# Section 7.Technical Specifications

* + - 1. Eastern Refinery Limited (ERL) intends to appoint a firm/ contractor for making & supplying of 3D drawing, 3D model & 3D animation of ERL’s Atmospheric Distillation Unit ( pipelines, valves, fittings, machinery, equipment, etc. as presented in block 1 &2)

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Model size: Block 1: 1000 mm × 825 mm

Block 2: 400 mm × 150 m

Number of blocks: 2

Block wise dimension: As shown below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl** | **Block no** | **Consisting machinery & equipment** | **Actual size (Dimension) of block** |
| 1 | Block-1 | All equipment & machinery with ancillaries of Topping unit | 1000 mm × 825 mm |
| 2 | Block-2 | Fuel gas system, Furnace & Flare system with ancillaries | 400 mm × 150 mm |

Real object to model object ratio: 44:1

Block wise details of equipment and machinery are shown bellow

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Equipment | **Service** | **Actual sizes** | **Nozzle size** | | **Block** | **Comments** |
|  |  | **Length & diameter (m)** | **Inlet**  **( ∅,inch)** | **Outlet**  **( ∅,inch)** |  |  |
| **Exchangers**  **= 14** |  |  |  |  |  |  |
| E1101 | Preheat train | L= 6.056, D= 0.700 | 8 | 8 | Block-1 | The exchangers must have following items along with exchanger’s main part:  1. Necessary inlet outlet nozzles; 2. Basements and structures, etc. & 3. Color code for pipelines |
| E1102 | L= 6.056, D= 0.700 | 8 | 8 | Block-1 |
| E1103 | L= 6.056, D= 0.700 | 8 | 8 | Block-1 |
| E1104 | L= 6.056, D= 0.700 | 8 | 8 | Block-1 |
| E1105 | L= 6.056, D= 0.700 | 8 | 8 | Block-1 |
| E1106 | L= 6.056, D= 0.700 | 8 | 8 | Block-1 |
| E1107 | L= 6.056, D= 0.700 | 8 | 8 | Block-1 |
| E1108 | L= 6.056, D= 0.700 | 8 | 8 | Block-1 |
| E1109A | L= 6.056, D= 0.700 | 8 | 8 | Block-1 |
| E1109B | L= 6.056, D= 0.700 | 8 | 8 | Block-1 |
| E1116A | C1103 feed-bottom exchanger | L= 6.056, D= 0.700 | 3 | 3 | Block-1 |
| E1116B | L= 6.056, D= 0.700 | 3 | 3 | Block-1 |
| E1118 | C1103 reboiler | L= 6.056, D= 0.700 | 4 | 4 | Block-1 |
| E1120 | C1104 reboiler | L= 6.056, D= 0.700 | 4 | 4 | Block-1 |
|  |  |  |  |  |  |  |
| **Water Coolers = 12** |  |  |  |  |  |  |
| E1110A | C1101 overhead cooler | L= 5.723, D= 0.700 | 8 | 8 | Block-1 | The coolers must have following items along with cooler’s main part:  1. Necessary inlet outlet nozzles; 2. Basements and structures, etc. & 3. Color code for pipelines |
| E1110B | L= 5.723, D= 0.700 | 8 | 8 | Block-1 |
| E1111 | K-I cooler | L= 5.723, D= 0.700 | 3 | 3 | Block-1 |
| E1112 | K-II cooler | L= 5.723, D= 0.700 | 4 | 4 | Block-1 |
| E1113 | LGO cooler | L= 5.723, D= 0.700 | 4 | 4 | Block-1 |
| E1114 | HGO cooler | L= 5.723, D= 0.700 | 4 | 4 | Block-1 |
| E1115 | RCO cooler | L= 5.723, D= 0.700 | 10 | 10 | Block-1 |
| E1117 | LPG cooler | L= 5.723, D= 0.700 | 8 | 8 | Block-1 |
| E1121 | HG Cooler | L= 5.723, D= 0.700 | 6 | 6 | Block-1 |
| E1122 | LG Cooler | L= 5.723, D= 0.700 | 2 | 2 | Block-1 |
| E1151 | Desalter water in/out | L= 6.000, D= 0.420 | 3 | 3 | Block-1 |
| E1152 | L= 6.000, D= 0.420 | 3 | 3 | Block-1 |
|  |  |  |  |  |  |  |
| **Aerocondenser** |  |  |  |  |  |  |
| E1123A | Overhead condenser of C1101 | L=25.5m W= 8.8m H= 6.5m (From 1st platform) |  |  | Block-1 | Following items to be shown in details:  1. Details elevation   * + - 1. Ladders, platforms and railings, etc       2. Aerocondenser domes, fans, motor & gear box, etc. |
| E1123B |  |  | Block-1 |
| E1123C |  |  | Block-1 |
| E1123D |  |  | Block-1 |
| E1123E |  |  | Block-1 |
| E1123F |  |  | Block-1 |
| E1123G |  |  | Block-1 |
| E1123H |  |  | Block-1 |
| E1124A | Overhead condenser of C1103 | L=6.375m W= 8.8m H= 6.5m(From 1st platform) |  |  | Block-1 |
| E1124B |  |  | Block-1 |
|  |  |  |  |  |  |  |
| **Pumps = 21** |  |  |  |  |  |  |
| PM1101A | Feed pump,  centrifugal | L=2.56m, W=1.2m | 10 | 10 | Block-1 | Following items to be shown in details:  1. Details elevation of pump civil base, metallic base body, etc 2. Suction discharge lines with valves 3. Motor-pump assembly, etc 4. color codes |
| PM1101B | L=2.56m, W=1.2m | 10 | 10 | Block-1 |
| PM1102A | Booster pump B1101  centrifugal | L=2.56m, W=1.2m | 10 | 10 | Block-1 |
| PM1102B | L=2.56m, W=1.2m | 10 | 10 | Block-1 |
| PM1103A/B | K-I, Centrifugal | L=2 m, W= 1m | 4 | 3 | Block-1 |
| PM1104 | K-II, Centrifugal | L=2 m, W= 1m | 4 | 3 | Block-1 |
| PM1105A/B | LGO, Centrifugal | L=2 m, W= 1m | 4 | 3 | Block-1 |
| PM1106 | HGO, Centrifugal | L=2 m, W= 1m | 4 | 2/3 | Block-1 |
| PM1107A/B | RCO, Centrifugal | L=2 m, W= 1m | 8 | 4 | Block-1 |
| PM1108A/B | Int. Reflux, Centrifugal | L=2 m, W= 1m | 8 | 4 | Block-1 |
| PM1109A/B | Top reflux, Centrifugal | L=2 m, W= 1m | 10 | 4/6/10 | Block-1 |
| PM1110A/B | Unstabilized naphtha to C1103, Centrifugal | L=2 m, W= 1m | 6 | 4 | Block-1 |
| PM1111A/B | LPG, Centrifugal | L=2 m, W= 1m | 3 | 2 | Block-1 |
| PM1112A/B | HG, Centrifugal | L=2 m, W= 1m | 4 | 3 | Block-1 |
| PM1113A/B | LG, Centrifugal | L=2 m, W= 1m | 4 | 3 | Block-1 |
|  | Sepacor, Reciprocating | L=0.5 m, W= 0.5m |  |  | Block-1 |
| PM1120A/B | Hot reflux/ Recirculation, Centrifugal | L=2 m, W= 1m | 4 | 4 | Block-1 |
| PM1121A/B | Water injection 7 stage Centrifugal | L=2 m, W= 1m | 3 | 3 | Block-1 |
| PM1122A/B | Water injection, Centrifugal | L=2 m, W= 1m | 3 | 3 | Block-1 |
| PM1115 | Sepacor dosing, Positive Displacement | L=0.5 m, W= 0.5m | 1 | 1 | Block-1 |
| PM1123 | Separol, Reciprocating | L=0.5 m, W= 0.5m | 1 | 3/4 | Block-1 |
| PM1124 | Caustic, Reciprocating | L=0.5 m, W= 0.5m | 1 | 3/4 | Block-1 |
|  |  |  |  |  |  |  |
| **Baloons = 11** |  |  |  |  |  |  |
| B1101 | Vertical, flash drum | H=9m, ∅=2.6m  (Drawing attached) | 8 | 8/10 | Block-1 | Following items to be shown in details:  1. Details elevation  2. Ladders, platforms, railings, etc.  3. Basement & support  4. Inlet outlet nozzle, Manholes & valves with pipelines  5. Proper Color codes for pipelines |
| B1102 | 3 phase separator | L=7.7m, ∅=2.1m  (Drawing attached) | 10 | 10 | Block-1 |
| B1103 | 3 phase separator | L=3.6m, ∅=1.1m  (Drawing attached) | 6 | 4 | Block-1 |
| B1104 | 3 phase separator | L=3.6m, ∅=1.1m  (Drawing attached) | 4 | 4 | Block-1 |
| B1111 | Desalter 1st stage | L=7.4m, ∅=3.6m  (Drawing attached) | 1 | 1 | Block-1 |
| B1112 | Desalter 2nd stage | L=7.4m, ∅=3.6m  (Drawing attached) | 8 | 8 | Block-1 |
| B1105 | Sepacor | H= 1.7m, ∅=0.4m | 1 | 1 | Block-1 |
| B1113 | Water | H= 1.55m, ∅=1.5m | 1 | 1 | Block-1 |
| B1114 | Separol | H= 1.55m, ∅=1.5m | 1 | 1 | Block-1 |
| B1115 | Caustic | H= 1.55m, ∅=1.5 m | 1 | 1 | Block-1 |
| Ammonia Cylinder | Ammonia Cylinder | H= 1.2m, ∅=0.36m | 1 | 1 | Block-1 |
| **Columns = 4** |  |  |  |  |  |  |
| C1101 | Atmospheric distillation | H=27.65 m, ∅=3.4m  H =5.1m, ∅=1.9m  (Drawing attached) |  |  | Block-1 | Following items to be shown in details:  1. Details elevation   1. Ladders, platforms, railings, etc 2. Basement & support 3. Inlet outlet nozzle, Manholes & valves with pipelines 4. Proper Color codes for pipelines |
| C1102 | Stripper | H=18m, ∅=1.09m  (Drawing attached) |  |  | Block-1 |
| C1103 | Stabilizer | H=9.7m, ∅=1.4m  H=7m, ∅=.9m  (Drawing attached) |  |  | Block-1 |
| C1104 | Re-distillation | H=14.75m, ∅=1.4m  (Drawing attached) |  |  | Block-1 |
|  |  |  |  |  |  |
| **F1101AB = 1** | Topping furnace | (Drawing attached) |  |  | Block-2 | Following items to be shown in details:  1. Details elevation   * 1. Ladders , platforms, railings, etc   2. Basement & support   3. Inlet outlet lines   4. Snuffing steam line   5. Fuel supply line (all lines) & controlling system. |
|  |  |  |  |  |  |  |
| **B1001 = 1** | Fuel gas system | L=7.1m, ∅=1.9m  (Drawing attached) |  |  | Block-2 | Following items to be shown in details:  1. Details elevation   1. Ladders, platforms, railings, etc 2. Basement & support 3. Inlet outlet nozzle, Manholes & valves with pipelines 4. Proper Color codes for pipelines |
|  | Fire extinguishing system and hydrant point |  |  |  | Block-1 |  |
| **Flare system** | 1 flare torch |  |  |  | Block-2 | 1. Flare torch should have a flame demonstration 2. Pipe rack and pipeline from B1001 to flare system |
| **Pipe and Pipe rack** | Carrying Process fluid, Fire gas, fuel, Flare gas | Different sizes of pipe |  |  | Block-1 &2 | As required |

2. The whole model must be sturdy and transportable.

3. In the model, the size of pipelines, pipe rack, equipment, machinery etc. will be customizable to maintain aesthetics upon confirmation from ERL.

4. Platform/ base material of model:

The platform/base of the model would be Acrylic/equivalent/better materials having sufficient strength to bear the load of model, non-deformable and non-rusting. Any platform in the model except the base & Aero-condenser domes will be transparent acrylic material to permit visibility.

5. Every object (valves, pumps, equipment, columns, balloons, etc.) should be marked with their equipment code with irremovable ink/ sticker.

6. The whole model should have a removable Transparent cover box.

7. The model should contain aesthetic roads, streetlights, signal lights, firefighting system & decorative items of 3D drawing & 3D model as per procuring entity’s requirement;

8. In model Pipelines size may not be required to maintain the ratio 44:1. These sizes would be as appropriate which is befitting for aesthetic view.

9. Structural supports, ladders, stairs railing, etc. would be provided for each equipment and machinery as present in plant but the ratio of those structure would be worthy for aesthetical view.

10. Roads, streetlight, firefighting system must be part of 3D drawing & 3D model.

11. Color code must be applied as per guidance of procuring entity.

12. The drawing shall have to be retrievable in groups/sections as per requirement of the procuring entity.

13. 3Danimation will be Full HD (minimum 1920\*1080 pixel, 30 fps) resolution, approximate 300s in length and the script and screenplay will be provided by ERL.

14. Whole model shall have provision for dismantling & reassembling as per requirement of procuring entity.

15. A Fire fighting vehicle should be provided with the 3D model.