

Testing and Commissioning Checklist for Fire Detection and Fire Alarm System

I. Reference

Project: FSD Ref.:
 Address:
 Type of Building:
 Domestic/Industrial/Institutional/Godown/Commercial/Office/Composite/Hotel/Hospital/Others
 and with/without basement.

II. Type of Equipment

2.1 Alarm Annunciation Panel

2.1.1 Manufacturer/Model No.: (Main panel)
 (Sub-panel/repeater panel, if any)
 2.1.2 Type: Conventional type []
 Addressable type []

2.2 Detectors

2.2.1 Heat detector Manufacturer/Model No.:
 Type: Fixed temperature []
 Rate-of-rise temperature []
 Combination []
 Linear cable []
 Others
 2.2.2 Smoke detector Manufacturer/Model No.:
 Type: Ionization []
 Optical []
 Beam []
 Aspirating []
 Others
 2.2.3 Flame detector Manufacturer/Model No.:
 Type: Infrared []
 Ultra-violet []
 Combination []
 Others
 2.2.4 Others Manufacturer/Model No.:
 Type:

- 2.3 Manual Call Points
 Manufacturer/Model No.:
 Type: Breakglass type []
 Others
- 2.4 Alarm Sounders
 Manufacturer/Model No.:
 Type: Bell []
 Yodalarm []
 Horn []
 Siren []
 Electronic sounder []
 Others
- 2.5 Visual Fire Alarm Units
 Manufacturer/Model No.:
- 2.6 Smoke Detector with Sounder Base
 Manufacturer/Model No.:
- 2.7 Power Supplies
 Mains supply: Supply voltage/Phase/Hz:
 Secondary supply: Type: Emergency generator []
 Feed before main switch []
 Secondary (rechargeable) battery []
 Rating: Voltage Amp-hour
 Others
- 2.8 Fire Resisting Cables
 Manufacturer/Model No.:

				Reference	
				BS	CL
III. Visual Inspection					
3.1	<u>General</u>				
3.1.1	The initial building plans submission is received by FSD on or after 1 September 2009.	[]	[]	[]	1/2009
3.1.2	All individual components of the fire alarm system including detectors and the control panel are mutually compatible.	[]	[]	[]	

		Yes	No	N/A	Remarks	Reference BS CL	
3.1.3	An as-fitted zoning schedule is provided adjacent to the alarm annunciation panel.	[ ]	[ ]	[ ]	.....		
3.1.4	A log book is provided adjacent to the alarm annunciation panel.	[ ]	[ ]	[ ]	.....		
3.1.5	The building plans submission for extensions and additions involving major alterations and additions to the building is in excess of 50% by volume and is received by FSD on 1 September 2009 or later.	[ ]	[ ]	[ ]	.....		1/2009
3.2	<u>Detector</u>						
3.2.1	The detection zonings are properly labelled at the alarm annunciation panel.	[ ]	[ ]	[ ]	.....	13.2.4a)	
3.2.2	Detectors are provided in areas as indicated on approved building plans.	[ ]	[ ]	[ ]	.....		
	Point type heat detector: nos.						
	Linear heat cable: sets						
	Point type smoke detector: nos.						
	Beam smoke detector: sets						
	Aspirating smoke detector: sets						
	Flame detector: nos.						
	Others: nos.						

		Yes	No	N/A	Remarks	Reference	
						BS	CL
3.2.3	On the floor(s) where sleeping risk exists (e.g. hotel, hospital, hostel, etc.):						2/2009
	(a) heat detector is used in kitchen and E/M plant room.	[ ]	[ ]	[ ]	.....		
	(b) smoke detector is used in other areas except toilet, bathroom and staircase where sprinkler is provided.	[ ]	[ ]	[ ]	.....		
	(c) sounder base is provided for smoke detector in guestrooms of hotels / guesthouses / bedrooms of student hostels except detector inside concealed space.	[ ]	[ ]	[ ]	.....		
3.2.4	Detectors are provided to basement according to the approved building plan.	[ ]	[ ]	[ ]	.....		
3.2.5	Intrinsically safe or flameproof device is used within potentially hazardous areas.	[ ]	[ ]	[ ]	.....		
3.2.6	External indicator is provided outside the doors of rooms where travel distance of the detectors inside the rooms exceeds 30 m of reach within a zone.	[ ]	[ ]	[ ]	.....	13.2.3b)	1/2009
3.2.7	Remote indicating lamps are provided for ceiling void or floor void detectors, if addressable text display in conjunction with layout plans are not provided adjacent to the control and indicating equipment.	[ ]	[ ]	[ ]	.....	13.2.4b) 13.2.5	1/2009
3.2.8	Detectors are provided for horizontal ceiling void ≥ 800 mm high.	[ ]	[ ]	[ ]	.....	22.2d)	1/2009

		Yes	No	N/A	Remarks	Reference BS CL	
3.2.9	Clearance below detector is ≥ 500 mm. (Not applicable for ceiling voids, floor voids, and area having no horizontal dimension greater than 1 m.)	[ ]	[ ]	[ ]	.....	22.3n)	
3.2.10	Point smoke detector is installed within ceiling height limit (general) of 10.5 m. (Note: $\leq 10\%$ of ceiling height may exceed this limit and ≤ 12.5 m).	[ ]	[ ]	[ ]	.....	22.9 Table 3	1/2009
3.2.11	Heat detector is installed within ceiling height limit (general) of 9 m for Class A1 to BS EN 54-5 and 7.5 m for other Classes to BS EN 54-5. (Note: $\leq 10\%$ of ceiling height may exceed this limit and ≤ 10.5 m).	[ ]	[ ]	[ ]	.....	22.9 Table 3	1/2009
3.2.12	Under flat ceiling, horizontal distance between any point and the nearest heat detector is ≤ 5.3 m.	[ ]	[ ]	[ ]	.....	22.3a)2)	
3.2.13	Under flat ceiling, horizontal distance between any point and the nearest smoke detector is ≤ 7.5 m.	[ ]	[ ]	[ ]	.....	22.3a)	
3.2.14	In corridors ≤ 2 m wide, heat detectors are sited at intervals of ≤ 10.6 m and ≤ 5.3 m from end wall.	[ ]	[ ]	[ ]	.....	22.3a), Note 1	
3.2.15	In corridors ≤ 2 m wide, smoke detectors are sited at intervals of ≤ 15 m and ≤ 7.5 m from end wall.	[ ]	[ ]	[ ]	.....	22.3a), Note 1	

		Reference			Remarks		
		Yes	No	N/A		BS	CL
3.2.16	In detector installation, ceiling obstructions > 10% overall ceiling height are treated as wall. (Note: Within horizontal voids, obstructions > 10% of the height between structural floor and structural ceiling are treated as wall regardless of the void location.)	[ ]	[ ]	[ ]	.....	22.3j), Note 8	1/2009
3.2.17	In detector installation, partitions or storage racks reaching within 300 mm of the ceiling are treated as wall.	[ ]	[ ]	[ ]	.....	22.3i)	
3.2.18	Detectors are mounted $\geq$ 1 m from any air inlet of forced ventilation system.	[ ]	[ ]	[ ]	.....	22.3m)	
3.2.19	Horizontal ceiling comprises: (a) a series of small cells (honeycomb ceiling), detector spacing is in accordance with Figure 10b) & Table 1 of BS 5839-1;	[ ]	[ ]	[ ]	.....	22.3k)	
	(b) a number of closely spaced structural beams, detector spacing is in accordance with Figure 10c) & Table 2 of BS 5839-1.	[ ]	[ ]	[ ]	.....		
3.2.20	Detector(s) is provided under intermediate horizontal surfaces such as ducts, loading platforms and storage racks in excess of 3.5 m in width and whose undersurface is in excess of 800 mm above the floor (other than when the side of the duct or structure is in excess of 800 mm from the wall or other ducts or structure).	[ ]	[ ]	[ ]	.....	22.3o)	

		Yes	No	N/A	Remarks	Reference	
						BS	CL
3.2.21	Other than point type smoke and heat detectors, the following detectors are according to manufacturer's standard and specification.						
	(a) Aspirating smoke detectors	[ ]	[ ]	[ ]	.....		
	(b) Flame detectors	[ ]	[ ]	[ ]	.....		
	(c) Video smoke detectors	[ ]	[ ]	[ ]	.....		
	(d) Beam detectors	[ ]	[ ]	[ ]	.....		
	(e) Others, please specify: .....	[ ]	[ ]	[ ]	.....		
3.3	<u>Alarm Sounder</u>						
3.3.1	Provided in areas as indicated on FSI layout plans.						
	Alarm sounder: nos.	[ ]	[ ]	[ ]	.....		
3.3.2	External fire alarm sounder is provided at the building entrance or the "Fire Service Access Point" and control and indicating equipment.					16.2.1f)	1/2009
	The sounder is clearly marked with the words "FIRE ALARM" (火警).	[ ]	[ ]	[ ]	.....		
3.3.3	One alarm sounder is provided at each hose reel point.	[ ]	[ ]	[ ]	.....	Code	
3.3.4	Each system incorporates at least two sounders and each fire compartment is provided with at least one sounder. (Note: Meaning of fire compartment is as defined in paragraph 5 of the FRC Code.)	[ ]	[ ]	[ ]	.....	16.2.1i)	1/2009

	Yes	No	N/A	Remarks	BS	CL
3.4	<u>Manual Call Point (MCP)</u>					
3.4.1	Provided in areas as indicated on FSI layout plans. MCP: nos. [] [] []					
3.4.2	The zoning is at least one zone per floor.					

		Yes	No	N/A	Remarks	Reference BS CL	
3.5.3	Flashing light of VFA is visible to normal eyesight in all areas required to be protected.	[ ]	[ ]	[ ]	.....	Code	
3.5.4	One VFA point is provided for each compartment and the distance between two VFA points $\leq$ 60 m.	[ ]	[ ]	[ ]	.....	Code	
3.5.5	Areas covered by VFA are in compliance with approved building plans and Design Manual: Barrier Free Access.	[ ]	[ ]	[ ]	.....	Code	
3.5.6	Design of VFA system conforms to Code of Practice and					Code CL	
	(a) NFPA 72: 2010 or	[ ]	[ ]	[ ]	.....		
	(b) BS 5839-1:2002+A2: 2008	[ ]	[ ]	[ ]	.....		
3.5.7	One VFA point is located near every hose reel.	[ ]	[ ]	[ ]	.....		
3.5.8	The power supply of the VFA system is from:						
	(a) DC supply source with back-up supply by battery; or	[ ]	[ ]	[ ]	.....		
	(b) AC supply source with secondary supply from emergency generator; or	[ ]	[ ]	[ ]	.....		
	(c) AC supply source with secondary supply from the main electricity supply obtained before main supply switch.	[ ]	[ ]	[ ]	.....		

	Yes	No	N/A	Remarks		
3.6	<u>Cables, Wiring and Other Interconnections</u>					
3.6.1	Cables used for:				26.2b)	1/2009
	(a) Critical signal path (panel to all field devices);					
	(b) extra low voltage supply from external power supply (charger / battery) to the system;					
	(c) final circuit providing low voltage mains supply to the system; and					
	(d) low voltage mains supply to the system (mains supply to panel / charger)					
	comply with:					
	(i) MICS cable conforming to BS EN 60702-1 & 60702-2;					
	or	[ ]	[ ]	[ ]	.....	
	(ii) Cable conforming to BS 7629; or					
		[]	[]	[]		
	(iii) Cable conforming to BS 7846; or					
		[]	[]	[]		
	(iv) Cable rated at 300/500 V (or greater) that provide same degree of safety to BS 7629;					
	or	[ ]	[ ]	[ ]	.....	
	(v) Fire resisting cables to other international standard accepted by FSD; or					
		[]	[]	[]		
	(vi) Cables as per Remarks Section in Appendix 8 of FS CoP and accepted being exempted from requirement of fire resistance;					
		[]	[]	[]		

	Yes	No	N/A	Remarks	Reference	
					BS	CL
Except for item (vi), item (i) to (v) shall also comply with:						
(vii) "Standard" fire resisting cables with PH30 classification according to BS EN 50200 and additional 30 min. survival time to Annex E of this standard; or	☐	☐	☐		26.2d)	1/2009
(viii) "Enhanced" fire resisting cables with PH120 classification according to BS 8434-2.	☐	☐	☐		26.2e)	1/2009

		Yes	No	N/A	Remarks	Reference	
						BS	CL
3.6.2	Cables used for power supply to sounders, visual fire alarms, fire alarm devices, control modules, signalling devices, etc. comply with:					26.2b)	1/2009
	(i) MICS cable conforming to BS EN 60702-1 & 60702-2; or	[ ]	[ ]	[ ]	.....		
	(ii) Cable conforming to BS 7629; or	[ ]	[ ]	[ ]	.....		
	(iii) Cable conforming to BS 7846; or	[ ]	[ ]	[ ]	.....		
	(iv) Cable rated at 300/500 V (or greater) that provide same degree of safety to BS 7629; or	[ ]	[ ]	[ ]	.....		
	(v) Fire resisting cables to other international standard accepted by FSD; or	[ ]	[ ]	[ ]	.....		
	(vi) Cable conforming to BS 6387 AWX or CWZ; or	[ ]	[ ]	[ ]	.....		
	(vii) Cables as per Remarks Section in Appendix 8 of FS CoP and accepted being exempted from requirement of fire resistance;	[ ]	[ ]	[ ]	.....		
	Except for item (vii), item (i) to (vi) shall also comply with:						
	(viii) "Standard" fire resisting cables with PH30 classification according BS EN 50200 and additional 30 min. survival time to Annex E of this standard; or	[ ]	[ ]	[ ]	.....	26.2d)	1/2009
	(ix) "Enhanced" fire resisting cables with PH120 classification according to BS 8434-2.	[ ]	[ ]	[ ]	.....	26.2e)	1/2009

		Yes	No	N/A	Remarks	Reference BS CL	
3.6.3	Conductors are having a cross-sectional area of $\geq 1 \text{ mm}^2$.	[ ]	[ ]	[ ]	.....	26.2j)	
3.6.4	Cables and conductors are separated from cables of other services.	[ ]	[ ]	[ ]	.....	26.2k) 26.2l) 26.2m)	
3.6.5	Cables carrying power in excess of extra-low voltage are segregated from extra-low voltage fire alarm circuits.	[ ]	[ ]	[ ]	.....	26.2n)	
3.6.6	Colour of cables is limited to ≤ two sets of common colours and one of the colours is red.	[ ]	[ ]	[ ]	.....	26.2o)	
3.7	<u>Control and Indicating Equipment</u>						
3.7.1	The alarm annunciation panel is located near entrance or in fire control centre.	[ ]	[ ]	[ ]	.....		
3.7.2	Manual call point indications are given at the control and indicating panel even if addressable text information is available.	[ ]	[ ]	[ ]	.....		
3.7.3	Manual call point and detection zone indications are given at the control and indicating panel even if addressable text information is available, by one or a combination of the following:					23.2.2c) to e)	
	(a) LED indicators	[ ]	[ ]	[ ]	.....		
	(b) Visual display units	[ ]	[ ]	[ ]	.....		
	(c) Computer graphics	[ ]	[ ]	[ ]	.....		
	(d) Other suitable means (please specify ..... .....)	[ ]	[ ]	[ ]	.....		

		Yes	No	N/A	Remarks	Reference BS CL	
3.7.4	The wirings are compatible with the type of control panel as recommended by the panel manufacturer. (2-wire system/4-wire system/twisted pair/.....) [] [] []						
3.7.5	Operation of alarm silent facility should:					16.2.1g)	
	(a) require manual operation; [] [] []						
	(b) not cancel any visual signal; [] [] []						
	(c) if a new zone goes into alarm, sound any fire alarm sounders belonging to that alarm zone; [] [] []						
	(d) not prevent correct operation of any control; [] [] []						
	(e) not prevent transmission of alarm to alarm receiving centre. [] [] []						
3.8	<u>Power Supplies</u>						
3.8.1	Connections to the mains supply is via an independent isolating protective device. [] [] []					25.2a)	

		Yes	No	N/A	Remarks	Reference BS CL	
3.8.2	Every isolator, switch and protective device is situated in a position inaccessible to unauthorized persons or protected against unauthorized operation and is properly labelled as appropriate: (a) “FIRE ALARM” (火警警報); or (b) “FIRE ALARM. DO NOT SWITCH OFF” (火警警報, 切勿切斷電源); or (c) “WARNING. THIS SWITCH ALSO CONTROLS THE SUPPLY TO THE FIRE ALARM SYSTEM” (警告, 此電掣同時控制火警警報系統電源). All labels are engraved in white letter/character with a red background. The words “FIRE ALARM” (火警) with height of English and Chinese wordings ≥ 10 mm and 15 mm respectively.					25.2f) 25.2g)	1/2009
3.8.3	Circuit supplying fire alarm system is not protected by a residual current device. (unless necessary to comply with CoP for the Electricity (Wiring) Regulations)					25.2h)	
3.8.4	The mains power supply and the standby battery are each capable of supplying the maximum alarm load of the system.					25.2i) 25.3d)	
3.8.5	Battery power supply is provided. (Voltage: DC Volts: Ahr:)						

		Yes	No	N/A	Remarks	Reference BS CL	
3.8.6	Secondary (rechargeable) battery supplies should:					25.4	
	(a) be with an automatic charger;	[ ]	[ ]	[ ]	.....		
	(b) have a life of at least 4 years;	[ ]	[ ]	[ ]	.....		
	(c) have date of installation labelled;	[ ]	[ ]	[ ]	.....		
	(d) have battery charger capable of recharging the battery from fully discharged to fully charged within 24 hours; and	[ ]	[ ]	[ ]	.....		
	(e) have capacity sufficient to maintain the system operation.	[ ]	[ ]	[ ]	.....		

IV. Testing

4.1 Detectors

4.1.1	Upon actuation of any detector in the building, the correct audio/visual warning device is initiated.	[ ]	[ ]	[ ]	.....		
4.1.2	The sensitivity of all heat/smoke/flame detectors are correctly set in full accordance with the manufacturer's recommendations.	[ ]	[ ]	[ ]	.....		
4.1.3	The zoning of detectors is correct.	[ ]	[ ]	[ ]	.....		

4.2 Manual Call Point, Alarm Sounder and Visual Fire Alarm Installations

4.2.1	Upon actuation of the detector, alarm is given by alarm sounder installed at the building entrance near the alarm annunciation panel.	[ ]	[ ]	[ ]	.....		
4.2.2	Background noise (N) likely to persist for a period longer than 30 seconds.	[]	[]	[]	at.....dB(A).....	16.2.1 a)1)	

		Yes	No	N/A	Remarks	Reference	
						BS	CL
4.2.3	For domestic building, the minimum sound level of alarm sounders is measured at 3 m from the inside of the main entrance door with all doors shut off & all windows open at all flats and the result is dB(A), which is: (a) ≥ 60 dB(A); and (b) ≥ 5 dB(A) + (background noise, N) =dB(A). [] [] []					16.2.1 a)1)	
4.2.4	For non-domestic building, the minimum sound level of alarm sounders is measured at 3 m from the inside of the main entrance door with all doors shut off & all windows open at all flats and the result is dB(A), which is: (a) ≥ 65 dB(A); and (b) ≥ 5 dB(A) + (background noise, N) =dB(A). [] [] []					16.2.1 a)1)	
4.2.5	The sound level measured right below the sounder base(s) of smoke detector and 1 m above floor level with all the guestroom/bedroom windows fully opened and doors closed is ≥ 65 dB(A) or > 5 dB(A) above background noise. [] [] []						1/2009 2/2009
4.2.6	The zoning of manual call points is correct. [] [] []					12.2.2j), Note 5	1/2009
4.2.7	Upon actuation of any manual call point in the building, the fixed fire pump serving the corresponding block comes into operation regardless of the zoning of the manual call point. [] [] []					Code	

		Yes	No	N/A	Remarks	Reference	
						BS	CL
4.2.8	Upon actuation of any manual call point in the building, the correct audio/visual warning device for the fire alarm and detection system is initiated.	[ ]	[ ]	[ ]	.....		
4.2.9	The delay between operation of a manual call point and the giving of an “evacuate” signal in the alarm zone does not exceed 3 seconds.	[ ]	[ ]	[ ]	.....	20.2b)	
4.2.10	All VFA flashing light is visible to normal eyesight in the required protected areas when the fire alarm system is actuated.	[ ]	[ ]	[ ]	.....	Code	
4.2.11	VFA signal is clearly distinguishable from any other non-fire services visual signals.	[ ]	[ ]	[ ]	.....		
4.3	<u>Power Supplies</u>						
4.3.1	For occupied premises, the standby battery is sufficient to maintain the system in operation for at least 24 hours, plus at least 30 min. for an “evacuate” signal in all alarm zones.	[ ]	[ ]	[ ]	.....	25.4e)1)	
4.3.2	For unoccupied premises, the standby battery is sufficient to maintain the system in operation for at least 24 hours longer than maximum period likely to be unoccupied or for 72 hours in total, whichever is the less, after which to operate all fire alarm devices for at least 30 min.	[ ]	[ ]	[ ]	.....	25.4.e)4)	

		Yes	No	N/A	Remarks	Reference	
						BS	CL
4.3.3	In building with standby generator that serves fire alarm system, capacity is sufficient to maintain the system in operation for at least six hours, plus at least 30 min. for an “evacuate” signal in all alarm zones.	[ ]	[ ]	[ ]	.....	25.4e)1) 25.4e)2)	
4.3.4	The normal or standby supply is indicated by a green indicator at main indicating equipment.	[ ]	[ ]	[ ]	.....	25.3c)	
4.3.5	Each of the normal supply and the standby supply is capable of supplying the largest load under normal, fire and fault conditions.	[ ]	[ ]	[ ]	.....		
4.4	<u>Control and Indicating Equipment</u>						
4.4.1	Alarm is given from the alarm sounder installed at building external upon fire detection.	[ ]	[ ]	[ ]	.....		
4.4.2	Direct telephone link (DTL) to service provider’s Computerized Fire Alarm Transmission System (CFATS) is connected. (Please state DTL no.: ..... .....)	[ ]	[ ]	[ ]	.....		
4.4.3	Other panel function works properly:						
	(a) alarm silence/reset.	[ ]	[ ]	[ ]	.....		
	(b) battery supply on. (if applicable)	[ ]	[ ]	[ ]	.....		
	(c) power on/failure indicator.	[ ]	[ ]	[ ]	.....		
	(d) direct link failure indicator. (if applicable)	[ ]	[ ]	[ ]	.....		
	(e) zone alarm/fault indicator.	[ ]	[ ]	[ ]	.....		

		Yes	No	N/A	Remarks	Reference	
						BS	CL
4.4.4	Detector solely using as actuating devices for fire service systems such as fire shutter, VAC control, fixed installations other than water, fixed installation using water, pressurization system, and smoke extraction systems are linked to the Computerized Fire Alarm Transmission System (CFATS) via DTL. (Remark: This linking is not mandatory.)	☐	☐	☐	.....		
4.4.5	For addressable type alarm annunciation panel, a facility/provision is provided so that individual detector can be tested without either sounding an alarm or requiring the complete system to be disabled to prevent such an alarm.	☐	☐	☐	.....		

V. Documentation

		Yes	No	N/A	Remarks	Reference BS CL	
5.1	The following equipment list and catalogues are provided (where applicable):						
	(a) alarm annunciation panel;	[ ]	[ ]	[ ]	.....		
	(b) repeater panels;	[ ]	[ ]	[ ]	.....		
	(c) detectors;	[ ]	[ ]	[ ]	.....		
	(d) manual call points;	[ ]	[ ]	[ ]	.....		
	(e) alarm sounders;	[ ]	[ ]	[ ]	.....		
	(f) visual fire alarm;	[ ]	[ ]	[ ]	.....		
	(g) fire resisting cables.	[ ]	[ ]	[ ]	.....		
5.2	FSD approval/listing by product certification bodies are provided for the following equipment:						1/2007
	(a) alarm annunciation panel;	[ ]	[ ]	[ ]	.....		
	(b) repeater panels;	[ ]	[ ]	[ ]	.....		
	(c) detectors;	[ ]	[ ]	[ ]	.....		
	(d) manual call points;	[ ]	[ ]	[ ]	.....		
	(e) alarm sounders;	[ ]	[ ]	[ ]	.....		
	(f) visual fire alarm with sounder.	[ ]	[ ]	[ ]	.....		
5.3	Testing certificates are provided for the fire resistant cables.	[ ]	[ ]	[ ]	.....		
5.4	Sound level measurement (including background noise) report for alarm sounders is provided.	[ ]	[ ]	[ ]	.....		
5.5	Calculation showing the required battery capacity is provided.	[ ]	[ ]	[ ]	.....		
5.6	Letter certifying the completion of the DTL to the FSCC/authorized service provider is provided.	[ ]	[ ]	[ ]	.....		
5.7	Confirmation or certification from panel manufacturer on the compatibility between the fire alarm control panel(s) and detectors is provided.	[ ]	[ ]	[ ]	.....		

		Yes	No	N/A	Remarks	Reference	
						BS	CL
5.8	As-fitted fire service installation drawings including the following are provided:						
	(a) schematic diagrams of the fire alarm and detection system;	[ ]	[ ]	[ ]	.....		
	(b) floor layout plans showing the location of detectors, devices, alarm annunciation panel and repeater panel(s) as applicable.	[ ]	[ ]	[ ]	.....		

Test conducted by:

..... (Signature)

.....
Name of FSI Contractor's Representative (in block letters)

.....
Company Chop

.....(RC /)
Name of FSI Contractor (FSI Contractor Registration Number)

Date