

LOG OF BORING

BOREHOLE: BS-16
sheet 2/2

| | | |
|-------------------------|---|------------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION OFF SHORE | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: 13°19' 54.8" - 87° 49' 8.2" | DRILLER: Swissboring |
| DEPTH 14.90 m | BOTTOM SEA LEVEL: -4.67 Chart Datum Level | DATE (START - FINISH): 19-20/10/01 |

| SOIL SAMPLING | | | | | | |
|---------------|---------------|-------|-------|-------|---------|--------------|
| SAMPLE TYPE | SAMPLE NUMBER | 1 SET | 2 SET | 3 SET | N VALUE | RECOVERED cm |
| | | 18 cm | 30 cm | 45 cm | | |

GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR

swissboring
Swissboring Overseas Corporation Ltd.

LOGGED BY:
Rodolfo Alvarado

INSPECTOR Dr. Pucal Yang

| ROCK CORE | | | | | | |
|-----------|------------|------------------|-------------|------------|--------|-------|
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD |
| SPT | 8 | 10 | 14 | 24 | 38 | 30 |
| HQ | 9 | 55 | 0 | 0 | 0 | 0 |
| SPT | 9 | 24 | 31 | 40 | >50 | 30 |
| HQ | 10 | 55 | 10 | 18 | 0 | 0 |
| SPT | 10 | 30 | 10/50 | >50 | >50 | 30 |
| HQ | 11 | 70 | 35 | 50 | 0 | 0 |
| HQ | 12 | 100 | 40 | 40 | 0 | 0 |
| HQ | 13 | 90 | 90 | 100 | 0 | 0 |

DEPTH IN m

GRAPHIC LOG

DESCRIPTION

SPT TEST

RQD

| DEPTH IN m | DESCRIPTION | SPT TEST | RQD |
|----------------|--|----------|-----|
| 11.45 to 14.30 | From 11.45 to 14.30 m | | |
| 11.45 | Gravel, brown to red, consists of angular to subangular rock fragments up to 100mm in size, matrix was not recovered | 38 | |
| 12.00 | Gravel 40% to 50%, fines 50% to 60% | >50 | |
| 14.30 | 14.3 m | >50 | |
| 14.90 | Clayey silt, tuffaceous, reddish brown, soft, weak, poorly cemented, water laid | | |
| 14.90 | 14.90 m END OF BORING | | |

LOG OF BORING

BOREHOLE: BS-17
sheet 1/3

| | | |
|-------------------------|---|------------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION OFF SHORE | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: 13°19' 51.2" - 87° 49' 2.0" | DRILLER: Swissboring |
| DEPTH 22.00 m | BOTTOM SEA LEVEL: -4.67 Chart Datum Level | DATE (START - FINISH): 18-20/10/01 |

| <p>SOIL SAMPLING</p> <table border="1"> <tr> <th>SAMPLE TYPE</th> <th>SAMPLE NUMBER</th> <th>15 cm</th> <th>30 cm</th> <th>45 cm</th> <th>N VALUE</th> <th>RECOVERED cm</th> </tr> <tr> <td>1 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | SAMPLE TYPE | SAMPLE NUMBER | 15 cm | 30 cm | 45 cm | N VALUE | RECOVERED cm | 1 SET | | | | | | | 2 SET | | | | | | | 3 SET | | | | | | | <p>GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR</p> <p>swissboring Swissboring Overseas Corporation Ltd.</p> | <p>LOGGED BY:</p> <p>Rodolfo Alvarado</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------------|------------------|---------------|------------------|-------------|--------------|---------|--------------|-------|---|----|---|---|---|---|-------|---|---|---|---|---|----|-------|---|----|---|---|---|---|--|---|----|---|---|---|---|-----|---|---|---|---|---|----|----|---|----|---|---|---|---|----|---|----|---|---|---|---|-----|---|---|---|---|---|----|----|---|----|---|---|---|---|-----|---|---|---|---|---|----|----|---|----|---|---|---|---|-----|---|---|---|---|---|----|----|---|----|---|---|---|---|-----|---|---|---|---|---|----|----|---|----|---|---|---|---|-----|---|---|---|---|---|----|----|----|----|---|---|---|---|-----|---|---|---|---|---|----|---------------------------------|
| SAMPLE TYPE | SAMPLE NUMBER | 15 cm | 30 cm | 45 cm | N VALUE | RECOVERED cm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 SET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 SET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 SET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>ROCK CORE</p> <table border="1"> <tr> <th>CORE SIZE</th> <th>RUN NUMBER</th> <th>RUN LENGTH IN cm</th> <th>RECOVERY cm</th> <th>% RECOVERY</th> <th>RQD cm</th> <th>% RQD</th> </tr> <tr> <td>HQ</td> <td>1</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>1</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>2</td> <td>30</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>HQ</td> <td>3</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>2</td> <td>1</td> <td>0</td> <td>0</td> <td>1</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>4</td> <td>30</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>HQ</td> <td>5</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>3</td> <td>1</td> <td>0</td> <td>1</td> <td>1</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>6</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>4</td> <td>1</td> <td>0</td> <td>1</td> <td>1</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>7</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>5</td> <td>1</td> <td>1</td> <td>1</td> <td>2</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>8</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>6</td> <td>1</td> <td>1</td> <td>1</td> <td>2</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>9</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>7</td> <td>1</td> <td>1</td> <td>1</td> <td>2</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>10</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>8</td> <td>1</td> <td>1</td> <td>1</td> <td>2</td> <td>45</td> </tr> </table> | | CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | HQ | 1 | 55 | 0 | 0 | 0 | 0 | SPT | 1 | 1 | 0 | 0 | 1 | 45 | HQ | 2 | 30 | 0 | 0 | 0 | 0 | HQ | 3 | 55 | 0 | 0 | 0 | 0 | SPT | 2 | 1 | 0 | 0 | 1 | 45 | HQ | 4 | 30 | 0 | 0 | 0 | 0 | HQ | 5 | 55 | 0 | 0 | 0 | 0 | SPT | 3 | 1 | 0 | 1 | 1 | 45 | HQ | 6 | 55 | 0 | 0 | 0 | 0 | SPT | 4 | 1 | 0 | 1 | 1 | 45 | HQ | 7 | 55 | 0 | 0 | 0 | 0 | SPT | 5 | 1 | 1 | 1 | 2 | 45 | HQ | 8 | 55 | 0 | 0 | 0 | 0 | SPT | 6 | 1 | 1 | 1 | 2 | 45 | HQ | 9 | 55 | 0 | 0 | 0 | 0 | SPT | 7 | 1 | 1 | 1 | 2 | 45 | HQ | 10 | 55 | 0 | 0 | 0 | 0 | SPT | 8 | 1 | 1 | 1 | 2 | 45 | <p>INSPECTOR Dr. Pucal Yang</p> |
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 1 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 1 | 1 | 0 | 0 | 1 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 2 | 30 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 3 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 2 | 1 | 0 | 0 | 1 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 4 | 30 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 5 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 3 | 1 | 0 | 1 | 1 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 6 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 4 | 1 | 0 | 1 | 1 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 7 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 5 | 1 | 1 | 1 | 2 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 8 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 6 | 1 | 1 | 1 | 2 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 9 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 7 | 1 | 1 | 1 | 2 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 10 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 8 | 1 | 1 | 1 | 2 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | CDL m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | | | | | RQD | | | | |
|-----------|------------|------------------|-------------|------------|--------|-------|--------|------------|-------------|-------------|---|----------|----|----|----|----|-----|---|----|----|----|
| | | | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | >50 | N | 20 | 40 | 60 |
| HQ | 1 | 55 | 0 | 0 | 0 | 0 | | | | | Clay with traces of sand, greenish gray, very soft consistency, high water content, high plasticity, moderate dry strength. | | | | | | | | | | |
| SPT | 1 | 1 | 0 | 0 | 1 | 45 | -5.67 | 1 | | | | | | | | | | | | | |
| HQ | 2 | 30 | 0 | 0 | 0 | 0 | | | | | Shelby #1. | | | | | | | | | | |
| HQ | 3 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 2 | 1 | 0 | 0 | 1 | 45 | -7.67 | 3 | | | | | | | | | | | | | |
| HQ | 4 | 30 | 0 | 0 | 0 | 0 | | | | | Shelby #2. | | | | | | | | | | |
| HQ | 5 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 3 | 1 | 0 | 1 | 1 | 45 | -9.67 | 5 | | | | | | | | | | | | | |
| HQ | 6 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 4 | 1 | 0 | 1 | 1 | 45 | -10.67 | 6 | | | | | | | | | | | | | |
| HQ | 7 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 5 | 1 | 1 | 1 | 2 | 45 | -11.67 | 7 | | | | | | | | | | | | | |
| HQ | 8 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 6 | 1 | 1 | 1 | 2 | 45 | -12.67 | 8 | | | | | | | | | | | | | |
| HQ | 9 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 7 | 1 | 1 | 1 | 2 | 45 | -13.67 | 9 | | | | | | | | | | | | | |
| HQ | 10 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 8 | 1 | 1 | 1 | 2 | 45 | -14.67 | 10 | | | | | | | | | | | | | |

LOG OF BORING

BOREHOLE: BS-17
sheet 2/3

| | | |
|-------------------------|---|------------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION OFF SHORE | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: 13°19' 51.2" - 87° 49' 2.0" | DRILLER: Swissboring |
| DEPTH 22.00 m | BOTTOM SEA LEVEL: -4.67 Chart Datum Level | DATE (START - FINISH): 18-20/10/01 |

| SOIL SAMPLING | | | | | |
|---------------|---------------|-------|-------|-------|---------|
| SAMPLE TYPE | SAMPLE NUMBER | 1 SET | 2 SET | 3 SET | N VALUE |
| | 15 cm | | | | |
| | 30 cm | | | | |
| | 45 cm | | | | |
| | RECOVERED cm | | | | |

GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR



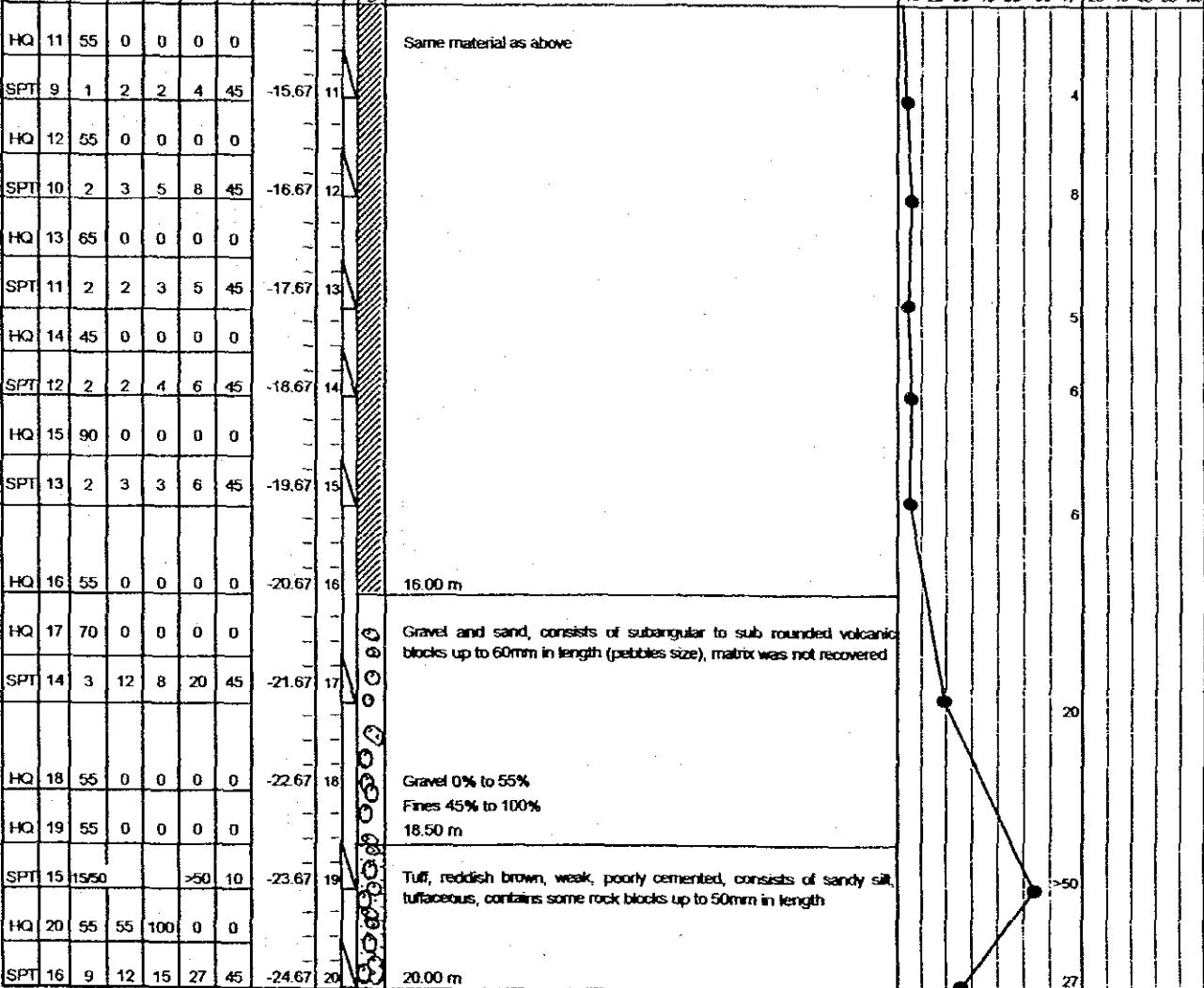
LOGGED BY:
Rodolfo Alvarado

INSPECTOR: Dr. Pucal Yang

ROCK CORE

| CORE SIZE | RUN NUMBER | RUN LENGTH IN CM | RECOVERY CM | % RECOVERY | RQC CM | % RQC |
|-----------|------------|------------------|-------------|------------|--------|-------|
| HQ | 11 | 55 | 0 | 0 | 0 | 0 |
| SPT | 9 | 1 | 2 | 2 | 4 | 45 |
| HQ | 12 | 55 | 0 | 0 | 0 | 0 |
| SPT | 10 | 2 | 3 | 5 | 8 | 45 |
| HQ | 13 | 65 | 0 | 0 | 0 | 0 |
| SPT | 11 | 2 | 2 | 3 | 5 | 45 |
| HQ | 14 | 45 | 0 | 0 | 0 | 0 |
| SPT | 12 | 2 | 2 | 4 | 6 | 45 |
| HQ | 15 | 90 | 0 | 0 | 0 | 0 |
| SPT | 13 | 2 | 3 | 3 | 6 | 45 |
| HQ | 16 | 55 | 0 | 0 | 0 | 0 |
| HQ | 17 | 70 | 0 | 0 | 0 | 0 |
| SPT | 14 | 3 | 12 | 8 | 20 | 45 |
| HQ | 18 | 55 | 0 | 0 | 0 | 0 |
| HQ | 19 | 55 | 0 | 0 | 0 | 0 |
| SPT | 15 | 15/50 | | | >50 | 10 |
| HQ | 20 | 55 | 55 | 100 | 0 | 0 |
| SPT | 16 | 9 | 12 | 15 | 27 | 45 |


| COL m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | RQC |
|-------|------------|-------------|-------------|-------------|----------------------|-----------------|
| | | | | | 10 20 30 40 50 >5C N | 20 40 60 80 100 |





LOG OF BORING

BOREHOLE: BS-17
sheet 3/3

| | | |
|-------------------------|---|------------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION OFF SHORE | DRILL RIG: LY-34 |
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| | | | |
|--|--|--|------------------------------------|
| SOIL SAMPLING SAMPLE TYPE SAMPLE NUMBER 1 SET 15 cm 2 SET 50 cm 3 SET 45 cm N VALUE RECOVERED cm | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | LOGGED BY: Rodolfo Alvarado |
| ROCK CORE CORE SIZE RUN NUMBER RUN LENGTH IN cm RECOVERY cm % RECOVERY ROD cm % ROD | | | INSPECTOR Dr. Pucal Yang |

| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | ROD cm | % ROD | COL m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | | | | | RQD | | | | | | |
|-----------|------------|------------------|-------------|------------|--------|-------|--------|------------|-------------|--|--|----------|----|----|----|----|-----|---|----|----|----|----|-----|
| | | | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | >50 | N | 20 | 40 | 60 | 80 | 100 |
| HQ | 21 | 100 | 70 | 70 | 0 | 0 | -25.67 | 21 | |  | Breccaceous till, dark brown, weak, consists of subangular to basaltic and andesitic clasts, up to 60mm in length, and contains occasional cobbles up to 200 mm, matrix is poorly cemented and loose, water laid, bedding can not be determined, appears to be massive | | | | | | | | | | | | |
| HQ | 22 | 100 | 80 | 80 | 45 | 45 | -26.67 | 22 | |  | 22.00m END OF BORING | | | | | | | | | | | | 45% |
| | | | | | | | | 23 | | | | | | | | | | | | | | | |
| | | | | | | | | 24 | | | | | | | | | | | | | | | |
| | | | | | | | | 25 | | | | | | | | | | | | | | | |
| | | | | | | | | 26 | | | | | | | | | | | | | | | |
| | | | | | | | | 27 | | | | | | | | | | | | | | | |
| | | | | | | | | 28 | | | | | | | | | | | | | | | |
| | | | | | | | | 29 | | | | | | | | | | | | | | | |
| | | | | | | | | 30 | | | | | | | | | | | | | | | |

LOG OF BORING

BOREHOLE: BS-18

sheet 1/3

CLIENT: NIPPON KOEI Ltd

SOIL INVESTIGATION OFF SHORE

DRILL RIG: LY-34

COUNTRY: EL SALVADOR

COORDINATES: 13°19' 48.3" - 87° 49' 2.0"

DRILLER: Swissboring

DEPTH: 23.80 m

BOTTOM SEA LEVEL: -7.02 Chart Datum Level

DATE (START - FINISH): 21-22/10/01

LOGGED BY:

Rodolfo Alvarado

GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR



Swissboring Overseas Corporation Ltd.

INSPECTOR

Dr. Pucal Yang

SOIL SAMPLING

| SAMPLE TYPE | SAMPLE NUMBER | 1 SET | 2 SET | 3 SET | N VALUE | RECOVERED cm |
|-------------|---------------|-------|-------|-------|---------|--------------|
| | 15 cm | | | | | |
| | 30 cm | | | | | |
| | 45 cm | | | | | |

ROCK CORE

| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | ROD cm | % ROD |
|-----------|------------|------------------|-------------|------------|--------|-------|
| SPT | 1 | 1 | 0 | 0 | 1 | 45 |
| HQ | 1 | 155 | 45 | 29 | 0 | 0 |
| HQ | 2 | 30 | 0 | 0 | 0 | 0 |
| SPT | 2 | 1 | 0 | 1 | 1 | 45 |
| SPT | 3 | 1 | 0 | 1 | 1 | 45 |
| HQ | 3 | 35 | 0 | 0 | 0 | 0 |
| SPT | 4 | 1 | 1 | 1 | 2 | 45 |
| SPT | 5 | 1 | 1 | 1 | 2 | 45 |
| HQ | 4 | 35 | 0 | 0 | 0 | 0 |
| SPT | 6 | 1 | 1 | 1 | 2 | 45 |
| SPT | 7 | 1 | 2 | 2 | 4 | 45 |
| HQ | 5 | 35 | 0 | 0 | 0 | 0 |
| SPT | 8 | 1 | 1 | 2 | 3 | 45 |
| HQ | 6 | 55 | 0 | 0 | 0 | 0 |

DESCRIPTION

SPT TEST

ROD

10 20 30 40 50 >5C N 20 40 60 80 100

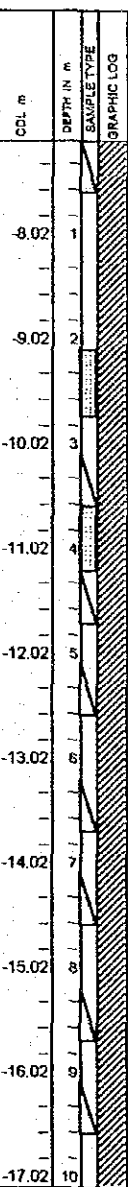
From 0 to 5.5 m
Clay, greenish gray, very soft consistency, high water content, high plasticity, moderate dry strength.

Shelby #1.

Shelby #2.

From 5.50 to 17.2 m
Silty clay, greenish gray, very soft to soft, high water content, high plasticity, high dry strength.


Same material, soft to medium stiff, with fine sand traces



LOG OF BORING

BOREHOLE: BS-18
sheet 2/3

| | | |
|-------------------------|---|------------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION OFF SHORE | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: 13°19' 48.3" - 87° 49' 2.0" | DRILLER: Swissboring |
| DEPTH 23.80 m | BOTTOM SEA LEVEL: -7.02 Chart Datum Level | DATE (START - FINISH): 21-22/10/01 |

| | | | |
|--|--|--|--------------------------------|
| SOIL SAMPLING TYPE NUMBER 15 cm 30 cm 45 cm SAMPLE 1 SET 2 SET 3 SET N VALUE RECOVERED cm | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | LOGGED BY: Rodolfo Alvarado |
| | | | INSPECTOR Dr. Pucal Yang |


| ROCK CORE | | | | | | | CDL m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | | | | | RQD | | | | | | |
|-----------|------------|------------------|-------------|------------|--------|-------|--------|------------|-------------|-------------|-------------|----------|----|----|----|----|-----|---|----|----|----|----|-----|
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | | | | | | 10 | 20 | 30 | 40 | 50 | >50 | N | 20 | 40 | 60 | 80 | 100 |
| SPT | 9 | 2 | 1 | 2 | 3 | 45 | | | | | | | | | | | | | | | | | |
| HQ | 7 | 55 | 0 | 0 | 0 | 0 | -18.02 | 11 | | | | | | | | | | | | | | | |
| SPT | 10 | 1 | 2 | 2 | 4 | 45 | | | | | | | | | | | | | | | | | |
| SPT | 11 | 2 | 2 | 2 | 4 | 45 | | | | | | | | | | | | | | | | | |
| HQ | 8 | 55 | 0 | 0 | 0 | 0 | -20.02 | 13 | | | | | | | | | | | | | | | |
| SPT | 12 | 2 | 2 | 2 | 4 | 20 | | | | | | | | | | | | | | | | | |
| HQ | 9 | 55 | 0 | 0 | 0 | 0 | -21.02 | 14 | | | | | | | | | | | | | | | |
| SPT | 13 | 1 | 2 | 2 | 4 | 20 | | | | | | | | | | | | | | | | | |
| HQ | 10 | 55 | 0 | 0 | 0 | 0 | -22.02 | 15 | | | | | | | | | | | | | | | |
| SPT | 14 | 2 | 3 | 3 | 6 | 30 | | | | | | | | | | | | | | | | | |
| HQ | 11 | 55 | 0 | 0 | 0 | 0 | -23.02 | 16 | | | | | | | | | | | | | | | |
| SPT | 15 | 2 | 3 | 3 | 6 | 35 | | | | | | | | | | | | | | | | | |
| HQ | 12 | 55 | 0 | 0 | 0 | 0 | -24.02 | 17 | | | | | | | | | | | | | | | |
| SPT | 16 | 3 | 4 | 5 | 9 | 30 | | | | | | | | | | | | | | | | | |
| HQ | 13 | 55 | 0 | 0 | 0 | 0 | -25.02 | 18 | | | | | | | | | | | | | | | |
| SPT | 17 | 3 | 4 | 6 | 10 | 35 | | | | | | | | | | | | | | | | | |
| HQ | 14 | 55 | 0 | 0 | 0 | 0 | -26.02 | 19 | | | | | | | | | | | | | | | |
| SPT | 18 | 5 | 7 | 12 | 19 | 45 | | | | | | | | | | | | | | | | | |
| HQ | 15 | 55 | 0 | 0 | 0 | 0 | -27.02 | 20 | | | | | | | | | | | | | | | |

19.0 m
Silt with some fine gravels, gray to dark, low water content, low plasticity, moderate dry strength, exhibits blocks from 10 to 20mm in length.

LOG OF BORING

BOREHOLE: BS-18
sheet 3/3

| | | |
|--------------------------------|---|------------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION OFF SHORE | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: 13°19' 48.3" - 87° 49' 2.0" | DRILLER: Swissboring |
| DEPTH 23.80 m | BOTTOM SEA LEVEL: -7.02 Chart Datum Level | DATE (START - FINISH): 21-22/10/01 |

| | | |
|--|--|--|
| SOIL SAMPLING SAMPLE TYPE SAMPLE NUMBER 1 SET 15 cm 2 SET 30 cm 3 SET 45 cm N VALUE RECOVERED cm | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. |
| ROCK CORE CORE SIZE RUN NUMBER RUN LENGTH IN cm RECOVERY cm % RECOVERY ROD cm % RQD | | |

| |
|------------------------------------|
| LOGGED BY: Rodolfo Alvarado |
| INSPECTOR Dr. Pucal Yang |


| ROCK CORE | | RECOVERY | | ROD | | CORRECTION | | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION |
|-----------|------------|------------------|-------------|------------|--------|------------|--------|------------|-------------|-------------|------------------------|
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | ROD cm | % RQD | COR. m | | | | |
| SPT | 19 | 8 | 12 | 15 | 27 | 45 | | -28.02 | 21 | | Same material as above |
| HQ | 16 | 55 | 0 | 0 | 0 | 0 | | -29.02 | 22 | | |
| HQ | 17 | 100 | 0 | 0 | 0 | 0 | | -30.02 | 23 | | |
| HQ | 18 | 160 | 160 | 100 | 0 | 0 | | | | | 23.80 m END OF BORING |

| SPT TEST | | | | | RQD | | | | | |
|----------|----|----|----|---------|-----|----|----|----|----|-----|
| 10 | 20 | 30 | 40 | 50 > SC | N | 20 | 40 | 60 | 80 | 100 |
| | | | | | 27 | | | | | |

LOG OF BORING

BOREHOLE: BS-19
sheet 1/1

| | | |
|-------------------------|---|------------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION OFF SHORE | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: 13°19' 54.7" - 87° 49' 11.2" | DRILLER: Swissboring |
| DEPTH 10.00 m | BOTTOM SEA LEVEL: -4.47 Chart Datum level | DATE (START - FINISH): 20-22/10/01 |

| | | | |
|--|--|--|-----------------------------------|
| SOIL SAMPLING SAMPLE TYPE SAMPLE NUMBER 1 SET 15 cm 2 SET 30 cm 3 SET 45 cm N VALUE RECOVERED cm | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | LOGGED BY: Rodolfo Avarado |
| ROCK CORE CORE SIZE RUN NUMBER ROR LENGTH IN cm RECOVERY cm % RECOVERY RCD cm % RCD | | DESCRIPTION | SPT TEST 10 20 30 40 50 >50 N |

| ROCK CORE | | DEPTH IN m | | DESCRIPTION | SPT TEST | | RCD | | | | | | | | | |
|-----------|------------|------------------|------------|-------------|----------|----|-----|----|----|-----|---|----|----|----|----|-----|
| CORE SIZE | RUN NUMBER | ROR LENGTH IN cm | DEPTH IN m | | 10 | 20 | 30 | 40 | 50 | >50 | N | 20 | 40 | 60 | 80 | 100 |
| SPT | 1 | 12 | 18 | 50 | >50 | 35 | | | | | | | | | | |
| HQ | 1 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | |
| SPT | 2 | 9 | 26 | 28 | >50 | 25 | | | | | | | | | | |
| HQ | 2 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | |
| SPT | 3 | 16 | 24 | 33 | >50 | 28 | | | | | | | | | | |
| HQ | 3 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | |
| SPT | 4 | 10/50 | | | >50 | 10 | | | | | | | | | | |
| HQ | 4 | 90 | 30 | 33 | 0 | 0 | | | | | | | | | | |
| HQ | 5 | 100 | 35 | 35 | 0 | 0 | | | | | | | | | | |
| SPT | 5 | 14/50 | | | >50 | 13 | | | | | | | | | | |
| HQ | 6 | 90 | 40 | 44 | 0 | 0 | | | | | | | | | | |
| SPT | 6 | 15/50 | | | >50 | 13 | | | | | | | | | | |
| HQ | 7 | 90 | 36 | 40 | 0 | 0 | | | | | | | | | | |
| HQ | 8 | 100 | 60 | 60 | 0 | 0 | | | | | | | | | | |
| HQ | 9 | 55 | 55 | 100 | 0 | 0 | | | | | | | | | | |
| SPT | 7 | 15 | 25 | 30 | >50 | 45 | | | | | | | | | | |
| HQ | 10 | 55 | 55 | 100 | 0 | 0 | | | | | | | | | | |
| SPT | 8 | 10 | 28 | 36 | >50 | 45 | | | | | | | | | | |

10.00 m END OF BORING

LOG OF BORING

BOREHOLE: BS-20
sheet 1/2

| | | |
|--------------------------------|---|------------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION OFF SHORE | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: 13°19' 48.5" - 87° 49' 8.2" | DRILLER: Swissboring |
| DEPTH 18.00 m | BOTTOM SEA LEVEL: -3.57 Chart Datum Level | DATE (START - FINISH): 17-18/10/01 |

| SOIL SAMPLING | | | | | |
|---------------|---------------|-------|-------|-------|--------------|
| SAMPLE TYPE | SAMPLE NUMBER | 15 cm | 30 cm | 45 cm | RECOVERED cm |
| 1 SET | | | | | |
| 2 SET | | | | | |
| 3 SET | | | | | |
| N VALUE | | | | | |

GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR

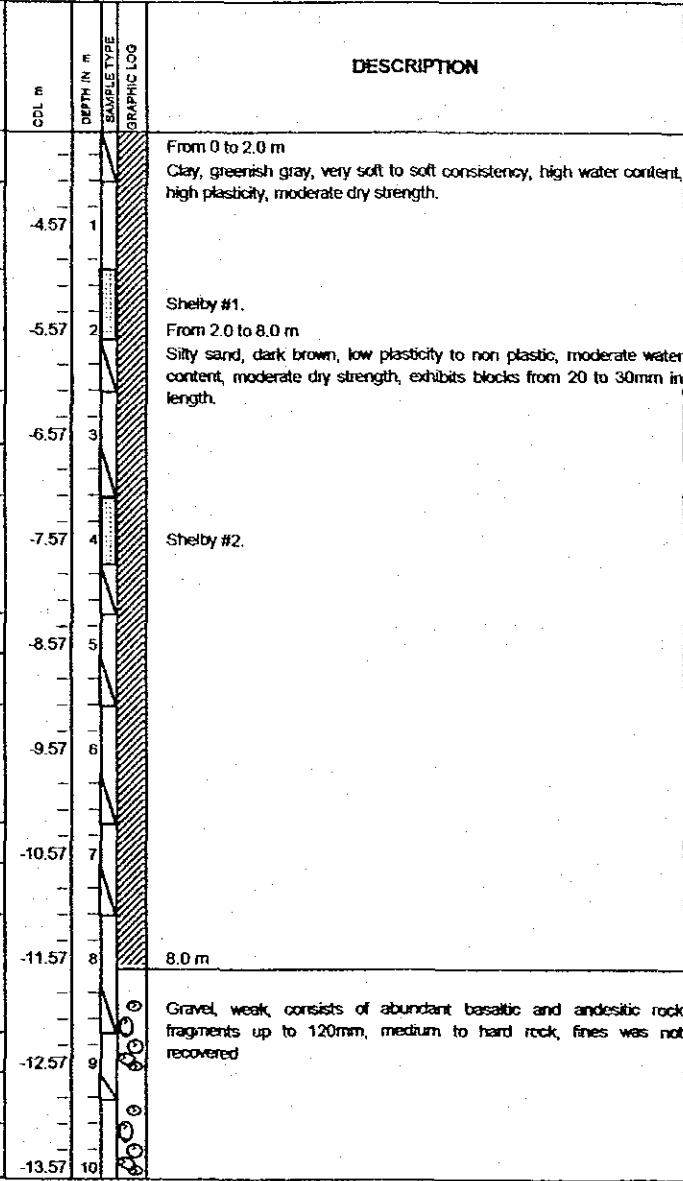
swissboring
Swissboring Overseas Corporation Ltd.

LOGGED BY:
Rodolfo Abarado

INSPECTOR: Dr. Puzai Yang

ROCK CORE

| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RCD cm | % RCD |
|-----------|------------|------------------|-------------|------------|--------|-------|
| SPT | 1 | 0 | 0 | 0 | 1 | 45 |
| HQ | 1 | 95 | 0 | 0 | 0 | 0 |
| SPT | 2 | 1 | 0 | 0 | 1 | 45 |
| HQ | 2 | 55 | 0 | 0 | 0 | 0 |
| SPT | 3 | 1 | 1 | 0 | 1 | 45 |
| SPT | 4 | 1 | 1 | 2 | 3 | 45 |
| HQ | 3 | 40 | 0 | 0 | 0 | 0 |
| SPT | 5 | 1 | 2 | 2 | 4 | 45 |
| SPT | 6 | 2 | 2 | 3 | 5 | 45 |
| HQ | 4 | 40 | 0 | 0 | 0 | 0 |
| SPT | 7 | 2 | 3 | 3 | 6 | 45 |
| SPT | 8 | 9 | 22 | 37 | >50 | 45 |
| HQ | 5 | 40 | 0 | 0 | 0 | 0 |
| SPT | 9 | 32 | 10/50 | | >50 | 20 |
| HQ | 6 | 75 | 60 | 80 | 0 | 0 |



| SPT TEST | | | | | RQD | | | | |
|----------|----|----|----|----------|-----|----|----|----|-----|
| 10 | 20 | 30 | 40 | 50 >5C N | 20 | 40 | 60 | 80 | 100 |
| | | | | 1 | | | | | |
| | | | | 1 | | | | | |
| | | | | 1 | | | | | |
| | | | | 3 | | | | | |
| | | | | 4 | | | | | |
| | | | | 5 | | | | | |
| | | | | 6 | | | | | |
| | | | | >50 | | | | | |
| | | | | >50 | | | | | |

LOG OF BORING

BOREHOLE: BS-21
sheet 1/1

CLIENT: **NIPPON KOEI Ltd** SOIL INVESTIGATION OFF SHORE DRILL RIG: LY-34

COUNTRY: **EL SALVADOR** COORDINATES: 13° 20' 7.5" - 87° 49' 0.3" DRILLER: **SWISSBORING**

DEPTH: 10.00 m BOTTOM SEA LEVEL: -13.22 Chart Datum Level DATE (START - FINISH): 27/10/01

LOGGED BY: **RODOLFO ALVARADO**

| SOIL SAMPLING | | | | | | |
|---------------|---------------|-------|-------|-------|---------|--------------|
| SAMPLE TYPE | SAMPLE NUMBER | 16 cm | 30 cm | 45 cm | N VALUE | RECOVERED cm |
| 1 BET | | | | | | |
| 2 BET | | | | | | |
| 3 BET | | | | | | |

GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR



INSPECTOR: **Dr. PUGAI YANG**

ROCK CORE

| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD |
|-----------|------------|------------------|-------------|------------|--------|-------|
| HQ | 1 | 55 | 0 | 0 | 0 | 0 |
| SPT | 1 | 1 | | | 1 | 45 |
| HQ | 2 | 55 | 0 | 0 | 0 | 0 |
| SPT | 2 | 1 | | | 1 | 45 |
| HQ | 3 | 55 | 0 | 0 | 0 | 0 |
| SPT | 3 | 1 | | | 1 | 45 |
| HQ | 4 | 55 | 0 | 0 | 0 | 0 |
| SPT | 4 | 1 | | | 1 | 45 |
| HQ | 5 | 55 | 0 | 0 | 0 | 0 |
| SPT | 5 | 1 | | | 1 | 45 |
| HQ | 6 | 55 | 0 | 0 | 0 | 0 |
| SPT | 6 | 1 | | | 1 | 45 |
| HQ | 7 | 55 | 0 | 0 | 0 | 0 |
| SPT | 7 | 1 | | | 1 | 45 |
| HQ | 8 | 55 | 0 | 0 | 0 | 0 |
| SPT | 8 | 1 | | | 1 | 45 |
| HQ | 9 | 55 | 0 | 0 | 0 | 0 |
| SPT | 9 | 1 | | | 1 | 45 |
| HQ | 10 | 55 | 0 | 0 | 0 | 0 |
| SPT | 10 | 1 | | | 1 | 45 |

| CDL m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG |
|--------|------------|-------------|-------------|
| -14.22 | 1 | | |
| -15.22 | 2 | | |
| -16.22 | 3 | | |
| -17.22 | 4 | | |
| -18.22 | 5 | | |
| -19.22 | 6 | | |
| -20.22 | 7 | | |
| -21.22 | 8 | | |
| -22.22 | 9 | | |
| -23.22 | 10 | | |

DESCRIPTION

Clay, greenish gray, very soft consistency, high water content, high plasticity, moderate dry strength.

idem material

idem material

idem material

idem material, moderate water content.

idem material, moderate water content.

10.00 m END OF BORING

| SPT TEST | | | | | RQD | | | | | |
|----------|----|----|----|--------|-----|----|----|----|----|-----|
| 10 | 20 | 30 | 40 | 50 >5C | N | 20 | 40 | 60 | 80 | 100 |
| | | | | | 1 | | | | | |
| | | | | | 1 | | | | | |
| | | | | | 1 | | | | | |
| | | | | | 1 | | | | | |
| | | | | | 1 | | | | | |
| | | | | | 1 | | | | | |
| | | | | | 1 | | | | | |
| | | | | | 1 | | | | | |
| | | | | | 1 | | | | | |
| | | | | | 1 | | | | | |
| | | | | | 1 | | | | | |
| | | | | | 1 | | | | | |
| | | | | | 1 | | | | | |
| | | | | | 1 | | | | | |
| | | | | | 1 | | | | | |
| | | | | | 1 | | | | | |

LOG OF BORING

BOREHOLE: BS-22
sheet 1/1

| | | |
|-------------------------|--|---------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION OFF SHORE | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: 13° 19' 17.6" - 87° 47' 51.3" | DRILLER: SWISSBORING |
| DEPTH 10.00 m | BOTTOM SEA LEVEL: -11.52 Chart Datum Level | DATE (START - FINISH): 25/10/01 |

| SAMPLE TYPE | SAMPLE NUMBER | 1 SET 15 cm | 2 SET 30 cm | 3 SET 45 cm | N VALUE | RECOVERED cm |
|-------------|---------------|-------------|-------------|-------------|---------|--------------|
| | | | | | | |

GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR

swissboring
Swissboring Overseas Corporation Ltd.

LOGGED BY:
RODOLFO ALVARADO

INSPECTOR Dr. PUCAI YANG

ROCK CORE

| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD |
|-----------|------------|------------------|-------------|------------|--------|-------|
| | | | | | | |

DESCRIPTION

| SPT TEST | | | | | RQD | | | | |
|----------|----|----|----|----------|-----|----|----|----|-----|
| 10 | 20 | 30 | 40 | 50 >5C N | 20 | 40 | 60 | 80 | 100 |
| | | | | | | | | | |

| SPT | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|-----------------|---|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| Run Number | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| Run Length (cm) | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| Recovery (cm) | | | | | | | | | | |
| % Recovery | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 |
| RQD (cm) | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| % RQD | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 | 45 |
| COL (m) | -12.52 | -13.52 | -14.52 | -15.52 | -16.52 | -17.52 | -18.52 | -19.52 | -20.52 | -21.52 |
| DEPTH (m) | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| SAMPLE TYPE | GRAPHIC LOG | | | | | | | | | |
| DESCRIPTION | Clay, greenish gray, very soft consistency, high water content, high plasticity, moderate dry strength, contains shelves. | | | | | | | | | |
| | Idem material | | | | | | | | | |
| | Idem material | | | | | | | | | |
| | Idem material, moderate to high water content. | | | | | | | | | |
| | Idem material, moderate to high water content. | | | | | | | | | |
| | Idem material, moderate to high water content. | | | | | | | | | |
| | Idem material, moderate to high water content. | | | | | | | | | |
| | Idem material, moderate water content. | | | | | | | | | |
| | Idem material, moderate water content. | | | | | | | | | |
| | Idem material, moderate water content. | | | | | | | | | |
| | 10.00 m END OF BORING | | | | | | | | | |

LOG OF BORING

BOREHOLE: BS-23
sheet 1/1

| | | |
|--------------------------------|---|--|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION OFF SHORE | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: 13° 18' 22.7" - 87° 46' 56.0" | DRILLER: SWISSBORING |
| DEPTH: 10.00 m | BOTTOM SEA LEVEL: -12.32 Chart Datum Level | DATE (START - FINISH): 25/10/01 |


| <p>SOIL SAMPLING</p> <table border="1"> <tr> <th>SAMPLE TYPE</th> <th>SAMPLE NUMBER</th> <th>1 BET</th> <th>2 BET</th> <th>3 BET</th> <th>N VALUE</th> <th>RECOVERED cm</th> </tr> <tr> <td></td> <td></td> <td>18 cm</td> <td>30 cm</td> <td>48 cm</td> <td></td> <td></td> </tr> </table> | | SAMPLE TYPE | SAMPLE NUMBER | 1 BET | 2 BET | 3 BET | N VALUE | RECOVERED cm | | | 18 cm | 30 cm | 48 cm | | | <p>GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR</p> <p>swissboring Swissboring Overseas Corporation Ltd.</p> | <p>LOGGED BY: RODOLFO ALVARADO</p> | | | | |
|--|---------------|------------------|---------------|------------|---------|--------------|-----------|--------------|------------------|-------------|------------|--------|-------|--|--|--|---|--|--|--|--|
| SAMPLE TYPE | SAMPLE NUMBER | 1 BET | 2 BET | 3 BET | N VALUE | RECOVERED cm | | | | | | | | | | | | | | | |
| | | 18 cm | 30 cm | 48 cm | | | | | | | | | | | | | | | | | |
| <p>ROCK CORE</p> <table border="1"> <tr> <th>CORE SIZE</th> <th>RUN NUMBER</th> <th>RUN LENGTH IN cm</th> <th>RECOVERY cm</th> <th>% RECOVERY</th> <th>RCD cm</th> <th>% RCD</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | | | | | | CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RCD cm | % RCD | | | | | | | | <p>INSPECTOR Dr. PUCAI YANG</p> |
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RCD cm | % RCD | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | |

| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RCD cm | % RCD | CDL m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | | | | | RQD | | | | |
|-----------|------------|------------------|-------------|------------|--------|-------|-------|------------|-------------|-------------|--|----------|----|----|----|----|-----|---|----|----|----|
| | | | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | >5C | N | 20 | 40 | 60 |
| SPT | 1 | 1 | | | 1 | 45 | | -13.32 | 1 | | Clay, greenish gray, very soft consistency, high water content, high plasticity, moderate dry strength, contains some shelves. | | | | | | | | | | |
| SPT | 2 | 1 | | | 1 | 45 | | -14.32 | 2 | | Idem material | | | | | | | | | | |
| SPT | 3 | 1 | | | 1 | 45 | | -15.32 | 3 | | Idem material | | | | | | | | | | |
| SPT | 4 | 1 | | | 1 | 45 | | -16.32 | 4 | | Idem material, moderate to high water content. | | | | | | | | | | |
| SPT | 5 | 1 | | | 1 | 45 | | -17.32 | 5 | | Idem material, moderate to high water content. | | | | | | | | | | |
| SPT | 6 | 1 | | | 1 | 45 | | -18.32 | 6 | | Idem material, moderate to high water content. | | | | | | | | | | |
| SPT | 7 | 1 | | | 1 | 45 | | -19.32 | 7 | | Idem material, moderate to high water content. | | | | | | | | | | |
| SPT | 8 | 1 | | | 1 | 45 | | -20.32 | 8 | | Idem material, moderate water content. | | | | | | | | | | |
| SPT | 9 | 1 | | | 1 | 45 | | -21.32 | 9 | | Idem material, moderate water content. | | | | | | | | | | |
| SPT | 10 | 1 | | | 1 | 45 | | -22.32 | 10 | | Idem material, moderate water content. | | | | | | | | | | |

LOG OF BORING

BOREHOLE: BS-24
sheet 1/1

| | | |
|--------------------------------|--|---------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION OFF SHORE | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: 13° 13' 50.7" - 87° 47' 42.0" | DRILLER: SWISSBORING |
| DEPTH: 4.00 m | BOTTOM SEA LEVEL: -11.67 Chart Datum Level | DATE (START - FINISH): 30/10/01 |

| SOIL SAMPLING <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>SAMPLE TYPE</th> <th>SAMPLE NUMBER</th> <th>15 cm</th> <th>30 cm</th> <th>45 cm</th> <th>N VALUE</th> <th>RECOVERED cm</th> </tr> <tr> <td>1 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>N VALUE</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | SAMPLE TYPE | SAMPLE NUMBER | 15 cm | 30 cm | 45 cm | N VALUE | RECOVERED cm | 1 SET | | | | | | | 2 SET | | | | | | | 3 SET | | | | | | | N VALUE | | | | | | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | LOGGED BY: RODOLFO ALVARADO INSPECTOR Dr. PUCAI YANG |
|--|---------------|---------------|-------|-------|---------|--------------|--------------|-------|--|--|--|--|--|--|-------|--|--|--|--|--|--|-------|--|--|--|--|--|--|---------|--|--|--|--|--|--|--|---|
| SAMPLE TYPE | SAMPLE NUMBER | 15 cm | 30 cm | 45 cm | N VALUE | RECOVERED cm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 SET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 SET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 SET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| N VALUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| ROCK CORE | | | | | | | COL m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | | | | | RQD | | | | |
|-----------|------------|------------------|-------------|------------|--------|-------|--------|------------|-------------|-------------|--|----------|----|----|----|----|-----|---|----|----|----|
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | | | | | | 10 | 20 | 30 | 40 | 50 | >5C | N | 20 | 40 | 60 |
| HQ | 1 | 55 | 0 | 0 | 0 | 0 | | | | | Clayey silt with fine-grained sand, dark gray, moderate plasticity. 3.00 m Idem material, exhibits sea shell residues. Sandy silt with clay, dark gray, low plasticity. 4.00 m END OF BORING | | | | | | | | | | |
| SPT | 1 | 1 | | | | 1 | -12.67 | 1 | | | | | | | | | | | | | |
| HQ | 2 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 2 | 1 | | | | 1 | -13.67 | 2 | | | | | | | | | | | | | |
| HQ | 3 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 3 | 1 | | | | 1 | -14.67 | 3 | | | | | | | | | | | | | |
| HQ | 4 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 4 | 1 | | | | 1 | -15.67 | 4 | | | | | | | | | | | | | |
| | | | | | | | -16.67 | 5 | | | | | | | | | | | | | |
| | | | | | | | -17.67 | 6 | | | | | | | | | | | | | |
| | | | | | | | -18.67 | 7 | | | | | | | | | | | | | |
| | | | | | | | -19.67 | 8 | | | | | | | | | | | | | |
| | | | | | | | -20.67 | 9 | | | | | | | | | | | | | |
| | | | | | | | -21.67 | 10 | | | | | | | | | | | | | |

LOG OF BORING

BOREHOLE: BS-25
sheet 1/1

| | | |
|-------------------------|--|---------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION OFF SHORE | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: 13° 11' 18.7" - 87° 48' 47.6" | DRILLER: SWISSBORING |
| DEPTH: 5.00 m | BOTTOM SEA LEVEL: -12.07 Chart Datum Level | DATE (START - FINISH): 30/10/01 |


| <p>SOIL SAMPLING</p> <table border="1"> <tr> <th>SAMPLE TYPE</th> <th>SAMPLE NUMBER</th> <th>16 cm</th> <th>30 cm</th> <th>45 cm</th> <th>N VALUE</th> <th>RECOVERED cm</th> </tr> <tr> <td>1 BET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2 BET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3 BET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | SAMPLE TYPE | SAMPLE NUMBER | 16 cm | 30 cm | 45 cm | N VALUE | RECOVERED cm | 1 BET | | | | | | | 2 BET | | | | | | | 3 BET | | | | | | | <p>GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR</p> <p>swissboring Swissboring Overseas Corporation Ltd.</p> | <p>LOGGED BY:</p> <p>RODOLFO ALVARADO</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------------|------------------|---------------|------------------|-------------|--------------|---------|--------------|-------|---|----|---|---|---|---|-------|---|---|--|--|---|----|-------|---|----|---|---|---|---|---|---|---|--|--|---|----|----|---|----|---|---|---|---|-----|---|---|--|--|---|----|----|---|----|---|---|---|---|-----|---|---|--|--|---|----|----|---|----|---|---|---|---|-----|---|---|--|--|---|----|---------------------------------|
| SAMPLE TYPE | SAMPLE NUMBER | 16 cm | 30 cm | 45 cm | N VALUE | RECOVERED cm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 BET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 BET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 BET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>ROCK CORE</p> <table border="1"> <tr> <th>CORE SIZE</th> <th>RUN NUMBER</th> <th>RUN LENGTH IN cm</th> <th>RECOVERY cm</th> <th>% RECOVERY</th> <th>RQD cm</th> <th>% RQD</th> </tr> <tr> <td>HQ</td> <td>1</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>1</td> <td>1</td> <td></td> <td></td> <td>1</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>2</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>2</td> <td>1</td> <td></td> <td></td> <td>1</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>3</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>3</td> <td>1</td> <td></td> <td></td> <td>1</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>4</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>4</td> <td>1</td> <td></td> <td></td> <td>1</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>5</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>5</td> <td>1</td> <td></td> <td></td> <td>1</td> <td>45</td> </tr> </table> | | CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | HQ | 1 | 55 | 0 | 0 | 0 | 0 | SPT | 1 | 1 | | | 1 | 45 | HQ | 2 | 55 | 0 | 0 | 0 | 0 | SPT | 2 | 1 | | | 1 | 45 | HQ | 3 | 55 | 0 | 0 | 0 | 0 | SPT | 3 | 1 | | | 1 | 45 | HQ | 4 | 55 | 0 | 0 | 0 | 0 | SPT | 4 | 1 | | | 1 | 45 | HQ | 5 | 55 | 0 | 0 | 0 | 0 | SPT | 5 | 1 | | | 1 | 45 | <p>INSPECTOR Dr. PUCAI YANG</p> |
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 1 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 1 | 1 | | | 1 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 2 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 2 | 1 | | | 1 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 3 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 3 | 1 | | | 1 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 4 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 4 | 1 | | | 1 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 5 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 5 | 1 | | | 1 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| ROCK CORE | | | | | | | SPT TEST | RQD | | | | | | | | | | | |
|--|------------|------------------|-------------|------------|--------|-------|----------|-----|----|----|----|-----|---|----|----|----|----|-----|--|
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | | | | | | | | | | | | | |
| DESCRIPTION | | | | | | | 10 | 20 | 30 | 40 | 50 | >50 | N | 20 | 40 | 60 | 80 | 100 | |
| HQ | 1 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | |
| SPT | 1 | 1 | | | | 1 | 45 | | | | | | | | | | | | |
| From 1.5 to 5.0 m | | | | | | | | | | | | | | | | | | | |
| HQ | 2 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | |
| SPT | 2 | 1 | | | | 1 | 45 | | | | | | | | | | | | |
| Sandy silt with little clay, dark gray, exhibits sea shell residues, low plasticity. | | | | | | | | | | | | | | | | | | | |
| HQ | 3 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | |
| SPT | 3 | 1 | | | | 1 | 45 | | | | | | | | | | | | |
| HQ | 4 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | |
| SPT | 4 | 1 | | | | 1 | 45 | | | | | | | | | | | | |
| 5.00 m END OF BORING | | | | | | | | | | | | | | | | | | | |
| HQ | 5 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | |
| SPT | 5 | 1 | | | | 1 | 45 | | | | | | | | | | | | |


LOG OF BORING

BOREHOLE: BS-A1
sheet 1/3

| | | |
|-------------------------|--|------------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION OFF SHORE | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: 13°20' 10.3" - 87° 49' 16.7" | DRILLER: Swissboring |
| DEPTH 21.30 m | BOTTOM SEA LEVEL: -11.00 Chart Datum Level | DATE (START - FINISH): 23-24/10/01 |

| SOIL SAMPLING <table border="1"> <tr> <th>SAMPLE TYPE</th> <th>SAMPLE NUMBER</th> <th>15 cm</th> <th>30 cm</th> <th>45 cm</th> <th>N VALUE</th> <th>RECOVERED cm</th> </tr> <tr> <td>1 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>N VALUE</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>RECOVERED cm</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | SAMPLE TYPE | SAMPLE NUMBER | 15 cm | 30 cm | 45 cm | N VALUE | RECOVERED cm | 1 SET | | | | | | | 2 SET | | | | | | | 3 SET | | | | | | | N VALUE | | | | | | | RECOVERED cm | | | | | | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | LOGGED BY: Rodolfo Anarado | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---------------|--------------------|---------------|--------------------|-------------|--------------|---------|--------------|-------|---|-----|---|---|---|---|-------|---|---|---|---|---|----|-------|---|----|---|---|---|---|---------|---|---|---|---|---|----|--------------|---|-----|---|---|---|---|--|-----------------------------------|---|---|---|---|----|----|---|----|---|---|---|---|-----|---|---|---|---|---|----|----|---|----|---|---|---|---|-----|---|---|---|----|----|----|----|---|-----|---|---|---|---|---------------------------------|
| SAMPLE TYPE | SAMPLE NUMBER | 15 cm | 30 cm | 45 cm | N VALUE | RECOVERED cm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 SET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 SET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 SET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| N VALUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| RECOVERED cm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ROCK CORE <table border="1"> <tr> <th>CORE SIZE</th> <th>RUN NUMBER</th> <th>RUN LENGTH (in cm)</th> <th>RECOVERY cm</th> <th>% RECOVERY</th> <th>RQD cm</th> <th>% RQD</th> </tr> <tr> <td>HQ</td> <td>1</td> <td>130</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>1</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>2</td> <td>85</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>2</td> <td>1</td> <td>0</td> <td>0</td> <td>1</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>3</td> <td>155</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>3</td> <td>1</td> <td>1</td> <td>1</td> <td>2</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>4</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>4</td> <td>1</td> <td>1</td> <td>2</td> <td>3</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>5</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>5</td> <td>4</td> <td>8</td> <td>16</td> <td>24</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>6</td> <td>155</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> </table> | | CORE SIZE | RUN NUMBER | RUN LENGTH (in cm) | RECOVERY cm | % RECOVERY | RQD cm | % RQD | HQ | 1 | 130 | 0 | 0 | 0 | 0 | SPT | 1 | 1 | 0 | 0 | 1 | 45 | HQ | 2 | 85 | 0 | 0 | 0 | 0 | SPT | 2 | 1 | 0 | 0 | 1 | 45 | HQ | 3 | 155 | 0 | 0 | 0 | 0 | SPT | 3 | 1 | 1 | 1 | 2 | 45 | HQ | 4 | 55 | 0 | 0 | 0 | 0 | SPT | 4 | 1 | 1 | 2 | 3 | 45 | HQ | 5 | 55 | 0 | 0 | 0 | 0 | SPT | 5 | 4 | 8 | 16 | 24 | 45 | HQ | 6 | 155 | 0 | 0 | 0 | 0 | INSPECTOR Dr. Pucal Yang |
| CORE SIZE | RUN NUMBER | RUN LENGTH (in cm) | RECOVERY cm | % RECOVERY | RQD cm | % RQD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 1 | 130 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 1 | 1 | 0 | 0 | 1 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 2 | 85 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 2 | 1 | 0 | 0 | 1 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 3 | 155 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 3 | 1 | 1 | 1 | 2 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 4 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 4 | 1 | 1 | 2 | 3 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 5 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 5 | 4 | 8 | 16 | 24 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 6 | 155 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| CORE SIZE | RUN NUMBER | RUN LENGTH (in cm) | RECOVERY cm | % RECOVERY | RQD cm | % RQD | COL m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | | | | | RQD | | | | |
|-----------|------------|--------------------|-------------|------------|--------|-------|--------|------------|-------------|-------------|--|----------|----|----|----|----|-----|---|----|----|----|
| | | | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | >5C | N | 20 | 40 | 60 |
| | | | | | | | -12.00 | 1 | | | Clayey silt, dark brown, very soft consistency, high water content, low plasticity, low dry strength. | | | | | | | | | | |
| | | | | | | | -13.00 | 2 | | | Shelby #1. | | | | | | | | | | |
| | | | | | | | -14.00 | 3 | | | | | | | | | | | | | |
| | | | | | | | -15.00 | 4 | | | Shelby #2. | | | | | | | | | | |
| | | | | | | | -16.00 | 5 | | | | | | | | | | | | | |
| | | | | | | | -17.00 | 6 | | | | | | | | | | | | | |
| | | | | | | | -18.00 | 7 | | | | | | | | | | | | | |
| | | | | | | | -19.00 | 8 | | | 7.50 m | | | | | | | | | | |
| | | | | | | | -19.00 | 8 | | | Gravel, consists of abundant angular to subangular basaltic and andesitic blocks ranging up to 10 mm in length, medium hard to hard, contains silt and medium to fine sand, gray, moderate plasticity, stiff consistency | | | | | | | | | | |
| | | | | | | | -20.00 | 9 | | | | | | | | | | | | | |
| | | | | | | | -21.00 | 10 | | | | | | | | | | | | | |


| Swissboring Overseas Corp. Ltd. | | CEPA | | JICA Study Team | | | |
|---|-------|------------|--|-----------------|-------------|----------------------------------|-----------------|
| LOG OF BORING | | | | | | BOREHOLE: BS-A1 sheet 2/3 | |
| CLIENT: NIPPON KOEI Hd | | | SOIL INVESTIGATION OFF SHORE | | | DRILL RIG: LY-34 | |
| COUNTRY: EL SALVADOR | | | COORDINATES: 13°20' 10.3" - 87° 49' 16.7" | | | DRILLER: Swissboring | |
| DEPTH 21.30 m | | | BOTTOM SEA LEVEL: -10.92 Chart Datum Level | | | DATE (START-FINISH): 23-24/10/01 | |
| SOIL SAMPLING GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | | | | | | LOGGED BY: Rodolfo Alvarado | |
| ROCK CORE | | | | | | INSPECTOR Dr. Pucai Yang | |
| DEPTH | CDL | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | RQD |
| | | | | | | 10 20 30 40 50 >5C N | 20 40 60 80 100 |
| SPT 6 | 13 | 18 | 19 | 37 | 45 | | |
| HQ 7 | 55 | 0 | 0 | 0 | 0 | | |
| SPT 7 | 20 | 16 | 25 | 41 | 45 | | |
| HQ 8 | 55 | 0 | 0 | 0 | 0 | | |
| SPT 8 | 19 | 22 | 27 | 49 | 45 | | |
| HQ 9 | 55 | 0 | 0 | 0 | 0 | | |
| SPT 9 | 10/50 | | | >50 | 10 | | |
| HQ 10 | 140 | 55 | 39 | 0 | 0 | | |
| SPT 10 | 15/50 | | | >50 | 12 | | |
| HQ 11 | 100 | 50 | 50 | 0 | 0 | | |
| SPT 11 | 10/50 | | | >50 | 10 | | |
| HQ 12 | 100 | 50 | 50 | 0 | 0 | | |
| SPT 12 | 15/50 | | | >50 | 10 | | |
| HQ 13 | 100 | 65 | 65 | 0 | 0 | | |
| SPT 13 | 10/50 | | | >50 | 10 | | |
| HQ 14 | 100 | 100 | 100 | 0 | 0 | | |
| SPT 14 | 14/50 | | | >50 | 12 | | |
| HQ 15 | 75 | 75 | 100 | 0 | 0 | | |
| SPT 15 | 10/50 | | | >50 | 10 | | |
| HQ 16 | 75 | 75 | 100 | 39 | 52 | | 52% |

| Swissboring Overseas Corp. Ltd. | | | | | | | | | | CEPA | | JICA Study Team | | LOG OF BORING | | | | BOREHOLE: BS-A2 sheet 1/3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------------|------------------|-------------|------------|--|--------------|--|--|--|--|--|-----------------|--|---------------|----------------------|-------------|-----------------|------------------------------|-------------|------------|---------|--------------|-------|---|----|---|---|---|---|-------|---|---|---|---|---|----|-------|---|-----|---|---|---|---|---|---|---|---|---|-----------------------------|----|----|---|----|---|---|---|---|-----|---|---|---|---|---|----|----|---|----|---|---|---|---|-----|---|---|---|---|---|----|----|---|----|---|---|---|---|-----|---|---|---|---|---|----|----|---|----|---|---|---|---|-----|---|---|---|---|---|----|----|---|----|---|---|---|---|-----|---|---|---|---|---|----|----|---|----|---|---|---|---|-----|---|---|---|---|----|----|----|---|----|---|---|---|---|-----|---|----|----|----|-----|----|--|--|--|--|--|---------------------------|--|--|--|--|
| CLIENT: NIPPON KOEI Ltd | | | | | SOIL INVESTIGATION OFF SHORE | | | | | DRILL RIG: LY-34 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COUNTRY: EL SALVADOR | | | | | COORDINATES: 13° 20' 12.6" - 87° 49' 18.8" | | | | | DRILLER: Swissboring | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DEPTH: 22.00 m | | | | | BOTTOM SEA LEVEL: -11.27 chart datum level | | | | | DATE (START - FINISH): 23-23/11/01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th colspan="6">SOIL SAMPLING</th> </tr> <tr> <th>SAMPLE TYPE</th> <th>SAMPLE NUMBER</th> <th>1 SET</th> <th>2 SET</th> <th>3 SET</th> <th>N VALUE</th> <th>RECOVERED cm</th> </tr> </thead> <tbody> <tr> <td>15 cm</td> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>30 cm</td> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>45 cm</td> <td>5</td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> | | | | | | | | | | SOIL SAMPLING | | | | | | SAMPLE TYPE | SAMPLE NUMBER | 1 SET | 2 SET | 3 SET | N VALUE | RECOVERED cm | 15 cm | 5 | | | | | | 30 cm | 5 | | | | | | 45 cm | 5 | | | | | | GEO TECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR | | | | | LOGGED BY: Rodolfo Alvarado | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SOIL SAMPLING | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SAMPLE TYPE | SAMPLE NUMBER | 1 SET | 2 SET | 3 SET | N VALUE | RECOVERED cm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 15 cm | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 30 cm | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 45 cm | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th colspan="6">ROCK CORE</th> </tr> <tr> <th>CORE SIZE</th> <th>RUN NUMBER</th> <th>RUN LENGTH IN cm</th> <th>RECOVERY cm</th> <th>% RECOVERY</th> <th>RCD cm</th> <th>% RCD</th> </tr> </thead> <tbody> <tr> <td>HQ</td> <td>1</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>1</td> <td>1</td> <td>0</td> <td>0</td> <td>1</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>2</td> <td>160</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>2</td> <td>1</td> <td>1</td> <td>1</td> <td>2</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>3</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>3</td> <td>1</td> <td>1</td> <td>2</td> <td>3</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>4</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>4</td> <td>1</td> <td>2</td> <td>3</td> <td>5</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>5</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>5</td> <td>1</td> <td>2</td> <td>4</td> <td>6</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>6</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>6</td> <td>1</td> <td>2</td> <td>3</td> <td>5</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>7</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>7</td> <td>1</td> <td>2</td> <td>3</td> <td>5</td> <td>45</td> </tr> <tr> <td>HQ</td> <td>8</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>8</td> <td>4</td> <td>8</td> <td>8</td> <td>14</td> <td>25</td> </tr> <tr> <td>HQ</td> <td>9</td> <td>55</td> <td>0</td> <td>0</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>9</td> <td>23</td> <td>28</td> <td>30</td> <td>>50</td> <td>45</td> </tr> </tbody> </table> | | | | | | | | | | ROCK CORE | | | | | | CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RCD cm | % RCD | HQ | 1 | 55 | 0 | 0 | 0 | 0 | SPT | 1 | 1 | 0 | 0 | 1 | 45 | HQ | 2 | 160 | 0 | 0 | 0 | 0 | SPT | 2 | 1 | 1 | 1 | 2 | 45 | HQ | 3 | 55 | 0 | 0 | 0 | 0 | SPT | 3 | 1 | 1 | 2 | 3 | 45 | HQ | 4 | 55 | 0 | 0 | 0 | 0 | SPT | 4 | 1 | 2 | 3 | 5 | 45 | HQ | 5 | 55 | 0 | 0 | 0 | 0 | SPT | 5 | 1 | 2 | 4 | 6 | 45 | HQ | 6 | 55 | 0 | 0 | 0 | 0 | SPT | 6 | 1 | 2 | 3 | 5 | 45 | HQ | 7 | 55 | 0 | 0 | 0 | 0 | SPT | 7 | 1 | 2 | 3 | 5 | 45 | HQ | 8 | 55 | 0 | 0 | 0 | 0 | SPT | 8 | 4 | 8 | 8 | 14 | 25 | HQ | 9 | 55 | 0 | 0 | 0 | 0 | SPT | 9 | 23 | 28 | 30 | >50 | 45 | | | | | | INSPECTOR: Dr. Pucal Yang | | | | |
| ROCK CORE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RCD cm | % RCD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 1 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 1 | 1 | 0 | 0 | 1 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 2 | 160 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 2 | 1 | 1 | 1 | 2 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 3 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 3 | 1 | 1 | 2 | 3 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 4 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 4 | 1 | 2 | 3 | 5 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 5 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 5 | 1 | 2 | 4 | 6 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 6 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 6 | 1 | 2 | 3 | 5 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 7 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 7 | 1 | 2 | 3 | 5 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 8 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 8 | 4 | 8 | 8 | 14 | 25 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 9 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 9 | 23 | 28 | 30 | >50 | 45 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | DESCRIPTION | | | | | SPT TEST | | ROD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | 10 20 30 40 50 >50 N | | 20 40 60 80 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | Silty clay, dark gray-brown, very soft consistency, high water content, moderate to high plasticity, moderate dry strength with traces of silty sand, contains few shell fragments | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | Shelby #1. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | Shelby #2. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | Idem material, very soft to soft consistency | | | | | | | 2 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | Idem material, soft consistency | | | | | | | 3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | Idem material, medium stiff consistency | | | | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | Idem material, medium stiff consistency | | | | | | | 6 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | 8.00 m | | | | | | | 5 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | Gravelly Sand, hard, contains gravel traces, moderate water content, low to moderate plasticity, low to moderate dry strength | | | | | | | 14 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | >50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |


LOG OF BORING


BOREHOLE: BS-A2
sheet 2/3


| | | |
|-------------------------|--|------------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION OFF SHORE | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: 13° 20' 12.6" - 87° 49' 18.8" | DRILLER: Swissboring |
| DEPTH 22.00 m | BOTTOM SEA LEVEL: -11.27 chart datum level | DATE (START - FINISH): 23-23/11/01 |


| | | | |
|--|--|--|--------------------------------|
| SOIL SAMPLING TYPE NUMBER 15 cm 30 cm 45 cm SAMPLE 1 SET 2 SET 3 SET N VALUE RECOVERED cm | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | LOGGED BY: Rodolfo Alvarado |
| ROCK CORE CORE SIZE RUN NUMBER RUN LENGTH IN cm RECOVERY cm % RECOVERY ROD cm % ROD | | | INSPECTOR Dr. Pucal Yang |

| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | ROD cm | % ROD | COL m | DEPTH IN m | SAMPLE TYPE GRAPHIC LOG | DESCRIPTION | SPT TEST | | | | | ROD | | | | |
|-----------|------------|------------------|-------------|------------|--------|-------|--------|------------|-------------------------|---|----------|----|----|----|----|-----|----|----|----|----|
| | | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | N | 20 | 40 | 60 | 80 |
| HQ | 10 | 55 | 33 | 60 | 0 | 0 | | | | Idem material as above | | | | | | | | | | |
| SPT | 10 | 45 | 50 | | >50 | 13 | -22.27 | 11 | | | | | | | | | | | | |
| HQ | 11 | 70 | 70 | 100 | 0 | 0 | | | | 11.80 m | | | | | | | | | | |
| HQ | 12 | 35 | 28 | 80 | 0 | 0 | -23.27 | 12 | | | | | | | | | | | | |
| SPT | 11 | 31 | 12/50 | | >50 | 23 | | | | | | | | | | | | | | |
| HQ | 13 | 83 | 83 | 100 | 0 | 0 | -24.27 | 13 | | Tuff, weak, dark brown - orange brown, consists of silty sand, tuffaceous, moderate water content, low plasticity to non plastic, low to moderate dry strength, contains some very weathered rock fragments, weak, poorly cemented, water laid, massive | | | | | | | | | | |
| SPT | 12 | 18/50 | | | >50 | 10 | | | | | | | | | | | | | | |
| HQ | 14 | 45 | 45 | 100 | 0 | 0 | | | | | | | | | | | | | | |
| SPT | 13 | 10 | 21 | 22 | 43 | 45 | -25.27 | 14 | | | | | | | | | | | | |
| HQ | 15 | 55 | 55 | 100 | 0 | 0 | | | | | | | | | | | | | | |
| SPT | 14 | 35 | 43 | 48 | >50 | 13 | -26.27 | 15 | | | | | | | | | | | | |
| HQ | 16 | 50 | 50 | 100 | 0 | 0 | | | | | | | | | | | | | | |
| SPT | 15 | 10/50 | | | >50 | 10 | -27.27 | 16 | | | | | | | | | | | | |
| HQ | 17 | 140 | 140 | 100 | 0 | 0 | | | | | | | | | | | | | | |
| SPT | 18 | 15/50 | | | >50 | 13 | -28.27 | 17 | | | | | | | | | | | | |
| HQ | 18 | 57 | 57 | 100 | 0 | 0 | | | | | | | | | | | | | | |
| SPT | 17 | 13/50 | | | >50 | 13 | -29.27 | 18 | | | | | | | | | | | | |
| HQ | 19 | 90 | 72 | 80 | 0 | 0 | | | | | | | | | | | | | | |
| HQ | 20 | 35 | 35 | 100 | 0 | 0 | -30.27 | 19 | | | | | | | | | | | | |
| HQ | 21 | 75 | 75 | 100 | 0 | 0 | -31.27 | 20 | | | | | | | | | | | | |

| Swissboring Overseas Corp. Ltd. | | CEPA | | JICA Study Team | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|---------------|------------------|--|-----------------|------------------|-----------------------------------|------------|------------|--------------|-------------|------------|-------------|-------------|----|----|----|-------|-----|---|---|--|----|--|-------|----|----|----|----|-----|---|---|--|--|--------------------------------------|--|----|----|----|----|-----|---|---|--|--|--|--|----|----|----|----|-----|---|---|--|----|--|--|---|--|---|--|-------------------------------|--|
| LOG OF BORING | | | | | | BOREHOLE: BS-A2 sheet 3/3 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| CLIENT: NIPPON KOEI Ltd | | | SOIL INVESTIGATION OFF SHORE | | | DRILL RIG: LY-34 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| COUNTRY: EL SALVADOR | | | COORDINATES: 13° 20' 12.6" - 87° 49' 18.6" | | | DRILLER: Swissboring | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DEPTH 22.00 m | | | BOTTOM SEA LEVEL: -11.27 chart datum level | | | DATE (START - FINISH): 23-23/1/01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SOIL SAMPLING <table border="1"> <tr> <th>SAMPLE TYPE</th> <th>SAMPLE NUMBER</th> <th>15 cm</th> <th>30 cm</th> <th>45 cm</th> <th>N VALUE</th> <th>RECOVERED cm</th> </tr> <tr> <td>1 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>2 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>3 SET</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | | SAMPLE TYPE | SAMPLE NUMBER | 15 cm | 30 cm | 45 cm | N VALUE | RECOVERED cm | 1 SET | | | | | | | 2 SET | | | | | | | 3 SET | | | | | | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | | | LOGGED BY: Rodolfo Abarado | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SAMPLE TYPE | SAMPLE NUMBER | 15 cm | 30 cm | 45 cm | N VALUE | RECOVERED cm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 1 SET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 2 SET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 3 SET | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ROCK CORE <table border="1"> <tr> <th>CORE SIZE</th> <th>RUN NUMBER</th> <th>RUN LENGTH IN cm</th> <th>RECOVERY cm</th> <th>% RECOVERY</th> <th>RQD cm</th> <th>% RQD</th> <th>CDL m</th> <th>DEPTH IN m</th> <th>SAMPLE TYPE</th> <th>GRAPHIC LOG</th> </tr> <tr> <td>HQ</td> <td>22</td> <td>45</td> <td>45</td> <td>100</td> <td>0</td> <td>0</td> <td></td> <td>21</td> <td></td> <td></td> </tr> <tr> <td>HQ</td> <td>23</td> <td>50</td> <td>50</td> <td>100</td> <td>0</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>HQ</td> <td>24</td> <td>80</td> <td>80</td> <td>100</td> <td>0</td> <td>0</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>HQ</td> <td>25</td> <td>35</td> <td>35</td> <td>100</td> <td>0</td> <td>0</td> <td></td> <td>22</td> <td></td> <td></td> </tr> </table> | | | CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | CDL m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | HQ | 22 | 45 | 45 | 100 | 0 | 0 | | 21 | | | HQ | 23 | 50 | 50 | 100 | 0 | 0 | | | | | HQ | 24 | 80 | 80 | 100 | 0 | 0 | | | | | HQ | 25 | 35 | 35 | 100 | 0 | 0 | | 22 | | | DESCRIPTION TOP OF SOUND ROCK, BRECCIACEOUS TUFF, weak, consists of subangular to subrounded volcanic clasts, up to 40mm in length, matrix is sandy tuffaceous, poorly cemented, water laid, some parts exhibit thin bedding. | | SPT TEST 10 20 30 40 50 >50 N | | RQD 20 40 60 80 100 | |
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | CDL m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 22 | 45 | 45 | 100 | 0 | 0 | | 21 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 23 | 50 | 50 | 100 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 24 | 80 | 80 | 100 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 25 | 35 | 35 | 100 | 0 | 0 | | 22 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| 22.00m END OF BORING | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Swissboring Overseas Corp. Ltd. | | CEPA | | JICA Study Team | | | | | | | | |
|---------------------------------|---------------|--|--|------------------------------------|-----------------------------------|-------|--------|------------|-------------|--|----------------------|-----------------|
| LOG OF BORING | | | | | | | | | | | | |
| CLIENT: NIPPON KOEI Ltd | | | SOIL INVESTIGATION OFF SHORE | | BOREHOLE: BS-A3 sheet 1/2 | | | | | | | |
| COUNTRY: EL SALVADOR | | COORDINATES: 13° 20' 10.1" - 87° 49' 23.1" | | DRILLER: Swissboring | | | | | | | | |
| DEPTH 19.80 m | | BOTTOM SEA LEVEL: -10.20 chart datum level | | DATE (START - FINISH): 20-20/11/01 | | | | | | | | |
| SOIL SAMPLING | | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | | LOGGED BY: Rodolfo Abarado | | | | | | | |
| SAMPLE TYPE | SAMPLE NUMBER | RECOVERED (m) | | | INSPECTOR: Dr. Pucal Yang | | | | | | | |
| 1 SET | 15 cm | | | | | | | | | | | |
| 2 SET | 30 cm | | | | | | | | | | | |
| 3 SET | 45 cm | | | | | | | | | | | |
| N VALUE | | | | | | | | | | | | |
| ROCK CORE | | | | | | | | | | | | |
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RCD cm | % RCD | COL m | DEPTH IN m | SAMPLE TYPE | DESCRIPTION | SPT TEST | RQD |
| | | | | | | | | | | | 10 20 30 40 50 >50 N | 20 40 60 80 100 |
| HQ | 1 | 55 | 0 | 0 | 0 | 0 | | | | From 0.0 to 5.6 m Silty clay, dark gray-brown, very soft consistency, high water content, moderate to high plasticity, moderate dry strength with traces of fine sand, contains few shell fragments | | |
| SPT | 1 | 1 | 0 | 0 | 1 | 45 | -11.20 | 1 | | | | |
| HQ | 2 | 30 | 0 | 0 | 0 | 0 | | | | Shelby #1. | | |
| | | | | | | | | | | | | |
| HQ | 3 | 55 | 0 | 0 | 0 | 0 | | | | Idem material | | |
| SPT | 2 | 1 | 0 | 0 | 1 | 45 | -13.20 | 3 | | | | |
| HQ | 4 | 55 | 0 | 0 | 0 | 0 | | | | | | |
| SPT | 3 | 1 | 0 | 0 | 1 | 45 | -14.20 | 4 | | | | |
| HQ | 5 | 55 | 0 | 0 | 0 | 0 | | | | | | |
| SPT | 4 | 1 | 0 | 0 | 1 | 45 | -15.20 | 5 | | | | |
| HQ | 6 | 55 | 0 | 0 | 0 | 0 | | | | From 5.6 to 7.0 m Sandy silt, dark gray-brown, very stiff to hard consistency, high water content, moderate plasticity, moderate dry strength | | |
| SPT | 5 | 1 | 1 | 1 | 2 | 45 | -16.20 | 6 | | | | |
| HQ | 7 | 55 | 0 | 0 | 0 | 0 | | | | | | |
| SPT | 6 | 1 | 1 | 3 | 4 | 45 | -17.20 | 7 | | 7.00m | | |
| HQ | 8 | 55 | 0 | 0 | 0 | 0 | | | | | | |
| SPT | 7 | 8 | 9 | 14 | 23 | 30 | -18.20 | 8 | | Gravel, weak, consists of subangular to subrounded volcanic block up to 100mm in length, moderate to high weathered, contains fine to medium sand and silt traces | | |
| HQ | 9 | 55 | 0 | 0 | 0 | 0 | | | | | | |
| SPT | 8 | 8 | 11 | 17 | 28 | 30 | -19.20 | 9 | | | | |
| HQ | 10 | 55 | 0 | 0 | 0 | 0 | | | | | | |
| SPT | 9 | 14 | 19 | 27 | 46 | 35 | -20.20 | 10 | | | | |


| Swissboring Overseas Corp. Ltd. | | CEPA | | JICA Study Team | | | | | | | | | | | | | | | | | |
|--|---------------|---|------------------------------|------------------------------------|------------------------------|------------|-------|---------|------------|--|--|-------|-------|-------|--|--|---|--|--|---|--|
| LOG OF BORING | | | | | | | | | | | | | | | | | | | | | |
| CLIENT: NIPPON KOEI Ltd | | | SOIL INVESTIGATION OFF SHORE | | BOREHOLE: BS-A4 sheet 1/2 | | | | | | | | | | | | | | | | |
| COUNTRY: EL SALVADOR | | COORDINATES: 13° 20' 7.6" - 87° 49' 27.5" | | DRILL RIG: LY-34 | | | | | | | | | | | | | | | | | |
| DEPTH: 16.00 m | | BOTTOM SEA LEVEL: -5.70 chart datum level | | DRILLER: Swissboring | | | | | | | | | | | | | | | | | |
| | | | | DATE (START - FINISH): 21-21/11/01 | | | | | | | | | | | | | | | | | |
| SOIL SAMPLING <table border="1"> <tr> <th>SAMPLE TYPE</th> <th>SAMPLE NUMBER</th> <th>1 SET</th> <th>2 SET</th> <th>3 SET</th> <th>N VALUE</th> <th>RECOVER OR</th> </tr> <tr> <td></td> <td></td> <td>15 cm</td> <td>30 cm</td> <td>45 cm</td> <td></td> <td></td> </tr> </table> | | | SAMPLE TYPE | SAMPLE NUMBER | 1 SET | 2 SET | 3 SET | N VALUE | RECOVER OR | | | 15 cm | 30 cm | 45 cm | | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | | | LOGGED BY: Rodofo Ahumado INSPECTOR: Dr. Pucal Yang | |
| SAMPLE TYPE | SAMPLE NUMBER | 1 SET | 2 SET | 3 SET | N VALUE | RECOVER OR | | | | | | | | | | | | | | | |
| | | 15 cm | 30 cm | 45 cm | | | | | | | | | | | | | | | | | |
| ROCK CORE | | | | | | | | | | | | | | | | | | | | | |
| CORE SIZE | RUN NUMBER | RUN LENGTH (m) | RECOVERY (cm) | % RECOVERY | RCD (cm) | % RCD | | | | | | | | | | | | | | | |
| SPT | 1 | 1 | 0 | 0 | 1 | 35 | | | | | | | | | | | | | | | |
| HQ | 1 | 110 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 2 | 1 | 0 | 2 | 2 | 40 | | | | | | | | | | | | | | | |
| HQ | 2 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 3 | 1 | 1 | 1 | 2 | 40 | | | | | | | | | | | | | | | |
| HQ | 3 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 4 | 1 | 1 | 1 | 2 | 45 | | | | | | | | | | | | | | | |
| HQ | 4 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 5 | 1 | 2 | 2 | 4 | 45 | | | | | | | | | | | | | | | |
| HQ | 5 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 6 | 3 | 4 | 9 | 13 | 45 | | | | | | | | | | | | | | | |
| HQ | 6 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 7 | 7 | 9 | 18 | 27 | 30 | | | | | | | | | | | | | | | |
| HQ | 7 | 55 | 0 | 0 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 8 | 9 | 12 | 20 | 32 | 30 | | | | | | | | | | | | | | | |
| HQ | 8 | 100 | 60 | 60 | 0 | 0 | | | | | | | | | | | | | | | |
| SPT | 9 | 14/50 | 0 | 0 | >50 | 12 | | | | | | | | | | | | | | | |
| HQ | 9 | 92 | 75 | 82 | 0 | 0 | | | | | | | | | | | | | | | |

| Swissboring Overseas Corp. Ltd. | | CFPA | | JICA Study Team | | | | | | | | | | | | | | | |
|--|---------------|--|---------------|------------------------------------|---------|--------------|---------|--------------|-------------|-------------|---|----------------------|-----------------|--|--|--|--|---------------------------|--|
| LOG OF BORING | | | | | | | | | | | | | | | | | | | |
| Piston sample | | | | | | | | | | | | | | | | | | | |
| CLIENT: NIPPON KOEI Ltd | | | | BOREHOLE: BS-A5 | | | | | | | | | | | | | | | |
| COUNTRY: EL SALVADOR | | | | sheet 1/2 | | | | | | | | | | | | | | | |
| DEPTH 14.00 m | | COORDINATES: 13° 20' 8.0" - 87° 49' 30.4" | | DRILL RIG: LY-34 | | | | | | | | | | | | | | | |
| BOTTOM SEA LEVEL: -4.00 chart datum level | | | | DRILLER: Swissboring | | | | | | | | | | | | | | | |
| | | | | DATE (START - FINISH): 21-21/11/01 | | | | | | | | | | | | | | | |
| SOIL SAMPLING | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR | | LOGGED BY: Rodolfo Alvarado | | | | | | | | | | | | | | | |
| <table border="1"> <tr> <th>SAMPLE TYPE</th> <th>SAMPLE NUMBER</th> <th>1 SET</th> <th>2 SET</th> <th>3 SET</th> <th>N VALUE</th> <th>RECOVERED cm</th> </tr> <tr> <td></td> <td></td> <td>15 cm</td> <td>30 cm</td> <td>45 cm</td> <td></td> <td></td> </tr> </table> | | SAMPLE TYPE | SAMPLE NUMBER | 1 SET | 2 SET | 3 SET | N VALUE | RECOVERED cm | | | 15 cm | 30 cm | 45 cm | | |  Swissboring Overseas Corporation Ltd. | | INSPECTOR: Dr. Pucal Yang | |
| SAMPLE TYPE | SAMPLE NUMBER | 1 SET | 2 SET | 3 SET | N VALUE | RECOVERED cm | | | | | | | | | | | | | |
| | | 15 cm | 30 cm | 45 cm | | | | | | | | | | | | | | | |
| ROCK CORE | | DESCRIPTION | | SPT TEST | | | | | | | | | | | | | | | |
| CORE SIZE | RUN NUMBER | RUN LENGTH (IN CM) | RECOVERY cm | % RECOVERY | RCD cm | % RCD | CDL m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | RCD | | | | | | |
| | | | | | | | | | | | | 10 20 30 40 50 >50 N | 20 40 60 80 100 | | | | | | |
| | | | | | | | | -5.00 | 1 | | Gravel, weak, consists of subrounded volcanic blocks, up to 70mm in length, contains sandy silt and clay, high water content, moderate plasticity, moderate dry strength. | | | | | | | | |
| HQ | 1 | 155 | 155 | 100 | 0 | 0 | | -6.00 | 2 | | | >50 | | | | | | | |
| SPT | 1 | 14/50 | | | >50 | 13 | | -7.00 | 3 | | | >50 | | | | | | | |
| HQ | 2 | 155 | 155 | 100 | 0 | 0 | | -8.00 | 4 | | | >50 | | | | | | | |
| SPT | 2 | 15/50 | | | >50 | 13 | | -9.00 | 5 | | | >50 | | | | | | | |
| HQ | 3 | 95 | 95 | 100 | 0 | 0 | | -10.00 | 6 | | 6.0 m | >50 | | | | | | | |
| SPT | 3 | 14/50 | | | >50 | 13 | | -11.00 | 7 | | Clayey gravel weak, consists of subrounded volcanic blocks, and contains sandy silt and clay, high water content, moderate plasticity, moderate dry strength, brown gray brown. | >50 | | | | | | | |
| HQ | 4 | 100 | 70 | 70 | 0 | 0 | | -12.00 | 8 | | | >50 | | | | | | | |
| SPT | 4 | 13/50 | | | >50 | 12 | | -13.00 | 9 | | | >50 | | | | | | | |
| HQ | 5 | 100 | 75 | 75 | 0 | 0 | | -14.00 | 10 | | | >50 | | | | | | | |
| SPT | 5 | 14/50 | | | >50 | 12 | | | | | | | | | | | | | |
| HQ | 6 | 100 | 70 | 70 | 0 | 0 | | | | | | | | | | | | | |
| SPT | 6 | 15/50 | | | >50 | 14 | | | | | | | | | | | | | |
| HQ | 7 | 100 | 75 | 75 | 0 | 0 | | | | | | | | | | | | | |
| SPT | 7 | 13/50 | | | >50 | 13 | | | | | | | | | | | | | |
| HQ | 8 | 100 | 70 | 70 | 0 | 0 | | | | | | | | | | | | | |
| SPT | 8 | 14/50 | | | >50 | 12 | | | | | | | | | | | | | |
| HQ | 9 | 100 | 65 | 65 | 0 | 0 | | | | | | | | | | | | | |


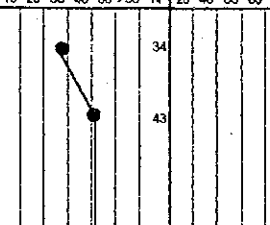
LOG OF BORING
Piston sample

BOREHOLE: BS-A5
sheet 2/2

| | | |
|--------------------------------|---|------------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION OFF SHORE | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: 13° 20' 6.0" - 87° 49' 30.4" | DRILLER: Swissboring |
| DEPTH: 14.00 m | BOTTOM SEA LEVEL: -4.00 chart datum level | DATE (START - FINISH): 21-21/11/01 |

| | | | |
|--|--|--|------------------------------------|
| SOIL SAMPLING SAMPLE TYPE SAMPLE NUMBER 1 BET 15 cm 2 BET 30 cm 3 BET 45 cm N VALUE RECOVERED cm | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | LOGGED BY: Rodolfo Alvarado |
| ROCK CORE CORE SIZE RUN NUMBER RUN LENGTH IN cm RECOVERY cm % RECOVERY ROD cm % ROD | | | INSPECTOR Dr. Pucal Yang |

| ROCK CORE | | DESCRIPTION | | SPT TEST | | ROD | | | | | | | |
|-----------|------------|------------------|-------------|------------|--------|-------|--------|------------|-------------|-------------|-----------------------|----------------------|-----------------|
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | ROD cm | % ROD | CDL m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | ROD |
| SPT | HQ | SPT | HQ | SPT | HQ | SPT | HQ | SPT | HQ | | | 10 20 30 40 50 >50 N | 20 40 60 80 100 |
| SPT 9 | 15/50 | 0 | 0 | >50 | 13 | | | | | | Idem material | | |
| HQ 10 | 100 | 70 | 70 | 0 | 0 | | -11.72 | 11 | | | | | |
| SPT 10 | 14/50 | 0 | 0 | >50 | 12 | | | | | | | | |
| HQ 11 | 100 | 70 | 70 | 0 | 0 | | -12.72 | 12 | | | | | |
| SPT 11 | 15/50 | 0 | 0 | >50 | 13 | | | | | | | | |
| HQ 15 | 100 | 60 | 60 | 0 | 0 | | -13.72 | 13 | | | | | |
| SPT 12 | 15/50 | 0 | 0 | >50 | 12 | | | | | | | | |
| HQ 16 | 100 | 70 | 70 | 0 | 0 | | -12.72 | 14 | | | 14.00 m END OF BORING | | |
| | | | | | | | | 15 | | | | | |
| | | | | | | | | 16 | | | | | |
| | | | | | | | | 17 | | | | | |
| | | | | | | | | 18 | | | | | |
| | | | | | | | | 19 | | | | | |
| | | | | | | | | 20 | | | | | |

| CLIENT: NIPPON KOEI Ltd | | SOIL INVESTIGATION OFF SHORE | | BOREHOLE: BS-A6 sheet 1/1 | | | |
|--|-----|---|----|--|----|---|--|
| COUNTRY: EL SALVADOR | | COORDINATES: 13° 20' 3.5" - 87° 49' 33.1" | | DRILL RIG: LY-34 | | | |
| DEPTH: 10.00 m | | BOTTOM SEA LEVEL: -2.20 chart datum level | | DRILLER: Swissboring | | | |
| | | | | DATE (START - FINISH): 21-21/11/01 | | | |
| | | | | LOGGED BY: Rodolfo Abarado | | | |
| | | | | INSPECTOR: Dr. Pucal Yang | | | |
| SOIL SAMPLING SAMPLE TYPE SAMPLE NUMBER 1 SET 15 cm 2 SET 30 cm 3 SET 45 cm N VALUE RECOVERED cm | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | | | | | |
| ROCK CORE CORE SIZE RUN NUMBER RUN LENGTH IN cm RECOVERY cm % RECOVERY RQD cm % RQD | | DESCRIPTION | | SPT TEST 10 20 30 40 50 >50 N RQD 20 40 60 80 100 | | | |
| SPT 1 | 17 | 15 | 19 | 34 | 45 | Sandy gravel, greenish gray, very soft consistency, high water content, high plasticity, moderate dry strength. |  |
| HQ 1 | 100 | 0 | 0 | 0 | 0 | | |
| SPT 2 | 20 | 18 | 25 | 43 | 45 | | |
| HQ 2 | 100 | 0 | 0 | 0 | 0 | | |
| SPT 3 | 19 | 18 | 25 | 43 | 45 | | |
| HQ 3 | 100 | 0 | 0 | 0 | 0 | | |
| SPT 4 | 26 | 23 | 30 | >50 | 45 | | |
| HQ 4 | 100 | 0 | 0 | 0 | 0 | | |
| SPT 5 | 21 | 24 | 25 | 49 | 45 | | |
| HQ 5 | 100 | 0 | 0 | 0 | 0 | | |
| SPT 6 | 23 | 25 | 31 | >50 | 45 | | |
| HQ 6 | 100 | 0 | 0 | 0 | 0 | | |
| SPT 7 | 24 | 28 | 31 | >50 | 45 | | |
| HQ 7 | 200 | 0 | 0 | 0 | 0 | | |
| SPT 8 | 31 | 25 | 30 | >50 | 45 | | |
| HQ 8 | 150 | 0 | 0 | 0 | 0 | | |
| SPT 9 | 19 | 26 | 28 | >50 | 40 | | |

| Swissboring Overseas Corp. Ltd. | | | | | | | | | | CEPA | | JICA Study Team | | LOG OF BORING | | | | | | | | | | BOREHOLE: BS-A7 | | | | | | | | | |
|---------------------------------|---------------|-------|-------|-------|---------|--------------|-----------|------------|------------------|---|------------|-----------------|-------|---------------|------------|-------------|-------------|--|----------|--|----|------------------------------------|----|-----------------|---|----|----|----|----|-------------|--|---------------------------------------|--|
| CLIENT: NIPPON KOEI Ltd | | | | | | | | | | SOIL INVESTIGATION OFF SHORE | | | | | | | | | | DRILL RIG: LY-34 | | sheet 1/2 | | | | | | | | | | | |
| COUNTRY: EL SALVADOR | | | | | | | | | | COORDINATES: 13° 20' 5.8" - 87° 49' 21.5" | | | | | | | | | | DRILLER: Swissboring | | DATE (START - FINISH): 21-21/11/01 | | | | | | | | | | | |
| DEPTH: 17.00 m | | | | | | | | | | BOTTOM SEA LEVEL: -9.20 chart datum level | | | | | | | | | | LOGGED BY: Rodolfo Alvarado | | INSPECTOR: Dr. Pucal Yang | | | | | | | | | | | |
| SOIL SAMPLING | | | | | | | | | | ROCK CORE | | | | | | | | | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR | | | | | | | | | | swissboring | | Swissboring Overseas Corporation Ltd. | |
| SAMPLE TYPE | SAMPLE NUMBER | 15 cm | 30 cm | 45 cm | N VALUE | RECOVERED cm | CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | CDL m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | | | | | RQD | | | | | | | | | |
| | | 1 SET | 2 SET | 3 SET | | | | | | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | >50 | N | 20 | 40 | 60 | 80 | 100 | | | |
| | | | | | | | | | | | | | | | | | | Clay, dark brown, very soft consistency, high water content, high plasticity, medium to high dry strength, organic smell | | | | | | | | | | | | | | | |
| HQ | 1 | 700 | 0 | 0 | 0 | 0 | | | | | | | | -10.20 | 1 | | | | | | | | | | | | | | | | | | |
| SPT | 1 | 1 | 0 | 0 | 1 | 45 | | | | | | | | -11.20 | 2 | | | | | | | | | | | | | | | | | | |
| HQ | 2 | 100 | 50 | 50 | 0 | 0 | | | | | | | | -12.20 | 3 | | | | | | | | | | | | | | | | | | |
| SPT | 2 | 1 | 1 | 1 | 2 | 45 | | | | | | | | -12.20 | 2 | | | | | | | | | | | | | | | | | | |
| HQ | 3 | 40 | 30 | 75 | 0 | 0 | | | | | | | | -13.20 | 4 | | | | | | | | | | | | | | | | | | |
| SPT | 3 | 1 | 1 | 2 | 3 | 45 | | | | | | | | -13.20 | 3 | | | | | | | | | | | | | | | | | | |
| HQ | 4 | 65 | 60 | 92 | 0 | 0 | | | | | | | | -14.20 | 5 | | | | | | | | | | | | | | | | | | |
| SPT | 4 | 1 | 2 | 4 | 6 | 45 | | | | | | | | -14.20 | 4 | | | | | | | | | | | | | | | | | | |
| HQ | 5 | 55 | 0 | 0 | 0 | 0 | | | | | | | | -15.20 | 6 | | | | | | | | | | | | | | | | | | |
| SPT | 5 | 1 | 2 | 3 | 5 | 45 | | | | | | | | -15.20 | 5 | | | | | | | | | | | | | | | | | | |
| HQ | 6 | 55 | 0 | 0 | 0 | 0 | | | | | | | | -16.20 | 7 | | | | | | | | | | | | | | | | | | |
| SPT | 6 | 1 | 2 | 4 | 6 | 45 | | | | | | | | -16.20 | 6 | | | | | | | | | | | | | | | | | | |
| HQ | 7 | 55 | 0 | 0 | 0 | 0 | | | | | | | | -17.20 | 8 | | | | | | | | | | | | | | | | | | |
| SPT | 7 | 4 | 6 | 8 | 14 | 35 | | | | | | | | -17.20 | 7 | | | | | | | | | | | | | | | | | | |
| HQ | 8 | 55 | 0 | 0 | 0 | 0 | | | | | | | | -18.20 | 9 | | | | | | | | | | | | | | | | | | |
| SPT | 8 | 7 | 10 | 10 | 20 | 30 | | | | | | | | -18.20 | 8 | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | -19.20 | 10 | | | | | | | | | | | | | | | | | | |

LOG OF BORING

BOREHOLE: BS-A7
sheet 2/2


| | | |
|-------------------------|---|------------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION OFF SHORE | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: LONG.: 627547; LAT.: 246397 | DRILLER: Swissboring |
| DEPTH: 17.00 m | BOTTOM SEA LEVEL: -8.00 chart datum level | DATE (START - FINISH): 21-21/11/01 |

| <p>SOIL SAMPLING</p> <table border="1"> <tr> <th>SAMPLE TYPE</th> <th>SAMPLE NUMBER</th> <th>1 SET 10 cm</th> <th>2 SET 30 cm</th> <th>3 SET 45 cm</th> <th>N VALUE</th> <th>RECOVERED - cm</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | SAMPLE TYPE | SAMPLE NUMBER | 1 SET 10 cm | 2 SET 30 cm | 3 SET 45 cm | N VALUE | RECOVERED - cm | | | | | | | | <p>GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR</p> <p>swissboring Swissboring Overseas Corporation Ltd.</p> | <p>LOGGED BY: Rodolfo Alvarado</p> |
|--|---------------|------------------|---------------|------------------|-------------|----------------|---------|----------------|--|--|--|--|--|--|--|---|--|
| SAMPLE TYPE | SAMPLE NUMBER | 1 SET 10 cm | 2 SET 30 cm | 3 SET 45 cm | N VALUE | RECOVERED - cm | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| <p>ROCK CORE</p> <table border="1"> <tr> <th>CORE SIZE</th> <th>RUN NUMBER</th> <th>RUN LENGTH IN cm</th> <th>RECOVERY cm</th> <th>% RECOVERY</th> <th>ROD cm</th> <th>% ROD</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | ROD cm | % ROD | | | | | | | | <p>INSPECTOR: Dr. Pucal Yang</p> | |
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | ROD cm | % ROD | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

| ROCK CORE | | | | | | | CDL m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | | | | | ROD | | | | |
|-----------------------|------------|------------------|-------------|------------|--------|-------|-------|------------|-------------|-------------|-------------|----------|----|----|----|----|-----|---|----|----|----|
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | ROD cm | % ROD | | | | | | 10 | 20 | 30 | 40 | 50 | >50 | N | 20 | 40 | 60 |
| SPT | 9 | 15/50 | | | | >50 | 12 | | | | | | | | | | | | | | |
| HQ | 10 | 100 | 100 | 100 | 0 | 0 | | -20.20 | | | | | | | | | | | | | |
| SPT | 10 | 14/50 | | | | >50 | 13 | | | | | | | | | | | | | | |
| HQ | 11 | 100 | 55 | 55 | 0 | 0 | | -21.20 | | | | | | | | | | | | | |
| SPT | 11 | 15/50 | | | | >50 | 14 | | | | | | | | | | | | | | |
| HQ | 12 | 100 | 30 | 30 | 0 | 0 | | -22.20 | | | | | | | | | | | | | |
| SPT | 12 | 13/50 | | | | >50 | 13 | | | | | | | | | | | | | | |
| HQ | 13 | 145 | 145 | 100 | 0 | 0 | | -23.20 | | | | | | | | | | | | | |
| SPT | 13 | 14/50 | | | | >50 | 12 | | | | | | | | | | | | | | |
| HQ | 14 | 100 | 30 | 30 | 0 | 0 | | -24.20 | | | | | | | | | | | | | |
| SPT | 14 | 13/50 | | | | >50 | 14 | | | | | | | | | | | | | | |
| HQ | 15 | 100 | 30 | 30 | 0 | 0 | | -25.20 | | | | | | | | | | | | | |
| SPT | 15 | 15/50 | | | | >50 | 12 | | | | | | | | | | | | | | |
| HQ | 16 | 130 | 30 | 23 | 0 | 0 | | -26.20 | | | | | | | | | | | | | |
| 17.00 m END OF BORING | | | | | | | | | | | | | | | | | | | | | |

LOG OF BORING


BOREHOLE: BL-1
sheet 2/2


| CLIENT: NIPPON KOEI Ltd | | SOIL INVESTIGATION ON LAND | | | | DRILL RIG: LY-34 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---------------|--|---------------|------------------|-------------|--------------------------------------|---------|--------------|----|----|----|----|----|---|---|--|----|----|----|--------------------------------|-----|----|----|----|----|----|----|---|---|-----|----|----|----|----|-----|----|----|----|----|----|----|---|---|-----|----|----|----|----|-----|----|----|----|----|----|----|---|---|-----|----|----|----|----|-----|----|----|----|----|----|----|---|---|-----|----|----|----|----|-----|----|----|----|----|----|----|---|---|---------------------------|--|
| COUNTRY: EL SALVADOR | | COORDINATES: LONG.: 627517.73; LAT.: 246049.02 | | | | DRILLER: Swissboring | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DEPTH 15.60 m | | ELEVATION: 12.34 (mosl) | | | | DATE (START - FINISH): 5-7/90/1 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SOIL SAMPLING <table border="1"> <tr> <th>SAMPLE TYPE</th> <th>SAMPLE NUMBER</th> <th>1 SET 15 cm</th> <th>2 SET 30 cm</th> <th>3 SET 45 cm</th> <th>N VALUE</th> <th>RECOVERED cm</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | SAMPLE TYPE | SAMPLE NUMBER | 1 SET 15 cm | 2 SET 30 cm | 3 SET 45 cm | N VALUE | RECOVERED cm | | | | | | | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | | | | LOGGED BY: Rodolfo Alvarado | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SAMPLE TYPE | SAMPLE NUMBER | 1 SET 15 cm | 2 SET 30 cm | 3 SET 45 cm | N VALUE | RECOVERED cm | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ROCK CORE <table border="1"> <tr> <th>CORE SIZE</th> <th>RUN NUMBER</th> <th>RUN LENGTH IN cm</th> <th>RECOVERY cm</th> <th>% RECOVERY</th> <th>RQD cm</th> <th>% RQD</th> </tr> <tr> <td>HQ</td> <td>16</td> <td>55</td> <td>25</td> <td>45</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>11</td> <td>16</td> <td>33</td> <td>43</td> <td>>50</td> <td>40</td> </tr> <tr> <td>HQ</td> <td>17</td> <td>55</td> <td>30</td> <td>55</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>12</td> <td>14</td> <td>27</td> <td>33</td> <td>>50</td> <td>40</td> </tr> <tr> <td>HQ</td> <td>18</td> <td>55</td> <td>40</td> <td>73</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>14</td> <td>14</td> <td>23</td> <td>34</td> <td>>50</td> <td>40</td> </tr> <tr> <td>HQ</td> <td>19</td> <td>55</td> <td>30</td> <td>55</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>13</td> <td>15</td> <td>29</td> <td>39</td> <td>>50</td> <td>40</td> </tr> <tr> <td>HQ</td> <td>20</td> <td>55</td> <td>25</td> <td>45</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>15</td> <td>15</td> <td>27</td> <td>45</td> <td>>50</td> <td>40</td> </tr> <tr> <td>HQ</td> <td>21</td> <td>55</td> <td>45</td> <td>82</td> <td>0</td> <td>0</td> </tr> </table> | | CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | HQ | 16 | 55 | 25 | 45 | 0 | 0 | SPT | 11 | 16 | 33 | 43 | >50 | 40 | HQ | 17 | 55 | 30 | 55 | 0 | 0 | SPT | 12 | 14 | 27 | 33 | >50 | 40 | HQ | 18 | 55 | 40 | 73 | 0 | 0 | SPT | 14 | 14 | 23 | 34 | >50 | 40 | HQ | 19 | 55 | 30 | 55 | 0 | 0 | SPT | 13 | 15 | 29 | 39 | >50 | 40 | HQ | 20 | 55 | 25 | 45 | 0 | 0 | SPT | 15 | 15 | 27 | 45 | >50 | 40 | HQ | 21 | 55 | 45 | 82 | 0 | 0 | INSPECTOR: Dr. Pucal Yang | |
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 16 | 55 | 25 | 45 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 11 | 16 | 33 | 43 | >50 | 40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 17 | 55 | 30 | 55 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 12 | 14 | 27 | 33 | >50 | 40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 18 | 55 | 40 | 73 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 14 | 14 | 23 | 34 | >50 | 40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 19 | 55 | 30 | 55 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 13 | 15 | 29 | 39 | >50 | 40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 20 | 55 | 25 | 45 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 15 | 15 | 27 | 45 | >50 | 40 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 21 | 55 | 45 | 82 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | ELEVATION (m) DEPTH IN m SAMPLE TYPE GRAPHIC LOG | | | | DESCRIPTION SPT TEST RQD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | Same material as above 10.65 m | | | | 10 20 30 40 50 >50 N 20 40 60 80 100 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | LAHAR, consists of volcanic blocks up to 200mm in length, most blocks are ranging in size from 30mm to 70mm in length slightly to moderately weathered, medium soft rock, weak, matrix is fine-to medium-grained sand, tuffaceous, loose, no plastic, low dry strength, silt to not fines. | | | | >50 >50 >50 >50 >50 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | 15.60 m END OF BORING | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

LOG OF BORING

BOREHOLE: BL-2
sheet 1/2

| | | |
|--------------------------------|--|------------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION ON LAND | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: LONG.: 627658.00, LAT.: 245900.00 | DRILLER: Swissboring |
| DEPTH: 14.00 m | ELEVATION: 12.23 most | DATE (START - FINISH): 17-20/10/01 |


| | | | |
|--|--|--|------------------------------------|
| SOIL SAMPLING SAMPLE TYPE SAMPLE NUMBER 1 SET 15 cm 2 SET 30 cm 3 SET 45 cm N VALUE RECOVERED cm | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | LOGGED BY: Rodolfo Alvarado |
| | | | INSPECTOR Dr. Pucal Yang |

| ROCK CORE | | | | | | | ELEVATION m | DEPTH IN m | SAMPLE TYPE GRAPHIC LOG | DESCRIPTION | SPT TEST | | | | | RQD | | | | |
|-----------|------------|------------------|-------------|------------|--------|-------|-------------|------------|--|--|----------|----|----|----|----|-----|---|----|----|----|
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | | | | | 10 | 20 | 30 | 40 | 50 | >50 | N | 20 | 40 | 60 |
| HQ | 1 | 55 | 55 | 100 | 0 | 0 | 11.23 | 1 |  | Sandy silt with clay, stiff consistency, dark brown, moderate water content, low plasticity, moderate dry strength, contains scattered decomposed roots, organic debris and few weathered rock fragments up to 10mm in size. | | | | | | | | | | |
| SPT | 1 | 2 | 5 | 6 | 11 | 45 | | | | 1.00 m | | | | | | | | | | |
| HQ | 2 | 55 | 55 | 100 | 0 | 0 | 10.23 | 2 | | Sandy silt, hard consistency, tuffaceous, beige to light brown, low water content, non-plastic, low dry strength, contains some weathered rock fragments up to 30mm in size. | | | | | | | | | | |
| SPT | 2 | 6 | 12 | 18 | 30 | 45 | | | | | | | | | | | | | | |
| HQ | 3 | 55 | 55 | 100 | 0 | 0 | 9.23 | 3 | | 3.00 m | | | | | | | | | | |
| SPT | 3 | 18 | 28 | 39 | >50 | 45 | | | | Lahar, weak, consists of some volcanic blocks, up to 100mm in length, medium hard to hard rock, contains silt, sand, gray, low consistency, low water content, non-plastic, low dry strength. | | | | | | | | | | |
| HQ | 4 | 55 | 53 | 96 | 0 | 0 | 8.23 | 4 | | | | | | | | | | | | |
| SPT | 4 | 27 | 37 | 38 | >50 | 45 | | | | | | | | | | | | | | |
| HQ | 5 | 55 | 55 | 100 | 0 | 0 | 7.23 | 5 | | 5.15 m | | | | | | | | | | |
| SPT | 5 | 5 | 14 | 33 | 47 | 45 | | | | | | | | | | | | | | |
| HQ | 6 | 55 | 40 | 73 | 0 | 0 | 6.23 | 6 | Sand and silt, light brown to cream, loose to medium dense, consists of fine to medium grained sand, pumiceous, with silt and pumice, low water content, non-plastic, low dry strength, contains some rock blocks up to 50 mm in length. | | | | | | | | | | | |
| SPT | 6 | 2 | 8 | 10 | 18 | 45 | | | | | | | | | | | | | | |
| HQ | 7 | 55 | 28 | 51 | 0 | 0 | 5.23 | 7 | | | | | | | | | | | | |
| SPT | 7 | 2 | 3 | 6 | 9 | 45 | | | | | | | | | | | | | | |
| HQ | 8 | 55 | 30 | 55 | 0 | 0 | 4.23 | 8 | 7.55 m | | | | | | | | | | | |
| SPT | 8 | 9 | 14 | 20 | 34 | 45 | | | | | | | | | | | | | | |
| HQ | 9 | 55 | 25 | 45 | 0 | 0 | 3.23 | 9 | Sandy silt with clay, hard consistency, light to dark brown, moderate to high water content, moderate plasticity, high dry strength, contains few and scattered, weathered rock fragments up to 20mm in size. | | | | | | | | | | | |
| SPT | 9 | 9 | 14 | 20 | 34 | 45 | | | | | | | | | | | | | | |
| HQ | 10 | 55 | 55 | 100 | 0 | 0 | 2.23 | 10 | 10.00 m | | | | | | | | | | | |
| SPT | 10 | 6 | 9 | 9 | 18 | 45 | | | | | | | | | | | | | | |

LOG OF BORING

BOREHOLE: BL-2
sheet 2/2

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|-------------------------|--|------------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION ON LAND | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: LONG.: 827658.00; LAT.: 245900.00 | DRILLER: Swissboring |
| DEPTH: 14.00 m | ELEVATION: 12.23 msl | DATE (START - FINISH): 17-20/10/01 |

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|---|--|--|-----------------------------|
| SOIL SAMPLING SAMPLE TYPE: 15 cm, 30 cm, 45 cm N VALUE, RECOVERED cm | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | LOGGED BY: Rodolfo Alvarado |
| ROCK CORE CORE SIZE, RUN NUMBER, RUN LENGTH IN cm, RECOVERY cm, % RECOVERY, ROD cm, % ROD | | | INSPECTOR |

| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | ROD cm | % ROD | ELEVATION m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | | ROD | | | |
|-----------|------------|------------------|-------------|------------|--------|-------|-------------|------------|-------------|-------------|--|----------|----|-----|----|----|-----|
| | | | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | >50 |
| HQ | 11 | 55 | 55 | 100 | 0 | 0 | | | | | Sandy silt with clay, hard consistency, light to dark brown, moderate to high water content, moderate plasticity, high dry strength, contains few and scattered, weathered rock fragments up to 20mm in size. 14.00 m END OF BORING | | | | | | |
| SPT | 11 | 6 | 11 | 13 | 24 | 45 | 2.23 | 11 | | | | | | | | | |
| HQ | 12 | 55 | 55 | 100 | 0 | 0 | | | | | | | | | | | |
| SPT | 12 | 8 | 14 | 16 | 30 | 45 | 0.23 | 12 | | | | | | | | | |
| HQ | 13 | 55 | 55 | 100 | 0 | 0 | | | | | | | | | | | |
| SPT | 13 | 15 | 15 | 17 | 32 | 45 | -1.23 | 13 | | | | | | | | | |
| SPT | 14 | 8 | 20 | 20 | 40 | 45 | | | | | | | | | | | |
| HQ | 14 | 10 | 10 | 100 | 0 | 0 | -2.23 | 14 | | | | | | | | | |
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LOG OF BORING

BOREHOLE: BL-3
sheet 1/1

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|-------------------------|--|----------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION ON LAND | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: LONG.: 627811.00; LAT.: 245735.00 | DRILLER: Swissboring |
| DEPTH: 7.20 m | ELEVATION: 25.97 m | DATE (START - FINISH): 3-5/10/01 |

| <p>SOIL SAMPLING</p> <table border="1"> <tr> <th>SAMPLE TYPE</th> <th>SAMPLE NUMBER</th> <th>1 SET 15 cm</th> <th>2 SET 30 cm</th> <th>3 SET 45 cm</th> <th>N VALUE</th> <th>RECOVERED cm</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | SAMPLE TYPE | SAMPLE NUMBER | 1 SET 15 cm | 2 SET 30 cm | 3 SET 45 cm | N VALUE | RECOVERED cm | | | | | | | | <p>GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR</p> <p>swissboring Swissboring Overseas Corporation Ltd.</p> | <p>LOGGED BY:</p> <p>Rodolfo Alvarado</p> |
|---|---------------|------------------|---------------|------------------|-------------|--------------|---------|--------------|--|--|--|--|--|--|--|---|---|
| SAMPLE TYPE | SAMPLE NUMBER | 1 SET 15 cm | 2 SET 30 cm | 3 SET 45 cm | N VALUE | RECOVERED cm | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| <p>ROCK CORE</p> <table border="1"> <tr> <th>CORE SIZE</th> <th>RUN NUMBER</th> <th>RUN LENGTH IN cm</th> <th>RECOVERY cm</th> <th>% RECOVERY</th> <th>RQD cm</th> <th>% RQD</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | | | | | | | | <p>INSPECTOR: Dr. Pucal Yang</p> | |
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

| ROCK CORE | | | | | | | ELEVATION m | DEPTH IN m | SAMPLE TYPE GRAPHIC LOG | DESCRIPTION | SPT TEST | | | | | RQD | | | | |
|-----------|------------|------------------|-------------|------------|--------|-------|-------------|------------|-------------------------|--|----------|----|----|----|----|-----|---|----|----|----|
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | | | | | 10 | 20 | 30 | 40 | 50 | >50 | N | 20 | 40 | 60 |
| HQ | 1 | 55 | 0 | 0 | 0 | 0 | 24.97 | 1 | | <p>Clayey silt with fine sand, stiff to very stiff consistency, dark to reddish brown, low water content, moderate plasticity, moderate dry strength, contains few weathered rock fragments up to 20mm in size, scattered and decomposed roots and organic debris.</p> | | | | | | | | | | |
| SPT | 1 | 2 | 4 | 7 | 11 | 30 | 23.97 | 2 | | | | | | | | | | | | |
| HQ | 2 | 55 | 0 | 0 | 0 | 0 | 22.97 | 3 | | | | | | | | | | | | |
| SPT | 2 | 9 | 12 | 24 | 36 | 35 | 21.97 | 4 | | | | | | | | | | | | |
| HQ | 3 | 55 | 0 | 0 | 0 | 0 | 20.97 | 5 | 3.60 m | <p>TOP OF SOUND ROCK. ANDESITIC BASALT, light to dark gray, hard to very hard rock, strong, moderately close to wide spaced jointing, joints are smooth, close, contains iron-oxides and manganese films, dip 0°, 45° and 60°, core is fine-grained, igneous.</p> | | | | | | | | | | |
| SPT | 3 | 16 | 40 | 5/50 | >50 | 25 | 19.97 | 6 | | | | | | | | | | | | |
| HQ | 4 | 60 | 60 | 100 | 0 | 0 | 18.97 | 7 | | | | | | | | | | | | |
| SPT | 4 | 20 | 45 | 5/50 | >50 | 25 | | 8 | | | | | | | | | | | | |
| HQ | 5 | 145 | 145 | 100 | 115 | 79 | | 9 | | | | | | | | | | | | |
| HQ | 6 | 150 | 150 | 100 | 125 | 83 | | 10 | | | | | | | | | | | | |
| HQ | 7 | 70 | 70 | 100 | 15 | 21 | | | | | | | | | | | | | | |

LOG OF BORING

BOREHOLE: BL-4
sheet 1/2

| | | |
|-------------------------|--|-----------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION ON LAND | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: LONG.: 627915.01; LAT.: 245627.02 | DRILLER: Swissboring |
| DEPTH 15.00 m | ELEVATION: 30.91 m | DATE (START - FINISH): 23-29/9/01 |

| <p>SOIL SAMPLING</p> <table border="1"> <tr> <th>SAMPLE TYPE</th> <th>SAMPLE NUMBER</th> <th>1 SET 15 cm</th> <th>2 SET 30 cm</th> <th>3 SET 45 cm</th> <th>N VALUE</th> <th>RECOVERED cm</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table> | | SAMPLE TYPE | SAMPLE NUMBER | 1 SET 15 cm | 2 SET 30 cm | 3 SET 45 cm | N VALUE | RECOVERED cm | | | | | | | | <p>GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR</p> <p>swissboring Swissboring Overseas Corporation Ltd.</p> | <p>LOGGED BY: Rodolfo Alvarado</p> |
|--|---------------|------------------|---------------|------------------|-------------|--------------|---------|--------------|--|--|--|--|--|--|--|---|--|
| SAMPLE TYPE | SAMPLE NUMBER | 1 SET 15 cm | 2 SET 30 cm | 3 SET 45 cm | N VALUE | RECOVERED cm | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| <p>ROCK CORE</p> <table border="1"> <tr> <th>CORE SIZE</th> <th>RUN NUMBER</th> <th>RUN LENGTH IN cm</th> <th>RECOVERY cm</th> <th>% RECOVERY</th> <th>RCD cm</th> <th>% RCD</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table> | | CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RCD cm | % RCD | | | | | | | | <p>INSPECTOR Dr. Pucal Yang</p> | |
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RCD cm | % RCD | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RCD cm | % RCD | ELEVATION m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | | RQD | |
|-----------|------------|------------------|-------------|------------|--------|-------|-------------|------------|-------------|-------------|---|----------|----------------|-----|--------------|
| | | | | | | | | | | | | 10 | 20 30 40 >50 N | 20 | 40 60 80 100 |
| HQ | 1 | 55 | 55 | 100 | 0 | 0 | 29.91 | 1 | | | Top soil, Redish-brown, wet, low water content, low to medium plasticity, sandy CLAY with gravels of 5 to 50 mm. | 19 | | | |
| SPT | 1 | 6 | 8 | 11 | 19 | 30 | 28.91 | 2 | | | | 37 | | | |
| HQ | 2 | 55 | 55 | 100 | 0 | 0 | 27.91 | 3 | | | 3.60 m | >50 | | | |
| SPT | 2 | 10 | 18 | 19 | 37 | 30 | 26.91 | 4 | | | LAHAR, weak, consists of sandy silt with clay, very stiff to hard consistency, moderate water content, low plasticity, moderate dry strength, contains angular, volcanic blocks up to 100mm in size, hard rock. | 33 | | | |
| HQ | 3 | 55 | 55 | 100 | 0 | 0 | 25.91 | 5 | | | | >50 | | | |
| SPT | 3 | 10 | 32 | 30 | >50 | 45 | 24.91 | 6 | | | | >50 | 34% | | |
| HQ | 4 | 55 | 55 | 100 | 0 | 0 | 23.91 | 7 | | | | >50 | 22% | | |
| SPT | 4 | 4 | 11 | 22 | 33 | 20 | 22.91 | 8 | | | | >50 | | | |
| HQ | 5 | 55 | 55 | 100 | 0 | 0 | 21.91 | 9 | | | | >50 | | | |
| SPT | 5 | 14 | 31 | 5/50 | >50 | 25 | 20.91 | 10 | | | | 45 | 33% | | |
| HQ | 6 | 65 | 65 | 100 | 0 | 0 | | | | | | | | | |
| SPT | 6 | 15 | 5/50 | | >50 | 20 | | | | | | | | | |
| HQ | 7 | 35 | 35 | 100 | 12 | 34 | | | | | | | | | |
| HQ | 8 | 55 | 55 | 100 | 12 | 22 | | | | | | | | | |
| SPT | 7 | 15/50 | | >50 | 15 | | | | | | | | | | |
| HQ | 9 | 55 | 55 | 100 | 10 | 18 | | | | | | | | | |
| HQ | 10 | 35 | 35 | 100 | 0 | 0 | | | | | | | | | |
| SPT | 8 | 14/50 | | >50 | 10 | | | | | | | | | | |
| HQ | 11 | 60 | 60 | 100 | 10 | 17 | | | | | | | | | |
| SPT | 9 | 10 | 20 | 25 | 45 | 20 | | | | | | | | | |
| HQ | 13 | 45 | 45 | 100 | 0 | 0 | | | | | | | | | |
| SPT | 10 | 10 | 15 | 20 | 35 | 25 | | | | | | | | | |
| HQ | 14 | 55 | 55 | 100 | 0 | 0 | | | | | | | | | |
| SPT | 11 | 5 | 6 | 20 | 26 | 40 | | | | | | | | | |

LOG OF BORING

BOREHOLE: BL-4
sheet 2/2

| | | |
|-------------------------|---|-----------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION ON LAND | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: LONG: 827815.01; LAT.: 245627.02 | DRILLER: Swissboring |
| DEPTH 15.00 m | ELEVATION: 30.91 mssl | DATE (START - FINISH): 23-29/8/01 |

| SOIL SAMPLING | | | | | |
|---------------|---------------|-------------|-------------|-------------|--------------|
| SAMPLE TYPE | SAMPLE NUMBER | 1 SET 15 cm | 2 SET 30 cm | 3 SET 45 cm | N VALUE |
| | | | | | RECOVERED cm |

GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR

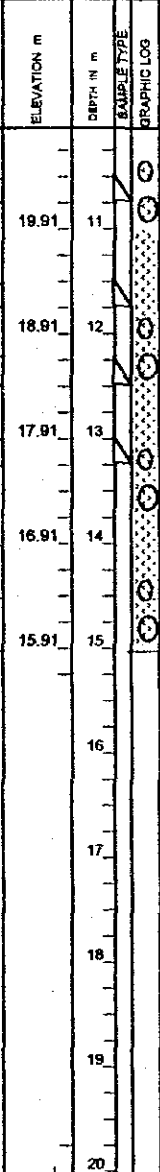


LOGGED BY:
Rodolfo Alvarado

INSPECTOR Dr. Pucal Yang

ROCK CORE

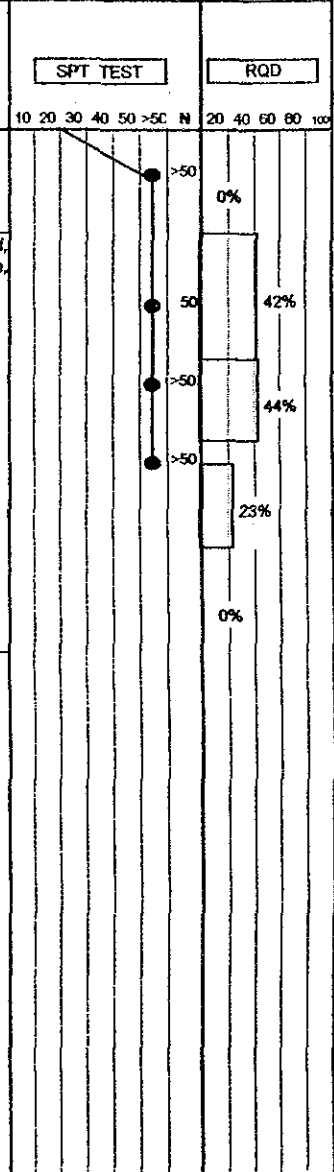
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RCD cm | % RCD |
|-----------|------------|------------------|-------------|------------|--------|-------|
| HQ | 15 | 55 | 55 | 100 | 0 | 0 |
| SPT | 12 | 10/50 | | | >50 | 0 |
| HQ | 16 | 45 | 45 | 100 | 0 | 0 |
| SPT | 13 | 20 | 10/50 | | >50 | 20 |
| HQ | 17 | 120 | 120 | 100 | 50 | 42 |
| SPT | 14 | 15 | 14/50 | | >50 | 20 |
| HQ | 18 | 80 | 80 | 100 | 35 | 44 |
| SPT | 15 | 23 | 13/50 | | >50 | 20 |
| HQ | 20 | 80 | 80 | 100 | 18 | 23 |
| HQ | 21 | 50 | 50 | 100 | 0 | 0 |
| HQ | 22 | 50 | 50 | 100 | 0 | 0 |



DESCRIPTION

From 11.0 15.0 m
Cobble and Gravel, gray, hard rock, fresh to highly weathered, moderate strength to strong, close jointing, joints are rough, open, clean, core is fine-grained, igneous.

15.00 m END OF BORING



LOG OF BORING

BOREHOLE: BL-5
sheet 1/2


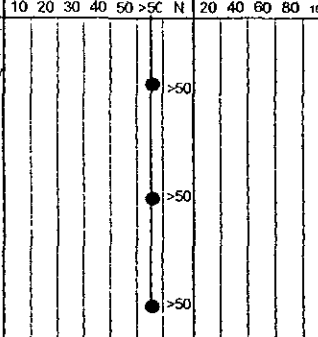
| | | |
|-------------------------|--|----------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION ON LAND | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: LONG.: 627428.18; LAT.: 245964.64 | DRILLER: Swissboring |
| DEPTH 13.00 m | ELEVATION: 18.09 most | DATE (START - FINISH): 9-10/9/01 |

| <p>SOIL SAMPLING</p> <table border="1"> <tr> <th>SAMPLE TYPE</th> <th>SAMPLE NUMBER</th> <th>1 SET 15 cm</th> <th>2 SET 30 cm</th> <th>3 SET 45 cm</th> <th>N VALUE</th> <th>RECOVERED cm</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | SAMPLE TYPE | SAMPLE NUMBER | 1 SET 15 cm | 2 SET 30 cm | 3 SET 45 cm | N VALUE | RECOVERED cm | | | | | | | | <p>GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR</p> <p>swissboring Swissboring Overseas Corporation Ltd.</p> | <p>LOGGED BY: Rodolfo Alvarado</p> |
|---|---------------|------------------|---------------|------------------|-------------|--------------|---------|--------------|--|--|--|--|--|--|--|---|--|
| SAMPLE TYPE | SAMPLE NUMBER | 1 SET 15 cm | 2 SET 30 cm | 3 SET 45 cm | N VALUE | RECOVERED cm | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| <p>ROCK CORE</p> <table border="1"> <tr> <th>CORE SIZE</th> <th>RUN NUMBER</th> <th>RUN LENGTH IN cm</th> <th>RECOVERY cm</th> <th>% RECOVERY</th> <th>RCD cm</th> <th>% RCD</th> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </table> | | CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RCD cm | % RCD | | | | | | | | <p>INSPECTOR Dr. Pucal Yang</p> | |
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RCD cm | % RCD | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

| | | | | | | | DESCRIPTION | | SPT TEST | | | | | RQD | | | | | |
|-----------|------------|------------------|-------------|------------|--------|-------|-------------|------------|---|----------------------|--|--|--|-----|-----------------|--|--|--|--|
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RCD cm | % RCD | ELEVATION m | DEPTH IN m | GRAPHIC LOG | 10 20 30 40 50 >50 N | | | | | 20 40 60 80 100 | | | | |
| HQ | 1 | 55 | 55 | 100 | 0 | 0 | 17.09 | 1 | ORGANIC SOIL, sandy silt with clay, dark brown, medium plasticity, medium water content, medium dry strength, contains organic material (roots). | | | | | | | | | | |
| SPT | 1 | 3 | 8 | 10 | 18 | 45 | | 1 | 0.15 m | | | | | | | | | | |
| HQ | 2 | 55 | 55 | 100 | 0 | 0 | 16.09 | 2 | SILT, reddish brown with traces of fine-grained sand and clay, low plasticity, low water content, moderate dry strength. | | | | | | | | | | |
| SPT | 2 | 10 | 19 | 17 | 36 | 40 | | 2 | 0.75 m | | | | | | | | | | |
| HQ | 3 | 55 | 55 | 100 | 0 | 0 | 15.09 | 3 | HIGHLY WEATHERED ROCK BLOCKS, light brown to beige, non-plastic, moderate to high dry strength, consists of sandy silt with rock blocks moderately to highly weathered, very weak. | | | | | | | | | | |
| SPT | 3 | 10 | 17 | 21 | 38 | 35 | | 3 | 2.55 m | | | | | | | | | | |
| HQ | 4 | 55 | 55 | 100 | 0 | 0 | 14.09 | 4 | Silty sand, greenish gray-brown, low to very low plasticity, low water content with some parts of high water content, low to moderate dry strength with rock fragments up to 50mm in size. | | | | | | | | | | |
| SPT | 4 | 20 | 36 | 32 | >50 | 30 | | 4 | | | | | | | | | | | |
| HQ | 5 | 55 | 55 | 100 | 0 | 0 | 13.09 | 5 | | | | | | | | | | | |
| SPT | 5 | 10 | 10 | 9 | 19 | 35 | | 5 | | | | | | | | | | | |
| HQ | 6 | 55 | 55 | 100 | 0 | 0 | 12.09 | 6 | 5.75 m | | | | | | | | | | |
| SPT | 6 | 29 | 49 | 13/50 | >50 | 32 | | 6 | LAHAR, sound to moderately weathered volcanic rock blocks up to 200mm in length with fine-grained material that was not recovered. From 9.15 to 9.45m depth, medium-to fine-grained sand bed with rock blocks up to 50mm in length. | | | | | | | | | | |
| HQ | 7 | 55 | 35 | 64 | 0 | 0 | 11.09 | 7 | | | | | | | | | | | |
| SPT | 7 | 29 | 45 | 10/50 | >50 | 32 | | 7 | | | | | | | | | | | |
| HQ | 8 | 55 | 30 | 55 | 0 | 0 | 10.09 | 8 | | | | | | | | | | | |
| SPT | 8 | 29 | 46 | 12/50 | >50 | 32 | | 8 | | | | | | | | | | | |
| HQ | 9 | 60 | 55 | 92 | 46 | 77 | 9.09 | 9 | | | | | | | | | | | |
| SPT | 9 | 29 | 44 | 11/50 | >50 | 32 | | 9 | | | | | | | | | | | |
| HQ | 10 | 60 | 30 | 50 | 0 | 0 | 8.09 | 10 | | | | | | | | | | | |
| SPT | 10 | 29 | 49 | 9/50 | >50 | 32 | | 10 | 10.00 m | | | | | | | | | | |

LOG OF BORING


BOREHOLE: BL-5
sheet 2/2

| CLIENT: NIPPON KOEI Ltd | | SOIL INVESTIGATION ON LAND | | | | DRILL RIG: LY-34 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---------------|--|-------------|--|-------------|--|--------|-------------|---------------|-------------|-------------|-------------|---------|---|---|-----|----|-------|--|--|--|----|----|--------------------------------|----|----|----|---|---|-----|----|-------|--|-----|--|----|----|----|----|----|----|---|---|-----|----|------|--|-----|--|----|----|----|----|----|----|---|---|---|--|-------------|--|-----------------|--|
| COUNTRY: EL SALVADOR | | COORDINATES: LONG.: 627428.18; LAT.: 245964.64 | | | | DRILLER: Swissboring | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| DEPTH: 13.00 m | | ELEVATION: 18.09 msl | | | | DATE (START - FINISH): 9-10/01 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| SOIL SAMPLING | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SAMPLE TYPE | SAMPLE NUMBER | 1 SET 15 cm | 2 SET 30 cm | 3 SET 45 cm | N VALUE | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| ROCK CORE | | | | | | INSPECTOR: Dr. Pucal Yang | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| <table border="1"> <thead> <tr> <th>CORE SIZE</th> <th>RUN NUMBER</th> <th>RUN LENGTH IN cm</th> <th>RECOVERY cm</th> <th>% RECOVERY</th> <th>RCD cm</th> <th>% RCD</th> </tr> </thead> <tbody> <tr> <td>HQ</td> <td>11</td> <td>25</td> <td>15</td> <td>60</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>11</td> <td>13/50</td> <td></td> <td>>50</td> <td></td> <td>12</td> </tr> <tr> <td>HQ</td> <td>22</td> <td>80</td> <td>40</td> <td>50</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>12</td> <td>11/50</td> <td></td> <td>>50</td> <td></td> <td>11</td> </tr> <tr> <td>HQ</td> <td>23</td> <td>80</td> <td>50</td> <td>63</td> <td>0</td> <td>0</td> </tr> <tr> <td>SPT</td> <td>13</td> <td>9/50</td> <td></td> <td>>50</td> <td></td> <td>12</td> </tr> <tr> <td>HQ</td> <td>24</td> <td>30</td> <td>25</td> <td>83</td> <td>0</td> <td>0</td> </tr> </tbody> </table> | | CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RCD cm | % RCD | HQ | 11 | 25 | 15 | 60 | 0 | 0 | SPT | 11 | 13/50 | | >50 | | 12 | HQ | 22 | 80 | 40 | 50 | 0 | 0 | SPT | 12 | 11/50 | | >50 | | 11 | HQ | 23 | 80 | 50 | 63 | 0 | 0 | SPT | 13 | 9/50 | | >50 | | 12 | HQ | 24 | 30 | 25 | 83 | 0 | 0 | ELEVATION m DEPTH IN m SAMPLE TYPE GRAPHIC LOG | | DESCRIPTION | | SPT TEST RQD | |
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RCD cm | % RCD | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 11 | 25 | 15 | 60 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 11 | 13/50 | | >50 | | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 22 | 80 | 40 | 50 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 12 | 11/50 | | >50 | | 11 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 23 | 80 | 50 | 63 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| SPT | 13 | 9/50 | | >50 | | 12 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| HQ | 24 | 30 | 25 | 83 | 0 | 0 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | SILTY SAND, fine-to medium-grained, dark brown, low plasticity to non-plastic, low dry strength, with some rock blocks up to 70mm in length. From 12.40 to 13.00m depth, sandy silt with some rock blocks, low plasticity. | | 10 20 30 40 50 >5C N 20 40 60 80 100  | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | 13.00 m END OF BORING | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

LOG OF BORING

BOREHOLE: BL-6
sheet 1/1

| | | |
|-------------------------|--|----------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION ON LAND | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: LONG.: 627722.32; LAT.: 245654.87 | DRILLER: Swissboring |
| DEPTH 8.10 m | ELEVATION: 35.18 mosl | DATE (START - FINISH): 7-7/10/01 |

| | | | |
|---|--|--|------------------------------------|
| SOIL SAMPLING SAMPLE TYPE: 1 SET (15 cm), 2 SET (30 cm), 3 SET (45 cm) N VALUE: _____ RECOVERED cm: _____ | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | LOGGED BY: Rodolfo Alvarado |
| ROCK CORE CORE SIZE: HQ, SPT RUN NUMBER: 1-8 RUN LENGTH IN cm: 55, 55, 72, 88, 140, 100, 110 RECOVERY cm: 55, 55, 72, 88, 140, 100, 110 % RECOVERY: 100, 100, 100, 100, 100, 100, 100 ROD cm: 0, 0, 0, 0, 125, 50, 65 % ROD: 0, 0, 0, 0, 89, 50, 59 | | | INSPECTOR: Dr. Pucal Yang |

| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | ROD cm | % ROD | ELEVATION m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | | | | | ROD | | | | | | |
|-----------|------------|------------------|-------------|------------|--------|-------|-------------|------------|-------------|-------------|--|----------|----|----|----|----|-----|---|----|----|----|----|------|
| | | | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | >50 | N | 20 | 40 | 60 | 80 | 100 |
| HQ | 1 | 55 | 55 | 100 | 0 | 0 | 34.18 | 1 | | | Silty sand with clay, stiff consistency, reddish brown, moderate water content, moderate plasticity, high dry strength, contains scattered decomposed roots and organic debris. | | | | | | | | | | | | |
| SPT | 1 | 3 | 6 | 8 | 14 | 45 | 34.18 | 1 | | | 1.00 m | | | | | | | | | | | | |
| HQ | 2 | 55 | 55 | 100 | 0 | 0 | 33.18 | 2 | | | Silty sand with clay, low water content, low plasticity to non-plastic, low to moderate dry strength, contains traces of sub-angular to sub-rounded volcanic blocks up to 50mm in size, moderate to highly weathered, medium hard rock. | | | | | | | | | | | | |
| SPT | 2 | 10 | 13/50 | - | >50 | 28 | 33.18 | 2 | | | | | | | | | | | | | | | |
| HQ | 3 | 72 | 72 | 100 | 0 | 0 | 32.18 | 3 | | | 3.10 m | | | | | | | | | | | | |
| SPT | 3 | 10/50 | - | - | >50 | 10 | 32.18 | 3 | | | | | | | | | | | | | | | |
| HQ | 4 | 88 | 88 | 100 | 0 | 0 | 31.18 | 4 | | | TOP OF WEATHERED ROCK. | | | | | | | | | | | | |
| | | | | | | | 31.18 | 4 | | | ANDESITIC BASALT, dark gray, medium soft to medium hard rock, slightly to highly weathered, weak to moderate strength, close to moderately close jointing, joints are stepped, rough, open, contains silt, fine-grained, igneous. | | | | | | | | | | | | 89% |
| HQ | 5 | 140 | 140 | 100 | 125 | 89 | 30.18 | 5 | | | 5.00 m | | | | | | | | | | | | 50% |
| | | | | | | | 30.18 | 5 | | | TOP OF SOUND ROCK. | | | | | | | | | | | | 100% |
| HQ | 6 | 100 | 100 | 100 | 50 | 50 | 29.18 | 6 | | | ANDESITIC BASALT, dark gray, hard to very hard rock, strong, moderately close to wide spaced jointing, joints are stepped and planar, most joints are smooth and open, dipping 0°, 30°, 45° and 60°, joints contain manganese films, core is very fine-to fine-grained, igneous. | | | | | | | | | | | | |
| HQ | 7 | 100 | 100 | 100 | 100 | 100 | 28.18 | 7 | | | | | | | | | | | | | | | |
| HQ | 8 | 110 | 110 | 100 | 65 | 59 | 27.18 | 8 | | | 8.10 m END OF BORING | | | | | | | | | | | | 59% |
| | | | | | | | | 9 | | | | | | | | | | | | | | | |
| | | | | | | | | 10 | | | | | | | | | | | | | | | |

LOG OF BORING

BOREHOLE: BL-7
sheet 1/2

| | | |
|-------------------------|--|-----------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION ON LAND | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: LONG.: 627334.52; LAT.: 245880.25 | DRILLER: Swissboring |
| DEPTH: 18.00 m | ELEVATION: 18.61 masl | DATE (START - FINISH): 12-15/9/01 |

| SOIL SAMPLING | | | | | | |
|---------------|---------------|-------|-------|-------|---------|--------------|
| SAMPLE TYPE | SAMPLE NUMBER | 15 cm | 30 cm | 45 cm | N VALUE | RECOVERED cm |
| 1 SET | | | | | | |
| 2 SET | | | | | | |
| 3 SET | | | | | | |

GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR

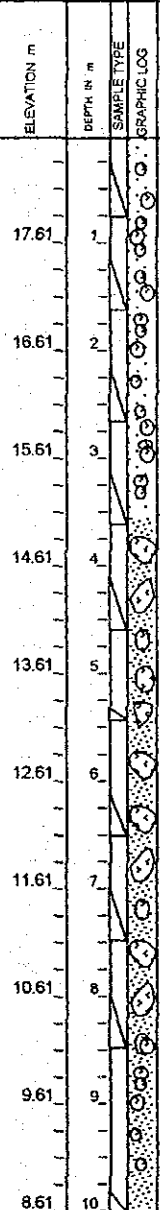


LOGGED BY:
Rodolfo Alvarado

INSPECTOR: Dr. Pucal Yang

ROCK CORE

| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | ROD | |
|-----------|------------|------------------|-------------|------------|-----|----|
| | | | | | cm | % |
| HQ | 1 | 35 | 20 | 57 | 0 | 0 |
| SPT | 1 | 5 | 12 | 45 | >50 | 30 |
| HQ | 2 | 45 | 45 | 100 | 0 | 0 |
| SPT | 2 | 12 | 27 | 34 | >50 | 30 |
| HQ | 3 | 50 | 20 | 40 | 0 | 0 |
| SPT | 3 | 21 | 35 | 49 | >50 | 30 |
| HQ | 4 | 45 | 35 | 78 | 0 | 0 |
| SPT | 4 | 21 | 49 | 27 | >50 | 30 |
| HQ | 5 | 45 | 35 | 78 | 0 | 0 |
| SPT | 5 | 18 | 34 | 45 | >50 | 30 |
| HQ | 6 | 80 | 80 | 100 | 0 | 0 |
| SPT | 6 | 13/50 | | | >50 | 13 |
| HQ | 7 | 80 | 30 | 38 | 0 | 0 |
| SPT | 7 | 18 | 37 | 10/50 | >50 | 40 |
| HQ | 8 | 40 | 35 | 88 | 0 | 0 |
| SPT | 8 | 38 | 48 | 37 | >50 | 45 |
| HQ | 9 | 40 | 35 | 88 | 0 | 0 |
| SPT | 9 | 12 | 18 | 17 | 35 | 45 |
| HQ | 10 | 55 | 55 | 100 | 0 | 0 |
| HQ | 11 | 80 | 50 | 63 | 0 | 0 |
| SPT | 10 | 14 | 10/50 | | >50 | 25 |



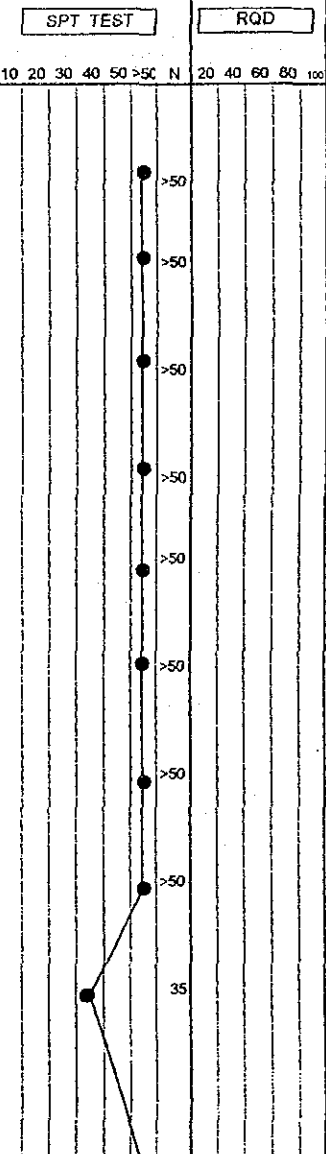
DESCRIPTION

GRAVEL, weak, consists of fine sand and silt, low water content, non-plastic, contains abundant, angular, volcanic blocks up to 200mm in size, hard rock.

3.50 m

SILTY SAND AND GRAVEL, consists of fine-to coarse sand, gray, non-plastic, very low dry strength, contains traces of sub-angular, volcanic blocks up to 150mm in size, weathered, weak.


10.10 m



LOG OF BORING

BOREHOLE: BL-7
sheet 2/2

| | | |
|--------------------------------|--|-----------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION ON LAND | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: LONG.: 627334.52; LAT.: 245880.25 | DRILLER: Swissboring |
| DEPTH: 18.00 m | ELEVATION: 18.61 mosl | DATE (START - FINISH): 12-15/9/01 |


| | | | |
|--|--|---|-----------------------------|
| SOIL SAMPLING SAMPLE TYPE: SAMPLE NUMBER, 1 SET (15 cm), 2 SET (30 cm), 3 SET (45 cm), N VALUE, RECOVERED cm | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | LOGGED BY: Rodolfo Alvarado |
| ROCK CORE CORE SIZE, RUN NUMBER, RUN LENGTH (in cm), RECOVERY cm, % RECOVERY, RCD cm, % RCD | | | INSPECTOR: Dr. Pucal Yang |

| ROCK CORE | | | | | | | ELEVATION m | DEPTH IN m | SAMPLE TYPE | DESCRIPTION | SPT TEST | | | | | RQD | | | | |
|-----------|------------|--------------------|-------------|------------|--------|-------|-------------|------------|--|-------------|----------|----|----|----|----|-----|---|----|----|----|
| CORE SIZE | RUN NUMBER | RUN LENGTH (in cm) | RECOVERY cm | % RECOVERY | RCD cm | % RCD | | | | | 10 | 20 | 30 | 40 | 50 | >50 | N | 20 | 40 | 60 |
| HQ | 12 | 85 | 50 | 59 | 0 | 0 | 7.61 | 11 | LAHAR, weak, light to dark gray, consists of angular, volcanic blocks up to 60mm in diameter, moderate weathered, medium hard rock, sandy, tuffaceous matrix, low water content, non-plastic, very poorly cemented. | | | | | | | | | | | |
| SPT | 11 | 34 | 5/50 | | >50 | 20 | | | | | | | | | | | | | | |
| HQ | 13 | 75 | 25 | 33 | 0 | 0 | 6.61 | 12 | 12.40 m | | | | | | | | | | | |
| SPT | 12 | 26 | 5/50 | | >50 | 20 | | | | | | | | | | | | | | |
| HQ | 14 | 75 | 60 | 80 | 0 | 0 | 5.61 | 13 | SANDY SILT, very weak, light gray, moderate water content, low plasticity, moderate dry strength, contains few, angular, volcanic blocks up to 30mm in size, moderate to high weathered, medium hard rock. | | | | | | | | | | | |
| SPT | 13 | 24 | 10/50 | | >50 | 25 | | | | | | | | | | | | | | |
| HQ | 15 | 75 | 20 | 27 | 0 | 0 | 4.61 | 14 | 13.60 m | | | | | | | | | | | |
| SPT | 14 | 8 | 10/50 | | >50 | 22 | | | | | | | | | | | | | | |
| HQ | 16 | 75 | 70 | 93 | 0 | 0 | 3.61 | 15 | LAHAR, weak, light gray, consists of some angular, volcanic blocks varying in size from 5mm to 70mm in size, medium hard to hard rock, moderate weathered, contains silt and sand, tuffaceous, low water content, non-plastic, low dry strength, not-cemented. | | | | | | | | | | | |
| SPT | 15 | 22 | 10/50 | | >50 | 23 | | | | | | | | | | | | | | |
| HQ | 17 | 75 | 45 | 60 | 0 | 0 | 2.61 | 16 | | | | | | | | | | | | |
| SPT | 16 | 34 | 10/50 | | >50 | 25 | | | | | | | | | | | | | | |
| HQ | 18 | 60 | 40 | 67 | 0 | 0 | 1.61 | 17 | | | | | | | | | | | | |
| SPT | 17 | 12 | 10/50 | | >50 | 20 | | | | | | | | | | | | | | |
| HQ | 19 | 25 | 50 | 200 | 0 | 0 | | | | | | | | | | | | | | |
| SPT | 18 | 21 | 10/50 | | >50 | 20 | | | | | | | | | | | | | | |
| HQ | 20 | 15 | 40 | 267 | 0 | 0 | 0.61 | 18 | 18.00 m END OF BORING | | | | | | | | | | | |
| | | | | | | | -1.61 | 19 | | | | | | | | | | | | |
| | | | | | | | -2.61 | 20 | | | | | | | | | | | | |

LOG OF BORING

BOREHOLE: BL-8
sheet 1/1

| | | |
|-------------------------|--|------------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION ON LAND | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: LONG.: 627479.00; LAT.: 245736.00 | DRILLER: Swissboring |
| DEPTH 10.00 m | ELEVATION: 18.63 most | DATE (START - FINISH): 22-29/10/01 |

| | | | |
|---|--|--|------------------------------------|
| SOIL SAMPLING TYPE NUMBER 15 cm 30 cm 45 cm SAMPLE NUMBER 1 SET 2 SET 3 SET N VALUE RECOVERED cm | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | LOGGED BY: Rodolfo Alvarado |
| ROCK CORE CORE SIZE RUN NUMBER RUN LENGTH IN cm RECOVERY cm % RECOVERY RQD cm % RQD | | | INSPECTOR Dr. Pucal Yang |


| ROCK CORE | | | | | | | ELEVATION m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | | RQD | | | | | |
|-----------|------------|------------------|-------------|------------|--------|-------|-------------|------------|-------------|-------------|---|----------|----|-----|----|----|-----|---|----|
| CORE SIZE | RUN NUMBER | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | | | | | | 10 | 20 | 30 | 40 | 50 | >50 | N | 20 |
| HQ | 1 | 55 | 55 | 100 | 0 | 0 | 15.63 | 1 | | | Clayey silt, tuffaceous, light to dark brown, very stiff to hard consistency, low to moderate water content, low plasticity, low to moderate dry strength, contains some angular to sub-angular rock fragments up to 12mm in length | 39 | | | | | | | |
| SPT | 1 | 9 | 22 | 17 | 39 | 45 | 14.63 | 2 | | | 2.00 m | 15 | | | | | | | |
| HQ | 2 | 55 | 55 | 100 | 0 | 0 | 13.63 | 3 | | | | >50 | | | | | | | |
| SPT | 2 | 4 | 10 | 5 | 15 | 35 | 12.63 | 4 | | | Lahar, medium gray, low consistency, weak, low water content, low plasticity, low dry strength, contains abundant rock fragments up to 5mm in length, poorly cemented, sandy silt matrix. | >50 | | | | | | | |
| HQ | 3 | 55 | 55 | 100 | 0 | 0 | 11.63 | 5 | | | 5.00 m | >50 | | | | | | | |
| SPT | 3 | 10 | 34 | 50 | >50 | 35 | 10.63 | 6 | | | Sand, very dense, weak, contains abundant angular basaltic and andesitic rock fragments up to 110mm in length, medium hard to hard rock fragments, matrix was not recovered. | >50 | | | | | | | |
| HQ | 4 | 55 | 55 | 100 | 0 | 0 | 9.63 | 7 | | | From 6.0 to 10.0 m | >50 | | | | | | | |
| SPT | 4 | 5 | 10/50 | - | >50 | 25 | 8.63 | 8 | | | Gravel, medium low to low consistency, weak, contains abundant angular basaltic and andesitic rock fragments up to 110mm in length, medium hard to hard rock fragments, matrix was not recovered. | >50 | | | | | | | |
| HQ | 5 | 80 | 80 | 100 | 0 | 0 | 7.63 | 9 | | | | >50 | | | | | | | |
| SPT | 5 | 12 | 20 | 35 | >50 | 35 | 6.63 | 10 | | | | >50 | | | | | | | |
| HQ | 6 | 55 | 37 | 67 | 0 | 0 | | | | | | >50 | | | | | | | |
| SPT | 6 | 22 | 28 | 32 | >50 | 35 | | | | | | >50 | | | | | | | |
| HQ | 7 | 50 | 35 | 70 | 0 | 0 | | | | | | >50 | | | | | | | |
| SPT | 7 | 22 | 34 | 32 | >50 | 35 | | | | | | >50 | | | | | | | |
| HQ | 8 | 100 | 41 | 41 | 0 | 0 | | | | | | >50 | | | | | | | |
| SPT | 8 | 18 | 22 | 45 | >50 | 35 | | | | | | >50 | | | | | | | |
| HQ | 9 | 100 | 20 | 20 | 0 | 0 | | | | | | >50 | | | | | | | |
| SPT | 9 | 12/50 | | | >50 | 10 | | | | | | >50 | | | | | | | |
| HQ | 10 | 90 | 40 | 44 | 0 | 0 | | | | | | >50 | | | | | | | |
| SPT | 10 | 13/50 | | | >50 | 10 | | | | | | >50 | | | | | | | |
| HQ | 11 | 12 | 5 | 42 | 0 | 0 | | | | | | >50 | | | | | | | |

10.00 m END OF BORING

LOG OF BORING

BOREHOLE: BL-9
sheet 1/1

| | | |
|-------------------------|--|-----------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION ON LAND | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: LONG.: 627633.24; LAT.: 245572.56 | DRILLER: Swissboring |
| DEPTH: 5.50 m | ELEVATION: 45.04 most | DATE (START - FINISH): 21-21/9/01 |


| | | | |
|--|--|--|------------------------------------|
| SOIL SAMPLING SAMPLE TYPE SAMPLE NUMBER 1 SET 15 cm 2 SET 30 cm 3 SET 45 cm N VALUE RECOVERED cm | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | LOGGED BY: Rodolfo Alvarado |
| ROCK CORE CORE SIZE RUN NUMBER RUN LENGTH IN cm RECOVERY cm % RECOVERY RQD cm % RQD | | | INSPECTOR Dr. Pucal Yang |

| ROCK CORE | | ELEVATION m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | | | | | RQD | | | | | | | |
|-----------|------------|-------------|------------|-------------|-------------|-------------|---|-------------|------------|--------|-------|-----|----|----|----|----|-----|---|----|
| CORE SIZE | RUN NUMBER | | | | | | RUN LENGTH IN cm | RECOVERY cm | % RECOVERY | RQD cm | % RQD | 10 | 20 | 30 | 40 | 50 | >50 | N | 20 |
| HQ | 1 | 50 | 50 | 100 | 0 | 0 | SANDY SILT, dark brown, stiff consistency, low to moderate water content, low to moderate plasticity, high dry strength, consists of silt with fine sand, tuffaceous, contains scattered basaltic and andesitic rock fragments, ranging in size up to 70mm in length, in the upper part exhibits scattered roots. | | | | | | | | | | | | |
| HQ | 2 | 50 | 50 | 100 | 0 | 0 | | 44.04 | 1 | | | | | | | | | | |
| SPT | 1 | 3 | 4 | 6 | 10 | 40 | | | | | | | | | | | | | |
| HQ | 3 | 55 | 55 | 100 | 0 | 0 | 1.50 m GRAVEL, consists of angular to sub-angular, volcanic rock fragments up to 80mm in length, contains very fine-to fine-grained sand, medium gray. | | | | | | | | | | | | |
| HQ | 4 | 30 | 30 | 100 | 0 | 0 | | 43.04 | 2 | | | | | | | | | | |
| SPT | 2 | 8 | 15 | 14 | 29 | 40 | | | | | | | | | | | | | |
| HQ | 5 | 70 | 70 | 100 | 0 | 0 | 2.00 m GRAVEL, consists of angular, andesitic and basaltic rock fragments up to 15mm in length, silty sand matrix, not consolidated and not cemented, light brown. | | | | | | | | | | | | |
| SPT | 3 | 4 | 14 | 21 | 35 | 40 | | 42.04 | 3 | | | | | | | | | | |
| HQ | 6 | 100 | 100 | 100 | 0 | 0 | 4.30 m LAHAR, weak, light gray, consists of some angular, volcanic blocks varying in size from 5mm to 50mm in size, medium hard to hard rock, moderate weathered, contains silt and sand, tuffaceous, low water content, non-plastic | | | | | | | | | | | | |
| SPT | 4 | 6 | 39 | 5/50 | >50 | 35 | | 41.04 | 4 | | | | | | | | | | |
| HQ | 7 | 65 | 65 | 100 | 20 | 31 | 5.50 m END OF BORING | | | | | | | | | | | | |
| HQ | 8 | 50 | 50 | 100 | 20 | 40 | | 40.04 | 5 | | | | | | | | | | |
| | | | | | | | | 6 | | | | | | | | | | | |
| | | | | | | | | 7 | | | | | | | | | | | |
| | | | | | | | | 8 | | | | | | | | | | | |
| | | | | | | | | 9 | | | | | | | | | | | |
| | | | | | | | | 10 | | | | | | | | | | | |

LOG OF BORING

BOREHOLE: BL-10
sheet 1/1

| | | |
|-------------------------|--|---------------------------------|
| CLIENT: NIPPON KOEI Ltd | SOIL INVESTIGATION ON LAND | DRILL RIG: LY-34 |
| COUNTRY: EL SALVADOR | COORDINATES: LONG.: 627740.67; LAT.: 245459.70 | DRILLER: Swissboring |
| DEPTH: 9.00 m | ELEVATION: 43.20 msl | DATE (START - FINISH): 18-19/01 |

| | | | |
|---|--|--|--------------------------------|
| SOIL SAMPLING SAMPLE TYPE: 1 SET (15 cm), 2 SET (30 cm), 3 SET (45 cm), N VALUE, RECOVERED cm | | GEOTECHNICAL INVESTIGATION FOR LA UNION PROJECT, EL SALVADOR  Swissboring Overseas Corporation Ltd. | LOGGED BY: Rodolfo Alvarado |
| ROCK CORE CORE SIZE, RUN NUMBER, RUN LENGTH (M cm), RECOVERY cm, % RECOVERY, RCD cm, % RCD | | | INSPECTOR: Dr. Pucal Yang |

| CORE SIZE | RUN NUMBER | RUN LENGTH (M cm) | RECOVERY cm | % RECOVERY | RCD cm | % RCD | ELEVATION m | DEPTH IN m | SAMPLE TYPE | GRAPHIC LOG | DESCRIPTION | SPT TEST | | | | | RQD | | | | | | |
|-----------|------------|-------------------|-------------|------------|--------|-------|-------------|------------|-------------|-------------|---|----------|----|----|----|----|-----|---|----|----|----|----|-----|
| | | | | | | | | | | | | 10 | 20 | 30 | 40 | 50 | >5C | N | 20 | 40 | 60 | 80 | 100 |
| HQ | 1 | 55 | 55 | 100 | 0 | 0 | 42.20 | 1 | | | Silty clay, dark brown, stiff consistency, low to moderate water content, low to moderate plasticity, high dry strength, consists of clayey silt with sand and weathered basaltic, andesitic rock fragments up to 7mm in length, in the upper part exhibits sca | | | | | | | | | | | | |
| SPT | 1 | 8 | 6 | 5 | 11 | 30 | 42.20 | 1 | | | | | | | | | | | | | | | |
| HQ | 2 | 40 | 40 | 100 | 0 | 0 | 41.20 | 2 | | | Coluvial deposits, volcanic rock fragments and sandy silt material, contains blocks fresh to highly weathered, weak to strong, block up to 30 cm. In length, and sandy silt, low water content, low to moderate strength, low plasticity. | | | | | | | | | | | | |
| HQ | 3 | 35 | 35 | 100 | 0 | 0 | 40.20 | 3 | | | | | | | | | | | | | | | |
| HQ | 4 | 25 | 25 | 100 | 0 | 0 | 40.20 | 3 | | | | | | | | | | | | | | | |
| HQ | 5 | 40 | 40 | 100 | 0 | 0 | 40.20 | 3 | | | | | | | | | | | | | | | |
| HQ | 6 | 60 | 60 | 100 | 0 | 0 | 39.20 | 4 | | | From 3.8 to 8.0 m | | | | | | | | | | | | |
| SPT | 2 | 20 | 30 | 40 | >50 | 15 | 39.20 | 4 | | | Andesite rock, light gray, slightly to moderate weathered, moderate strength, very close jointing joints are opened, rough, with clay an oxid stains | | | | | | | | | | | | |
| HQ | 7 | 40 | 40 | 100 | 0 | 0 | 38.20 | 5 | | | | | | | | | | | | | | | |
| HQ | 8 | 30 | 30 | 100 | 0 | 0 | 38.20 | 5 | | | | | | | | | | | | | | | |
| SPT | 3 | 30 | 40 | 45 | >50 | 10 | 37.20 | 6 | | | | | | | | | | | | | | | |
| HQ | 9 | 90 | 90 | 100 | 0 | 0 | 37.20 | 6 | | | | | | | | | | | | | | | |
| SPT | 4 | 35 | 40 | 50 | >50 | 10 | 36.20 | 7 | | | | | | | | | | | | | | | |
| HQ | 10 | 15 | 15 | 100 | 0 | 0 | 36.20 | 7 | | | | | | | | | | | | | | | |
| HQ | 11 | 75 | 75 | 100 | 0 | 0 | 36.20 | 7 | | | | | | | | | | | | | | | |
| HQ | 12 | 40 | 40 | 100 | 0 | 0 | 36.20 | 7 | | | | | | | | | | | | | | | |
| HQ | 13 | 60 | 60 | 100 | 0 | 0 | 35.20 | 8 | | | From 8.0 to 9.0 m | | | | | | | | | | | | |
| HQ | 14 | 30 | 20 | 67 | 0 | 0 | 35.20 | 8 | | | | | | | | | | | | | | | |
| HQ | 17 | 70 | 55 | 79 | 21 | 30 | 34.20 | 9 | | | ANDESITE, light brown - gray, medium hard to hard rock, slightly weathered, moderate strength to strong, close to very close jointing, joints are open to moderately open, planar, rough, contain clay minerals and dip 20°, 30° and 45°. | | | | | | | | | | | | |
| HQ | 18 | 100 | 100 | 100 | 44 | 44 | 34.20 | 9 | | | 9.00 m END OF BORING | | | | | | | | | | | | |
| | | | | | | | 33.20 | 10 | | | | | | | | | | | | | | | |