



**STRUCTURAL ENGINEERING DIVISION**  
**Test Floor Laboratory**  
**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
**Pakistan. Ph: 92-42-99029202**

To,  
 Resident Engineer  
 NESPAK  
 China – Pakistan Economic Corridor (CPEC), Western Route Hakla (on M1) – Yarak (D.I. Khan) Motorway, Package-3 (Trap to Kot Belian)(M/s Star Engineering)

Reference # CED/TFL **34750** (Dr. Usman Akmal) Dated: 27-02-2020  
 Reference of the request letter # CPEC/NESPAK/CS/RE/PKG3/19/1405 Dated: 25-02-2020

**Tension Test Report** (Page – 1/1)

Date of Test 06-03-2020  
 Gauge length 2 inches  
 Description W-Metal beam, Metal Post & Metal Spacer (Galvanized) Strip Tensile Test

as per AASHTOO A-180

| Sr. No.                                  | Designation  | Size of Strip | X Section Area | Yield load | Breaking Load | Yield Stress | Ultimate Stress | Elongation | % Elongation | Remarks |
|--|--------------|---------------|----------------|------------|---------------|--------------|-----------------|------------|--------------|---------|
|  |              |               |                |            |               |              |                 |            |              |         |
| 1  | W-Metal beam | 2.90x0.30     | 0.87           | 3450       | 4400          | 3966         | 5057            | 0.60       | 30.00        |         |
| 2  |              | 2.90x0.30     | 0.87           | 3400       | 4400          | 3908         | 5057            | 0.60       | 30.00        |         |
| 3  | Metal Post   | 2.40x0.60     | 1.44           | 5400       | 7600          | 3750         | 5278            | 0.70       | 35.00        |         |
| 4  |              | 2.40x0.60     | 1.44           | 5100       | 7600          | 3542         | 5278            | 0.70       | 35.00        |         |
| 5  | Metal Spacer | 2.40x0.50     | 1.20           | 4600       | 6600          | 3833         | 5500            | 0.65       | 32.50        |         |
| 6  |              | 2.20x0.50     | 1.10           | 3900       | 6400          | 3545         | 5818            | 0.70       | 35.00        |         |
| <b>Only Six Samples for Tensile Test</b> |              |               |                |            |               |              |                 |            |              |         |
| <b>Bend Test</b>                         |              |               |                |            |               |              |                 |            |              |         |
|  |              |               |                |            |               |              |                 |            |              |         |
|  |              |               |                |            |               |              |                 |            |              |         |
|  |              |               |                |            |               |              |                 |            |              |         |

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**UET Lahore, Pakistan.**

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**Pakistan. Ph: 92-42-99029202**

To,  
Resident Engineer  
NESPAK  
China – Pakistan Economic Corridor (CPEC), Western Route Hakla (on M1) – Yarak (D.I.  
Khan) Motorway, Package-3 (Trap to Kot Belian)(M/s Star Engineering)

Reference # CED/TFL **34750** (Dr. Usman Akmal) Dated: 27-02-2020  
Reference of the request letter # CPEC/NESPAK/CS/RE/PKG3/19/1405 Dated: 25-02-2020

**Size Test Report** (Page – 2/2)

Date of Test 06-03-2020

Gauge length -----

Description W-Metal beam, Metal Post & Metal Spacer (Galvanized)Size Test

| Sr.<br>No.                         | Designation  | Thickness | Remark |
|------------------------------------|--------------|-----------|--------|
|                                    |              | (mm)      |        |
| 1                                  | W-Metal beam | 3.00      |        |
| 2                                  | Metal Post   | 6.00      |        |
| 3                                  | Metal Spacer | 5.00      |        |
| -                                  | -            | -         | -      |
| -                                  | -            | -         | -      |
| -                                  | -            | -         | -      |
| -                                  | -            | -         | -      |
| <b>Only Three Samples for Test</b> |              |           |        |
|                                    |              |           |        |

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**UET Lahore, Pakistan.**

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**Test Floor Laboratory**  
**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
**Pakistan. Ph: 92-42-99029202**

To,  
Resident Engineer  
REC – LOYA – TECHNIA – Jv  
Construction of 4-Lane Bridge Across River Indus Linking Layyah with Taunsa including 2  
Lane Approach Roads and Training Works, Package-I, Major Bridge on River Indus (WMI)

Reference # CED/TFL **34780** (Dr. Qasim Khan) Dated: 04-03-2020  
Reference of the request letter # REC-LOYA-TECHNIA/Coord/224 Dated: 03-03-2020

**Tension Test Report** (Page – 1/2)

Date of Test 06-03-2020  
Gauge length 640 mm  
Description Steel Strand Tensile Test as per ASTM A-416-94a

| Sr. No.                         | Nominal Diameter | Nominal Weight | Measured weight | Yield strength clause (6.3) |        | Breaking strength clause (6.2) |       | Young's Modulus of Elasticity | % Elongation | Remarks / Coil No. |
|---------------------------------|------------------|----------------|-----------------|-----------------------------|--------|--------------------------------|-------|-------------------------------|--------------|--------------------|
|                                 | (mm)             | (kg/km)        | (kg/km)         | (kg)                        | (kN)   | (kg)                           | (kN)  | E, GPa                        |              |                    |
| 1                               | 15.24 (0.6")     | 1102.0         | 1113.0          | 24100                       | 236.42 | 27700                          | 271.7 | 199                           | >3.50        | xx                 |
| -                               | -                | -              | -               | -                           | -      | -                              | -     | -                             | -            |                    |
| -                               | -                | -              | -               | -                           | -      | -                              | -     | -                             | -            |                    |
| -                               | -                | -              | -               | -                           | -      | -                              | -     | -                             | -            |                    |
| -                               | -                | -              | -               | -                           | -      | -                              | -     | -                             | -            |                    |
| -                               | -                | -              | -               | -                           | -      | -                              | -     | -                             | -            |                    |
| <b>Only one sample for Test</b> |                  |                |                 |                             |        |                                |       |                               |              |                    |

Note:

1. Modulus of Elasticity is based on nominal steel area of the steel strand vide clause 13.3 of ASTM – A416a
2. Load versus percentage strain graphs are attached

**I/C Testing Laboratoires**  
**UET Lahore, Pakistan.**

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**Test Floor Laboratory**  
**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
**Pakistan. Ph: 92-42-99029202**

To,  
Resident Engineer  
REC – LOYA – TECHNIA – Jv  
Construction of 4-Lane Bridge Across River Indus Linking Layyah with Taunsa including 2  
Lane Approach Roads and Training Works, Package-I, Major Bridge on River Indus (WMI)

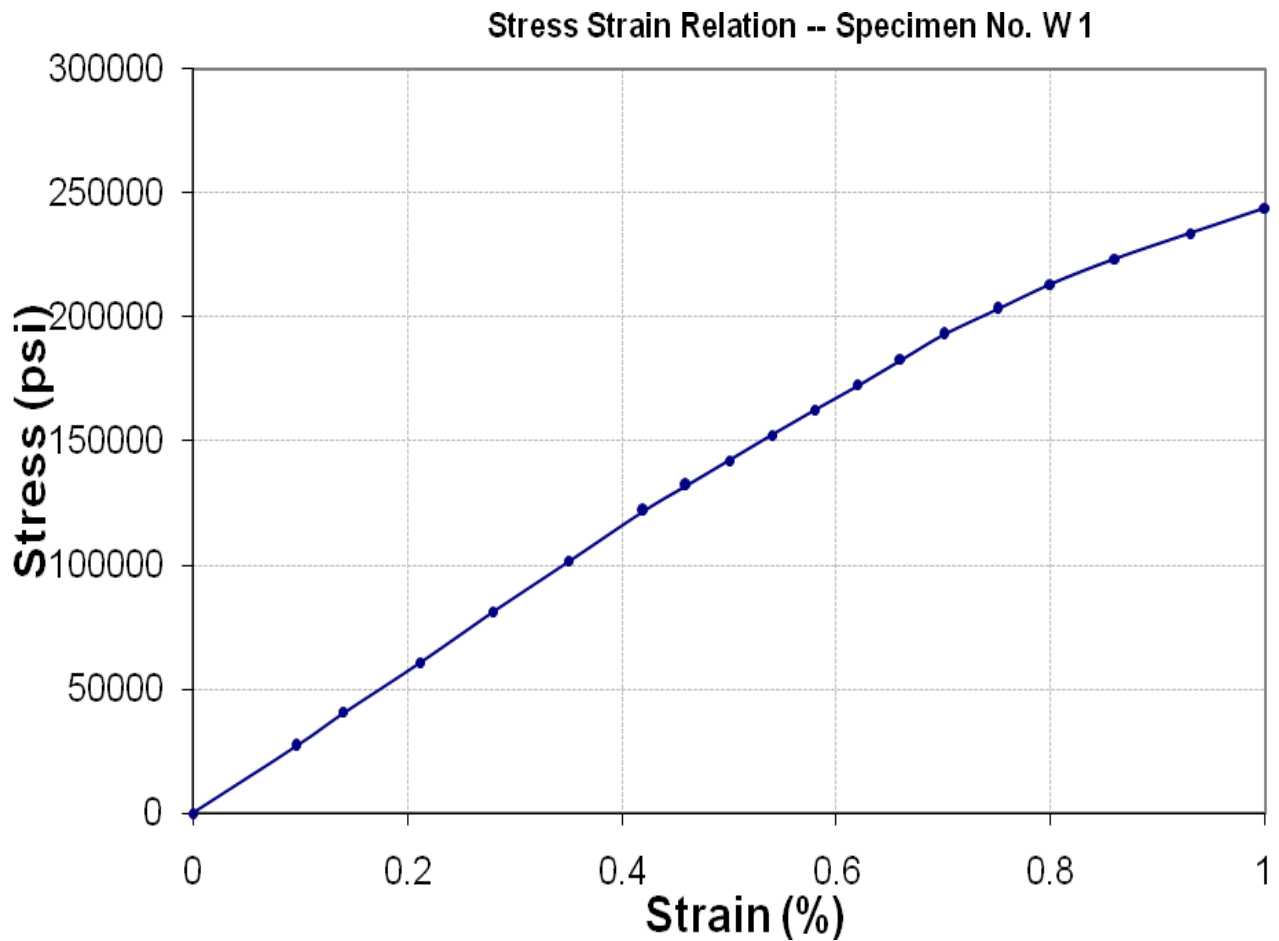
Reference # CED/TFL **34780** (Dr. Qasim Khan)

Dated: 04-03-2020

Reference of the request letter # REC-LOYA-TECHNIA/Coord/224

Dated: 03-03-2020

**Graph** (Page – 2/2)



**I/C Testing Laboratoires**  
**UET Lahore, Pakistan.**

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**University of Engineering and Technology Lahore, 54890**  
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To,  
Resident Engineer  
ZEERUK – LOYA – MIHA jv  
Construction of Burma Bridge at Lehtrar Road, Islamabad  
(Wire Manufacturing Industry, Lahore)

Reference # CED/TFL **34781** (Dr. Qasim Khan)  
Reference of the request letter # ZI/RE/20/24

Dated: 04-03-2020  
Dated: 27-02-2020

**Tension Test Report** (Page – 1/3)

Date of Test 06-03-2020  
Gauge length 640 mm  
Description Steel Strand Tensile Test as per ASTM A-416-94a

| Sr. No.                          | Nominal Diameter | Nominal Weight | Measured weight | Yield strength clause (6.3) |        | Breaking strength clause (6.2) |       | Young's Modulus of Elasticity "E" | % Elongation | Remarks / Coil No. |
|----------------------------------|------------------|----------------|-----------------|-----------------------------|--------|--------------------------------|-------|-----------------------------------|--------------|--------------------|
|                                  | (mm)             | (kg/km)        | (kg/km)         | (kg)                        | (kN)   | (kg)                           | (kN)  | GPa                               |              |                    |
| 1                                | 12.70<br>(1/2")  | 775.0          | 782.0           | 17900                       | 175.60 | 19700                          | 193.3 | 199                               | >3.50        | 21077              |
| 2                                | 12.70<br>(1/2")  | 775.0          | 785.0           | 17700                       | 173.64 | 19700                          | 193.3 | 198                               | >3.50        | 21080              |
| -                                | -                | -              | -               | -                           | -      | -                              | -     | -                                 | -            | -                  |
| -                                | -                | -              | -               | -                           | -      | -                              | -     | -                                 | -            | -                  |
| -                                | -                | -              | -               | -                           | -      | -                              | -     | -                                 | -            | -                  |
| -                                | -                | -              | -               | -                           | -      | -                              | -     | -                                 | -            | -                  |
| <b>Only two samples for Test</b> |                  |                |                 |                             |        |                                |       |                                   |              |                    |

Note:

1. Modulus of Elasticity is based on nominal steel area of the steel strand vide clause 13.3 of ASTM – A416a
2. Load versus percentage strain graphs are attached

**I/C Testing Laboratoires**  
**UET Lahore, Pakistan.**

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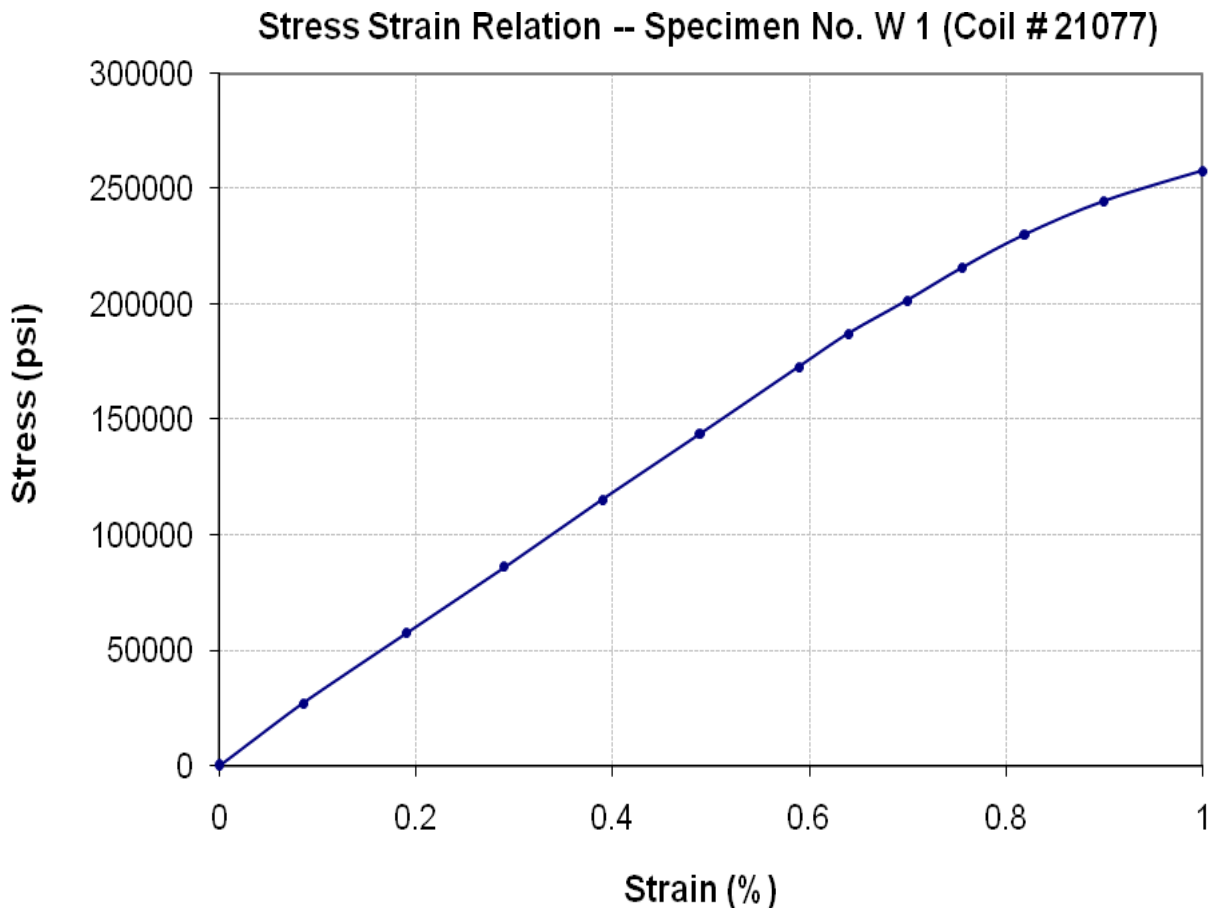
**STRUCTURAL ENGINEERING DIVISION**  
**Test Floor Laboratory**  
**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
**Pakistan. Ph: 92-42-99029202**

To,  
Resident Engineer  
ZEERUK – LOYA – MIHA jv  
Construction of Burma Bridge at Lehtrar Road, Islamabad  
(Wire Manufacturing Industry, Lahore)

Reference # CED/TFL **34781** (Dr. Qasim Khan)  
Reference of the request letter # ZI/RE/20/24

Dated: 04-03-2020  
Dated: 27-02-2020

**Graph** (Page – 2/3)



**I/C Testing Laboratories**  
**UET Lahore, Pakistan.**

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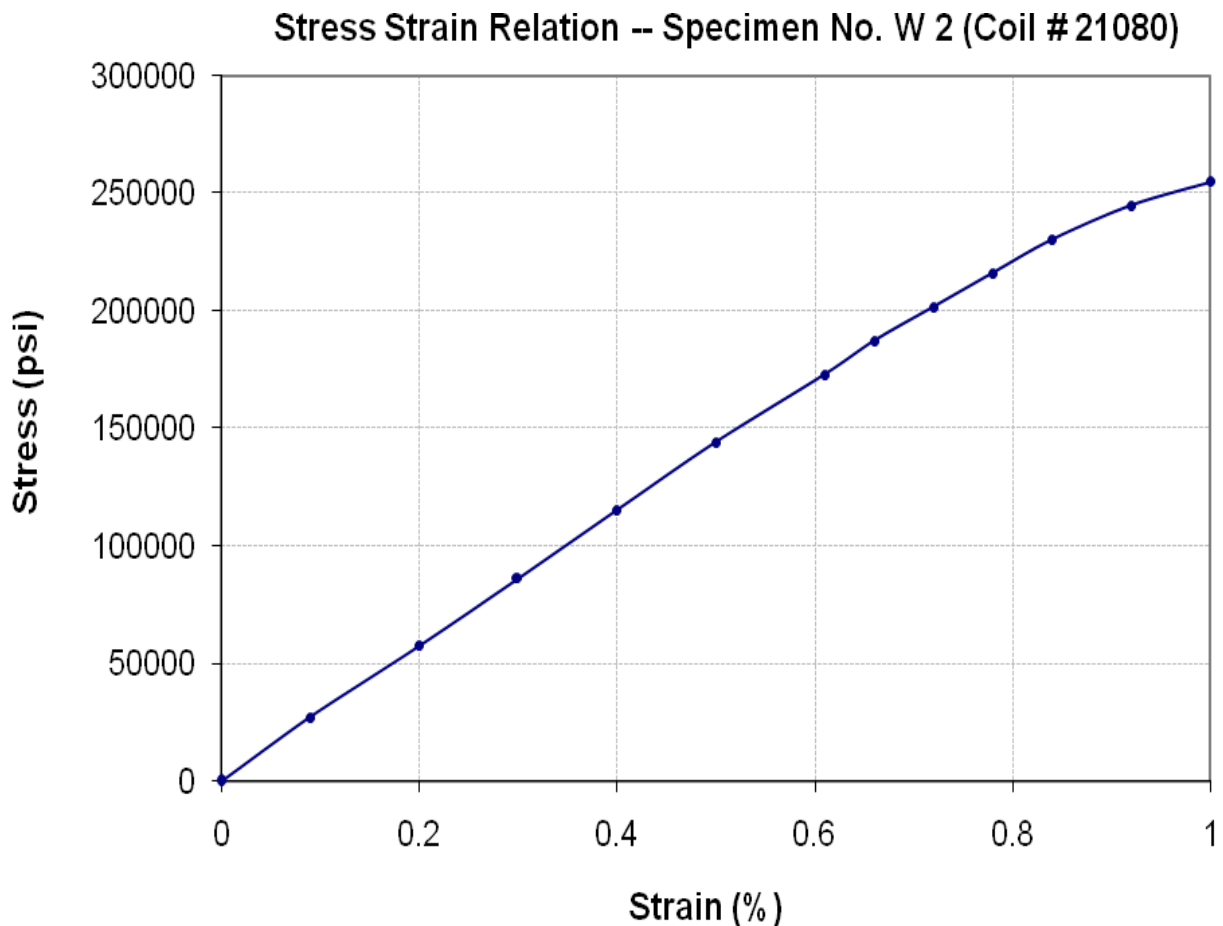
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**Test Floor Laboratory**  
**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
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To,  
Resident Engineer  
ZEERUK – LOYA – MIHA jv  
Construction of Burma Bridge at Lehtrar Road, Islamabad  
(Wire Manufacturing Industry, Lahore)

Reference # CED/TFL **34781** (Dr. Qasim Khan)  
Reference of the request letter # ZI/RE/20/24

Dated: 04-03-2020  
Dated: 27-02-2020

**Graph** (Page – 3/3)



**I/C Testing Laboratories**  
**UET Lahore, Pakistan.**

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**Test Floor Laboratory**  
**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
**Pakistan. Ph: 92-42-99029202**

Ref: CED/TFL/03/34787

Dated: 04-03-2020

Dated of Test: 06-03-2020

To  
**Resident Engineer**  
**Engineering Consultancy Services Punjab (Pvt) Ltd**  
**Resident Supervision for Repair / Rehabilitation of Roads Scheme Under Punjab**  
**Municipal Services Programme (2019 - 20) Phase-I**  
**(Mashallah Warraich Pipe Factory, Gujranwala)**

Subject: **TESTING OF R.C.C. PIPE [ASTM-C76 - 08a]**

Reference to your letter No. ECSP/RE/MCG/Lab/24, dated 02-03-2020

on the subject cited above. Three R.C.C. Pipes as received by us have been tested. The results are tabulated as under.

| <b>Sr. No</b> | <b>Nominal Size</b> | <b>Total Length</b> | <b>Loaded Length</b> | <b>External Diameter</b> | <b>Internal Diameter</b> | <b>Wall Thickness</b> | <b>Proof load</b> | <b>Ultimate Load</b> | <b>Proof Stress</b>    | <b>Ultimate Stress</b> |
|---------------|---------------------|---------------------|----------------------|--------------------------|--------------------------|-----------------------|-------------------|----------------------|------------------------|------------------------|
|               | (inch)              | (foot)              | (foot)               | (foot)                   | (foot)                   | (inch)                | (kg)              | (kg)                 | Pound/Linear foot/foot | Pound/Linear foot/foot |
| 1             | 9                   | 7.82                | 7.29                 | 0.93                     | 0.74                     | 1.09                  | 3000              | 4000                 | 1220                   | 1626                   |
| 2             | 12                  | 7.74                | 7.33                 | 1.33                     | 1.02                     | 1.86                  | 7500              | 12500                | 2215                   | 3691                   |
| 3             | 21                  | 7.72                | 7.26                 | 2.19                     | 1.70                     | 2.93                  | 6220              | 8440                 | 1111                   | 1508                   |

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**STRUCTURAL ENGINEERING DIVISION**  
**Test Floor Laboratory**  
**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
**Pakistan. Ph: 92-42-99029202**

To,  
M.E  
AS Enterprises  
Ahmed Oriental Industrial Estate Rahim Yar Khan  
(AA Associates)(Afce)

Reference # CED/TFL **34789** (Dr. Usman Akmal)  
Reference of the request letter # USD/ASE/01

Dated: 05-03-2020  
Dated: 05-03-2020

**Tension Test Report** (Page -1/1)

Date of Test 06-03-2020  
Gauge length 8 inches  
Description Deformed Steel Bar Tensile and Bend Test as per ASTM-A615

| Sr. No.  | Weight<br>(lbs/ft) | Diameter/<br>Size<br>(mm) |        | Area<br>(in <sup>2</sup> ) |        | Yield load<br>(kg) | Breaking<br>Load<br>(kg) | Yield Stress<br>(psi) |        | Ultimate Stress<br>(psi) |        | Elongation<br>(inch) | % Elongation | Remarks |
|--|--------------------|---------------------------|--------|----------------------------|--------|--------------------|--------------------------|-----------------------|--------|--------------------------|--------|----------------------|--------------|---------|
|  |                    | Nominal                   | Actual | Nominal                    | Actual |                    |                          | Nominal               | Actual | Nominal                  | Actual |                      |              |         |
| 1  | 0.396              | 10                        | 9.78   | 0.12                       | 0.116  | 3000               | 3800                     | 55115                 | 56810  | 69812                    | 72000  | 1.40                 | 17.5         |         |
| 2  | 0.415              | 10                        | 10.01  | 0.12                       | 0.122  | 3300               | 4000                     | 60627                 | 59640  | 73487                    | 72300  | 1.70                 | 21.3         |         |
| -  | -                  | -                         | -      | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| -  | -                  | -                         | -      | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| -  | -                  | -                         | -      | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| -  | -                  | -                         | -      | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| <b>Note: only two samples for tensile and one sample for bend test</b> |                    |                           |        |                            |        |                    |                          |                       |        |                          |        |                      |              |         |
| Bend Test  |                    |                           |        |                            |        |                    |                          |                       |        |                          |        |                      |              |         |
| 10mm Dia Bar Bend Test Through 180° is Satisfactory                    |                    |                           |        |                            |        |                    |                          |                       |        |                          |        |                      |              |         |
|  |                    |                           |        |                            |        |                    |                          |                       |        |                          |        |                      |              |         |
|  |                    |                           |        |                            |        |                    |                          |                       |        |                          |        |                      |              |         |

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**STRUCTURAL ENGINEERING DIVISION**  
**Test Floor Laboratory**  
**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
**Pakistan. Ph: 92-42-99029202**

To,  
 Sub Divisional Officer  
 Highway Sub Division  
 Isa Khel  
 (W/I of Road from Kalabagh to Chuglan Length 4.21 km Tehsil Isa Khel  
 (W/I of Road from Trug to Sultan Khel Length 3.00 km Tehsil Isa Khel

Reference # CED/TFL **34790** (Dr. Usman Akmal)  
 Reference of the request letter # 57

Dated: 05-03-2020  
 Dated: 16-02-2020

**Tension Test Report** (Page -1/2)

Date of Test 06-03-2020  
 Gauge length 8 inches  
 Description Deformed Steel Bar Tensile and Bend Test as per ASTM-A615

| Sr. No.   | Weight<br>(lbs/ft) | Diameter/<br>Size<br>(inch) |        | Area<br>(in <sup>2</sup> ) |        | Yield load<br>(kg) | Breaking<br>Load<br>(kg) | Yield Stress<br>(psi) |        | Ultimate Stress<br>(psi) |        | Elongation<br>(inch) | % Elongation | Remarks |
|---|--------------------|-----------------------------|--------|----------------------------|--------|--------------------|--------------------------|-----------------------|--------|--------------------------|--------|----------------------|--------------|---------|
|   |                    | Nominal                     | Actual | Nominal                    | Actual |                    |                          | Nominal               | Actual | Nominal                  | Actual |                      |              |         |
| 1   | 0.370              | 3/8                         | 0.372  | 0.11                       | 0.109  | 2800               | 4300                     | 56200                 | 56760  | 86200                    | 87200  | 1.30                 | 16.3         |         |
| 2   | 5.188              | 1 1/8                       | 1.393  | 1.56                       | 1.525  | 42200              | 69400                    | 59700                 | 61000  | 98100                    | 100400 | 1.40                 | 17.5         |         |
| -   | -                  | -                           | -      | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| -   | -                  | -                           | -      | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| -   | -                  | -                           | -      | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| -   | -                  | -                           | -      | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| <b>Note: only two samples for tensile and two samples for bend test</b> |                    |                             |        |                            |        |                    |                          |                       |        |                          |        |                      |              |         |
| Bend Test   |                    |                             |        |                            |        |                    |                          |                       |        |                          |        |                      |              |         |
| 3/8" Dia Bar Bend Test Through 180° is Satisfactory                     |                    |                             |        |                            |        |                    |                          |                       |        |                          |        |                      |              |         |
| 1 1/8" Dia Bar Bend Test Through 180° is Satisfactory                   |                    |                             |        |                            |        |                    |                          |                       |        |                          |        |                      |              |         |

**I/C Testing Laboratoires**  
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**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
**Pakistan. Ph: 92-42-99029202**

To,  
 Sub Divisional Officer  
 Highway Sub Division  
 Isa Khel

(W/I of Road from Isa Khel to Khaglan wala Road Length 4.00 km, Length 4.21 km Tehsil Isa Khel  
 (W/I of Road from Chashmia to Gula Khel Length 4.25 km Tehsil Isa Khel

Reference # CED/TFL **34790** (Dr. Usman Akmal)  
 Reference of the request letter # 63

Dated: 05-03-2020  
 Dated: 16-02-2020

**Tension Test Report** (Page -2/2)

Date of Test 06-03-2020  
 Gauge length 8 inches  
 Description Deformed Steel Bar Tensile and Bend Test as per ASTM-A615

| Sr. No.   | Weight<br>(lbs/ft) | Diameter/<br>Size<br>(inch) |        | Area<br>(in <sup>2</sup> ) |        | Yield load<br>(kg) | Breaking<br>Load<br>(kg) | Yield Stress<br>(psi) |        | Ultimate Stress<br>(psi) |        | Elongation<br>(inch) | % Elongation | Remarks |
|---|--------------------|-----------------------------|--------|----------------------------|--------|--------------------|--------------------------|-----------------------|--------|--------------------------|--------|----------------------|--------------|---------|
|   |                    | Nominal                     | Actual | Nominal                    | Actual |                    |                          | Nominal               | Actual | Nominal                  | Actual |                      |              |         |
| 1   | 0.383              | 3/8                         | 0.379  | 0.11                       | 0.113  | 2900               | 4500                     | 58200                 | 56720  | 90200                    | 88100  | 1.20                 | 15.0         |         |
| 2   | 5.161              | 1 1/8                       | 1.390  | 1.56                       | 1.517  | 42600              | 69000                    | 60200                 | 61900  | 97500                    | 100300 | 1.20                 | 15.0         |         |
| -   | -                  | -                           | -      | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| -   | -                  | -                           | -      | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| -   | -                  | -                           | -      | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| -   | -                  | -                           | -      | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| <b>Note: only two samples for tensile and two samples for bend test</b> |                    |                             |        |                            |        |                    |                          |                       |        |                          |        |                      |              |         |
| Bend Test   |                    |                             |        |                            |        |                    |                          |                       |        |                          |        |                      |              |         |
| 3/8" Dia Bar Bend Test Through 180° is Satisfactory                     |                    |                             |        |                            |        |                    |                          |                       |        |                          |        |                      |              |         |
| 1 1/8" Dia Bar Bend Test Through 180° is Satisfactory                   |                    |                             |        |                            |        |                    |                          |                       |        |                          |        |                      |              |         |

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**STRUCTURAL ENGINEERING DIVISION**  
**Test Floor Laboratory**  
**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
**Pakistan. Ph: 92-42-99029202**

To,  
 P.M (Wan Bhachran/Chashma)  
 PAEC-WASO  
 Construction of Archive Building at Chashma  
 (Al-Moez Steel)(Heat No. 743)

Reference # CED/TFL **34791** (Dr. Usman Akmal) Dated: 05-03-2020  
 Reference of the request letter # PD(CH)/WASO/PDS/C3&C4/93/18/528 Dated: 24-02-2020

**Tension Test Report** (Page -1/1)

Date of Test 06-03-2020  
 Gauge length 8 inches  
 Description Deformed Steel Bar Tensile and Bend Test as per ASTM-A615

| Sr. No.  | Weight<br>(lbs/ft) | Diameter/<br>Size |                  | Area<br>(in <sup>2</sup> ) |        | Yield load<br>(kg) | Breaking<br>Load<br>(kg) | Yield Stress<br>(psi) |        | Ultimate Stress<br>(psi) |        | Elongation<br>(inch) | % Elongation | Remarks |
|--|--------------------|-------------------|------------------|----------------------------|--------|--------------------|--------------------------|-----------------------|--------|--------------------------|--------|----------------------|--------------|---------|
|  |                    | Nominal<br>(#)    | Actual<br>(inch) | Nominal                    | Actual |                    |                          | Nominal               | Actual | Nominal                  | Actual |                      |              |         |
| 1  | 0.374              | 3                 | 0.374            | 0.11                       | 0.110  | 3300               | 5000                     | 66200                 | 66100  | 100200                   | 100200 | 1.20                 | 15.0         |         |
| 2  | 0.377              | 3                 | 0.375            | 0.11                       | 0.111  | 3200               | 5000                     | 64200                 | 63730  | 100200                   | 99600  | 1.40                 | 17.5         |         |
| -  | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| -  | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| -  | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| -  | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| <b>Note: only two samples for tensile and one sample for bend test</b> |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |         |
| Bend Test  |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |         |
| #3 Bar Bend Test Through 180° is Satisfactory                          |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |         |
|  |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |         |

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**STRUCTURAL ENGINEERING DIVISION**  
**Test Floor Laboratory**  
**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
**Pakistan. Ph: 92-42-99029202**

To,  
 Resident Engineer  
 NESPAK  
 Infrastructure Works of DHA Housing Scheme Gujranwala

Reference # CED/TFL **34792** (Dr. Usman Akmal)  
 Reference of the request letter # 4055/13/SA/09/615

Dated: 05-03-2020  
 Dated: 03-03-2020

**Tension Test Report** (Page -1/3)

Date of Test 06-03-2020  
 Gauge length 8 inches  
 Description Deformed Steel Bar Tensile and Bend Test as per ASTM-A615

| Sr. No.  | Weight<br>(lbs/ft) | Diameter/<br>Size |                  | Area<br>(in <sup>2</sup> ) |        | Yield load<br>(kg) | Breaking<br>Load<br>(kg) | Yield Stress<br>(psi) |        | Ultimate Stress<br>(psi) |        | Elongation<br>(inch) | % Elongation | Remarks        |
|--|--------------------|-------------------|------------------|----------------------------|--------|--------------------|--------------------------|-----------------------|--------|--------------------------|--------|----------------------|--------------|----------------|
|  |                    | Nominal<br>(#)    | Actual<br>(inch) | Nominal                    | Actual |                    |                          | Nominal               | Actual | Nominal                  | Actual |                      |              |                |
| 1  | 0.363              | 3                 | 0.368            | 0.11                       | 0.107  | 2900               | 4200                     | 58200                 | 59940  | 84200                    | 86900  | 1.50                 | 18.8         | Kamran<br>G-40 |
| 2  | 0.357              | 3                 | 0.366            | 0.11                       | 0.105  | 2900               | 4100                     | 58200                 | 60900  | 82200                    | 86100  | 1.70                 | 21.3         |                |
| -  | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |                |
| -  | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |                |
| -  | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |                |
| -  | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |                |
| <b>Note: only two samples for tensile and one sample for bend test</b> |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |                |
| Bend Test  |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |                |
| #3 Bar Bend Test Through 180° is Satisfactory                          |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |                |
|  |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |                |
|  |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |                |

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**STRUCTURAL ENGINEERING DIVISION**  
**Test Floor Laboratory**  
**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
**Pakistan. Ph: 92-42-99029202**

To,  
 Resident Engineer  
 NESPAK  
 Infrastructure Works of DHA Housing Scheme Gujranwala

Reference # CED/TFL **34792** (Dr. Usman Akmal)  
 Reference of the request letter # 4055/13/SA/09/614

Dated: 05-03-2020  
 Dated: 03-03-2020

**Tension Test Report** (Page -2/3)

Date of Test 06-03-2020  
 Gauge length 8 inches  
 Description Deformed Steel Bar Tensile and Bend Test as per ASTM-A615

| Sr. No.  | Weight<br>(lbs/ft) | Diameter/<br>Size |                  | Area<br>(in <sup>2</sup> ) |        | Yield load<br>(kg) | Breaking<br>Load<br>(kg) | Yield Stress<br>(psi) |        | Ultimate Stress<br>(psi) |        | Elongation<br>(inch) | % Elongation | Remarks  |
|--|--------------------|-------------------|------------------|----------------------------|--------|--------------------|--------------------------|-----------------------|--------|--------------------------|--------|----------------------|--------------|----------|
|  |                    | Nominal<br>(#)    | Actual<br>(inch) | Nominal                    | Actual |                    |                          | Nominal               | Actual | Nominal                  | Actual |                      |              |          |
| 1  | 0.366              | 3                 | 0.370            | 0.11                       | 0.107  | 3900               | 5200                     | 78200                 | 79980  | 104200                   | 106700 | 0.90                 | 11.3         | FF Steel |
| 2  | 0.358              | 3                 | 0.366            | 0.11                       | 0.105  | 3700               | 5000                     | 74200                 | 77430  | 100200                   | 104700 | 1.20                 | 15.0         |          |
| 3  | 4.247              | 10                | 1.261            | 1.27                       | 1.248  | 36800              | 53200                    | 63900                 | 64980  | 92400                    | 94000  | 1.60                 | 20.0         |          |
| 4  | 4.241              | 10                | 1.260            | 1.27                       | 1.247  | 37000              | 53200                    | 64300                 | 65420  | 92400                    | 94100  | 1.80                 | 22.5         |          |
| -  | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |          |
| -  | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |          |
| <b>Note: only four samples for tensile and two samples for bend test</b> |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |          |
| Bend Test  |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |          |
| #3 Bar Bend Test Through 180° is Satisfactory                            |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |          |
| #10 Bar Bend Test Through 180° is Satisfactory                           |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |          |

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**STRUCTURAL ENGINEERING DIVISION**  
**Test Floor Laboratory**  
**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
**Pakistan. Ph: 92-42-99029202**

To,  
 Resident Engineer  
 NESPAK  
 Infrastructure Works of DHA Housing Scheme Gujranwala

Reference # CED/TFL **34792** (Dr. Usman Akmal)  
 Reference of the request letter # 4055/13/SA/09/620

Dated: 05-03-2020  
 Dated: 04-03-2020

**Tension Test Report** (Page -3/3)

Date of Test 06-03-2020  
 Gauge length 8 inches  
 Description Deformed Steel Bar Tensile and Bend Test as per ASTM-A615

| Sr. No.  | Weight<br>(lbs/ft) | Diameter/<br>Size |                  | Area<br>(in <sup>2</sup> ) |        | Yield load<br>(kg) | Breaking<br>Load<br>(kg) | Yield Stress<br>(psi) |        | Ultimate Stress<br>(psi) |        | Elongation<br>(inch) | % Elongation | Remarks          |
|--|--------------------|-------------------|------------------|----------------------------|--------|--------------------|--------------------------|-----------------------|--------|--------------------------|--------|----------------------|--------------|------------------|
|  |                    | Nominal<br>(#)    | Actual<br>(inch) | Nominal                    | Actual |                    |                          | Nominal               | Actual | Nominal                  | Actual |                      |              |                  |
| 1  | 0.394              | 3                 | 0.384            | 0.11                       | 0.116  | 2900               | 4400                     | 58200                 | 55190  | 88200                    | 83800  | 1.40                 | 17.5         | Royal Steel Mill |
| 2  | 0.394              | 3                 | 0.384            | 0.11                       | 0.116  | 2900               | 4400                     | 58200                 | 55190  | 88200                    | 83800  | 1.60                 | 20.0         |                  |
| -  | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |                  |
| -  | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |                  |
| -  | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |                  |
| -  | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |                  |
| <b>Note: only two samples for tensile and one sample for bend test</b> |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |                  |
| Bend Test  |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |                  |
| #3 Bar Bend Test Through 180° is Satisfactory                          |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |                  |
|  |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |                  |
|  |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |                  |

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**STRUCTURAL ENGINEERING DIVISION**  
**Test Floor Laboratory**  
**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
**Pakistan. Ph: 92-42-99029202**

To,  
 Resident Engineer  
 NESPAK  
 Construction of Under Passes at Kashmir Bridge along Canal Faisalabad

Reference # CED/TFL **34793** (Dr. Usman Akmal)  
 Reference of the request letter # 3994/103/AS/02/207

Dated: 05-03-2020  
 Dated: 04-03-2020

**Tension Test Report** (Page -1/1)

Date of Test 06-03-2020  
 Gauge length 8 inches  
 Description Deformed Steel Bar Tensile and Bend Test as per ASTM-A615

| Sr. No.   | Weight<br>(lbs/ft) | Diameter/<br>Size |                  | Area<br>(in <sup>2</sup> ) |        | Yield load<br>(kg) | Breaking<br>Load<br>(kg) | Yield Stress<br>(psi) |        | Ultimate Stress<br>(psi) |        | Elongation<br>(inch) | % Elongation | Remarks        |
|---|--------------------|-------------------|------------------|----------------------------|--------|--------------------|--------------------------|-----------------------|--------|--------------------------|--------|----------------------|--------------|----------------|
|   |                    | Nominal<br>(#)    | Actual<br>(inch) | Nominal                    | Actual |                    |                          | Nominal               | Actual | Nominal                  | Actual |                      |              |                |
| 1   | 0.374              | 3                 | 0.374            | 0.11                       | 0.110  | 3800               | 5000                     | 76200                 | 76120  | 100200                   | 100200 | 0.80                 | 10.0         | Kisan<br>Steel |
| 2   | 0.371              | 3                 | 0.373            | 0.11                       | 0.109  | 3900               | 5100                     | 78200                 | 78830  | 102200                   | 103100 | 1.00                 | 12.5         |                |
| -   | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |                |
| -   | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |                |
| -   | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |                |
| -   | -                  | -                 | -                | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |                |
| <b>Note: only two samples for tensile and two samples for bend test</b> |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |                |
| Bend Test   |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |                |
| #3 Bar Bend Test Through 180° is Satisfactory                           |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |                |
| #3 Bar Bend Test Through 180° is Satisfactory                           |                    |                   |                  |                            |        |                    |                          |                       |        |                          |        |                      |              |                |

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**STRUCTURAL ENGINEERING DIVISION**  
**Test Floor Laboratory**  
**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
**Pakistan. Ph: 92-42-99029202**

To,  
M/S Moaz Steel  
Lahore  
(Couplers for CGGC-DESCON Jv Muhammad Dam Hydro Power Project)  
(Grad – 1045)

Reference # CED/TFL **34795** (Dr. Usman Akmal)

Dated: 05-03-2020

Reference of the request letter # MZ/CGGC-DES/MD/UET/015

Dated: 05-03-2020

**Tension Test Report** (Page -1/1)

Date of Test 06-03-2020

Gauge length 8 inches

Description Plain Steel Bar Tensile Test

| Sr. No.                                       | Weight | Diameter/size |             | Area (mm <sup>2</sup> ) |        | Yield load | Breaking Load | Yield Stress (MPa) | Ultimate Stress (MPa) | Elongation | % Elongation | Remarks |
|---|--------|---------------|-------------|-------------------------|--------|------------|---------------|--------------------|-----------------------|------------|--------------|---------|
|   | (kg/m) | Nominal (mm)  | Actual (mm) | Nominal                 | Actual | (kg)       | (kg)          | Actual             | Actual                | (inch)     |              |         |
| 1   | 6.343  | 32            | 32.07       | -----                   | 808.0  | 29600      | 48800         | 359                | 593                   | 2.00       | 25.0         |         |
| .   | .      | .             | .           | .                       | .      | .          | .             | .                  | .                     | .          | .            |         |
| .   | .      | .             | .           | .                       | .      | .          | .             | .                  | .                     | .          | .            |         |
| .   | .      | .             | .           | .                       | .      | .          | .             | .                  | .                     | .          | .            |         |
| .   | .      | .             | .           | .                       | .      | .          | .             | .                  | .                     | .          | .            |         |
| .   | .      | .             | .           | .                       | .      | .          | .             | .                  | .                     | .          | .            |         |
| <b>Note: only one sample for tensile test</b> |        |               |             |                         |        |            |               |                    |                       |            |              |         |
| Bend Test                                     |        |               |             |                         |        |            |               |                    |                       |            |              |         |
|   |        |               |             |                         |        |            |               |                    |                       |            |              |         |
|   |        |               |             |                         |        |            |               |                    |                       |            |              |         |

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**STRUCTURAL ENGINEERING DIVISION**  
**Test Floor Laboratory**  
**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
**Pakistan. Ph: 92-42-99029202**

To,  
 M/S Moaz Steel  
 Lahore  
 (Couplers for CGGC-DESCON Jv Muhammad Dam Hydro Power Project)  
 (Grad – 4140)

Reference # CED/TFL **34796** (Dr. Usman Akmal)

Dated: 05-03-2020

Reference of the request letter # MZ/CGGC-DES/MD/UET/014

Dated: 05-03-2020

**Tension Test Report** (Page -1/1)

Date of Test 06-03-2020

Gauge length 8 inches

Description Plain Steel Bar Tensile Test

| Sr. No.                                       | Weight<br>(kg/m) | Diameter/<br>size |                | Area<br>(mm <sup>2</sup> ) |        | Yield load<br>(kg) | Breaking Load<br>(kg) | Yield Stress<br>(MPa)<br>Actual | Ultimate Stress<br>(MPa)<br>Actual | Elongation<br>(inch) | % Elongation | Remarks |
|---|------------------|-------------------|----------------|----------------------------|--------|--------------------|-----------------------|---------------------------------|------------------------------------|----------------------|--------------|---------|
|   |                  | Nominal<br>(mm)   | Actual<br>(mm) | Nominal                    | Actual |                    |                       |                                 |                                    |                      |              |         |
| 1   | 6.287            | 32                | 31.93          | -----                      | 800.9  | 47800              | 54400                 | 586                             | 666                                | 0.80                 | 10.0         |         |
| .   | .                | .                 | .              | .                          | .      | .                  | .                     | .                               | .                                  | .                    | .            |         |
| .   | .                | .                 | .              | .                          | .      | .                  | .                     | .                               | .                                  | .                    | .            |         |
| .   | .                | .                 | .              | .                          | .      | .                  | .                     | .                               | .                                  | .                    | .            |         |
| .   | .                | .                 | .              | .                          | .      | .                  | .                     | .                               | .                                  | .                    | .            |         |
| .   | .                | .                 | .              | .                          | .      | .                  | .                     | .                               | .                                  | .                    | .            |         |
| <b>Note: only one sample for tensile test</b> |                  |                   |                |                            |        |                    |                       |                                 |                                    |                      |              |         |
| Bend Test                                     |                  |                   |                |                            |        |                    |                       |                                 |                                    |                      |              |         |
|   |                  |                   |                |                            |        |                    |                       |                                 |                                    |                      |              |         |
|   |                  |                   |                |                            |        |                    |                       |                                 |                                    |                      |              |         |

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**STRUCTURAL ENGINEERING DIVISION**  
**Test Floor Laboratory**  
**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
**Pakistan. Ph: 92-42-99029202**

To,  
 Mr. Kongchunpeng  
 Manager Laboratory  
 Yangtze Three Gorges Technology & Economy Development Co., Ltd  
 Azad Pattan Hydro Power Project Section 05 Azad Kashmir (TGDC-5)  
 (Tianjin Tiantie Zhaer Steel Production Co., Ltd)

Reference # CED/TFL **34801** (Dr. Usman Akmal)  
 Reference of the request letter # Nil

Dated: 06-03-2020  
 Dated: 05-03-2020

**Tension Test Report** (Page -1/4)

Date of Test 06-03-2020  
 Gauge length 8 inches  
 Description Deformed Steel Bar Tensile Test as per ASTM-A615

| Sr. No.                                       | Weight<br>(lbs/ft) | Diameter/<br>Size<br>(mm) |        | Area<br>(in <sup>2</sup> ) |        | Yield load<br>(kg) | Breaking<br>Load<br>(kg) | Yield Stress<br>(psi) |        | Ultimate Stress<br>(psi) |        | Elongation<br>(inch) | % Elongation | Remarks |
|---|--------------------|---------------------------|--------|----------------------------|--------|--------------------|--------------------------|-----------------------|--------|--------------------------|--------|----------------------|--------------|---------|
|   |                    | Nominal                   | Actual | Nominal                    | Actual |                    |                          | Nominal               | Actual | Nominal                  | Actual |                      |              |         |
| 1   | 4.302              | 32                        | 32.23  | 1.25                       | 1.265  | 70600              | 91000                    | 124516                | 123040 | 160495                   | 158600 | 0.90                 | 11.3         |         |
| -   | -                  | -                         | -      | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| -   | -                  | -                         | -      | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| -   | -                  | -                         | -      | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| -   | -                  | -                         | -      | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| -   | -                  | -                         | -      | -                          | -      | -                  | -                        | -                     | -      | -                        | -      | -                    | -            |         |
| <b>Note: only one sample for tensile test</b> |                    |                           |        |                            |        |                    |                          |                       |        |                          |        |                      |              |         |
| Bend Test                                     |                    |                           |        |                            |        |                    |                          |                       |        |                          |        |                      |              |         |
|   |                    |                           |        |                            |        |                    |                          |                       |        |                          |        |                      |              |         |
|   |                    |                           |        |                            |        |                    |                          |                       |        |                          |        |                      |              |         |

**I/C Testing Laboratoires**  
**UET Lahore, Pakistan.**

Note:

- 1- You can See your reports On Internet in the following web site  
[http://www.uet.edu.pk/faculties/facultiesinfo/civil/index.html?RID=testing\\_reports](http://www.uet.edu.pk/faculties/facultiesinfo/civil/index.html?RID=testing_reports)
- 2- The above results pertain to sample /samples supplied to this laboratory.
- 3- Sealed sample / Unsealed sample / Marked sample/Signed Samples



**STRUCTURAL ENGINEERING DIVISION**  
**Test Floor Laboratory**  
**Department of Civil Engineering**  
**University of Engineering and Technology Lahore, 54890**  
**Pakistan. Ph: 92-42-99029202**

To,  
Mr. Kongchunpeng  
Manager Laboratory  
Yangtze Three Gorges Technology & Economy Development Co., Ltd  
Azad Pattan Hydro Power Project Section 05 Azad Kashmir (TGDC-5)  
(Tianjin Tiantie Zhaer Steel Production Co., Ltd)

Reference # CED/TFL **34801** (Dr. Usman Akmal)  
Reference of the request letter # Nil

Dated: 06-03-2020

Dated: 05-03-2020

**Tension Test Report** (Page – 2/4)

Date of Test           06-03-2019  
Gauge length         -----  
Description            Connection Load Test

| Sr. No.                         | Diameter/<br>Size | Breaking Load | Remarks           |
|---------------------------------|-------------------|---------------|-------------------|
|                                 | (mm)              | (kg)          |                   |
| 1                               | 32                | 91200         | Steel bar failure |
| -                               | -                 | -             | -                 |
| -                               | -                 | -             | -                 |
| -                               | -                 | -             | -                 |
| -                               | -                 | -             | -                 |
| -                               | -                 | -             | -                 |
| -                               | -                 | -             | -                 |
| -                               | -                 | -             | -                 |
| <b>Only One Sample for Test</b> |                   |               |                   |

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To,  
Mr. Kongchunpeng  
Manager Laboratory  
Yangtze Three Gorges Technology & Economy Development Co., Ltd  
Azad Pattan Hydro Power Project Section 05 Azad Kashmir (TGDC-5)  
(Tianjin Chunpeng Prestressed Concrete Strand Co., Ltd)  
Reference # CED/TFL **34801** (Dr. Qasim Khan)  
Reference of the request letter # Nil

Dated: 06-03-2020

Dated: 05-03-2020

**Tension Test Report** (Page – 3/4)

Date of Test 06-03-2020  
Gauge length 640 mm  
Description Steel Strand Tensile Test as per ASTM A-416-94a

| Sr. No.                  | Nominal Diameter | Nominal Weight | Measured weight | Yield strength clause (6.3) |        | Breaking strength clause (6.2) |        | Young's Modulus of Elasticity | % Elongation | Remarks / Coil No. |
|--------------------------|------------------|----------------|-----------------|-----------------------------|--------|--------------------------------|--------|-------------------------------|--------------|--------------------|
|                          | (mm)             | (kg/km)        | (kg/km)         | (kg)                        | (kN)   | (kg)                           | (kN)   | E, GPa                        |              |                    |
| 1                        | 15.24 (0.6")     | 1102.0         | 1120.0          | 24300                       | 238.38 | 27400                          | 268.79 | 199                           | >3.50        | xx                 |
| -                        | -                | -              | -               | -                           | -      | -                              | -      | -                             | -            |                    |
| -                        | -                | -              | -               | -                           | -      | -                              | -      | -                             | -            |                    |
| -                        | -                | -              | -               | -                           | -      | -                              | -      | -                             | -            |                    |
| -                        | -                | -              | -               | -                           | -      | -                              | -      | -                             | -            |                    |
| -                        | -                | -              | -               | -                           | -      | -                              | -      | -                             | -            |                    |
| Only one sample for Test |                  |                |                 |                             |        |                                |        |                               |              |                    |

Note:

1. Modulus of Elasticity is based on nominal steel area of the steel strand vide clause 13.3 of ASTM – A416a
2. Load versus percentage strain graphs are attached

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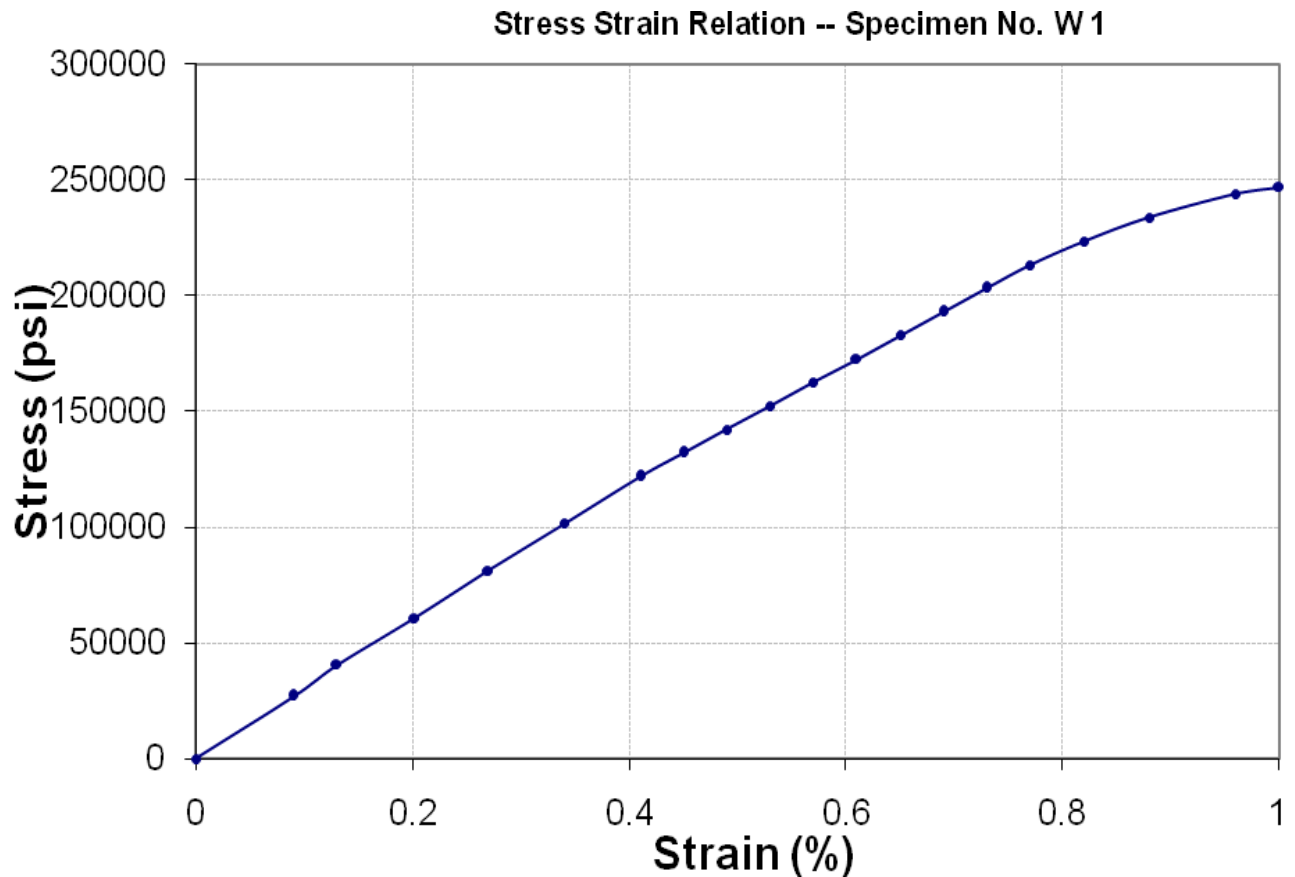
To,  
Mr. Kongchunpeng  
Manager Laboratory  
Yangtze Three Gorges Technology & Economy Development Co., Ltd  
Azad Pattan Hydro Power Project Section 05 Azad Kashmir (TGDC-5)  
(Tianjin Chunpeng Prestressed Concrete Strand Co., Ltd)

Reference # CED/TFL **34801** (Dr. Qasim Khan)  
Reference of the request letter # Nil

Dated: 06-03-2020

Dated: 05-03-2020

**Graph** (Page – 4/4)



**I/C Testing Laboratories**  
**UET Lahore, Pakistan.**

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