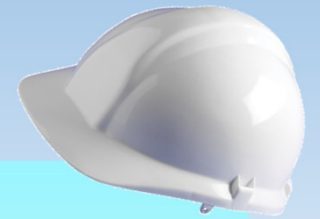




Successful Application of NEC in Government (DSD) Projects

HKIS CPD Talk



Ir. Simon Lai
Senior Engineer

Ir. C L Leung
Engineer

31.7.2018





- 7:00 – 8:00** (i) NEC Journey in DSD &
 (ii) Contract No DC/2012/03
 Happy Valley Underground Stormwater Storage Scheme (Option C)
- 8:00 – 8:30** (iii) Contract No. DC/2016/01
 Additional Sewage Rising Main between Tung Chung
 and Siu Ho Wan (Option D)
 (iv) Q&A



New Engineering Contract vs General Conditions of Contract





*Time to
Reply*

Mindset

Audit

*Subcon's
Management*

Risk

Guidelines

Payment

Programme



NEC Journey in DSD

- **Started small, in 2009**
 - **1 target cost works contract <\$100M**
- **Tasted NEC**
- **Trained a seed team**
- **Achieved good result**
 - **5% saving, 6 months faster**
- **In 2012, another larger works contract started**
 - **Target cost, \$1 B**
 - **8% saving, 14 months faster**



Now DSD

- **Complete** **~ 10**
 - **On going** **~ 35**
 - **Coming shortly** **~ 10**
- } **Works contracts,
~ 1/3 is target
cost**
-
- **Another** **~ 10**
- consultancy
contracts ongoing
or shortly start,
1/5 target cost**



DSD Internal Support System

- **Half administrative half knowledge management**
- **1st tier, NEC Working Group**
 - **discuss policies**
 - **endorse options**
 - **pull in external stakeholders (eg ICAC, DEVB)**
- **2nd tier, NEC Support Group**
 - **disseminate practices**
 - **address queries**
 - **share experience**
- **3rd tier, NEC Focus Group**
 - **on target cost, PSC etc**
- **KM through NEC Corner/Portal and sharing with practitioners**



What next in DSD

- **So far only a small step**
- **Continue to train staff**
- **Entrench collaborative culture**
- **Try different arrangements**
 - **Bonus for early completion**
 - **NEC subcontracting**
 - **Co-location of office with consultants**
 - **NEC 4**
 - **Early contractor involvement**



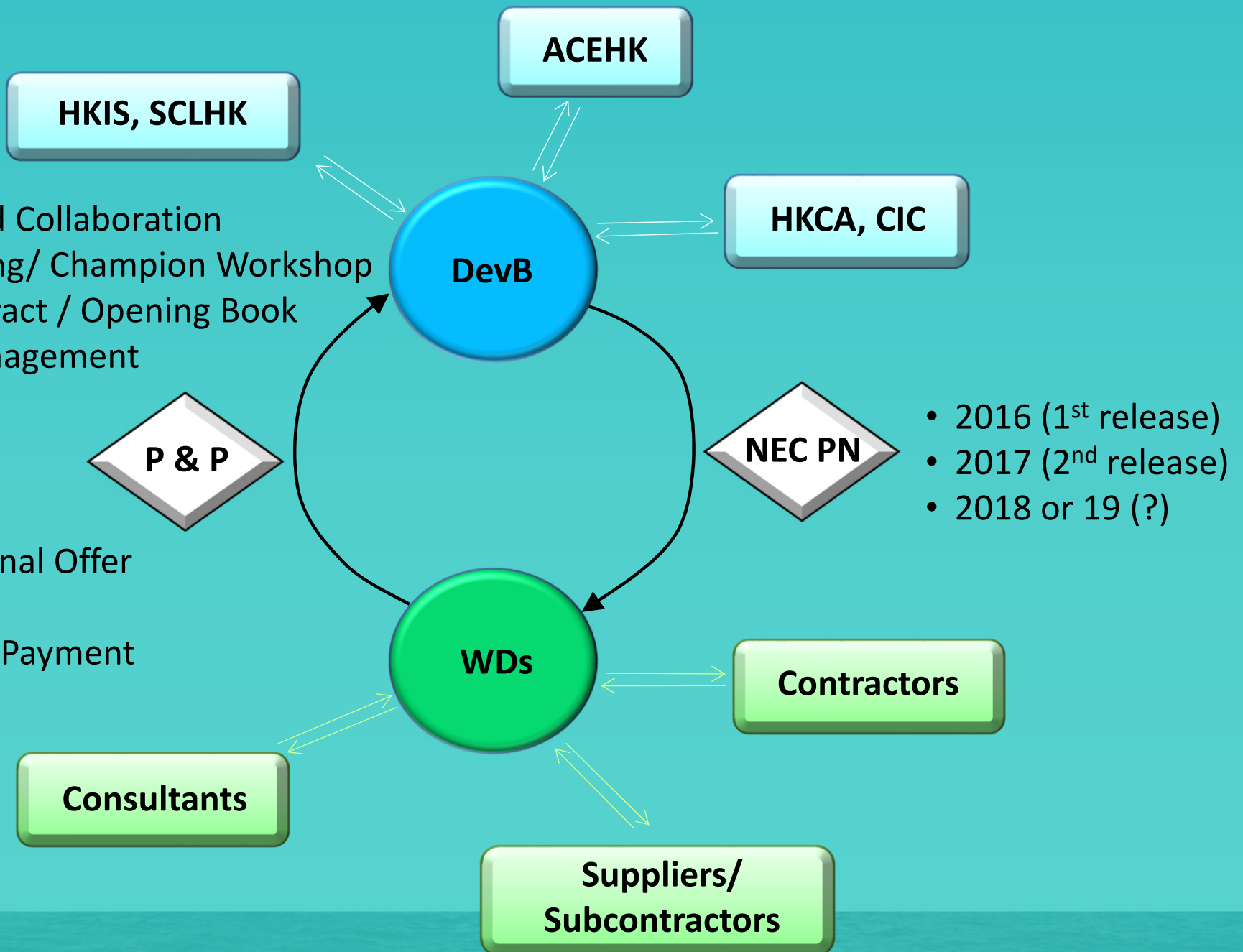
Practice, Pilot and Practice Note for NEC

Practice

- Trust and Collaboration
- Partnering/ Champion Workshop
- Subcontract / Opening Book
- Risk Management

Pilots

- Best & Final Offer
- Pre-bid
- Forecast Payment
- Bonus





Happy Valley

Underground Stormwater Storage Scheme

Flooding in Happy Valley 24.08.2000, 24.04.2006, 07.06.2008



Happy Valley Recreation Ground



Happy Valley Racecourse



Junction between Morrison Hill Road
and Queen's Road East



Wong Nai Chung Road



Happy Valley Racecourse

Happy Valley

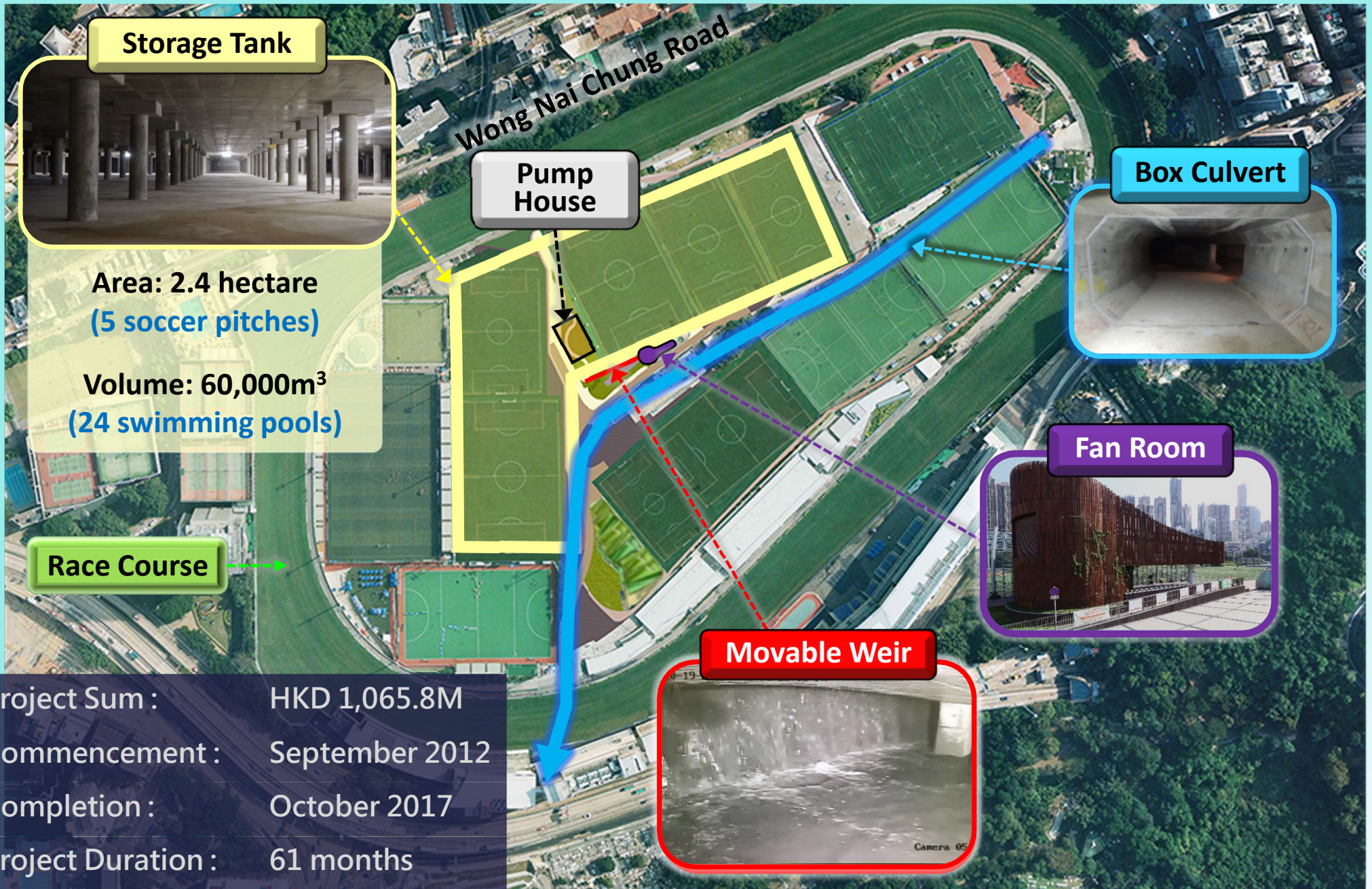


Happy Valley Race Course



Happy Valley Recreation Ground

Project Scope





NEC in HVUSSS

NEC3 Cl. 10.1:

(i) Mutual Trust and Cooperation

among
Employer,
Project Manager,
Supervisor, Contractor,.....





Collaboration (extended to others)

Employer
Project Manager
Supervisor
Contractor
Sub-contractor
Stakeholders
Consultants

.....

Collaboration That Works





Chapter 3

Good practice following award and the crucial first months

- training – or, more precisely, common understanding of – for those involved in the running of the contract
- putting in place a system and protocols for the efficient administration of the contract (i.e. how you are going to communicate, both informally and formally)
- payment, especially where the *Contractor* is reimbursed his costs (e.g. options C to F) and how the pain/gain share operates under options C and D
- making best use of the programme, so that there is always an up-to-date, understood, agreed and accepted programme
- operating the early warning and risk-reduction process
- quickly and amicably agree quotations for compensation events/development of the programme by the *Contractor* and, if possible, acceptance of the programme by the *Project Manager*
- use of adjudication as a last resort to resolve disputes, whilst suggesting alternative means to resolve the underlying issues sooner whilst they are still ‘disagreements’ as opposed to ‘disputes’.

Preparation for Contract Commencement

Development Bureau

Practice Notes for New Engineering Contract (NEC)
– Engineering and Construction Contract (ECC) for
Public Works Projects in Hong Kong

October 2016

Familiar with NEC Contract Provisions and Practice Notes



Identified and defined terms

11
11.1

The main definitions used in the contract are given in clause 11.2. Other definitions are given in optional clauses where they are specific to a particular main or secondary Option. Capital initial letters are used in the ECC for the defined terms to distinguish them from undefined terms.

Any term that is identified in the Contract Data is written in italics.

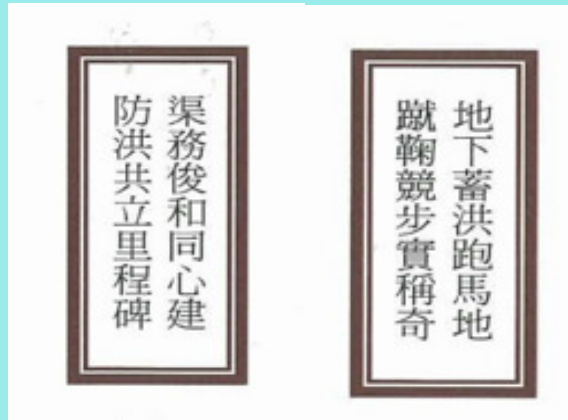
The *Project Manager* cannot change identified or defined terms.

A combination of these two systems is used when the details of a term in italics may need to be changed during the course of the contract – e.g. the Completion Date, clause 11.2(3). The definition of the defined term (the Completion Date) includes a reference to the same term in italics (the *completion date*) but also refers to the possibility of changes 'in accordance with the contract'. This combination therefore provides

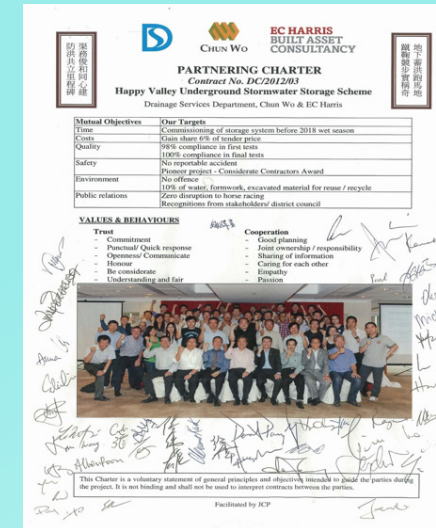
- a basis for tenders and the contract at the Contract Date, at which time the defined term is the same as the italicised term,

- (9) The definition of Equipment is broad and avoids using separate terms for items which are treated in the same way under the contract. It covers, for example, construction plant, vehicles, consumables, tools, temporary works, cabins, temporary access roads and other such facilities. The term 'Equipment' has been used where it has been customary to use 'plant' or 'constructional plant' in UK building and civil engineering practice. This change is made so that the ECC can be used internationally and for other engineering work where it is customary for 'the plant' to mean part of the *works* to be provided.

1st Partnering Workshop



Project Slogan



Project Charter



Project Logo



Mutual Objectives

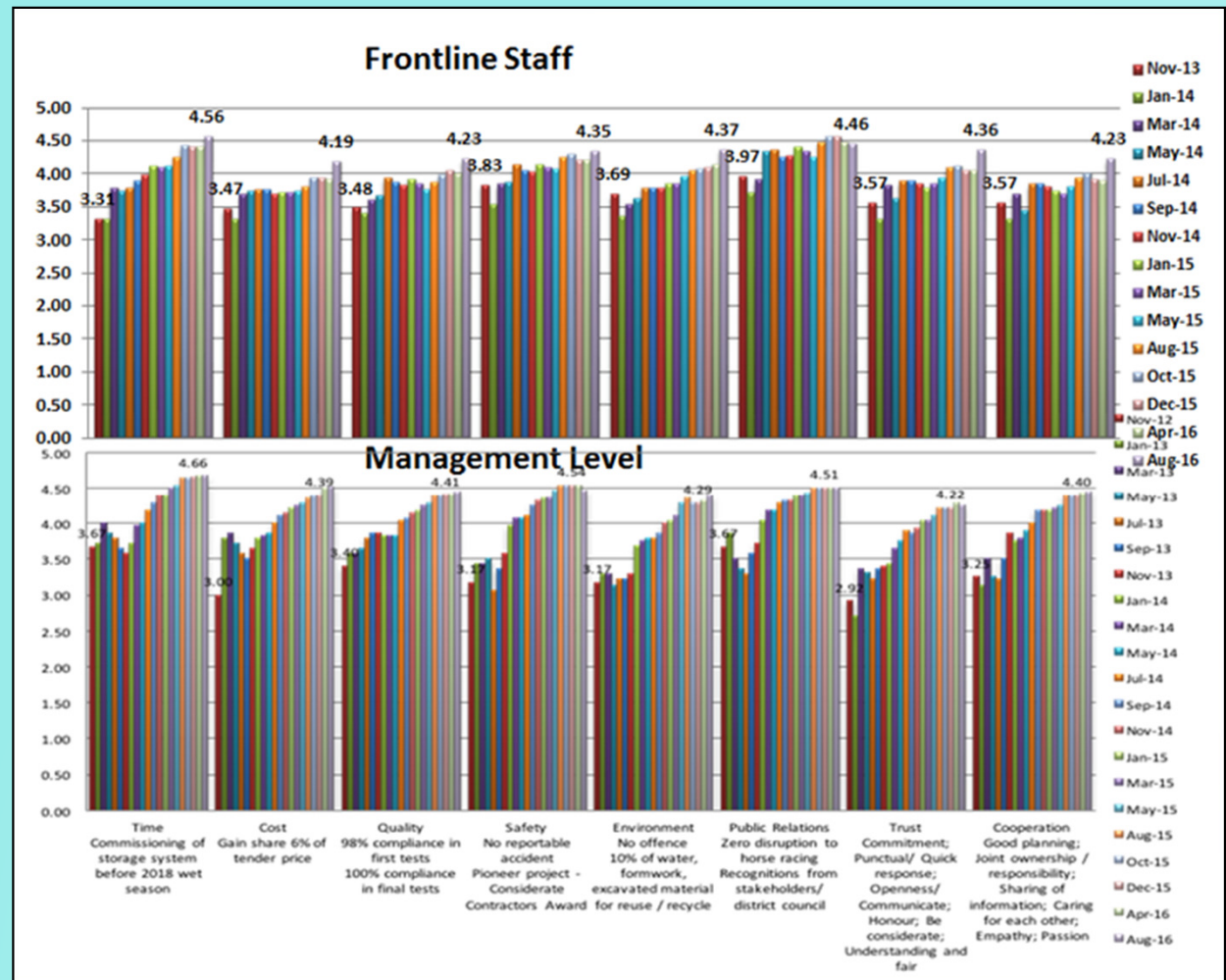
	MUTUAL OBJECTIVES	TARGET
1	Time	Commissioning of storage system before 2018 wet season
2	Cost	Gain share 6% of tender price
3	Quality	98% compliance in first tests 100% compliance in final tests
4	Safety	No reportable accident Pioneer project - Considerate Contractors Award
5	Environment	No offence 10% of water, formwork, excavated material for reuse / recycle
6	Public Relations	Zero disruption to horse racing Recognitions from stakeholders/ district council
	VALUES and BEHAVIOURS	
7	Trust	Commitment; Punctual/ Quick response; Openness/ Communicate; Honour; Be considerate; Understanding and fair
8	Cooperation	Good planning; Joint ownership / responsibility; Sharing of information; Caring for each other; Empathy; Passion

Management Level

Employer / PM / S		
CE	SE	E

Contractor		
Project Director	Construction Manager	Site Agent

Cost Consultant
Project Director



Partnering Review Workshop



Partnering Review Workshop

What's going well?	What's not going well?
<ul style="list-style-type: none">• Works at confined space• 得到顧問協助• 齊心• Partnering & cooperation as well• 多解決方法 / Problem solving• Swift action• 多交談, good / open mind communication & relationship• Trust & cooperation• Clear target• Performance on Quality, safety & environmental• Public relations• Survey update on time	<ul style="list-style-type: none">• Punctuation (不守時)• Slow progress• 太多會議 / too much meetings• Too much "WhatsApp" groups• Slow response time• Coordination with others• Slow decision

NEC3 :

- ***Risk Management***
- ***Subcontractor Management***
- ***Cost Saving Design***
- ***Compensation Events***
- ***Programme Management***
- ***Open Book Account***

Who are the risk owners?

- The **risk owner** should be capable of managing the risk and have the knowledge, resources, and authority to deal with the risk.



Risk Management in NEC Contract

Early Warning:

ECC Clause 16.1 “The Contractor and the Project Manager give an early warning..... 1)Increase the total of the Prices; 2)Delay Completion; 3)Delay Meeting a Key Date; 4)impair the performance of the works use....”

Risk Reduction Meeting:

ECC Clause 16.2 “Either the Project Manager and the Contractor may instruct the other to attend a risk reduction meeting.....”

Risk Register:

ECC Clause 11.2 (14) “The Risk Register is a register of the risks.....includes a description of the risk and a description of the actions.....”



Early Warning and Risk Register

Pre contract : 9

- Ground Condition
- Excessive Settlement
- Congested Working Environment
- Flood Risk

Construction : over 50

- Interfacing works with HKJC
- Delay in Access Date of Pitch No. 4
- Lack of engineering and site resources
- Slow progress of different work fronts
- Missing details
- Defects





Risk Register (Early Warning raised by PM)

Risk ID Ref.	Description of Risk	Date of Issue of EW	Mitigating Measures / Decisions/ Updates (Party to follow up)	Status (Open/ Closed)	Date of Close of EW	Raised by (CW/DS)
CD1/05	Excessive settlement of adjacent structures and ground	Pre-contract	<ul style="list-style-type: none">- Monitoring of geotechnical instrumentation and ensure all investigative and rectifying actions are being completed when necessary. (DSD & CW)- Step up site supervision and control. (DSD & CW)- Submit action plan (action level) by CW	Open		DSD
CD1/08	Severe flooding in Site due to heavy rainstorms	Pre-contract	<ul style="list-style-type: none">- CW submitted the temporary drainage management plan to PM for acceptance- Provided add./stand-by pumping facilities. (CW)	Open		DSD
CD1/09	Lack of adequate liaison between stakeholders and/or design team and contractors	Pre-contract	<ul style="list-style-type: none">- Regular meeting with stakeholders. (DSD & CW)	Closed	12-Aug-13	DSD
EW/028	Damages of Warning Bar and Structures at Exit of the EVA	7-Mar-14	<ul style="list-style-type: none">- Repairing of existing goal post was completed- Design of laser sensor was accepted by HJKC and installation of sensor was completed- Plastering of concrete structure is in progress	Closed	31-Mar-14	DSD
EW/032	Increased cost of rebar fixing	5-Jun-14	<ul style="list-style-type: none">- Response to NCE was issued	Closed	28-Oct-14	DSD
EW/036	Slow progress of demolition of conveyor belt system	27-Aug-14	<ul style="list-style-type: none">- CW to call quotations for the demolition and material collection of the conveyor belt system- DSD to provide connection details between the twin DN600 pipes and USST	Closed	28-Oct-14	DSD
EW/037	Energisation of the HEC Substation	14-Nov-14	<ul style="list-style-type: none">- CW and ATAL to complete all outstanding works in HEC substation for handover- DSD to issue a letter to HEC (Energization by end of Dec 2014 and two meters are ready)	Open		DSD



Risk Register (Early Warning raised by Contractor)

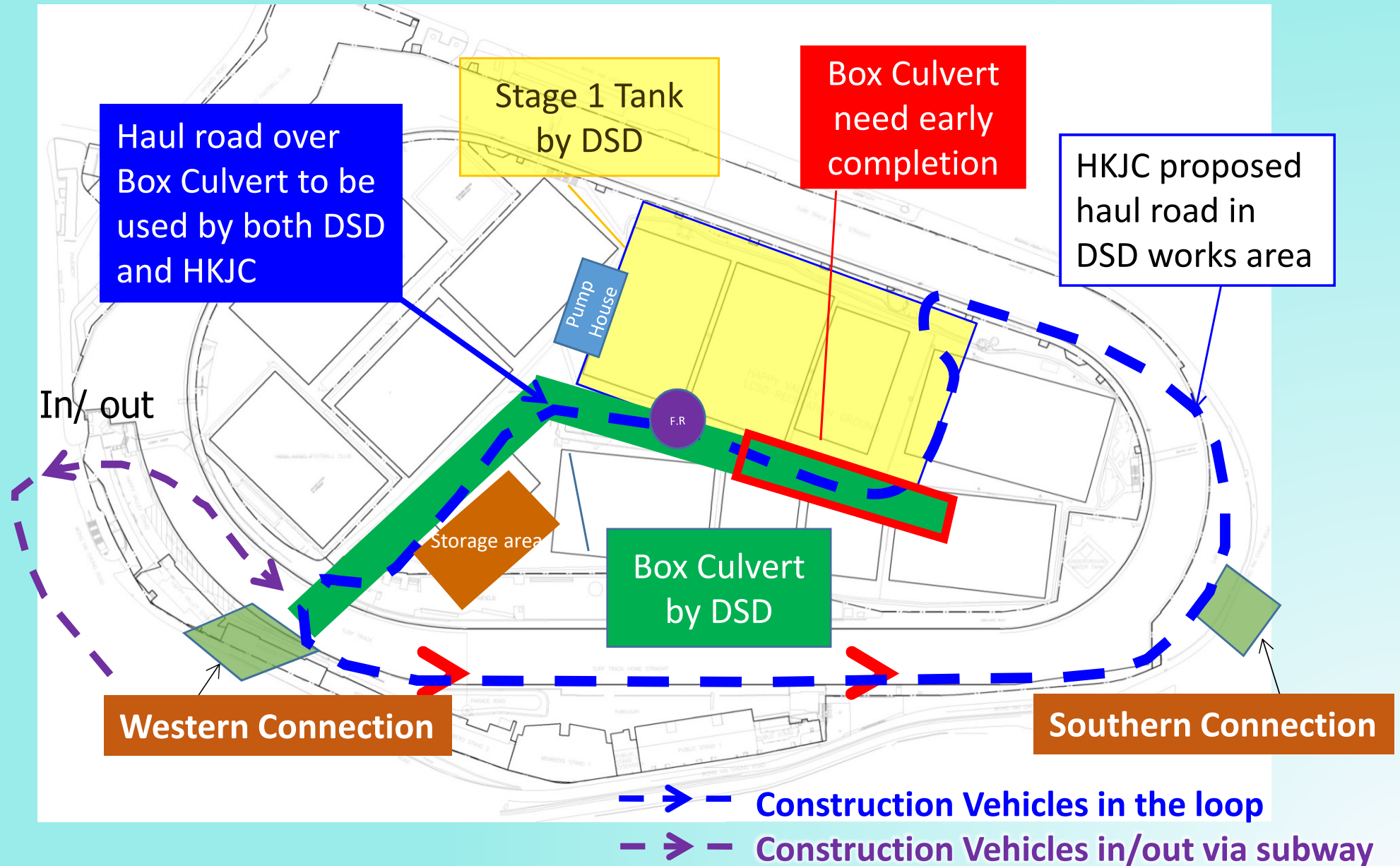
Risk ID Ref.	Description of Risk	Date of Issue of EW	Mitigating Measures / Decisions/ Updates (Party to follow up)	Status (Open/ Closed)	Date of Close of EW	Raised by (CW/DS)
EW/005	The alignment of box culverencroached into Pitch Nos. 6 & 12	8-Mar-13	<ul style="list-style-type: none"> - Details of the revised alignment of rising mains were provided to CW. - CW would provide comments on the revised details of rising main by 23 August 2013. (CW) 	Closed	16-Oct-13	CW
EW/013	Significant increase in the volume of marine sediment and similar unsuitable materials	4-Jun-13	<ul style="list-style-type: none"> - DSD and IGE would critically review the volume of marine sediment and similar unsuitable materials and suggest mitigation measures. (DSD) - CW to develop new scheme to reduce settlement (such as double layers of sheetpile, use of FSP V sheetpile and strut preloading) (CW) 	Closed	15-Jul-13	CW
EW/016	Proposed Temporary Traffic Arrangement (TTA) Scheme at Wong Nai Chung Road near Crescent Garden for Stilling Basin Construction	12-Aug-13	<ul style="list-style-type: none"> - Apply CNP for loading and unloading at night and conduct trial run of loading and unloading from 10:00am to 4:00pm on 9 September 2013 (CW) - Explore alternative such as construction of a temporary lay-by on existing footpath for loading and unloading of construction materials. (CW) - Liaise with Traffic Consultant to revise the TTA scheme. (CW) - Check the alignment of existing box culvert along Wong Nai Chung Road. (DSD) 	Closed	16-Oct-13	CW
EW/027	Unexpected Ground Condition of ELS at Crescent Garden	13-Jan-14	<ul style="list-style-type: none"> - adopted the approach of prebording method for sheetpile installation - engaged subcontractor to commence to prebording works 	Closed	31-Mar-14	CW

Interface construction works of HKJC and DSD during summer break of 2014



Tight Schedule, High Project Risk

Construction Logistics



Shared Access

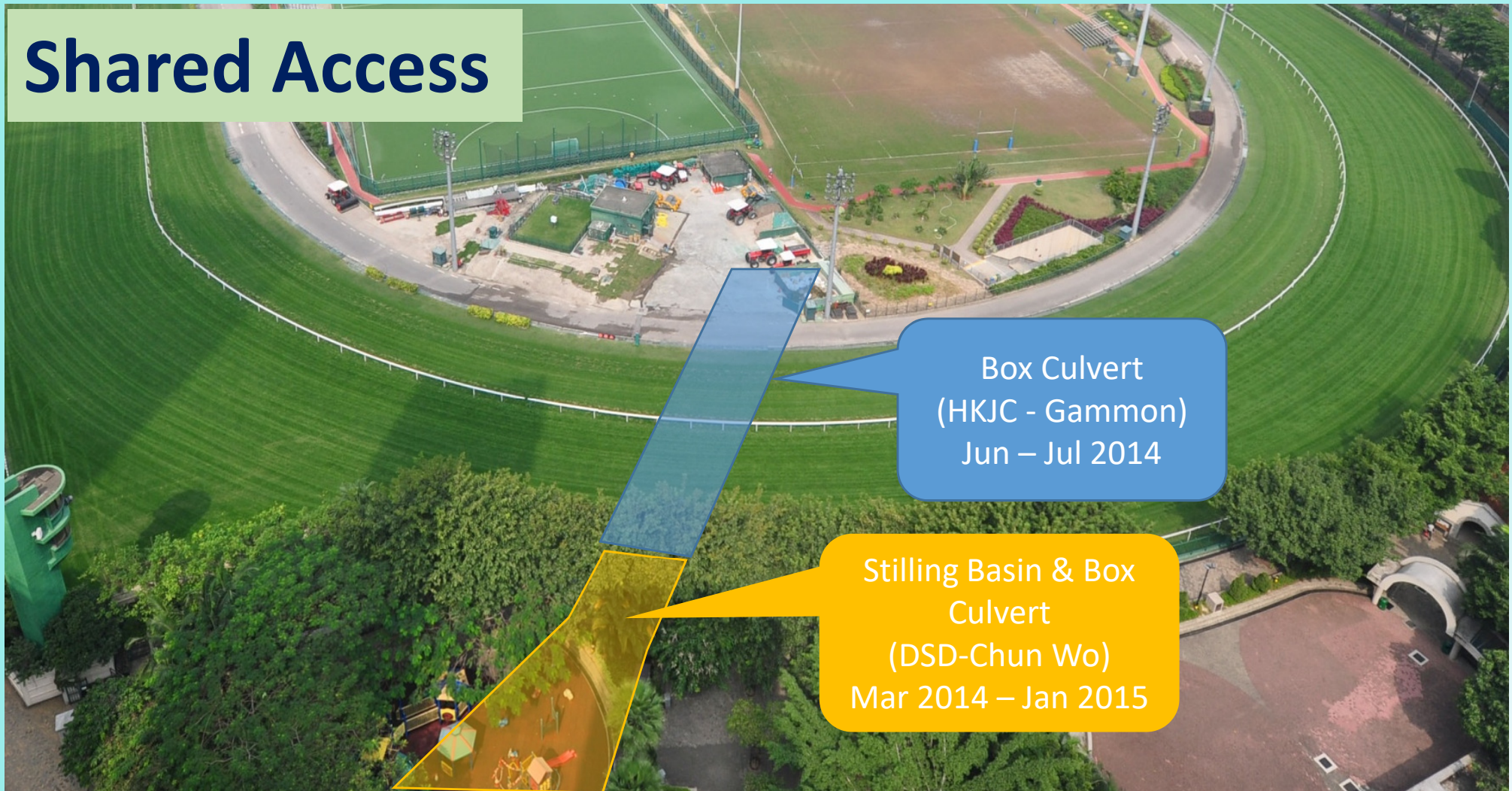


Shared ELS System

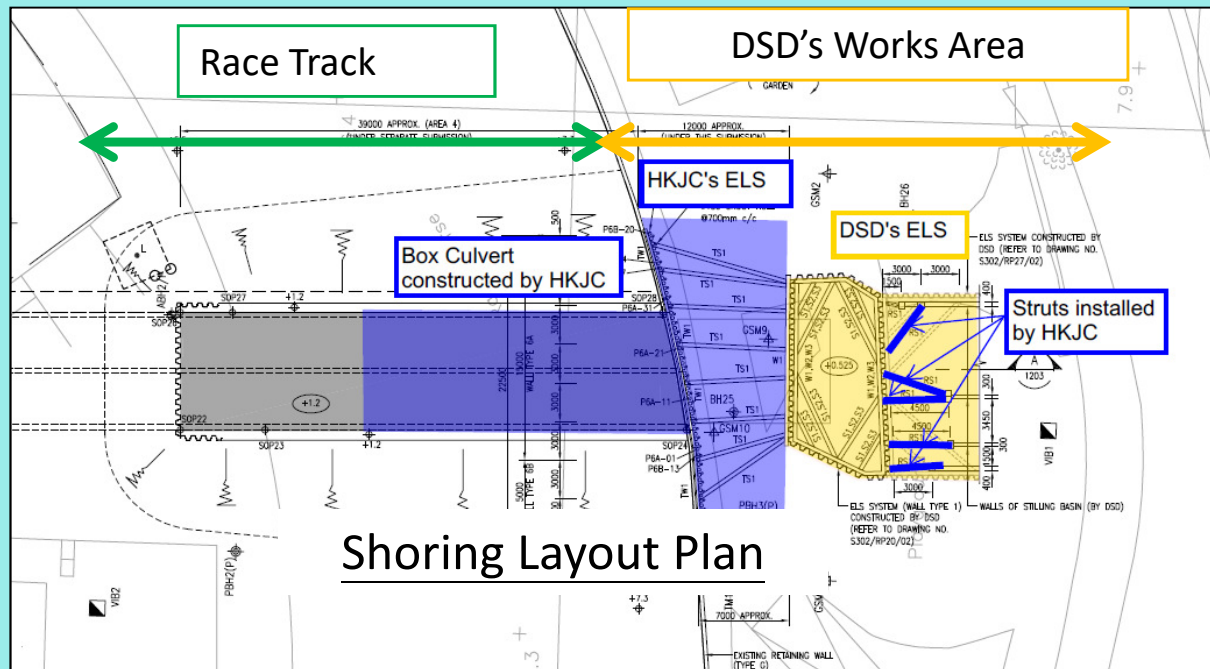


Construction of Pipe Pile Wall at Crescent Garden

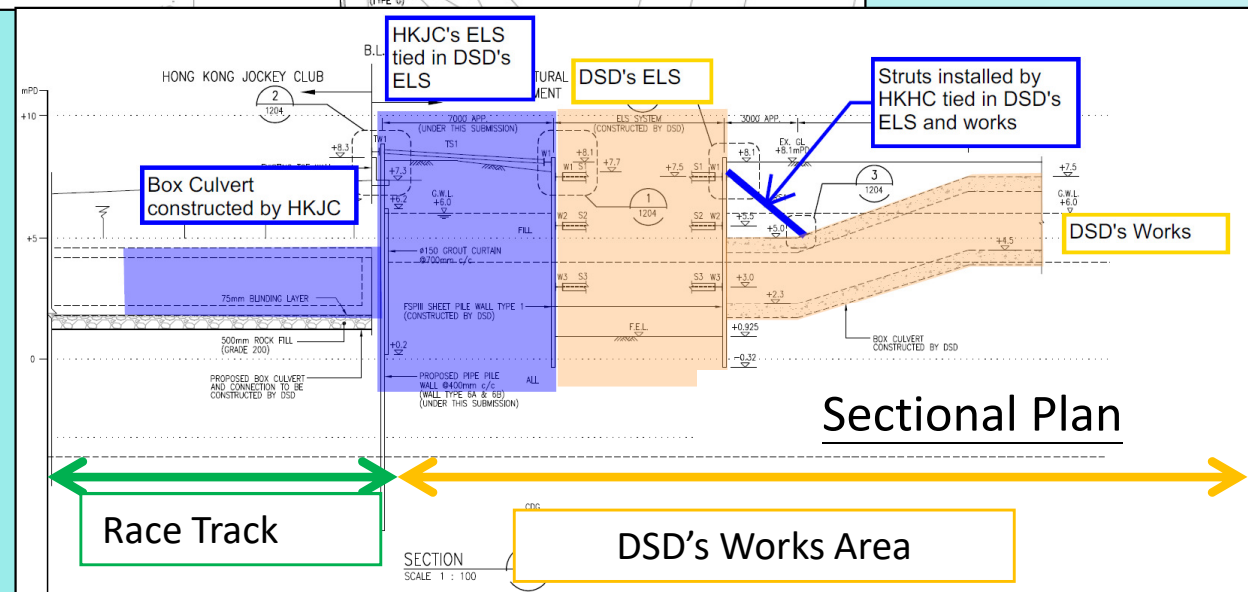
Shared Access



Risk Management



Shared ELS System



Partnering Charter – 2 Clients and 2 Contractors



PARTNERING CHARTER

Happy Valley Underground Stormwater Storage Scheme

Hong Kong Jockey Club, Gammon, Chun Wo, Drainage Services Department

Mutual Objectives	Common Targets
Time	Completion of box culverts and related works for commencement of 2014-15 race season in Happy Valley by 19 October 2014 and operation of Stage 1 of the Scheme before 31 March 2015
Safety and Environmental	No reportable accident No offence
Quality	100% compliance in final tests
Public relations	Zero disruption to horse racing Zero complaints

VALUES & BEHAVIOURS

Trust

- Commitment
- Punctual/Quick response
- Openness/Communication
- Honour
- Be considerate
- Understanding and fair

Cooperation

- Good planning
- Joint ownership/responsibility
- Sharing of information
- Caring for each other
- Empathy
- Passion

Handwritten signatures and initials:

Paul
David Pang
[Signature]
[Signature]

Handwritten signatures and initials:

[Signature]
[Signature]
[Signature]
[Signature]
[Signature]

This Charter is a voluntary statement of general principles and objectives to guide the parties during the project. It is not binding and shall not be used to interpret contracts between the parties

Win – Win – Win - Win



Management Involvement from both sides

Tender Interview in Subcontracting

- **Fairness of Tender Interview**

- PN 6.5.2 Responses to tender queries
in pre-tender meetings/tender interviews to be copied to all tenderers

- **Integrity**

- PN 6.5.2.1 Tender Interview should be attended by Government officers

- **Documentation**

Reasons for 1) Difference between Tender Price and Estimate

2) No. of Returned Tender is less than requirement

3) Returned Tender Price is higher than threshold limit

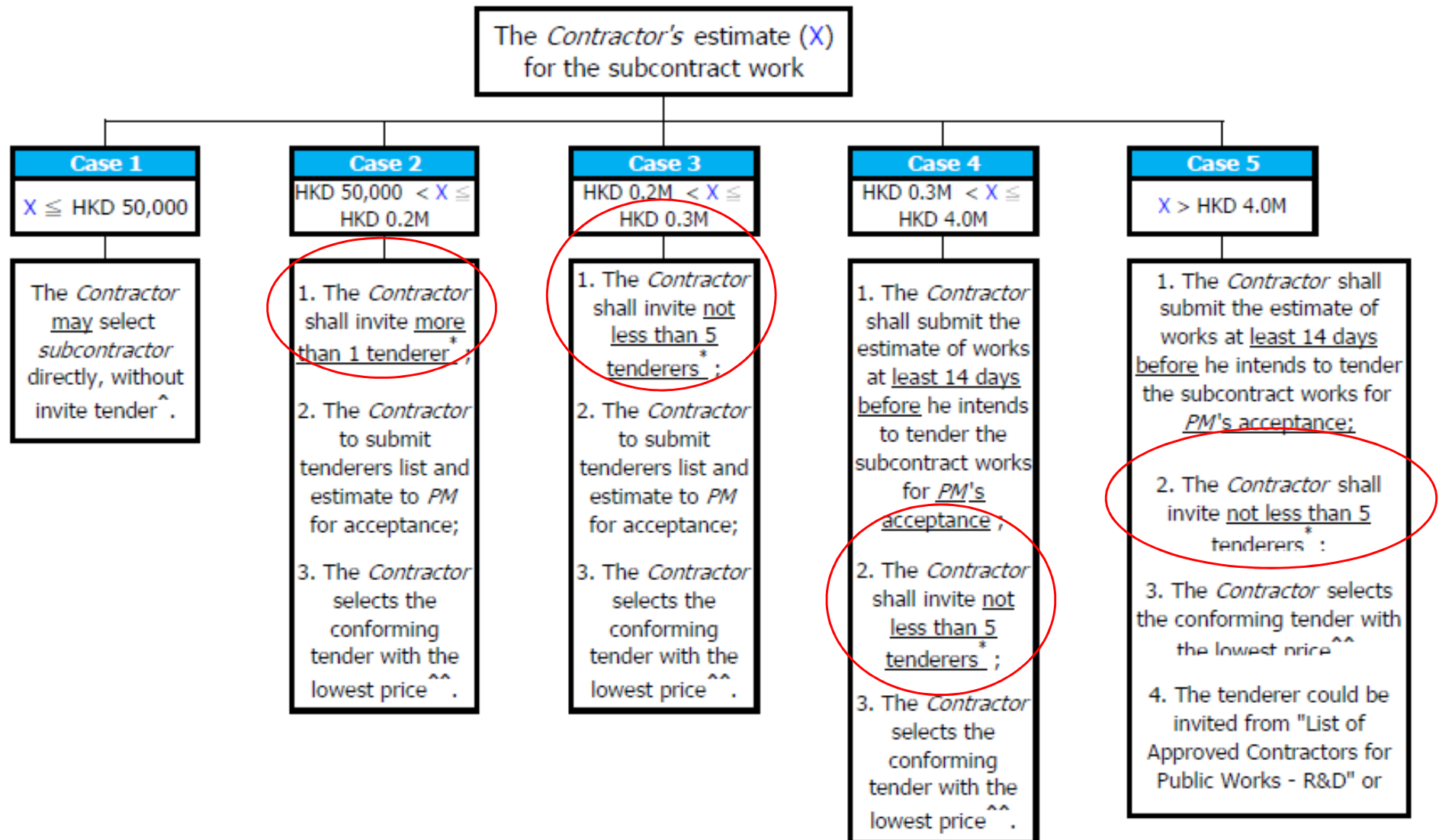
4) Major discussions in Tender Interviews

5) Increase in Best and Final Offer

Subcontracting Management

Subcontracting – Requirement on Number of Tenderers (ACC C10)

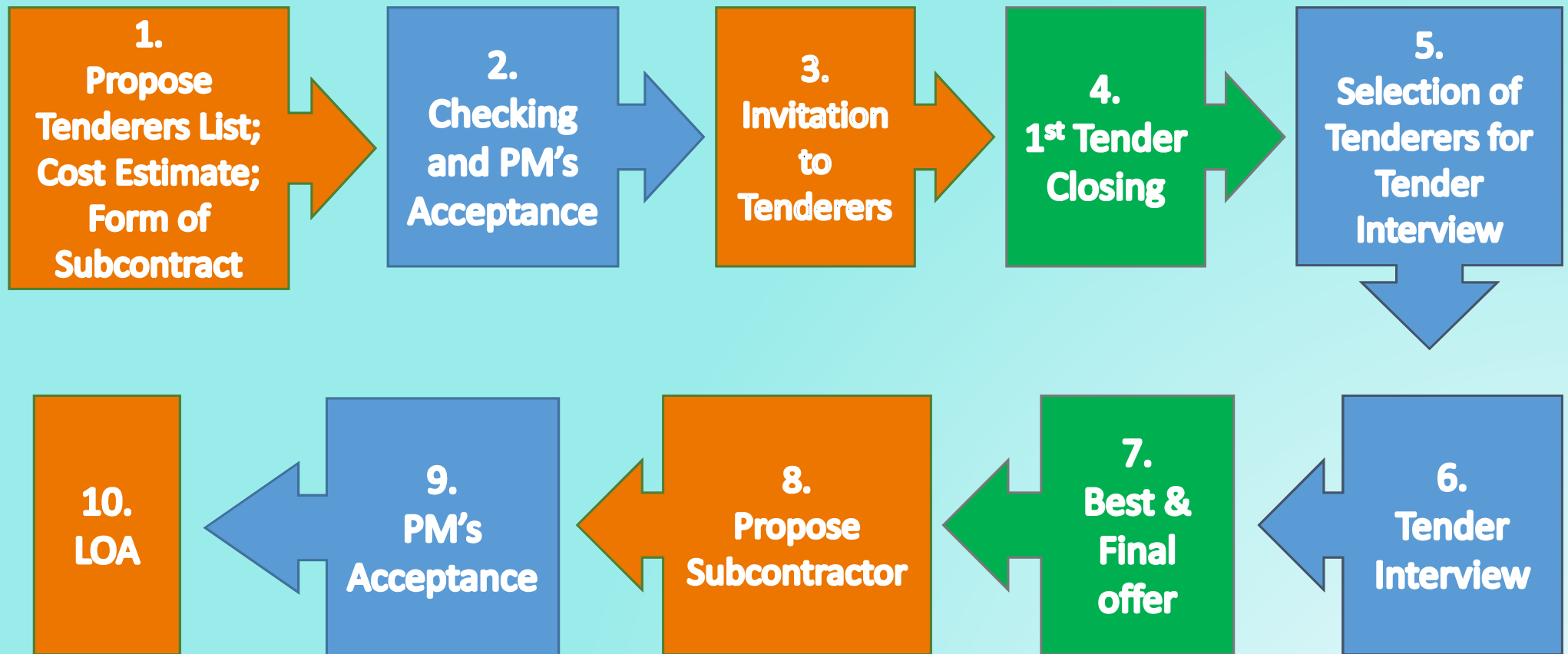
Tender requirements for subcontracting



Subcontracting Management

PM's involvement in Subcontract *

*** In HVUSSS only**



	<\$50,000	\$50,000-\$300,000	\$300,000-\$4M	>\$4M	Total
Subcontract Package	53	19	40	28	140

Subcontracting Management

Active Subcontractor Management



Tender Interview

- Individual Tender (lowest 3 or 4 bids)
- Contractor (QS and Site Agent)
- PMR
- Independent Cost Consultant

Contractor's In-house Rules

Site Constraints

Construction Method/ Innovations

Programme

Payment

Alternative Design

Discrepancies/ Queries

Risks

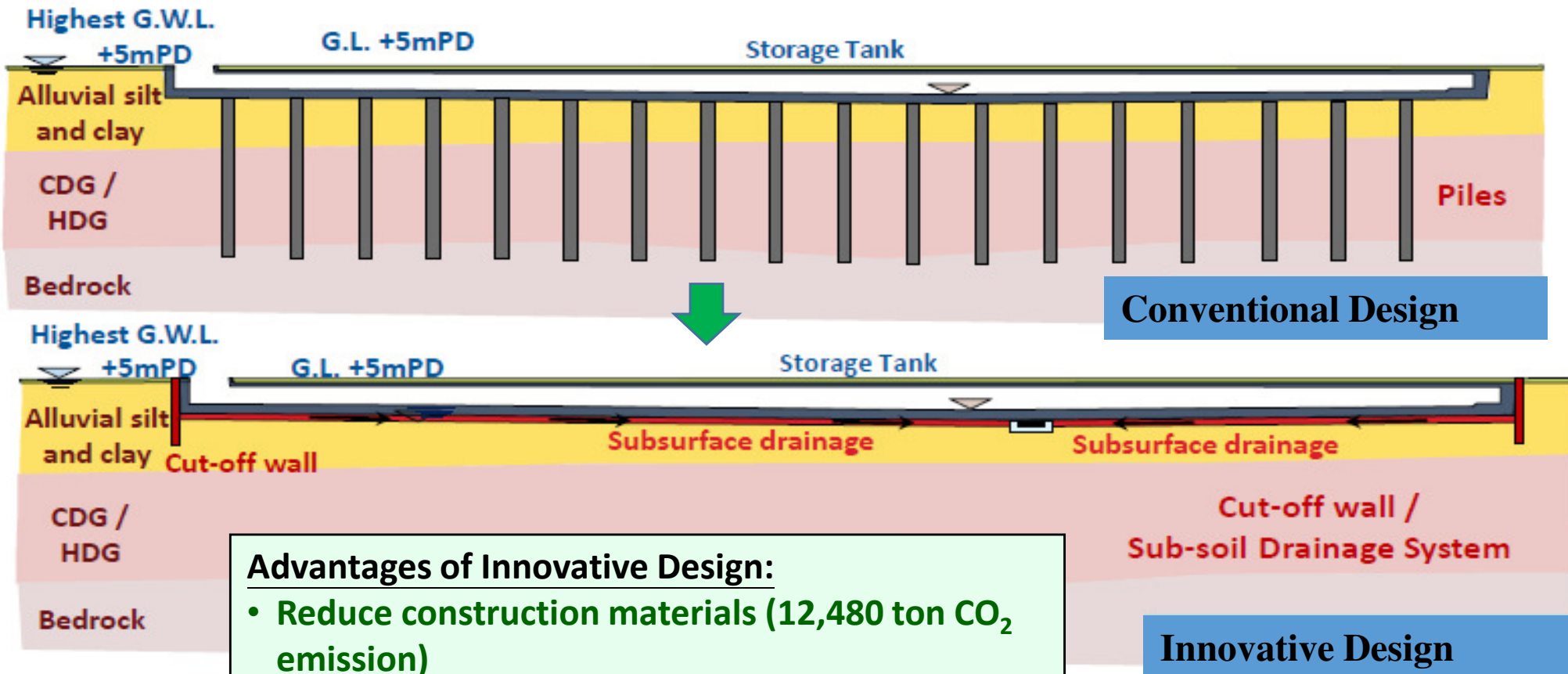
High/Low Rates

Job Reference/ experiences



Cost Saving Design

- Replace original pre-bored H piles by **cut off wall** and **subsoil drainage system**

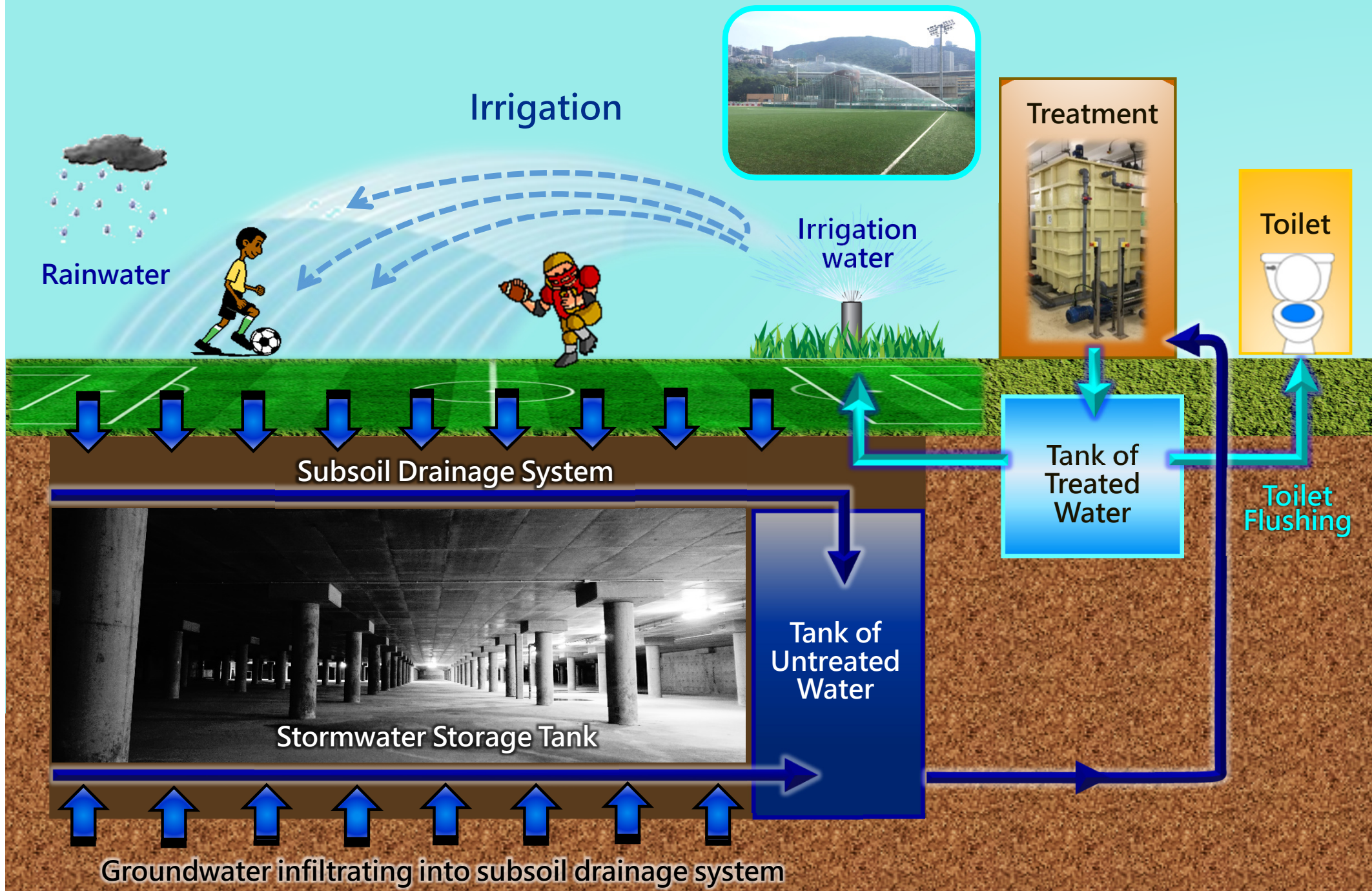


Advantages of Innovative Design:

- Reduce construction materials (12,480 ton CO₂ emission)
- Minimize environmental impacts
- **Water Harvesting System**



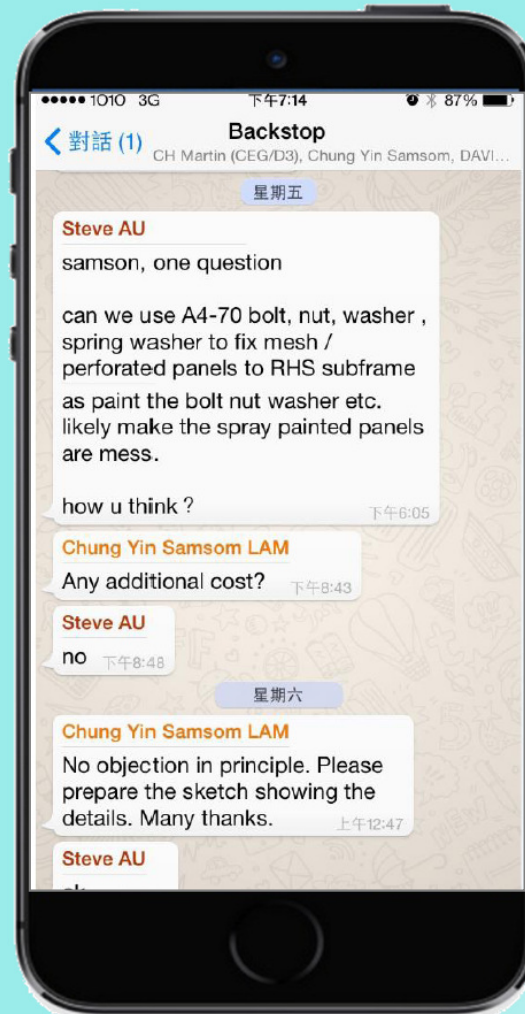
Compensation Event - Water Harvesting System



Team Building

360° Communication Network

**Over 50
WhatsApp
Groups**
in different
categories



Stakeholders Workshop

**District Council members,
HKJC, LCSD, Contractor,
Subcontractors...**

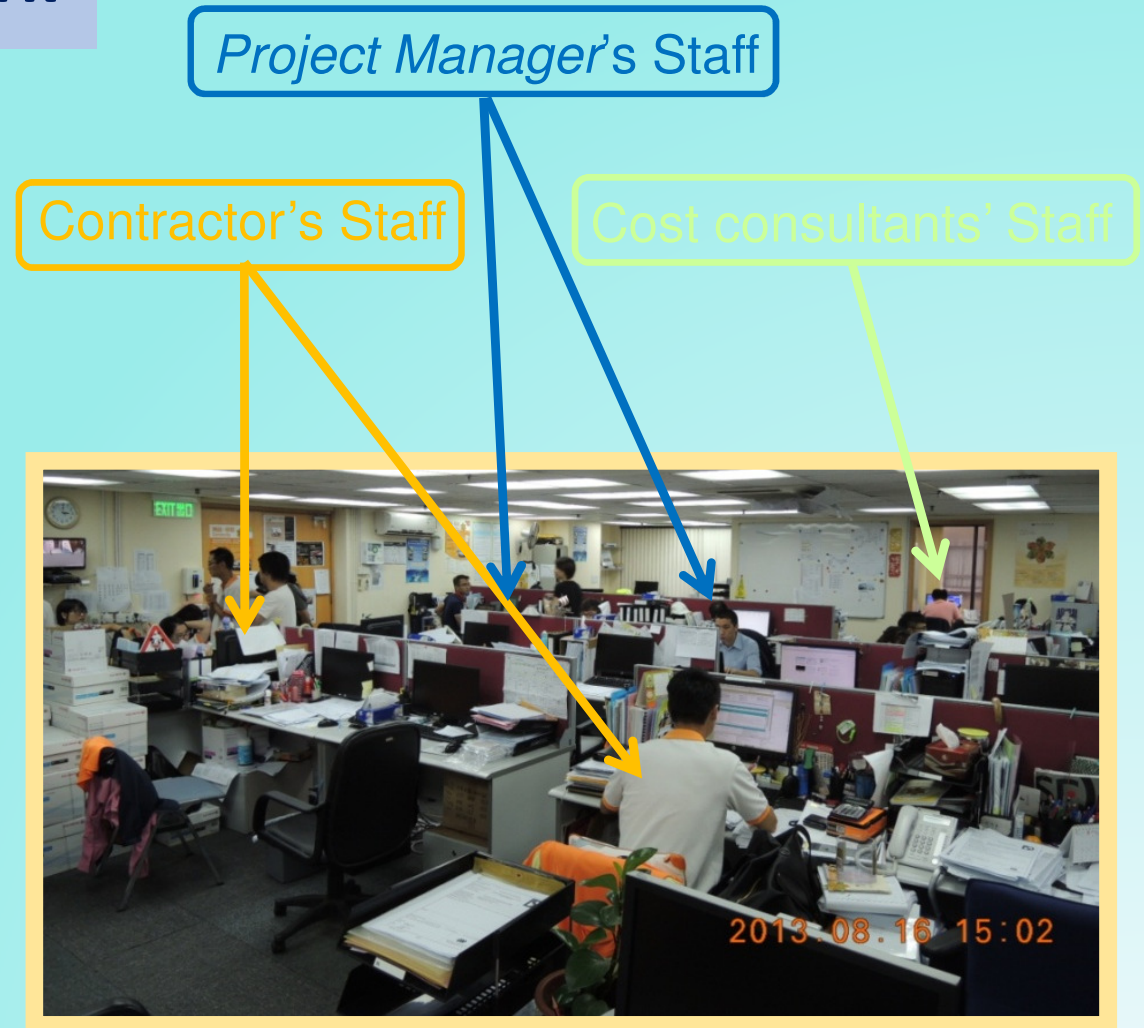


Team Building

360° Communication Network



Morning Briefing



Joint Office



Joint Organization Chart



Achievement



Achievement

2012

About **6%** Cost Saving
Commissioned by **end March 2018**

2018

About **8%** Cost Saving
Commissioned by **mid March 2017**

NEC: Mutual Trust & Cooperation



Tabassum Nazar added 6 new photos —
at **Happy Valley Hockey Pitch**

1 hr · Hong Kong ·

Good news... yesterday we had a meeting with very nice folks of DSD and LCSD, most likely we will get HV1 before end January 2017 and HV2 by April 2017



The short lead time to organize the necessary tender in just three months was very efficient indeed. Throughout the project period, all three parties had maintained very good working partnership which is essential for a successful project. The Association was invited to offer inputs on design specifications, user feedbacks and also site visits to see the progress regularly.



Sharing on Facebook

香港曲棍球總會
元龍賽理道六號京士柏曲棍球場行政大樓一樓
HONG KONG HOCKEY ASSOCIATION
Administration Block, 1/F., King's Park Hockey Ground,
6 Wyke Road, Kowloon, Hong Kong.
電話 (Tel): (852) 3782-4932
傳真 (Fax): (852) 2384-0535
電郵 (Email): hkha@hockey.org.hk
網址 (Website): www.hockey.org.hk



本會為國際曲棍球協會、
亞洲曲棍球協會及
中國香港體育協會
暨奧林匹克委員會的屬會
Affiliated to the Federation Internationale de Hockey,
the Asian Hockey Federation and
the Sports Federation
and Olympic Committee of Hong Kong, China.

Director of Leisure and Cultural Services
Director of Drainage Services

20 January 2017

Dear Ms Li and Mr Tong,

Letter of Appreciation
Returfing Project of Hockey Pitches at Happy Valley Recreation Ground

On behalf of the Hong Kong Hockey Association and the hockey community, I would like to extend our appreciation to LCSD and DSD for undertaking the returfing project of the two hockey pitches at Happy Valley.

The condition of the old hockey turfs was deteriorating badly in recent years due to heavy usage. We had raised the problem to LCSD and requested for returfing as soon as possible. In late 2015, LCSD brought us a good news that they were going to entrust the returfing works to DSD project team at Happy Valley including replacement of the drainage, flood lighting and turf systems.

Our first meeting with LCSD and DSD was held on 24 Feb 2016. By early Jun 2016 when our league season had just finished, the contractor immediately started work.

/cont...I wish to

Appreciation Letter

Awards



2012 IWA Project Innovation Awards

- East Asia Regional Awards in Planning Category



NEC Awards 2015

- Highly Commended New Engineering Contract (NEC) Large Project of the Year



2017 Hong Kong Awards for Industries

- Innovation and Creativity Award – Grand Award



21th Considerate Contractors Site Award Scheme (2015)

- Outstanding Environmental Management & Performance Awards – Gold
- Considerate Contractors Site Awards (Public Works – New Works) – Silver



The Civil Service Outstanding Service Award Scheme 2017

- Team Award (Specialised Service) – Gold
- Inter-departmental Partnership Award – Merit

DSD Contract No. DC/2016/01

Construction of an Additional Sewage Rising Main between Tung Chung and Siu Ho Wan and Associated Works

建造東涌至小蠔灣 加壓污水管及其相關工程

Project Background

Project Office: Consultants Management Division

Supervisor : Black & Veatch Hong Kong Limited

Contractor : Penta-Ocean – Wo Hing Joint Venture

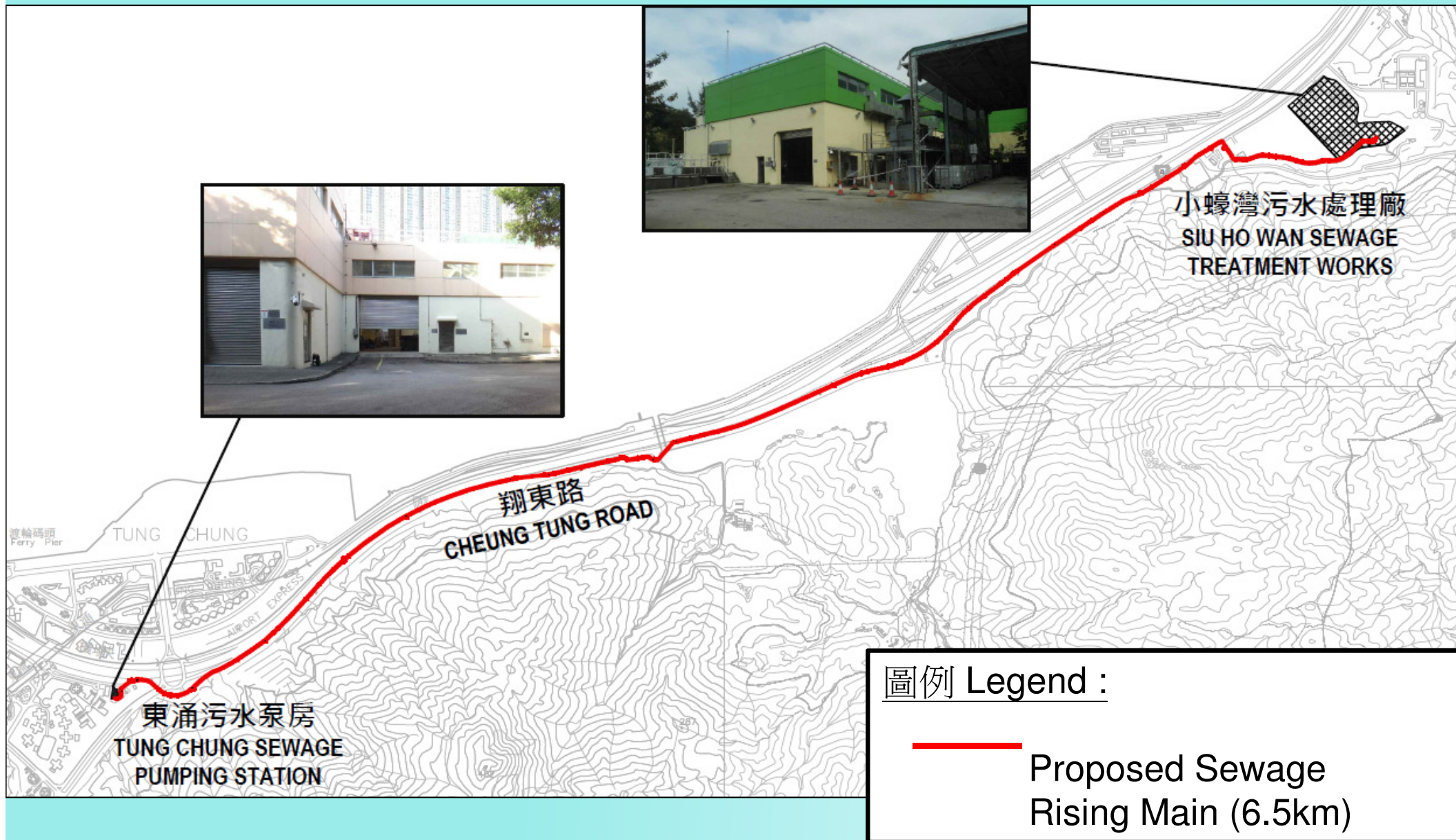
Contract Sum: HK\$ 299M

Date of Commencement: 19/08/2016

Date of Completion: 18/07/2022 (71 months)

Contract Form NEC3 Option D

Scope of Works



Clause 10.1

- The *Employer*, the *Contractor*, the *Project Manager* and the *Supervisor* shall act as stated in this contract and in a spirit of mutual trust and co-operation.

What Do You Expect from
the *Employer*?



Employer's Involvement



? Monitor RSS and contractor's works

? Spy from the Employer

? Help RSS on day-to-day contract administration



Employer's Involvement (Cont.)





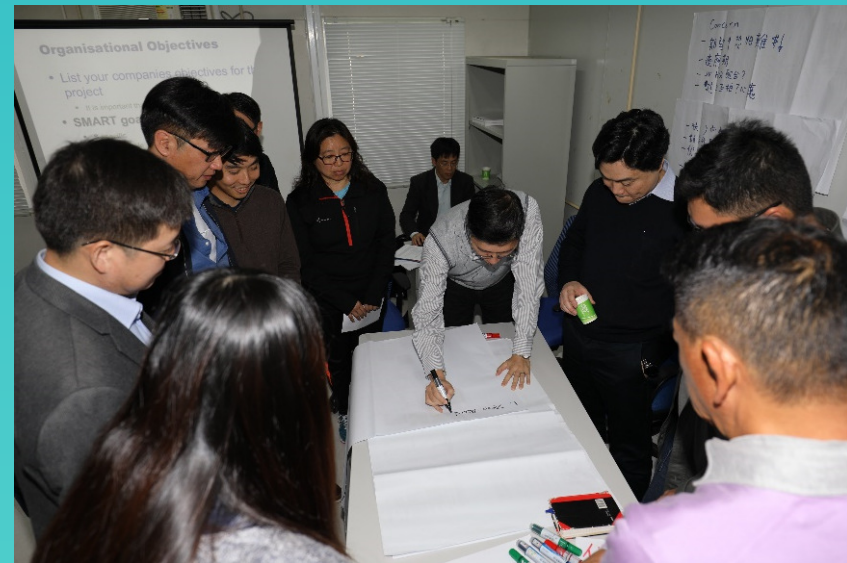
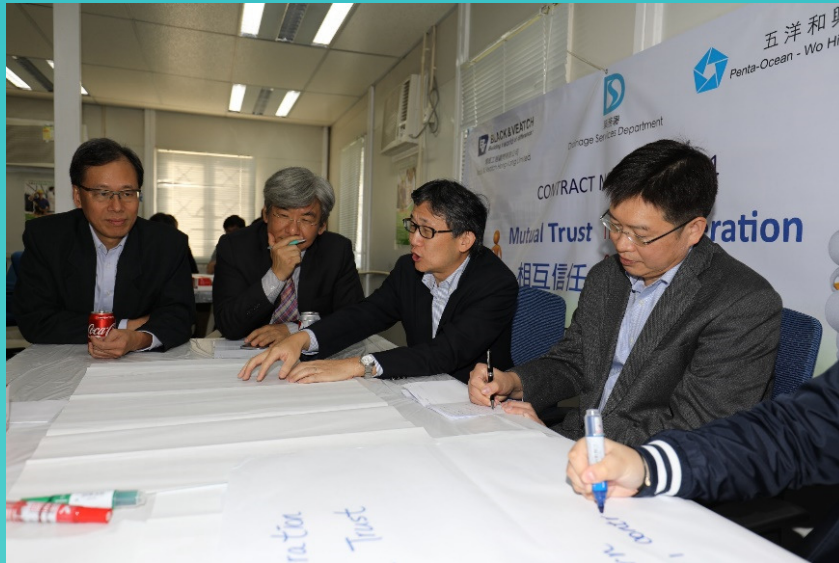
Partnering Meeting and Champion Group Meeting

Partnering
Meeting



Champion
Group Meeting

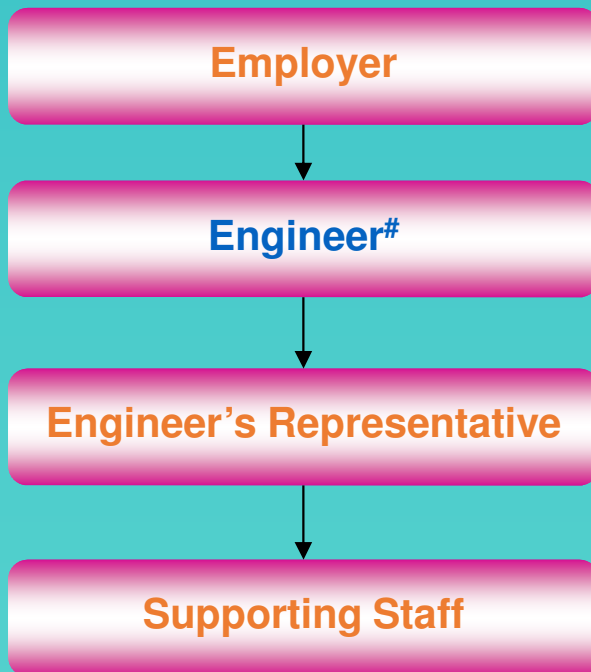
NEC Workshop





Project Team Set-up

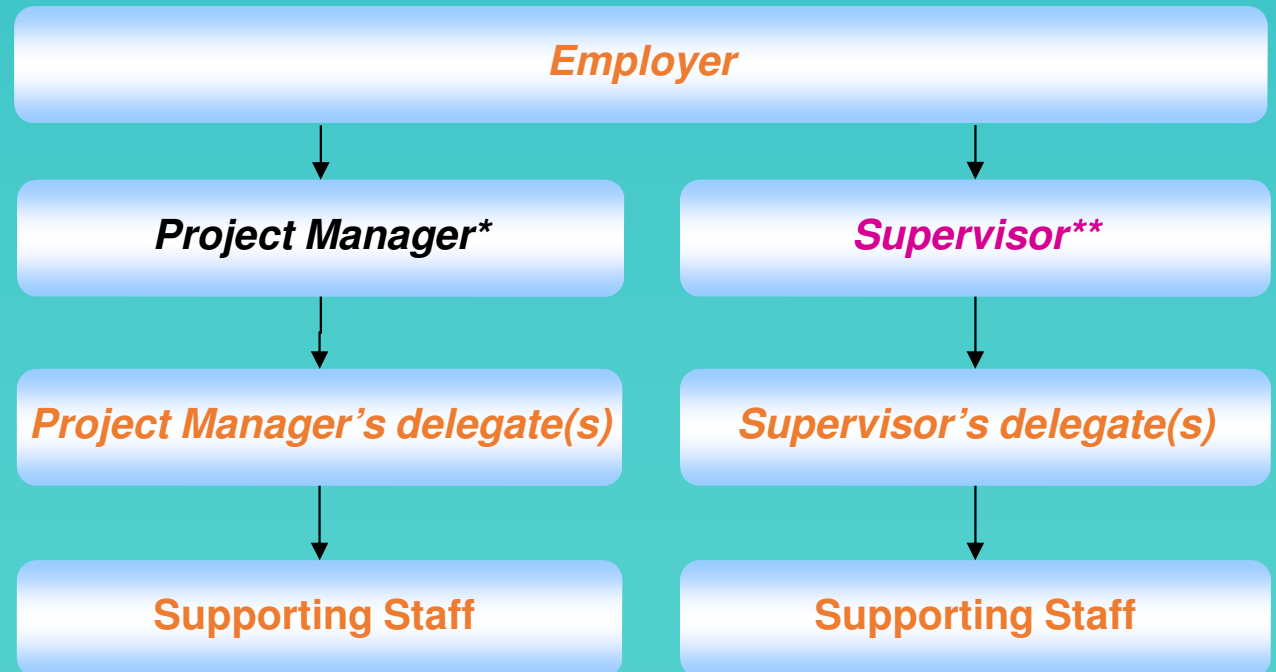
Traditional GCC



Duties

All contract administration duties by Engineer

NEC3 ECC



* Key Duties

To carry out all contract administration duties **other than that performed by the Supervisor**

** Key Duties

To check works in accordance with Works Information and issue Defects Certificate



Risk Management

Early Warning:

Clause 16.1 “The Contractor and the Project Manager give an early warning.....
1)Increase the total of the Prices; 2)Delay Completion; 3)Delay Meeting a Key Date; 4)impair the performance of the works use....Project Manager enters early warning matters in the Risk Register.....”

Risk Register:

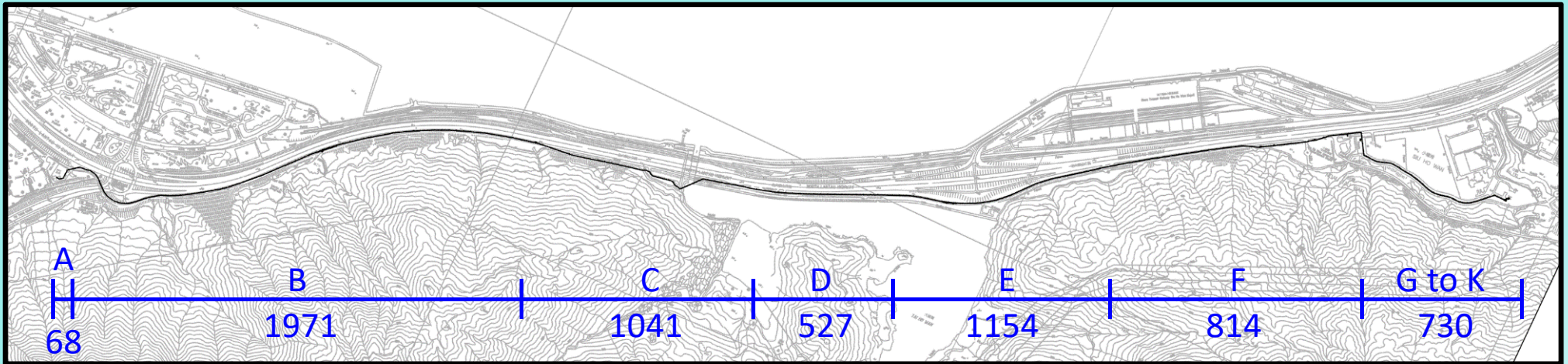
Clause 11.2 (14) “The Risk Register is a register of the risks.....includes a description of the risk and a description of the actions.....”

Risk Reduction Meeting:

Clause 16.2 “Either the Project Manager and the Contractor may instruct the other to attend a risk reduction meeting.....”

Clause 16.3 “deciding on the actions which will be taken and who, in accordance with this contract, will take them.....”

Major Risk - Possession of Site



Portion	Access Date	Commencement	Completion	Possession
A	19-Aug-2016	14-Jan-2017	5-Jul-2017	Yes
B	19-Aug-2016	28-Jan-2017	14-Jan-2021	Yes
C	19-Jul-2018	19-Jul-2018	16-Sep-2021	No
D	19-Aug-2016	19-Aug-2016	23-Jun-2018	Yes
E	19-Jul-2018	19-Jul-2018	12-Feb-2021	No
F	19-Aug-2016	30-Mar-2017	28-Mar-2020	Yes
G to K	19-Aug-2016	11-Mar-2017	16-Dec-2020	Yes
Whole of the Works		19-Aug-2016 (contract start)	18-Jul-2022 (contract completion)	

Case Study 1 (Construction risks)

Risks:

- Underground obstructions
- Water-tightness of jacking/receiving pits
- Interface with TMCLKL

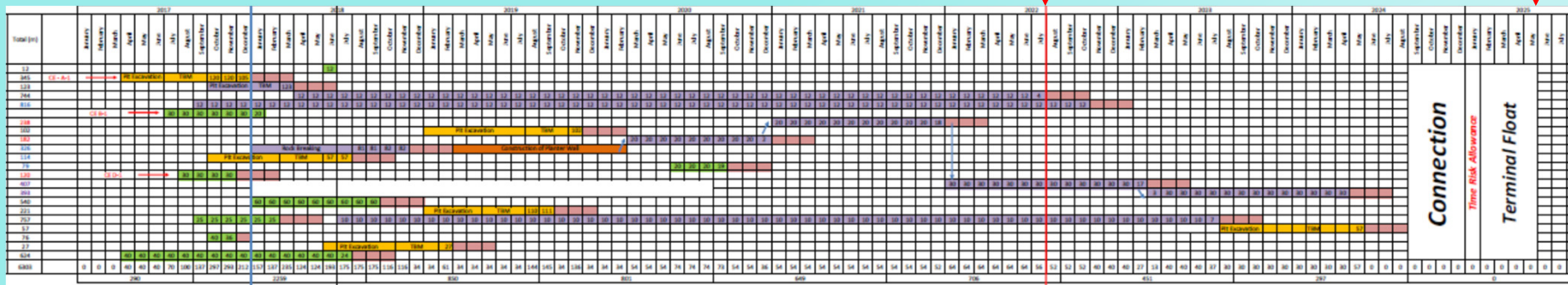


Case Study 1 (Construction risks)

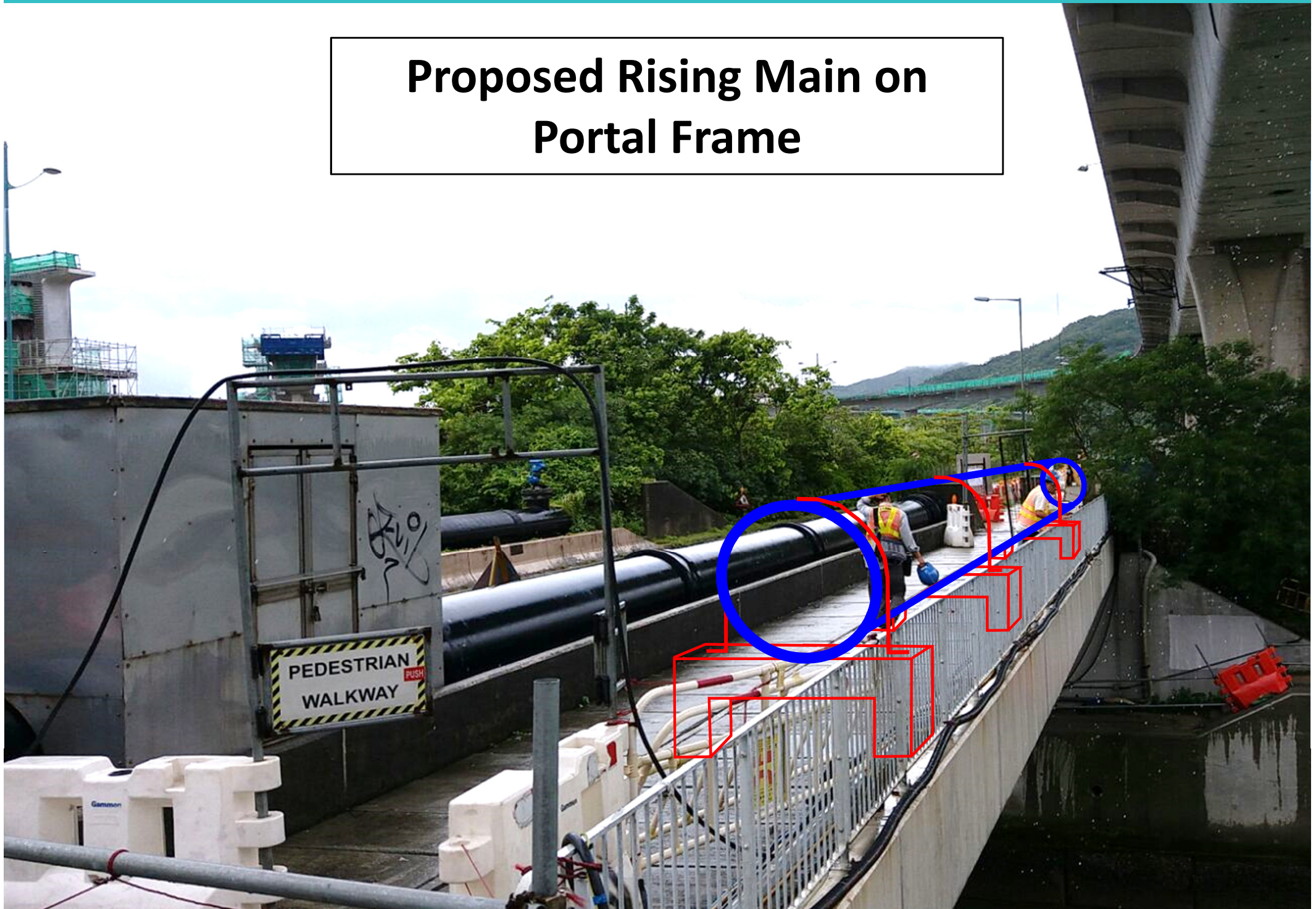
Completion
Date
Jul 2022

Planned
Completion
May 2025

3 yrs delay



Proposed Rising Main on Portal Frame



Case Study 1 (Construction risks)

Actions	Responsible Parties (GCC)	Responsible Parties (NEC)
Checking of Bridge Capacity	Consultants	Consultants & Contractor
Design of realignment	Consultants	Consultants & Contractor
Liaison with Government Departments (i.e. HyD, TD & CEDD)	Consultants	Employer & Consultants
Liaison with Utility Companies (i.e. CLP)	Consultants & Contractor	Employer, Consultants & Contractor

Case Study 2 (Material procurement risks)



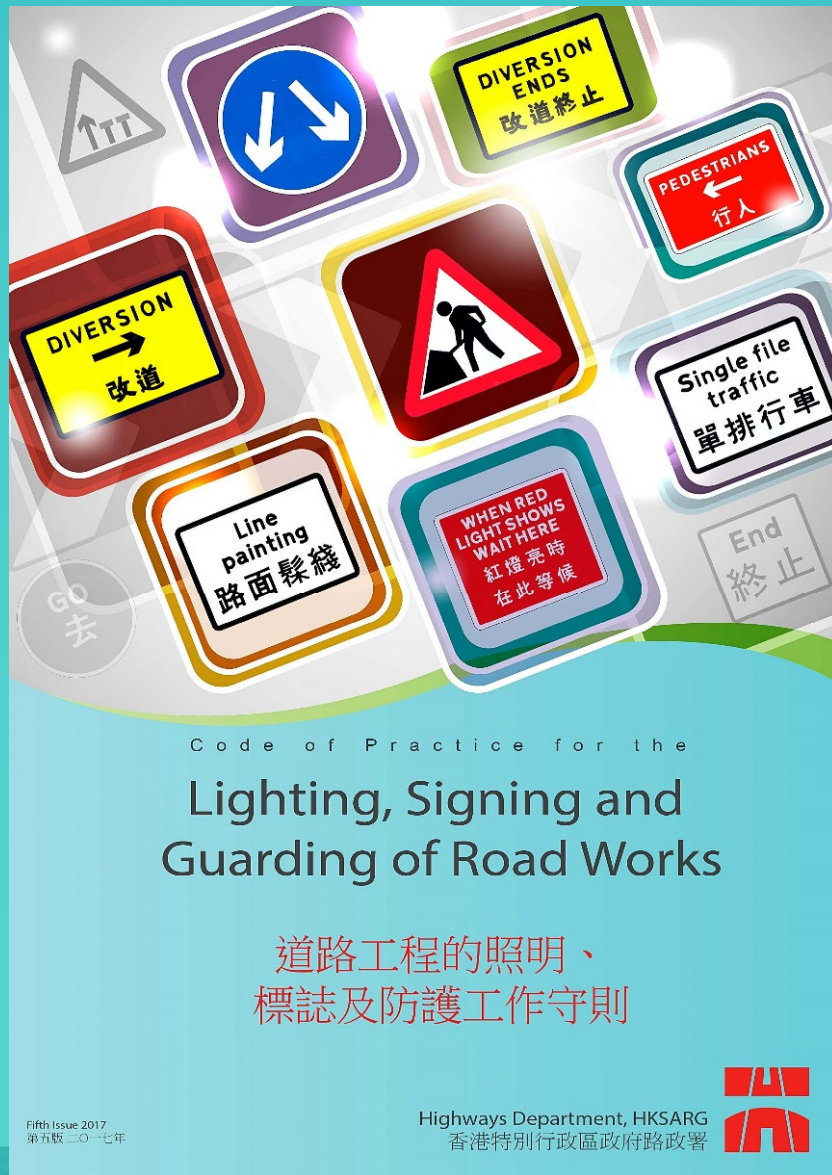
Case Study 2 (Material procurement risks)

Actions	Responsible Parties (GCC)	Responsible Parties (NEC)
Timing and packaging of procurement	Contractor	Employer, Consultants & Contractor
Negotiation with suppliers	Contractor	Contractor
Logistic of material delivery	Contractor	Employer, Consultants & Contractor
Storage area	Contractor	Employer, Consultants & Contractor

Case Study 3 (Construction Risk)

COP for the LSG of Road Works (5th Issue 2017)

Effective Date: 1 Jan 2018



Case Study 3 (Construction Risk)

TTA as per CoP for LSG 5th Issue



Set up & removal
time: 4hrs

Productive working
hour: 4hrs

Case Study 3 (Construction Risk)

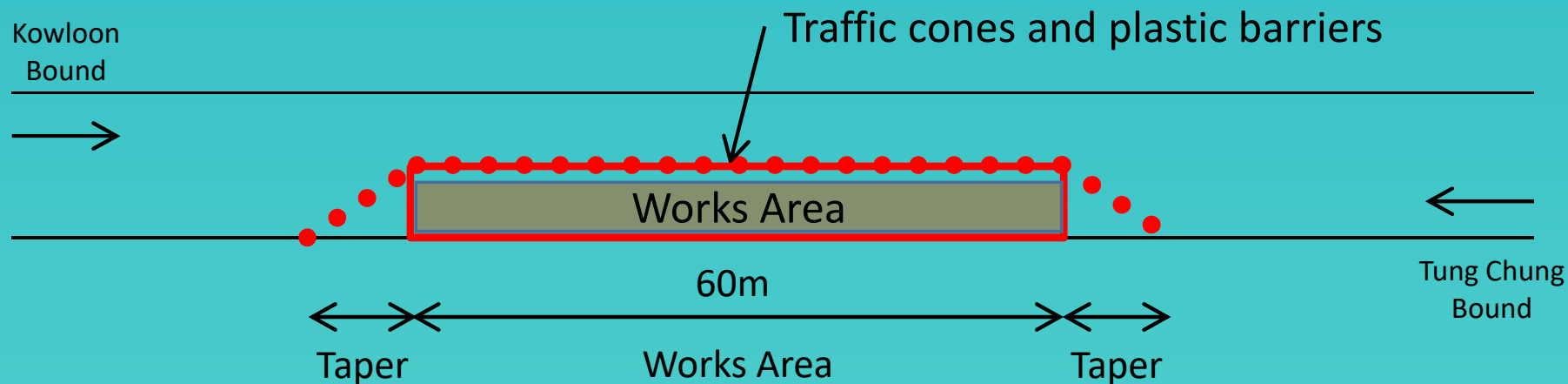
TTA as per CoP for LSG 4th Issue



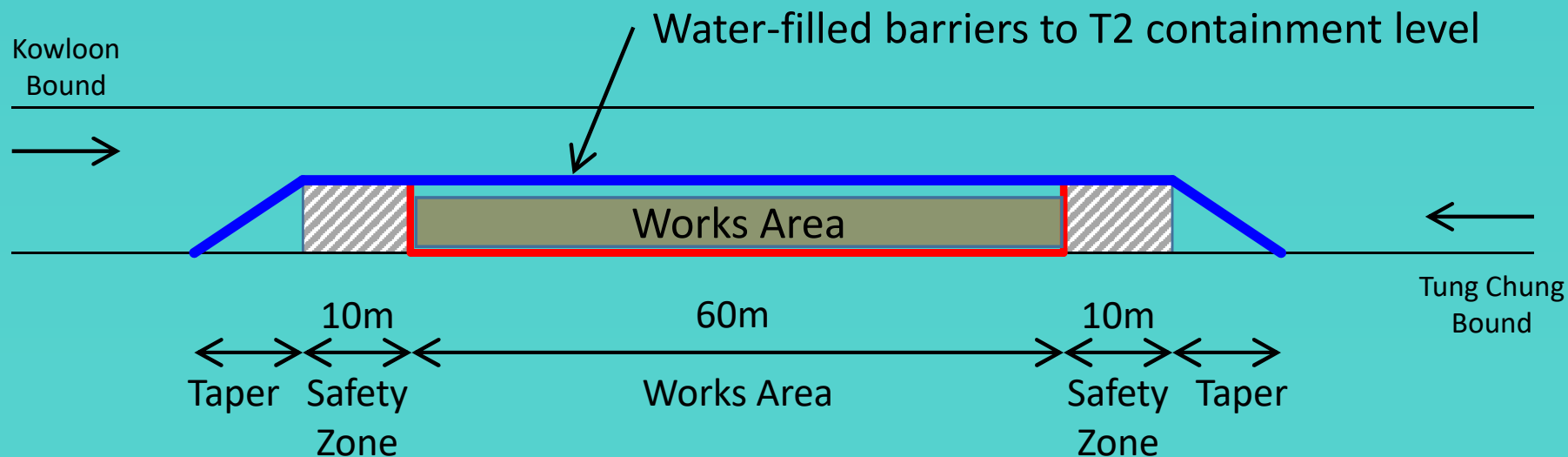
Set up & removal
time: 1hr

Productive working
hour: 7hrs

TTM Arrangement under COP 4th Issue



TTM Arrangement under COP 5th Issue



Legend: — Water-Filled Barriers — Plastic Barriers ● ● ● Traffic Cones

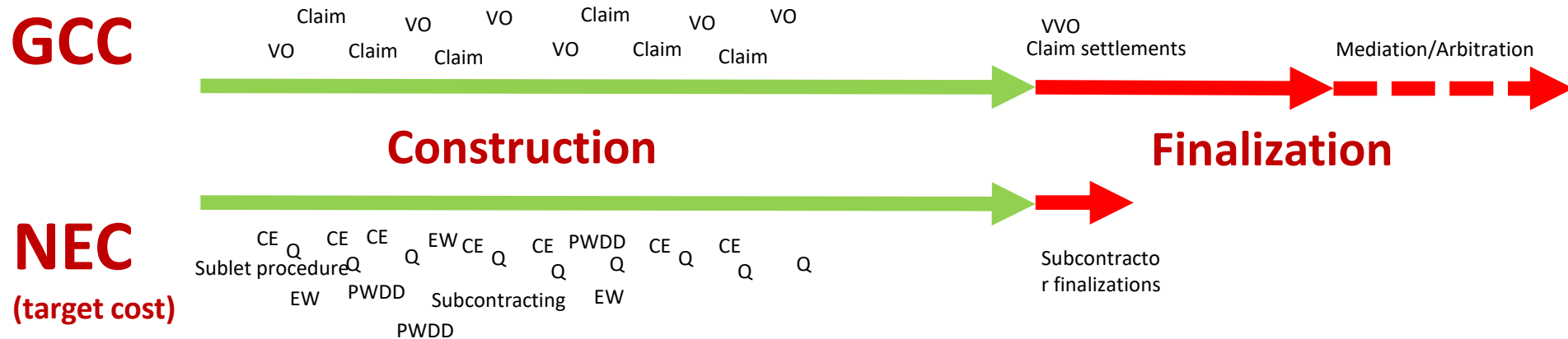
Case Study 3 (Construction Risk)

Actions	Responsible Parties (GCC)	Responsible Parties (NEC)
Derive practical TTA Schemes	Contractor	Employer, Consultants & Contractor
Study alternative construction method	Consultants	Employer, Consultants & Contractor
Obtain approval from TMLG on the revised TTA Scheme	Contractor	Employer, Consultants & Contractor
Procure T2 water barriers	Contractor	Contractor



“We shall act in a spirit of **mutual trust** and **co-operation**.”

GCC + collaboration = NEC ???



Changes in System

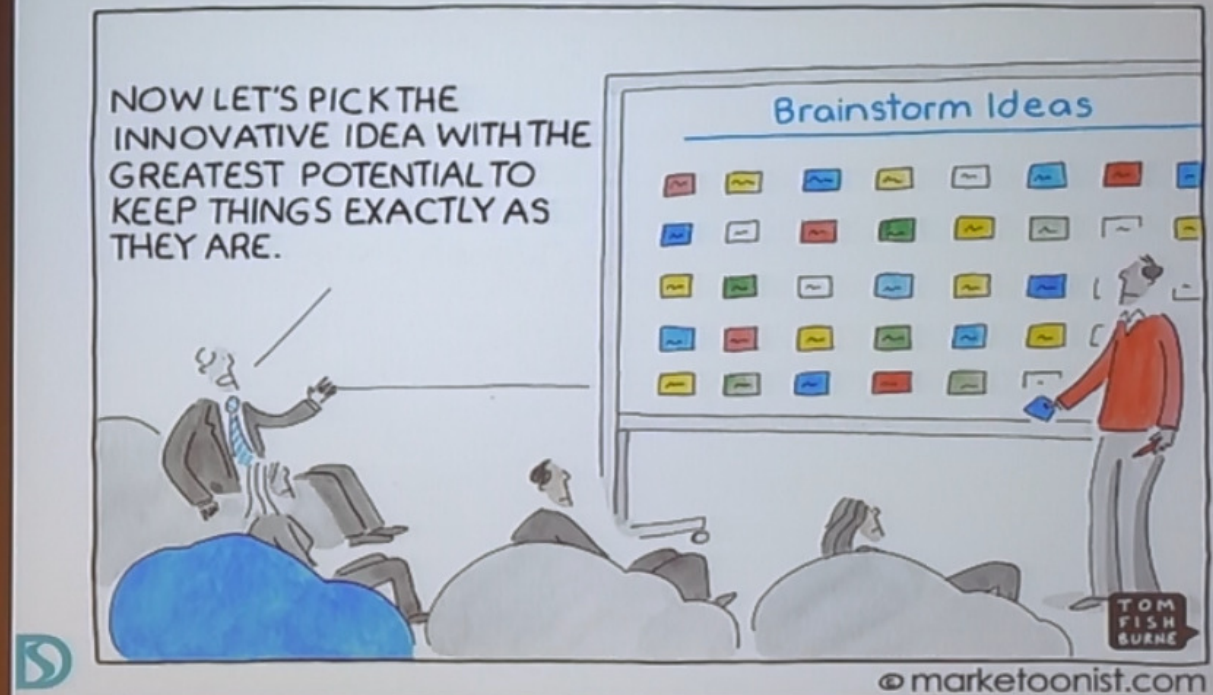
- Pace/speed/efforts
- Resources
- Employer's and PM's involvement
- Early Warning and Risk Reduction Meeting
- Subcontracting
- Payment/PWDD/Target; Pain/Gain
- Common goals



Changes in People

- Skills/capability strengthening (training, learning)
- Works prioritization and team building
- Proactive involvement (Employer's rep full time on site ?)
- Options and decisions; management involvement
- Packaging, alternative and design input
- Forecasting and mechanism
- Keep working towards or beyond the goals

5.2 How Can We Be More Innovative? – Essential Elements



Thank You

