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. Faheem Ahmed
ARE,
Package-I (PCP),
Daska.

Subject: **Testing of Water Bound Macadam**
Rehabilitation of 36" I/D Damaged Sewer Line Along Stadium Road

Dear Sir,

It is with reference to your letter No. DSK/CON/1094/SW/219/2025 dated 11-05-2025. Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 14-05-2025 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	80.22	16.14	0.31	0	0	0	0	0

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

Specific Gravity (oven dried condition)	2.71
Specific Gravity (saturated surface dry condition)	2.72
Apparent Specific Gravity	2.75
Water Absorption (%)	0.61

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"	5004.3	4982.0	0.45	0.36
	Total = 0.36%			

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

Grading Used	**Los Angeles Abrasion Value (%)**
1	20.46

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. Faheem Ahmed
ARE,
Package-I (PCP), Daska.

Subject: **Testing of Sub-base Material**
Rehabilitation of 36" I/D Damaged Sewer Line Along Stadium Road

Dear Sir,

It is with reference to your letter No. DSK/CON/1094/SW/215/2025 dated 02-05-2025. Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 14-05-2025 through your representative.

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

Sieve Size	2"	1 ½"	1"	¾"	½"	3/8"	#4
%age Passing	100	99.22	90.72	80.72	60.80	47.22	39.44

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

Specific Gravity (oven dried condition)	2.66
Specific Gravity (saturated surface dry condition)	2.69
Apparent Specific Gravity	2.75
Water Absorption (%)	1.17

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

Grading Used	**Los Angeles Abrasion Value (%)**
A	28.24

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. Ishtiaq Ahmed
Chief Resident Engineer,
NESPAK,
ADP (2024-2025), SEW, Faisalabad.

Subject: **Testing of Coarse Aggregates** (Source: Sargodha)
Water & Sanitation Agency (F.D.A), Faisalabad
Design & Resident Supervision of the Project Development Schemes (ADP 2024-2025) to Cater Sewerage Issues of Faisalabad City (Job # P-4936)

Dear Sir,

It is with reference to your letter No. 4936/SEW (2024-2025)/CRE/FSD/47 dated 28-07-2025. Please find below the results for the tests conducted on the aggregate samples provided to this laboratory through your representative.

Sample # 1 (10-20 mm)

Sieve Analysis (ASTM C-136)

Sieve Size	¾”	½”	3/8”	#4
%age Passing	100	56.16	10.18	0.34

Sample # 2 (5-10 mm)

Sieve Analysis (ASTM C-136)

Sieve Size	3/8”	#4
%age Passing	100	20.88

Mixed 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	2.85
Water Absorption (%)	0.49

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.
$1/2$" + $3/8$"	1001.4	992.0	0.94	0.67
	Total = 0.67%			

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

Grading Used	Los Angeles Abrasion Value (%)
B	15.80

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.)				
$3/4$	$1/2$	7.70	2.70	10.17	3.56
$1/2$	$3/8$	8.81	3.24	10.52	3.86
$3/8$	$1/4$	9.61	2.71	10.85	3.06
		Flakiness Index = 8.65%		**Elongation Index = 10.48%**	

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

Loose Unit Weight (g/cm^3)	1.49
Rodded Unit Weight (g/cm^3)	1.57

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. Ishtiaq Ahmed
Chief Resident Engineer,
NESPAK,
ADP (2024-2025), SEW, Faisalabad.

Subject: **Testing of Fine Aggregate**
Water & Sanitation Agency (F.D.A), Faisalabad
Design & Resident Supervision of the Project Development Schemes (ADP 2024-2025) to Cater Sewerage Issues of Faisalabad City (Job # P-4936)

Dear Sir,

It is with reference to your letter No. 4936/SEW (2024-2025)/CRE/FSD/46 dated 28-07-2025. 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	3/8"	#4	#8	#16	#30	#50	#100	#200
%age Passing	100	99.69	99.27	98.59	97.87	81.97	9.88	2.04

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

Fineness Modulus (%)	1.13

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

Specific Gravity (OD)	2.65
Specific Gravity (SSD)	2.67
Apparent Specific Gravity	2.70
Water Absorption (%)	0.71

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

Loose Unit Weight (g/cm^3)	1.62
Rodded Unit Weight (g/cm^3)	1.73

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:----------

The Resident Engineer,
ESS-I-AAR Consultants,
Multan.

Subject: **Testing of Fine Aggregate** (Harrow Sand)
Resident Supervision of Re-routing of 24", 18" & 12" i/d RCC Sewer Lines at Dehli-Multan Road from Babar Chowk to Darama Wala Morr (Right Side), WASA, Multan

Dear Sir,

It is with reference to your letter No. 5267-A/WASA dated 16-07-2025.
Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 01-08-2025 through your representative.

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

Sieve Size	½"	3/8"	#4	#8	#16	#30	#50	#100	#200
%age Passing	100	99.15	95.02	90.07	79.39	63.09	26.99	5.17	1.05

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

Fineness Modulus (%)	2.41

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 Resident Engineer,
ESS-I-AAR Consultants,
Multan.

Subject: **Testing of Coarse Aggregate**
Resident Supervision of Re-routing of 24", 18" & 12" i/d RCC Sewer Lines at Dehli-Multan Road from Babar Chowk to Darama Wala Morr (Right Side), WASA, Multan

Dear Sir,

It is with reference to your letter No. 5268/WASA dated 16-07-2025.
Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 01-08-2025 through your representative.

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

Sieve Size	1"	¾"	½"	3/8"	#4
%age Passing	100	97.95	9.04	0.64	0.21

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

Specific Gravity (oven dried condition)	2.72
Specific Gravity (saturated surface dry condition)	2.73
Apparent Specific Gravity	2.76
Water Absorption (%)	0.56

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.
$^1/_2$" + $^3/_8$"	1001.7	989.3	1.24	1.21
	Total = 1.21%			

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

Grading Used	**Los Angeles Abrasion Value (%)**
B	22.70

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. Ishtiaq Ahmed
Chief Resident Engineer,
NESPAK,
ADP (2024-2025), SEW, Faisalabad.

Subject: **Testing of Coarse Aggregates** (Source: Sargodha)
Water & Sanitation Agency (F.D.A), Faisalabad
Design & Resident Supervision of the Project Development Schemes (ADP 2024-2025) to Cater Sewerage Issues of Faisalabad City (Job # P-4936)

Dear Sir,

It is with reference to your letter No. 4936/SEW (2024-2025)/CRE/FSD/53 dated 31-07-2025. Please find below the results for the tests conducted on the aggregate samples provided to this laboratory through your representative.

Sample # 1 (10-20 mm)

Sieve Analysis (ASTM C-136)

Sieve Size	¾”	½”	3/8”	#4
%age Passing	100	64.00	27.29	0.76

Sample # 2 (5-10 mm)

Sieve Analysis (ASTM C-136)

Sieve Size	½”	3/8”	#4
%age Passing	100	96.21	24.05

Mixed Sample

1. **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	2.85
Water Absorption (%)	0.38

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.
$^1/_2$" + $^3/_8$"	1004.9	994.8	1.01	0.49
	Total = 0.49%			

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

Grading Used	Los Angeles Abrasion Value (%)
B	16.56

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.)				
$^3/_4$	$^1/_2$	8.16	1.89	12.34	2.86
$^1/_2$	$^3/_8$	7.97	1.99	10.49	2.62
$^3/_8$	$^1/_4$	10.17	5.28	14.69	7.62
		Flakiness Index = 9.16%		**Elongation Index = 13.10%**	

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

Loose Unit Weight (g/cm^3)	1.47
Rodded Unit Weight (g/cm^3)	1.56

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

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

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

Mr. Ishtiaq Ahmed
Chief Resident Engineer,
NESPAK,
ADP (2024-2025), SEW, Faisalabad.

Subject: **Testing of Fine Aggregate**
Water & Sanitation Agency (F.D.A), Faisalabad
Design & Resident Supervision of the Project Development Schemes (ADP 2024-2025) to Cater Sewerage Issues of Faisalabad City (Job # P-4936)

Dear Sir,

It is with reference to your letter No. 4936/SEW (2024-2025)/CRE/FSD/54 dated 31-07-2025. 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	3/8"	#4	#8	#16	#30	#50	#100	#200
%age Passing	100	99.81	99.30	98.54	97.63	81.82	10.18	1.91

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

Fineness Modulus (%)	1.15

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

Specific Gravity (OD)	2.64
Specific Gravity (SSD)	2.66
Apparent Specific Gravity	2.68
Water Absorption (%)	0.66

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

Loose Unit Weight (g/cm^3)	1.60
Rodded Unit Weight (g/cm^3)	1.70

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. Ishtiaq Ahmed
Chief Resident Engineer,
NESPAK,
ADP (2024-2025), SEW, Faisalabad.

Subject: **Testing of Coarse Aggregates** (Source: Sargodha)
Water & Sanitation Agency (F.D.A), Faisalabad
Design & Resident Supervision of the Project Development Schemes (ADP 2024-2025) to Cater Sewerage Issues of Faisalabad City (Job # P-4936)

Dear Sir,

It is with reference to your letter No. 4936/SEW (2024-2025)/CRE/FSD/53 dated 04-08-2025. Please find below the results for the tests conducted on the aggregate samples provided to this laboratory through your representative.

Sample # 1 (10-20 mm)

Sieve Analysis (ASTM C-136)

Sieve Size	¾”	½”	3/8”	#4
%age Passing	100	59.36	22.38	0.51

Sample # 2 (5-10 mm)

Sieve Analysis (ASTM C-136)

Sieve Size	3/8”	#4
%age Passing	100	12.61

Mixed Sample

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

Specific Gravity (oven dried condition)	2.81
Specific Gravity (saturated surface dry condition)	2.83
Apparent Specific Gravity	2.85
Water Absorption (%)	0.46

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.
$1/2$" + $3/8$"	1001.4	990.4	1.10	0.85
	Total = 0.85%			

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

Grading Used	Los Angeles Abrasion Value (%)
B	16.50

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.)				
$3/4$	$1/2$	8.70	2.93	10.68	3.60
$1/2$	$3/8$	7.82	2.40	11.83	3.63
$3/8$	$1/4$	10.22	3.64	11.56	4.10
		Flakiness Index = 8.97%		**Elongation Index = 11.33%**	

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

Loose Unit Weight (g/cm^3)	1.47
Rodded Unit Weight (g/cm^3)	1.56

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. Ishtiaq Ahmed
Chief Resident Engineer,
NESPAK,
ADP (2024-2025), SEW, Faisalabad.

Subject: **Testing of Fine Aggregate**
Water & Sanitation Agency (F.D.A), Faisalabad
Design & Resident Supervision of the Project Development Schemes (ADP 2024-2025) to Cater Sewerage Issues of Faisalabad City (Job # P-4936)

Dear Sir,

It is with reference to your letter No. 4936/SEW (2024-2025)/CRE/FSD/54 dated 04-08-2025. 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	3/8"	#4	#8	#16	#30	#50	#100	#200
%age Passing	100	99.76	99.27	98.63	97.80	81.39	10.36	2.05

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

Fineness Modulus (%)	1.15

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

Specific Gravity (OD)	2.65
Specific Gravity (SSD)	2.68
Apparent Specific Gravity	2.72
Water Absorption (%)	0.86

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

Loose Unit Weight (g/cm^3)	1.61
Rodded Unit Weight (g/cm^3)	1.71

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

Best Regards,

Director
Transportation Engineering Laboratory

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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.
5. This test report shall not be reproduced wholly or in parts unless negotiated.