

# 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. Syed Azhar Hussain  
Resident Engineer,  
PRSWSS Project,  
Mohalla Qabristan, Noorpur Thal City, District Khushab.

Subject: **Testing of Coarse Aggregate for RCC Sewerage Pipe**  
Contract Package: PRSWSSP, Procurement of Civil Works (NPT 05), North,  
Tehsil Noorpur Thal, (Villages Nawa Sagu and Katimar)

Dear Sir,

It is with reference to your letter No. TCI/PRSWSSP-North/Phase-III/NPT-05/005 dated 14-05-2024. Please find below the results for the tests conducted on the coarse aggregate sample provided to this laboratory on 21-05-2024 through your representative.

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

Sieve Size	3/8"	#4
%age Passing	100	80.82

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

Specific Gravity (oven dried condition)	2.80
Specific Gravity (saturated surface dry condition)	2.82
Apparent Specific Gravity	2.83
Water Absorption (%)	0.68

## 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.
#4	304.3	288.4	5.23	1.00
	<b>Total = 1.00%</b>			

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

Grading Used	Los Angeles Abrasion Value (%)
C	18.99

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

Loose Unit Weight (g/cm <sup>3</sup> )	1.59
Rodded Unit Weight (g/cm <sup>3</sup> )	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. Syed Azhar Hussain  
Resident Engineer,  
PRSWSS Project,  
Mohalla Qabristan, Noorpur Thal City, District Khushab.

Subject: **Testing of Sample “Gravel for Shrouding”**  
Contract Package: PRSWSSP, Procurement of Civil Works (NPT 05), North,  
Tehsil Noorpur Thal, (Villages Nawa Sagu and Katimar)

Dear Sir,

It is with reference to your letter No. TCI/PRSWSSP-North/Phase-III/NPT-05/004 dated 17-05-2024. Please find below the results for the tests conducted on the aggregate sample provided to this laboratory on 21-05-2024 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	94.61	66.21	18.20	0.84	0.78	0.76	0.70	0.32

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

Specific Gravity (oven dried condition)	2.57
Specific Gravity (saturated surface dry condition)	2.59
Apparent Specific Gravity	2.62
Water Absorption (%)	0.74

## 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.
#4	300.4	287.0	4.46	1.27
	<b>Total = 1.27%</b>			

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

Loose Unit Weight (g/cm <sup>3</sup> )	1.55
Rodded Unit Weight (g/cm <sup>3</sup> )	1.69

## 5. Organic Impurities (ASTM C-40)

Organic Impurities	Nil
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Best Regards,

Director  
Transportation Engineering Laboratory

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Ref:-----

Date:-----

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

Subject: **Testing of Fine Aggregate (Lawrancepur Sand)**  
Contract Package: PRSWSSP, Procurement of Civil Works (NPT 05), North,  
Tehsil Noorpur Thal, (Villages Nawa Sagu and Katimar)

Dear Sir,

It is with reference to your letter No. TCI/PRSWSSP-North/Phase-III/NPT-05/007 dated 14-05-2024. Please find below the results for the tests conducted on the fine aggregate sample provided to this laboratory on 21-05-2024 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	99.24	96.44	91.56	80.77	64.60	27.27	5.55	1.18

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

Fineness Modulus (%)	2.35
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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	98.0	2.00	0.10
#8 to #16	100	98.7	1.30	0.14
#16 to #30	100	98.2	1.80	0.29
#30 to #50	100	98.0	2.00	0.75
<b>Total = 1.28%</b>				

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Director  
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Date:-----

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

Subject: **Testing of Coarse Aggregate**

Contract Package: PRSWSSP, Procurement of Civil Works (NPT 05), North,  
Tehsil Noorpur Thal, (Villages Nawa Sagu and Katimar)

Dear Sir,

It is with reference to your letter No. TCI/PRSWSSP-North/Phase-III/NPT-05/006 dated 14-05-2024. Please find below the results for the tests conducted on the coarse aggregate sample provided to this laboratory on 21-05-2024 through your representative.

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

Sieve Size	1"	3/4"	1/2"	3/8"	#4
%age Passing	100	73.75	14.59	2.00	0

## 2. 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	2.86
Water Absorption (%)	0.46

## 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	991.4	1.20	0.86
	<b>Total = 0.86%</b>			

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

Grading Used	Los Angeles Abrasion Value (%)
B	16.49

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

Loose Unit Weight (g/cm <sup>3</sup> )	1.46
Rodded Unit Weight (g/cm <sup>3</sup> )	1.62

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

Ref:-----

Date:-----

The Resident Engineer,  
ESS-I-AAR Consultant,  
Dera Ghazi Khan.

Subject: **Testing of Aggregate**

Construction of Metalled Road from Dera Mero Ladan to Ghous Abad Along Link No, 1,  
Length = 30.40 km, (Length = 22.40 km Part-B)

Dear Sir,

It is with reference to your letter No. ADP 2021-22/1369 dated 11-05-2024.

Please find below the results of tests conducted on the aggregate sample provided to this laboratory on 30-05-2024 through your representative.

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

Sieve Size	1"	3/4"	1/2"	3/8"	#4
%age Passing	100	100	92.07	36.54	2.63

## 2. 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	2.86
Water Absorption (%)	0.45

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

Grading Used	Los Angeles Abrasion Value (%)
B	19.57

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

Clay Lumps and Friable Particles (%)	0.28
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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	5.66	0.46
1/2	3/8	7.84	4.47
3/8	1/4	6.91	2.41
<b>Flakiness Index = 7.34%</b>			

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Ref:-----

Date:-----

The Resident Engineer,  
ESS-I-AAR Consultant,  
Dera Ghazi Khan.

Subject: **Testing of Bitumen**

Construction of Metalled Road from Dera Mero Ladan to Ghous Abad Along Link No, 1, Length = 30.40 km, (Length = 22.40 km Part-B)

Dear Sir,

It is with reference to your letter No. ADP 2021-22/1370 dated 11-05-2024.

Please find below the results of tests conducted on the bitumen sample provided to this laboratory on 30-05-2024 through your representative.

Sr.#	Laboratory Tests	Results
1	Penetration (ASTM D-5)	66 Units
2	Penetration of Residue (ASTM D-5)	59 Units
3	Ductility (ASTM D-113)	Above 100 cm
4	Softening Point (ASTM D-36)	49.7°C
5	Flash Point (ASTM D-92)	298°C
6	Solubility (ASTM D-2042)	99.80%
7	Specific Gravity Value (ASTM D-70)	1.013
8	Loss on Heating Value (ASTM D-6)	0.231%

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Ref.-----

Date:-----

Mr. M. Zabeeh Ullah  
Asia Poultry Feeds (Pvt.) Ltd.,  
Lahore.

Subject: **Testing of Bitumen**

Dear Sir,

It is with reference to your letter No. Nil dated 31-05-2024.

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)	62 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)	320°C
6	Solubility (ASTM D-2042)	99.80%
7	Thin Film Oven Test Value (ASTM D-1754)	0.263%
8	Loss on Heating Value (ASTM D-6)	0.238%

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