

# 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:-----

The Deputy Director (Engineering),  
LDA,  
Lahore.

Subject: **Testing of Sand Material**

Reconstruction of Road After Laying of Sewer Line by WASA at Pilot School Road, Allama Iqbal Town. Lahore

Dear Sir,

It is with reference to your letter No. DD(ENGG)/LDA/398 dated 27-06-2024.

Please find below the results for the tests conducted on the aggregate sample (sand) provided to this laboratory on 26-07-2024 through your representative.

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

Sieve Size	½"	3/8"	#4	#8	#16	#30	#50	#100	#200
%age Passing	100	98.90	95.45	90.42	79.62	63.41	27.01	5.49	1.36

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

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

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

Best Regards,

Director  
Transportation Engineering Laboratory

### Note:

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Ref.:-----

Date:-----

The Deputy Director (Engineering),  
LDA,  
Lahore.

Subject: **Testing of WBM**

Reconstruction of Road After Laying of Sewer Line by WASA at Pilot School Road, Allama Iqbal Town. Lahore

Dear Sir,

It is with reference to your letter No. DD(ENGG)/LDA/395 dated 27-06-2024.

Please find below the results for the tests conducted on the aggregate sample (WBM) provided to this laboratory on 26-07-2024 through your representative.

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

Sieve Size	3"	2 1/2"	2"	1 1/2"	3/4"	1/2"	3/8"	#4
%age Passing	100	95.10	44.85	9.29	2.43	2.43	2.43	2.43

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

Specific Gravity (oven dried condition)	2.70
Specific Gravity (saturated surface dry condition)	2.71
Apparent Specific Gravity	2.73
Water Absorption (%)	0.38

## 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"	5004.3	4986.9	0.35	0.30
	<b>Total = 0.30%</b>			

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

Grading Used	Los Angeles Abrasion Value (%)
1	19.58

## 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	6.44	3.32
2	1 ½	9.25	3.34
1 ½	1	6.25	0.27
1	¾	0	0
<b>Flakiness Index = 6.93%</b>			

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

Ref.-----

Date:-----

The Executive Engineer,  
Highways Division,  
Narowal.

Subject: **Testing of Sand**

Special Repair of Road from Narowal to Muridke Road, km No. 0.0 to 5.15,  
(Length = 5.15 km) in District Narowal  
*Sarkain Bahal Punjab Khushal Programme*

Dear Sir,

It is with reference to your letter No. 808/DB dated 09-05-2024.

Please find below the results for the tests conducted on the aggregate sample (sand) provided to this laboratory on 26-07-2024 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	98.69	95.24	90.35	79.67	63.54	26.52	5.43	1.06

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

Fineness Modulus (%)	2.41
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Ref:-----

Date:-----

The Executive Engineer,  
Highways Division,  
Narowal.

Subject: **Testing of Coarse Aggregate**

Special Repair of Road from Narowal to Muridke Road, km No. 0.0 to 5.15,  
(Length = 5.15 km) in District Narowal  
*Sarkain Bahal Punjab Khushal Programme*

Dear Sir,

It is with reference to your letter No. 803/DB dated 09-05-2024.

Please find below the results for the tests conducted on the coarse aggregate sample provided to this laboratory on 26-07-2024 through your representative.

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

Sieve Size	1"	3/4"	1/2"	3/8"	#4
%age Passing	100	84.51	31.96	10.21	0.68

## 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	2.85
Water Absorption (%)	0.47

## 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	0.74
	<b>Total = 0.74%</b>			

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

Best Regards,

Director  
Transportation Engineering Laboratory

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TEL-UET

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Ref.:-----

Date:-----

The Executive Engineer,  
Highways Division,  
Narowal.

Subject: **Testing of Base Course Material**

Special Repair of Road from Narowal to Muridke Road, km No. 0.0 to 5.15,  
(Length = 5.15 km) in District Narowal  
*Sarkain Bahal Punjab Khushal Programme*

Dear Sir,

It is with reference to your letter No. 805/DB dated 09-05-2024.

Please find below the results for the tests conducted on the coarse aggregate sample provided to this laboratory on 26-07-2024 through your representative.

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

Sieve Size	3"	2 1/2"	2"	1 1/2"	3/4"	1/2"	3/8"	#4
%age Passing	100	95.00	45.00	9.99	2.99	2.99	2.99	2.99

## 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 1/2"	5009.1	4988.1	0.42	0.36
<b>Total = 0.36%</b>				

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

Grading Used	Los Angeles Abrasion Value (%)
1	19.66

#### 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	0	0
2 ½	2	9.57	4.93	10.94	5.64
2	1 ½	7.87	2/84	9.42	3.40
1 ½	1	6.78	0.34	13.60	0.68
1	¾	5.28	0.12	14.03	0.31
<b>Flakiness Index = 8.23%</b>			<b>Elongation Index = 10.03%</b>		

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