香港特別行政區政府 The Government of the Hong Kong Special Administrative Region
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22 February 2016

Clerk to the Public Works Subcommittee
Legislative Council Secretariat,
Legislative Council Complex,
1 Legislative Council Road,
Central, Hong Kong.

(Attn.: Ms. Sharon Chung)

Dear Ms. Chung,

**Public Works Subcommittee**
**Follow-up to Meeting on 17 February 2016**
**PWSC (2015-16)49**

In considering the paper referenced PWSC(2015-16)49 on **223DS** "Yuen Long and Kam Tin sewage treatment upgrade – upgrading of San Wai sewage treatment works" and **235DS** "Yuen Long and Kam Tin sewerage and sewage disposal", Dr Hon KWOK Ka-ki requested the Administration to provide supplementary information on (a) international experience in the adoption of Design-Build-Operate ("DBO") form of contract for procuring sewage treatment facilities; and (b) how the adoption of DBO would achieve cost-effectiveness and efficiency when compare to the conventional method.

The requested information is set out at Annex (in Chinese and English) for Members' reference.

Yours sincerely,

( Henry K. M. CHAU )
*for* Director of Drainage Services

Encl.

c.c. Ir. Dr. Hon. LO Wai Kwok, BBS, MH, JP.
Chairman of the Public Works Subcommittee – w/e
Secretary for Financial Services and the Treasury (Attn. : Mr. Joe K K HSIE) - w/e
Secretary for the Environment (Attn. : Miss Amy W Y YUEN) – w/e

Annex

**Public Works Subcommittee**
**Follow-up to meeting on 17 February 2016**

**PWSC(2015-16)49**
**223DS – Yuen Long and Kam Tin sewage treatment upgrade – upgrading of San Wai sewage treatment works**

**235DS – Yuen Long and Kam Tin sewerage and sewage disposal**

**Supplementary information on (a) international experience in the adoption of Design-Build-Operate (DBO) form of contract for procuring sewage treatment facilities; and (b) how the adoption of DBO would achieve cost effectiveness and efficiency when compare to the conventional method**

At the Public Works Subcommittee Meeting on 17 February 2016 during the discussion of the captioned item, Members have requested the Administration to provide supplementary information on the international experience and cost effectiveness in the adoption of the Design-Build-Operate (DBO) form of contract. This paper provides such information for Members' consideration.

2. Although DBO is a relatively new procurement approach for providing sewage treatment facilities in Hong Kong, its use has in fact been widely adopted internationally. The Drainage Services Department (DSD) brings in DBO for procuring sewage treatment facilities with a view to trying out its potential merits which include:

(i) encouraging the introduction of overseas innovative technology/experience/management technique;
(ii) larger scope for optimisation resulting in lower life-cycle cost;
(iii) minimisation in government staff resources; and
(iv) clearer accountability of responsibilities among design, construction, and operations phases as only one party is responsible for the whole design-build-operation process.

3. DSD's first pilot use of DBO is for the Upgrading of Pillar Point sewage treatment works (STW). The operation stage of this STW has commenced in mid 2014 and we have achieved around 2% reduction in life cycle cost and 30% saving in land use. The Upgrading of the San Wai STW is DSD's second pilot sewage treatment project.

**Achieving Cost Effectiveness and Efficiency through DBO**

i) Improved efficiency through innovation – DBO is more conducive to bringing in innovation. A number of overseas innovative sewage treatment technologies could only be brought in through DBO. This is because these innovative sewage treatment technologies are often developed by specialists of respective international contractors. These innovative sewage treatment technologies could help to improve the efficiency of sewage treatment process. For example, under the Upgrading of Pillar Point STW, the contractor adopted an innovative enhanced primary treatment process which improved the efficiency of sewage treatment. Furthermore, as smaller footprint is required due to the innovative process, this has resulted in leaving more space for greening and beautification of the plant for the benefits of the neighbourhood, as well as more flexibility for future expansion when necessary.

ii) Larger scope for optimisation – Under the conventional design and build approach, different parties, i.e. consultants, installation contractors and operators are respectively responsible for design, construction and operation. Therefore the design, construction and operation of the treatment works would normally follow a conventional approach. On the other hand, the DBO contractor is responsible for the whole design-build-operation process and therefore there is more room for optimisation through considering the treatment plant's long-term efficiencies holistically and resulting in a reduction in life-cycle costs.

iii) Reduction in government resources – As operation of the sewage treatment works is carried out by the DBO contractor, DSD is only required to deploy a limited number of staff for managing the DBO contractor during the operation stage which can reduce the government staff requirement for plant operation.

iv) Improved efficiency through clearer accountability of responsibilities – As only one party is responsible for the whole design-build-operation process, accountability of responsibilities is much clearer and hence improves efficiency.

4. There are many successful cases in adopting DBO for providing sewage treatment facilities internationally. Examples of them are given in Appendix A. It can be seen that the range of saving in life cycle costs could be up to 10 – 20%.

Examples of successful cases in adopting DBO for providing sewage treatment facilities

| Oversea Project | Treatment capacity ($1000m^3/d$) | Contract Term (years) | Estimated Savings against conventional procurement methodologies |
|---|---|---|---|
| USA | | | |
| Plymouth, Mass. wastewater DBO | 57 | 20 | 20% |
| Washington Borough, NJ wastewater DBO | 4.5 | 15+ 5 | 11% |
| New York, Advanced Wastewater Treatment Plant (AWTP) | 5.6 | - | 10% |
| Fillmore, California, Water Recycling Plant | 20 | - | 15% |
| Australia | | | |
| Bega Valley, NSW wastewater DBO | Multiple | 10+ 5+ 5 | 14% |

Remark: The figure after "+" denotes the number of years of contract term extension.