Worli-Lovegrove wastewater treatment facility on the west side of Mumbai. The plant is basic, with an influent pump station, raw sewage screening, air de-gritting, effluent pump station, and drop shaft with an underground connection to the Arabian Sea.

Photo: RVA

CONSORTIUM APPROACH IN MUMBAI

A Canadian company shares lessons it has learned as a key partner in a consortium to complete one of the largest wastewater design and construction projects in India.

By Alan Perks, P.Eng. and Sanjay Devnani, P.E.
R.V. ANDERSON ASSOCIATES

India is currently at the cusp of an infrastructure boom. With a new government in place, the country is in the process of enacting policies that support infrastructure spending and expedite the implementation of critical urban infrastructure projects across all sectors.

Considering the size and scale of cities in India, almost all projects end up being large infrastructure projects. However, the projects in India's six mega-cities tend to overshadow the scale of urban projects elsewhere in the world.

R.V. Anderson Associates has been involved as a key member of a consortium that was retained by the Municipal Corporation of Brihan Mumbai (MCBM) to complete one of the largest wastewater design and construction projects in India. Our company has been engaged in the practice of civil, municipal and environmental consulting engineering internationally since 1990, with a focus on projects in India.

The current scope of the Brihan Mumbai project is over $1 billion (CAD) worth of capital upgrades. RVA, along with the consortium, is responsible for the project management, construction management and design for the work, which includes the installation of primary and secondary treatment at seven wastewater treatment facilities; 10 new sewage pumping stations; new tunnel sewers; and 10 kilometres of transfer tunnels to a new 4.5-km ocean outfall.

RVA and the consortium are currently involved in completing the final phases of design and are responsible for delivering the program for these priority works.

Strength and adaptability

Because of the size and scope of such projects, a consortium approach is usually the most suitable way to manage and execute the work as it ensures the availability of resources and range of expertise required. This trend of partnering is now prevalent and even some of the largest consulting firms prefer to adopt a consortium approach.

On large and complex projects such as Mumbai's, the strength and adaptability of a multi-firm consortium can be more effective in addressing changes, and the result can be lower overall design and contract administration costs, as well as new and innovative technical solutions.

Creating a consortium is usually the easier part; operating them successfully under difficult and challenging project conditions over long durations is altogether a different matter. The challenges are often in dealing with work sharing, changes in personnel, unforeseen client issues, and determining applicable standards for the team.

Creating a consortium that is fair and equitable to all parties and encourages cooperation becomes the key to success.

Project management

One successful approach to manage a consortium requires the creation of a project management team with representation from all firms. The project manager reports to the management team. The management team meets regularly to assist and provide an agreeable solution to the project manager on difficult issues.

This approach ensures open communication and buy-in by all members, thus minimizing the possibility of costly disputes. Most importantly, the consortium team can develop and apply mutually agreed upon project management, quality management, scheduling, risk management, and client communications and stakeholder engagement protocols. This approach is perhaps one of the most valuable benefits of a true work-share consortium.

Project teams must then follow local codes and standards as much as possible and adapt international "best practices" where local codes may not address the issues. Experienced consortium team members are in a position to fill in any gaps and conduct discussions with the client about the agreed-upon codes.

Each firm is significantly involved at the conceptual stage to ensure the concept is acceptable to all. Design changes can be readily addressed to deal with any potential cost overruns. As well, detailed designs prepared by one partner team can be reviewed by the other as a quality assurance mechanism — a very important mechanism in large scale infrastructure projects subjected to intense client and public scrutiny at every stage.

Sharing the workload with local firms

A multi-firm consortium can share the workload in terms of professional person-months of effort over the entire project. For example, each of the partners would be responsible for a certain percentage of the estimated inputs and the corresponding professional fees.

Most importantly, this approach includes the local firms who may be participating in the project, especially as an increasing share of internationally financed project work in countries like India is now performed by local firms. As reported elsewhere, the ratio of international "expats" to local professionals has reduced from 1:4 twenty years ago, to about 1:15 now.

Above: operator's garden at Worli-Lovegrove being watered using the plant's effluent water.

This level of effort-sharing needs to be established on an equitable basis, taking into consideration the strengths of each of the firms and the level of detail defined in the scope. If the level of effort for a certain task is underestimated, it is necessary to resolve such issues at the start of the bidding process. This approach generates trust and an open dialogue policy, and it helps ensure the effort remains balanced.

Higher cost structure

In a bidding process, a consortium generally experiences a higher cost structure than a single firm, considering the costs of managing a consortium and mitigating the different nature of risks of the member firms. However a consortium can be motivated to explore new ways to reduce costs and be more competitive. ■

Alan Perks, P.Eng. is a senior engineering consultant with R.V. Anderson Associates' Ottawa office. Sanjay Devnani P.E. is a senior engineer and business manager with RVA's Mumbai office.