

د افغانستان برېښنا شرکت
Da Afghanistan Breshna Sherkat - DABS

39

Da Afghanistan Breshna Sherkat (DABS)

Operational Division

Planning & Engineering Directorate

Head of Engineering

HV Transmission Line Survey & Design Department

Technical Specification for High Voltage Transmission Line Equipment



Prepared by: Survey and Design of Transmission Line Department

Four handwritten signatures in blue ink are visible at the bottom of the page.

Contents

| | |
|---|---|
| Table 1.1- Line Conductor | 3 |
| Table 1.2 Stockbridge Vibration Dampers for ACSR 158.1 mm ² Conductors | 4 |
| Table 1.3 Suspension Insulator (Composite Long Rod) for 220kv | 5 |
| Table 1.4 Tension Insulator (Composite Long Rod) for 220kv | 6 |
| Table 1.5- Optical Fiber Ground Wire (OPGW) | 7 |
| Table 1.9- Stockbridge Vibration Dampers for OPGW | 9 |



Handwritten signatures and initials in blue ink, including a large stylized signature and several smaller initials.

36

Table 1.1- Line Conductor

| Sr. No | Description/Details | Unit | Specified | Tendered |
|--------|-------------------------------------|-------------------|---|----------|
| 1 | Manufacturer | | To be specified | |
| 2 | Conductor Type | | ACSR | |
| 3 | Conductor Code Name | | Wolf | |
| 4 | Stranding and wire diameter | | To be specified | |
| 4.1 | Aluminum | mm | 26 / 3.86 | |
| 4.2 | Steel | mm | 7 / 3.0 | |
| 5 | Nominal Al. Cross sectional Area | mm ² | 158.1 | |
| 6 | Conductor Diameter | mm | | |
| 7 | Ultimate Strength | KN | To be specified | |
| 8 | Modulus of Elasticity | N/mm ² | To be specified | |
| 9 | Coefficient of linear expansion | /°C | 19.30 x 10 ⁻⁶ | |
| 10 | Standard mass of conductor | Kg/km | To be specified | |
| 11 | Electrical DC Resistance at 20°C | Ohm/km | 0.0949 | |
| 12 | Standard up jointed length per drum | m | ----- | |
| 13 | Applicable Standards | | BS 215 Part 2, IEC 60888, 60889, 61089, EN50182 | |


 24/7/2024
 24/7/2024
 24/7/2024

37
Table 1.2 Stockbridge Vibration Dampers for ACSR 158.1 mm² Conductors

| Sr. No. | Description/Details | Unit | Specified | Tendered |
|---------|----------------------------|-----------------|---|----------|
| 1 | Manufacturer | | To be specified | |
| 2 | Type | | To be specified | |
| 3 | Material | | | |
| 3.1 | Mass of vibration damper: | | forged steel or malleable cast iron | |
| 3.2 | Spring element | | hot-dip galvanized steel wires | |
| 3.3 | Clamps | | corrosion-resistant, high-strength aluminum alloy (AlMgSi), drop-forged | |
| 3.4 | Screw | | steel, hot-dip galvanized | |
| 4 | Cross section of Conductor | mm ² | 158.1 | |
| 5 | Applicable standard(s) | | DIN 48204 | |

24/11/2019



✓

Table 1.3 Suspension Insulator (Composite Long Rod) for 220kV

| Sr. No. | Description/Details | Unit | Specified | Tendered |
|---------|---|-------|--|----------|
| 1 | Manufacturer | | To be specified | |
| 2 | Manufacturer's Type and references | | IEC HT- Silicon Rubber | |
| 3 | Insulator Type | | Composite Long Rod | |
| 4 | Normal Voltage | kV | 220 | |
| 5 | Maximum Voltage | kV | 245 | |
| 6 | System Frequency | Hz | 50 | |
| 7 | Rated impulse withstand voltage (Peak) | kV | 1050 | |
| 8 | Rated 1 min power frequency withstand voltage (Peak) | kV | 460 | |
| 9 | Minimum Mechanical Failing Load for fittings and Insulators | kN | 210 | |
| 10 | Outside diameter of unit | mm | As per design | |
| 11 | Minimum creepage distance | mm/kV | 25 | |
| 12 | Minimum protective leakage path | % | To be specified | |
| 13 | Applicable standard | | DIN 48013, IEC 60016, 60305, 60430, 606815 | |

[Handwritten signatures and stamps are present at the bottom of the page.]

Table 1.4 Tension Insulator (Composite Long Rod) for 220kv

38

| Sr. No. | Description/Details | Unit | Specified | Tendered |
|---------|---|-------|--|----------|
| 1 | Manufacturer | | To be specified | |
| 2 | Manufacturer's Type and references | | IEC HT- Silicon Rubber | |
| 3 | Insulator Type | | Composite Long Rod | |
| 4 | Normal Voltage | kV | 220 | |
| 5 | Maximum Voltage | kV | 245 | |
| 6 | System Frequency | Hz | 50 | |
| 7 | Rated impulse withstand voltage (Peak) | kV | 1050 | |
| 8 | Rated 1 min power frequency withstand voltage (Peak) | kV | 460 | |
| 9 | Minimum Mechanical Failing Load for fittings and Insulators | kN | 210 | |
| 10 | Outside diameter of unit | Mm | As per design | |
| 11 | Minimum creepage distance | mm/kV | 25 | |
| 12 | Minimum protective leakage path | % | To be specified | |
| 13 | Applicable standard | | DIN 48013, IEC 60016, 60305, 60430, 060815 | |

[Handwritten signature]

[Handwritten signature]

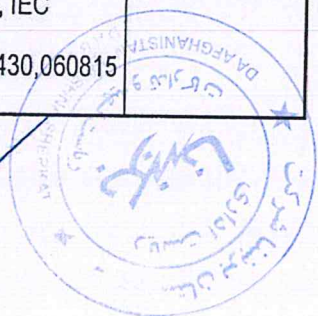
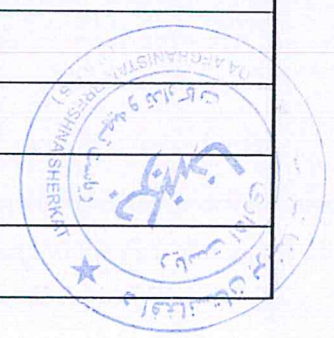


Table 1.5- Optical Fiber Ground Wire (OPGW)

39

| Sr. No. | Description/Details | Unit | Specified | Tendered |
|---------|--------------------------------------|--------------------|-------------------------|----------|
| 1 | Manufacturer | | To be specified | |
| 2 | Manufacturer's Type and references | | ACSR/AW SS-nf 24/48 | |
| 3 | Fiber Type | | Single mode | |
| 4 | Constructional Data | | | |
| 4.1 | Optical Unit | | | |
| 4.1.1 | Number of Fiber | No | 24 | |
| 4.1.2 | Tube Diameter | mm | 6.34 | |
| 4.2 | Armouring | | | |
| 4.2.1 | Aluminum alloy wires | No/mm | 3/3.18 | |
| 4.2.2 | Aluminum clad steel wires | No/mm | 6/3.18 | |
| 4.3 | Cable Overall | | | |
| 4.3.1 | Nominal diameter | mm | 12.7 | |
| 4.3.2 | Weight | kg/km | 450 | |
| 4.3.3 | Cross sectional area | mm ² | 71.5 | |
| 5 | Breaking Load | kN | 69 | |
| 6 | Final modulus of elasticity | kN/mm ² | 118 | |
| 7 | Permanent elongation due to creepage | % | 0 | |
| 8 | Elongation coefficient | /°C | 14.4 x 10 ⁻⁶ | |
| 9 | Rated DC Resistance at 200C | Ohm/km | 0.792 | |
| 10 | Standard length per drum | m | 4,000 | |
| 11 | Minimum bending radius | | | |
| 11.1 | During installation | mm | To be specified | |
| 11.2 | After installation | mm | To be specified | |
| 12 | Applicable Standards | | | |
| 12.1 | Aluminum alloy wires | | IEC 60104 type A | |



[Handwritten signatures and marks]

[Handwritten signature]

20

| | | | | |
|------|---------------------------|--|-------------|--|
| 12.2 | Aluminum clad steel wires | | IEC 61232 | |
| 12.3 | Cable Construction | | IEC 61089 | |
| 12.4 | Optical Unit | | ITU-T-G 652 | |

Table 1.6- Joint box for OPGW 24 Fiber

| |
|--|
| Joint box shall be made of aluminum ally shield with stainless steel part |
| Joint box shall support at least 24 core fiber |
| Joint box shall fulfill IP68(international protection) water proof (continues immersion) |
| Applicable temperature of -40 to =80 Celsius |
| Fiber bending radius of $\geq 45\text{mm}$ |
| Retaining fiber length of $\geq 1.5\text{m}$ |
| Fiber bending additional attenuation $\leq 0.01\text{db}$ |
| Joint box shall be used for at least 25y in different environments |

Table 1.7- Tension Clamps for OPGW 24 fiber

| Sr. No. | Description/Details | Unit | Specified | Tendered |
|---------|-------------------------------|-----------------|--|----------|
| 1 | Manufacturer | | To be specified | |
| 2 | Type | | Compression | |
| 3 | Material | | | |
| 3.1 | Body | | corrosion-resistant high-strength aluminum alloy (AlMgSi), drop-forged | |
| 3.2 | Screw | | steel, hot-dip galvanized | |
| 4 | Nominal Cross-section of OPGW | mm ² | 71.5 | |
| 5 | Ultimate tensile strength | KN | 95% OF OPGW | |
| 6 | Applicable standard(s) | | DIN 48204 | |

[Handwritten signature]



Table 1.8- Suspension Clamps for OPGW 24 fiber

| Sr. No. | Description/Details | Unit | Specified | Tendered |
|---------|-------------------------------|-----------------|--|----------|
| 1 | Manufacturer | | To be specified | |
| 2 | Type | | to be specified | |
| 3 | Material | | | |
| 3.1 | Body | | corrosion-resistant high-strength aluminum alloy (AlMgSi), drop-forged | |
| 3.2 | Screw | | steel, hot-dip galvanized | |
| 4 | Nominal Cross-section of OPGW | mm ² | 71.5 | |
| 5 | Ultimate tensile strength | KN | to be specified | |
| 6 | Applicable standard(s) | | DIN 48204 | |

Table 1.9- Stockbridge Vibration Dampers for OPGW

| Sr. No. | Description/Details | Unit | Specified | Tendered |
|---------|---------------------------|-----------------|---|----------|
| 1 | Manufacturer | | To be specified | |
| 2 | Type | | To be specified | |
| 3 | Material | | | |
| 3.1 | Mass of vibration damper: | | forged steel or malleable cast iron | |
| 3.2 | Spring element | | hot-dip galvanized steel wires | |
| 3.3 | Clamps | | corrosion-resistant, high-strength aluminum alloy (AlMgSi), drop-forged | |
| 3.4 | Screw | | steel, hot-dip galvanized | |
| 4 | Cross section of OPGW | mm ² | 71.5 | |
| 5 | Applicable standard(s) | | DIN 48204 | |

[Handwritten signature]

[Handwritten signature]

