

To: Agencies/Developers/Qualified Persons/Contractors

PUB (WRN) ADVISORY NOTE ON PREVENTION OF DAMAGE TO PUBLIC SEWERAGE SYSTEM (REVISED EDITION- MAR 2023)

The public sewerage system, including the deep tunnel sewerage system (DTSS), is a national infrastructure that conveys used water for reclamation. The sewerage system thus is an integral part of Singapore's water supply system. Any damage to the sewerage system will not only cause environmental pollution but also affect the disruption of used water which is feed water for the production of NEWater. We seek your cooperation and diligence in the conduct of your construction activities to ensure that the sewerage system is well protected and prevented from any damage.

In this respect, you are advised to keep the proposed works away from the large diameter ($\geq 900\text{mm}$) sewers or DTSS at the earliest planning stage where possible. These large diameter sewers and DTSS are critical pipelines that serve very large catchments. Any damage to these sewers/DTSS could lead to used water overflow/leaks affecting a sizable area where the consequential pollution/environment impact could be catastrophic.

You are required to comply with the technical requirements for protection of public sewerage system stipulated in the **Code of Practice on Sewerage and Sanitary Works (COPSSW 2nd Edition Jan 2019)**, which can be found in the PUB website at <http://www.pub.gov.sg/usedwater/legislation> (under Used Water-Legislation and Requirements).

This advisory provides guidance to assist qualified persons (QPs), professional engineers and contractors in submitting to PUB the online application for carrying out any works/specified activities within the public sewer corridors. The advisory consists of the following Annexes:

- Annex 1 - Dos and Don'ts
- Annex 2 - Approval of plans for proposed development or building works or specified activity within public sewer corridor
- Annex 3 - Guidelines on protection of large diameter (900mm or greater) sewers and DTSS tunnels & structures
- Annex 4 - Penalties for offences under the Sewerage and Drainage Act 1999 and the Sewerage and Drainage (Protection of Public Sewerage System) Regulations 2017

For clarification:

- a) General requirements for protection and site verification, please contact Ms Hui Shan Khong at Tel: 68056273 or Mr Jonathan JW Lim at E-mail: Jonathan_JW_LIM@pub.gov.sg of the Network Management Branch;
- b) Consultation and submission of application, please contact Mr Sophian Ismail at Tel: 67313656 or Ms Taraney Gunasekaran at Tel: 67313691 of the Planning & Design Division.

Issued by:
Water Reclamation (Network) Department
PUB

ANNEX 1

DOs AND DON'Ts ON THE PREVENTION OF DAMAGE TO THE SEWERAGE SYSTEM

[Reminder: Under the Sewerage and Drainage Act 1999, the penalty for erecting any object, building or structure over, across or adjacent to any sewerage system without prior approval from PUB is a fine of up to \$20,000. The penalty for causing any damage to sewer is a fine of up to \$200,000 or to imprisonment for a term up to 2 years or to both.]

DO

1. Do purchase a Sewerage Information Plan (SIP) through SLA's INLIS Portal (<https://www.sla.gov.sg/INLIS/#/PUB/UP/Search>). The user guide for PUB service plans on INLIS can be downloaded from the link (<https://www.sla.gov.sg/INLIS/SamplePDF/PUBUserGuide.pdf>) and display a copy of the SIP at site.
2. Do submit the application for approval of plan for specified activities within public sewer corridor through POWS system (<http://bpu.pub.gov.sg/pows>) to obtain the written clearance from PUB (WRN) before carrying out any of the specified activities within the public sewer corridor.
3. Do consult PUB (WRN), **Network Management Branch (NMB)** at Tel: **67313294** when you are unable to locate existing sewers/pumping mains/manholes/chambers, etc at site.
4. Do engage a Registered Surveyor to peg the outer edge of the sewers/pumping mains alignment to forewarn contractors of the presence of sewers/pumping mains, etc.
5. Do use only manual excavation near the pipes while carrying out trial trenches to ascertain the exact location of existing sewers/pumping mains/sanitary drain-lines before carrying out any excavation, boring or piling work. Do take photos of the trial holes/pre-probing.
6. Do reconfirm the sewers/pumping mains alignment before replacing any missing or faded pegs.
7. Do have proper protection for existing sewers/pumping mains during excavation. Prior approval must be obtained from PUB (WRN) for protection/diversion works.
8. Do ensure that daily site briefings with all worksite workers are conducted (in languages that are understood by all workers) to remind them about the location of the sewers/pumping mains and the measures to be taken to prevent damage.
9. Do ensure that information on the presence of sewers/pumping mains in the vicinity of the worksite and all mitigation measures to be taken to prevent damage have been communicated and adhered to by all personnel of all working levels in the project team, including sub-contractors and any third party who are in any way involved with any part of the intended work.
10. Do contact PUB (WRN) immediately if you find any live or abandoned sewers/pumping mains, which are not shown in the SIP, in the course of carrying out any work at the worksite.
11. Do report to PUB (WRN), **Network Management Branch (NMB)** at Tel: **67313294** should any of the sewerage system be damaged, exposed or any sealing work is required for immediate attention.

DON'T

1. Don't carry out any specified activity (eg excavate, pile, etc) or construct any structures within the public sewer corridors without prior approval from PUB (WRN).
2. Don't allow heavy machinery to move over any existing sewer/pumping main without adequate protection (e.g steel plate).
3. Don't use excavator or equipment/machineries with sharp edges to dig trial holes to locate the existing sewers/pumping mains/sanitary drain-lines.
4. Don't lay any services on top of any existing sewer/pumping main.
5. Don't place any structures above or within public sewer setback. For public sewer setback requirement, please refer to Code of Practice on Sewerage & Sanitary Works (2nd Edition) clause 1.2.5.
6. Don't lay any services inside any manhole/chamber.
7. Don't cover any manhole/chamber with earth, concrete, premix, construction debris or any other materials during the construction work.
8. Don't place any surcharge such as excavated earth on top of any sewer/pumping main/manhole/chamber. No overburden load should be imposed on the sewers/pumping mains/manholes/chambers.
9. Don't leave the manhole or inspection chamber cover open. If the cover is damaged in the course of the construction work, replace them immediately or call the PUB(WRN), **Network Management Branch (NMB)** at Tel: **67313294** for assistance.

ANNEX 2

Approval of plans for proposed development or building works and specified activity within public sewer corridor

A. PUB's Clearance Certificate or approval under section 14 & 33 of Sewerage and Drainage Act (SDA) 1999 for proposed development or building or works likely to affect sewer or sewerage system

1. For any development or building works if the plan requires the approval of the Commissioner of Building Control (BCA), the QP for the development or building works must obtain a Clearance Certificate for the proposal development or building works to be carried out **in or outside** a public sewer corridor from the Building Plan Unit (BPU) of PUB.
2. For any other works, if the plan does not require the approval of the Commissioner of Building Control (BCA), a registered professional engineer (or the contractor if permitted by PUB under certain circumstances) for the proposed works must obtain a clearance from Building Plan Unit (BPU) of PUB for the proposal works to be carried out **in or outside** a public sewer corridor.

B. PUB's approval under regulation 5 of Sewerage and Drainage (Protection of Public Sewerage System) Regulations for carrying out specified activity within a public sewer corridor

1. The contractor of the specified activity must obtain an approval from PUB(WRN) before carrying out the specified activity (eg trial trenching or soil investigation works, site formation works, earth works, piling works, building works, etc) **within** a public sewer corridor.

2. **Who to make application?**

An application to PUB(WRN) through POWS (<http://bpu.pub.gov.sg/pows>) for the approval of the plan for any specified activity within public sewer corridor must:

- (a) be made by the contractor of the activity;
 - (b) be prepared and submitted: -
 - (i) if the plan requires the Commissioner of Building Control's approval, by the appointed qualified person; or
 - (ii) if the plan does not require the Commissioner of Building Control's approval:-
 - (A) by the appointed registered professional engineer; or
 - (B) if PUB permits in any particular case, by the contractor;
- (a) be accompanied by the plan.

3. **What documents to be submitted?**

(a) If the Specified Activity is within the public sewer corridor of sewers < 900mm in diameter:

- i. SIP showing the existing sewers/manholes within and near the site;
- ii. Layout plan showing the proposed building/structures (including retaining and boundary walls, footings drains, etc.) or engineering works. The plan shall indicate the minimum setback distance for the existing sewer to the structures;
- iii. Survey plan endorsed by Registered Surveyor (RS) showing the alignment of all the affected public sewers/manholes and the public sewer corridors;

- iv. Pre-construction closed-circuit television (CCTV) inspection report together with the CCTV video for the public sewer (to be submitted through CCTV online submission system (<http://www.sewerccctv.pub.gov.sg>));
- v. Method statement detailing how the works/activities are proposed to be carried out;
- vi. Detailed drawings for the works/activities (e.g. piling plans) and details of the machinery/equipment to be used;
- vii. PE's analysis/assessment that the construction method proposed will not cause any impact or damage to the sewerage system; and
- viii. Such other plan, information, technical report, certificate and document such as Construction Impact Assessment Report (CIAR), instrumentation and monitoring plan as may be required by PUB.

(b) If the Specified Activity is within the public sewer corridor of sewers \geq 900mm in diameter or DTSS tunnel

- i. All the documents listed in (a) (i) to (viii) above;
- ii. Construction Impact Assessment Report (CIAR)
- iii. Instrumentation and monitoring plan; and
- iv. Details of installation of web-based IP surveillance cameras if the specified activities are carried out within sewer setback.

4. Approval for the application

(a) PUB will review the submissions within 14 working days and if all the documents are in order, grant the approval for the specified activity, with or without conditions. No works are to commence until the approval has been granted by PUB(WRN).

(b) PUB, when reviewing the submission, may direct the responsible person (i.e. QP/PE/contractor) to comply with such requirements as it may specify and re-submit the application within such period as may be specified in the direction.

(c) The approval for the specified activity will cease:

- (i) if the activity does not start before the end of the commencement window period for that activity;
- (ii) upon the failure of the contractor to comply with any condition or requirement imposed by PUB;
- (iii) upon the QP/PE ceases to supervise the specified activity; or
- (iv) upon the revocation by PUB of the approval.

5. Commencement window period

(a) The contractor of the specified activity must ensure that the activity is commenced before the period of **12 months** from the date of approval.

(b) The contractor may apply to PUB for an extension of the commencement window period not later than 14 days before the expiry of the commencement window period. PUB, in granting the application, will also fix the period of the extension.

(c) The date of commencement must be clearly indicated in the application form.

6. **Amendment to approved plan**

(a) No deviation from the plans approved by PUB shall be made unless with prior written approval from PUB (WRN).

(b) The contractor of the activity may make application to PUB for permission to amend the approved plan. The Application shall be prepared by the person who prepared the application for approval of the original plan (refer to item 2 above).

(c) The contractor must ensure that the activity is carried out in accordance with an approved plan (including any amendment permitted to the plan) for the activity.

7. **Supervision of specified activity**

(a) The specified activity to be carried out in a public sewer corridor must be supervised by the QP (if the plan for the activity requires the Commissioner of Building Control's approval) or the PE (if the plan for the activity does not require the Commissioner of Building Control's approval) who prepared the application for the approval of the plan (refer to item 2 above).

(b) The supervisor must:

(b) exercise due diligence in supervising and inspecting the carrying out of the activity;

(ii) take all reasonable steps when supervising and inspecting the carrying out of the activity to ensure that the activity is carried out in accordance with the approved plan for the activity and any condition or requirement imposed by PUB.

(iii) notify PUB of any contravention of the Act/Regulations or any condition or requirement imposed by PUB.

(iv) keep and maintain at the premises at which the activity is carried out, such document, book or record;

(v) carry out the inspection of the activity;

(vi) submit to PUB a declaration and certificate of completion of works relating to the activity; and

(vii) submit such other document at such time as PUB may specify.

8. **Post-construction CCTV inspection**

The post-construction CCTV inspection videos and reports shall be submitted through CCTV online submission system (<http://www.sewercctv.pub.gov.sg>) to PUB(WRN) when the QP/PE submits the declaration and certificate of completion of works/activity to PUB or at such time as specified by PUB(WRN).

9. **Submission of "as-built" survey plan upon completion of works**

Upon completion of the development, QP/PE shall submit a **certificate of completion** and an **"as-built"** survey plan endorsed by a registered surveyor to show the exact location/clearances (horizontal/vertical) between the existing sewers/manholes and all the existing/new buildings/structures including wall, drains, boundary lines, services laid etc. The top and invert levels of all the sewer manholes shall be indicated in the plan. The QP/PE shall:

- highlight and certify if there are any changes in the condition of the existing sewers/manholes between the post and the pre-construction CCTV inspection.

- confirm that the minimum clearance distance between the building/structure/services and the sewer met the stipulated requirements in the code of practice and is in accordance with the requirements/conditions imposed by PUB (WRN) when the development plans were approved.
- certify with submission of the as-built drawing of the installed piles/drilling boreholes that there are no impacts/damages caused to the sewers, manholes and pumping mains based on the as-constructed works, instrumentation monitoring results, sewer pre/post construction CCTV survey report and pre/post sewer levels as detailed in the construction survey report submitted to PUB (WRN).

ANNEX 3

GUIDELINES ON PROTECTION OF LARGE DIAMETER (900mm or GREATER) SEWERS AND DTSS TUNNELS & STRUCTURES

- 1 The responsible QP, PE and Contractor shall comply with the technical requirements stipulated in Part 2 and Annex G of the Code of Practice on Sewerage and sanitary Works(COPSSW 2nd edition Jan 2019) to protect the sewers and DTSS tunnels in the vicinity of the works.
- 2 The responsible QP or PE shall design both the temporary and permanent works in such a way to ensure that ground movements are kept to an absolute minimum. The **employment of proven techniques and good workmanship** are important to minimize ground loss and in turn ground movements.
- 3 The QP or PE shall select and ensure the operation of construction equipment shall be in a manner such that vibration induced damage to the sewers and DTSS tunnels/structures is prevented.
- 4 The QP or PE shall establish and inform PUB (WRN) of the procedures and methods for all excavation and other construction works within the public sewer corridor of large diameter sewers and DTSS tunnels to prevent damage to the sewers and DTSS structures during the work.

Assessment of Construction Effects on Existing Structures

- 5 **Construction Impact Assessment Report (CIAR)** - The construction impact assessment of the construction effects of the works on the sewers and DTSS structures in the vicinity of the works shall be submitted to PUB (WRN) for evaluation. The report shall include the following details:
 - (i) The ground conditions, geotechnical profiles and relevant borehole logs.
 - (ii) The proposed construction equipment and methods, and sequencing of construction.
 - (iii) Assessments on the use of the proposed construction equipment/methodology on the existing sewers/DTSS tunnels, vibrations, ground displacements, load transfer from foundation elements to the sewers and DTSS tunnels and groundwater draw downs and how the impacts would be mitigated to meet requirements.
 - (iv) Vibration characteristics and attenuation for major construction equipment/methodology.
 - (v) Instrumentation and monitoring proposals.
 - (vi) The damage potential and risks to the sewers and DTSS structures.
 - (vii) Preventative and precautionary measures to protect the sewers and DTSS structures from damage and remedial measures to be taken in the event of damage/incidents.

6 Instrumentation and Monitoring Programme

- (a) The QP or PE shall include in the monitoring plan all sewers and DTSS tunnels/structures that in his view are likely to be affected by the works.
- (b) The QP or PE shall submit full details of the proposed monitoring procedures and instrumentation to PUB (WRN) for concurrence before commencing the works.
- (c) The QP's or PE's method statement shall include the proposed monitoring intervals and all requirements imposed by PUB (WRN).
- (d) **QP or PE shall stop the works immediately if the instrumentation monitoring results exceed the allowable limits and inform PUB (WRN), Network Management Branch (NMB)** immediately before investigating whether the works have any impacts on the sewers. The QP or PE shall submit his assessment of the impacts of the works on the sewer, including his proposed mitigating measures to address the excessive ground movement or any other abnormalities, to PUB (WRN) for approval, before resuming the works.

ANNEX 4

PENALTIES FOR OFFENCES UNDER THE SEWERAGE AND DRAINAGE ACT 1999 AND THE SEWERAGE AND DRAINAGE (PROTECTION OF PUBLIC SEWERAGE SYSTEM) REGULATIONS 2017

(A) Sewerage and Drainage Act 1999

Section	Description of Section/Regulation	Penalty
13A(1)	<p>Duty to enquire before excavation</p> <p>Any person who digs, bores, trenches, grades, excavates, tunnels or breaks any ground with any mechanical equipment, tool or explosive, or allows his employee or agent to do so, without first: -</p> <p>a) obtaining from the Board the relevant drainage plan or sewerage plan or other plans or records to ascertain the location of any public sewerage system or part thereof that may be interfered with by such works;</p> <p>b) carrying out trial trenches to physically ascertain the location of any such public sewerage system or part thereof that may be interfered with by such works; and</p> <p>c) complying with such other requirements as the Board may specify to protect any such public sewerage system or part thereof within the vicinity of such works,</p> <p>shall be guilty of an offence.</p>	<p>Any person found guilty of an offence shall be liable on conviction to a fine not exceeding \$50,000 or to imprisonment for a term not exceeding 3 years or to both.</p>
14(1)	<p>Works likely to affect sewer or sewerage system not to be carried out without Board's certificate or approval</p> <p>No person shall –</p> <p>a) erect or cause or permit to be erected any object, building or structure over, across or adjacent to any sewer or sewerage system; or</p> <p>b) carry out or cause to be carried out any other works which adversely affect or are likely to adversely affect any sewer or sewerage system, directly or indirectly</p> <p>without obtaining, in respect of those works, a clearance certificate or the approval of the Board under section 33.</p>	<p>Any person found guilty of an offence shall be liable on conviction to a fine not exceeding \$20,000.</p>
20(1)	<p>Damage caused to public sewer, etc.</p> <p>Any person who –</p> <p>a) causes any damage to any public sewer or any drain-line or sewer communicating with a public sewer; or</p> <p>b) renders any public sewer or private sewer a nuisance,</p> <p>shall be guilty of an offence.</p>	<p>Any person found guilty of an offence shall be liable on conviction to a fine not exceeding \$40,000 or to imprisonment for a term not exceeding 3 months or to both</p>
20(2)	<p>Any person who –</p> <p>a) does any act which renders any public sewer or private sewer dangerous or injurious to health;</p> <p>b) causes any damage to a pipe of 0.9 metres or greater in diameter that is part of or connected to the public sewerage system; or</p> <p>c) does any act which disrupts the operation of or causes damage to any sewage treatment plant, sewage treatment works or water reclamation facility,</p> <p>shall be guilty of an offence.</p>	<p>Any person found guilty of an offence shall be liable on conviction to a fine not exceeding \$200,000 or to imprisonment for a term not exceeding 2 years or to both.</p>

63(b)	<p>General Penalties</p> <p>Any person who fails to comply with any condition subject to which any clearance certificate is issued or approval is granted by the Board under section 33,</p> <p>Shall be guilty of an offence.</p>	Any person found guilty of an offence shall be liable on conviction to a fine not exceeding \$15,000 or to imprisonment for a term not exceeding 3 months or to both, and in the case of a continuing offence, to a further fine not exceeding \$500 for every day or part thereof during which the offence continues after conviction.
Reg 4(1)	<p>Sewerage and Drainage (Sanitary Works) Regulations</p> <p>Permission to work in public sewerage system</p> <p>No person shall enter the public sewerage system to carry out any works except with the prior permission of the Board.</p>	Any person found guilty of an offence shall be liable on conviction to a fine not exceeding \$15,000 and, in the case of a continuing offence, to a further fine not exceeding \$500 for every day or part thereof during which the offence continues after conviction.
Reg 4A	<p>Sewerage and Drainage (Sanitary Works) Regulations</p> <p>Prohibitions relating to manhole and chamber of public sewerage system</p> <p>No person shall do any of the following except with the prior permission of the Board:</p> <p>(a) cover up or pave over, or cause or permit to be covered up or paved over with bitumen, cement, concrete slab or any hard material any access into any manhole or chamber of the public sewerage system;</p> <p>(b) open, or cause or permit to be opened, any cover of a manhole or chamber of the public sewerage system.</p>	Any person found guilty of an offence shall be liable on conviction to a fine not exceeding \$5,000 and, in the case of a continuing offence, to a further fine not exceeding \$500 for every day or part thereof during which the offence continues after conviction.

(B) Sewerage and Drainage (Protection of Public Sewerage System) Regulations 2017

Reg	Description of Regulation	Penalty
4(1)	<p>Obligation relating to specified activity</p> <p>A contractor who is engaged in or is to carry out any specified activity within a part of a public sewer corridor must ensure that the activity is carried out in accordance with an approved plan (including any amendment permitted to the plan) for the activity.</p>	Any person found guilty of an offence shall be liable on conviction to a fine not exceeding \$15,000 and, in the case of a continuing offence, to a further fine not exceeding \$500 for every day or part of a day during which the offence continues after conviction.
9 (2)	<p>Supervision of specified activities</p> <p>A contractor of any specified activity to be carried out in a public sewer corridor must —</p>	A contractor found guilty of an offence shall be liable on

	<p>(a) appoint the following person as a supervisor to supervise the carrying out of the activity:</p> <p>(i) if the plan for the activity requires the Commissioner's approval, the qualified person who prepared the application for the approval of the plan; or</p> <p>(ii) if the plan for the activity does not require the Commissioner's approval, the registered professional engineer who prepared the application for the approval of the plan; and</p> <p>(c) ensure at all times when the activity is carried out, that it is supervised by the supervisor appointed under paragraph (a).</p>	<p>conviction to a fine not exceeding \$15,000.</p>
<p>9(4)</p>	<p>The supervisor must —</p> <p>(d) exercise due diligence in supervising and inspecting the carrying out of the activity;</p> <p>(e) take all reasonable steps when supervising and inspecting the carrying out of the activity, to ensure that the activity is carried out in accordance with —</p> <p>(i) the Act;</p> <p>(ii) these Regulations;</p> <p>(iii) the approved plan for the activity; and</p> <p>(iv) any condition or requirement imposed by the Board under regulation 5(3), 12(1)(a) or 15(2)(a);</p> <p>(f) notify the Board of any contravention of —</p> <p>(i) the Act;</p> <p>(ii) these Regulations; or</p> <p>(iii) any condition or requirement imposed by the Board under regulation 5(3), 12(1)(a) or 15(2)(a);</p> <p>(g) keep and maintain at the premises at which the activity is carried out, such document, book or record as the Board may require;</p> <p>(h) carry out the inspection of the activity in such manner as the Board may require;</p> <p>(i) submit to the Board a declaration and certificate of completion of works relating to the activity in such form and at such time as the Board specifies; and</p> <p>(j) submit such other document to the Board at such time as the Board may specify.</p>	<p>Any supervisor found guilty of an offence shall be liable on conviction to a fine not exceeding \$15,000.</p>