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| **طرح نگهداشت و افزایش تولید 27 مخزن** |
| **MTO FOR EARTHING & LIGHTNING SYSTEMS - MANIFOLD & W007S****نگهداشت و افزایش تولید میدان نفتی بینک** |
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| D00 | Oct. 2022 | IFI | H.Shakiba | M.Fakharian | M.Mehrshad |  |
| **Rev.** | **Date** | **Purpose of Issue/Status** | **Prepared by:** | **Checked by:** | **Approved by:** | **CLIENT Approval** |
| **Class:3** | **CLIENT Doc. Number:** **F8Z-708036** |
| **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 |  |  |  |  | **51** |  |  |  |  |  |
| **2** | X |  |  |  |  | **52** |  |  |  |  |  |
| **3** | X |  |  |  |  | **53** |  |  |  |  |  |
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| **MTO for Earthing & Lightning Systems – W007S** |
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| **Item** | **Description** | **Unit** | **Earthing** | **Lightning** | **Spare** | **Total** |
|  | Bare Round Earthing Copper Conductor 70 mm2 | m | 360 | 0 | 20 | **380** |
|  | Earthing Copper Wire, G/Y PVC Insulated 35 mm2 | m | 370 | 0 | 30 | **400** |
|  | Earthing Copper Wire, G/Y PVC Insulated 70 mm2 | m | 75 | 0 | 10 | **85** |
|  | Earthing Copper Wire, G/Y PVC Insulated 300 mm2 | m | 15 | 0 | 5 | **20** |
|  | Stainless Steel 316L/Copper Earthing Rod with 19 mm Diameter and 2x1.5 m Length (One End Sharp, One End Flat) With All Accessories. | Set. | 2 | 2 | 1 | **5** |
|  | Stainless Steel 316L /Copper Earthing Rod with 19 mm Diameter and 2x1.5m Length (One End Sharp, One End Flat) With All Accessories. &Test Earth Pit | Set. | 2 | 0 | 0 | **2** |
|  | Copper Clamp for Connecting Round Conductor Size of 300 mm2 to Earth Rod | No. | 1 | 0 | 1 | **2** |
|  | Copper Clamp for Connecting Round Conductor Size of 70 mm2 to Earth Rod | No. | 3 | 4 | 1 | **8** |
|  | Tinned Copper Earth Bar with disconnect link on both end with 10 Holes, HDG Fixing Base , "Ω" Base, | Set. | 2 | 0 | 1 | **3** |
|  | Crimp Type Earthing Terminal Lug 300 Sqmm, Tinned Copper Type (With Suitable Bolt & Nut With 1-Spring,2-Flat Washers, Size M12, tin plated or bronze | No. | 1 | 0 | 0 | **1** |
|  | Crimp Type Earthing Terminal Lug 70 Sqmm, Tinned Copper Type (With Suitable Bolt & Nut With 1-Spring,2-Flat Washers, Size M12, tin plated or bronze | No. | 9 | 0 | 1 | **10** |
|  | Crimp Type Earthing Terminal Lug 35 Sqmm, Tinned Copper Type (With Suitable Bolt & Nut With 1-Spring,2-Flat Washers, Size M12, tin plated or bronze | No. | 21 | 0 | 4 | **25** |
|  | Exothermic Mould for T Connection300/300/300 mm2 | Set. | 1 | 0 | 0 | **1** |
|  | Exothermic Mould for T Connection70/300/70 mm2 | Set. | 1 | 0 | 0 | **1** |
|  | Exothermic Mould for T Connection35/70/35 mm2 | Set. | 3 | 0 | 1 | **4** |
|  | Exothermic Mould for T Connection70/70/70 mm2 | Set. | 2 | 0 | 0 | **2** |
|  | Exothermic Welding Powder Suitable for 3 Ways Connections 70/300/70 including disc and starter | No. | 1 | 0 | 0 | **1** |
|  | Exothermic Welding Powder Suitable for 3 Ways Connections 300/300/300 including disc and starter | No. | 1 | 0 | 0 | **1** |
|  | Exothermic Welding Powder Suitable for 3 Ways Connections 35/70/35 including disc and starter | No. | 21 | 0 | 4 | **25** |
|  | Exothermic Welding Powder Suitable for 3 Ways Connections 70/70/70 including disc and starter | No. | 12 | 0 | 2 | **14** |
|  | Copper nickel Chrome Coated Air Terminal Class I, 19mm Diameter, 0.6m Length with, with all accessories Thread | Set. | 0 | 4 | 0 | **4** |
|  | Air Terminal Saddle Suitable for 0.6m Air Terminal, also Suitable for Connecting 25x3 mm2 Flat tape to rod | No. | 0 | 4 | 0 | **4** |
|  | Flat Copper Tape with 25 mm Width and 3 mm Thickness | m | 0 | 110 | 10 | **120** |
|  | Clip Suitable for 25\*3 mm2 Flat Copper Tape fixing, with all accessories | No. | 0 | 120 | 10 | **130** |
|  | Test Link Suitable for 25\*3 mm2 Copper Tape and 70 mm2 Round Wire, with all accessories | Set. | 0 | 4 | 0 | **4** |
|  | Installation tools kit for thermo weld connection comprising flint gun, glove, scraper & brush | Set | 1 | 0 | **1** |

| **MTO for Earthing Systems - Manifold** |
| --- |
| **Item** | **Description** | **Unit** | **QTY** | **Spare** | **Total** |
|  | Earthing Copper Wire, G/Y PVC Insulated 70 mm2 | m | 90 | 10 | **100** |
|  | Stainless Steel 316L/Copper Earthing Rod with 19 mm Diameter and 1m Length (One End Sharp, One End Flat) With All Accessories. | Set. | 12 | 0 | **12** |
|  | Stainless Steel 316L /Copper Earthing Rod with 19 mm Diameter and 1m Length (One End Sharp, One End Flat) With All Accessories. &Test Earth Pit | Set. | 2 | 0 | **2** |
|  | Copper Clamp for Connecting Round Conductor Size of 70 mm2 to Earth Rod | No. | 14 | 0 | **14** |
|  | Tinned Copper Earth Bar with disconnect link on both end with 10 Holes, HDG Fixing Base , "Ω" Base, | Set. | 4 | 0 | **4** |
|  | Crimp Type Earthing Terminal Lug 70 Sqmm, Tinned Copper Type (With Suitable Bolt & Nut With 1-Spring,2-Flat Washers, Size M12, tin plated or bronze | Set. | 8 | 0 | **8** |
|  | Exothermic Mould for T Connection70/70/70 mm2 | Set. | 2 | 0 | **2** |
|  | Exothermic Welding Powder Suitable for 3 Ways Connections 70/70/70 including disc and starter | No. | 22 | 3 | **25** |

Notes:

1. This document shall be Based on below references:

Document Title: “Calculation Note For Earthing & Lightning System of Well Pads”

Document No.: “BK-SSGRL-PEDCO-110-EL-CN-0007”

Document Title: “Earthing & Lightning Layout for well pads”

Document No.: “BK-SSGRL-PEDCO-110-EL-PY-0010”