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| **طرح نگهداشت و افزایش تولید 27 مخزن** |
| **MTO FOR POWER & CONTROL CABLES****نگهداشت و افزایش تولید میدان نفتی بینک** |
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| D01 | Dec. 2023 | IFI | H.Shakiba | M.Fakharian | S.Faramarzpour |  |
| D00 | May. 2023 | IFI | H.Shakiba | M.Fakharian | A.M.Mohseni |  |
| **Rev.** | **Date** | **Purpose of Issue/Status** | **Prepared by:** | **Checked by:** | **Approved by:** | **Client Approval** |
| **Class:3** | **Client Doc. Number: F8Z-709075** |
| **Status:** | **IDC: Inter-Discipline Check****IFC: Issued For Comment** **IFA: Issued For Approval****AFD: Approved For Design** **AFC: Approved For Construction** **AFP: Approved For Purchase****AFQ: Approved For Quotation** **IFI: Issued For Information****AB-R: As-Built for CLIENT Review** **AB-A: As-Built –Approved** |

**REVISION RECORD SHEET**

|  |  |  |  |  |  |  |  |  |  |  |  |  |
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| **PAGE** | **D00** | **D01** | **D02** | **D03** | **D04** |  | **PAGE** | **D00** | **D01** | **D02** | **D03** | **D04** |
| **1** | X | X |  |  |  | **51** |  |  |  |  |  |
| **2** | X | X |  |  |  | **52** |  |  |  |  |  |
| **3** | X | X |  |  |  | **53** |  |  |  |  |  |
| **4** | X | X |  |  |  | **54** |  |  |  |  |  |
| **5** | X | X |  |  |  | **55** |  |  |  |  |  |
| **6** | X | X |  |  |  | **56** |  |  |  |  |  |
| **7** | X | X |  |  |  | **57** |  |  |  |  |  |
| **8** | X | X |  |  |  | **58** |  |  |  |  |  |
| **9** |  | X |  |  |  | **59** |  |  |  |  |  |
| **10** |  | X |  |  |  | **60** |  |  |  |  |  |
| **11** |  | X |  |  |  | **61** |  |  |  |  |  |
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**Electrical Cable Type**

A: Cu/XLPE/Bd/Lsh/Bd/SWA/PVC - N2XKYRY (LV Multi-Core with Lead Sheath)

B: Cu/XLPE/Bd/SWA/PVC - N2XRY (LV Multi-Core)

C: Cu/XLPE/Bd/AWA/PVC - N2XRY (LV Single-Core)

D: Cu/PVC/Bd/Lsh/Bd/SWA/PVC - NYKYRY (Control Multi-Core with Lead Sheath)

E: Cu/PVC/Bd/SWA/PVC - NYRY (Control Multi-Core)

F: Cu/SC/XLPE/SC/SCT/Lsh/Bd/SWA/PVC - N2XSEYKYRY (MV Multi-Core with Lead Sheath)

G: Cu/SC/XLPE/SC/SCT/Lsh/Bd/AWA/PVC - N2XSYKYRY (MV Single-Core with Lead Sheath)

H: Cu/SC/XLPE /SC/SCT/CWS/Bd/AWA/PVC - N2XSYRY (MV Single-Core)

I: Cu/SC/XLPE/SC/SCT/ICWS/Bd/SWA/PVC - N2XSEYRY (MV Multi-Core)

J: CU/SM/XLPE/SM/SC/PVC/SWA/PVC - N2XSEYRY (HV Multi-Core)

K: CU/SM/XLPE/SM/SC/PVC/AWA/PVC - N2XSYRY (HV Single-Core)

R: Cu/PVC/OSCR/Bd/LSH/Bd/SWA/PVC (RTD Cable)

S: CU/XLPE/PVC - N2XY (LV Single-Core Flexible)

Z: Fire Resistant or MICC Lighting Cable

|  |
| --- |
| **11 KV POWER CABLE** |
| Insulation Grade - Service Voltage: 6/10 (12) KVD01 |
| Conductor: Plain Annealed Stranded Copper (Class 2) |
| Insulation: XLPE Insulation (Color Coding as per IEC) |
| Semiconducting Material: Yes |
| Screening : Semi-Conductor |
| Binder Tape: Yes |
| Fillers : PVC |
| Bedding: Extruded PVC |
| Armor: Multi-Core Cables : Galvanized Steel Wire Armor (SWA) Single-Core Cables : Aluminum Wire Armor (AWA) |
| Other Sheath: PVC |
| Color of Core: 1. 1Core Cables= Black
2. 3Cores Cables= Red, Yellow, Blue
 |
| **Item** | **Description** | **Type** | **Quantity (m)** | **Spare****(m)**  | **Total****(m)** |
|  | Cu/SC/XLPE/SC/SCT/ICWS/Bd/SWA/PVC |
|  | 3C×95 mm2 | I | 405 | 45 | 450 |
|  | Cu/SC/XLPE/SC/SCT/Lsh/Bd/SWA/PVC |
|  | 3C×95 mm2 | F | 900 | 50 | 950 |
| **Total Cable** | **1400** |

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| **3.3 KV POWER CABLE** |
| Insulation Grade - Service Voltage: 1.8/3 (3.6) KVD01 |
| Conductor: Plain Annealed Stranded Copper (Class 2) |
| Insulation: XLPE Insulation (Color coding as per IEC) |
| Semiconducting Material: Yes |
| Screening : Semi-Conductor |
| Binder Tape: Yes |
| Fillers : PVC |
| Bedding: Extruded PVC |
| Armor: Multi-Core Cables : Galvanized Steel Wire Armor (SWA) Single-Core Cables : Aluminum Wire Armor (AWA) |
| Other Sheath: PVC |
| Color of Core: 1. 1Core Cables= Black
2. 3Cores Cables= Red, Yellow, Blue
 |
| **Item** | **Description** | **Type** | **Quantity (m)** | **Spare****(m)**  | **Total****(m)** |
|  | C/SC/XLPE/SC/SCT/ICWS/Bd/SWA/PVC |
|  | 3C×95 mm2 | I | 320 | 30 | 350 |
|  | Cu/SC/XLPE /SC/SCT/CWS/Bd/AWA/PVC |
|  | 1C×95 mm2 | H | 5 | - | 5 |
| **Total Cable** | **355** |

| **LV POWER CABLE (3PAHSE SYSTEM)** |
| --- |
| Insulation Grade - Service Voltage: 600/1000 VD01 |
| Conductor: Plain Annealed Stranded Copper (Class 2) |
| Insulation: XLPE  |
| Binder Tape: If Required |
| Fillers : PVC |
| Bedding: Extruded PVC |
| Armor: Multi-Core Cables : Galvanized Steel Wire Armor (SWA) Single Core Cables : Aluminum Wire Armor (AWA) |
| Other Sheath: PVC |
| Color of Core: 1. 3Cores Cables = Red, Yellow, Blue (3 Phases)
2. 3Cores + Neutral = Red, Yellow, Blue, Black
3. 3Cores + Earth = Red, Yellow, Blue, G/Y
4. 3Cores + Neutral + Earth = Red, Yellow, Blue, Black & G/Y
 |
| **Item** | **Description** | **Type** | **Color Code** | **Quantity (m)** | **Spare****(m)**  | **Total****(m)** |
|  | Cu/XLPE/Bd/Lsh/Bd/SWA/PVC - N2XKYRY (LV Multi-Core with Lead Sheath) |
|  | 3C×4 mm2 | A | (1) | 1980 | 220 | 2200 |
|  | 3C×6 mm2 | A | (1) | 1500 | 150 | 1650 |
|  | 3C×10 mm2 | A | (1) | 6560 | 640 | 7200 |
|  | 3C×16 mm2 | A | (1) | 3780 | 420 | 4200 |
|  | 3C×25 mm2 | A | (1) | 820 | 80 | 900 |
|  | 4C×10 mm2 | A | (2) | 675 | 75 | 750 |
|  | 4C×25 mm2 | A | (2) | 250 | 50 | 300 |
|  | 4C×50 mm2 | A | (2) | 250 | 50 | 300 |
|  | 3C×25+16 mm2 | A | (2) | 260 | 40 | 300 |
|  | 3C×50+25 mm2 | A | (2) | 745 | 85 | 830 |
|  | 3C×70+35 mm2 | A | (2) | 840 | 110 | 950 |
|  | 3C×95+50 mm2 | A | (2) | 250 | 50 | 300 |
|  | 3C×120+70 mm2 | A | (2) | 1080 | 170 | 1250 |
|  | Cu/XLPE/Bd/SWA/PVC - N2XRY (LV Multi-Core) |
|  | 3C×4 mm2 | B | (1) | 305 | 45 | 350 |
|  | 3C×35 mm2 | B | (1) | 430 | 40 | 470 |
|  | 3C×185 mm2 | B | (1) | 120 | 30 | 150 |
|  | 4C×4 mm2 | B | (2) | 260 | 40 | 300 |
|  | 4C×10 mm2 | B | (2) | 480 | 50 | 530 |
|  | 4C×16 mm2 | B | (2) | 165 | 25 | 190 |
|  | 4C×25 mm2 | B | (2) | 295 | 35 | 330 |
|  | 3C×25 + 16 mm2 | B | (2) | 55 | 51 | 70 |
|  | 3C×35 + 16 mm2 | B | (2) | 375 | 45 | 420 |
|  | 3C×50 + 25 mm2 | B | (2) | 500 | 50 | 550 |
|  | 3C×70 + 35 mm2 | B | (2) | 560 | 60 | 620 |
|  | Cu/XLPE/Bd/AWA/PVC - N2XRY (LV Single-Core) |
|  | 1C×300 mm2 | C | Black | 770 | 80 | 850 |
|  | Fire Resistant or MICC Lighting Cable |
|  | 3C×120+70 mm2 | Z | - | 400 | 30 | 430 |
| **Total Cable** | **26390** |

| **LV POWER CABLE (1PAHSE SYSTEM)** |
| --- |
| Insulation Grade - Service Voltage: 600/1000 V |
| Conductor: Plain Annealed Stranded Copper (Class 2)D01 |
| Insulation: XLPE  |
| Binder Tape: If Required |
| Fillers : PVC |
| Bedding: Extruded PVC |
| Armor: Multi-Core Cables : Galvanized Steel Wire Armor (SWA) Single Core Cables : Aluminum Wire Armor (AWA) |
| Other Sheath: PVC |
| Color of Core: 1. 1Core Cables = Black
2. 1Core + Neutral = Blue & Black
3. 1Core + Neutral + Earth = Blue, Black & G/Y
4. 2Cores Cables (for DC Cable)= Red & Black
 |
| **Item** | **Description** | **Type** | **Color Code** | **Quantity (m)** | **Spare****(m)**  | **Total****(m)** |
|  | **Cu/XLPE/Bd/Lsh/Bd/SWA/PVC - N2XKYRY (LV Multi-Core with Lead Sheath)** |
|  | 2C×4 mm2 | A | (2) | 1740 | 260 | 2000 |
|  | 2C×16 mm2 | A | (2) | 840 | 110 | 950 |
|  | 3C×4 mm2 | A | (2) | 10 | 10 | 20 |
|  | **Cu/XLPE/Bd/SWA/PVC - N2XRY (LV Multi-Core)** |
|  | 3C×2.5 mm2 | B | (3) | 162 | 38 | 200 |
|  | 3C×4 mm2 | B | (3) | 909 | 91 | 1000 |
|  | 3C×6 mm2 | B | (3) | 105 | 25 | 130 |
|  | 3C×10 mm2 | B | (3) | 205 | 45 | 250 |
|  | 3C×50 mm2 | B | (3) | 1200 | 150 | 1350 |
|  | 2C×6 mm2 | B | (4) | 145 | 25 | 75 |
|  | 2C×50 mm2 | B | (4) | 140 | 30 | 170 |
|  | 2C×95 mm2 | B | (4) | 120 | 30 | 150 |
|  | 2C×120 mm2 | B | (4) | 160 | 40 | 200 |
|  | 2C×150 mm2 | B | (4) | 60 | 20 | 80 |
|  | 2C×185 mm2 | B | (4) | 70 | 30 | 100 |
| **Total Cable** | **6675** |

**Note: Only cables of items 2.6 to 2.11 of this table shall be class 5.**

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| **LV CONTROL CABLE** |
| Insulation Grade - Service Voltage: 600/1000 V |
| Conductor: Plain Annealed Stranded Copper (Class 2) |
| Insulation: PVC  |
| Binder Tape: If RequiredD01 |
| Fillers : PVC |
| Bedding: Extruded PVC |
| Armor: Galvanized Steel Wire Armor (SWA) |
| Other Sheath: PVC  |
| Color of Core: Black with White Identification Numbers |
| **Item** | **Description** | **Type** | **Quantity (m)** | **Spare****(m)**  | **Total****(m)** |
|  | **Cu/PVC/Bd/Lsh/Bd/SWA/PVC - NYKYRY (Control Multi-Core with Lead Sheath)** |
|  | 3C×4 mm2 | D | 6780 | 720 | 7500 |
|  | 3C×6 mm2 | D | 900 | 100 | 1000 |
|  | 7C×2.5 mm2 | D | 1940 | 260 | 2200 |
|  | 10C×2.5 mm2 | D | 6820 | 680 | 7500 |
|  | **Cu/PVC/Bd/SWA/PVC - NYRY (Control Multi-Core)** |
|  | 3C×4 mm2 | E | 110 | 20 | 130 |
|  | 7C×2.5 mm2 | E | 195 | 25 | 220 |
|  | 12C×2.5 mm2 | E | 775 | 125 | 900 |
|  | 16C×2.5 mm2 | E | 625 | 75 | 700 |
| **Total Cable** | **20150** |

| **LV LIGHTING SYSTEM** |
| --- |
| Insulation Grade - Service Voltage: 600/1000 V |
| Conductor: Plain Annealed Stranded Copper (Class 2)D01 |
| Insulation: XLPE  |
| Binder Tape: If Required |
| Fillers : PVC |
| Bedding: Extruded PVC |
| Armor: Multi-Core Cables : Galvanized Steel Wire Armor (SWA) Single Core Cables : Aluminum Wire Armor (AWA) |
| Other Sheath: PVC |
| Color of Core:1. 1Core Cables = Black
2. 1Core + Neutral = Blue & Black
3. 1Core + Neutral + Earth = Blue, Black & G/Y
4. 3Cores Cables = Red, Yellow, Blue (3 Phases)
5. 3Cores + Neutral = Red, Yellow, Blue, Black
6. 3Cores + Earth = Red, Yellow, Blue, G/Y
7. 3Cores + Neutral + Earth = Red, Yellow, Blue, Black & G/Y
 |
| **Item** | **Description** | **Type** | **Color Code** | **Quantity (m)** | **Spare****(m)**  | **Total****(m)** |
|  | **Cu/XLPE/Bd/Lsh/Bd/SWA/PVC - N2XKYRY (LV Multi-Core with Lead Sheath)** |
|  | 3C×6 mm2 | A | (3) | 2430 | 570 | 3000 |
|  | 5C×10 mm2 | A | (7) | 530 | 120 | 650 |
|  | **Cu/XLPE/Bd/SWA/PVC - N2XRY (LV Multi-Core)** |
|  | 3C×2.5 mm2 | B | (3) | 1115 | 385 | 1500 |
|  | 3C×6 mm2 | B | (3) | 505 | 95 | 600 |
|  | 5C×10 mm2 | B | (7) | 210 | 40 | 250 |
| **Total Cable** | **6000** |

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| Required Power Cable for GCS |
| **Item** | **Cable Type** | **Quantity (m)** |
| 1 | 11 KV Power Cable | 1400 |
| 2 | 3.3 KV Power Cable | 355 |
| 3 | LV Power Cable (3pahse System) | 26390 |
| 4 | LV Power Cable (1pahse System) | 6675 |
| 5 | LV Control Cable | 20150 |
| 6 | LV Lighting System | 6000 |
| **Total** | **60970** |

Notes:

1. This document shall be Based on below references:

Document Title: “Specification for Power & Control Cables”

Document No.: “BK-GNRAL-PEDCO-000-EL-SP-0014”

Document Title: “Data Sheets for Power & Control Cables”

Document No.: “BK-GCS-PEDCO-120-EL-DT-0010”

Document Title: “Electrical Power & Control Cable Schedule”

Document No.: “BK-GCS-PEDCO-120-EL-LI-0002”