

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 Executive Officer,
Al-Hafeez Garden Phase-II,
Lahore.

Subject: **Bitumen Extraction Test**

Dear Sir,

It is with reference to your letter No. Nil dated Nil.
Please find below the results of the test conducted on the sample provided to this laboratory on 11-06-2024 through your representative.

BITUMEN EXTRACTION TEST:

Bitumen Extraction Value (ASTM D-2172)							4.31%	
Gradation Analysis								
Sieve No.	1"	¾"	½"	3/8"	#4	#8	#50	#200
% Passing	100	94.98	63.97	51.06	39.02	23.00	9.00	4.01

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

Best Regards,

Director
Transportation Engineering Laboratory

Note:

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Date:-----

Mr. Syed Ahmed Raza Naqvi
A. Resident Engineer,
Syedwala Project,
Techno-Consult International.

Subject: **Testing of Bitumen and Crush Materials**
Construction of 2.25 km Missing Link Road on Okara Side to Connect Rai Mansab Ali Khan Kharal Bridge, Approach Road with Existing Provincial Highway Network

Dear Sir,

It is with reference to your letter No. RE(ML)/Techno/2024/036 dated 27-05-2024. Please find below the results for the tests conducted on the bitumen and crush samples provided to this laboratory on 30-05-2024 through your representative.

Bitumen

Sr.#	Laboratory Tests	Results
1	Penetration (ASTM D-5)	83 Units
2	Penetration of Residue (ASTM D-5)	76 Units
3	Ductility (ASTM D-113)	Above 100 cm
4	Ductility of Residue (ASTM D-113)	94 cm
5	Flash Point (ASTM D-92)	292°C
6	Solubility (ASTM D-2042)	99.75%
7	Thin Film Oven Test Value (ASTM D-1754)	0.254%

Crush Materials

Sample # 1

1. Sieve Analysis (ASTM C-136)

Sieve Size	1 1/2"	1"	3/4"	1/2"	3/8"	#4
%age Passing	100	88.04	33.96	0.47	0	0

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

Specific Gravity (oven dried condition)	2.85
Specific Gravity (saturated surface dry condition)	2.86
Apparent Specific Gravity	2.89
Water Absorption (%)	0.53

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

Grading Used	Los Angeles Abrasion Value (%)
A	16.49

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 ½	1	8.44	1.01	10.31	1.23
1	¾	7.28	3.94	8.30	4.49
¾	½	7.13	2.39	7.79	2.61
½	⅜	0	0	32.72	0.15
Flakiness Index = 7.34%			Elongation Index = 8.48%		

Sample # 2

1. Sieve Analysis (ASTM C-136)

Sieve Size	1"	¾"	½"	⅜"	#4
%age Passing	100	85.56	0.61	0	0

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

Specific Gravity (oven dried condition)	2.84
Specific Gravity (saturated surface dry condition)	2.86
Apparent Specific Gravity	2.89
Water Absorption (%)	0.64

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

Grading Used	Los Angeles Abrasion Value (%)
B	16.90

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	3/4	8.47	1.22	10.30	1.49
3/4	1/2	7.20	6.11	7.57	6.43
1/2	3/8	21.74	0.13	34.78	0.21
Flakiness Index = 7.46%			Elongation Index = 8.13%		

Sample # 3

1. Sieve Analysis (ASTM C-136)

Sieve Size	3/4"	1/2"	3/8"	#4
%age Passing	100	100	99.77	67.19

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

Specific Gravity (oven dried condition)	2.84
Specific Gravity (saturated surface dry condition)	2.86
Apparent Specific Gravity	2.89
Water Absorption (%)	0.60

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

Grading Used	Los Angeles Abrasion Value (%)
C	19.50

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.)				
1/2	3/8	0	0	0	0
3/8	1/4	8.32	8.26	9.04	8.98
Flakiness Index = 8.26%			Elongation Index = 8.98%		

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. Haris Rashid
Engineer QA/QC Civil,
(Project No. 10087),
DESCON Engineering Limited.

Subject: **Unit Weight of Coarse Aggregates (3/4" and 3/8")**
Source: Sargodha
Project: Main Works for DIC Greenfield Project at Packages Industrial Estate Kasur - 10087

Dear Sir,

It is with reference to your letter No. DES/HO/01 QA/QC Civil dated 04-07-2024. Please find below the results for the tests conducted on the coarse aggregate samples provided to this laboratory through your representative.

Coarse Aggregate (3/4")

Unit Weight (Loose); (ASTM C 29/C 29M)

Loose Unit Weight (g/cm ³)	1.45
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Coarse Aggregate (3/8")

Unit Weight (Loose); (ASTM C 29/C 29M)

Loose Unit Weight (g/cm ³)	1.45
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