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. M. Hassan Khan
Resident Engineer,
NESPAK, Lahore.

Subject: **Testing of WBM Material**
Scheme # 11, Rehabilitation/Improvement of Ehsan Road, Faiz Bagh Shahi Road, Macca Chowk to Khushi Marriage Ghulam Hussain Park Road, Shalamar Zone MCL

Dear Sir,

It is with reference to your letter No. 4084/103/LDP/SMZ(S-11)/04/25 dated 14-01-2025. Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 11-02-2025 through your representative.

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

Sieve Size	3”	2 ½”	2”	1 ½”	1”	¾”	½”	3/8”	#4
%age Passing	100	80.74	16.21	0.47	0	0	0	0	0

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

Specific Gravity (oven dried condition)	2.69
Specific Gravity (saturated surface dry condition)	2.72
Apparent Specific Gravity	2.76
Water Absorption (%)	0.90

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
2” + 1 ½”	5003.4	4934.1	1.39	1.11
	Total = 1.11%			

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

Grading Used	**Los Angeles Abrasion Value (%)**
1	19.09

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

Best Regards,

Director
Transportation Engineering Laboratory

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LAHORE – 54890 (PAKISTAN)

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

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

Mr. M. Hassan Khan
Resident Engineer,
NESPAK, Lahore.

Subject: **Testing of Sub-base Material**
Scheme # 11, Rehabilitation/Improvement of Ehsan Road, Faiz Bagh Shahi Road, Macca Chowk to Khushi Marriage Ghulam Hussain Park Road, Shalamar Zone MCL

Dear Sir,

It is with reference to your letter No. 4084/103/LDP/SMZ(S-11)/04/24 dated 14-01-2025. Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 11-02-2025 through your representative.

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

Sieve Size	2”	1 ½”	1”	¾”	½”	3/8”	#4
%age Passing	100	100	78.58	55.80	39.08	26.67	21.36

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

Specific Gravity (oven dried condition)	2.66
Specific Gravity (saturated surface dry condition)	2.71
Apparent Specific Gravity	2.78
Water Absorption (%)	1.63

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” + ¾”	1007.9	985.9	2.18	0.96
	Total = 0.96%			

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

Grading Used	**Los Angeles Abrasion Value (%)**
1	26.07

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

Best Regards,

Director
Transportation Engineering Laboratory

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LAHORE – 54890 (PAKISTAN)

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

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

The Team Leader,
Enviro Consult (SMC-PVT) Ltd.,
Lahore.

Subject: **Testing of Coarse and Fine Aggregates**
Solarization of MC Office & Disposal Stations in Okara City
Detailed Design of Solarization of Sub-Projects and Resident Supervision in 10 out of 16 Cities of Punjab

Dear Sir,

It is with reference to your letter No. ENVIRO/PMDFC/SOLAR/334/2025/29 dated 01-01-2025. Please find below the results for the tests conducted on the aggregate samples provided to this laboratory on 06-01-2025 through your representative.

Coarse Aggregate

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

Sieve Size	¾”	½”	3/8”	#4
%age Passing	100	40.55	7.44	0

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

Specific Gravity (oven dried condition)	2.82
Specific Gravity (saturated surface dry condition)	2.83
Apparent Specific Gravity	2.86
Water Absorption (%)	0.45

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
$1/2" + 3/8"$	1002.2	990.9	1.13	1.05
	Total = 1.05%			

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

Grading Used	Los Angeles Abrasion Value (%)
B	16.12

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.)				
$^3/_4$	$^1/_2$	12.82	7.62	17.24	10.25
$^1/_2$	$^3/_8$	13.09	4.34	15.34	5.08
$^3/_8$	$^1/_4$	18.06	1.34	43.00	3.20
		Flakiness Index = 13.30%		**Elongation Index = 18.53%**	

Fine Aggregate (Sand)

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

Sieve Size	#4	#8	#16	#30	#50	#100	#200
%age Passing	100	99.89	99.71	99.43	87.34	9.55	1.40

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

Fineness Modulus (%)	1.04

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

Specific Gravity (OD)	2.63
Specific Gravity (SSD)	2.65
Apparent Specific Gravity	2.68
Water Absorption (%)	0.81

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

Best Regards,

Director
Transportation Engineering Laboratory

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LAHORE – 54890 (PAKISTAN)

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

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

Mr. Muhammad Zain-Ul-Abadeen
Resident Engineer,
NESPAK, Lahore.

Subject: **Testing of Coarse Aggregate**
Tender No. XEN(O&M-I) NT/2024-25/87 - Improvement of Water Supply and Sewerage System in UC-239, Nishter Zone, Lahore

Dear Sir,

It is with reference to your letter No. 43101/MZA/01/1032 dated 03-01-2025.
Please find below the results for the tests conducted on the aggregate sample provided to this laboratory through your representative.

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

Sieve Size	¾”	½”	3/8”	#4
%age Passing	100	8.93	0	0

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

Specific Gravity (oven dried condition)	2.86
Specific Gravity (saturated surface dry condition)	2.87
Apparent Specific Gravity	2.89
Water Absorption (%)	0.31

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
$1/2" + 3/8"$	1001.1	992.3	0.88	0.88
	Total = 0.88%			

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

Grading Used	**Los Angeles Abrasion Value (%)**
B	15.38

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.)				
$^{3}/_{4}$	$^{1}/_{2}$	4.10	3.73	6.13	5.58
$^{1}/_{2}$	$^{3}/_{8}$	4.36	0.39	7.05	0.63
		Flakiness Index = 4.12%		**Elongation Index = 6.21%**	

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

Best Regards,

Director
Transportation Engineering Laboratory

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LAHORE – 54890 (PAKISTAN)

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

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

Mr. Muhammad Zain-Ul-Abadeen
Resident Engineer,
NESPAK, Lahore.

Subject: **Testing of Fine Aggregate**
Tender No. XEN(O&M-I) NT/2024-25/87-Improvement of Water Supply and Sewerage System in UC-239, Nishter Zone, Lahore

Dear Sir,

It is with reference to your letter No. 43101/MZA/01/1162 dated 09-01-2025.
Please find below the results for the tests conducted on the aggregate sample provided to this laboratory through your representative.

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

Sieve Size	#4	#8	#16	#30	#50	#100	#200
%age Passing	100	99.86	99.64	99.39	87.34	9.29	1.20

2. **Percentage of Fines (ASTM D-1140)** ***Wet Sieving***

Silt and Clay (%)	4.44

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

Fineness Modulus (%)	1.04

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

Specific Gravity (OD)	2.64
Specific Gravity (SSD)	2.66
Apparent Specific Gravity	2.69
Water Absorption (%)	0.77

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

Organic Impurities	Nil

6. 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
#30 to #50	100.0	98.7	1.30	0.16
			Total = 0.16%	

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

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Director
Transportation Engineering Laboratory

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LAHORE – 54890 (PAKISTAN)

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

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

Mr. Salim Javed
Resident Engineer,
NESPAK, Lahore.

Subject: **Testing of Coarse Aggregate**
Tender No. XEN(O&M-I) NT/2024-25/76 - Provision of Water Supply and Sewerage System in Azam Chowk to Ch. Colony, UC-242, Nishter Zone, Lahore

Dear Sir,

It is with reference to your letter No. 43101/MZA/01/1134 dated 08-01-2025.
Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 14-01-2025 through your representative.

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

Sieve Size	¾”	½”	3/8”	#4
%age Passing	100	17.93	0.37	0

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

Specific Gravity (oven dried condition)	2.86
Specific Gravity (saturated surface dry condition)	2.87
Apparent Specific Gravity	2.89
Water Absorption (%)	0.34

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
$1/2" + 3/8"$	1002.4	992.9	0.95	0.94
	Total = 0.94%			

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

Grading Used	**Los Angeles Abrasion Value (%)**
B	14.87

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.)				
$^3/_4$	$^1/_2$	6.83	5.61	7.14	5.86
$^1/_2$	$^3/_8$	6.25	1.10	8.24	1.45
$^3/_8$	$^1/_4$	0	0	100	0.37
		Flakiness Index = 6.71%		**Elongation Index = 7.68%**	

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

Best Regards,

Director
Transportation Engineering Laboratory

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

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

Mr. Salim Javed
Resident Engineer,
NESPAK, Lahore.

Subject: **Testing of Fine Aggregate**
Tender No. XEN(O&M-I) NT/2024-25/76-Provision of Water Supply and Sewerage System in Azam Chowk to Ch. Colony, UC-242, Nishter Zone, Lahore

Dear Sir,

It is with reference to your letter No. 43101/MZA/01/1135 dated 08-01-2025.
Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 14-01-2025 through your representative.

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

Sieve Size	#4	#8	#16	#30	#50	#100	#200
%age Passing	100	99.43	98.76	98.36	96.28	12.68	2.35

2. **Percentage of Fines (ASTM D-1140)** ***Wet Sieving***

Silt and Clay (%)	6.89

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

Fineness Modulus (%)	0.94

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

Specific Gravity (OD)	2.65
Specific Gravity (SSD)	2.77
Apparent Specific Gravity	2.71
Water Absorption (%)	0.86

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

Organic Impurities	Nil

6. 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
#30 to #50	100.0	98.2	1.80	0.10
			Total = 0.10%	

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

Best Regards,

Director
Transportation Engineering Laboratory

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LAHORE – 54890 (PAKISTAN)

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

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

Mr. Ghulam Rasool Domki
Resident Engineer,
NESPAK,
Mandi Baha Uddin.

Subject: **Testing of Coarse and Fine Aggregates**
Construction of Service More Flyover to Connect with Industrial Area-II Gujrat Link Road in District Gujrat

Dear Sir,

It is with reference to your letter No. 4376/GF/GRD/02 dated 16-01-2025.
Please find below the results for the tests conducted on the aggregate samples provided to this laboratory on 20-01-2025 through your representative.

Coarse Aggregate

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

Sieve Size	1”	¾”	½”	3/8”	#4
%age Passing	100	93.20	40.79	12.19	0.19

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	2.83
Water Absorption (%)	0.29

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
$1/2" + 3/8"$	1004.9	991.0	1.38	1.12
	Total = 1.12%			

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

Grading Used	Los Angeles Abrasion Value (%)
B	14.42

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	$^3/_4$	6.83	0.47	8.26	0.56
$^3/_4$	$^1/_2$	4.94	2.60	5.72	3.00
$^1/_2$	$^3/_8$	4.50	1.29	6.27	1.80
$^3/_8$	$^1/_4$	4.57	0.55	10.60	1.27
		Flakiness Index = 4.91%		**Elongation Index = 6.63%**	

Fine Aggregate (Sand)

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

Sieve Size	3/8"	#4	#8	#16	#30	#50	#100	#200
%age Passing	100	97.51	82.10	71.90	58.40	26.49	8.19	1.00

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

Fineness Modulus (%)	2.55

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

Specific Gravity (OD)	2.69
Specific Gravity (SSD)	2.71
Apparent Specific Gravity	2.74
Water Absorption (%)	0.68

4. **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
#4 to #8	100	98.8	1.20	0.19
#8 to #16	100	98.8	1.20	0.12
#16 to #30	100	99.1	0.90	0.12
#30 to #50	100	98.9	1.10	0.35
				Total = 0.78%

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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LAHORE – 54890 (PAKISTAN)

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

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

Mr. M. Hassan Khan
Resident Engineer,
NESPAK, Lahore.

Subject: **Testing of Sand for Concrete/Mortar**
Scheme # 11, Rehabilitation/Improvement of Ehsan Road, Faiz Bagh Shahi Road, Macca Chowk to Khushi Marriage Ghulam Hussain Park Road, Shalamar Zone MCL

Dear Sir,

It is with reference to your letter No. 4084/103/LDP/SMZ(S-11)/04/21 dated 14-01-2025. Please find below the results for the tests conducted on the sand (Ravi) sample provided to this laboratory on 11-02-2025 through your representative.

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

Sieve Size	#4	#8	#16	#30	#50	#100	#200
%age Passing	100	98.80	97.95	97.53	92.24	8.22	1.38

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

Fineness Modulus (%)	1.05

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

Specific Gravity (OD)	2.64
Specific Gravity (SSD)	2.66
Apparent Specific Gravity	2.69
Water Absorption (%)	0.76

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

Best Regards,

Director
Transportation Engineering Laboratory

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UNIVERSITY OF ENGINEERING & TECHNOLOGY (UET)

LAHORE – 54890 (PAKISTAN)

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

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

Mr. Abid Azim
Resident Engineer, NESPAK,
Ravi Zone, Lahore.

Subject: **Testing of Aggregate (Granular Sub-base)**
Rehabilitation/Improvement of Roads, UC 07 Ravi Zone MCL
Source: Sargodha Quarry

Dear Sir,

It is with reference to your letter No. 4084/103/LDP/Ravi/04/123 dated 30-01-2025.
Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 13-02-2025 through your representative.

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

Sieve Size	2”	1 ½”	1”	¾”	½”	3/8”	#4
%age Passing	100	100	82.02	65.50	52.45	42.99	36.49

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

Grading Used	**Los Angeles Abrasion Value (%)**
B	26.33

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

Best Regards,

Director
Transportation Engineering Laboratory

Note:
1. This test report is based solely on the particular sample(s) supplied by the client and should not be reproduced in parts.
2. Sampling has not been performed by Transportation Engineering Laboratory (TEL), UET and TEL-UET does not accept the responsibility that the sample(s) supplied is/are truly representative sample(s) of any batch or stock or entire project.
3. While TEL-UET agrees to take every reasonable precaution to ensure validity of its test results, it assumes no liability thereof beyond the amount of the fee charged for the analysis or test.
4. The party shall assume full responsibility for the ethical use of the results in the test reports and the TEL-UET shall be held free from any and all claims which may result from the use of such data by client or others.
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