 | 2.750 | 235.70 | 71.99 | 0.00 | 1.494 |

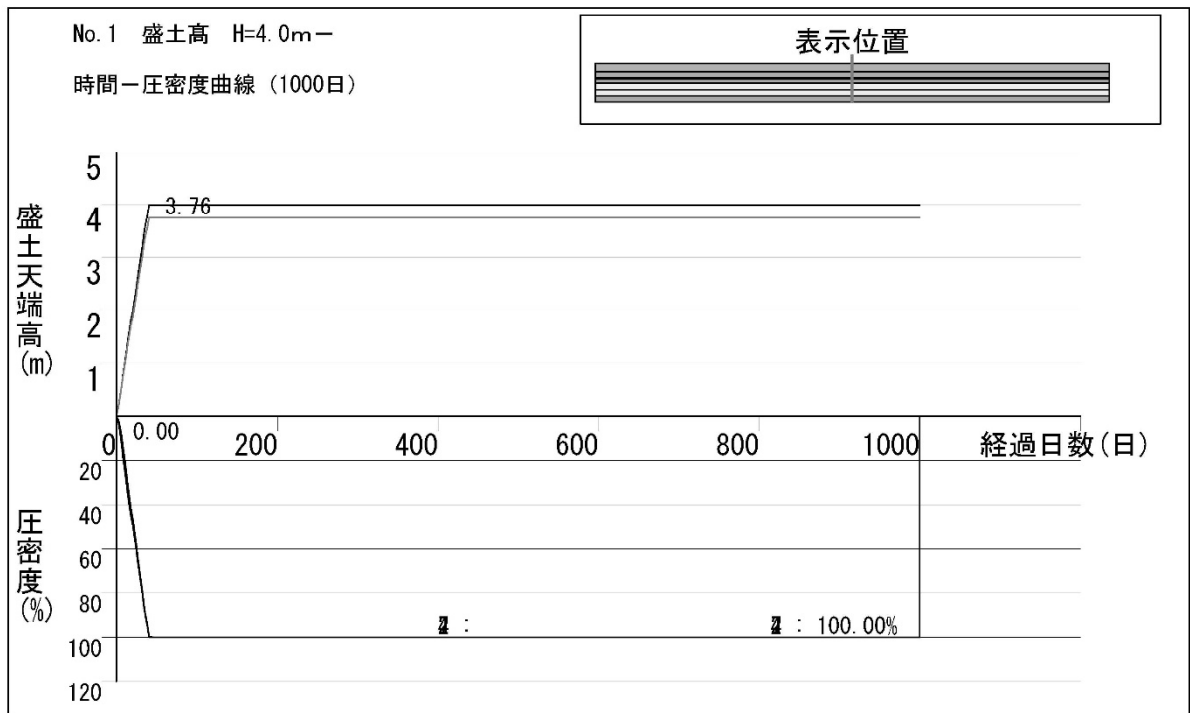
小計 (cm) : 24.318

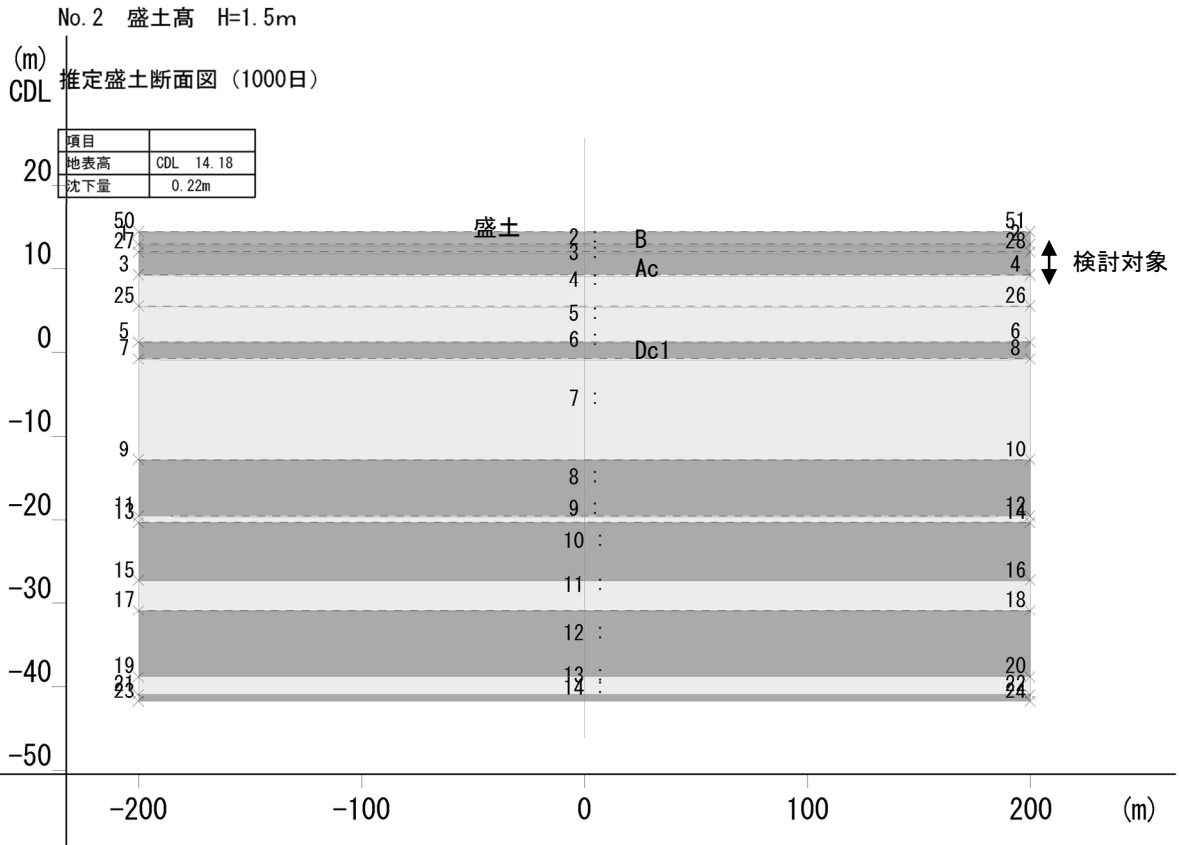
| 層No | 初期間隙比 e_0 | 間隙比 e_1 | 体積圧縮係数 M_v (m ² /kN) | 圧縮指数 C_{c1} | 膨張指数 C_{c2} | 相乗平均 $\sqrt{p_0(p_0+\Delta p)}$ (kN/m ²) | 相加平均 $p_0+\Delta p/2$ (kN/m ²) | 圧密係数 C_v (cm ² /day) |
|-----|----------------|--------------|---|------------------|------------------|--|--|---|
| 2 | 1.7010 | 1.5831 | --- | --- | --- | 52.04 | --- | 2470.902 |
| 3 | --- | --- | --- | --- | --- | --- | --- | --- |
| 4 | 1.6154 | 1.4804 | --- | --- | --- | 116.35 | --- | 2116.742 |
| 5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | --- | --- | --- | --- | --- | --- | --- | --- |
| 7 | 2.3274 | 2.3093 | --- | --- | --- | 269.31 | --- | 2093.240 |

時間-沈下曲線



時間-圧密度曲線



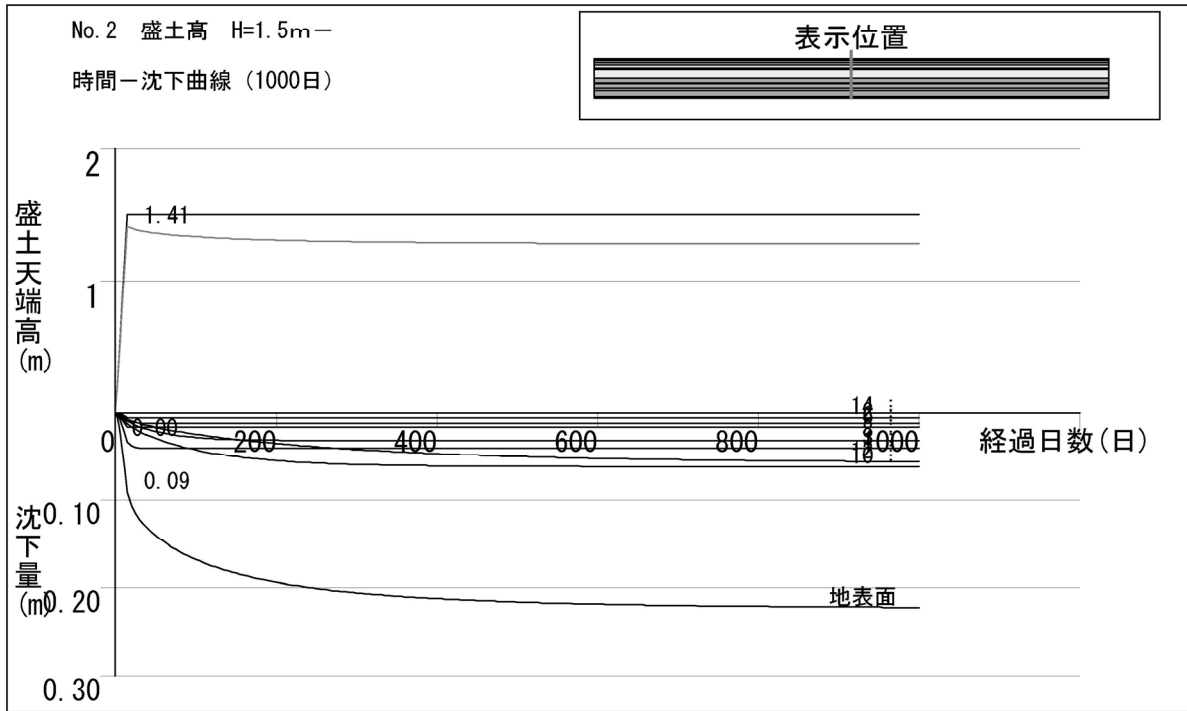


| 層No | 土層名 | 計算方法 | 層厚 (m) | 有効土被り圧 p_0 (kN/m ²) | 増加応力 Δp (kN/m ²) | 先行圧密の 増加量 q_0 (kN/m ²) | 沈下量 (cm) |
|-----|-----|--------------|-----------|--------------------------------------|---|--|-------------|
| 2 | B | Δe 法 | 0.900 | 8.10 | 27.00 | 0.00 | 1.139 |
| 3 | Ac | Δe 法 | 2.700 | 39.96 | 27.00 | 0.00 | 4.033 |
| 4 | | 非圧密層 | 3.800 | --- | --- | --- | --- |
| 5 | | 非圧密層 | 4.300 | --- | --- | --- | --- |
| 6 | Dc1 | Δe 法 | 2.000 | 227.49 | 27.00 | 0.00 | 1.615 |
| 7 | | 非圧密層 | 12.100 | --- | --- | --- | --- |
| 8 | | Δe 法 | 6.600 | 533.71 | 26.97 | 0.00 | 3.132 |
| 9 | | 非圧密層 | 0.800 | --- | --- | --- | --- |
| 10 | | Δe 法 | 7.000 | 667.23 | 26.93 | 0.00 | 6.131 |
| 11 | | 非圧密層 | 3.600 | --- | --- | --- | --- |
| 12 | | Δe 法 | 7.900 | 867.63 | 26.85 | 0.00 | 5.659 |
| 13 | | 非圧密層 | 2.100 | --- | --- | --- | --- |
| 14 | | Δe 法 | 0.900 | 988.83 | 26.79 | 0.00 | 0.583 |

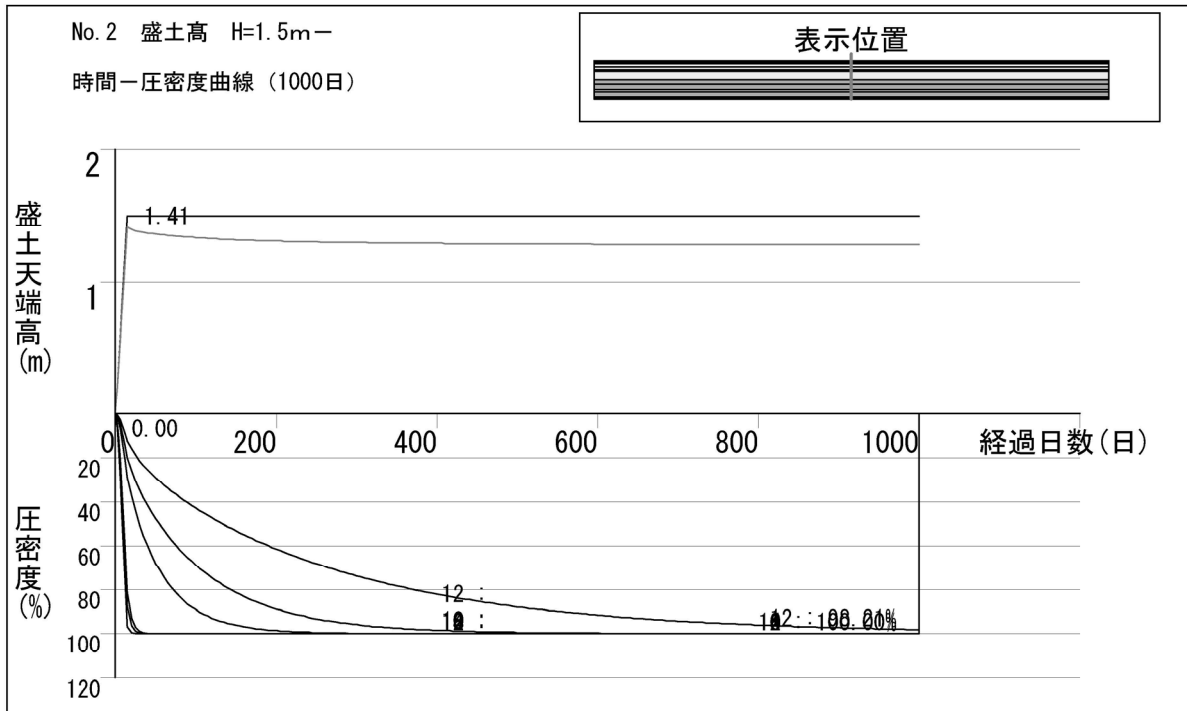
小計 (cm) : 22.291

| 層No | 初期間隙比 e_0 | 間隙比 e_1 | 体積圧縮係数 M_v (m ² /kN) | 圧縮指数 C_{c1} | 膨張指数 C_{c2} | 相乗平均 $\sqrt{p_0(p_0+\Delta p)}$ (kN/m ²) | 相加平均 $p_0+\Delta p/2$ (kN/m ²) | 圧密係数 C_v (cm ² /day) |
|-----|----------------|--------------|---|------------------|------------------|--|--|---|
| 2 | 1.7272 | 1.6927 | --- | --- | --- | 16.86 | --- | 2870.602 |
| 3 | 1.6875 | 1.6474 | --- | --- | --- | 51.73 | --- | 2473.636 |
| 4 | --- | --- | --- | --- | --- | --- | --- | --- |
| 5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | 1.1641 | 1.1466 | --- | --- | --- | 240.61 | --- | 1734.930 |
| 7 | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 2.1471 | 2.1322 | --- | --- | --- | 547.03 | --- | 956.942 |
| 9 | --- | --- | --- | --- | --- | --- | --- | --- |
| 10 | 2.0566 | 2.0298 | --- | --- | --- | 680.56 | --- | 510.385 |
| 11 | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 1.8789 | 1.8583 | --- | --- | --- | 880.95 | --- | 242.850 |
| 13 | --- | --- | --- | --- | --- | --- | --- | --- |
| 14 | 1.7904 | 1.7723 | --- | --- | --- | 1002.14 | --- | 206.680 |

時間-沈下曲線

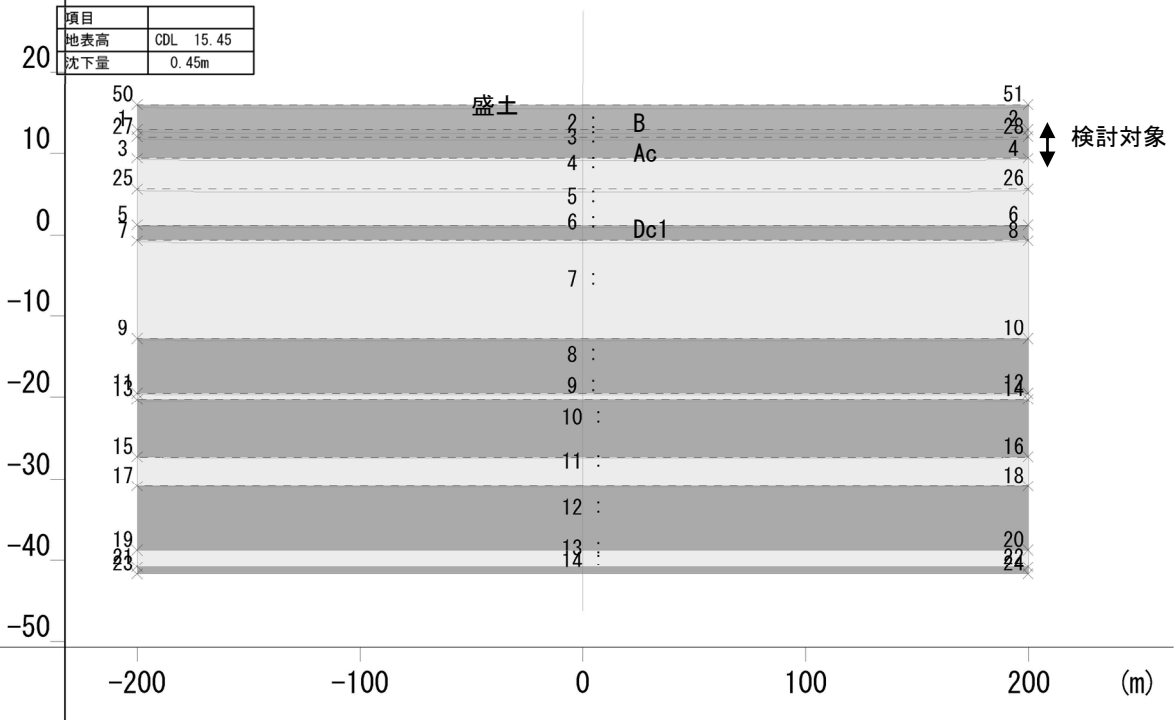


時間-圧密度曲線



No. 2 盛土高 H=3.0m

(m) CDL 推定盛土断面図 (1000日)

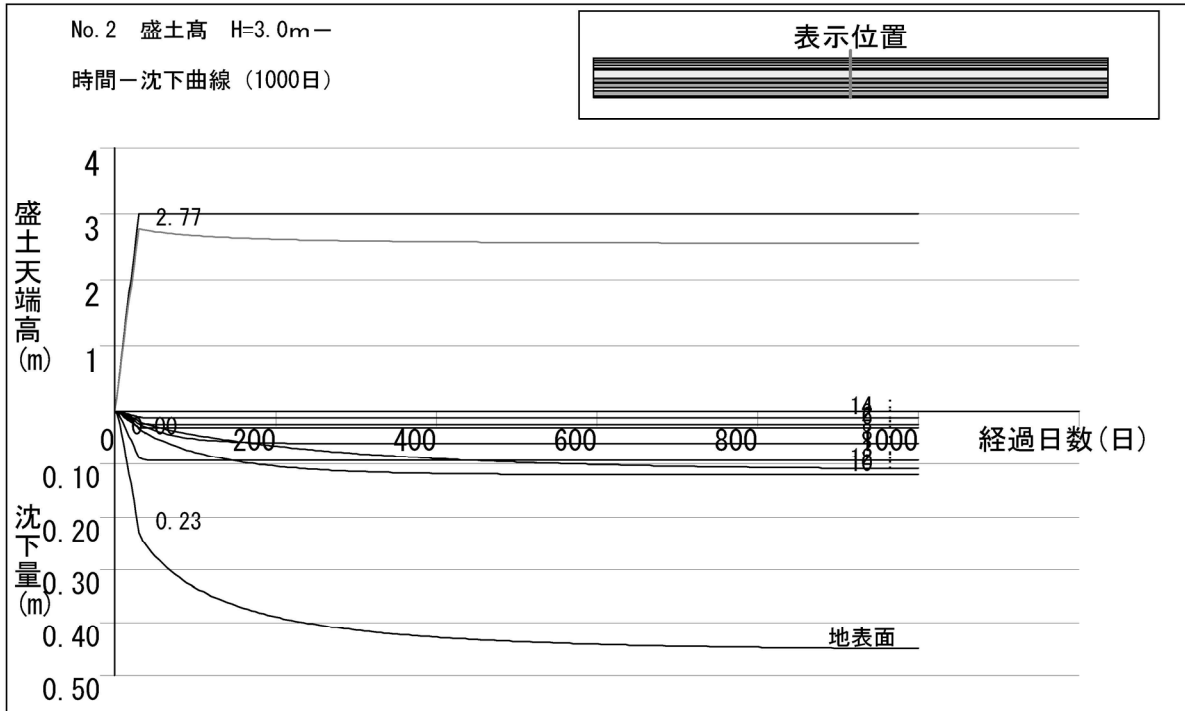


| 層No | 土層名 | 計算方法 | 層厚 (m) | 有効土被り圧 p_0 (kN/m ²) | 増加応力 Δp (kN/m ²) | 先行圧密の 増加量 q_0 (kN/m ²) | 沈下量 (cm) |
|-----|-----|--------------|-----------|--------------------------------------|---|--|-------------|
| 2 | B | Δe 法 | 0.900 | 8.10 | 54.00 | 0.00 | 2.440 |
| 3 | Ac | Δe 法 | 2.700 | 39.96 | 54.00 | 0.00 | 9.265 |
| 4 | | 非圧密層 | 3.800 | --- | --- | --- | --- |
| 5 | | 非圧密層 | 4.300 | --- | --- | --- | --- |
| 6 | Dc1 | Δe 法 | 2.000 | 227.49 | 53.99 | 0.00 | 3.067 |
| 7 | | 非圧密層 | 12.100 | --- | --- | --- | --- |
| 8 | | Δe 法 | 6.600 | 533.71 | 53.93 | 0.00 | 6.116 |
| 9 | | 非圧密層 | 0.800 | --- | --- | --- | --- |
| 10 | | Δe 法 | 7.000 | 667.23 | 53.86 | 0.00 | 12.029 |
| 11 | | 非圧密層 | 3.600 | --- | --- | --- | --- |
| 12 | | Δe 法 | 7.900 | 867.63 | 53.71 | 0.00 | 11.151 |
| 13 | | 非圧密層 | 2.100 | --- | --- | --- | --- |
| 14 | | Δe 法 | 0.900 | 988.83 | 53.58 | 0.00 | 1.151 |

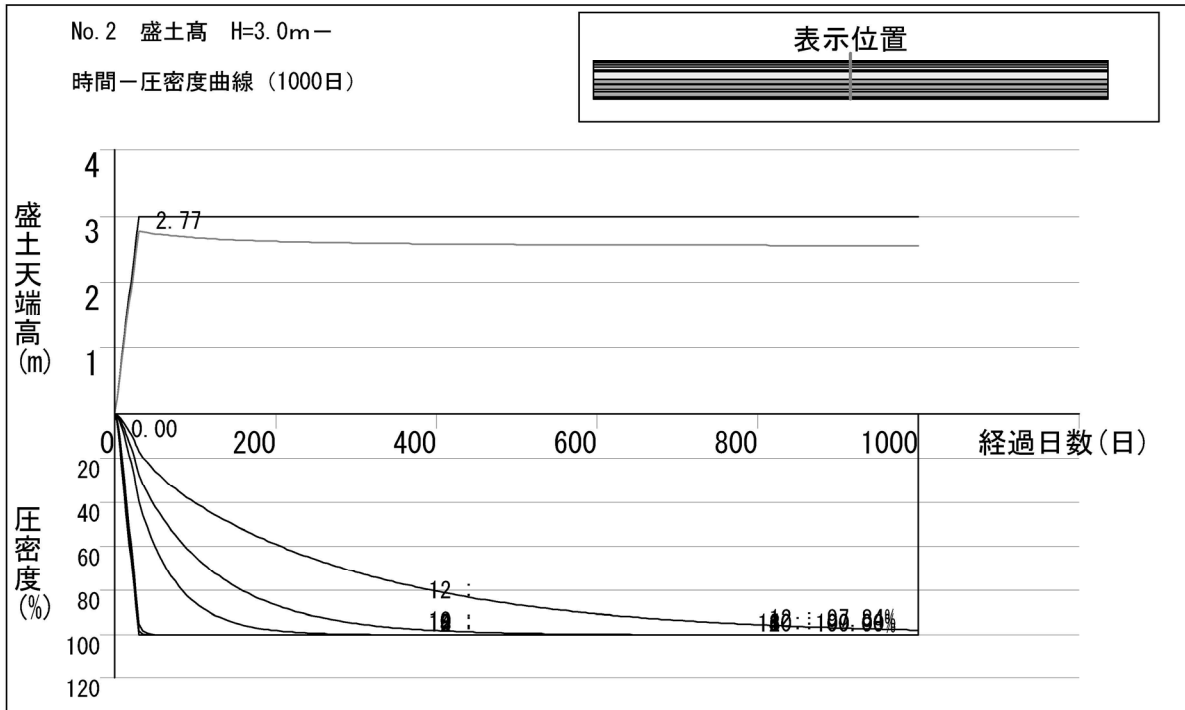
小計 (cm) : 45.219

| 層No | 初期間隙比 e_0 | 間隙比 e_1 | 体積圧縮係数 M_v (m ² /kN) | 圧縮指数 C_{c1} | 膨張指数 C_{c2} | 相乗平均 $\sqrt{p_0(p_0+\Delta p)}$ (kN/m ²) | 相加平均 $p_0+\Delta p/2$ (kN/m ²) | 圧密係数 C_v (cm ² /day) |
|-----|----------------|--------------|---|------------------|------------------|--|--|---|
| 2 | 1.7272 | 1.6532 | --- | --- | --- | 22.43 | --- | 2803.983 |
| 3 | 1.6875 | 1.5953 | --- | --- | --- | 61.28 | --- | 2397.239 |
| 4 | --- | --- | --- | --- | --- | --- | --- | --- |
| 5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | 1.1641 | 1.1309 | --- | --- | --- | 253.05 | --- | 1697.503 |
| 7 | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 2.1471 | 2.1179 | --- | --- | --- | 560.03 | --- | 894.399 |
| 9 | --- | --- | --- | --- | --- | --- | --- | --- |
| 10 | 2.0566 | 2.0041 | --- | --- | --- | 693.64 | --- | 483.182 |
| 11 | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 1.8789 | 1.8383 | --- | --- | --- | 894.08 | --- | 232.730 |
| 13 | --- | --- | --- | --- | --- | --- | --- | --- |
| 14 | 1.7904 | 1.7547 | --- | --- | --- | 1015.27 | --- | 207.970 |

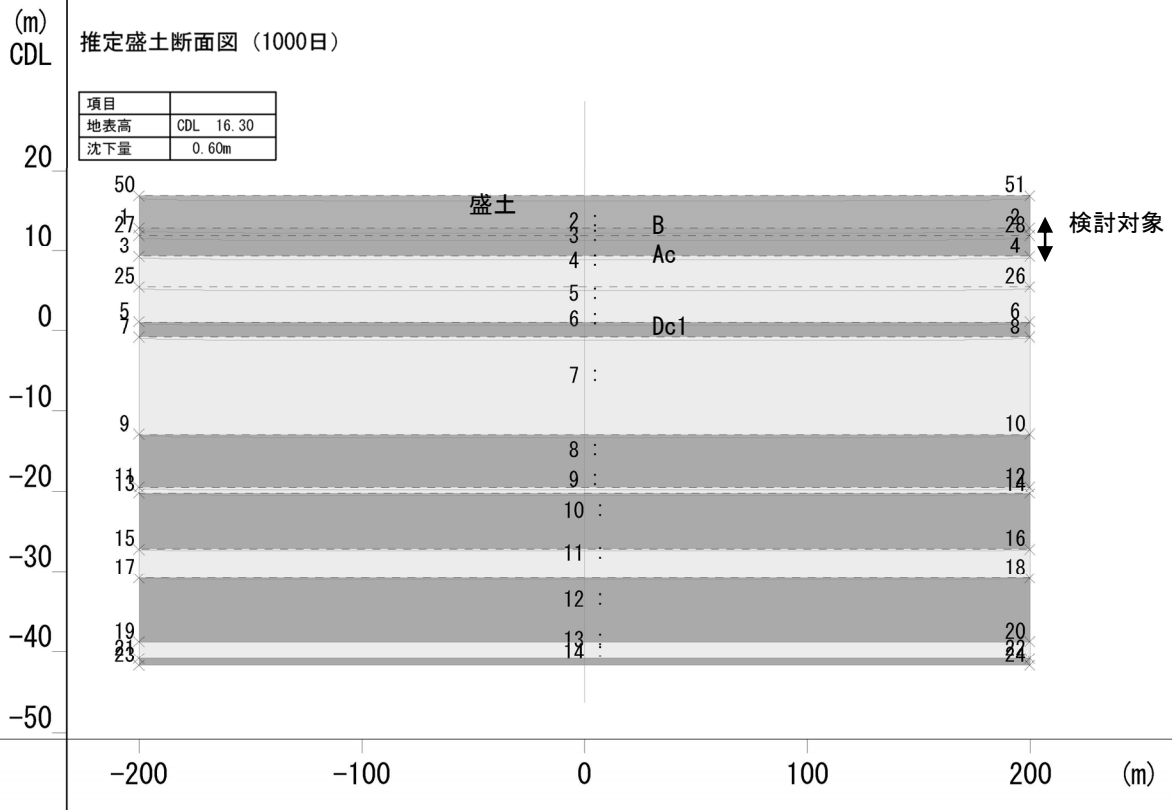
時間-沈下曲線



時間-圧密度曲線



No. 2 盛土高 H=4.0m

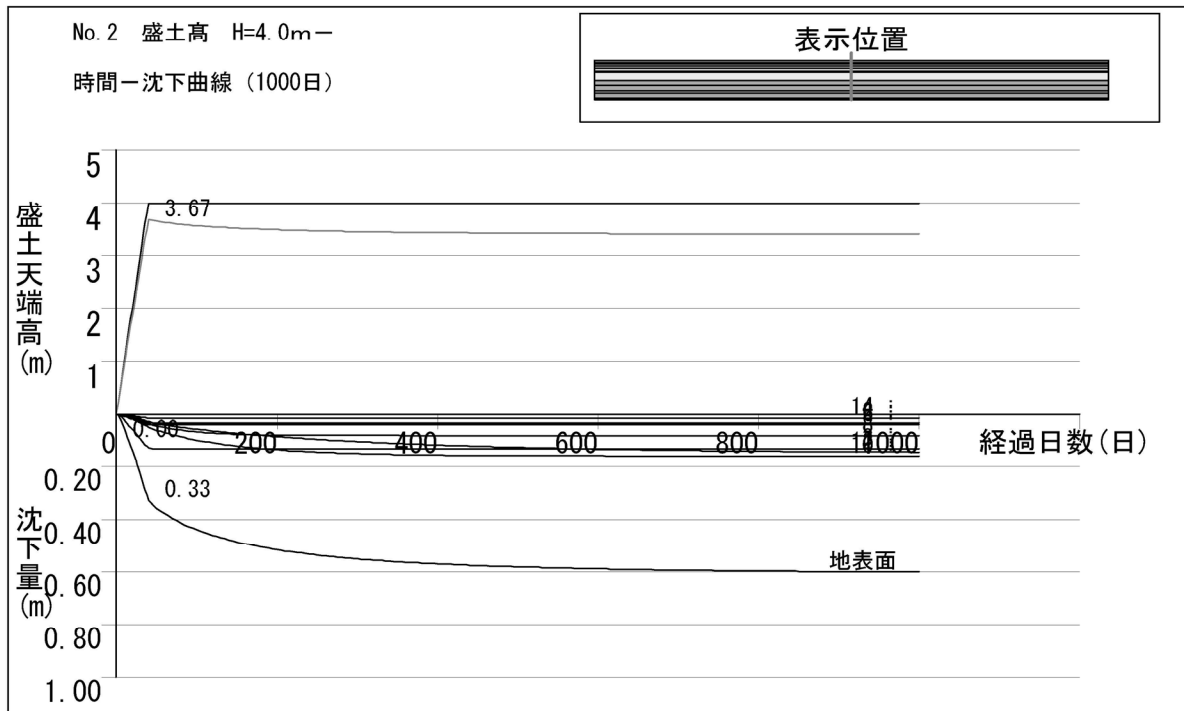


| 層No | 土層名 | 計算方法 | 層厚 (m) | 有効土被り圧 p_0 (kN/m ²) | 増加応力 Δp (kN/m ²) | 先行圧密の増加量 q_0 (kN/m ²) | 沈下量 (cm) |
|-----|-----|--------------|-----------|--------------------------------------|---|--|-------------|
| 2 | B | Δe 法 | 0.900 | 8.10 | 72.00 | 0.00 | 3.189 |
| 3 | Ac | Δe 法 | 2.700 | 39.96 | 72.00 | 0.00 | 13.156 |
| 4 | | 非圧密層 | 3.800 | --- | --- | --- | --- |
| 5 | | 非圧密層 | 4.300 | --- | --- | --- | --- |
| 6 | Dc1 | Δe 法 | 2.000 | 227.49 | 71.99 | 0.00 | 3.959 |
| 7 | | 非圧密層 | 12.100 | --- | --- | --- | --- |
| 8 | | Δe 法 | 6.600 | 533.71 | 71.91 | 0.00 | 8.031 |
| 9 | | 非圧密層 | 0.800 | --- | --- | --- | --- |
| 10 | | Δe 法 | 7.000 | 667.23 | 71.82 | 0.00 | 15.839 |
| 11 | | 非圧密層 | 3.600 | --- | --- | --- | --- |
| 12 | | Δe 法 | 7.900 | 867.63 | 71.61 | 0.00 | 14.723 |
| 13 | | 非圧密層 | 2.100 | --- | --- | --- | --- |
| 14 | | Δe 法 | 0.900 | 988.83 | 71.44 | 0.00 | 1.522 |

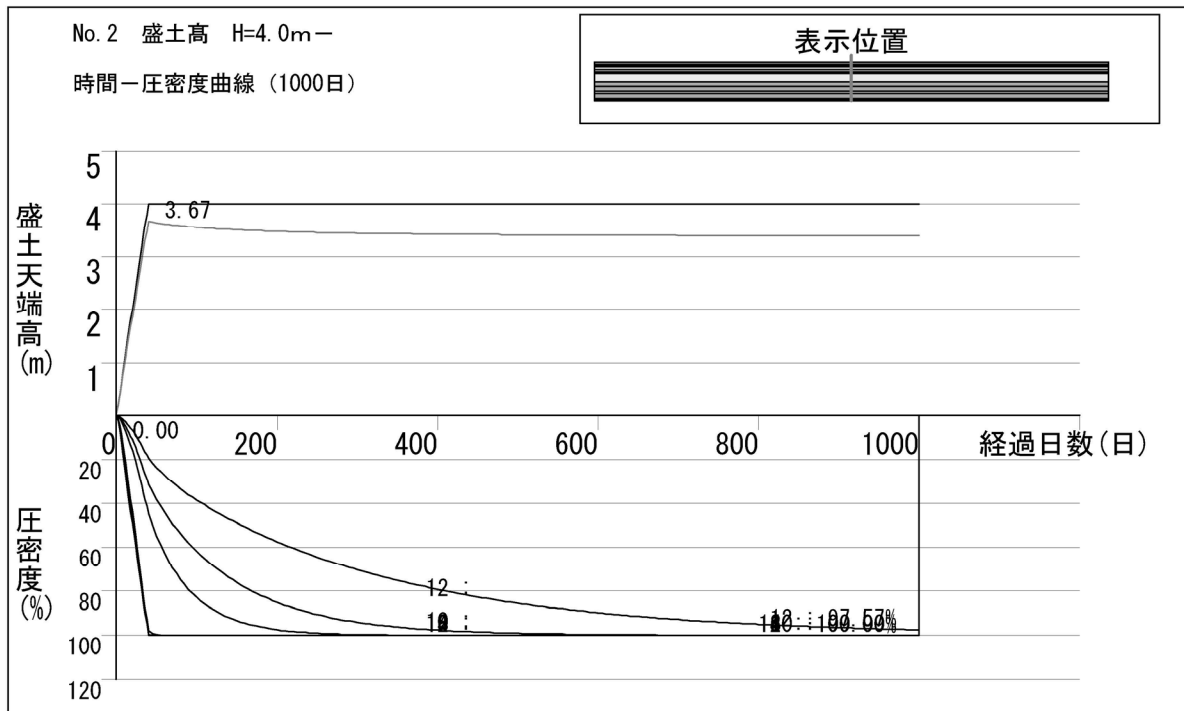
小計 (cm) : 60.419

| 層No | 初期間隙比 e_0 | 間隙比 e_1 | 体積圧縮係数 M_v (m ² /kN) | 圧縮指数 C_{c1} | 膨張指数 C_{c2} | 相乗平均 $\sqrt{p_0(p_0+\Delta p)}$ (kN/m ²) | 相加平均 $p_0+\Delta p/2$ (kN/m ²) | 圧密係数 C_v (cm ² /day) |
|-----|----------------|--------------|---|------------------|------------------|--|--|---|
| 2 | 1.7272 | 1.6305 | --- | --- | --- | 25.47 | --- | 2774.764 |
| 3 | 1.6875 | 1.5566 | --- | --- | --- | 66.89 | --- | 2356.813 |
| 4 | --- | --- | --- | --- | --- | --- | --- | --- |
| 5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | 1.1641 | 1.1213 | --- | --- | --- | 261.02 | --- | 1674.898 |
| 7 | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 2.1471 | 2.1088 | --- | --- | --- | 568.53 | --- | 856.447 |
| 9 | --- | --- | --- | --- | --- | --- | --- | --- |
| 10 | 2.0566 | 1.9874 | --- | --- | --- | 702.22 | --- | 466.382 |
| 11 | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | 1.8789 | 1.8252 | --- | --- | --- | 902.73 | --- | 226.374 |
| 13 | --- | --- | --- | --- | --- | --- | --- | --- |
| 14 | 1.7904 | 1.7432 | --- | --- | --- | 1023.93 | --- | 208.817 |

時間-沈下曲線



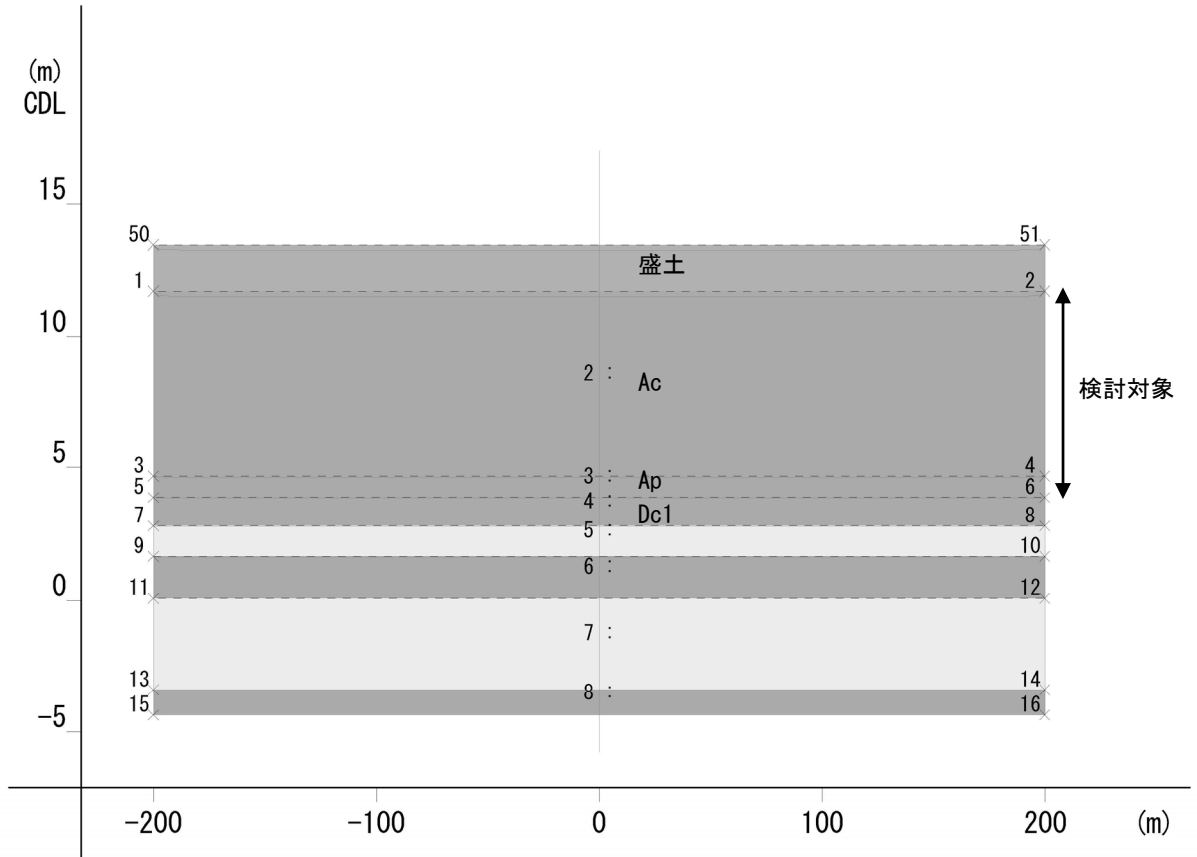
時間-圧密度曲線



No. 3 盛土高 H=1.5m

推定盛土断面図 (1000日)

| | |
|-----|-----------|
| 項目 | |
| 地表高 | CDL 13.28 |
| 沈下量 | 0.19m |

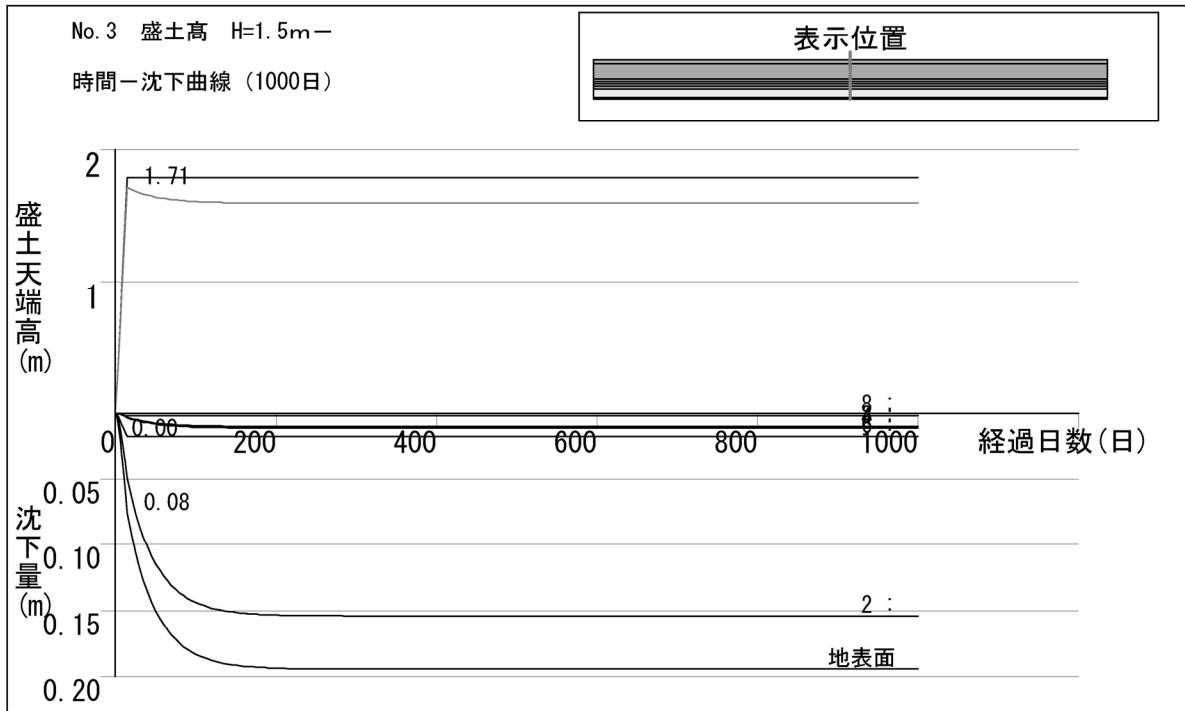


| 層No | 土層名 | 計算方法 | 層厚 (m) | 有効土被り圧 p_0 (kN/m ²) | 増加応力 Δp (kN/m ²) | 先行圧密の 増加量 q_0 (kN/m ²) | 沈下量 (cm) |
|-----|-----|--------------|-----------|--------------------------------------|---|--|-------------|
| 2 | Ac | Δe 法 | 7.000 | 61.60 | 32.22 | 0.00 | 15.362 |
| 3 | Ap | Δe 法 | 0.800 | 127.88 | 32.22 | 0.00 | 0.997 |
| 4 | Dc1 | Δe 法 | 1.100 | 142.96 | 32.22 | 0.00 | 1.113 |
| 5 | | 非圧密層 | 1.150 | --- | --- | --- | --- |
| 6 | | Δe 法 | 1.550 | 187.43 | 32.22 | 0.00 | 1.746 |
| 7 | | 非圧密層 | 3.500 | --- | --- | --- | --- |
| 8 | | Δe 法 | 0.960 | 276.93 | 32.21 | 0.00 | 0.216 |

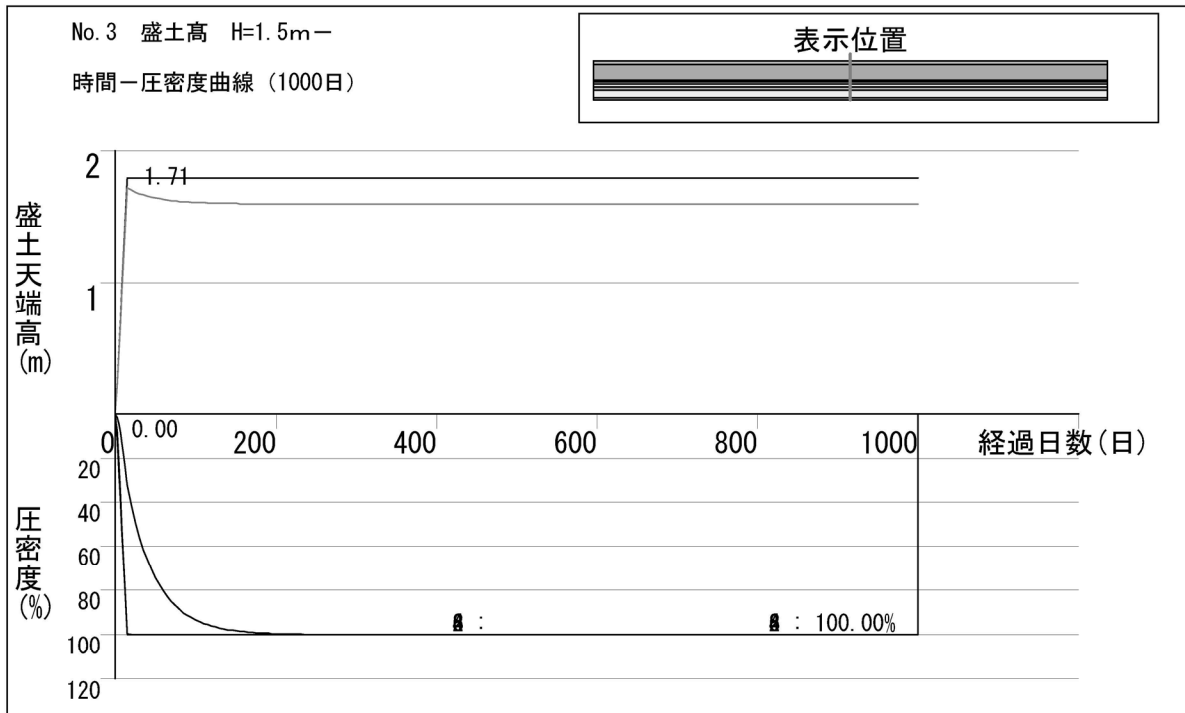
小計 (cm) : 19.434

| 層No | 初期間隙比 e_0 | 間隙比 e_1 | 体積圧縮係数 M_v (m ² /kN) | 圧縮指数 C_{c1} | 膨張指数 C_{c2} | 相乗平均 $\sqrt{p_0(p_0+\Delta p)}$ (kN/m ²) | 相加平均 $p_0+\Delta p/2$ (kN/m ²) | 圧密係数 C_v (cm ² /day) |
|-----|----------------|--------------|---|------------------|------------------|--|--|---|
| 2 | 1.6539 | 1.5956 | --- | --- | --- | 76.02 | --- | 2298.984 |
| 3 | 3.1334 | 3.0819 | --- | --- | --- | 143.09 | --- | 1580.818 |
| 4 | 1.2274 | 1.2048 | --- | --- | --- | 158.25 | --- | 2048.940 |
| 5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | 1.1943 | 1.1696 | --- | --- | --- | 202.90 | --- | 1857.311 |
| 7 | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 2.3165 | 2.3090 | --- | --- | --- | 292.60 | --- | 1987.113 |

時間-沈下曲線



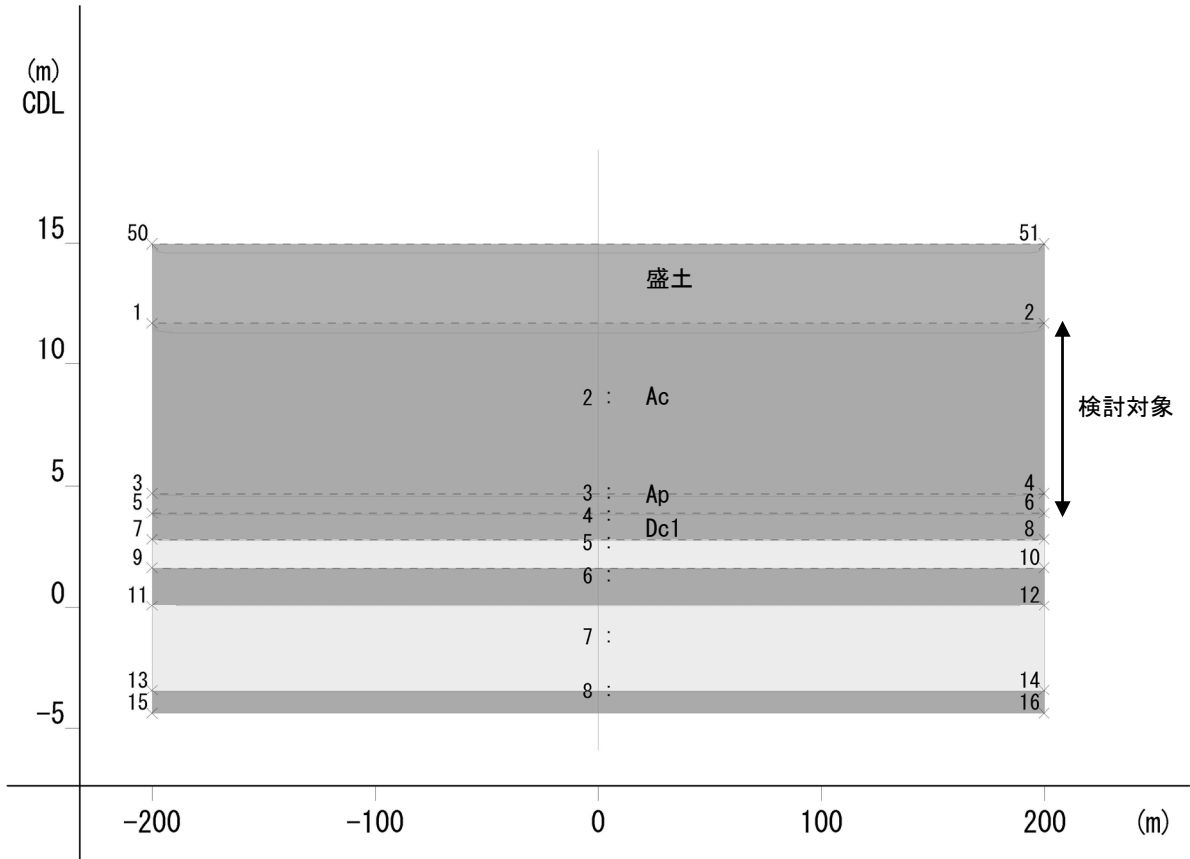
時間-圧密度曲線



No. 3 盛土高 H=3.0m

推定盛土断面図 (1000日)

| | |
|-----|-----------|
| 項目 | |
| 地表高 | CDL 14.58 |
| 沈下量 | 0.39m |

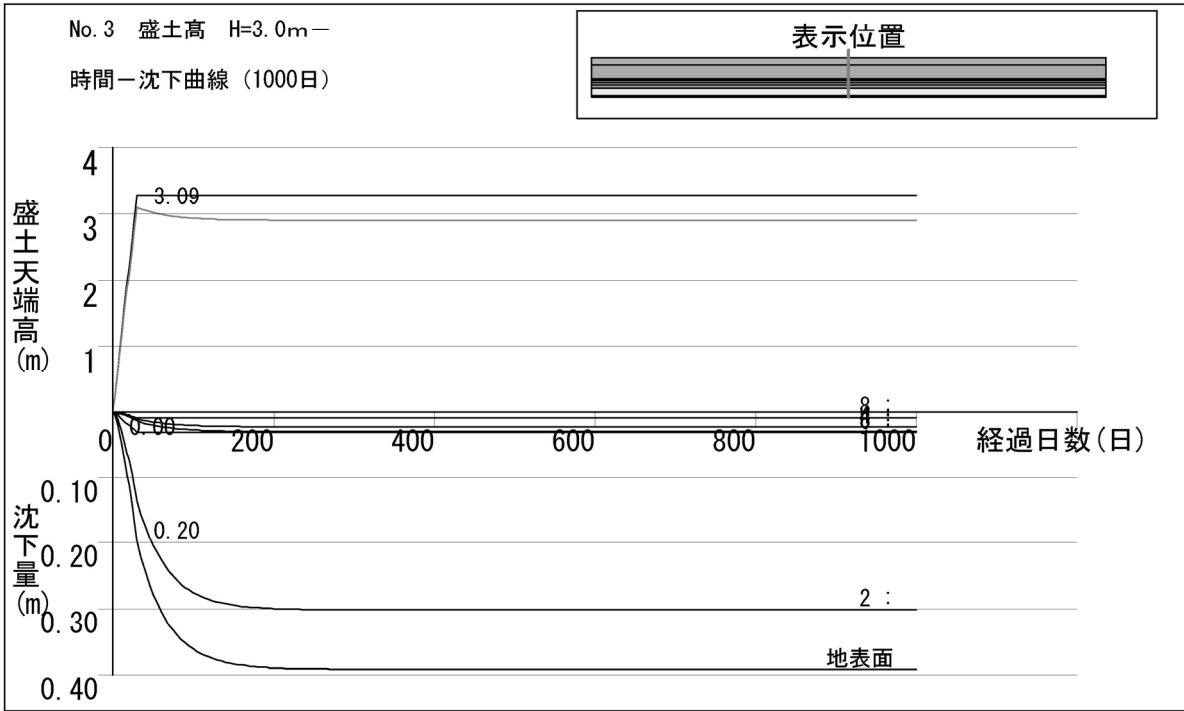


| 層No | 土層名 | 計算方法 | 層厚 (m) | 有効土被り圧 p_0 (kN/m ²) | 増加応力 Δp (kN/m ²) | 先行圧密の 増加量 q_0 (kN/m ²) | 沈下量 (cm) |
|-----|-----|--------------|-----------|--------------------------------------|---|--|-------------|
| 2 | Ac | Δe 法 | 7.000 | 61.60 | 59.22 | 0.00 | 30.101 |
| 3 | Ap | Δe 法 | 0.800 | 127.88 | 59.22 | 0.00 | 2.960 |
| 4 | Dc1 | Δe 法 | 1.100 | 142.96 | 59.22 | 0.00 | 2.216 |
| 5 | | 非圧密層 | 1.150 | --- | --- | --- | --- |
| 6 | | Δe 法 | 1.550 | 187.43 | 59.22 | 0.00 | 3.022 |
| 7 | | 非圧密層 | 3.500 | --- | --- | --- | --- |
| 8 | | Δe 法 | 0.960 | 276.93 | 59.21 | 0.00 | 0.848 |

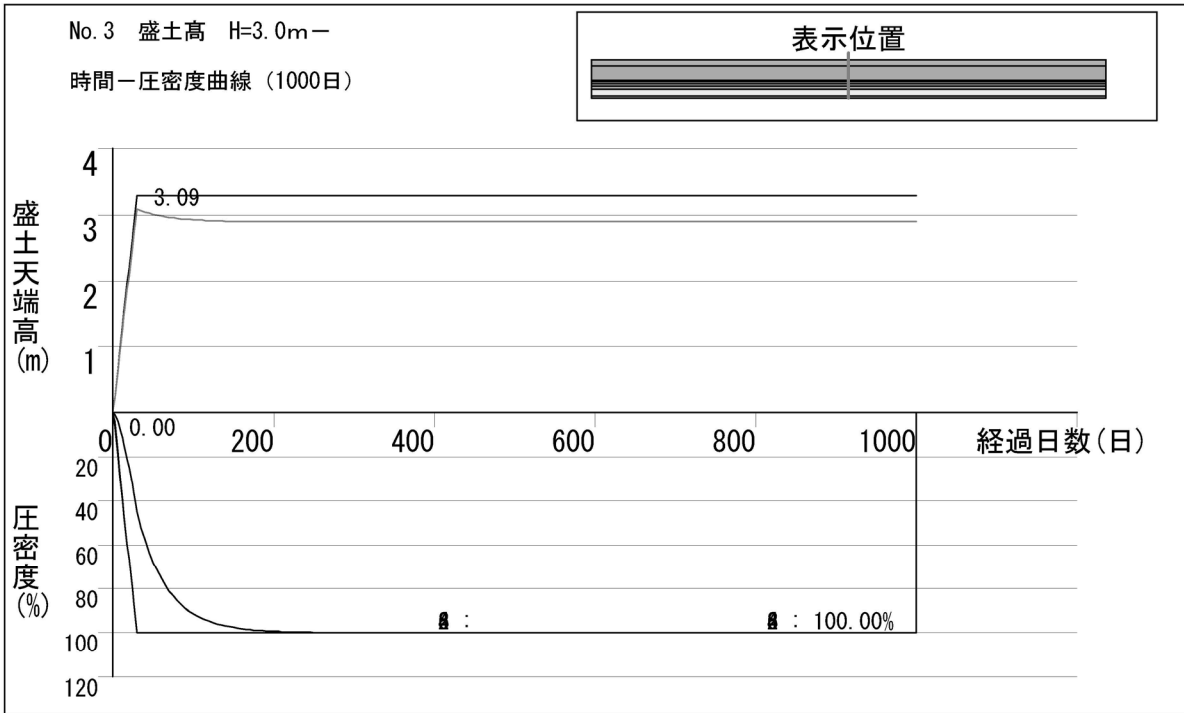
小計 (cm) : 39.147

| 層No | 初期間隙比 e_0 | 間隙比 e_1 | 体積圧縮係数 M_v (m ² /kN) | 圧縮指数 C_{c1} | 膨張指数 C_{c2} | 相乗平均 $\sqrt{p_0(p_0+\Delta p)}$ (kN/m ²) | 相加平均 $p_0+\Delta p/2$ (kN/m ²) | 圧密係数 C_v (cm ² /day) |
|-----|----------------|--------------|---|------------------|------------------|--|--|---|
| 2 | 1.6539 | 1.5397 | --- | --- | --- | 86.27 | --- | 2243.248 |
| 3 | 3.1334 | 2.9805 | --- | --- | --- | 154.68 | --- | 1444.189 |
| 4 | 1.2274 | 1.1825 | --- | --- | --- | 170.00 | --- | 1991.743 |
| 5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | 1.1943 | 1.1515 | --- | --- | --- | 215.01 | --- | 1815.268 |
| 7 | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 2.3165 | 2.2872 | --- | --- | --- | 305.10 | --- | 1935.617 |

時間-沈下曲線



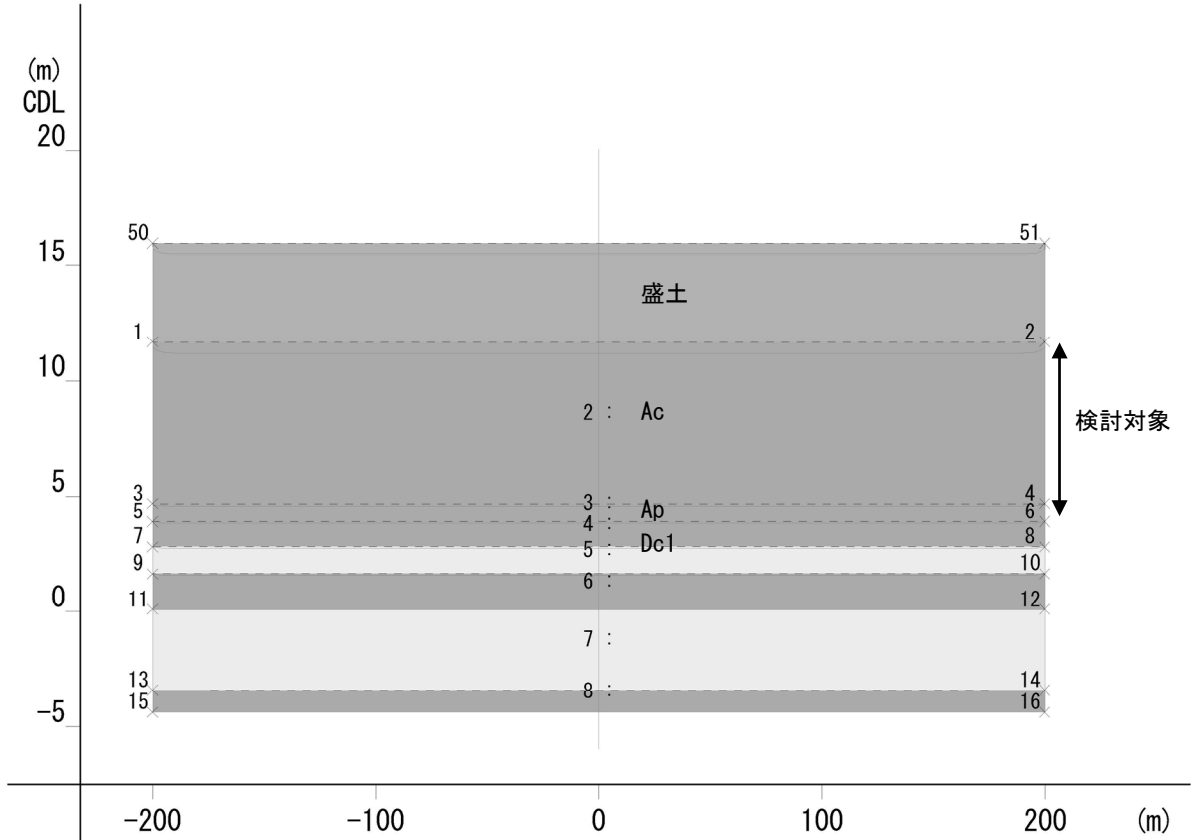
時間-圧密度曲線



No. 3 盛土高 H=4.0m

推定盛土断面図 (1000日)

| | |
|-----|-----------|
| 項目 | |
| 地表高 | CDL 15.47 |
| 沈下量 | 0.50m |

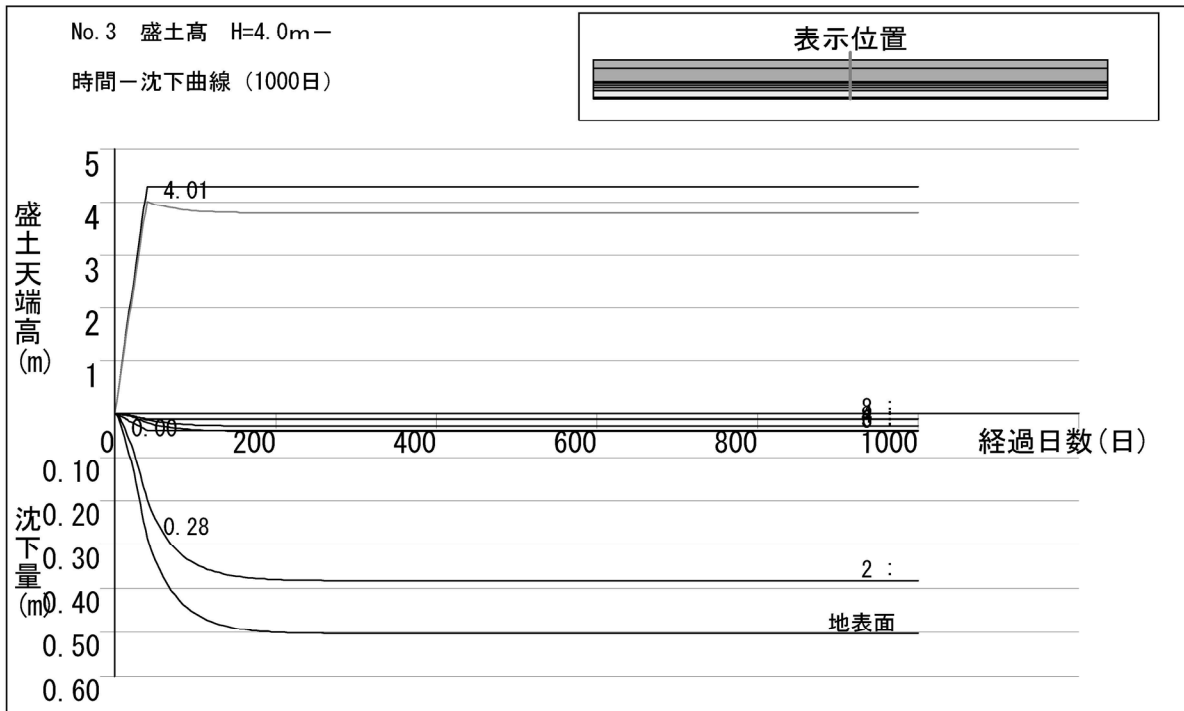


| 層No | 土層名 | 計算方法 | 層厚 (m) | 有効土被り圧 p_0 (kN/m ²) | 増加応力 Δp (kN/m ²) | 先行圧密の 増加量 q_0 (kN/m ²) | 沈下量 (cm) |
|-----|-----|--------------|-----------|--------------------------------------|---|--|-------------|
| 2 | Ac | Δe 法 | 7.000 | 61.60 | 77.22 | 0.00 | 38.194 |
| 3 | Ap | Δe 法 | 0.800 | 127.88 | 77.22 | 0.00 | 4.117 |
| 4 | Dc1 | Δe 法 | 1.100 | 142.96 | 77.22 | 0.00 | 2.873 |
| 5 | | 非圧密層 | 1.150 | --- | --- | --- | --- |
| 6 | | Δe 法 | 1.550 | 187.43 | 77.21 | 0.00 | 3.797 |
| 7 | | 非圧密層 | 3.500 | --- | --- | --- | --- |
| 8 | | Δe 法 | 0.960 | 276.93 | 77.20 | 0.00 | 1.306 |

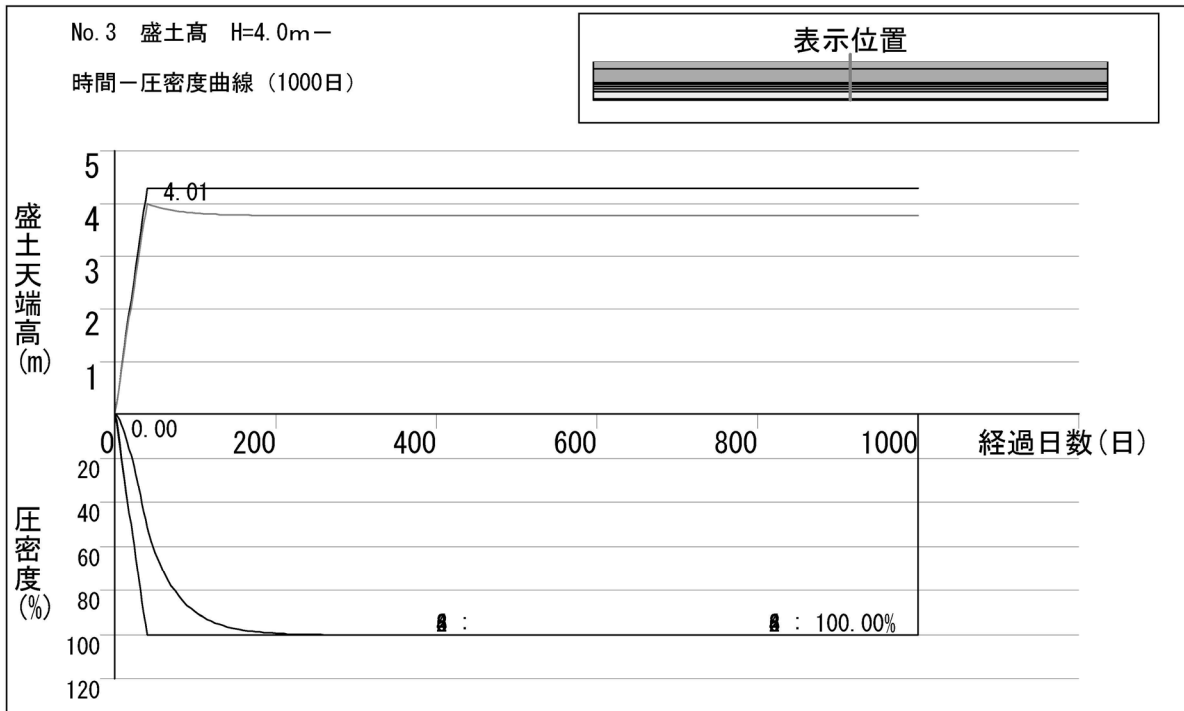
小計 (cm) : 50.286

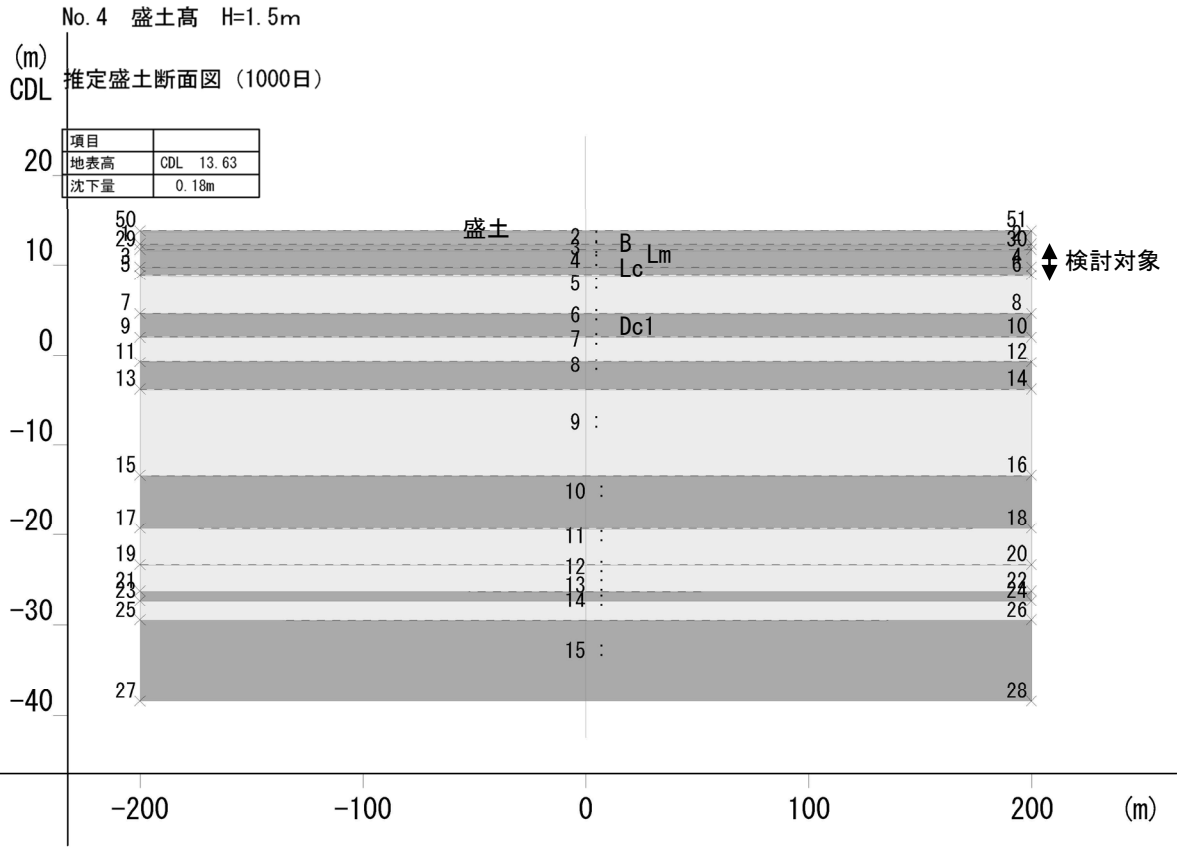
| 層No | 初期間隙比 e_0 | 間隙比 e_1 | 体積圧縮係数 M_v (m ² /kN) | 圧縮指数 C_{c1} | 膨張指数 C_{c2} | 相乗平均 $\sqrt{p_0(p_0+\Delta p)}$ (kN/m ²) | 相加平均 $p_0+\Delta p/2$ (kN/m ²) | 圧密係数 C_v (cm ² /day) |
|-----|----------------|--------------|---|------------------|------------------|--|--|---|
| 2 | 1.6539 | 1.5090 | --- | --- | --- | 92.47 | --- | 2213.221 |
| 3 | 3.1334 | 2.9207 | --- | --- | --- | 161.95 | --- | 1369.259 |
| 4 | 1.2274 | 1.1692 | --- | --- | --- | 177.41 | --- | 1958.472 |
| 5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | 1.1943 | 1.1405 | --- | --- | --- | 222.72 | --- | 1790.189 |
| 7 | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 2.3165 | 2.2714 | --- | --- | --- | 313.16 | --- | 1904.212 |

時間-沈下曲線



時間-圧密度曲線

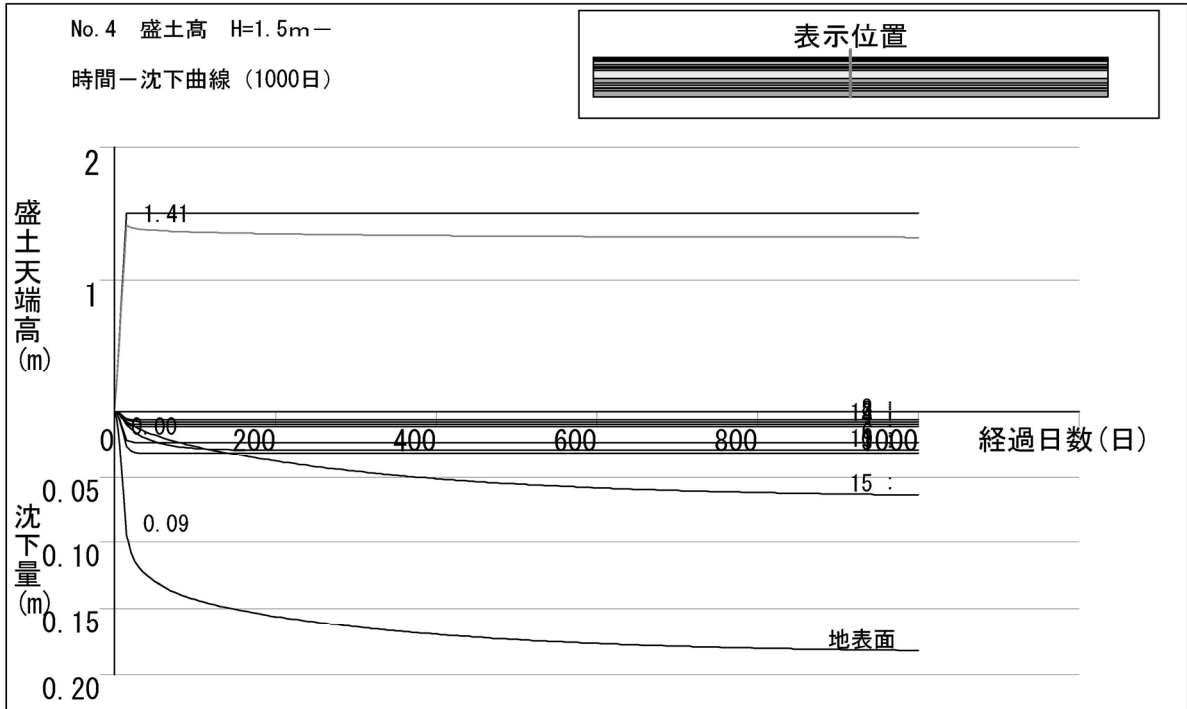




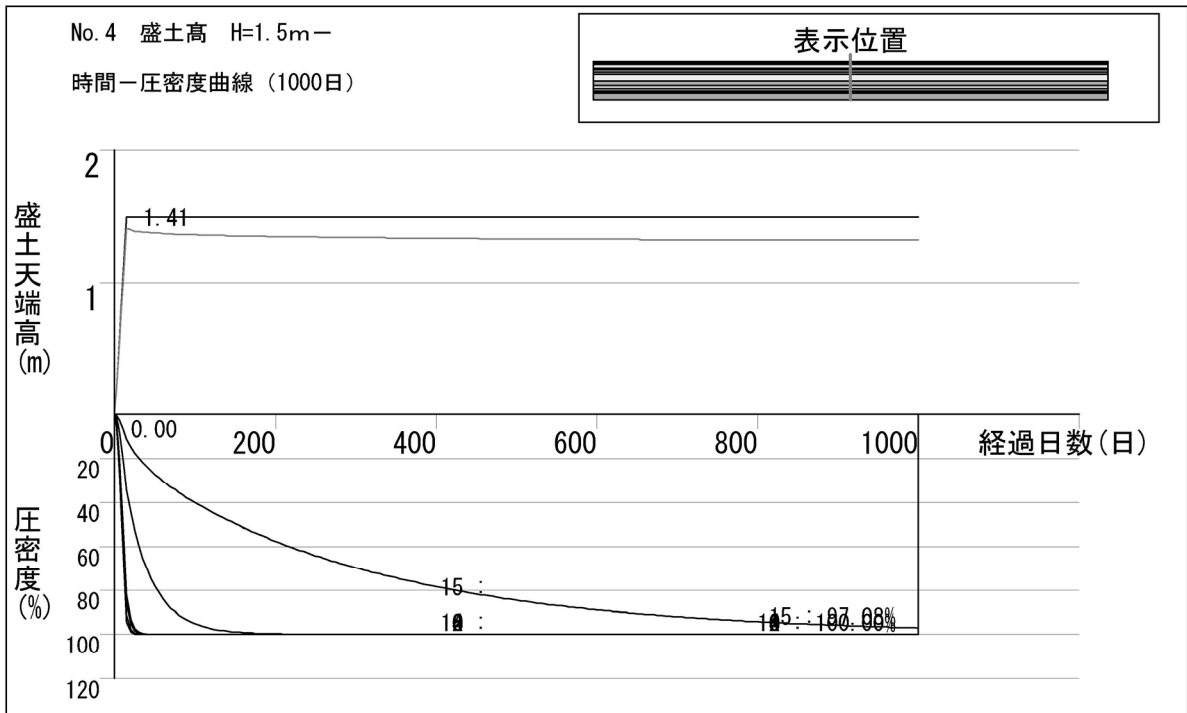
| 層No | 土層名 | 計算方法 | 層厚 (m) | 有効土被り圧 p_0 (kN/m ²) | 増加応力 Δp (kN/m ²) | 先行圧密の 増加量 q_0 (kN/m ²) | 沈下量 (cm) |
|-----------|-----|--------------|-----------|--------------------------------------|---|--|-------------|
| 2 | B | Δe 法 | 0.600 | 5.40 | 27.00 | 0.00 | 0.755 |
| 3 | Lm | Δe 法 | 1.900 | 24.10 | 27.00 | 0.00 | 3.150 |
| 4 | Lc | Δe 法 | 0.900 | 43.61 | 27.00 | 0.00 | 1.141 |
| 5 | | 非圧密層 | 4.300 | --- | --- | --- | --- |
| 6 | Dc1 | Δe 法 | 2.600 | 147.06 | 27.00 | 0.00 | 2.326 |
| 7 | | 非圧密層 | 2.800 | --- | --- | --- | --- |
| 8 | | Δe 法 | 3.000 | 250.93 | 27.00 | 0.00 | 0.625 |
| 9 | | 非圧密層 | 9.600 | --- | --- | --- | --- |
| 10 | | Δe 法 | 5.900 | 510.76 | 26.97 | 0.00 | 2.910 |
| 11 | | 非圧密層 | 4.000 | --- | --- | --- | --- |
| 12 | | 非圧密層 | 2.900 | --- | --- | --- | --- |
| 13 | | Δe 法 | 1.100 | 705.66 | 26.92 | 0.00 | 0.923 |
| 14 | | 非圧密層 | 2.200 | --- | --- | --- | --- |
| 15 | | Δe 法 | 8.900 | 837.13 | 26.87 | 0.00 | 6.552 |
| 小計 (cm) : | | | | | | | 18.382 |

| 層No | 初期間隙比 e_0 | 間隙比 e_1 | 体積圧縮係数 M_v (m ² /kN) | 圧縮指数 C_{c1} | 膨張指数 C_{c2} | 相乗平均 $\sqrt{p_0(p_0+\Delta p)}$ (kN/m ²) | 相加平均 $p_0+\Delta p/2$ (kN/m ²) | 圧密係数 C_v (cm ² /day) |
|-----|----------------|--------------|---|------------------|------------------|--|--|---|
| 2 | 1.7297 | 1.6953 | --- | --- | --- | 13.23 | --- | 2930.983 |
| 3 | 3.4895 | 3.4151 | --- | --- | --- | 35.09 | --- | 2298.622 |
| 4 | 3.4336 | 3.3774 | --- | --- | --- | 55.49 | --- | 2170.772 |
| 5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | 1.2257 | 1.2058 | --- | --- | --- | 159.99 | --- | 2040.086 |
| 7 | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 2.3232 | 2.3162 | --- | --- | --- | 264.08 | --- | 2119.112 |
| 9 | --- | --- | --- | --- | --- | --- | --- | --- |
| 10 | 2.1604 | 2.1448 | --- | --- | --- | 524.07 | --- | 1082.599 |
| 11 | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | --- | --- | --- | --- | --- | --- | --- | --- |
| 13 | 2.0187 | 1.9934 | --- | --- | --- | 718.99 | --- | 435.755 |
| 14 | --- | --- | --- | --- | --- | --- | --- | --- |
| 15 | 1.9031 | 1.8817 | --- | --- | --- | 850.46 | --- | 268.764 |

時間-沈下曲線

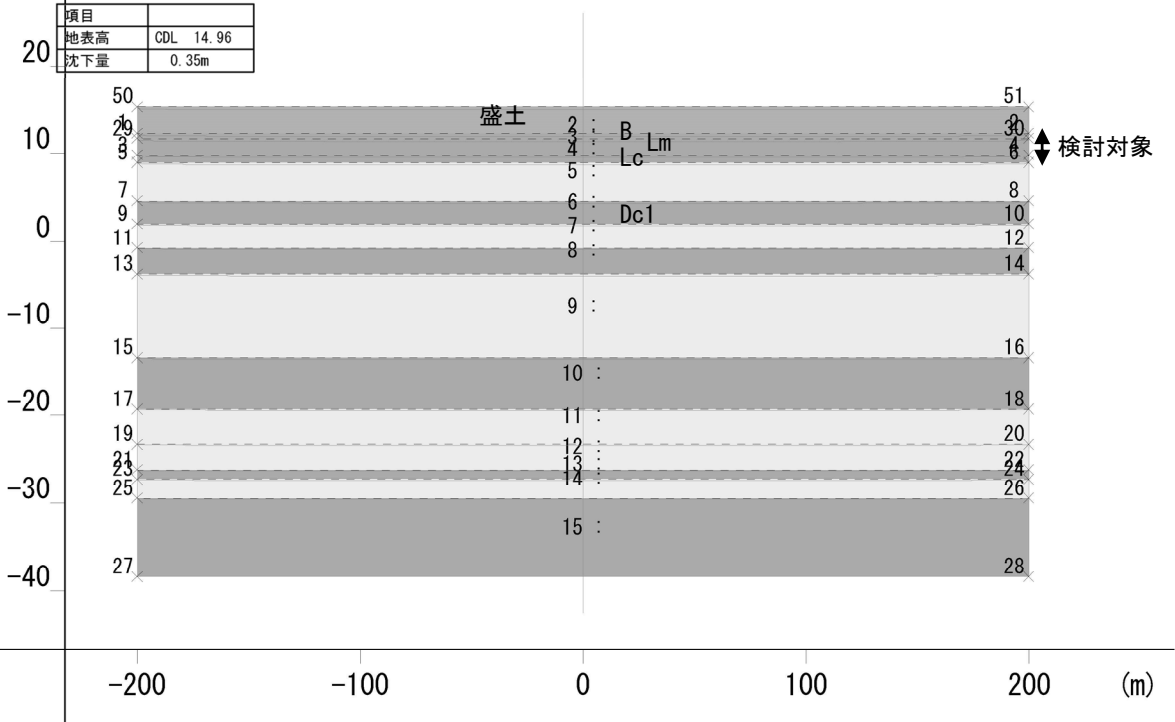


時間-圧密度曲線



No. 4 盛土高 H=3.0m

(m) 推定盛土断面図 (1000日)

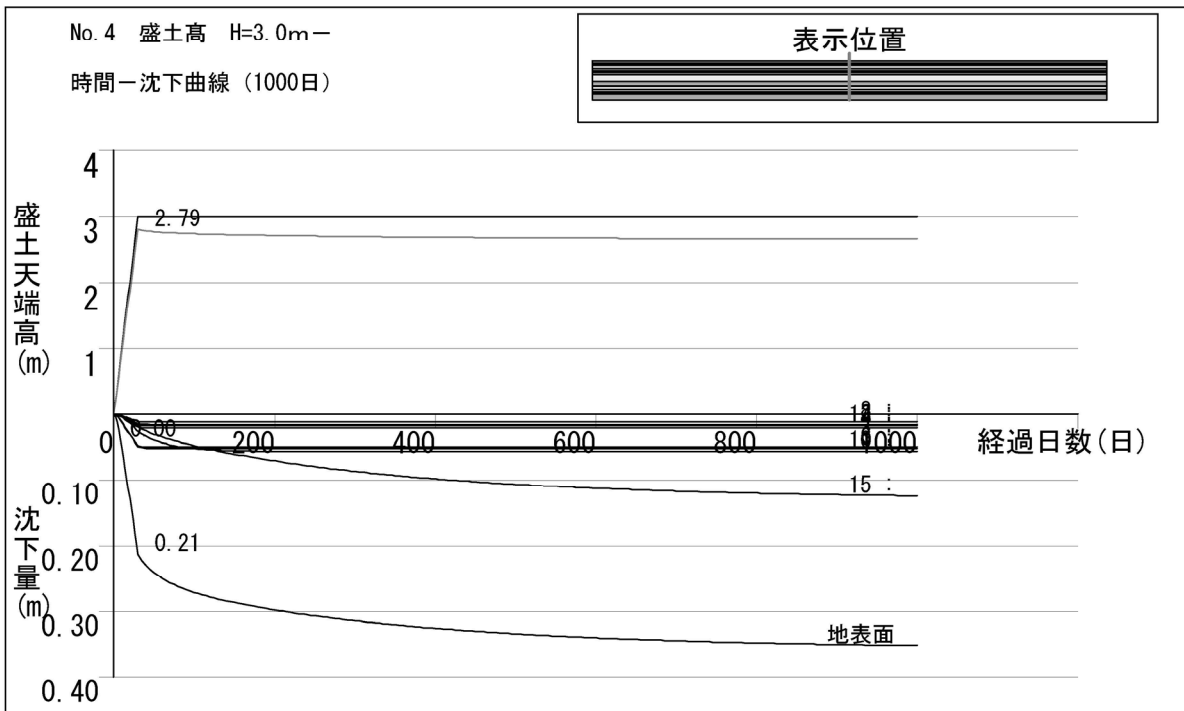


| 層No | 土層名 | 計算方法 | 層厚 (m) | 有効土被り圧 p_0 (kN/m ²) | 増加応力 Δp (kN/m ²) | 先行圧密の 増加量 q_0 (kN/m ²) | 沈下量 (cm) |
|-----|-----|--------------|-----------|--------------------------------------|---|--|-------------|
| 2 | B | Δe 法 | 0.600 | 5.40 | 54.00 | 0.00 | 1.604 |
| 3 | Lm | Δe 法 | 1.900 | 24.10 | 54.00 | 0.00 | 5.244 |
| 4 | Lc | Δe 法 | 0.900 | 43.61 | 54.00 | 0.00 | 2.133 |
| 5 | | 非圧密層 | 4.300 | --- | --- | --- | --- |
| 6 | Dc1 | Δe 法 | 2.600 | 147.06 | 54.00 | 0.00 | 4.951 |
| 7 | | 非圧密層 | 2.800 | --- | --- | --- | --- |
| 8 | | Δe 法 | 3.000 | 250.93 | 53.99 | 0.00 | 1.193 |
| 9 | | 非圧密層 | 9.600 | --- | --- | --- | --- |
| 10 | | Δe 法 | 5.900 | 510.76 | 53.93 | 0.00 | 5.678 |
| 11 | | 非圧密層 | 4.000 | --- | --- | --- | --- |
| 12 | | 非圧密層 | 2.900 | --- | --- | --- | --- |
| 13 | | Δe 法 | 1.100 | 705.66 | 53.84 | 0.00 | 1.813 |
| 14 | | 非圧密層 | 2.200 | --- | --- | --- | --- |
| 15 | | Δe 法 | 8.900 | 837.13 | 53.73 | 0.00 | 12.903 |

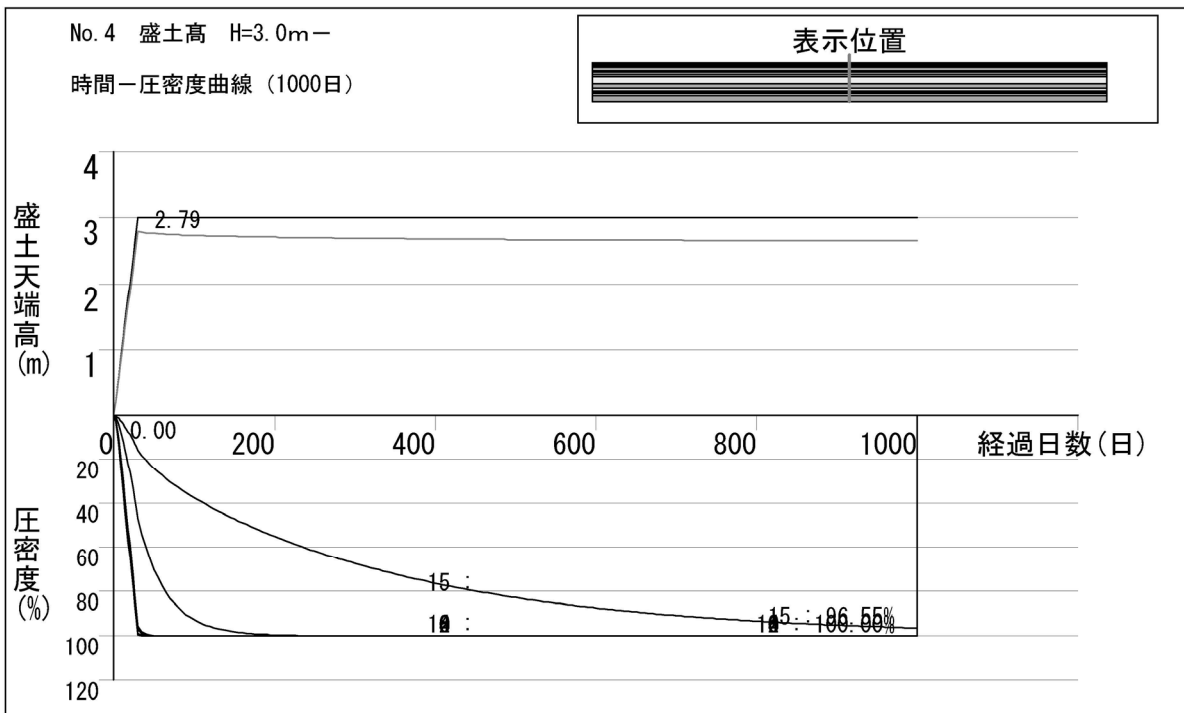
小計 (cm) : 35.518

| 層No | 初期間隙比 e_0 | 間隙比 e_1 | 体積圧縮係数 M_v (m ² /kN) | 圧縮指数 C_{c1} | 膨張指数 C_{c2} | 相乗平均 $\sqrt{p_0(p_0+\Delta p)}$ (kN/m ²) | 相加平均 $p_0+\Delta p/2$ (kN/m ²) | 圧密係数 C_v (cm ² /day) |
|-----|----------------|--------------|---|------------------|------------------|--|--|---|
| 2 | 1.7297 | 1.6567 | --- | --- | --- | 17.91 | --- | 2856.387 |
| 3 | 3.4895 | 3.3656 | --- | --- | --- | 43.38 | --- | 2238.534 |
| 4 | 3.4336 | 3.3285 | --- | --- | --- | 65.24 | --- | 2124.070 |
| 5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | 1.2257 | 1.1834 | --- | --- | --- | 171.95 | --- | 1982.802 |
| 7 | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 2.3232 | 2.3099 | --- | --- | --- | 276.61 | --- | 2058.387 |
| 9 | --- | --- | --- | --- | --- | --- | --- | --- |
| 10 | 2.1604 | 2.1300 | --- | --- | --- | 537.05 | --- | 1008.995 |
| 11 | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | --- | --- | --- | --- | --- | --- | --- | --- |
| 13 | 2.0187 | 1.9689 | --- | --- | --- | 732.08 | --- | 413.707 |
| 14 | --- | --- | --- | --- | --- | --- | --- | --- |
| 15 | 1.9031 | 1.8610 | --- | --- | --- | 863.58 | --- | 257.179 |

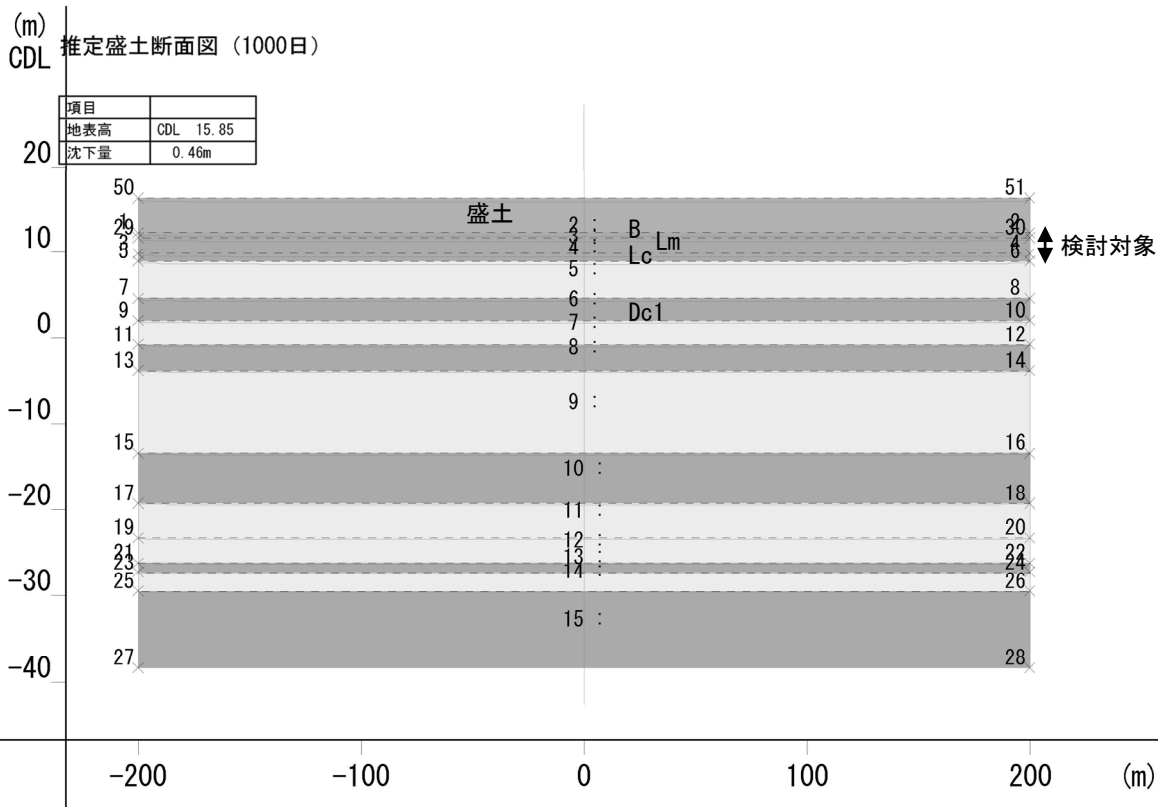
時間-沈下曲線



時間-圧密度曲線



No. 4 盛土高 H=4.0m

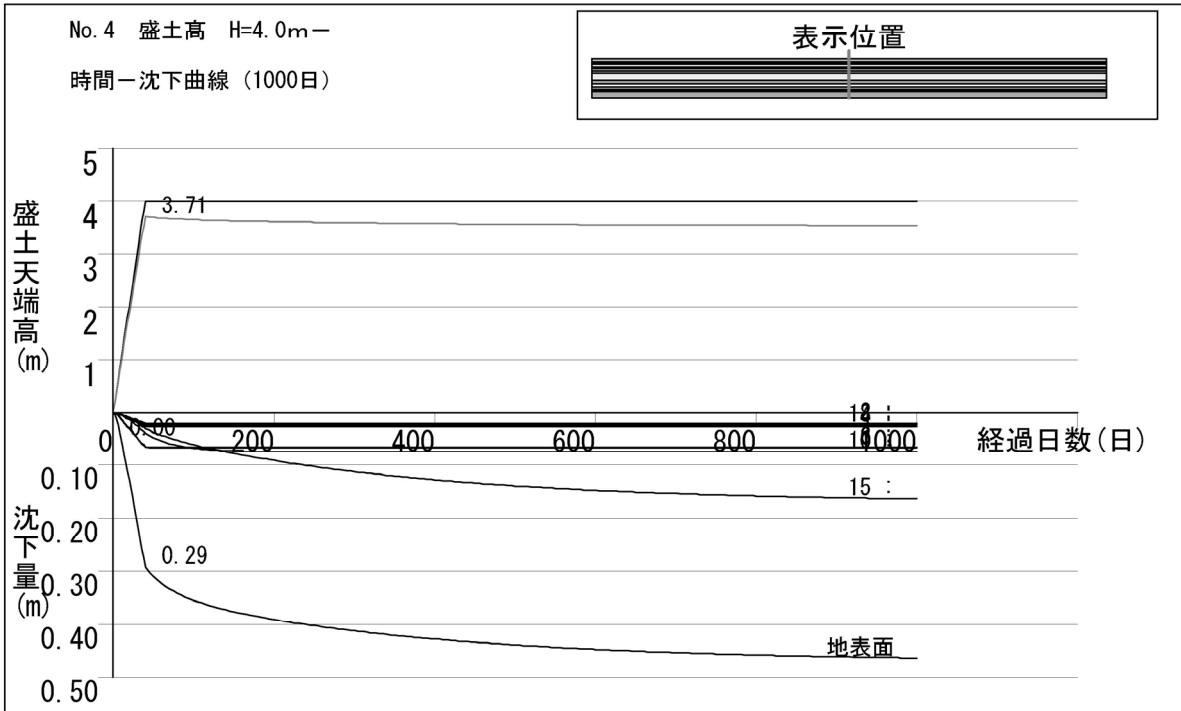


| 層No | 土層名 | 計算方法 | 層厚 (m) | 有効土被り圧 p_0 (kN/m ²) | 増加応力 Δp (kN/m ²) | 先行圧密の増加量 q_0 (kN/m ²) | 沈下量 (cm) |
|-----|-----|--------------|--------|-----------------------------------|--------------------------------------|-------------------------------------|----------|
| 2 | B | Δe 法 | 0.600 | 5.40 | 72.00 | 0.00 | 2.056 |
| 3 | Lm | Δe 法 | 1.900 | 24.10 | 72.00 | 0.00 | 6.704 |
| 4 | Lc | Δe 法 | 0.900 | 43.61 | 72.00 | 0.00 | 2.708 |
| 5 | | 非圧密層 | 4.300 | --- | --- | --- | --- |
| 6 | Dc1 | Δe 法 | 2.600 | 147.06 | 72.00 | 0.00 | 6.511 |
| 7 | | 非圧密層 | 2.800 | --- | --- | --- | --- |
| 8 | | Δe 法 | 3.000 | 250.93 | 71.99 | 0.00 | 2.152 |
| 9 | | 非圧密層 | 9.600 | --- | --- | --- | --- |
| 10 | | Δe 法 | 5.900 | 510.76 | 71.91 | 0.00 | 7.450 |
| 11 | | 非圧密層 | 4.000 | --- | --- | --- | --- |
| 12 | | 非圧密層 | 2.900 | --- | --- | --- | --- |
| 13 | | Δe 法 | 1.100 | 705.66 | 71.78 | 0.00 | 2.388 |
| 14 | | 非圧密層 | 2.200 | --- | --- | --- | --- |
| 15 | | Δe 法 | 8.900 | 837.13 | 71.65 | 0.00 | 17.032 |

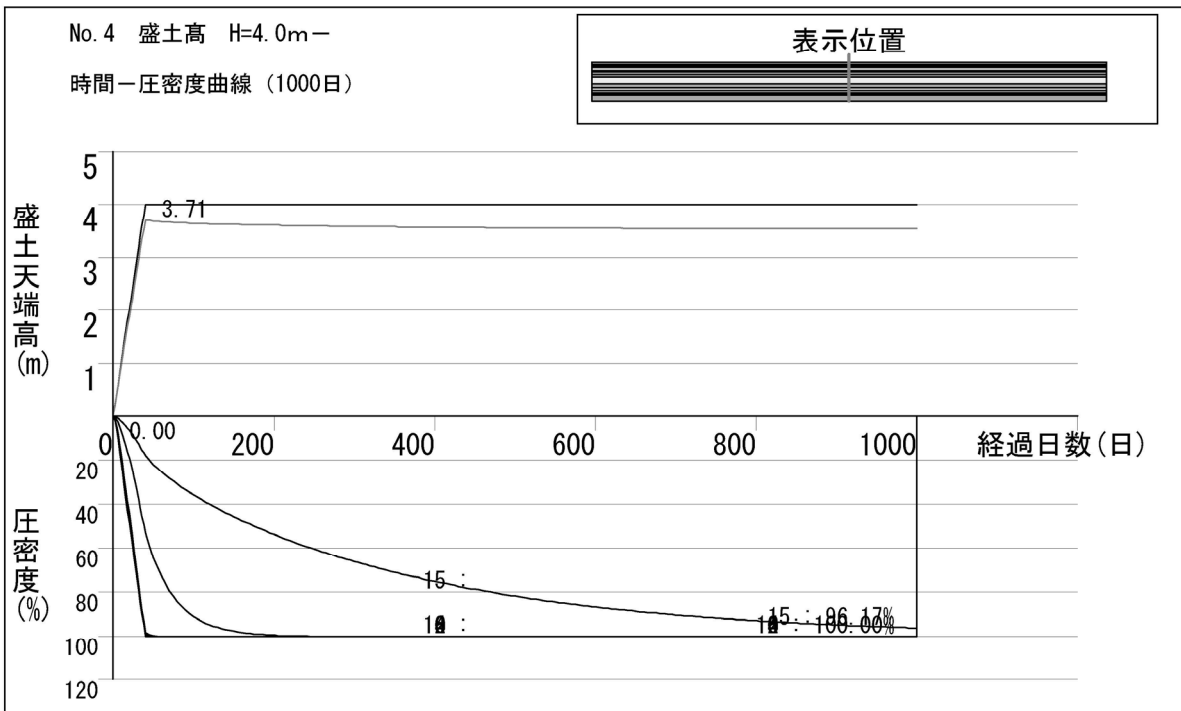
小計 (cm) : 47.002

| 層No | 初期間隙比 e_0 | 間隙比 e_1 | 体積圧縮係数 M_v (m ² /kN) | 圧縮指数 C_{c1} | 膨張指数 C_{c2} | 相乗平均 $\sqrt{p_0(p_0+\Delta p)}$ (kN/m ²) | 相加平均 $p_0+\Delta p/2$ (kN/m ²) | 圧密係数 C_v (cm ² /day) |
|-----|-------------|-----------|-----------------------------------|---------------|---------------|--|--|-----------------------------------|
| 2 | 1.7297 | 1.6361 | --- | --- | --- | 20.44 | --- | 2825.440 |
| 3 | 3.4895 | 3.3311 | --- | --- | --- | 48.12 | --- | 2209.730 |
| 4 | 3.4336 | 3.3002 | --- | --- | --- | 71.01 | --- | 2099.105 |
| 5 | --- | --- | --- | --- | --- | --- | --- | --- |
| 6 | 1.2257 | 1.1700 | --- | --- | --- | 179.48 | --- | 1949.506 |
| 7 | --- | --- | --- | --- | --- | --- | --- | --- |
| 8 | 2.3232 | 2.2993 | --- | --- | --- | 284.66 | --- | 2021.696 |
| 9 | --- | --- | --- | --- | --- | --- | --- | --- |
| 10 | 2.1604 | 2.1205 | --- | --- | --- | 545.53 | --- | 964.504 |
| 11 | --- | --- | --- | --- | --- | --- | --- | --- |
| 12 | --- | --- | --- | --- | --- | --- | --- | --- |
| 13 | 2.0187 | 1.9531 | --- | --- | --- | 740.68 | --- | 400.036 |
| 14 | --- | --- | --- | --- | --- | --- | --- | --- |
| 15 | 1.9031 | 1.8475 | --- | --- | --- | 872.22 | --- | 249.917 |

時間-沈下曲線

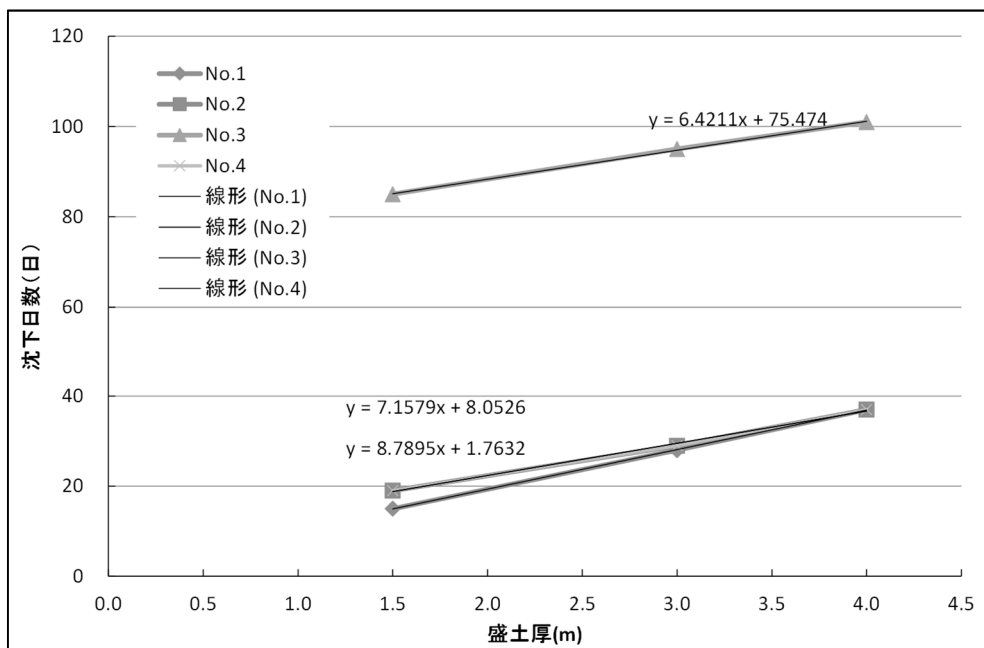
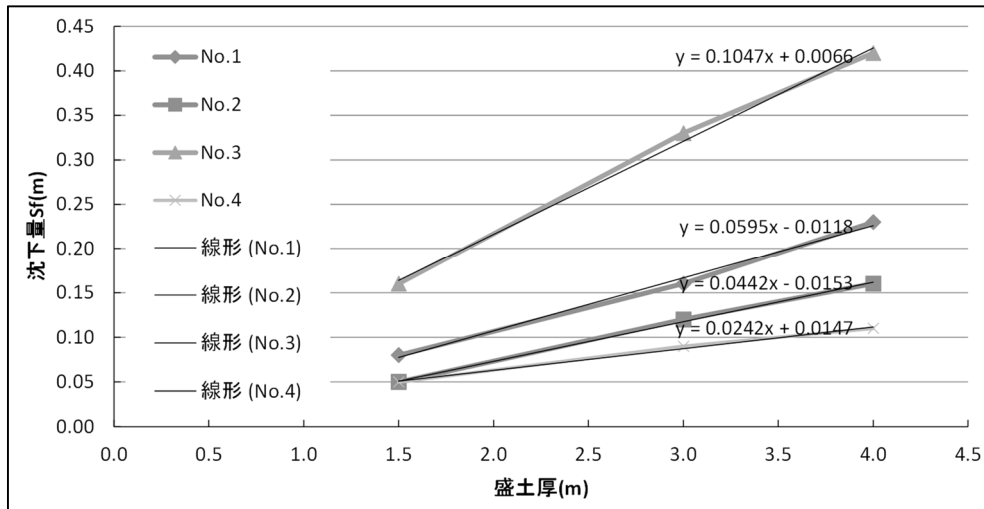


時間-圧密度曲線



5.3 盛土厚による圧密沈下量、沈下時間の補正

盛土厚と沈下量、盛土厚と沈下時間の相関式を用いて、盛土厚による圧密沈下量、沈下時間の補正を行った。



沈下収束後の地盤高が FH=12.5m となる場合の圧密沈下量、沈下時間は、表-2 に示すとおりである。

表-2 補正後の圧密沈下の検討結果

| 地点 | 位置 | 計画高 FH (m) | 地盤高 H (m) | 沈下対象層厚 (m) (B/Ac/Ap/Lm/Lc 層) | 沈下収束後 FH=12.5m | | |
|-------|----|------------|-----------|---------------------------------|----------------|----------|----------------|
| | | | | | 盛土層厚 m | 最終沈下量 cm | 沈下時間 day U=90% |
| No. 1 | 低地 | 12.50 | 11.97 | 4.90 | 0.56 | 3.4 | 6.7 |
| No. 2 | 低地 | 12.50 | 10.60 | 3.60 | 1.98 | 7.9 | 22.3 |
| No. 3 | 水田 | 12.50 | 10.68 | 7.80 | 2.04 | 21.5 | 88.5 |
| No. 4 | 台地 | 12.50 | 12.31 | 3.40 | 0.20 | 0.5 | 9.5 |