

# PMC for 400 MLD SWRO Desalination Plant at Perur, Chennai

## Consortium Partners



SMEC International Pty. Ltd. (ACN-065440619/FCRN-F01483)

NJS Engineers India Pvt Ltd, India (CIN - U74210PN2007PTC129798)

Tata Consulting Engineers Limited, India (CIN- U74210MH1999PLC123010)

SMEC (India) Pvt. Ltd. (CIN: U93000DL1997PTC088574)

Ref: SMEC/ CMWSSB / 5061185/128

Date: 05<sup>th</sup> August 2020

To,  
**The Superintending Engineer (Desalination)**  
6<sup>th</sup> floor, Chennai Metropolitan Water Supply and Sewerage Board,  
No.1, Pumping Station Road,  
Chintadripet, Chennai 600 002  
Tamil Nadu, India

**Sub:** Consultancy for "Design, Preparation of Bid Documents & Evaluation of Bids for the Proposed Construction of 400 MLD Capacity Seawater Reverse Osmosis Desalination Plant at Perur along East Coast Road, South of Chennai, Tamil Nadu and Construction Management & Supervision for the Proposed Desalination Plant and its Product Water Conveyance Pipeline from the Plant and upto Porur and all allied works"

### Action Taken Report / Reply to Queries on the Draft Concept Design Report for CP1 – Reg.

- Ref:
1. Queries from CMWSSB vide your email, dated 03.08.2020
  2. Our Letter no. Ref: SMEC/ CMWSSB / 5061185/093, dated 09.07.2020
  3. Our Letter no. Ref: SMEC/ CMWSSB / 7061563/005, dated 20.01.2020
  4. Your Letter no. Lr.no.CMWSSB/SE(Desal)/400 MLD Plant / PMC/2020, dated 13.01.2020
  5. Our Contract Agreement with CMWSSB, dated 09.01.2020

Dear Sir,

With reference to our agreement with CMWSSB vide our letter cited in reference no.3, dated 09.01.2020, please find below details of the action taken report / reply to queries on the Draft Concept Design Report from CMWSSB vide your email, dated 03.08.2020 for the subject project.

| Sl. No. | Queries from CMWSSB vide email, dated 03.08.2020   | Action Taken Report / Reply to Queries   |
|---------|--|--|
| 1       | The invert level of the intake pipe at offshore intake structure and at the pumping station of the plant.  | The preliminary calculation indicates the following values:<br>The crown level of the intake pipe at pump station will be at depth of -6.01m and at intake head it will be at the depth of -13.50m with respect to the CD.   |
| 2       | Pl. mark the details (in number) of pumping station depth, intake depth, minimal pump coverage in Fig 21, for better clarity.                                    | A detailed drawing is attached herewith:<br>Pumping station depth will be about -9.26m with respect to Chart Datum (CD). It is based on pump height from manufacturer (at present it is assumed 1.5 m) and final length of intake pipeline (at present it is 1800m). The pump station depth will vary with the change in these design parameters.<br>The pump cover will be 2.5 m based on 1600 mm bell mouth diameter of pump.  |
| 3       | The relation between increase in TDS (g/l) and osmotic pressure (in bar) may be clarified, since different values are furnished in Interim report (pg.no.29) and | The osmotic pressure is highly influenced by TDS, permeate flux and temperature. At low permeate flux and TDS, the osmotic pressure is low. While with decrease in temperature, the osmotic pressure increases. RO projection is run at the medium temperature i.e. 28.3°C and 3:5 (HR:LR) membrane combination at 13.4 l/m <sup>2</sup> flux. The rate of change of osmotic pressure is 1.5 bar per 1000 mg/l TDS. The figure below shows the trend of osmotic pressure with TDS. |

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| Sl. No.    | Queries from CMWSSB vide email, dated 03.08.2020  | Action Taken Report / Reply to Queries   |            |               |                |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |
|------------|---|--|------------|---------------|----------------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|-------|------|------|
|            | Draft Concept Design (pg.no.42)   | <p><b>TDS vs. Osmotic Pressure at 46% Recovery &amp; 28.3 °C</b></p> <table border="1"> <caption>Data points for TDS vs. Osmotic Pressure at 46% Recovery &amp; 28.3 °C</caption> <thead> <tr> <th>TDS (mg/l)</th> <th>Osm Pr. (Bar)</th> <th>Feed Pr. (Bar)</th> </tr> </thead> <tbody> <tr><td>31000</td><td>42.5</td><td>50.5</td></tr> <tr><td>32000</td><td>44.0</td><td>51.5</td></tr> <tr><td>33000</td><td>45.5</td><td>53.0</td></tr> <tr><td>34000</td><td>47.0</td><td>54.5</td></tr> <tr><td>35000</td><td>48.5</td><td>56.0</td></tr> <tr><td>36000</td><td>50.0</td><td>57.5</td></tr> <tr><td>37000</td><td>51.5</td><td>59.0</td></tr> <tr><td>38000</td><td>53.0</td><td>60.5</td></tr> <tr><td>39000</td><td>54.5</td><td>62.0</td></tr> <tr><td>40000</td><td>56.0</td><td>63.5</td></tr> <tr><td>41000</td><td>57.5</td><td>65.0</td></tr> </tbody> </table> | TDS (mg/l) | Osm Pr. (Bar) | Feed Pr. (Bar) | 31000 | 42.5 | 50.5 | 32000 | 44.0 | 51.5 | 33000 | 45.5 | 53.0 | 34000 | 47.0 | 54.5 | 35000 | 48.5 | 56.0 | 36000 | 50.0 | 57.5 | 37000 | 51.5 | 59.0 | 38000 | 53.0 | 60.5 | 39000 | 54.5 | 62.0 | 40000 | 56.0 | 63.5 | 41000 | 57.5 | 65.0 |
| TDS (mg/l) | Osm Pr. (Bar)   | Feed Pr. (Bar)   |            |               |                |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |
| 31000      | 42.5  | 50.5   |            |               |                |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |
| 32000      | 44.0  | 51.5   |            |               |                |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |
| 33000      | 45.5  | 53.0   |            |               |                |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |
| 34000      | 47.0  | 54.5   |            |               |                |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |
| 35000      | 48.5  | 56.0   |            |               |                |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |
| 36000      | 50.0  | 57.5   |            |               |                |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |
| 37000      | 51.5  | 59.0   |            |               |                |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |
| 38000      | 53.0  | 60.5   |            |               |                |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |
| 39000      | 54.5  | 62.0   |            |               |                |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |
| 40000      | 56.0  | 63.5   |            |               |                |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |
| 41000      | 57.5  | 65.0   |            |               |                |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |
| 4          | Requested to check the maximum RO feed pressure and its appropriate saving of operating cost. | <p>At Page 76, the Concept Report indicates the following:<br/> <b>“However, the maximum RO feed pressure value being @ 61.5 bars with our selected configuration compared to 63.91 bars with Case 3-DPR which will result in a saving of operating cost by about 1 million USD per annum.”</b></p> <p>The pressure comparison given above is at TDS 38020 mg/l while our saving calculation at Table 28 in the Concept Report is based on TDS 35942 mg/l.</p>   |            |               |                |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |       |      |      |

Thanking you assuring our services at all times.

Yours truly,  
 For **Consortium of SMEC International Pty. Ltd.-TCE Ltd.-NJSEI Pvt. Ltd.-SMEC (India) Pvt. Ltd.**

**S.Srinivasa Rao**  
 Project Coordinator  
 SMEC India Pvt. Ltd.

Encl: Drawing for SWRO Plant Intake (in A3 Size)

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