Supplementary Information on the Redevelopment of Fire Services Training School

Proposed Simulation Training Facilities

To prepare fire services members for complex emergency scenarios, FSD has made reference to the training facilities of advanced fire brigades around the world (e.g. in the United States, the United Kingdom, Sweden, Singapore and Mainland China, etc.) and confirmed that all of them adopt simulation-based training. FSD considers that this training mode would allow fire services members to receive realistic training in safe simulated settings, so as to better equip them with fire-fighting and rescue techniques to achieve higher efficiency in operations. Since it would be difficult to simulate the required training scenarios in the real life environment such as flooding and rapids, or a fire in an oil depot or underground railway, it is necessary to provide simulation training facilities in the Fire Services Training School (FSTS) so that the training could be conducted in a realistic, yet controlled and safe, environment. This could also reduce the risk of having accidents or injuries during the training.

2. The proposed FSTS will provide simulators covering mainly seven types of possible emergency situations which are relatively complex and large scale, including incidents related to buildings, transportation, marine and water, gas, aircraft, hazardous material and structural collapse. Information about the simulators and the justifications for each of them are set out in **Annex 1**. All these incidents could possibly be encountered by firemen and ambulancemen in Hong Kong, and their impact could be serious and widespread. FSD advises that as incidents related to vessel, aircraft, gas, land transport and marine transport happen outdoors, the relevant simulators should be provided in outdoor training grounds. Various types of fire appliances used for training and the fire-fighting and rescue training should also be conducted in a realistic outdoor environment, rather than inside multi-storey buildings.

Fire Services Education Centre

3. Certain Members had questions on the need to set up an earthquake simulator in the public education centre. After due consideration, FSD agrees that the possibility of earthquake happening in Hong Kong is not high and that the proposal would be modified. FSD now proposes to set up a small-scale exhibition gallery in the education centre to introduce the department's history and development to visiting schools and public groups. Fire services uniforms of different periods, fire services installations, fire services equipment and tools, etc. would be displayed.

Teaching and Supporting Facilities

4. Some Members also expressed concerns about the need to provide classrooms and storerooms in all buildings of the FSTS. In fact, it is essential to have theory-based training on fire safety and rescue techniques in addition to simulation-based training. It is therefore necessary to provide classrooms in the teaching block and driving training block for lecture classes.

5. The FSTS also needs to keep various specialised tools and equipment such as fire hose, rescue ladders and equipment, ambulance equipment, fire-fighting agent and breathing apparatus for training purpose. Storerooms have to be provided in the teaching block for proper storage of the equipment. Storage space is also required for storing spare tyres, tools and supplies for vehicle cleaning in the driving training block and for storing medical supplies, uniforms and other sundries for training purpose in the main office block.

Project Cost and Facility Cost

6. The major facilities and layout plan of the proposed FSTS are set out in **Annex 2** and **Annex 3** respectively for Members' reference. Since the Architectural Services Department is still evaluating the tenders on the construction of FSTS, the information on the latest estimated project cost and the cost breakdown could only be available after completion of the evaluation process (in around April this year). We plan to provide detailed information on the project cost and facilities cost in the paper to be submitted to the Public Works Subcommittee of the Legislative Council in May this year.

Implementation Plan

7. We plan to submit the proposal to the Public Works Subcommittee in May 2012 and seek funding approval from the Finance Committee in June. Subject to funding approval, we plan to commence construction works of the FSTS in the second half of 2012 and expect them be completed by the second half of 2015. After the commissioning of the new training school, the existing FSTS in Pat Heung will be closed.

Security Bureau
Fire Services Department
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Annex 1

Proposed Simulation Training Facilities

Types of Emergency Incidents	Simulation Training Facilities	Justifications
Buildings	Burn house	The variety of the materials used, partitioning, and the furniture and storage in premises in various types of buildings increase the difficulty on the part of the firefighters in carrying out fire fighting and rescue duties. In view of this, advanced indoor live fire training facilities should be provided to enhance their fire-fighting capability in various types of fire incidents. With reference to fire incidents in the past, the burn house will simulate a number of indoor fire scenarios, including sub-divided units in old buildings, hotels, industrial buildings and karaokes, etc. Vivid live fire, high temperature, audio effect and smoke will be simulated to help fire services trainees acquire better fire-fighting techniques in a safe and controlled environment.
	Rescue training tower	With many high-rise buildings in Hong Kong, firefighters should always be prepared to deal with high angle rescue cases. Hence, FSD has established the High Angle Rescue Team in August 2011. FSD proposes to build a ten-storey rescue training tower in which different settings, including shopping centre, old residential building, public housing estate, factory and commercial building with curtain walls, will be simulated on different floors and at

Types of Emergency Incidents	Simulation Training Facilities	Justifications
		the building facade. Scenarios of people being locked in a lift will also be simulated. Trainees can practise fire-fighting and rescue strategies and techniques for different kinds of buildings. This facility can also help enhance the high angle rescue training of the High Angle Rescue Team.
	Compartment fire behaviour training simulator	Firefighters often have to deal with building fires and constantly face the extreme threats of "flashovers" and "backdraughts" [1] of indoor fires. The proposed facility comprises different training units that demonstrate "flashover" and "backdraught" effects. It will help enhance the response capability and readiness of firefighters for working under such extreme circumstances.
Transport	Simulated railway and tunnel fire cum rescue zone	Due to geographical factors, many railways and roads in Hong Kong have to pass through tunnels to be connected to a transport network. Incidents occurred inside the tunnels have the potential risk of causing significant loss of lives and property, and hence it is necessary for firefighters to enhance their fire-fighting and rescue skills in this respect. With this facility, trainees may learn and practise the techniques and deployment strategies for tackling rail and tunnel fires, which

[1] Flashover is a temperature-induced phenomenon that occurs in the early stage of fire development. As the fire develops, individual items in the room will burst into flames when the temperature reaches 650 Celsius or above. The flames reaching the ceiling at one end of a room will be transformed to a rapid, almost simultaneous ignition of all flammable items. Backdraught occurs in the later stage of a fire. When the fire burns in a condition of limited ventilation, flammable gaseous products will accumulate. These products do not necessarily ignite. However, when air is induced into the room, it is possible for the flammable products to ignite in a fierce condition.

Types of Emergency Incidents	Simulation Training Facilities	Justifications
		include working in confined spaces, extinguishing different types of vehicle fire in tunnels, strategies for moving trains, as well as methods and techniques for efficient evacuation of drivers and passengers, etc.
	Simulated carriageway zone	The simulated carriageway zone will provide a training venue for simulating large scale vehicle incidents. With this facility, firefighters and ambulancemen can practise the rescue techniques required to deal with road accidents. A mock-up expressway will be built for the simulation of traffic accidents involving various types of vehicles (including heavy goods vehicles, private cars and buses etc.) which will be used to train firefighters and ambulancemen on pre-hospital emergency care, vehicle stabilisation and cutting techniques.
	Road tanker fire simulator	The fire caused by traffic accidents involving a road tanker will be more serious than those involving general vehicles. To enhance the ability of firefighters in handling tanker fires and explosions, the proposed simulator will include a road tanker, which simulates fuel spillage (e.g. LPG or petrol) resulting from a traffic accident, as well as fire and explosion of the fuel tank.
	Vehicle fire simulator	This facility is designed to train firefighters to deal with different types of vehicle fire. There will be a simulated vehicle for the simulation of engine fire, compartment fire and fuel tank fire.

Types of Emergency Incidents	Simulation Training Facilities	Justifications
Marine and Water	Ship fire simulator	As the interior environment and structure of a ship are quite different from those of a building, firefighters face much greater challenges when performing firefighting and rescue duties inside a ship. At present, FSD does not have specific training facilities for ship fire. This facility simulates a six-deck ship, in which the lowest two decks simulate a cargo ship and the other four decks a cruise liner. There are a number of live fire training compartments in the mock-up ship for the simulation of scenarios like passenger compartment, engine room, heated oil piping, etc. for training purpose.
	Swift water rescue simulator	There were a number of serious flooding incidents in Hong Kong in the past. Sporadic rapids brought about by heavy rain may lead to loss of lives. This facility simulates an outdoor river channel encircling the ship fire simulator, which will create artificial swift water effects, to enhance trainees' techniques and response capability in swift water rescue.
Gas	Fuel and LPG refilling station simulator	In Hong Kong, there are many fuel and LPG refilling stations, with many of them located in densely populated areas. Although these stations are required to provide fire service installations by law, the possibility of fire could not be completely ruled out. Fuel and LPG refilling station simulator can strengthen training in this regard.

Types of Emergency Incidents	Simulation Training Facilities	Justifications
	Oil tank simulator	Incidents in oil depots may involve fire and oil leakage. They may result in severe damages if not handled properly. Techniques on sealing and using chemical foam to suppress fire are involved in handling oil tank incidents. This facility can help trainees understand the circumstances they may face in oil tank fire and strengthen the training of firefighters in this respect.
	LPG tank simulator	There are a number of large-scale LPG tanks in Hong Kong. This facility can provide practice opportunities for trainees on the proper handling of explosion and rupture caused by internal pressure rapidly built up in an LPG tank in a fire.
Aircraft	Aircraft fire simulator	Air traffic in Hong Kong is very busy. An aircraft incident may result in a large number of casualties. These incidents may occur at the airport and at other locations. As the firefighting and rescue techniques for aircraft incidents are quite different from those used in other major incidents, it is necessary to set up an aircraft fire simulator to strengthen training of the trainees in this regard.
Hazardous material (HazMat)	Simulated HazMat training area (attached to the burn house)	While Hong Kong has relevant legislation to regulate the manufacture, conveyance and storage of hazardous materials, such as chemicals and radioactive materials, etc, severe damage may still be caused in case of Hazmat incidents. Specialised knowledge, techniques, tools and training are instrumental in dealing with such incidents.

Types of Emergency Incidents	Simulation Training Facilities	Justifications
		In recent years, FSD has been striving to enhance its capability in handling HazMat incidents and has recently set up a HazMat Team. The HazMat Team conducts training at part of the Sheung Wan Fire Station at present. In the long run, the HazMat Team needs a permanent venue with adequate facilities for training. FSD will set up a simulated HazMat training area in the burn house. Facilities in the training area include simulated gas leakage chamber, HazMat laboratory, dangerous goods store and chlorine store, etc. Trainees can acquaint themselves with operational strategies, skills of using various detectors and protective equipment, as well as sealing and decontamination techniques.
Structural collapse	Urban search and rescue training area	FSD established the Urban Search and Rescue (USAR) Team in end-2008. The USAR team will conduct search and rescue operations under adverse circumstances such as landslides, building collapse or train collision incidents. To enhance the search and rescue capabilities of the USAR Team, relevant members need to be provided with facilities to receive trainings on urban search and rescue and underground conduits.

Annex 2

Major Facilities of the Proposed FSTS

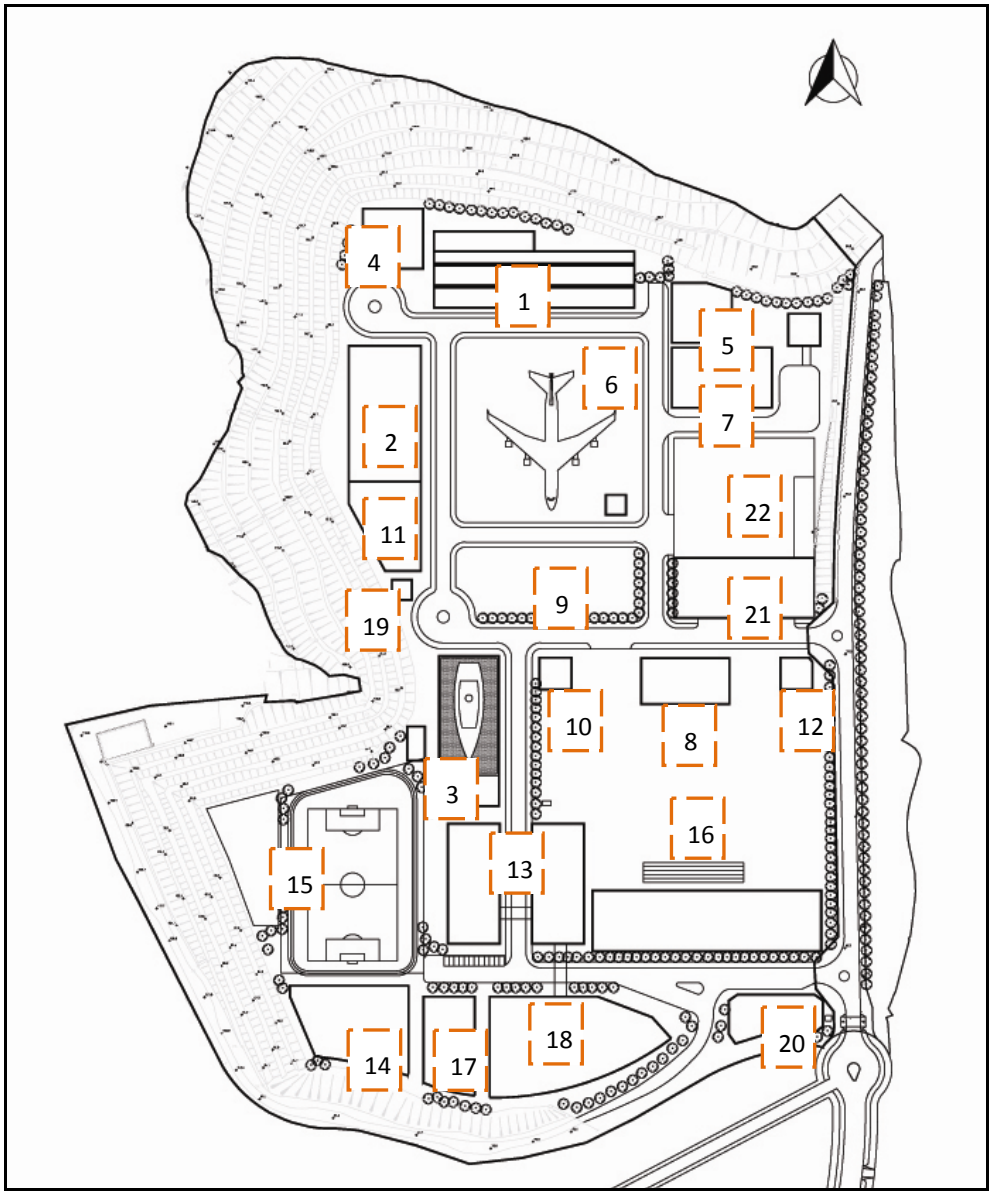
Type of facilities	Major facilities
• Outdoor training facilities	• Simulated carriageway zone • Road tanker fire simulator • Simulated railway and tunnel fire cum rescue zone • Compartment fire behaviour training simulator • Ship fire simulator • Swift water rescue simulator • Oil tank simulator • LPG tank simulator • Fuel and LPG refilling station simulator • Vehicle fire simulator • Aircraft fire simulator • Urban search and rescue training area • Parade ground
• Indoor training facilities	• Burn house (consists of four simulated facilities, i.e.: sub-divided domestic unit, hotel/guesthouse, factory and karaoke. The breathing apparatus training complex and simulated Hazmat training area will also be situated in the burn house.) • Rescue training tower • Drill tower • Indoor rescue pool • Fire investigation demonstration units • Fire engineering laboratories

Type of facilities	Major facilities
• Physical training facilities	• Outdoor physical training ground and gymnasium • Exercise room and outdoor adventure challenge course
• Teaching block	• Classrooms, auditorium and multi-purpose hall • Computer rooms and resource centre • Various types of training rooms, such as simulated dangerous goods store for prosecution training and simulated ambulance compartment for ambulancemen training, etc
• Main office block	• Offices, conference room and interview room, etc
• Fire services education centre	• Fire evacuation experience area • Fire-fighting experience area • Fire services installations/equipment demonstration area • Multimedia area • Basic first aid and cardiopulmonary resuscitation training area • Fire services history and equipment display area and historical appliances display area, etc
• Driving training block	• Driving simulator training room • Driving training/drill ground • Classrooms
• Ancillary facilities	• Residential complex for recruits • Staff standby rooms • Server room and generator room

Type of facilities	Major facilities
	• Pantry, canteen and kitchen • Changing rooms, shower units and toilets • First aid room • Laundry/drying room • Store rooms and dangerous goods store • Kennel complex • Appliance room, open car park, vehicle washing bay and fuel refilling station • Smoke extraction and scrubber system • Management office and reception area, etc

Annex 3

Layout Plan of the Proposed Fire Services Training School



Legend

1. Simulated Carriageway Zone, Road Tanker Fire Simulator, Simulated Railway and Tunnel Fire cum Rescue Zone
2. Compartment Fire Behaviour Training Simulator
3. Ship Fire and Swift Water Rescue Simulators
4. Oil/LPG Tank Simulators
5. Vehicle Fire Simulator
6. Aircraft Fire Simulator
7. Fuel and LPG Refilling Station Simulator
8. Burn House (with Simulated HazMat Training Area)
9. Urban Search and Rescue Training Area
10. Rescue Training Tower
11. Fire Investigation Demonstration Units
12. Drill Tower
13. Teaching Block
14. Physical Training Complex
15. Outdoor Physical Training Ground
16. Parade Ground
17. Residential Complex
18. Main Office Block
19. Fuel Refilling Station
20. Fire Services Education Centre
21. Driving Training Block
22. Driving Drill Ground