

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 Asif Bajwa
Resident Engineer,
NESPAK.
Nankana Sahib.

Subject: **Testing of Water Bound Macadam (WBM) Material**
Restoration/Improvement of Road from Shahkot to Safdarabad,
Road Length = 17.00 km in District Nankana Sahib

Dear Sir,

It is with reference to your letter No. 3811/103/RRPNS/AB/306 dated 20-11-2024.

Please find below the results for the tests conducted on the WBM sample provided to this laboratory on 20-12-2024 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	80.38	27.53	0.83	0	0	0	0	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
2" + 1 ½"	5004.3	4987.3	0.34	0.27
Total = 0.27%				

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

Grading Used	Los Angeles Abrasion Value (%)
1	19.25

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.)				
3	2 ½	0	0	4.21	0.83
2 ½	2	6.59	3.48	7.21	3.81
2	1 ½	7.37	1.97	9.14	2.44
1 ½	1	0	0	35.09	0.29
Flakiness Index = 5.45%			Elongation Index = 7.37%		

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 Resident Engineer,
NESPAK (Job # 4834).
Highway Division, Sahiwal.

Subject: **Testing of WBM Material**
Improvement of Sahiwal to Old Chichawatni Road via Harappa Museum,
Length = 43.00 km in District Sahiwal

Dear Sir,

It is with reference to your letter No. 4267/Sahiwal/RRP/RE/24 dated 10-12-2024.
Please find below the results for the tests conducted on the WBM sample provided to this laboratory on 24-12-2024 through your representative.

1. Sieve Analysis (ASTM C-136)

Sieve Size	3"	2 1/2"	2"	1 1/2"	1"	3/4"	1/2"	3/8"	#4
%age Passing	100	80.24	16.72	0	0	0	0	0	0

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

Specific Gravity (oven dried condition)	2.80
Specific Gravity (saturated surface dry condition)	2.81
Apparent Specific Gravity	2.83
Water Absorption (%)	0.36

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 1/2"	5007.9	4992.9	0.30	0.24
	Total = 0.24%			

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

Grading Used	Los Angeles Abrasion Value (%)
1	18.40

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	2 ½	0	0	9.11	1.80
2 ½	2	6.91	4.39	6.99	4.44
2	1 ½	5.30	0.89	6.17	1.03
Flakiness Index = 5.28%			Elongation Index = 7.27%		

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. M. Waseem Azhar
Assistant Director (Q.C.D),
WASA,
LDA,
Lahore.

Subject: **Testing of Crush** (M/s Allah Hoo Yasir Pipe Industry)

Dear Sir,

It is with reference to your letter No. QCD/2646 dated 27-12-2024.

Please find below the results for the tests conducted on the aggregate sample provided to this laboratory through your representative.

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 (%)	0.42

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
$1/2'' + 3/8''$	1009.3	998.9	1.03	0.83
	Total = 0.83%			

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

Grading Used	Los Angeles Abrasion Value (%)
B	16.73

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Best Regards,

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TEL UET

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

Ref.:-----

Date:-----

Mr. Syed Yasir Ali Sherazi
Authorized Representative,
NETRACON Technologies (Pvt.) Ltd.

Subject: **Testing of Fine Aggregate** (Source: Qutab Bandi)
PK-NTDC PMU-163725-TL-RFB
Design, Supply, Installation, Testing and Commissioning of 500 kv D/C T/Line from
500 kv Tarbela 5th Extension, Switchyard to 765/500 kv Islamabad West Substation

Dear Sir,

It is with reference to your letter No. NTT-HO/T5/2024/033 dated 27-12-2024.

Please find below the results for the tests conducted on the fine aggregate sample provided to this laboratory through your representative.

1. Sieve Analysis (ASTM C-136)

Sieve Size	1/2"	3/8"	#4	#8	#16	#30	#50	#100	#200
%age Passing	100	99.15	96.17	91.54	80.88	64.84	27.49	5.63	1.08

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

Specific Gravity (OD)	2.68
Specific Gravity (SSD)	2.70
Apparent Specific Gravity	2.74
Water Absorption (%)	0.84

3. Unit Weight (*Loose & Rodded*); (ASTM C 29/C 29M)

Loose Unit Weight (g/cm ³)	1.57
Rodded Unit Weight (g/cm ³)	1.71

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	98.6	1.40	0.07
#8 to #16	100	98.7	1.30	0.14
#16 to #30	100	98.8	1.20	0.19
#30 to #50	100	98.7	1.30	0.49
Total = 0.89%				

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

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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/2024-25/86 - Improvement of Water Supply and Sewerage System in UC-238, Nishter Zone, Lahore

Dear Sir,

It is with reference to your letter No. 43101/MZA/01/1043 dated 03-01-2025.

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	3/4"	1/2"	3/8"	#4
%age Passing	100	66.44	17.81	0

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

Specific Gravity (oven dried condition)	2.83
Specific Gravity (saturated surface dry condition)	2.84
Apparent Specific Gravity	2.87
Water Absorption (%)	0.53

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"	1001.3	989.8	1.15	0.95
	Total = 0.95%			

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

Grading Used	Los Angeles Abrasion Value (%)
B	16.88

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.)				
$\frac{3}{4}$	$\frac{1}{2}$	7.68	2.58	22.95	7.70
$\frac{1}{2}$	$\frac{3}{8}$	15.84	7.70	22.27	10.83
$\frac{3}{8}$	$\frac{1}{4}$	11.17	1.99	21.15	3.77
Flakiness Index = 12.27%			Elongation Index = 22.30%		

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

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Ref.:-----

Date:-----

Mr. Muhammad Zain-Ul-Abadeen

Resident Engineer,

NESPAK, Lahore.

Subject: **Testing of Fine Aggregate (Sand)**

Tender No. XEN(O&M-I) NT/2024-25/86 - Improvement of Water Supply and Sewerage System in UC-238, Nishter Zone, Lahore

Dear Sir,

It is with reference to your letter No. 43101/MZA/01/1041 dated 03-01-2025.

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	99.95	99.85	99.71	87.90	9.63	1.33

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

Silt and Clay (%)	3.84
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3. Fineness Modulus (ASTM C-142)

Fineness Modulus (%)	1.03
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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 (%)	0.70

5. Organic Impurities (ASTM C-40)

Organic Impurities	Nil
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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	98.5	1.50	0.18
Total = 0.18%				

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

Best Regards,

Director
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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 04 & 05 Ravi Zone MCL
Rehabilitation/Improvement of Street Pavement, Sewerage/Drainage, UC 01 Ravi Zone MCL
Rehabilitation/Improvement of Street Pavement, Sewerage/Drainage, UC 04 & 05 Ravi Zone MCL
Rehabilitation/Improvement of Street Pavement, Sewerage/Drainage, UC 02 Ravi Zone MCL

Source: Sargodha Quarry

Dear Sir,

It is with reference to your letter No. 4084/103/LDP/Ravi/04/141 dated 05-02-2025.

Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 18-02-2025 through your representative.

1. Sieve Analysis (ASTM C-136)

Sieve Size	1 1/2"	1"	3/4"	1/2"	3/8"	#4
%age Passing	100	83.88	70.02	46.28	36.16	29.39

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

Grading Used	Los Angeles Abrasion Value (%)
A	27.02

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

Best Regards,

Director
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Ref.:-----

Date:-----

Mr. Mian Zubair Zafar
Resident Engineer,
Package-III (PCP) Jaranwala,
MM Pakistan (Pvt.) Ltd.

Subject: **Testing of Fine Aggregates**
Punjab Cities Program (PCP)
Sewerage System in City Jaranwala (Package-01) Under PCP Sub Projects
Improvement of Sewerage System in Jaranwala City and Construction of Waste
Water Treatment Plant (WWTP)

Dear Sir,

It is with reference to your letter No. MMP/1095/Jaranwala/SEW/46/2025 dated 12-03-2025.
Please find below the results for the tests conducted on the aggregate samples provided to this
laboratory through your representative.

Sample No. 1 (Blend of Lawrencepur Sand)

1. Sieve Analysis (ASTM C-136)

Sieve Size	3/4"	1/2"	3/8"	#4	#8	#16	#30	#50	#100	#200
%age Passing	100	99.17	98.23	94.91	74.32	68.60	63.35	41.44	4.73	1.27

2. Fineness Modulus (ASTM C-142)

Fineness Modulus (%)	2.55
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3. Specific Gravity & Water Absorption (ASTM C-128)

Specific Gravity (OD)	2.66
Specific Gravity (SSD)	2.68
Apparent Specific Gravity	2.72
Water Absorption (%)	0.77

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	98.9	1.10	0.23
#8 to #16	100	99.0	1.00	0.06
#16 to #30	100	98.9	1.10	0.06
#30 to #50	100	98.8	1.20	0.26
Total = 0.61%				

Sample No. 2 (Crushed Sand and Chenab Sand with Different Proportion)

1. Sieve Analysis (ASTM C-136)

Sieve Size	¾"	½"	3/8"	#4	#8	#16	#30	#50	#100	#200
%age Passing	100	100	99.31	97.24	80.82	74.61	66.68	29.42	4.85	1.35

2. Fineness Modulus (ASTM C-142)

Fineness Modulus (%)	2.47
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3. Specific Gravity & Water Absorption (ASTM C-128)

Specific Gravity (OD)	2.62
Specific Gravity (SSD)	2.65
Apparent Specific Gravity	2.69
Water Absorption (%)	0.99

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	0.20
#8 to #16	100	98.7	1.30	0.08
#16 to #30	100	98.6	1.40	0.11
#30 to #50	100	98.7	1.30	0.48
Total = 0.87%				

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

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

Ref:-----

Date:-----

Mr. Jawad Qayyum Khan
Resident Engineer (NESPAK), 4834,
Sargodha.

Subject: **Testing of Water Bound Macadam**
Restoration/Improvement of Road from Mangni Pull at km No. 141.00 of Lahore
Sargodha Bannu Road to Ghullapur Bangalow, Length = 15.50 km in District
Sargodha

Dear Sir,

It is with reference to your letter No. RE/4834/JQK/25/7623 dated 08-03-2025.

Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 14-03-2025 through your representative.

1. Sieve Analysis (ASTM C-136)

Sieve Size	3 ½"	3"	2 ½"	2"	1 ½"	1"	¾"	½"	3/8"	#4
%age Passing	100	98.39	86.55	47.58	2.26	1.31	0.83	0	0	0

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

Specific Gravity (oven dried condition)	2.76
Specific Gravity (saturated surface dry condition)	2.77
Apparent Specific Gravity	2.79
Water Absorption (%)	0.43

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	4994.4	0.32	0.27
	Total = 0.27%			

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

Grading Used	Los Angeles Abrasion Value (%)
1	19.19

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Best Regards,

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Ref.:-----

Date:-----

ARE PCP Package-V,
MMP/AiD Consultants,
Khanewal.

Subject: **Testing of Sand**

Comprehensive Sewerage System in Khanewal City Under Punjab Cities Program (PCP)

Dear Sir,

It is with reference to your letter No. PCP/KWL-183/2025 dated 27-02-2025.

Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 19-03-2025 through your representative.

1. Sieve Analysis (ASTM C-136)

Sieve Size	3/4"	1/2"	3/8"	#4	#8	#16	#30	#50	#100	#200
%age Passing	100	94.43	92.46	89.58	83.94	70.51	59.12	41.99	3.14	0.94

2. Fineness Modulus (ASTM C-142)

Fineness Modulus (%)	2.65
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Best Regards,

Director
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