

**STATEMENT OF QUALIFICATIONS**

**IRRIGATION AND WATER RESOURCE DIVISION**



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## 1 Executive Summary

SECON Private Limited is an ISO 9001:2008 certified, NABL Accredited, GIS Driven Multidiscipline Engineering Company. 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 one of the largest and oldest Surveying and Mapping firms in India. Most of SECON’s clients are repeat and long-term clients.

The key differentiator for SECON is that the company is a well-established (established in 1981) financially stable (Zero Debt and Consistently Profit Making) Multidiscipline Mapping and Engineering firm that provides a total solution from a single window for the entire lifecycle of an Infrastructure development project.

The domain expertise of SECON comprises:

Design Consultancy and Engineering Services	Investigation and Services
<ol style="list-style-type: none"> <li>1. Irrigation, Flood Control and Water Management</li> <li>2. Water, Sanitation and Storm water Engineering(Public Health Engineering)</li> <li>3. Highway Engineering and Construction Supervision</li> <li>4. Electrical Network Distribution Engineering</li> <li>5. Oil and Gas Pipeline Transportation Routing and Feasibility</li> <li>6. Web enabled GIS Driven Software Development and Database Creation for Infrastructure.</li> <li>7. Software development to improve productivity for Engineering Design and Drafting (CAD) fields.</li> <li>8. Civil and Structural Design</li> <li>9. Town Planning and Urban Development</li> <li>10. Environmental Engineering and Environmental Impact Assessments and Permitting</li> <li>11. Assistance in Right of Use Acquisition and Permitting</li> </ol>	<ol style="list-style-type: none"> <li>1. Land Surveying for Topographic, Cadastral Mapping, Construction Supervision and Hydrographic Surveys</li> <li>2. Geotechnical Engineering and Soil Investigations</li> <li>3. Water Distribution System Leak Detection, Rehabilitation and GIS Based Asset Management Services</li> <li>4. Photogrammetry, LiDar, Satellite Image Processing and Remote Sensing and generation of 3D Digital Terrain and City models.</li> <li>5. GIS Data Conversion and Maintenance</li> <li>6. Route Planning, 3D Corridor Mapping, Generation of GIS database</li> <li>7. Ground water and Resistivity Surveys</li> <li>8. Underwater Leak Detection and Turnkey Solutions</li> <li>9. Exploration, Mine Survey &amp; Planning</li> <li>10. Terrain Evaluation and Geological Appraisal</li> <li>11. Detection of Underground Utilities using Ground Penetrating Radar and Associated Tools.</li> </ol>

SECON is the only firm in India to offer a Total Solution for Mapping, Infrastructure Investigation, Engineering Design and Construction Supervision. All of these services are offered wholly in-house by SECON.

SECON’s over **3 decades of mapping experience** in Land Surveying, Photogrammetry, LiDAR Data Acquisition and Processing, and Remote Sensing, gives it a significant advantage for advanced mapping since it has a comprehensive combined experience in all of the above technologies.

SECON has long-term partnerships with International Engineering and Mapping Firms across Asia, North America, Africa, Middle East, Europe and Australia and has executed both Engineering and Mapping projects in these areas



for its clients. SECON is registered with Asian Development Bank (ADB) and DACON (World Bank) to provide consultancy services.

SECON has been awarded the 3rd CIDC Vishwakarma Award 2011. This is a National Award for Projects of National Excellence.

SECON has been awarded the best services Export Excellence Award-2010 by Federation of Chamber of Commerce and State Bank of India.

SECON has the following standing in India:

- The largest private Land Surveying and Mapping firm in India for Topographic and Cadastral Surveys.
- One of the Largest and most Experienced Firms for Land Acquisition Assistance for Pipeline, Highway and other Linear Corridor and Large Area projects. SECON has developed Customized Web Enabled Software for Data Management and Administration of this Complex Process which have included the compilation and data management more than 10 million parcels compiled by SECON as of date (including field data collection).
- One of the leading private Mapping and Design firm for Irrigation and Water Management projects.
- One of the largest private Highway Mapping, Design and Construction Supervision firms in India.
- One of a handful of firms in India to have the NABL certification for its Geotechnical Laboratory. NABL is the National Accreditation Board for Testing and Calibration Laboratories (NABL).

Government of India has authorized NABL as the sole accreditation body for Testing and Calibration laboratories.

- The first private company to execute LiDAR flying and processing services in India. SECON now one of the largest LiDAR Data processing company in India.

SECON has executed over:

- 65,000 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.
- 15000 km of mapping, design, and construction supervision of highways
- 11950 sq km of large-scale mapping (topographical and cadastral) for Irrigation projects. This includes the Topographic and Cadastral Mapping of 6000 Sq Km for the World Bank Aided Uttar Pradesh Water System Restructuring Project.
- 7950 Sq Km of Irrigation and Water Management design projects. SECON is currently executing and Irrigation Mapping and Design Project for an area of 14000 sq km for the Narmada River Basin in Madhya Pradesh. This project was done by mapping with a combination of High Resolution (0.5 m) Stereo Satellite Imagery and Land Survey Method. This technology is being used for the first time in India for an Irrigation and Water Management project.
- 600 infrastructure development projects (includes subdivision/township mapping, design and planning) which includes construction supervision and quality control for the International Tech Park (ITPL) in Bangalore.
- 600,000 meters of geotechnical investigation and drilling in various soil strata including investigations for the Bangalore International Airport.
- SECON has completed a major multimillion dollar mapping and consulting project for the planning and design of the Water and Sanitation system for 13 municipalities (100 settlements) in Libya. The capital expenditure of the project is around 2.5 billion US\$.

Statement of Qualification, Irrigation and Water Resource Division

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- SECON has successfully completed the Multi Million Dollar Contract for Project Management Consultancy Services for Up Gradation of important Road Corridors in Bangalore Urban and Rural Districts for a length of 1004 Km. Estimated capital expenditure of the project is 9.96 Billion Rupees(US \$ 220 million).
- SECON has successfully completed more than 500,000 Sq Km of LiDar, Photogrammetry and Remote Sensing Projects as of August 2010.

SECON has a state of the art 105,000 sq ft ISO 9001:2008 certified operations center set on a 2.5 acre campus in Bangalore, India that is fully owned by the company. Bangalore is the technology capital of India and is globally recognized for its technical excellence.



## 2 Irrigation and Water resource Division

### 2.1 Introduction

SECON Irrigation and Water Resource Division is the pioneer division to be established in SECON. Globally, India has one of the largest, oldest as well as modern irrigation systems in the world. SECON is one of the leading consulting organizations in India for irrigation projects. SECON has covered more than 10,000 Sq.Km of Surveying and Mapping for irrigation projects and about 8000 sq km of Irrigation and Water Management Design Projects.

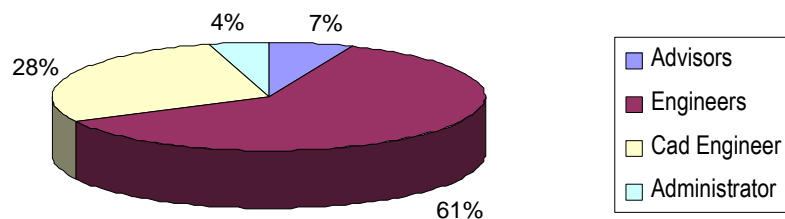
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SECON Provides consultancy services/Technical assistance in irrigation and Water resources field to Private / Public and Government sectors on Feasibility studies, Survey, Investigation, Design, Tendering and Construction Management and Supervision.

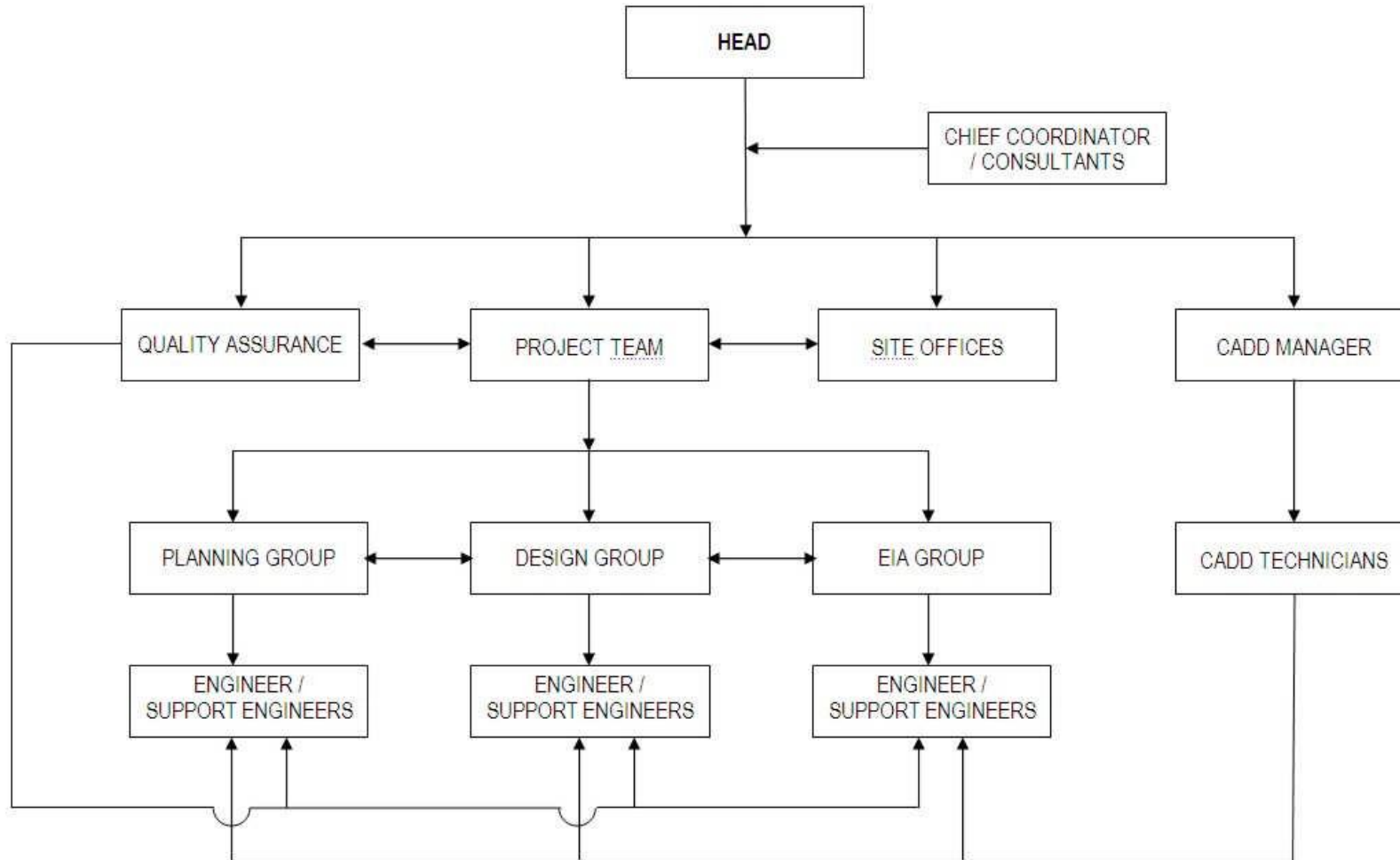
Our rich experience in the field of Irrigation helps us to recognize the unique character of each project and its environs and customize our approach to the needs of the facility. For any project our goal in the development of each new or improved idea or action is to achieve the practical optimum in terms of efficiency, reliability, and economy.

### 2.2 Human Resources

The Team composition is a very good mix of senior and experienced engineers having held responsible positions in their respective fields in both public and private sectors and have successfully implemented various infrastructural schemes. The staff composition chart will be as follows



### 2.3 Organization Chart



### **3 Facilities**

#### **3.1 Hardware and Software and Custom adopted technology**

SECON Irrigation and Water resource Division is well equipped with the latest Hardware and Software to successfully execute various projects. The team is well versed with the usage of latest software and is capable to liaise with the skilled software team to develop software related to various GIS and Civil Engineering applications.

#### **3.2 Computer Aided Optimal Design and Drawings**

SECON as already highlighted has **In-House Software Application** development department to develop project specific / need based software like **Design - Drawing - BOQ Interface, Electronic Quality Assurance**, etc.

Some of the important software held and used for Design and drawings in the field of Irrigation include the following:

##### **3.2.1 LS generator**

LS Generator is a User friendly software, extensively used in the generation of ready to plot Longitudinal Sections. Information such as ground profile, depth of cut, height of bank, details of Cross Drainages and its locations, Full Supply level, Canal Bed Level, Reach details, Curve details, Soil details etc., are obtained from LS.

This software accepts the input from a CSV file containing the Ground Levels, Structure Details and the Reach Details.

##### **3.2.2 Earthwork Program**

Earthwork program is developed to ascertain the quantity of earthwork involved in the execution of canal.

##### **3.2.3 Slope Stability Analysis of Earthen Dams**

The conventional approach of carrying out Stability Analysis of Earthen Dam requires the user to perform series of activities which are recurring and consumes time and resources. Since the process is repetitive in nature, customized software is developed to analyze the Earthen Dam / Embankment.

##### **3.2.4 Estimate of a Canal Drop**

In order to negotiate the steep gradient of the ground, drops are provided whose magnitude varies from 0.30 to 1.50 depending on the project.

Since drops occur in more numbers along the alignment the Design, Drawing & Estimate of a drop is automated.

### **3.3 GIS Driven Information System**

GIS is a computer based system “for Capture, Storage, Retrieval, Analysis and Display of Spatial Data”. By querying of both spatial and non-spatial data various planning scenarios for decision making can be generated. Man, Machine Users, Data, Software are major components of GIS.

GIS represents the real world digitally. Data could be gathered in many ways, and overlaid to present maps, which could enable people to make the right decisions.

SECON has capability in understanding client requirement and developing project specific GIS System for Water Resource Management.

### **3.4 Knowledge Base**

Irrigation library is well equipped with collection of Manuals, Technical Circulars, Journals, Books Covering different Fields of Water resource Management, IS Codes, BS Codes and ASTM Standards. SECON being an ISO 9001:2008 Certified, the Irrigation and Water Resource department has all activities complied to ISO Standards and activity manuals are available for the approach to Planning, Design and Preparation of Drawings.

## 4 Service Offerings

SECON has the capability to address and identify solutions in a gamut of issues associated with Irrigation and Water Resource management.

SECON's Core Competence is supported by adoption of latest technologies, advanced equipment and skilled & qualified manpower. The key differentiator for SECON is that the company is a well-established Multidiscipline Engineering firm that provides end to end solution for the entire lifecycle of an Infrastructure development project.

SECON is the only company in India that provides total solution from a single window right from **Feasibility Studies, Survey & Investigation, Planning and Design, Construction Supervision**, all provided in-house.

The service offerings are as detailed below;

### 4.1 Survey and Investigation

- Hydrographic survey, Hydrological Investigations
- Reservoir Capacity Survey
- Geotechnical Investigation
- Submergence and Land Acquisition
- Rehabilitation and Re-settlement Survey

### 4.2 Design Engineering

- Compendium Planning for Irrigation Command Area and Irrigation Water
- Water Availability Studies, Flood estimation, capacity assessment & sedimentation analysis for reservoirs - Reservoir Planning, Project Evaluation.
- Integrated River Basin Planning for Irrigation, power generation, Flood control, Drinking & Industrial Water Supply & other purposes.



- Preparation of Regional Master Plans.
- Feasibility Reports and Detailed Project Reports
- Agricultural ,Urban Drainage Planning
- Design of Hydraulic Structures- Dams, Barrages, Intakes, water conveyance systems including Canals, Tunnels, Pipelines.

- Cyclone protection works
- Detailed Estimations, BOQ
- Advanced Geospatial data processing and GIS integration

#### **4.3 Water Management**

- Inter State Water Disputes.
- Environment Impact Assessment of Water Resource Projects
- Command Area development
- Catchment Area treatment

#### **4.4 Contract and Construction Management**

- Project and contract management
- Draft Tender Documents & Tender Evaluation.
- Technical control, monitoring and inspection services
- Quality and Quantity control.
- Measurements and Certifications.

#### **4.5 GIS Based Asset Management**

- Field Survey and Data Collection
- GIS Data Development (Converting Hardcopy / CAD Plans / Asbuilt Drawings into GIS Database for Water/ resource projects)
- Development of Enterprise GIS applications for Asset Management and Environmental Monitoring
- Generation of Network Mapbooks (Generation of Network System Maps in Hard Copy and Digital format Viewable on Web Based Systems)

#### **4.6 Training and Capacity Building Programs**

SECON has capacity in carrying out tailor made training and capacity building programs to various stakeholders in the field of Irrigation and Water management.

## 5 Relevant Project Experience

### 5.1 Relevant experience gained in Major projects are listed below

#### ➤ Central Institute of Coastal Engineering for Fishery, Bangalore

Brackish water shrimp farm project at P T Palem II, in Andhra Pradesh, Bedeipur and Narendrapur in Orissa (10,000 Ha) **(World Bank Aided)**

#### ➤ Sardar Sarovar Narmada Nigam Ltd. – Gujarat

Macro and Micro network planning includes survey, planning and design of water conveyance, management and drainage system, related structures; detailed estimates field verification, etc. of Block 6D-5 and 6F of Amleshwar, Keshrol and Mehgam distributaries of Amleshwar Branch Canal, Bharuch District, Gujarat State, covering an area of 33,000 Ha.

#### ➤ Bandi Nehra and Dharia Projects, Govt. of Rajasthan

Macro and Micro network planning of canal system, water courses, field channels for command area of whole canal system including survey work, planning, design, estimate, fixing of canal alignment, water courses, laterals and related structures along with preparation of project report of Bandi-Nehra and Dharia Irrigation Projects, Pali District Rajasthan, covering an area of about 3,000 Ha.

#### ➤ Jaiyakwadi Project - Maharashtra

Survey, Planning and Design of On-Farm Development Works for water distribution network along the Paithan Left Bank Canal, covering an area of 25,000 acres.

#### ➤ Sri Sailam Right Branch Canal, CADA, (World Bank funded project)

Survey, Design, Drawing and Estimates of Micro network Field channels for Sri Sailam Right Branch Canal of Block XI, XI A and XII, covering an area of 7,800 Ha.

#### ➤ Upper Krishna Project – Krishna Bhagya Jala Nigam Ltd (KBJNL)

Layout planning for the entire command area showing network canals, detailed design, drawings, Estimates and BOQ for Main canal, covering about 50 km for Indi Lift Canal and Almatti Left Bank Canal, covering an area of about 48,000 Ha.

#### ➤ Chikodi Branch Canal (CBC) - Karnataka Neeravari Nigam Limited (KNNL)

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 for main canal between km 21/0 and 80/0 and distributaries between km 0/0 and 80/0.

➤ **UP Water Sector Restructuring Project (World Bank Aided Project)**

Topographical survey work in selected pilot command areas of Nagapur Distributary Canal for an area of 6.0 Lakh Ha.

➤ **Hirehalla project (CADA)**

Rehabilitation Project on Evaluation of existing buildings and vacant sites of people affected by backwaters of Hirehalla reservoir under Hirehalla Project.

➤ **Kotabagi LIS 2<sup>nd</sup> Lift Karnataka Neeravari Nigam Limited**

Investigation, survey preparation of designs, drawings and draft bid document for the main canal and distribution network of Kotabagi LIS 2nd Lift (9000Ha).

➤ **Ainapur West Canal - Karnataka Neeravari Nigam Limited**

Investigation, survey, planning and preparation of designs, drawings, estimates and draft bid document for the West Canal & Distribution network of Ainapur LIS (From Km 0 to 52)

Survey, Geotechnical investigation, design and preparation of estimates of **Chimmalgi Lift Irrigation Scheme** in the district of Almatti, Karnataka covering an area of 40,000 Ha.

➤ **DPR's for Upper Krishna Stage – III Water Resources Department, Government of Karnataka**

Identification, Conceptualization, Socio Economic Investigation, Engineering Survey and investigation and Preparation of DPR's for Upper Krishna Stage – III Water Resources Department, Government of Karnataka

**Tech Assistance to Government of Karnataka on Krishna Water Allocation and Distribute** -Water Resource Organization, Government of Karnataka

➤ **Preparation of Detailed Project Report of Bariyarpur Right Bank Canal Project**, Panna District of Madhya Pradesh, Water Resources Department, Government of Madhya Pradesh

➤ **Preparation of Detailed Project Report of Pancham Nagar Right Bank Canal Project in Sagar and Damoh Districts of Madhya Pradesh** - Water Resources Department, Government of Madhya Pradesh

➤ **Identification, Survey, Preparation of Detailed Project Report and Detailed Estimates** of Balance Medium and Minor Projects in Narmada Basin from Downstream of Handia Gauge Site to Omkareshwar Dam site for 1,30,000 ha of CCA.

- **Establishing Techno-Economic Feasibility, Survey, Investigation, Planning, Design, Drawings, Estimates & Preparation of Detailed Project Report** for Morand and Ganjal Complex Project in Narmada Basin as per CWC guidelines.
- Detailed Engineering Services for Execution of **Punasa Lift Irrigation Scheme** (CCA 35,008 Hect) including supervision of survey and construction work, proof checking of Crop water Requirement calculations, Command area calculations, designs of Intake wells, pumping Houses etc, taking measurements, making bills and quality control during construction and monitoring the implementation activity, Government of Madhya Pradesh.
- **Surface Water and Ground Water Availability, Topographical & Geotechnical studies** for the proposed Integrated Steel Plant project in Damoh, Madhya Pradesh.
- **Construction Supervision, Quality and Quantity Control of Drainage Works** in UP Sodic Lands Reclamation III Project (**World Bank Funded Project**) for Uttar Pradesh .

Following are the list of Dam projects executed by the SECON Irrigation and Water Resource Division:

- Dam across Bellary Nala in Belgaum district, Karnataka state, India
- Dam across Netravathi River near Thumbe in Mangalore District, Karnataka state, India
- Barrage across Bhima River near Kallur(B) in Gulbarga District, Karnataka state, India
- Bridge cum Barrage across Hemavathy River near Holenarsipura town, Hassan District, Karnataka state, India
- 5 Dams in Pancham nagar Complex Irrigation Project
- 3 Dams in Bariyarpur Right Bank Canal Project.
- Vented Dam across sita River near Mundadi-Yapikadu in Kadur Village Udupi Taluk, Karnataka state, India
- Salt Water exclusion dam across Varahi River near Balkur Village, Kundapura Taluk, Udupi District, Karnataka state, India

Sl. No	Assignment Name	Client	Assignment Highlights	Consultancy Fee in Rs 100,000
1.	Survey and design of Sri Sailam Right Branch Canal (SRBC) Project - 8,395 ha ( <b>World Bank Funded</b> )	Govt. of Andhra Pradesh	<ul style="list-style-type: none"> <li>• <b>Consultation with farmers in the programme for developing the micro level network</b></li> <li>• <b>Participatory Rural approach exercise with the beneficiaries in the area and collecting details in relation to location, extent and configuration of each individual holding.</b></li> <li>• <b>Field Survey using latest techniques and preparation of necessary maps.</b></li> <li>• Planning, designing economic distribution network for FICs and drainage on map. Approval of design from competent authority.</li> <li>• Preparation of technical details of designs and drawings to be followed in relation to plan and obtaining approval from TAC.</li> <li>• Design and drawing of structures</li> <li>• Preparation of earthwork quantities for water course and field channel</li> <li>• Organizing beneficiary meetings and farmers involvement in the project</li> <li>• Preparation of Technical Reports</li> </ul>	39.21
2.	<b>World Bank Funded Project for Establishing extensive Ground Control Network</b> using DGPS, Precision Leveling, Digitization, Landuse Mapping of Satellite Data and Generation of <b>Topographical and Cadastral Plans</b> for UP Water Sector Restructuring Project covering <b>6068.32 Sq Km</b> and Development of <b>Irrigation Resource Information System (IRIS)</b> application and Generation of GIS Geodatabase.	Govt. of Uttar Pradesh	<ul style="list-style-type: none"> <li>• <b>Topographical Survey for an area covering 6,06,832 Ha.</b></li> <li>• Establishment of planimetric control points using DGPS at 2.5 to 3.5 Km intervals and further densification of secondary bench marks in both directions using Total Stations.</li> <li>• Establishment of height control to the site by transferring level from the nearest G.T.S. B.M</li> <li>• <b>Detailed topographical using Total Station</b> based on planimetric control provided by DGPS and Height Control established by transferring levels from GTS BM to site using Automatic levels.</li> <li>• Longitudinal section of canal and drains and cross section at 200 m apart from head of canal / drain upto 50 m on both sides beyond the toe of the canals / drains and generation of LS to the required scale.</li> <li>• <b>Hydraulic and structural design details of the canals as provided by the Department will be superimposed on longitudinal sections and cross sections so generated from Survey output.</b></li> <li>• Collection of Details of Water Abstraction Structures such as open wells, tube wells etc.</li> </ul>	105.9

Sl. No	Assignment Name	Client	Assignment Highlights	Consultancy Fee in Rs 100,000
			<ul style="list-style-type: none"> <li>• Terrestrial Photographs along the canals showing significant structures, points of importance and problematic areas.</li> <li>• The locations of all photographs recorded electronically and <b>integrated into GIS out put files</b> as hotlinks.</li> <li>• Preparation of village maps.</li> <li>• Information such as field number, its area ownership details, 7 /12 extract, type of land collected and stored in different layers (GIS).</li> <li>• Submission of Final deliverable in required No. of copies as per agreement. Training will be provided to 40 Engineers from various divisions of UPID to give the participants an opportunity to observe the organization and implementation of GIS / MIS in large irrigation projects. Trainees shall study especially the application of latest technology in data acquisition, processing maintenance and retrieval.</li> </ul>	
3.	<b>Survey, Investigation and Preparation of necessary Drawings, Estimates</b> (Earthwork and Canal lining) and DTP for the work of <b>Modernization of Bhadra Canal Network</b>	Govt. of Karnataka	<ul style="list-style-type: none"> <li>• Collection of GTS Benchmark/reference BMs, details of existing Canal</li> <li>• Reconnaissance of the project area.</li> <li>• Carrying out Detailed Survey of Main Canals and superimposing the designed cross section as per the approved cut off statement.</li> <li>• Preparation of Detailed Estimates for Main Canals including Earthwork lining for remodeling of Canal section as per the detailed cross sections.</li> <li>• Preparation of Detailed Estimates for Distributaries including Earthwork lining for re modeling of Canal section as per the approved cut off statements.</li> </ul>	99.00
4.	Identification, Conceptualization, Socio Economic Investigation, Engineering Survey and investigation and	Govt. of Karnataka	<ul style="list-style-type: none"> <li>• Collection of Additional Data / Information from different Departments / Agencies required for preparation of Techno Economic Feasibility Report.</li> <li>• Identification of Command Area of the Project.</li> <li>• Preparation of Concept Plan and make presentation to GOK, GOI and Krishnan Water Tribunal.</li> <li>• Review of Survey &amp; Investigation Data Available with the Department.</li> </ul>	85.00

	Preparation of DPR's for Upper Krishna Stage - III		<ul style="list-style-type: none"> <li>• Identification of Additional Preliminary Surveys, Geotechnical and Geological Investigations Necessary to Establish Techno Economic Feasibility of Project.</li> <li>• Conducting Preliminary Surveys, Geotechnical and Geophysical Investigations Necessary to establish Techno Economic Feasibility or Project.</li> <li>• On Approval of Concept Plan, Conduct Detailed Surveys, Geo Technical and Geophysical Investigations required for preparation of DPR.</li> </ul>	
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Sl. No	Assignment Name	Client	Assignment Highlights	Consultancy Fee in Rs 100,000
			<ul style="list-style-type: none"> <li>• Project Planning, Designing, Preparation of Drawings, Estimates etc for different Components of Project and Construction Planning for Preparation of DPR.</li> <li>• Proposal for formation of Water User Association</li> </ul>	
5.	Technical Assistance to Government of Karnataka on Krishna Water Dispute Tribunal and Water Allocation.	Govt of Karnataka	<ul style="list-style-type: none"> <li>• Structure Located at Vijayawada for its Consistency and Homogeneity. Consistency Tests are Carried by Double Mass Curves and the Homogeneity Test followed the Parametric and Non Parametric Statistical Tests</li> <li>• Arrive at Flows of Krishna River at the Terminal Point Vijayawada for Various Dependabilities</li> <li>• Study the Effect of Carryover Storages and Corresponding Changes in Dependable Flows</li> <li>• Assessment of Inevitable Wastage if any at the Terminal Point and check the Adequacy of Provision by the Earlier Tribunal to Compensate Inevitable Wastages</li> <li>• Prior Appropriation of Water and its Implications</li> <li>• Possible Climatic Changes, Scenario Analysis and the Extent to which it should be considered in Future Inflows</li> <li>• Suggest basis for Water Allocation, Ways and Means of Utilization of Surplus Water</li> </ul>	25.00

			<ul style="list-style-type: none"> <li>• Provide Necessary Statistics of State on Equity Issues</li> <li>• Carry out Reservoir Simulation Studies Specially of Almatti and Narayanapur Dams</li> <li>• Assist in Preparation of Master Plan Projects and Provide Necessary DPRs</li> <li>• Assist in Countering the Argument of other States which are Detrimental to Karnataka</li> <li>• Provide on Line Control and Decision Support System Concepts and the Institutional Arrangement in Sharing Deficit and Surpluses in each year and Implementation of the Final Decision of the Tribunal</li> </ul>	
6.	Preparation of Detailed Project Report of Bariyarpur Right Bank Canal project, Panna District of Madhya Pradesh	Govt. of Madhya Pradesh	<ul style="list-style-type: none"> <li>• Carrying out Analysis of Socio Economic Condition and Agricultural Scenario, Cropping Pattern in CCA Area.</li> <li>• Preparation of Irrigation Development Report to Delineate Development of Irrigated Agriculture, Cropping Pattern in the Proposed Culturable Command Area, outlines of Primary and Secondary Canal System.</li> <li>• Assess the Feasibility of Providing Water Supply to near by Villages on Sustainable basis, with detail Water Adequacy Analysis.</li> </ul>	159.28

Sl. No	Assignment Name	Client	Assignment Highlights	Consultancy Fee in Rs 100,000
			<ul style="list-style-type: none"> <li>• Presentation to Senior Officials of GoMP, GOI, Central Water Commission and Planning Commission of India, Public Health Engineering Department, Fishery Department, Central Electricity Authority.</li> <li>• Observations on Drainage, Conjunctive Water Utilization and Efficient Approach to full Irrigation Development as per Norms Acceptable to Central Water Commission, GOI and the GoMP.</li> <li>• Micro Development Report of 10% Command Area.</li> <li>• Preparation of Fishery Development Report to Delineate Development of Pisciculture in Reservoir.</li> <li>• Preparation of Detailed Hydropower development Report in the Bariyarpur RBC Project.</li> <li>• Preparation of Report to Cover Complete information in the Bariyarpur RBC Project for Harnessing Optimum Multipurpose Development, including collection of all Hydrological / Hydro - Metrological Data Necessary as per Norms.</li> <li>• Environment Impact Assessment for Setting Environment and Forest Clearance of Project from GOI as per Norms Acceptable to Ministry of Environment and Forest.</li> <li>• Designing most Economic Canal System Primary (Stage I) to Irrigate about 20500 Ha CCA.</li> <li>• Digitization, Reconciliation and Verification of available Data with Departments as per Details and Completing our missing links in order to enable the Consultant / Contractor to Assess need of Collecting Additional Valid Data.</li> <li>• Carrying out Geological Investigations for Proper Location of Dams and Feeder Canals.</li> <li>• Preparation of Detail Project Report along with Engineering Design, Drawings, Cost Estimate and Tender Document for each Component.</li> </ul>	
7.	Hydrological analysis and	Govt. of Karnataka	<ul style="list-style-type: none"> <li>• Collection of details of all MI tanks/ Bandaras such as FRL, gross storage capacity, command area covered under each tank etc which</li> </ul>	9.90

	ascertaining of Quantity of water to be lifted from Krishna River for 2 times filling annually in order to fill 16 MI		<p>proposed to be filled.</p> <ul style="list-style-type: none"> <li>Ascertaining quantity of water to be lifted from Krishna River for 2 times filling annually.</li> <li>Study of flow data of Krishna River, working tables of Almatti reservoir and fixing Intake bed level for the Scheme.</li> </ul>	
<b>Sl. No</b>	<b>Assignment Name</b>	<b>Client</b>	<b>Assignment Highlights</b>	<b>Consultancy Fee in Rs 100,000</b>
	tanks, 5 Bandaras in Bijapur district and 7 MI tanks in Bagalkot district by identifying the tap off points from the water spread of Almatti reservoir.		<ul style="list-style-type: none"> <li>Detailed alignment survey for intake canal, raising main and its connected distribution system with apex details, location of raising main and distribution system marking on RS map and KM wise L section including CD details.</li> <li>Detailed topographical survey with Block leveling for a) Jack well b) Don river crossing c) Kud Don river crossing d) Kajibilagi nala e) Nai halla covering at least one meter above HFL and width as per requirement and L sections of Nalas including trial pit details.</li> <li>Preparation of design drawings and quantity estimates for Intake channel, Jack well / Pump house, raising main gravity main, Delivery chambers, aqueduct for gravity main, Distribution line / Branch lines, Pumping machinery, Substations for two stages lift.</li> <li>Preparation of Draft Tender document.</li> </ul>	
8.	Surface water and Ground water availability, topography and geotechnical studies for the proposed Integrated Steel plant project.	Madhya Pradesh	<ul style="list-style-type: none"> <li>Collection of relevant Hydrological data including satellite imageries, water commitments/water allocations for various users by the Government of Madhya Pradesh.</li> <li>Analysis of the data for Monthly, seasonal pattern of flows, water use commitments to establish balance water at the selected locations for all the available water sources.</li> <li>Deciding on the location of the river structure and the intake from the available water sources. Flow duration analysis/storage requirements at the selected locations.</li> <li>Topographical survey to assess the storage possibilities and also to identify the water pipeline corridor from various Sources to the plant</li> </ul>	101.00



			<p>site.</p> <ul style="list-style-type: none"><li>• Design of all storage structures</li><li>• Ground water availability study at the project site.</li><li>• Geotechnical investigations and soil report</li><li>• Preparation of Comprehensive report including recommendations based on the preliminary soil investigation.</li></ul>	
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Sl. No	Assignment Name	Client	Assignment Highlights
9.	Consultancy services for raw water Intake system for proposed power plant	Chattisgarh	<ul style="list-style-type: none"> <li>Hydrological studies for ascertaining the water availability to ensure 70 Mcm of water for the Thermal plant from the intake point of the Barrage.</li> <li>Route survey for water conveying system and identification of most economical and practical alignment for pipeline.</li> <li>Design of the Transport main from Intake point of Barrage to the Intermediate reservoir and to the plant site.</li> <li>Topographic surveys for sites of pump houses and the intermediate reservoir as per the approved alignment and location.</li> <li>Identification of suitable/ideal location for pump houses on side of river Mahanadi</li> <li>Preparation of Land Plan schedule &amp; Assistance to competent authority for Land acquisition procedure.</li> <li>Related Geotechnical investigations along with relevant tests for foundation pipeline and intermediate reservoir</li> <li>Design of pump Houses, Intermediate reservoir, pipelines, cross drainages and appurtenances</li> <li>Design of pump house building and sizing of pump.</li> <li>Preparation of project deliverables in hard and soft copies.</li> </ul>
10.	Establishing Techno-Economic Feasibility, Survey, Investigation, Planning, Design, Drawings, Estimates & Preparation of Detailed Project Report for Morand and Ganjal Complex Project in Narmada Basin	Govt. of Madhya Pradesh	<ul style="list-style-type: none"> <li>Collection and review of available data / information / maps</li> <li>Collection of data/information from different departments/agencies such as hydrologic data, Metrologic data, statistical data etc.</li> <li>Obtaining necessary clearance from the appropriate authority to begin the project related activities.</li> <li><b>Procurement of high resolution Stereo Satellite Images</b></li> <li><b>Topographical Survey of the Sub Basin using Modern technology for Survey on GIS platform.</b></li> <li><b>Identification and Carrying out preliminary and detailed Surveys, Geotechnical and Geophysical investigations</b></li> <li>Preparation of Sub Basin Plan and techno economic feasibility report.</li> <li>Project planning, Designing, Preparation of Drawings, Estimates for</li> </ul>

			<p>different components and construction planning</p> <ul style="list-style-type: none"> <li>• Preparation and submission of Detailed Project Report as per guidelines of CWC.</li> <li>• Obtaining Clearance from different directorates of Central Water Commission including assisting in providing data / information, Collection of data / information from</li> </ul>
			<p>different Departments / Agencies for preparation of Rehabilitation and Resettlement Plans, Catchment Area Treatment Plans, Command Area Development Plan.</p> <ul style="list-style-type: none"> <li>• Submission of reports for Environment Impact Assessment Plan, Environment Management Plan, Health Action Plan etc. and obtaining approval from concerned Departments.</li> <li>• Obtaining Clearance from Ministry of Environment and Forests, Ministry of Tribal Affairs etc.</li> <li>• Obtaining Investment Clearance from Planning Commission, Government of Madhya Pradesh / Government of India</li> <li>• <b>Detailed Planning, design, preparation of plans and estimates of Head works, Main canal and distribution network of 40 ha chak.</b></li> <li>• Preparation of detailed estimates of field channels based on RES CSR based on NREGS guidelines beyond 40 ha chak.</li> <li>• Obtaining technical Sanction from the competent authority</li> <li>• Preparation of Land Acquisition cases including forest and revenue forest cases</li> <li>• <b>Submission of Proposal for formation of WUA's</b></li> </ul>
<b>Sl. No</b>	<b>Assignment Name</b>	<b>Client</b>	<b>Assignment Highlights</b>

11.	Identification, Survey, Preparation of Detailed Project Report and Detailed Estimates of Balance Medium and Minor Projects in Narmada Basin from Down stream of Handia Gauge Site to Omkareshwar Dam site for 1,30,000 ha of CCA	Govt. of Madhya Pradesh	<ul style="list-style-type: none"> <li>• Collection and Review of additional Data / Information</li> <li>• <b>Identification and carrying out of Additional Preliminary Surveys, Geo technical and Geological Investigations</b></li> <li>• Preparation of draft Basin Plan based on water availability and water use of entire sub-basin as integrated planning</li> <li>• Submission of Techno economic feasibility reports</li> <li>• <b>Carrying out detailed Surveys using High Resolution Stereo Satellite Imageries of 0.6m resolution.</b></li> <li>• <b>Preparation of Cadastral Maps by superimposition of Village maps on ortho-satellite Images</b></li> <li>• Preparation of Detailed Alignment Plan</li> <li>• Conducting Geo-technical and Geophysical Investigations</li> <li>• Project Planning, Designing, Preparation of Drawings, Estimates etc.</li> <li>• <b>Preparation and Submission of Detailed Project Report</b></li> <li>• Obtaining Clearance from State Design Organisation and different Directorates of C.W.C. including <b>Water Planning and Hydrology as per CWC guidelines</b></li> </ul>
			<ul style="list-style-type: none"> <li>• Preparation and Submission of Reports for obtaining Approval / Clearances / Sanctions from Ministry of Environment and Forest, Ministry of Tribal Affairs etc. and Planning Commission as per latest guidelines/circulars issued by concerned department/ministry.</li> <li>• <b>Detailed Planning, design, preparation of plans and estimates of Head works, main canal and distribution network of 40 ha chak.</b></li> <li>• Preparation of detailed estimates of field channels based on RES CSR based on NREGS guidelines beyond 40 ha chak.</li> <li>• Obtaining technical Sanction from the competent authority</li> <li>• Preparation of Land Acquisition cases including forest and revenue forest cases</li> <li>• <b>Submission of Proposal for formation of WUA's</b></li> </ul>
<b>Sl. No</b>	<b>Assignment Name</b>	<b>Client</b>	<b>Assignment Highlights</b>
12.	<b>Construction Supervision,</b>		<ul style="list-style-type: none"> <li>• Reconnaissance to familiarize with the site conditions.</li> </ul>



	<p><b>Quality and Quantity Control of Drainage Works</b> in UP Sodic Lands Reclamation III Project <b>(World Bank Funded Project)</b> for Uttar Pradesh</p>	<ul style="list-style-type: none"> <li>• Review of Feasibility Report</li> <li>• Checking of the detailed estimate of each drain prepared by the implementing agencies.</li> <li>• Advise in preparing quality and quantity assurance programme and render advice on any fault, ambiguities in the design suitability of construction methods.</li> <li>• Checking of initial levels and cross sections and estimates of each drain</li> <li>• Team Leader to visit each of the on going site works and inspect the work on drains.</li> <li>• <b>Test checking teams to visit site with initial measurements, estimates, plans sections and check the quality of construction materials used at site.</b></li> <li>• Before commencement of field work the Field Engineer will check at least 10% of the initial measurements at site.</li> <li>• Advise executing agencies on site organization, equipment and manpower deployment and construction scheduling</li> <li>• <b>Suggest quality and quantity control monitoring system to ensure high standard of quality and timely deliverables.</b></li> <li>• Suggest formats for progress reporting and plan for rehabilitation of individual drains.</li> <li>• Checking and approval of quality of construction materials used at site</li> <li>• Submission of Monthly progress reports, Field reports etc.</li> <li>• Scrutiny of contractor's bills and recommending payments</li> <li>• <b>Submission of Close out Report.</b></li> </ul>
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Sl. No	Assignment Name	Client	Assignment Highlights	Consultancy Fee in Rs 100,000
			<p>different Departments / Agencies for preparation of Rehabilitation and Resettlement Plans, Catchment Area Treatment Plans, Command Area Development Plan.</p> <ul style="list-style-type: none"> <li>• Submission of reports for Environment Impact Assessment Plan, Environment Management Plan, Health Action Plan etc. and obtaining approval from concerned Departments.</li> <li>• Obtaining Clearance from Ministry of Environment and Forests, Ministry of Tribal Affairs etc.</li> <li>• Obtaining Investment Clearance from Planning Commission, Government of Madhya Pradesh / Government of India</li> <li>• <b>Detailed Planning, design, preparation of plans and estimates of Head works, Main canal and distribution network of 40 ha chak.</b></li> <li>• Preparation of detailed estimates of field channels based on RES CSR based on NREGS guidelines beyond 40 ha chak.</li> <li>• Obtaining technical Sanction from the competent authority</li> <li>• Preparation of Land Acquisition cases including forest and revenue forest cases</li> <li>• <b>Submission of Proposal for formation of WUA's</b></li> </ul>	
11.	Identification, Survey, Preparation of Detailed Project Report and Detailed Estimates of Balance Medium and Minor Projects in Narmada Basin from Down stream of Handia Gauge Site to Omkareshwar Dam site for 1,30,000 ha of CCA	Govt. of Madhya Pradesh	<ul style="list-style-type: none"> <li>• Collection and Review of additional Data / Information</li> <li>• <b>Identification and carrying out of Additional Preliminary Surveys, Geo technical and Geological Investigations</b></li> <li>• Preparation of draft Basin Plan based on water availability and water use of entire sub-basin as integrated planning</li> <li>• Submission of Techno economic feasibility reports</li> <li>• <b>Carrying out detailed Surveys using High Resolution Stereo Satellite Imageries of 0.6m resolution.</b></li> <li>• <b>Preparation of Cadastral Maps by superimposition of Village maps on ortho-satellite Images</b></li> <li>• Preparation of Detailed Alignment Plan</li> <li>• Conducting Geo-technical and Geophysical Investigations</li> </ul>	3210.11

Sl. No	Assignment Name	Client	Assignment Highlights	Consultancy Fee in Rs 100,000
			<ul style="list-style-type: none"> <li>Project Planning, Designing, Preparation of Drawings, Estimates etc.</li> <li><b>Preparation and Submission of Detailed Project Report</b></li> </ul>	
			<ul style="list-style-type: none"> <li>Obtaining Clearance from State Design Organisation and different Directorates of C.W.C. including <b>Water Planning and Hydrology as per CWC guidelines</b></li> <li>Preparation and Submission of Reports for obtaining Approval / Clearances / Sanctions from Ministry of Environment and Forest, Ministry of Tribal Affairs etc. and Planning Commission as per latest guidelines/circulars issued by concerned department/ministry.</li> <li><b>Detailed Planning, design, preparation of plans and estimates of Head works, main canal and distribution network of 40 ha chak.</b></li> <li>Preparation of detailed estimates of field channels based on RES CSR based on NREGS guidelines beyond 40 ha chak.</li> <li>Obtaining technical Sanction from the competent authority</li> <li>Preparation of Land Acquisition cases including forest and revenue forest cases</li> <li><b>Submission of Proposal for formation of WUA's</b></li> </ul>	
12.	<b>Construction Supervision, Quality and Quantity Control of Drainage Works</b> in UP Sodic Lands Reclamation III Project <b>(World Bank Funded Project)</b> for Uttar Pradesh		<ul style="list-style-type: none"> <li>Reconnaissance to familiarize with the site conditions.</li> <li>Review of Feasibility Report</li> <li>Checking of the detailed estimate of each drain prepared by the implementing agencies.</li> <li>Advise in preparing quality and quantity assurance programme and render advice on any fault, ambiguities in the design suitability of construction methods.</li> <li>Checking of initial levels and cross sections and estimates of each drain</li> <li>Team Leader to visit each of the on going site works and inspect the work on drains.</li> <li><b>Test checking teams to visit site with initial measurements, estimates, plans sections and check the quality of construction materials used at site.</b></li> </ul>	911.00



		<ul style="list-style-type: none"> <li>• Before commencement of field work the Field Engineer will check at least 10% of the initial measurements at site.</li> <li>• Advise executing agencies on site organization, equipment and manpower deployment and construction scheduling</li> <li>• <b>Suggest quality and quantity control monitoring system to ensure high standard of quality and timely deliverables.</b></li> <li>• Suggest formats for progress reporting and plan for rehabilitation of individual drains.</li> <li>• Checking and approval of quality of construction materials used at site</li> <li>• Submission of Monthly progress reports, Field reports etc.</li> <li>• Scrutiny of contractor's bills and recommending payments</li> <li>• <b>Submission of Close out Report.</b></li> </ul>	
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