



COMIBASSAL International Controllers

Internal inspection and laboratories sector

Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011

I-Introduction

General Consultant : SYSTRA
Consultant : DR/ Khaled Kandil
Contractor : شركة الصالحين للمقاولات
Sample : Coarse Aggregate Filter layer.
Station : From Stred Materials
Date of Test : 18-11-2023
QC : 2352

II- Sample description:

Coarse Aggregate mix.

III- Required tests and Results:

| Required tests | | Results |
|---|--|---------------------|
| 1- Specific gravity (SG), absorption and degradation. | SSD | 2.605 |
| | Absorption | 1.56% |
| | Degradation | 0.1% |
| 2- Grain size analysis | Grain size analysis | As shown in figures |
| 3- Los Angeles test | Abrasion ratio | 29.1% |
| 4- Percentage of flakiness Aggregate. | Total Percentage of flakiness portion | 3.35% |
| 5- Percentage of Elongation Aggregate. | Total Percentage of Elongation portion | 1.57% |
| 6- Percentage of natural aggregate. | Total Percentage of natural aggregate | 8.06% |

IV- Notes

- 1- Samples were brought by : Consultant.
- 2- Samples are responsible from the Person who brought it.
- 3- The results are applying only for the present report.
- 4-

LAB DIRECTOR

Eng / Eman kandil



Geotechnical consultant

Dr. Mohamed Mostafa Badry



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APPENDIX





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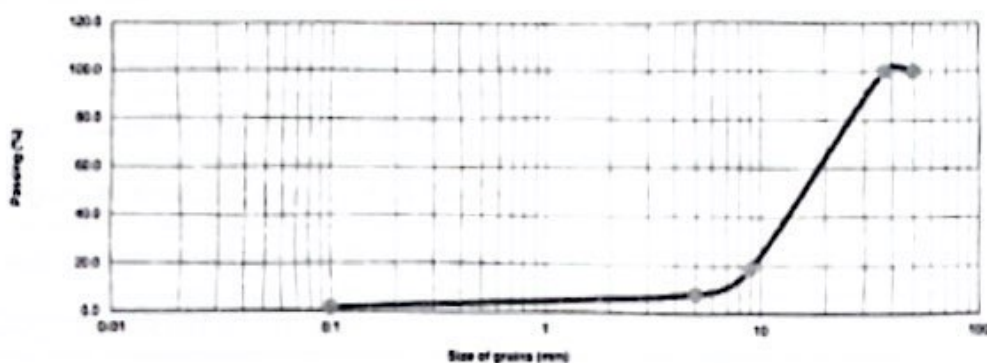
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PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

| Sieve size (mm) | WEIGHT | CUMULATIVE | CUMULATIVE | CUMULATIVE | STANDARD | |
|--------------------|------------------|-------------------------|----------------------------|---------------------------|-------------------------|-----|
| | RETAINED (gm) | WEIGHT RETAINED (gm) | PERCENTAGE RETAINED (%) | PERCENTAGE PASSING (%) | SPECIFICATION LIMITS | |
| 75 | 0.00 | 0.00 | 0.00 | 100.0 | 100 | 100 |
| 50 | 0.00 | 0.00 | 0.00 | 100.0 | 75 | 90 |
| 10 | 8123.00 | 8123.00 | 81.23 | 18.8 | 15 | 25 |
| No.4 | 1097.00 | 9220.00 | 92.20 | 7.80 | 0 | 10 |
| No.200 | 406.00 | 406.00 | 81.20 | 1.47 | 0 | 5 |

Total sample weight = 10000.00 pass No.4 = 780.0 Total fine aggregates weight = 500 gm
% 7.8

Size analysis distribution curve



Coarse Agg.





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Absorption and specific gravity for Coarse Aggregate ASTM C 127 - AASHTO T 85

| | |
|--|------|
| Weight of sample | 2500 |
| Weight of saturated - dry surface sample (B) | 2537 |
| Weight of saturated sample in water (C) | 1563 |
| Weight of dry sample after heating (A) | 2498 |

Results:-

| | |
|---|-------|
| Saturation surface dry specific gravity = $B / (B - C)$ | 2.605 |
| Bulk specific gravity = $A / (B - C)$ | 2.56 |
| Apparent specific gravity = $A / (A - C)$ | 2.67 |
| Absorption of water = $(B - A) / A * 100$ | 1.56 |
| Degradation of aggregate = $(2500 - A) / A * 100$ | 0.1 |





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ABRASION AND IMPACT " LOS ANGELES " TEST

(For small size coarse aggregate)

ASTM- C 131-96 / AASHTO-T-96

Results

| Speed | Rotate at 30 to 33 Rpm For 500 Revolution |
|---|--|
| Trial Grading | A |
| Intital Weight (W1) gms | 5000 |
| Weight of tested sample (W2) gms Retained on sieve No.12 | 3543 |
| % Wear By Weight Passing on Sieve No.12 | 29.1% |





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percentage of flakiness aggregate
ASTM D-4791

Flakiness Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass of flakiness (gm) | Percentage of flakiness portion % |
|------------------------|----------|------------------------|------------------------|-----------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 607 | 0 | 0.00 |
| 3/4 | 1/2 | 101 | 23 | 14.29 |
| 1/2 | 3/8 | 214 | 10 | 4.67 |
| 3/8 | no. 4 | 152 | 5 | 3.29 |
| Calculations | Total | 1134 | 38 | 3.35 |
| Standard Specification | | | | ≤10% |

Elongated Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass elongated (gm) | Percentage of elongated portion % |
|------------------------|----------|------------------------|---------------------|-----------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 607 | 10 | 1.65 |
| 3/4 | 1/2 | 616 | 0 | 0.00 |
| 1/2 | 3/8 | 214 | 2 | 0.93 |
| 3/8 | no. 4 | 157 | 13 | 8.28 |
| Calculations | Total | 1594 | 25 | 1.57 |
| Standard Specification | | | | ≤10% |





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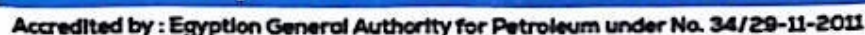
Percentage of crushed aggregate

Crushed Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass natural (gm) | Percentage of crushed portion % |
|-------------------|----------|------------------------|-------------------|---------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 607 | 14 | 97.69 |
| 3/4 | 1/2 | 616 | 81 | 86.85 |
| 1/2 | 3/8 | 214 | 20 | 90.65 |
| 3/8 | no. 4 | 152 | 13 | 91.45 |
| Total | | 1589.00 | 128 | 91.94 |

| | | |
|-------------------------|-------|---|
| Percentage of crushed = | 91.94 | % |
| Percentage of natural = | 8.06 | % |
| Standard specification | < 10 | % |



Humidity : 40%

Mustaf



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I-Introduction

General Consultant : SYSTRA
Consultant : DR/ Khaled Kandil
Contractor : شركة الصالحين للمقاولات
Sample : Coarse Aggregate Filter layer.
Station : From Stored Materials
Date of Test : 18-11-2023
QC : 2471-2

II- Sample description:

Coarse Aggregate mix.

III- Required tests and Results:

| Required tests | | Results |
|---|--|---------------------|
| 1- Specific gravity (SG), absorption and degradation. | SSD | 2.527 |
| | Absorption | 2.12% |
| | Degradation | 0.1% |
| 2- Grain size analysis | Grain size analysis | As shown in figures |
| 3- Los Angeles test | Abrasion ratio | 24.7% |
| 4- Percentage of flakiness Aggregate. | Total Percentage of flakiness portion | 5.53% |
| 5- Percentage of Elongation Aggregate. | Total Percentage of Elongation portion | 4.36% |
| 6- Percentage of natural aggregate. | Total Percentage of natural aggregate | 7.54% |

IV- Notes

- 1- Samples were brought by : Consultant.
- 2- Samples are responsible from the Person who brought it.
- 3- The results are applying only for the present report.

LAB DIRECTOR

Eng / Eman kandil

Eman



Geotechnical consultant

For: Dr. M.

Dr. Mohamed Mostafa Badry





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APPENDIX





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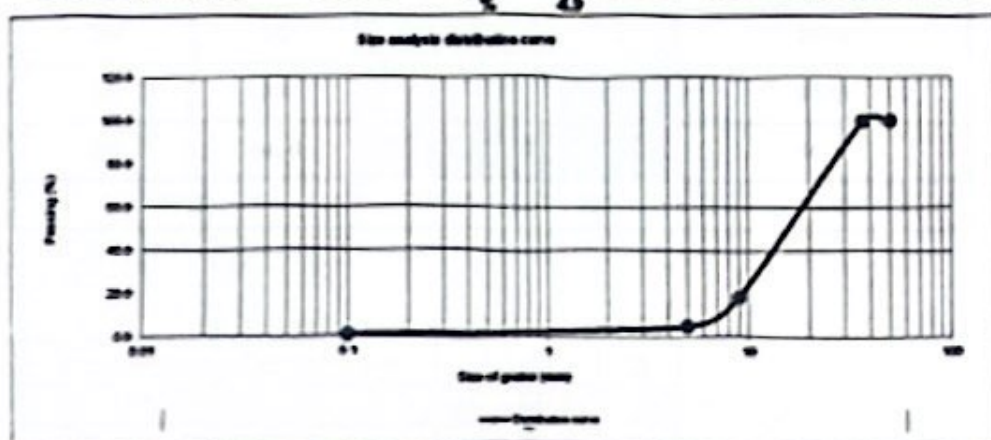
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PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

| Sieve size (mm) | WEIGHT RETAINED | CUMULATIVE WEIGHT | CUMULATIVE PERCENTAGE | CUMULATIVE PERCENTAGE | STANDARD SPECIFICATION LIMITS | |
|--------------------|--------------------|----------------------|--------------------------|--------------------------|-------------------------------------|-----|
| | (gm) | RETAINED (gm) | RETAINED (%) | PASSING (%) | | |
| 75 | 0.00 | 0.00 | 0.00 | 100.0 | 100 | 100 |
| 50 | 0.00 | 0.00 | 0.00 | 100.0 | 75 | 90 |
| 10 | 8142.00 | 8142.00 | 81.42 | 18.6 | 10 | 25 |
| No.4 | 1365.00 | 9507.00 | 95.07 | 4.93 | 0 | 10 |
| No.200 | 435.00 | 435.00 | 87.00 | 0.64 | 0 | 5 |

Total sample weight = 10000.00 pass No.4 = 493.0 Total fine aggregates weight = 500 gm





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Percentage of crushed aggregate

Crushed Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass natural (gm) | Percentage of crushed portion % |
|-------------------|----------|------------------------|-------------------|---------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 965 | 121 | 87.46 |
| 3/4 | 1/2 | 1547 | 77 | 95.02 |
| 1/2 | 3/8 | 869 | 66 | 92.41 |
| 3/8 | no. 4 | 452 | 25 | 94.47 |
| Total | | 3833.00 | 289 | 92.46 |

| | | |
|-------------------------|-------|---|
| Percentage of crushed = | 92.46 | % |
| Percentage of natural = | 7.54 | % |
| Standard specification | ≤ 10 | % |



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percentage of flakiness aggregate ASTM D-4791

Flakiness Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass of flakiness (gm) | Percentage of flakiness portion % |
|-------------------|----------|------------------------|------------------------|-----------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 965 | 78 | 8.08 |
| 3/4 | 1/2 | 1547 | 53 | 3.43 |
| 1/2 | 3/8 | 869 | 69 | 7.94 |
| 3/8 | no. 4 | 452 | 11.8 | 2.61 |

| | | | | |
|--------------|------------------------|------|-------|------|
| Calculations | Total | 3833 | 211.8 | 5.63 |
| | Standard Specification | | | ≤10% |

Elongated Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass elongated (gm) | Percentage of elongated portion % |
|-------------------|----------|------------------------|---------------------|-----------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 965 | 36 | 3.73 |
| 3/4 | 1/2 | 1547 | 55 | 3.62 |
| 1/2 | 3/8 | 869 | 47 | 5.41 |
| 3/8 | no. 4 | 452 | 28 | 6.19 |

| | | | | |
|--------------|------------------------|------|-----|------|
| Calculations | Total | 3833 | 167 | 4.36 |
| | Standard Specification | | | ≤10% |





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Absorption and specific gravity for Coarse Aggregate ASTM C 127 - AASHTO T 85

| | |
|--|------|
| Weight of sample | 2500 |
| Weight of saturated - dry surface sample (B) | 2550 |
| Weight of saturated sample in water (C) | 1541 |
| Weight of dry sample after heating (A) | 2497 |

Results:-

| | |
|---|-------|
| Saturation surface dry specific gravity = $B / (B - C)$ | 2.527 |
| Bulk specific gravity = $A / (B - C)$ | 2.47 |
| Apparent specific gravity = $A / (A - C)$ | 2.61 |
| Absorption of water = $(B - A) / A * 100$ | 2.12 |
| Degradation of aggregate = $(2500 - A) / A * 100$ | 0.1 |





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ABRASION AND IMPACT " LOS ANGELES " TEST (For small size coarse aggregate) ASTM- C 131-96 / AASHTO-T-96

Results

| Speed | Rotate at 30 to 33 Rpm For 500 Revolution |
|---|--|
| Trial Grading | A |
| Intitlial Weight (W1) gms | 5000 |
| Weight of tested sample (W2) gms Retained on sieve No.12 | 3765 |
| % Wear By Weight Passing on Sieve No.12 | 24.7% |





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Internal inspection and laboratories sector

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| | |
|----------|------------------|
| Report : | 854 - 2 - Center |
| Date : | 21/11/2023 |

CHEMICAL ANALYSIS

General Consultant : SYSTRA
Consultant : DR / KHALED KANDIL
Contractor : شركة الصالحين للمقاولات
Project : Electric express train
Sample : Corse Aggregate Filter Layer
Station : From Stored Materials
Date of Test : 18-11-2023

Temperature : 26°C

Humidity : 40%

| ANALYSIS | RESULTS | TEST METHOD |
|----------------|----------|-------------|
| CHLORIDE | 0.0028% | ASTM D 2974 |
| SULPHATE | 0.0073% | |
| ORGANIG MATTER | NEGATIVE | |



LAB DIRECTOR
CH/ Mostafa Asker

Mostafa





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I-Introduction

| | |
|----------------------|--------------------------------|
| General Consultant : | SYSTRA |
| Consultant : | DR/ Khaled Kandil |
| Contractor : | شركة الصالحين للمقاولات |
| Sample : | Coarse Aggregate Filter layer. |
| Station : | From Stored Materials |
| Date of Test : | 18-11-2023 |
| QC : | 2471-1 |

II- Sample description:

Coarse Aggregate mix.

III- Required tests and Results:

| Required tests | | Results |
|---|--|---------------------|
| 1- Specific gravity (SG), absorption and degradation. | SSD | 2.555 |
| | Absorption | 1.97% |
| | Degradation | 0.3% |
| 2- Grain size analysis | Grain size analysis | As shown in figures |
| 3- Los Angeles test | Abrasion ratio | 25.9% |
| 4- Percentage of flakiness Aggregate. | Total Percentage of flakiness portion | 4.43% |
| 5- Percentage of Elongation Aggregate. | Total Percentage of Elongation portion | 3.08% |
| 6- Percentage of natural aggregate. | Total Percentage of natural aggregate | 7.80% |

IV- Notes

- 1- Samples were brought by : Consultant.
- 2- Samples are responsible from the Person who brought it.
- 3- The results are applying only for the present report.

LAB DIRECTOR

Eng / Eman kandil



Geotechnical consultant

Dr. Mohamed Mostafa Badry



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APPENDIX





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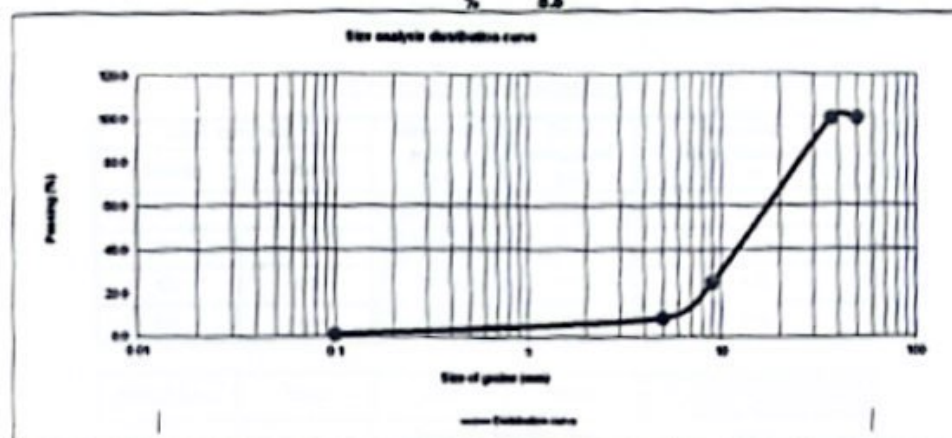
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PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

| Sieve size (mm) | WEIGHT RETAINED | CUMULATIVE WEIGHT | CUMULATIVE PERCENTAGE | CUMULATIVE PERCENTAGE | STANDARD SPECIFICATION LIMITS | |
|--------------------|--------------------|----------------------|--------------------------|--------------------------|-------------------------------------|-----|
| | (gm) | RETAINED (gm) | RETAINED (%) | PASSING (%) | | |
| 75 | 0.00 | 0.00 | 0.00 | 100.0 | 100 | 100 |
| 50 | 0.00 | 0.00 | 0.00 | 100.0 | 75 | 90 |
| 10 | 7635.00 | 7635.00 | 74.99 | 25.0 | 15 | 25 |
| No. 4 | 1654.00 | 9289.00 | 91.23 | 8.77 | 0 | 10 |
| No. 200 | 441.30 | 441.30 | 88.26 | 1.03 | 0 | 5 |

Total sample weight = 10182.00 pass No. 4 = 893.0 Total fine aggregates weight = 500 gm
% 8.8





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percentage of flakiness aggregate ASTM D-4791

Flakiness Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass of flakiness (gm) | Percentage of flakiness portion % |
|-------------------|----------|------------------------|------------------------|-----------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 878.5 | 33 | 3.76 |
| 3/4 | 1/2 | 1759 | 65 | 3.70 |
| 1/2 | 3/8 | 697.8 | 49.9 | 7.15 |
| 3/8 | no. 4 | 229.7 | 9.8 | 4.27 |

| | | | | |
|------------------------|-------|------|-------|------|
| Calculations | Total | 3663 | 167.7 | 4.63 |
| Standard Specification | | | | ≤10% |

Elongated Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass elongated (gm) | Percentage of elongated portion % |
|-------------------|----------|------------------------|---------------------|-----------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 878.5 | 35 | 3.99 |
| 3/4 | 1/2 | 1759 | 22.7 | 1.29 |
| 1/2 | 3/8 | 697.8 | 38.6 | 5.53 |
| 3/8 | no. 4 | 229.7 | 13.6 | 5.92 |

| | | | | |
|------------------------|-------|------|-------|------|
| Calculations | Total | 3663 | 109.9 | 3.06 |
| Standard Specification | | | | ≤10% |





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Percentage of crushed aggregate

Crushed Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass natural (gm) | Percentage of crushed portion % |
|-------------------|----------|------------------------|-------------------|---------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 876.5 | 102 | 88.36 |
| 3/4 | 1/2 | 1759 | 71 | 95.96 |
| 1/2 | 3/8 | 697.8 | 65 | 90.69 |
| 3/8 | no. 4 | 229.7 | 40 | 82.59 |
| Total | | 3563.00 | 278 | 92.20 |

| | | |
|-------------------------|-------|---|
| Percentage of crushed = | 92.20 | % |
| Percentage of natural = | 7.80 | % |
| Standard specification | ≤ 10 | % |





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Absorption and specific gravity for Coarse Aggregate ASTM C 127 - AASHTO T 85

| | |
|--|------|
| Weight of sample | 2500 |
| Weight of saturated - dry surface sample (B) | 2542 |
| Weight of saturated sample in water (C) | 1547 |
| Weight of dry sample after heating (A) | 2493 |

Results:-

| | |
|---|-------|
| Saturation surface dry specific gravity = $B / (B - C)$ | 2.555 |
| Bulk specific gravity = $A / (B - C)$ | 2.51 |
| Apparent specific gravity = $A / (A - C)$ | 2.64 |
| Absorption of water = $(B - A) / A \times 100$ | 1.97 |
| Degradation of aggregate = $(2500 - A) / A \times 100$ | 0.3 |





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ABRASION AND IMPACT " LOS ANGELES " TEST **(For small size coarse aggregate)** **ASTM- C 131-96 / AASHTO-T-96**

Results

| Speed | Rotate at 30 to 33 Rpm For 500 Revolution |
|---|--|
| Trial Grading | A |
| Intitil Weight (W1) gms | 5000 |
| Weight of tested sample (W2) gms Retained on sieve No.12 | 3706 |
| % Wear By Weight Passing on Sieve No.12 | 25.9% |





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| | |
|----------|------------------|
| Report : | 919 - 1 - Center |
| Date : | 07/12/2023 |

CHEMICAL ANALYSIS

General Consultant : SYSTRA
Consultant : DR / KHALED KANDIL
Contractor : شركة الصالحين للمطاولات
Project : Electric express train
Sample : Coarse Aggregate Filter Layer
Station : From Stored Materials
Date of Test : 18-11-2023
Temperature : 24°C Humidity : 45%

| ANALYSIS | RESULTS | TEST METHOD |
|----------------|----------|-------------|
| CHLORIDE | 0.0011% | ASTM D 1411 |
| SULPHATE | 0.0037% | ASTM D 1560 |
| ORGANIC MATTER | NEGATIVE | ASTM D 2974 |



LAB DIRECTOR
CH/ Mostafa Asker

Mostafa





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I-Introduction

| | |
|----------------------|--------------------------------|
| General Consultant : | SYSTRA |
| Consultant : | DR/ Khaled Kandil |
| Contractor : | شركة الصالحين للمقاولات |
| Sample : | Coarse Aggregate Filter layer. |
| Station : | From Stored Materials |
| Date of Test : | 30-11-2023 |
| QC : | 2471-3 |

II- Sample description:

Coarse Aggregate mix.

III- Required tests and Results:

| Required tests | | Results |
|---|--|---------------------|
| 1- Specific gravity (SG), absorption and degradation. | SSD | 2.547 |
| | Absorption | 2.2% |
| | Degradation | 0.2% |
| 2- Grain size analysis | Grain size analysis | As shown in figures |
| 3- Los Angeles test | Abrasion ratio | 26.2% |
| 4- Percentage of flakiness Aggregate. | Total Percentage of flakiness portion | 3.52% |
| 5- Percentage of Elongation Aggregate. | Total Percentage of Elongation portion | 3.80% |
| 6- Percentage of natural aggregate. | Total Percentage of natural aggregate | 7.73% |

IV- Notes

- 1- Samples were brought by : Consultant.
- 2- Samples are responsible from the Person who brought it.
- 3- The results are applying only for the present report.
- 4-

LAB DIRECTOR

Eng / Eman kandil



Geotechnical consultant

For Dr. H.
Dr. Mohamed Mostafa Badry



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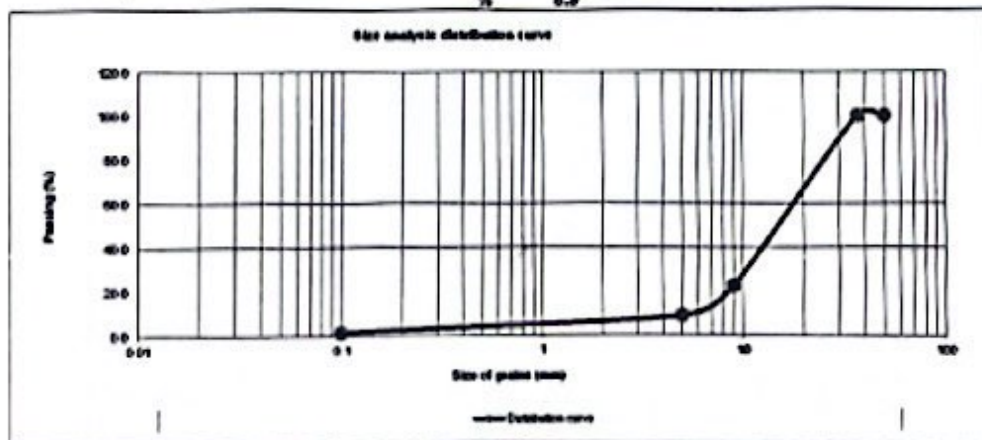
Internal inspection and laboratories sector

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PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

| Sieve size (mm) | WEIGHT | CUMULATIVE | CUMULATIVE | CUMULATIVE | STANDARD | |
|--------------------|------------------|-------------------------|----------------------------|---------------------------|-------------------------|-----|
| | RETAINED (gm) | WEIGHT RETAINED (gm) | PERCENTAGE RETAINED (%) | PERCENTAGE PASSING (%) | SPECIFICATION LIMITS | |
| 75 | 0.00 | 0.00 | 0.00 | 100.0 | 100 | 100 |
| 50 | 0.00 | 0.00 | 0.00 | 100.0 | 75 | 90 |
| 10 | 7798.00 | 7798.00 | 77.49 | 22.5 | 15 | 25 |
| No.4 | 1365.00 | 9163.00 | 91.06 | 8.94 | 0 | 10 |
| No.200 | 422.00 | 422.00 | 84.40 | 1.40 | 0 | 5 |

Total sample weight = 10063.00 pass No.4 = 900.0 Total fine aggregates weight = 500 gm
% 8.9





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percentage of flakiness aggregate ASTM D-4791

Flakiness Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass of flakiness (gm) | Percentage of flakiness portion % |
|-------------------|----------|------------------------|------------------------|-----------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 768 | 44 | 5.73 |
| 3/4 | 1/2 | 1953 | 51 | 2.61 |
| 1/2 | 3/8 | 865 | 35 | 4.05 |
| 3/8 | no. 4 | 254 | 5.2 | 2.05 |

| | | | | |
|------------------------|-------|------|-------|------|
| Calculations | Total | 3840 | 136.2 | 3.52 |
| Standard Specification | | | | ≤10% |

Elongated Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass elongated (gm) | Percentage of elongated portion % |
|-------------------|----------|------------------------|---------------------|-----------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 768 | 47 | 6.12 |
| 3/4 | 1/2 | 1953 | 45 | 2.30 |
| 1/2 | 3/8 | 865 | 31 | 3.58 |
| 3/8 | no. 4 | 254 | 23 | 9.06 |

| | | | | |
|------------------------|-------|------|-----|------|
| Calculations | Total | 3840 | 146 | 3.80 |
| Standard Specification | | | | ≤10% |





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Percentage of crushed aggregate

Crushed Determination

| Sieve size "Inch" | | Mass test portion (gm) | Mass natural (gm) | Percentage of crushed portion % |
|-------------------|----------|------------------------|-------------------|---------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 768 | 114 | 85.16 |
| 3/4 | 1/2 | 1953 | 70 | 96.42 |
| 1/2 | 3/8 | 865 | 57 | 93.41 |
| 3/8 | no. 4 | 254 | 56 | 77.95 |
| Total | | 3840.00 | 297 | 92.27 |

| | | |
|-------------------------|-------|---|
| Percentage of crushed = | 92.27 | % |
| Percentage of natural = | 7.73 | % |
| Standard specification | ≤ 10 | % |





COMIBASSAL International Controllers

Internal inspection and laboratories sector

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Absorption and specific gravity for Coarse Aggregate ASTM C 127 - AASHTO T 85

| | |
|--|------|
| Weight of sample | 2500 |
| Weight of saturated - dry surface sample (B) | 2550 |
| Weight of saturated sample in water (C) | 1549 |
| Weight of dry sample after heating (A) | 2495 |

Results:-

| | |
|---|-------|
| Saturation surface dry specific gravity = $B / (B-C)$ | 2.547 |
| Bulk specific gravity = $A / (B-C)$ | 2.49 |
| Apparent specific gravity = $A / (A-C)$ | 2.64 |
| Absorption of water = $(B-A) / A * 100$ | 2.20 |
| Degradation of aggregate = $(2500-A) / A * 100$ | 0.2 |





COMIBASSAL International Controllers

Internal inspection and laboratories sector

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ABRASION AND IMPACT " LOS ANGELES " TEST **(For small size coarse aggregate)** **ASTM- C 131-96 / AASHTO-T-96**

Results

| Speed | Rotate at 30 to 33 Rpm For 500 Revolution |
|---|--|
| Trial Grading | A |
| Intitlal Weight (W1) gms | 5000 |
| Weight of tested sample (W2) gms Retained on sieve No.12 | 3690 |
| % Wear By Weight Passing on Sieve No.12 | 26.2% |





COMIBASSAL International Controllers

Internal inspection and laboratories sector

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| | |
|----------|------------------|
| Report : | 919 - 3 - Center |
| Date : | 07/12/2023 |

CHEMICAL ANALYSIS

General Consultant : SYSTRA
Consultant : DR / KHALED KANDIL
Contractor : شركة الصالحين للمقاولات
Project : Electric express train
Sample : Corse Aggregate Filter Layer
Station : From Stored Materials
Date of Test : 30-11-2023
Temperature : 24°C Humidity : 45%

| ANALYSIS | RESULTS | TEST METHOD |
|----------------|----------|-------------|
| CHLORIDE | 0.0015% | ASTM D 1411 |
| SULPHATE | 0.0038% | ASTM D 1580 |
| ORGANIG MATTER | NEGATIVE | ASTM D 2974 |



LAB DIRECTOR
CH/ Mostafa Asker

Mostafa





COMIBASSAL International Controllers

Internal inspection and laboratories sector

Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011

I-Introduction

| | |
|----------------------|---------------------------------|
| General Consultant : | SYSTRA |
| Consultant : | DR/ Khaled Kandil |
| Contractor : | شركة الصالحين للمقاولات |
| Sample : | Coarse Aggregate Filter layer. |
| Station : | From St(318+730) to St(319+900) |
| Date of Test : | 6-12-2023 |
| QC : | 2508-1 |

II- Sample description:

Coarse Aggregate mix.

III- Required tests and Results:

| Required tests | | Results |
|---|--|---------------------|
| 1- Specific gravity (SG), absorption and degradation. | SSD | 2.573 |
| | Absorption | 1.44% |
| | Degradation | 0.2% |
| 2- Grain size analysis | Grain size analysis | As shown in figures |
| 3- Los Angeles test | Abrasion ratio | 26.0% |
| 4- Percentage of flakiness Aggregate. | Total Percentage of flakiness portion | 4.77% |
| 5- Percentage of Elongation Aggregate. | Total Percentage of Elongation portion | 5.23% |
| 6- Percentage of natural aggregate. | Total Percentage of natural aggregate | 6.32% |

IV- Notes

- 1- Samples were brought by : Consultant.
- 2- Samples are responsible from the Person who brought it.
- 3- The results are applying only for the present report.

LAB DIRECTOR

Eng / Eman kandil



Geotechnical consultant

For: DR. M.
Dr. Mohamed Mostafa Badry



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APPENDIX





COMIBASSAL International Controllers

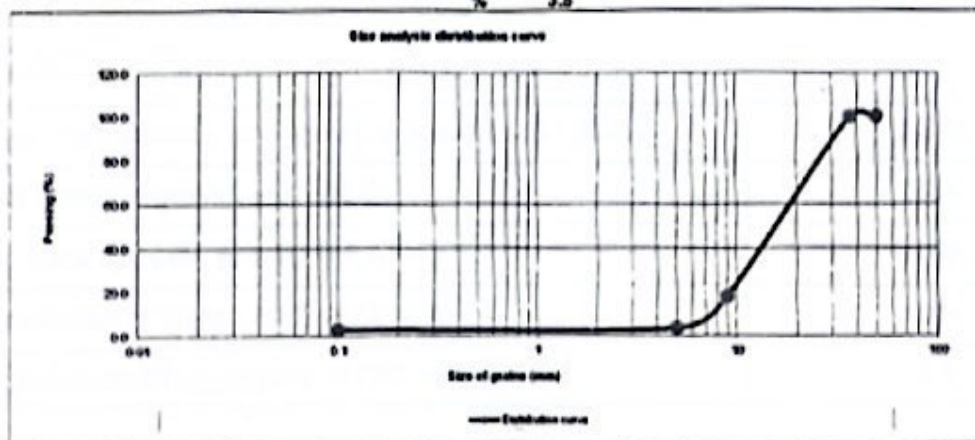
Internal inspection and laboratories sector

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PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

| Sieve size (mm) | WEIGHT | CUMULATIVE | CUMULATIVE | CUMULATIVE | STANDARD | |
|--------------------|------------------|-------------------------|----------------------------|---------------------------|-------------------------|-----|
| | RETAINED (gm) | WEIGHT RETAINED (gm) | PERCENTAGE RETAINED (%) | PERCENTAGE PASSING (%) | SPECIFICATION LIMITS | |
| 75 | 0.00 | 0.00 | 0.00 | 100.0 | 100 | 100 |
| 50 | 0.00 | 0.00 | 0.00 | 100.0 | 75 | 90 |
| 10 | 8200.00 | 8200.00 | 82.00 | 18.0 | 15 | 25 |
| No. 4 | 1450.00 | 9650.00 | 96.50 | 3.50 | 0 | 10 |
| No. 200 | 111.00 | 111.00 | 22.20 | 2.72 | 0 | 5 |

Total sample weight = 10000.00 pass No. 4 = 350.0 Total fine aggregates weight = 500 gm
% 3.5





COMIBASSAL International Controllers

Internal inspection and laboratories sector

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Absorption and specific gravity for Coarse Aggregate ASTM C 127 - AASHTO T 85

| | |
|--|------|
| Weight of sample | 2500 |
| Weight of saturated - dry surface sample (B) | 2532 |
| Weight of saturated sample in water (C) | 1548 |
| Weight of dry sample after heating (A) | 2496 |

Results:-

| | |
|---|-------|
| Saturation surface dry specific gravity = $B / (B-C)$ | 2.573 |
| Bulk specific gravity = $A / (B-C)$ | 2.54 |
| Apparent specific gravity = $A / (A-C)$ | 2.63 |
| Absorption of water = $(B-A)/A \times 100$ | 1.44 |
| Degradation of aggregate = $(2500-A)/A \times 100$ | 0.2 |





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ABRASION AND IMPACT " LOS ANGELES " TEST **(For small size coarse aggregate)** **ASTM- C 131-96 / AASHTO-T-96**

Results

| Speed | Rotate at 30 to 33 Rpm For 500 Revolution |
|---|--|
| Trial Grading | A |
| Intitial Weight (W1) gms | 5000 |
| Weight of tested sample (W2) gms Retained on sieve No.12 | 3702 |
| % Wear By Weight Passing on Sieve No.12 | 26.0% |





COMIBASSAL International Controllers

Internal inspection and laboratories sector

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percentage of flakiness aggregate ASTM D-4791

Flakiness Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass of flakiness (gm) | Percentage of flakiness portion % |
|-------------------|----------|------------------------|------------------------|-----------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 1217 | 63 | 5.16 |
| 3/4 | 1/2 | 1002 | 51 | 5.09 |
| 1/2 | 3/8 | 150 | 1.4 | 0.93 |
| 3/8 | no. 4 | 291.2 | 11.6 | 3.98 |

| | | | | |
|--------------|-------|------------------------|-----|------|
| Calculations | Total | 2660.2 | 127 | 4.77 |
| | | Standard Specification | | ≤10% |

Elongated Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass elongated (gm) | Percentage of elongated portion % |
|-------------------|----------|------------------------|---------------------|-----------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 1217 | 46 | 3.78 |
| 3/4 | 1/2 | 1002 | 36 | 3.59 |
| 1/2 | 3/8 | 150 | 4 | 2.67 |
| 3/8 | no. 4 | 291.2 | 53 | 18.20 |

| | | | | |
|--------------|-------|------------------------|-----|------|
| Calculations | Total | 2660.2 | 139 | 5.23 |
| | | Standard Specification | | ≤10% |





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Internal inspection and laboratories sector

Accredited by : Egypt General Authority for Petroleum under No. 34/29-11-2011

Percentage of crushed aggregate

Crushed Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass natural (gm) | Percentage of crushed portion % |
|-------------------|----------|------------------------|-------------------|---------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 1217 | 43 | 96.47 |
| 3/4 | 1/2 | 1002 | 25 | 97.50 |
| 1/2 | 3/8 | 150 | 42 | 72.00 |
| 3/8 | no. 4 | 291.2 | 58 | 80.08 |
| Total | | 2660.20 | 168 | 93.68 |

| | | |
|-------------------------|-------|---|
| Percentage of crushed = | 93.68 | % |
| Percentage of natural = | 6.32 | % |
| Standard specification | ≤ 10 | % |





COMIBASSAL International Controllers

Internal inspection and laboratories sector

Accredited by : Egypt General Authority for Petroleum under No. 34/29-11-2011

| | | |
|--------|---|------------------|
| Report | : | 931 - 1 - Center |
| Date | : | 13/12/2023 |

CHEMICAL ANALYSIS

| | | |
|--------------------|---|------------------------------|
| General Consultant | : | SYSTRA |
| Consultant | : | DR / KHALED KANDIL |
| Contractor | : | شركة الصالحين للمقاولات |
| Project | : | Electric express train |
| Sample | : | Corse Aggregate Filter Layer |
| Station | : | ST(318+730):(319+900) |
| Date of Test | : | 6-12-2023 |

Temperature : 24°C

Humidity : 45%

| ANALYSIS | RESULTS | TEST METHOD |
|----------------|----------|-------------|
| CHLORIDE | 0.0018% | ASTM D 1411 |
| SULPHATE | 0.0027% | ASTM D 1540 |
| ORGANIG MATTER | NEGATIVE | ASTM D 2974 |



LAB DIRECTOR
CH/ Mostafa Asker

Mostafa





COMIBASSAL International Controllers

Internal inspection and laboratories sector

Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011

I-Introduction

| | |
|----------------------|---------------------------------|
| General Consultant : | SYSTRA |
| Consultant : | DR/ Khaled Kandil |
| Contractor : | شركة الصالحين للمقاولات |
| Sample : | Coarse Aggregate Filter layer. |
| Station : | From St(318+730) to St(319+900) |
| Date of Test : | 6-12-2023 |
| QC : | 2508-2 |

II- Sample description:

Coarse Aggregate mix.

III- Required tests and Results:

| Required tests | | Results |
|---|--|---------------------|
| 1- Specific gravity (SG), absorption and degradation. | SSD | 2.554 |
| | Absorption | 1.84% |
| | Degradation | 0.2% |
| 2- Grain size analysis | Grain size analysis | As shown in figures |
| 3- Los Angeles test | Abrasion ratio | 25.5% |
| 4- Percentage of flakiness Aggregate. | Total Percentage of flakiness portion | 4.45% |
| 5- Percentage of Elongation Aggregate. | Total Percentage of Elongation portion | 5.03% |
| 6- Percentage of natural aggregate. | Total Percentage of natural aggregate | 6.86% |

IV- Notes

- 1- Samples were brought by : Consultant.
- 2- Samples are responsible from the Person who brought it.
- 3- The results are applying only for the present report.

LAB DIRECTOR

Eng / Eman kandil

Eman.



Geotechnical consultant

For Dr. H.

Dr. Mohamed Mostafa Badry





COMIBASSAL International Controllers

Internal inspection and laboratories sector

Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011

APPENDIX



COMIBASSAL International Controllers

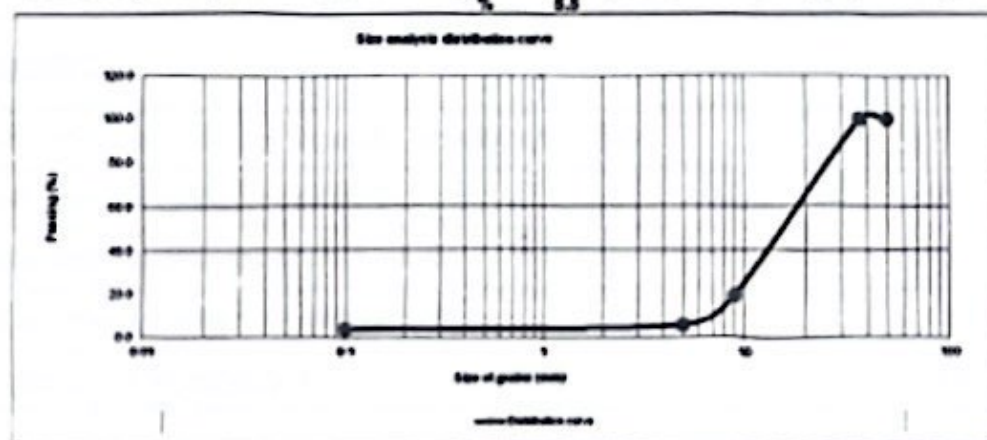
Internal inspection and laboratories sector

Accredited by : Egypt General Authority for Petroleum under No. 34/29-11-2011

PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

| Sieve size (mm) | WEIGHT RETAINED | CUMULATIVE WEIGHT | CUMULATIVE PERCENTAGE | CUMULATIVE PERCENTAGE | STANDARD SPECIFICATION LIMITS | |
|--------------------|--------------------|----------------------|--------------------------|--------------------------|-------------------------------------|-----|
| | (gm) | RETAINED (gm) | RETAINED (%) | PASSING (%) | | |
| 75 | 0.00 | 0.00 | 0.00 | 100.0 | 100 | 100 |
| 50 | 0.00 | 0.00 | 0.00 | 100.0 | 75 | 90 |
| 10 | 8330.00 | 8321.00 | 81.21 | 18.8 | 15 | 25 |
| No.4 | 1333.00 | 9454.00 | 94.54 | 5.46 | 0 | 10 |
| No.200 | 152.00 | 152.00 | 30.40 | 3.80 | 0 | 5 |

Total sample weight = 10000.00 pass No.4 = 546.0 Total fine aggregates weight = 500 gm
%





COMIBASSAL International Controllers

Internal inspection and laboratories sector

Accredited by : Egypton General Authority for Petroleum under No. 34/29-11-2011

Absorption and specific gravity for Coarse Aggregate ASTM C 127 - AASHTO T 85

| | |
|--|------|
| Weight of sample | 2500 |
| Weight of saturated - dry surface sample (B) | 2541 |
| Weight of saturated sample in water (C) | 1546 |
| Weight of dry sample after heating (A) | 2495 |

Results:-

| | |
|---|-------|
| Saturation surface dry specific gravity = $B / (B - C)$ | 2.554 |
| Bulk specific gravity = $A / (B - C)$ | 2.51 |
| Apparent specific gravity = $A / (A - C)$ | 2.63 |
| Absorption of water = $(B - A) / A * 100$ | 1.84 |
| Degradation of aggregate = $(2500 - A) / A * 100$ | 0.2 |





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ABRASION AND IMPACT " LOS ANGELES " TEST

(For small size coarse aggregate)

ASTM- C 131-96 / AASHTO-T-96

Results

| Speed | Rotate at 30 to 33 Rpm For 500 Revolution |
|---|--|
| Trial Grading | A |
| Intitial Weight (W1) gms | 5000 |
| Weight of tested sample (W2) gms Retained on sieve No.12 | 3726 |
| % Wear By Weight Passing on Sieve No.12 | 25.5% |





COMIBASSAL International Controllers

Internal inspection and laboratories sector

Accredited by : Egyptian General Authority for Petroleum under No. 34/29-11-2011

percentage of flakiness aggregate ASTM D-4791

Flakiness Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass of flakiness (gm) | Percentage of flakiness portion % |
|-------------------|----------|------------------------|------------------------|-----------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 1320 | 78 | 5.88 |
| 3/4 | 1/2 | 1478 | 42 | 2.84 |
| 1/2 | 3/8 | 987 | 53 | 5.37 |
| 3/8 | no. 4 | 365 | 11.8 | 3.23 |

| | | | | |
|--------------|------------------------|------|-------|------|
| Calculations | Total | 4166 | 184.8 | 4.48 |
| | Standard Specification | | | ≤10% |

Elongated Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass elongated (gm) | Percentage of elongated portion % |
|-------------------|----------|------------------------|---------------------|-----------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 1320 | 63 | 4.75 |
| 3/4 | 1/2 | 1478 | 25 | 1.69 |
| 1/2 | 3/8 | 987 | 85 | 8.61 |
| 3/8 | no. 4 | 365 | 36 | 9.86 |

| | | | | |
|--------------|------------------------|------|-----|------|
| Calculations | Total | 4166 | 209 | 5.03 |
| | Standard Specification | | | ≤10% |





COMIBASSAL International Controllers

Internal inspection and laboratories sector

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Percentage of crushed aggregate

Crushed Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass natural (gm) | Percentage of crushed portion % |
|-------------------|----------|------------------------|-------------------|---------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 1326 | 111 | 91.63 |
| 3/4 | 1/2 | 1474 | 56 | 96.20 |
| 1/2 | 3/8 | 987 | 97 | 90.17 |
| 3/8 | no. 4 | 365 | 21 | 94.25 |
| Total | | 4152.00 | 285 | 93.14 |

| | | |
|-------------------------|-------|---|
| Percentage of crushed = | 93.14 | % |
| Percentage of natural = | 6.86 | % |
| Standard specification | < 10 | % |





COMIBASSAL International Controllers

Internal inspection and laboratories sector

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| | | |
|--------|---|------------------|
| Report | : | 931 - 2 - Center |
| Date | : | 13/12/2023 |

CHEMICAL ANALYSIS

General Consultant : SYSTRA
Consultant : DR / KHALED KANDIL
Contractor : شركة الصالحين للمقاولات
Project : Electric express train
Sample : Corse Aggregate Filter Layer
Station : ST(318+730):(319+900)
Date of Test : 6-12-2023
Temperature : 24°C Humidity : 45%

| ANALYSIS | RESULTS | TEST METHOD |
|----------------|----------|-------------|
| CHLORIDE | 0.0014% | ASTM D 1411 |
| SULPHATE | 0.0032% | ASTM D 1540 |
| ORGANIG MATTER | NEGATIVE | ASTM D 2974 |



LAB DIRECTOR
CH/ Mostafa Asker

Mostafa Asker





COMIBASSAL International Controllers

Internal inspection and laboratories sector

Accredited by : Egypt General Authority for Petroleum under No. 34/29-11-2011

I-Introduction

General Consultant : SYSTRA
Consultant : DR/ Khaled Kandil
Contractor : شركة الصالحين للمقاولات
Sample : Coarse Aggregate Filter layer.
Section : St(318+730) to St(319+900)-
St(1+150) to St(1+620)
Station : From Stored materials
Date of Test : 16-12-2023
QC : 2547-3

II- Sample description:

Coarse Aggregate mix.

III- Required tests and Results:

| Required tests | | Results |
|---|--|---------------------|
| 1- Specific gravity (SG), absorption and degradation. | SSD | 2.546 |
| | Absorption | 1.81% |
| | Degradation | 0.3% |
| 2- Grain size analysis | Grain size analysis | As shown in figures |
| 3- Los Angeles test | Abrasion ratio | 24.2% |
| 4- Percentage of flakiness Aggregate. | Total Percentage of flakiness portion | 4.28% |
| 5- Percentage of Elongation Aggregate. | Total Percentage of Elongation portion | 4.49% |
| 6- Percentage of natural aggregate. | Total Percentage of natural aggregate | 5.78% |

IV- Notes

- 1- Samples were brought by : Consultant.
- 2- Samples are responsible from the Person who brought it.
- 3- The results are applying only for the present report.

LAB DIRECTOR

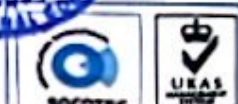
Eng / Eman kandil



Geotechnical consultant

Dr. Mohamed Mostafa Badry

Kilo 23 Alexandria - Cairo Desert Road - Merghem
Tel: 002 03 4704595 - 002 034701191
Email : clvdept@comibassal.com



49 El Horria Ave. Alex, Egypt
Tel: 002 033920176 - 002 033931482
Fax :002 033900476



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Internal inspection and laboratories sector

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APPENDIX

Kilo 23 Alexandria - Cairo Desert Road - Merghem
Tel: 002 03 4704595 - 002 034701191
Email : chdept@comibassal.com
WebSite : www.comibassal.com



49 El Horria Ave. Alex, Egypt
Tel: 002 033920176 - 002 033931482
Fax : 002 033900476
Email : Internal-inspection@comibassal.com



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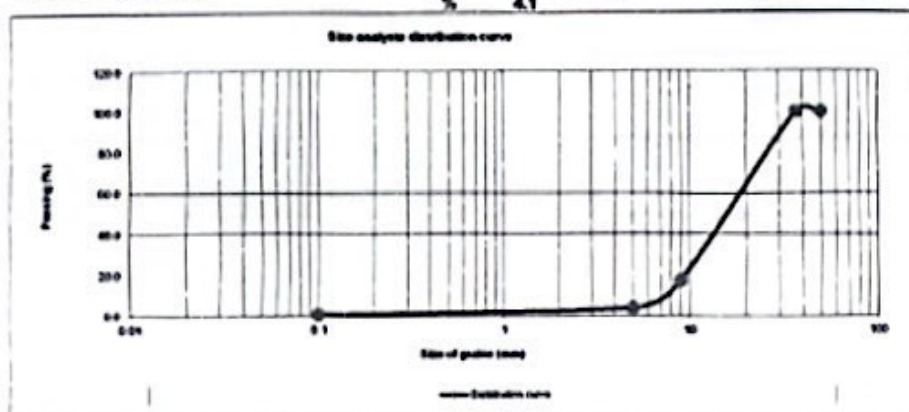
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PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

| Sieve size (mm) | WEIGHT | CUMULATIVE | CUMULATIVE | CUMULATIVE | STANDARD | |
|--------------------|------------------|-------------------------|----------------------------|---------------------------|----------|-----|
| | RETAINED (gm) | WEIGHT RETAINED (gm) | PERCENTAGE RETAINED (%) | PERCENTAGE PASSING (%) | | |
| 75 | 0.00 | 0.00 | 0.00 | 100.0 | 100 | 100 |
| 50 | 0.00 | 0.00 | 0.00 | 100.0 | 75 | 90 |
| 30 | 8241.00 | 8241.00 | 82.35 | 17.6 | 15 | 25 |
| No.4 | 1352.00 | 9593.00 | 95.86 | 4.14 | 6 | 10 |
| No.200 | 429.00 | 429.00 | 85.80 | 0.59 | 0 | 5 |

Total sample weight = 10007.00 pass No.4 = 414.0 Total fine aggregates weight = 500 gm
%



Cairo 23 Alexandria - Cairo Desert Road - Merghem
Tel: 002 03 4704595 - 002 034701191
mail: civdept@comibassal.com
WebSite : www.comibassal.com



49 El Horria Ave. Alex, Egypt
Tel: 002 033920176 - 002 033931482
Fax : 002 033900476
Email : internal-inspection@comibassal.com



COMIBASSAL International Controllers Internal inspection and laboratories sector

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ABRASION AND IMPACT " LOS ANGELES " TEST

(For small size coarse aggregate)

ASTM- C 131-96 / AASHTO-T-96

Results

| Speed | Rotate at 30 to 33 Rpm For 500 Revolution |
|---|--|
| Trial Grading | A |
| Intital Weight (W1) gms | 5000 |
| Weight of tested sample (W2) gms Retained on sieve No.12 | 3790 |
| % Wear By Weight Passing on Sieve No.12 | 24.2% |



Kilo 23 Alexandria - Cairo Desert Road - Merghem
Tel: 002 83 4704595 - 002 834701191
Email : chdept@comibassal.com
WebSite : www.comibassal.com



49 El Horria Ave. Alex, Egypt
Tel: 002 033920176 - 002 033931482
Fax : 002 033900476
Email : internal-inspection@comibassal.com



COMIBASSAL International Controllers

Internal inspection and laboratories sector

Accredited by : Egypt General Authority for Petroleum under No. 34/29-11-2011

percentage of flakiness aggregate ASTM D-4791

Flakiness Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass of flakiness (gm) | Percentage of flakiness portion % |
|-------------------|----------|------------------------|------------------------|-----------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 676.3 | 50 | 7.39 |
| 3/4 | 1/2 | 1993 | 37.8 | 1.90 |
| 1/2 | 3/8 | 128 | 33.1 | 25.86 |
| 3/8 | no. 4 | 163 | 6.8 | 3.72 |

| | | | | |
|--------------|------------------------|--------|-------|------|
| Calculations | Total | 2969.3 | 127.7 | 4.28 |
| | Standard Specification | | | ≤10% |

Elongated Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass elongated (gm) | Percentage of elongated portion % |
|-------------------|----------|------------------------|---------------------|-----------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 676.3 | 42.9 | 6.34 |
| 3/4 | 1/2 | 1993 | 43.9 | 2.20 |
| 1/2 | 3/8 | 128 | 37.22 | 29.06 |
| 3/8 | no. 4 | 163 | 9.9 | 5.41 |

| | | | | |
|--------------|------------------------|--------|--------|------|
| Calculations | Total | 2969.3 | 133.92 | 4.49 |
| | Standard Specification | | | ≤10% |



Kilo 23 Alexandria - Cairo Desert Road - Merghem
Tel: 002 03 4704595 - 002 034701191
Email : civdept@comibassal.com
WebSite : www.comibassal.com



49 El Horria Ave. Alex, Egypt
Tel: 002 033920176 - 002 033931482
Fax :002 033900476
Email : Internal-Inspection@comibassal.com



COMIBASSAL International Controllers

Internal inspection and laboratories sector

Accredited by : Egypt General Authority for Petroleum under No. 34/29-11-2011

Percentage of crushed aggregate

Crushed Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass natural (gm) | Percentage of crushed portion % |
|-------------------|----------|------------------------|-------------------|---------------------------------|
| Passing | Retained | | | |
| 1 | 3/4 | 576.3 | 38.9 | 94.25 |
| 3/4 | 1/2 | 1993 | 12.05 | 99.40 |
| 1/2 | 3/8 | 2180 | 190 | 91.28 |
| 3/8 | no. 4 | 189.3 | 50.1 | 73.53 |
| Total | | 5038.60 | 291.05 | 94.22 |

| | | |
|-------------------------|-------|---|
| Percentage of crushed = | 94.22 | % |
| Percentage of natural = | 5.78 | % |
| Standard specification | ≤ 10 | % |



Kilo 23 Alexandria - Cairo Desert Road - Merghem
Tel: 002 83 4704595 - 002 034701191
Email : clvdept@comibassal.com
WebSite : www.comibassal.com



49 El Horria Ave. Alex, Egypt
Tel: 002 033920176 - 002 033931482
Fax : 002 033900476
Email : internal-inspection@comibassal.com



COMIBASSAL International Controllers Internal inspection and laboratories sector

Accredited by : Egypt General Authority for Petroleum under No. 34/29-11-2011

Absorption and specific gravity for Coarse Aggregate ASTM C 127 - AASHTO T 85

| | |
|--|------|
| Weight of sample | 2500 |
| Weight of saturated - dry surface sample (B) | 2538 |
| Weight of saturated sample in water (C) | 1541 |
| Weight of dry sample after heating (A) | 2493 |

Results:-

| | |
|---|-------|
| Saturation surface dry specific gravity = $B / (B - C)$ | 2.546 |
| Bulk specific gravity = $A / (B - C)$ | 2.50 |
| Apparent specific gravity = $A / (A - C)$ | 2.62 |
| Absorption of water = $(B - A) / A * 100$ | 1.81 |
| Degradation of aggregate = $(2500 - A) / A * 100$ | 0.3 |



Kilo 23 Alexandria - Cairo Desert Road - Merghem
Tel: 002 03 4704595 - 002 034701191
Email : civdept@comibassal.com
WebSite : www.comibassal.com



49 El Horria Ave. Alex, Egypt
Tel: 002 033920176 - 002 033931482
Fax : 002 033900476
Email : Internal-Inspection@comibassal.com



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I-Introduction

General Consultant : SYSTRA
Consultant : Dr/khaked kandil
Contractor : شركة الصالحين للمقاولات
Sample : Coarse Aggregate Filter layer.
Section : St(318+730) to st(319+900)-
St(1+150) to st(1+620)
Station : From Stored materials
Date of Test : 16-12-2023
QC : 2547-4

II- Sample description:

Coarse Aggregate mix.

III- Required tests and Results:

| Required tests | | Results |
|---|--|---------------------|
| 1- Specific gravity (SG), absorption and degradation. | SSD | 2.587 |
| | Absorption | 1.48% |
| | Degradation | 0.1% |
| 2- Grain size analysis | Grain size analysis | As shown in figures |
| 3- Los Angeles test | Abrasion ratio | 25.8% |
| 4- Percentage of flakiness Aggregate. | Total Percentage of flakiness portion | 5.90% |
| 5- Percentage of Elongation Aggregate. | Total Percentage of Elongation portion | 2.91% |
| 6- Percentage of natural aggregate. | Total Percentage of natural aggregate | 6.28% |

IV- Notes

- 1- Samples were brought by : Consultant
- 2- Samples are responsible from the Person who brought it.
- 3- The results are applying only for the present report.

LAB DIRECTOR
Eng / Eman kandil

Geotechnical consultant
Dr. Mohamed Mostafa Badry



Kilo 23 Alexandria - Cairo Desert Road - Merghem
Tel: 002 03 4704595 - 002 034701191
Email : chvdept@comibassal.com
WebSite : www.comibassal.com



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Tel: 002 033920176 - 002 033931482
Fax :002 033900476
Email : internal-inspection@comibassal.com



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APPENDIX

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Tel: 002 03 4704595 - 002 034701191
Email : cindept@comibassal.com
WebSite : www.comibassal.com



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Tel: 002 033920176 - 002 033931482
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Absorption and specific gravity for Coarse Aggregate ASTM C 127 - AASHTO T 85

| | |
|--|------|
| Weight of sample | 2500 |
| Weight of saturated - dry surface sample (B) | 2535 |
| Weight of saturated sample in water (C) | 1555 |
| Weight of dry sample after heating (A) | 2498 |

Results:-

| | |
|---|-------|
| Saturation surface dry spicific gravity = $B / (B-C)$ | 2.587 |
| Bulk spicific gravity = $A / (B-C)$ | 2.55 |
| Apparent spicific gravity = $A / (A-C)$ | 2.65 |
| Absorbition of water = $(B-A)/A \times 100$ | 1.48 |
| Degradation of aggregate = $(2500-A)/A \times 100$ | 0.1 |



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Tel: 002 033920176 - 002 033931482
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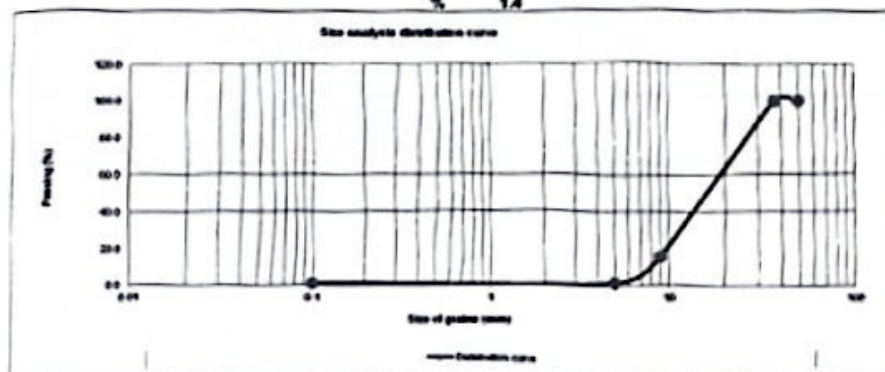
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PARTICLE SIZE DISTRIBUTION ANALYSIS ASTM C-136 / AASHTO T27

| Sieve size (mm) | WEIGHT | CUMULATIVE | CUMULATIVE | CUMULATIVE | STANDARD SPECIFICATION LIMITS | |
|--------------------|------------------|-------------------------|----------------------------|---------------------------|-------------------------------------|-----|
| | RETAINED (gm) | WEIGHT RETAINED (gm) | PERCENTAGE RETAINED (%) | PERCENTAGE PASSING (%) | | |
| 75 | 0.00 | 0.00 | 0.00 | 100.0 | 100 | 100 |
| 50 | 0.00 | 0.00 | 0.00 | 100.0 | 75 | 90 |
| 30 | 8413.00 | 8413.00 | 84.13 | 15.9 | 15 | 25 |
| No. 4 | 1450.00 | 9863.00 | 98.63 | 1.4 | 0 | 10 |
| No. 200 | 114.40 | 114.40 | 22.88 | 1.1 | 0 | 5 |

Total sample weight = 10000.00 pass No. 4 = 137.0 Total fine aggregates weight = 500
% 1.4



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Fax : 002 033900476
Email : Internal-Inspection@comibassal.com



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ABRASION AND IMPACT " LOS ANGELES " TEST

(For small size coarse aggregate)

ASTM- C 131-96 / AASHTO-T-96

Results

| Speed | Rotate at 30 to 33 Rpm For 500 Revolution |
|---|--|
| Trial Grading | A |
| Intitial Weight (W1) gms | 5000 |
| Weight of tested sample (W2) gms Retained on sieve No.12 | 3710.4 |
| % Wear By Weight Passing on Sieve No.12 | 25.8% |



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Tel: 002 033920176 - 002 033931482
Fax :002 033900476
Email : Internal-inspection@comibassal.com



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percentage of flakiness aggregate ASTM D-4791

Flakiness Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass of flakiness (gm) | Percentage of flakiness portion % |
|---|----------|------------------------|------------------------|-----------------------------------|
| Passing | Retained | | | |
| 1.5 | 1 | 696 | 0 | 0.00 |
| 1 | 3/4 | 515 | 15 | 2.91 |
| 3/4 | 1/2 | 321 | 5.1 | 1.59 |
| 1/2 | 3/8 | 150 | 2.1 | 1.40 |
| Total Percentage of flakiness portion % | | | | 5.90 |
| Standard Specification | | | | ≤ 10% |

Elongated Determination

| Sieve size "inch" | | Mass test portion (gm) | Mass elongated (gm) | Percentage of elongated portion % |
|---|----------|------------------------|---------------------|-----------------------------------|
| Passing | Retained | | | |
| 1.5 | 1 | 696 | 0 | 0.00 |
| 1 | 3/4 | 515 | 12.6 | 2.45 |
| 3/4 | 1/2 | 321 | 1.5 | 0.47 |
| 1/2 | 3/8 | 150 | 0 | 0.00 |
| Total Percentage of Elongated portion % | | | | 2.91 |
| Standard Specification | | | | ≤ 10% |



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Tel: 002 03 4704595 - 002 034701197
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Tel: 002 033920176 - 002 033931482
Fax : 002 033900476
Email : internal-inspection@comibassal.com



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Percentage of crushed aggregate

Crushed Determination

| Sieve size "Inch" | | Mass test portion (gm) | Mass natural (gm) | Percentage of crushed portion % |
|-------------------|----------|------------------------|-------------------|---------------------------------|
| Passing | Retained | | | |
| 1 1/2 | 1 | 696 | 35 | 94.97 |
| 1 | 3/4 | 515 | 28.6 | 94.45 |
| 3/4 | 1/2 | 321 | 30 | 90.65 |
| 1/2 | 3/8 | 150 | 12 | 92.00 |
| Total | | 1682.00 | 105.6 | 93.72 |

| | | |
|-------------------------|-------|---|
| Percentage of crushed = | 93.72 | % |
| Percentage of natural = | 6.28 | % |
| Standard specification | < 10 | % |



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Email : civdept@comibassal.com
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Tel: 002 033920176 - 002 033931482
Fax :002 033900476
Email : Internal-Inspection@comibassal.com



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| | |
|----------|------------------|
| Report : | 883 - 1 - Center |
| Date : | 25/12/2023 |

CHEMICAL ANALYSIS

General Consultant : SYSTRA
Consultant : DR / KHALED KANDIL
Contractor : شركة الصالحين للمقاولات
Project : Electric express train
Sample : Coarse Aggregate Filter Layer
Station : From Stored Materials
Section : ST(318+730):(319+900)
ST(1+150):(1+620)

Date of Test : 16-12-2023

Temperature : 22°C

Humidity : 45%

| ANALYSIS | RESULTS | TEST METHOD |
|----------------|----------|-------------|
| CHLORIDE | 0.0017% | ASTM D 2974 |
| SULPHATE | 0.0031% | |
| ORGANIC MATTER | NEGATIVE | |



LAB DIRECTOR
CH/ Mostafa Asker

Moustafa

Kilo 23 Alexandria - Cairo Desert Road - Merghem
Tel: 002 03 4704595 - 002 034701191
Email: clvdept@comibassal.com
WebSite: www.comibassal.com



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Tel: 002 033920176 - 002 033931482
Fax: 002 033900476
Email: Internal-Inspection@comibassal.com

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| | |
|----------|------------------|
| Report : | 919 - 2 - Center |
| Date : | 25/12/2023 |

CHEMICAL ANALYSIS

General Consultant : SYSTRA
Consultant : DR / KHALED KANDIL
Contractor : شركة الصالحين للمطاولات
Project : Electric express train
Sample : Corse Aggregate Filter Layer
Station : From Stored Materials
Section : ST(318+730):(319+900)
ST(1+150):(1+620)

Date of Test : 16-12-2023

Temperature : 22°C Humidity : 45%

| ANALYSIS | RESULTS | TEST METHOD |
|----------------|----------|-------------|
| CHLORIDE | 0.0013% | ASTM D 2974 |
| SULPHATE | 0.0034% | |
| ORGANIC MATTER | NEGATIVE | |



LAB DIRECTOR
CH/ Mostafa Asker

Moustafa

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Email: clvdept@comibassal.com
WebSite: www.comibassal.com



49 El Horria Ave. Alex, Egypt
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Fax: 002 033900476
Email: internal-inspection@comibassal.com

محضر استلام موقع

العملية:

اسناد أعمال الجسر الترابي للخط الأول لمشروع القطار الكهربائي السريع (العين السخنة - العاصمة الإدارية - العلمين - مطروح) (قطاع وادي النطرون / برج العرب) لتنفيذ المسافة من W(318+730) إلى W(319+900) بطول 1170م وفي المسافة من 1+150 إلى 1+620 بطول 470م المرحلة الأولى " ردم سن الفلتر "

تنفيذ: شركة "شركة الصالحين للمقاولات العامة"

استشاري المشروع: المكتب الاستشاري الهندسي (أ.د/خالد قنديل)

إشراف: المنطقة الخامسة - منطقة غرب الدلتا

طبقاً للعقد رقم (1557-2023-2024) بتاريخ (2024/05/15)

أنه في يوم الاثنين الموافق 2024/08/05 اجتمع كل من:

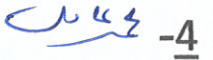


- | | |
|---|---|
| 1- السيد المهندس / محمد حسني فياض | مدير عام المشروعات - الهيئة العامة للطرق والكباري |
| 2- السيد المهندس / أحمد جلال عبد السلام | مهندس العملية - الهيئة العامة للطرق والكباري |
| 3- السيد المهندس / هشام محمد صبري | استشاري المشروع (أ.د خالد قنديل) |
| 4- السيد المهندس / محمد عادل | مدير مشروع - شركة الصالحين للمقاولات العامة |

وذلك للمرور على مسار العملية المذكورة عالية لاستلام الموقع. وقد تبين أن الموقع خالي من العوائق الظاهرية ويسمح بالبدء في التنفيذ وبناءً عليه يعتبر تاريخ 2024/08/05 هو تاريخ استلام الموقع وبدء أعمال الإشراف بالعملية. واقفل المحضر علي ذلك ووقع الحضور.

التوقيعات:

رئيس الإدارة المركزية
منطقة غرب الدلتا
الاسكندرية - مرسى مطروح
عميد مهندس /
"هاني محمد محمود طه"



4- 
3- 
2- أحمد جلال
1- 

محضر بيان نسبة الغرز بطبقة الفلتر بالمياه الجوفية

انه في يوم البار الموافق ١٩ / ١٢ / ٢٠٢٢ تم الاجتماع بالقطاع الخاص بشركة "الصالحين للمقاولات العامة" من الكم W (318+730) الي الكم W (319+900) ومن الكم 1+150 الي الكم 1+620 في حضور كلا من :

عن الاستشاري هيئة الطرق والكباري:

- 1- م/ هشام صبري
(مدير مشروع مكتب دكتور خالد قنديل)
- 2- م/ محمد علي
(مدير مشروع مكتب اكس واي زد)

عن شركة " الصالحين للمقاولات العامة "

- 3- م/ محمد عادل
(مدير مشروع شركة الصالحين للمقاولات العامة)

تم عمل قطاع تجريبي لبيان نسبة غرز السن في طبقة الفلتر في المياه الجوفية في قطاع الشركة
وعليه تم الاتفاق أن نسبة الغرز هي (25%)

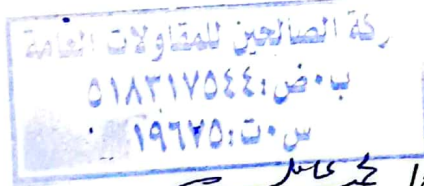
وقد تحرر هذا المحضر منا بتاريخ ٢٠٢٢ / ١٢ / ٢٠

التوقيعات :

3- م/ محمد عادل

2- م/ محمد علي

1- م/ هشام صبري

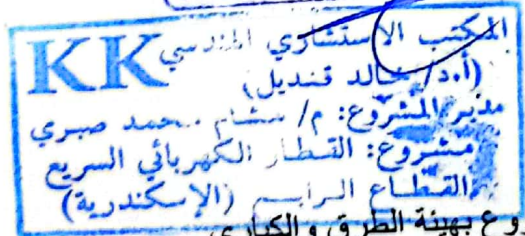


التوقيع / محمد علي



التوقيع / محمد علي

التوقيع /



مدير المشروع بهيئة الطرق والكباري
م/ أحمد جلال عبد السلام

أحمد جلال

**المقايضة المعدلة لبنود استكمال أعمال ردم سن فلتر (1)
في المسافة من W(318+730) إلى W(319+900) بطول 1170م
وفي المسافة من 1+150 إلى 1+620 بطول 470م
بمسار القطار الكهربائي السريع قطاع (وادي النطرون-برج العرب-الاسكندرية)
تنفيذ شركة الصالحين للمقاولات العامة**

| رقم البند | بيان الأعمال | الوحدة | الكمية | الفئة | الإجمالي |
|---|--|--------|--------|--------|------------|
| 1 | أعمال الردم | | | | |
| 1-1 | بالمتر المكعب أعمال توريد وفرش طبقة فلتر من الاحجار الصلبة المترججة ناتج تكسير كسرات والمطبقة للمواصلات وأقصى حجم حبيبي ما بين 20 مم الي 75 مم والا يزيد نسبة المار من منخل 200 عن 5% والتدرج الوارد بالاشتراطات الخاصة بالمشروع وهي احجار مقل من 1 : 2 : 4 او من 6 بنسبة 1 : 1 : 1 والا يقل معامل المرونة EV2 من تجربة لوح التحميل عن 50 ميجاباسكال والا يزيد نسبة الفاقد بجهاز لوس اتجلوس عن 45 % والفئة تشمل أعمال التجارب المعملية والبند يشمل اجراء التجارب المعملية والحقلية طبقا لأصول الصناعة الممتازة وتقرير الاستشاري وتعليمات المهندس المشرف . -مسافة النقل 20 كم. -الفئة شاملة قيمة المادة المحجيرة. - يتم احتساب 1.3 جنيه للكم بالزيادة او النقصان | | | | |
| | السعر خلال شهر مايو طبقاً للمفاوضة الخاصة بتاريخ 18/12/2023 | 3م | 34400 | 347.20 | 11,943,680 |
| | علاوة مسافة النقل 161 كم | 3م | 34400 | 183.30 | 6,305,520 |
| | علاوة تحصيل رسوم الكارثة والموازن طبقاً لائحة الشركة الوطنية | 3م | 34400 | 25.00 | 860,000 |
| | الإجمالي | | | | 19,109,200 |
| (تسعة عشر مليوناً ومائة وتسعة ألفاً ومئتان جنيه مصري فقط لا غير) | | | | | |
| ملحوظة :- يرجى العلم بان الفئات المذكورة طبقاً للمفاوضة الخاصة بالقطاع الرابع بتاريخ 2023-12-18 | | | | | |

مدير مشروعات الهيئة

م/محمد حسني فياض

مدير المشروع الهيئة

أحمد جلال
م / أحمد جلال

مدير المشروع الاستشاري

م/هشام محمد صبري

مدير المشروع المقاول

م / أحمد عادل

بمكتب
رئيس الإدارة المركزية
منطقة غرب الدلتا
الاسكندرية - مرسى مطروح
عميد مهندس
هاني محمد محمود طه
01131781131

المكتب الاستشاري الهندسي
أ.د/ خالد قنديل
م/ هشام محمد صبري
مدير المشروع
القطاع الرابع (الاسكندرية)
م/ هادي محمد صبري

م/ أحمد عادل
01131781131
19/12/2023