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. Khurram Iqbal
Resident Engineer,
NESPAK,
RRP Narowal.

Subject: **Testing of Materials (Aggregates)**
Restoration/Improvement of Shakargarh Road Bypass from Zafarwal - Shakargarh Road to Baien Bridge via Narowal Shakargarh Road

Dear Sir,

It is with reference to your letter No. RE/RRP/NRWL/KI/14 dated 08-11-2024.
Please find below the results for the tests conducted on the aggregate samples provided to this laboratory on 24-12-2024 through your representative.

Water Bound Macadam

1. Sieve Analysis (ASTM C-136)

Sieve Size	3”	2 ½”	2”	1 ½”	1”	¾”	½”	3/8”	#4
%age Passing	100	77.69	16.31	1.00	0	0	0	0	0

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

Specific Gravity (oven dried condition)	2.70
Specific Gravity (saturated surface dry condition)	2.72
Apparent Specific Gravity	2.75
Water Absorption (%)	0.64

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”	5010.4	4989.6	0.42	0.32
	Total = 0.32%			

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

Grading Used	Los Angeles Abrasion Value (%)
1	18.93

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

Sieve Size		Individual Flakiness Index (%)	Weighted Flakiness Index (%)
Passing (in.)	Retained (in.)		
3	2 ½	0	0
2 ½	2	6.77	4.15
2	1 ½	6.55	1.00
1 ½	1	0	0
		Flakiness Index = 5.15%	

Sub-base

Sieve Analysis (ASTM C-136)

Sieve Size	1 ½"	1"	¾"	½"	3/8"	#4
%age Passing	100	84.02	53.71	30.53	22.37	15.46

Sand

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

Sieve Size	3/8"	#4	#8	#16	#30	#50	#100	#200
%age Passing	100	99.72	98.99	97.70	96.63	80.67	10.52	1.99

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

Fineness Modulus (%)	1.16

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

Engr. Ghulam Rasool
Resident Engineer,
NESPAK,
MCL Nishtar Zone, Lahore.

Subject: **Testing of Aggregate (Granular Sub-base)**
Rehabilitation/Improvement of Streets (P.C.C), Sewerage, Drainage at Village Theht & Gowala Colony Block, A, B, C, D, UC-241 Nishtar Zone MCL

Dear Sir,

It is with reference to your letter No. 4084/103/LDP/NZ/04/135 dated 16-01-2025.
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	1 ½"	1"	¾"	½"	3/8"	#4
%age Passing	100	88.85	55.55	31.34	27.17	24.54

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

Grading Used	**Los Angeles Abrasion Value (%)**
A	25.53

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 ½	1	9.27	1.37	10.31	1.52
1	3/4	6.43	2.84	9.51	4.20
3/4	1/2	8.41	2.70	9.57	3.07
1/2	3/8	8.39	0.46	9.97	0.55
3/8	1/4	9.36	0.33	10.40	0.36
		Flakiness Index = 7.70%		**Elongation Index = 9.70%**	

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

Engr. Ghulam Rasool
Resident Engineer,
NESPAK,
MCL Nishtar Zone, Lahore.

Subject: **Testing of Aggregate (PCC Crush)**
Rehabilitation/Improvement of Streets (P.C.C), Sewerage, Drainage at Village Theht & Gowala Colony Block, A, B, C, D, UC-241 Nishtar Zone MCL

Dear Sir,

It is with reference to your letter No. 4084/103/LDP/NZ/04/132 dated 16-01-2025.
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	31.90	4.40	0

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

Grading Used	**Los Angeles Abrasion Value (%)**
B	17.74

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.)**				
$^3/_4$	$^1/_2$	8.15	5.55	9.24	6.29
$^1/_2$	$^3/_8$	6.50	1.79	9.13	2.51
$^3/_8$	$^1/_4$	9.35	0.41	21.57	0.95
		Flakiness Index = 7.75%		**Elongation Index = 9.75%**	

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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