Land Transport Authority

Quick Guides for Development Proposal Series:

Managing Manholes Displaced by Road Widening/ Improvements

Preface:

As part of development requirements, proposed civil works sometimes affect existing utility services located beneath the public streets. To ensure the safety and comfort of road users, manholes should be situated outside of the carriageway where possible.

This quick guide seeks to clarify LTA's requirements pertaining to service manholes displaced onto the road carriageway due to road widening/ improvement works. In this guide, we will explain the required processes and outline the possible options that should be explored by the qualified person (QP) as part of his/her design development.

Introduction:

Under the standard road typology (refer to Figure 1), side-table space is safeguarded for tree planting and to house the relevant services and utilities. As this available space is limited, it is unavoidable for services to run below the road carriageway.

LTA allows the use of carriageway space within the public streets to house services and utilities. However, the implemented services need to comply with technical specifications, and must not affect the proper design of road elements.

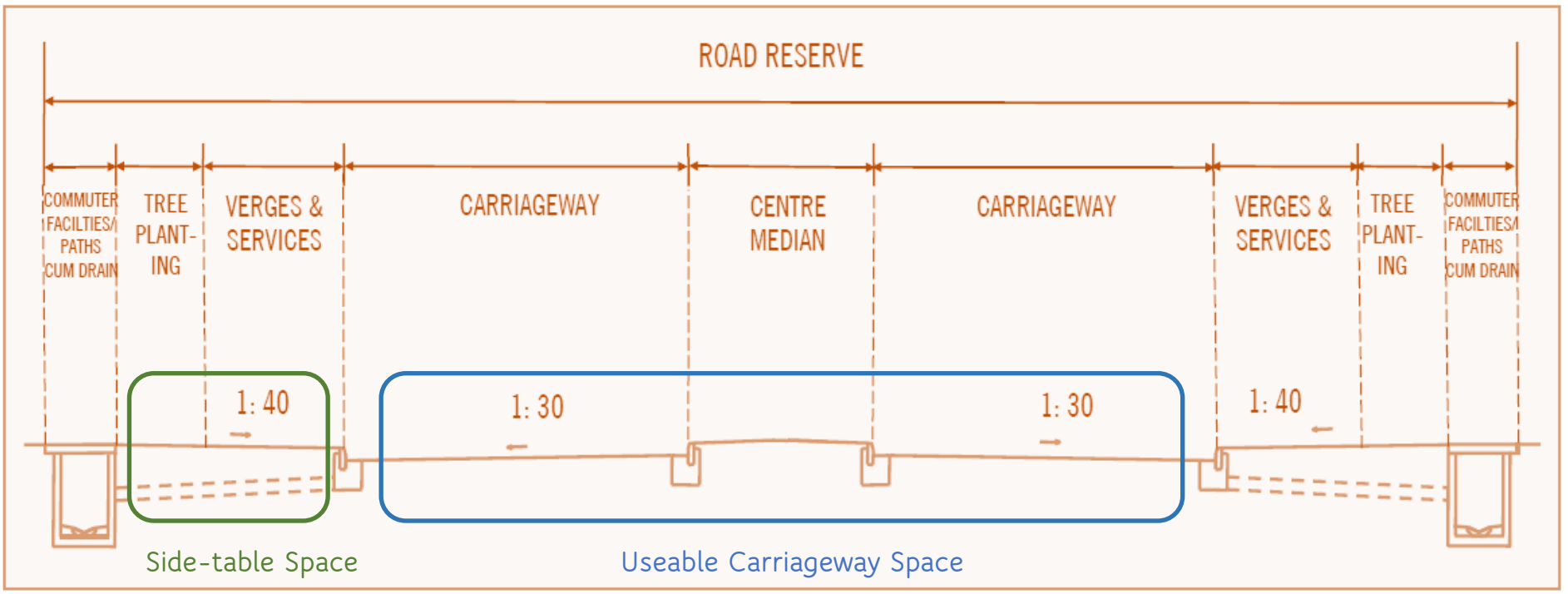


Figure 1: Depiction of a typical road layout for a divided 2 way road

Safety Risks Posed by Manholes on Road Carriageways

Manholes (MH), chambers and valves shall not be introduced onto the carriageway, as they pose a safety threat (i.e. serious injury or potential fatality) to road users. In particular, motorcyclists are the most vulnerable user group, and they are highly susceptible to the following risks:

i. Skid/Slip Issues
   - Motorcyclists run a high risk of skidding during rainy days, or during occasions when there is debris (loose sand) on the MH cover.

ii. Road Hazard
   - MH structures within carriageway causes differential settlement of road pavement. This results in a protruded or depressed road profile that is hazardous to motorcyclists.
   - Poor maintenance by apparatus owner results in defective road conditions e.g. spalled concrete, broken/ dislodged cover, broken up of premix around manhole covers. These defects create additional road hazards.

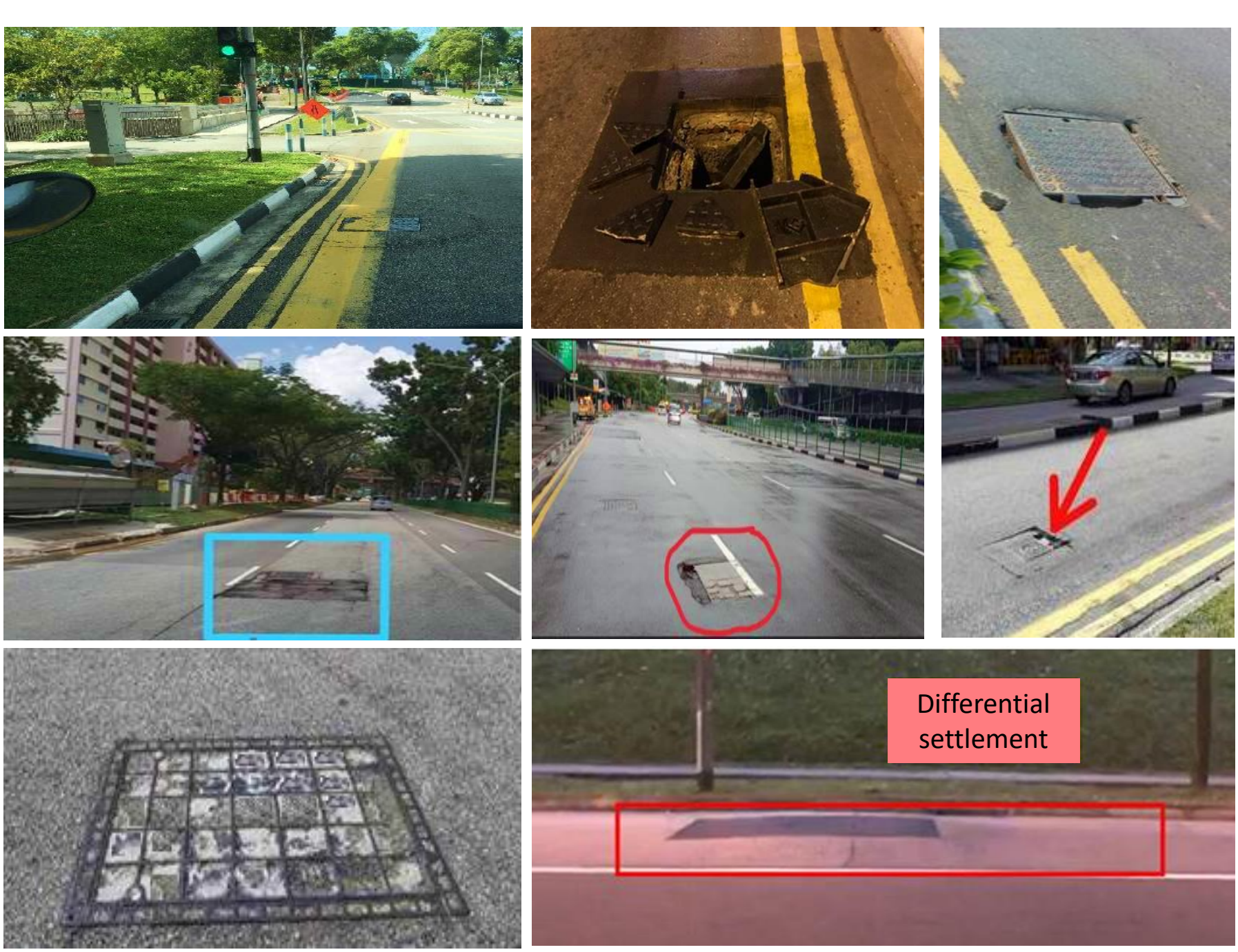


Figure 2: Safety Hazards on Road Carriageway due to Manholes

Solutions to resolve issue of manholes on road carriageway

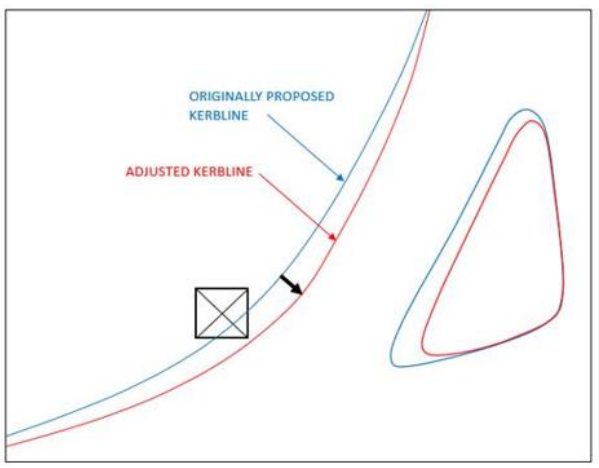
As part of road improvement/modification works, existing services and their manholes may inadvertently be displaced onto the road carriageway. A straightforward solution would be to relocate the services and their manholes onto the road side table. However, full service diversion is costly and takes a long time.

As an alternative, LTA has been working with QPs to identify, explore and implement alternate solutions to relocate manholes out of road carriageway instead of relocating the services entirely. LTA allows manholes to be retained if they are adjusted/designed to sufficiently address safety considerations.

Some workable options are as follows:

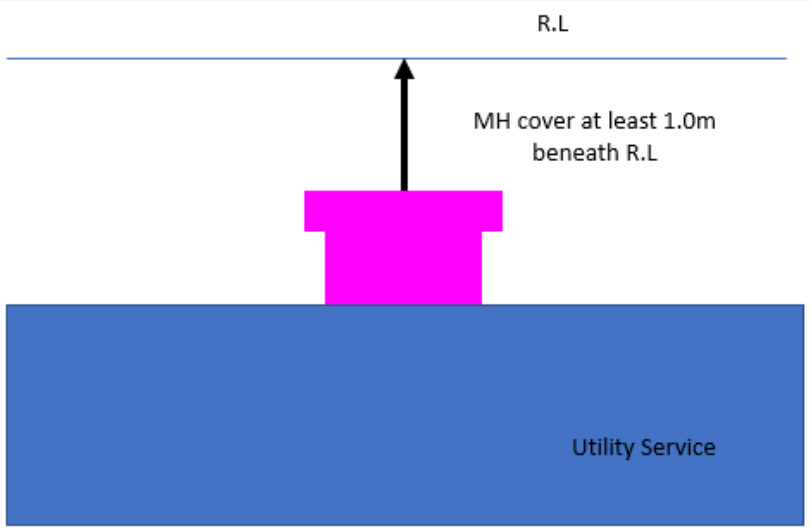
- Adjustment to move manhole out of wheel path; e.g. by changing proposed scheme, or shifting chevron/ center median
- Structural modification to relocate MH cover
- Burying the MH
- Eliminating/reducing the number of manholes

The following figure illustrates the various workable options which were identified and implemented for various road infrastructure projects:



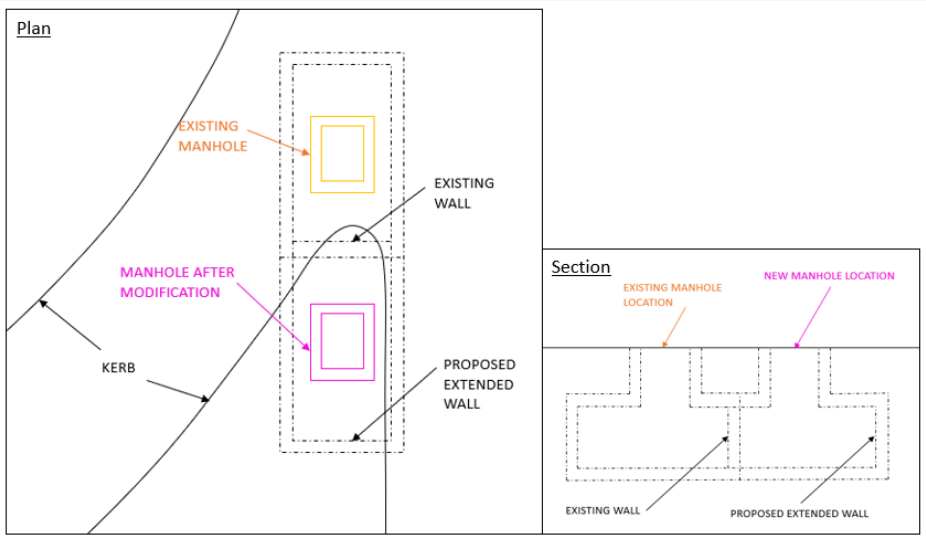
ADJUSTING KERBLINE SLIGHTLY (BLUE TO RED)

Adjustment in proposed scheme to avoid MH

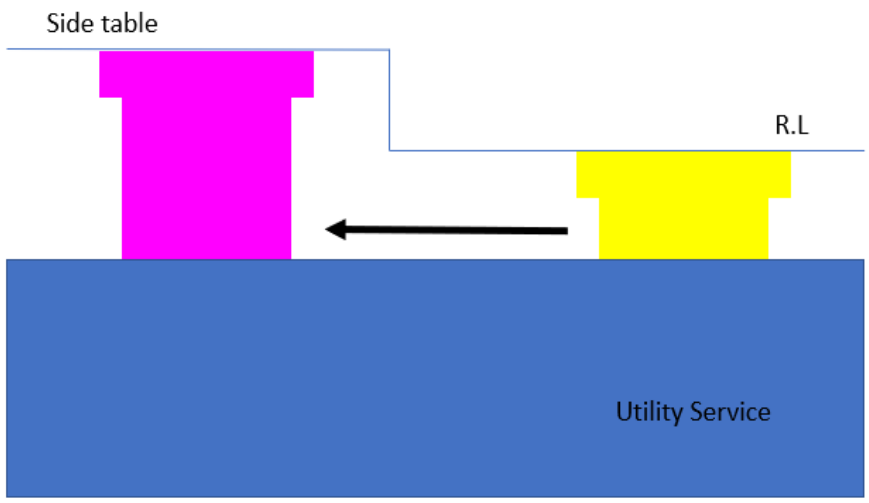


Embedding/Burying MH at least 1.0m beneath road surface

Burying the MH



STRUCTURAL MODIFICATION OF MANHOLE OPENING



Shifting of MH into verge

Structural modification to relocate MH cover

Figure 3: Depiction of various options to resolve issue of manholes on road carriageways.

What to do when MH/Valve is encountered within the carriageway?

Step 1:

- As part of design development, consider possible options (see previous page) to comply with the technical requirements of not displacing MH/Valve onto carriageway.

Step 2:

- Proposals to retain the MH/Valve within the road carriageway will only be considered after all alternative options have been exhausted, and upon QP's demonstration that all risks are sufficiently mitigated/ minimised.

Step 3:

- QPs shall put up a waiver request to allow the retention of displaced MH/Valve onto the road carriageway. This shall be accompanied with an endorsed report (as part of BP correspondence) to properly document the study process and recommendations after balancing all considerations and factors.

As a guide, the report shall minimally contain the following:

- Clear plans reflecting the affected MH/Valve that is proposed to be retained on carriageway
- Clear explanation on explored options/solutions. Suitable drawings (section and details) shall be furnished to develop in-depth explanation.
- Supporting evidence and elaboration to substantiate encountered constraints or issues that render explored options infeasible.
- Necessary cost and impact assessment for various options.
- Correspondence record of technical discussion between QP and apparatus owner.
- Measures to mitigate risks caused by MH/Valve on road carriageway

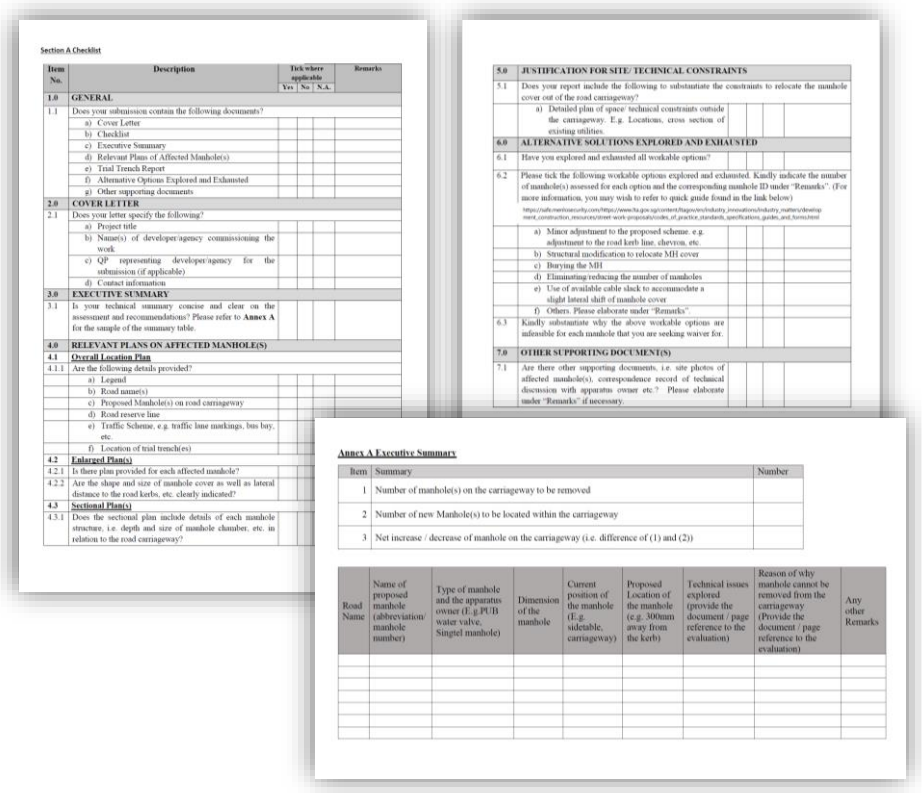
When the submitted report is in order, LTA will issue a formal acknowledgement receipt. LTA will inform QPs on the outcome of their appeal within a month from the date of acknowledgement.

Submission Checklist

To aid industry professionals prepare a complete report, LTA has developed a submission checklist specifying the plans and details to be provided. The document can be downloaded from LTA's corporate website, under Industry & Innovations > Industry Matters > Development & Construction Resources > Street Work Proposals > Requirements for Street Work Proposals.

Alternatively, the checklists can be accessed by scanning the QR code below:

https://go.gov.sg/checklist-wavier-of-manhole-carriageway


Section A Checklist

Item No.	Description	Tick where applicable: Yes	No	N.A.	Remarks
1.0	GENERAL				
1.1	Does your submission contain the following documents?				
	a) Cover Letter				
	b) Checklist				
	c) Executive Summary				
	d) Relevant Plans of Affected Manhole(s)				
	e) Trial Trench Report				
	f) Alternative Options Explored and Exhausted				
	g) Other supporting documents				
2.0	COVER LETTER				
2.1	Does your letter specify the following?				
	a) Project title				
	b) Name(s) of developer/agency commissioning the work				
	c) QP representing developer/agency for the submission (if applicable)				
	d) Contact information				
3.0	EXECUTIVE SUMMARY				
3.1	Is your technical summary concise and clear on the assessment and recommendations? Please refer to **Annex A** for the sample of the summary table.				
4.0	RELEVANT PLANS ON AFFECTED MANHOLE(S)				
4.1	Overall Location Plan				
4.1.1	Are the following details provided?				
	a) Legend				
	b) Road name(s)				
	c) Proposed Manhole(s) on road carriageway				
	d) Road reserve line				
	e) Traffic Scheme, e.g. traffic line markings, bus bay, etc.				
	f) Location of trial trench(es)				
4.2	Enlarged Plan(s)				
4.2.1	Is there plan provided for each affected manhole?				
4.2.2	Are the shape and size of manhole cover as well as lateral distance to the road kerbs, etc. clearly indicated?				
4.3	Sectional Plan(s)				
4.3.1	Does the sectional plan include details of each manhole structure, i.e. depth and size of manhole chamber, etc. in relation to the road carriageway?				

5.0	JUSTIFICATION FOR SITE/ TECHNICAL CONSTRAINTS				
5.1	Does your report include the following to substantiate the constraints to relocate the manhole cover out of the road carriageway?				
	a) Detailed plan of space/ technical constraints outside the carriageway. E.g. Locations, cross section of existing utilities.				
6.0	ALTERNATIVE SOLUTIONS EXPLORED AND EXHAUSTED				
6.1	Have you explored and exhausted all workable options?				
6.2	Please tick the following workable options explored and exhausted. Kindly indicate the number of manhole(s) assessed for each option and the corresponding manhole ID under "Remarks". (For more information, you may wish to refer to quick guide found in the link below)				
	a) Minor adjustment to the proposed scheme, e.g. adjustment to the road kerb line, chevron, etc.				
	b) Structural modification to relocate MH cover				
	c) Burying the MH				
	d) Eliminating/reducing the number of manholes				
	e) Use of available cable slack to accommodate a slight lateral shift of manhole cover				
	f) Others. Please elaborate under "Remarks".				
6.3	Kindly substantiate why the above workable options are infeasible for each manhole that you are seeking waiver for.				
7.0	OTHER SUPPORTING DOCUMENT(S)				
7.1	Are there other supporting documents, i.e. site photos of affected manhole(s), correspondence record of technical discussion with apparatus owner etc.? Please elaborate under "Remarks" if necessary.				

Annex A Executive Summary

Item	Summary	Number
1	Number of manhole(s) on the carriageway to be removed	
2	Number of new Manhole(s) to be located within the carriageway	
3	Net increase / decrease of manhole on the carriageway (i.e. difference of (1) and (2))	

Road Name	Name of proposed manhole (abbreviation/ manhole number)	Type of manhole and the apparatus owner (E.g.PUB water valve, Singtel manhole)	Dimension of the manhole	Current position of the manhole (E.g. sidetable, carriageway)	Proposed Location of the manhole (e.g. 300mm away from the kerb)	Technical issues explored (provide the document / page reference to the evaluation)	Reason of why manhole cannot be removed from the carriageway (Provide the document / page reference to the evaluation)	Any other Remarks

Land Transport Authority
We Keep Your World Moving

About this Series

With effect from April 2020, LTA has published a series of quick guides to broaden and consolidate understanding of LTA's building plan regulations and processes. The guides feature in-depth explanation of the principles behind specific requirements, coupled with examples of good practices & common mistakes.

LTA has developed a publication roadmap for the year 2021, with topics featured herein relating to pertinent issues emerging within the built-environment. All publications are made available at LTA's corporate website, under Who We Are > Statistics & Publications > Journals & Newsletters > Quick Guides for Development Proposals.

To be Published in 2021

- Manholes within the road carriageway
- Designing safe drop-off areas within development
- Lodging vehicular parking proposals
- Making Payments on CCRS
- Lodging street works proposals
- Understanding Profile (Horizontal/vertical/super elevation) of roads
- Preparation of Declaration Plans

Published in 2020

- Designing Tactile Tiles for Safe Travel
- Designing Covered Linkways
- Designing Safe Access for developments

Access our guides by scanning this QR code and then navigating to the 'Guideline' tab:

https://go.gov.sg/lta-quick-guides