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: SSNT PMC 400 MLD/ CMWSSB / 5061185/403

Date: 16th August 2021

To,
The Superintending Engineer (Desalination)
Chennai Metropolitan Water Supply and Sewerage Board,
Urban Administrative Building,
2nd Floor, No.75, Santhome High Road,
Raja Annamalaipuram,
Chennai 600 028
Tamil Nadu, India

Sub: JICA Assisted "Project for Construction of 400 MLD Capacity Seawater Reverse Osmosis Desalination Plant at Perur and allied works (**JICA Loan ID-P267**)"
Replacement of Water Supply Engineer (International Expert No.3) (Key position) – Reg.

Ref:
1. Our Letter no. Ref: SMEC/ CMWSSB / 7061563/005, dated 20.01.2020
2. Your Letter no. Lr.no. CMWSSB/SE(Desal)/400 MLD Plant / PMC/2020, dated 13.01.2020
3. Our Contract Agreement with CMWSSB, dated 09.01.2020

Dear Sir,

There have been increased project activities to improve the existing water distribution system in the Chennai Core city (CP4) component in the recent past. PMC has mobilised all the named resources pertaining to CP4 to meet the planned deliverables, except Water Supply Engineer (International) Mr. Shane Farquharson, who has opted out due to personal reasons and the current worldwide Covid-19 pandemic.

Hence, we are proposing Mr.S.Srinivasarao, who is well versed with the project and currently working as Project Coordinator as a replacement. He meets the criteria and is better experienced in the water supply network and, in particular, local conditions.

The brief of the proposed staff has been given below:

Sl.No.	Proposed Staff Name	Position	Brief
1	**S.Srinivasarao**	Water Supply Engineer (International Expert)	**S.Srinivasarao** is a Post Graduate in Environmental Engineering and trained in Project Management from IIM Kozhikode with 26 years of rich experience in various Water and wastewater projects in developing and developed countries **(Singapore, Oman, Egypt, UAE, Qatar and India)**. He has involved and delivered major water supply projects covering source selection, WTPs, large Transmission / Distribution networks, NRW studies, large storage Reservoirs, Contract Management, O&M and Commissioning, team management and client coordination, also involved in training and capacity building activities. He has also experienced various multilateral/IFI funding projects, including ADB, DFID, World Bank, and JICA. He has a good ability to add value to Indian Projects by bringing his International Experience.

SUPERINTENDING ENGINEER (DESAL) CMWSS BOARD, CHENNAI-2
16 AUG 2021

PMC Chennai Office Address:
13th Floor, Purva Primus, No 236, Okhiyampettai, Old Mahabalipuram Road, Thoraipakkam, Chennai, Tamil Nadu 600097
+91 044 66973300 indiabd@smec.com www.smec.com

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His addition will strengthen the team and the delivery system. His overall experience in India and International will assist the project in resolving many local challenges.

We now seek your approval for the above staff, and upon receipt of your approval, he will be mobilised to project full-time.

Thanking you and assuring you of our best services always.

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

SMEC International Pty. Ltd.-TCE Ltd.-NJSEI Pvt. Ltd.-SMEC (India) Pvt. Ltd.
PMC for 400 MLD
CHENNAI.

Dr.P.Dharmabalan
Project Manager/Team Leader
SMEC International Pty Ltd

Encl: CV of Mr.S.Srinivasarao

Form TECH-6 Curriculum Vitae (CV)

1. General

Position Title and No.	**Water Supply Engineer– International Expert (No.3)**
Name of Key Expert	**S. Srinivasa Rao**
Name of the Firm proposing the Key Expert	SMEC International Pty. Ltd.
Date of Birth	04.08.1971
Nationality	Indian
Country of Citizenship/ Residence	India

2. Education:

- M.E Environmental Engineering, MS University of Baroda, India, 1996
- B.E Civil Engineering – Andhra University, India,1993
- Project Management - Indian Institute of Management, Kozhikode, 2014
- Certified course on Arc GIS from Edge Map Training Centre, 2017

3. Employment record relevant to the Assignment:

S.Srinivasarao is a **Postgraduate in Environmental Engineering** with 26 years of rich experience in various Water & wastewater projects in developing and developed countries (**Singapore, Oman, Egypt, UAE, Qatar & India**). He has involved and delivered major water supply projects covering source selection, WTPs, large Transmission / Distribution networks, NRW studies, large storage Reservoirs, Contract Management, O&M and Commissioning, team management & client coordination and also involved in training and capacity building activities. He has also experienced various multilateral/IFI funding projects, including ADB, DFID, World Bank, and JICA. Has good ability to add value to the Indian Projects by bringing the International Experience.

Period	Employing organisation and your title/position. Contact information for references*	Country	Summary of activities performed relevant to the Assignment
Oct 2018 to till date	**Employing organisation:** SMEC India Pvt. Ltd. **Position Held:** Project Coordinator / Operations Head **Reference:** Name: Dr.Janardhan Sundaram, Executive Director Mob: +91 8527911998 Email: janardhan.sundaram@smec.com	India	• Working as Project Coordinator for PMC for **Construction of 400 MLD Desalination Plant in Perur**, Chennai funded by JICA. Involving in reviewing and guiding the project team in various deliverables such as Inception Report, Concept Design Report, Bid documents, Resources and communication management between the Consortium partners, overall coordination with client and team members, attending all key meetings. • As Infrastructure Expert involved in guiding the technical team & reviewing the deliverables of infrastructure (**Wet & Dry utility, road, park, Master Planning for Industries and residential layouts**), designs and reports for Hyderabad Pharma City – an Industrial development zone spread across **70Sq.Km**. Client coordination & attending the key meetings. Client: TSIIC • As Project Director, oversee the technical deliverables review and in time delivery for Bundelkhand Region (Sonbhadra District) water supply system covering 700 villages, 3 towns and planned multi-village water supply schemes with **Water Treatment Plant of 116 MLD Capacity on Sone River at Patwdh, Uttar Pradesh, India.** Client: UP Jal Nigam • As Technical lead review the submissions of Contractor's designs, QAP and periodic site visits for checking the quality of works and resolving the issues on-site for PMC services for Koppal **Multi Village (331 Villages) project** on **DBOT** contract with **63 MLD WTP**, **250 Km Transmission mains** (Raw & Clean Water with MS & DI pipes) & Zonal Balancing reservoirs, OHTs. Client: RWS, Karnataka. • Providing Technical support to PMC project for Karnataka Water Supply Modernization Project in 3 Cities, including implementation of **24x7 Water Supply** including metered house service connections in DBOT Contract funded by WB. Client: KUIDFC
May 2016 to Sep. 2018	**Employing Organisation:** Infrastructure Development Corporation Karnataka Limited (iDeCK)	India	• As Urban Division head, responsible for managing all the division's activities, including Project Execution, Technical Reviews, Resources planning, project budgeting, strategy development. Major Projects Handled: • As Team leader involved in comprehensive Water Supply system development for Adityapur City with **100 MLD Capacity of Water Treatment plant, 35 Km of Transmission main (1000mm) and 460 Km Distribution**

Period	Employing organisation and your title/position. Contact information for references*	Country	Summary of activities performed relevant to the Assignment
	Position held: Senior Vice President and Head of the Department (Urban) **Reference:** Name: Mr. Mruthunjay Mob: 9739621172 Email: mruthyunjaya.sm@ideck.in		**system** designed in **24x7-DMA Model** with Metered House Service connections. Provided Operational plan for converting the Intermitted supply system to continuous. Also involved in the bid document preparation, bid process management, quality control and supervision plans. Client: JUIDCo • As Technical expert involved in existing system analysis, demand analysis (Domestic and Industrial), Stakeholder consultation & Presentations, evaluation of process technologies and preparation of Techno-Commercial report and bid structuring for **100 MLD capacity of** a **desalination plant** for Mangalore City. Client: KUWS&DB • Involved in providing technical inputs and reviewing the Financial Analysis outcome for implementing the **24x7 water supply scheme in 3 Cities** in Karnataka (Hubli-Dharwad, Belgavi, Kalburgi) by checking the project feasibility with due consultations with KUIDFC, Municipalities etc. This project is under the implementation phase. Client : KUIDFC
Apr 2014 to May 2016	**Employing Organisation** CDM Smith (I) Pvt Ltd **Position Held**: General Manager (Water) **Reference:** Name: Mr.V.S.Ganesan Mob: +91 9790975044 Email: ganesan.vs@cdmsmith.com	India	Responsible for Managing all assignments in the department consists of water supply, sewerage, drainage, SWM projects. List of Relevant Projects handled : • **As Team Leader** involved in guiding the team and technical reviews of source selection, WTPs designs, bulk water transmission and distribution system hydraulics. Also involved in the tariff structure and bid process management for Design, Construction Supervision Consultancy for Implementation of **24x7 Water Supply** and UGD in Package-2 (5 ULBs) Kampli, Tekkalkote, Kottur, Kamplapuram and Molkalmur Client: KUIDFC; • **Lead Design Engineer**, Karnataka Integrated Urban Water Management Investment Programme (ADB funded) - Preparation of DPR, cost estimate, Bid document preparation for **24x7 Water Supply** and Sewerage system for 3 Towns (Davanagere, Byadagi and Ranebennur) **where up-gradation of existing WTPs and proposed new WTPs (60 MLD and 33 MLD) and improvement of water supply network of 2000 km**. Client: KUIDFC; • **NRW expert** involved in existing system analysis, field study & investigation, data/information analysis, Water Audit, stakeholder consultation, developing the water balance, developed various strategies/interventions to meet the reduction of NRW and to improve the system efficiency in 6 Selected Cities (Varanasi, Haridwar, Puri, Chindwara, Kurukshetra, Solapur) in India, funded by World Bank, Client: Ministry of Urban Development, Govt. of India. • **Technical lead** for Catchment area study, flow estimate and Rehabilitation of 60 MLD STP at Hebbal and Design and bid document preparation for the construction of new **100 MLD STP** for BWSSB. Client: BWSSB.
Dec 2008 To Dec 2013	**Employing Organisation**: Hyder Consulting Middle East Ltd, (Now Acquired by Arcadis Inc) Abu Dhabi and Doha **Position Held**: Senior/Lead Design Engineer	UAE and Qatar	• As lead design Engineer involved in designing the large Bulk Water Corridor between Rus Abu Fontas Desalination plants **(with a total of 747 MLD)** and Ras Laffan **(292 MLD)** and their sub-systems to carry the desalinated water to various parts of the country and in addition, involved in developing the Mega reservoirs **(36 nos. x 97 MIGD)** layout to store the water for 7 days of full supply to keep the water security. Involved in preparing basic hydraulic operational philosophy, design guidelines, modelling hydraulic analysis for the steady-state, extended simulation using **InfoWater Software with GIS interface**, sizing the pipe with all techno-economic feasibility, developed the system curves involved in pump, control valve selection and involved in the preparation of schematic flow diagrams, reservoir layouts and Pumping station designs. Prepared the Hydraulics report, operational philosophy, Preliminary and detailed design report, involved in Tender Document & BOQ preparation. Collaborative workshops with contractors on risks & milestones to be addressed in the target cost. Country- Qatar; Client: KAHRAMAA • **As Project Manager** involved in team formation, preparation of basic design document, hydraulic modelling, surge analysis, detailed designs of the **pipeline (60 km of 600 mm to 400mm) /** pumping station and drawings of the project. Bid documents and BOQ preparation for Consultancy Services for the detailed designs of water Transmission system for RAK area in UAE Client: FEWA (Federal Electricity and Water Authority, Dubai).

Period	Employing organisation and your title/position. Contact information for references*	Country	Summary of activities performed relevant to the Assignment
			• **As a Water Supply expert** involved in data collection, field testing and investigations, system operational analysis, DMA boundaries confirmation, network calibrations, the pumping stations operational strategies, Water losses estimate, guiding the hydraulic team in model building and carrying out the analysis for the outcome to assess overall rehabilitation/replacement improvements to the system and to develop operational strategies for Consultancy services for Abu Dhabi is existing water network analysis **(~8,000 km**), calibration, model building. Client: ADDC • **As Project Manager** for Al Ain new Water transmission and improvement of the distribution system, it was involved in detailed design, engineering of 1600mm dia. DI bulk water transmission main of **70 Km for 30 bar test pressure** & its sub-systems. Also involved in augmentation of the distribution system of core city **(80mm – 800 mm with 170 MIGD supply),** which includes hydraulics designs and prepare detailed engineering report, supply zoning **(24x7) and DMA formation**. Periodically inspecting the site execution works, hydraulic testing, commissioning of major pipelines. Coordinating with MECIA works, client and Contractor on various technical matters, attending all technical and progress meetings. Client: TRANSCO, Abu Dhabi. • **Project Manager involved in** Al Ain Reception Centre pumping station design, intending to pump the water to Al Ain distribution system through various pumping mains ranging from **900mm to 2200 mm dia. MS Pipe 7km length**. Involved in leading the team in pump station design, pumps selection, piping detail design works including various interfaces, GA piping layout plan, pipeline profile, chamber drawing, MEP works etc. • Preparation of Cost Estimate, BOQ. Lead Design engineer for new Capital District-Emirati Neighbourhood development project in 4,500 Ha in Abu Dhabi. The potable water supply involved in the water demand estimate includes the firefighting requirements, bulk water supply & distribution system design, preparation of hydraulic design report, and detailed design reports. Coordinating with clients and utility corridor, and fire safety authorities.
Nov 2001 to Nov 2008	**Employing Organisation**: Consulting Engineering Services (India) Pvt. Ltd. (now Acquired by Jacobs Inc) **Position Held:** Sr. Engineer, Dy. Project Manager, Project Manager, Deputy General Manager in Environmental Engineering Division.	India, Oman & Egypt	• As Project In-charge for quality control supervision of water pipeline and UGD laying works in newly added areas of BBMP and third-party Inspection of all Material including pipes (RCC, DI, GSW), Specials, valves, laboratory testing of material for BWSSB. • Senior Design Engineer involved in data collection, alignment fixing, demand assessment, sources analysis, coordination with surveys & investigations, hydraulic designs, surge analysis, PDR and DDR preparation, BOQs, bid document preparation for two projects in OMAN 1.Jebal Akhdar, 2.Barka, Wilayat of Bidbid and Funjah Water Supply Schemes for Ministry of Regional Water Supply, Muscat, Sultanate of Oman. • Senior Engineer involved in Detailed designs of large diameter pipeline, Surge Analysis and Construction supervision of **1400mm diameter OD MS Pipeline** for raw water supply to Bellary Thermal Power Station (BTPS) of **36Km**. Also involved in third party inspection of MS pipeline lining, guneting, laying, jointing and testing Client: Karnataka Power Corporation Limited. • **Project Manager** for Preparation of Master Plan for Regional Water Supply Schemes in three districts in Karnataka (Gulbarga, Bidar & Bijapur) under World Bank Scheme covering both Surface & Ground Water sources. Analysis, identification of water quality/quantity affected areas, cluster formation, preparation of Master Plan & Preliminary Scheme Report. Client: KRWSSA • **Project Coordinator for Karnataka Rural Water Supply and Sanitation project-JALNIRMAL- for Gulbarga & Bidar Districts 2 Packages in North Karnataka (World Bank Aided)** Involved in providing technical support to the project teams in both the packages. Arranging the sub-agencies like survey team, geophysical, geotechnical, social activity (NGO), etc. and coordinated with the client for various technical and commercial matters. Attending various workshops/discussions/meetings with the client, world bank & other agencies involved.

Period	Employing organisation and your title/position. Contact information for references*	Country	Summary of activities performed relevant to the Assignment
			• **Lead Design Engineer** for Preparation of Detailed Scheme Report for a regional Water Supply schemes in Belgaum District, Karnataka - **funded by World Bank** • Senior Design Engineer: Comprehensive Water Supply scheme for Warangal Municipal Corporation for APUSP under **DFID fund.** As Senior design engineer responsible for existing system evaluation, preparation of augmentation for Source, Raw Water pipelines, as per the ultimate demand increased **WTPs capacity to 220 MLD** and hydraulic design of distribution system (680km) for the city including rehabilitation and replacements. • **Project Manager** for Consultancy services for Preparation of Sewerage Master Plan for Rehabilitation, strengthening and improving the existing sewerage system for Kapra and Uppal Municipality in Greater Hyderabad. • **Senior Utility Engineer** for Preparation of Preliminary Scheme Report for Riyadh-Light Rail Transport Project, Saudi Arabia. Worked with our associate consultant-Dar Al-handasah for the above project from their office in Cairo, Egypt. involved in estimate and preparation of preliminary scheme report for the rehabilitation of Utilities (like water supply, sewerage, stormwater drains and other dry utilities) for the LRT-North-South & East-West corridors • **Senior Utility Engineer** for Project: Development of King Abdul-Aziz Endowment Project-Central Utility Plant- Saudi Arabia. Worked with our associate consultant-Dar Al-handasah for the above project from their office in Cairo, Egypt and was involved in the design & preparation of detailed engineering reports for wet utilities (Water supply, sewerage network & SWD network) for the above project.
June 1999 to June 2001	**Employing Organisation**: Hyundai Engg. & Const. Co. Ltd, Singapore **Position Held:** Project Engineer	Singapore	• **Project Engineer for Seletar Wastewater Treatment Plant Ph-III of 133MLD**. Assisting to project control Manager on process-related matters, coordinating with various departments and agencies to achieve the project milestone. Involved in project execution activities such as equipment specifications, quality assurance plans, preparation of datasheets, checking the piping layouts, GAD & bill of materials. Coordinating, making necessary correspondence with clients, vendors and subcontractors for approval of all technical submission, looking after the contract administration, variation order matters and arranging training classes in coordination with vendors for the client's operational staff and participating in technical discussions & monthly progress review meetings and preparing weekly & MPR and also assisting to Commissioning Manager in compilation & preparation of O&M manual and trainee manual as per the process schematic and formulation & preparation of site testing and commissioning procedures for Full Loop Commissioning.
Jul 1997 To Mar 1999	**Employing Organisation**: **M/s. Geo Miller & Co. Ltd., New Delhi** **Position Held:** Project Engineer/Assistant Engineer		**Projects Handled:** • **Prepared Basic Process Engineering package for ETP for Indian Oil Corporation Ltd., plant at IOCL Panipat, India.** • **Execution of the ETP works at IOCL, Panipat (Major units are Archimedian Screw Pumps, Tilted Plate Interceptor, Floating Oil Skimmer, DAF, Dual Media pressure Filters and Sludge Handling Units.** Piping & MS Tank fabrication work, coordination between office, site & client for M&E works) • **Involved in Performance Guarantee tests and commissioned ETPs of IOCL, Panipat and Hindustan Petroleum Corporation Vijayawada, INDIA.** • **Participated in several techno-commercial meetings along with clients, contractors and vendors.** As a Project Engineer, responsible for preparing the Basic process Engineering package (including Unit Sizing & hydraulic process calculation) for the water and wastewater treatment plants. Assisting in Detailed Engineering activities such as system design, specification, quality assurance plan, datasheet, piping layout, GAD & bill of materials, project planning and scheduling, progress reports and liaising with clients, contractors for technical discussions & for document approval. And also looked after the Commissioning and Performance Guarantee Test activities, coordinated between site and office for M&E works.

Period	Employing organisation and your title/position. Contact information for references*	Country	Summary of activities performed relevant to the Assignment
May 1996 to July 1997	**Employing Organisation:** MAXWELL Engineers **Position Held:** Environment Engineer	Surat, Hazira	• Actively involved in the commissioning activities of "Bio-Tower treatment Plant" at ONGC Hazira • As a plant Coordinator for ETP in ONGC, Hazira checked the daily O&M activities of the ETPs and advised the Operating Staff and ONGC Utility Department on various process-related operation control parameters. • Review of Daily sample analysis and reporting the same. • Up keeping the maintenance of the ETP plants and recording the same.

4. **Membership in Professional Associations and Publications:**
   - Member of Indian Water Works Association
   - Member of Institution of Engineers
   - Qualified Chartered Engineer

5. **Language Skills (indicate only languages in which you can work):**

Language	Speaking	Reading	Writing
English	Excellent	Excellent	Excellent
Hindi	Good	Good	Good
Telugu	Good	Good	Good
Kannada	Good	Good	

6. **Adequacy for the Assignment:**

Detailed Tasks Assigned on Consultant's Team of Experts:

- Shall function as a technical supervisor in design and tender assistance for CP 1, CP 2 and CP 4
- Shall study the improvement of the water distribution network and plan the scope of CP 4
- Shall evaluate the bids for CP 1, CP 2 and CP 4 in technical aspects
- Shall assist the Organizational Expert in capacity development and organisational improvement in technical aspects
- Shall be responsible for skill transfer to CMWSSB for establishment and maintenance of GIS database and hydraulic model

Reference to Prior Work/Assignments that Best illustrates Capability to Handle the Assigned Tasks

1. **Name of Project: Project Management Consultancy for Construction of 400 MLD SWRO Desalination Plant in Perur, Chennai, Tamil Nadu funded by JICA (Estimated Project Cost INR 6075 Crores)**
   Year: January 2020 to Till Date
   Location: Chennai, Tamil Nadu
   Client: Chennai Metropolitan Water Supply & Sewerage Board (CMWSSB)
   Main Project Features: The major components within the Scope of Work for the overall project are: CP1 - 400 MLD Sea Water Reverse Osmosis Desalination Plant at Perur; CP2 - Pumping Stations & Reservoirs at Perur and Porur; CP3 - Product Water Conveyance Main for about **65Km length of 1600mm to 2000mm MS pipe** from Perur to Porur; CP4 - Improvements to Existing Distribution System in the core area of Chennai City; CP5 - Installation of the external dedicated transmission line.
   Position Held: Project Coordinator
   Activities Performed: Involving in reviewing and guiding the project team in various deliverables such as Inception Report, Concept Report, Bid documents, Resources and communication management between the Consortium partners and client, overall coordination with client and team members, attending all key meetings for **Construction of 400 MLD SWRO Desalination Plant at Perur for CP1** component. Attending various meetings and interactions with the PMC team and client.

2. **Name of the Project: Consultancy Services for the overall planning, engineering survey, designing, preparation of DPR for piped drinking water supply scheme in Bundelkhand, Vindhya Region, Arsenic/ Fluoride & JE /AES affected areas of State of Uttar Pradesh from groundwater and surface water sources (Estimated Project Cost INR 3129 Crores)**
   Year: Jan'2019 to Dec'2020
   Location: Uttar Pradesh
   Client: State Water and Sanitation Mission, (Namami Gange and Rural Water Supply Department), Lucknow, Uttar Pradesh
   Main Project Features: The main features are of the project includes: 13 nos. Water Supply Schemes covering 1294 villages, Over 30 Lakhs projected population is covered under this project as per projected population of 2051; Construction of 13 Intakes and **13 new Water Treatment Plants with capacity ranging from 5 MLD to 116 MLD**; Transmission Mains of over 1180 km with sizes ranges from 80mm DI to 1200 DI; Distribution Network of over 7490km with water distribution pipe sizes ranging from 50mm GI to 500mm DI; **172 nos. of water storage structures** which comprise of OHSRs and GLRs; Over 5.85 Lakhs proposed Household Service connections for ultimate stage (2051).
   Position Held: Project Director
   Activities Performed: As Project Director, oversee the technical deliverables review and in time delivery for Bundelkhand Region (Sonbhadra District) water supply system covering 700 villages and 3 towns and planned multi village water supply

schemes, Technical review of the hydraulic designs of water distribution and transmission network, **Water Treatment Plant of 116 MLD capacity near Sone River at Patwdh,** obtaining the approval from Technical and Finance Committee; Attending various technical meetings with client and stakeholders.

3. **Name of the Project: PMC services for Koppal Multi Village (331 Villages) Project on DBOT contract (Cost INR 697Cr);**
Year: Apr'2019 to till date;
Location: Koppal, Karnataka, Client: RWS (PRED).
Main Features: Multi Village (331 nos)Water supply scheme planned with source from Tungabhadra Dam with 63 MLD WTP and 47 Km Raw Water Main and 200 Km of Transmission main and 50 Zonal balancing reservoirs and OHTs.
Position Held: Project Director/Technical Advisor
As Technical Advisor reviews the submissions of Contractor's designs and QAPs, guiding the team in preparing procedures for various quality control checks, testing, and inspection of works. Third-party inspection of material such as pipes, pumps, valves etc. Periodic site visits for checking compliance of works and resolving the issues at the site.

4. **Name of the Project: Comprehensive Water Supply improvement Project for Adityapur city (Cost: INR 325 Cr)**
Year: July'2017 to Aug'2018
Location: Jharkhand ;
Client: JUIDCO
Main Project Features Adithyapur water supply improvement project consisting of rehabilitation of existing WTPs (22 MLD) and Pumping stations and Proposed new Jack well and Intake works on river Subarnarekha River with **WTP of 100 MLD** to meet the domestic and industrial demand. The transmission is main of **1000 mm dia. of 35 Km** and improvement of the distribution system for **460 Km**.
Position Held: Team Leader
Activities Performed: As Team leader involved in all technical studies such as source selection, existing system analysis, conducted NRW studies, demand assessment (domestic & Industrial), technical review of Headworks, WTP, Transmission system designs, involved in preparing the supply zones and DMAs and hydraulic analysis of distribution network in 24x7. Provided Operational plan for converting the Intermitted supply system to continuous. Also involved in the bid documents preparation and bid process management, quality control and supervision procedures for the quality control team.

5. **Name of Project: Techno-Commercial report and bid structuring for a desalination plant for Mangalore City, Karnataka, India**
Year: Dec'2017 to Apr'2018
Location: Bangalore;
Client: KUWS&DB
Main Project Features: 100 MLD capacity Desalination Plant with strong Industrial demand in PPP mode
Position Held: Technical Expert
Activities Performed: Involved in existing system analysis, demand analysis (Domestic & Industrial), Stakeholder consultation & Presentations, evaluation of process technology & selection of process technology and preparation of Techno-Commercial report and bid structuring. Presented to KUWS&DB board and obtained approval on the recommendations.

6. **Name of Project: IWRM-Preparing Detailed Project reports for tranche-1 investment under KIUWMIP for the three towns Ranebennur, Davangere and Byadgi**
Year: 2014 to 2016
Location: Davangere city, Ranebennur, Byadagi CMC
Client: KUIDFC, Bangalore
Main Project Features: Improving the water supply system to convert the system to **24x7**. The features Davanagere-Construction of New Jack well and headworks, additional WTP of (60 MLD), rehabilitation of existing WTPs (60 MLD), laying of new Transmission main (Raw water) of 60 km, construction of 19 service reservoirs, 1160 km of distribution pipeline with 98,000 HSC. Byadagi- Rehabilitation of 10 MLD WTP, 100 km of new distribution system with 8,000 Service connections and Ranebennur – 33 MLD WTP, 13 Km of **600 mm dia. Transmission main**, 290 km of distribution system with 23,000 HSCs.
Position Held: Technical Lead
Activities Performed: Responsible for guiding the team in field investigations, conducted the hydrological survey for source, existing system analysis, proposed up-gradation/rehabilitation works, finalisation of hydraulic designs of transmission and distribution system and process design, tender document preparation.

7. **Name of Project: Design and Construction Supervision Consultancy for Implementation of 24x7 Water Supply and Under Ground Drainage in Package-2 (5 ULBs) Kampli, Tekkalkote, Kottur, Kamplapuram and Molkalmur.**
Year: Apr'2014 to Feb'2015
Location: Karnataka
Client: KUIDFC.
Main Project Features: Medium level towns with population less than 1 lakh, improvements of Water supply system were proposed for all components including Source, WTPs, Transmission system and distribution system to achieve 24x7 water supply and also proposed telescopic tariff system to match the revenue to meet the operational expenses.
Position Held: Team Leader
Activities Performed: Responsible for guiding the team in field investigations, conducted the hydrological survey for source, existing system analysis, proposed up-gradation/rehabilitation works, finalisation of hydraulic designs of transmission and distribution system, process design, tender document preparation and stakeholder consultations.

8. **Name of Project: Developing Strategy for reduction of Non-Revenue water in 6 selected cities across India.**
Year: Dec'2014 to Feb'2017
Location: Varanasi, Haridwar, Puri, Chindwara, Kurukshetra, Solapur
Client: MoUD, Govt of India, funded by WB.
Main Project Features: All the 6 cities having piped water supply network, but having high levels of Non-Revenue Water seriously affect the financial viability and sustainability of water utilities through lost revenues, increased operational costs and lack of funds necessary for the expansion of service, especially to the poor communities. Based on the field investigations, audits, and data collection & analysis of Technical/non-Technical/O&M issues, key strategies are developed for continuous, short term and long-term interventions with financial analysis and involvement in performance-based contract models.
Position Held: NRW Expert
Activities Performed: Involved in existing system analysis, field studies and investigations, data/information analysis, Water Audit, stakeholder consultation, developing the water balance, developed various strategies/interventions to meet the reduction of NRW and improved system efficiency.

9. **Name of Project: Consultancy services for the detailed designs of Strategic water storage Mega Reservoirs and corridor mains for the state of Qatar (Estimated project cost: USD 4.70 Billion)**
Year: 2012-2014
Location: Doha, Qatar
Client: KAHRAMAA (Qatar Water and Electricity Company)
Main Project Features: This is one of the biggest water supply schemes with the largest storage reservoirs in the Middle East. The basic concept of the project is to create 7 days of strategic security storage without compromising the water quality. The water from the desalination plants (~1100 MLD) will be transmitted through piping corridor throughout the country (ranging from **1200mm to 1600mm diameter, DI pipeline of 370km and MS pipeline of 30 Km length**) of 400 km and will be stored in Mega Storage Reservoirs (**capacity of 97MIG each** and total of 36 nos with a **total storage 3781 MIG**). From Mega reservoirs, the water will be transmitted to secondary storage reservoirs spread across Qatar.
Position Held: Lead Design Engineer
Activities Performed: As lead design Engineer involved in designing the large Bulk Water Corridor between Rus Abu Fontas Desalination plants **(with a total of 747 MLD)** and Ras Laffan **(292 MLD),** their sub-systems to carry the desalinated water to various parts of the country and in addition, involved in developing the Mega reservoirs **(36 nos. x 97 MIGD)** layout to store the water for 7 days of full supply to keep the water security. Involved in preparing basic hydraulic operational philosophy, design guidelines, modelling hydraulic analysis for the steady-state, extended simulation using InfoWater Software with GIS interface, sizing the pipes with all techno-economic feasibility, and developed the system curves involved in pumps, control valve selections and involved in the preparation of schematic flow diagrams, reservoir layouts and Pumping station designs. Prepared the Hydraulics report, operational philosophy, preliminary & detailed design reports. Involved in Tender Documents and BOQs preparation. Collaborative workshops with contractors on risks & milestones to be addressed in the target cost, involved in phasing plan for the construction of works.

10. **Name of Project: Al Ain Bulk water Transmission and improvement of the distribution system (Estimated project cost: USD 500 Million)**
Year: 2009-2011
Location: Abu Dhabi, UAE
Client: TRANSCO (Water and Electricity Transmission company)
Main Project Features Detailed design, construction of 1600 mm dia, DI transmission main of 70 km with 16 sub-systems to connect to zonal areas with SCADA, Control system, hydraulic and surges analysis of pumping system. Detailed design and augmentation of the distribution system of 2000 km for an estimated flow of 170 MIGD.
Position Held: Project Manager
Activities Performed: Involved in detailed design and engineering of 1600mm dia. DI bulk water transmission main of 70Km for 30 bar test pressure and its sub-systems. Also involved in augmentation of the core city's distribution system, which includes hydraulics designs and prepares detailed engineering reports and drawings to the level of Good for Construction, **supply zoning (24x7) and DMA formation**. Periodically inspecting the site execution works, hydraulic testing, commissioning of major pipelines, coordinating with MECIA works, client and Contractors on various technical matters, and attending all technical and progress meetings.

11. **Name of Project: Comprehensive Water Supply scheme for Warangal Municipal Corporation.**
Year: 2005-06
Location: Warangal, AP
Client: APUSP under DFID fund
Main Project Features: Increased the Source capacity of Dharma Sagar Lake from 0.784 TMC to 1.5 TMC by raising the bundh on three sides, providing three pipes (**1200, 1000 & 1000 mm of MS pipes of ~ 12 Km**) from Dharma Sagar Lake to gravitate individually to the 3 existing WTPs and increasing the cumulative treatment plants capacity to **222 MLD** to meet 2036 requirement and providing the distribution system to cover the entire city (680 km).
Position Held: Senior Engineer
Activities Performed: Involved in data collection, surveys and investigations, existing system analysis, and augmentation proposals. Hydraulic design of pipeline, distribution system and process units for WTPs and cost estimate. Involved in presentations and stakeholder consultations.

12. **Name of Project: Detailed Design, Surge Analysis and construction supervision of 1400mm diameter OD Mild Steel Pipeline for raw water supply to Bellary Thermal Power Station (BTPS)**
Year: 2004-05
Location: Kampli, Karnataka
Client: KPTCL
Main Project Features: Providing raw water supply to Bellary Thermal Power Station (BTPS) from Tungabhadra River through **1400 mm dia. MS pipeline of 36km length.**
Position Held: Senior Engineer
Activities Performed: Overall in charge of the project, which includes carrying out the complete hydraulic design with pump stations and pipeline and complete surge analysis (transient analysis) of pipeline with detailed design works of **1400mm diameter OD MS Pipeline for 36 Km length.** Preparation of quality assurance plans and inspection reports and coordinating with site inspectors, Client and Contractor. Thoroughly involved in pipeline structural designs, restrained lengths and thrust blocks. Also involved in third party inspection of MS pipeline lining, guneting, laying, jointing and testing.

13. **Name of Project: Design and Construction of Jebal Akhdar, Wilayat of Bidbid & Funjah Water Supply Scheme (Ph-1); Project Cost: USD 50 Million**
Year: 2003-2004
Location: Muscat, Oman
Client: Ministry of Housing, Electricity and Water
Main Project Features Design, Construction of Storage Reservoirs (Capacity 10,000 cum, 4,000 cum), Service Reservoirs (Capacity 3,500 cum, 2,500 cum), Tanker Filling Stations; **MS transmission main 56 km of dia. 1118 mm,** storage and distribution network 54 Km dia. 600 to 300 mm, HDPE of dia. 250 mm to 100 mm and DI 200 to 100 mm with pumping. Other units involve Treated Water Reservoirs, Pump Houses, 15 Nos. Overhead Tanks
Position Held: Senior Design Engineer
Activities Performed: Senior Design Engineer involved in data collection, alignment fixing, demand assessment, sources analysis (borewells), coordination with surveys & investigations, hydraulic design of transmission and distribution system, surge analysis, PDR, and DDR reports, BOQs, bid documents preparation.

14. **Name of Project: Preparation of Master Plan for Multi-Village Water Supply schemes in 3 Districts (Gulbarga, Bidar and Bijapur)**
Year: 2002-03
Location: Gulabrga, Bidar and Bijapur
Client: KRWSSA funded by WB.
Main Project Features: North Karnataka Districts faces acute water shortage due to depletion of groundwater sources and quality issues. Due to which many rural water supply schemes have become defunct. KRWSSA, with fund assistance from WB, has planned to take up Multi-villages schemes by duly forming the clusters with surface/perennial sources to create sustainable water sources.
Position Held: Senior Engineer
Activities Performed: Senior Engineer for Preparation of Master Plan for Regional Water Supply Schemes in 3 districts in North Karnataka (Gulbarga, Bidar & Bijapur) covering both Surface and Ground Water sources and involved in sampling, analysis and identification of water quality/quantity affected areas, identification of perennial sources, formation of clusters and preparation of Master Plan and Preparation of Preliminary Scheme Reports.

15. **Name of Project: Seletar Wastewater Treatment Plant Ph-III of 133 MLD**
Year: 1999-2001
Location: Singapore
Client: (A S$ 400 Miln. Project, for Ministry of Environment)
Main Project Features: Seletar Wastewater Treatment Works is a 133MLD STP with conventional Activated Sludge Process and as a compact, covered design with enhanced facilities such as odour treatment plant & dual-fuel engines power generation unit for generating power from the digested gas. The plant is designed to control the process operation by utilising the state of the art of distributed control system (DCS)
Position Held: Project Engineer
Activities Performed: Assisting project control Manager on process-related matters and coordinating with various departments and agencies to achieve the project milestones and involved in project execution activities such as equipment specifications, quality assurance plans, preparation of datasheets, checking the piping layout, GAD & bill of materials. Coordinating and making necessary correspondence with clients, vendors, and sub-contractors to get the approval of all technical submissions and look after the contract administration and variation order matters. Arranging training classes in coordination with vendors for the client's operational staff, participating in technical discussions, monthly progress review meetings, preparing weekly & MPR and also assisting to Commissioning Manager in compilation & preparation of O&M manual, trainee manual as per the process schematic and formulation & preparation of site testing and commissioning procedures for Full Loop Commissioning.

7. Certification:

I, the undersigned, certify to the best of my knowledge and belief that:

I. this CV correctly describes my qualifications and my experience;
II. In the absence of medical incapacity, I will undertake this Assignment for the duration, and in terms of the inputs specified for me in the Expert Schedule in Form TECH-7 provided team mobilisation takes place within the validity of this proposal or any agreed extension thereof;
III. I am committed to undertaking the Assignment within the validity of the proposal;
IV. I am not part of the team who wrote the terms of reference for this consulting services assignment;
V. I am, according to Clauses 3 and 4 of the ITC, eligible for engagement.

I understand that any misstatement described herein may lead to my disqualification or dismissal if engaged.

Signature of Key Expert or **authorised representative** of the firm **Date: 16/08/2021**

Full name of authorised representative: Dr. P. Dharmabalan

SMEC INTERNATIONAL PTY. LTD.