

PARADIGM SHIFT IN THE RISK & COST MANAGEMENT FOR MAINLAYING IN URBAN AREA

AGENDA

1. Mainlaying in Urban Area
2. Risk and Cost Management for Urban Mainlaying Work
3. New Approaches in future Mainlaying Contracts
4. Conclusions



MAINLAYING WORK IN URBAN AREA

MAINLAYING WORK IN URBAN AREA

- Adopt **GCC Term Contract**
- Engineer issues **Works Order** to Contractor as **instruction** to carry out mains replacement/rehabilitation work
- Typically information available in the Works Order is only the **indicative alignment of the works.**



MAINLAYING WORK IN URBAN AREA

- Scope of works in the WO typically includes:
 - Replacement or rehabilitation of existing water mains,
 - Construction of all chambers,
 - Design and implement TTA,
 - Utility diversion,
 - Any temporary bypass arrangements,
 - Pick up service connection,
 - Arrangement of water service shutdown,
 - Installation of fire hydrants.....



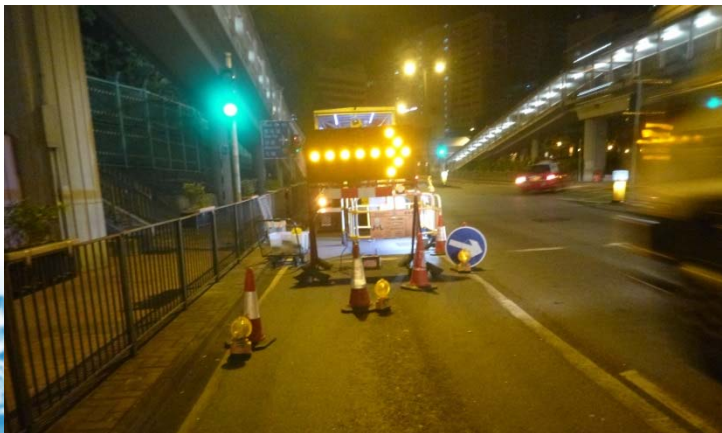
MAINLAYING WORK IN URBAN AREA

➤ Risks in Mainlaying Work:

- Stringent traffic and noise restrictions, leading to very **limited working hours and space.**
- **Unforeseeable** ground condition/ utilities obstruction
- **Uncertain** alignment of existing watermain

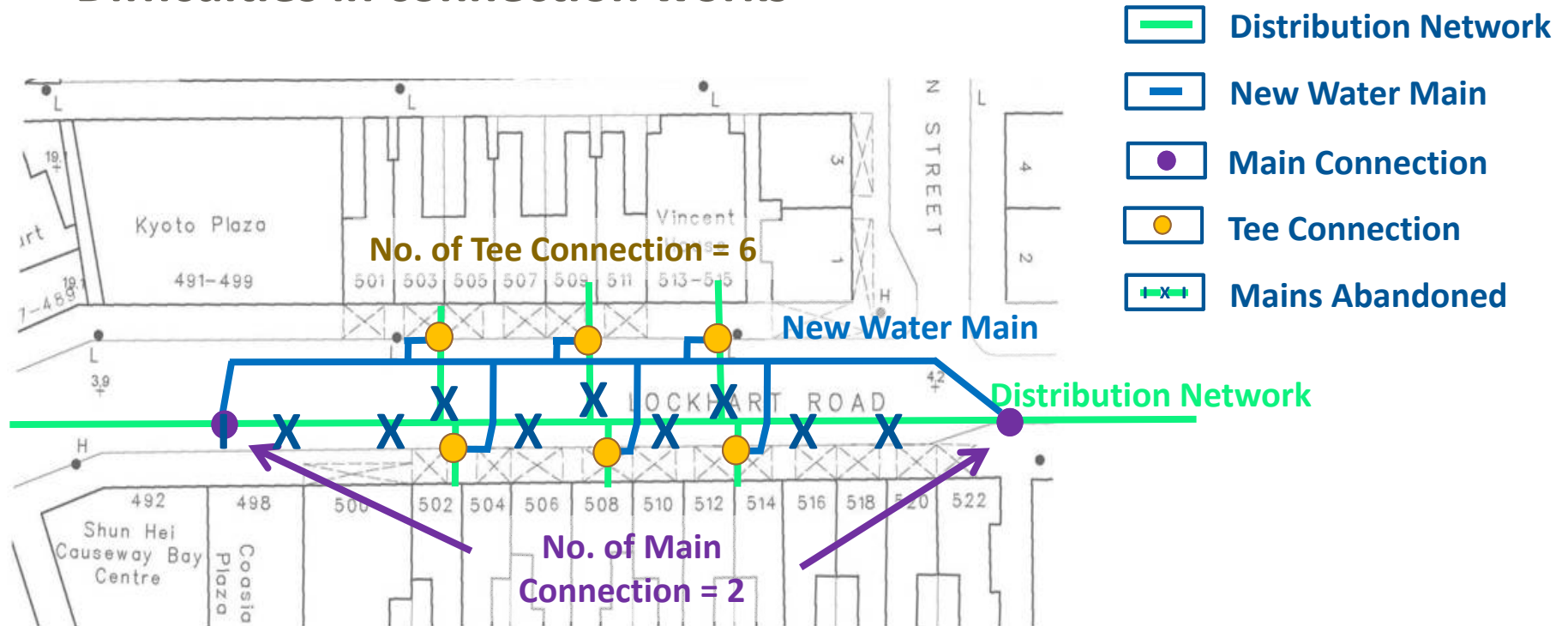


➤ **With insufficient information, Contractors usually cannot develop effective solution and can only ensure more than adequate allowance for risks – high price/erratic pricing.**



MAINLAYING WORK IN URBAN AREA

Difficulties in connection works



MAINLAYING WORK IN URBAN AREA

- **Involved large number of temporary traffic arrangements (TTA)**
 - Typically abandonment of 100 m of water main involves 2 main connections, 20 tee connections and 9 TTA applications for works in stages
- **Restriction on water suspensions to minimize inconvenience to the consumers**
 - Avoid repeated water suspensions over short period of time
 - No more than 8 hrs water suspension



COST AND RISK MANAGEMENT FOR MAINLAYING IN URBAN AREA

VICIOUS CYCLE IN POORLY PERFORMED CONTRACTS

1. Contractor did not have enough information about site constraints

2. Inadequate allowance of site risks by the Contractor

3. Insufficient contract provisions to cater for contractor's special arrangements

4. Delay in progress, disputes, curtailment of scope of works



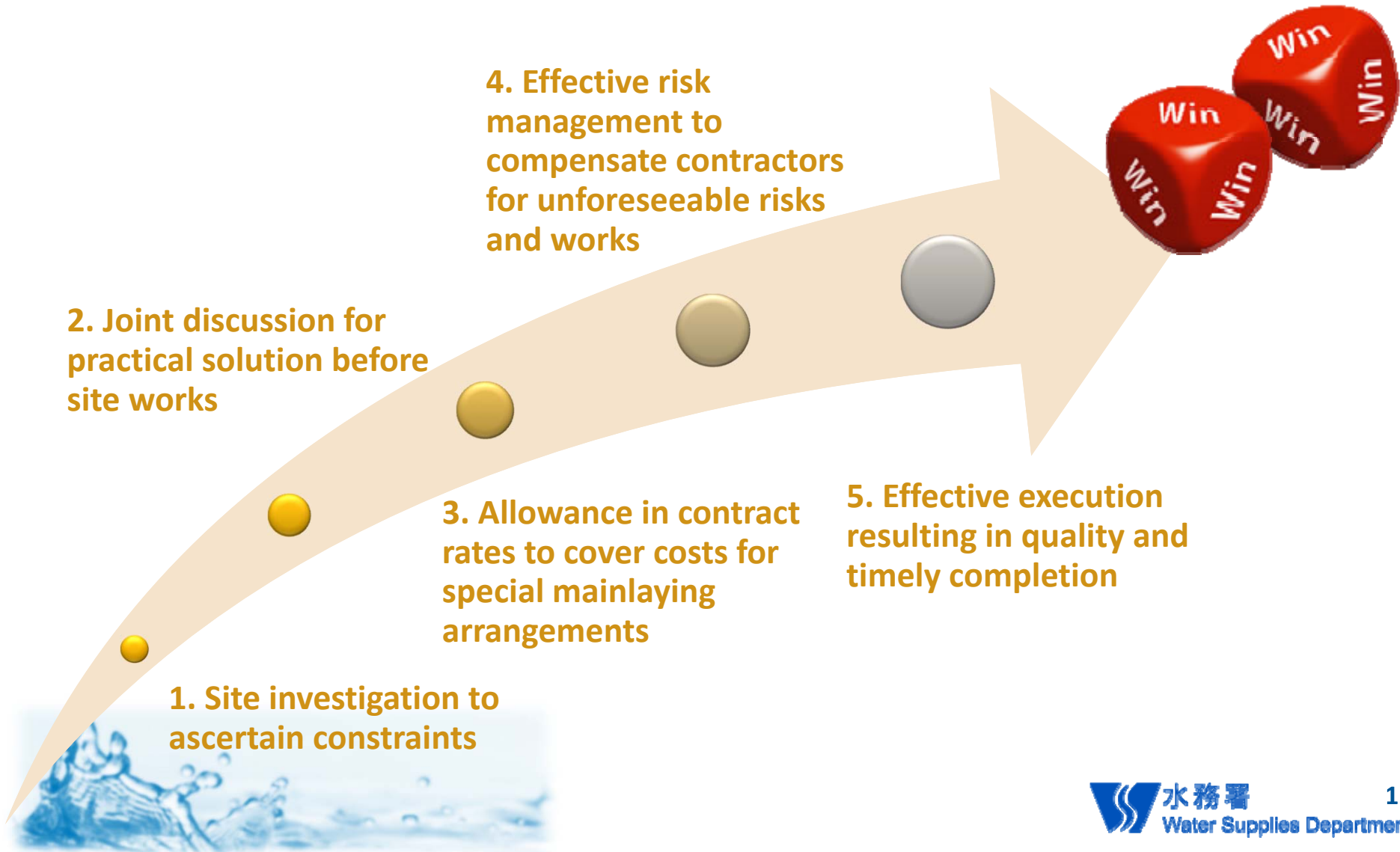
RISK AND COST MANAGEMENT FOR MAINLAYING WORK IN URBAN AREA

➤ Innovative approach to

- Better risk sharing
- Adequate schedule of rates to cater for different site constraints
- NEC contract for better change management
- Barricade erratic pricing



PARADIGM SHIFT IN COST AND RISK MANAGEMENT IS NEEDED



NEW APPROACHES IN FUTURE MAINLAYING CONTRACT

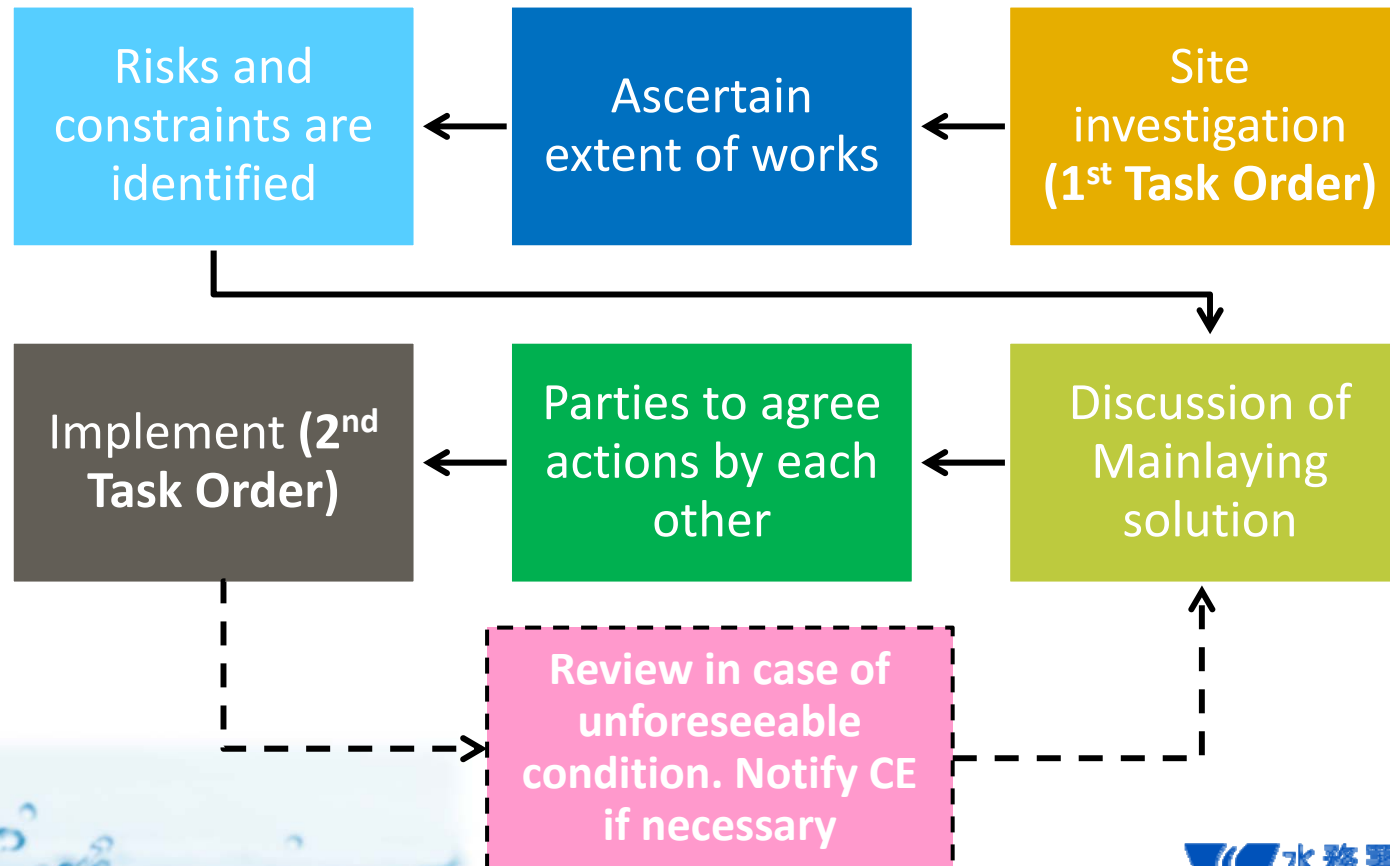
NEW APPROACH TO TASKS ORDER ADMINISTRATION

- **Two or more separate Task Orders** will be issued for a part of the works:
- **Mainlaying Works**
 - **1st Task Order** – Site Investigation to ascertain the alignment of the proposed water mains and locations of the connection points with agreed TTA
 - **2nd Task Order** – Mainlaying works (including connection works)



NEW APPROACH TO TASKS ORDER ADMINISTRATION

Aim at harnessing Contractor's expertise to ensure practicality of works before implementation



SUFFICIENT CONTRACT PROVISIONS FOR DIFFERENT SITE ARRANGEMENTS

- **Allow billed items in Bills of Quantities to cater for different site constraints:**
 - **Adequate provision** for different scenario of works: TTA, pipe laying, connection work
 - **Separate items** for mainlaying by trenchless method and heading method (short distance undermining work)
 - **Extra over** for works in restricted working hours and night works
 - **Restrict the room for erratic pricing** or adopt pre-priced items
- **Allow sufficient time in Task Order**
 - **Duration of 2nd Task Order** for mainlaying/ connection should be based on results of site investigation (1st Task Order) and agreed mainlaying solution



ENHANCING PROJECT MANAGEMENT



Collaborative Working Relationship

- Use of NEC Contract to facilitate partnering approach
- Uphold one team, one goal approach



Joint problem solving

- Proactive communication with focus on problem solving
- Set up holistic communication network for all levels of staff



Effective risk and change management

- Active participation by senior management to control and mitigate risks
- Effective use of early warning mechanisms and risk register



Example of Successful Mainlaying Work by Effective Project Management and Collaborative Effort

Repeated fresh water & salt water ranging 150-250 mm dia. main burst incidents in the vicinity of City Garden, North Point on 14 Jun & 29 Dec 2015, 9 Jun, 13 Jun, 19 Jul & 8 Aug 2016



- With full support from DC members and City Garden's Incorporated Owners Committee, achievements to speed up progress include:
 - Approval of waiver on Repeated Road Opening Restriction for XP
 - Approval for shallow cover
 - Approval of 24hrs lane closure TTAs (instead of restricted time of 1000-1500 (Mon – Fri)) was obtained and Concurrent 24hrs lane closure TTAs (within 300m apart)
- R&R works advanced by 3 – 4 months for completion to be scheduled by May 2017

CONCLUSIONS

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- As a department committed to reduce water loss, WSD will continue to instigate various scales of Mainlaying projects to replace and rehabilitate aging water mains.
- New contract provisions and administration procedures are introduced to make future Mainlaying works in urban area more efficiently performed.
- With the new provisions in place, the industry will see a paradigm shift in cost and risk management for Mainlaying works in Urban Areas to be more effective and beneficial to all.

