



nec users' group NEWSLETTER

NEC delivers a fresh start for Hong Kong construction



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Welcome to this Hong Kong special issue of the NEC Users' Group newsletter.

As many readers will know, NEC has become a major force in the global construction and engineering industry since publication of the first edition in 1993. With the arrival of the third edition (NEC3) in 2005 and recent amendments in 2013, NEC3 contracts have successfully delivered thousands of multi-disciplinary projects around the world.

This special issue focuses on the rapidly increasing use of NEC3 contracts in Hong Kong and how they are transforming the region's construction industry. It provides a number of case studies which will give you a deeper insight into the application of NEC in Hong Kong.

Government commitment

Following successes on an initial tranche of 30 NEC pilot projects, most of which are still ongoing, the Hong Kong government has committed to using NEC3 contracts generally for all government projects tendered in 2015 and 2016 (see page 2).

The HK\$11 billion worth of pilot contracts range from various options of the NEC3 Engineering and Construction Contract (ECC) to the NEC3 Term Service Contract (TSC), NEC3 Professional Services Contract (PSC), NEC3 Framework Contract (FC) and the NEC3 Engineering and Construction Subcontract (ECS).

As described on pages 4 and 5 of this issue, they cover a wide variety of public works, from major drainage and sewerage schemes to hospital construction and infrastructure maintenance projects.

Private sector interest

Hong Kong's private sector is also showing considerable interest in using NEC3 contracts, with completed examples including a major private school campus and a new electricity substation for computer data centres (see pages 6 and 7).

The second phase of a new swimming pool is also now being delivered as part of the West Island Line railway project using ECC, a first for client MTR. The first phase was delivered using a traditional contract, so the outcome of this



project will be of particular interest to existing and potential NEC users.

Collaboration and synergy

NEC is renowned for its use of plain language and clear allocation of risks, which stimulates better management of the relationship between the contract parties (see page 7).

It is a suite of documents which promote a collaborative approach based on mutual trust instead of an adversarial relationship between the contractor and the client, resulting in time and cost savings and more successful project delivery.

Indeed NEC represents a true breakthrough in the way projects are procured and managed. It defines a fresh, more efficient approach to procurement of works, services and supply, raising the bar for project delivery. It is for these reasons that application of NEC3 contracts is expected to grow significantly in the Asia-Pacific region.

Supporting NEC implementation

Numerous initiatives to support implementation of NEC in Hong Kong are available. These include various training and networking events organised by the NEC Asia-Pacific Users' Group (see page 8), and the publication of a frequently asked questions (FAQ) booklet for easy reference by the Hong Kong Construction Industry Council (page 3).

I hope this issue of newsletter will give you both a further insight to NEC and in particular its application in Hong Kong.

▲ NEC3 contracts are currently being trialled in both the public and private sectors of Hong Kong's HK\$170 billion construction industry and will be used generally for all government works tendered in 2015 and 2016

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Hong Kong government's NEC journey: an interview with Wai Chi-sing

SIMON FULLALOVE EDITOR



Wai Chi-sing is the permanent secretary for development (works) of the Hong Kong Special Administrative Region Government and has pioneered the introduction of NEC3 contracts for public works in Hong Kong.

He has a civil engineering degree from the University of Hong Kong, a master's degree in transportation engineering from the Purdue University USA and professional qualifications in civil and geotechnical engineering. He was appointed permanent secretary in 2010 following a 30-year career in Hong Kong government works departments.

NEC Users' Group newsletter editor Simon Fullalove spoke to him recently.

You announced last year that NEC3 contracts will be generally used for government construction contracts in Hong Kong in 2015 and 2016. Can you elaborate?

Yes, for all new government works contracts tendered in fiscal years 2015 and 2016 (our fiscal years start in April) I have asked my works departments to use the full suite of NEC3 contracts as far as possible for extending our trial on the use of NEC3 contracts. If a works department has already decided on another form of contract for a particular project before April 2015, I will not insist they change it. So far we have completed three NEC3 pilot projects, have 14 more under way and a further 15 in various planning stages. These range from a HK\$10 million Professional Services Contract (PSC) to a HK\$3 billion Engineering and Construction Contract (ECC), with a total value exceeding HK\$11 billion (see table). Our total works expenditure is currently around HK\$70 billion a year so I expect a significant proportion of this being undertaken by NEC3 contracts by March 2017. We will then carry out a performance review of all NEC3 projects, both completed and under way, before deciding how to proceed. Based on my personal assessment I think we will continue using NEC3 contracts in the future.

What forms of contract do you normally use and what led you to NEC?

The most commonly used form of contract for public works in Hong Kong is the Hong Kong General Conditions of Contract. It is based on the former ICE Conditions of Contract and has been used for many years, but it tends to create an adversarial relationship between the contracting parties which in turn leads to disputes and delays. In 2000 the government appointed a committee chaired by Henry

Tang to conduct a review of the Hong Kong construction industry and identify measures to improve performance. The committee observed that the industry lacked a teamwork culture so, as soon as its report was published in January 2001, we started introducing a non-contractual partnering arrangement into the Hong Kong General Conditions of Contract. We also started to shift our focus from dispute resolution towards dispute avoidance and, since 2005, we have been appointing dispute resolution advisers on most of the bigger contracts to help resolve disagreements as soon as they arise. In parallel we reviewed the Hong Kong General Conditions of Contract to see if we could convert the non-contractual partnering arrangement into a contractual partnering obligation. However, this proved too difficult – it basically meant overhauling the entire conditions of contract. So, since the NEC3 suite with its inherent partnering was already available, we decided to try it rather than attempting to produce our own partnering-based contract. That is the journey we have been on.

What do you see as the main benefits of NEC over conventional contracts?

The main benefit of NEC3 contracts over conventional contracts is that they have partnering built in, encouraging the two contracting parties to work together to solve problems. An NEC feature we especially like is the risk-sharing mechanism in some of the options. The pain share / gain share mechanism basically drives the contracting parties to the common goal of completing the works at the lowest cost and in the shortest possible construction period. The NEC early warning system for advance notification and reduction of risk is also very good, encouraging the contracting parties to act together to deal with risk instead of not addressing it and trying to mitigate its effects later on. Overall it is NEC's collaborative spirit that

helps to improve contract management, increase cost-effectiveness and improve project outcomes.

How are the NEC3 pilot projects going so far?

For the three NEC3 contracts completed so far the results are very positive. They were all on time and within budget, and one of the contracts finished 6 months earlier than the completion date and the final construction cost was 5% lower than the final target cost. So yes, the initial outcome is very good. Our main concerns relate to the expertise required to get the most from NEC3 contracts. We require sufficiently trained professionals in Hong Kong – especially engineers. We note that some of the contractors misuse some of the features in NEC3 contracts, in particular compensation events. We are thus currently working on how to deliver more training for both government and industry staff to ensure we can make full use of and get full benefit from NEC3 contracts.

And what about the private sector?

Certainly the private sector is also showing considerable interest in NEC3 contracts, with a number of trial projects already underway. Organisations such as MTR and CLP are very likely to follow the government's lead and both have recently let NEC3 contracts. And while we cannot impose anything upon private developers, they too are expressing serious interest – not least the Hong Kong Academy, which completed a campus last year under an ECC option C. The private sector is represented on the Hong Kong Construction Industry Council, which will be promulgating reference materials on using NEC3 contracts, so we hope all sectors of the construction industry will soon start switching over. In addition, main contractors on NEC projects are also beginning to let

Project	NEC3 contract	Value: HK\$ million	Completion date
Completed projects			
Fuk Man Road nullah (see page 4)	ECC option C	76	May 2012
Noise barriers on Fanling Highway	ECC option C	207	Dec 2013
Noise barriers on Tai Po Tai Wo Road	ECC option C	82	May 2014
Current projects			
Improvement to Pok Oi interchange	ECC option C	265	Sep 2015
Improvement of fresh water supply to Cheung Chau	ECC option C	182	Nov 2015
Slope maintenance term contract for New Territories and outlying islands (see page 5)	TSC option A	404	Mar 2016
Tin Shui Wai hospital (see page 4)	ECC option A	2968	May 2016
Lam Tsuen Valley sewerage	ECC option B	173	May 2016
Pak Hok Lam trunk sewer and Sha Tau Kok village sewerage	FC + ECC option B	187	Aug 2016
Yuen Long and Kam Tin sewerage, stage 3	ECC option D	145	Sep 2016
Maintenance contract for seawalls and navigation channels	TSC option A	98	Oct 2016
Building and civil maintenance and minor works to Drainage Services Department plants and facilities	TSC option A	160	Nov 2016
Maintenance contract for piers	TSC option A	95	Mar 2017
Happy Valley underground stormwater storage (see page 4)	ECC option C	678	Dec 2017
Management and maintenance of high-speed roads in east New Territories and Hong Kong Island	TSC option A	490	Mar 2019
Landslip prevention and mitigation programme 2013 – investigation, design and construction supervision	PSC option C	16	Q4 2019
Drainage improvement works in Happy Valley – investigation, design and construction supervision (see page 4)	PSC option G	9	Q4 2019

Hong Kong government NEC3 pilot projects at August 2014. **Key:** ECC – Engineering and Construction Contract, PSC – Professional Services Contract, TSC – Term Service Contract, FC – Framework Contract. ►

NEC3 subcontracts, recognising the benefits collaborative working can bring to their own supply chains.

What are the main challenges to making the switch?

As I have already mentioned, training is probably the biggest challenge to the universal adoption of NEC3 contracts in Hong Kong. The government has been providing extensive NEC training for our professional engineers and technical staff. A total of around 2000 staff have already received some NEC training, including 70% of our just over 2500 professional engineers, though much of this is just preliminary rather than in-depth training. Some of the courses we organise are open for our contractors as well. In addition, quite a number of our contractors are organising training for their own staff – not least because they will have to employ formally NEC-trained staff in order to win government contracts in 2015 and 2016. We generally source our training from experienced practitioners including those from UK and local training organisations.

Do you think the new NEC3 ECC project manager accreditation programme will help?

Yes, I have personally studied the details of the ECC project manager accreditation course. I think it is a very intensive course – much more so than the other NEC courses we have so far

provided for our staff. It looks very useful and I believe it will help us to build the capacity of our project managers on ECC contracts. I have thus asked our works departments to nominate staff to take part in the course and so far we have around 40 candidates. We will arrange the accreditation courses for these people later this year and will continue to put our engineers through them if they prove worthwhile.

Can universities help?

I think it is vital that procurement and associated management subjects including NEC are taught on construction and engineering university courses. This will give future graduates a better grounding in these topics and make them more adaptable to working in a collaborative environment. I am currently a member of the advisory committees of the civil engineering departments for both the University of Hong Kong and the Hong Kong Polytechnic University, and I am pleased to note they are both now putting more emphasis on procurement in their curricula.

NEC3 contracts are fostering collaboration on Hong Kong government projects. Clockwise from top: DSD Happy Valley storage project stakeholder workshop, ArchSD Tin Shui Wai hospital team partnering and collaborative workshop, ArchSD New Territories slope maintenance partnering and collaborative workshop, DSD plant maintenance partnering workshop, DSD Fuk Man Road nullah joint dragon boat team. ►

What would you say to construction professionals in other parts of the Asia-Pacific region?

Having been in the construction industry in Hong Kong for over 30 years I am determined to change the prevailing adversarial attitude. As the old saying goes, 'divided we fail'. My message to fellow engineers in the Asia-Pacific is just one word: 'collaboration'. I think the construction industry, not only in Hong Kong, but also right across the world needs collaboration among all the parties involved, in particular as projects get more and more complex and increasingly difficult to deal with.



NEC3 contracts help industry switch to collaborative working



SING-MO HO CHAIRMAN, CONSTRUCTION INDUSTRY COUNCIL NEC3 TASK FORCE AND CHIEF PROCUREMENT OFFICER, CLP POWER

The Hong Kong Construction Industry Council (CIC) supports all forms of partnering and collaborative relationships with contractors, including contractual partnering and non-contractual partnering. This is set out in CIC's 2010 publication *Guidelines on Partnering*.

For contractual partnering, there are two main approaches in Hong Kong. Some employers modify their normal form of contract to incorporate a partnering spirit and/or clauses. In more recent years, other employers have selected a different form of contract, such as NEC, that is specifically written for a partnering or collaborative relationship. In the latter case, employers in Hong Kong invariably choose NEC3 contracts despite there being other forms of contract available. Early users are responding positively to its effectiveness.

CIC's committee on procurement and subcontracting has thus set up a task force on NEC3 collaborative contracts to help promote partnering and collaborative working further.

NEC3 FAQ document

Given the increasing use of NEC3 contracts in Hong Kong and in particular in the public sector, the NEC3 task force has drafted a collection of frequently asked questions (FAQ). This is designed to inform industry participants of these relatively new forms of contract to the Hong Kong market and to share knowledge and experience on their practical application.

Principally, the FAQ document is intended to assist

- construction practitioners – including employers, consultants, contractors and sub-contractors – in deciding whether or not to adopt an NEC3 contract for their specific projects
- construction practitioners already engaged in NEC3 contracts, in seeking ways to manage their contracts effectively
- construction practitioners using traditional forms of contract, non-contractual partnering contracts and other forms of partnering contracts, to learn from the valuable experience gained in relation to NEC3 contract management practices.

The FAQ document is being prepared and expected to be published either this year or early next year. Once published, it will be available on the CIC website. It is believed that the publication will serve as a quick and useful reference to industry participants, in addition to the previous *Guidelines on Partnering*, on the use of NEC3 as a form of collaborative contracts in Hong Kong.

Gaining momentum

Current experience on the use of NEC3 contracts in the Hong Kong construction industry is relatively limited. However, we are pleased to

see that the contract suite is gaining momentum over the past few years through increasing use in both the public and private sectors.

We do hope that the FAQ document can serve its purpose as a useful reference document, aiding construction practitioners to cope with the ever-changing business environment through collaborative working relationships.

I am pleased to report that we are currently working together with the NEC office to deliver NEC accredited training programmes and events in Hong Kong. Subject to approval from the CIC, we intend to announce the dates for the first NEC3 ECC project manager accreditation to run in Hong Kong later this year. Further announcements will be made in future issues of the NEC Users' Group newsletter and at the Users' Group conference on 10 October.

Footnote from NEC UK: NEC UK sees CIC as a trustworthy local link in Hong Kong to maintain the appropriate standards required for its NEC3 ECC project manager accreditation programme, which will be further extended in 2015. Whilst CIC itself will not be involved in direct training, it will help guarantee standardisation of the trainers in the market for NEC training. CIC's *Guidelines on Partnering* provides a useful introduction to NEC3 contracts and will soon be joined by a document on NEC3 frequently asked questions.

Fuk Man Road nullah improvement paves the way for NEC adoption

ELLEN CHENG SENIOR ENGINEER, DRAINAGE SERVICES DEPARTMENT

The HK\$76 million Fuk Man Road nullah improvement project was the first of the Hong Kong government's NEC pilot schemes to be completed. Its success in 2012 helped pave the way for the wholesale adoption of NEC3 contracts for public-sector work from 2015.

The Drainage Services Department (DSD) project was designed to improve the local environment of Sai Kung town, known to many as the back garden of Hong Kong. It involved decking over an existing 180 m long 12 m wide open nullah, constructing a 4000 m² urban park over the top and upgrading an adjacent roundabout.

The Development Bureau chose the Fuk Man Road scheme in 2006 to be the first to trial the NEC3 Engineering and Construction Contract (ECC). An ECC option C (priced contract with activity schedule) was subsequently awarded to contractor Chun Wo Construction & Engineering Company Ltd in August 2009.

Partnering workshop and training

The project team adopted a number of measures to make the contract work. First, a partnering workshop and NEC practical training sessions were arranged for DSD, the consultant and the contractor at the beginning of the

contract. These were designed to bring about a change in mindset, from a traditional adversarial to a partnering approach, and to ensure a common understanding of the ECC contract conditions.

Secondly, DSD engaged an NEC adviser to guide the project team throughout the project to work with a partnering spirit and to comply with the contract requirements. A common office was adopted for the project so that the project manager, the consultant and the contractor could sit side by side to facilitate more effective daily communications. At the time this was a highly unusual arrangement for government contracts in Hong Kong.

Throughout the project, regular meetings among senior management of the three parties were held to monitor performance and jointly solve problems as they arose. The NEC early warning and pain / gain share mechanisms promoted joint and prompt problem solving.

With such good relationships established, the

project team arranged joint functions, such as public relations events, joint charity activities and even dragon boat races.

Ahead of time and under budget

The project was finished in May 2012, six months ahead of its original 39 month programme and 5% below the final target cost.

In addition to the significant cost and time savings, ECC fostered the creation of a project team with a partnering spirit and collaborative working culture. This resulted in high job satisfaction of staff working on the project, which differed quite significantly to other government contracts in terms of working culture.

DSD's NEC-procured marine-themed park over Fuk Man Road nullah includes water-drop-shaped seating, a 30 m long play ship and an 8 m long brass and stainless steel dragon-boat sculpture weighing 3 t. ▶



Designing and building Tin Shui Wai hospital: NEC's biggest test

DAVID CHAK CHIEF PROJECT MANAGER, ARCHITECTURAL SERVICES DEPARTMENT

At an estimated HK\$2.91 billion, the Tin Shui Wai hospital project being procured by the Architectural Services Department (ArchSD) is currently the largest NEC project underway in Hong Kong. It is also the first government-procured NEC design and build project.

Contractor Leighton-Able joint venture started on site in February 2013 and is scheduled to

complete the project by mid-2016. The result will be a new 12-storey general hospital with 300 in-patient and day beds, strengthening healthcare provision in Tin Shui Wai and New Territories West.

Driven steel H-pile foundations have been adopted to suit the geological profile and achieve an economic design. The main structure is reinforced concrete, with multiple reinforced concrete cores distributed evenly over the floor plan together with regular beam-column rigid frames. The exterior is finished with a mixture of smooth curtain walling and rustic granite cladding, while warm-coloured materials are used throughout the interior.

ECC option A chosen

Owing to a substantial volume of complicated specialist works and the high technical and managerial skill required to design and build the project, the NEC3 Engineering and Construction Contract (ECC) option A – priced contract with activity schedule – was considered to be the most suitable NEC form.

By using a lump sum option for such a sizable contract, it is envisaged that both the client and contractor will benefit from NEC's contractual partnering and non-traditional

contract procedures, such as early warnings and compensation events.

To cater for the contractor's design responsibility, the works information defined the corresponding scope and requirements in accordance with the provisions of ECC. The well-developed status of the project in terms of the employer's requirements during the pre-contract phase supported the use of an activity schedule.

Partnering development

With support from the top management of both contracting parties, plus their active participation in a series of NEC partnering workshops with the project teams and regular collaboration meetings, there has been an on-going partnering development on the project.

While room for improvement has been recognised at times for areas such as effectiveness of communication, the project team's mind-set is certainly changing towards collaborative working and a 'sort it now' approach.

With proper application of NEC procedures and continual improvement in communication, there is a strong belief that effective partnering will be maintained throughout the project, helping to ensure its completion on time and budget.



▶ Due for completion in mid-2016, ArchSD's HK\$2.91 billion Tin Shui Wai hospital is the largest NEC project in Hong Kong and the first government-procured NEC design and build project

Happy Valley drainage schemes provide test bed for ECC, ECS and PSC

LUK WAI-HUNG CHIEF ENGINEER, DRAINAGE SERVICES DEPARTMENT

Improving the drainage of the Happy Valley area in Wan Chai is providing a range of opportunities to pilot NEC3 contracts in Hong Kong, with some forms being used for the first time.

The HK\$678 million Happy Valley underground stormwater storage scheme is the largest NEC3 Engineering and Construction Contract (ECC) option C (target contract with activity schedule) awarded by the Hong Kong government to date. It is also the first in Hong Kong to trial the NEC3 Engineering and Construction Subcontract (ECS).

In addition, a recently let HK\$9 million project to investigate, design and supervise drainage improvement works in the Happy Valley area is the government's first NEC3 Professional Services Contract.

Underground storage scheme

The underground storage scheme involves construction of a 60 000 m³ underground stormwater storage tank, a pump house, a 650 m long twin-cell box culvert and associated works including reinstatement of sports pitches and landscaping. Contractor Chun Wo started works for the Drainage Services Department (DSD) in September 2012. The first phase of the scheme is due for completion in early 2015 with overall completion following in March 2018.

A number of measures have been implemented on the project to promote mutual trust and co-operation between contracting parties and stakeholders. DSD and cost audit consultant Mott MacDonald and NEC advisor EC Harris arranged a series of practical training workshops at the start of the contract and then on an annual basis to promote the NEC partnering spirit with contracting parties.

DSD also arranged partnership workshops with all stakeholders – including the Hong Kong Jockey Club, Leisure and Cultural Services Department, Hong Kong Football Club, Wan Chai District

Council and representatives from neighbouring schools – to show their concern and care for them. This built a spirit of trust and partnership among all stakeholders, enabling them to work with the project team and contractor to minimise the impact to the public.

A pain/gain share mechanism was then implemented to set common goals for the employer and contractor. This ensures that the project manager and contractor collaborate closely to optimise progress, resources – including people, plant, equipment and materials – and ultimately reduce the cost of the contract. It also encourages innovation and cost saving. For example, the contractor proposed an alternative design for the tank foundation that offered a cost saving of around HK\$70 million. DSD promptly accepted the proposal to reduce costs and the risk of delays.

In addition, a risk register was established at the pre-contract stage and is being monitored and updated throughout the project. Both the project manager and contractor issue early warnings to each other whenever there is likely to be a risk and arrange risk reduction meetings to identify mitigation measures for proper risk management.

Box culvert sub-contract

In a first for a Hong Kong government project, the Happy Valley underground storage scheme contractor subcontracted a 380 m long box culvert under an NEC3 ECS option B (priced contract with bill of quantities).

The use of NEC3 terms for both main contract and subcontract provided a common platform for the project manager, contractor and subcontractor, especially in dealing with compensation events and risk management. With uniform use of the NEC3 risk management mechanism, all contracting parties can work

collaboratively and have site problems resolved rapidly to ensure timely completion of the works.

Drainage works consultancy

In April 2014 DSD also awarded the government's first PSC option G (term contract) to Black & Veatch Hong Kong Limited for a 5 year consultancy contract in the Happy Valley area. The HK\$8.9 million contract involves investigating and designing drainage and sewerage improvement works at 13 distinct locations in Happy Valley and Causeway Bay, and providing technical support DSD to supervise their construction.

PSC option G was chosen to manage the implementation programme for the various locations of works, addressing the complicated nature of the construction and the requirements for coordination with other utilities and public works projects in each area. Option G will also allow flexibility in changing the scope of services for both the extent of works and the time of service provision by the consultant via the 'task order' mechanism.



▲ The DSD Happy Valley underground stormwater storage site is within the horse-racing track of the Hong Kong Jockey Club and impacts many other leisure users – NEC's collaborative approach has greatly facilitated relationships with stakeholders

New Territories slope maintenance term contract pioneers TSC

HY CHAN CHIEF PROPERTY SERVICES MANAGER, ARCHITECTURAL SERVICES DEPARTMENT

The HK\$400 million, 4 year term contract for slope maintenance in the New Territories and northern outlying islands was the Hong Kong government's first to be procured using the NEC3 Term Service Contract (TSC).

It was also the first NEC contract to be awarded by the Architectural Services Department (ArchSD), with contractor China Road and Bridge Corporation being appointed in April 2012.

In all other aspects the project is similar to other regional slope maintenance term

contracts procured by ArchSD, with the scope encompassing delivery of routine as well as ad-hoc slope and vegetation maintenance services and works. The TSC is ideally suited to this, with ad hoc works procured via task orders.

Option X19 task orders

Amongst the three main options available under TSC – option A (priced contract), option C (target contract) and option E (cost-reimbursable contract) – option A was selected.

Its contractual approach, with a price list and task order mechanism via secondary option X19, is capable of accommodating the employer's needs using the schedule of rates for term contracts published by ArchSD.

While the risk for slope maintenance term contracts is relatively low due to certainty and a well-defined scope of maintenance services, and the task orders are generally minor in nature, the selection of option A offers another advantage of allowing the employer's and contractor's resources to be better deployed.

Active partnering relationship

Entering into the third year of the term contract, an active and positive partnering relationship has developed steadily through top management engagement as well as partnering workshops, regular risk-reduction meetings and close collaboration between the client and contractor.

Certainly the partnering culture in NEC contract administration requires a continual commitment from both parties to sustain its success.

Hong Kong Academy: Asia's first private-sector NEC building

STEVE PORTER PRINCIPAL AND MANAGING DIRECTOR, EVANS & PECK

Hong Kong Academy is an independent, non-profit, co-educational day school for over 560 children aged from 3 to 18 years. In August 2013 the school moved to a new purpose-built campus at Sai Kung in the New Territories, marking successful delivery of Asia's first private-sector NEC building project.

The new 20 000 m², five-storey campus features classrooms, learning support facilities, an international standard gymnasium and a multi-use performance space containing a 350-seat auditorium. The project has been designed and built to achieve the highest platinum rating under the Hong Kong building environment assessment method BEAM Plus, with a wide range of innovative and efficient cooling, lighting and water systems.

Following a period of early contractor involvement, main contractor Leighton Asia delivered the main construction works under an NEC3 Engineering and Construction Contract (ECC) option C (target cost with activity schedule) with a target contract value of HK\$365 million. Specialist contractors were engaged using the NEC3 Engineering and Construction Short Contract (ECSC) and all contracts were administered by Evans & Peck, which has extensive experience of advising on the NEC suite for Hong Kong government projects.

Early contractor involvement and NEC

Evans & Peck was originally engaged by the client in 2010 to advise on procurement. The challenge was to provide the client with an early start to construction while design was still progressing, to provide certainty of delivery on time, and to provide some ability to accommodate design development during construction while managing within a fixed budget.

The solution recommended by the firm was for early contractor involvement followed by use of ECC option C for the main works and ECSC for specialist elements. Evans & Peck was subsequently appointed as project manager for the fast-track procurement, design and construction stages, with responsibility for finalising the design concurrently with construction and managing the project budget, programme and commercial arrangements.

After construction started in June 2011, the firm administered the main contract and a number of specialist contracts with a full-time site presence, working closely with the client's and contractor's project teams. The firm also provided collaborative working services to assist the teams to work in partnership.

Accommodating design changes

The ECC target cost option allowed the

contract to be signed and work to get under way on site while the design was still being completed. The collaborative and target cost elements of the contract also allowed a range of design changes to be accommodated as the client's requirements evolved during the duration of the project.

Transparency of the contractor's costs and implications of changes allowed the client to evaluate in real time if design changes could be afforded or needed to be adjusted. This flexibility was important in the many adjustments required to achieve a provisional BEAM Plus platinum rating.

Evans & Peck used 4Projects NEC3 Manager, one of two NEC licenced content providers, to help administer project files, contractors' submissions and the work flows for compensation events, early warnings and project manager's instructions.



◀ Hong Kong Academy at Sai Kung was Asia's first private-sector NEC building project

Kennedy Town swimming pool: MTR sets up head-to-head for NEC

MALCOLM O'NEILL CONTRACT ADMINISTRATION MANAGER, MTR CORPORATION

How do you know if NEC is actually better than your tried-and-tested procurement model? MTR Corporation has decided to find out by using each one to build the first and second phases of a community swimming pool, part of its West Island Line extension project.

Started in 2009, the extension project involved adding 3 km of track to the west of Sheung Wan station, with new stations at Sai Ying Pun, Hong Kong University and Kennedy Town – the latter being on the site of a community swimming pool.

The extension is due to come into operation later this year. It was procured using MTR's traditional fixed-price, lump-sum contracts and two target-cost contracts, with contract selection governed by the degree of unforeseen risk associated with delivery and the party best placed to deal with those risks.

One pool, two phases

Unusually the re-provision of Kennedy Town swimming pool is being undertaken in two distinct phases, with one at the start of the project and one at the end.

Phase one commenced on 14 July 2009, was completed on 14 March 2011 and the draft final account was settled with contractor Paul Y within 3 months of completion. There were a significant number of minor construction clarifications and a number of variations along the way.

Collaboration was achieved using MTR's non-contractual partnering ethos and a willingness from both parties to avoid any wastage in time or resources.

For phase two MTR has decided to tender the work with an NEC3 Engineering and Construction Contract (ECC) option A (priced contract with activity schedule). All available members of the MTR's phase one project team will also be working on the project to enable a direct comparison as possible with phase one.

The pool is a critical community project, involving several major stakeholders, each with their own concerns and expectations. Work is further complicated by being in a part of town that dated back to 1950s, with few or no records of utilities or ground obstructions.

Tenderer collaboration

MTR has invited five contractors to tender for phase two. It has also initiated shared NEC training sessions with its own personnel and the tenderers, followed up with individual exchange sessions with each of the tenderers' proposed project delivery teams. This has enabled the teams to understand and appreciate the involvement and level of expertise of the potential contracting parties.

Feedback so far is that NEC appears to be more challenging, structured and programme-driven

and will require a shift in mindset and discipline. However, the ECC option A and relevant secondary clauses have not been changed, apart from a few necessary tweaks to achieve MTR's project division compliance standards. In particular, the need for Z clauses has been avoided, unlike other NEC pilot projects currently underway in Hong Kong.

The phase two tenders were received in June 2014 and will be awarded later in the year. Within a couple of weeks of contract award MTR will put in place a comprehensive training and exchange programme so we can jointly launch the contract in a true spirit of mutual trust and co-operation. The contract is due to commence in September 2014 with completion due in late 2016.

A real challenge for NEC

Given the success of phase one of the swimming pool under MTR's conventional approach, the minimal changes to ECC option A and the retention of most of the phase one team, it will be interesting to see if NEC can rise to the challenge and improve the delivery of phase two over phase one.

MTR is keen to compare, in a very practical way, the contract intent and softer collaboration and problem-solving aspects of NEC with its own conventional procurement model. Watch this space!

Chun Yat Street substation: CLP's first NEC superstructure contract

ANDREW CHAN SENIOR PROJECT ENGINEER, CLP POWER HK

Completed in December 2013, the Chun Yat Street 132 kV substation in the Tseung Kwan O industrial estate represents a number of firsts for client CLP Power.

It is Hong Kong's first substation specifically for data centres, featuring segregated twin switchgear rooms to ensure uninterrupted power supply. It was also built in the shortest time in CLP's history, taking just 3 years from conception to commissioning.

And finally it was CLP's first use of NEC to deliver a building superstructure. The company is one of Hong Kong's first private-sector NEC users.

Delivered using ECC option B

Chun Yat Street superstructure contractor Hip Hing Construction Co. Ltd. was engaged in November 2012 under an NEC3 Engineering and Construction Contract (ECC) option B (priced contract with bill of quantities).

Originally planned to take 15 months, the superstructure works were safely and successfully

completed 6 weeks early. This was thanks to perceived programme risks to the project completion date being captured and mitigated in a timely fashion.

ECC effectively encouraged a collaborative working relationship among all parties. It also defined clear roles and responsibilities for everyone and led to project team members proactively adhering to time-critical events and notifications.

Stringent programme control was primarily achieved through procedures embedded within the contract. Indeed it is these procedures which differentiate NEC from conventional contracts, namely: early availability of the programme, the need for a transparent and realistic programme, and the requirement for contractual risk-reduction meetings.

Early and realistic programme

Submission of the first programme for acceptance was required within 1 week of signing the contract, and thereafter at monthly intervals.

To ensure the completion date was achieved, the dates of planned completion and completion date were clearly identified on the programme. The terminal float time between the planned completion and completion date was the early foresight to predict delays and prompt initiation of programme mitigation measures if needed.

Critical activities with float time were clearly shown in the monthly accepted programme. The float time was time-risk allowances due to the possible programme downtime in seasonal inclement weather, delays of material delivery,

delays of statutory consent and so on. These risks were owned by the contractor and therefore the float was also owned by the contractor.

The programme components were more transparent and realistic than conventional contracts, giving CLP a better understanding of project progress. Extended time due to additional works was also included to reflect accurately the planned completion and completion date for programme monitoring.

Contractual risk-reduction meeting

The contract encouraged the contractor to forewarn CLP of any programme and cost risks during the course of construction. The contract operated well under the collaborative mindset among project team members, helping them to mitigate risks as early as possible.

There were no penalties if the contractor failed to give early warning. However, a penalty was applied if a compensation event was not formally notified to CLP within 8 weeks if that event might have delayed completion. In such a case the contractor would not have been entitled to any extra time and cost.

Monthly risk-reduction meetings were conducted to capture all risks. The effects of these programme risks were then reflected in the monthly accepted programme.

Conclusion

Overall the Chun Yat Street substation project was a great success and proved the benefits of using NEC3 contracts over conventional contracts.



◀ The superstructure for CLP's Chun Yat Street 132 kV substation was completed within budget and 6 weeks early using ECC option B

A contract revolution

PETER CLAYTON PARTNER, PINSENT MASON

When NEC is talked about in Hong Kong there is frequent reference to the all-important 'spirit of mutual trust and co-operation' and the early warning procedure. These key elements are fundamental to maximising success, but the different contractual approaches taken by NEC are also revolutionary for Hong Kong.

Clarity and simplicity

Hong Kong's traditional contracts (public and private) tend to be lengthy and legalistic on larger projects. Contracts often incorporate numerous tender addenda, supplements, tender queries and multiple specifications which often overlap. It is sometimes a major undertaking to establish what a contract finally comprises and there is frequently potential for ambiguities and inconsistencies.

The short and simple approach of NEC is markedly different and to be welcomed. NEC's guidance and recommended approach to preparing works information in a clear and concise manner using objective language and standards should, over time, assist the Hong Kong construction industry to reduce the complexity of some of its contractual documentation.

Diversity of procurement

Historically, much of Hong Kong's construction work has been procured using contracts based on bills of quantities. However, a feature of the government's NEC pilots has been the trialling of different main options, most of which do not use bills. It is a significant shift and requires a detailed understanding of NEC procurement models to tender and administer contracts successfully.

Also, claims and disputes in Hong Kong have often revolved around rates and adjustment of rates – something that will not arise on NEC contracts where claims are addressed using a cost-based approach unless agreed otherwise.

Proactive claims resolution

Traditional Hong Kong contracts generally allow time and money claims to be considered retrospectively taking account of actual delays and costs. There is invariably provision for a final account, which may take considerable time to resolve even where no formal dispute resolution is required.

The NEC approach is radically different. Where a compensation event arises then prompt notification is required and entitlement

is resolved through a rapid quotation and assessment process. To the extent the effects of a compensation event have not been felt at the time of notification, then prospective assessments are made based on forecast effects, which can include risk allowances.

Furthermore, assessments will not be re-opened if they prove to be inaccurate. This means claims can be resolved earlier and that no final account process is necessary (none is provided for by NEC).

Conclusion

The long-term measure of success of NEC in Hong Kong will probably depend on whether protracted disputes and arbitration can be avoided – something traditional forms have conspicuously not always achieved.

Avoiding disputes often depends on the ability and willingness of the parties to operate the proactive NEC machinery properly and promptly. This requires adequate resources to operate the contract – but hopefully fewer after completion to resolve claims. It also means ensuring key staff are empowered to make bold decisions, such as agreeing prospective assessments of cost and risk allowances for a compensation event.

In addition it means ensuring those preparing quotations for compensation events are realistic and fair in their forecasts. All of which brings us back full circle – to mutual trust and co-operation.

Introducing the NEC Asia-Pacific Users' Group



IVAN CHEUNG SECRETARY, NEC ASIA-PACIFIC USERS' GROUP

Established in 2011, the NEC Asia-Pacific Users' Group is now in its fourth year. The role of the group is to provide an official platform for NEC users seeking support in their application of the NEC suite of contracts. Currently the Asia-Pacific Users' Group has 38 member organisations consisting of clients, consultants, contractors and surveyor organisations (see members list).

Members of the Asia-Pacific Users' Group have access to local forums which include seminars and workshops that bring NEC users together to exchange information and experience. These forums are commonly delivered via a mixture of local and overseas speakers, who provide different

perspectives from their respective regions and share their user experiences with members.

Annual conference

Each year, members also gain access to the annual NEC Asia-Pacific Users' Group conference, which is to be held this year on 10 October 2014 at Langham Place. In addition to this, there are ad hoc breakfast meetings held at regular intervals with the aim of providing networking opportunities for members while providing technical support to local practitioners.

Members also have access to a helpline facility, which provides technical support on the use of

the contracts. There are regular updates via the NEC Users' Group newsletters on the development of the contract as well as frequently asked questions and an event and training calendar.

Given the increasing popularity of NEC in the region, particularly in Hong Kong, all construction industry practitioners should consider taking advantage of the many benefits which the users' group can provide.

The current secretary is Ivan Cheung of Driver Trett. For more information on the Users' Group and how to join, please contact Ivan via ivan.cheung@drivertrett.com or visit www.necontract.com/users_group/index.asp.

Research on NEC in Hong Kong

JOSEPH BARRY MARKETING MANAGER, NEC

The growing usage of NEC contracts around the world has also attracted increasing interest from academia. Dozens of research projects and case studies on NEC implementation have been or are being written, either as part of degree submissions or for publication in peer-reviewed journals.

The NEC Users' Group supports such studies wherever possible, either by encouraging members to take part in questionnaire surveys or through publishing the results on the NEC website.

One the latest studies to be posted on the website is entitled 'An analysis of the use and

implementation of NEC vs traditional forms of contract in the HK construction industry'. The study was written last year by Robert Dickson as part of a dissertation for an international construction management degree at Bath University in the UK.

More education needed

Bearing in mind the report was written nearly 12 months ago, Dickson concluded rather presciently, 'NEC has potential to provide significant benefits to the industry and there is a lot of enthusiasm surrounding its growing stature in the region. However, there are fundamental

issues and barriers to change, predominantly the existing culture and change in mind-set that is required.

'The government needs to continue to drive the changes and ensure that it administers the contract in its intended form. To be wholly successful, it will eventually require the buy-in of the majority of the industry, which it currently does not have. Much of this seems to be due to a lack of awareness, so the industry must work hard to educate professionals into understanding the processes and benefits of NEC'.

The dissertation can be downloaded from www.necontract.com/hongkongresearch.

NEC Asia-Pacific Users' Group members

Airport Authority Hong Kong
APM (HK)
Beria Consultants Ltd
BK Surco Ltd
Chun Wo Construction & Engineering Co Ltd

Civil Engineering & Development Department, HKSAR Government
CLP Power Hong Kong Ltd
Construction Industry Council
Development Bureau, HKSAR Government
Drainage Services Department, HKSAR Government
Driver Trett (Hong Kong) Ltd
Evans & Peck (Hong Kong) Co Ltd

Fugro (Hong Kong) Ltd
Gammon Construction Ltd
Highways Department, HKSAR Government
Hogan Lovells (Hong Kong)
Hsin Chong Construction Group Ltd
Hyder Consulting (HK) Ltd
Institution of Civil Engineers (Hong Kong)
Kum Shing (KF) Construction Co Ltd

Langdon & Seah Hong Kong Ltd
Leighton Contractors (Asia) Ltd
Maka Consulting Company Ltd
Mayer Brown JSM
Meinhardt Infrastructure & Environment Ltd
Mott MacDonald Hong Kong Ltd
MTR Corporation
Navigant Consulting (Hong Kong) Ltd

PERT Management Consultants
Pinsent Masons
Shun Yuen Construction Co. Ltd
Sum Kee Construction Ltd
The Contracts Group Ltd
The Hong Kong Construction Association Ltd
Turner & Townsend (HK)
URS Hong Kong Ltd
VSL Intrafor (HK)

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Date	Event	Speakers	Venue
25 September	Z clause webinar	Peter Higgins and Robert Gerrard <i>NEC Office</i>	NEC website, www.bit.ly/necwebinar (live and recorded for later viewing)
10 October	NEC Asia-Pacific Users' Group conference	CK Hon, <i>Civil Engineering and Development Department</i> ; Vincent Connor, <i>CIC Task Force</i> ; Ronnie Thomson, <i>URS</i> ; Peter Clayton, <i>Pinsent Masons</i> ; Rex Wong, <i>Kum Shing Group</i> ; WH Luk and Ricky Li, <i>Drainage Services Department</i>	Langham Place, 555 Shanghai Street, Mongkok, Kowloon, Hong Kong
November (to be confirmed)	NEC Asia-Pacific Users' Group breakfast meeting	Damon So, <i>Partner, Hogan Lovells</i>	11th Floor, One Pacific Place, 88 Queensway, Hong Kong

All articles in this newsletter are the opinions of the authors and do not necessarily reflect the views of the NEC.

For ease of reading, all NEC contract terms are set in lower-case, non-italic type and their meanings (unless stated otherwise) are intended to be as defined and/or identified in the relevant NEC3 contract.

Constructive contributions to the newsletter are always welcomed and should be emailed to the editor Simon Fullalove at simon@fullalove.com (telephone +44 20 8744 2028).

Current and past issues of the newsletter are also available on the NEC website at www.necontract.com.

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