Transportation Engineering Laboratory (TEL)

Department of Civil Engineering (CED)

UNIVERSITY OF ENGINEERING & TECHNOLOGY (UET)

LAHORE – 54890 (PAKISTAN)

Phone: 092-42-9929202 Cable: UNIVENGTECH Fax: 092-42-9922566

Ref.---------- Date:----------

Mr. Muhammad Mohsin
Resident Engineer,
NESPAK, Lahore.

Subject: **Testing of Material Samples** (Coarse and Fine Aggregates)
Tender No. P&S/25.01/5655 – Storm Water Drainage System from Sham Nagar to River Ravi (Package-II)

Dear Sir,

It is with reference to your letter No. 3882/11/MM/01/447 dated 20-01-2025.
Please find below the results for the tests conducted on the aggregate samples provided to this laboratory through your representative.

Coarse Aggregate

1. **Sieve Analysis (ASTM C-136)**

Sieve Size	1”	¾”	½”	3/8”	#4
%age Passing	100	97.95	21.47	3.40	0

2. **Specific Gravity & Water Absorption (ASTM C-127)**

Specific Gravity (oven dried condition)	2.81
Specific Gravity (saturated surface dry condition)	2.82
Apparent Specific Gravity	2.84
Water Absorption (%)	0.40

3. **Sodium Sulphate Soundness (ASTM C-88)**

Sieve Size	Weight of Fraction Before Test. (gm)	Weight of Fraction After Test. (gm)	Percentage Passing Designated Sieve After Test.	Weighted Percentage Loss.
$1/2" + 3/8"$	1001.4	992.4	0.90	0.85
	Total = 0.85%			

4. **Los Angeles Abrasion Value Test (ASTM C-131/535)**

Grading Used	Los Angeles Abrasion Value (%)
B	17.50

5. **Flakiness & Elongation Index (BS 812: Part 105)**

Sieve Size		Individual Flakiness Index (%)	Weighted Flakiness Index (%)	Individual Elongation Index (%)	Weighted Elongation Index (%)
Passing (in.)	Retained (in.)				
1	$^3/_4$	0	0	28.21	0.58
$^3/_4$	$^1/_2$	5.95	4.55	7.34	5.62
$^1/_2$	$^3/_8$	4.17	0.75	13.52	2.44
$^3/_8$	$^1/_4$	11.45	0.39	23.02	0.78
		Flakiness Index = 5.69%		**Elongation Index = 9.42%**	

Fine Aggregate (Sand)

1. **Sieve Analysis (ASTM C-136)**

Sieve Size	½"	3/8"	#4	#8	#16	#30	#50	#100	#200
%age Passing	100	98.95	95.57	90.02	79.00	63.32	26.77	5.86	1.20

2. **Silt and Clay Content (ASTM D-1140)** ***Wet Sieving***

Silt and Clay (%)	1.66

3. **Fineness Modulus (ASTM C-142)**

Fineness Modulus (%)	2.41

4. **Specific Gravity & Water Absorption (ASTM C-128)**

Specific Gravity (OD)	2.68
Specific Gravity (SSD)	2.71
Apparent Specific Gravity	2.75
Water Absorption (%)	0.93

5. **Organic Impurities (ASTM C-40)**

Organic Impurities	Nil

If you have further query, please do not hesitate to contact the undersigned.

Best Regards,

Director
Transportation Engineering Laboratory

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Ref.---------- Date:----------

The Sub Divisional Officer,
Highway Sub Division,
Choubara.

Subject: **Testing of Coarse Aggregates**
Restoration of Road from Adda Saharan Chowk to Head Mast Ali I/C Link to Chak No. 123/ML & Basti Waraich (Taken Length = 11.00 km) District Layyah

Dear Sir,

It is with reference to your letter No. 77 dated 10-02-2025.
Please find below the results for the tests conducted on the aggregate samples provided to this laboratory on 14-03-2025 through your representative.

Base Course Sample

1. **Specific Gravity & Water Absorption (ASTM C-127)**

Specific Gravity (oven dried condition)	2.73
Specific Gravity (saturated surface dry condition)	2.75
Apparent Specific Gravity	2.78
Water Absorption (%)	0.63

2. **Los Angeles Abrasion Value Test (ASTM C-131/535)**

Grading Used	Los Angeles Abrasion Value (%)
1	20.65

3. **Flakiness & Elongation Index (BS 812: Part 105)**

Sieve Size		Individual Flakiness Index (%)	Weighted Flakiness Index (%)	Individual Elongation Index (%)	Weighted Elongation Index (%)
Passing (in.)	Retained (in.)				
3	2 ½	0	0	0	0
2 ½	2	7.75	4.37	10.19	5.74
2	1 ½	5.99	1.75	7.02	2.05
		Flakiness Index = 6.12%		**Elongation Index = 7.79%**	

Sub-base Course Sample

1. **Specific Gravity & Water Absorption (ASTM C-127)**

Specific Gravity (oven dried condition)	2.68
Specific Gravity (saturated surface dry condition)	2.72
Apparent Specific Gravity	2.78
Water Absorption (%)	1.34

2. **Los Angeles Abrasion Value Test (ASTM C-131/535)**

Grading Used	Los Angeles Abrasion Value (%)
A	26.19

3. **Flakiness & Elongation Index (BS 812: Part 105)**

Sieve Size		Individual Flakiness Index (%)	Weighted Flakiness Index (%)	Individual Elongation Index (%)	Weighted Elongation Index (%)
Passing (in.)	Retained (in.)				
2	1 ½	0	0	23.65	0.65
1 ½	1	11.99	3.32	17.78	4.93
1	3/4	12.30	3.70	15.55	4.68
3/4	1/2	17.43	3.36	34.27	6.62
1/2	3/8	15.54	1.81	18.13	2.11
3/8	1/4	5.37	0.46	13.72	1.17
		Flakiness Index = 12.65%		**Elongation Index = 20.16%**	

Wearing Course Sample

1. **Specific Gravity & Water Absorption (ASTM C-127)**

Specific Gravity (oven dried condition)	2.81
Specific Gravity (saturated surface dry condition)	2.82
Apparent Specific Gravity	2.84
Water Absorption (%)	0.37

2. **Los Angeles Abrasion Value Test (ASTM C-131/535)**

Grading Used	Los Angeles Abrasion Value (%)
B	16.38

3. Flakiness & Elongation Index (BS 812: Part 105)

Sieve Size		Individual Flakiness Index (%)	Weighted Flakiness Index (%)	Individual Elongation Index (%)	Weighted Elongation Index (%)
Passing (in.)	Retained (in.)				
1	$^3/_4$	0	0	15.75	0.22
$^3/_4$	$^1/_2$	6.28	3.30	11.75	6.17
$^1/_2$	$^3/_8$	4.32	1.51	6.68	2.33
$^3/_8$	$^1/_4$	8.31	0.93	13.37	1.49
		Flakiness Index = 5.74%		**Elongation Index = 10.21%**	

If you have further query, please do not hesitate to contact the undersigned.

Best Regards,

Director
Transportation Engineering Laboratory

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Ref.---------- Date:----------

Mr. Amjad Saeed
Resident Engineer,
NESPAK.

Subject: **Testing of Coarse Aggregate**
Road Rehabilitation/Annual Development Programme (2024-2025) in Highway Circle No. 2, Faisalabad
Restoration/Improvement of Road from Jahangeer Morr to Gojra Road,
Length = 27.15 km (Reach from Jalandar Pull to Chak # 277/RB Seetlan), Remaining Portion District Faisalabad, Taken km # 14.32 to km # 27.15,
Length = 12.83 km (GS-2013)

Dear Sir,

It is with reference to your letter No. 4834/F/(RR)/103/AS/03/384 dated 14-03-2025.
Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 24-03-2025 through your representative.

1. **Sieve Analysis (ASTM C-136)**

Sieve Size	1”	¾”	½”	3/8”	#4
%age Passing	100	95.34	9.47	0.46	0

2. **Sodium Sulphate Soundness (ASTM C-88)**

Sieve Size	Weight of Fraction Before Test. (gm)	Weight of Fraction After Test. (gm)	Percentage Passing Designated Sieve After Test.	Weighted Percentage Loss.
$1/2" + 3/8"$	1004.3	995.1	0.92	0.87
	Total = 0.87%			

3. **Los Angeles Abrasion Value Test (ASTM C-131/535)**

Grading Used	**Los Angeles Abrasion Value (%)**
B	15.66

4. Flakiness & Elongation Index (BS 812: Part 105)

Sieve Size		Individual Flakiness Index (%)	Weighted Flakiness Index (%)	Individual Elongation Index (%)	Weighted Elongation Index (%)
Passing (in.)	Retained (in.)				
1	$^3/_4$	0	0	0	0
$^3/_4$	$^1/_2$	4.47	3.84	6.47	5.55
$^1/_2$	$^3/_8$	3.88	0.35	19.32	1.74
$^3/_8$	$^1/_4$	0	0	51.90	0.24
		Flakiness Index = 4.19%		**Elongation Index = 7.53%**	

If you have further query, please do not hesitate to contact the undersigned.

Best Regards,

Director
Transportation Engineering Laboratory

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