

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. Armughan Khan
Deputy Director (QCD),
WASA,
Lahore.

Subject: **Testing of Coarse Aggregate**

Tender No. XEN (O&M-II) AWT/2024-2025/143/Provision of Trunk Sewer
(Umer Khan Road to Lahore Lyceum School Manawan Campus)
M/s SA4 Construction Company

Dear Sir,

It is with reference to your letter No. QCD/2978 dated 02-07-2025.

Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 10-07-2025 through your representative.

1. Sieve Analysis (ASTM C-136)

Sieve Size	2"	1 1/2"	1"	3/4"	1/2"	3/8"	#4
%age Passing	100	73.66	11.68	0.17	0	0	0

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

Specific Gravity (oven dried condition)	2.60
Specific Gravity (saturated surface dry condition)	2.63
Apparent Specific Gravity	2.67
Water Absorption (%)	0.94

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" + 3/4"	1501.2	1484.8	1.09	0.80
	Total = 0.80%			

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

Grading Used	Los Angeles Abrasion Value (%)
A	25.23

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.)				
2	1 ½	6.44	1.70	8.74	2.30
1 ½	1	6.56	4.07	7.93	4.92
1	¾	4.43	0.51	11.61	1.34
¾	½	0	0	0	0
Flakiness Index = 6.28%			Elongation Index = 8.56%		

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

Loose Unit Weight (g/cm ³)	1.40
Rodded Unit Weight (g/cm ³)	1.51

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. Armughan Khan
Deputy Director (QCD),
WASA,
Lahore.

Subject: **Testing of Fine Aggregate (Ravi Quarry)**
Tender No. XEN (O&M-II) AWT/2024-2025/143/Provision of Trunk Sewer
(Umer Khan Road to Lahore Lyceum School Manawan Campus)
M/s SA4 Construction Company

Dear Sir,

It is with reference to your letter No. QCD/2979 dated 02-07-2025.

Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 10-07-2025 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	99.33	96.03	91.00	80.13	63.83	27.17	5.40	1.21

2. Fineness Modulus (ASTM C-142)

Fineness Modulus (%)	2.37
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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:-----

Mr. M. Armughan Khan
Deputy Director (QCD),
WASA, Lahore.

Subject: **Testing of Fine Aggregate (Lawrencepur Sand)**
Tender No. XEN (O&M-I) NT/2024-2025/79 – Sewerage System in UC-228,
Nishter Zone, Lahore (M/s Safa & Co)

Dear Sir,

It is with reference to your letter No. QCD/2989 dated 02-07-2025.

Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 10-07-2025 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	98.79	95.31	90.28	79.46	62.45	26.52	5.26	1.01

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

Material Finer than #200 Sieve (%)	1.64
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3. Fineness Modulus (ASTM C-142)

Fineness Modulus (%)	2.44
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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.

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

Ref.:-----

Date:-----

Mr. Syed Azhar Hussain
Resident Engineer,
PRSWSS Project, Noorpur Thal City, District Khushab.

Subject: **Testing of Fine Aggregate (Lawrencepur Sand)**
Contract Package: PRSWSSP
Procurement of Civil Works (NPT 04), North, Tehsil Noorpur Thal,
(Villages Chak 51 DB, Chak 52 DB, Maikan)

Dear Sir,

It is with reference to your letter No. TCI/PRSESSP-NORTH/Phase-III/NPT-04/004 dated 24-05-2024. Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 10-07-2025 through your representative.

1. Sieve Analysis (ASTM C-136)

Sieve Size	3/8"	#4	#8	#16	#30	#50	#100	#200
%age Passing	100	95.84	90.53	79.65	63.54	27.60	5.34	1.07

2. Fineness Modulus (ASTM C-142)

Fineness Modulus (%)	2.38
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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	2.71
Water Absorption (%)	0.75

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	98.4	1.60	0.08
#8 to #16	100	98.3	1.70	0.19
#16 to #30	100	98.5	1.50	0.26
#30 to #50	100	98.9	1.10	0.40
Total = 0.93%				

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

Ref.-----

Date:-----

Mr. Waqas Javaid
Senior Project Manager, IDAP.

Subject: **Testing of Coarse and Fine Aggregates**
Construction of Punjab Revenue Authority, Headquarter, Lahore

Dear Sir,

It is with reference to your letter No. SPM (PRA-HQ)/IDAP/2025/22838 dated 04-07-2025. Please find below the results for the tests conducted on the aggregate samples provided to this laboratory on 16-07-2025 through your representative.

Coarse Aggregate

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	2.84
Water Absorption (%)	0.29

2. 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	4.95	3.33	7.69	5.18
1/2	3/8	9.44	2.52	14.69	3.92
3/8	1/4	12.43	0.74	19.98	1.19
Flakiness Index = 6.59%			Elongation Index = 10.29%		

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"	1003.4	993.5	0.99	0.93
	Total = 0.93%			

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

Grading Used	Los Angeles Abrasion Value (%)
B	16.50

5. Clay Lumps and Friable Particles (ASTM C-142)

Clay Lumps and Friable Particles (%)	0.33
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6. Unit Weight (*Loose & Rodded*); (ASTM C 29/C 29M)

Loose Unit Weight (g/cm ³)	1.41
Rodded Unit Weight (g/cm ³)	1.53

Fine Aggregate (Sand)

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

Specific Gravity (OD)	2.68
Specific Gravity (SSD)	2.70
Apparent Specific Gravity	2.74
Water Absorption (%)	0.79

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
#4 to #8	100	98.9	1.10	0.05
#8 to #16	100	99.0	1.00	0.11
#16 to #30	100	99.0	1.00	0.16
#30 to #50	100	98.9	1.10	0.41
Total = 0.73%				

3. Organic Impurities (ASTM C-40)

Organic Impurities	Nil
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4. Clay Lumps and Friable Particles (ASTM C-142)

Clay Lumps and Friable Particles (%)	0.65
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5. Unit Weight (*Loose & Rodded*); (ASTM C 29/C 29M)

Loose Unit Weight (g/cm ³)	1.59
Rodded Unit Weight (g/cm ³)	1.71

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

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Ref.:-----

Date:-----

Engr. Asmat Ullah Siyal
CRE/The Engineer,
Indus Associated Consultants (JV),
Mianwali.

Subject: **Testing of Bitumen – AASHTO Standard (M-20)**
Project: Contract No. RH-N-135-21-22/08 for Rehabilitation/Improvement of Mianwali
Muzaffargarh Road (N-135) from km 160+000 to km 200+000 on N-135

Dear Sir,

It is with reference to your letter No. CRE/IAC/2025/1602 dated 18-08-2025.
Please find below the results of tests conducted on the bitumen sample provided to this
laboratory through your representative.

Sr.#	Laboratory Tests	Results
1	Penetration (ASTM D-5)	64 Units
2	Penetration of Residue (ASTM D-5)	56 Units
3	Ductility (ASTM D-113)	Above 100 cm
4	Ductility of Residue (ASTM D-113)	Above 100 cm
5	Flash Point (ASTM D-92)	298°C
6	Solubility (ASTM D-2042)	99.80%
7	Thin Film Oven Test Value (ASTM D-1754)	0.475%
8	Loss on Heating Value (ASTM D-6)	0.429%

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