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Issue 125

bulletin

Quarterly Magazine of Consolidated Contractors Company

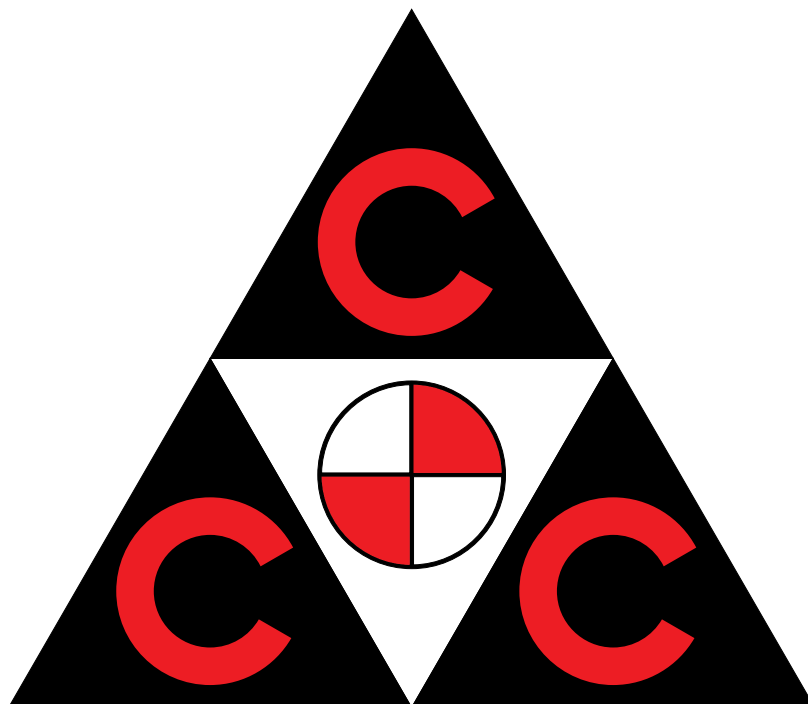
Trends in
Project Development
& Finance

JORDAN

As-Samra (BOT) Wastewater Treatment Plant



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MENA REGION MARKET TRENDS

I can best describe the current construction market in the MENA region by three geographical trends that we expect to dominate our industry in the next few years:

1. More stability in oil prices.
2. Increase in demand for economic and political reforms.
3. Shortage of government budgets to keep up with population growth and social infrastructure needs.

CCC has to adapt to this market by changing its traditional role of simply being a contractor to become more of a solution provider. A finance and project developer is a role we can play.

I know we have done this successfully on some projects, but I believe we need to partner with European firms who have done this more aggressively in Europe and other parts of the world.

I ask you all to be on the lookout for any such opportunities and bring them to the attention of the Management.

Construction and Upgrading of Mesaimeer Road (P008 C3)

Qatar



The project scope comprises the upgrade of approximately four kilometres of existing dual carriageway on Mesaimeer Road. The existing road is widened to four lanes in each direction plus parallel at-grade service roads on either side of the main carriageway.

The upgrade works include the construction of two bridges of 1200m and 150m in length using the precast segment, balanced cantilever method of construction. The longer bridge will cross Salwa Road where it is designed as a cable stayed bridge. Four pedestrian bridges are included in the works.

Additional works include the design and build to provide upgrades to nine sections of the periphery roads including Wholesale Market Street, which will allow traffic to be diverted away from Mesaimeer Road during the construction period.

- The client is Ashghal - Public Works Authority (PWA).
- The consultant is Parsons Brinkerhoff.
- The project was awarded on 14 February 2018.
- The project start was 18 February 2018 for a duration of forty-two months ending on 17 August 2021.

3D Printing Utilizing CyBe Robotic Arm Machinery

Saudi Arabia



The project scope comprises the Design & Build of a 78m2 demo unit (pilot project) in order to demonstrate the capabilities of 3D printing technology. The pilot will be conducted through the collaboration between a technology provider and a general contractor. The pilot should be conducted utilizing innovative 3D printing technology pioneered by CyBe, who uses robotic arm machinery.

The demo unit shall be fully furnished, connected to the utilities, approved by local authorities and ready for occupancy.

- The client is National Housing Services Co.
- The technology provider is CyBe Construction.
- The local licensed consultant is yet to be advised.
- The project was awarded on 7 May 2018.
- The project start was 8 May 2018 for a duration of less than three months ending in August 2018.



Commissioning

Introduction

In CCC Bulletin Number 124 we discussed the basic initial requirements necessary to complete in order for a project to start pre-commissioning / commissioning activities. In this Bulletin we will continue with the same subject covering the requirements for pre-commissioning and commissioning operations for the projects. Therefore, the article in this bulletin should be read in conjunction with the previous article in Bulletin 124.

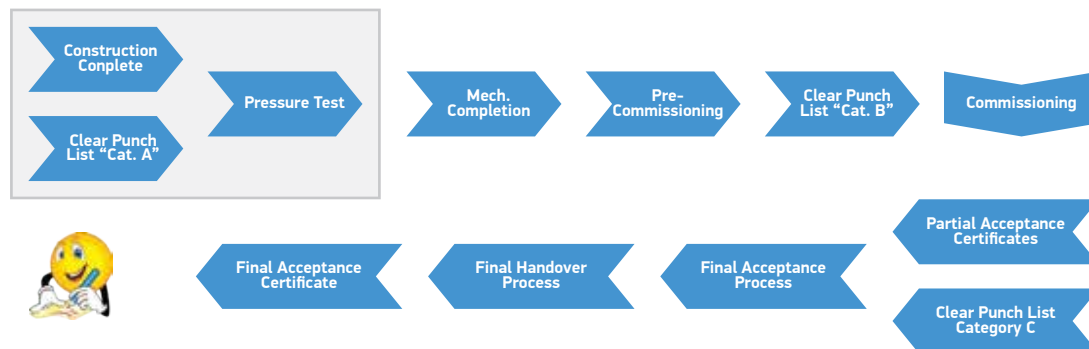
Pre-Commissioning

This is the activity which checks and simulates plant function and prepares the plant for operation. It is normally carried out by each discipline in isolation of other disciplines, for example:

- Piping will be flushed and prepared for its operating fluid.
- Electric switchgear will be energized.
- Lighting and small power circuits will be energized.
- Electric motors will be run-in where possible uncoupled.
- Instrument loop will be tested.
- Fire and gas loops will be tested.
- "Cause and effect" will be verified.

Pre-commissioning tests will be recorded on record sheets.

Chart 01



The following activities shall be considered:

• Planning

A "system based" critical path monitoring network plan will be developed incorporating interdependencies and commissioning priorities showing constraints between system activities. The system work sequence will be derived from the network and the plan will also be used as a progress reporting tool. The plan will identify target completion dates, as well as contractual milestones. Changeover from construction "area" plans to the "system" approach will be made at an appropriate time. The plans will be resourced-levelled to allow for limitations of some resources.

• Systems

The installation will be divided into operating systems by the design or main contractor. Systems will also be defined so each tagged item will be identified by a reference tag number: this will enable spreadsheets to be sorted out by system. System identity will be allocated to instruments, pipes, mechanical and electrical equipment, cables and so on. The system listing of tagged items will enable the exact work content necessary for each trade to be easily apparent and will be useful for progress monitoring and work planning.

• Sequencing

The normal requirements of starting up a plant are to deal with safety items first and then utilities. Power generation and distribution are also early requirements, while the process systems are the last to be commissioned.

• Status Indices

Produced from information provided by the design or main contractor, the list of all agreed tagged components will be tabulated by system given space for entry of status information. This will be used as a reference document and will be updated to show completion status of tagged items in a system. It will be included in the system handover package representing the scope of work of a package. These status indices will be maintained electronically.

• Project Completion Documentation Review

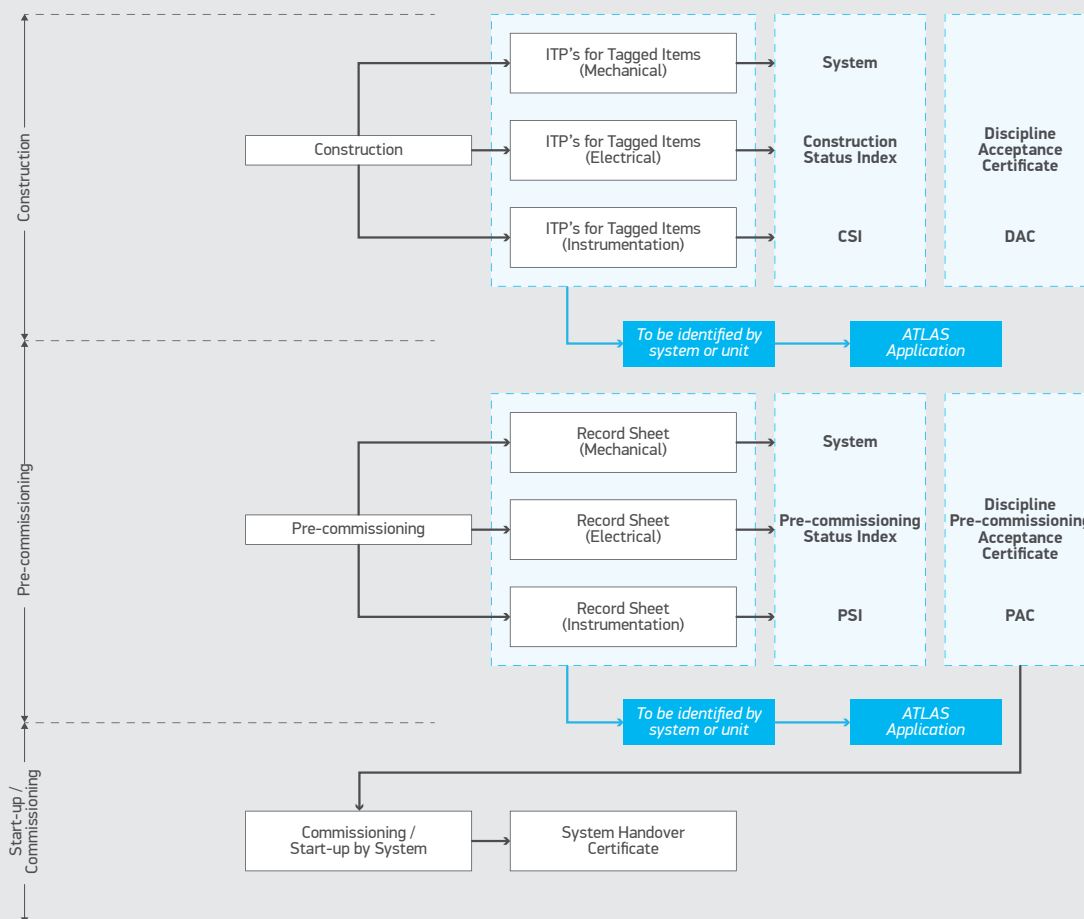


Chart 02

Commissioning

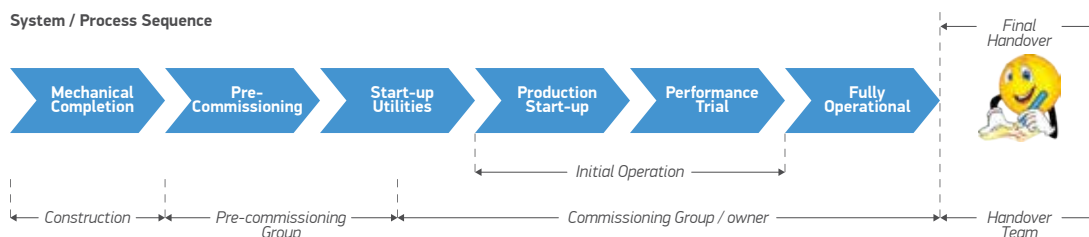
Commissioning is bringing into service the process plant using actual process fluids. It is often divided into the following phases:

- Start Up: first time introduction of process fluid into system for initial start-up and operation.
- Performance Trial / Performance Testing: monitoring of compliance of performance to design parameters over a fixed period.

Commissioning

The sequence of the processes is illustrated in Chart 03.

Chart 03



The following activities must be considered:

• Systems

Systems and subsystems are identified by Engineering Group. However, for commissioning purposes it is recommended including the Commissioning Group in this process to identify system and subsystem limits to ensure that defined limits are in line with the commissioning plan, sequence and priorities.

• Plans and Procedures

A comprehensive commissioning plan will be developed by the Commissioning Group. The plan will include a reference to all systems and subsystems subject to the commissioning process. Specific commissioning procedures will be developed by the commissioning group in conjunction with specialized vendors for the systems in question.

• Responsibility Matrix

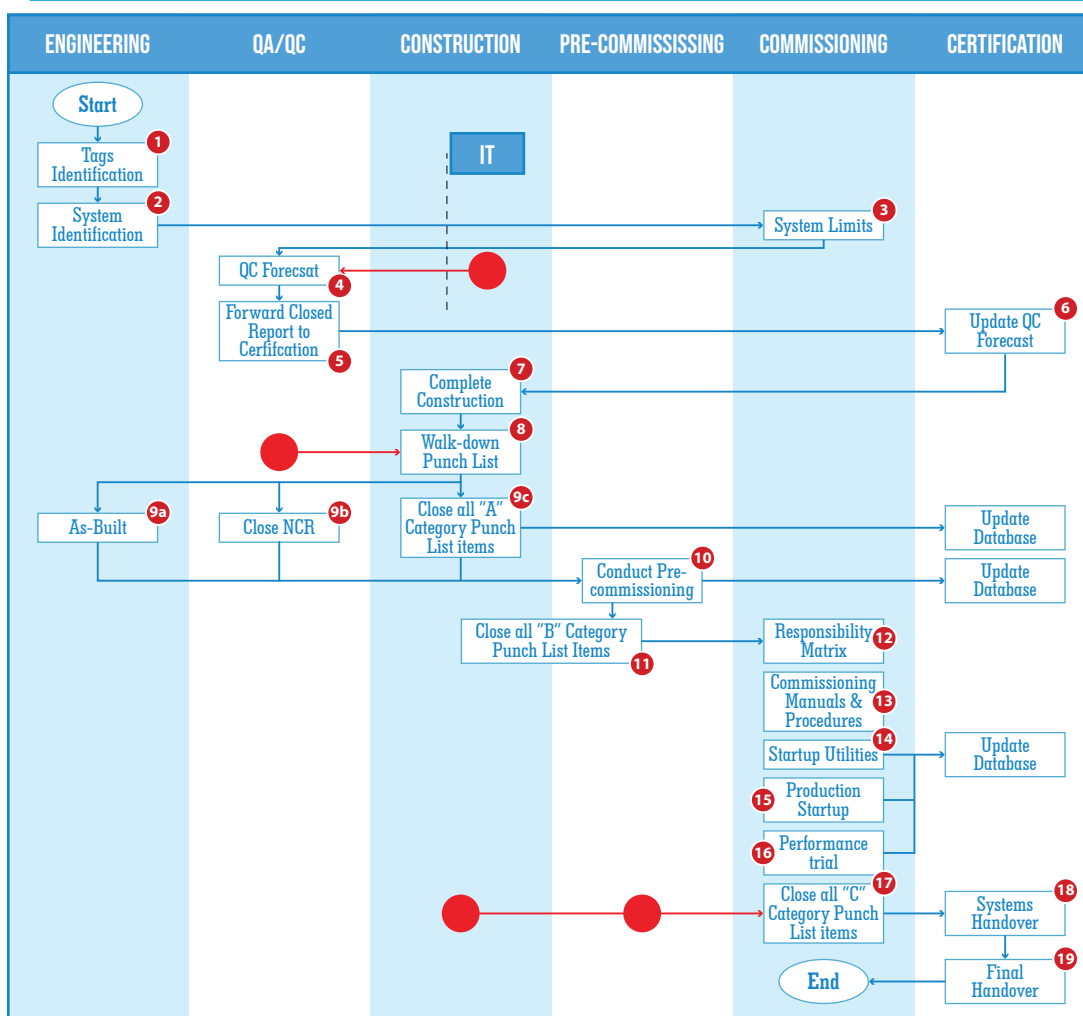
A “system responsibility matrix” will be produced by the Commissioning Manager indicating responsibility for each system available for commissioning purposes. The responsible commissioning engineer will be aware of all works taking place and planned to take place on his/her system. The construction team or pre-commissioning team is not allowed to do any work on the systems without permission from the responsible commissioning engineer.

• System Handover

System handover packages will be developed in line with commissioning systems and with handover requirements for the project in accordance with contractual requirements. This will be used to obtain provisional acceptance certificates in preparation for the final acceptance certificate. The in-house software application “ATLAS” is a mandatory software controlling site operation and testing, punch list processing, pre-commissioning and commissioning activities and the handover process.

• Overall Workflow for Commissioning Operation

Chart 04



Conclusion

Subcontractors for mechanical projects have limited or no responsibility in relation to the commissioning operation. The commissioning operation is usually carried out by the main contractor. Pre-commissioning is carried out by the mechanical subcontractor in coordination with vendors.

For civil projects where systems are simpler in comparison to power projects or oil and gas, the contractor has full responsibility for the commissioning operation even if all the mechanical systems are subcontracted to specialized organizations. Unfortunately, for civil projects there is a misunderstanding in relation to commissioning responsibilities starting with the estimation process. During estimation, it is assumed that the MEP subcontractor will carry out the complete commissioning operations and, based on this assumption, the estimator will not allow in the budget for a commissioning specialist as part of the contractor's organization. It is true that commissioning of each single system is carried out by a relevant specialized subcontractor including submission of commissioning manuals and procedures. However, we need to keep in mind that the overall commissioning plan that consolidates all commissioning manuals and procedures for all the systems explaining the whole philosophy of the commissioning operation is the responsibility of the main contractor.

For this reason, the main contractor should allow for a commissioning specialist in its organization to coordinate with all subcontractors and to have the overall responsibility for commissioning in order for the main contractor to deliver all the systems to the customer in accordance with contractual requirements, and applicable rules and regulations.

Reference: CCC Quality Management Procedures

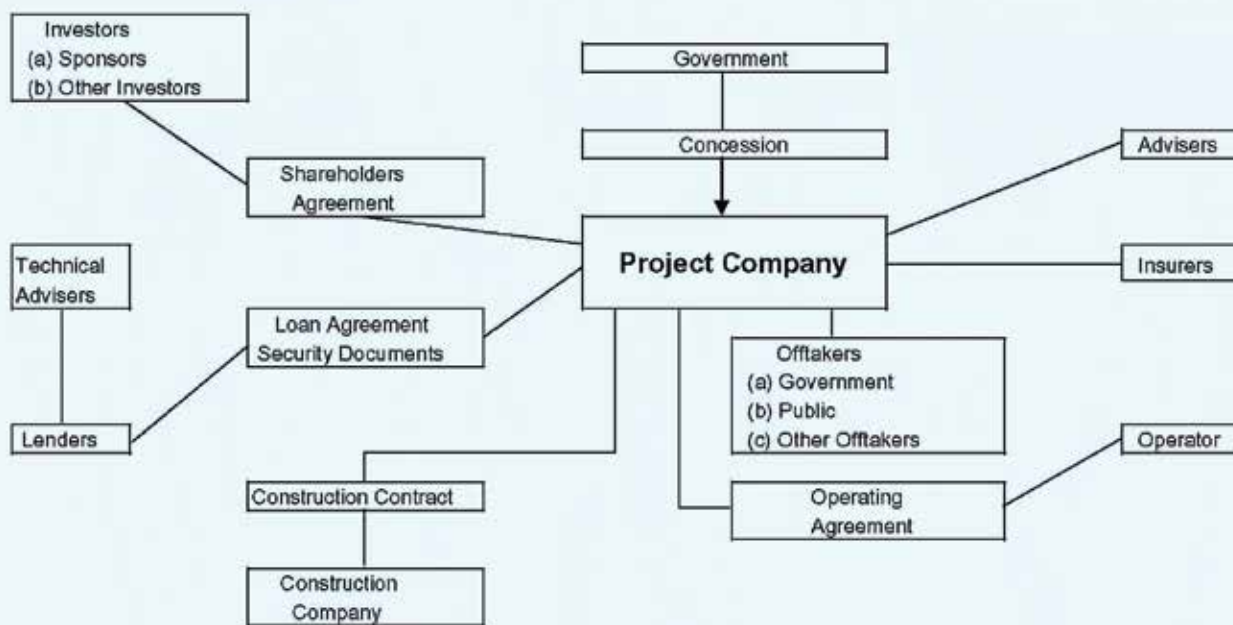
Privately Financed Projects (PF Projects)

A General Overview

CCC, as the leading construction company in the Middle East, has adopted a strategy that includes, among several other initiatives, developing an internal capability that is coherent with the trends in this region and that includes the capability to engage in privately-financed major infrastructure and utilities projects both as the DB/EPC contractor partner and as a co-developer or lead developer. The objective is to maintain its leadership in the region and to feed its engineering and construction business with new projects that are frequently (now more than ever) tendered using this procurement system.

The structure that is being adopted more frequently for such projects is presented in the graphic. There are many variations but the basic structure is almost always the same.

THE PARTIES INVOLVED IN A BOT SCHEME



PF projects take many forms and are typically referred to as BOT (Build, Own, Transfer), BOO (Build, Own, Operate), PPP (Public Private Partnerships) and several other permutations.

The basic concept behind this procurement system is in the involvement of private funds in the capital cost of the project to varying degrees, to reduce the financial burden on the ultimate owner of the project (often named as the grantor). This is done by the provision of some sort of a Concession Agreement (CA) that grants a private party (in partnership with public authorities or on its own) the right to build the facility, finance it, operate and maintain it, and collect the revenues from the use of such facility for a set period of time, or indefinitely as the case may be.

Typically, facilities where such a procurement system can be applied are power plants, water generation plants, sewage treatment plants, hospitals, schools, airports, ports, pipelines, highways (toll roads), bridges, tunnels, mass transit and so on. However, the details of the CA agreement depend on the nature of the project and there are many variations in such agreements reflecting the specific nature of the project and its location. In this brief article, I will not address specifics of CA agreements, but only a few general features that are common to all such CAs.

The motivation behind this procurement process for the Grantor (normally a public authority) is the public need/demand for infrastructure combined with a shortage of public funds at the time the facility is needed or demanded. Another reason could be public policy to involve the community and to deepen the private investment markets. The motivation for the private party is the economic benefit of the project. The economic benefit for the private developer, investors and other parties can be the return on development efforts, investment, the returns from the construction or from operating the facility.

Privately Financed Projects (PF Projects) - A General Overview

For the private developer to maximize its returns from the investment, the developer will almost always seek funding from financial investors (to cover equity requirements to some extent) and from lending institutions (debt), such as banks or credit agencies in order to leverage the project and thereby increase the return on the investment in the project (equity). Lenders welcome such projects simply because lending is their core business. Private developers, who take on such projects also typically demand additional economic benefits for their competence and initial (at risk) efforts in developing such projects (pre-development efforts) over and above their investment share returns while financial investors look only for the return on investment.

The pre-development efforts (all the activities that precede the point when the implementation of the project can start, including developing the structure (see the figure) and all the contracts and availing the necessary funds (financial close) are extremely complex and all efforts are at high risk. The list of such activities and risks associated with these activities are shown generically in the following article.

For the lenders to provide any debt funding for such a project, their focus is on what everyone in this business refers to as the “bankability” of the project. The bankability of a project is a function of its feasibility, the predicted cash flows, the robustness of the business case (including the contractual arrangements and the financial model), the reliability and capabilities of the parties involved in the development, construction and operations, and the financial credibility of all the parties, grantor included. All the above form part of the risk assessment by the lenders.

The robustness of the cash flow depends primarily on the contractual arrangements. For some projects a public authority provides the revenues such as for power, water, and sewage treatment. In such projects there is almost always a take-or-pay arrangement¹. For some other type of projects, such as schools or hospitals, the revenues depend on availability payments². With other projects, such as toll roads and airports, the revenues are generated from market demand and are not normally guaranteed by the grantor.

Clearly, therefore, the cash flows for different projects have different levels of robustness. Assuming that all the other estimates (capital cost and operating expenses, insurances, interest costs and so on) are accurate and robust, the cash flow risks (possible variations from the estimates used in the project feasibility) will be higher or lower depending on the revenue arrangements and the financial credibility of the payers. Lenders will determine if a project is bankable and to what extent (how much to provide) depends on their assessment of the project cash flow risks and the credulity of the parties involved. A separate article within this bulletin provides a glimpse of the risks of such projects in relation to the phases of the procurement process. Lenders consider shareholders’ funds (equity) as the risks’ shock absorber and as such will demand a level of equity to match the riskiness of the project.

¹ *Take-or-Pay is an agreement whereby the off-taker commits to take the output of the facility or pay for it in any case.*

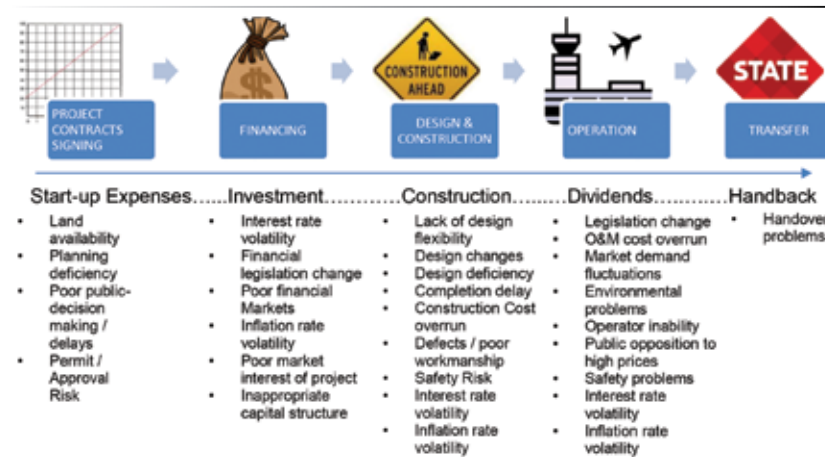
² *Availability payments is an arrangement to pay a certain monthly or yearly sum based on the facility it’s available for the purpose of its development (teaching or medical services, for example).*

Risk in Project-Finance / Public-Private-Partnership / Concession-Type Projects

PPP projects have benefits for several parties, even beyond the public and the private actors involved and include the users of the projects e.g. children attending newly-built and well-maintained schools under an availability-type scheme such as the Kuwait PPP Schools Development Program, or passengers using state-of-the-art airport facilities and systems in BOT airports such as the ones for Taif in Saudi Arabia.

However, due to the long concession period (25-30 years) and the large amount of investment the risks associated with PPP projects should not be underestimated.

The diagram depicts the main risks which can be encountered over the term of a concession project. The risks are many more and this in no way is meant to be an exhaustive list.



1. Project Contract Signing

Once a project has been “won” and is awarded to a company (or a consortium of companies) the signing of the contracts takes place and this marks the project’s official start.

During this phase, there can be problems with the land for the project - land expropriations or re-settlement required, or perhaps land may be insufficient so additional land is needed. These matters can be serious and can cause delays and potentially additional cost. Clarity on land availability must be ensured before the bid and should be reflected in the project’s draft contract, as reviewed and confirmed by lawyers and technical teams.

Other risks during this phase may have to do with permitting and licensing for construction. Permits need to be carefully considered during bid-stage taking into account local requirements (specific authorities involved),

granting of certain permits as part of the project contract (obligation of the granting authority), and facilitation (assistance) by the authority provisioned in the contract. Adequate time to obtain these and provisions for extension of time in case of delays, provisions for cost compensation, or even termination in case of failure to obtain key permits need to be drafted into the project contract.

2. Financing

Concession type projects are typically highly (above 65%) leveraged so having banks on board to provide debt is key. Lenders should be involved during the bid stage, to review and comment on the project terms and draft contracts, so a) their requirements are taken into consideration in the bid parameters and

b) have comfort that “all things being the same”, if we win the project, the financing will be available.

As we live in a dynamic world, not all things stay the same. The market can change, either globally or for a country or region. Interest-rate spikes, inflation, currency exchange rate fluctuations, or declining oil prices:

such events are critical and are known in legal and financing lingo as ‘MACs’ or Material Adverse Changes. They can affect not only the cost of lending, but depending on the magnitude, the very offer to lend to the project.

Events such as the devaluation of the Egyptian Pound in 2016 combined with the depletion of hard currency reserves and high inflation are real and do occur.

To cater to MACs prior to the start of the project, companies take into account the risk of losing their bid bond - a guarantee amount we are normally required to submit along with our offer for a project and which is in the range of 0.5 - 1% of project capital expenditures (CapEx) as well as incurring the costs of resources (internal and external).

Some tendering authorities foresee such events, such as a spike in the base lending rate (which forms a good part of the lending cost), or the introduction of new laws or taxes. In

most cases, MACs occurring before financial close will render the financing of the project from costly to impossible.

3. Design & Construction

When financing is in place, some risks are already behind but still a number of things need to go well during the design and construction phase.

Besides completing the project on time and within budget, during the construction phase we may have requests for variations and changes which impact cost and time and possibly the operation of the project. These are normally foreseen contractually to allow for time and cost compensation and sometimes even the right not to accept certain changes if they adversely affect the financial aspects of the project (leading to excessive extra cost to be funded, the projected returns are lower than the ones of our bid and so on.)

The contractor is normally a different entity than the investors (shareholders of the project company) and the operator of the project (normally led by a sector expert). CCC often leads in the contractor entity or is even participating fully on its own at 100%.

4. Operations Period

Having completed construction means the end of several risks. The project is now able to earn revenues (road or bridge tolls, airport charges, availability payment). The risks are significantly less and many companies even refinance at this point, depending on market conditions.

The operations period is not risk-free. In a demand-risk project (relying on road or airport traffic) when demand is down, there is not enough cash flow to cover operating costs, to service bank debt and nothing for dividends. There could be contractual provisions to mitigate these costs, depending on the project e.g. a capacity payment by the state / grantor, to cover the operating costs, the debt service and a minimum return on the investment. In this case, the risk then is to achieve the remaining (higher) projected return but the project can still continue to operate and repay its debt, hoping for the market demand to improve over the term.

Without this protective “floor” the project has to rely on termination and default provisions in the contracts. In most cases, when a project’s demand is so suppressed that it cannot cope with its obligations, it will enter default

conditions, lenders may step in to take it over and it may be terminated. In such cases, the project company is not liable for the debt (if it is pure project finance, although in the Middle East for specific instances of own default, the project company may need to cover 10% of the debt) but will normally lose its equity and costs to date. Termination is a long subject and merits an article of its own!

In availability payment projects (receiving a monthly fee), market demand is not important. In this case there are contractual provisions to meet a specific level of service (defined performance standards). When the operator falls below these standards, the payment is then subject to deductions. So, even in availability payment projects, there are revenue risks depending on the performance. Choosing the right, credible and expert operator, securing a performance guarantee against potential deductions for poor performance are ways to mitigate - if not completely shield - the project company from this risk.

Also, during operations, as for the entire term of the project, inflation can occur, throwing the operating expenses for the project off. Regular, rolling forecasts of macroeconomic indicators as well as contingency can help mitigate this risk.

5. Handover - End of Concession

At the end of the concession term most projects are handed back to the state. The main conditions include handing the project back with some remaining useful life (it should ‘work’ for a number of years). Also, training of new staff to take over the project after handover may be another condition.

To cover these, a special reserve facility (setting money aside in a dedicated bank account) is provided for, so adequate funds exist for handover costs. In addition, regular periodic maintenance serves to ensure the good condition of the project along the years and minimize any major issues at the end of the term.

Other handover risks may involve manuals, drawings and other project-related documents which are to be handed over to the state. Keeping good records and having appropriate procedures helps ensure that all of these are in order.

Successfully structured contracts achieve a balanced allocation risk between state and private sectors, each taking on risks which it can reasonably control and manage.

Samra Wastewater Treatment Plant

A Major Asset for Jordan

Project Overview

Awarded in 2003 through an international competitive bid and completed in 2008, the initial As Samra Wastewater Treatment Plant (Phase 1) was designed to treat the wastewater of 2.3 million-equivalent inhabitants of Amman and the surrounding areas. This modern plant replaced the polluted waste stabilization pond system that was in place and has improved the downstream agricultural areas that rely heavily on treated water for irrigation. **What was**

heavily polluted a few years ago is now becoming one of the cleanest rivers in Jordan!

In 2009, facing increasing growth in population, the government of Jordan, represented by the Ministry of Water and Irrigation (MWI), decided to expand the plant.

The 25-year build, operate and transfer (BOT) contract for the expansion of the As- Samra WWTP entered into force on 18 July 2012. The expanded plant is expected to meet the wastewater treatment needs of 3.5 million-equivalent inhabitants of the Amman and Zarqa areas through to 2025.



Salient Features

Around 10% of the Water Supply in Jordan The plant produces increasing supplies of treated wastewater used for agriculture that represents around 10% of the water supply available in Jordan freeing up fresh water for other more valuable uses.	An Affordable Tariff The total cost of treatment per cubic meter for this plant is the lowest in Jordan and much less than the wastewater tariff collected from Jordanian citizens per cubic meter as well.	70% of the Water Treated in Jordan The plant produces around 70% of the total treated wastewater in Jordan. The produced effluent meets international standards and far exceeds the Jordanian standards.	Energy Recovery At 95% The plant produces up to 95% of its power needs and imports the remaining 5% from the national power grid.
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Project Firsts

01 Size Biggest waste water treatment plant in Jordan.	02 BOT First Build-Operate-Transfer project in Jordan.	03 Local Banks First BOT financed by local banks (exceptional 20-year tenor).	04 US funds participation First BOT with USAID or MCC funding.
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Samra Wastewater Treatment Plant - A Major Asset for Jordan

A Strategy Boosting the Economy of Jordan

The Samra Project is about much more than just treating wastewater. Its implementation enters into a global strategy giving Jordan a powerful tool for the development of its economy and its people.



Agriculture and Irrigation Reuse

To provide high quality water for irrigation

The Samra plant treats waste water at the highest standard for the valley of Samra to be irrigated with high quality water, enabling the farming products to be recognized and sold in the whole Middle-East. The potential reuse of biosolids by-product in agriculture is also one of the targets of the Jordanian authorities.



Employment and Transfer of Know-How

Promoting the Development of Talents inside Jordan

To guarantee its resources match its international standing and strengthen the expertise level of its activities, the Project Company recruits staff almost exclusively from Jordan and when possible from local communities. All employees are closely monitored and attend targeted skill improvement programs.



An Affordable Tariff

The total cost of treatment per cubic meter is the lowest in Jordan.

The participation of the donors' institutions namely USAID and MCC together with the innovative nature of certain aspects of financing as well as the power recovery contributed to make the water more affordable to the Government of Jordan.

- 180 permanent local employees.
- Up to 1,000 employees during construction phases.
- The cost of the produced water is far below the wastewater tariff collected.
- 4,000 farms and 10,000 hectares are irrigated with Samra high quality water.
- Samra WWTP employees aspire to uphold the principles which have driven its shareholders to excellence:
 - ✓ Safety
 - ✓ Accountability
 - ✓ Team work
 - ✓ Integrity.

It is this culture that is the source of the company's expertise and performance.



Samra Wastewater Treatment Plant - A Major Asset for Jordan

A Vision Implementing Sustainable Solutions

The Government of Jordan made clear that the development of the economy has to go along with the sustainability of the project this is why so much thought and deep involvement have been deployed to reach this primary objective.

Dialogue with Stakeholders

The project provides services that are essential to life and have strong local and societal contents.

As a BOT project, the project company has established a sound and productive relationship with stakeholders that concretely grows and lasts long. Communication targets different audiences to create new dialogue lines which can improve the performance of all partners and meet with the new upcoming challenges.

N°1 Renewable Energy Producer

Fossil energies are not sustainable and their importation is an important burden for Jordan. Biogas generators and hydraulic turbines allow for the recovery of 95% of the electricity consumed by the plant, with the remaining 5% coming from the national grid.

Reduction of Toxic Gases

Due to the new adapted technology, carbon emissions are significantly reduced.

In addition, other toxic gases created due to the process such as CH₄ and H₂S are well controlled and safely contained.

Protection of Environmental Resources

Designed to treat ultimately the waste water of 3.5 million inhabitants of Greater Amman, the Samra plant implements advanced solutions for waste water treatment and for sludge treatment. Groundwater resources are protected from infiltrations and the water produced enables to widely reduce the use of water from fossil aquifer.

Biodiversity

As a consequence of the drastic changes incurred biodiversity has risen and some bird species have decided to return to this part of Jordan.



95% Energy Sufficient

N°1 renewable energy producer in Jordan using biogas.

N°1 renewable energy producer in Jordan using hydraulic energy.

300,000 Tons/Year

Reduction in carbon emissions.

Samra Wastewater Treatment Plant - A Major Asset for Jordan

Areas of Expertise

None of these achievements would have been possible without the implementation of various expertises ranging from water treatment to energy production, management and financing innovation.



Biogas and Hydraulic Energies Producer

Supporting government policy for renewable energy

The Samra plant is the biggest Jordan energy producer using biogas with its biogas generators. It is also the biggest private company using hydraulic energy thanks to its Pelton & Francis turbines.

Energy Production = 133,000 kWh/day (equivalent to a city of 8000 households)



High Technology Waste Water Treatment

To Provide High Quality Water for Irrigation

The Samra plant treats waste water at the highest standard and far above the Jordanian standards for treated wastewater, using proven biological technologies. Samra WWTP is one of the biggest WWTPs in the MiddleEast.

90 million cubic meters of high quality treated water produced every year.



Public and Occupational Health and Safety

Compliance with International Standards

As the safety of the public and the staff is a first priority, the project is applying the best industrial practices to mitigate and eliminate all risks which may rise due to treatment activities through applying work systems which propagate a safe culture for everyone.

Samra WWTP Expansion BOT Project has been granted the OHSAS 18001, ISO 9001 and ISO 14001 Certifications

An Innovative Financing

A Template for Viability Gap Financing

This plant is the first wastewater treatment facility in the Middle East to have used a combination of private, local government and donor financing. Donor institutions involved in the financing included the USAID and MCC.

This project was partly financed by local banks. The loan has a tenor of 13 years extendible to 20. This tenor marks the longest maturity that Jordanian banks offered to date for a Dinar-denominated limited-recourse loan.

By bringing down the capital costs, the grant funding enabled the project to be financially viable, thus benefiting the government and local rate-payers, without subsidizing the private sector.

Closing the financing of the expansion proved the feasibility and demonstrated the significant benefits of combining private sector financing with viability-gap grant funding.

- A 20-year commercial loan, the longest maturity in Jordan to date.
- A JOD denominated loan - no exchange risk for the client.
- Strong appetite of local banks for robust infrastructure projects in local currency.



Samra Wastewater Treatment Plant - A Major Asset for Jordan

A Successful Project for Jordan

This project significantly improves water resources management for one of the most water-deprived countries in the world, providing increased supply of high quality treated wastewater for agricultural use at an affordable price, while freeing up fresh water for other uses and implementing sustainable solutions in a region with multiple needs for drinking water and sanitation infrastructures, given the scarcity of the resource.

Thank you!

It would not have happened without the real commitment of several actors guided by the imperious necessity and aspiring vision to deliver high value for money infrastructure and services, enabling the country to face its future demand for water having the community and the country enjoy a greener place for the next generations.

These actors are:

- ✓ The government of Jordan, represented by the Minister of Water and Irrigation, paving the way for a better environment in the country while bridging the gap between the water supply and demand for water-scarce Jordan.
- ✓ USAID and MCC by providing total donations of more than 185 MUS\$ with the main objective of helping the people of Jordan in reducing poverty through sustainable economic growth.
- ✓ A syndicate of 11 local banks led by Arab Bank, by providing a more than 100 MJOD loan with exceptional tenor and interest rates with the objective of helping the development of the country.
- ✓ The sponsors, Degremont-Suez Environnement and Morganti, two world-leader groups that are transferring their expertise and the know-how of engineering, constructing, financing, operating and maintaining state-of-the-art wastewater treatment plants.



PPPs: The Transition from Lump Sum Bids to Collaboration, Ownership, Tariffs and Dividends

FEATURE

Although the notion of Private Public Partnerships (PPP) for infrastructure development has been around for years it is only recently that these distinctive contracting relationships have been receiving more mainstream attention and usage. Governments, especially in developing countries, are focusing on PPP because they have had substantial difficulties raising tax proceeds to finance public infrastructure projects under traditional competitive Design-Bid-Build lump sum tendering arrangements.

In an era of increasingly unbalanced economic environments, government finances are deteriorating to a point where infrastructure spending is often the first item to be cut from national budgets (see GCC in the last few years). Governments are always keen to develop additional infrastructure but, without lavish public budgets, would prefer to involve the private sector developers together with lending institutions in helping to provide project financing. Given the current trend of shrinking public budgets then it is not surprising that governments are seeking new creative ways to finance projects by tapping into private sector ideas and welcoming them to participate in collaborative ownership and governance which if done correctly can promote social responsibility as well as profits for the private entity.

Allocate, Align, then Bind

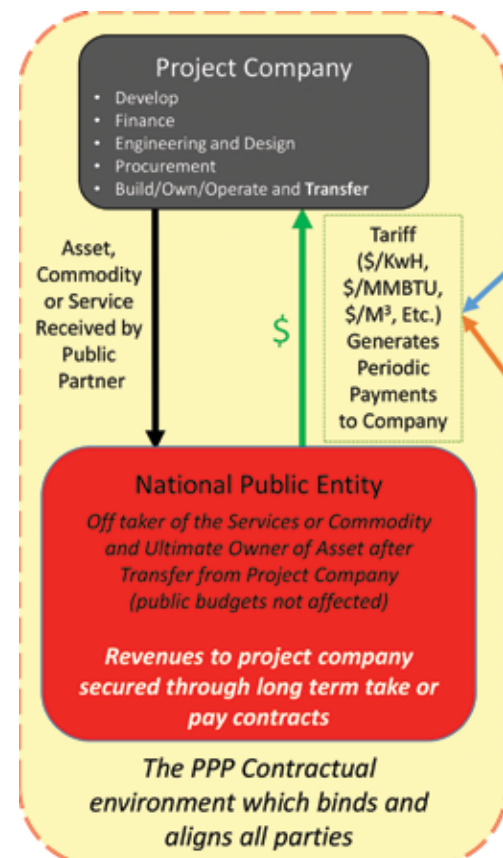
So, what options are available to governments that want to develop productive infrastructure but don't have the required capital to do so? Under PPP many contractual arrangements are available so as to allow governments to provide infrastructure to the public without having to put the cost of such on the public books. This doesn't come without strings attached though. In order to offload initial project costs onto the private sector, the private sector must be incentivized through the ability to own/control the asset (i.e. its cash flow) and profit from the arrangement. Critically, revenues that flow to the private project company ideally must be secured through long term take-or-pay contracts with the public entity. These various arrangements all serve to align public sector objectives to the needs of private sector capital. They also serve to efficiently allocate risk between all parties. The resulting risk matrix is the result of a laborious and complex negotiation and there is no straightforward roadmap that guides and promotes PPP development.

"We Are All in this Together, by Ourselves..."

Assignment of risks and alignment of goals between public and private parties while delivering the promises and benefits of PPP can be a challenge. "Win-win" benefits that supposedly flow to each party can be problematic and elusive as initially the objectives of private and public entities are often perpendicular to each other. For example, the public wishes to deliver infrastructure at the lowest possible life cycle cost while the private side wants to maximize investor returns. Public borrowing often costs less than private borrowing. The public side tends to offload as much risk as possible to the private side. The private side wants a reduction of regulations and red tape but the public interest seeks to ensure that the project's quality can be verified to acceptable standards. Furthermore, maintaining stable and positive political will and support can be challenging because politicians' terms are generally shorter than the typical length of PPP relationships. More problematic is that the public is often weary of relying on private companies to run and own, even temporarily, public resources. The recent 'takeover' of various Greek public assets by foreign private companies, financially backed by national governments, is a cautionary example of how anxious and skeptical the public can be for certain PPP arrangements. Protecting the public interest while aligning the interests of all parties involved captures the essence (and exposes the challenges) of PPP.

Consultants Don't Get out of Bed for Less Than 50k!

Developing numerous agreements that regulate and/or define rights and obligations for all involved is neither easy nor inexpensive. PPPs are fundamentally complex contractual



agreements that differ across projects, sectors, levels of government and countries. Often times they are unique arrangements and include many complex and interrelated agreements which define the extent of private partner participation and associated government support and guarantees. Agreements include EPC, O&M, operating, shareholder, permitting/environmental and long term offtake contracts just to name a few. Lawyers/consultants who have expert knowledge and experience in developing this documentation can charge hundreds+ of dollars per hour. Making sure all agreements are in place can easily run into hundreds of thousands of dollars (and even millions for large projects). This is why PPP is more suitable for largish projects (\$100M+).

Although the PPP environment encompasses many contracting arrangements the philosophy of most will set out to allocate risk and align the interests of all groups while giving the opportunity for the private entity to have increased participation in the public project. The agreements include provisions to allow the private developer to temporarily own the public asset for a length of time so as to recover their capital expenditures (CAPEX) and associated profit. At the end of the agreed amount of time

(say 20 years) the asset is then transferred back to the public entity. This type of arrangement is known as a Build-Own-Transfer (BOT). If the developer is also involved in the operation of the asset then it would be known as Build-Own-Operate-Transfer (BOOT). Within BOTs and BOOTs the developer may be asked to bring financing to the project. Other structures might include concessions, long term leasing, joint ventures, delegated management and so on.

Want to Play? Place your Bets.

Nowadays, governments/clients are increasingly requiring project developers take on more participation in public infrastructure projects. As such, clients are requiring contractors to not only provide Engineering/design, Procurement and Construction (EPC) activities but also be responsible for arranging the project's financing and more critically to provide equity (cash) to the project.

How do private contractors confront these new tendering realities? Once a contractor has accepted responsibilities for project financing and equity participation the bidding strategy changes completely. What in the past was a turnkey lump sum quote for a delivered and

commissioned public asset now becomes a tariff quote which reflects optimized life cycle costs. In other words, "we can deliver and commission a defined sized pipeline and associated infrastructure at an agreed date for \$300M" traditional Design-Bid-Build lump sum bid becomes "we can reliably deliver gas to the off taker at an average rate of \$6.00 / MMBTU over the next 20 years" under PPP. Obviously the two bids reflect radically differing risk

and reward environments.

Since tariff based bids reflect a project's entire life cycle cost it is possible that a bid with the highest EPC price can win (generally means lowest price) if operational costs are low. It also gives significant advantages to bidders that can bring sovereign backed 'subsidized' financing to the bid (e.g. China). So it is possible that a bid can be won not necessarily on the strength of EPC and operational pricing but on the ability to secure large amounts of funding at interest rates that are well below market rates.

Components of the tariff under the PPP Environment

Capacity Charge (fixed payment that is paid each period during operations for available resource capacity)

Capital Expenditures (CAPEX)

- Owners Cost Pre-FC
- Development Cost
- EPC Cost
- Finance Charges
- Interest During Construction

Debt Repayment, Taxes, Dividends

- Lenders
- Government
- Investors

Fixed O&M Costs

Transfer Costs

Recurring Charge (variable amount paid each period during operations for each resource dispatched and delivered)

Variable O&M

- Normal Maintenance
- Major Maintenance Sinking Fund

Commodity Charges

- Feedstock
- Ancillary services

Revenge of the Number Crunchers

PPPs that involve tariff based tendering will certainly require innovative financial analysis tools to support the bid. These tools typically include very complex, custom built financial models which are essentially Excel spreadsheets consisting of dozens of tabs in the horizontal direction each with hundreds of rows in the vertical direction. The tabs are interlinked by many intricate equations which follow economic, financial and accounting logic. These complex interdependencies between the tabs are what allows the project's cash flows to be calculated and analyzed throughout the entire business case lifecycle from development, design, construction, operation and transfer and ultimately to investor dividend.

In particular, the modelling process begins by defining the project's programmatic (development, construction and operating periods and so on) variables along with estimated capital expenditures for each line item defined in the work breakdown structure. Each line item's cost is further defined by a customizable drawdown schedule throughout the construction timeline. This data is used to determine periodic cash requirements and is used to calculate funding requirements based on any debt (funding provided by the lending institution and/or syndicate) and equity (funding provided by the investors) ratio desired. Typical debt/equity ratios fall into the 70% for debt and 30% for equity range.

Models will typically allow for financing structures that define several independent borrowing sources (e.g., tranches) each with its own unique interest rate and term length variables. Uses and sources of cash during the construction phase are used to calculate interest during construction charges and can also be used to identify potential funding shortfalls during construction. By multiplying demand curves by the associated tariffs operational revenues are calculated and essentially become periodical payments to the project company for making the asset available. Loan repayment and operational/maintenance schedules (fixed, variable, reserves and so on) and associated costs are also accounted for.

Numbers Have Feelings Too

Once all of these inputs and assumptions are defined, the project's financial performance can be modelled using recursive calculations (along with many other technical and financing assumptions) which gives way to an estimate, or pro-forma, of the project's cash flow, balance sheet, and profit and loss financial statements and various other important financial metrics (e.g. NPV, IRR, Pay Back and so on). When the assumptions are stabilized a baseline model and resulting tariff can be established. From this point onwards various sensitivities can be tested in order analyze their effects on the tariff and associated investment return.

For example, what happens to the tariff if EPC increases by 10% or operational costs decrease by 10% and the target investment return is maintained? Frequently the scope to alter the tariff may be tightly constrained by market forces and/or the competitive bidding process. In these cases the tariff can be held fixed (let's say at a level that would be perceived as the winning bid) while other variables are changed in order to see what the effect is on investor returns. For example, for a given tariff, if the loan interest rate is marginally increased and EPC is increased by 10%, can a desired return on investment still be maintained? Again, once the model baseline has been defined all of these interesting questions along with many others can be analyzed at the press of a button.

Under PPP, traditional Design-Bid-Build/Lump Sum type tendering has given way to tariff style tendering bids which depend on project developer financing, contractor equity positions, optimal life cycle cost considerations, increased private participation and partnership with public entities. This tendering environment leads to more complexity and risk and can lead to considerable uncertainty. Bids of this type are inherently investment decisions which, in large part, depend on accuracy of the project's numerous assumptions and associated numbers. It is worth keeping in mind that despite all the apparent collaboration, complexity and the numerous ironclad contracts that bind the parties together, the system can suffer from Garbage-In-Garbage-Out syndrome. The analysis that flows from financial modelling is wholly dependent on the robust and accurate assumptions that drive the model. As such, as the famous quote goes, assumptions and their numbers are like fine perfume; to be sniffed but not swallowed.

Saraya Aqaba Project

Jordan



Located at the northern edge of the Red Sea, the Saraya Aqaba Project boasts a development of prestigious 5-star hotels, luxury residential units and mixed use buildings.

The completion of Phase 1 was awarded to a joint venture consisting of Consolidated Contractors Group S.A.L. (Offshore) (CCC) and Drake & Skull Construction Co. LLC (DSC) and Arabtec Construction LLC (ATC) on 17 May 2013.

The scope comprised the design, redesign, value engineering (VE), construction, commissioning, and handover of four hotels, a beach club, a conference centre, an old souq, an office building,

twelve grand villas, beach villas, a water park, a technical building and offsite staff facilities complete with all infrastructure, a district cooling plant and man-made lagoon with a total built-up area of approximately 390,000m². The works commenced on 7 July 2013.

In April 2018 the luxury collection hotel 200 Keys will open with the beach club and the development lagoon off site staff facilities and infrastructure.

By September 2019 the balance of the works will be completed.

AREA NEWS





Greece

Hassam Allam Holding, Visit to Athens

AREA NEWS

On Wednesday 28 February, a delegation from Hassan Allam Holding visited the CCC main office in Athens to meet senior management following an invitation from Jamal Bahlawan, CCC General Manager, North Africa.

Hassan Allam Holding has been CCC's strategic partner in Egypt since 2002. Both companies, in joint venture, have delivered prestigious mega projects in the country. In addition to a strong pipeline of future projects, the joint venture is currently executing \$1.3 billion worth of projects in Egypt.

The delegation was headed by Hassan E. Allam (Group CEO) with the participation of Mohamed Dahshoury (COO - Hassan Allam Construction), Mohey Ahmed (Managing Director - Hassan Allam Construction) and Sherif Youssef (CEO - Hassan Allam Technologies).

The visitors were warmly welcomed by Samer Khoury and CCC senior management from the Athens office and North Africa who expressed their appreciation for the successful relation between CCC and Hassan Allam during the past fifteen years.



IPS Recognizes CCC Founders

Lebanon



On 2 March 2018, the Institute for Palestine Studies (IPS) in Beirut hosted a fundraising gala featuring the works of renowned Palestinian and Arab artists. Guests included intellectuals, artists, academics, and politicians.

IPS Chairman of the Board of Trustees Dr Tarek Mitri, Ambassador Lakhdar Brahimi, and IPS General Director Khaled Farraj dedicated medals of recognition to Hasib Sabbagh and Said Khoury, both of whom supported IPS since its inception and had served as Chairs of the Board of Trustees.

AREA NEWS



Suheil Sabbagh receiving the medal on behalf of his late father



“To Do Well, You Need To Do Good.”

The What and the Why of Corporate Social Responsibility (CSR)

“CSR....Simply because we Care” is not just a catchy slogan, but a genuine belief, translated into real action by CCC. Throughout the history of the company and even before the concept of Corporate Social Responsibility (CSR) became popular in the business world, CCC’s philanthropy was embedded in the founders’ beliefs and values. To them, as to the 92% of people who believe that business success should be measured by more than profit¹, it was and still is a conscious effort to give back to society. Maximizing the company’s profits always came in second to human development, employee wellbeing and social investment in the communities where CCC conducts its business.

While there is no universal definition of Corporate Social Responsibility (CSR), the World Business Council for Sustainable Development described it as “the business contribution to sustainable economic development”. Indeed, CSR is a broad concept used to describe a company’s efforts to improve society. These efforts range from donating funds to charities to implementing environmentally-friendly policies in the workplace. According to statistics from Double the Donation Research, corporations donated \$17.8 billion to charities last year, 55% of consumers are willing to pay more for products from socially responsible companies, and 93% of the world’s largest 250 companies now publish annual CSR Reports. Despite the fact that some critics have described CSR as a fad, a type of public relations tool, these statistics indicate that CSR has become a vital component for succeeding in our ever changing business world.

Furthermore, in the global business world, stakeholders, in the general sense of the word, are becoming highly attuned as to whether a business is socially responsible, as they prefer to be associated with companies who engage in programmes and projects that have a positive effect on communities. A company’s ability to practice social responsibility can be the difference between a potential client choosing CCC over a competitor. To give an example, according to the Nielsen Global Survey on Corporate Social Responsibility “55% of global online consumers across 60 countries say they are willing to pay more for products and services provided by companies that are committed to positive social and environmental impact.” Accordingly, effective CSR can improve a company’s operations, cut costs, make it competitive with other peer companies, and boost employee morale. It has been shown that companies with an active and effective CSR policy enhances employees’ engagement and assists companies to attract and keep



qualified personnel. More than two-thirds (67%) of respondents in Nielsen’s third annual global online survey on Corporate Social Responsibility say they prefer to work for a socially responsible company. Employees have also been shown to be more engaged and to perform better when

"To Do Well, You Need To Do Good." The What and the Why of Corporate Social Responsibility (CSR)

they feel good about their company's CSR involvement. According to a study by Society for Human Resources Management, companies with strong sustainability programmes had 55% better morale, 43% more efficient businesses processes, 43% stronger public image and 38% better employee loyalty.

The benefits for employees themselves are equally important. When employees contribute their time to worthy causes and engage in beneficial social activities, such as skill-based volunteering projects, they develop professionally and personally by furthering their technical expertise, and enhancing their intrapersonal skills. Participants in volunteering programmes report that leadership, innovation, communication, collaboration and teamwork are some of the main skills developed and most importantly volunteering gave them a sense of purpose and pride.

After carrying out a thorough review of 21 companies' CSR activities selected from Engineering New Records' (ENR) 2017 top 250 contractors, the following similarities were apparent. The majority of companies:

1. Have a giving strategy or a CSR policy framework in place.
2. Invested largely in impactful projects versus philanthropic donations.
3. Have built successful relationships with grass root non-governmental organizations with whom they cooperate to implement CSR activities, and
4. Publicized their CSR projects on their website which includes a press section where they post their press releases.

Their CSR projects ranged from water safety, climate change, to education, skill development and employment creation, and in some cases even bringing electricity to villages. For example, Bechtel rated number five on ENR's list focuses its CSR on access to clean water and disease prevention. In its effort to prevent water-borne illnesses in Weledi Village in Ethiopia, the company cooperated with Engineers without Borders to build latrines and hand-washing stations at the public marketplace. The project will impact nearly 10,000 people as the latrines will enable market vendors to keep their stores open longer, increasing their income to support their families. Another example is Samsung Engineering & Construction Group's flagship programme called "Samsung Villages". Through this programme, a team of the company's staff was directly engaged in building five villages in

South Korea, Indonesia, India and Vietnam. The employee volunteers dug foundations, stacked bricks and applied coats of paint by hand to build safe and clean homes and schools with working restrooms and running water.

At CCC, the management's commitment to making social responsibility a core component of CCC's operations is by itself one of the described prerequisites for improving the company's corporate responsibility practices and succeeding at it. CCC's corporate giving strategy as envisioned from the top is to improve the social and economic livelihood of marginalized and underprivileged communities. Its strategy and community development will include financial support for impactful projects and in-kind contribution in the form of volunteerism.

The decision to establish a CSR Department at CCC underpins the CCC founders' belief in "to do well you need to do good". The mission of the CSR Department is to build on CCC's philanthropic culture and promote it within the company, improve the welfare of its employees and enhance the long term economic and social sustainability of communities where CCC conducts its business. With focus on themes of crucial importance such as **1.** Education (formal and vocational training); **2.** science, technology and innovation; **3.** Health, and **4.** Humanitarian aid and relief, CSR plans to assess the needs of marginalized communities in which CCC operates, and build partnerships with local, public and private institutions to design, plan, and implement impactful projects that address those needs.

Internally, CSR plans to inform, motivate and engage employees in addressing challenges and societal needs, as well as encourage the culture of giving and volunteerism among CCC staff. In achieving its mission, CSR will look to the support of its volunteer CSR Lead Coordinators in the CCC project areas, and the CSR Committee.

There is a long road ahead of us to reach our destination and to see our positive social impact, but the vision of bringing a smile to a refugee child, or improving the livelihoods of vulnerable families makes it worth taking the trip. The way to improving the living conditions of needy people and to addressing inequalities is when more and more individuals and corporations and NGOs join together and embrace giving as the normal thing to do.



Contribution to CSR Initiative

CCC Staff are encouraged to come up with ideas and activities related to CCC's CSR Initiatives including **Going Green** and community involvement events. Please send your ideas, initiatives and achievements to "CSR-CCC" email address csr@ccc.net.

JORDAN

Train the Trainers in Advanced Welding Technology

A training course in Advanced Welding Technology was offered to 19 trainers of the government owned Vocational Training Corporation. The course ran for 65 hours and it featured training on:

1. Gas tungsten arc welding - bead weld - straight line - free weld on 6mm thickness plate.
2. Pipe welding technical knowledge - 6g position - gas tungsten arc welding - penetration technology.
3. Gas tungsten arc welding external weld 5g position (pipe diameter 2").
4. Gas tungsten arc welding butt weld and penetration and hot pass.
5. Shielded metal arc welding 3g position - external weld on 8mm plate.
6. Shielded metal arc welding and gas tungsten arc welding - butt weld - 6" pipe 6g position.

The course was delivered in Sahab Training Center by our trainers Mohammad Abu Atieh, Ziad Daraghmeh (Welding Trainers) and Mahmoud Al Zeirini (Safety Officer) under the supervision of Radwan Al Shammass (Training Supervisor).



Al Mouj Muscat Marathon 2018

Oman



For the second consecutive year CCC participated in the Muscat Marathon, but this year more effort was put into its organization.

Although the usual closing date for registration was 31 December 2017, we started the registration for the marathon ahead of time in order to give a longer period of time for the employees to enroll. The end of October 2017 was the registration deadline we set in order to give enough time to start the training of the runners for the race. 35 staff members registered for the race and they started training every Friday under the supervision of Stephan Mueller, the Area Contract Manager who is also an experienced long distance runner. Special T-shirts were made and distributed to the running participants.

The Marathon Day was set for 19 January 2018 and 35 employees participated. While only one of the CCC team members ran the full marathon, four ran the half marathon, 14 members participated in the 5km and 16 members in the 10km races. All the team members completed the races with good results, considering that for some this was their first experience of the kind. Everybody in the team enjoyed the event and expressed their interest in participating again the following year.

The positive outcome of employees' participation in the marathon race is that they continued to meet every Friday for a morning run, which is in line with our goal to encourage employees to follow a healthy life style.

The table shows the First place results.

1st Place	Event	Location
Stefan Mueller	Full Marathon	AMO
Ahmed Nigm	Half Marathon	RHOP
Hussein Taha	10K	MOO
Ali Khalfan	5K	RHOP



American University of Sharjah (AUS) Visit to Project Site



As part of CCC's Sustainability and Corporate Social Responsibility Programme, we are glad to inform you of the Al Zahia City Center Project's latest initiative which we carried out on the project site.

On Thursday, 15 February 2018 we received a delegation of civil engineering undergraduate students and three professors from the American University of Sharjah. Their visit was part of CCC's ongoing community outreach programme, the aim being to introduce them to our project, show the progress so far, explain the structure works and how this development will benefit the community and the surroundings.

In the presence of our client (MAF) and consultant (K&A) we started the programme by welcoming the visitors. Samer Haddad, Project Director, gave a speech and then a video about CCC's core business, principles and methods was shown. Subsequently, the MAF Civil Project Manager gave a presentation addressing the project scope of work, stakeholders and project details.

Our guests were given a site visit to the project to observe the structure works that include piles, pile caps, beams, hollow-core slabs, rafts and columns. The visit ended with a question and answer session, refreshments were served and the attendees were thanked for their visit.



CCC's First Annual Sustainability Competition Results

In August 2017, CCC's first annual Sustainability Competition was launched, striving to further promote sustainable behaviour across operations. The target was to encourage the implementation of internal best practices and recognize efficient and cost effective measures carried out at offices, projects and camps.

The submissions made by the CCC teams included various practical sustainability success stories, as shown in Table 1.

#	NAME	COUNTRY	CATEGORY
1	Bausher Waste Water (Madinat Sultan Qaboos)	Oman	Project
2	City Center Almaza	Egypt	Project
3	EPIC for Hamad International Airport Jet A1 Supply (JSPP)	Qatar	Project
4	Jazan Integrated Gasification Combined Cycle -Sulfur Recovery Unit (JIGCC-SRU) Camp	KSA	Camp
5	Jazan Refinery Utility (JRUP) Camp	KSA	Camp
6	Kazakhstan Camp	Kazakhstan	Camp
7	PEO Camp	Qatar	Camp
8	Riyadh Metro Project Camps	KSA	Camp
9	Water Mega Reservoir (WMR-C)	Qatar	Project

Table 1 - Project and Camp Participants

The criteria set for evaluating the entries considered all three dimensions of sustainable development- environmental, economic and societal. As a result, submissions were expected to demonstrate applications under the following categories:

- Energy Efficiency.
- Water Efficiency.
- Waste Management.
- Transportation Management.
- Renewable Energy.
- Economic, Behavioral & Environmental Impacts.

Additional significant evaluation criteria included:

- The use of facts and figures to support environmental reductions.
- Indication of financial savings (ideally through analysis such as a lifecycle cost assessment).
- Plans for the continuous improvement of applied initiatives.

Based on these criteria, the winners are as shown in Table 2.

CAMP CATEGORY	COUNTRY	SCORE (%)	RANK
Jazan Integrated Gasification Combined Cycle -Sulfur Re-covery Unit (JIGCC-SRU) Camp	KSA	87.2	1st
Riyadh Metro Project Camps	KSA	86	2nd
Kazakhstan Camp	Kazakhstan	70.2	3rd

PROJECT CATEGORY	COUNTRY	SCORE (%)	RANK
Water Mega Reservoir Project (WMR-C)	Qatar	73	1st
Bausher Waste Water (Madinat Sultan Qaboos)	Oman	57	2nd

Table 2 - Winning Projects and Camps

CCC's First Annual Sustainability Competition Results

FIRST PLACE-WINNING CAMP JIGCC-SRU (KSA)	FIRST PLACE-WINNING PROJECT WMR-C (QATAR)
Initiatives	Initiatives
Energy Efficient A/C Units Solar Water Heater System Solar Street Lights LED Lights	Water Dewatering water for dust control
Water Pressure Reducing Valves Reverse Osmosis Water Treatment Plant Efficient Laundry Equipment	Materials Advanced formwork system (technopolymer-based instead of plywood)
Sewage Sewage Treatment Plant Adjustment of Toilet Flush	Waste Reuse of construction waste Recycling
Estimated Annual Savings of 900,000 USD	Estimated Annual Savings of 400,000 USD

Table 3 - Estimated Annual Savings (per participants' calculations)

The winners' allocated prizes are participation in the following prestigious conferences:

Camps:

- JIGCC-SRU Camp: 50th Waste Expo, 23-26 April 2018, Las Vegas, USA.
- Riyadh Metro Project Camps: Greenbuild Europe, 16-18 April 2018, Berlin, Germany.
- Kazakhstan Camp: SUM 2018/4th Symposium on Urban Mining and Circular Economy, 21-23 May 2018, Bergamo, Italy.

Projects:

- Water Mega Reservoir Project (WMR-C): World Waste to Energy and Recourses Summit, 23-24 May 2018, London, UK.
- Madinat Sultan Qaboos (® Bausher Wastewater): Intersolar Europe, 19-20 June 2018, Munich, Germany.

These specialized conferences are training opportunities, offering the winning teams exposure to trends that CCC can capitalize on. With the intention to keep sustainability at high momentum within the organization, the above conventions will help to spur innovative ideas and best practice strategies applicable to CCC.



WMR-C Project Management Team, from left to right: A. Shkokani, N. Did, K. Hayek, N. Gaya, A. Eid, Ziad Kamel: Project Director, Talal Mhanna: HSE Manager, Rabih Rouwadi: Project Manager, MEICA, Mohammad Afroz: HSE Coordinator, Khaled El Cheikh: Section Engineer.

CCC's First Annual Sustainability Competition Results

SUSTAINABILITY



WMR-C Project - Advanced formwork system



JIGCC-SRU Camp-Sewage treatment plant



JIGCC-SRU Camp-Sewage treatment plant (Control)



RJIGCC-SRU Camp-Reverse Osmosis Water Treatment Plant



Bausher Waste Water (MSQ) Project-S. Al Jayyousi, H. Al Masri and the Off-grid Solar Cabin



Engagements and Marriages

Umar Gulzar Bajwa (ATD Oman) is delighted to announce his marriage to **Rabia Butt**. The wedding took place on 12 January 2018 in Gujranwala, Pakistan.



Baby Boys

Sherif Mangoud (JSP Project, Qatar) and his wife Doaa S. Emam are very glad to announce the birth of their baby boy named **Marwan**, born on 18 October 2017 in Cairo, Egypt.

Syed Ayaz Hussain (Jazan, Saudi Arabia) and his wife Syeda Tania Zehra Naqvi wish to present the latest member of their family, a boy named **Syed Muhammed Mehdi**. He was born on 28 November 2017.

Wahid L. Chaker (Area Office, Riyadh) and his wife are pleased to announce the birth of their first baby boy, called **Anas**. He was born in Saudi Arabia on 11 March 2018.

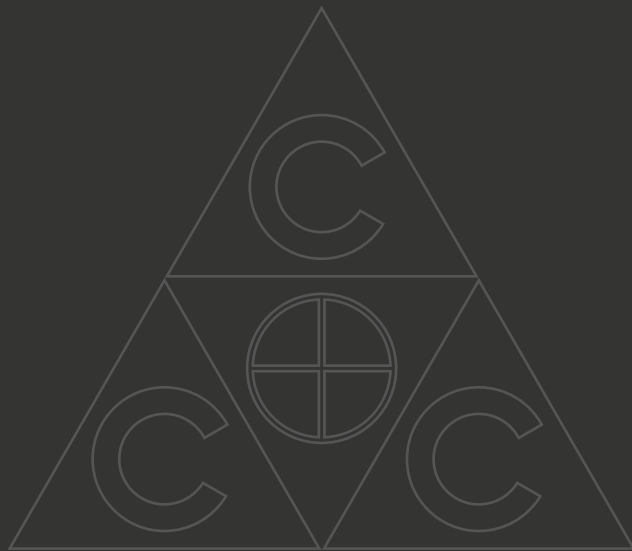


Baby Girls

Pramo R. Pilla (JRTF Project, Saudi Arabia) and his wife Devika are pleased to announce the birth of their first baby, a daughter named **Devatha**. She was born on 9 February 2018 in Kerala, India.

Ahmed Mohammad Khalili (MTB Project, Abu Dhabi) and his wife Safa Abu Zayed are pleased to announce the birth of their first baby girl called **Sham**. She was born on 21 February 2018 in Abu Dhabi. Their little princess has brought love, joy and pride to all the family.



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