

Statement of Qualifications
Irrigation and Water Management



SECON Private Limited

<http://www.secon.in>



1) Profile of SECON Private Limited	1
2) Expertise of SECON in Irrigation and Water Management.....	2
a) Preparation of Basemap (for US Markets and International Markets).....	2
b) Surveys and Investigation (for Asian, Middle East and African Markets)	2
c) Soil and Material Investigation (for Asian, Middle East and African Markets)	3
d) Design and Detailed Engineering (for US Markets and International Markets).....	3
e) Construction Supervision and Generation of As Built Drawings (for Asian, Middle East and African Markets).....	3
f) GIS Based Asset Management. (for US Markets and International Markets)	4
3) Security at SECON's ISO 9001:2000 Certified Operations Center	5
Security - Physical Controls	5
Security - Technical Controls	5
4) SECON's Global Delivery Model	5
Contracts.....	Error! Bookmark not defined.
Project Management	5
Communications Protocols	6
5) Offices and Contact Information.....	6
6) Appendix 'A' Infrastructural Resources.....	7
a. Precision Survey Instruments.....	8
b. Computers and Peripherals.....	8
c. Software	9
d. Geotechnical and Soil Investigation Field Equipment	10
e. Laboratory Soil Testing Equipment	10
f. Laboratory Concrete testing equipment	12
7) Appendix 'B' Past Experience.....	13



1) Profile of SECON Private Limited

SECON is an ISO 9001:2000 certified GIS Driven Multidiscipline Engineering company with over 850 personnel. SECON is a financially sound, stable, zero-debt company that was established in 1981. SECON is one of the leading multidiscipline engineering consulting firms and the largest and oldest surveying and mapping firm in India with over 27 years of experience. Most of SECON's clients are repeat and long-term clients.

SECON provides world-class GIS services and software solutions at cost-effective rates by using the global delivery model. SECON is an ESRI Business Partner and a member of the Autodesk Developer Network (ADN).

SECON has long-term partnerships with international engineering firms and can operate in most areas of Asia, the Middle East, and North Africa. SECON prefers the partnering model for its US and European areas of operations.

The key differentiator for SECON is that the company is not just an offshore services firm, but a well-established (established in 1981) Multidiscipline Engineering firm. The SECON QA/QC staff working on the surveying and mapping projects have firsthand experience in dealing with SECON's Engineering Consulting staff that provide input while working on SECON's engineering consulting projects.

SECON personnel have access to SECON's engineering talent and domain expertise in:

- Oil and Gas Pipeline Transportation Routing
- Water and Sanitation Engineering
- Highway and Transportation Engineering
- Civil and Structural Design
- Irrigation and Flood Control Engineering
- Electrical Engineering
- Environmental Engineering
- Geotechnical Engineering
- Cadastral and Parcel Mapping
- Land Surveying and Mapping
- Photogrammetry, LIDAR and Image Processing
- GIS Driven Software Development
- GIS Data Conversion and Maintenance

SECON has the following standing in India:

- The largest private (non-government) surveying and mapping firm in India
- The dominant pipeline corridor mapping firm in India
- The largest private (non-government) mapping and design firm for irrigation and water management projects
- One of the largest private (non-government) highway mapping and design firms in India

SECON has executed over:

- 52,000 km of large-scale Pipeline Corridor Mapping – this includes Route Engineering, Topographical and Cadastral Mapping and Rights-of-Way Acquisition assistance and management. This is the largest amount of Pipeline Corridor mapping done by any corporation in India.



Statement of Qualifications
Irrigation and Water Management

- 10000 km of mapping, design, and construction supervision of highways
- 1,000,000 Hectares (3,861 sq miles) of large-scale mapping (topographical and cadastral) for Irrigation projects
- 600,000 Hectares (1,550 sq miles) of Irrigation and Water Management design projects
- 600 infrastructure development projects (includes subdivision/township mapping, design and planning)
- 600,000 meters of geotechnical investigation and drilling in various soil strata.
- SECON has also extracted the Detailed Project Report data for 7,300 km of National Highways in India and collated this data for entry into the NHAI Road Information System.
- SECON is currently short-listed for the pioneering National Highway Asset Inventory project in India. This project is to perform the asset inventory of 5,700 km of National Highways in India.
- SECON is currently executing a major multimillion dollar mapping and consulting project for the planning and design of the Water and Sanitation system for 13 municipalities (119 settlements) in Libya.
- SECON was the only firm selected in India by OPUS, New Zealand (<http://www.opus.co.nz>) to be their offshore design center.

2) Expertise of SECON in Irrigation and Water Management

SECON has superior technology, world-class office infrastructure, highly mobile crew, stringent quality systems, strict HSE policies and a large data bank of information. In addition to the designs all the investigations and services are provided from a single source. This leads to a high level of quality. A combination of all the above provides a good framework for the Department to achieve high level of technical quality, innovative techniques, cost savings and rapidly progress in the projects in a scientific manner. This is seen in all the projects we have executed.

Details of major projects are furnished in Appendix ' B'

a) Preparation of Basemap (for US Markets and International Markets)

- Topographic/Planimetric/ mapping
- Digital Terrain models
- Preparation by data collection and processing from:
 - Satellite Images
 - Field Surveys
 - Aerial Photos and Lidar

b) Surveys and Investigation (for Asian, Middle East and African Markets)

- Establishing GPS control for the command area based on National Network of Control
- Extension of primary control by Total Station based on coordinates of GPS control points
- Providing bench marks and connection of the same to the National Datum
- Monumentation of the Panimetric and Height control
- Topographical survey of the entire area including field to field survey
- Computer aided downloading, processing, digitisation, development of Digital Terrain Model (DTM), data management for engineering application.

- Preparation of horizontal and vertical profile for the Canals and distribution network
- Data acquisition and preparation of land schedules for acquisition.
- Hydrographic Survey and Hydrological study
- Capacity surveys for Storage Reservoirs
- Rehabilitation study of submerged area, etc.
- EIA and EMP Studies

c) Soil and Material Investigation (for Asian, Middle East and African Markets)

- Drilling 150mm dia. boreholes in all kinds of strata for structures, deep cuttings and high embankment
- Conducting Standard Penetration Tests (SPT)
- Collecting 100mm dia. undisturbed soil samples in cohesive layers;
- Identification of quarries for construction material
- Testing of the samples and quantum available
- Assessing the soil strata along the canals by trial pits/auger boreholes
- In addition to above, following laboratory tests are conducted at our in-house laboratory.
 - ✓ Grain size analysis – Both Sieve and Hydrometer analysis;
 - ✓ Atterberg Limits;
 - ✓ Natural Moisture Content;
 - ✓ Bulk and Dry Density;
 - ✓ Specific Gravity;
 - ✓ Direct Shear Test;
 - ✓ Triaxial – UU Test;
 - ✓ Consolidation Test;
 - ✓ Crushing Strength of Rock;
 - ✓ Specific Gravity of rock;
 - ✓ Water absorption of rock;

d) Design and Detailed Engineering (for US Markets and International Markets)

- Planning & design of irrigation network of canals and distributaries
- Design of cross drainage structures
- Hydraulic and structural designs for dams, barrages, Aqueducts, Siphons, etc.
- Preparation of cost estimates, rate analysis, Bill of Quantities
- Sedimentation analysis of large water bodies,

e) Construction Supervision and Generation of As Built Drawings (for Asian, Middle East and African Markets)

- Construction supervision and project management
- Preparation of Inspection Checklist for critical items including material testing and investigation
- Assistance in obtaining project related clearances from the concerned Authorities.
- Contract management involving various aspects of Civil Engineering Construction
- Supervision of bulk earthwork handling, site grading, high embankments, controlled filling of low-lying areas, alignment and survey control, storm water drainage, landscaping, etc.
- Checking and Certification of quantities executed as per the specifications laid down in the tender document
- Verification of bills
- Assisting Client in clearing arbitration and Disputes
- Identification of approved variations from the Tender drawings



- Preparation of as built drawings incorporating the changes, if any for effective management.

f) GIS Based Asset Management. (for US Markets and International Markets)

- Field Survey and Data collection
- GIS Data Development (converting hardcopy/CAD plans/asbuilt drawings into GIS database)
- Development of Enterprise GIS applications for Asset management and Environmental monitoring
- Generation of Network Mapbooks and Atlases(generation of network system maps in hard copy and digital format viewable on web based systems)

3) Security at SECON's ISO 9001:2000 Certified Operations Center

SECON has a state-of-the-art 105,000 sq. ft. ISO 9001:2000 certified Operations Center that is fully owned by the company.



The Operations Center is a secure facility and has robust security controls:

Aesthetically designed 105,000 sq. ft. Company owned office space

Security - Physical Controls

- 24X7 security guards
- Access Control Devices to restrict access to the different areas of the Operations Center.



Security - Technical Controls

- Network Monitoring Tools
- Web content filtering tools to restrict websites and ftp sites
- Anti-Virus Tools
- Firewalls
- Secure Servers
- Encryption
- Restricted and controlled access to floppy drives, zipped drives, and CD/DVD writers--these are disabled on all machines. Disabled USB drive data transfer on all machines. Only the network administrator can perform data transfer to external devices and closely controls this external data transfer.
- Restricted access and monitoring of SECON FTP site
- Regular backup of data on daily and weekly intervals
- Power Backup with UPS and Generators
- Leased Line Backup for Internet Connectivity

4) SECON's Global Delivery Model

Project Management

Weekly progress reports will be sent by email from SECON to the client project manager. The SECON Project Lead will interact on a frequent basis (more than 2-3 times a week) with the technical lead from the client during the project.

SECON will extensively use webconferencing tools, such as Webex and Citrix Online to interact with the client on an as-required basis. Project documentation will be exchanged by Microsoft Word, Excel, Visio, and MS Project.



Communications Protocols

Email will be the preferred method of communication. In addition, teleconferencing and webconferencing will be used. File transfer will be accomplished through FTP.

5) Offices and Contact Information

<p>India 147, 7B Road, EPIP, Whitefield Bangalore 560066 Phone:91-80-41197778 Fax:91-80-41194277 Email: feedback@SECON.in</p>	<p>USA 10460 Roosevelt Blvd N, Ste 387 St Petersburg, FL 33716 Phone: 727-493-2214 Fax: 727-499-6945 Email: dhyan.appachu@secon.in</p>
<p>LIBYA SECON Private Limited PO Box 13456, Tripoli,Libya Phone: (218)914624857 Rupesh Jang Shah Email: Rupesh.shah@SECON.in</p>	



6) Appendix 'A' Infrastructural Resources

a. Precision Survey Instruments

Sl. No.	Description and Make	Quantity	Remarks
1.	Dual Frequency Real Time (RTK) Global Positioning System (GPS) - LEICA	1	
2.	Hand-held GPS – Garmin, Magellan	17	
3.	Total Stations High-end – LEICA, TOPCON, TRIMBLE, PENTAX	46	
4.	Electronic Distance Meter (EDM) – SOKKISHA, LEICA	3	
5.	Glass Arc Theodolite - CARL ZEISS THEO	1	
6.	Theodolites – WILD, NIKKON, THEO	15	
7.	Self Reducing Tacheometer – WILD	1	
8.	Automatic Levels – WILD, NIKKON, SOKKIA, PENTAX, TRIMBLE	58	
9.	Pipeline Locator - Fisher	4	
10.	Compact Flash GPS	4	
11.	Video Camera	2	
12.	Camera digital	5	
13.	Soil Resistivity Meter - Aquameter	13	
14.	Current Meters - Professional	2	
15.	Type 'N' Schmidt Concrete Test Hammer	1	
16.	Benkalmen Beam Apparatus - AIMIL	1	
17.	Echo Sounder	1	By Arrangement

b. Computers and Peripherals

Sl. No.	Description and Make	Quantity	Remarks
1.	Personal Computers- Intel Pentium, AMD Athlon, Cyrix	Over 450	
2.	Laptop Computer – Toshiba, Acer, Vesta, Compaq	65	
3.	Compaq Ipaq	4	
4.	Largeformat Design Jet Plotter - HP	7	
5.	Laser Jet Printer – Rex Rotary, HP	16	
6.	InkJet Printer - EPSON	15	
7.	Dot Matrix – Wipro, TVS	4	
8.	Digitizers - Calcomp	6	
9.	CD Writer – HP, LG	4	
10.	Modems - D-link	10	
11.	Hubs	7	
12.	Switches	3	
13.	Scanner - HP	2	
14.	UPS	187 kVA	
15.	Captive Power Generator – Kirloskar, Simpson, Escon	175 kVA	



c. Software

Civil Design

- AutoDesk Land Development Desk Top
- AutoCad Revit Structure
- Auto Civil Rel. 8.0, Autodesk Civil 3D,
- Staad Pro, Geopak, Nova Point Road Professional, MXRoadMax
- WaterCAD, WaterGEM, SewerCAD, SewerGEM, StormCAD

Photogrammetry and LiDAR Processing

- Inpho Match AT
- Inpho Match T
- DAT/EM Summit Evolution
- Inpho Orthomaster
- Inpho OrthoVista
- TerraSolid TerraScan

GIS

- AutoCAD Map, Autodesk Raster Design, Autodesk MapGuide
- ArcGIS ArcView, ArcGIS ArcInfo, ArcGIS Spatial Analyst, ArcGIS 3D Analyst
- ArcSDE, ArcIMS, ArcGIS Server
- ArcEngine, ArcPad
- MicroStation Geographics

CAD

- AutoCAD
- MicroStation V8
- MicroStation J
- IntelliCAD

Software Development

- Visual Studio.NET Enterprise
- Visual Studio.NET Enterprise Architect
- Visual Studio.NET Professional
- Visual Studio Enterprise Developer
- MSDN Universal
- Mantis

**Statement of Qualifications
Irrigation and Water Management**

All the computers are networked on Local Area Network with **Windows 2000/NT 4.0** as the operating software.

d. Geotechnical and Soil Investigation Field Equipment

Sl. No.	Description and Make	Qty	Remarks
1	Rotary boring & drilling rigs – Radha, Coimbatore	20	Upto 60 m depth
a.	Standard penetration test - Kit	20	
b.	Undisturbed sampling outfit	20	
2	Static Cone Penetration Test - HEICO	1	10t capacity (Hyd. operated)
3	Shell & Auger Boring kits Post hole Augers	49	
4	Plate load testing kit with 2 Nos. of 50t & 100t jack – HEICO & ALFOMEGA, Chennai	3	Upto 100t/sq m load Intensity
5	Field Vane Shear Test in Borehole sets of blades – PMS (37.5, 50 & 70mm)	03	Upto 30 m depth For soft clay
6	Field California Bearing Ratio - HEICO	1	
7	Dynamic Cone Penetration Test – AIMIL	2	40mm
8	Field Permeability Test Kit (Packer Method)	2	
9	Field density kit – AIMIL	3	
10	Pocket Penetrometer Test Kit – AIMIL	2	
11	Benkelman beam deflection, AIMIL	1	For NH projects
12	Dynamic Cone Penetrometer, AIMIL	1	For NH projects
13	High Volume Sampler, APM 430 & 411, PMS	1	
14	Current resistivity meter, ANVIC	13	
15	Water current meter, LYNX	02	

e. Laboratory Soil Testing Equipment

Sl. No.	Description and Make	Qty	Remarks
1	Rapid Moisture meter–upto 50% - TIC, Bangalore	1	
2	Natural Moisture content cups	100	
3	Grain size Sieve Shaker - TIC /AIMIL, Bangalore	1 set	
4	Hydrometer analysis – TECHNO, Bangalore	2	
5	Atterberg limit apparatus (liquid, plastic & shrinkage cups) - TIC, Bangalore	2	
6	Cone Penetrometer - PMC, Bangalore	1	
7	Direct shear apparatus - AIMIL, Bangalore	1	
8	Consolidation Oedometer - JDEW, Bangalore	6	
9	Compaction Test Apparatus (Standard & Modified Proctor) – ALPHATECH, Bangalore	5	
10	Auto Compactor equipment – AIMIL, Bangalore	1	
11	Laboratory California Bearing Ratio - ASEW, New Delhi	1	
12	Additional moulds for Lab CBR Test - JDEW, Bangalore	22	
13	Proving Ring Test Equipment - AIMIL, Bangalore	1	

Statement of Qualifications
Irrigation and Water Management



Sl. No.	Description and Make	Qty	Remarks
14	Triaxial Shear Test - PMC, Bangalore	1	
15	Salinometer - Datta Scientific, Bangalore	1	
16	Laboratory Permeability Test Kit – Alphatech	1	
17	Pycnometer, Techno Instruments, Bangalore	2	
	Other Accessories – Sieves, Dial Gauge, etc.		Reqd No.
	Chemical Analysis of Soil & Water		
18	Research Microscope - P.C.Tech, Bangalore	1	
19	Electronic Weighing Balance – Techno & Sansui	3	
20	Mechanical Shaker (Chemical) - TIC, Bangalore	1	
21	Vacuum pump - AIMIL, TIC, Bangalore	2	
22	Hot air ovens – APOLLO & ELITE, Mumbai	2	
23	Distillation Unit – SRINIVASA, Bangalore	1	
24	Nephelometer, ELICO, Bangalore	1	
25	Hot plate - VASA, Bangalore	1	
26	pH Meter Digital – Systronics	1	
27	Calorimeter (Digital) – Systronics	1	
28	Flame photometer - Systronics, Bangalore	1	
29	Digital Conductivity Meter - Elico, Bangalore	1	
30	Other glass apparatus		Reqd No.

f. **Laboratory Concrete testing equipment**

Sl. no.	Description	Qty	Remarks
1	100T (1000 Kn) Compression Testing Machine, Pragathi-Bangalore	1	
2	Vicat Needle Apparatus with complete accessories, HEICO, Bangalore	1	
3	Slump Cone Test Apparatus with complete accessories, HEICO, Bangalore	1	
4	Cube moulds of size 150 x 150 x 150mm, ISI mark, Pragathi, Bangalore	6	
5	Cube moulds of size 7.06cm without ISI mark, Heico, Bangalore	3	
6	Cube moulds of size 7.06cm with ISI mark, Heico, Bangalore	6	
7	Le Chatelier's mould with ISI certification mark and the accessories – Split cylinder 30mm dia. 30mm high with two indicator arms, two glass plates and a lead weight – HC 38.05 – Heico, Bangalore	1	
8	Blaine's Air Permeability apparatus and the accessories – Permeability cell, U tube manometer with stop clock mounted sunmica wooden stand, perforated metal disc, plunger, rubber stopper, rubber tube with rubber bulb – Aimil, Bangalore	1	



7) Appendix 'B' Past Experience

Sl. No.	Name of the Project and Location Name of Work	Owner or sponsoring Authority	Year
1.	Amarja Irrigation Project, Gulbarga, Karnataka Investigation of Balance Work and rectification of existing Canal system including preparation of designs, drawings, estimates and DTPs for such works of main canal and distribution system including FICs	Executive Engineer BNT Division Karnataka Neeravari Nigam Limited, Gulbarga	Ongoing
2.	Balundagi and Allagi Lift Irrigation Scheme Gulbarga Surveys, investigation, design, preparation of Estimate, DTP for main canal and distributary network	The Managing Director Karnataka Neeravari Nigam Limited	Ongoing
3.	Pancham Nagar Irrigation Project Damoh, Madhya Pradesh Topographical and cadastral survey, environmental and forest land assessment, geological, geotechnical and hydrological assessments and investigations and preparation of DPRs of Pancham Nagar complex major Irrigation project as per CWC.	Executive Engineer, Pancham Nagar Survey Division Sagar, MP	Ongoing
4.	UP Water Sector Restructuring Project (World Bank Aided Project), Lucknow, Uttar Pradesh Topographic & cadastral survey & preparation of land records in sub basin areas of UPWSRP	PACT, UP Water Sector Restructuring Project, UP Irrigation Dept.	On going
5.	Bennithora Left Bank Canal Kodli cross Sulepeth Camp Gulbarga District Chitapur/ Sedam Taluk Investigation, Survey, Design preparation of Drawings and Estimates for FIC works in BLBC (Package-III)	Karnataka Neeravari Nigam Limited	On going
6.	Lower Mullamari Package –II, Kodli cross, Chincholi Taluk Gulbarga District Investigation, Survey, Design preparation of Drawings and Estimates for FIC works in LMRBC (Package-II)	Karnataka Neeravari Nigam Limited	On going
7.	Lower Mullamari Package-1, Kodli cross, Chincholi Taluk Gulbarga District Investigation, Survey, Design preparation of Drawings and Estimates for FIC works in LMRBC (Package-I)	Karnataka Neeravari Nigam Limited	On going
8.	Kotabagi Lift Irrigation Scheme Bagewadi (Hukkeri and Chikodi) Taluk Belgaum (Dist) Investigation, Survey, Preparation of Designs, Drawings, Estimates and draft bid document for Main Canal and Distribution network of 2 nd Lift Kotabagi Lift Irrigation Scheme	Karnataka Neeravari Nigam Limited	On going

Sl. No.	Name of the Project and Location Name of Work	Owner or sponsoring Authority	Year
9.	Itagi Sasalwad Lift Irrigation Scheme Itagi, Shirahatti Taluk Gadag District Investigation, Survey, Preparation of Designs, Drawings, Estimates and Draft bid documents for the Main Canal and Distribution network of Itagi sasalwad Lift Irrigation Scheme	Karnataka Neeravari Nigam Limited	On going
10.	Kachenahalli Lift Irrigation Scheme Chanraypatna Hassan (Dist) Investigation, Survey, Preparation of Designs, Drawings, Estimates with report and draft bid document for Main Canal and Distribution network of Kachenahally Lift Irrigation Scheme	Cavery Neeravari Nigam Limited	On going
11.	Ainapur West Canal Athani, Belgaum Dist Investigation, Survey, Preparation of Designs, Drawings, Estimates and draft bid document for Main Canal and Distribution network of Ainapur LIS 0km to 52 km	Karnataka Neeravari Nigam Limited	On going
12.	Chimmelgi Lift Irrigation Scheme Almatti, Bijapur Dist Detailed Survey Investigation design and preparation of estimates and DTP of - Chimmelgi Lift Irrigation Scheme (Initial reach)	Krishna Bhagya Jala Nigam Limited	On going
13.	Indi Lift Bank Canal from km 0/0 to km 60/0 Bijapur and Gulbarga Dist, Karnataka Survey, investigation and preparation of estimates of balance works of Upper Krishna Projects	Krishna Bhagya Jala Nigam Limited, PWD Office Annexe, 3rd Floor, KR Circle, Bangalore - 560 001	2003
14.	Markandeya Right Bank Canal (MRBC) Gokak Karnataka - do - for main canal between km 21/0 and 80/0 and distributaries between km 0/0 and 80/0	Karnataka Neeravari Nigam Limited, 4th Floor, Coffee Board Building, No. 1, Dr. BR. Ambedkar Road, Bangalore - 560 001.	2002
15.	Sri Sailam Right Branch Canal sub Project (SRBC) (World Bank Aided Project) Kurnool, Andhra Pradesh Survey, design and submission of final drawings and estimates for micro network field channels in distributary Nos. XI & XII of S.R.B.C. in N.S.R.S. project.	Superintending Engineer, SRBC Circle No. 1, Nandyal - 518501, Kurnool District, Andhra Pradesh	2002

Sl. No.	Name of the Project and Location Name of Work	Owner or sponsoring Authority	Year
16.	Almatti Left Bank Canal 69 km onwards Bijapur, Karnataka Survey, investigation and preparation of estimates of balance works of Upper Krishna Projects	Krishna Bhagya Jala Nigam Limited, PWD Office Annexe, 3rd Floor, KR Circle, Bangalore - 560 001	2002
17.	Chikodi Branch Canal (CBC) Belgaum Karnataka Consultancy services for investigation, survey, preparation of designs, drawings, estimates of CBC from 68 km to 86 km and distributaries taking off from chainage 57 km to 86 km.	Karnataka Neeravari Nigam Limited, 4th Floor, Coffee Board Building, No. 1, Dr. BR. Ambedkar Road, Bangalore – 560 001.	2001
18.	Bandi-Nehra and Dharia Irrigation Projects Pali Marwar, Rajasthan Consultancy Services for network planning of canal system water courses and field channels for command area of whole canal system including survey work, planning designing, estimating, fixing of Alignment of different canal, water courses, laterals and canal structures for Dharia and Bandi Irrigation projects for 3,000 Ha.	Executive Engineer, Irrigation Division, Pali, Marwar, Rajasthan	1999
19.	Sardar Sarovar Narmada Nigam Limited, Govt. of Ahmedabad, Gujarat Macronetwork planning & design of distributaries field to field survey, minors, subminors, VSA, chak, subchak, related structures, BOQ, including project report under Vehlal Branch Canal covering about 45,000 acres.	Executive Engineer, Sardar Sarovar Narmada Nigam Limited, Bharuch/ Ahmedabad	1994
20	Topographical survey, Soil Investigation and hydrographical surveys for proposed shrimp farms in Orissa and Andhra Pradesh covering an area of 10,600 acres. Soil investigation, topo-graphical and hydrographical surveys for proposed shrimp farms in Orissa and Andhra Pradesh covering an area of 10,600 acres.	Central Institute for Coastal Engineering for Fishery, 64, Palace Road, Bangalore - 560 052	1993
21	Sardar Sarovar Narmada Nigam Ltd., Govt. of Bharuch, Gujarat Macronet & Micronet survey, planning and design of distributaries, minors including structures for Amleshwar, Keshrol and Megham distributaries under Amleshwar Branch Canal, covering about 33,000 acres.	Executive Engineer, Sardar Sarovar Narmada Nigam Limited, Bharuch	1992