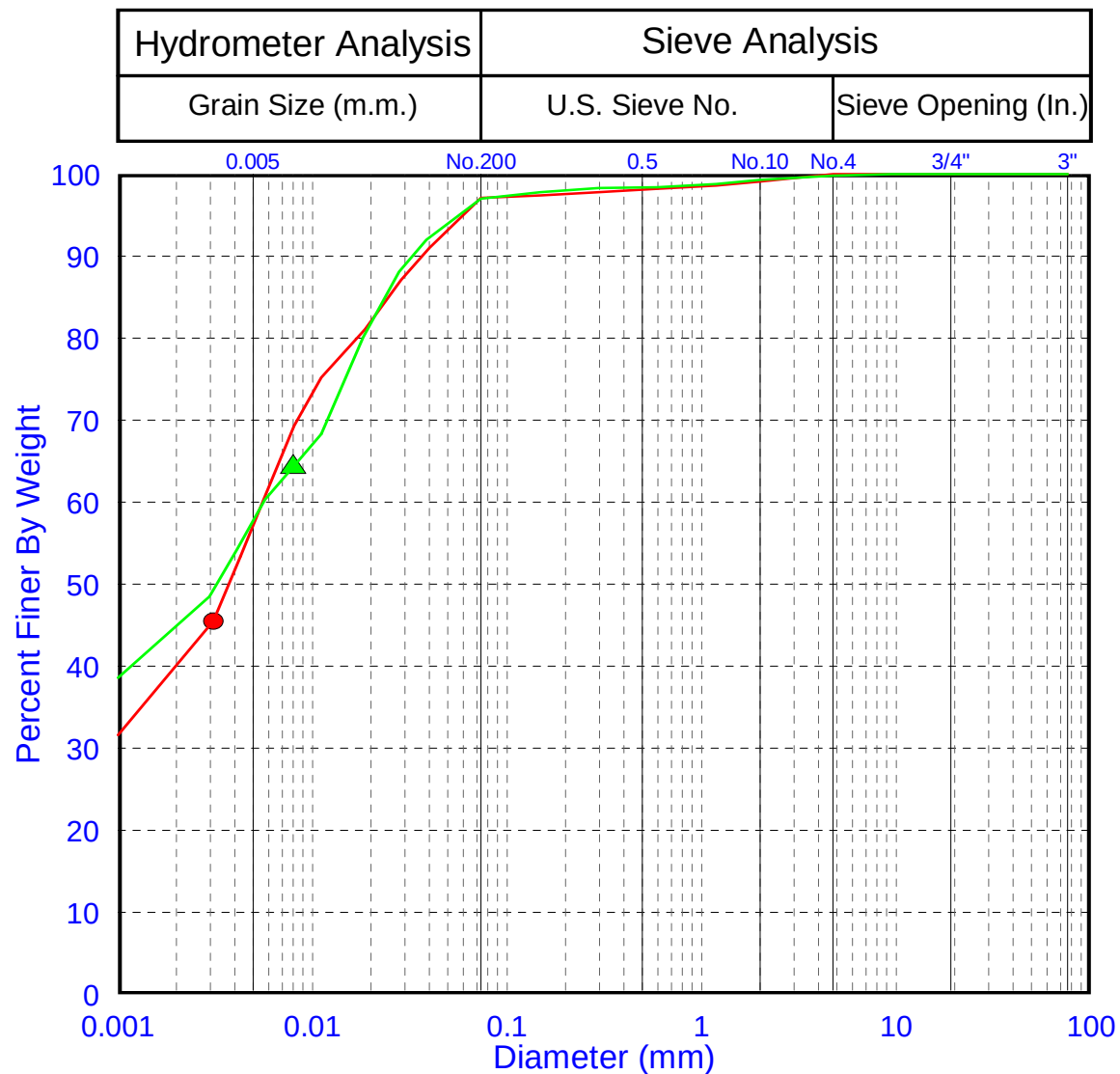


|                                                                                   |                                                                                                    |        |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------|
|  | SOIL ENGINEERING SERVICES (SES) <span>خدمات مهندسی مکانیک خاک</span>                               |        |
|                                                                                   | PROJ NO: 1347-EE-PEP-GEO-001-B                                                                     | REV: B |
|                                                                                   | SUBJECT: GEOTECHNICAL INVESTIGATION, PHASE I, FACTUAL REPORT, SOUTH ALUMINIUM SMELTER (SALCO) IRAN |        |

## Enclosure Q

### Grain Size Distribution Charts



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-002   | U4     | 13.00-13.50 | 31   | 21   | 10   | CL/ML       |
| ▲    | BH-002   | U5     | 16.00-16.50 | 49   | 23   | 26   | CL/CH       |

## GRAIN SIZE DISTRIBUTION CHART



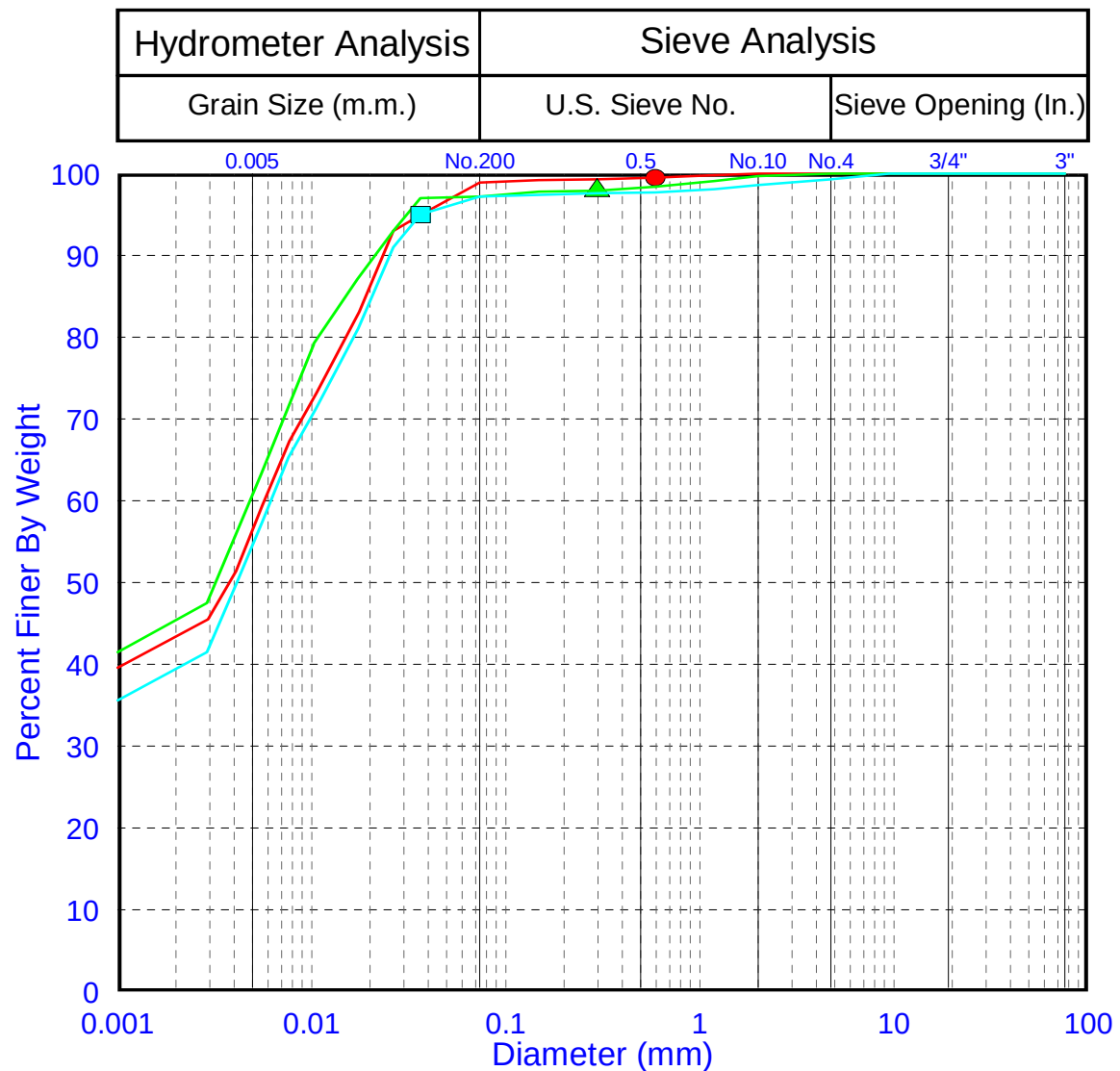
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 1

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

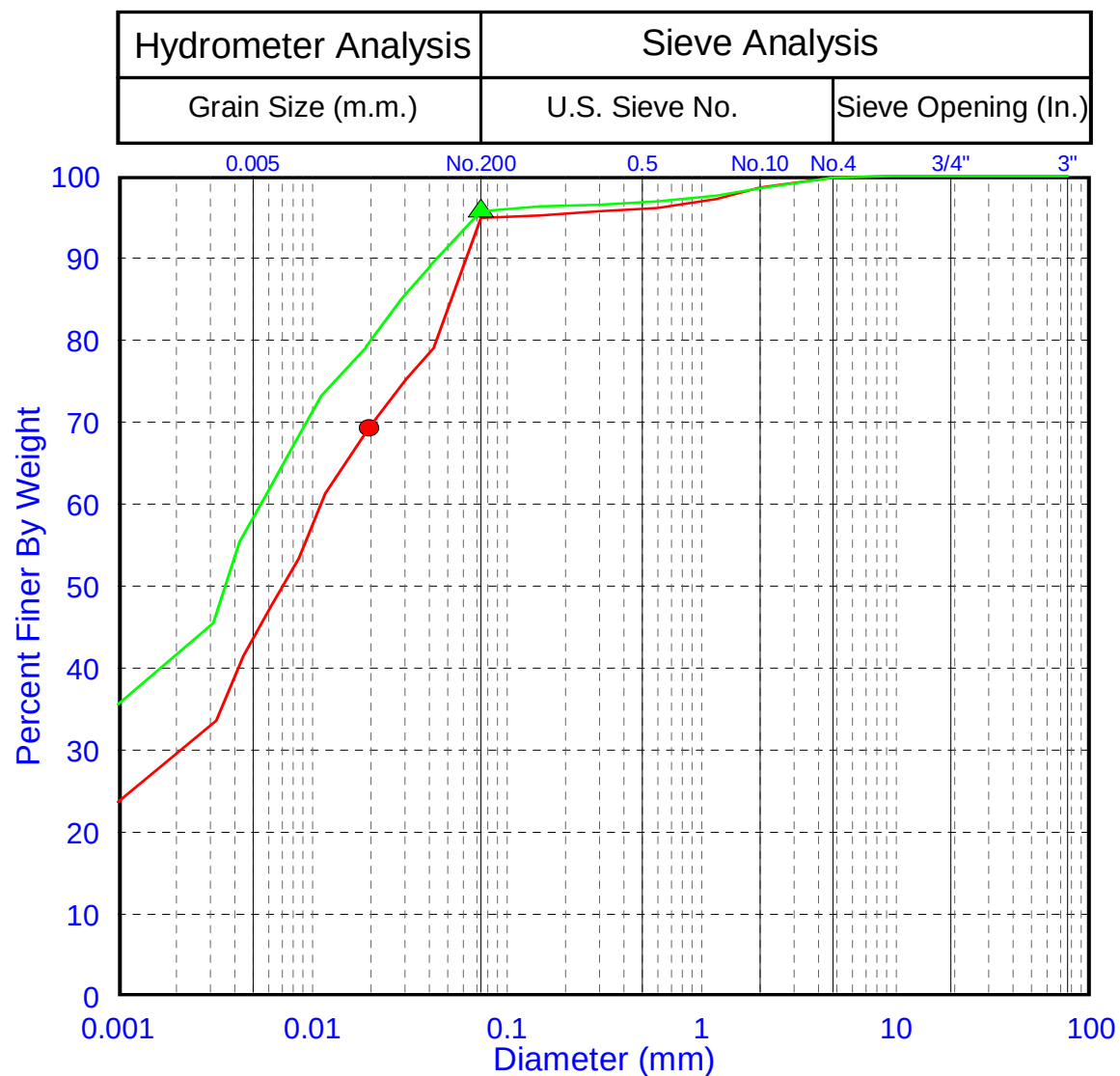


| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-008   | U2     | 8.00-8.50   | 36   | 18   | 18   | CL          |
| ▲    | BH-008   | U5     | 14.00-14.50 | 37   | 20   | 17   | CL          |
| ■    | BH-008   | U10    | 24.00-24.50 | 41   | 21   | 20   | CL          |

## GRAIN SIZE DISTRIBUTION CHART

|                                                              |                                        |  |                 |
|--------------------------------------------------------------|----------------------------------------|--|-----------------|
|                                                              | Project : SOUTH ALUMINUM SMELTER PLANT |  | Fig.: 2         |
|                                                              | Client : NFC                           |  |                 |
| <b>Soil Engineering Services Consultant &amp; Contractor</b> |                                        |  | Proj No. : 1347 |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-013   | U1     | 7.50-8.00   | 40   | 23   | 17   | CL/ML       |
| ▲    | BH-013   | U3     | 11.50-12.00 | 37   | 25   | 12   | ML/CL       |

## GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

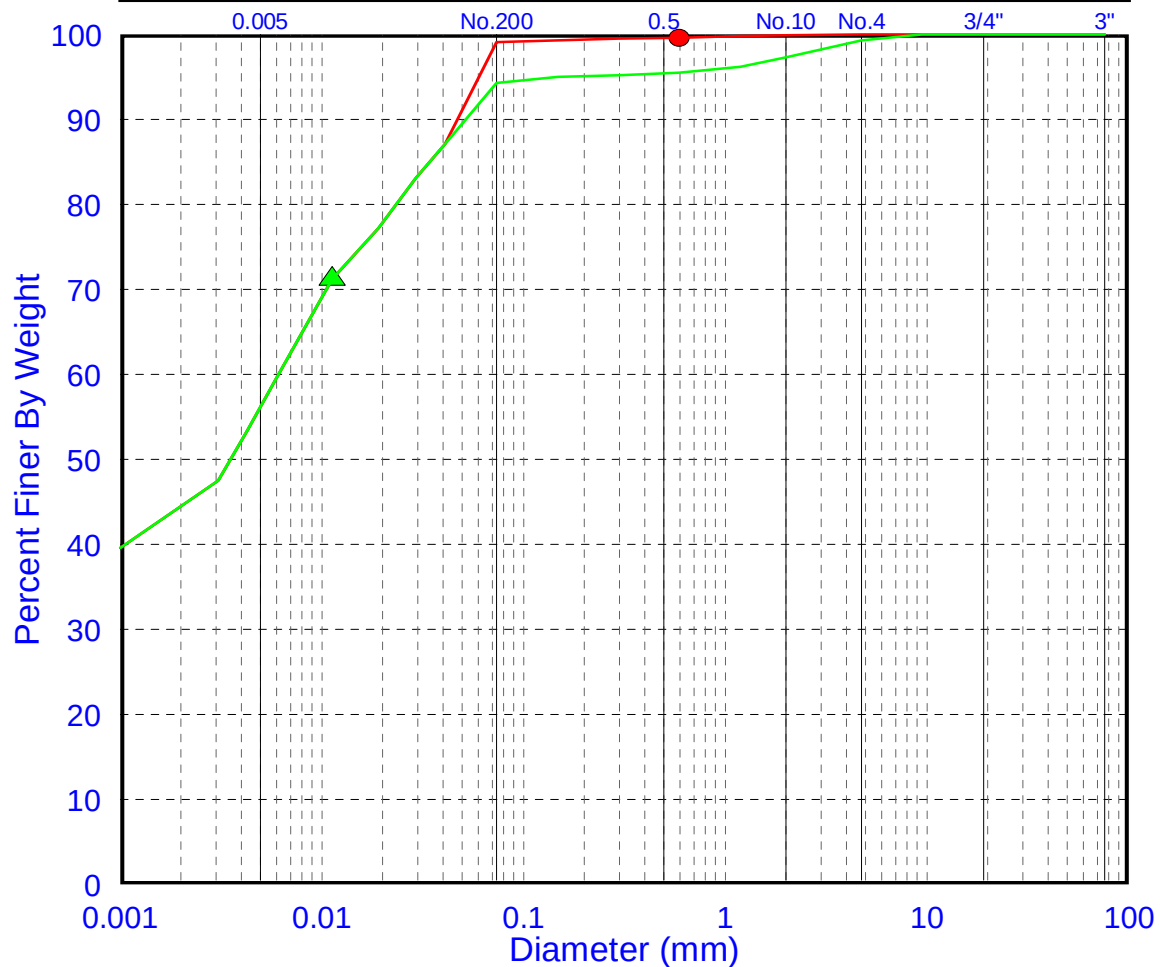
Client : NFC

Fig.: 3

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-018   | U7     | 19.00-19.50 | 37   | 23   | 14   | CL/ML       |
| ▲    | BH-018   | U9     | 23.00-23.50 | 37   | 24   | 13   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

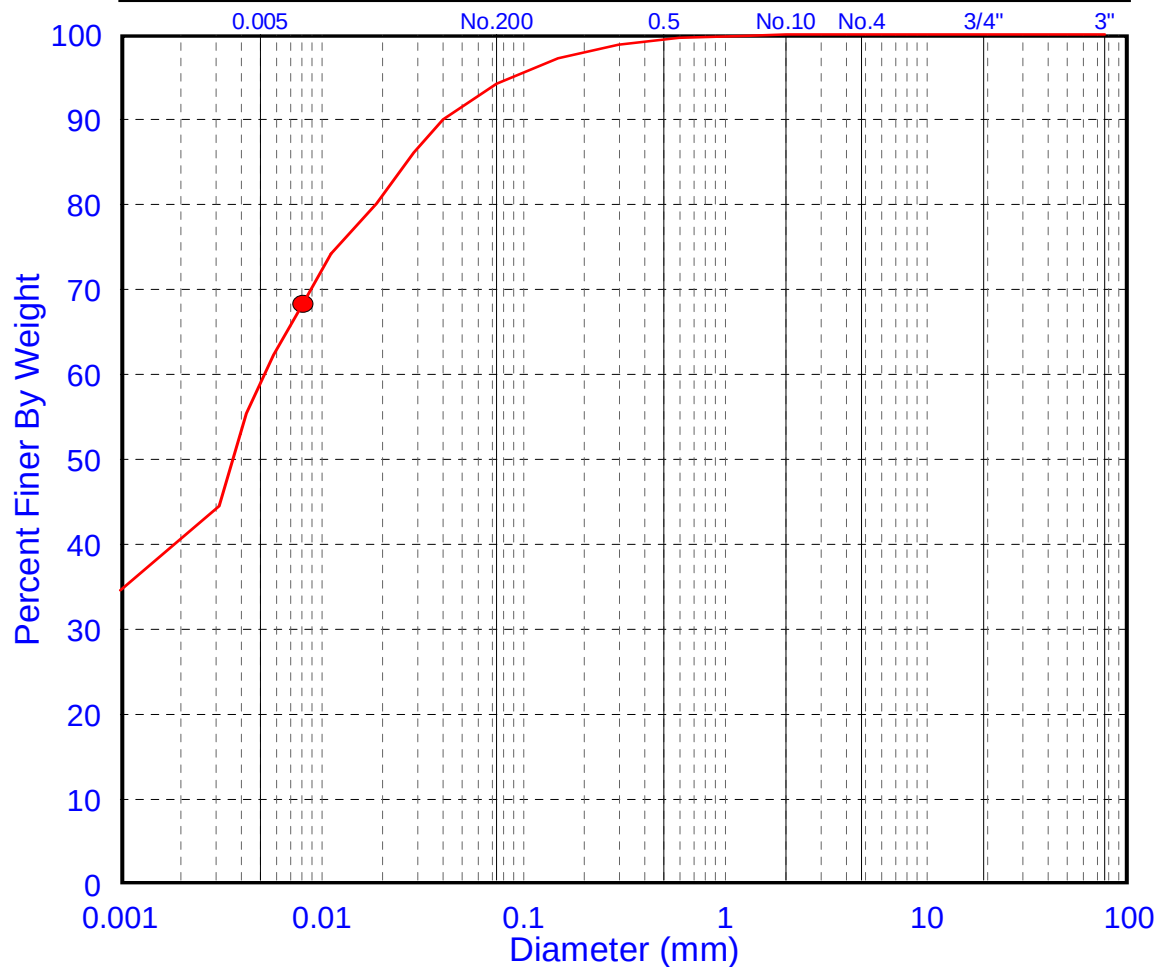
Client : NFC

Fig.: 4

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)  | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-----------|------|------|------|-------------|
| ●    | BH-021   | U2     | 6.50-7.00 | 46   | 31   | 15   | ML          |

## GRAIN SIZE DISTRIBUTION CHART



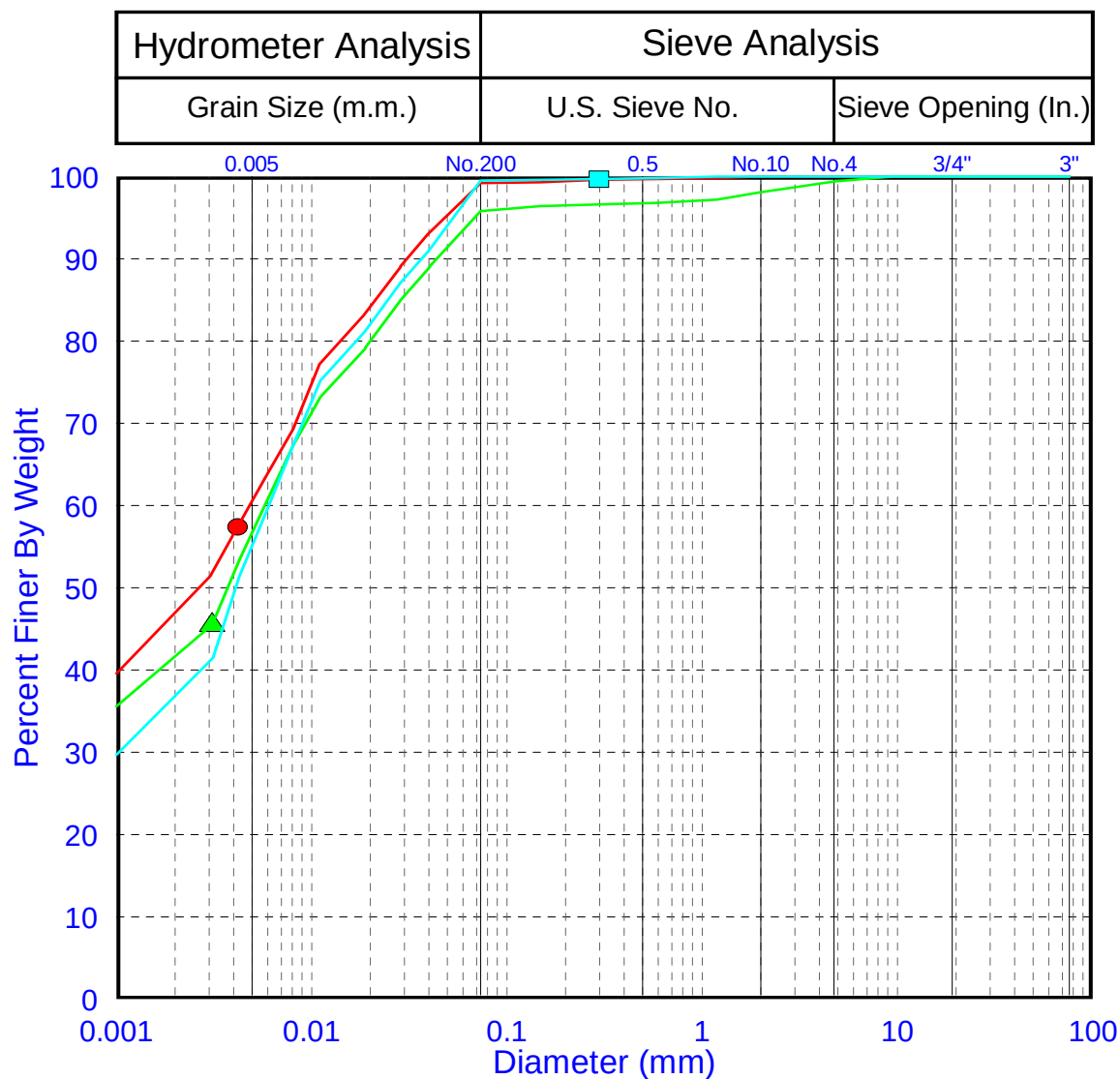
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 5

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-024   | D3     | 9.00-9.45   | 31   | 22   | 9    | CL/ML       |
| ▲    | BH-024   | D7     | 21.00-21.45 | 33   | 23   | 10   | CL/ML       |
| ■    | BH-024   | D11    | 33.00-33.45 | 34   | 25   | 9    | ML/CL       |

### GRAIN SIZE DISTRIBUTION CHART



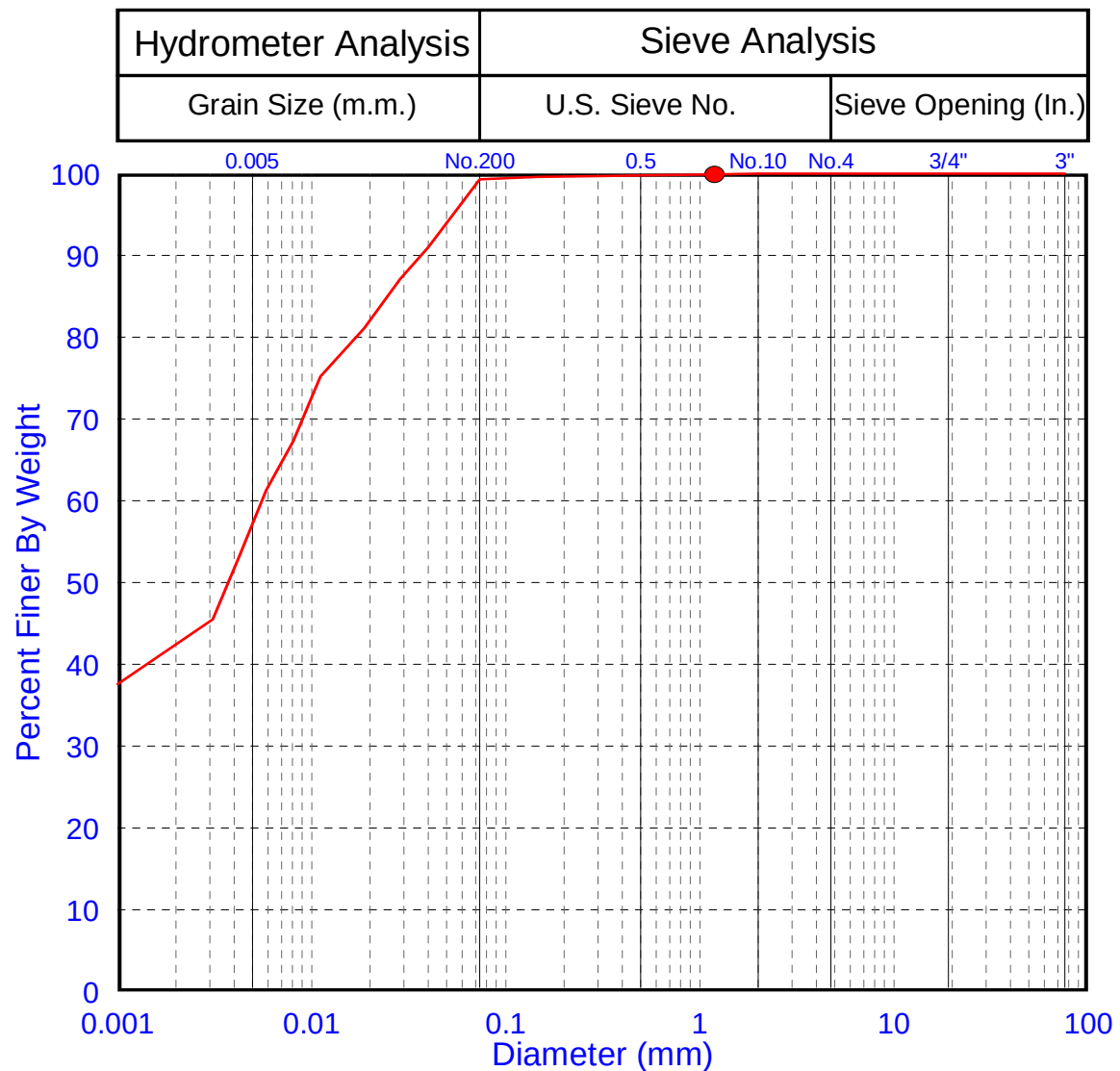
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 6

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-024   | D15    | 45.00-45.45 | 35   | 23   | 12   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



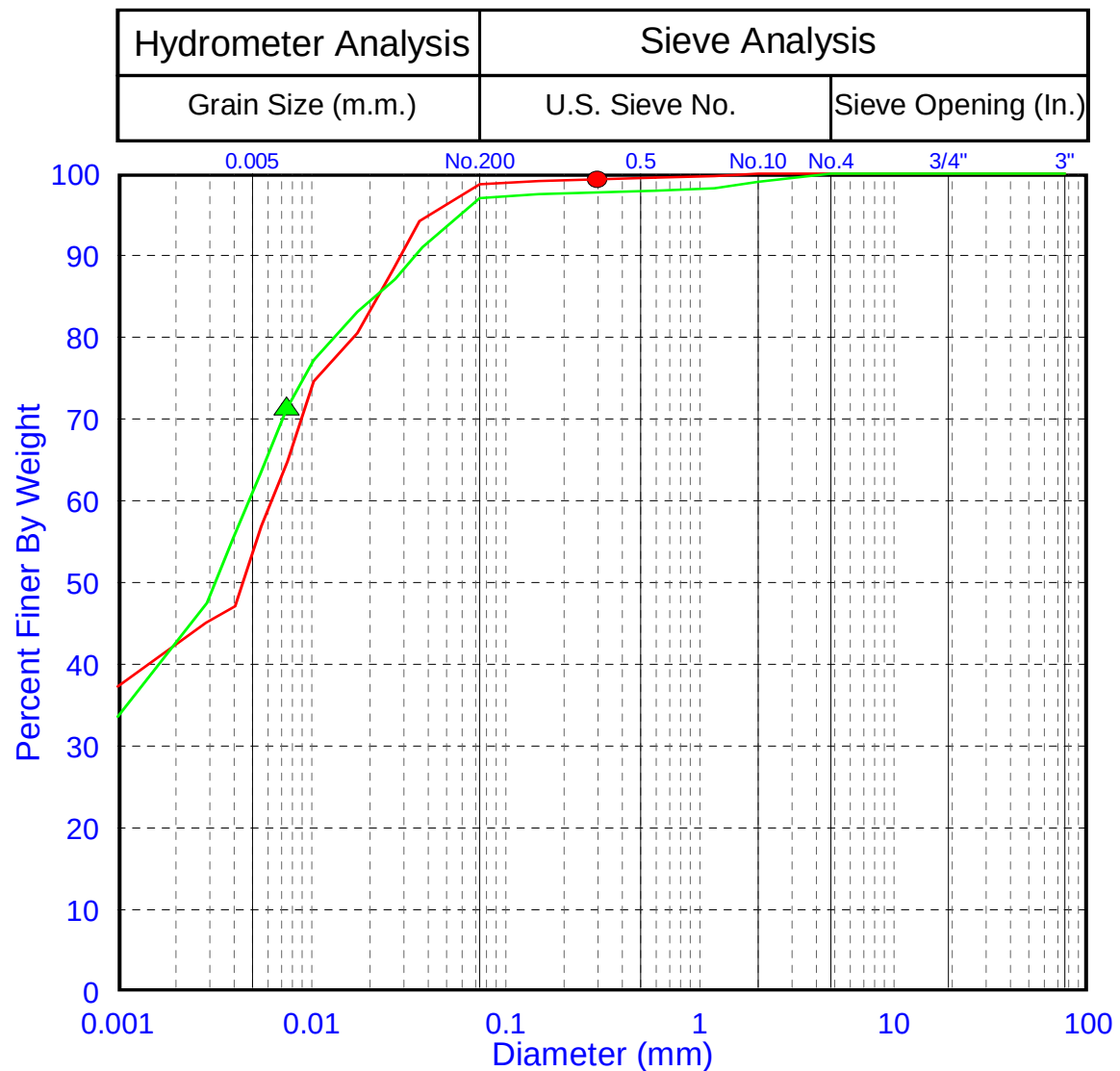
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 7

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-025   | U1     | 3.00-3.50   | 37   | 21   | 16   | ML          |
| ▲    | BH-025   | U5     | 14.50-15.00 | 37   | 21   | 16   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



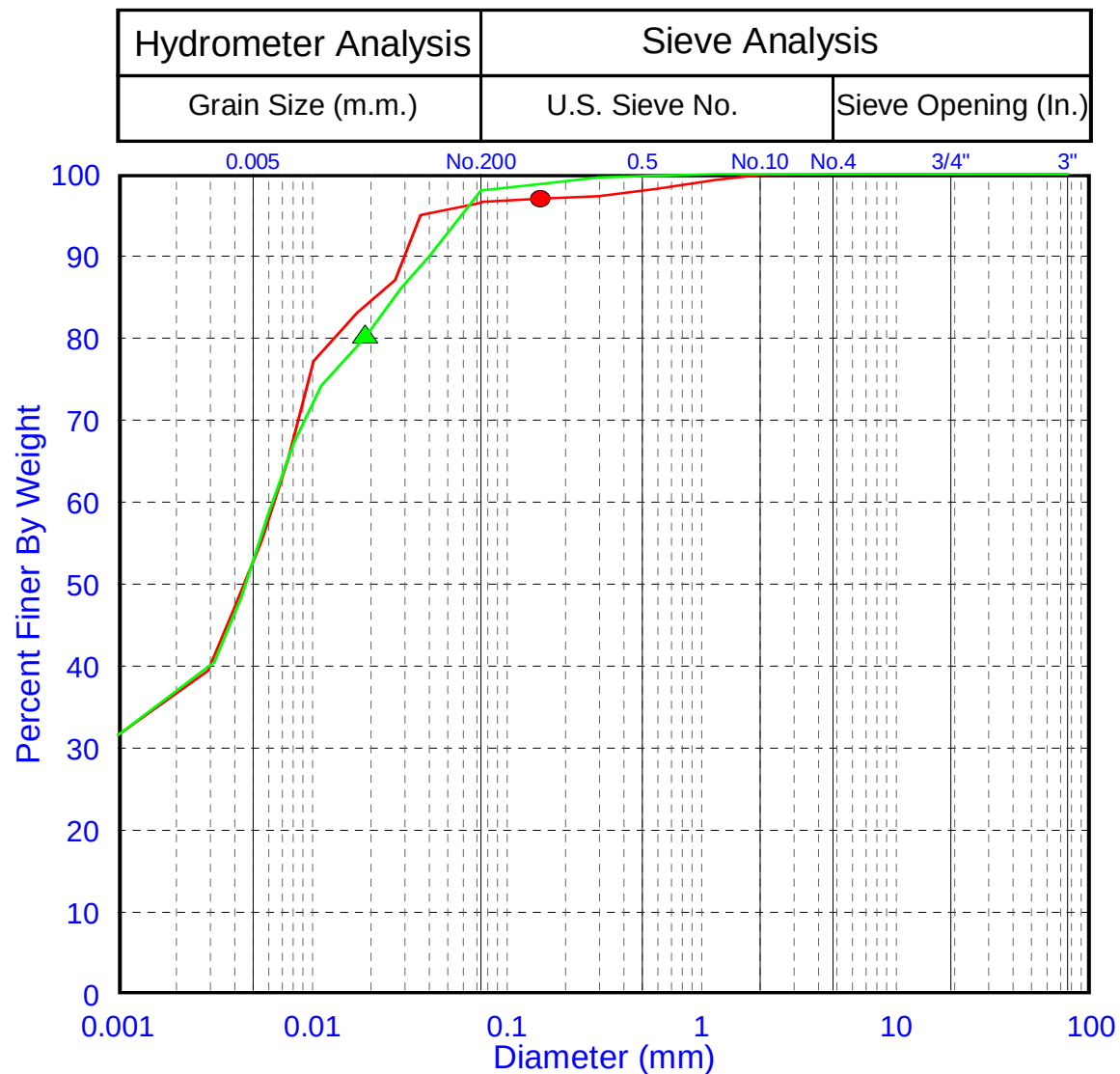
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 8

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-027   | U2     | 7.00-7.50   | 36   | 19   | 17   | CL          |
| ▲    | BH-027   | U4     | 11.50-12.00 | 32   | 24   | 8    | ML/CL       |

## GRAIN SIZE DISTRIBUTION CHART



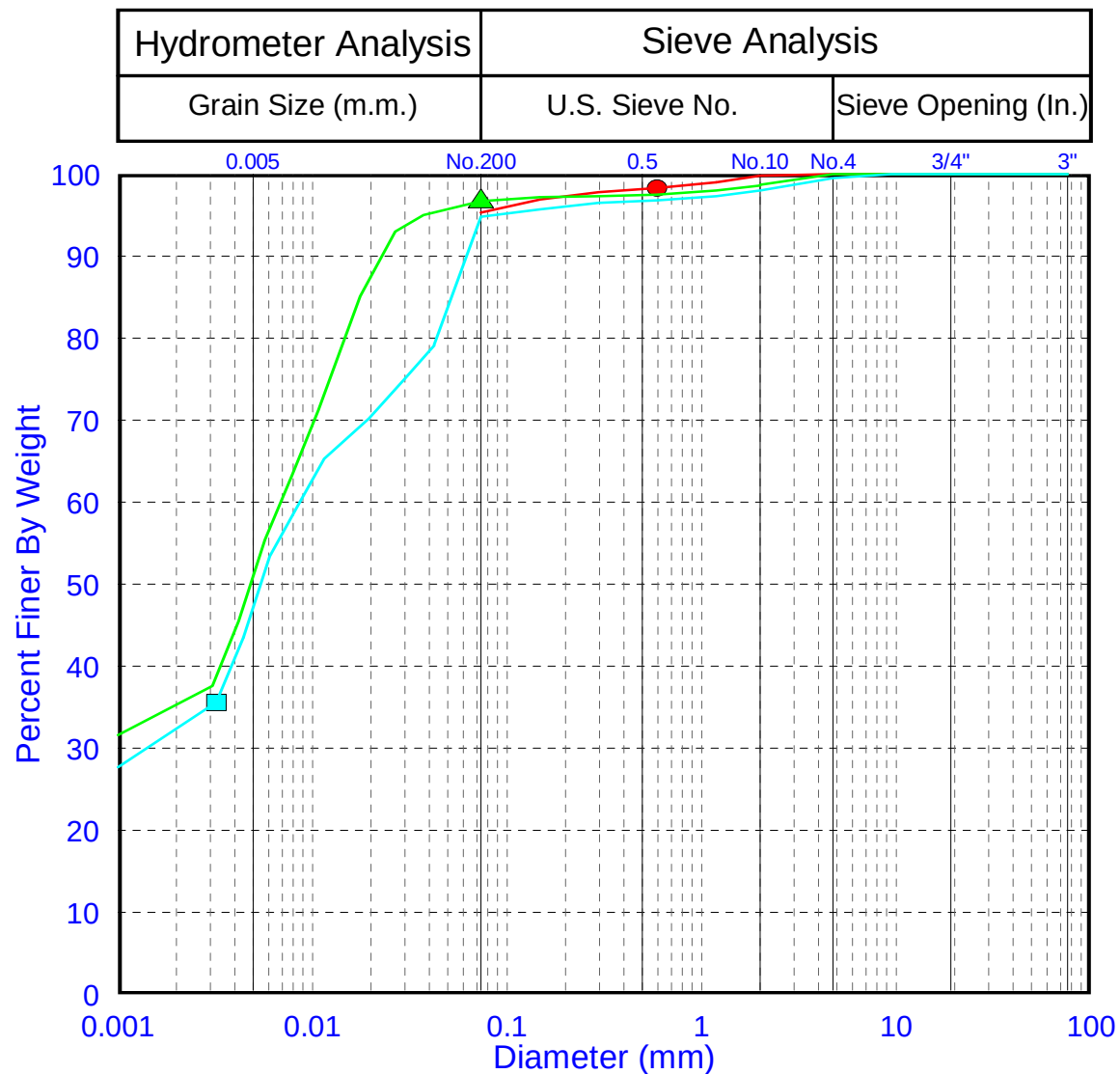
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 9

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| Sym.                                 | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|--------------------------------------|----------|--------|-------------|------|------|------|-------------|
| <span style="color: red;">●</span>   | BH-031   | U1     | 5.00-5.50   | 52   | 25   | 27   | CH/CL       |
| <span style="color: green;">▲</span> | BH-031   | U3     | 10.00-10.50 | 35   | 23   | 11   | CL/ML       |
| <span style="color: cyan;">■</span>  | BH-031   | U4     | 12.00-12.50 | 35   | 25   | 10   | ML/CL       |

## GRAIN SIZE DISTRIBUTION CHART



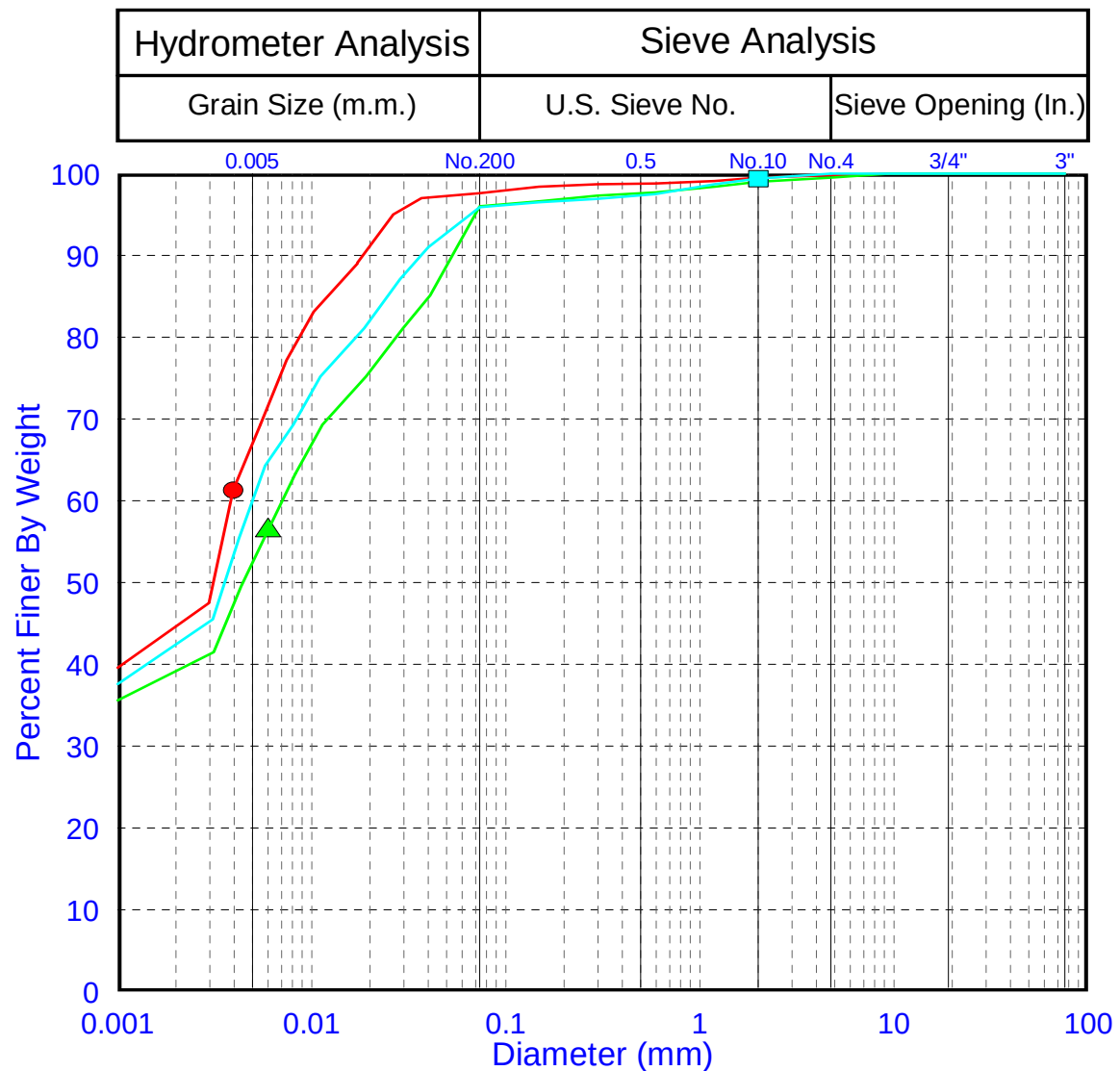
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 10

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-031   | U5     | 14.00-14.50 | 39   | 23   | 15   | CL/ML       |
| ▲    | BH-031   | U6     | 16.00-16.50 | 33   | 23   | 10   | CL/ML       |
| ■    | BH-031   | U8     | 20.00-20.50 | 33   | 24   | 9    | ML/CL       |

### GRAIN SIZE DISTRIBUTION CHART



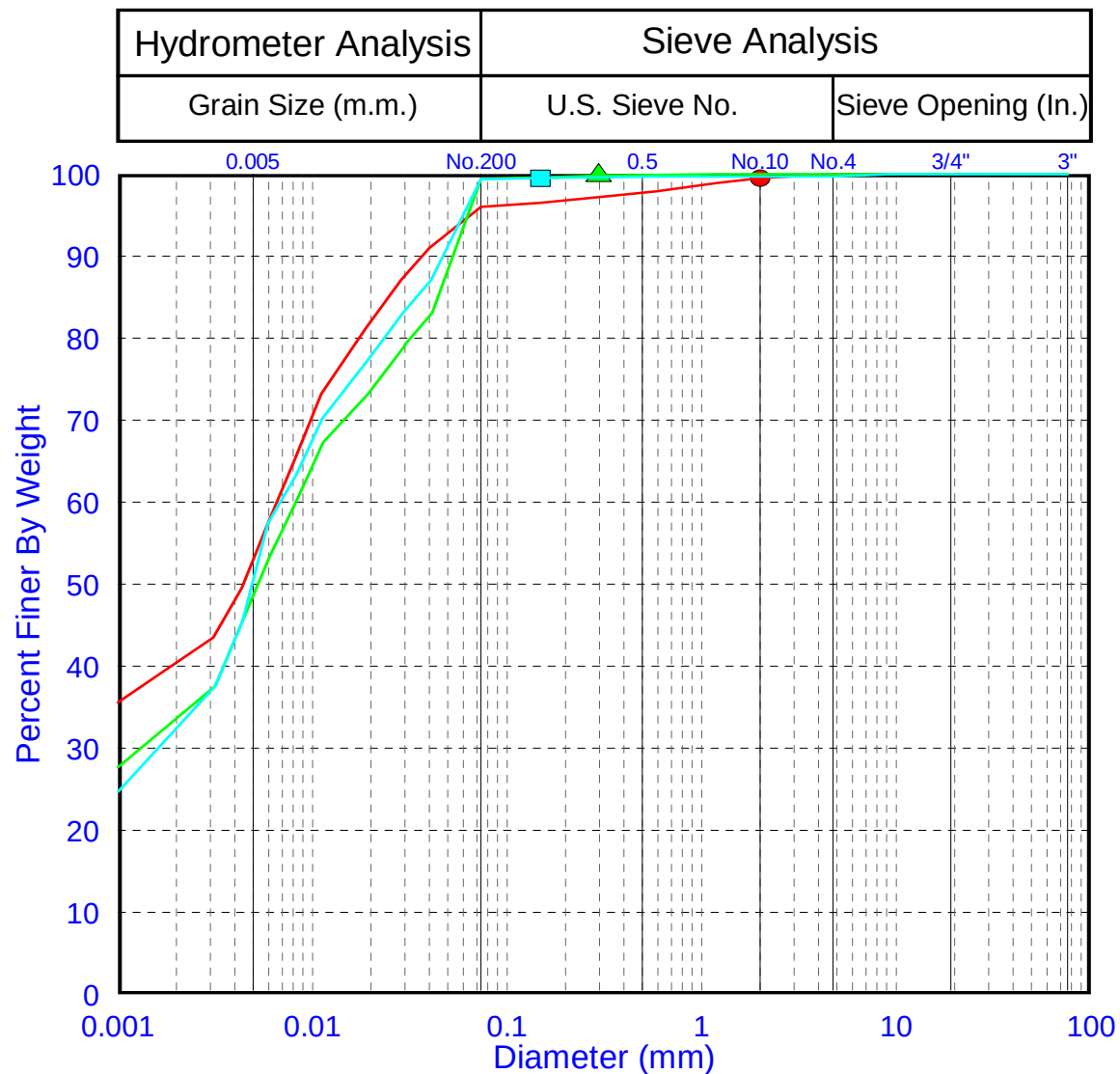
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 11

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-031   | U10    | 29.00-29.50 | 35   | 20   | 15   | CL          |
| ▲    | BH-031   | U12    | 36.00-36.50 | 30   | 21   | 9    | CL/ML       |
| ■    | BH-031   | U13    | 39.00-39.50 | 33   | 20   | 13   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



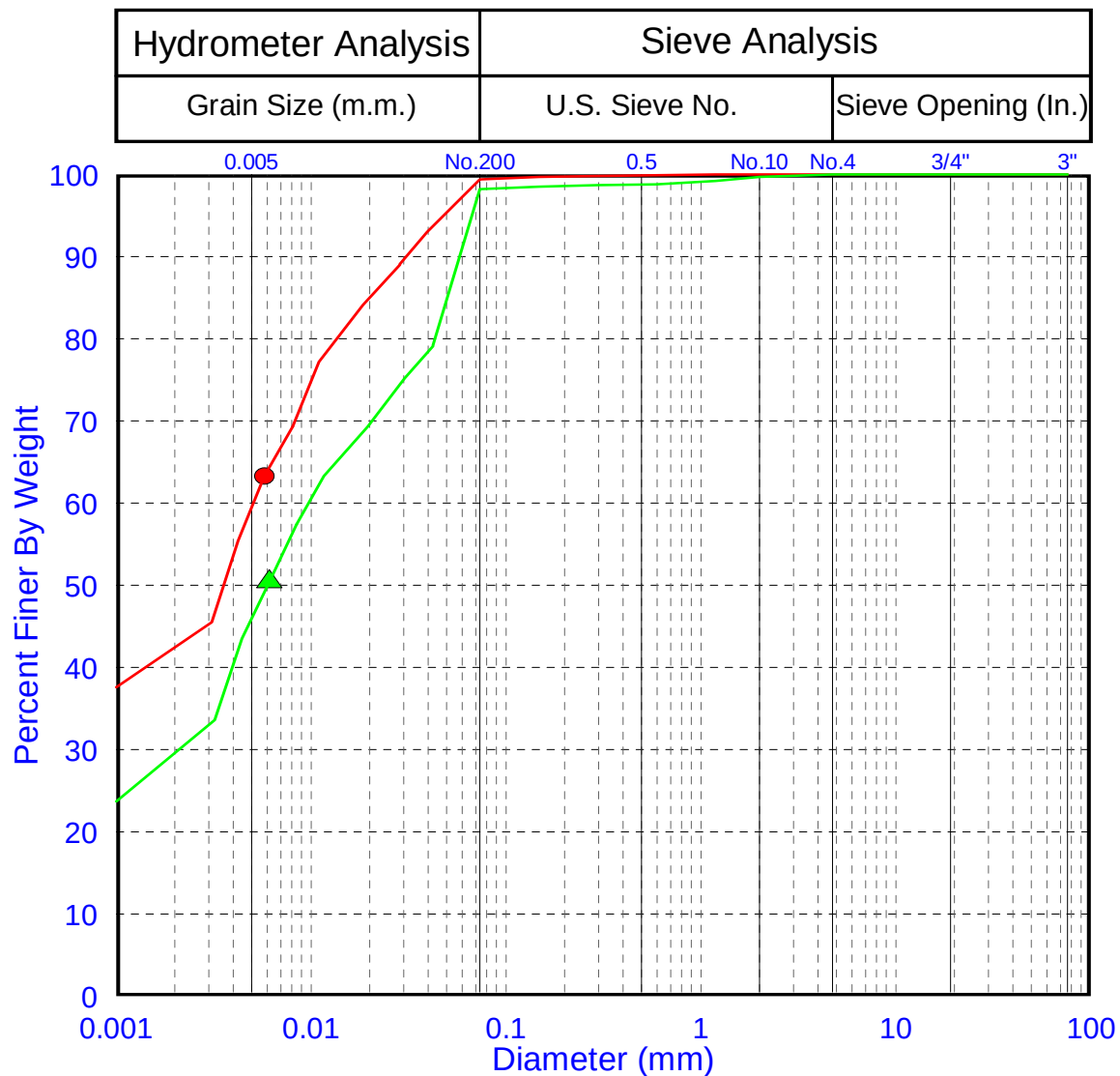
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 12

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-035   | U1     | 5.50-6.00   | 36   | 23   | 13   | CL/ML       |
| ▲    | BH-035   | U6     | 18.00-18.50 | 38   | 24   | 14   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



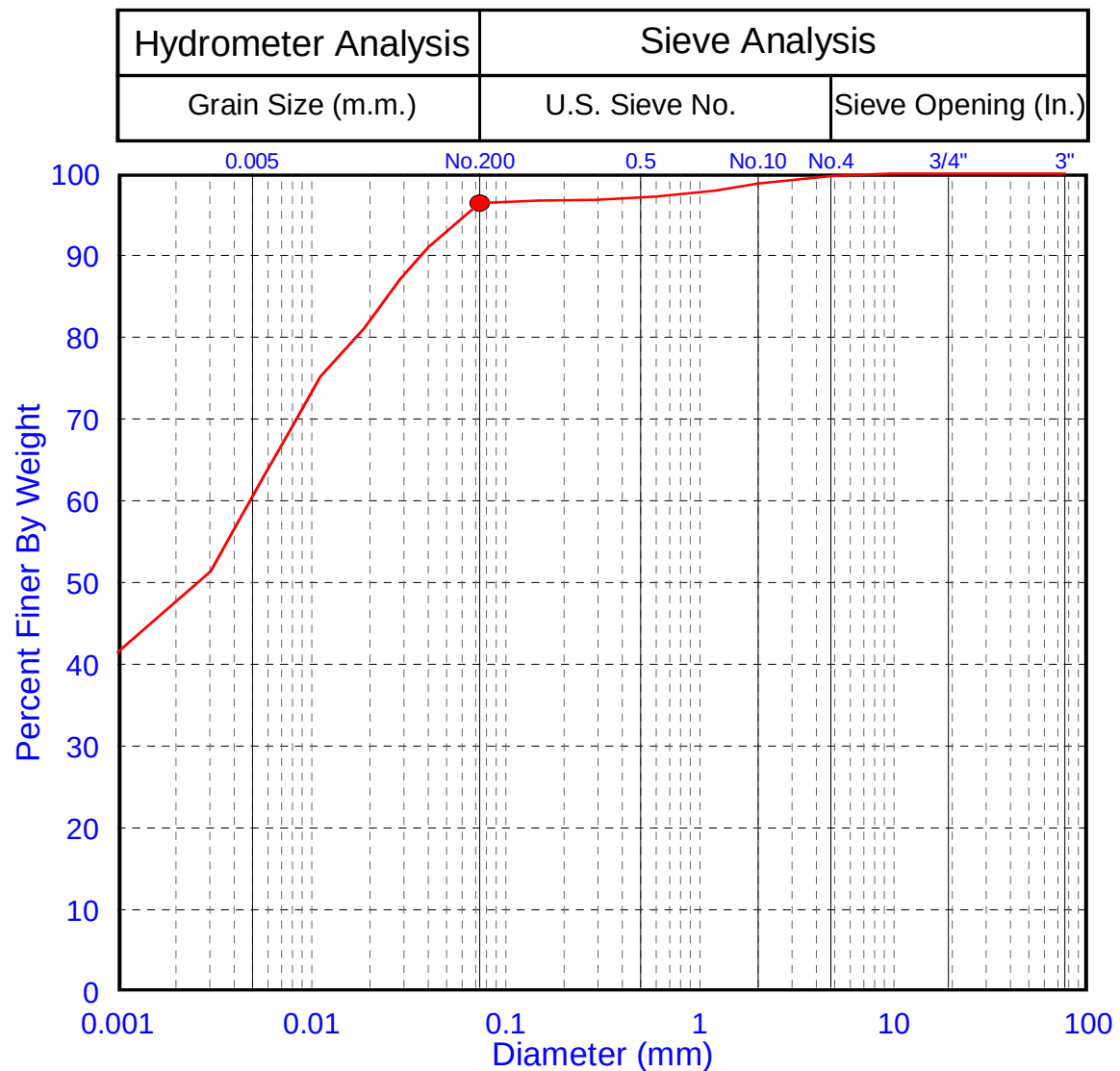
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 13

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-039   | U5     | 16.00-16.50 | 37   | 23   | 14   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



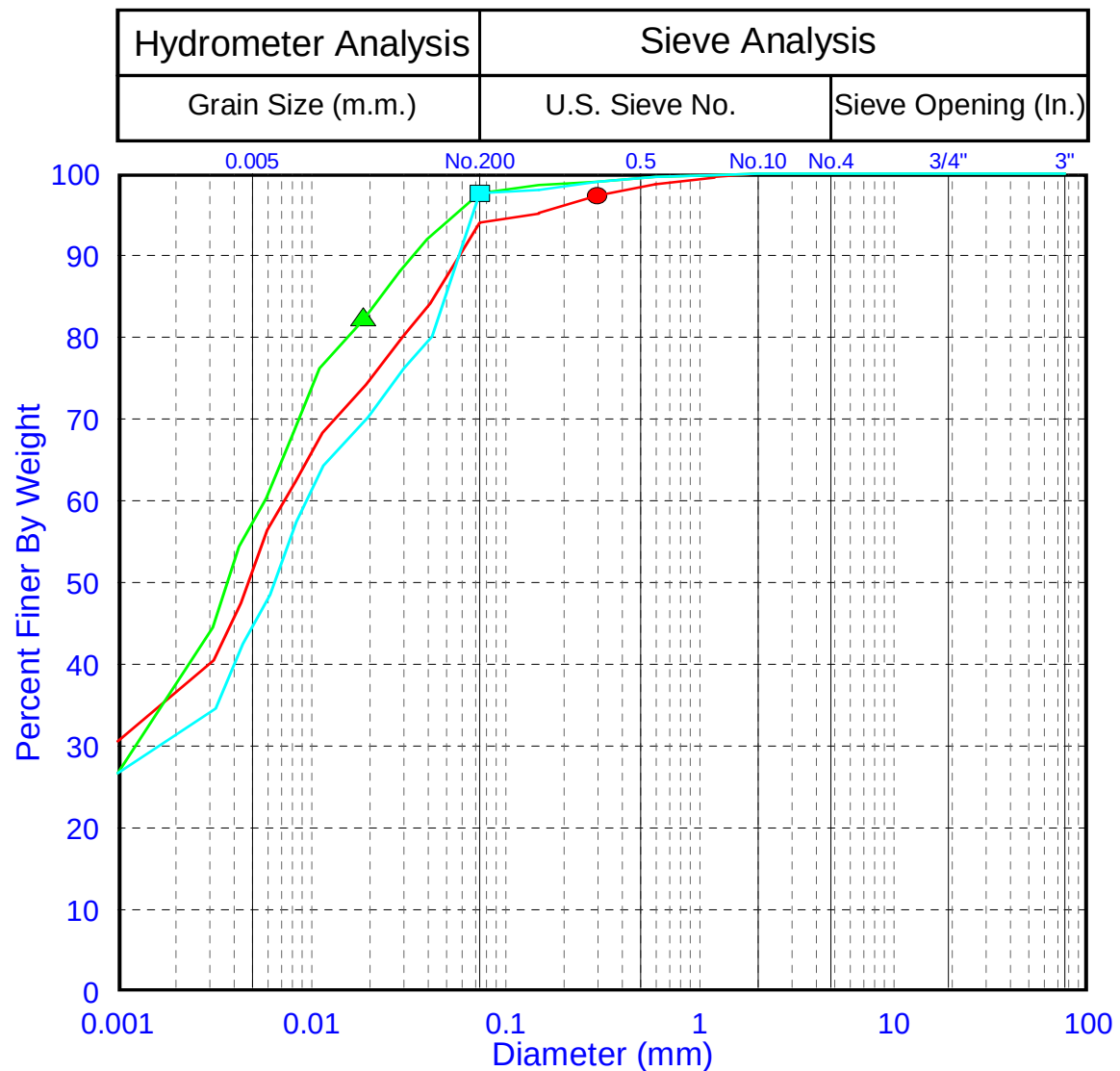
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 14

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-042   | U2     | 8.00-8.50   | 35   | 24   | 11   | CL/ML       |
| ▲    | BH-042   | U9     | 24.00-24.50 | 35   | 25   | 10   | ML/CL       |
| ■    | BH-042   | U10    | 26.00-26.50 | 36   | 26   | 10   | ML/CL       |

## GRAIN SIZE DISTRIBUTION CHART



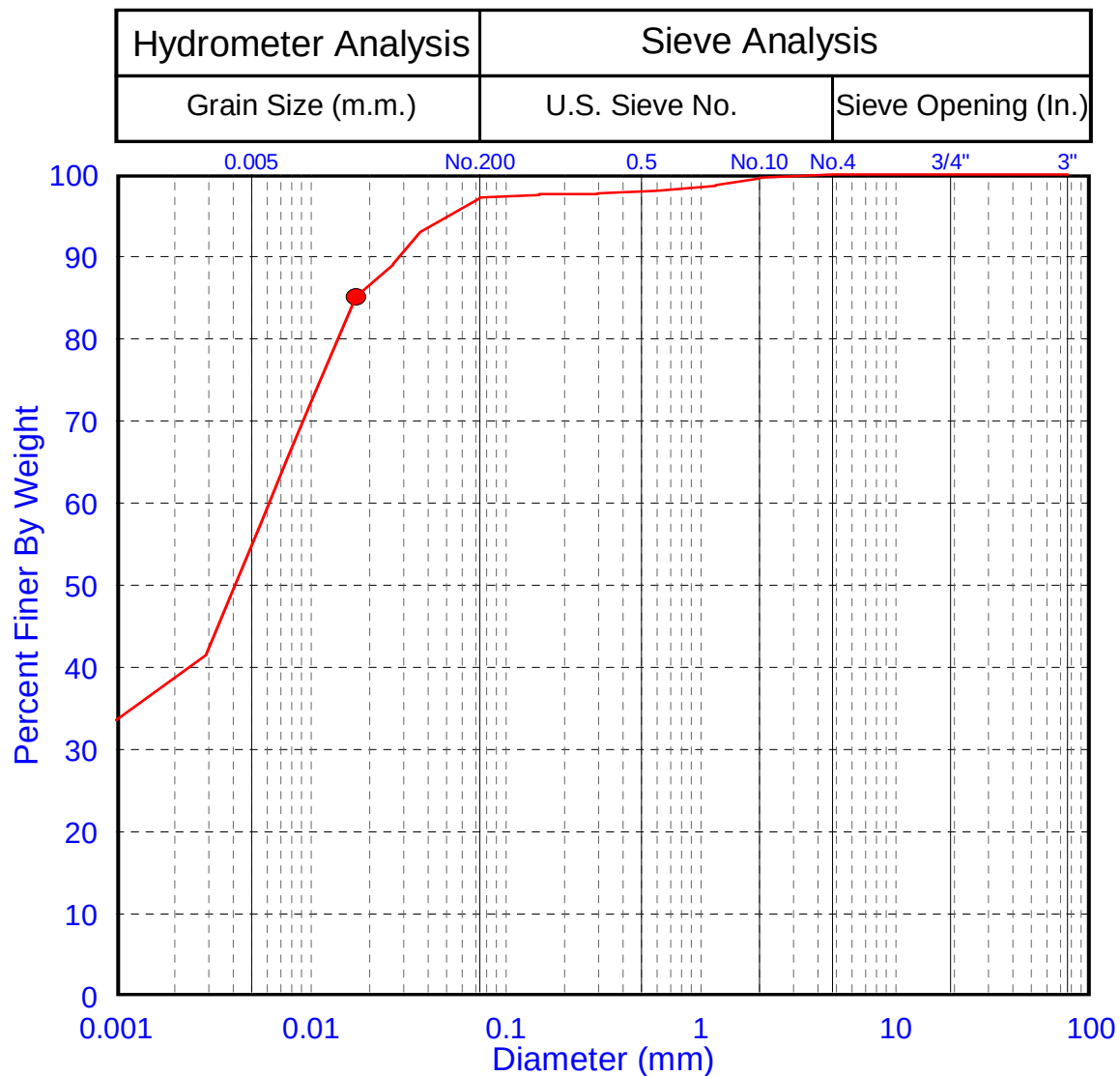
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 15

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-042   | U12    | 30.00-30.50 | 48   | 28   | 20   | ML/MH/CL/CH |

### GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

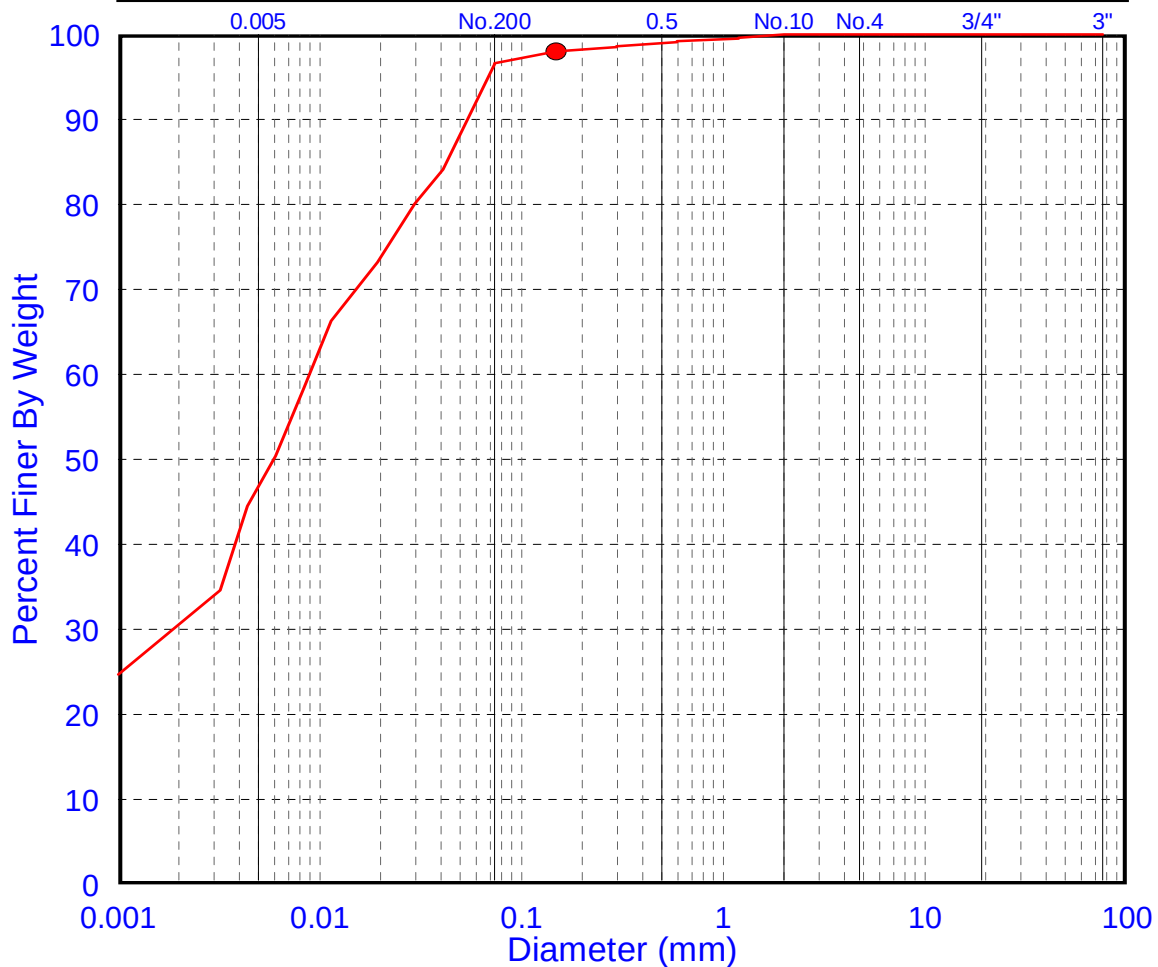
Client : NFC

Fig.: 16

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-044   | U4     | 12.00-12.50 | 34   | 24   | 10   | ML/CL       |

## GRAIN SIZE DISTRIBUTION CHART



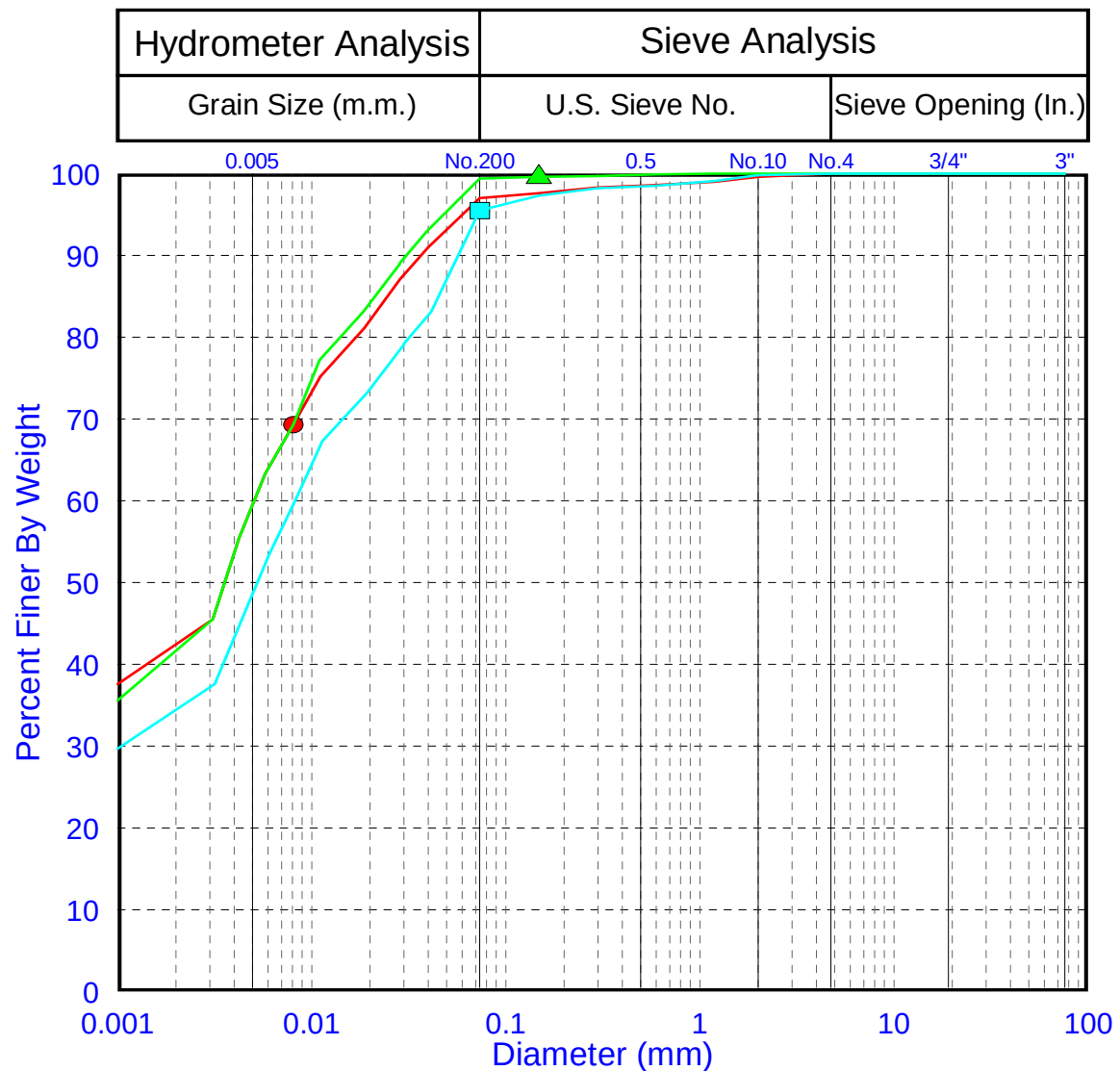
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 17

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-048   | U1     | 7.50-7.90   | 36   | 22   | 14   | CL/ML       |
| ▲    | BH-048   | U2     | 10.00-10.50 | 34   | 23   | 11   | CL/ML       |
| ■    | BH-048   | U3     | 12.50-13.00 | 28   | 19   | 9    | CL          |

### GRAIN SIZE DISTRIBUTION CHART



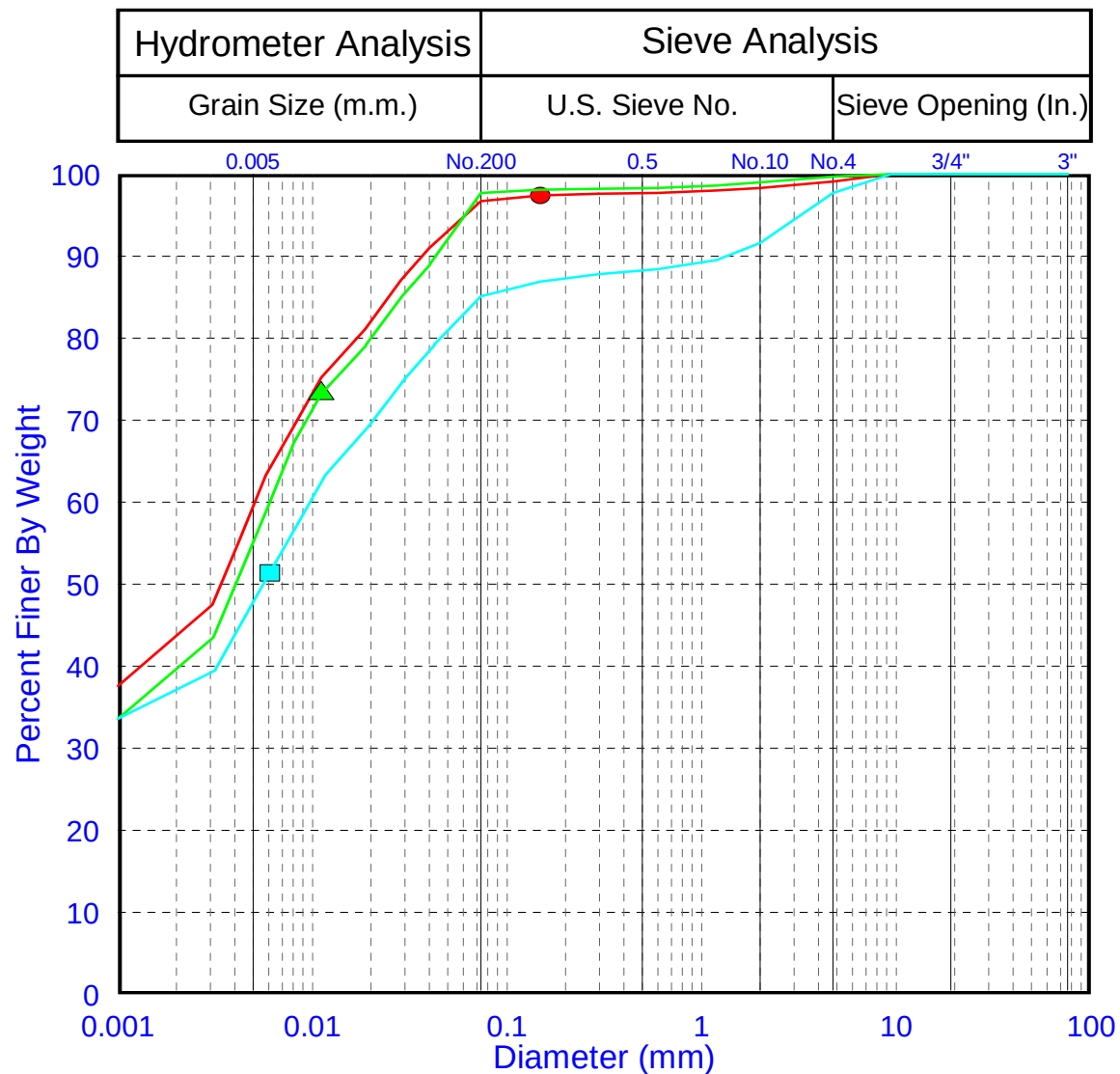
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 18

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-048   | U5     | 17.50-17.95 | 36   | 24   | 12   | CL/ML       |
| ▲    | BH-048   | U8     | 25.00-25.45 | 35   | 23   | 12   | CL/ML       |
| ■    | BH-048   | U12    | 35.00-35.20 | 46   | 25   | 21   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



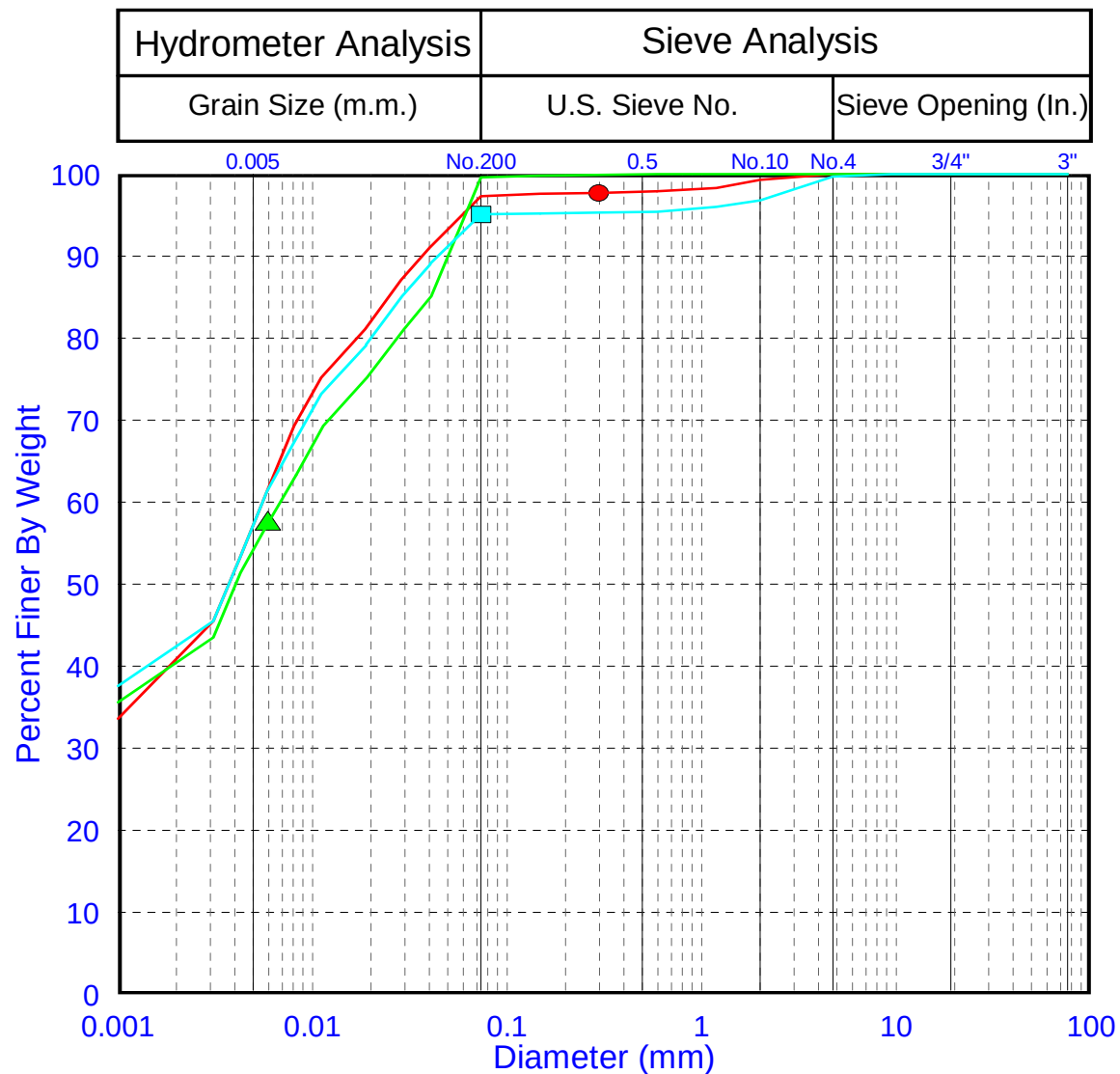
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 19

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-048   | U14    | 40.00-40.25 | 33   | 21   | 12   | CL/ML       |
| ▲    | BH-048   | U16    | 45.00-45.25 | 47   | 28   | 19   | ML/CL       |
| ■    | BH-048   | U18    | 50.00-50.25 | 37   | 25   | 12   | ML/CL       |

## GRAIN SIZE DISTRIBUTION CHART



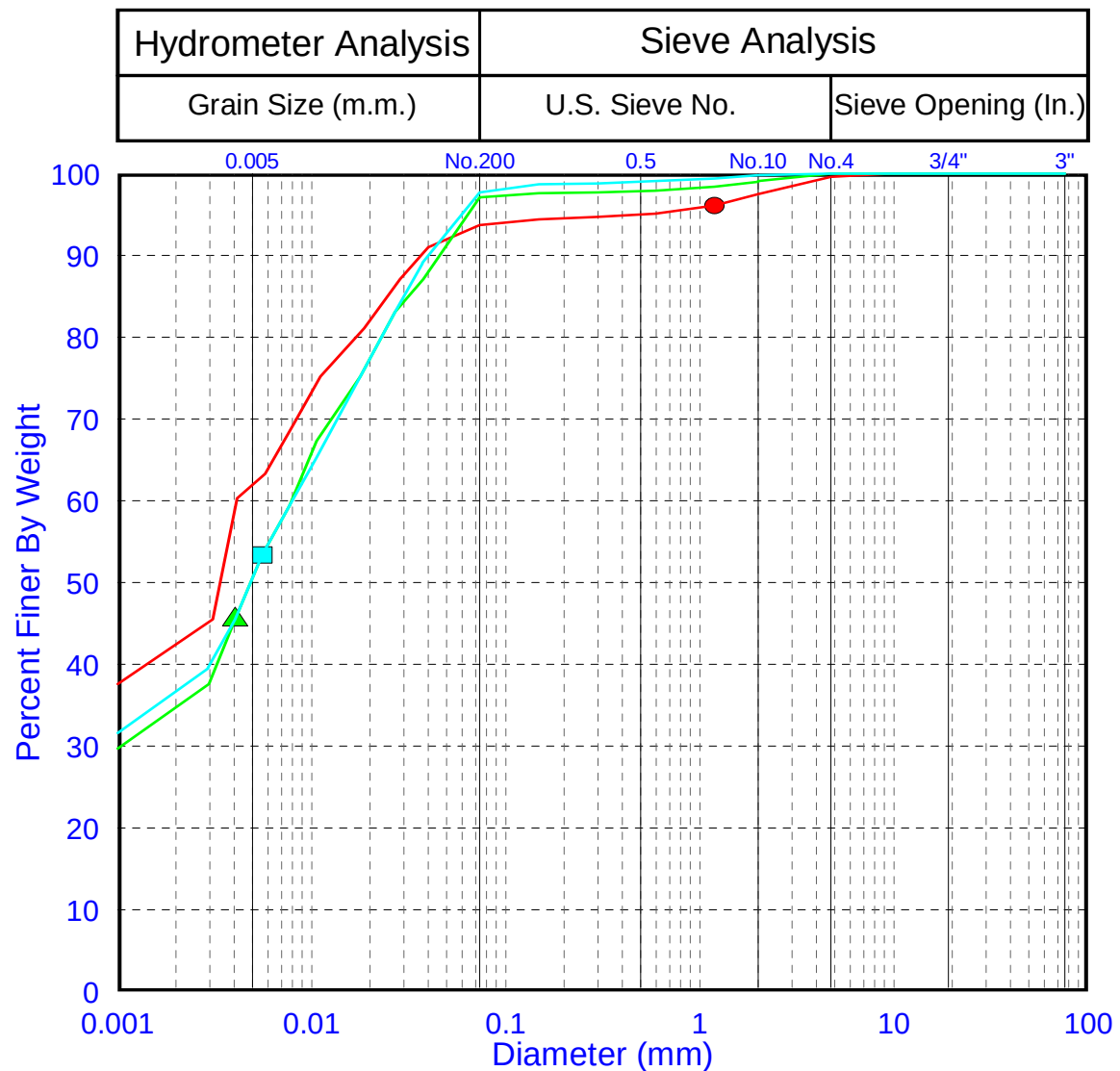
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 20

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-049   | U4     | 13.00-13.50 | 31   | 21   | 10   | CL/ML       |
| ▲    | BH-049   | U5     | 15.00-15.50 | 42   | 23   | 19   | CL          |
| ■    | BH-049   | U9     | 23.00-23.50 | 38   | 21   | 17   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



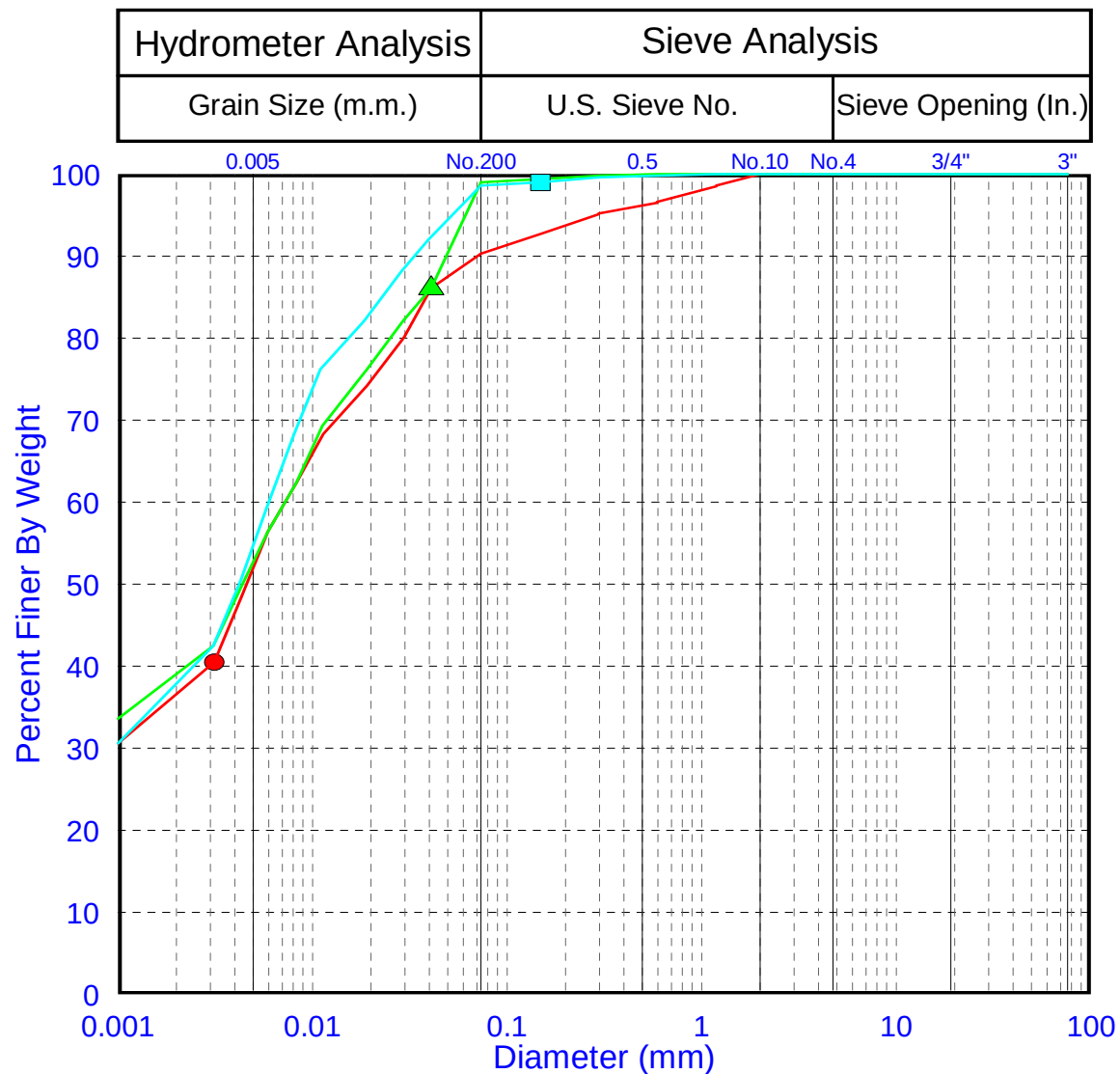
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 21

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-049   | U11    | 27.00-27.50 | 31   | 22   | 9    | CL/ML       |
| ▲    | BH-049   | U13    | 31.00-31.50 | 36   | 24   | 12   | CL/ML       |
| ■    | BH-049   | U16    | 37.00-37.50 | 34   | 23   | 11   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



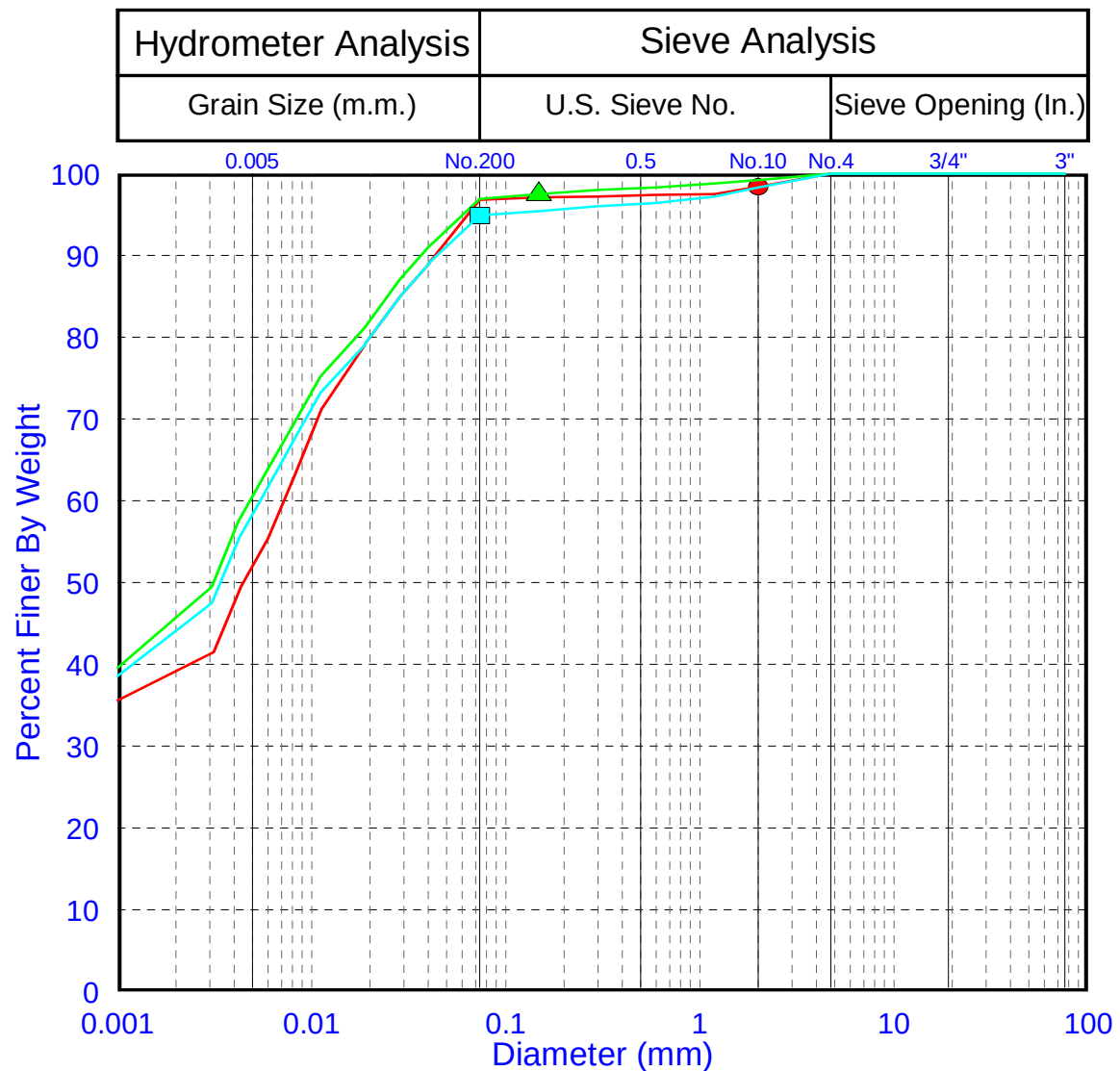
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 22

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| Sym.                                 | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|--------------------------------------|----------|--------|-------------|------|------|------|-------------|
| <span style="color: red;">●</span>   | BH-052   | D4     | 12.00-12.45 | 35   | 26   | 9    | ML/CL       |
| <span style="color: green;">▲</span> | BH-052   | D9     | 27.00-27.45 | 41   | 21   | 20   | CL          |
| <span style="color: cyan;">■</span>  | BH-052   | D13    | 39.00-39.45 | 40   | 26   | 14   | ML/CL       |

## GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

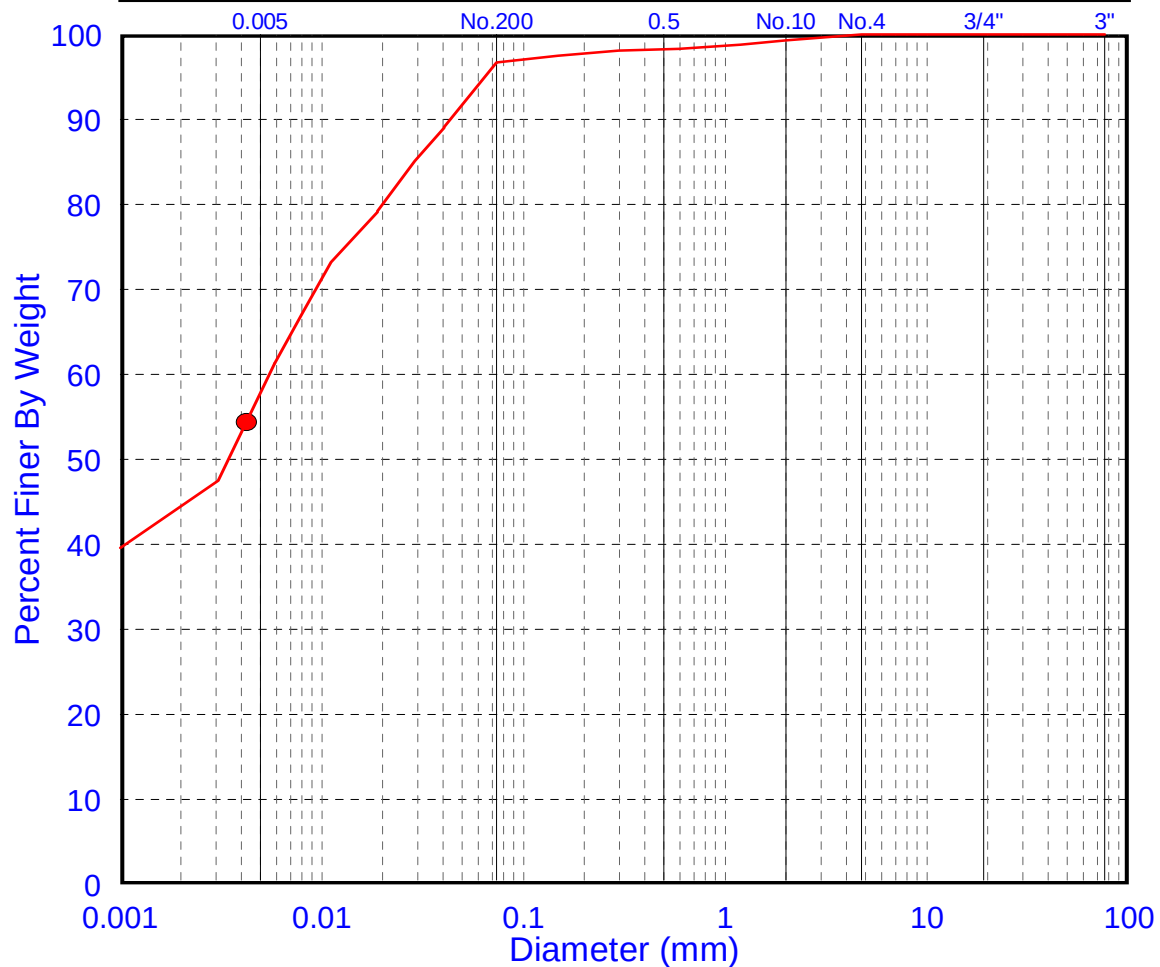
Client : NFC

Fig.: 23

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-052   | D16    | 48.00-48.45 | 41   | 24   | 17   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



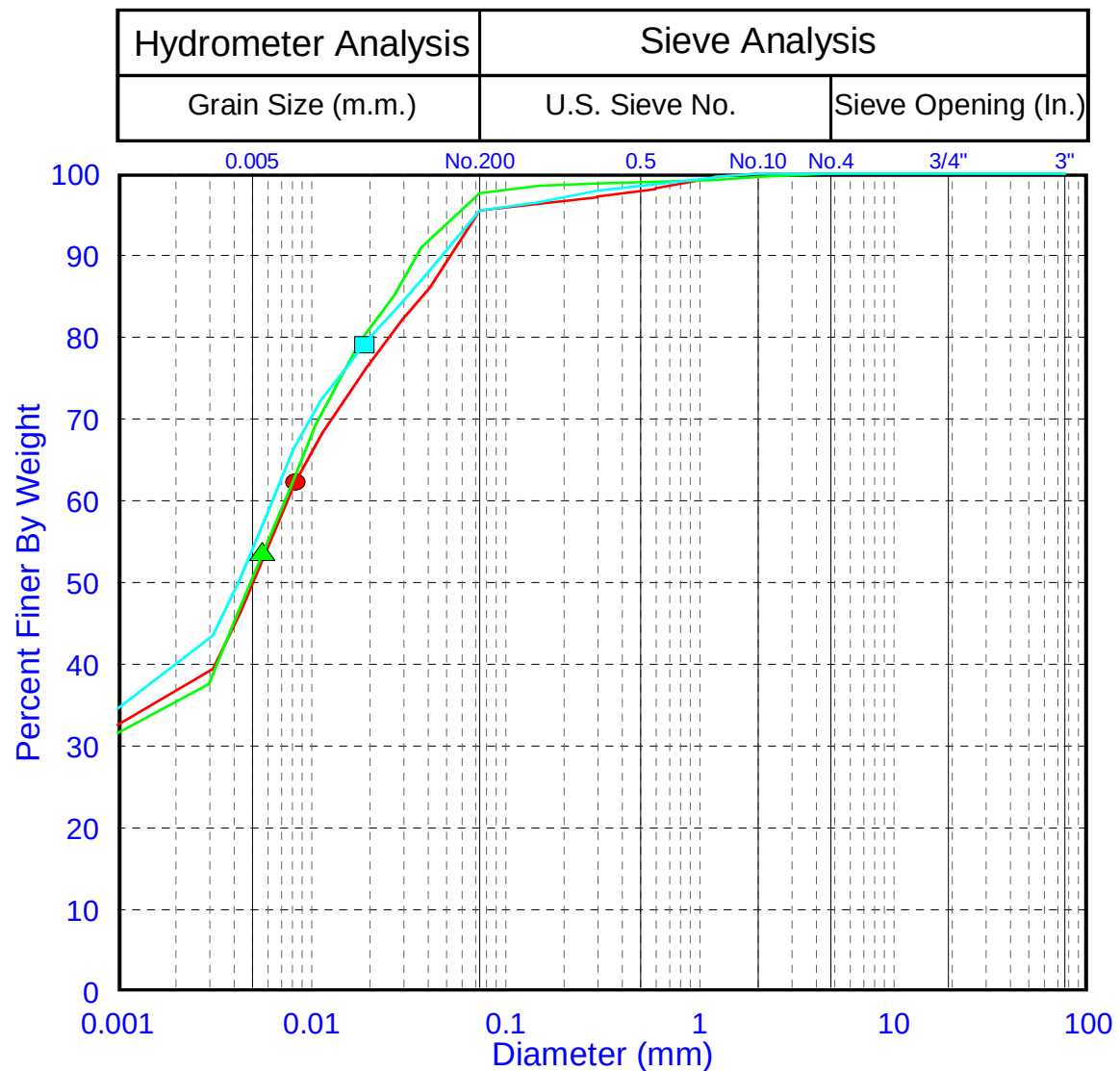
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 24

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-053   | U3     | 9.50-10.00  | 29   | 22   | 7    | CL-ML/CL    |
| ▲    | BH-053   | U6     | 15.50-16.00 | 40   | 21   | 19   | CL          |
| ■    | BH-053   | U7     | 17.50-18.00 | 30   | 22   | 8    | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

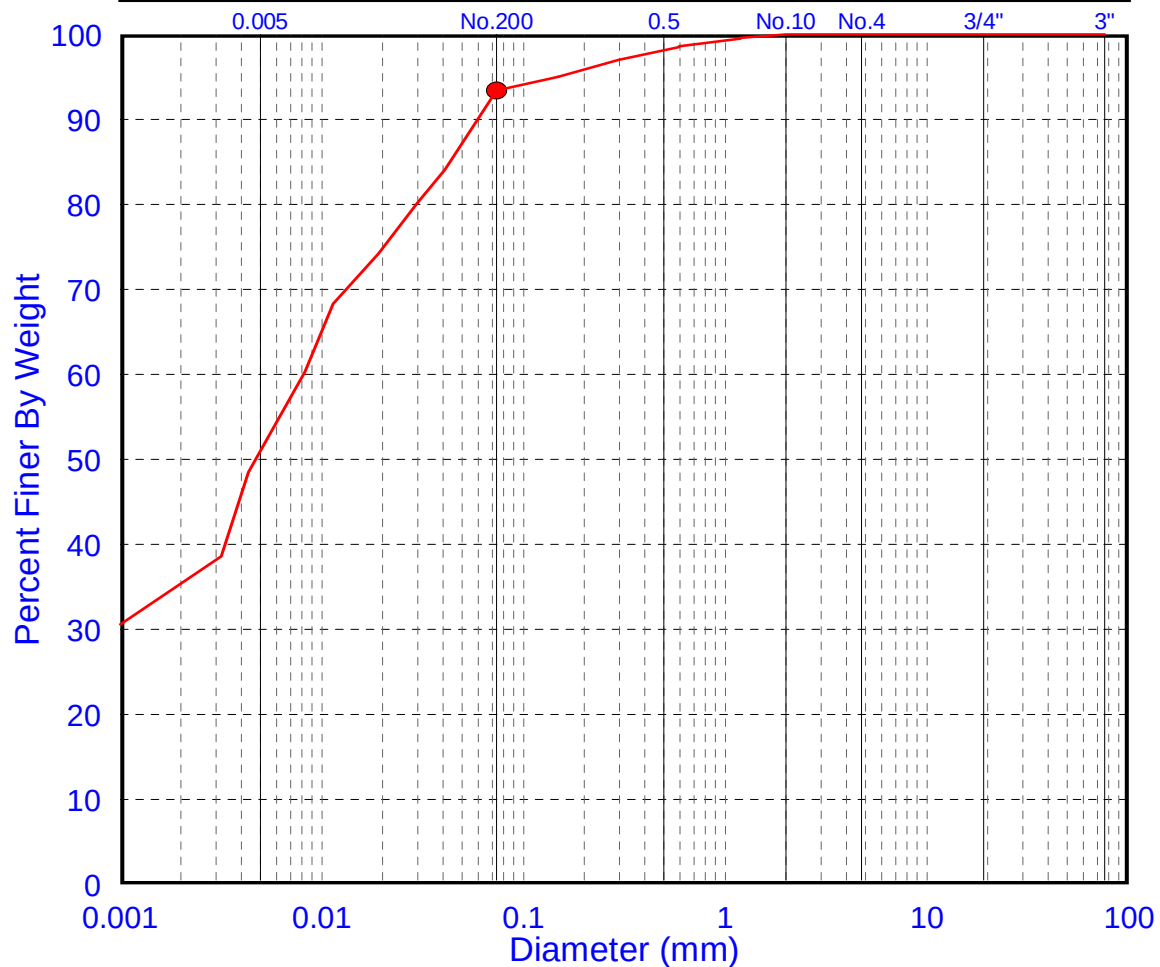
Fig.: 25

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-058   | U7     | 17.50-18.00 | 37   | 24   | 13   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



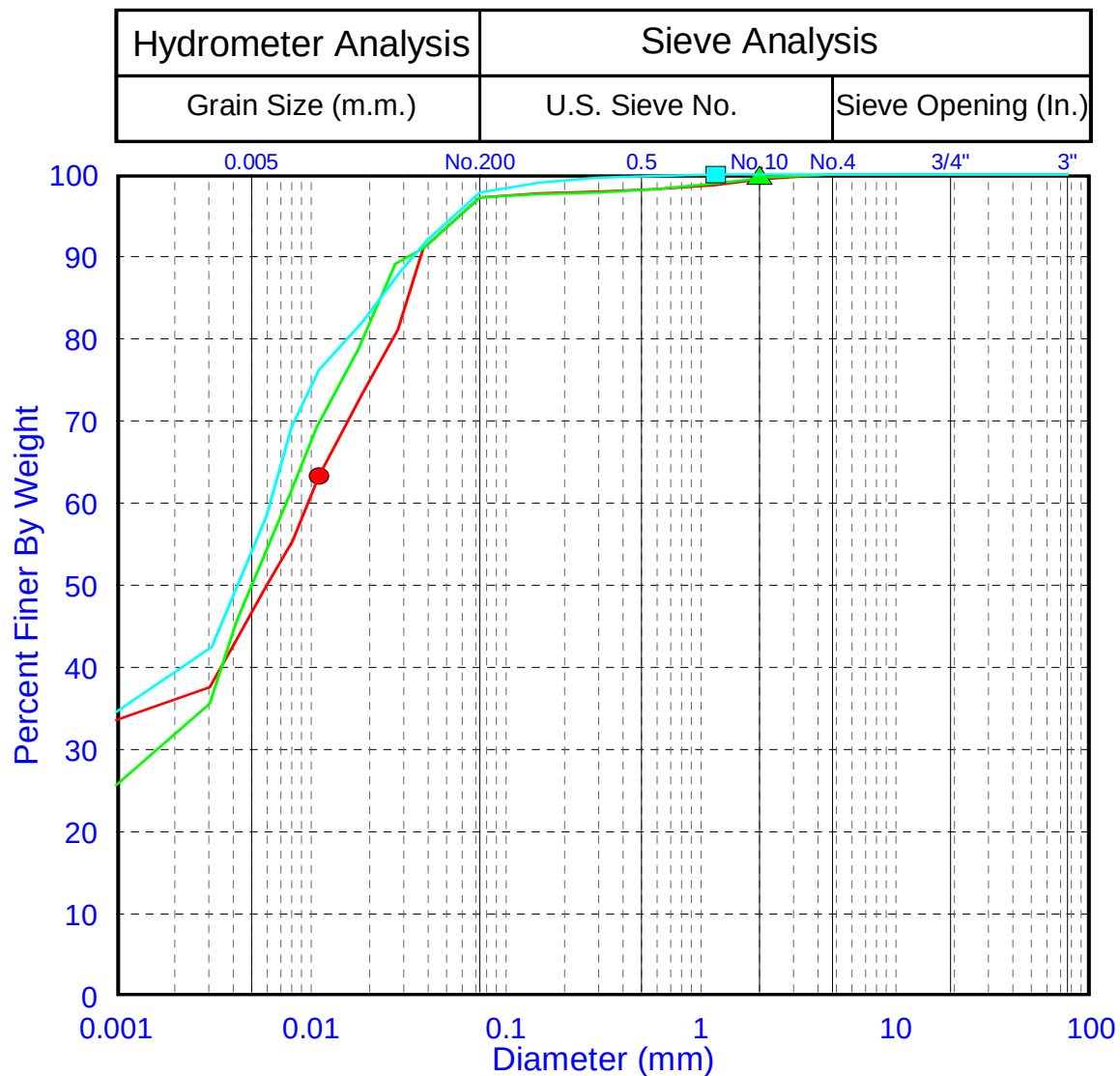
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 27

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-059   | U1     | 3.50-4.00   | 43   | 23   | 20   | CL          |
| ▲    | BH-059   | U9     | 20.00-20.50 | 34   | 23   | 12   | ML          |
| ■    | BH-059   | U16    | 33.50-34.00 | 35   | 24   | 11   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



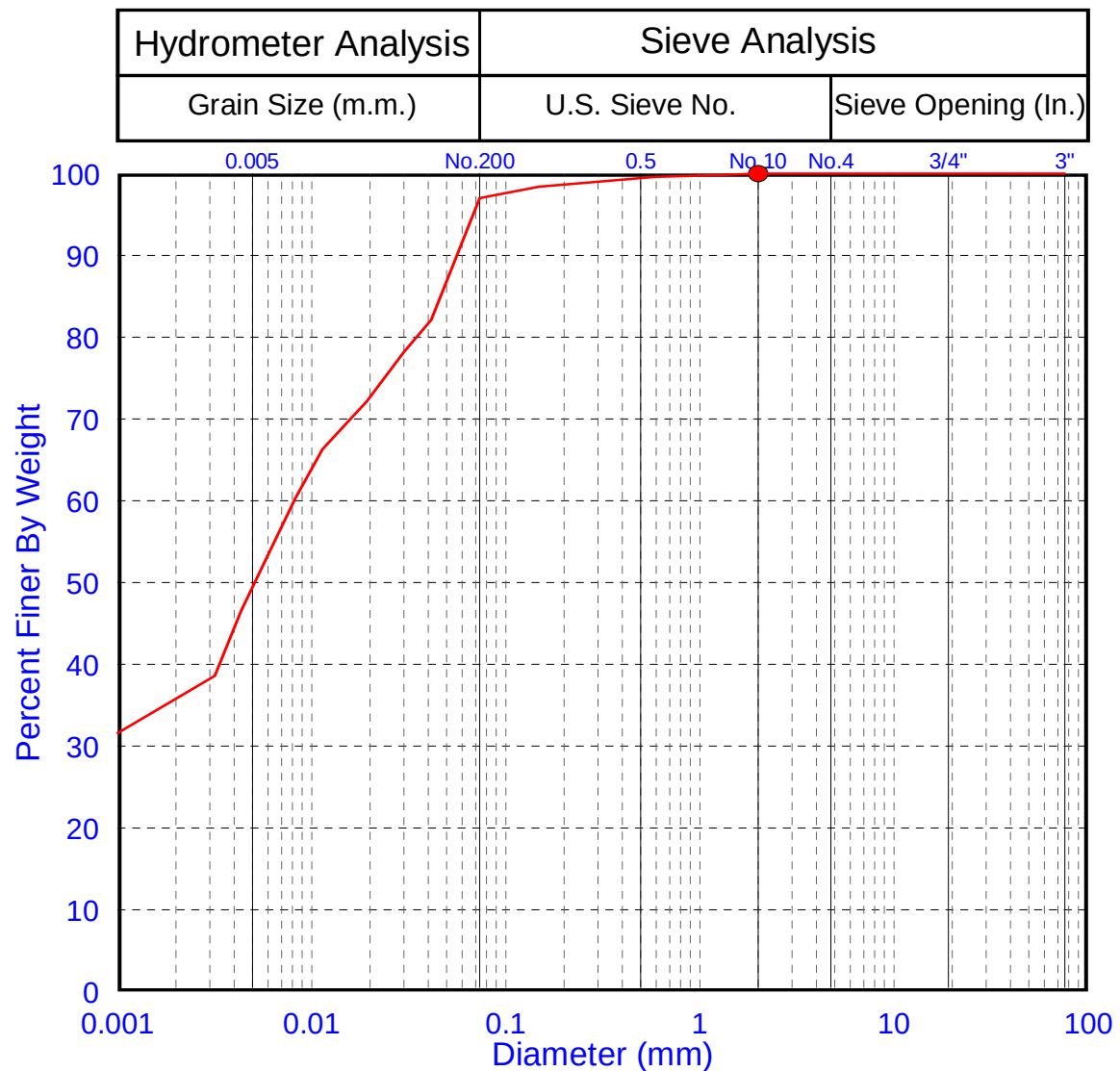
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 28

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-059   | U17    | 35.50-36.00 | 33   | 24   | 9    | ML/CL       |

## GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

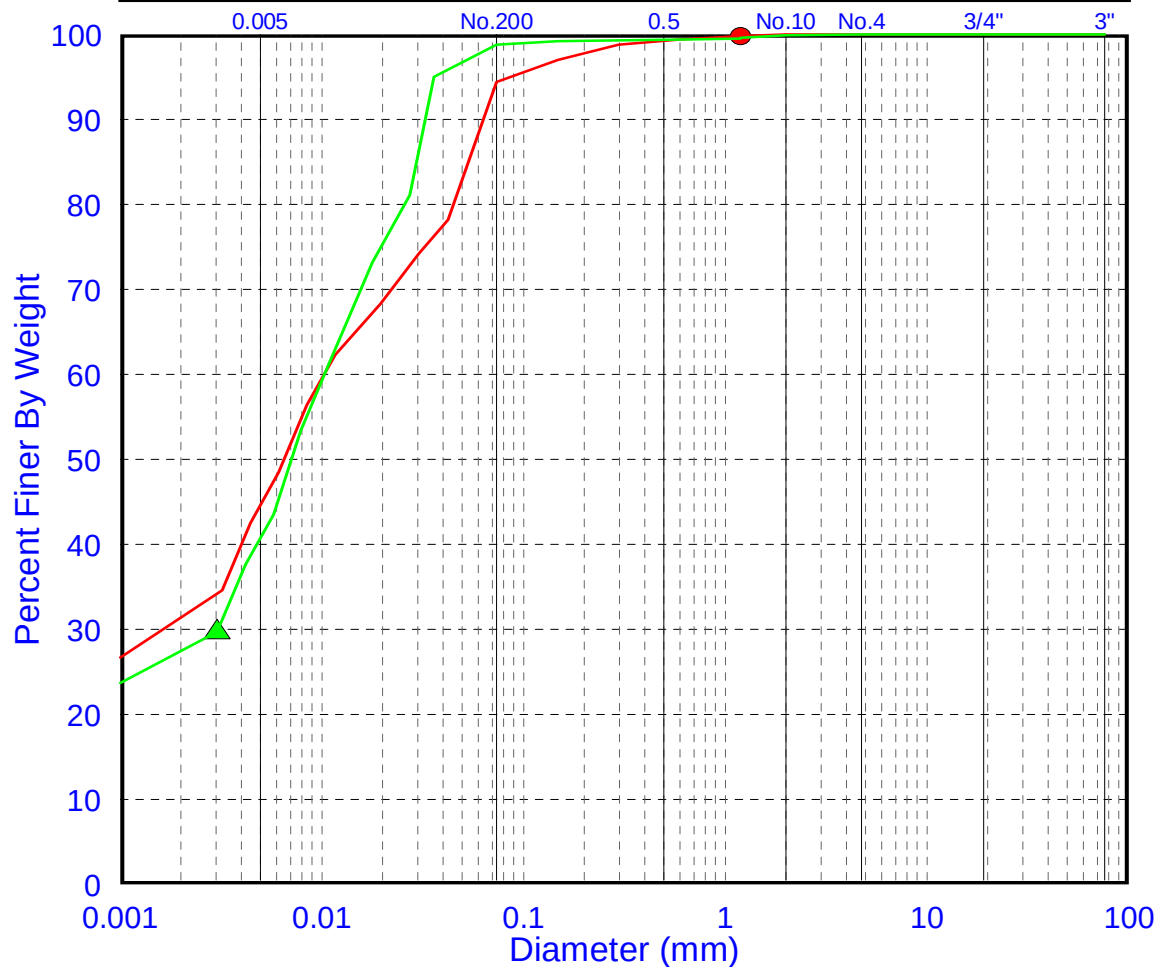
Client : NFC

Fig.: 29

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)   | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|------------|------|------|------|-------------|
| ●    | BH-062   | U2     | 7.50-8.00  | 27   | 21   | 6    | CL-ML       |
| ▲    | BH-062   | U3     | 9.50-10.00 | 44   | 25   | 19   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



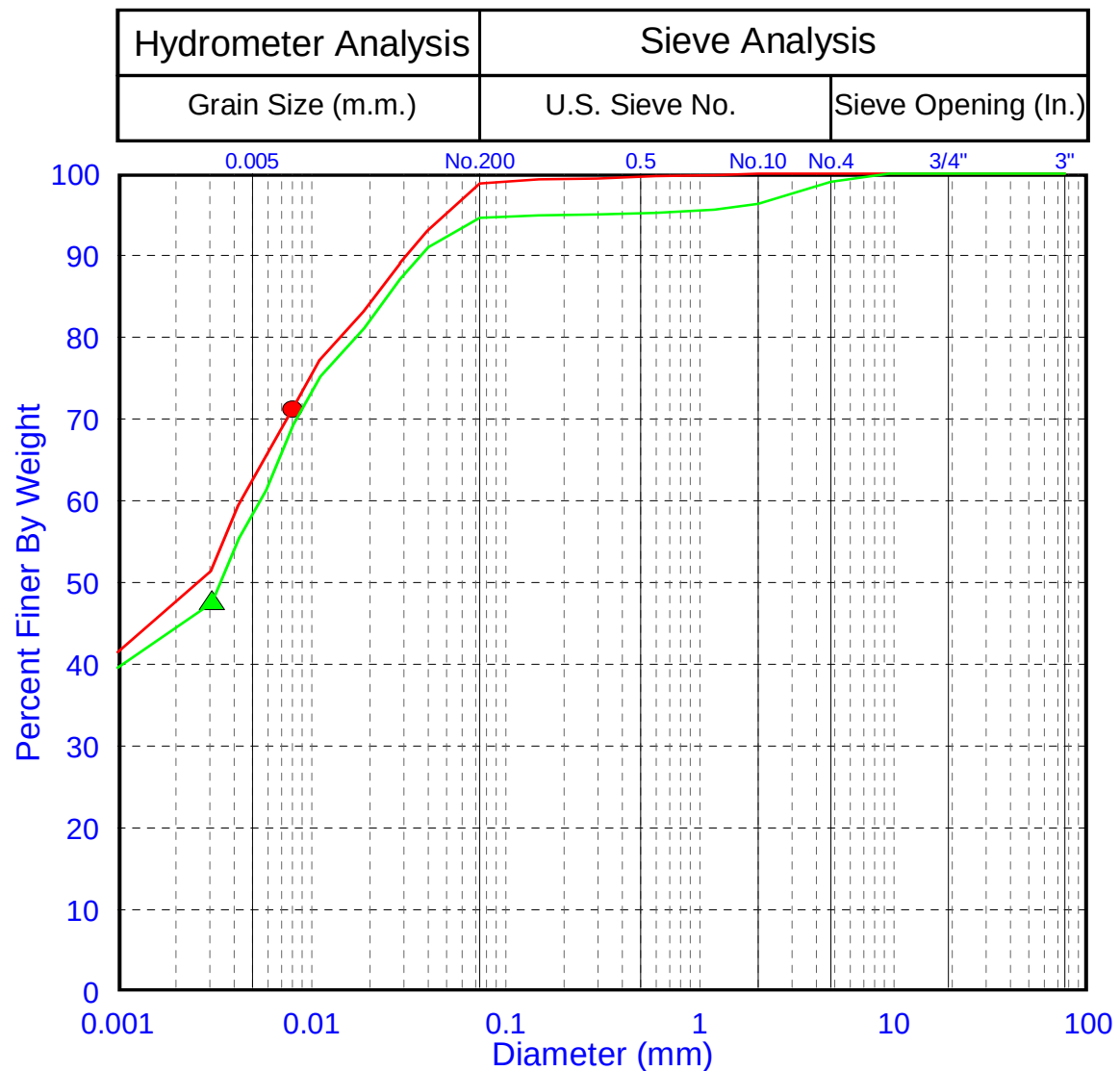
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 30

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-064   | U2     | 6.50-6.95   | 33   | 24   | 9    | ML/CL       |
| ▲    | BH-064   | U8     | 18.50-18.95 | 29   | 20   | 9    | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



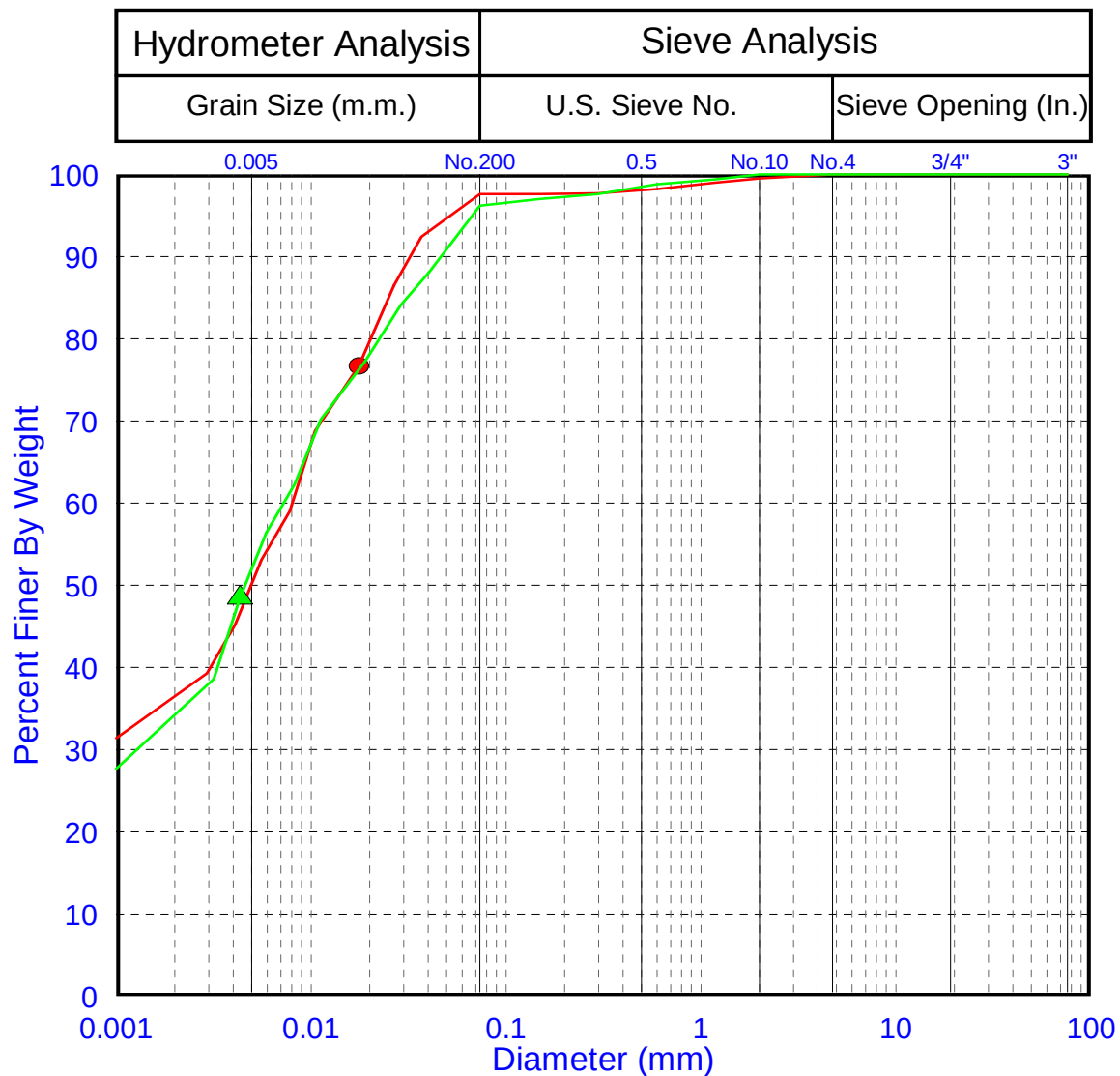
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 31

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-069   | U1     | 4.00-4.50   | 41   | 22   | 19   | CL          |
| ▲    | BH-069   | U6     | 14.00-14.50 | 41   | 24   | 17   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



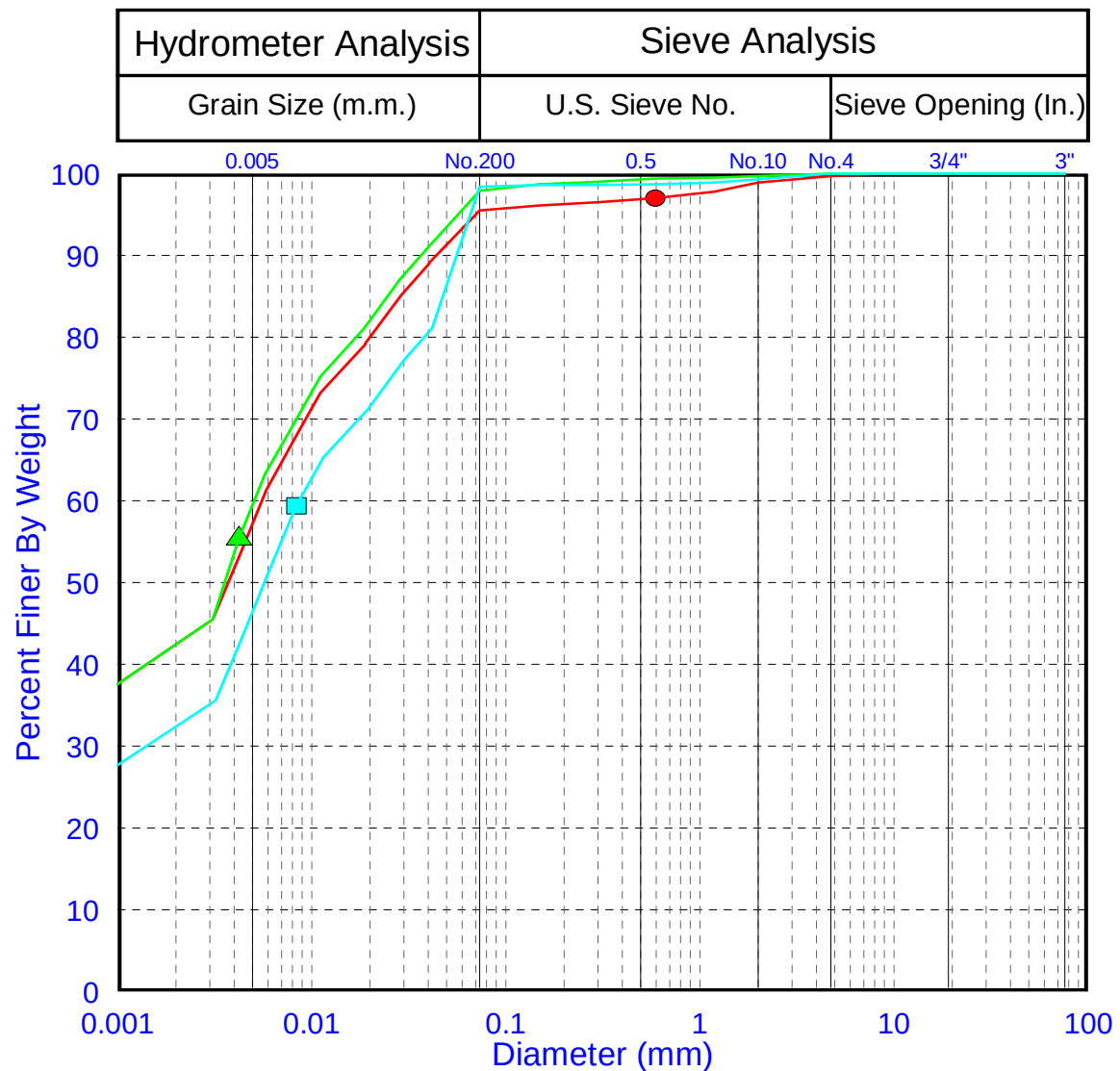
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 32

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-073   | U2     | 13.00-13.75 | 39   | 23   | 16   | CL/ML       |
| ▲    | BH-073   | U4     | 23.00-23.45 | 40   | 24   | 16   | CL/ML       |
| ■    | BH-073   | U6     | 33.00-33.30 | 45   | 23   | 22   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



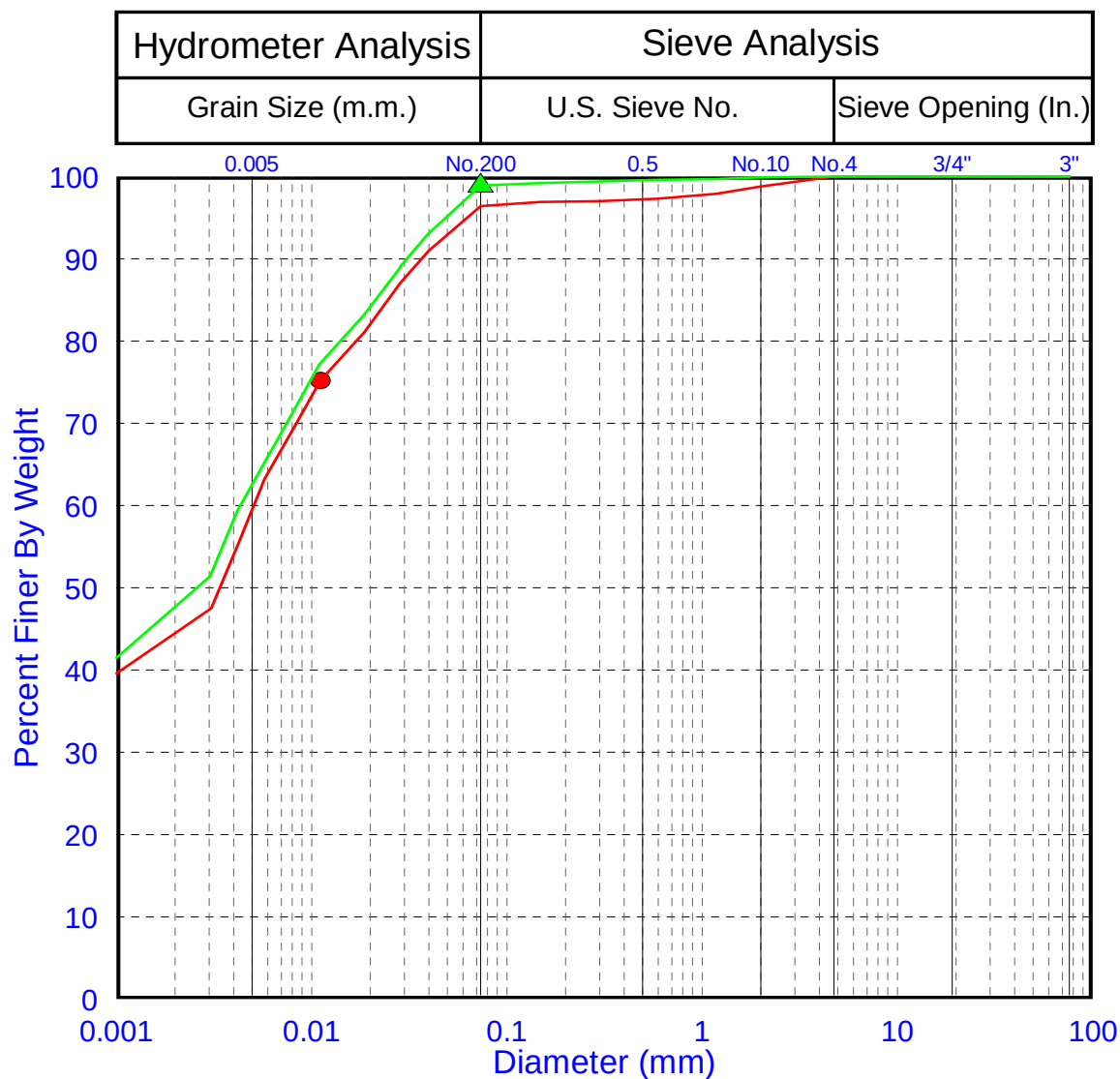
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 33

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-082   | U2     | 8.00-8.50   | 29   | 21   | 8    | CL/ML       |
| ▲    | BH-082   | U7     | 18.00-18.50 | 36   | 23   | 13   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

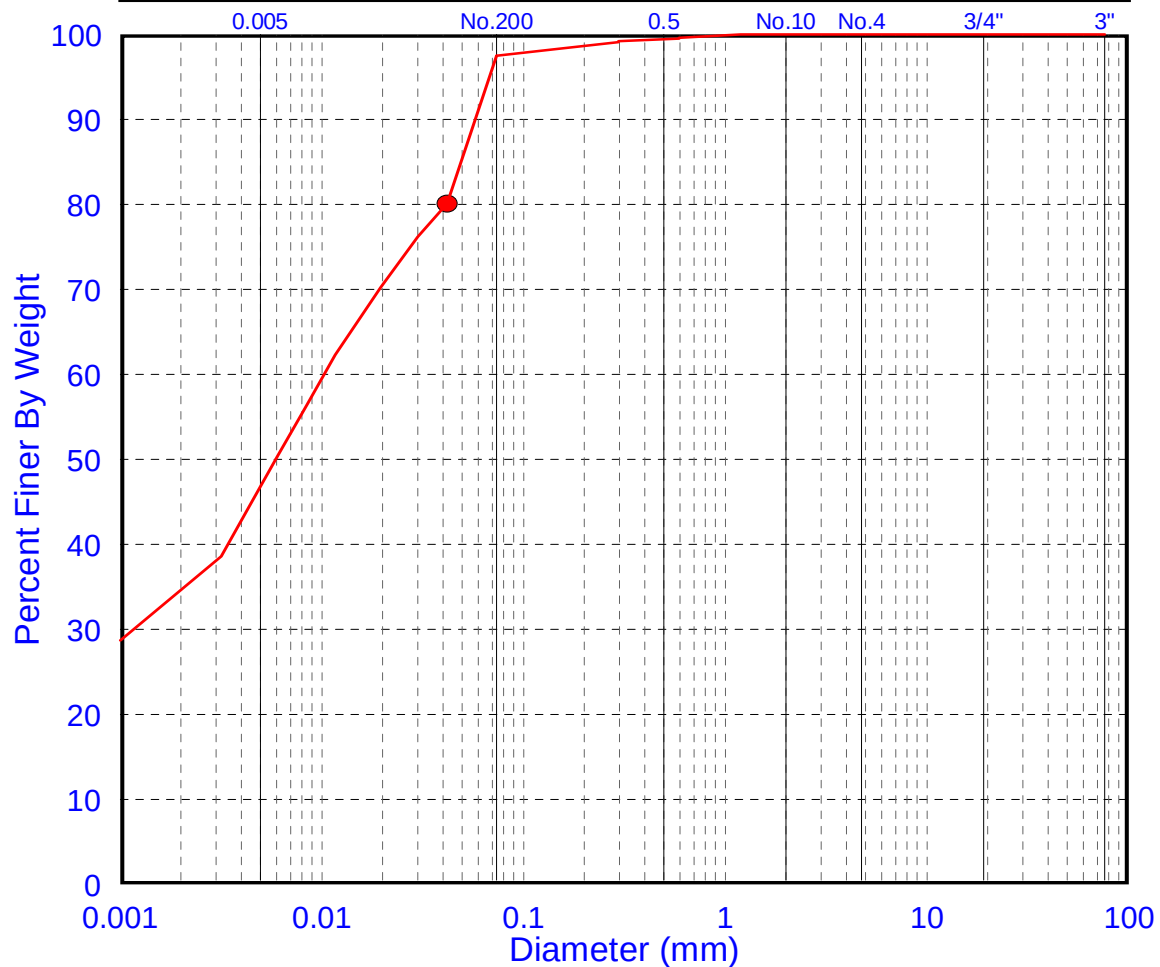
Client : NFC

Fig.: 34

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)  | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-----------|------|------|------|-------------|
| ●    | BH-086   | U1     | 5.00-5.50 | 31   | 21   | 10   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



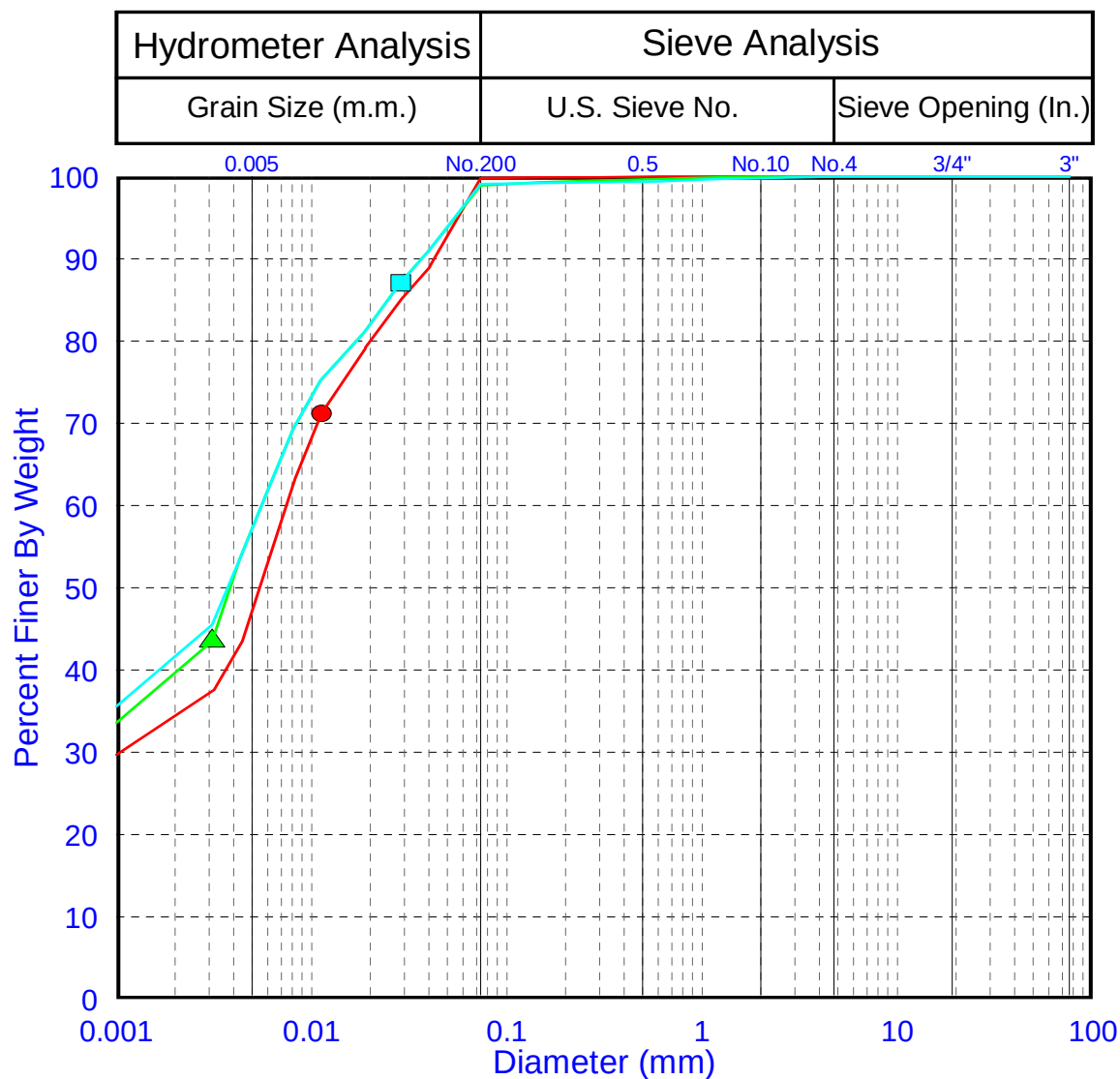
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 35

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

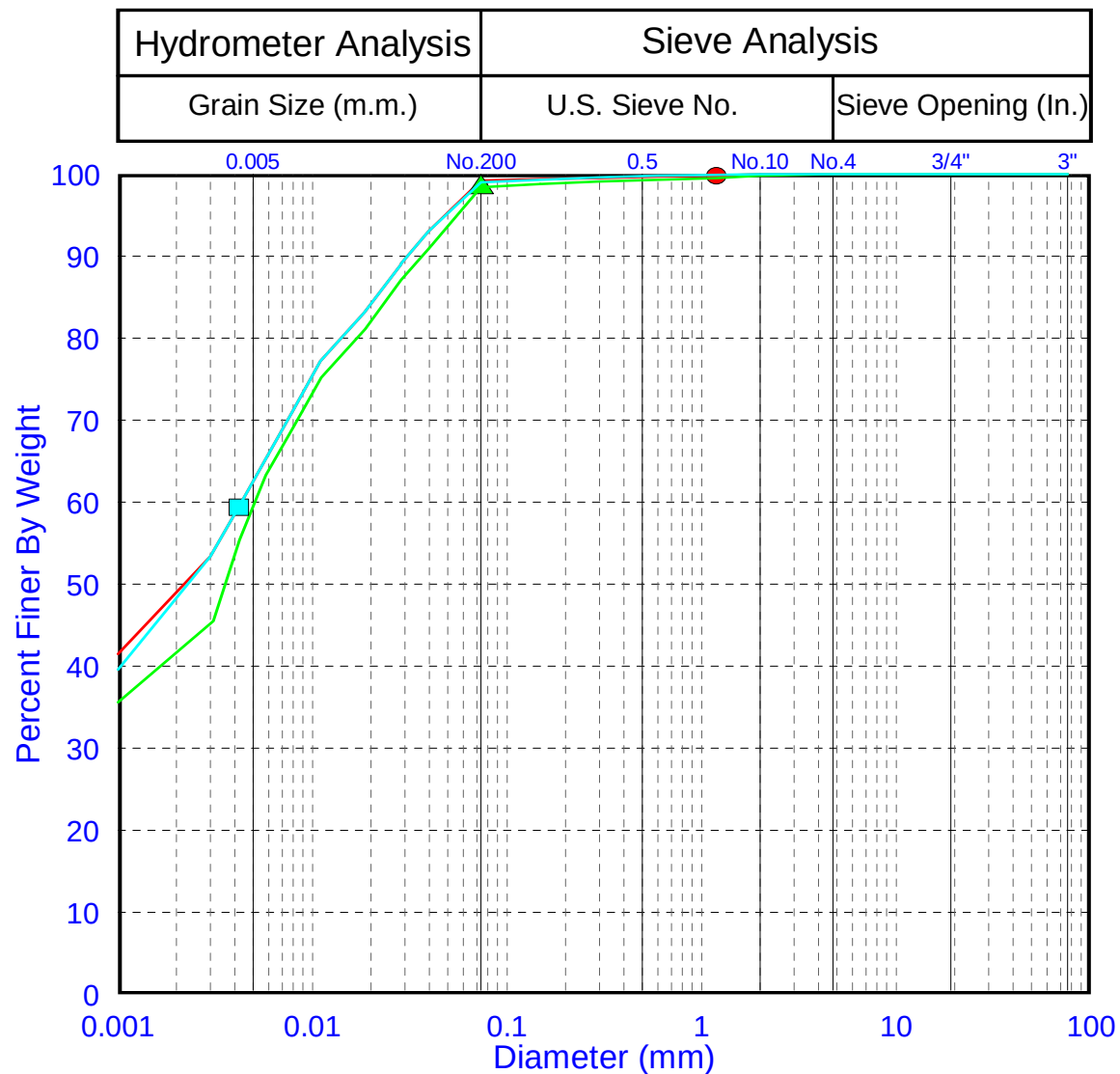


| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-096   | U16    | 38.00-38.50 | 36   | 21   | 15   | CL          |
| ▲    | BH-096   | U17    | 40.00-40.50 | 36   | 21   | 15   | CL          |
| ■    | BH-096   | U18    | 42.00-42.50 | 38   | 21   | 17   | CL          |

## GRAIN SIZE DISTRIBUTION CHART

|                                                   |                                        |                 |
|---------------------------------------------------|----------------------------------------|-----------------|
|                                                   | Project : SOUTH ALUMINUM SMELTER PLANT | Fig.: 36        |
|                                                   | Client : NFC                           |                 |
| Soil Engineering Services Consultant & Contractor |                                        | Proj No. : 1347 |



| Sym.                                 | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|--------------------------------------|----------|--------|-------------|------|------|------|-------------|
| <span style="color: red;">●</span>   | BH-096   | U20    | 46.00-46.50 | 39   | 24   | 15   | CL/ML       |
| <span style="color: green;">▲</span> | BH-096   | U21    | 48.00-48.50 | 35   | 24   | 11   | CL/ML       |
| <span style="color: cyan;">■</span>  | BH-096   | U22    | 50.00-50.50 | 42   | 22   | 20   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



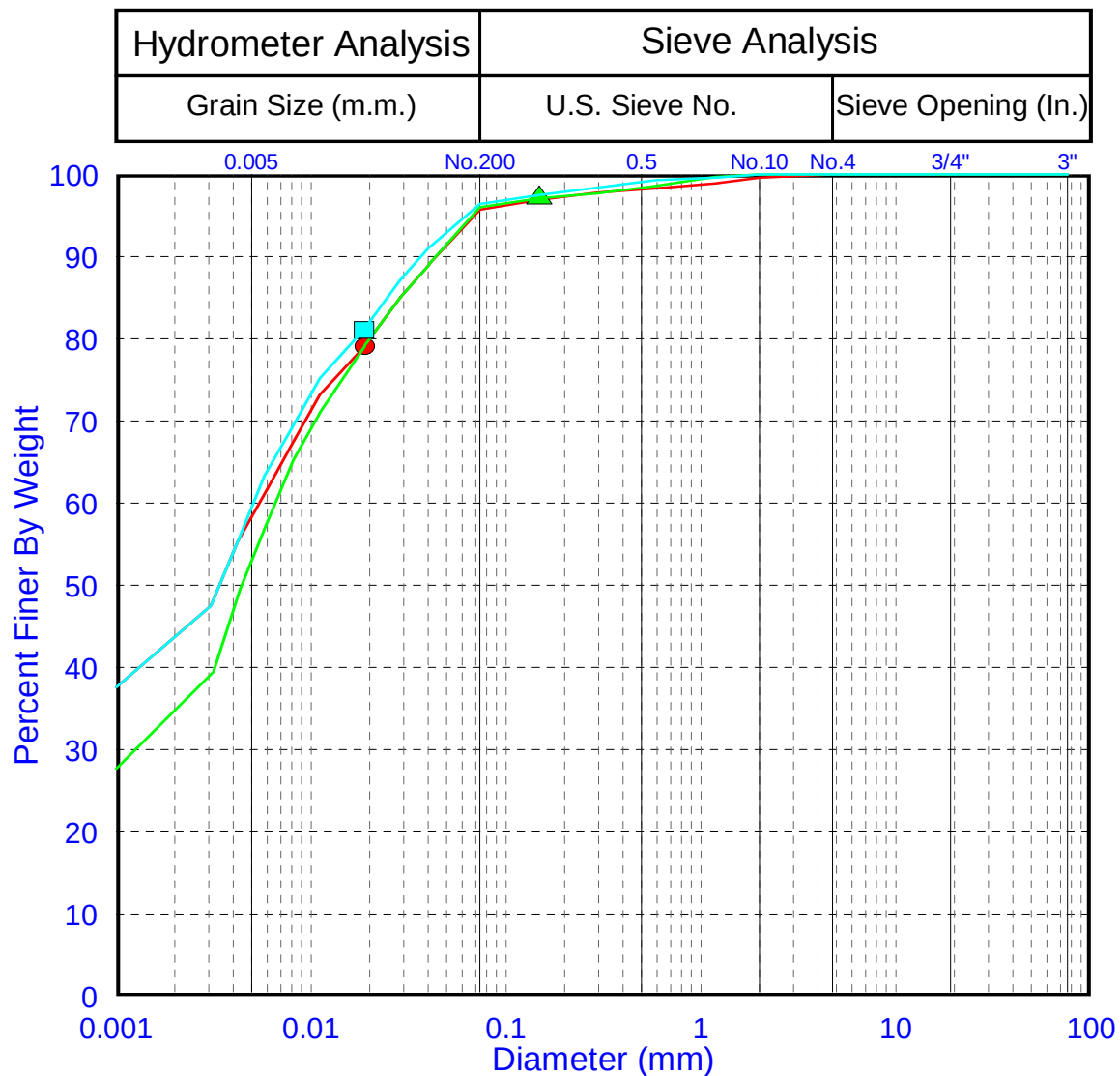
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 37

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-098   | D3     | 9.00-9.45   | 36   | 20   | 16   | CL          |
| ▲    | BH-098   | D6     | 18.00-18.45 | 38   | 22   | 16   | CL/ML       |
| ■    | BH-098   | D9     | 27.00-27.45 | 36   | 21   | 15   | CL          |

### GRAIN SIZE DISTRIBUTION CHART



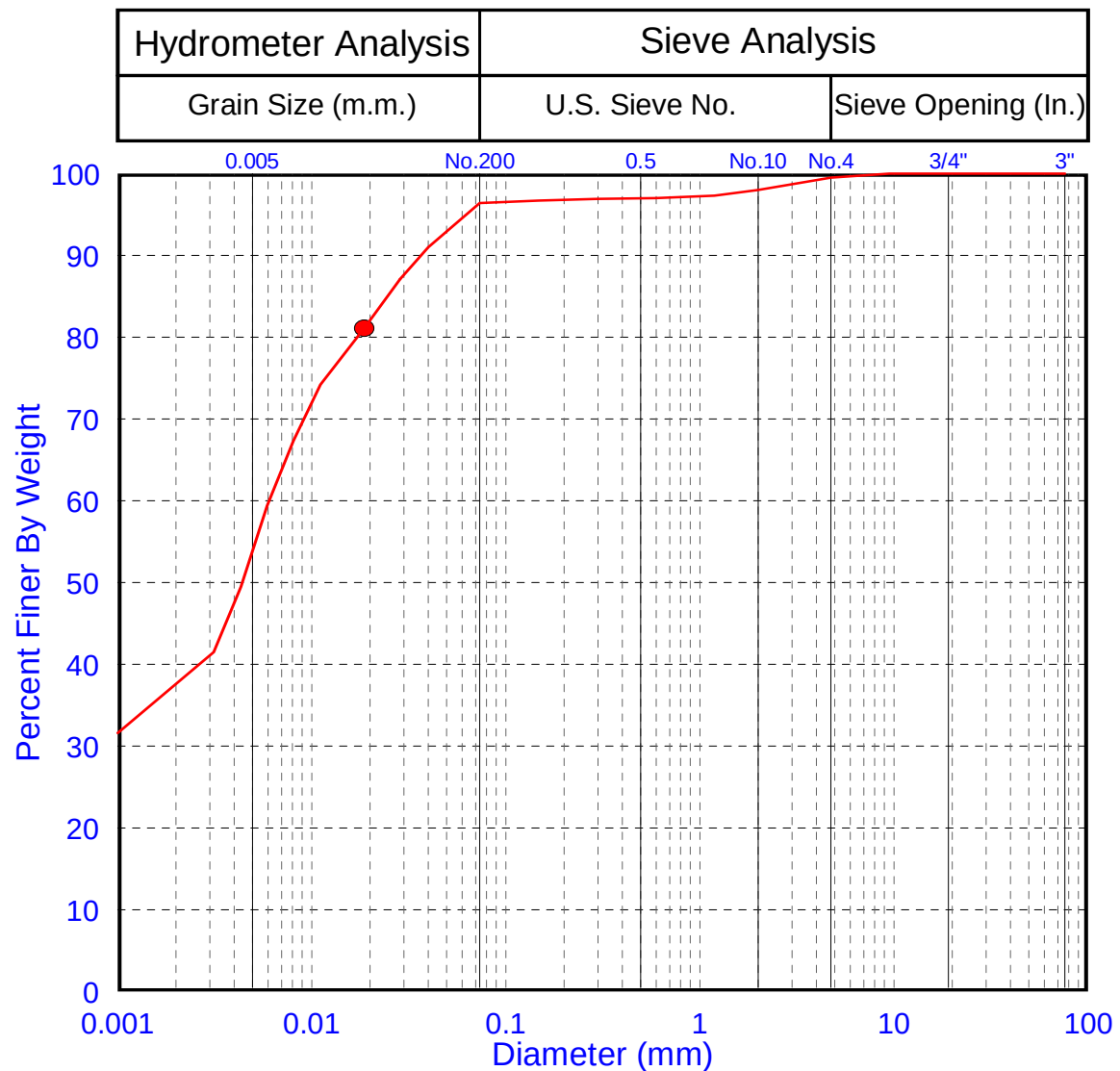
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 38

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-098   | D12    | 36.00-36.45 | 35   | 20   | 15   | CL          |

### GRAIN SIZE DISTRIBUTION CHART



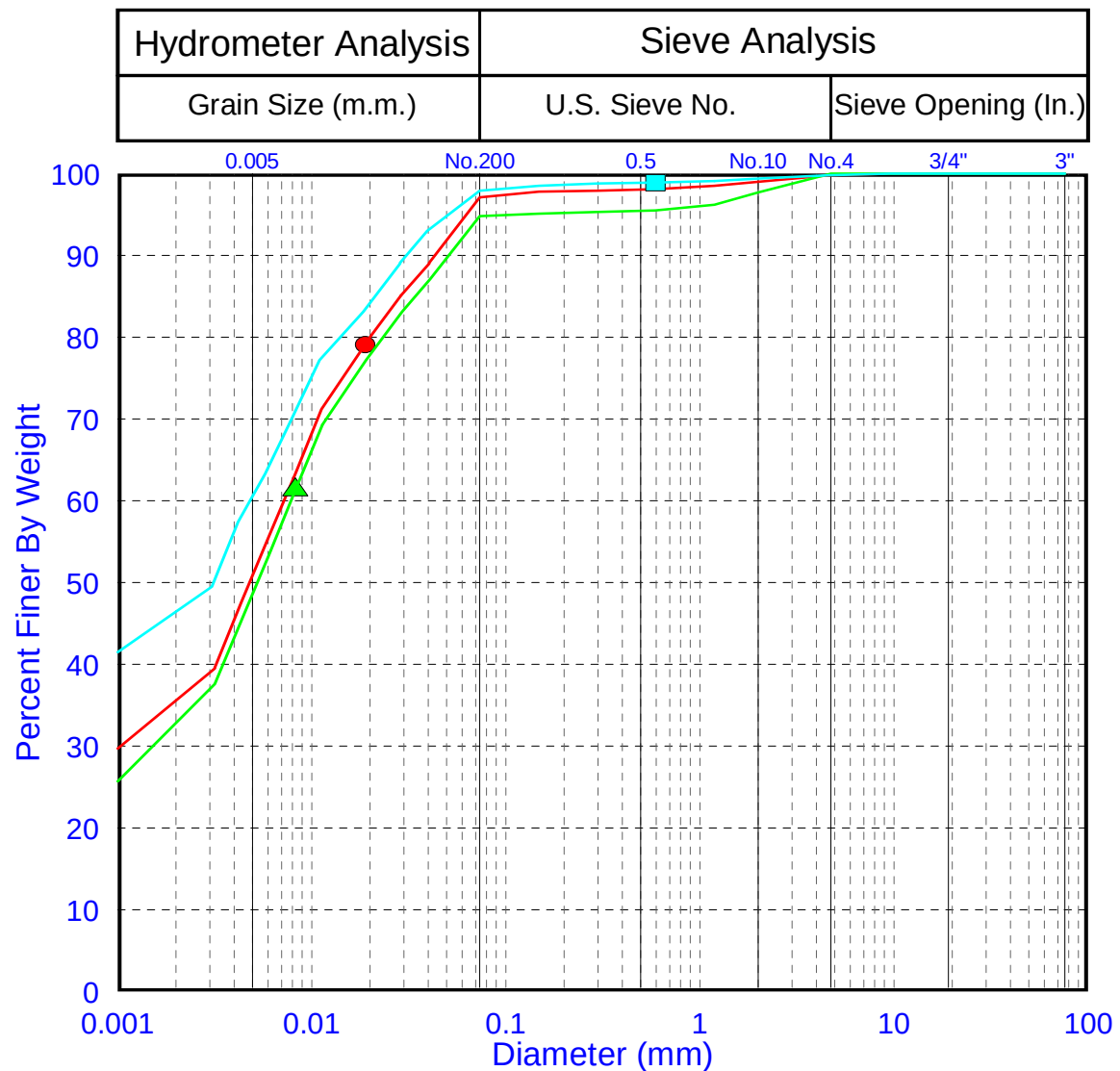
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 39

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-100   | U1     | 6.00-6.50   | 31   | 20   | 11   | CL/ML       |
| ▲    | BH-100   | U2     | 8.00-8.50   | 33   | 24   | 9    | ML/CL       |
| ■    | BH-100   | U3     | 10.00-10.50 | 30   | 21   | 9    | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

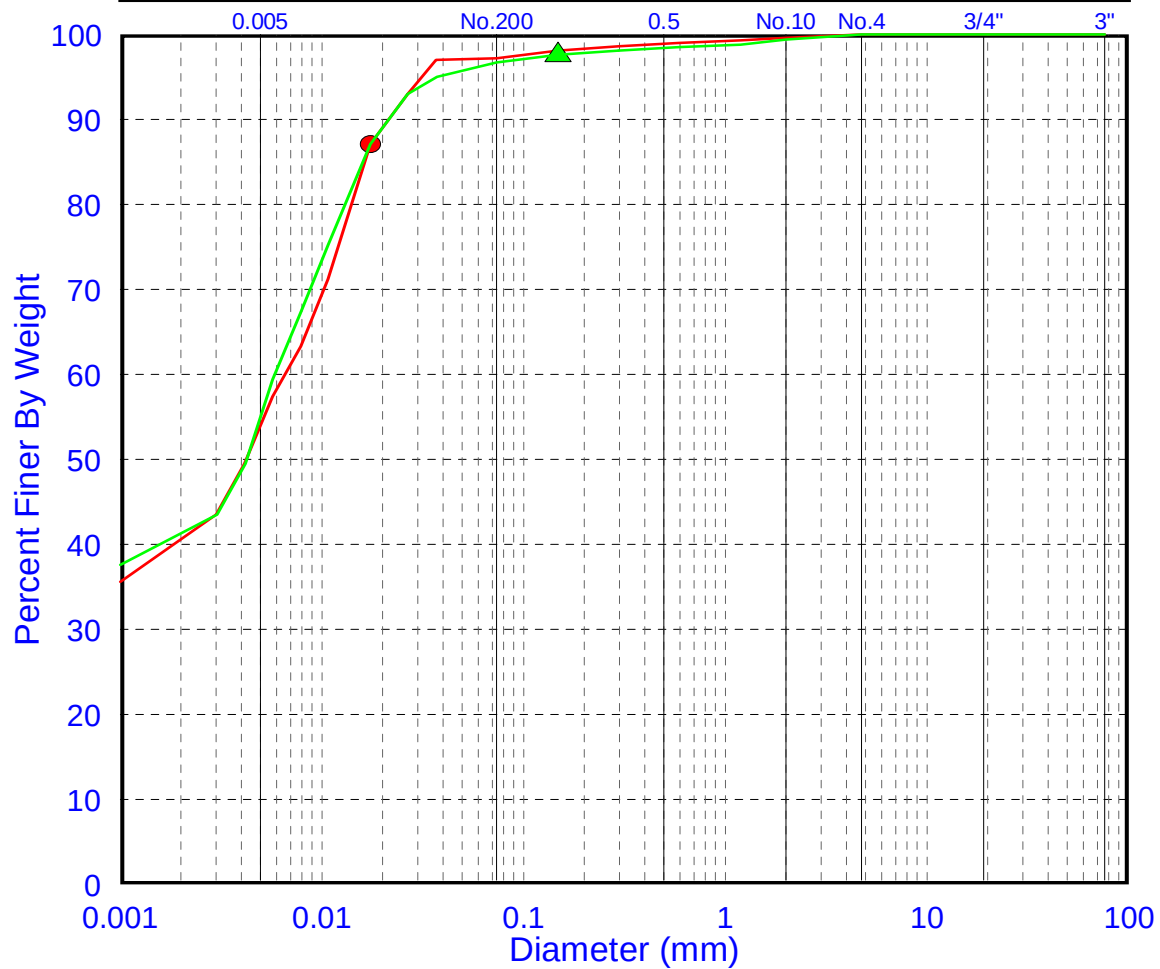
Client : NFC

Fig.: 40

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-104   | U2     | 8.00-8.50   | 40   | 23   | 17   | CL/ML       |
| ▲    | BH-104   | U7     | 18.00-18.50 | 37   | 21   | 16   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



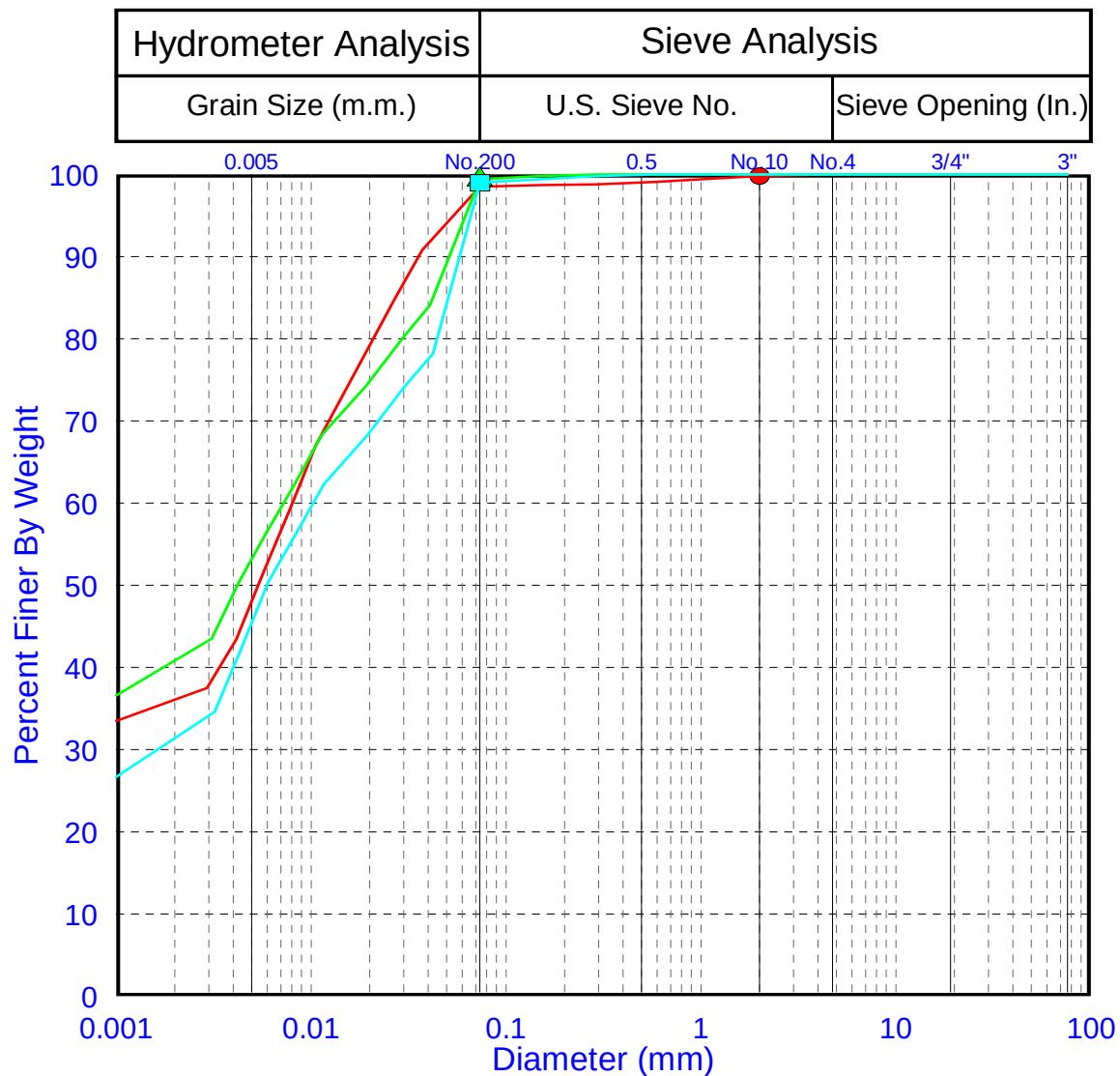
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 41

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-107   | U1     | 4.00-4.50   | 45   | 26   | 19   | ML          |
| ▲    | BH-107   | U3     | 9.00-9.50   | 31   | 22   | 9    | CL/ML       |
| ■    | BH-107   | U5     | 14.00-14.50 | 34   | 27   | 7    | ML          |

## GRAIN SIZE DISTRIBUTION CHART



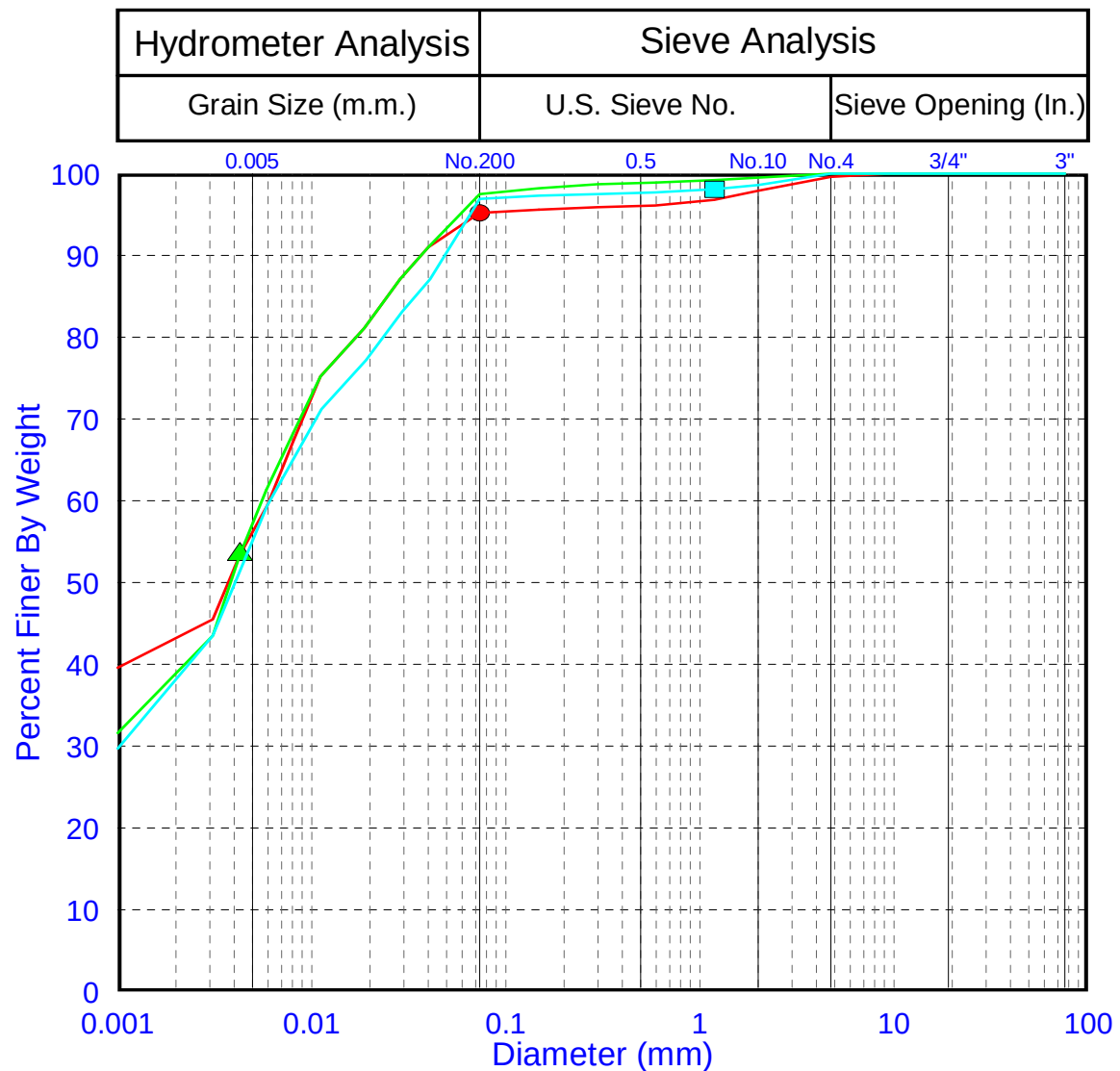
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 42

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-109   | U1     | 7.00-7.40   | 31   | 24   | 7    | ML/CL-ML/CL |
| ▲    | BH-109   | U2     | 9.00-9.40   | 36   | 26   | 10   | ML/CL       |
| ■    | BH-109   | U3     | 11.50-11.90 | 35   | 22   | 13   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



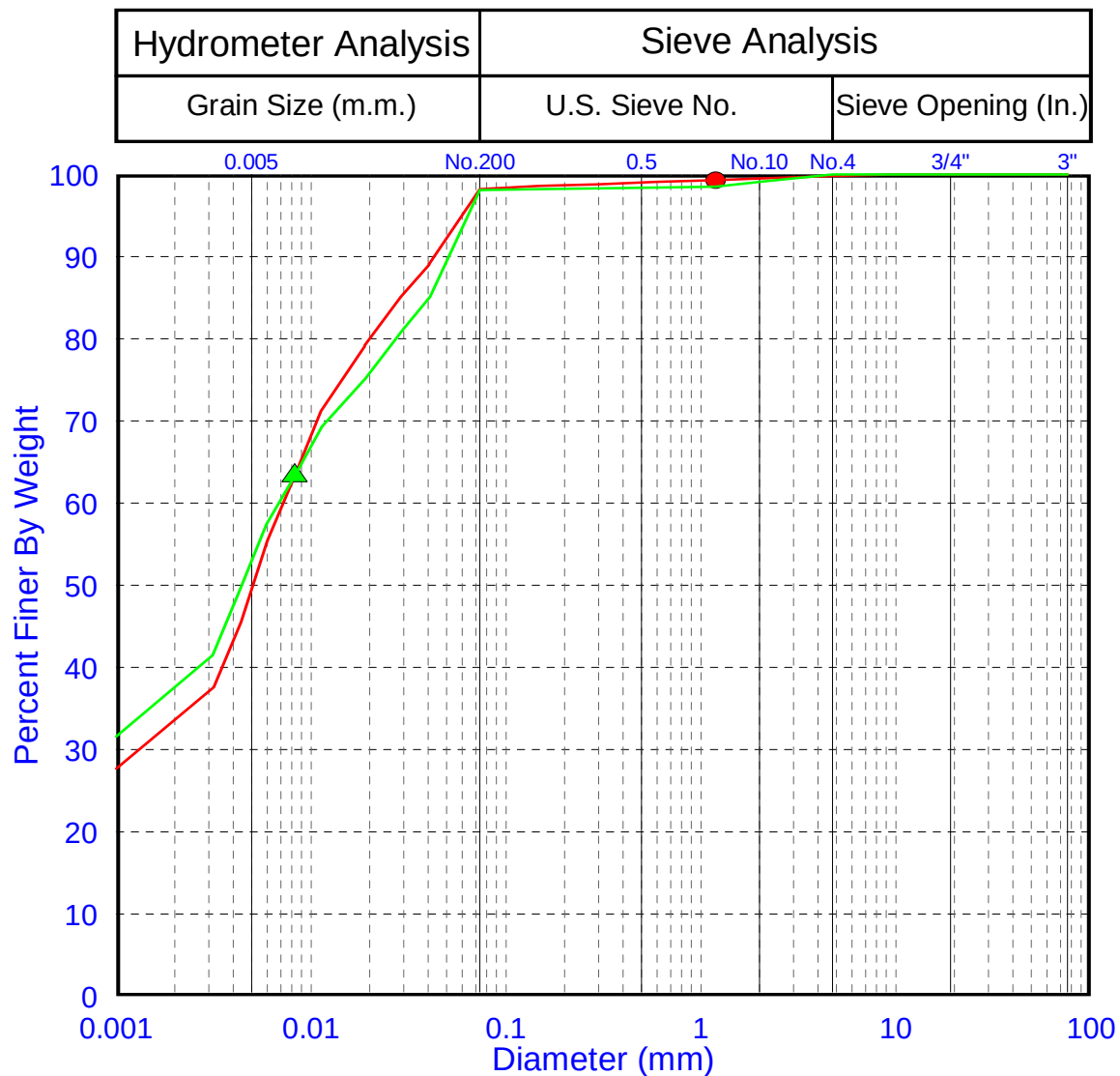
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 43

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-109   | U14    | 33.00-33.45 | 41   | 21   | 20   | CL          |
| ▲    | BH-109   | CB1    | 49.60-50.00 | 39   | 24   | 15   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



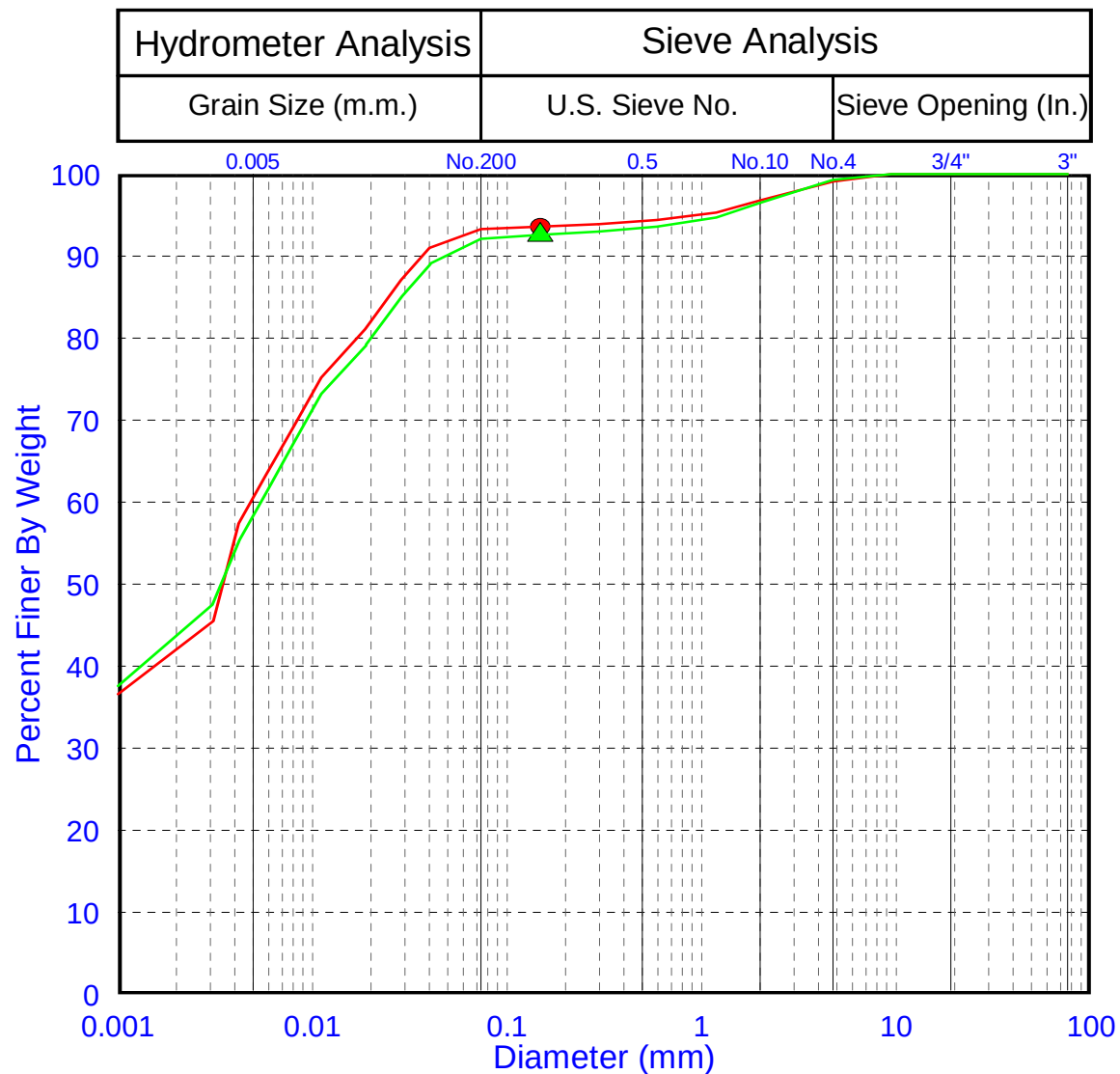
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 44

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-111   | U1     | 6.50-6.95   | 40   | 23   | 17   | CL/ML       |
| ▲    | BH-111   | U4     | 12.50-12.95 | 33   | 23   | 10   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



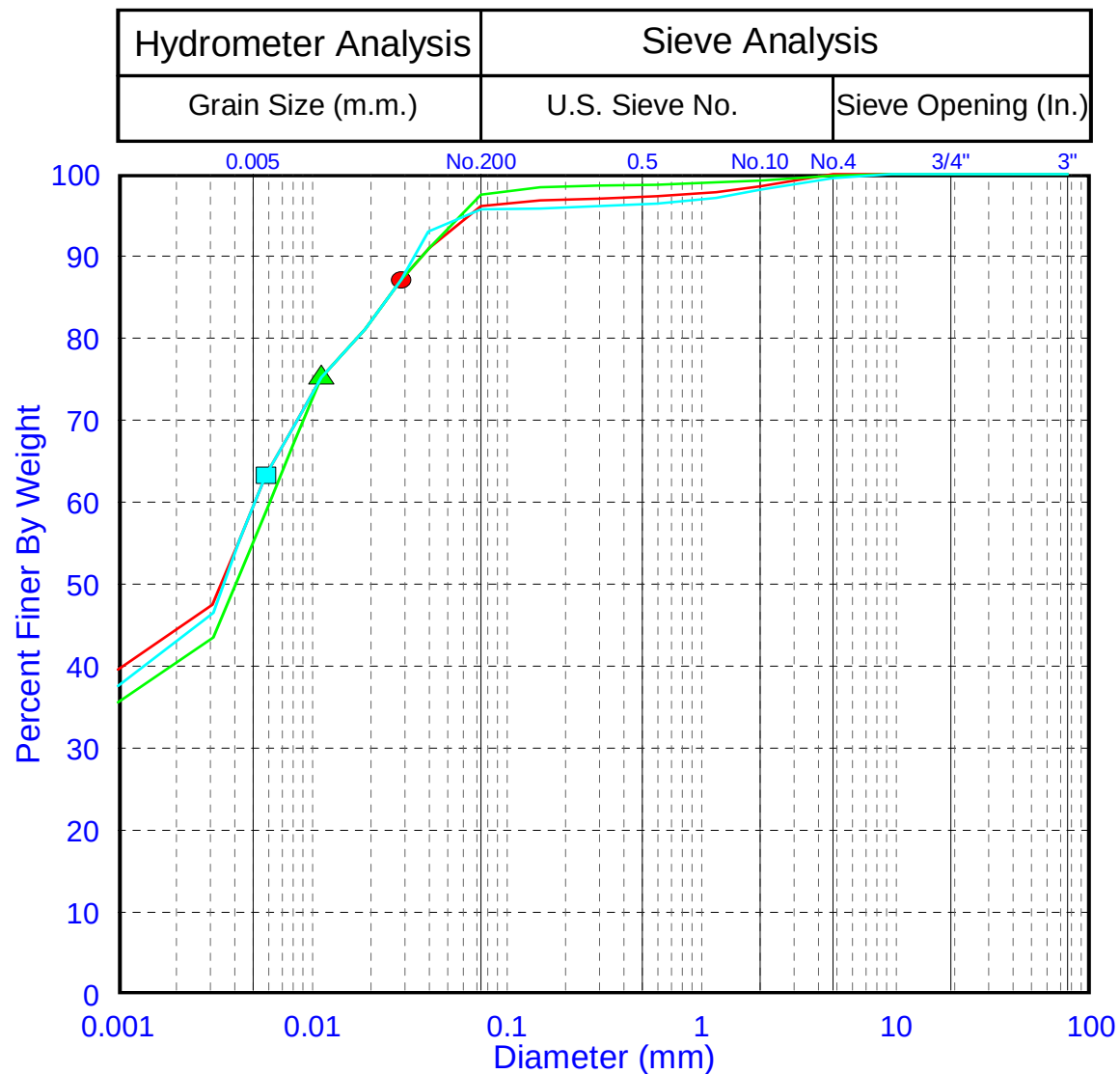
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 45

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-112   | U2     | 10.00-10.55 | 34   | 22   | 12   | CL/ML       |
| ▲    | BH-112   | U4     | 15.00-15.60 | 30   | 20   | 10   | CL/ML       |
| ■    | BH-112   | U6     | 20.00-20.75 | 36   | 23   | 13   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



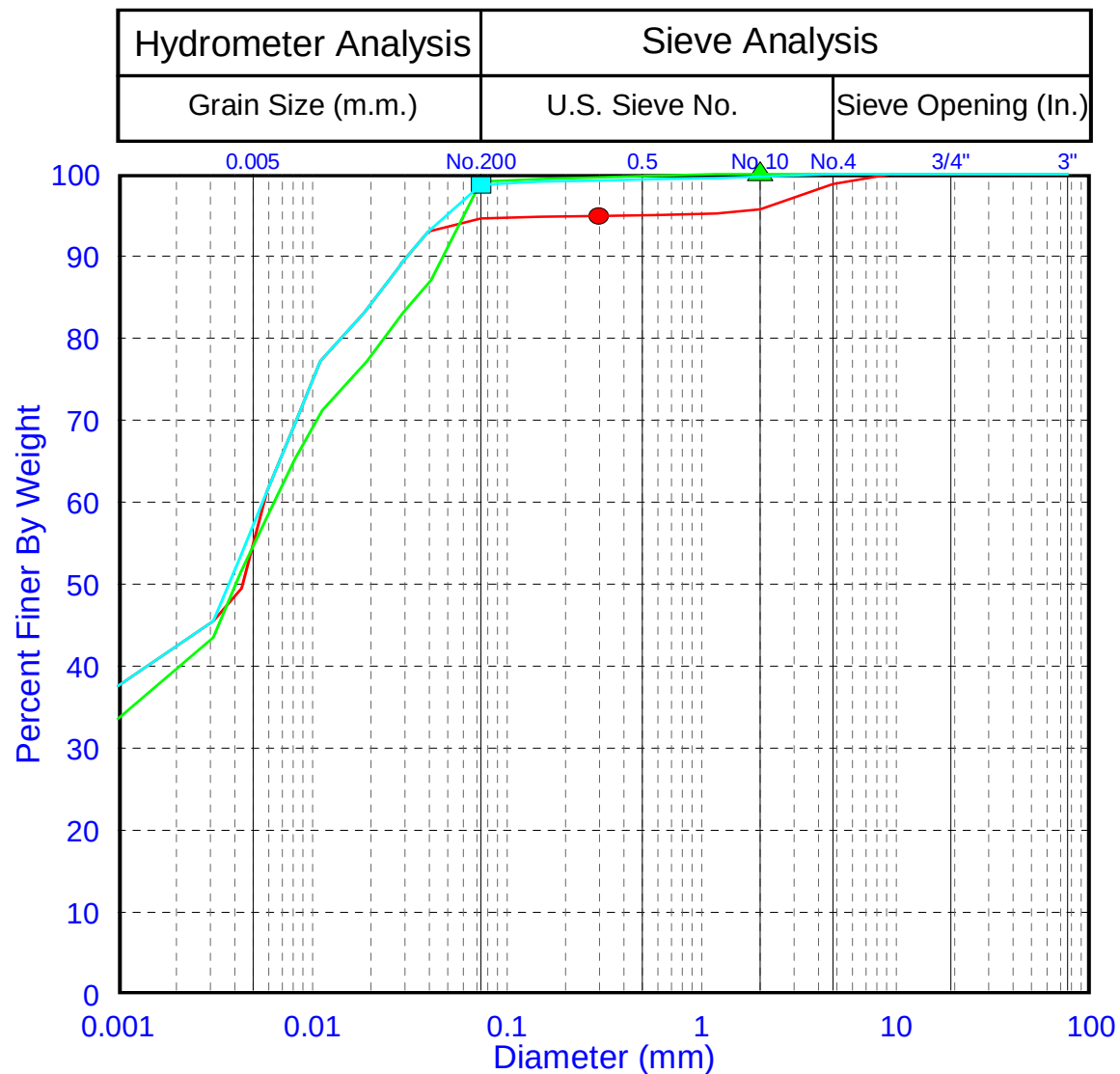
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 46

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-112   | U9     | 27.50-27.80 | 39   | 23   | 16   | CL/ML       |
| ▲    | BH-112   | U12    | 35.00-35.35 | 42   | 24   | 18   | CL/ML       |
| ■    | BH-112   | U14    | 40.00-40.30 | 36   | 23   | 13   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



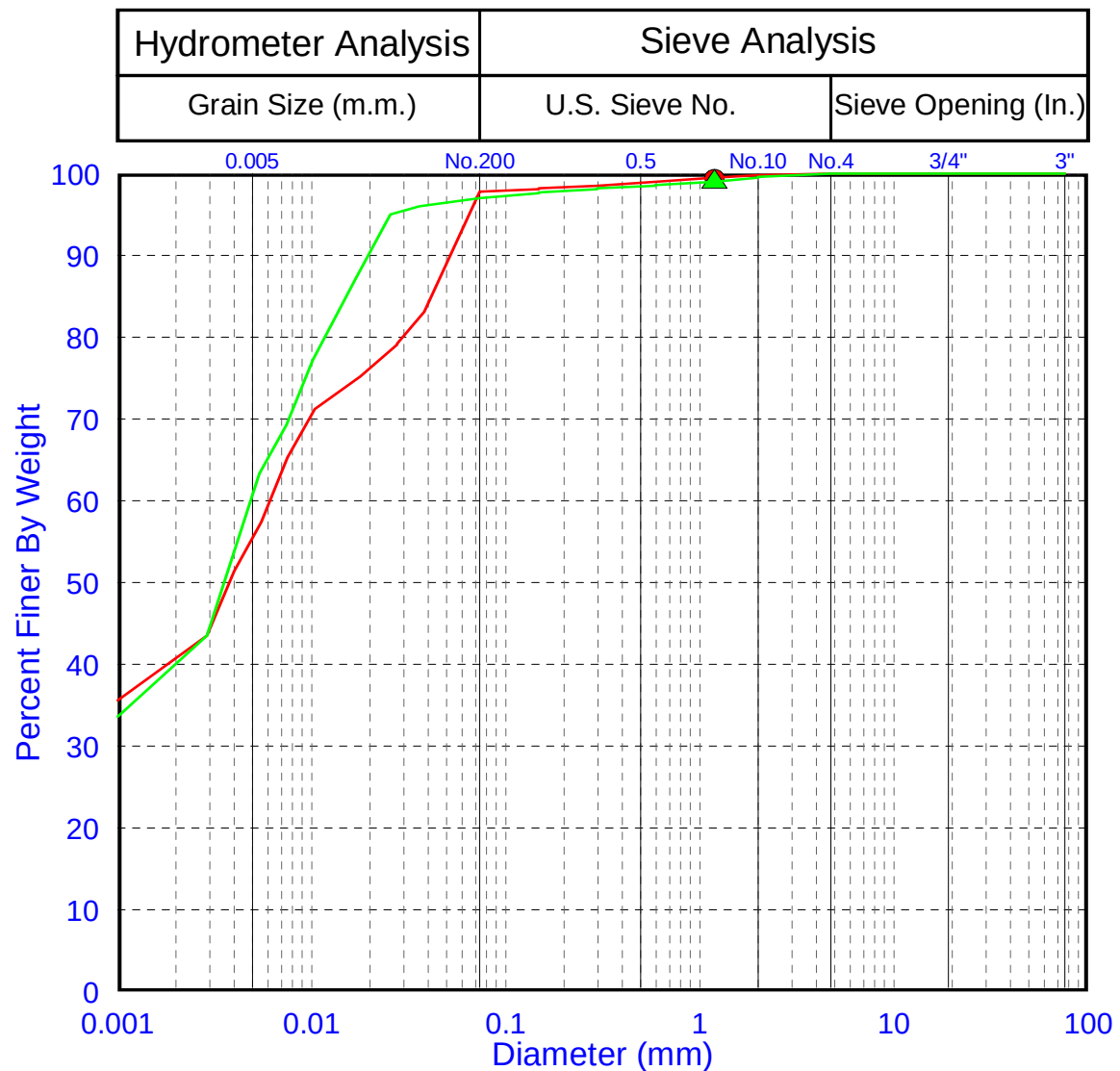
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 47

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-114   | U2     | 7.00-7.50   | 43   | 24   | 19   | CL/ML       |
| ▲    | BH-114   | U7     | 17.00-17.50 | 38   | 23   | 14   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



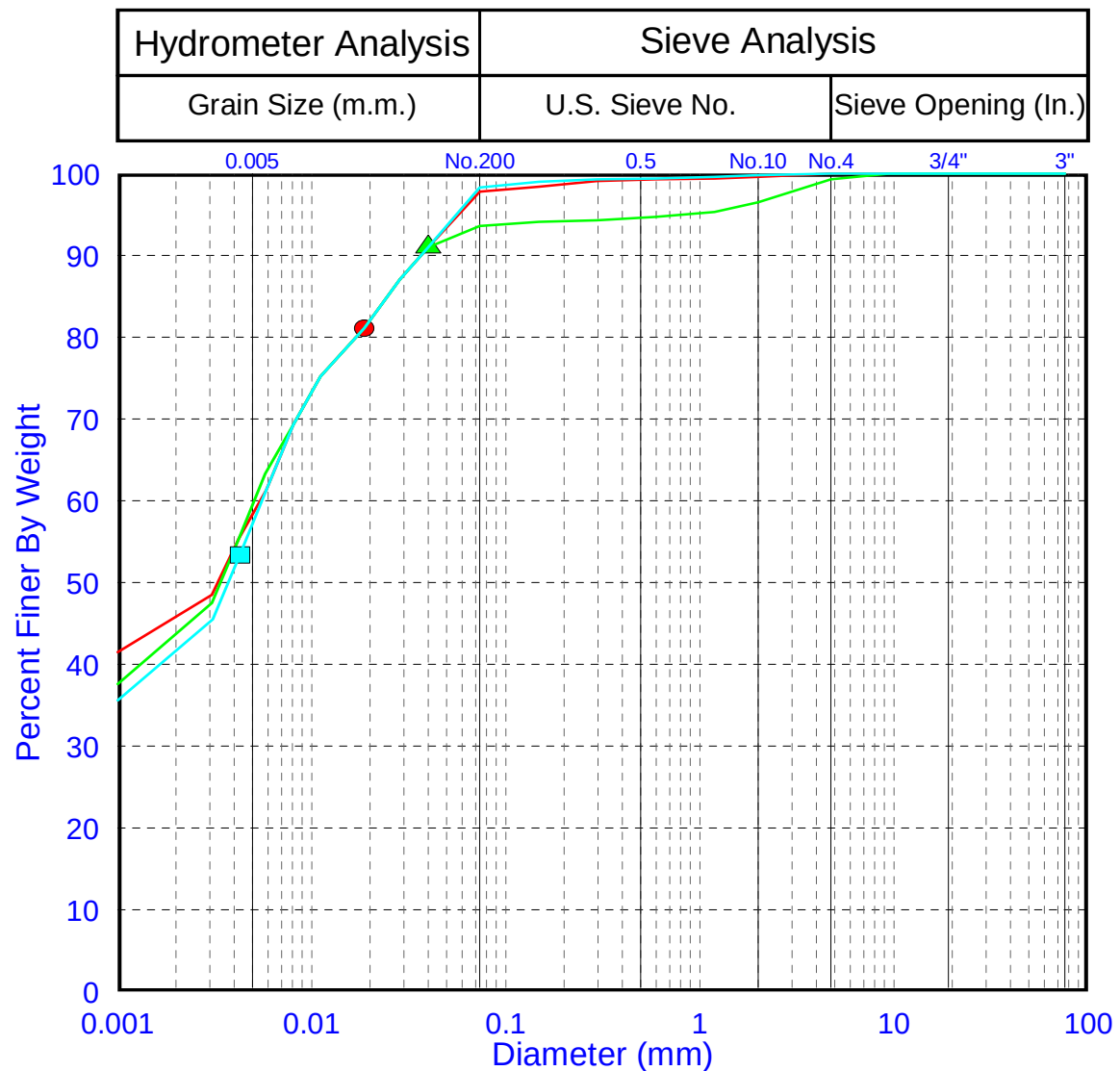
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 48

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-117   | D4     | 11.50-12.00 | 44   | 25   | 19   | CL          |
| ▲    | BH-117   | D8     | 23.50-24.00 | 38   | 25   | 13   | ML/CL       |
| ■    | BH-117   | D12    | 30.00-30.45 | 42   | 24   | 18   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



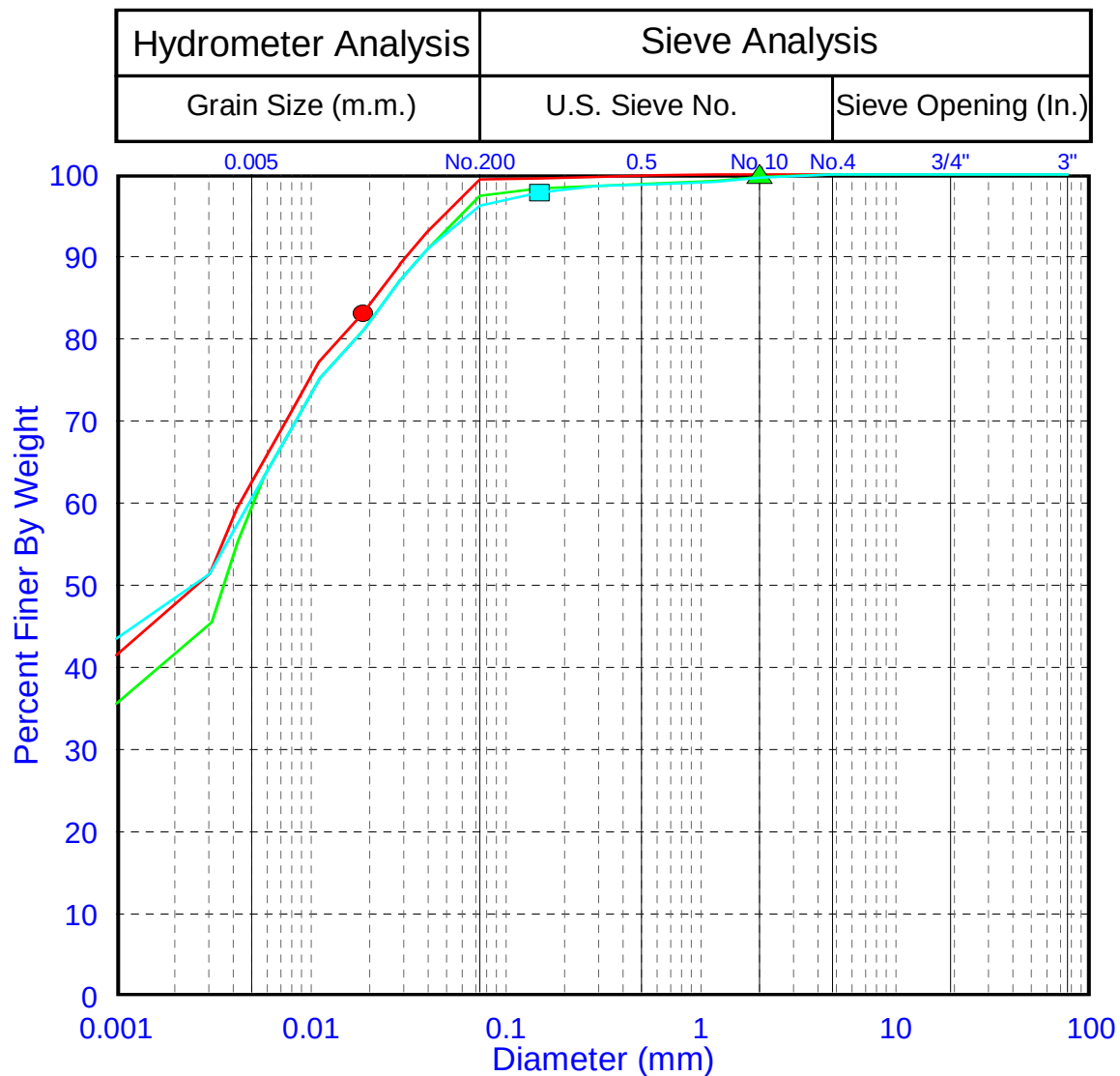
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 49

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-117   | D16    | 36.00-36.45 | 37   | 23   | 14   | CL/ML       |
| ▲    | BH-117   | D20    | 42.00-42.45 | 41   | 24   | 17   | CL/ML       |
| ■    | BH-117   | D24    | 48.00-48.45 | 37   | 21   | 16   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



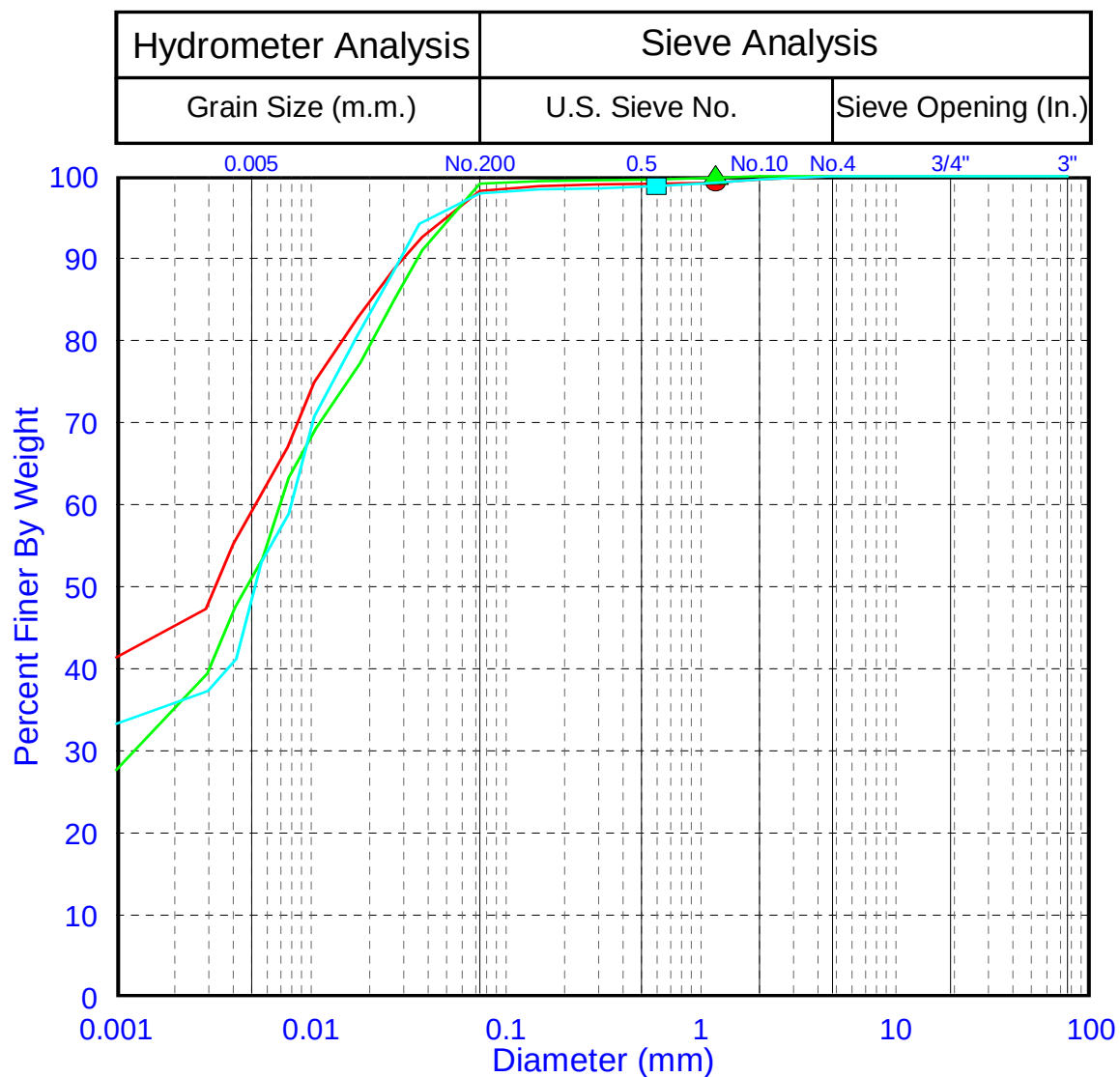
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 50

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-119   | U2     | 6.00-6.50   | 36   | 19   | 17   | CL          |
| ▲    | BH-119   | U6     | 16.00-16.50 | 40   | 21   | 19   | CL          |
| ■    | BH-119   | U10    | 26.00-26.50 | 43   | 22   | 21   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



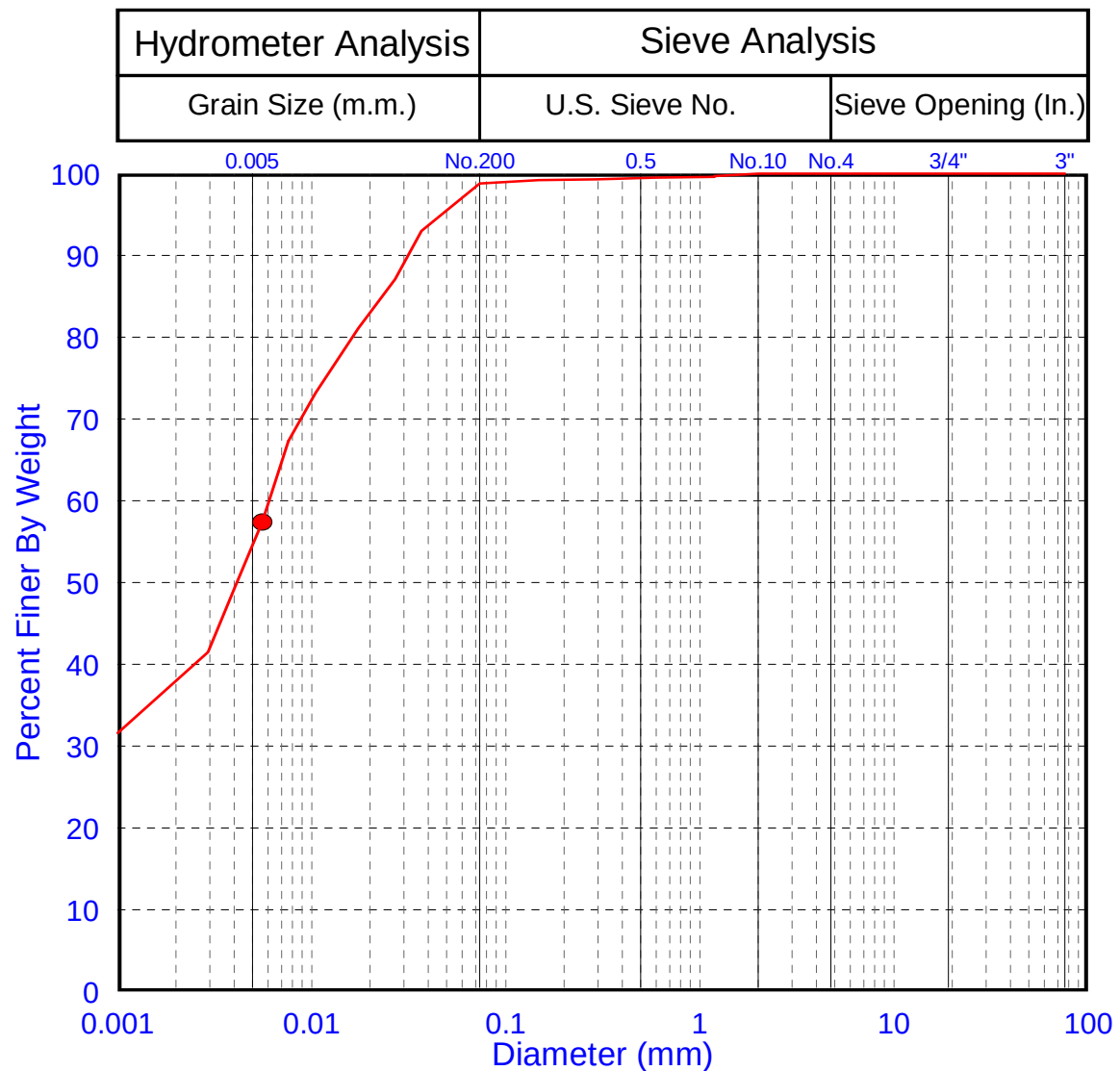
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 51

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-119   | U18    | 46.00-46.50 | 40   | 22   | 17   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



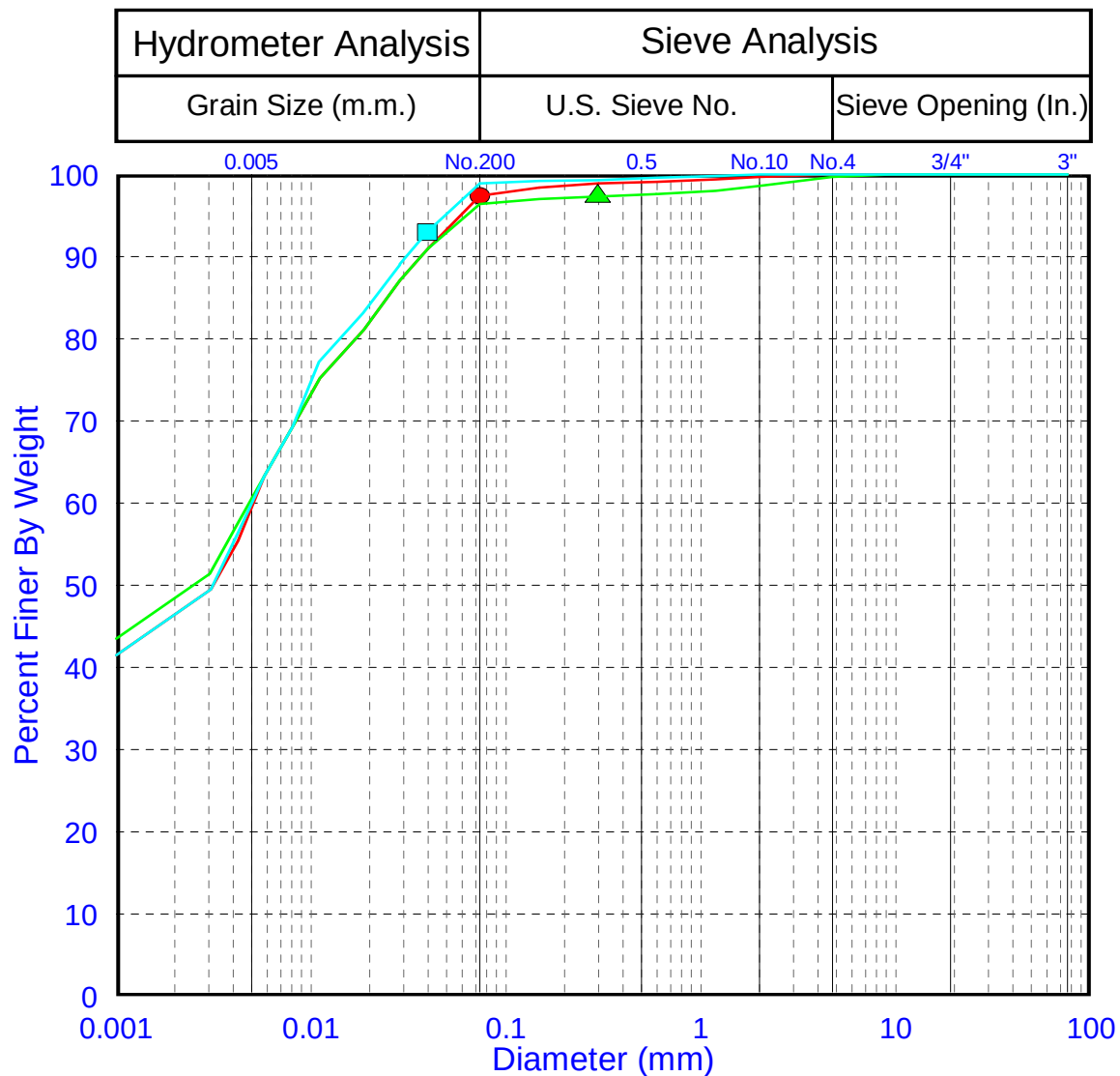
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 52

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-125   | D3     | 9.00-9.45   | 32   | 22   | 10   | CL/ML       |
| ▲    | BH-125   | D7     | 21.00-21.45 | 33   | 21   | 12   | CL/ML       |
| ■    | BH-125   | D11    | 33.00-33.45 | 43   | 25   | 18   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



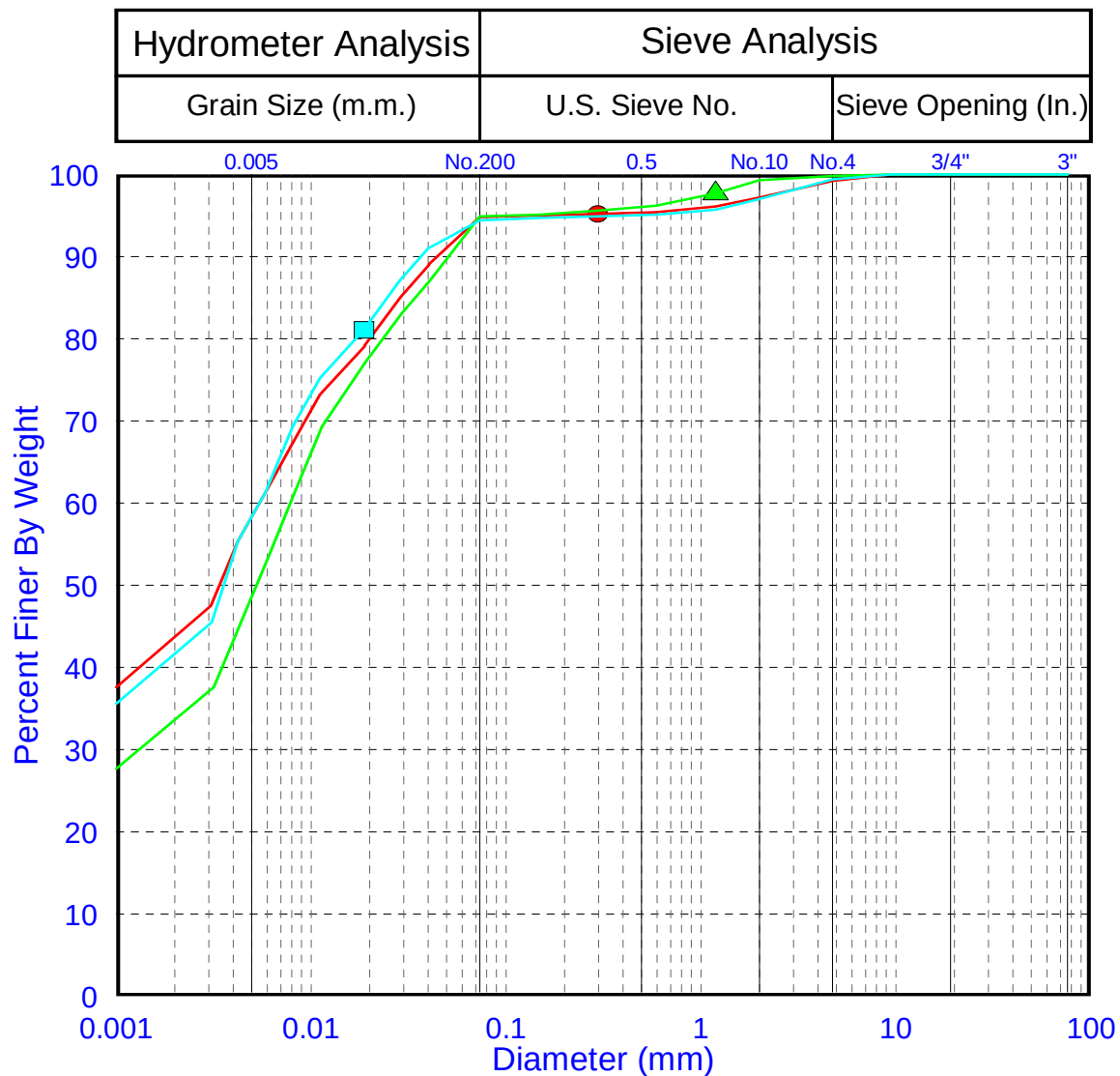
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 53

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-130   | U1     | 4.00-4.50   | 37   | 23   | 14   | CL/ML       |
| ▲    | BH-130   | U2     | 6.00-6.50   | 40   | 25   | 15   | CL/ML       |
| ■    | BH-130   | U5     | 12.00-12.50 | 31   | 22   | 9    | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



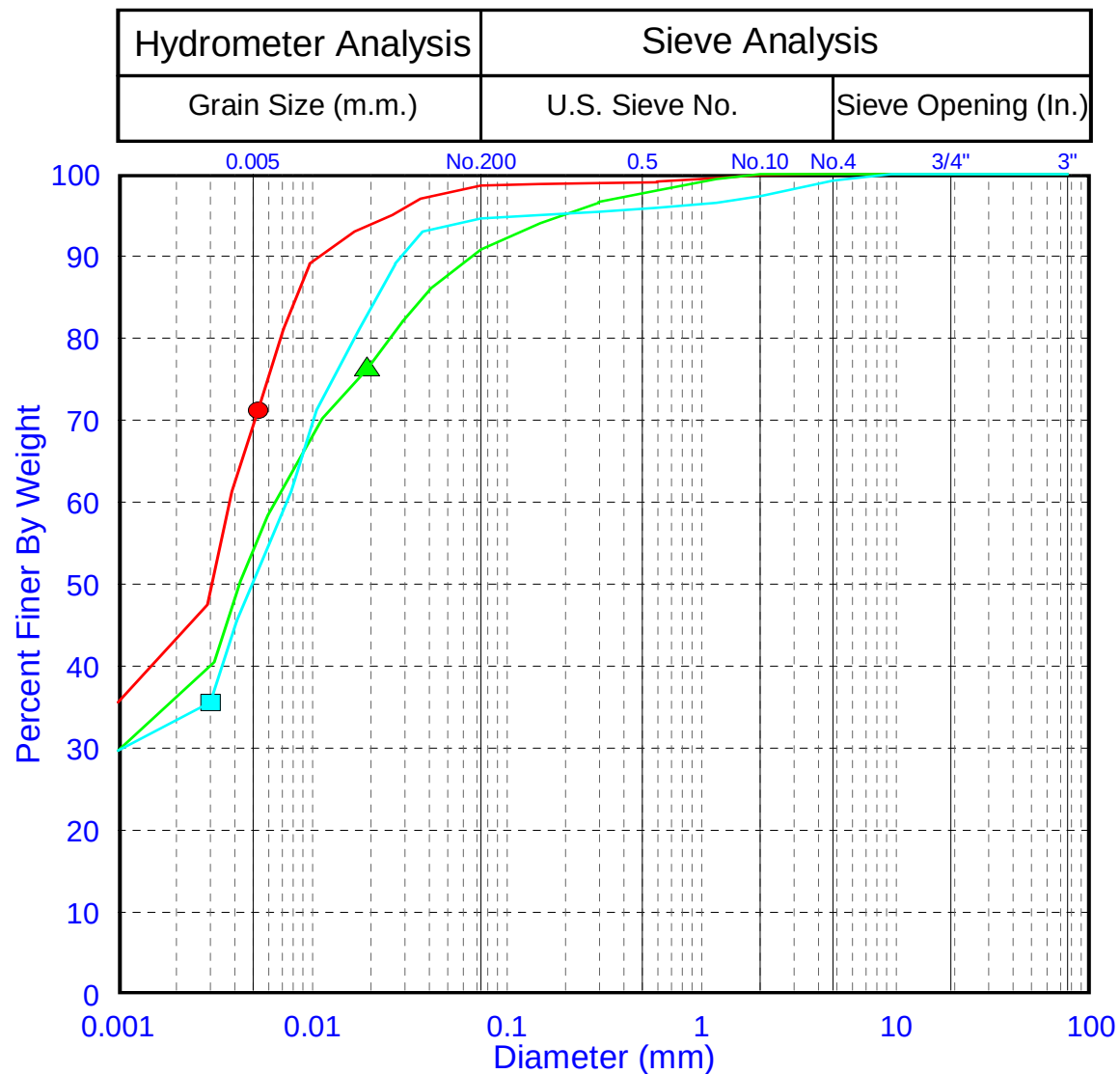
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 54

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-133   | U2     | 7.00-7.50   | 38   | 20   | 18   | CL          |
| ▲    | BH-133   | U7     | 17.00-17.50 | 38   | 25   | 13   | ML/CL       |
| ■    | BH-133   | U8     | 19.00-19.50 | 38   | 21   | 17   | CL          |

### GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

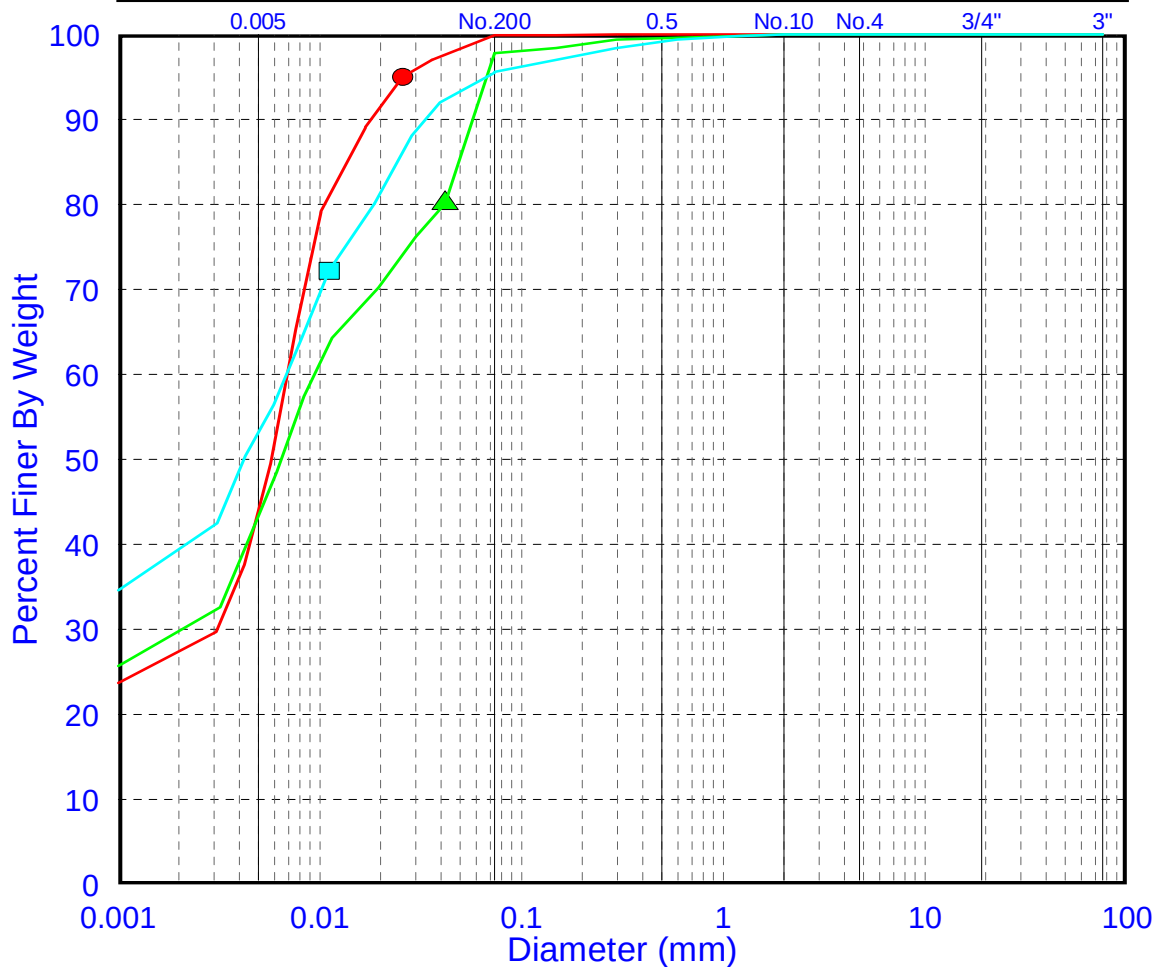
Client : NFC

Fig.: 55

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-139   | U2     | 10.00-10.50 | 38   | 19   | 19   | CL          |
| ▲    | BH-139   | U3     | 12.00-12.50 | 29   | 20   | 9    | CL/ML       |
| ■    | BH-139   | U5     | 16.00-16.50 | 33   | 23   | 10   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



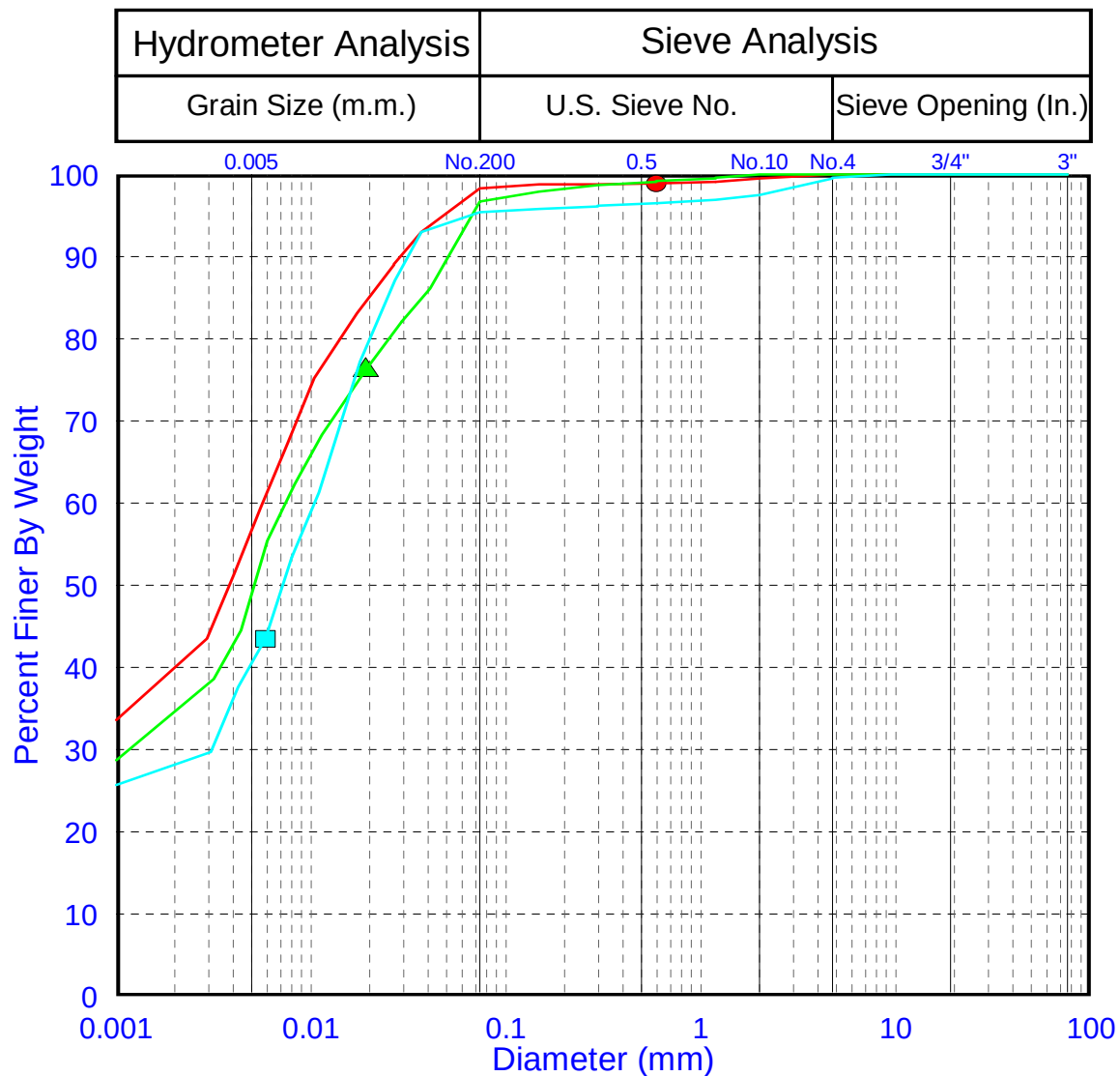
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 56

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-139   | U6     | 18.00-18.50 | 42   | 22   | 20   | CL          |
| ▲    | BH-139   | U7     | 20.00-20.50 | 31   | 20   | 11   | CL/ML       |
| ■    | BH-139   | U8     | 22.00-22.50 | 39   | 22   | 17   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



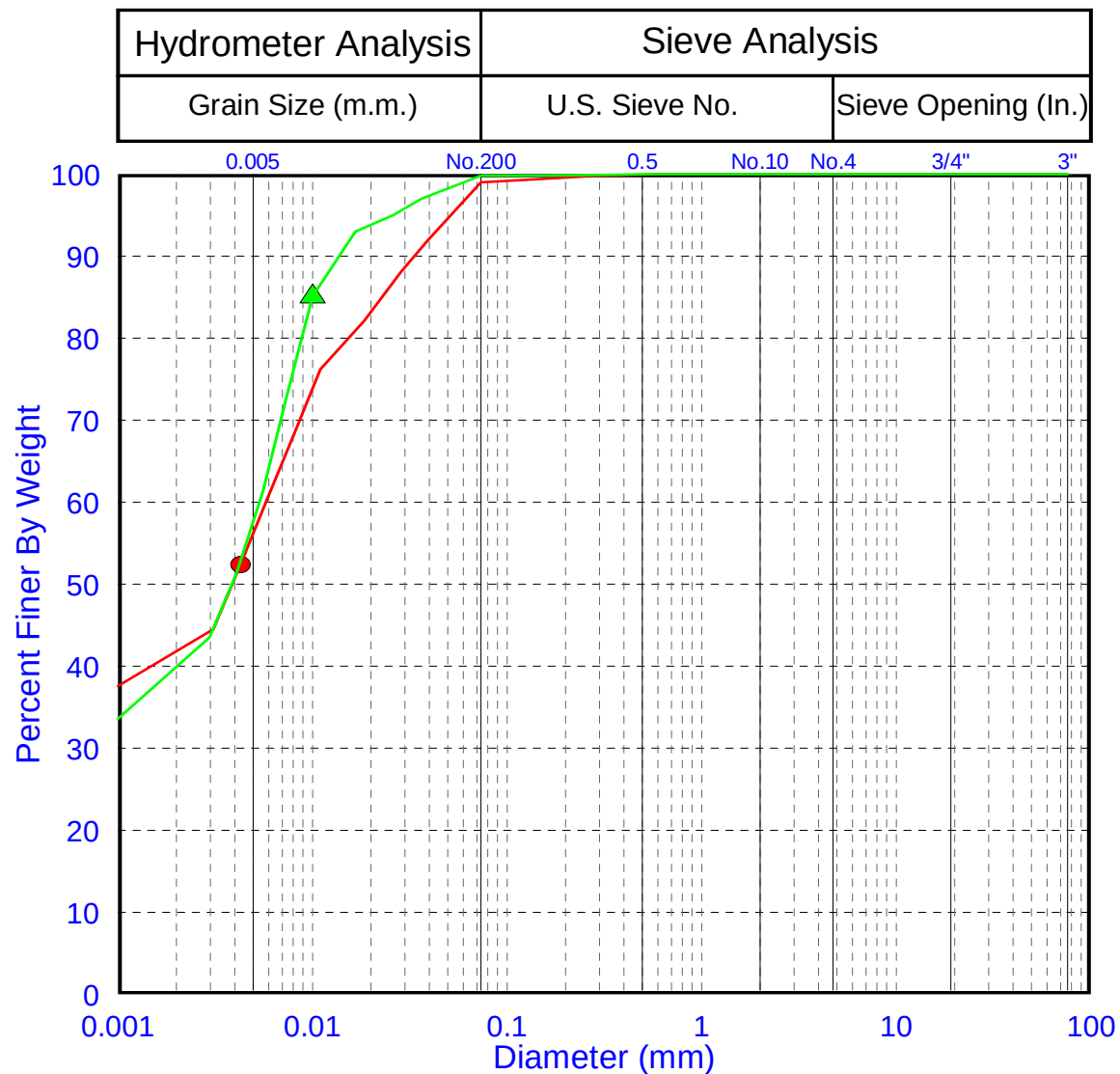
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 57

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-139   | U21    | 48.00-48.50 | 30   | 22   | 8    | CL/ML       |
| ▲    | BH-139   | U22    | 50.00-50.50 | 43   | 19   | 24   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



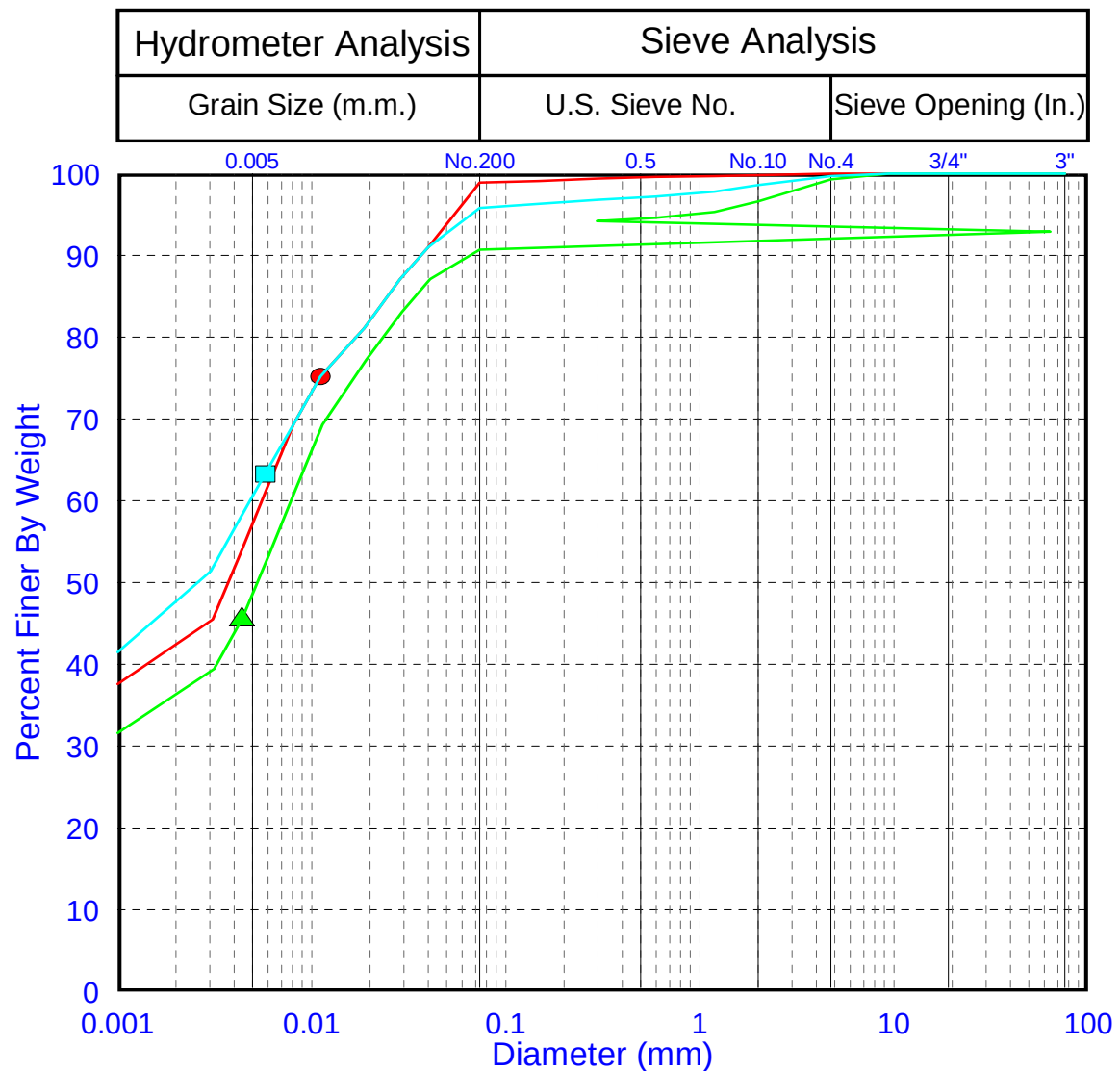
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 58

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-141   | D3     | 9.00-9.45   | 41   | 26   | 15   | ML/CL       |
| ▲    | BH-141   | D6     | 18.00-18.45 | 33   | 21   | 12   | CL/ML       |
| ■    | BH-141   | D9     | 27.00-27.45 | 41   | 28   | 13   | ML/CL       |

### GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

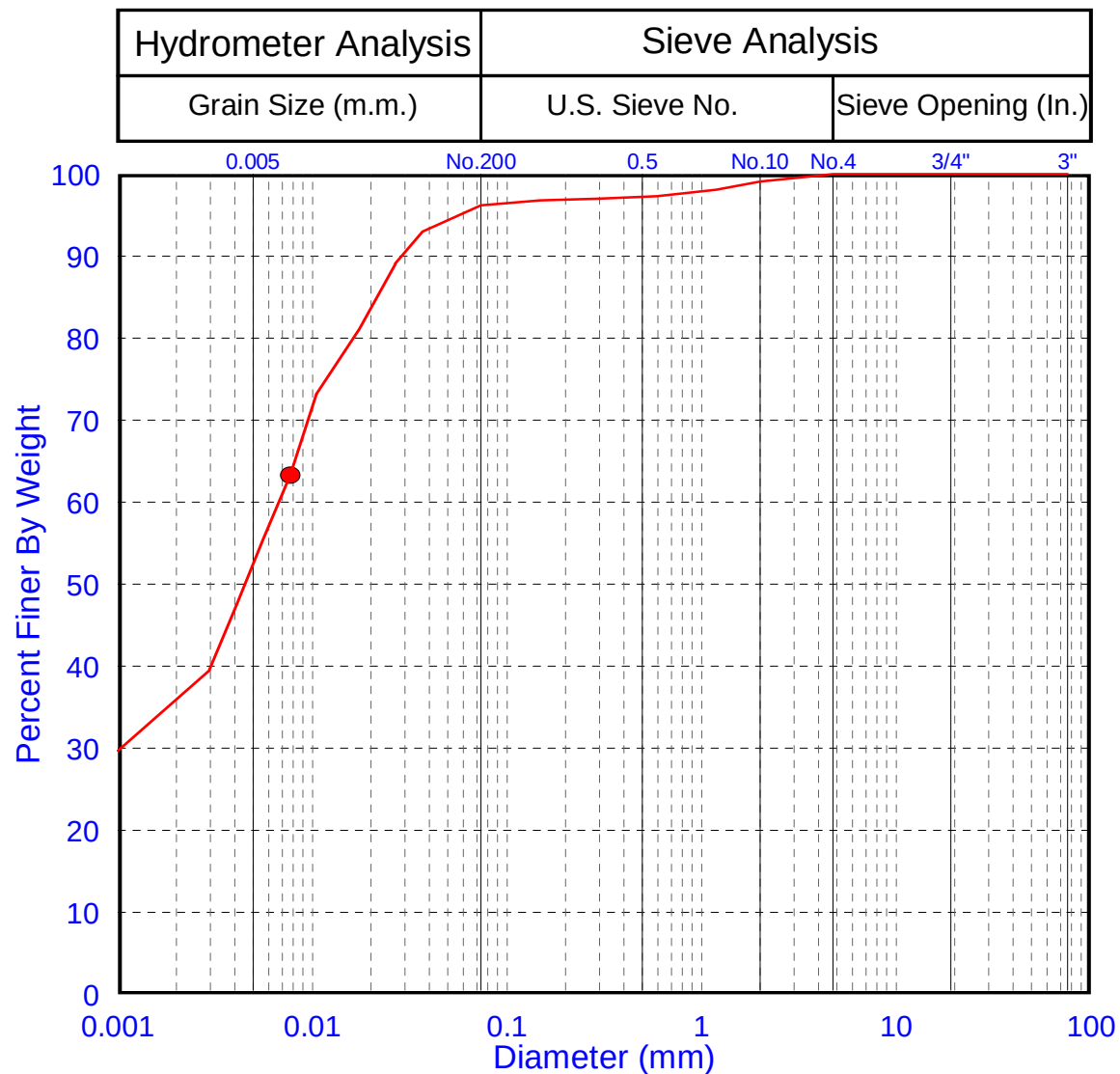
Client : NFC

Fig.: 59

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347





| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)  | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-----------|------|------|------|-------------|
| ●    | BH-143   | U2     | 7.50-8.00 | 41   | 23   | 18   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



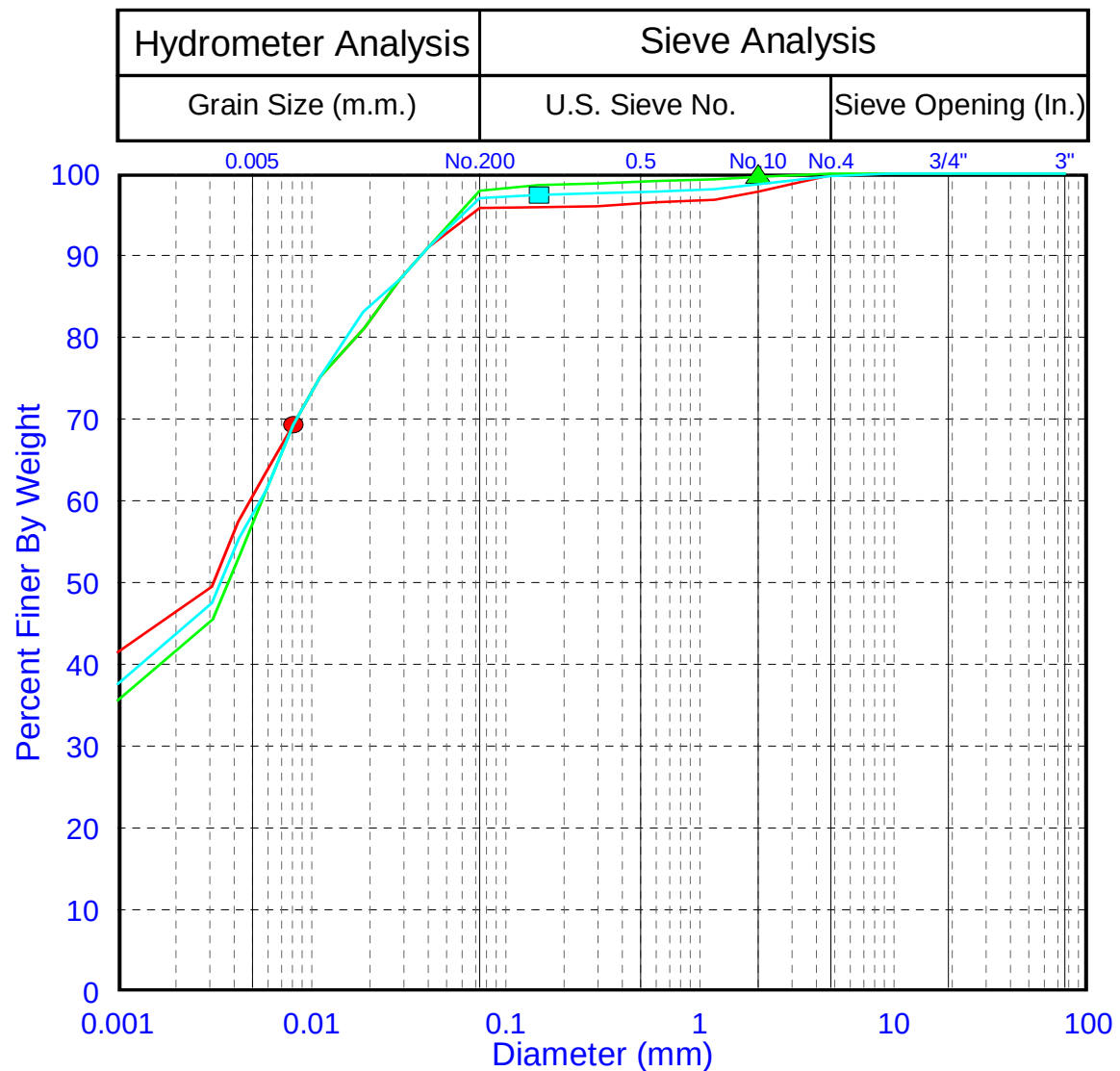
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 61

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-146   | D1     | 3.00-3.45   | 35   | 25   | 10   | ML/CL       |
| ▲    | BH-146   | D4     | 12.00-12.45 | 35   | 20   | 15   | CL          |
| ■    | BH-146   | D7     | 21.00-21.45 | 31   | 20   | 11   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



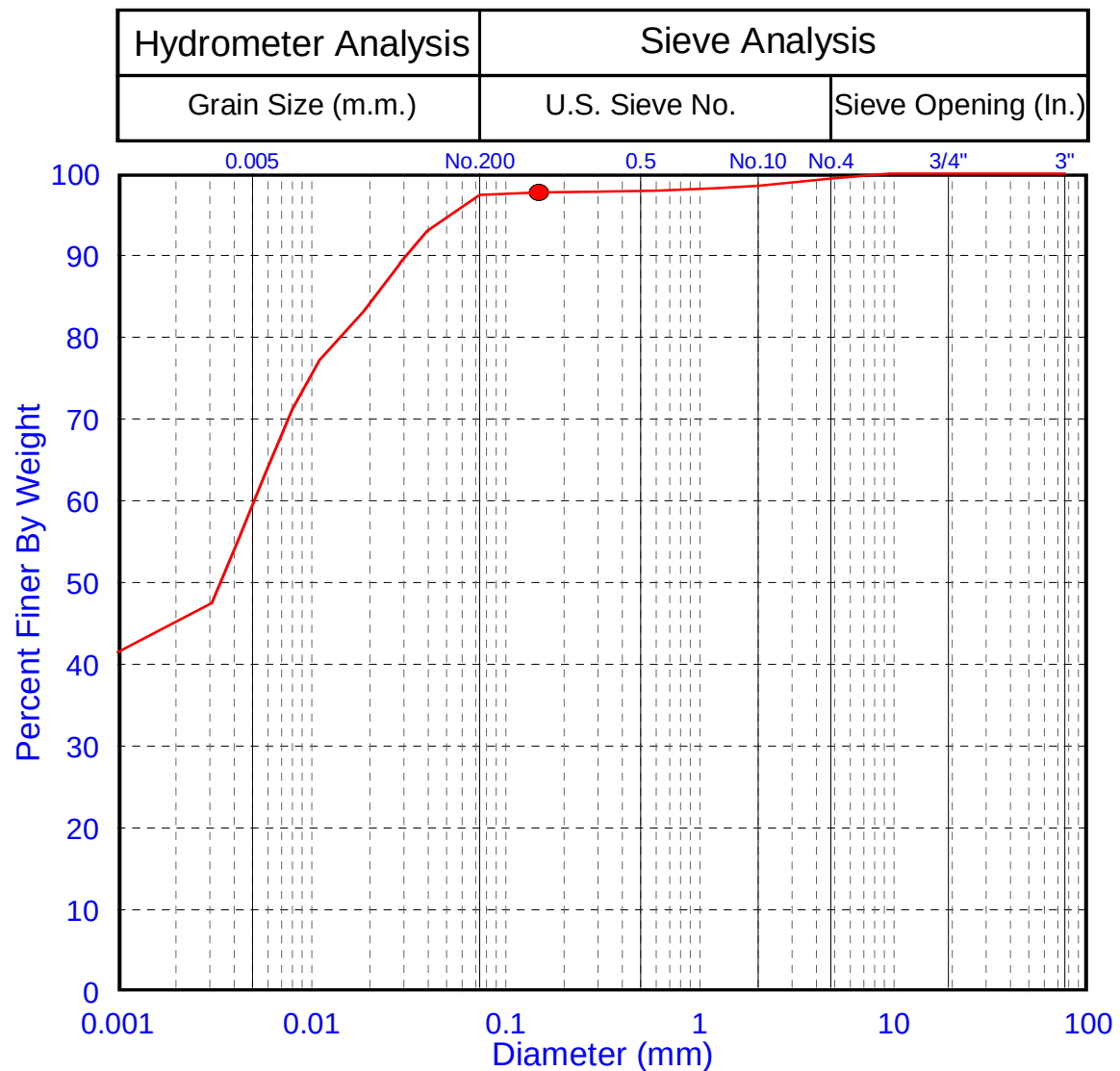
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 62

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-146   | D10    | 30.00-30.45 | 49   | 22   | 27   | CL/CH       |

## GRAIN SIZE DISTRIBUTION CHART



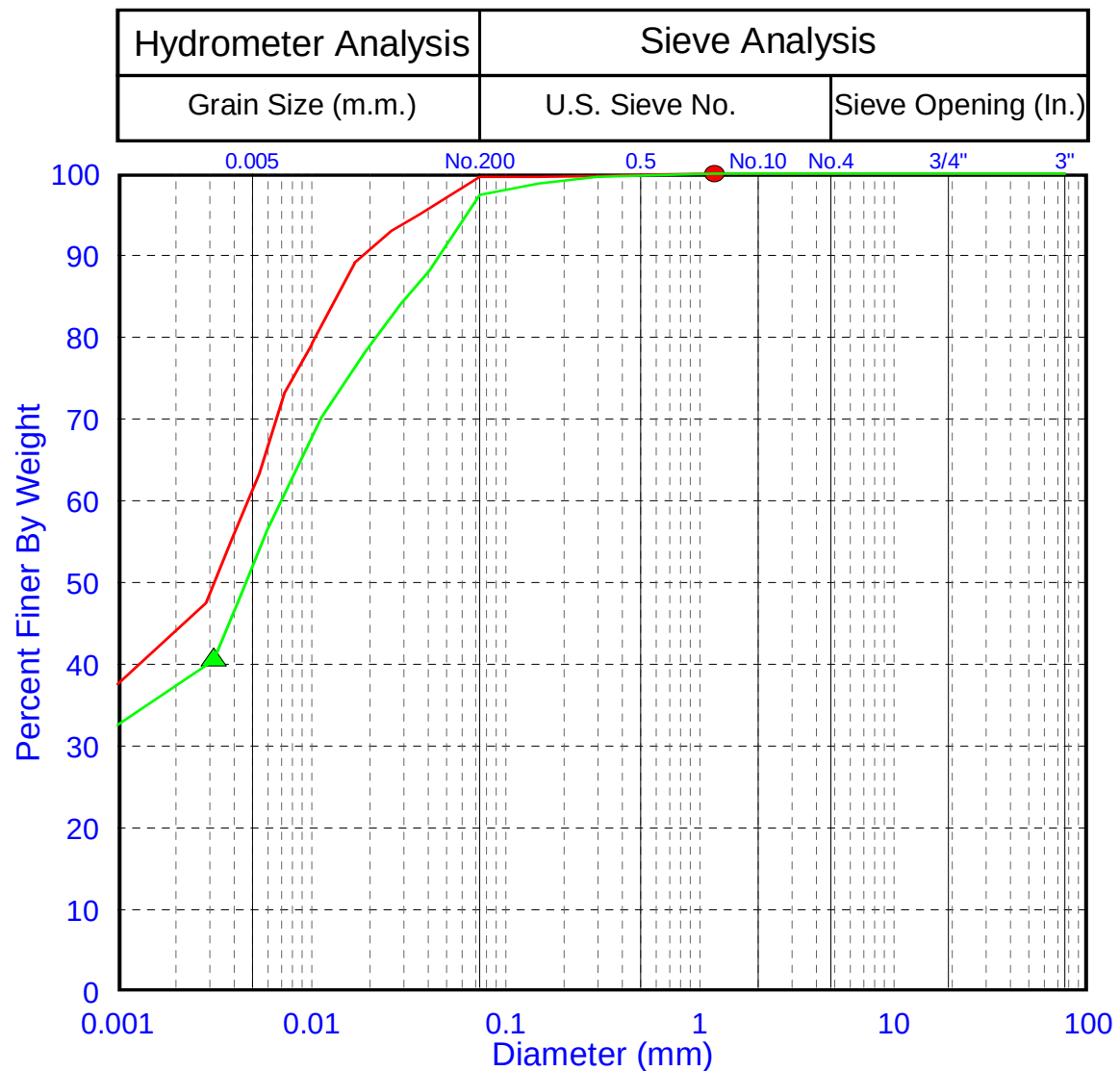
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 63

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-148   | U1     | 3.50-4.00   | 42   | 20   | 22   | CL          |
| ▲    | BH-148   | U5     | 13.50-14.00 | 32   | 24   | 8    | ML/CL       |

### GRAIN SIZE DISTRIBUTION CHART



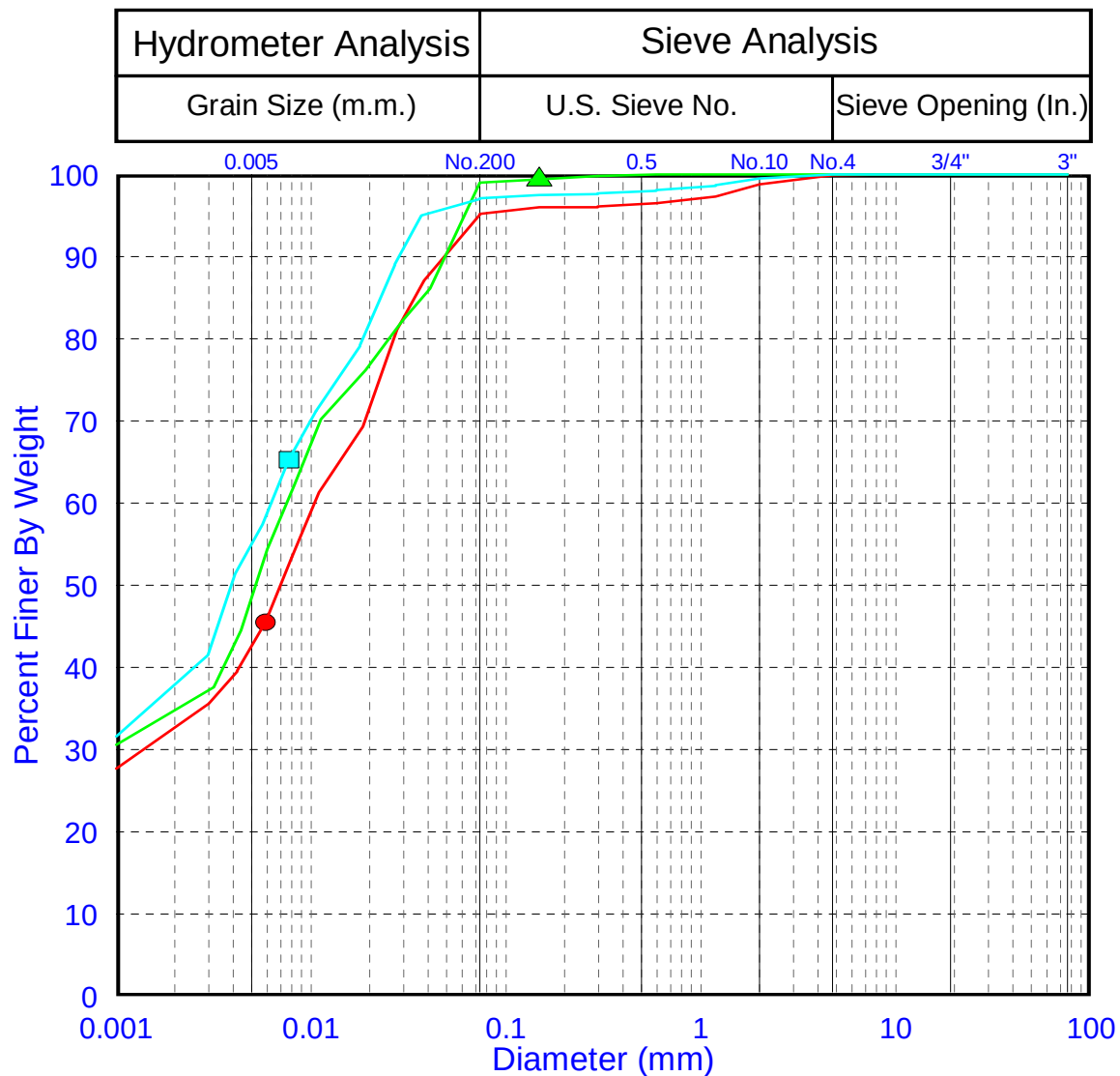
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 64

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-151   | U1     | 9.50-10.00  | 29   | 18   | 11   | CL          |
| ▲    | BH-151   | U2     | 11.50-12.00 | 28   | 21   | 7    | CL-ML/CL    |
| ■    | BH-151   | U4     | 15.50-16.00 | 42   | 22   | 20   | CL          |

### GRAIN SIZE DISTRIBUTION CHART



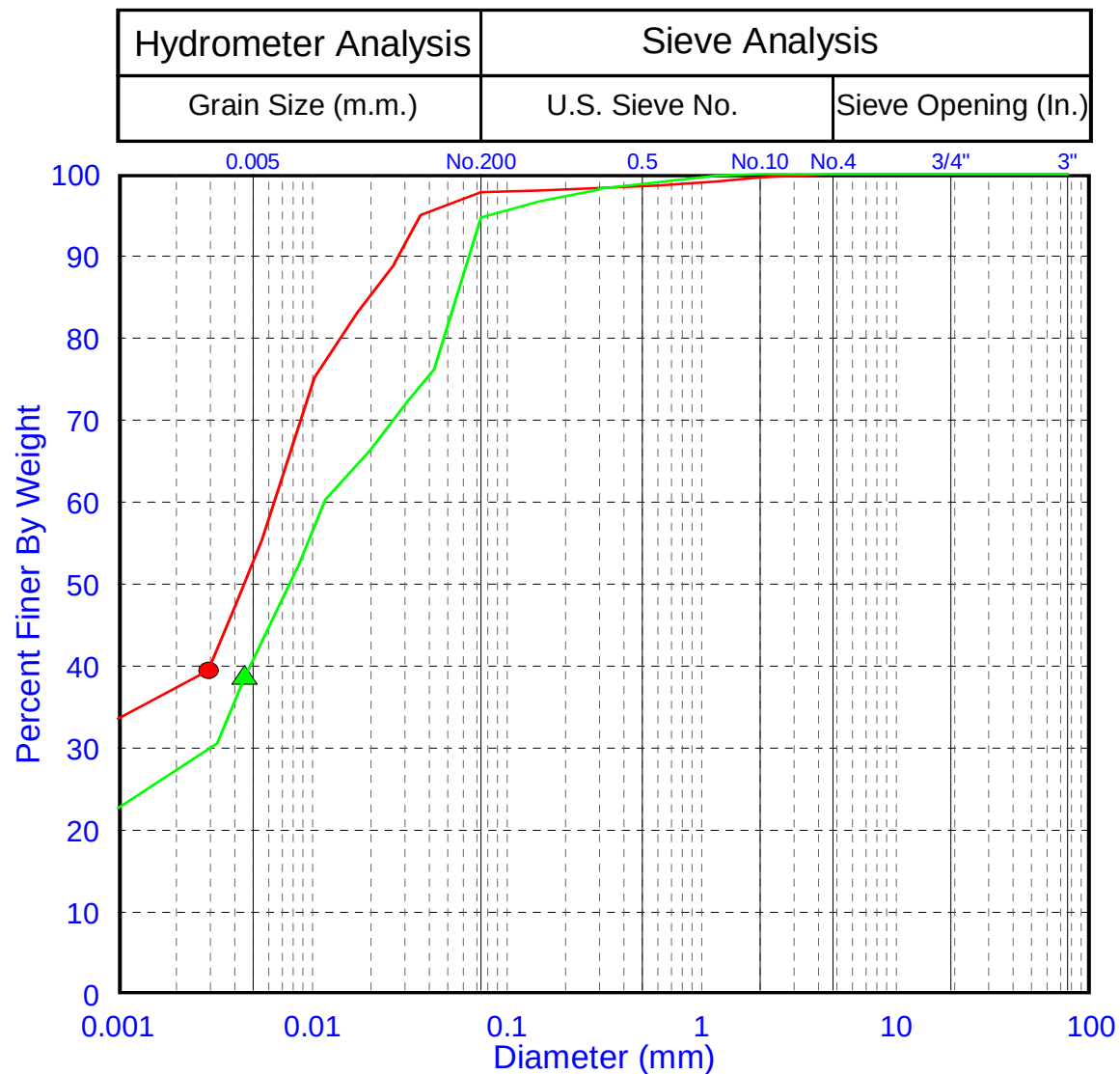
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 65

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-156   | U2     | 6.00-6.50   | 38   | 21   | 18   | CL          |
| ▲    | BH-156   | U4     | 11.00-11.50 | 30   | 22   | 8    | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



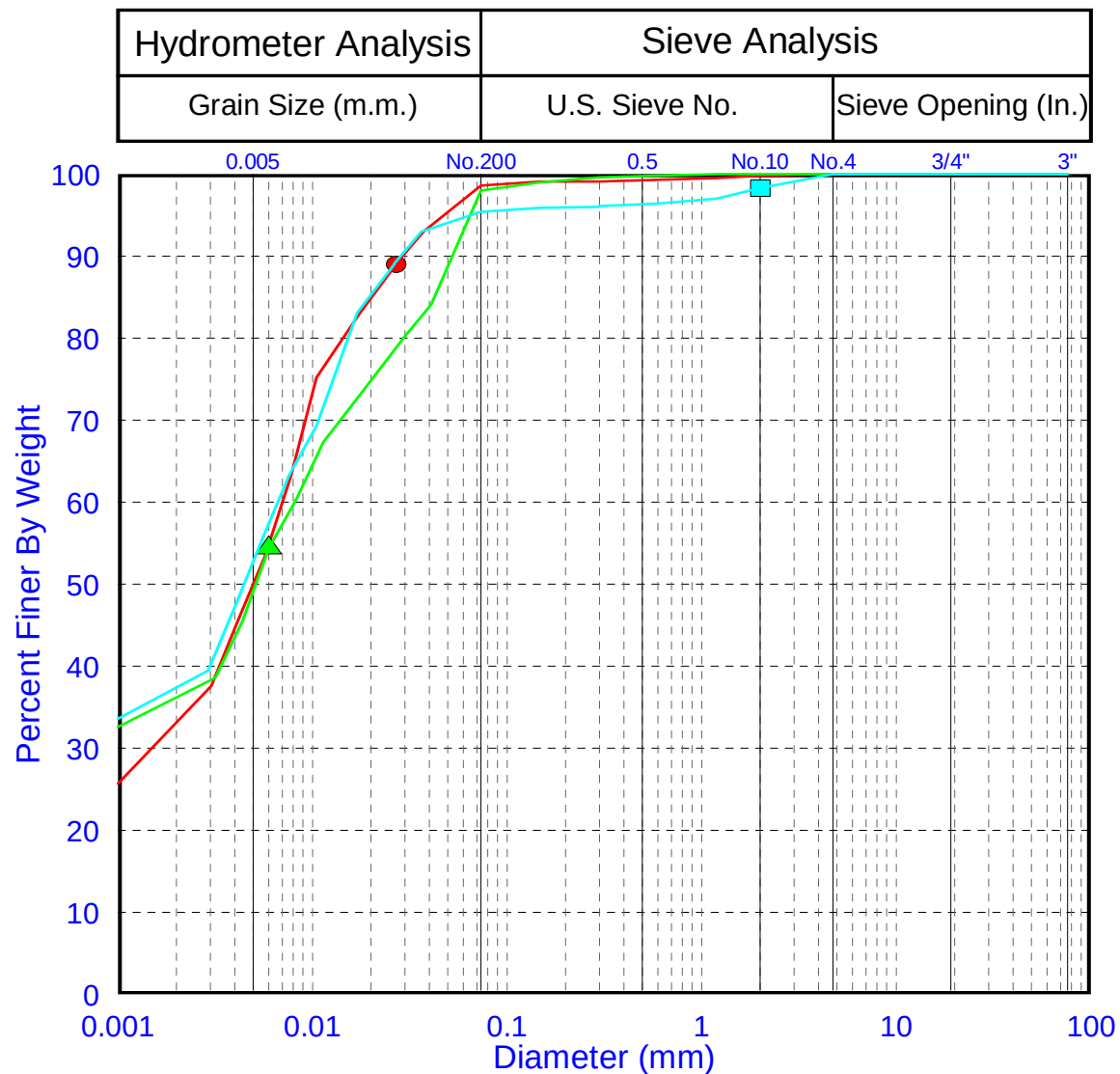
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 66

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-157   | U3     | 10.00-10.50 | 38   | 20   | 18   | CL          |
| ▲    | BH-157   | U4     | 12.00-12.50 | 30   | 22   | 8    | CL/ML       |
| ■    | BH-157   | U10    | 24.00-24.50 | 40   | 21   | 19   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



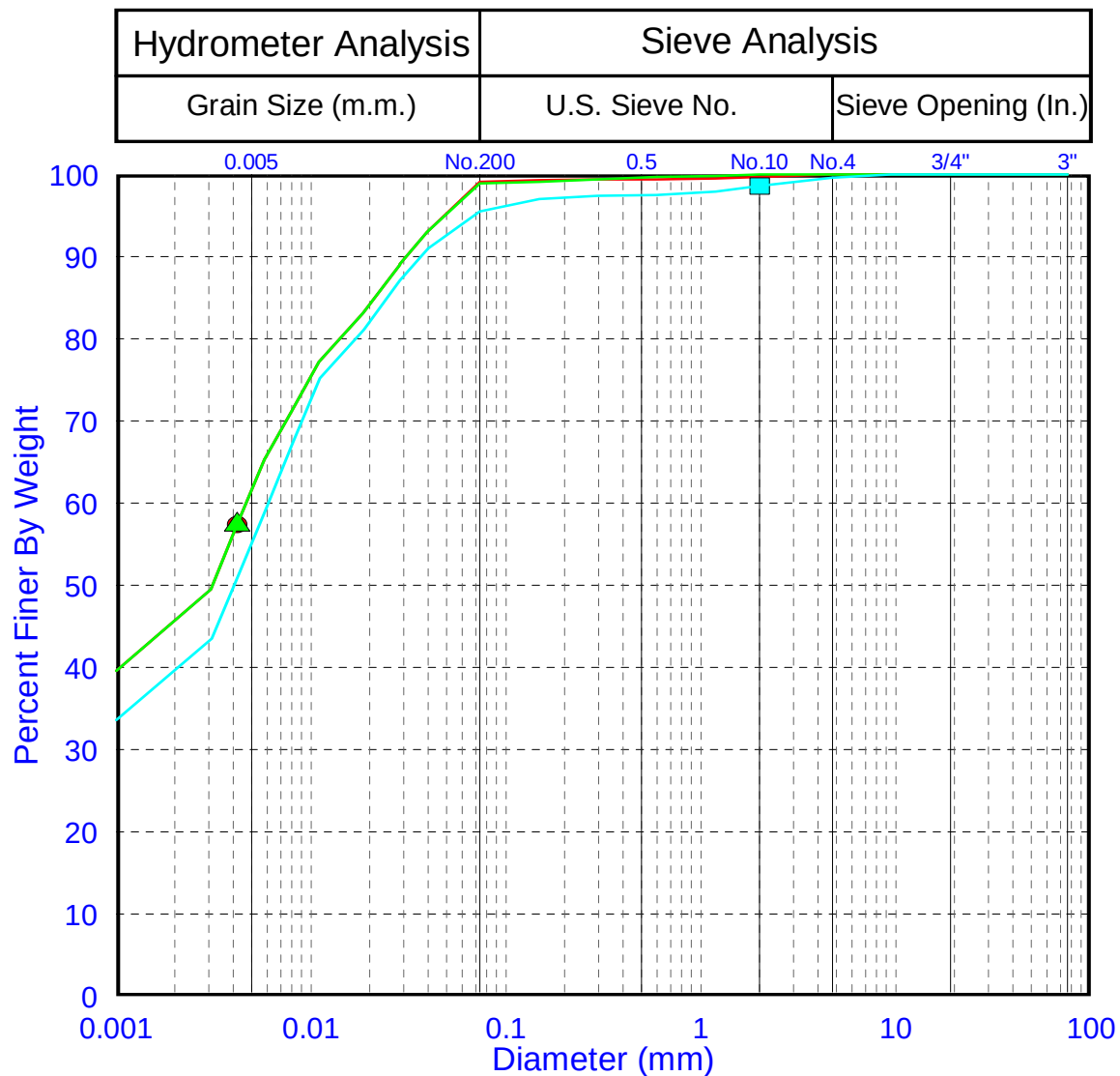
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 67

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| Sym.                                 | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|--------------------------------------|----------|--------|-------------|------|------|------|-------------|
| <span style="color: red;">●</span>   | BH-161   | U1     | 8.00-8.25   | 49   | 22   | 27   | CL/CH       |
| <span style="color: green;">▲</span> | BH-161   | U3     | 13.00-13.40 | 55   | 31   | 24   | MH/CH       |
| <span style="color: cyan;">■</span>  | BH-161   | U5     | 18.00-18.20 | 31   | 21   | 10   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



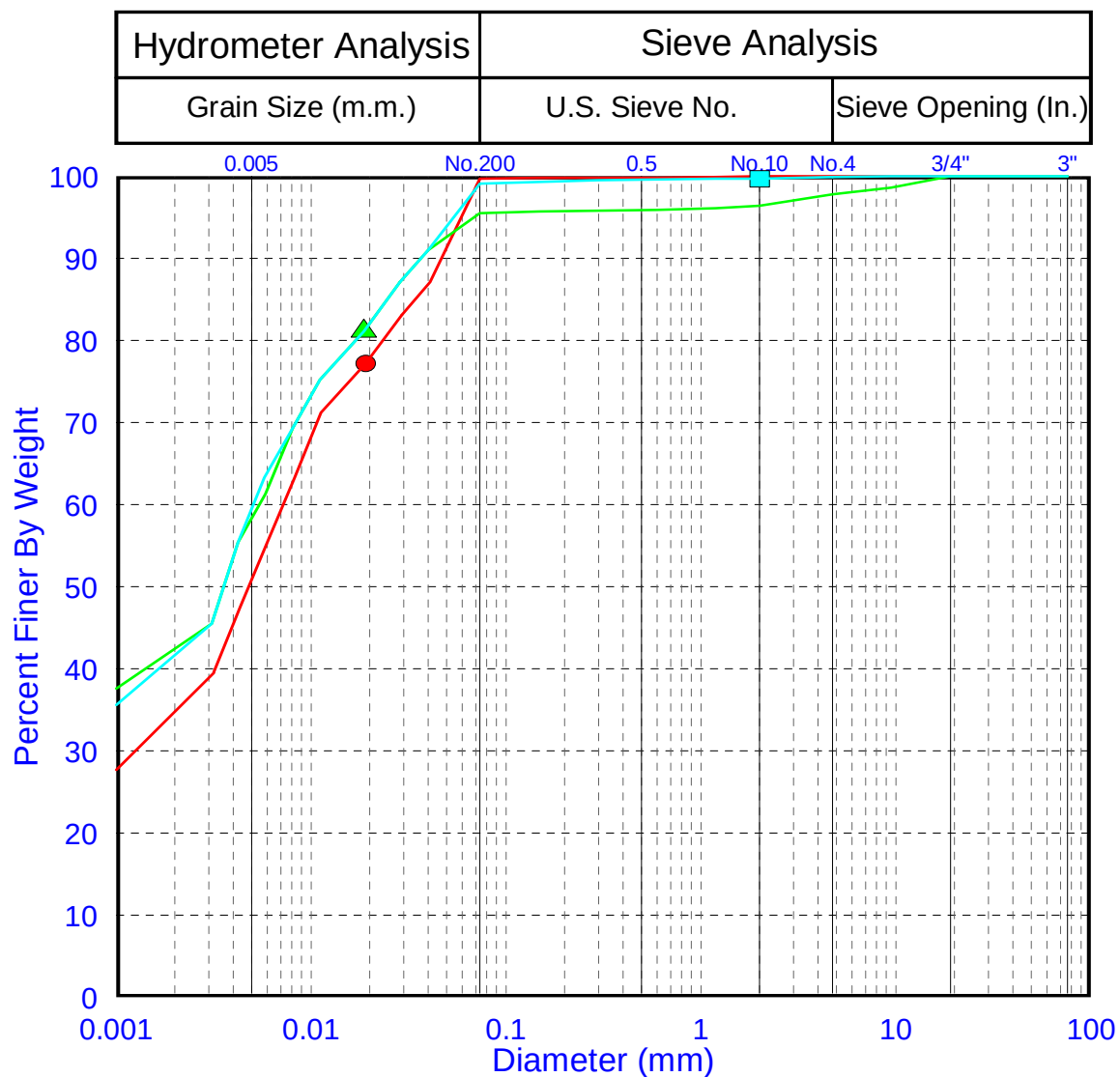
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 68

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-161   | U7     | 23.00-23.35 | 37   | 24   | 13   | CL/ML       |
| ▲    | BH-161   | U9     | 28.00-28.55 | 33   | 20   | 13   | CL          |
| ■    | BH-161   | U11    | 33.00-33.70 | 40   | 24   | 16   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

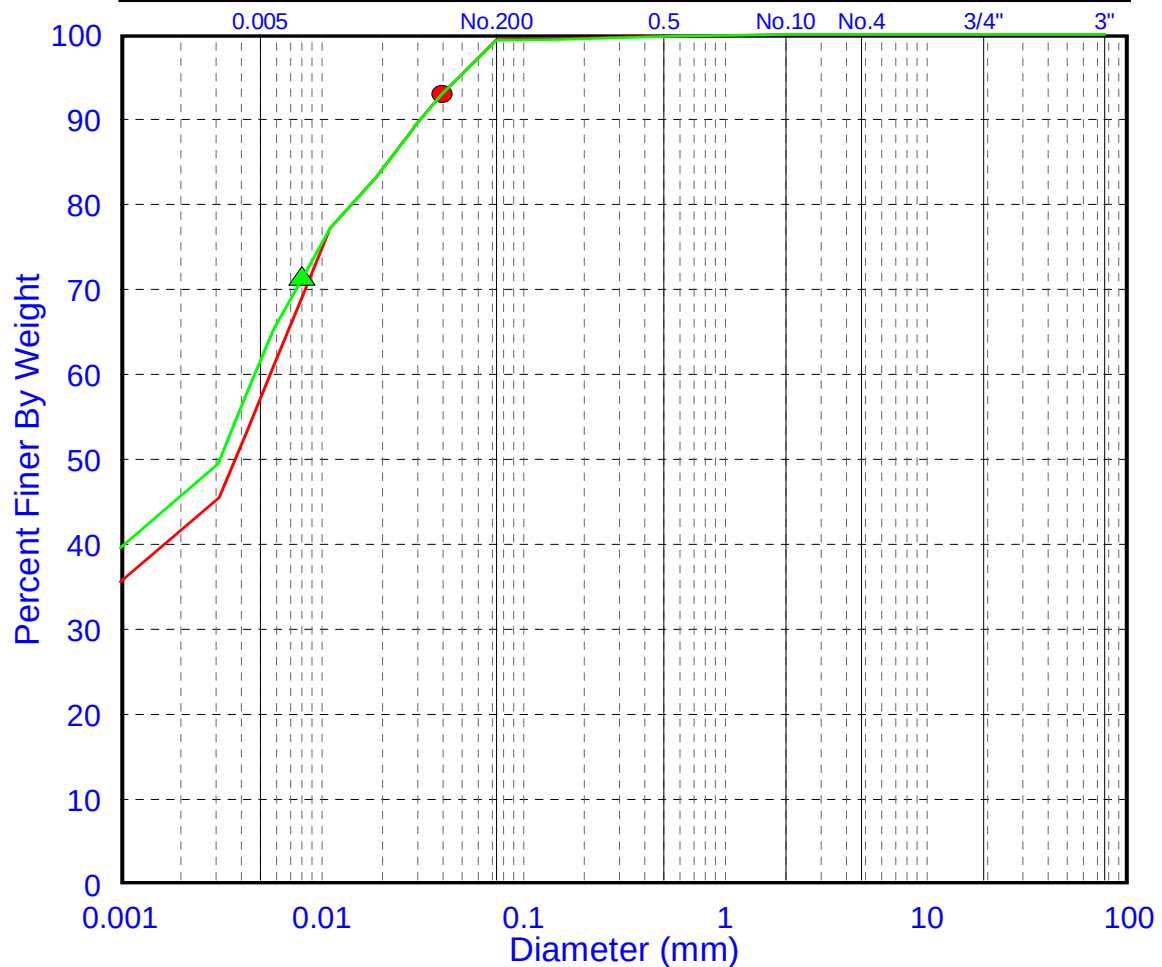
Client : NFC

Fig.: 69

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-161   | U13    | 38.00-38.50 | 34   | 22   | 12   | CL/ML       |
| ▲    | BH-161   | U15    | 43.00-43.50 | 32   | 20   | 12   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



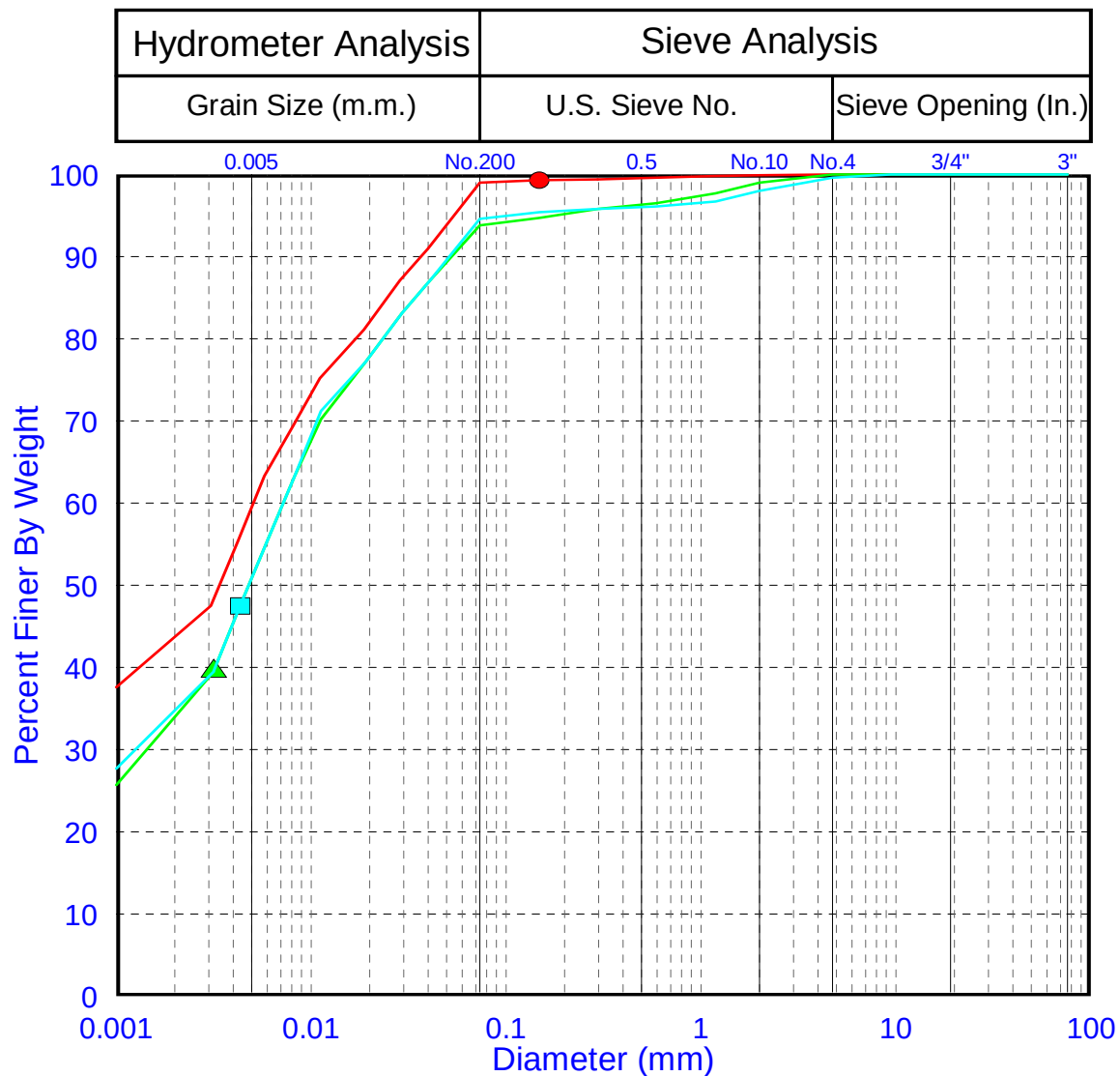
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 70

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| Sym.                                 | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|--------------------------------------|----------|--------|-------------|------|------|------|-------------|
| <span style="color: red;">●</span>   | BH-164   | U1     | 5.50-6.00   | 38   | 22   | 16   | CL/ML       |
| <span style="color: green;">▲</span> | BH-164   | U2     | 7.50-8.00   | 32   | 21   | 11   | CL/ML       |
| <span style="color: cyan;">■</span>  | BH-164   | U5     | 13.50-14.00 | 31   | 23   | 8    | ML/CL-ML/CL |

### GRAIN SIZE DISTRIBUTION CHART



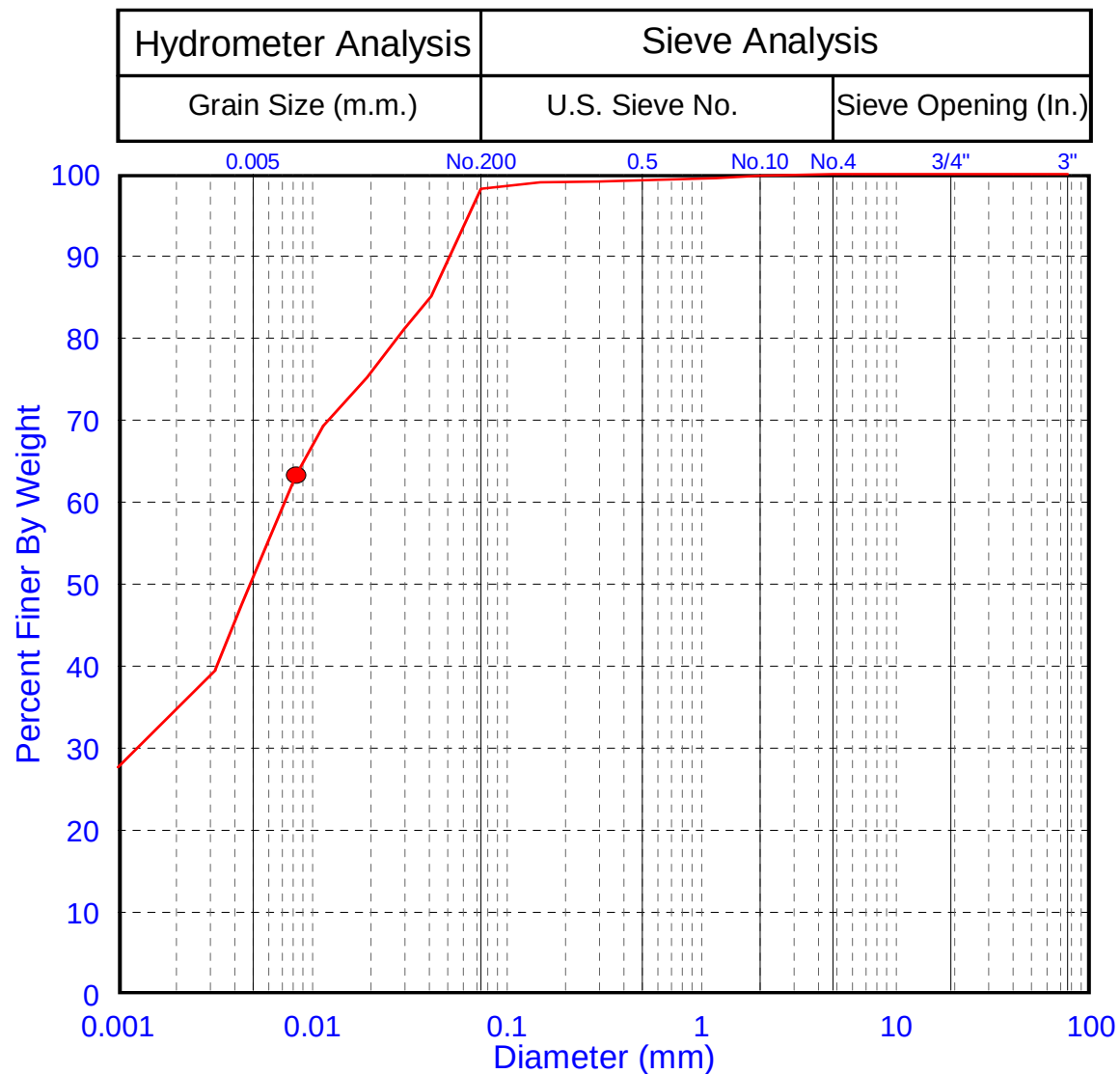
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 71

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-164   | U8     | 19.50-20.00 | 36   | 22   | 14   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

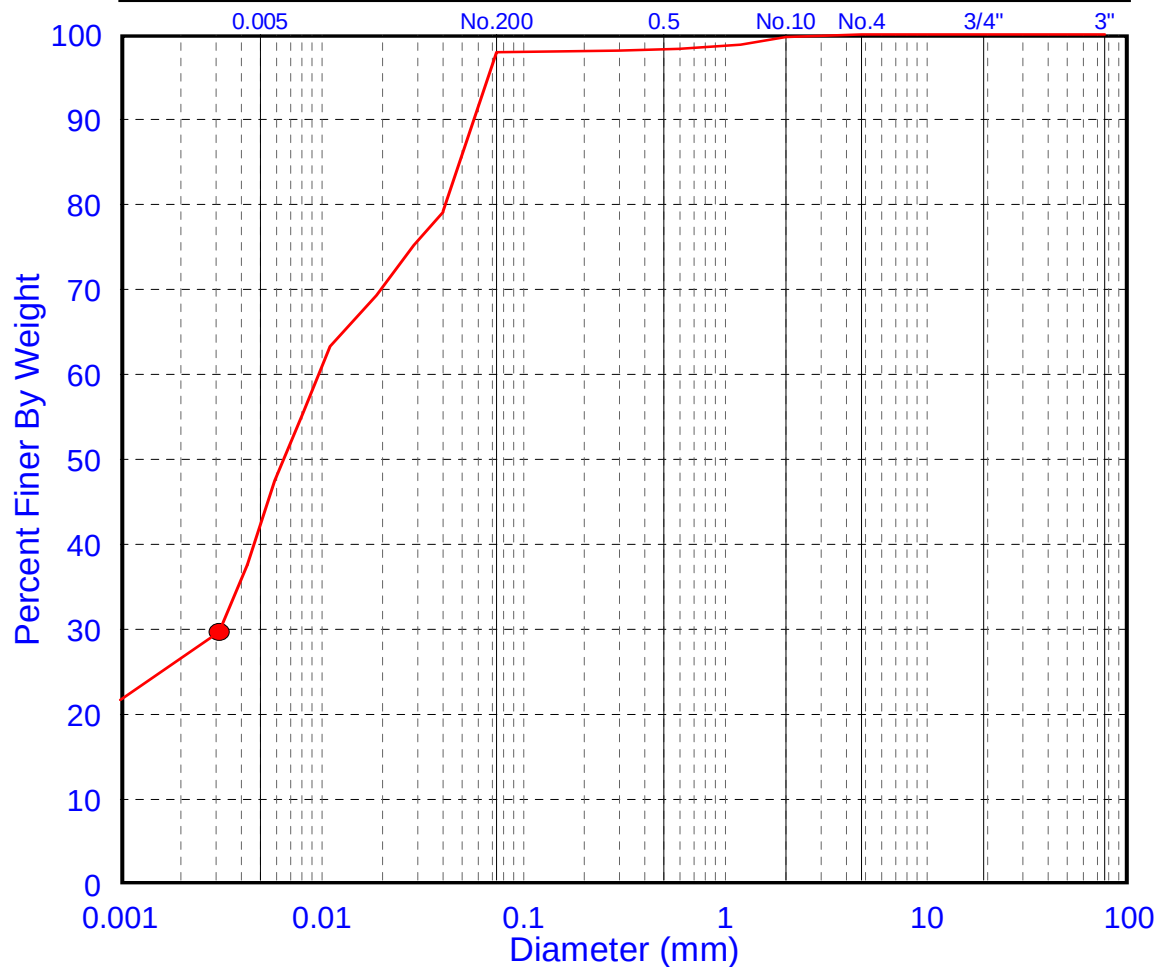
Client : NFC

Fig.: 72

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)  | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-----------|------|------|------|-------------|
| ●    | BH-166   | U2     | 9.00-9.50 | 39   | 21   | 17   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



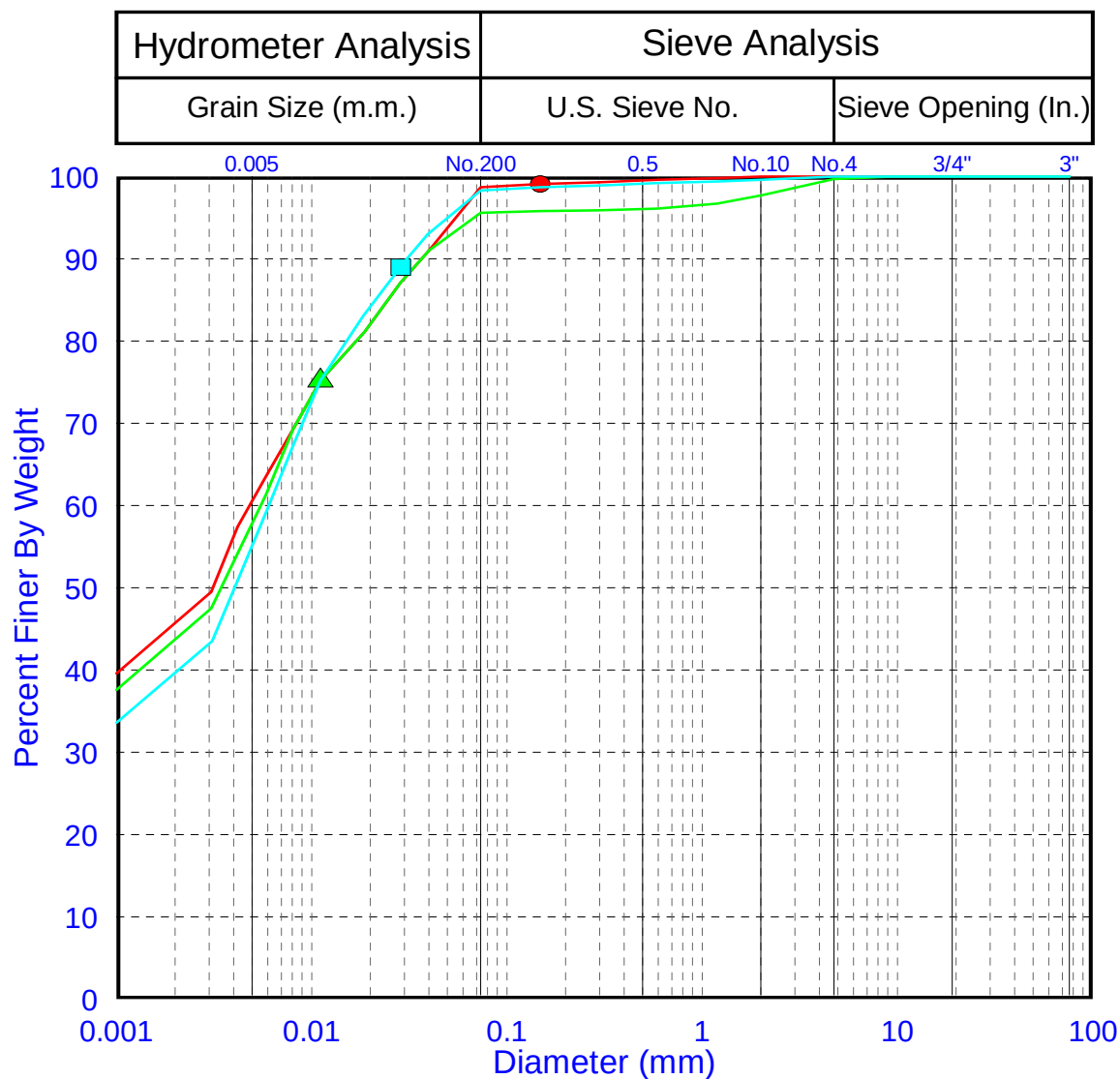
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 73

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

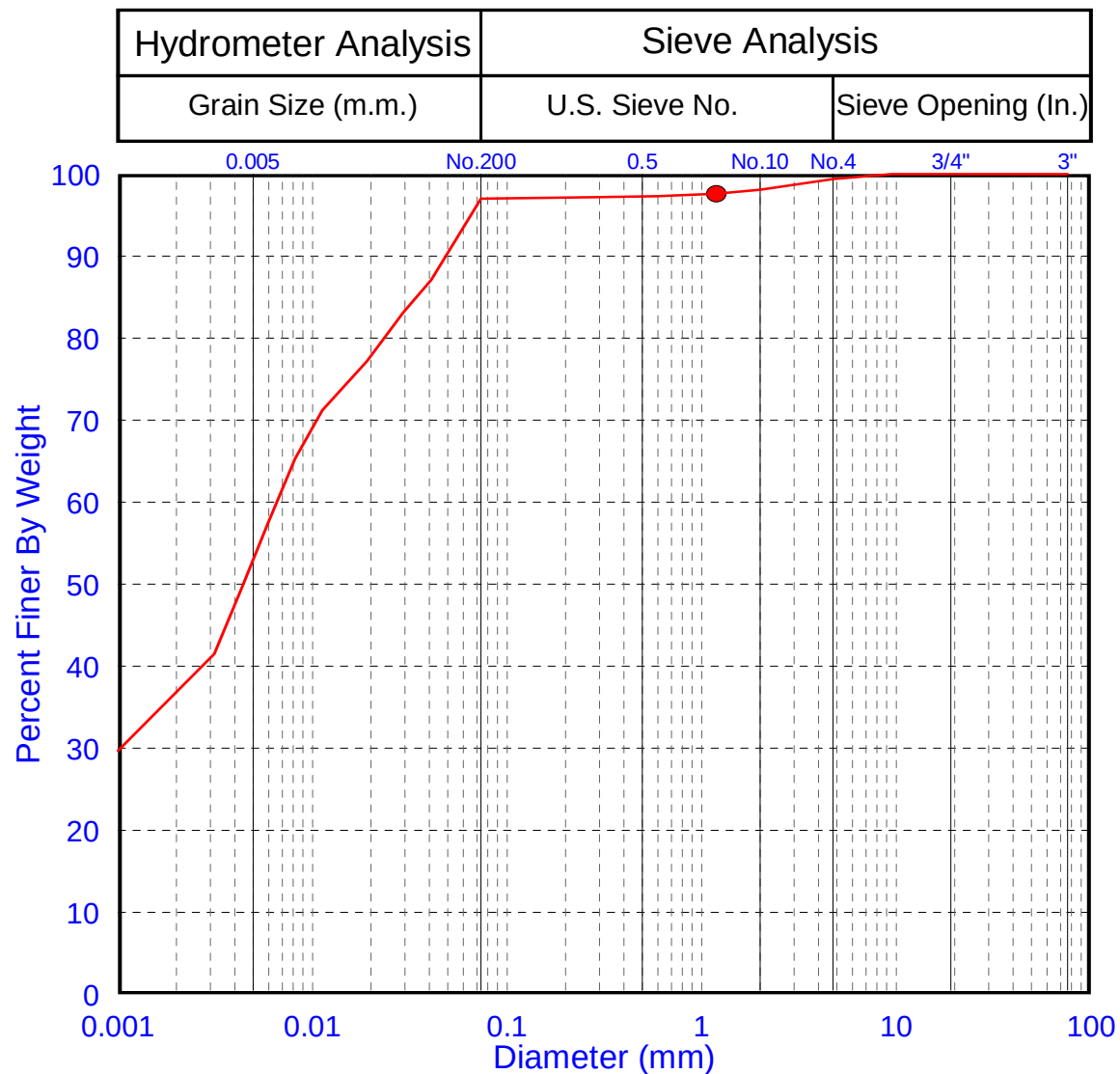


| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-169   | U1     | 5.50-6.00   | 42   | 25   | 17   | CL/ML       |
| ▲    | BH-169   | U3     | 9.50-10.00  | 30   | 20   | 10   | CL/ML       |
| ■    | BH-169   | U6     | 15.50-16.00 | 42   | 23   | 19   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART

|                                                   |                                        |                 |
|---------------------------------------------------|----------------------------------------|-----------------|
|                                                   | Project : SOUTH ALUMINUM SMELTER PLANT | Fig.: 74        |
|                                                   | Client : NFC                           |                 |
| Soil Engineering Services Consultant & Contractor |                                        | Proj No. : 1347 |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-169   | U8     | 19.50-20.00 | 31   | 21   | 10   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



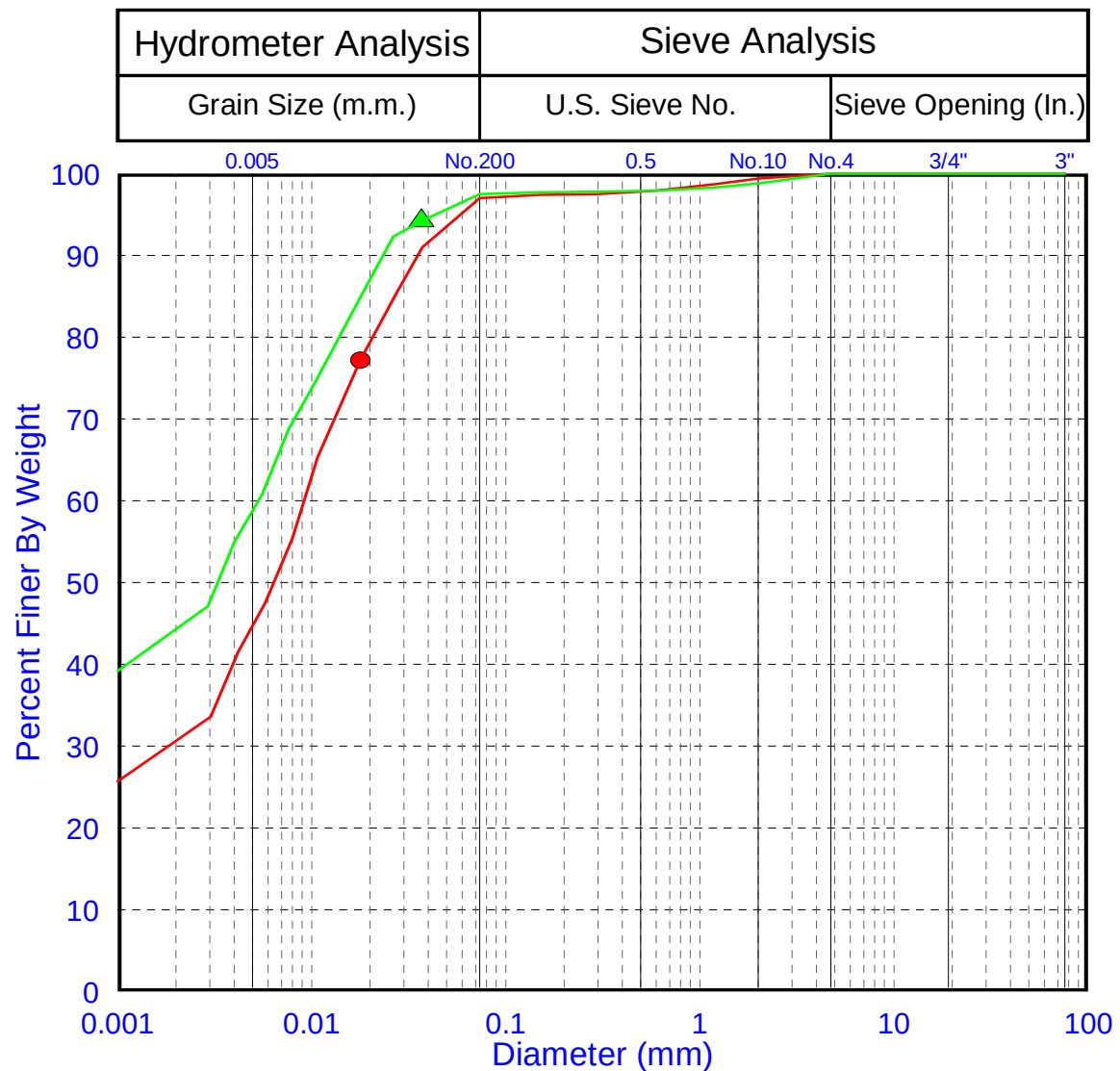
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 75

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-173   | U3     | 10.00-10.50 | 42   | 19   | 23   | CL          |
| ▲    | BH-173   | U12    | 28.00-28.40 | 37   | 19   | 18   | CL          |

### GRAIN SIZE DISTRIBUTION CHART



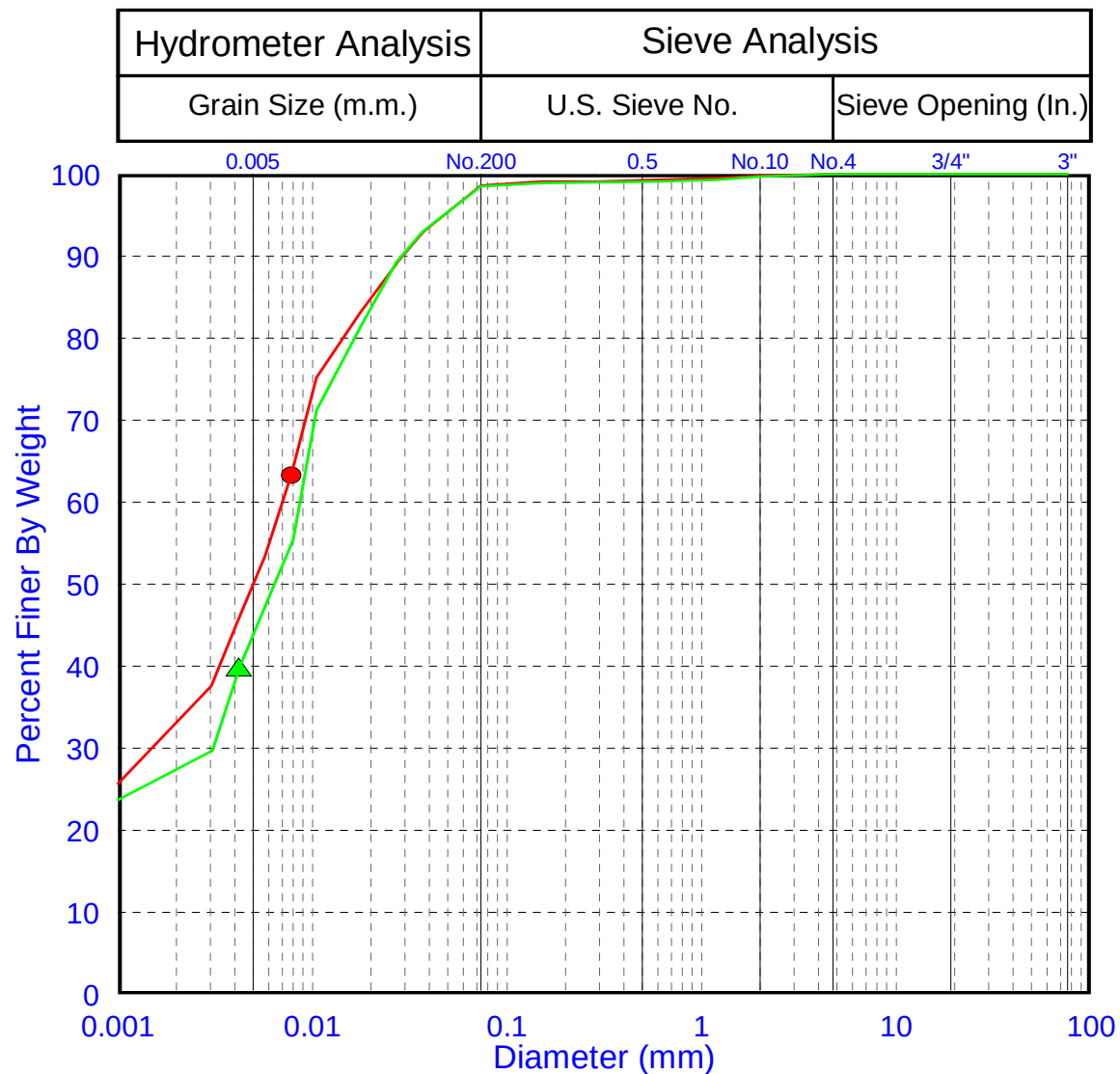
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 76

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-175   | U2     | 10.00-10.50 | 36   | 23   | 13   | CL/ML       |
| ▲    | BH-175   | U7     | 20.00-20.50 | 39   | 21   | 18   | CL          |

### GRAIN SIZE DISTRIBUTION CHART



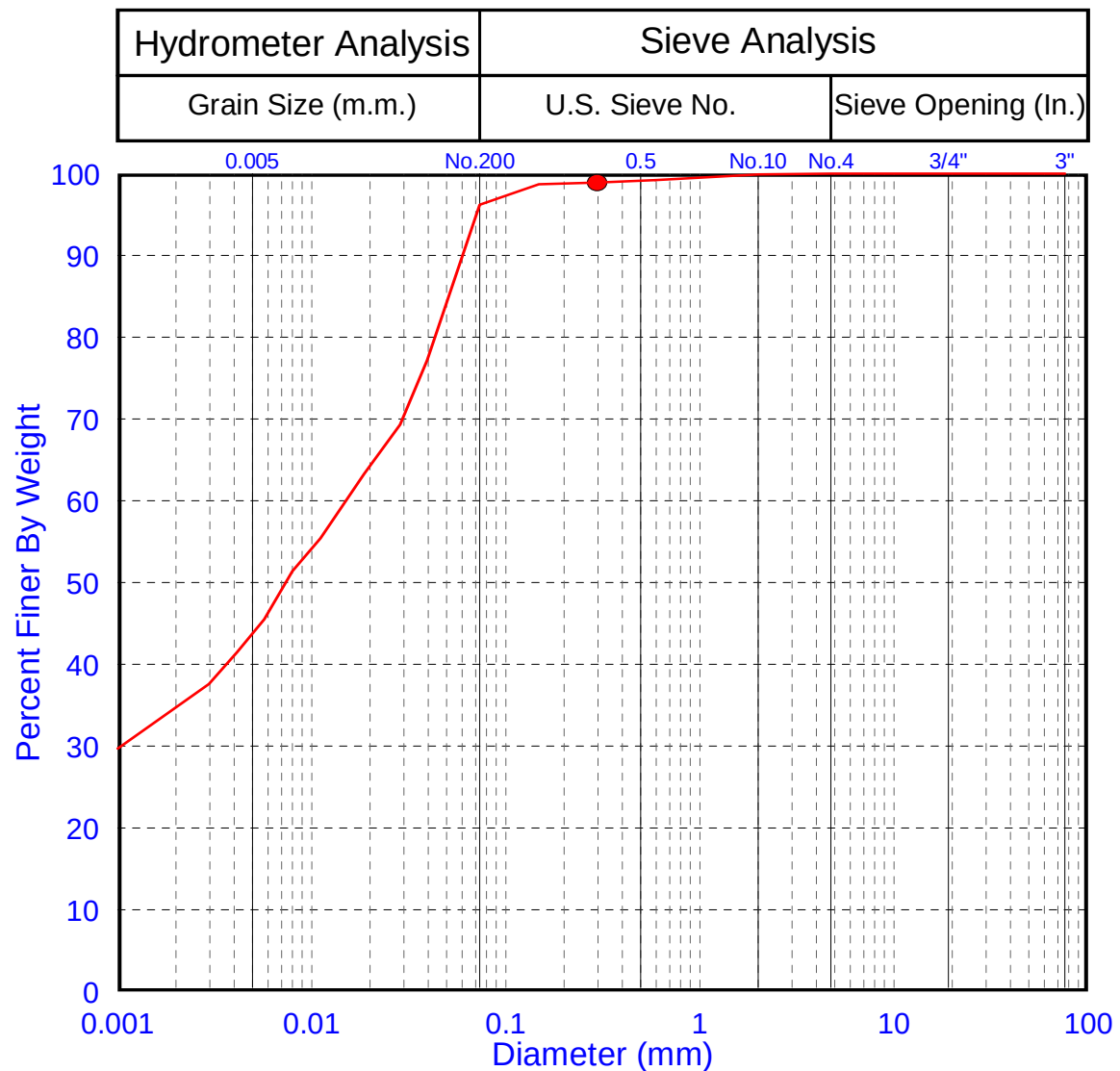
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 77

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-180   | U6     | 16.00-16.50 | 37   | 21   | 16   | CL          |

### GRAIN SIZE DISTRIBUTION CHART



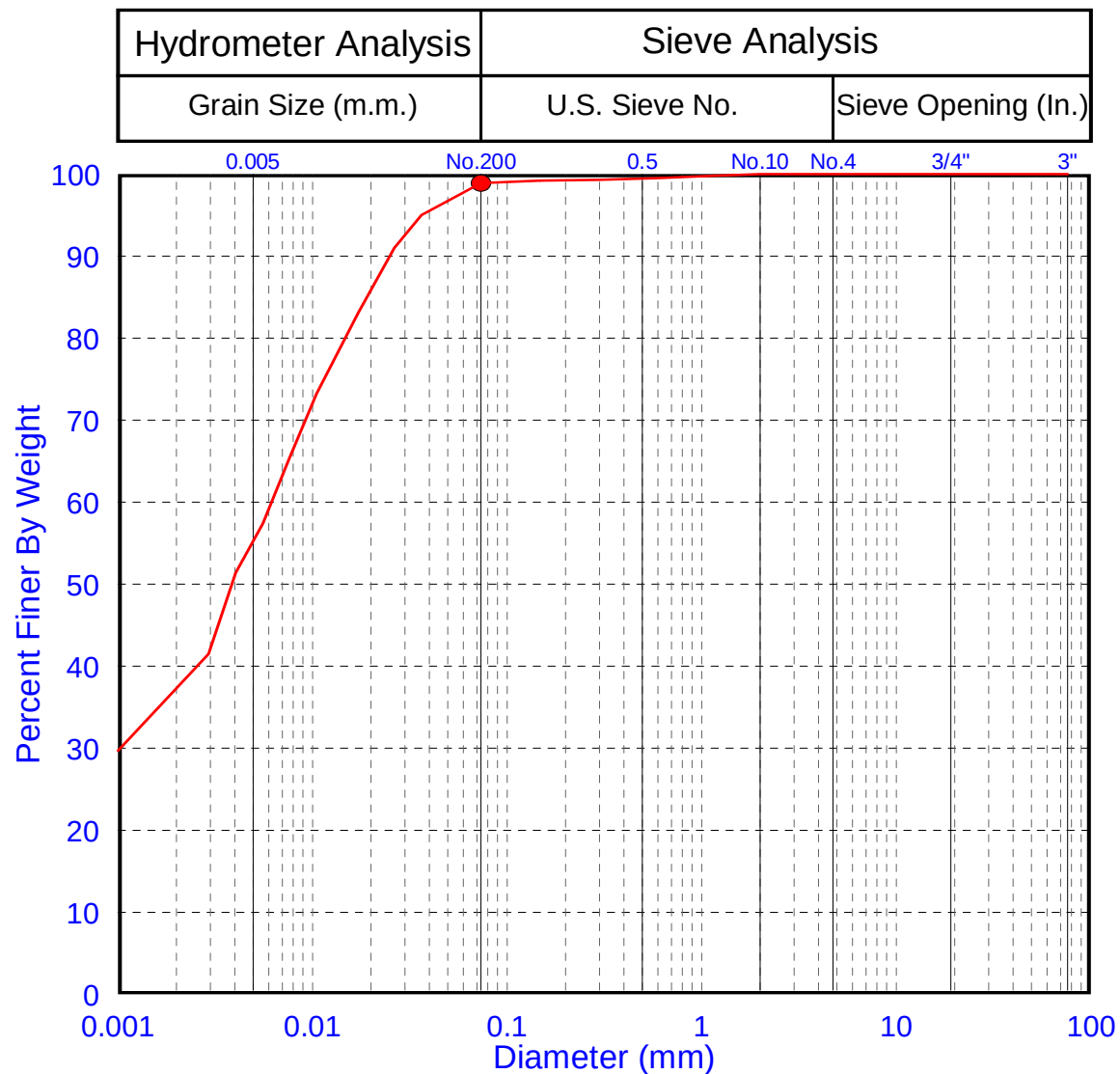
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 78

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-184   | U4     | 11.50-12.00 | 37   | 21   | 16   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



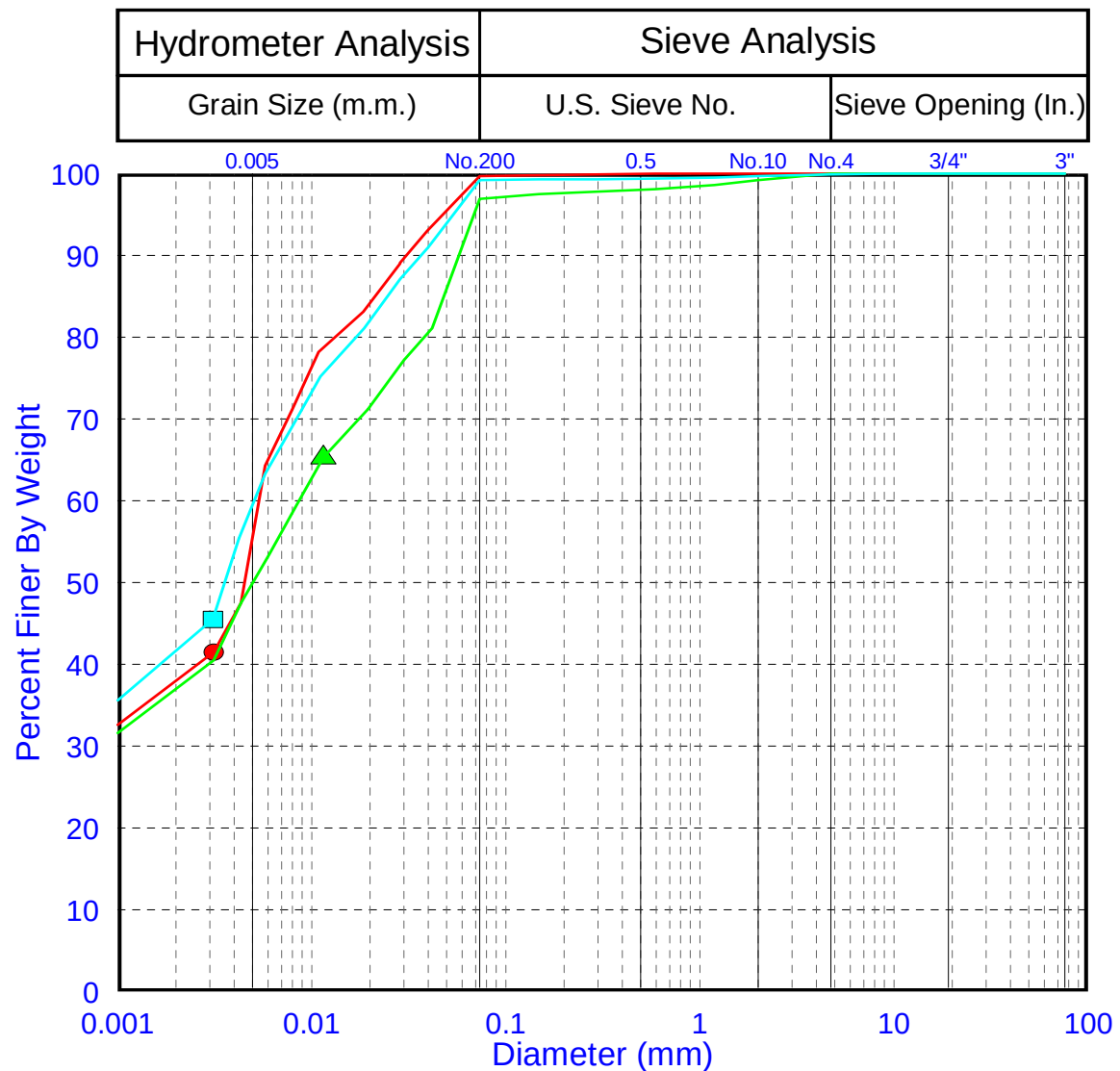
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 79

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)  | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-----------|------|------|------|-------------|
| ●    | BH-185   | U1     | 3.50-4.00 | 29   | 22   | 7    | CL-ML/CL    |
| ▲    | BH-185   | U2     | 5.50-6.00 | 37   | 22   | 15   | CL/ML       |
| ■    | BH-185   | U3     | 7.50-8.00 | 33   | 24   | 9    | ML/CL       |

## GRAIN SIZE DISTRIBUTION CHART



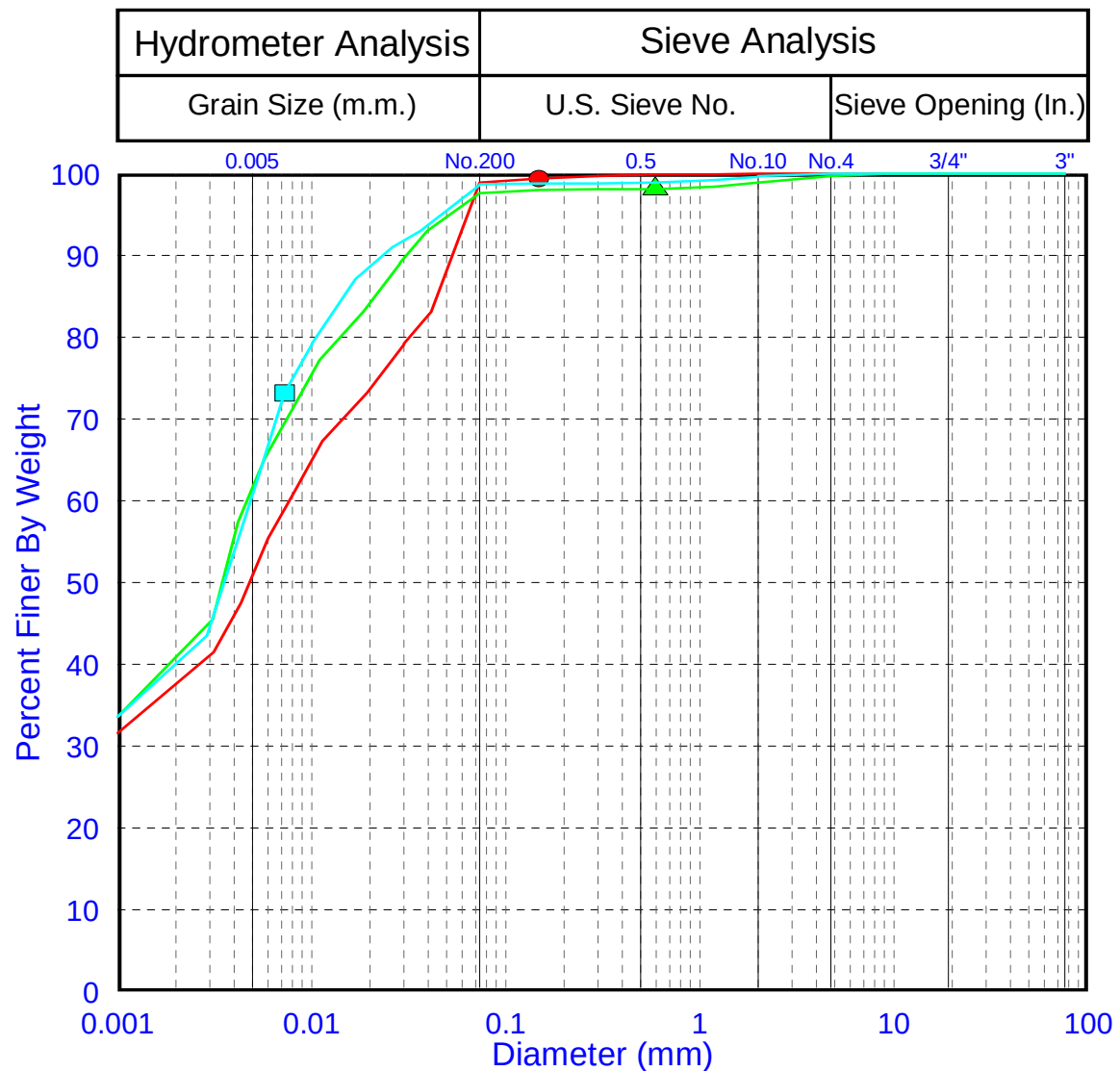
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 80

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-185   | U10    | 21.50-22.00 | 39   | 25   | 14   | CL/ML       |
| ▲    | BH-185   | U12    | 25.50-26.00 | 34   | 21   | 13   | CL/ML       |
| ■    | BH-185   | U14    | 29.50-30.00 | 40   | 23   | 17   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



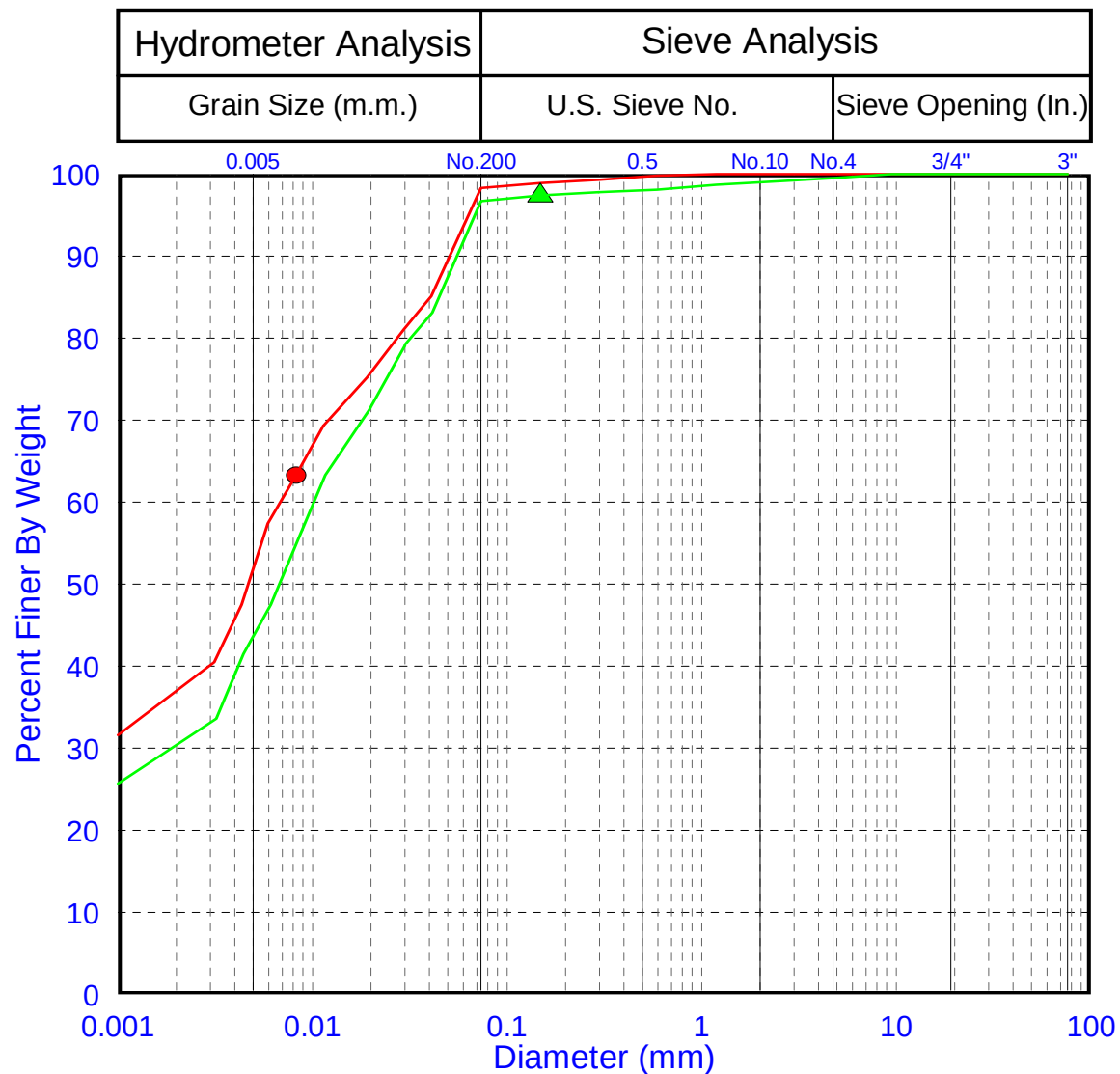
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 81

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-185   | U15    | 31.50-32.00 | 40   | 24   | 16   | CL/ML       |
| ▲    | BH-185   | U16    | 33.50-34.00 | 35   | 23   | 12   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



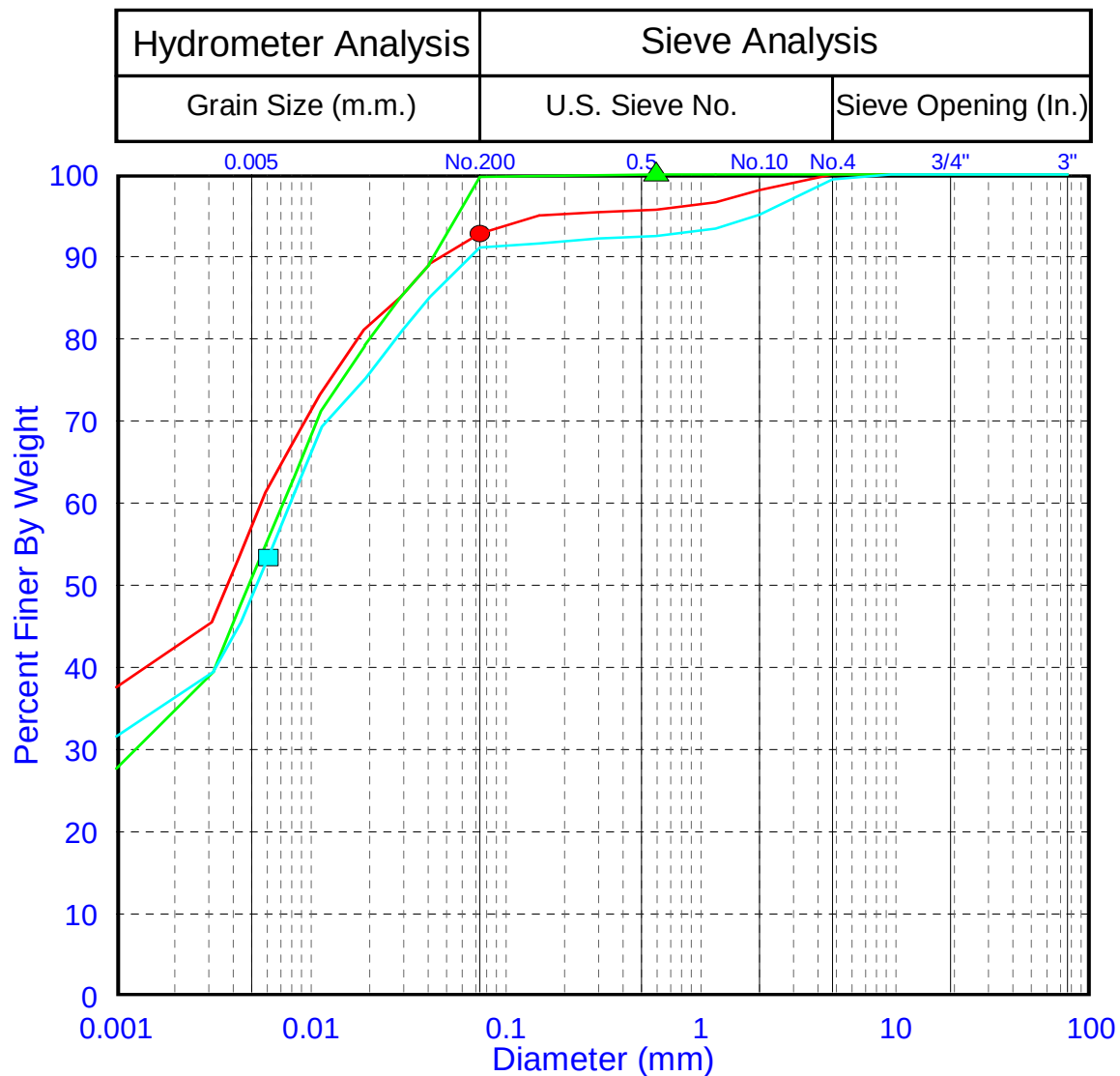
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 82

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

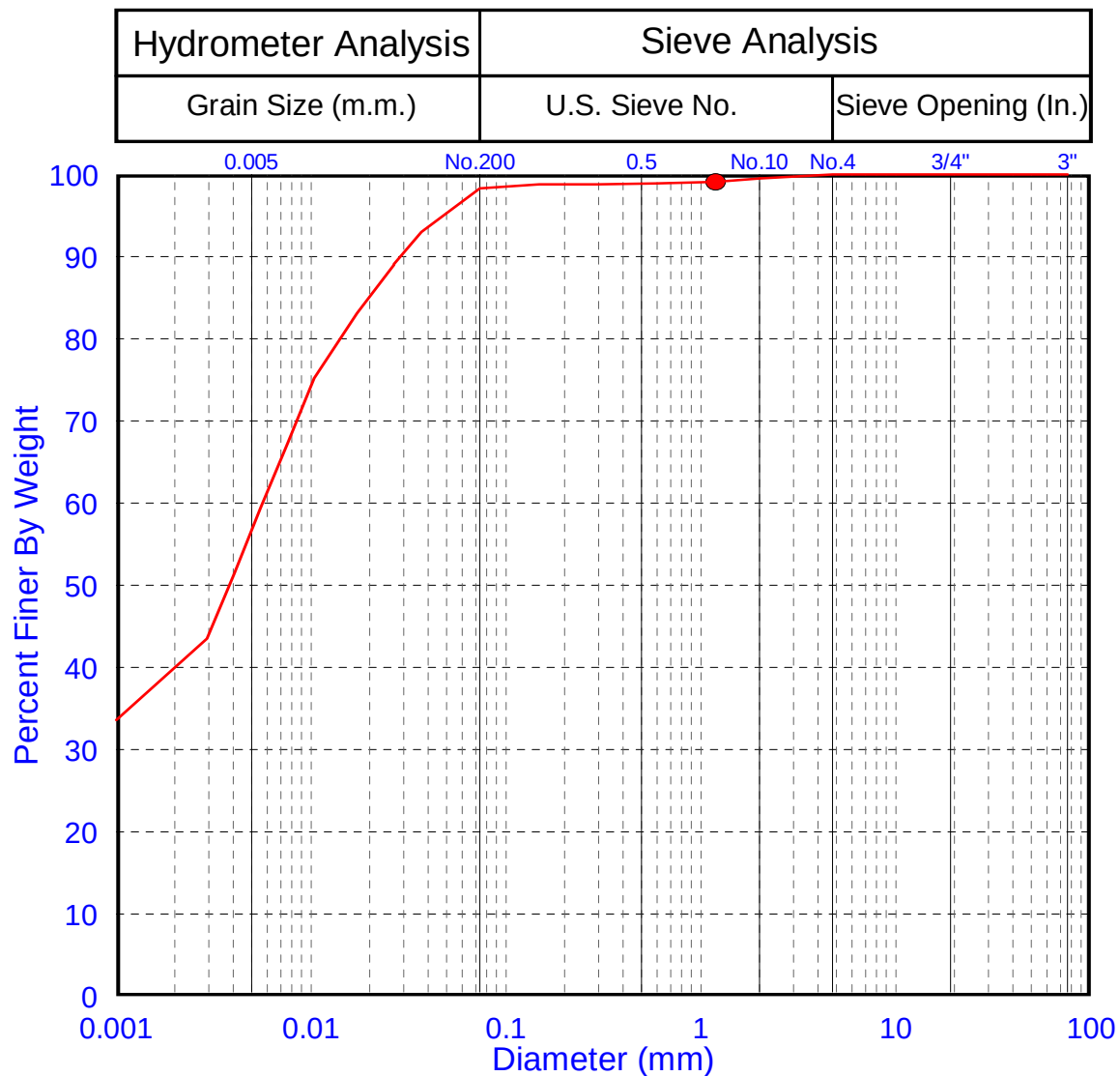


| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-186   | U3     | 9.50-10.00  | 29   | 20   | 9    | CL/ML       |
| ▲    | BH-186   | U7     | 17.50-18.00 | 43   | 26   | 17   | CL/ML       |
| ■    | BH-186   | U8     | 19.50-20.00 | 42   | 22   | 20   | CL          |

### GRAIN SIZE DISTRIBUTION CHART

|                                                   |                                        |                 |
|---------------------------------------------------|----------------------------------------|-----------------|
|                                                   | Project : SOUTH ALUMINUM SMELTER PLANT | Fig.: 83        |
|                                                   | Client : NFC                           |                 |
| Soil Engineering Services Consultant & Contractor |                                        | Proj No. : 1347 |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-198   | U7     | 17.50-18.00 | 38   | 21   | 17   | CL          |

### GRAIN SIZE DISTRIBUTION CHART



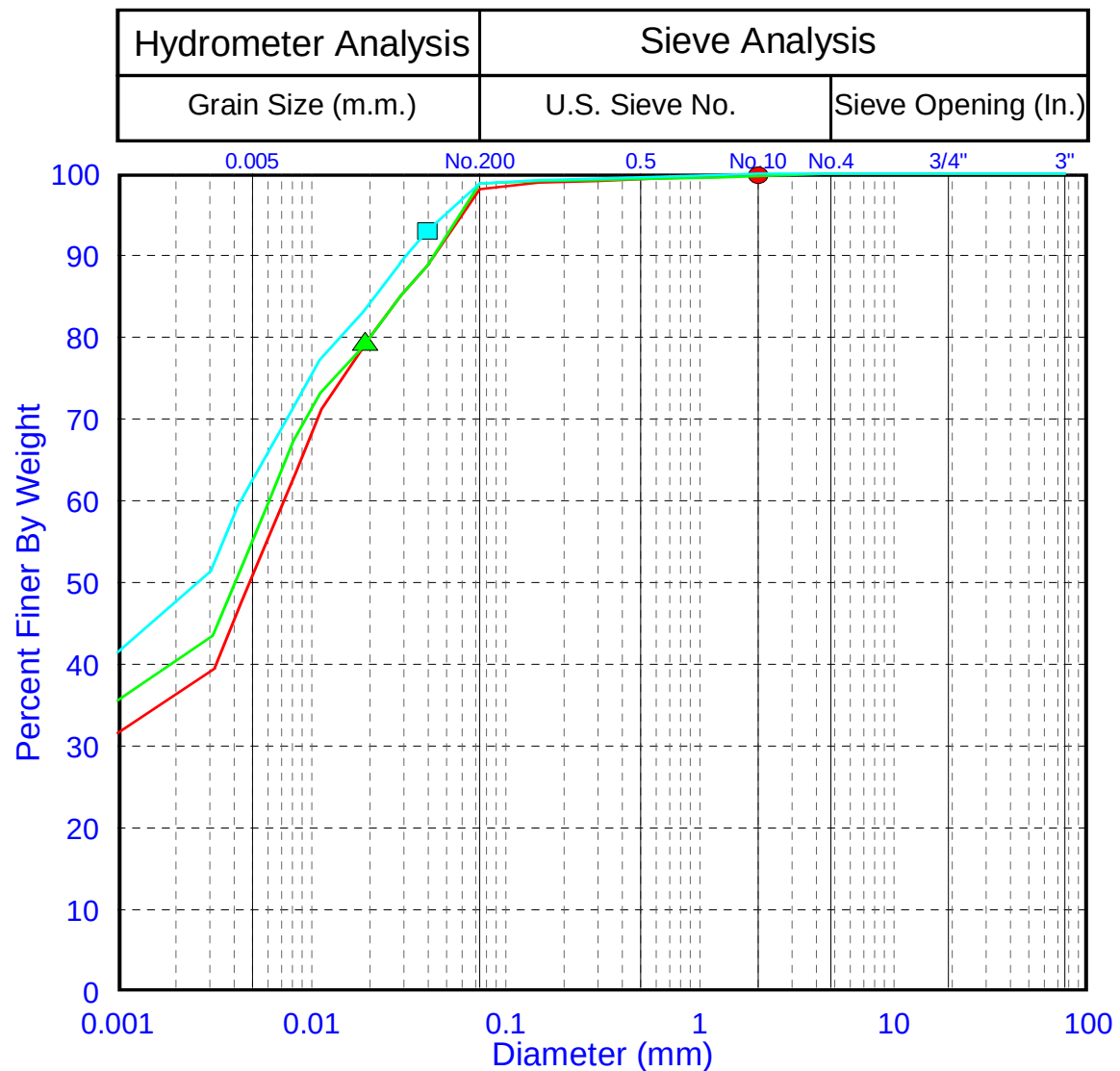
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 84

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-202   | U11    | 26.00-26.50 | 41   | 24   | 17   | CL/ML       |
| ▲    | BH-202   | CB1    | 28.00-28.50 | 41   | 24   | 17   | CL/ML       |
| ■    | BH-202   | CB2    | 30.00-30.50 | 36   | 23   | 13   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



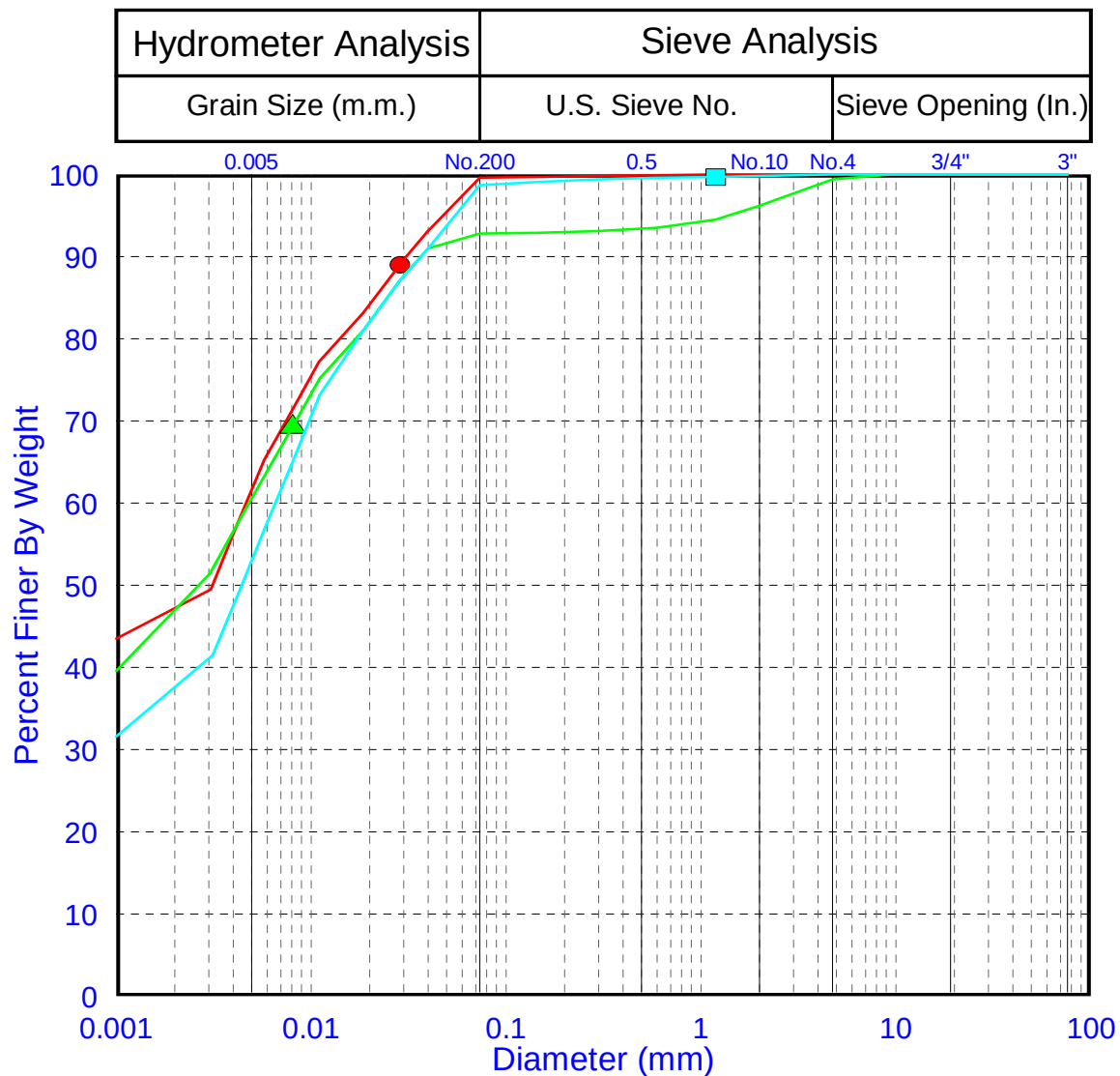
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 85

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-202   | CB3    | 32.00-32.50 | 37   | 25   | 12   | ML/CL       |
| ▲    | BH-202   | CB4    | 34.00-34.50 | 33   | 22   | 11   | CL/ML       |
| ■    | BH-202   | CB6    | 38.00-38.50 | 42   | 23   | 19   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



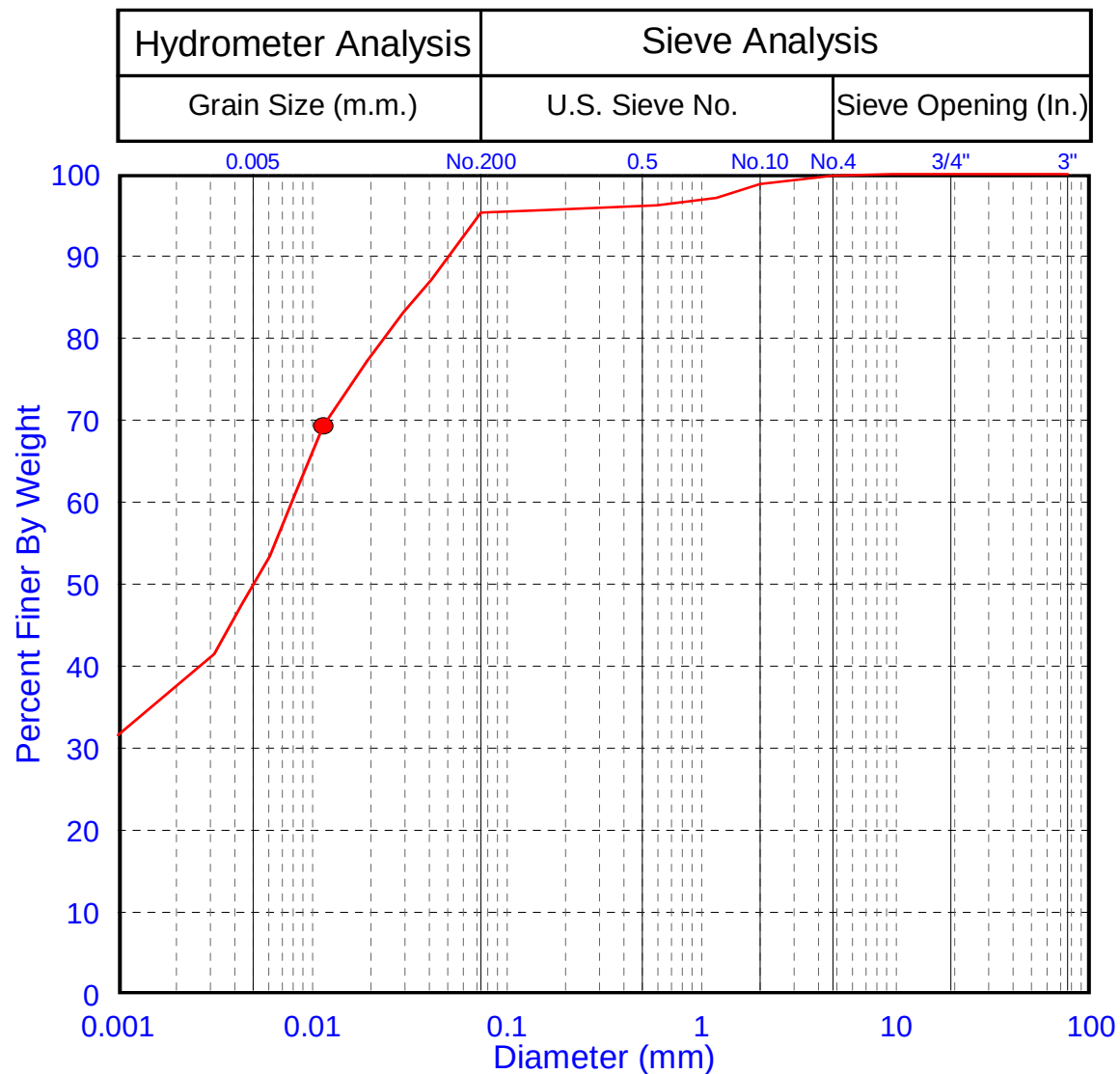
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 86

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-202   | CB7    | 40.00-40.50 | 44   | 27   | 17   | ML/CL       |

## GRAIN SIZE DISTRIBUTION CHART



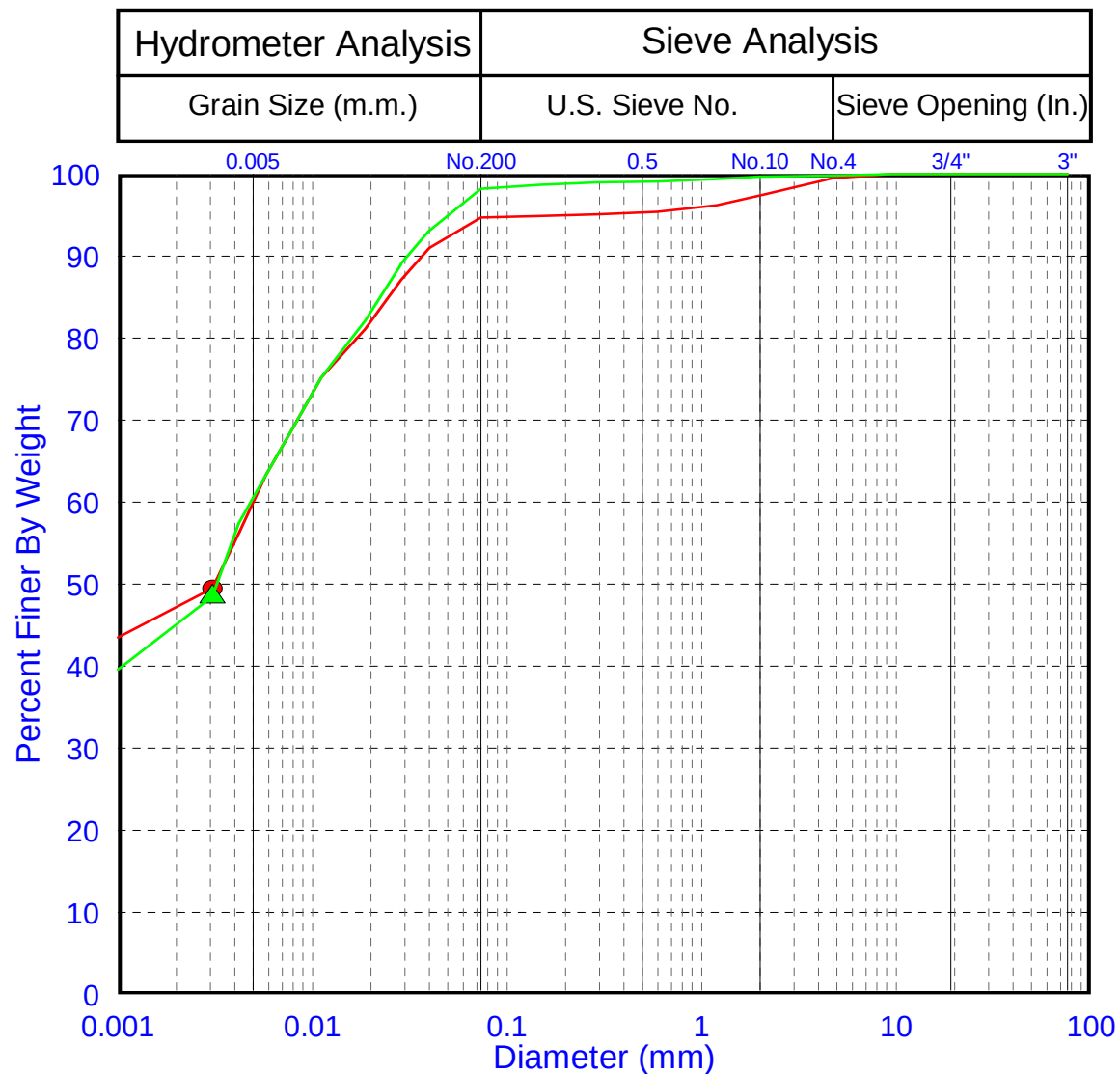
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 87

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-216   | U3     | 12.00-12.45 | 33   | 23   | 10   | CL/ML       |
| ▲    | BH-216   | U7     | 22.00-22.50 | 39   | 23   | 16   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



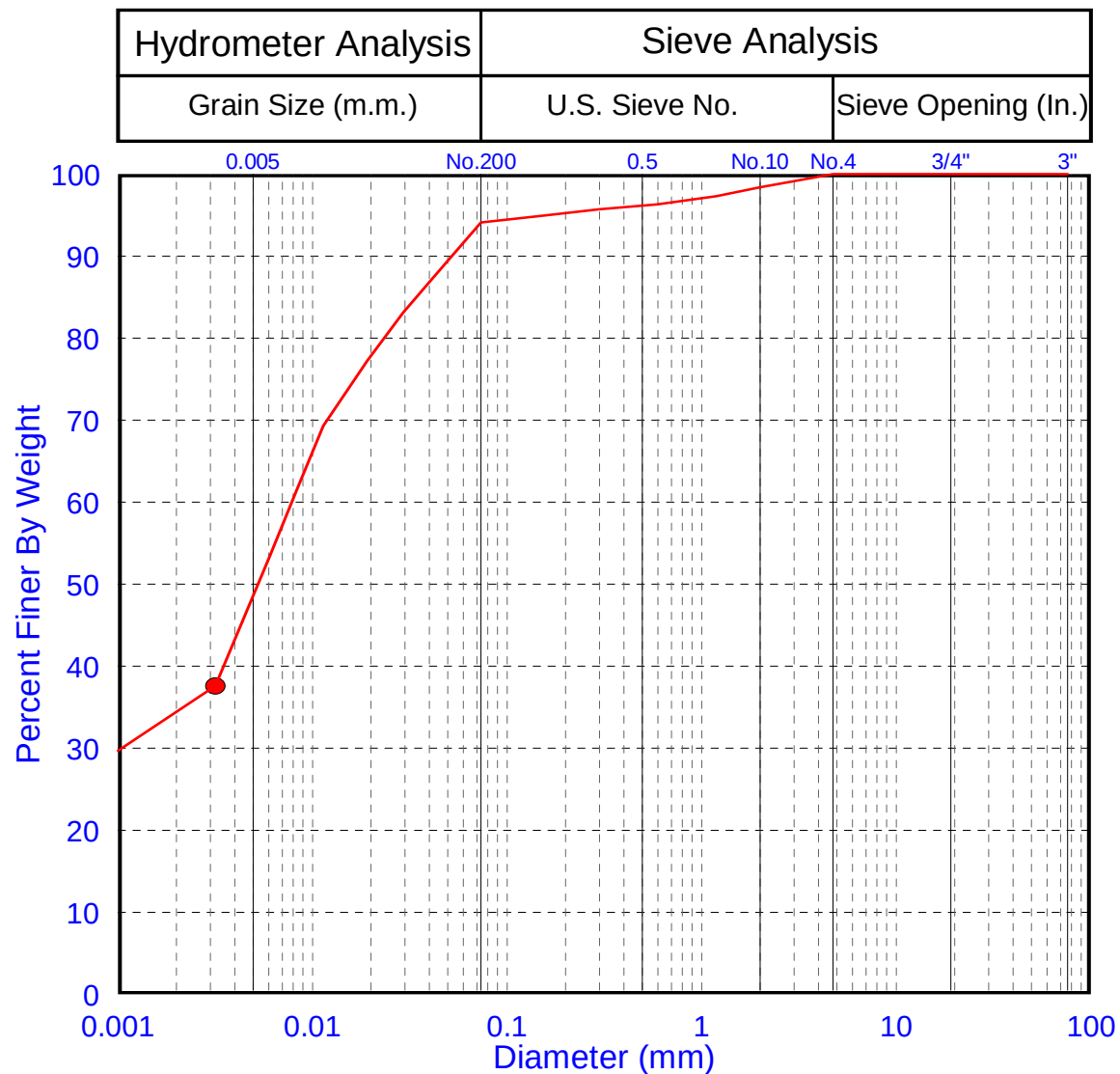
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 88

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-220   | U3     | 14.50-15.00 | 37   | 21   | 16   | CL          |

### GRAIN SIZE DISTRIBUTION CHART



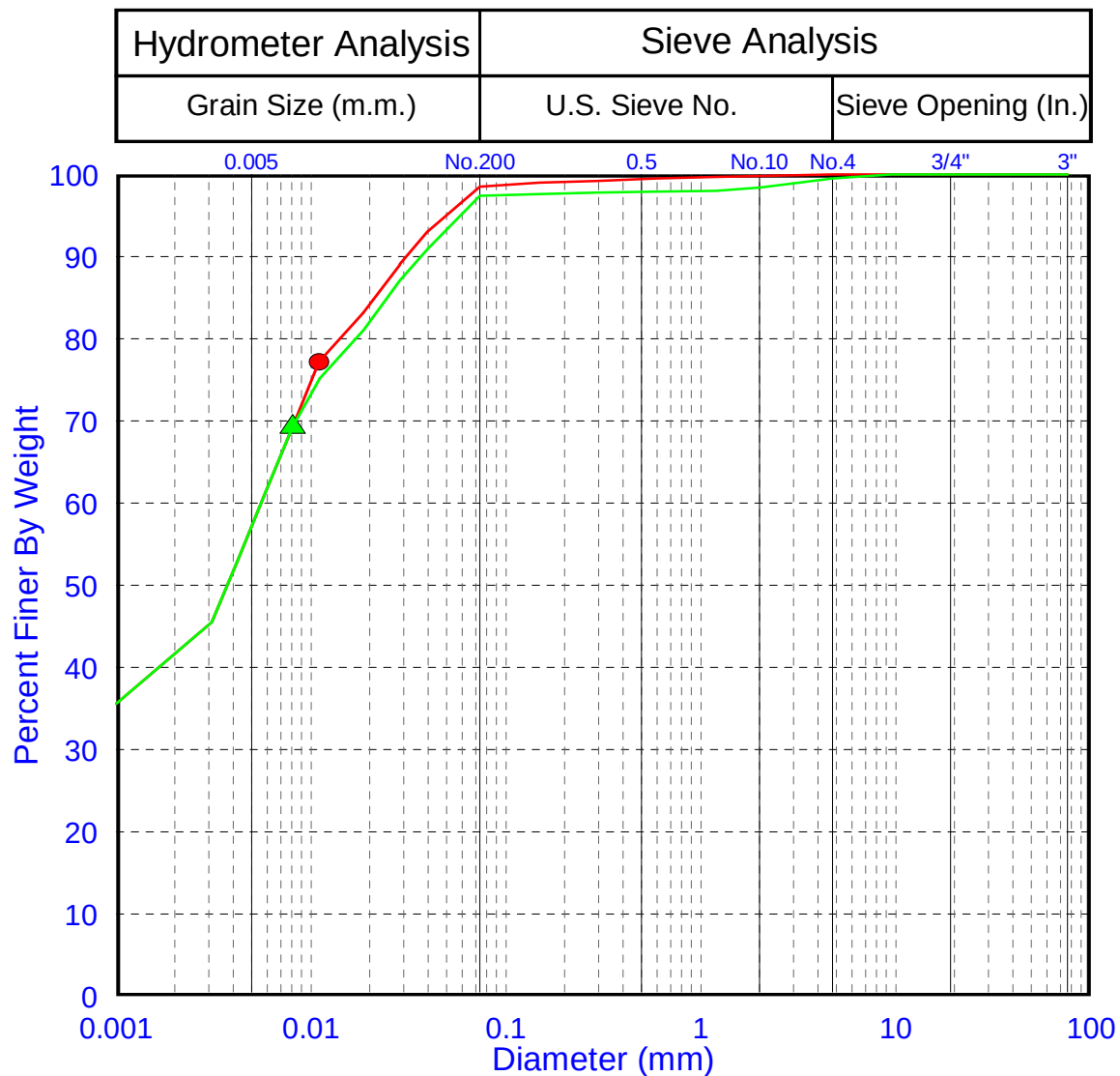
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 89

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-222   | U8     | 20.00-20.50 | 37   | 23   | 14   | CL/ML       |
| ▲    | BH-222   | U10    | 24.00-24.50 | 33   | 23   | 10   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



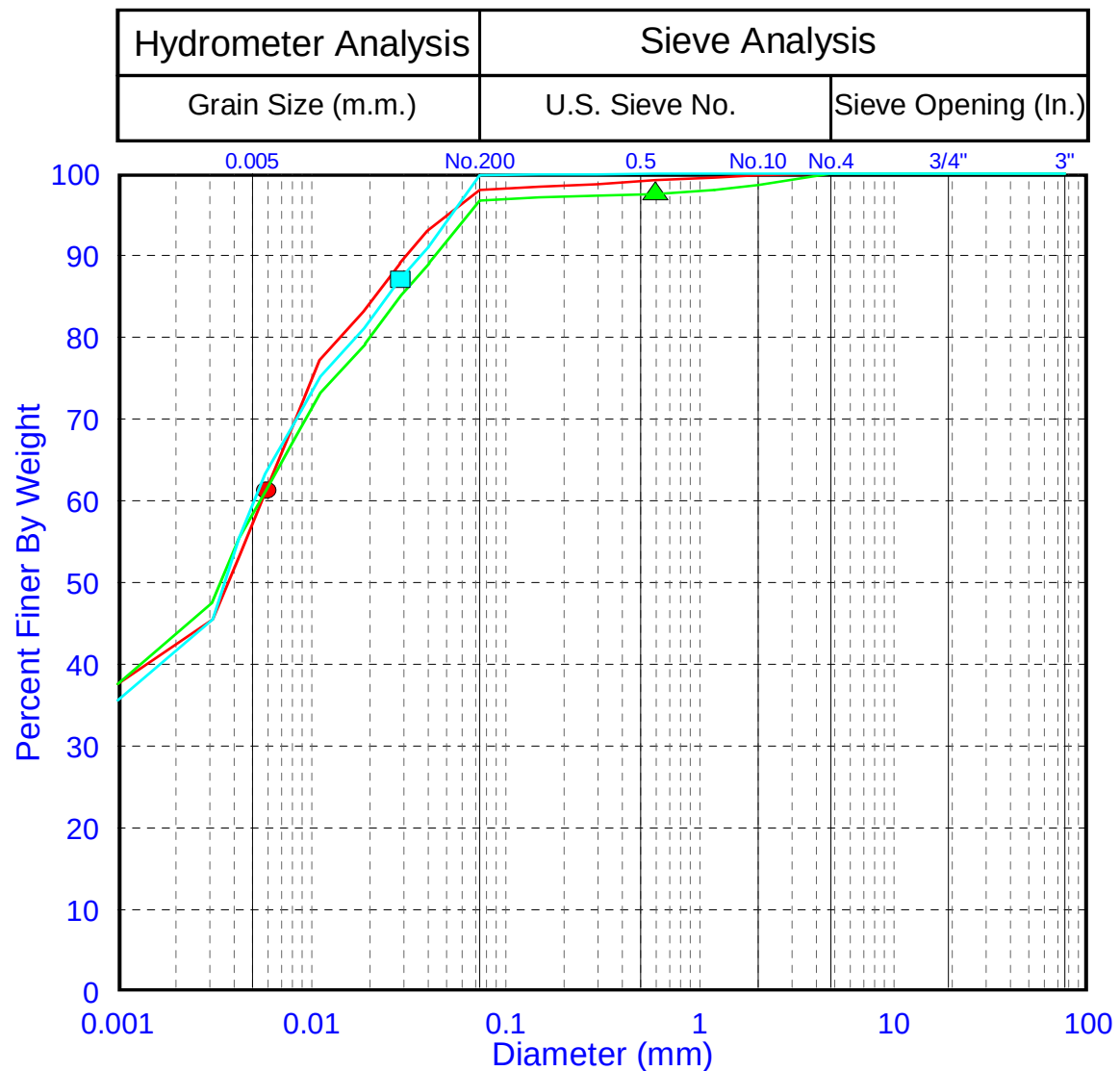
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 90

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-234   | U1     | 7.00-7.50   | 38   | 26   | 12   | ML/CL       |
| ▲    | BH-234   | U7     | 22.00-22.50 | 36   | 24   | 12   | CL/ML       |
| ■    | BH-234   | U8     | 24.50-25.00 | 35   | 23   | 12   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



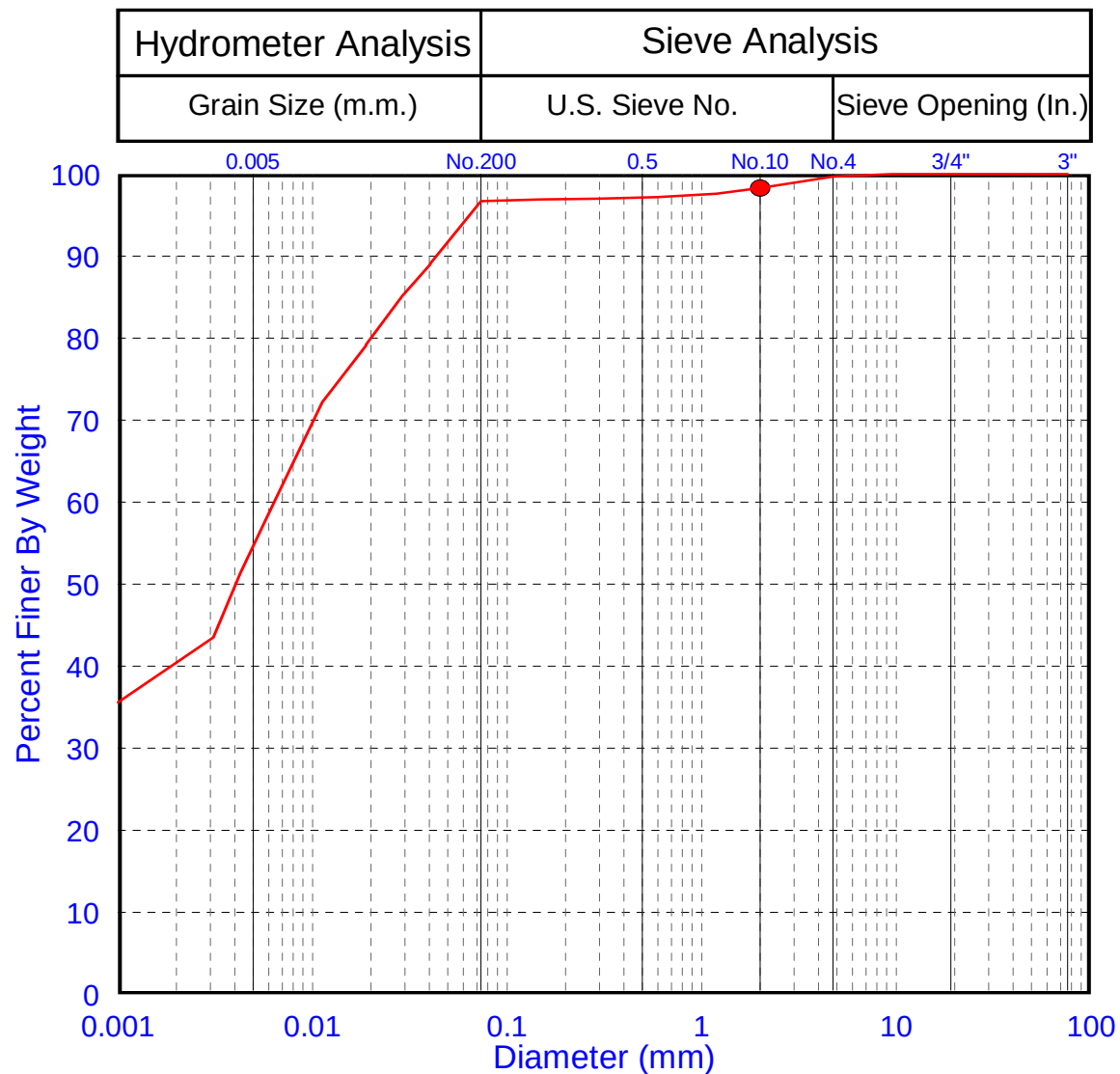
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 91

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-237   | U4     | 14.50-15.00 | 35   | 22   | 13   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



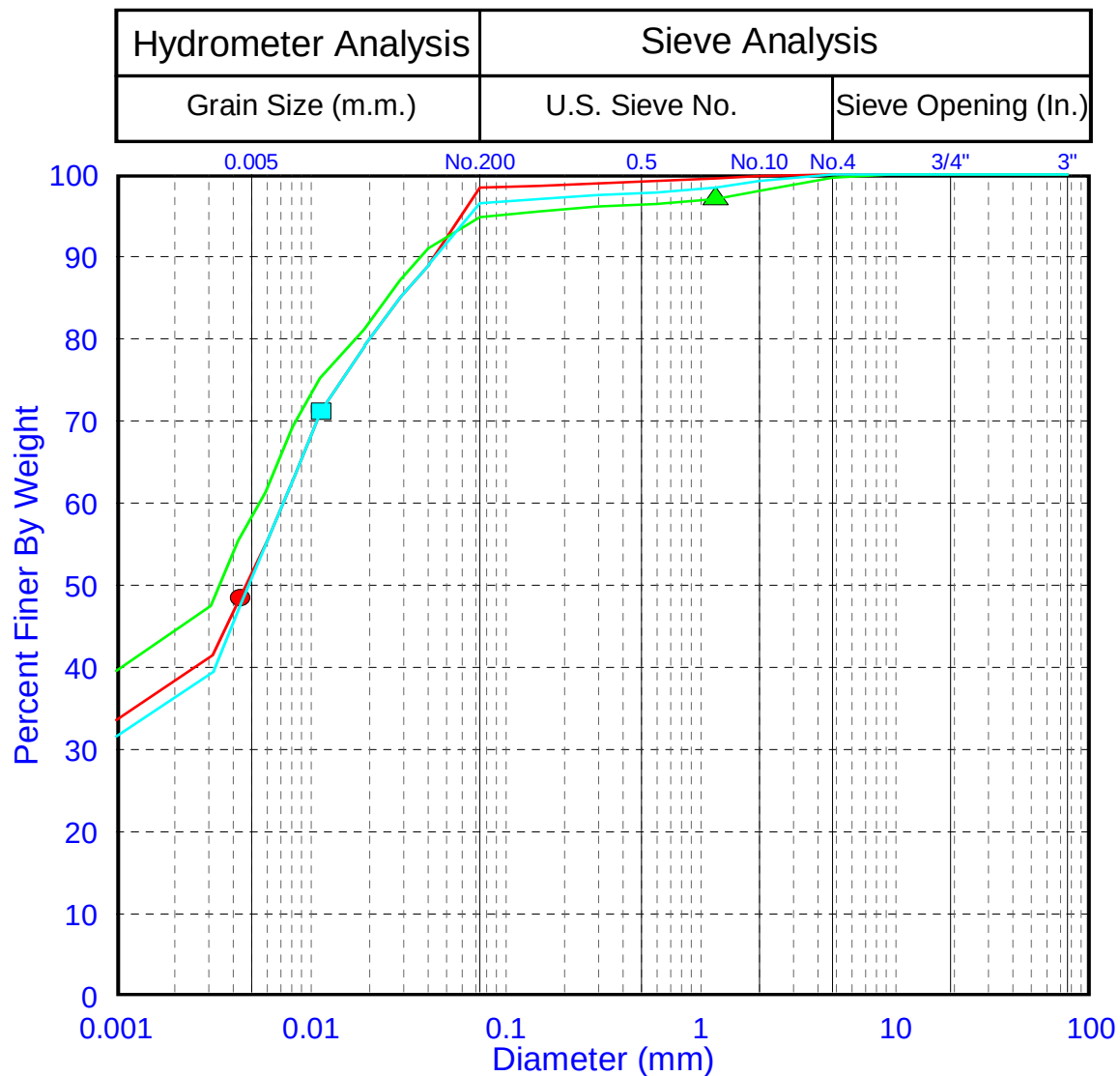
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 92

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-243   | U8     | 20.00-20.50 | 35   | 24   | 11   | CL/ML       |
| ▲    | BH-243   | U9     | 22.00-22.50 | 32   | 23   | 9    | CL/ML       |
| ■    | BH-243   | U10    | 24.00-24.50 | 40   | 21   | 19   | CL          |

### GRAIN SIZE DISTRIBUTION CHART



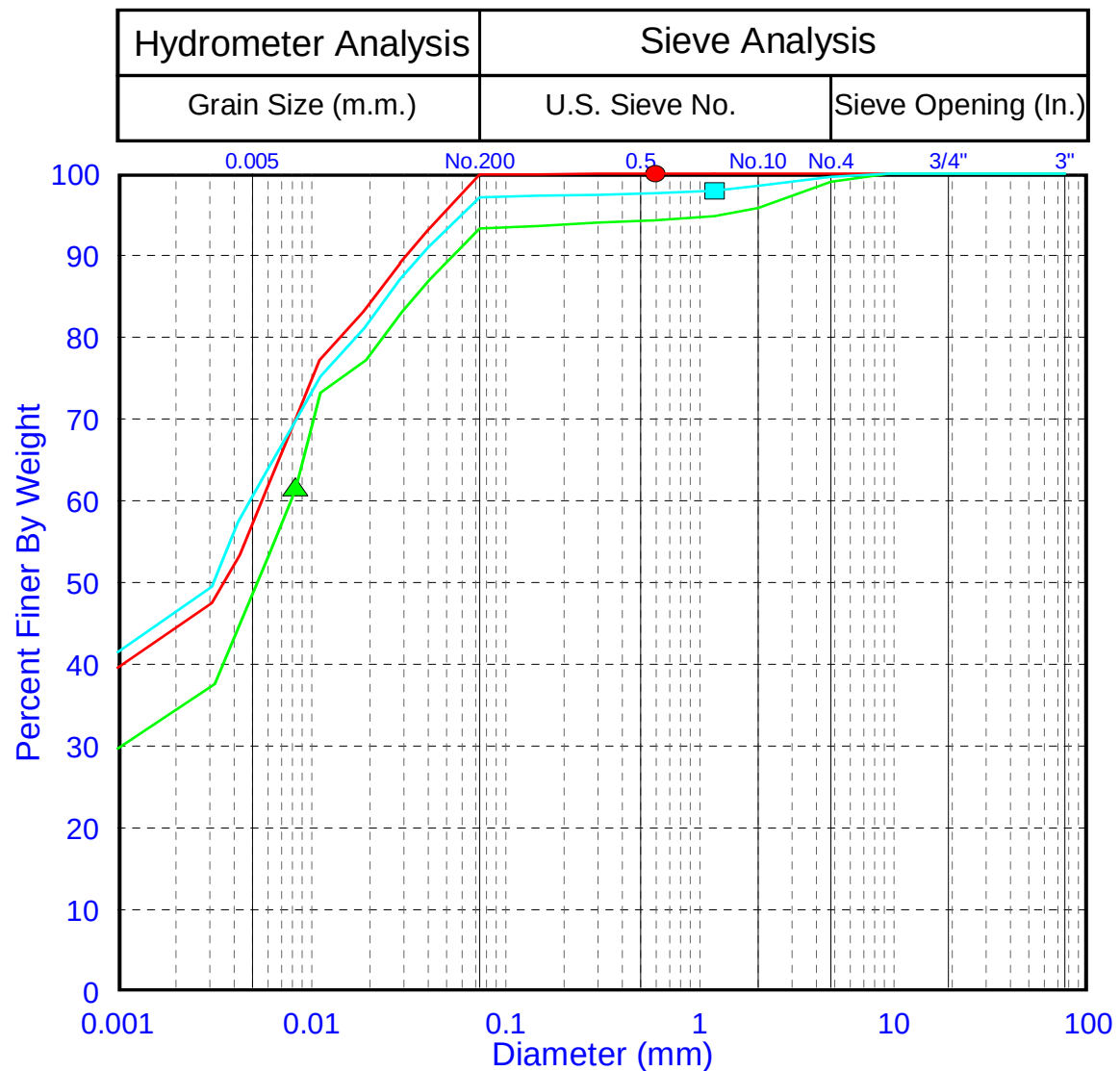
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 93

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-249   | U1     | 4.00-4.50   | 43   | 26   | 17   | CL/ML       |
| ▲    | BH-249   | U9     | 20.00-20.50 | 38   | 23   | 15   | CL/ML       |
| ■    | BH-249   | U11    | 24.00-24.50 | 34   | 26   | 8    | ML/CL       |

## GRAIN SIZE DISTRIBUTION CHART



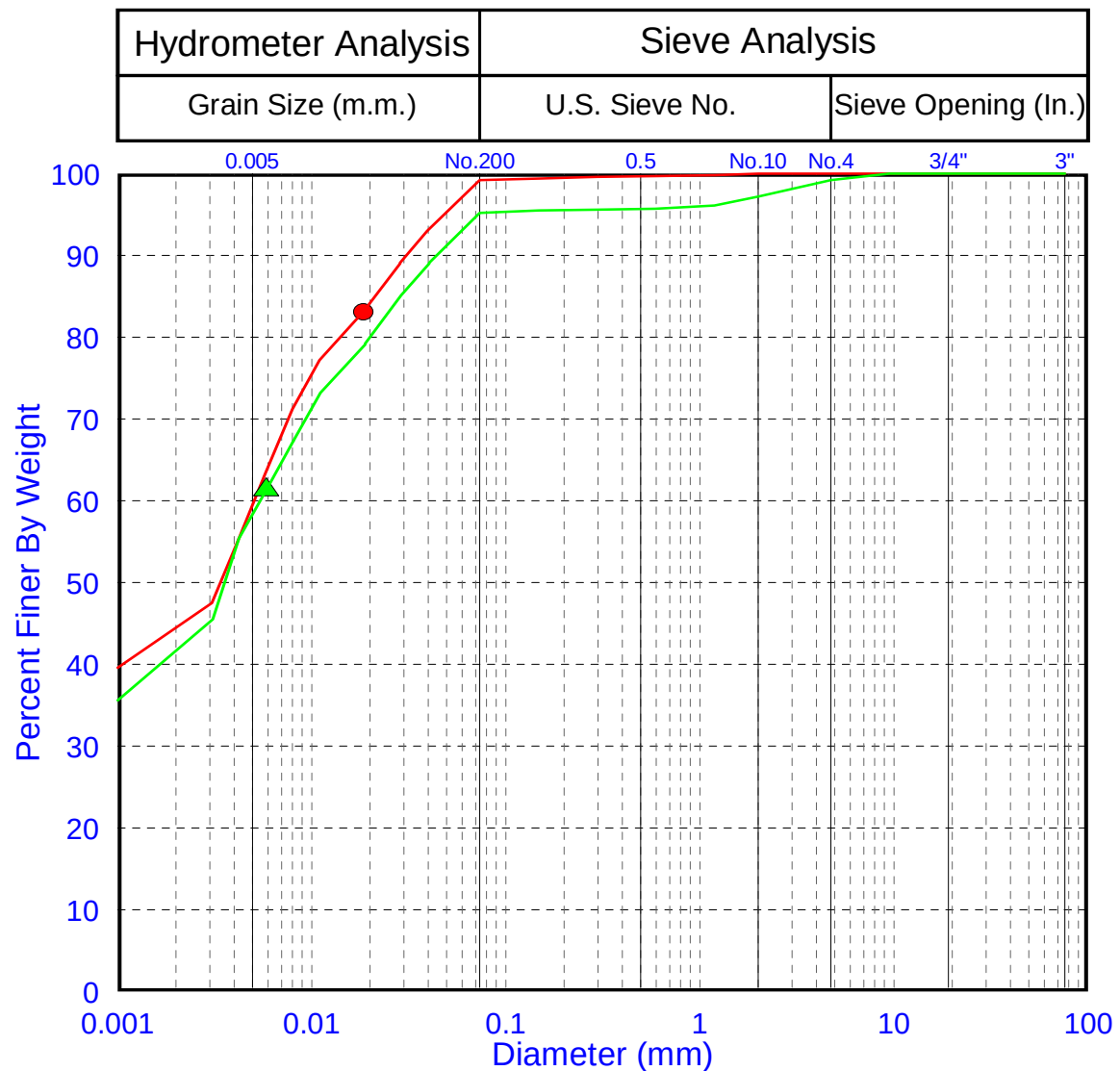
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 94

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-251   | U1     | 4.00-4.50   | 36   | 23   | 13   | CL/ML       |
| ▲    | BH-251   | U5     | 12.00-12.50 | 31   | 23   | 8    | ML/CL-ML/CL |

## GRAIN SIZE DISTRIBUTION CHART



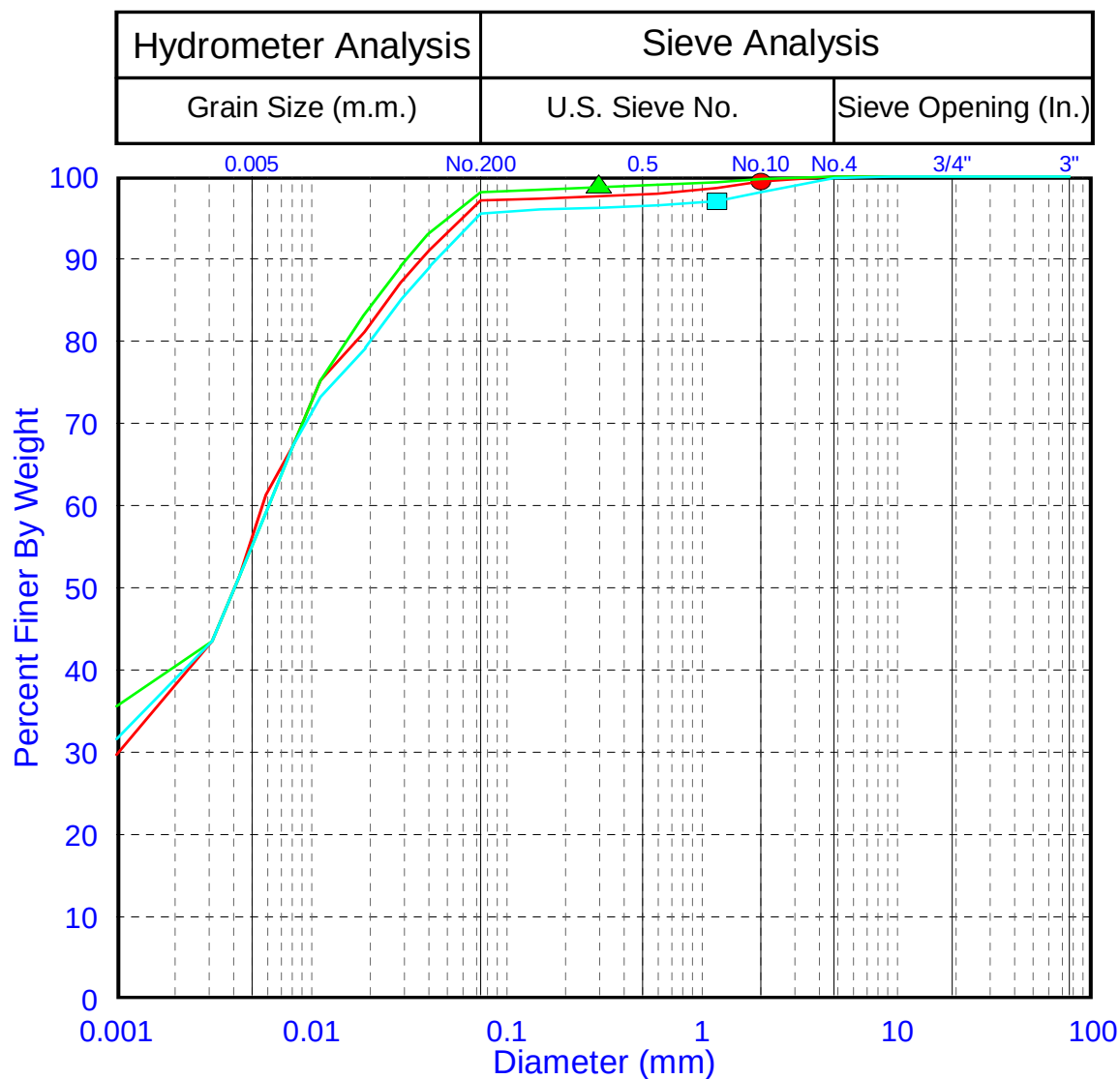
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 95

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-254   | U1     | 4.00-4.50   | 46   | 24   | 22   | CL/ML       |
| ▲    | BH-254   | U9     | 20.00-20.50 | 32   | 22   | 10   | CL/ML       |
| ■    | BH-254   | U11    | 24.00-24.50 | 35   | 23   | 12   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



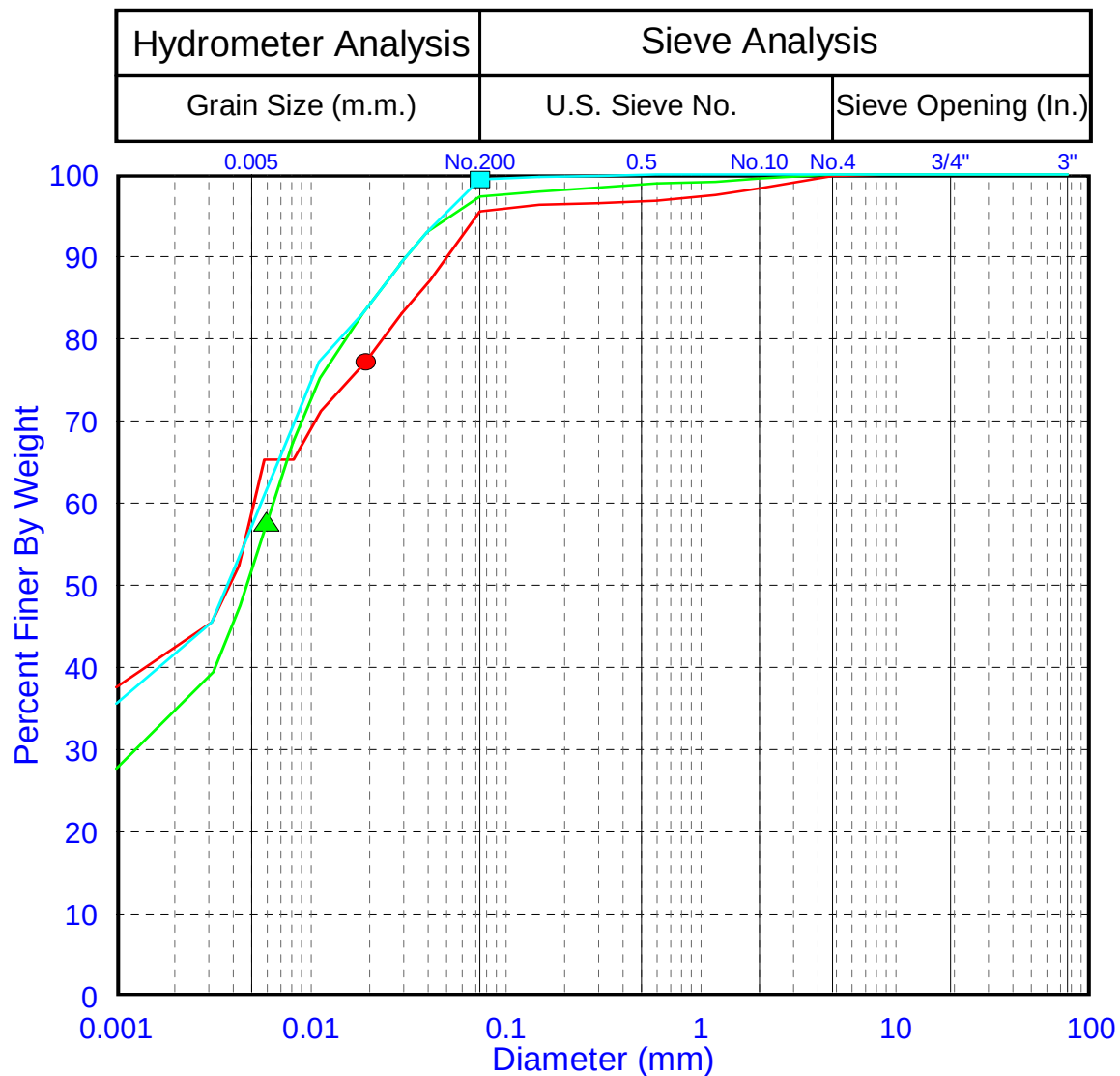
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 96

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



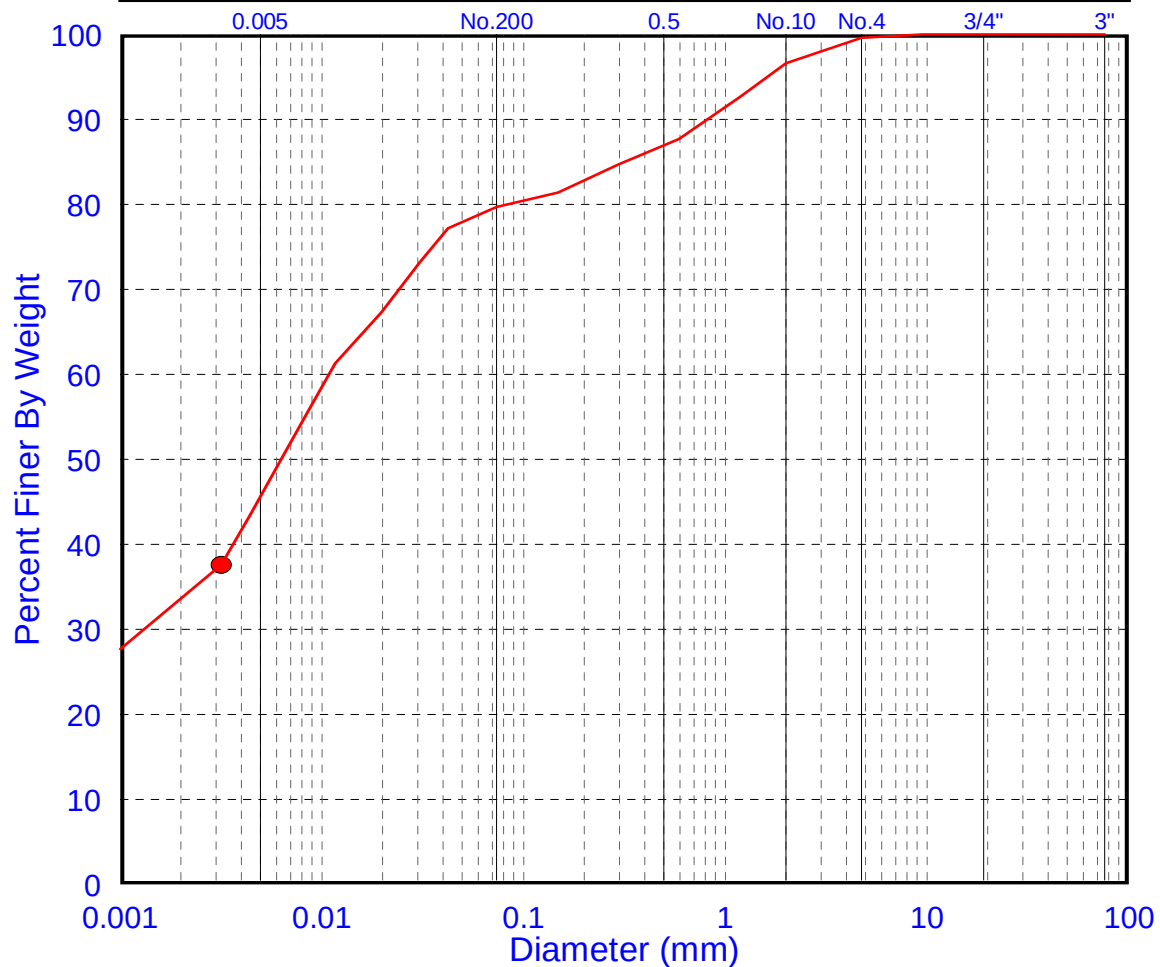
| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-256   | U1     | 7.50-8.30   | 40   | 23   | 17   | CL/ML       |
| ▲    | BH-256   | U3     | 12.50-13.00 | 35   | 21   | 14   | CL/ML       |
| ■    | BH-256   | U9     | 30.00-30.42 | 39   | 23   | 16   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART

|                                                   |                                        |                 |
|---------------------------------------------------|----------------------------------------|-----------------|
|                                                   | Project : SOUTH ALUMINUM SMELTER PLANT | Fig.: 97        |
|                                                   | Client : NFC                           |                 |
| Soil Engineering Services Consultant & Contractor |                                        | Proj No. : 1347 |

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-256   | U15    | 45.00-45.50 | 45   | 34   | 11   | ML          |

## GRAIN SIZE DISTRIBUTION CHART



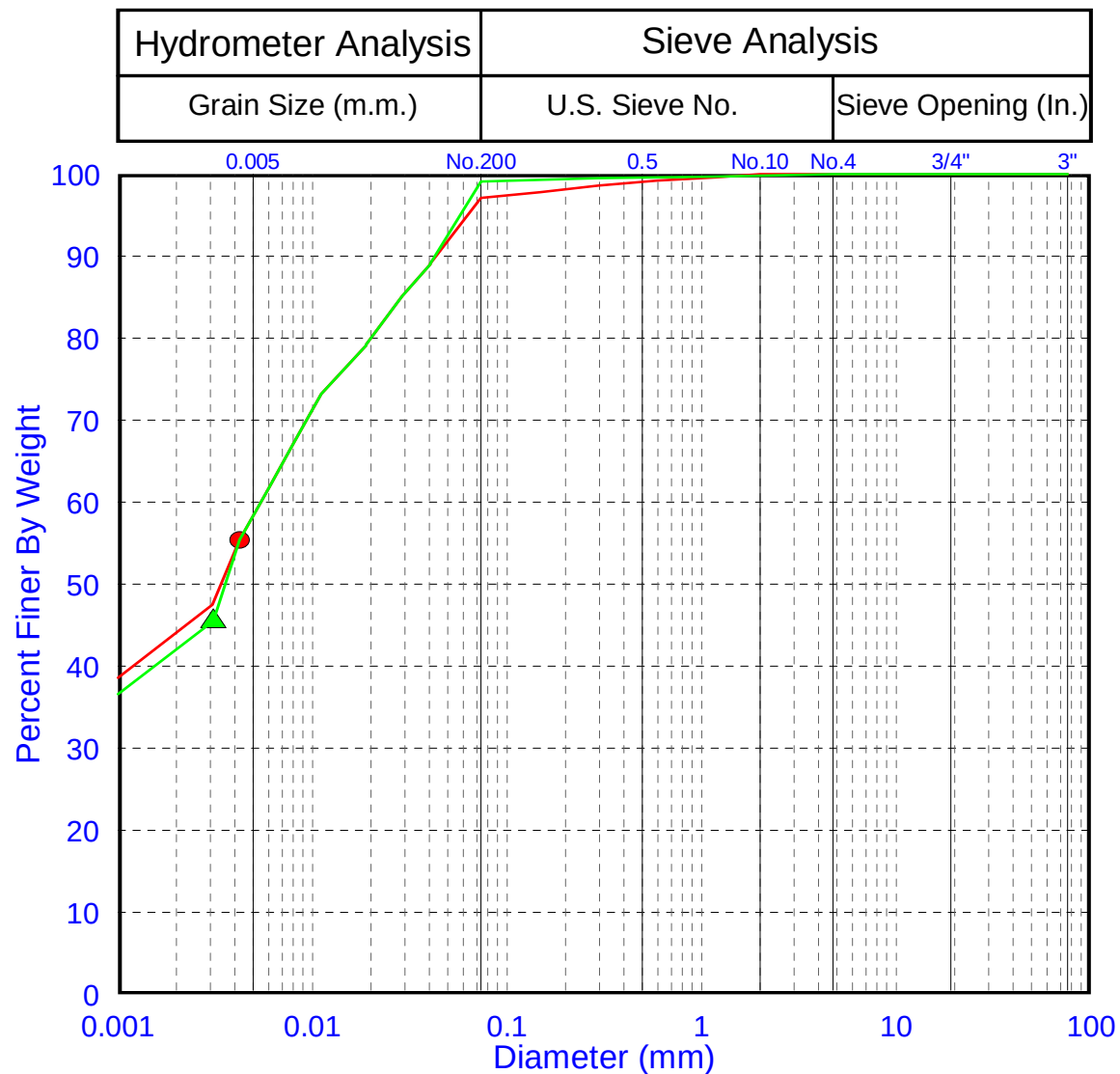
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 98

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| Sym. | Borehole | Sample | Depth(m)  | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-----------|------|------|------|-------------|
| ●    | BH-262   | U1     | 6.00-6.50 | 40   | 27   | 13   | ML/CL       |
| ▲    | BH-262   | U2     | 8.00-8.50 | 32   | 22   | 10   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



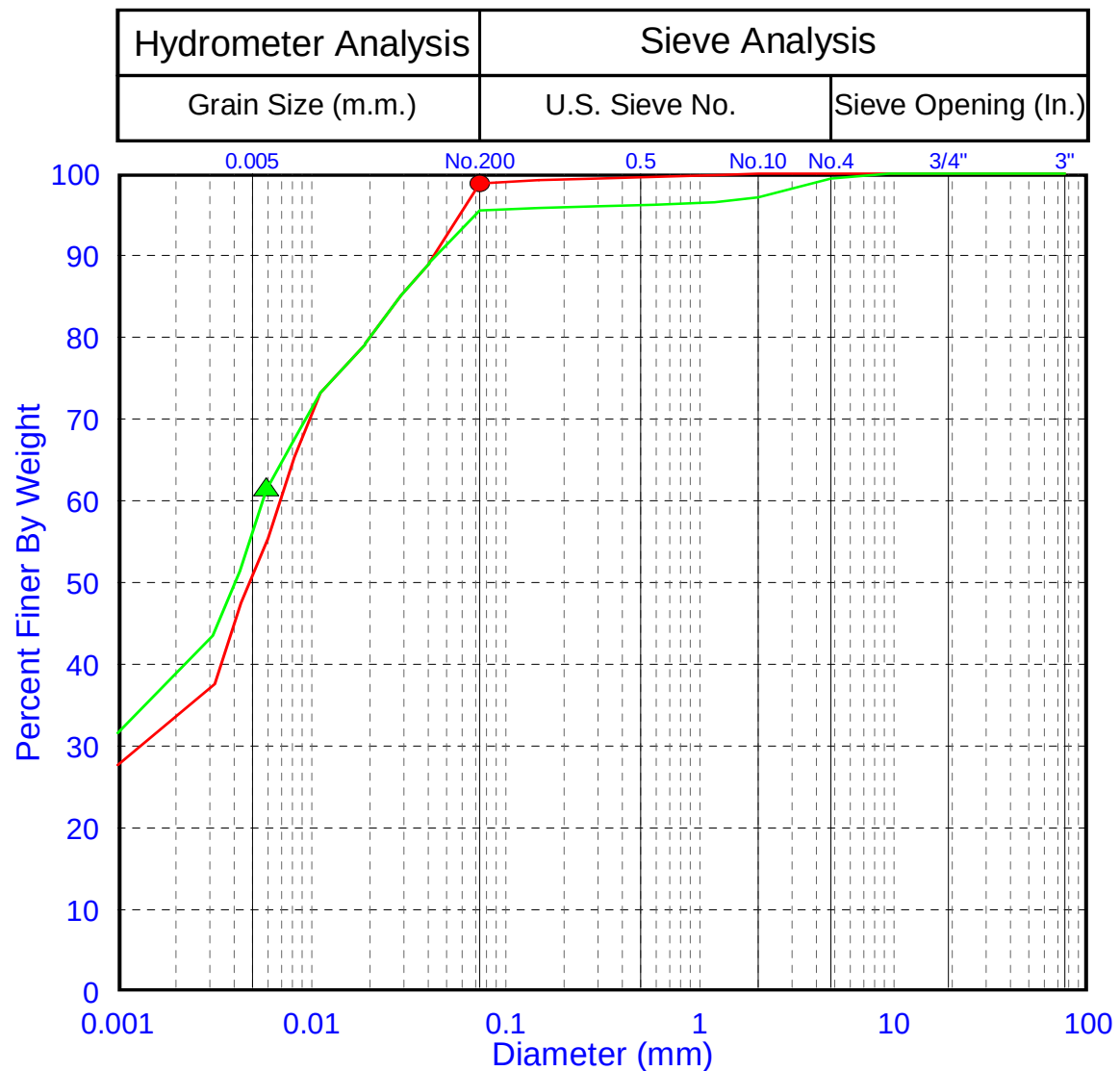
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 99

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| Sym.                                 | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|--------------------------------------|----------|--------|-------------|------|------|------|-------------|
| <span style="color: red;">●</span>   | BH-267   | U2     | 8.00-8.50   | 35   | 23   | 12   | CL/ML       |
| <span style="color: green;">▲</span> | BH-267   | U4     | 12.00-12.50 | 35   | 23   | 12   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



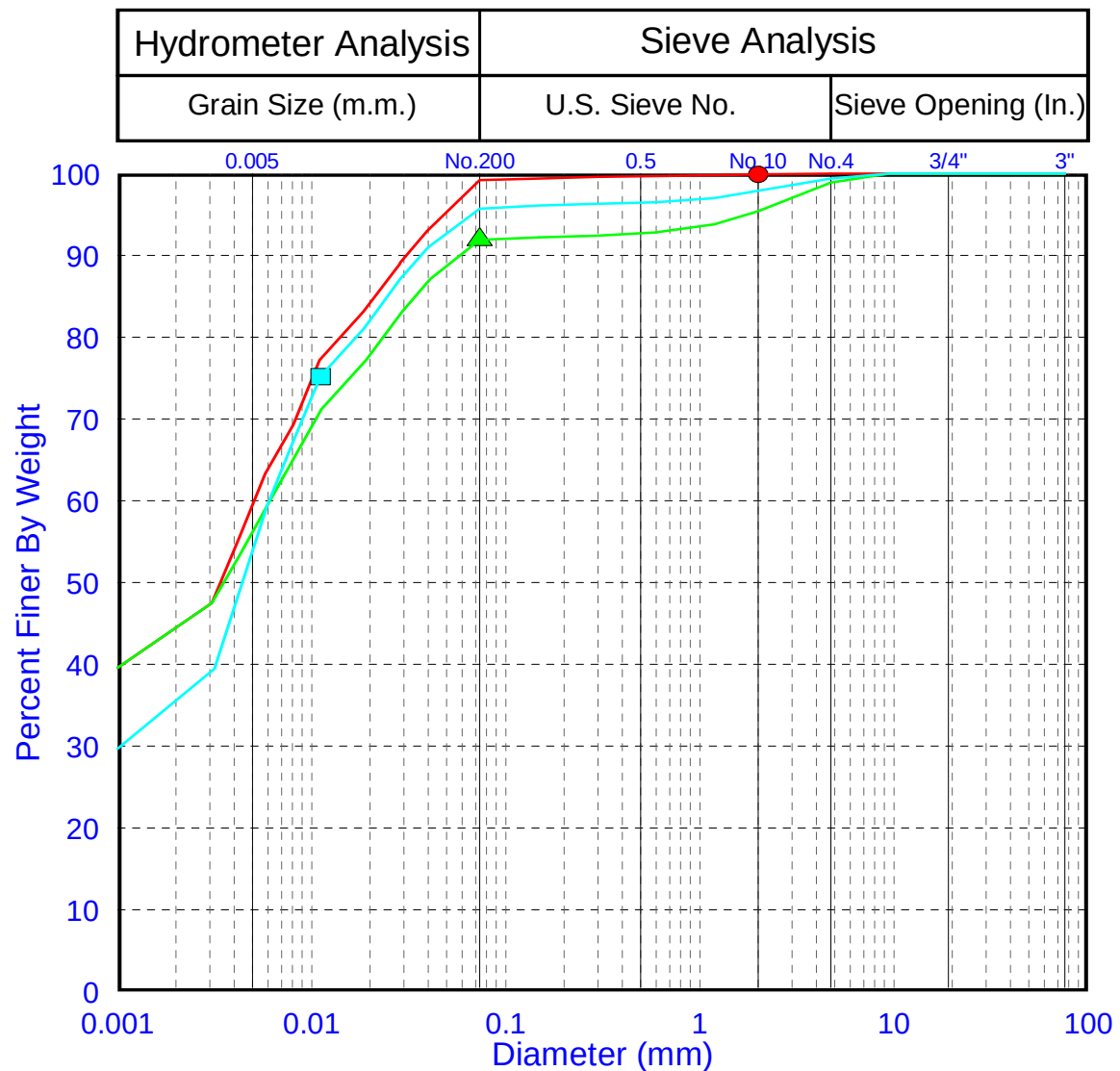
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 100

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-270   | D1     | 3.00-3.45   | 40   | 26   | 14   | ML/CL       |
| ▲    | BH-270   | D4     | 12.00-12.45 | 38   | 27   | 11   | ML/CL       |
| ■    | BH-270   | D7     | 21.00-21.45 | 38   | 25   | 13   | ML/CL       |

## GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

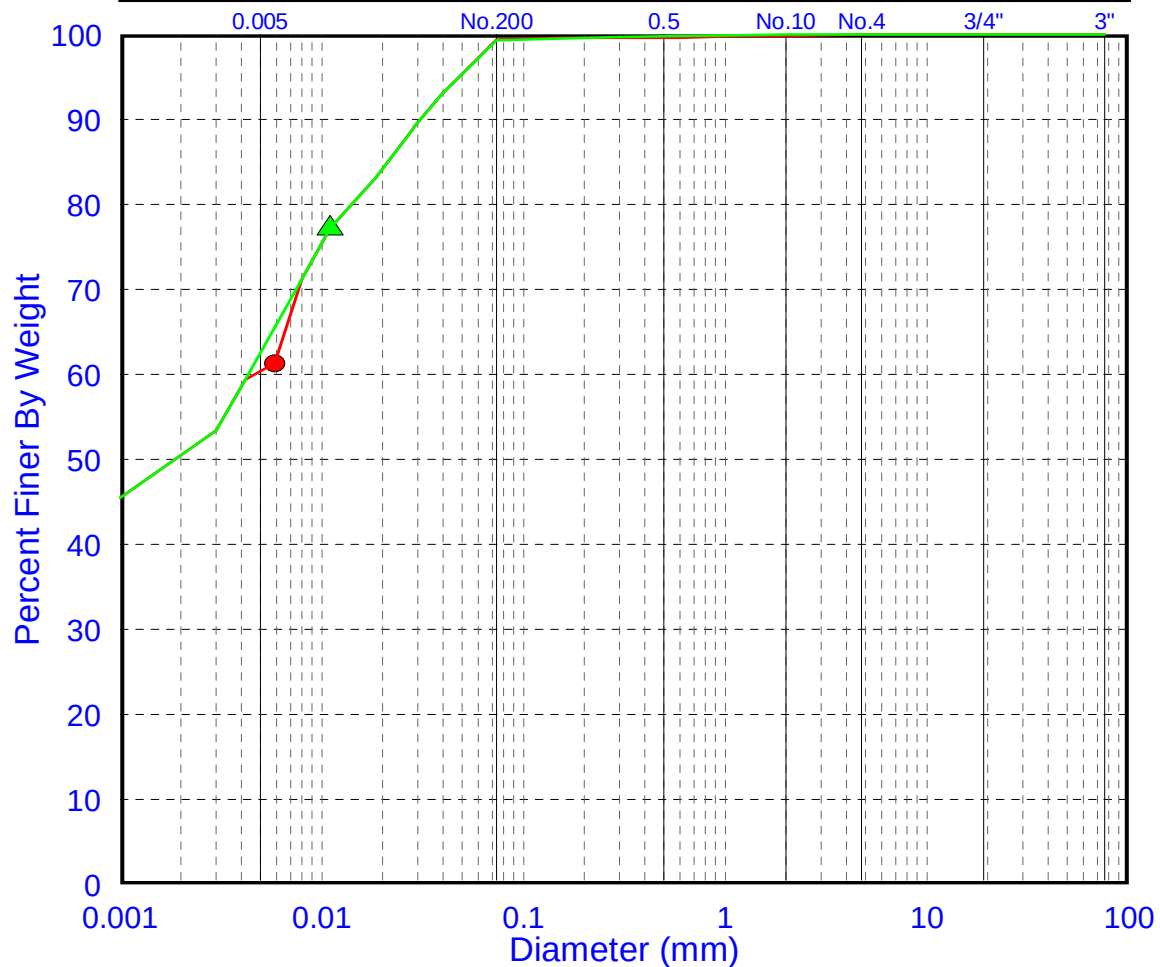
Client : NFC

Fig.: 101

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-270   | D10    | 30.00-30.45 | 42   | 25   | 17   | CL/ML       |
| ▲    | BH-270   | D13    | 40.00-40.45 | 44   | 27   | 17   | ML/CL       |

## GRAIN SIZE DISTRIBUTION CHART



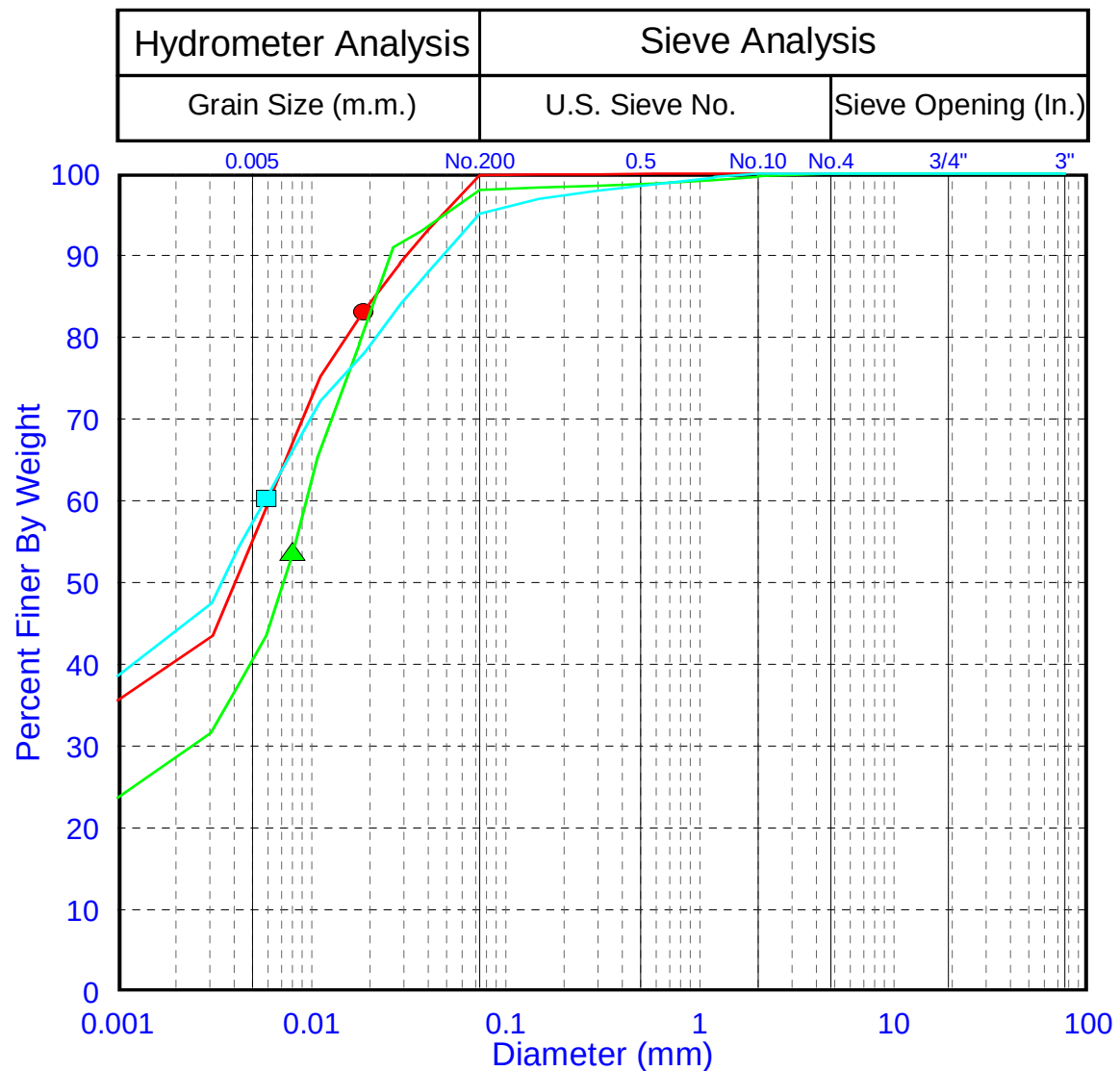
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 102

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-273   | U3     | 9.50-10.00  | 33   | 23   | 10   | CL/ML       |
| ▲    | BH-273   | U8     | 22.00-22.50 | 39   | 22   | 18   | CL          |
| ■    | BH-273   | U9     | 24.50-25.00 | 34   | 23   | 11   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



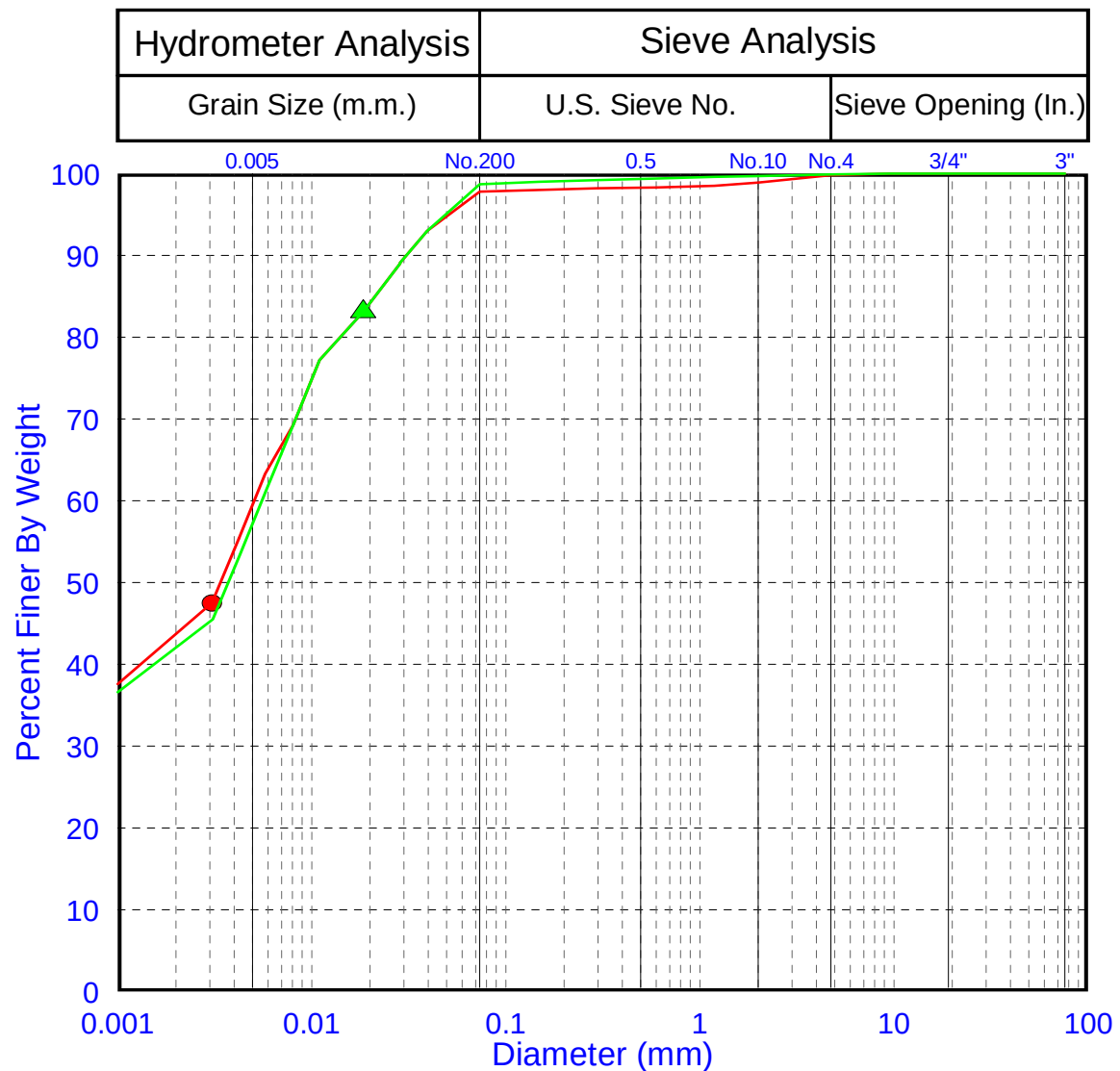
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 103

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-277   | U2     | 10.50-10.95 | 34   | 23   | 11   | CL/ML       |
| ▲    | BH-277   | U4     | 14.50-14.95 | 30   | 19   | 11   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



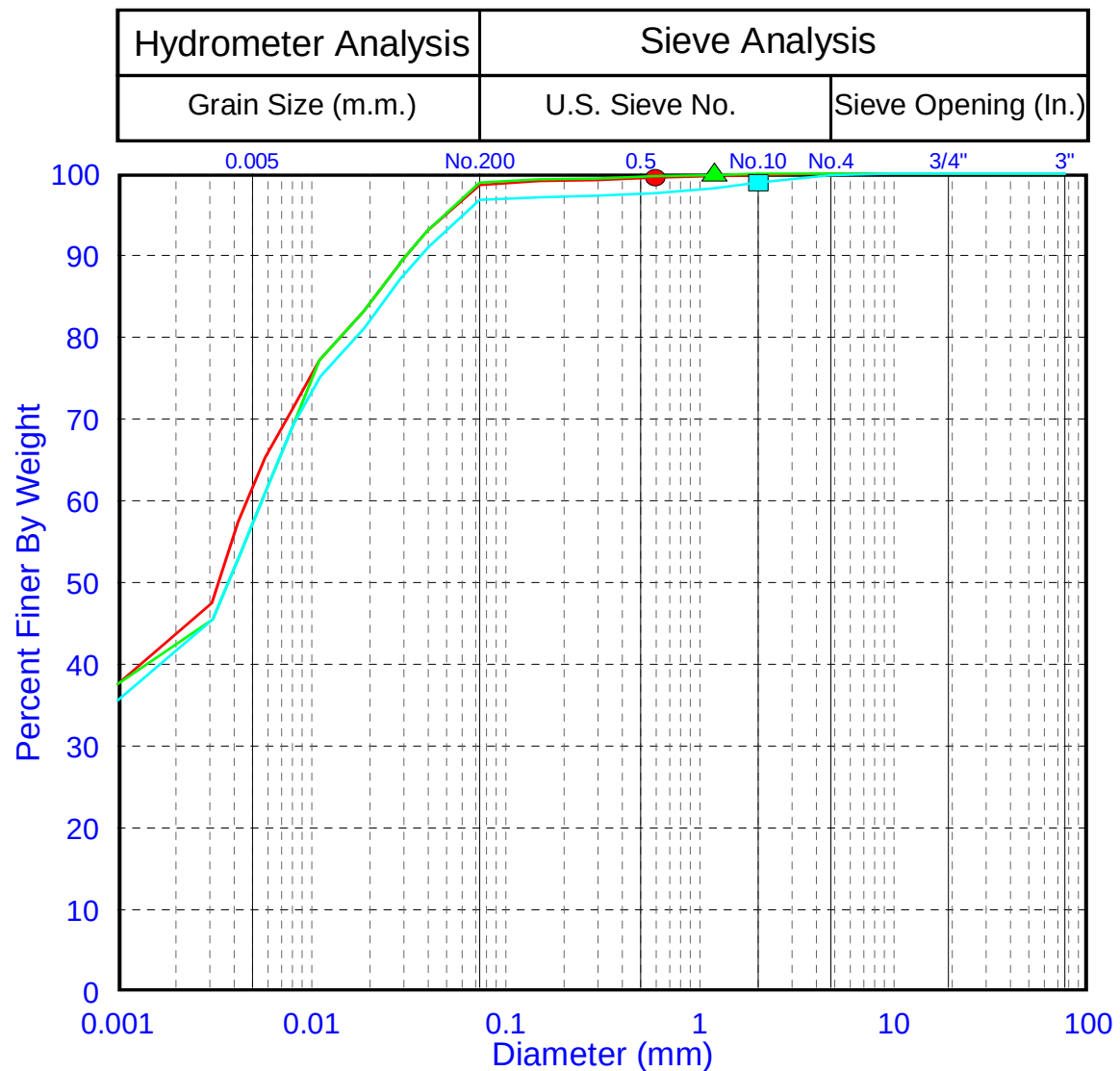
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 104

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-279   | U1     | 3.50-4.00   | 41   | 24   | 17   | CL/ML       |
| ▲    | BH-279   | U12    | 27.00-27.50 | 41   | 24   | 17   | CL/ML       |
| ■    | BH-279   | U13    | 29.50-30.00 | 40   | 25   | 15   | CL/ML       |

### GRAIN SIZE DISTRIBUTION CHART



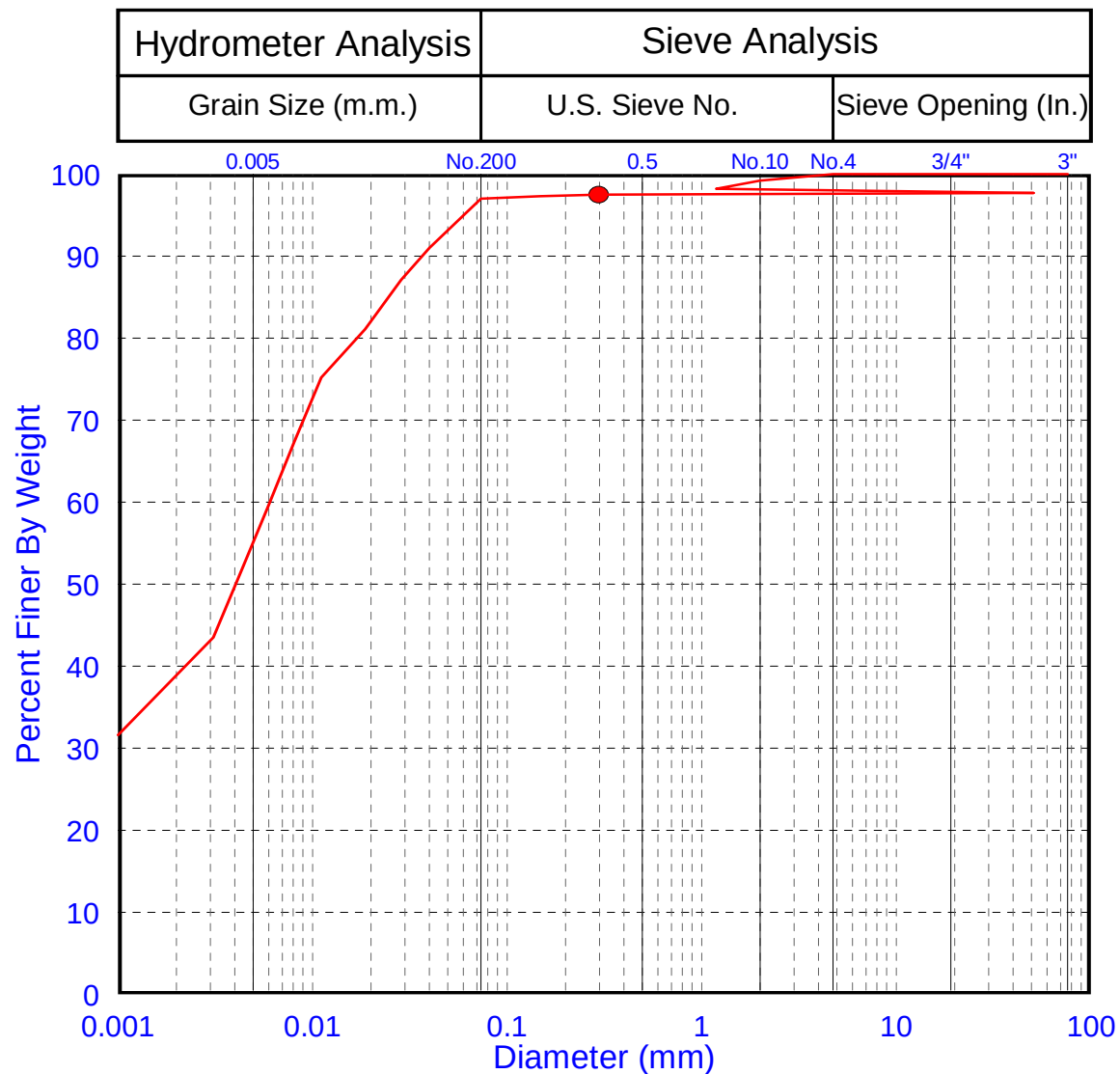
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 105

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-279   | U16    | 37.00-37.50 | 39   | 24   | 15   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

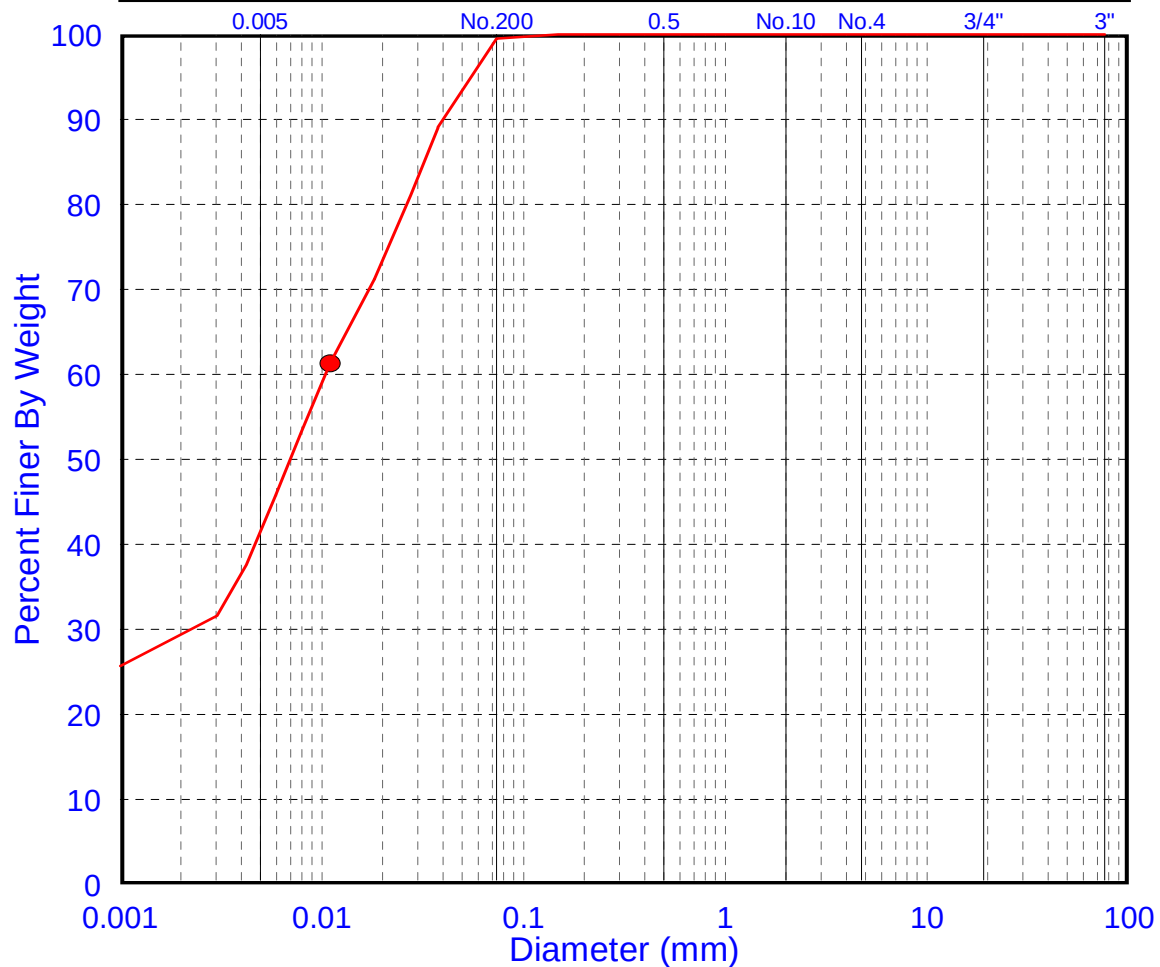
Client : NFC

Fig.: 106

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)  | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-----------|------|------|------|-------------|
| ●    | BH-282   | U1     | 4.00-4.50 | 33   | 20   | 13   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

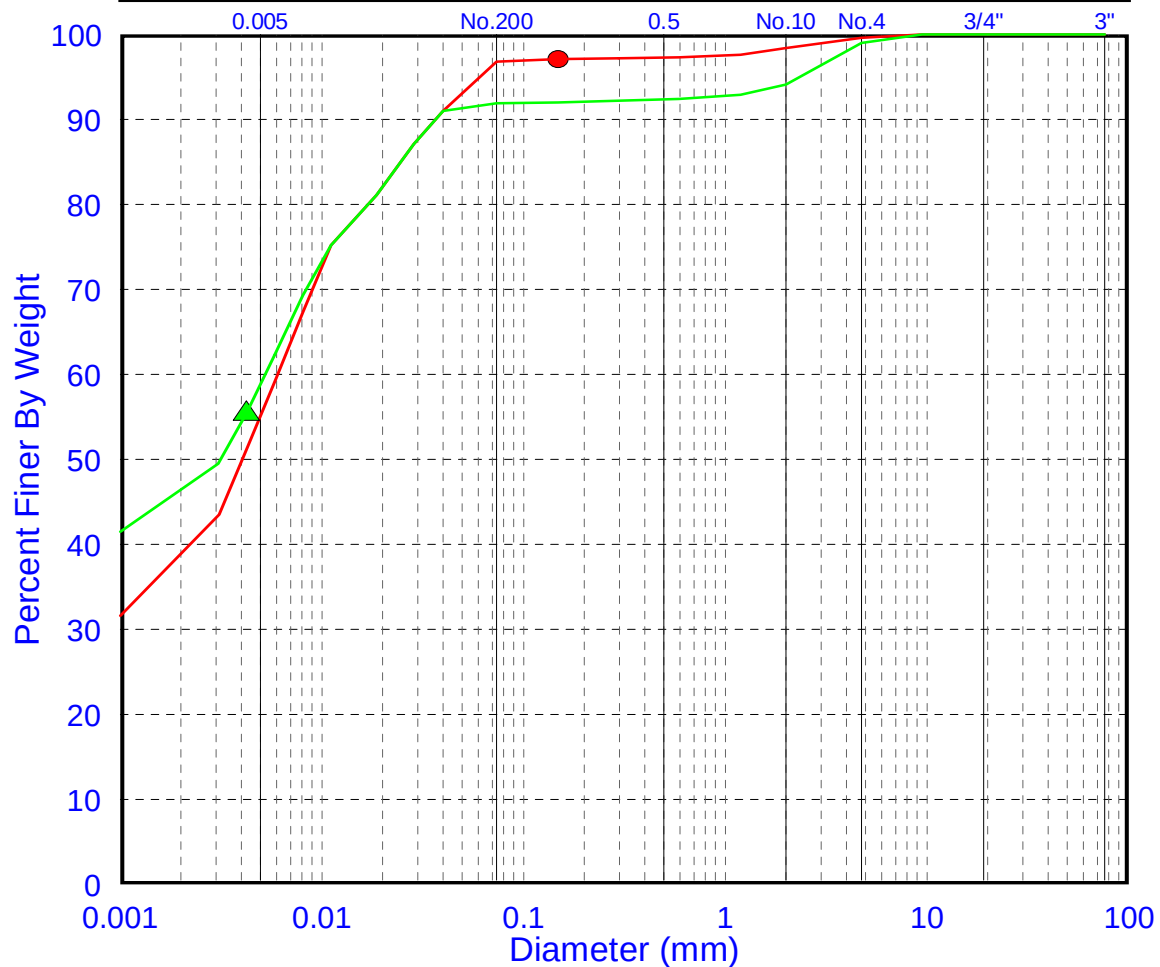
Client : NFC

Fig.: 107

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-284   | U1     | 6.00-6.50   | 39   | 26   | 13   | ML/CL       |
| ▲    | BH-284   | U3     | 12.00-12.50 | 33   | 23   | 10   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



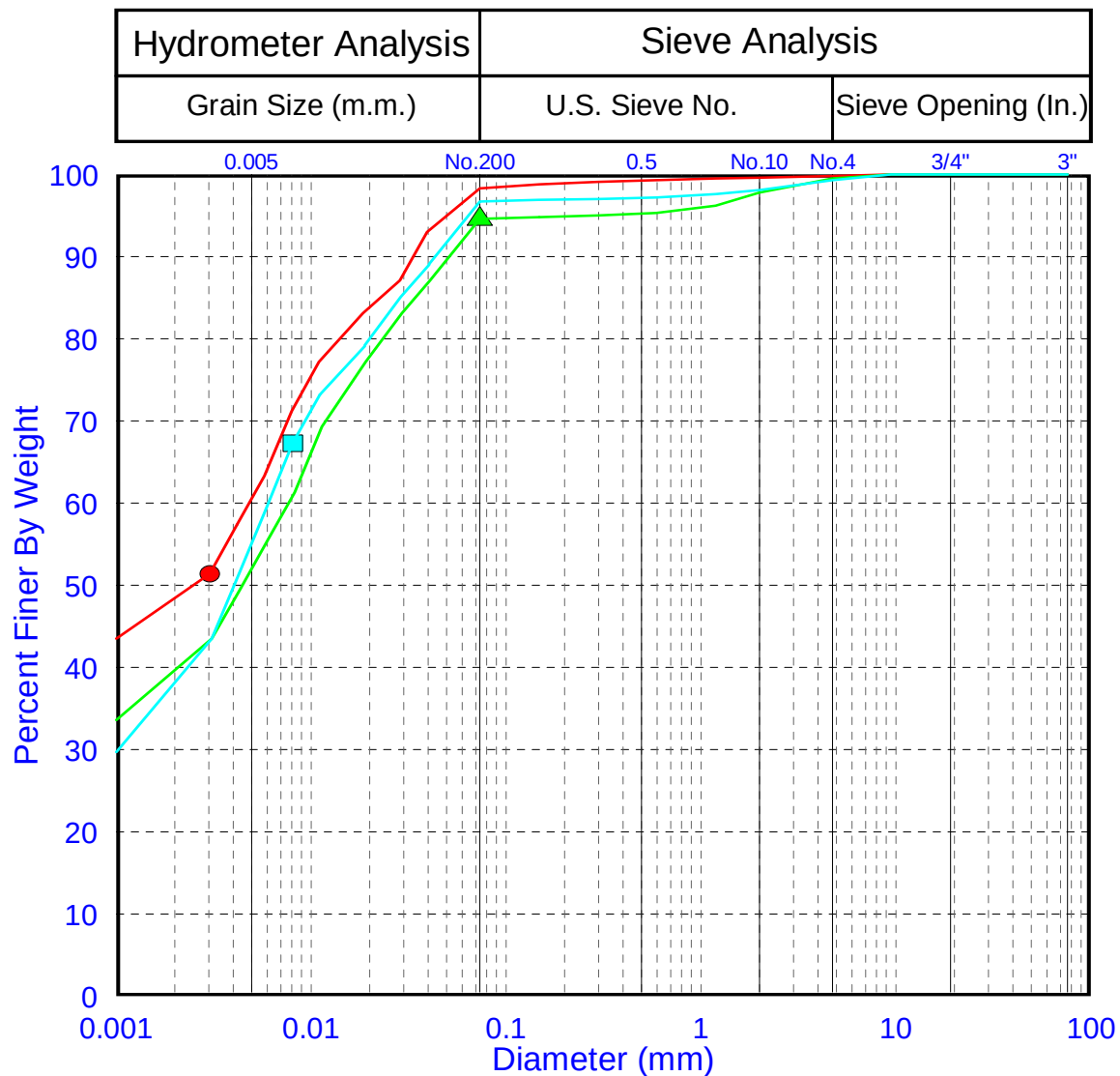
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 108

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-286   | U4     | 13.50-14.00 | 38   | 23   | 15   | CL/ML       |
| ▲    | BH-286   | U9     | 23.50-24.00 | 51   | 30   | 21   | MH/ML/CH/CL |
| ■    | BH-286   | U11    | 27.50-28.00 | 35   | 24   | 11   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



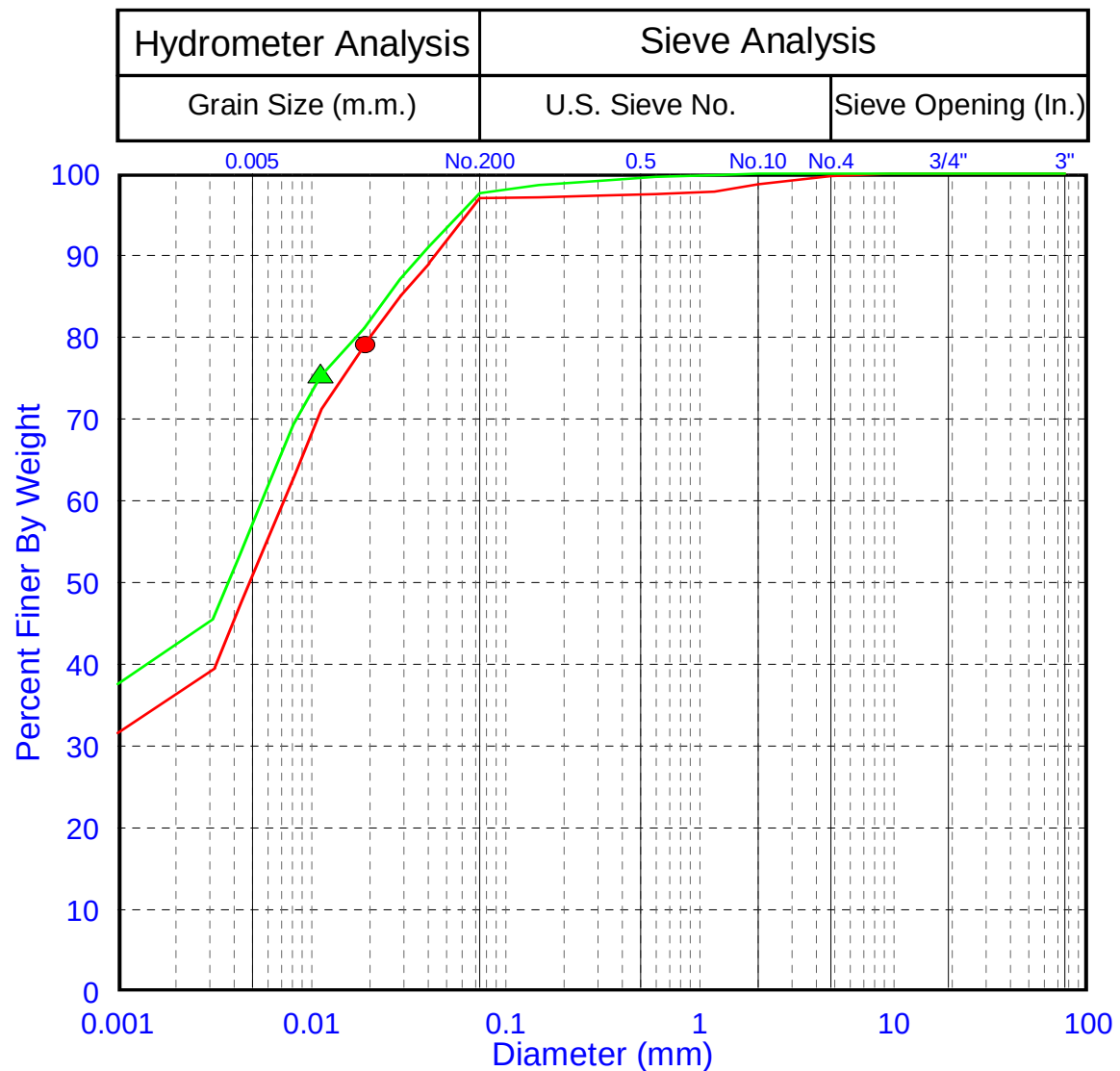
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 109

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-286   | U15    | 35.50-36.00 | 37   | 23   | 14   | CL/ML       |
| ▲    | BH-286   | U19    | 43.50-44.00 | 32   | 21   | 11   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



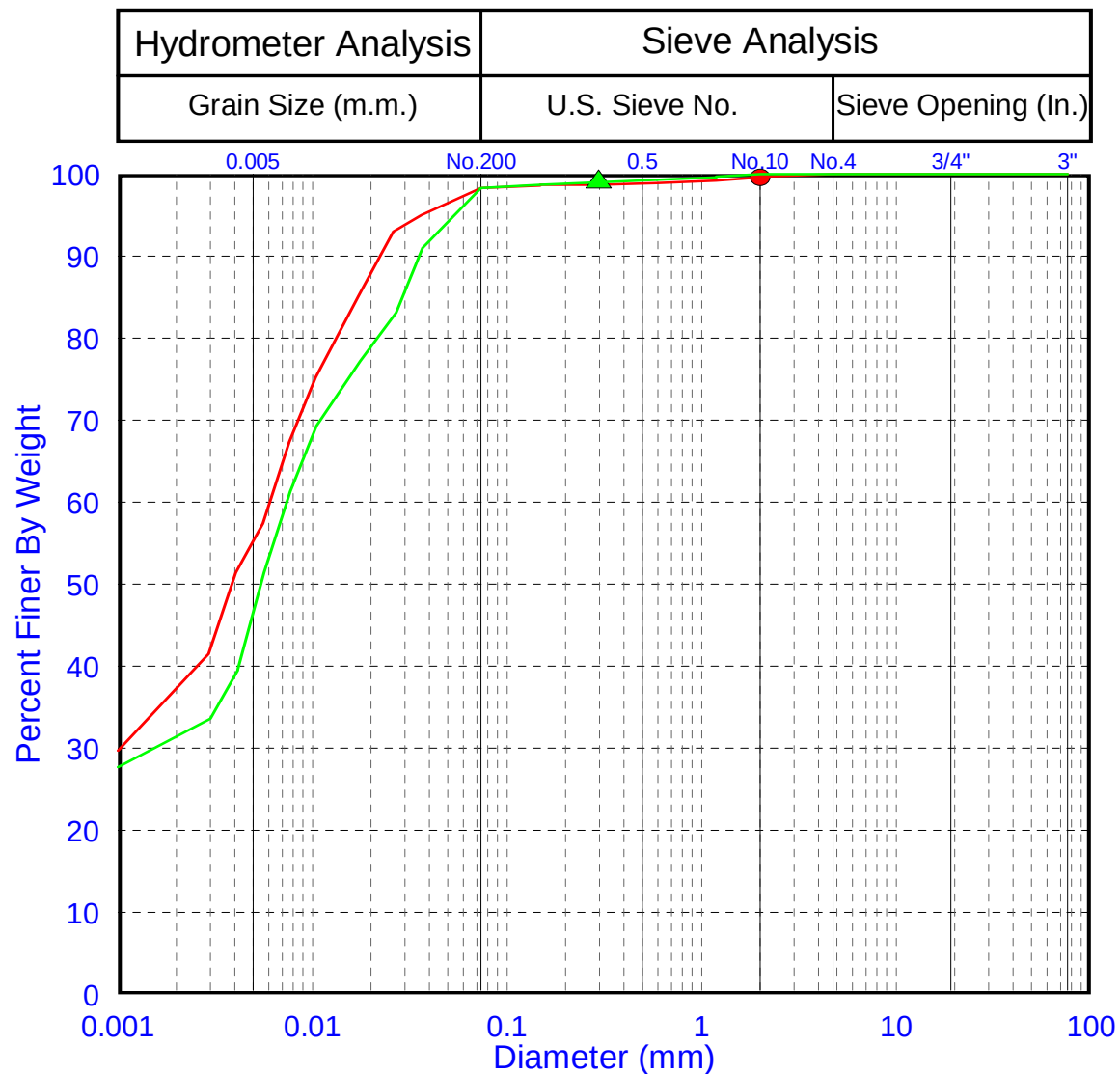
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 110

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-288   | U6     | 14.00-14.50 | 41   | 22   | 19   | CL          |
| ▲    | BH-288   | U14    | 30.00-30.50 | 39   | 20   | 19   | CL          |

### GRAIN SIZE DISTRIBUTION CHART



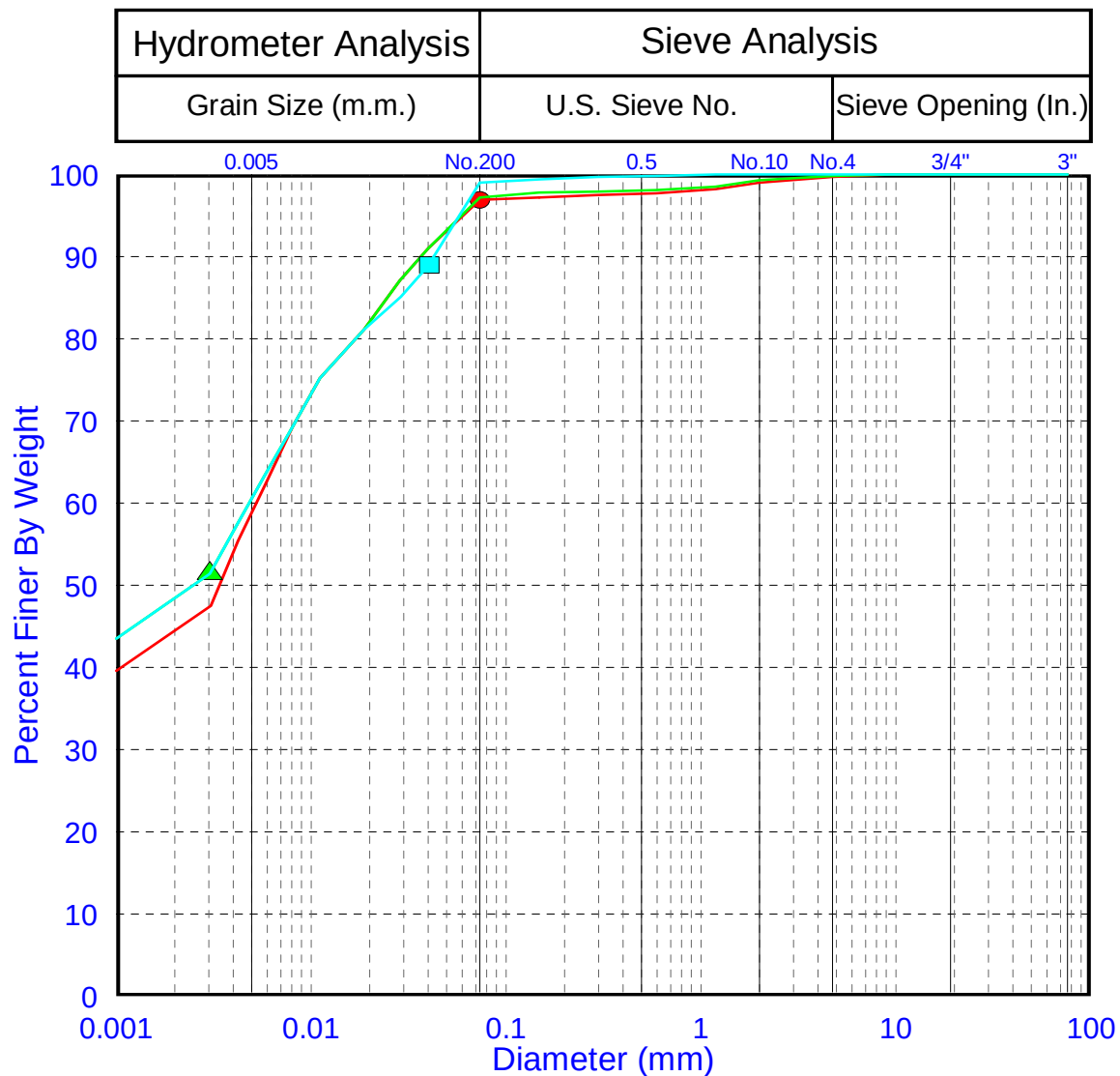
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 111

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-307   | D2     | 6.00-6.45   | 37   | 22   | 15   | CL/ML       |
| ▲    | BH-307   | D5     | 15.00-15.45 | 36   | 21   | 15   | CL          |
| ■    | BH-307   | D8     | 24.00-24.45 | 36   | 22   | 14   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

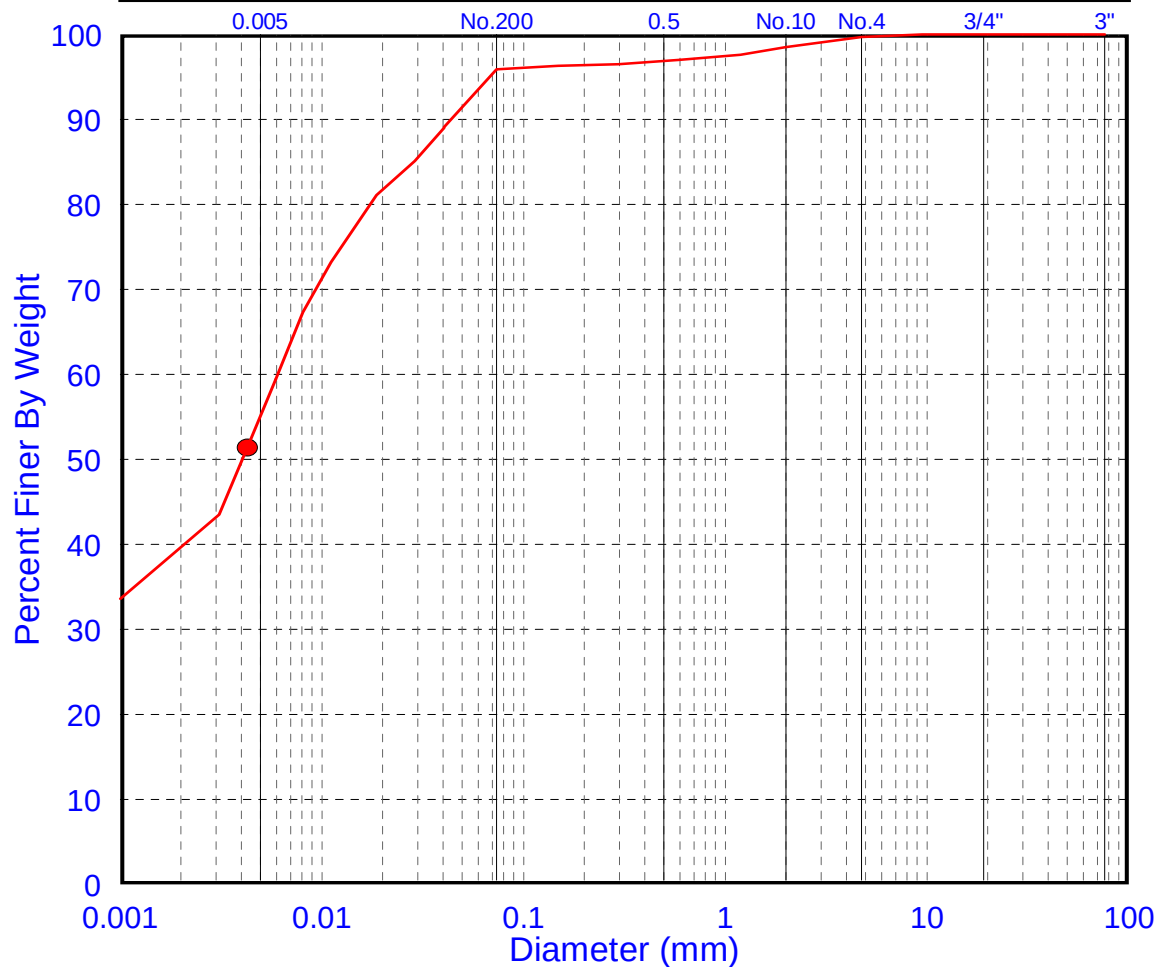
Client : NFC

Fig.: 112

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-307   | D11    | 33.00-33.45 | 34   | 20   | 14   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



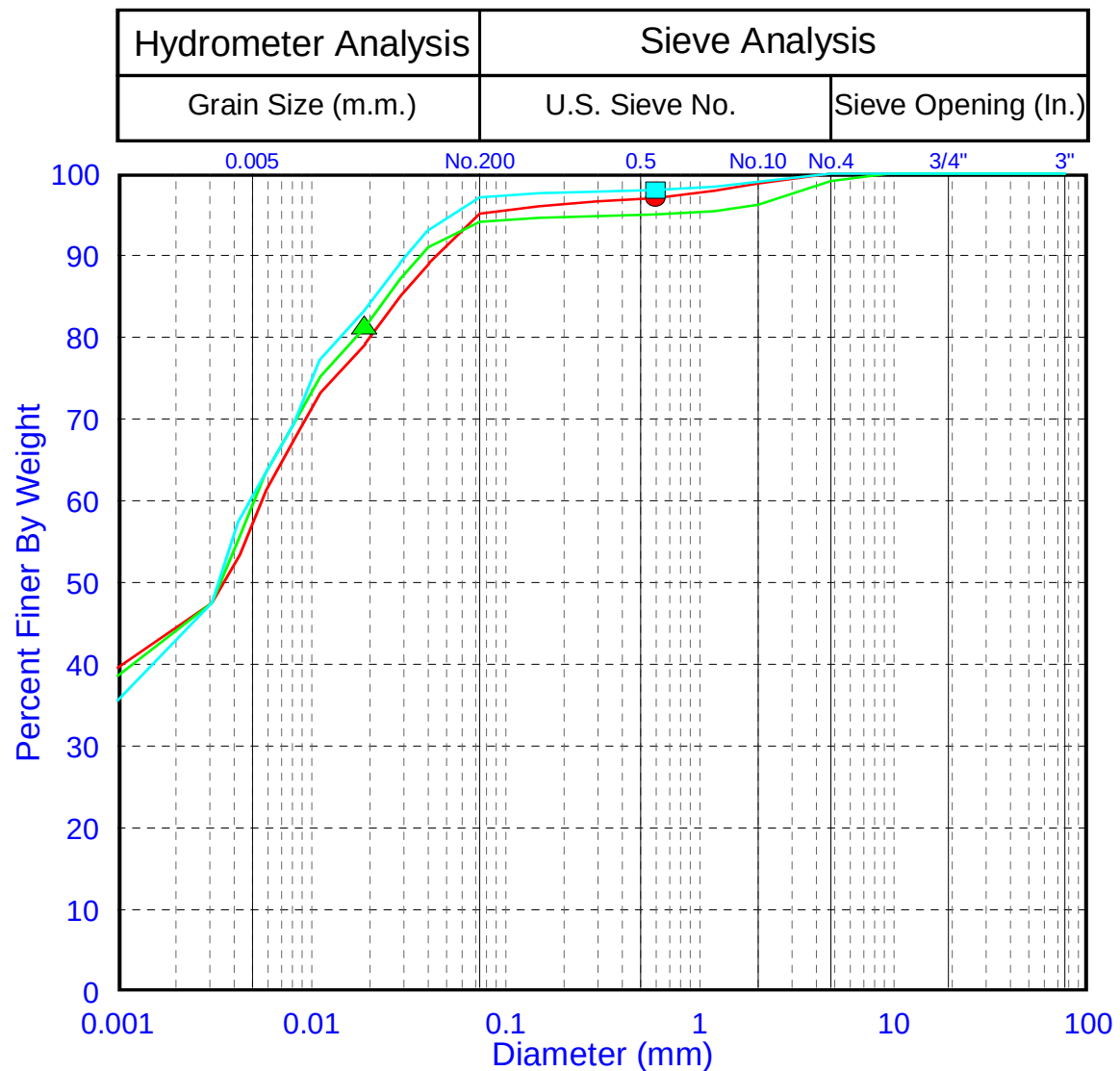
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 113

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-312   | D1     | 3.00-3.45   | 40   | 22   | 18   | CL          |
| ▲    | BH-312   | D4     | 12.00-12.45 | 36   | 23   | 13   | CL/ML       |
| ■    | BH-312   | D9     | 27.00-27.45 | 37   | 26   | 11   | ML/CL       |

## GRAIN SIZE DISTRIBUTION CHART



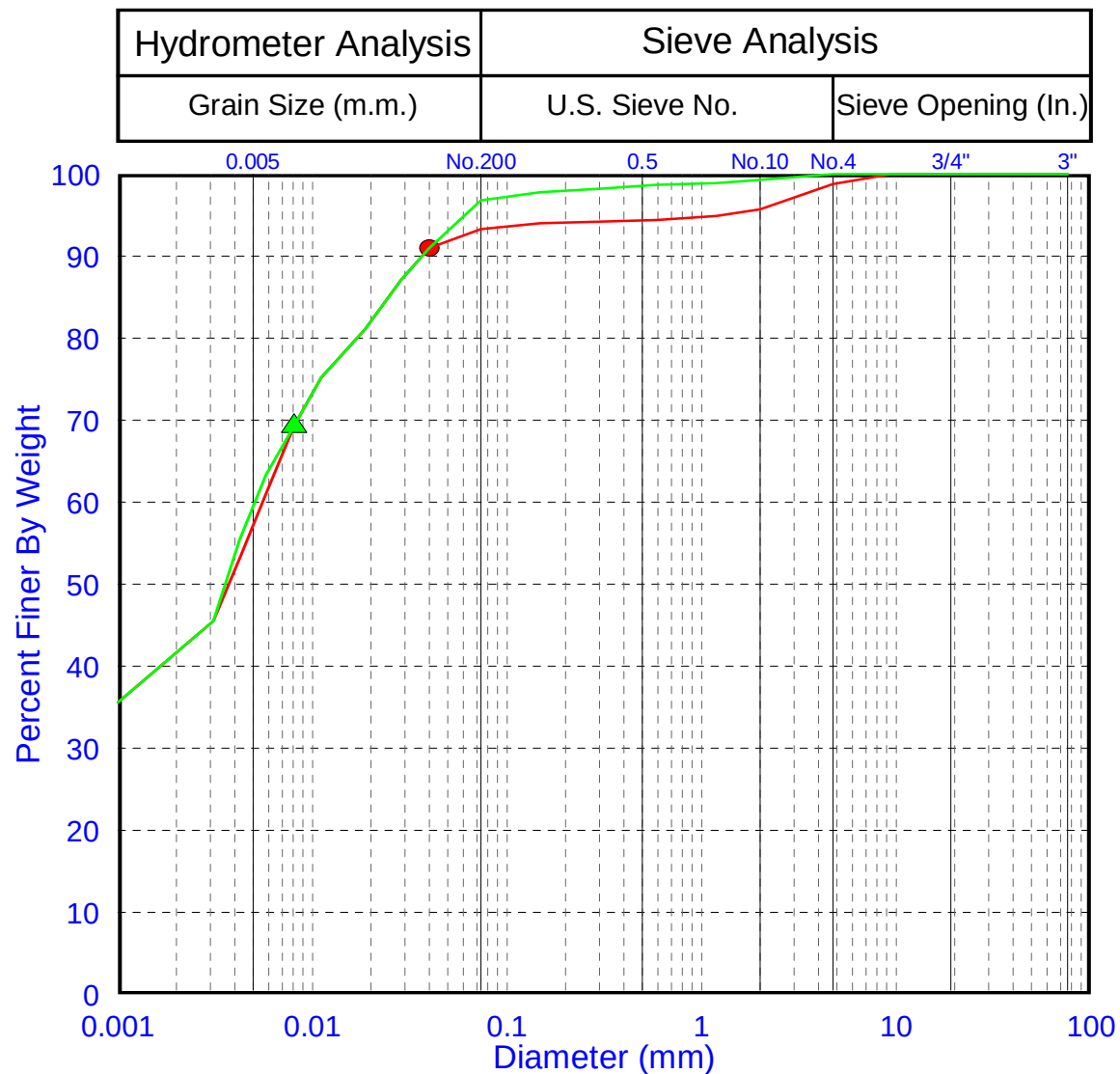
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 114

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |
|      |      |      |        |        |        |        |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-312   | D13    | 39.00-39.45 | 36   | 22   | 14   | CL/ML       |
| ▲    | BH-312   | D17    | 50.00-50.45 | 44   | 23   | 21   | CL          |

### GRAIN SIZE DISTRIBUTION CHART



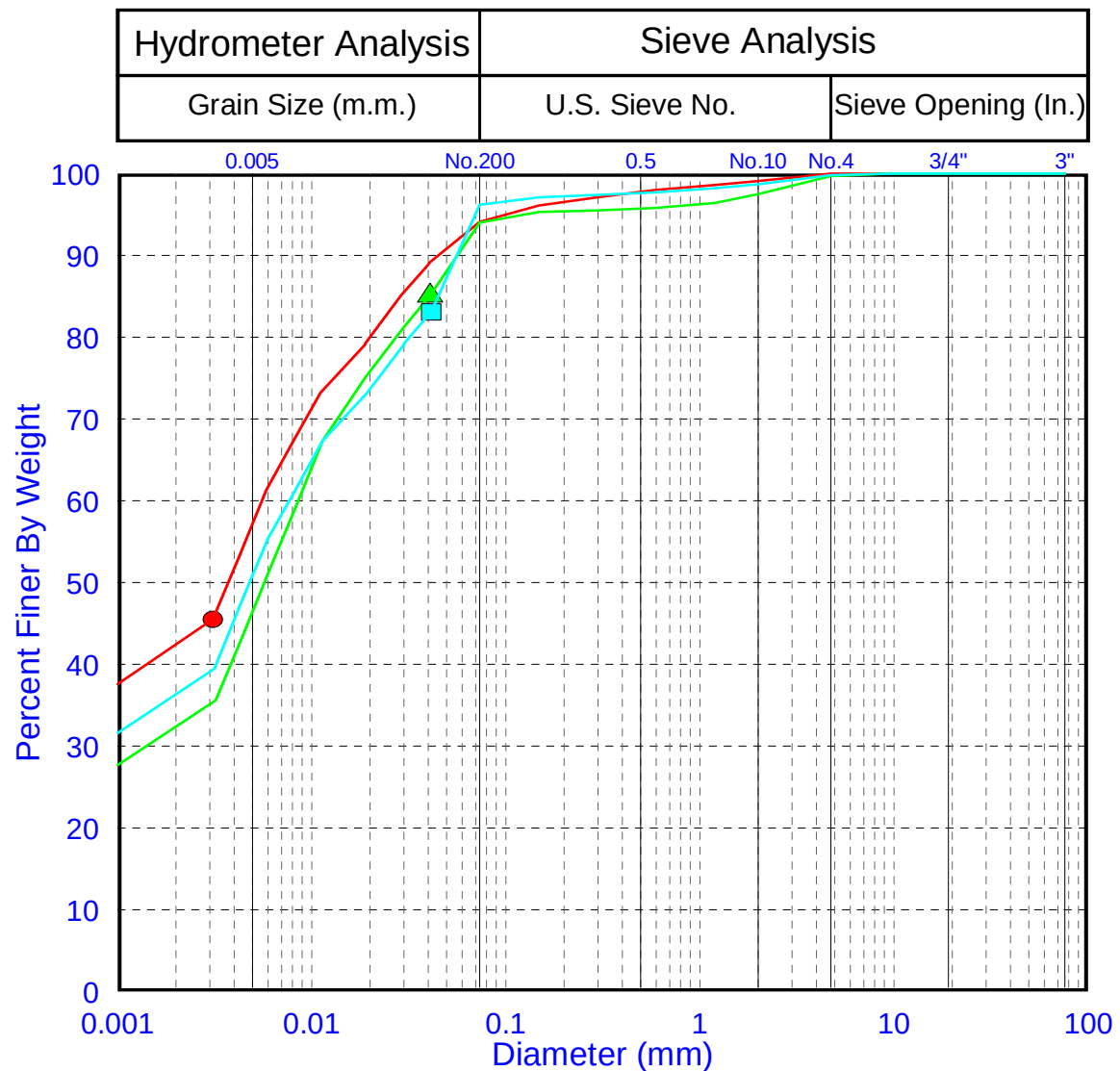
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 115

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-317   | U1     | 7.50-8.05   | 34   | 23   | 11   | CL/ML       |
| ▲    | BH-317   | U3     | 12.50-12.85 | 28   | 20   | 8    | CL/ML       |
| ■    | BH-317   | U6     | 20.00-20.45 | 32   | 19   | 13   | CL          |

### GRAIN SIZE DISTRIBUTION CHART



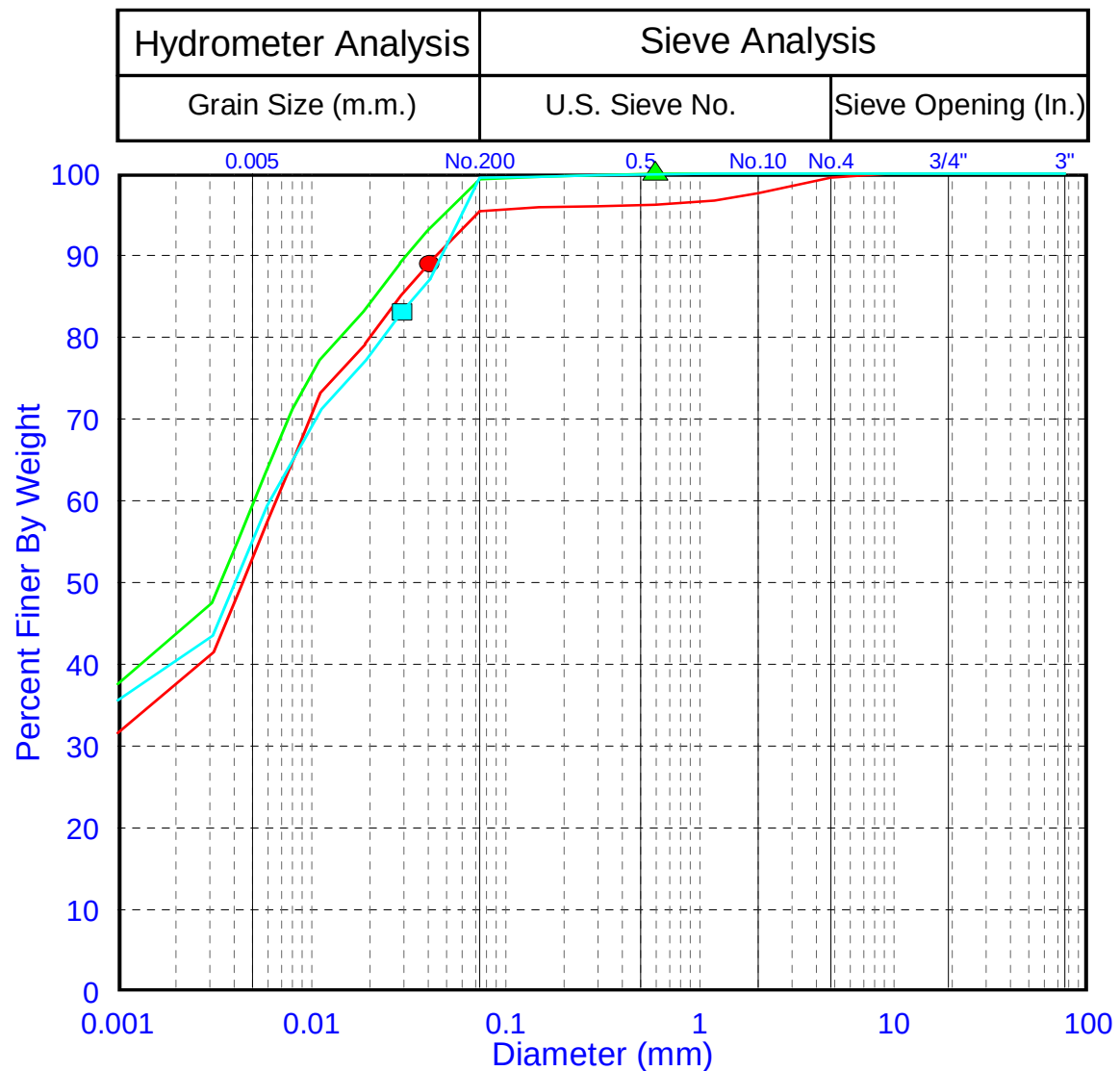
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 116

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-317   | U8     | 25.00-25.30 | 30   | 22   | 8    | CL/ML       |
| ▲    | BH-317   | U11    | 32.50-32.80 | 30   | 22   | 8    | CL/ML       |
| ■    | BH-317   | U17    | 47.50-47.90 | 32   | 21   | 11   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

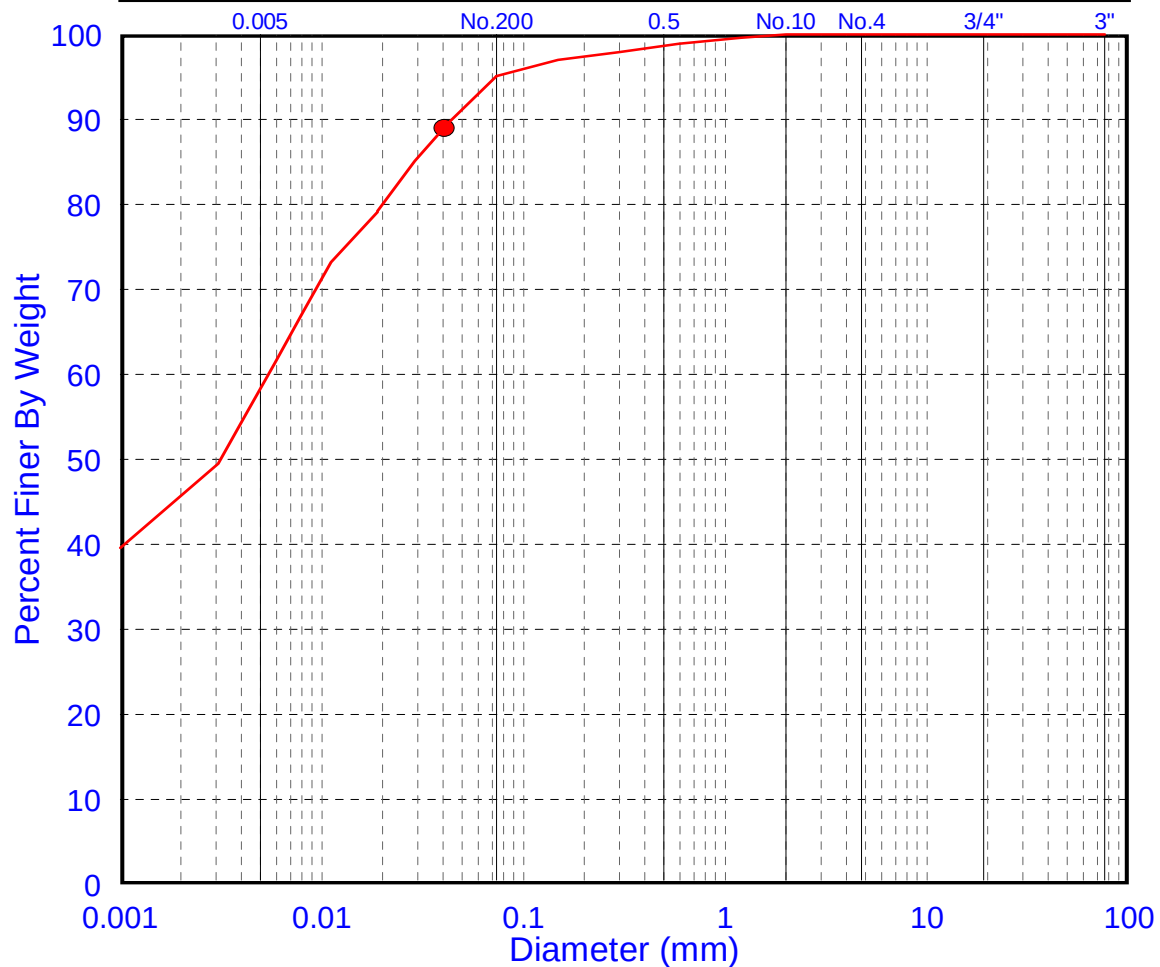
Client : NFC

Fig.: 117

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)  | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-----------|------|------|------|-------------|
| ●    | BH-320   | U1     | 4.50-4.95 | 38   | 26   | 12   | ML/CL       |

## GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

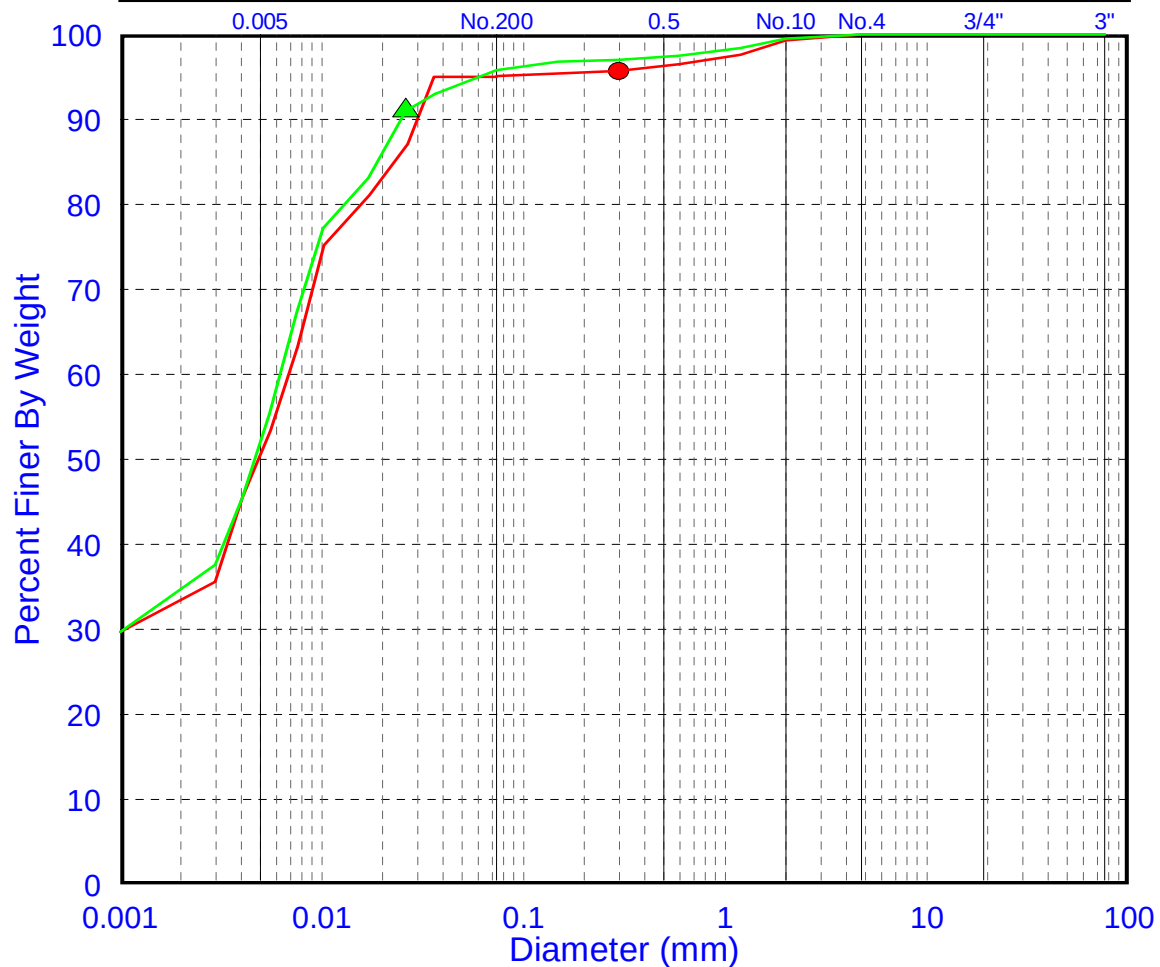
Client : NFC

Fig.: 118

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-322   | U2     | 6.00-6.50   | 37   | 20   | 17   | CL          |
| ▲    | BH-322   | U4     | 10.00-10.50 | 41   | 19   | 22   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



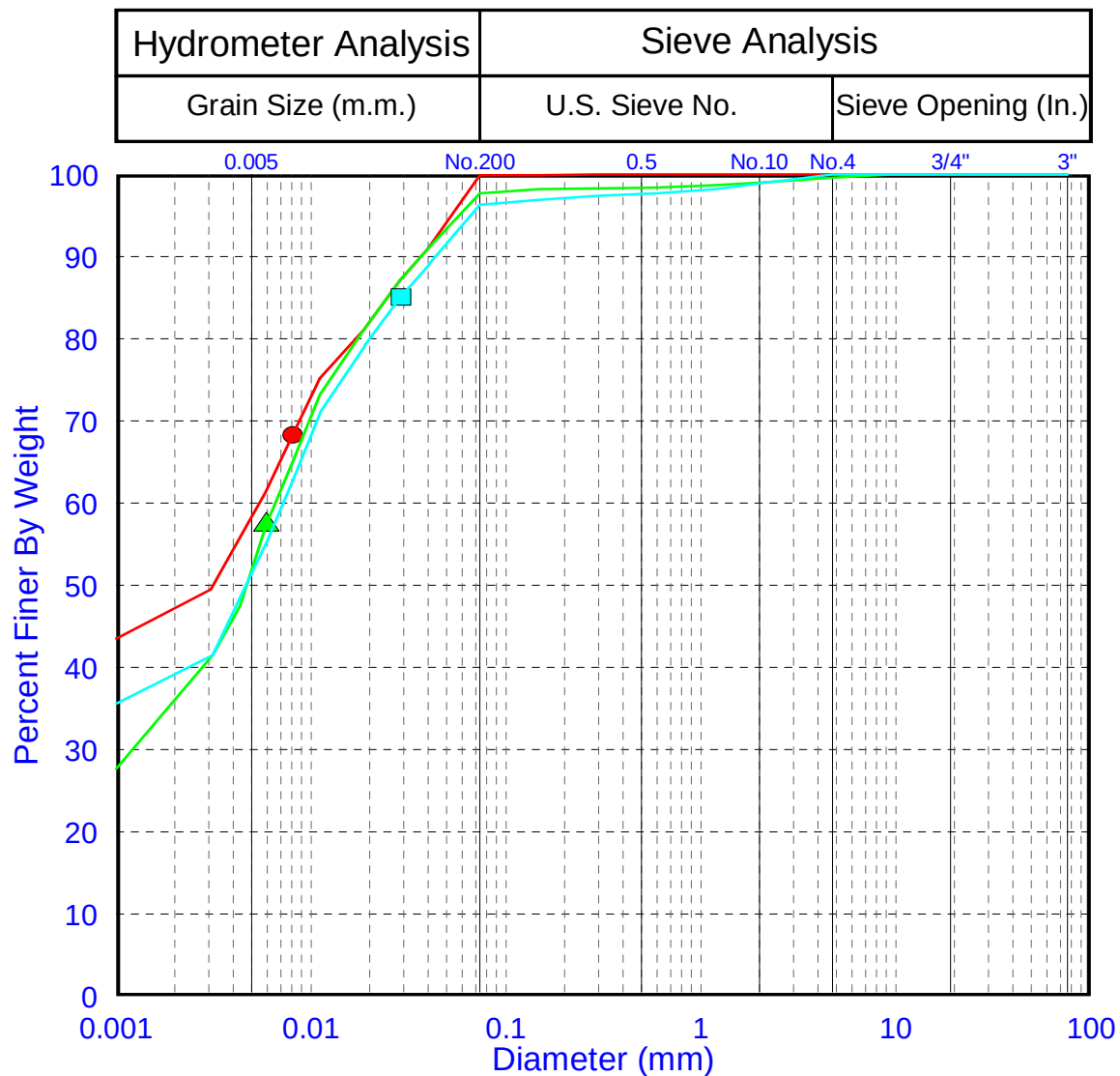
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 119

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-329   | U1     | 4.00-4.50   | 42   | 30   | 12   | ML          |
| ▲    | BH-329   | U6     | 14.00-14.50 | 30   | 22   | 8    | CL/ML       |
| ■    | BH-329   | U10    | 22.00-22.50 | 35   | 26   | 9    | ML/CL       |

## GRAIN SIZE DISTRIBUTION CHART



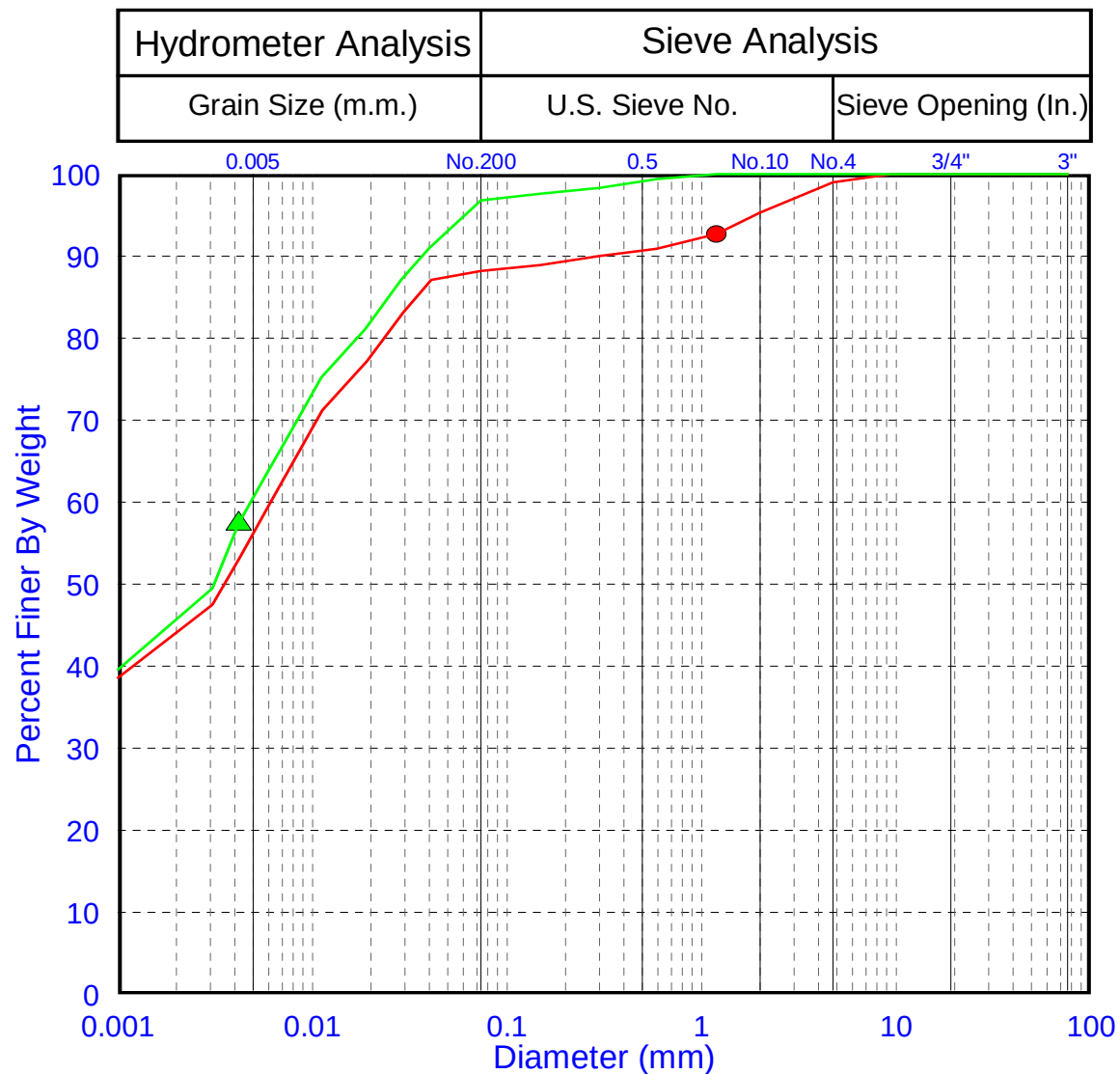
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 120

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-329   | U13    | 28.00-28.50 | 36   | 22   | 14   | CL/ML       |
| ▲    | BH-329   | U15    | 32.00-32.50 | 34   | 22   | 12   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



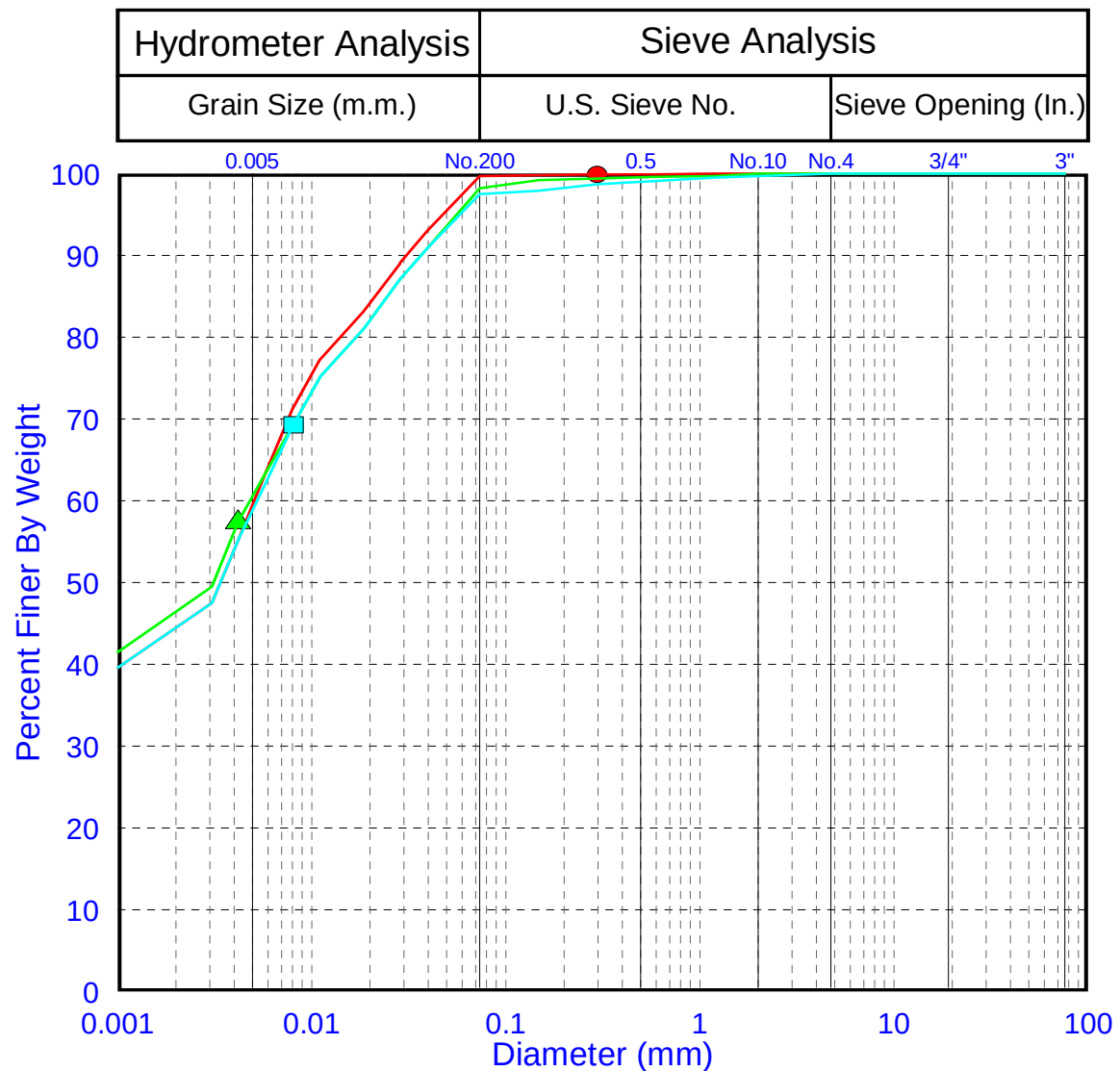
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 121

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-335   | D1     | 3.00-3.45   | 38   | 23   | 15   | CL/ML       |
| ▲    | BH-335   | D5     | 15.00-15.45 | 35   | 20   | 15   | CL          |
| ■    | BH-335   | D8     | 24.00-24.45 | 35   | 23   | 12   | CL/ML       |

## GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

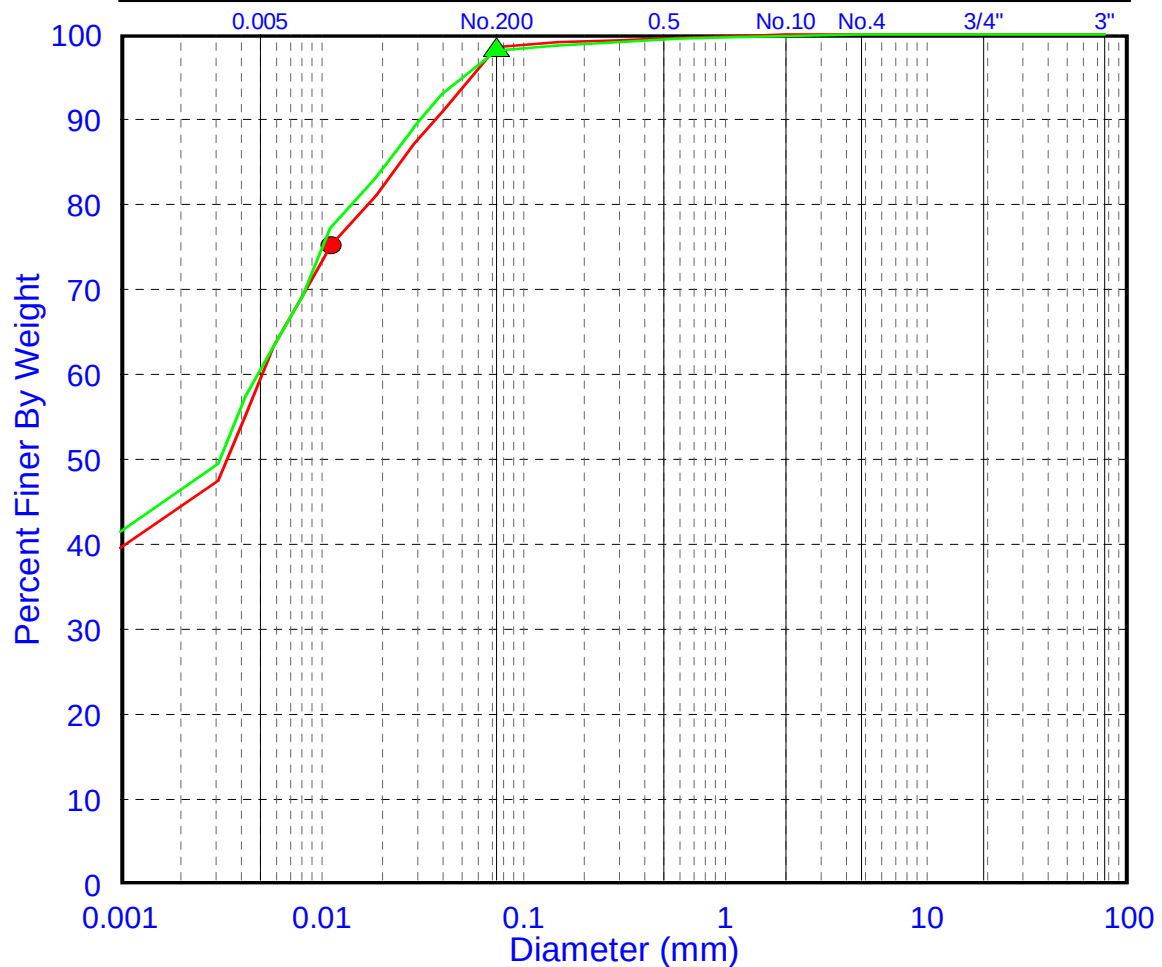
Client : NFC

Fig.: 122

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-335   | D12    | 36.00-36.45 | 34   | 24   | 10   | ML/CL       |
| ▲    | BH-335   | D16    | 48.00-48.45 | 41   | 26   | 15   | ML/CL       |

## GRAIN SIZE DISTRIBUTION CHART



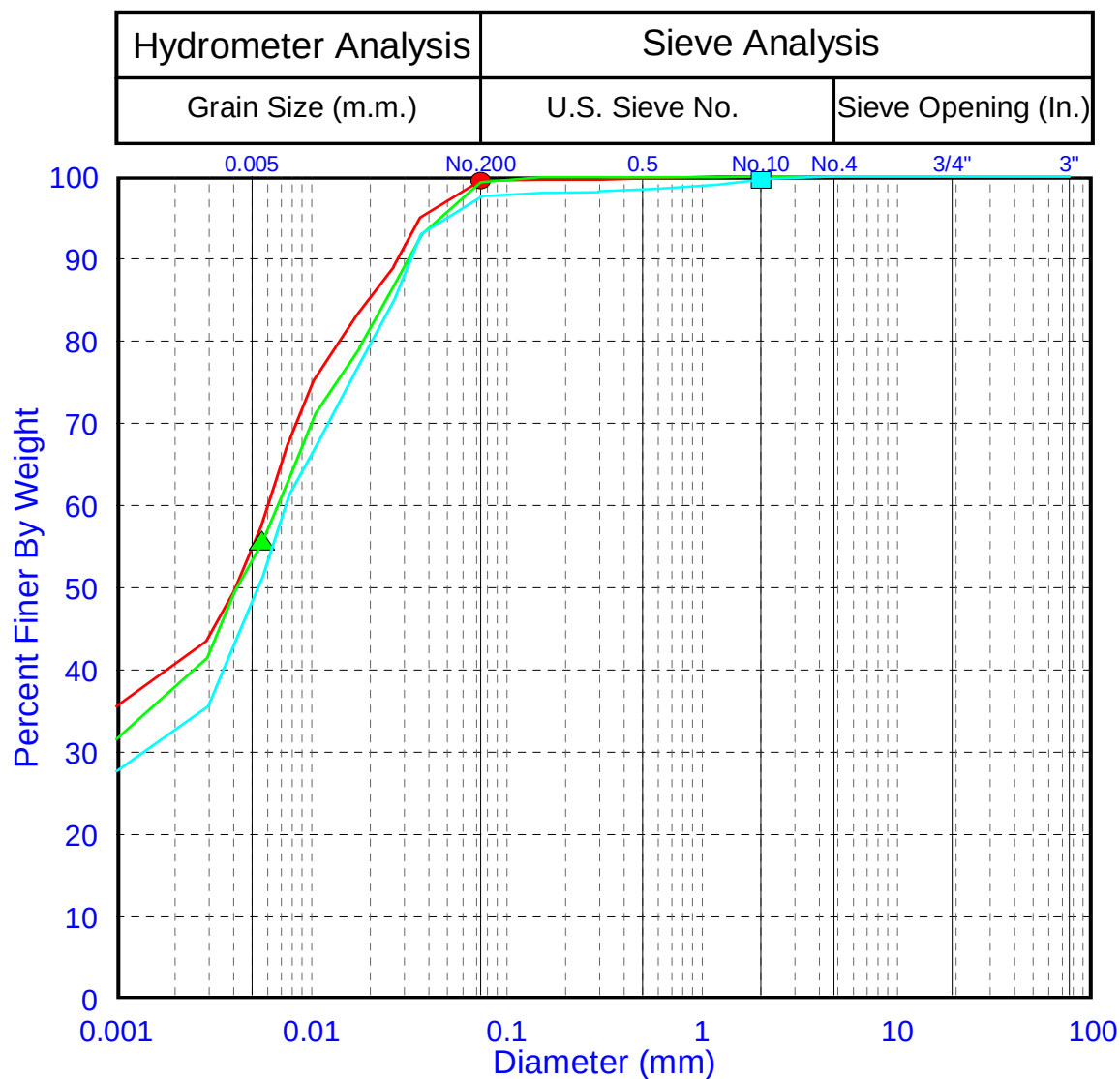
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 123

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-337   | U1     | 4.00-4.50   | 36   | 20   | 16   | CL          |
| ▲    | BH-337   | U7     | 16.00-16.50 | 33   | 21   | 12   | CL/ML       |
| ■    | BH-337   | U10    | 22.00-22.50 | 36   | 21   | 15   | CL          |

## GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

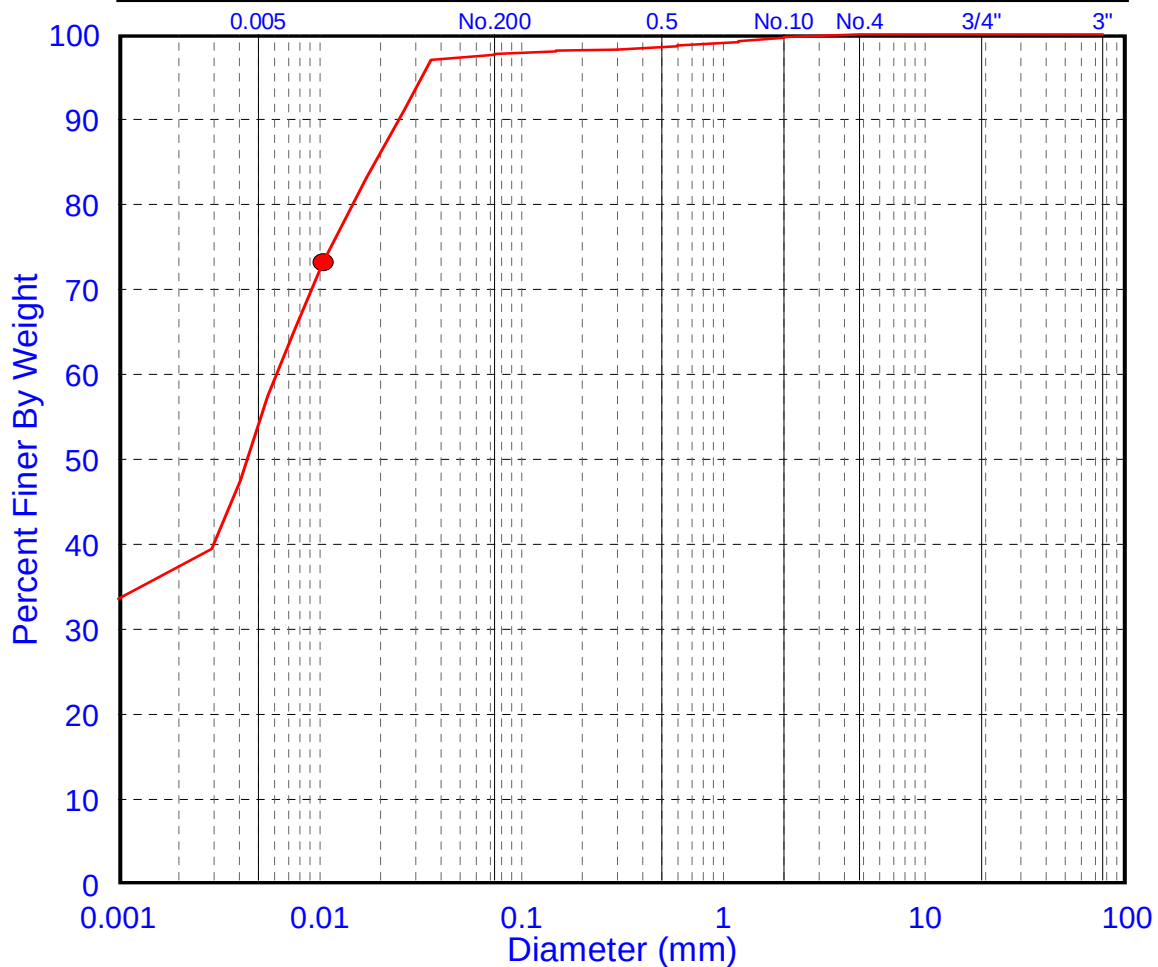
Client : NFC

Fig.: 124

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

| Hydrometer Analysis | Sieve Analysis |                     |
|---------------------|----------------|---------------------|
| Grain Size (m.m.)   | U.S. Sieve No. | Sieve Opening (In.) |



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-337   | U12    | 26.00-26.50 | 26   | 22   | 5    | ML/CL-ML/CL |

## GRAIN SIZE DISTRIBUTION CHART



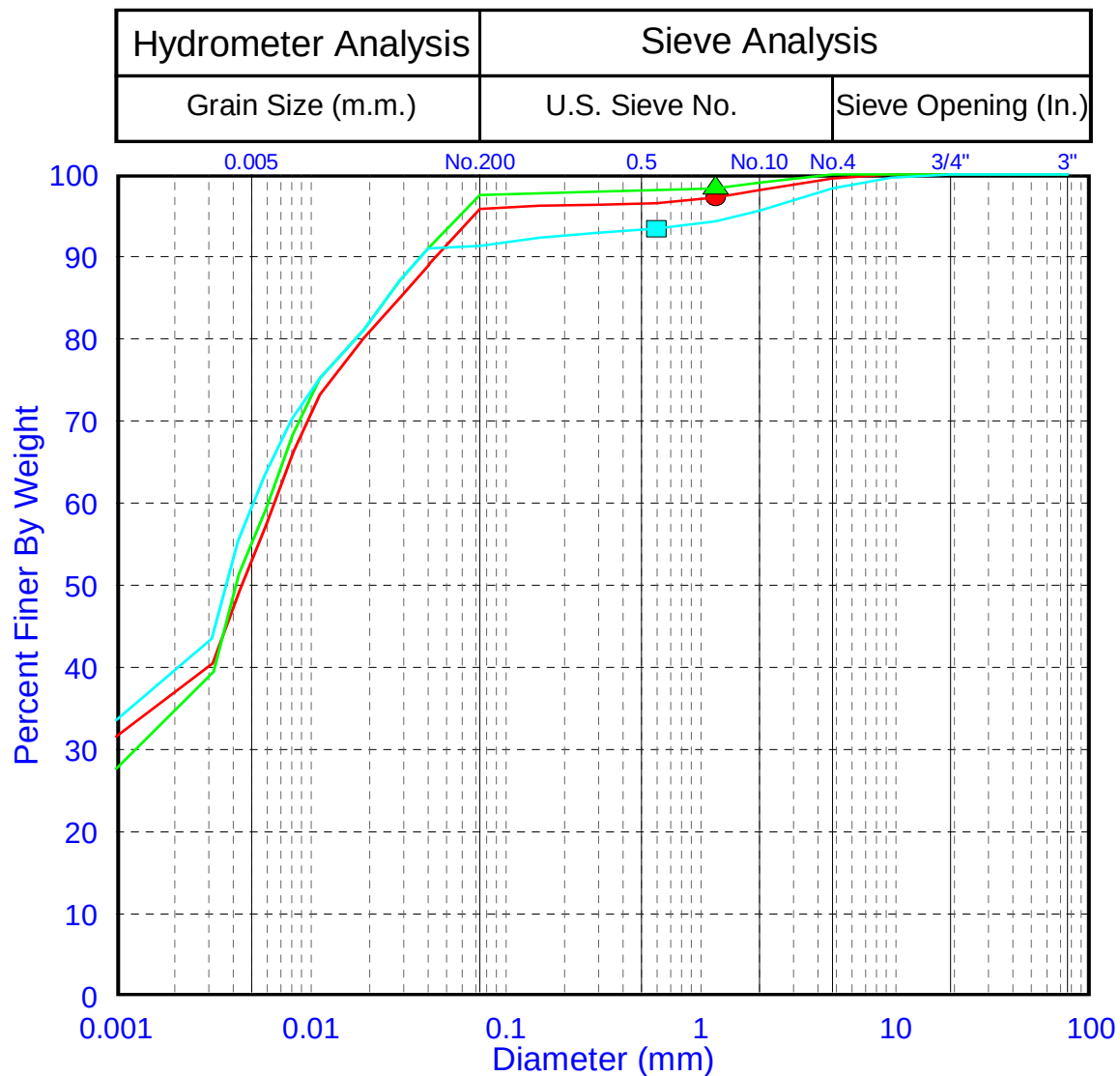
Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 125

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347



| CLAY | SILT | SAND |        |        | GRAVEL |        |
|------|------|------|--------|--------|--------|--------|
|      |      | Fine | Medium | Coarse | Fine   | Coarse |

| Sym. | Borehole | Sample | Depth(m)    | L.L. | P.L. | P.I. | USCS Symbol |
|------|----------|--------|-------------|------|------|------|-------------|
| ●    | BH-354   | U2     | 7.50-8.00   | 37   | 22   | 15   | CL/ML       |
| ▲    | BH-354   | U4     | 13.50-14.00 | 46   | 27   | 19   | CL/ML       |
| ■    | BH-354   | U5     | 15.50-16.00 | 31   | 23   | 8    | ML/CL-ML/CL |

## GRAIN SIZE DISTRIBUTION CHART



Project : SOUTH ALUMINUM SMELTER PLANT

Client : NFC

Fig.: 126

**Soil Engineering Services Consultant & Contractor**

Proj No. : 1347

