LaTeX Introduction

1. Sample latex code to develop documentation with heading, complicated equation, new line and in-line equation.

```
1  $\underline{Terzaghi}$
2  $\\$
3
4  $\bullet$Continuous foundation:
5  \begin{equation}\label{eq1}
6  q_u=c' \cdot N_c+q \cdot N_q+\frac{1}{2}\cdot \gamma \cdot B \cdot N_{\gamma}
7  \end{equation}
8  $\\$
9
10 The calculations of $q$ and $\gamma$ needs to consider the groundwater conditions. Assuming the depth of water table is $D_w$,
11 $q$ and $\gamma$ can be calculated using the following equations.
12
13 \begin{equation}\label{eq5}
14     q=
15 \begin{cases}
16     \gamma  D ,        \space  \space\space\space\space\space\space\space\space   \text{if } D_w \ge  D\\
17     \gamma D_w +(\gamma_\text{sat}-\gamma_\text{w})(D-D_w),              \text{if } D_w \lt D
18 \end{cases}
19 \end{equation}
20
21 \begin{equation}\label{eq6}
22    \gamma=
23    \begin{cases}
24     \gamma^\prime \space\space\space\space\space              \text{if } D_w \lt  D+B \space \text{and } D_w \lt D\\
25     \overline{\gamma} \space\space\space\space\space\space      \text{if } D_w \lt  D+B  \text{ and } D_w \ge D\\
26     \gamma  \space\space\space\space\space\space \text{ if } D_w \ge  D+B
27 \end{cases}
28 \end{equation}
29 where,
30 $\gamma^\prime = \gamma_\text{sat} - \gamma_\text{w} \text { and}                \\
31     \overline{\gamma}  = \gamma^\prime + \frac{D_\text{w}-D}{B} (\gamma-\gamma^\prime).        \\$
32 $\\$
```

2. The detailed description of above code is given below
    - Line 1 refers to the heading “Terzaghi” which is underlined
    - Line 2 refers to new line after the heading.
    - Line 4 refers to the heading starting with bullet point
    - Lines 5-7 represents the complicated equation.
    - begin, end, label keywords are mandatory to represent equation.
    - Line 8 represents newline and Lines 10-11 describes the equations
    - The equivalent representation of equations is provided at the end
    - Equations representing Lines 13-19 and 21-28 are considered as in-line equations.
    - Line 29-31 describes the equations.
    - Line 32 refers to new line at the end

3. The equivalent representation of the above LateX code is given below

LaTeX Documentation

Terzaghi.tex

Terzaghi

•Continuous foundation:

$$q_u = c' \cdot N_c + q \cdot N_q + \frac{1}{2} \cdot \gamma \cdot B \cdot N_\gamma$$

The calculations of q and γ needs to consider the groundwater conditions. Assuming the depth of water table is D_w, q and γ can be calculated using the following equations.

$$q = \begin{cases} \gamma D, & \text{if } D_w \geq D \\ \gamma D_w + (\gamma_{\text{sat}} - \gamma_{\text{w}})(D - D_w), & \text{if } D_w < D \end{cases}$$

$$\gamma = \begin{cases} \gamma' & \text{if } D_w < D + B \text{ and } D_w < D \\ \overline{\gamma} & \text{if } D_w < D + B \text{ and } D_w \geq D \\ \gamma & \text{if } D_w \geq D + B \end{cases}$$

where,

$\gamma' = \gamma_{\text{sat}} - \gamma_{\text{w}}$ and

$\overline{\gamma} = \gamma' + \frac{D_w - D}{B}(\gamma - \gamma')$.