

**SCHEDULE OF RATE    PRICED BID**

**2 YEARS ARC FOR FRP/PPGL IN DM AND OTHER PLANT.**

**REQUIREMENT OF FRP/RUBBER LINING IN DM AND OTHER PLANTS AS PER DETAILS GIVEN BELLOW:-**

| SN | Item description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | UOM     | Estimated QTY | RATE/UNIT<br>(RS) | AMOUNT IN(RS.) |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------------|-------------------|----------------|
| 1  | <b>APPLICATION OF 3(THREE) LAYERS CSM, FRP</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | SQ. MTR | 100           |                   |                |
|    | APPLICATION OF 3(THREE) LAYERS CSM FOLLOWED BY 1(ONE) LAYER SURFACE MAT FRP LINING WITH MIN. THICKNESS: 3.0-3.3MM ON TANK/VESSEL/ PIPING SPOOL /ELBOW/ REDUCER/ TEE/ OTHER ITEMS (NEW OR OLD USED)<br>Removal of existing lining from surface of Tank/Vessel/Piping Spool/Elbow/ Reducer/Tee/Other items (new/old used) by scrapping/mechanical/ chemical/thermal ways, whichever is feasible and get rid off all previous lining material from the surface by mechanical ways, if require for surface preparation, or grit blasting/shot blasting, if require, for application of protective coating; Application of FRP lining on the cleaned surface of the items with three(3) layers of CSM mat followed by one layer of surface mat (isophalalic base), Min. Thickness:3.0 to 3.3mm and allow for curing of the applied lining for acceptance. FRP material shall be confirm IS6746:1994 & ASTM-D790-49T standard. |         |               |                   |                |
| 2  | <b>APPLICATION OF 1(ONE) LAYER CSM</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | SQ. MTR | 50            |                   |                |
|    | APPLICATION OF 1(ONE) LAYER CSM FOLLOWED BY 1(ONE) LAYER SURFACE MAT FRP LINING WITH MIN. THICKNESS: 1.0-1.1MM ON TANK/ VESSEL/ PIPING SPOOL/ ELBOW/ REDUCER/ TEE/ OTHER ITEMS (NEW OR OLD USED)<br>Removal of existing lining from surface of Tank/ Vessel/ Piping Spool/ Elbow/ Reducer/ Tee/ Other items (new/old used) by scrapping/ mechanical/ chemical/ thermal ways, whichever is feasible and get rid off all previous lining material from the surface by mechanical ways, if require for surface preparation, or grit blasting/shot blasting, if require, for application of protective coating; Application of FRP lining on the cleaned surface of the items with one(1) layer of CSM mat followed by one layer of surface mat (isophalalic base), Min. Thickness: 1.0-1.1mm and allow for curing of the applied lining for acceptance. FRP material shall be confirm IS6746:1994 & ASTM-D790-49T standard. |         |               |                   |                |

| SN | Item description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | UOM     | Estimated QTY | RATE/UNIT (RS) | AMOUNT IN(RS.) |
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| 3  | <b>APPLICATION OF 2(TWO) LAYERS CSM</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | SQ. MTR | 100           |                |                |
|    | <p>APPLICATION OF 2(TWO) LAYERS CSM FOLLOWED BY 1(ONE) LAYER SURFACE MAT FRP LINING WITH MIN. THICKNESS : 2.0 - 2.10 MM ON CONCRETE SURFACE/OTHER ITEMS (NEW OR OLD USED)</p> <p>Removal of existing lining from surface of Concrete/ Other items (new/old used) by scrapping/mechanical/ chemical/thermal ways, whichever is feasible and get rid off all previous lining material from the surface by mechanical ways, if require for surface preparation, or grit blasting/shot blasting, if require, for application of protective coating; Application of FRP lining on the cleaned concrete surface with two(2) layers of CSM mat followed by one layer of surface mat (isophalalic base), Min. Thickness: 2.0-2.1mm and allow for curing of the applied lining for acceptance. FRP material shall be confirm IS6746:1994 &amp; ASTM-D790-49T standard.</p> |         |               |                |                |
| 4  | <b>LAYING OF 5.0MM PP SHEET WITH FRP LINING</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | SQ. MTR | 75            |                |                |
|    | <p>LAYING OF PP SHEET ON TANK/VESSEL/CONCRETE SURFACE AND OTHER CS ITEMS(NEW OR OLD USED)</p> <p>Removal of existing lining from surface of Tank/Vessel/Concrete Surface/ Floor/ Other items (new/old used) by scrapping/ mechanical/ chemical/ thermal ways, whichever is feasible and get rid off all previous lining material from the surface by mechanical ways, if require for surface preparation, or grit blasting/shot blasting, if require, for application of protective coating; Laying of 5.0mm PP sheet with supporting FRP lining (min. thickness: 2.0 mm), PP welding on the surface of the items and allow for curing of the applied lining for acceptance. The applied resin shall be suitable for 46% alkali service.</p>                                                                                                                      |         |               |                |                |

| SN | Item description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | UOM          | Estimated QTY | RATE/UNIT (RS) | AMOUNT IN(RS.) |
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| 5  | <b>FABRICATION OF FRP PIPING/FITTINGS&lt;6"</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Inch Mtr(IM) | 75            |                |                |
|    | <p>FABRICATION/REPAIRING OF COMPLETE FRP PIPING AND PIPE FITTINGS EXCEPT FLANGE AND OTHER ITEMS(NEW OR OLD USED) UPTO 6" DIA</p> <p>Preparation of fixtures, fabrication of FRP pipe/ elbow/ branch line/ reducer/ tee/ taping and other items except flange for acid or alkali service upto 6(six) Inch Dia.; dimensions and minimum thickness of the piping/pipe fittings shall be as per standard engineering practices, BS: 4994 and according to the operating/ service conditions. The applied resin shall be suitable for 36% acid or 5% alkali services. FRP material shall be confirm IS6746:1994 &amp; ASTM-D790-49T standard.</p>                                               |              |               |                |                |
| 6  | <b>FABRICATION OF FRP PIPING/FITTINGS&gt;6"</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Inch Mtr(IM) | 50            |                |                |
|    | <p>FABRICATION OF FRP PIPING/ PIPE FITTINGS AND OTHER ITEMS EXCEPT FLANGE ABOVE 6" DIA</p> <p>FABRICATION/REPAIRING OF COMPLETE FRP PIPING AND PIPE FITTINGS EXCEPT FLANGE AND OTHER ITEMS(NEW OR OLD USED) for replacement (pipe dia above 6"). Preparation of fixtures, if required, fabrication of FRP pipe along with elbows/branch lines/reducer/tapings etc without flange for acid or alkali service. The measurement will be done in running mtr, minimum thickness of the pipes should be as per standard engineering practices BS: 4994 and according to the operating/service conditions. The applied resin should be suitable for 36% HCL acid or 5% NAOH caustic service.</p> |              |               |                |                |
|    | <b>FABRICATION OF FRP FLANGE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |               |                |                |

| SN | Item description                                                                                                                                                                                                                                                                                                                                                                                                                                 | UOM          | Estimated QTY | RATE/UNIT<br>(RS) | AMOUNT IN(RS.) |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|---------------|-------------------|----------------|
| 7  | Preparation of fixtures, fabrication of FRP flange including installation with the FRP piping/pipe fittings for use in acid/ alkali service; dimension and minimum thickness of flanges shall be as per standard engineering practices, BS: 4994 and according to the operating/ service conditions. The applied resin shall be suitable for 36% acid or 5% alkali services. FRP material shall be confirm IS6746:1994 & ASTM-D790-49T standard. | Inch Dia(ID) | 30            |                   |                |

| SN                         | Item description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | UOM     | Estimated QTY | RATE/UNIT (RS) | AMOUNT IN(RS.) |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------------|----------------|----------------|
| 8                          | RUBBER LINING WITH MIN. THICKNESS: 5.0 M                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | SQ. MTR | 30            |                |                |
|                            | RUBBER LINING WITH MIN. THICKNESS: 5.0 MM ON TANK/ VESSEL/ SPOOL/ ELBOW/ REDUCER/ TEE AND OTHER ITEMS (NEW OR OLD USED)<br>Removal of existing lining from internal surface of Tank/ Vessel/ Piping Spool/ Elbow/ Reducer/ Tee and Other items by scrapping/ mechanical/ chemical/ thermal ways, whichever is feasible and get rid off all previous lining material from the surface by mechanical ways, if require for surface preparation, or grit blasting/shot blasting, if require, for application of protective coating; Application of rubber lining on internal surface of the cleaned item with min. thickness: 5.0mm and allow for curing of the applied lining for acceptatance. Rubber lining specification: Natural Rubber (soft), Hardness: 65-70 Shore A as per IS:4682, Part-I. |         |               |                |                |
| TOTAL UNIT RATE            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |               |                |                |
| GST @ ____%                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |               |                |                |
| TOTAL RATE INCLUDING TAXES |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |         |               |                |                |