



Guideline for Implementing **Mechanized Vehicle Parking Systems**



EMSD



Preface

Mechanized Vehicle Parking System (MVPS) means a mechanical plant that has a power operated mechanism for conveying a vehicle to a parking space within the plant. MVPS is also known as automated parking systems, intelligent or smart parking systems.

The key advantage of MVPSs is better land utilization when compared to traditional multi-storey car parks as ramps, driveways, passenger lifts, etc., can be eliminated. Furthermore, the emergence in the market of innovative and advanced MVPSs means that the use of MVPSs has become a promising way to meet the rising demand for parking spaces.

MVPSs are regarded as “lift” subject to the regulatory control of the Lifts and Escalators Ordinance (the LEO), Cap. 618. Except those which have been excluded from the control of the LEO, only MVPSs of a type which has been approved by the Director of Electrical and Mechanical Services are allowed to be installed in the territory. Nevertheless, only qualified personnel are allowed to install, repair and maintain, alter or demolish MVPSs. Depending on the design and configuration of a MVPS, the regulatory controls related to building, fire safety, planning, lands and noise are also applicable, whereas the operation of a MVPS may give rise to traffic issue as well as concerns of local residents.

This Guideline describes the considerations for implementation and regulatory measures regarding the design, installation, operation and maintenance of MVPSs, in order to facilitate project proponents to take forward and smoothly implement their MVPS projects.

Disclaimer

This guideline, which is prepared by the Electrical and Mechanical Services Department (EMSD), is for general reference only. The content of all legal clauses mentioned must be read in the original context of the relevant ordinances.

Whilst every effort has been made to ensure the accuracy of the guideline, EMSD shall not be responsible for any liability howsoever caused to any person by the use of or reliance on this guideline.

Table of Content

Preface	1
Introduction to MVPS	3
Types of MVPSs	4
Selection of MVPS	5
Regulatory Controls related to MVPS	6
Type Approval and Design Standard for MVPS	8
Application for Type Approval	9
MVPSs of Tailor-Made Design or Configuration	12
Preliminary Enquiry for MVPS Design	14
Operational Considerations	15
Registration as Lift Contractors	17
Enquiries	17
Appendix I	18
Appendix II	20

Introduction to MVPS

Mechanized vehicle parking systems (MVPSs) are also known as automated parking systems or intelligent/smart parking systems, which are mechanized plants capable of increasing parking spaces within a footprint for better land utilization. In comparison with conventional multi-storey car parks, MVPSs do not require ramps, driveways, passenger lifts, etc.

2. MVPS is defined under the Lifts and Escalators Ordinance (the LEO), Cap. 618, as a mechanical plant that has a power operated mechanism for conveying a vehicle¹ to a parking space within the plant. MVPS is regarded as a kind of “lift” under the LEO² such that the design, construction, commissioning and examination, repair and maintenance, alteration of MVPSs are subject to regulatory controls under the LEO. Only qualified personnel, i.e. registered lift contractors (RLCs), registered lift engineers (RLEs) and registered lift workers (RLWs) or persons under their supervision are allowed to carry out works involving MVPSs.

3. MVPSs are sophisticated engineering installations requiring multi-disciplinary expertise inputs and holistic planning to cope with statutory requirements and streamline work processes for their smooth implementation and operation. As MVPSs may change the number of parking spaces within a designated development area, consideration should be given early to seek clearance³ for altering the number of parking spaces for a designated site. For MVPSs of a scale in the order of hundreds or thousands of parking spaces, more attention should be

¹ ‘Vehicle’ in this Guideline has the meaning as defined in section 2 of the Road Traffic Ordinance, Cap. 374, but does not include bicycle / tricycle or the similar.

² The LEO does not apply to a lift which is used solely for the raising of motor vehicles provided that the height of travel of the lift does not exceed 3.5 meters nor pass through any floor. See section 3(f) of the LEO. Guideline to lifts that are used solely for the raising of motor vehicles and do not exceed 3.5 meters nor pass through any floor can be viewed from:

https://www.emsd.gov.hk/en/lifts_and_escalators_safety/publications/guidance_notes_guidelines/guide_to_safety_on_double_deck_car_park/index.html

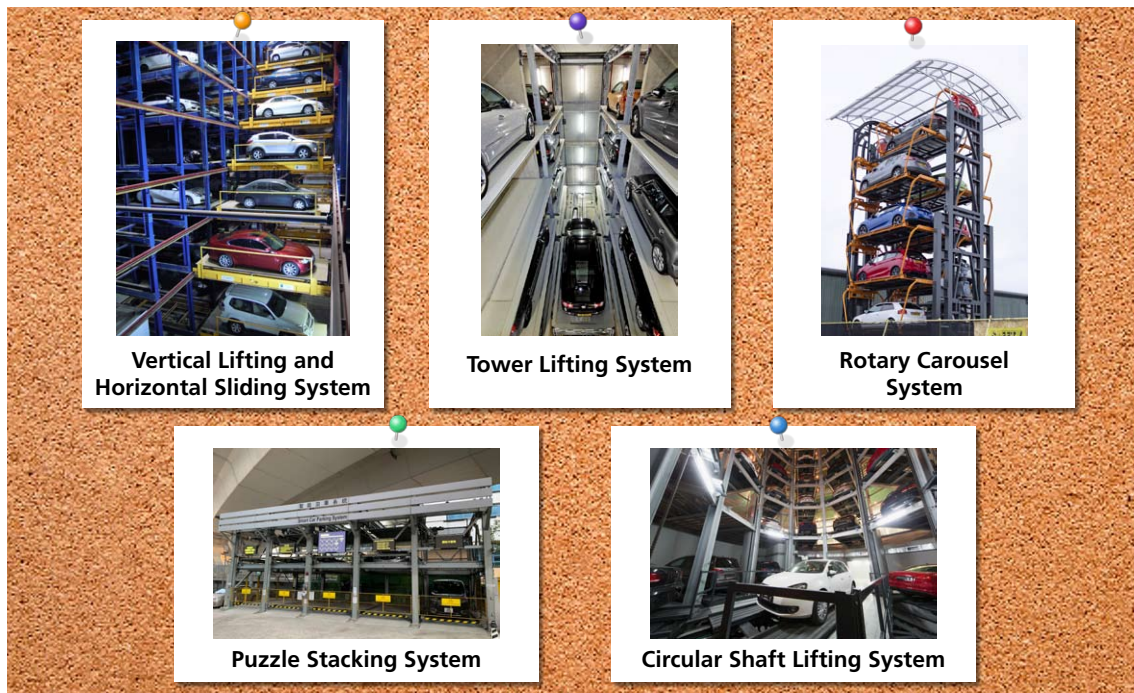
³ There may be a need to seek clearance with the Lands Department in respect of the increase in the number of parking spaces in the piece of land concerned. Refer to LandsD Practice Note 2/2000 - “Car Parking Requirement Mechanical Parking System”.

made to noise, fire and building safety requirements, and operations of the parking system and its impact on adjacent road traffic and compatibility with the surrounding land uses. Early consultation with the relevant authorities for the planning and implementation of MVPSs is highly recommended.

4. Project proponents intending to put up a MVPS are recommended to collate necessary expertise from the outset to address the concerns/ requirements in a systematic manner.

Types of MVPSs

5. There are different types of MVPSs available in the market. The more common ones are shown below.



6. MVPSs are of varying configurations and sophistication. The simpler cases like puzzle type and carousel type can multiply the number of parking spaces within a designated footprint to several times and their operation can be made semi- or fully-automatic, with or without attendants. Whereas, for large scale MVPSs such as the tower type, vertical lifting and horizontal sliding arrangement, or circular shaft type, the parking spaces can go up to tens of that of the footprint area for parking hundreds or thousands of vehicles, and there are additional concerns associated with the operation and upkeep of such larger parking systems.

7. It should be noted that automatic guided vehicles (AGVs) by nature are not regarded as MVPS⁴. Thus an AGV on its own is not subject to the regulatory control of the LEO. Where the AGV is an integral part or operates in association with a MVPS with interactive control, the AGV will be regarded as associated equipment⁵ of the MVPS subject to the control of the LEO. So whether AGVs are subject to the regulatory control will need to be assessed on a case by case basis.

Selection of MVPS



8. Selection of a MVPS is normally done on the parking demand, availability and location of land, capital investment, etc. The configuration of a MVPS may on the other hand bring in varying complexities to the project, needing early attention and resolution.

9. Operational features such as level of automation, working in association with ancillary systems, opening hours, backup support, availability of essential power supply, restriction on users (e.g. private, public, drivers with mobility difficulty), etc., need to be looked at. Apart from standard arrangement, considerations can be given to





⁴ See the definition of MVPS in paragraph 2.

⁵ In such case, the AGV should have been covered in the type examination certificate of the MVPS (see paragraph 17 below).

request manufacturers to furnish a MVPS with additional features of security, safety and control logics to uplift the performance of the system or to meet specific customers' requirements. For large scale MVPSs, mechanical safety and fire safety are of particular concern. There should be suitably designed provisions to guard against property damage and personnel injury, and facilities to enable emergency operations for lowering or removal of stuck vehicles as well as release of personnel⁶.

10. With technological advancements, MVPSs of newer configurations may emerge from time to time. More cutting-edge facilities will be available for incorporation into MVPSs, in particular large scale ones, to enhance their adaptability to vehicle designs as well as specific users' requirements, e.g. recharging for new generation vehicles.

Regulatory Controls related to MVPS

	<p>Design</p> <ul style="list-style-type: none"> - Design compliant with EN14010 or recognized international standards - Application for type approval made by RLC
	<p>Installation</p> <ul style="list-style-type: none"> - Works undertaken by RLC and performed by qualified persons (QP) - Examination by RLE following commissioning
	<p>Operation</p> <ul style="list-style-type: none"> - MVPS to be put into use only if a valid use permit is displayed
	<p>Maintenance</p> <ul style="list-style-type: none"> - Periodic maintenance undertaken by RLC and performed by QP - Periodic examination by RLE
	<p>Alteration & Replacement</p> <ul style="list-style-type: none"> - Alteration & replacement undertaken by RLC and performed by QP - Examination by RLE following major alteration
	<p>Demolition</p> <ul style="list-style-type: none"> - Demolition undertaken by RLC and performed by QP

⁶ For example, trapped servicing personnel.

11. According to the LEO, MVPSs⁷ to be put up in the territory must be of a type which has been approved by the Director of Electrical and Mechanical Services (the Director). The RLC responsible for the erection of a MVPS must not commence installation of the MVPS unless the contractor has already sought **approval**⁸ in respect of the type of MVPS from the Director. Furthermore, works involving repair/maintenance, alteration, examination or demolition of MVPSs are required under the LEO to be performed by **qualified persons**⁹ or persons under the direct supervision¹⁰ of such qualified persons.

12. The **responsible person**¹¹ for a MVPS, on the other hand, is required under the LEO to cause the MVPS to be maintained by an RLC at intervals not exceeding a month¹² and examined by an RLE following commissioning¹³, major alteration¹⁴, and at intervals not exceeding a year¹⁵. Every five years, the examination of a MVPS is required to be carried out with load¹⁶. Unless a valid use permit is displayed in a conspicuous position at the main landing¹⁷ of the MVPS, the MVPS should not be put into use¹⁸.

13. Reference should be made to the LEO for the specific and full legislative requirements in relation to the upkeep and running of a MVPS. Nevertheless, consideration should also be given to requirements in respect of building, environmental, fire, lands, noise,

⁷ Unless excluded by virtue of section 3 or exempted by virtue of section 148 of the LEO, MVPSs to be installed in the territory must be of a type which has been approved by the Director.

⁸ See section 16(1)(e) of the LEO.

⁹ In relation to any works concerning a MVPS or any part of a MVPS, or any associated equipment or machinery of the MVPS, means (i) an RLE or (ii) an RLW who is qualified to carry out such works is at the same time under employment of the RLC who undertakes the works. For greater details, please refer to section 2 of the LEO.

¹⁰ See section 8 of the LEO.

¹¹ In relation to a MVPS, means a person who owns the MVPS; or any other person who has the management or control of the MVPS.

¹² See section 15 of the LEO.

¹³ See section 20 of the LEO.

¹⁴ See section 21 of the LEO.

¹⁵ See section 22 of the LEO.

¹⁶ See section 23 of the LEO.

¹⁷ The main landing in the context of a MVPS should be taken as the place at which the driver drops off his or her vehicle or the main entrance to the MVPS.

¹⁸ See section 39 of the LEO.

occupational safety and health, traffic and other applicable issues related to MVPSs. Early consultation with the relevant authorities for the implementation of MVPS projects is strongly recommended.

14. This Guideline describes the requirements for seeking type approval and arrangement for operation and maintenance (O&M) of MVPSs to facilitate project proponents to formulate their work plans for implementation of MVPS projects.

Type Approval and Design Standard for MVPS

15. Type approval is meant to assess a particular type of products on the fulfilment of regulatory, technical and safety requirements for its general implementation and applications. With type approval for a brand and model of MVPSs, an RLC can install any such MVPSs provided that their system parameters and operational arrangement are within the approved application and design parameters.

16. In reviewing an application for type approval, the Electrical and Mechanical Services Department (EMSD) will look at the MVPS as a plant assessing its system design, principles in relation to sizing of components, control logics, safeguards, assurance of quality, sufficiency of instructions concerning installation, commissioning and testing, examination, repair and maintenance, emergency operation, availability of technical support and spare parts, etc. The assessment for type approval will be made in a holistic and systematic approach. MVPSs and their associated equipment and ancillary facilities will be looked at as a system to gauge their suitability, operational reliability and safety for implementation in Hong Kong.

17. The MVPS (brand and model) to be put up is required to have been certified by a notified body or independent checker¹⁹ to be in

¹⁹ A notified body refers to an independent testing institute which has been officially designated by an European Union member state to carry out conformity assessment within the meaning of applicable Union harmonisation legislation. Type examination certificates issued by a notified body or an independent testing institute (independent checker) recognized by mutual recognition agreement (MRA) partners under the Hong Kong Laboratories Accreditation Scheme (HOKLAS) would be acceptable. See independent testing institute in Annex B of Appendix II of the Works Code.

compliance with **EN 14010 - Safety of machinery — Equipment for power driven parking of motor vehicles — Safety and EMC requirements for design, manufacturing, erection and commissioning stages**. MVPSPs complying with other recognized international standard²⁰ such as AS 5124²¹, JGJ/T326²² and JIS B 9991²³ will also be acceptable; in such cases, the applicant will need to furnish a deviation table showing the departure of the design from the requirements of EN 14010 and the corresponding improvement measures, where applicable, to make up for the difference in requirements between the standards.

18. In determining whether the MVPSP is of good design, assessment would be made to see whether such installation/provisions can fulfil a recognized international standard and specific local requirements²⁴. All main equipment of MVPSPs is expected to be standard products the manufacture of which is in conformity with an established quality assurance scheme.

Application for Type Approval

19. Applications for type approval are to be made by RLCs²⁵. Reference should be made to **Appendix II of the Code of Practice for Lift Works and Escalator Works (Works Code)**²⁶ for the basic requirements and procedure for type approval.

²⁰ EN 14010 is currently taken as the reference engineering standard for type approval of MVPSPs.

²¹ Australian Standard: AS 5124:2017 Safety of machinery – Equipment for power driven parking of motor vehicles – Safety and EMC requirements for design, manufacturing, erection and commissioning stages (EN 14010:2003, MOD).

²² Code of China: JGJ/T326 – Technical Code for Mechanical Parking Garage Engineering. Reference should also be made to the following Codes of China: TSG Q7013-2006 - Type Test Rule for Mechanical Parking System, and GB17907-2010 - Mechanical Parking Systems - General Safety Requirement.

²³ Japanese Industrial Standard: JIS B 9991 – Safety requirements for mechanical parking system.

²⁴ Refer to Appendix for details of local requirements.

²⁵ See section 16(1)(e) of the LEO.

²⁶ A copy of which can be downloaded from: https://www.emsd.gov.hk/en/lifts_and_escalators_safety/publications/code_of_practice/index.html

20. To simplify the process and facilitate ascertaining critical technical requirements early in the planning stage, EMSD, in processing the type approval application, will act as a single contact point to collaborate with the Fire Services Department (FSD) to give advice/comments on the MVPS. It is therefore **advisable** for the applicant to include in his/her submission proposal for type approval supporting documents for fire safety provisions/measures of the MVPS (preferably under a separate folder or index). EMSD will relay the fire safety related submissions to FSD for review and provision of comments and advice collectively on fire and mechanical safety on the MVPS type approval application. FSD's approval for fire services installation (FSI) provisions of the MVPS²⁷, where applicable, will be granted independently. Examples of fire services requirements for open-ground MVPSs are provided in Appendix II for reference²⁸.

21. The information that is required to be included in the submission proposal for type approval for a lift design has been given in Annex A of Appendix II of the Works Code. The following are essential items repeated from Annex A (the information for a lift duly revised to be made comparable and corresponding to that for a MVPS) and additional information²⁹ specifically required for seeking type approval for a MVPS –

- a. Type examination certificate and the corresponding report for the system and technical specifications and manuals for all safety devices³⁰;

²⁷ Whether the fire safety provisions/measures in respect of a MVPS installation are sufficient will however be determined/concluded when the site and configuration of the MVPS and associated building have been finalized.

²⁸ For MVPSs which are installed in a building or underground, the applicant is advised to consult the Buildings Department on whether submission of building plans through the Centralized Processing System (CPS) is required. Detailed fire services requirements will be formulated by FSD upon receipt of formal submission of general building plans, if necessary.

²⁹ Covering job references of the particular MVPS model; configuration, outdoor or indoor application; operation mode (automatic or non-automatic); type of lifting element, type of the drive system and the associated braking system; declaration of conformity by the MVPS manufacturer for compliance with EMC requirements of EN 61000; and assessment report of the structural frame certified by a registered structural engineer (RSE) to fulfill the requirements of relevant building codes.

³⁰ Safety devices for a MVPS cover overspeed governors, door locking devices, trip devices, emergency stop devices and safety circuit containing electronic components.

- b. Layout drawings, circuit diagrams, drawings showing critical dimensions, operation limits, location and dimensions of refuge areas, and means of access to and egress from various parts of the MVPS;
- c. Technical documents including installation instructions, O&M manual, emergency procedure, evacuation plan, design calculation, etc.;
- d. Design and operation parameters³¹, control philosophy with description and listing of factors of safety for general and specific components³²;
- e. Arrangement for system integration or segregation and the procedure and safeguard for the various modes of operation;
- f. List of safety protective devices, their trip settings, safety critical items and alarms, and description of the control logic of protective devices; and
- g. Risk assessment report covering activities related to installation, repair and maintenance, overhaul, emergency operation, dismantling, etc., and the corresponding hazard mitigating measures.

Supporting documents with respect to fire safety, which cover drawings of the MVPS layout and emergency vehicular access, where applicable, details of typical FSI and arrangement of water supplies for firefighting, should be submitted in tandem with the submission proposal for type approval.

22. It should be noted that type approval does not normally cover assessment for structural strength and building requirements³³. Submission of such information³⁴ may be called for to facilitate review where situation warrants.

³¹ Design and operation parameters include, but not limited to, overall dimensions of MVPS, allowable car dimension, maximum number of parking spaces, maximum number of levels, rated speed and rated load.

³² General and specific components that require listing of factors of safety include, but not limited to, the lifting elements and transmission elements.

³³ Assessment for compliance with such requirements would normally be handled by the corresponding authorities.

³⁴ For example, the project proponent may be requested to submit an assessment report of the structural frame of a puzzle type/carousel type MVPS, which has been duly certified by a registered structural engineer (RSE).

23. Nevertheless, re-validation or re-assessment for type approval for a particular brand/model will be needed in case the original type examination certificate used for acquiring type approval has been renewed or the design of the MVPS modified, e.g. with variations in operating principle, operating outside the approved system parameters (rise, lifting speed, rated load, etc.). Reference can be made to the Works Code for requirements for re-validation and re-assessment.

24. The time required for type approval assessment is dependent on the complexity, scale, and level of automation of the plant and the comprehensiveness of the submission. It is always advisable for project proponents to engage an RLC to handle the submission proposal in the early stage of the project. Project proponents should work closely with the supplier and RLC to furnish the required information for type approval in order to avoid repetitious reviews and unnecessarily prolonging the assessment process.

25. With clear, accurate and adequate design and system information, EMSD will attempt to provide its general feedback within a month for the need of supplementary and refined submissions, and attempt to conclude the type approval assessment within the shortest timeframe (normally a couple of months). Where there is a lack of information or the materials being furnished are incorrect, or the case is comparatively complex, the overall assessment time will be longer.

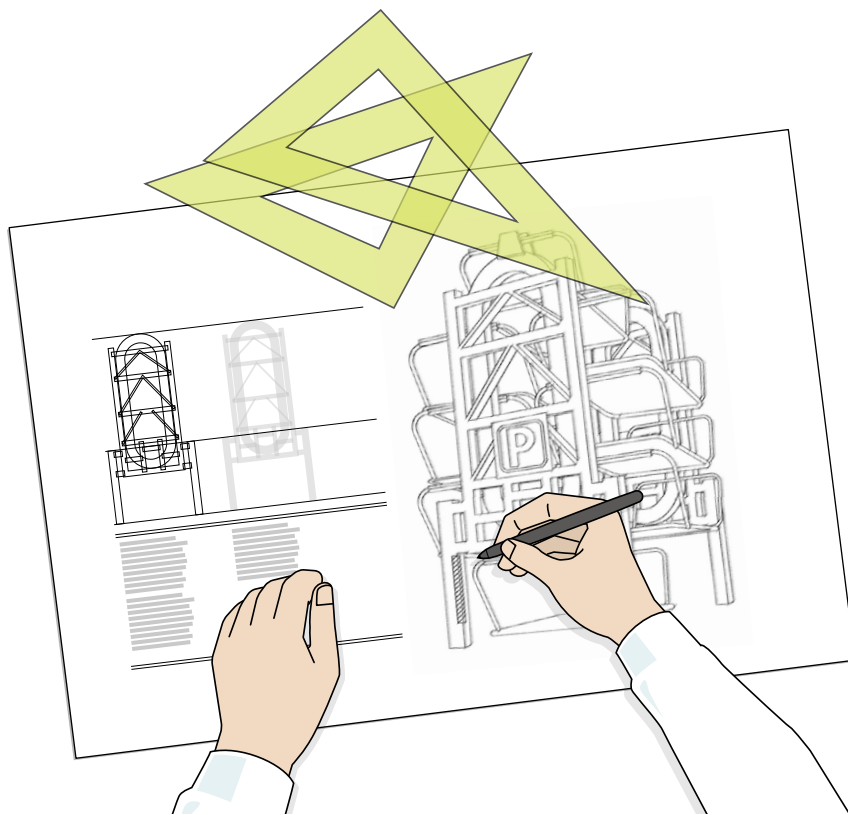
MVPSs of Tailor-Made Design or Configuration

26. Instead of going for standard or packaged design, consideration can be given for seeking type approval for a design/configuration of a MVPS to suit specific project requirements. Again, the applications for such type approval are to be made by RLCs. Project proponents should be cautious that this particular arrangement would normally take an unduly long period for review and one may have to risk last-minute system modification for gaining approval and permission for putting into use and operation.

27. Since the proposed MVPS is yet of a proven design or configuration complying with a recognized international standard, submission of a

design review report, which is based on EN 14010 and carried out by a notified body or independent checker, detailing assessment made from first principle and conclusion drawn on whether the parking system is of good engineering design and robust for safe and reliable operation from the outset would be needed. Following documentary review and assessment, acceptance for the RLC to proceed with installation without yet acquiring the necessary type approval would be granted, provided the design has been checked to be in general in order and the RLC has committed to seek type examination certification by a notified body or independent checker for the MVPS upon completion of installation, but before putting into use.

28. Formal type approval would only be issued upon satisfactory certification of the installation and submission of all the design documents and examination report issued by the notified body or independent checker overseeing the test for the prototype. This particular approach of having type examination certification conduction following installation is more applicable to small non-packaged MVPS designs³⁵.



³⁵ It will be extremely difficult to set a sensible timeline for a complicated MVPS adopting the approach, let alone the need to bear the risk of serious delay due to unsatisfactory site test results.

Preliminary Enquiry for MVPS Design

29. Understandably, project proponents may have difficulties in engaging an RLC to process the design proposal and seek type approval without confirming an offer to the RLC or entering the project formulation stage. In support of project proponents to explore and adopt innovative solutions, EMSD will offer preliminary advice to facilitate progression of MVPS projects provided that sufficient information³⁶ is available from the project proponent.

30. With the information furnished by the project proponents³⁷, EMSD will review and indicate whether the design is in general in line with the acceptable design requirements/standard and if an **approval-in-principle** could be granted to facilitate the project proponent to line-up an RLC to take on the role of MVPS installer and upkeep service provider in subsequent stages of the project. The project proponent may proceed with detailed design and engagement of specialist supplier/contractor without unnecessary impediments.

31. In this regard, an individual MVPS supplier may also furnish its proposals with necessary information to EMSD to find out whether a MVPS design is in general compliant with the acceptable standard in respect of type approval for installation in the territory. Again, timing for advising the acceptability of a design will depend on the sufficiency of materials for review and the complexity of the system.

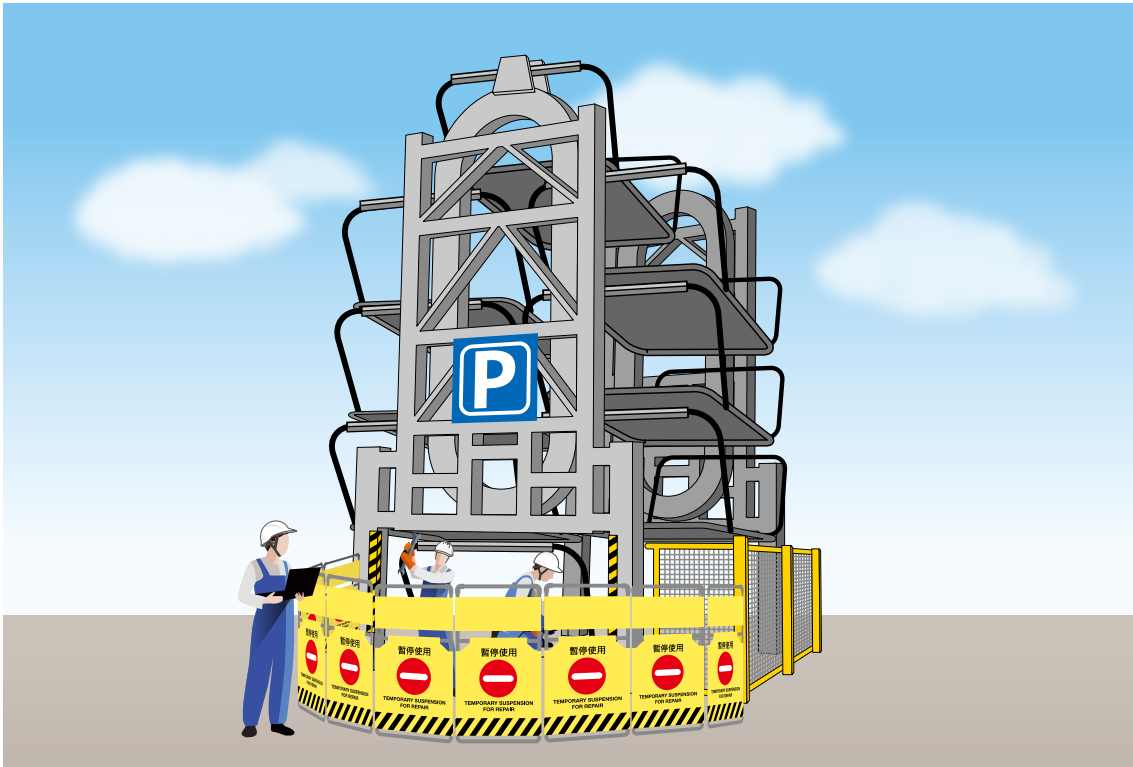
32. For large scale and complicated projects, civil works may need to cope with the design of the MVPS and erection of the MVPS may be integrated with the construction of the building. EMSD may, on request, give an advance review of the MVPS proposal to the project proponent to indicate in general the acceptability of the MVPS design.

33. Granting of the ultimate type approval allowing a MVPS to be put up by an RLC will still be subject to the legislative requirements under the LEO.

³⁶ Reference should be made to the requirements given in the Works Code and details given in the section "Application for Type Approval" above.

³⁷ Or MVPS suppliers.

Operational Considerations



34. For MVPSs with a large capacity, it would be advisable to include suitable flexibilities, e.g. segregation of the plant into sub-systems to minimize the impact of service suspension arising from routine maintenance or repair of part of the installation. When it comes to periodic examination, the plant covered by a **use permit** will need to be taken out of service for a thorough examination. At periodic intervals stipulated in Schedule 5 to the LEO, i.e. not exceeding five years, the plant is required to be subject to a load test to prove its functionality. Every lifting system and safety device of the MVPS would need to be subject to the load test. Periodic maintenance and repair may have similar impacts on the operation of a MVPS. Project proponents should bear these in mind and allow for flexibility in the plant, i.e. by demarcation or sub-division into sub-systems, so as to avoid total shut down of the plant during the process of thorough examination or periodic maintenance.

35. Furthermore, sub-system can be interconnected but governed by different use permits such that routine maintenance / examination can be staggered with vehicles shifted to the unaffected sections. Good project planning is therefore important for elimination of unnecessary operational deadlock or impediments.

36. Basic requirements of the factors of safety of system components are already stipulated in EN 14010. Project proponents may liaise with the manufacturer to suitably strengthen the plant to match the design life anticipated for a particular MVPS³⁸. Normally, no separate approval would be needed for enhancing the factors of safety of system components from the approved design. It is, however, advisable to obtain from the manufacturer a declaration of compatibility and good design for the installation.

37. In regard to the daily operation of a MVPS, project proponents must consider the provision of attendant for immediate and direct responses and guidance to users. Intercom is particularly needed for communication between the user and the attendant where the attendant is stationed away from the MVPS. The requirement for attendants may vary dependent upon the size, design³⁹ and application of the plant; attendants may not be needed for a small and private installation of MVPS where the users could be more easily trained up to use the installation. Attendants can facilitate emergency rescue and provide instant support in case of system breakdown or users requiring assistance. Attendants for large MVPSs are always advisable. Disregarding whether an attendant is provided or not, consideration can always be given to make fully automatic control feature available with the MVPS enabling subsequent determination of the operation mode of the installation.

38. For a specific application, it is better to make sure the standard design has provisions covering all the required operational features, otherwise the departure from standard design would need to be separately certified⁴⁰. In such case, there may as well be a need to provide independent certification for the software program for functioning or operational control of the MVPS.

³⁸ *The service life of load bearing components of very large MVPSs would be comparatively long and suitably strengthening the factor of safety for the components is advisable.*

³⁹ *The design of transfer area of a MVPS is also a factor for consideration.*

⁴⁰ *See the section on "Application for Type Approval".*

Registration as Lift Contractors

39. Smooth and reliable operation of MVPSPs will depend on the provision of appropriate technical support and supply of spare parts and quality maintenance services by competent personnel.

40. With the growth in MVPSPs⁴¹, there will be an increasing demand on services for proper upkeep of MVPSPs. Apart from companies which are on the Register of Lift Contractors⁴² qualified to provide support and services in relation to installation and upkeep of MVPSPs, organizations such as MVPSP suppliers which have the necessary technical expertise and resources can also acquire registration to undertake installation and maintenance of the growing number of MVPSPs. By so doing, the company can provide one-stop-shop service for supply, installation and upkeep of MVPSPs to project proponents or developers. That may also save the hassles of project proponents needing to locate specialist maintenance contractors for upkeep of the plant following commissioning.

41. The requirements⁴³ for an applicant for registration as a lift contractor are set out in Part 2 of Schedule 8 to the LEO. Explanatory notes on the requirements for application for registration as a lift contractor are available from the Notes to Applicant attached to the Application Form⁴⁴ and the How-to-Apply⁴⁵.

Enquiries

Enquiries can be made by email to info@emsd.gov.hk or by phone to 1823.

⁴¹ There were less than 10 MVPSPs in operation as at end 2019.

⁴² Register of Lift Contractors established by virtue of section 105 of the LEO.

⁴³ For example, if the applicant is a body corporate, the applicant is required to have at least one director who is a corporate member of the Hong Kong Institution of Engineers or a registered lift engineer; and have at least two other persons who are employees of the applicant, with at least one of them being a registered lift worker whose registration is for all kinds of lift works.

⁴⁴ https://www.emsd.gov.hk/en/lifts_and_escalators_safety/publications/specified_forms/index.html

⁴⁵ https://www.emsd.gov.hk/en/lifts_and_escalators_safety/how_to_apply/registered_contractor/index.html

Appendix I

Examples of local requirements related to mechanical safety of MVPSs

It should be pointed out that specific local requirements vary depending on the configuration and application of the MVPS. A list of the local requirements for MVPSs in general is provided for reference:

- (a) Means and procedures for handling the following emergency situations:
 - i. Retrieval of vehicles inside a MVPS in case of a system breakdown;
 - ii. Emergency entrance into the MVPS for rescue of personnel; and
 - iii. Emergency evacuation from the MVPS.
- (b) Provision of audio and visual alert to persons in proximity to the MVPS before closure of the motorized gates of the MVPS.
- (c) Provision of intercom for users to communicate with the carpark operators.
- (d) Provision of overload protection satisfying the following requirements:
 - i. It satisfies the requirements of 'safety device' stipulated in EN 14010;
 - ii. It prevents the vehicle from being moved if it exceeds the overload setting of the MVPS;
 - iii. The overload limit is adjustable; and
 - iv. There are audible and visual signals perceptible by the user if the overload protection is triggered.
- (e) A motorized gate or similar device be installed for the separation of persons from the MVPS when the MVPS is in motion.
- (f) Means be provided to prevent foreign object or person (except the vehicle) inside the transfer area before closing of the gate and safeguard of obstruction during closing of the gate.
- (g) Provision of safety mechanisms to stop the MVPS if the lifting/transmission element breaks or stretches beyond an allowable limit.

- (h) Light intensity of 200 lux level be maintained at locations where maintenance works would take place, and light intensity of 50 lux level be maintained at locations where drivers have access.
- (i) In preparation for tropical cyclones that could affect the operation of the MVPS, an adverse weather handling procedure with necessary precautions and measures be formulated.

Appendix II

Examples of fire services requirements for open-ground MVPs

The requirements below are applicable to open-ground MVPs that fulfill the following:

- (a) the height does not exceed 15 m; and
- (b) the total floor area (including vehicle parking deck and access walkway) does not exceed 230 m².

MVPs that do not fulfill the conditions above shall comply with the requirements as set out in the current Code of Practice for Minimum Fire Service Installations and Equipment.

Requirements – systems/installations/equipment for:

- (a) Access walkway facilities
- (b) Emergency generator
- (c) Emergency fireman's switch
- (d) Hose reel system
- (e) Portable hand-operated approved appliance
- (f) Special equipment/requirements

Extent

- (a) External access stair and walkway of not less than 800 mm in width and 2 000 mm in height with guard railing on both sides are required to be provided for ensuring safe and unobstructed access to firemen to at least one side of each vehicle, preferably close to the front portion of the vehicle. Such access walkway facilities should have a stability of not less than that required for the elements of construction.

- (b) An independently powered generator of sufficient electrical capacity to meet the fire service installations.
- (c) A manual emergency stop device shall be provided for suspension of machinery movement and electric power supply for electric vehicle charging facilities.
- (d) There shall be sufficient hose reels to ensure that every part of the facility can be reached by a length of not more than 30 m of Fire Services hose and hose reel tubing.
- (e) As required by the risk.
- (f) Non-perforated and non-combustible materials (e.g. steel plate) shall be provided between the upper and lower parking decks as fire separation facilities to prevent vertical radiation transmission, vertical fire spread and burning running fuel spread.



General Legislation  **EMSD**

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