

# 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 Material Engineer,  
NESPAK,  
Sahiwal.

Subject: **Testing of Coarse Aggregates**

Punjab Intermediate Cities Improvement Investment Program (PICIIIP)  
Consultancy Services for Engineering, Procurement and Construction Management  
Trunk Main Sewer Lines and Allied Works (NCB-WORKS/PICIIIP-03) Lot-02

Dear Sir,

It is with reference to your letter No. 3976/11/MS/SWL/Lot-2/01/1341 dated 27-05-2024.  
Please find below the results of tests conducted on the aggregate samples provided to this  
laboratory on 06-06-2024 through your representative.

## **Sample # 1**

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

Sieve Size	1"	3/4"	1/2"	3/8"	#4
%age Passing	100	91.16	3.85	0	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 (%)	0.51

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

Grading Used	Los Angeles Abrasion Value (%)
B	17.49

### **4. Clay Lumps and Friable Particles (ASTM C-142)**

Clay Lumps and Friable Particles (%)	0.45
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5. Flakiness Index (BS 812: Part 105)

Sieve Size		Individual Flakiness Index (%)	Weighted Flakiness Index (%)
Passing (in.)	Retained (in.)		
1	3/4	0	0
3/4	1/2	7.59	6.63
1/2	3/8	13.33	0.51
<b>Flakiness Index = 7.14%</b>			

**Sample # 2**

1. Sieve Analysis (ASTM C-136)

Sieve Size	3/4"	1/2"	3/8"	#4
%age Passing	100	95.71	42.52	0.64

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 (%)	0.52

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

Grading Used	Los Angeles Abrasion Value (%)
B	18.00

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

Clay Lumps and Friable Particles (%)	0.48
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5. Flakiness Index (BS 812: Part 105)

Sieve Size		Individual Flakiness Index (%)	Weighted Flakiness Index (%)
Passing (in.)	Retained (in.)		
3/4	1/2	4.29	0.19
1/2	3/8	10.41	5.57
3/8	1/4	3.95	1.66
<b>Flakiness Index = 7.42%</b>			

### Sample # 3

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

<b>Sieve Size</b>	1/2"	3/8"	#4
<b>%age Passing</b>	100	99.51	64.69

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

<b>Specific Gravity (oven dried condition)</b>	2.83
<b>Specific Gravity (saturated surface dry condition)</b>	2.85
<b>Apparent Specific Gravity</b>	2.89
<b>Water Absorption (%)</b>	0.67

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

<b>Grading Used</b>	<b>Los Angeles Abrasion Value (%)</b>
C	18.30

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

<b>Clay Lumps and Friable Particles (%)</b>	0.77
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#### 5. Flakiness Index (BS 812: Part 105)

<b>Sieve Size</b>		<b>Individual Flakiness Index (%)</b>	<b>Weighted Flakiness Index (%)</b>
<b>Passing (in.)</b>	<b>Retained (in.)</b>		
1/2	3/8	0	0
3/8	1/4	9.70	9.56
<b>Flakiness Index = 9.56%</b>			

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

Best Regards,

Director  
Transportation Engineering Laboratory

#### **Note:**

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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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Ref:-----

Date:-----

The Material Engineer,  
NESPAK,  
Sahiwal.

Subject: **Testing of Bitumen**

Punjab Intermediate Cities Improvement Investment Program (PICIIIP)  
Consultancy Services for Engineering, Procurement and Construction Management  
Trunk Main Sewer Lines and Allied Works (NCB-WORKS/PICIIIP-03) Lot-02

Dear Sir,

It is with reference to your letter No. 3976/11/MIA/SWL/Lot-02/01/1340 dated 27-05-2024.  
Please find below the results of tests conducted on the bitumen sample provided to this laboratory  
on 06-06-2024 through your representative.

Sr.#	Laboratory Tests	Results
1	Penetration (ASTM D-5)	61 Units
2	Ductility (ASTM D-113)	Above 100 cm
3	Softening Point (ASTM D-36)	49.3°C
4	Flash Point (ASTM D-92)	310°C
5	Fire Point (ASTM D-92)	338°C
6	Solubility (ASTM D-2042)	99.80%
7	Specific Gravity Value (ASTM D-70)	1.018
8	Loss on Heating Value (ASTM D-6)	0.228%

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Transportation Engineering Laboratory

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

Ref.:-----

Date:-----

Mr. Ahmed Hassan  
Engineer QA/QC,  
Vision Developers (Pvt.) Ltd.

Subject: **Testing of Sub-base**

Dear Sir,

It is with reference to your letter No. 38 dated 24-06-2024.

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

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

Grading Used	Los Angeles Abrasion Value (%)
A	28.41

## 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.)				
2	1 1/2	10.90	0.72	11.54	0.76
1 1/2	1	13.82	3.49	14.53	3.67
1	3/4	11.78	2.76	12.91	3.02
3/4	1/2	11.13	1.99	11.84	2.12
1/2	3/8	11.38	1.90	12.44	2.08
3/8	1/4	14.91	1.52	21.12	2.15
<b>Flakiness Index = 12,38%</b>			<b>Elongation Index = 13.80%</b>		

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Director  
Transportation Engineering Laboratory

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Ref:-----

Date:-----

Hafiz Saeed Ur Rehman  
Resident Engineer,  
NESPAK.

Subject: **Testing of Coarse Aggregate**  
Remodeling and Upgradation of Ada Nullah & Walton Road (Package-I)

Dear Sir,

It is with reference to your letter No. 4702/13/HCR/09/63 dated 13-06-2024.  
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)

<b>Specific Gravity (oven dried condition)</b>	2.85
<b>Specific Gravity (saturated surface dry condition)</b>	2.86
<b>Apparent Specific Gravity</b>	2.88
<b>Water Absorption (%)</b>	0.35

## 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"	1003.4	993.2	1.02	0.49
	<b>Total = 0.49%</b>			

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

Grading Used	Los Angeles Abrasion Value (%)
A	18.00

#### 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.)				
1 1/2	1	0	0	5.14	0.51
1	3/4	5.85	2.01	6.78	2.34
3/4	1/2	5.44	1.63	6.10	1.83
1/2	3/8	8.61	1.52	9.90	1.75
3/8	1/4	7.28	0.58	9.26	0.74
<b>Flakiness Index = 5.74%</b>			<b>Elongation Index = 7.17%</b>		

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Director  
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