ANNEX 1 Staff Qualification for Specific Categories

Works Categories:

- Air-conditioning Installation
- Audio Electronics Installation
- Broadcast Reception Installation
- Burglar Alarm and Security Installation
- Catering Equipment Installation
- Diesel Generator Installation
- Electrical and Mechanical Installation for Sewage Treatment & Screening Plant
- Electrical Installation
- Electronic Timing and Display Installation
- Fire Service Installation
- Fountain Installation
- Industrial Type Electrical Installation
- Lift, Escalator and Passenger Conveyor Installation
- Liquefied Petroleum Gas Installation
- Low Voltage Cubicle Switchboard Installation
- Mechanical Handling and Lifting Installation
- Mechanical Plant and Equipment Installation
- Motor Vehicle Body-building and Painting
- Plumbing Installation
- Radio Electronics Installation
- Steam and Compressed Air Installation
- Survey of Government Land Pressure Receivers subject to Steam and Air Pressure (but excluding Steam Boilers)
- Survey of Government Land Steam Boilers
- Survey of Lifting Appliances and Lifting Gear
- Swimming Pool Water Treatment Installation
- Uninterruptible Power Supply Installation
- Video Electronics Installation

1. To count as staff, individuals must be full time employees of the applicant and must be resident Hong Kong ID Card holders or Works Visa holders, and the practice must constitute their principal source of employment. Documentary evidence such as self-declaration letter specifying full-time employment with the company, bank payroll statement, Mandatory Provident Fund (MPF) contribution record, Employer's Return of Remuneration and Pensions to Inland Revenue Department, etc. shall be produced.

2. The Qualified Engineer shall be
   - a corporate member of the Hong Kong Institution of Engineers elected after 5 December 1975 with discipline relevant to category under application and with a minimum 2 years post-qualification experience in HKSAR, or
   - a Registered Professional Engineer (Engineer Registration Ordinance, Cap. 409) with discipline relevant to category under application.

3. The Technician shall have
   - an ordinary diploma or ordinary certificate of discipline relevant to the category under application from a Hong Kong polytechnic, technical college or technical institute, or equivalent, with 5 years' relevant experience in HKSAR, or
   - a higher diploma or higher certificate of discipline relevant to the category under application from a Hong Kong polytechnic, technical college or technical institute, or equivalent, with 3 years' relevant experience in HKSAR, or
   - a degree of discipline relevant to the category under application from a Hong Kong university, or equivalent, with 2 years' relevant experience in HKSAR.

   The Site supervisor shall have a minimum of 2 years' relevant experience in site supervision in HKSAR.

   The Draftsman shall have relevant experience in drawing preparation and use of CAD terminal.

   For the category of "Motor Vehicle Body-building and Painting" only, the Technician may be exempted from the above certificate/diploma/degree requirement should he have not less than 15 years' proven adequate experience.

4. The Draftsman can be the Qualified Engineer, Technician or Site supervisor, but in that case, the manpower resource for the respective rank of staff shall be increased accordingly, i.e. the total nos. of technical support staff required shall remain the same.

5. The Craftsman shall have a minimum of 2 years' working experience in HKSAR. The definitions of Qualified Tradesman and Intermediate Tradesman under the requirements of "Craftsman" shall refer to those specified in *Works Bureau Technical Circular (WBTC) No. 13/2002*. Ordinary Tradesman refers to experienced craftsman in the relevant trade not meeting the qualifications specified in the above-mentioned WBTC. For easy reference, the definitions of Qualified Tradesman and Intermediate Tradesman are extracted as follows. In case of deviations from future amendments, the latest version of the above WBTC shall prevail.

   (i) Qualified Electrician means:

   - an electrician who has obtained the Trade Test Certificate of "Electrician" issued by VTC; or
   - an electrician who has obtained the Certificate of Completion of Apprenticeship of "Electrical / Electrician or Electrical Fitter" issued under the Apprenticeship Ordinance (Cap. 47) or issued by the Government of the HKSAR; or

- an electrician who is a registered electrical worker registered under Electricity Ordinance (Cap. 406).

(ii) Intermediate Electrician means:

- an electrician who has obtained relevant Intermediate Trade Certificate of "Electrical Work" issued by VTC; or
- a Qualified Tradesman as Lift Electrician.

(iii) Qualified Plumber means:

- a plumber who has obtained the Trade Test Certificate of "Plumber" issued jointly by VTC & CITA; or
- a plumber who has obtained the Certificate of Completion of Apprenticeship of "Plumber" issued under the Apprenticeship Ordinance (Cap. 47) or issued by the Government of the HKSAR; or
- a plumber who is a licenced plumber registered under Waterworks Ordinance, Cap. 102.

(iv) Intermediate Plumber means a plumber who has obtained relevant Intermediate Trade Certificate of "Plumber" issued by CITA.

(v) Qualified BS Mechanic means a mechanic who has obtained the Certificate of Completion of Apprenticeship of "Building Services Mechanic" issued under the Apprenticeship Ordinance (Cap. 47) or issued by the Government of the HKSAR.

(vi) Intermediate BS Mechanic means:

- a mechanic who has obtained Intermediate Trade Certificate of any one of "Electrical Work, Sheet Metal Work, Mechanical Fitting, Pipe Works (E&M) or Welding (E&M)" issued by VTC; or
- a Qualified Tradesman as any one of an Electrician/Electrical Fitter, Fire Services Mechanic, Lift Electrician, Lift Mechanic, Mechanical Fitter, Refrigeration/Air-Conditioning/Ventilation Mechanic or Sheet Metal Worker.

(vii) Qualified AC Mechanic means:

- a mechanic who has obtained the Trade Test Certificate of "Refrigeration/Air-Conditioning/Ventilation Mechanic" issued by VTC, or
- a mechanic who has obtained the Certificate of Completion of Apprenticeship of "Air-Conditioning or Refrigeration/Air-Conditioning/Ventilation Mechanic" issued under the Apprenticeship Ordinance (Cap. 47) or issued by the Government of the HKSAR.

(viii) Intermediate AC Mechanic means:

- a mechanic who has obtained relevant Intermediate Trade Certificate of "Electrical Work, Sheet Metal Work, Mechanical Fitting, Pipe Works (E&M) or Welding (E&M)" issued by VTC; or
- a Qualified Tradesman as any one of an Electrician/Electrical Fitter, Building Services Mechanic, Fire Services Mechanic, Lift Electrician, Lift Mechanic, Mechanical Fitter or Sheet Metal Worker.

(ix) Qualified FS Mechanic means a mechanic who has obtained the Certificate of Completion of Apprenticeship of "Fire Services Mechanic" issued under the Apprenticeship Ordinance (Cap. 47) or issued by the Government of the HKSAR.

(x) Intermediate FS Mechanic means:

- a mechanic who has obtained Intermediate Trade Certificate of any one of "Electrical Work, Mechanical Fitting or Pipe Works (E&M)" issued by VTC; or
- a Qualified Tradesman as any one of an Electrician/Electrical Fitter, Building Services Mechanic, Lift Electrician, Lift Mechanic, Mechanical Fitter, Refrigeration/Air-Conditioning/Ventilation Mechanic or Sheet Metal Worker.

(xi) Qualified Lift Electrician means a mechanic who has obtained the Certificate of Completion of Apprenticeship of "Lift Electrician" issued under the Apprenticeship Ordinance (Cap. 47) or issued by the Government of the HKSAR.

(xii) Intermediate Lift Electrician means:

- a mechanic who has obtained Intermediate Trade Certificate of "Electrical Work" issued by VTC; or
- a Qualified Tradesman as Electrician/Electrical Fitter.

(xiii) Qualified Lift Mechanic means a mechanic who has obtained the Certificate of Completion of Apprenticeship of "Lift Mechanic" issued under the Apprenticeship Ordinance (Cap. 47) or issued by the Government of the HKSAR.

(xiv) Intermediate Lift Mechanic means:

- a mechanic who has obtained Intermediate Trade Certificate of "Mechanical Fitting" issued by VTC; or
- a Qualified Tradesman as any one of an Electrician/Electrical Fitter, Building Services Mechanic, Fire Services Mechanic, Lift Electrician, Mechanical Fitter, Refrigeration/Air-Conditioning/Ventilation Mechanic or Sheet Metal Worker.

(xv) Qualified Mechanical Fitter means:

- a fitter who has obtained the Trade Test Certificate of "Mechanical Fitter" issued by VTC, or
- a fitter who has obtained the Certificate of Completion of Apprenticeship of "Mechanical or Mechanical Fitter" issued under the Apprenticeship Ordinance (Cap. 47) or issued by the Government of the HKSAR.

(xvi) Intermediate Mechanical Fitter means:

- a fitter who has obtained Intermediate Trade Certificate of "Mechanical Fitting" issued by VTC; or
- a Qualified Tradesman as any one of an Electrician/Electrical Fitter, Building Services Mechanic, Fire Services Mechanic, Lift Electrician, Lift Mechanic, Refrigeration/Air-Conditioning/Ventilation Mechanic or Sheet Metal Worker.

(xvii) Qualified Sheet Metal Worker means a worker who has obtained the Certificate of Completion of Apprenticeship of "Sheet Metal Worker" issued under the Apprenticeship Ordinance (Cap. 47) or issued by the Government of the HKSAR.

(xviii) Intermediate Sheet Metal Worker means:

- a fitter who has obtained Intermediate Trade Certificate of "Sheet Metal Worker" issued by VTC; or

- a Qualified Tradesman as any one of an Electrician/Electrical Fitter, Building Services Mechanic, Fire Services Mechanic, Lift Electrician, Lift Mechanic, Mechanical Fitter or Refrigeration/Air-Conditioning/Ventilation Mechanic.

6. Qualified welder means a welder who has certificate issued by a testing laboratory within the past 6 months conforming to the following standards for pipe weld:

   - BS EN 287 or other equivalent international standards for the approval testing of welders for fusion welding, or
   - BS EN 288 or other equivalent international standards for welding procedures of metallic materials.

7. Electronics Craftsman

   A Qualified Electronics Craftsman is a craftsman who has obtained a relevant electronics certificate issued by recognized institutions e.g. VTC or CITA or has obtained relevant certificate of completion of apprenticeship issued by recognized organizations.

8. Craftsman for Motor Vehicle Body-building and Painting

   (i) A Qualified Body Repairer/Builder is a craftsman who has obtained a relevant vehicle body repair/building certificate issued by recognized institutions e.g. VTC or CITA or has obtained relevant certificate of completion of apprenticeship issued by recognized organizations.

   (ii) A Qualified Vehicle Mechanic is a craftsman who has obtained a relevant vehicle mechanic certificate issued by recognized institutions e.g. VTC or CITA or has obtained relevant certificate of completion of apprenticeship issued by recognized organizations.

   (iii) A Qualified Vehicle Electrician is a craftsman who has obtained a relevant vehicle electrician certificate issued by recognized institutions e.g. VTC or CITA or has obtained relevant certificate of completion of apprenticeship issued by recognized organizations.

   (iv) A Qualified Vehicle Painter is a craftsman who has obtained a relevant vehicle painting certificate issued by recognized institutions e.g. VTC or CITA or has obtained relevant certificate of completion of apprenticeship issued by recognized organizations.

ANNEX 2 List of Tools / Equipment and Testing Instruments for Air-conditioning Installation Category

Item of Assessment	Minimum Requirements		Remarks
	Group I	Group II	
Flow meters & pressure gauges	1	2	
Sound level meter	1	1	With full spectrum and complete with tester/frequency generator
Hydraulic pump with pressure gauges	1	2	
Hot wire anemometer	1	2	Accompanied with diffuser measuring hood
Welding machine	1	2	
Threading machine	1	2	
Bending machine	1	2	
Drilling machine	1	2	
Mercury manometers	1	2	
Tachometer	1	2	
Smoke generator	1	2	
Voltmeter	1	2	
Ammeter	1	2	One set can be tong tester
Air quality tester	1	1	“Andersen Sampler” or equivalent
Dial gauges	1	2	With appropriate scales
Refrigerant leakage tester	1	1	
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	Required	At least yearly and as requested when the testing instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 3 List of Tools / Equipment and Testing Instruments for Audio Electronics Installation Category

Item of Assessment	Minimum Requirements	Remarks
Digital voltage meter (DVM)	1	
Oscilloscope	1	
Signal generator	1	
Sound level meter	1	
Audio signal level meter	1	
Distortion analyzer	1	
Test / Maintenance workbench	1	Suitably equipped with test equipment, power sockets, inspection lamp, etc. for ready set-up, testing, fine-tuning and maintenance of equipment
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 4 List of Tools / Equipment and Testing Instruments for Broadcast Reception Installation Category

Item of Assessment	Minimum Requirements	Remarks
Multi-tester (AVO)	1	
Insulation tester	1	
Electric drill	1	
Basic workshop tools (electronics)	1 lot	
Basic testing instruments (electronics)	1 lot	
Proof of regular calibration (for instrument only) , e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the testing instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 5 List of Tools / Equipment and Testing Instruments for Burglar Alarm and Security Installation Category

Item of Assessment	Minimum Requirements	Remarks
Multi-tester (AVO)	1	
Insulation tester	1	
Electric drill	1	
Basic workshop tools (electronics)	1 lot	
Basic testing instruments (electronics)	1 lot	
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the testing instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 6 List of Tools / Equipment and Testing Instruments for Catering Equipment Installation Category

Item of Assessment	Minimum Requirements	Remarks
Hydraulic press	1	
Rolling machine	1	
Angle bender	1	
Welding machine	1	
Drilling machine	1	
Shaping machine	1	
Shearing machine	1	

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 7 List of Tools / Equipment and Testing Instruments for Diesel Generator Installation Category

Item of Assessment	Minimum Requirements	Remarks
Continuity tester	2	
Earth loop impedance tester	2	
Earth resistance tester	2	
Insulation tester	2	
Multi-meter	2	
Clamp-on ammeter	2	
Sound level meter	2	
Synchronizing tachometer	2	
Phase sequence tester	2	
Resistor bank	1	
Hydraulic tester	2	
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 8 List of Tools / Equipment and Testing Instruments for Electrical & Mechanical Installation for Sewage Treatment and Screening Plant Category

Item of Assessment	Minimum Requirements	Remarks
Welding equipment	2	
Drilling machine	1	
Metal cutting machine	1	
Lathe	1	
Milling machine	1	
Shaping machine	1	
Abrasive wheels	1	
Pipe threading and bending machines	1	
Portable generator	1	
Sewage/sludge pump	1	
Gas detectors	2	Capable of measuring oxygen deficiency, explosive gas, hydrogen sulphide and carbon monoxide
Non-spark hand tools	1 set	The tools should be safe for working in gas risk areas
Portable air blower	1	Complete with portable air duct and the transformation piece
Metal scaffolding	1 set	The assembly should include the platforms, accessing ladders and guard railings
Non-contact thermometer	1	
Integrated sound level meter	1	
Paint thickness gauge	1	
Portable air flow meter	1	
Earth loop impedance tester	1	

Item of Assessment	Minimum Requirements	Remarks
Earth resistance tester	1	
Insulation tester	1	500 V D.C. injection voltage
Multi-meter	2	
Clamp-on ammeter	2	
Voltmeter	2	
Conduit bender and cutter	1	
Continuity tester	1	
RCD tester	1	
Phase sequence tester	1	
Illumination meter	1	
D.C. voltage and current injection set	1	For the calibration of instruments (0 - 1 A D.C. and 0 - 10 V D.C.)
Hydraulic compression tool	1 set	Capable of jointing power supply cable to the cable lugs
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 9 List of Tools / Equipment and Testing Instruments for Electrical Installation Category

Item of Assessment	Minimum Requirements			Remarks
	Group I	Group II	Group III	
Conduit bender	1	2	3	
Conduit cutter	1	2	3	
Continuity tester	1	2	3	
Earth loop impedance tester	1	2	3	
Earth resistance tester	1	2	3	
Insulation tester	1	2	3	
Multi-tester (AVO)	1	2	3	
Clamp-on ammeter	1	2	3	
RCD tester	1	1	2	
Ductor tester	-	-	1	
Applied voltage tester	1	1	1	
Electric hammer	1	2	3	
Welding equipment	1	1	1	
Lux meter	1	1	1	
Cable jointer	May be exempted	1	1	
Metal cutter	May be exempted	1	1	
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	Required	Required	At least yearly and as requested when the instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 10 List of Tools / Equipment and Testing Instruments for Electronic Timing and Display Installation Category

Item of Assessment	Minimum Requirements	Remarks
Digital Voltage Meter (DVM)	1	
Oscilloscope	1	
Computer set or suitable test set for programming of display patterns	1	
Light meter	1	
Test/Maintenance workbench	1	Suitably equipped with test equipment, power sockets, inspection lamp, etc. for ready set-up, testing, fine-tuning and maintenance of equipment
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 11 Specification for Protection of Pipework for Fabrication of Steel Pipe Specials Category

Prior to the application of paint or protection, the pipe fittings shall be tested in accordance with the Clause of Inspection to the satisfaction of the Engineer or his representative.

Unless otherwise specified, pipe fittings shall be protected internally and externally as specified below. They are intended for use in the tropics.

(a) Internal Protection

Internal protection shall be bitumen lining to BS 534:1990, Clause 27.2 or equivalent. The requirements of Clause 27.2 are amended to the extent that the tenderer may offer bitumen lining with or without filler, provided that the bitumen conforms in all other respects with Type 2 compounds of BS 4147:1980 or equivalent.

Alternatively, tenderers may quote prices for coal tar enamel lining to American Water Works Association Standards AWWA C203.

The lining at the ends of pipe fittings shall be omitted for a sufficient length to permit making welds without damaging the lining.

All lining will be checked for continuity as specified in clause 28.1 of BS 534:1990 or equivalent. Discontinuities and pinholes indicated shall be made good at no extra cost to Government. Before the adhesion test specified in BS 534:1990, Clause 28.2 or equivalent, the rings shall be heated to 170^{o}F for 24 hours and the lining shall not show any tendency to creep or flow.

(b) External protection

All underground pipes shall be reinforced bitumen sheathed on the outside. This shall be bitumen sheathing as specified in Clause 26.2 of BS 534:1990 or equivalent with the addition of a spiral wrapping of woven glass cloth firmly embedded into the surface of the sheathing with an overlap of not less than 6.3mm.

Flange jointing surfaces need not be painted.

The applicant shall submit details of his quoted alternative standards for assessment.

ANNEX 12 Standard Requirements for Waterworks Installations for Fabrication of Unfired Pressure Vessels Category

Contractors must be capable of fabricating manufacturing unfired pressure vessels (both vertical and horizontal) to BS 5500 and the requirements as detailed below:

Category of construction : 1& 2

Diameter of vessels: up to 3500mm

Materials of construction : steel

Working pressure of vessel : 1600 kPa

Hydraulic test pressure : 2400 kPa

Applications: salt water or potable water

Construction shall also provide accessories associated with the vessel, including:

Pressure relief valve

Anti-vacuum valve

Water level gauges, pressure gauges & isolating valves

Level electrodes and controller

ANNEX 13 List of Tools / Equipment and Testing Instruments for Fire Service Installation Category

Item of Assessment	Minimum Requirements		Remarks
	Group I	Group II	
Hydrant flow & pressure gauges	1	1	Calibration is permanent, components to be replaced if damaged
Level measure meter (Gas system), optional	1	1	
Hydraulic pump with pressure gauge	1	2	
Smoke detector tester	1	2	
Insulation tester	1	2	
Multi-tester (AVO)	1	2	
Welding machine	1	2	
Threading machine	1	2	
Bending machine	1	2	
Drilling machine	1	2	
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	Required	At least yearly and as requested when the instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 14 List of Tools / Equipment and Testing Instruments for Fountain Installation Category

Item of Assessment	Minimum Requirements	Remarks
Flow meters & pressure gauges	1	
Hydraulic pump with pressure gauges	1	
Welding m/c	1	
Threading m/c	1	
Bending m/c	1	
Drilling m/c	1	
Conduit bender	1	
Conduit cutter	1	
Tachometer	1	
Multi-meter	2	
Continuity tester	1	
Clamp-on ammeter	1	
Earth fault loop impedance tester	1	
Insulation tester	1	
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the testing instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 15 Minimum Personnel Requirements for Ground Investigation Field Work Category

Position[(a) & (b)]	Academic Qualification	Experience	No.	
			GP I	GP II
Site Agent	None	10 years in civil or geotechnical engineering, of which at least 5 must be in ground investigation	1	1
	Ordinary Certificate in civil engineering or equivalent	7 years in civil or geotechnical engineering, of which at least 5 must be in ground investigation		
Geotechnical Engineer/ Engineering Geologist	Degree[(c)] in civil engineering, geotechnical engineering or a geology-related subject	5 years of post-qualification experience in civil or geotechnical engineering, of which at least 3 must be in ground investigation	1	2
Logging Geologist	Degree[(c)] in geology[(d)] or a cognate subject[(e)] in which at least 50% of the course content comprises geological based subjects[(g)]	3 years of post-qualification experience in ground investigation which must include logging of samples[(f)]	1	2
	Degree[(c)] in geology[(d)] or a cognate subject[(e)] in which at least 25% of the course content comprises geological based subjects[(g)]	5 years of post-qualification experience in ground investigation which must include logging of samples[(f)]		
Geotechnical Field Technician	Ordinary Certificate in civil engineering or equivalent	2 years in ground investigation	1	2
	Relevant Degree[(c)]	1 year in ground investigation		
Ground Investigation Driller	CITA (Construction Industry Training Authority) Trade Test Certificate for Ground Investigation Operator		4	10
Safety Officer	Registered in accordance with the FIU(SO&SS)R	3 years in ground investigation	1[(h)]	1
Safety Supervisor	-		0	1

Notes: (a) All except Ground Investigation Drillers must be able to speak English and understand instructions written in English.

(b) An individual may fill only one of the positions at any one time.

(c) The degree shall be up to degree level as assessed by the Hong Kong Council for Academic Accreditation (HKCAA).

(d) Examples of degree in geology: Applied Geology, Earth Science, Engineering Geology, Geological Sciences, Geology, Mining Geology and Petroleum Geology.

(e) Examples of cognate subjects: Environmental Science, Geography, Geomorphology, Geotechnical Engineering, Mining and Soil Science.

(f) Applicants will be required to submit documentary evidence in support of their core logging experience (e.g. submission of logs that the applicant has produced, including a brief statement of 2-3 pages explaining the reasons for submitting those particular logs).

(g) Examples of geological based subjects: Applied Geology, Earth Dynamics, Earth Systems, Economic/Mining Geology, Engineering Geology, Environmental Geology, Field Camp/Field School/Field Mapping, Geochemistry, Geomorphology, Earth/Surficial Processes, Landform/Quaternary Geology, Geophysics, Historical Geology, Hydrogeology, Mineralogy, Palaeontology, Petroleum Geology, Petrology (Igneous, Metamorphic & Sedimentary), Physical Geology, Physics of the Earth, Plate Tectonics, Regional Geology, Rock Mechanics, Sedimentology/Principles of Sedimentation, Stratigraphy, Soil Mechanics and Structural Geology. An applicant who holds a degree in geology or a cognate subject in which at least 25% but less than 50% of the course content comprises geological based subjects is considered to have topped up the geological based subjects in his or her degree to at least 50% if he or she has obtained a recognized relevant post-degree qualification (e.g. Post-graduate Diploma in Earth Sciences at the University of Hong Kong or equivalent).

(h) The Safety Officer may be working part-time only for a Group I contractor.

ANNEX 16 Minimum Equipment Requirements for Ground Investigation Field Work Category

Equipment		Number/Length/Set	
		Group I	Group II
Water Pumps		4	10
Set of equipment for air-foam drilling		0	2
Casings	NW & HW	160m for each size	600m for each size
	PW and SW	40m for each size	100m for each size
Drilling rods	NW	160m	600m
	HW	40m	100m
Soil samplers	U100/U76	4	10
	Piston	2	2
	Mazier	4	10
Rock samplers	Double tube (TNW & T2-101)	4 each	10 each
	Triple tube (NMLC, HMLC & 4C-MLC)	1 each	2 each
Equipment for insitutests	SPT	4	10
	Impression packer, rising, falling and constant head permeability, packer (water absorption) and vane shear	1 each	2 each
	Dipmeters	4	10
	GCO probe	2	4

ANNEX 17 List of Tools / Equipment and Testing Instruments for Industrial Type Electrical Installation Category

Item of Assessment	Minimum Requirements	Remarks
Conduit bender	2	
Conduit cutter	2	
Continuity tester	2	
Earth loop impedance tester	1	
Earth resistance tester	1	
Insulator tester	1	
Multi-meter	2	
RCD tester	1	
Ductor tester	1	
Applied voltage tester	1	
Cable jointer	1	
HV insulator tester	1	
Injection tester	1	
Clamp-on ammeter	2	
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 18 Technical Requirement for Landslip Preventive/Remedial Works to Slopes/Retaining Walls Category

1. Qualification Criteria

1.1 The applicant must be registered in the list of Registered Specialist Contractor for Site Formation Works of the Buildings Department.

1.2 The applicant must have obtained either ISO Certification or if they do not have suitable works contracts in hand for certification auditing, a confirmation from a certification body accredited by the HKAS to issue the Certification or considered to be equivalent by the DEVB that a full review of the Quality Manual of their Hong Kong office has been carried out in Hong Kong by the certification body and such Quality Manual has been confirmed by the certification body as being in conformity with the requirements of the relevant ISO standard. The scope of certification should include landslip preventive/remedial works to slopes/retaining walls.

1.3 The applicant must achieve the minimum passing scores for the aggregate mark of the assessment and for individual or combined sections of the assessment as detailed in Section 2 below in the following attributes:

1.3.1 Experience and performance on Government contracts (see Notes 1 and 2 of section 2.1 below) on Roads & Drainage and/or Site Formation categories (Group B or above) in the past 3 years.

1.3.2 Experience and performance on landslip preventive, remedial or formation works of slopes and/or retaining walls in areas immediately behind occupied structures, adjacent to railway lines or public roads in the past 3 years.

1.3.3 Experience, availability and organization of managerial, professional, technical and site safety staff with particular emphasis on Landslip Preventive Measures (LPM) type works.

1.3.4 Availability of plant and equipment for LPM type works.

2. Method of Assessment

2.1 Experience on Government contracts(see Note 1) under the Roads & Drainage and/or Site Formation categories in the past 3 years

Criteria	Marks
Applicant is not on the Approved List under R&D or SF categories	0
Applicant is on the Approved List under R&D or SF categories at Group B	2
Applicant is on the Approved List under R&D or SF categories at Group C	5
Between 1 and 5 no. performance reports(see Note 2) in either or both categories	Add 2
Between 6 and 8 no. performance reports(see Note 2) in either or both categories	Add 4
Between 9 and 12 no. performance reports(see Note 2) in either of both categories	Add 6
More than 12 performance reports in either or both categories	Add 10
	Maximum score 15 marks

Notes:

(1) Government contracts that have been completed by the applicant as main contractor or first-tier sub-contractor of the main contract.

(2) For the applicant as main contractor for Government contract, performance reports shall refer to the reports stipulated in Section 4 of Contractor Management Handbook. For the applicant as sub-contractor for Government contract, performance reports shall refer to the above quarterly reports covering the applicant's work period of the sub-contract.

2.2 Performance on Government Contracts(see Note 1 of section 2.1 above) under Road & Drainage and/or Site Formation categories in the past 3 years

Criteria	Marks
10% or more of performance reports adverse or no performance reports	0
More than 5% but less than 10% performance reports adverse	4
Up to 5% performance reports adverse	8
No adverse reports	12
No adverse and some very good reports	15
	Maximum score 15 marks

Note 1 - Notwithstanding Note 2 in section 2.1 above for counting the number of performance reports on Government contract to assess the applicant's experience, only performance reports of the applicant as main contractor for Government contract will be counted for assessing his performance under section 2.2. Therefore, this section 2.2 will not apply when the applicant has undertaken only subcontracts in the period.

2.3 Experience and performance on landslip preventive, remedial or formation works of slopes and/or retaining walls in areas immediately behind occupied structures, adjacent railway lines or public roads in the past 3 years

Criteria		Marks
No. of sites on which LPM works were completed by the applicant satisfactorily	Less than 3	0
	3 to 6	5
	More than 6	10
No. of sites each with value of LPM works higher than $2M completed by the applicant satisfactorily	2 to 3	Add 5
	4 or more	Add 10
Multiple-site experience	The applicant completed LPM works satisfactorily on at least 6 simultaneously active sites with total value of works higher than $7M	Add 5
	The applicant completed LPM works satisfactorily on at least 8 simultaneously active sites with total value of works higher than $10M	Add 10
		Maximum score 30 marks

Note 1 – For avoidance of doubt, for entry into probation, relevant sub-contracts of any tier for Government LPM works will be counted for assessment in section 2.3.

2.4 Overall experience and performance in works of Roads & Drainage, Site Formation and Landslip Preventive Works in the past 3 years

Criteria	Marks
Assessments in Sections 2.1, 2.2 and 2.3 above	Aggregate of marks scored in Sections 2.1, 2.2 and 2.3 above
	Maximum score 60 marks (or 45 marks when section 2.2 does not apply, vide Note 1 of section 2.2 above) *Minimum passing score [(1)] 50% of maximum score*

Note 1 - The application will be rejected if the mark achieved is below the minimum passing score in this section irrespective of whether the aggregate total of marks achieved in this assessment is higher than the overall minimum passing score.

2.5 Experience, availability and organization of managerial, professional, technical and safety staff with particular emphasis on experience for LPM type works

2.5.1 Management level staff

Criteria	Marks
No full-time member of management level staff has 5 years or more relevant local experience (gained within the past 10 years) in managing a construction firm	0
At least one full-time member(1) of management level staff has a minimum of 5 years relevant local experience (gained within the past 10 years) in managing a construction firm	5
At least one full-time member(1) of management level staff has a minimum of 5 years relevant local experience (gained within the past 10 years) in managing a construction firm Plus A minimum 2 years experience in managing multiple site contracts and LPM type works over the past 5 years	10
	Maximum score 10 marks *Minimum passing score(2) 5 marks*

Notes:

(1) The member of staff must have worked full-time for the applicant for at least one year.

(2) The application will be rejected if the marks achieved are below the minimum passing score in this section irrespective of whether the aggregate total of marks achieved in this assessment is higher than the overall minimum passing score.

2.5.2 Professional staff (excluding staff assessed in 2.5.1)

Criteria	Marks
No staff employed full-time who holds a relevant degree from a HK university or equivalent and with a minimum of 5 years local experience in site formation or LPM-type works	0
At least one full-time member of staff(1) with a relevant degree from a HK university or equivalent and with a minimum of 5 years local experience in site formation or LPM-type works	5
At least one full-time member of staff(1) with a relevant professional qualification (RPE (G or C), MHKIE (G or C), etc.) and with a minimum of 5 years local experience in site formation or LPM-type works	10
	Maximum score 10 marks *Minimum passing score(2) 5 marks*

Notes:

(1) The member of staff must have worked full-time for the applicant for at least one year.

(2) The application will be rejected if the marks achieved are below the minimum passing score in this section irrespective of whether the aggregate total of marks achieved in this assessment is higher than the overall minimum passing score.

2.5.3 Technical staff (excluding staff assessed in 2.5.1 and 2.5.2)

Criteria	Marks
No full time member of technical staff has the academic qualification and minimum local experience in site formation or LPM-type works of the 3 combinations below	0
At least one full-time member of staff(1) with an Ordinary Certificate in Civil Engineering and with a minimum of 5 years local experience in site formation or LPM-type works	2
At least one full-time member of staff(1) with a Higher Certificate in Civil Engineering and with a minimum of 3 years local experience in site formation or LPM-type works	3
At least one full-time member of staff(1) with a relevant degree from a HK university or equivalent and with a minimum of 3 years local experience in site formation or LPM-type works	5
	Maximum score 5 marks *Minimum passing score(2) 2 marks*

Notes:

(1) The member of staff must have worked full-time for the applicant for at least one year.

(2) The application will be rejected if the marks achieved are below the minimum passing score in this section irrespective of whether the aggregate total of marks achieved is higher than the overall minimum passing score.

2.5.4 Safety Staff (excluding staff assessed in 2.5.1, 2.5.2 and 2.5.3)

Criteria	Marks
No Registered Safety Officer employed full time	0
One Registered Safety Officer(1) employed full time	3
Two or more Registered Safety Officers(1) employed full time	5
	Maximum score 5 marks *Minimum passing score(2) 3 marks*

Notes:

(1) The member of staff must have worked full-time for the applicant for at least one year.

(2) The application will be rejected if the marks achieved are below the minimum passing score in this section irrespective of whether the aggregate total of marks achieved in this assessment is higher than the overall minimum passing score.

2.6 Availability of plant and equipment for LPM type works

Criteria	Marks
The applicant owns less than 7 types of the following 10 types of plant: Drilling rig for soil nails, grout pump, shotcrete machine, excavator, hydraulic breaker, pneumatic drill, roller, crane truck, air compressor, generator.	0
The applicant owns at least 7 types of the above plant.	5
The applicant owns all 10 types of the above plant and more than one unit each of the following: Drilling rig for soil nails, grout pump, shotcrete machine, air compressor and generator.	10
	Maximum score 10 marks *Minimum passing score(1) 5 marks*

Note 1 – The application will be rejected if the marks achieved are below the minimum passing score in this section irrespective of whether the aggregate total of marks achieved in this assessment is higher than the overall minimum passing score.

3. Acceptance Criteria

3.1 The applicant will be recommended for acceptance if the aggregate total of marks achieved in Sections 2.4, 2.5.1, 2.5.2, 2.5.3, 2.5.4 and 2.6 is equal to or higher than 65% of the maximum marks, and the marks achieved in these sections are all higher than the minimum passing scores of the respective sections subject to compliance with the criteria stated in Sections 1.1 and 1.2.

3.2 Successful applicants will normally be accepted into the List on probation. Probationary contractors will be allowed to take on not more than two Government contracts with total outstanding value of works of not greater than $100M tendered under the LPM Specialist Category.

4. Criteria for Confirmation

4.1 A probationary contractor may, subject to a minimum probationary period of 24 months, apply for confirmation to the Secretary for Development in writing when they have satisfactorily completed, as main contractor or first-tier sub-contractor (see Note 1 in section 2.1 above), at least one Government Landslip Preventive Measures contract or its first tier sub-contract respectively, containing multiple sites and of value not less than $40M. Confirmation will also be subject to the contractor being able to meet the financial criteria applicable to confirmed status, having the appropriate technical and management capabilities and in all other ways being considered suitable for confirmation.

ANNEX 19 List of Tools / Equipment and Testing Instruments for Lift, Escalator and Passenger Conveyor Installation Category

Item of Assessment	Minimum Requirements	Remarks
Equipment & instruments for examinations and tests under the Lifts & Escalators (Safety) Ordinance, such as tachometer, dead weight, walkie-talkie etc.	2 sets	
Tools & equipment recommended by the lift/escalator manufacturer for: (a) the installation of lifts & escalators (b) the servicing, maintenance and repair of lifts & escalators.	 1 set 2 sets	
Basic workshop tools such as conduit bender, conduit cutter, electric drill/hammer, grinder etc.	1 lot	
Basic testing instruments such as multi-tester (AVO), insulation tester, clamp on ammeter, light meter, sound meter etc.	1 lot	
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the testing instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 20 List of Tools / Equipment and Testing Instruments for Liquefied Petroleum Gas Installation Category

Item of Assessment	Minimum Requirements	Remarks
Detect gas leaking gauge	1	
Welding machine	1	
Grinding machine	1	
Drilling machine	1	
Vacuum pump, compressor	1	
Chain block	1	
Shearing machine	1	
Edging machine	1	
Water pump with gauge	1	
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 21 List of Tools / Equipment and Testing Instruments for Low Voltage Cubicle Switchboard Installation Category

Item of Assessment	Minimum Requirements	Remarks
Multi-tester (AVO)	2	
Insulation tester	2	
Ductor tester	1	
Continuity tester	1	
Primary injection test set	1	
Secondary injection test set	1	
Dielectric strength test set, 2kV	1	
Busbar bending machine	1	
Busbar cutter	1	
Sheet metal cutter	1	
Sheet metal press	1	
Electric drilling machine	1	
Basic workshop tools	1 lot	
Basic testing instruments	1 lot	
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the testing instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 22 List of Tools / Equipment and Testing Instruments for Mechanical Handling and Lifting Installation Category

Item of Assessment	Minimum Requirements	Remarks
Welding equipment	1	
Drilling machine	1	
Metal cutting machine	1	

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 23 List of Tools / Equipment and Testing Instruments for Mechanical Plant and Equipment Installation Category

Item of Assessment	Minimum Requirements	
	Group I	Group II
Welding equipment	1	2
Lathe	1	1
Drilling machine	1	2
Metal cutting machine	1	1
Abrasive wheels	1	1
Milling machine	-	1
Shaping machine	-	1
Pipe threading and bending machines	1	2

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 24 List of Equipment / Tools for Motor Vehicle Body-building and Painting Category

Item of Assessment	Minimum Requirements	Remarks
Welding equipment • Oxy-acetylene • MIG • TIG	 1 1 1	
Sheet metal cutting machine	1	
Sheet metal shaping machine	1	
Hydraulic lift/jib crane (1000 kg)	1	
Vehicle jack • 1000 kg • 3000 kg	 2 2	
Compressed air supply	2 outlets	
Spray-painting equipment	Clean, force-ventilated, enclosed area for 1 vehicle	
Digital camera of resolution not less than 1200 X 1024	1	
Vehicle trade licence plate	1	Proof of availability from third party is acceptable

Note : All equipment/tools should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 25 List of Tools / Equipment and Testing Instruments for Radio Electronics Installation Category

Item of Assessment	Minimum Requirements	Remarks
Digital Voltage Meter (DVM)	1	
Oscilloscope	1	
Radio frequency signal generator	1	
Signal level meter	1	
Spectrum analyzer	1	
Field test antennae	1	
Frequency counter	1	
Test/Maintenance workbench	1	Suitably equipped with test equipment, power sockets, inspection lamp, etc. for ready set-up, testing, fine-tuning and maintenance of equipment
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 26 List of Electrical Equipment for Repair in Water Supplies Department for Repair of Motors, Transformers and Switchgear Category

High Voltage Equipment

1. Bulk oil or SF6 circuit-breaker switchgear panel rated up to 2000A 11kV.
2. Squirrel cage induction motors up to 3000kW 11kV.
3. Variable speed motors up to 650kW 6.6kV.
4. Power factor correction capacitors up to 11kV.
5. Bulk oil power transformers up to 16000kVA 33kV.
6. Resin encapsulated power transformers up to 1000 kVA 11kV.
7. Cabling work up to 11kV including PILC, XLPE, Raychem, compound and resin filled cable jointing.

380V Equipment

1. Switchboard

1.1 FBA switchboard of rating up to 3150A 2-bus section arrangement.
1.2 Air circuit-breaker switchgear panel up to 2500A.
1.3 Bulk oil circuit-breaker up to 2500A.
1.4 Fuse switchgear and isolators up to 2000A.
1.5 Pump motor starters including direct-on-line, auto-transformer, star-delta, liquid resistor starters and contactors up to 780A.
1.6 Panel fabrication and painting work.

2. Control and Protection

2.1 Protection systems including relay repair and calibration.
2.2 Control panel for power supply, auto pump control and associated instrumentation equipment.

3. Rotating Machines

3.1 Squirrel cage induction motors up to 480kW 380V 50Hz.
3.2 Slip-ring induction motors up to 360kW 380V 50Hz.
3.3 Emergency generators up to 1000kVA.

4. **Plant Auxiliaries**

4.1 Power factor correction capacitor banks.

4.2 Electric valve actuators, drainage pumps and ventilation fans.

4.3 24-110V d.c. battery and charger equipment, UPS and frequency converters.

4.4 Electric overhead cranes and hoists.

4.5 Cathodic protection equipment.

4.6 Electro-chlorinator.

4.7 Cabling work up to 1000mm^2, PVC, PILC, XLPE, Raychem, compound and resin cable jointing.

ANNEX 27 Typical Equipment for High Voltage and 380 Volt Equipment for Repair of Motors, Transformers and Switchgear Category

1. Equipment for General Use

1.1 Typical Workshop Equipment

- Guillotine for insulation sheet cutting.
- Oxy-acetylene, T.I.G. or other welders.
- Band saw, circular saw etc. for insulation board cutting.
- Solvent tank for components cleaning.
- Bench and pedestal drill e.g. 25mm diameter hole.
- Paint spray equipment and booth, if any.
- Compressed air ring main for pneumatic tools and components cleaning.
- Overhead crane, fork lift truck etc.

1.2 Typical Test Equipment

- Precision voltmeter, ammeter and voltmeter.
- High voltage phasing rod and meters.
- R, L, C bridge.
- 5kV & 10kV Megger.
- Electrical appliance tester as Thorn EMI Model Part 2.
- Earth loop tester as Thorn EMI Model LT5.
- Digital Earth tester as Thorn EMI Model DET2.

2. Switchgear Repair and Testing Equipment

2.1 Typical Workshop Equipment for Switchgear Repair

- Oil filtration plant for O.C.B. oil re-cycling.
- Cabling drum jacks rollers etc. for cable laying.
- Cable termination and jointing equipment.
- Portable SF_6 gas detector, pressure gauge and topping up device.

2.2 Typical Switch gear Test Equipment

- High voltage 50Hz. and d.c. output test set up to 30kV 2kVA for switchboard and power cable testing.
- Low resistance Ductor set. (for contact resistance testing)
- 60kV Oil tester for transformer/OCB oil.
- Primary injection test set up to 3000A with integral meters.

- Secondary injection test set up to 100A with integral timer and meters.
- Switchgear test control board.

3. Typical Motor Repair and Testing Equipment

3.1 Typical Workshop Equipment for Motor Repair

- Air conditioned room for H.V. motor rewinding.
- Dryout oven e.g. 2400X 2400 X 3600 mm (b x d x h) for motor after repair.
- Winding burnt-out oven.
- Motorised winding overhang cutter & coil puller.
- Coil winding machine for stator coil rewinding.
- Milling machine for slot wedge cutting.
- Induction current motor heater.
- T.I.G. welder for motor rotor repair.
- Commutator under-cutting tool.
- 30 ton & 150 ton hydraulic extractor for bearings and couplings.
- Varnishing tank.
- Thermal setting insulation storage cabinet.
- Steam cleaner.
- Motor stool for supporting vertical motor for repair.

3.2 Typical Motor Test Equipment

- High voltage 50 Hz. Test set for dielectric properties testing, up to 30 kV 60kVA.
- Tangent Delta tester for British Standard tests.
- Dielectric Loss Analyser for motor insulation testing.
- Double beam storage CRO for motor starting characteristics display and/or transient display.
- X-Y plotter for transient record (or CRO camera; portable recorder).
- Dynamic balancing machine for rotor balancing for up to 6000kg.
- Noise meter for motor characteristics analysis to BS 4999.
- Vibrameter for vibration measurement.
- Bearing analyzer for analysis of bearing condition.
- Winding high frequency surge tester with waveform display by CRO.
- Motor test bed.
- Power Supply for testing at 380V, 3.3kV, 6.6kV and 11kV.

ANNEX 28 List of Tools / Equipment and Testing Instruments for Steam and Compressed Air Installation Category

Item of Assessment	Minimum Requirements	Remarks
Welding equipment	2	
Hydraulic tester	2	
Workbench with vice	1	
Drilling machine	2	
Pipe threading and bending machine	2	
Pressure gauge	2	
Temperature Gauge	2	
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 29 List of Tools / Equipment and Testing Instruments for Survey of Government Land Pressure Receivers subject to Steam and Air Pressure (but excluding Steam Boilers) Category

Item of Assessment	Minimum Requirements	Remarks
Hydraulic test pump & accessories	1	
Ultrasonic thickness tester	1	
Dye penetrant tester	1	
Magnetic particle tester	1	
Megger tester	1	
Multimeter / AVO meter	1	
Personnel safety devices (e.g. helmet, eye goggles, safety belt & shoes, heat resistant gloves & overall)	3	
Miscellaneous tools (e.g. screw driver, spanner, drill, hammer, inspection mirror, sealing chipper, lead chip & wire)	2	
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 30 List of Tools / Equipment and Testing Instruments for Survey of Government Land Steam Boilers Category

Item of Assessment	Minimum Requirements	Remarks
Hydraulic test pump & assessories	1 set	
Ultrasonic thickness tester	1 set	
Dye penetrant tester	1 set	
Magnetic particle tester	1 set	
Megger tester	1 set	
Multimeter / AVO meter	1 set	
Miscellaneous tools (e.g. screw driver, spanner, drill, hammer, inspection mirror, sealing chipper, lead chip & wire)	2 sets	
Personnel safety devices (e.g. helmet, eye goggles, safety belt & shoes, heat resistant gloves & overall)	3 sets	
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 31 List of Tools / Equipment and Testing Instruments for Survey of Lifting Appliances and Lifting Gear Category

Item of Assessment	Minimum Requirements	Remarks
Weighscale, measuring tape, level gauge, callipers, deflection scale, etc.	1 set	
Dead weight	1 set (10,000 kg minimum)	
Lifting appliance and gear	1 set	
Crane Lorry	1 set	
Handtools (e.g. screw driver, spanners, electric drill, hammer, etc.)	2 sets	
AVO meter / multimeter	1 set	
Megger tester	1 set	
Personnel safety device (e.g. helmet, eye goggles, safety belt, shoes and overall, etc.)	3 sets	
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 32 List of Tools / Equipment and Testing Instruments for Swimming Pool Water Treatment Installation Category

Item of Assessment	Minimum Requirements	Remarks
Flow meters & pressure gauges	1	
Hydraulic pump with pressure gauges	1	
Welding m/c	1	
Threading m/c	1	
Bending m/c	1	
Drilling m/c	1	
Conduit bender	1	
Conduit cutter	1	
Tachometer	1	
Multi-meter	2	
Continuity tester	1	
Clamp-on ammeter	1	
Earth fault loop impedance tester	1	
Insulation tester	1	
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the testing instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 33 List of Tools / Equipment and Testing Instruments for Uninterruptible Power Supply Installation Category

Item of Assessment	Minimum Requirements	Remarks
Digital voltage meter (DVM)	1	
Oscilloscope	1	
Clamp-on ampere meter	1	
Phase meter	1	
Distortion analyzer	1	
Dummy load	1	
Test/Maintenance workbench	1	Suitably equipped with test equipment, power sockets, inspection lamp, etc. for ready set-up, testing, fine-tuning and maintenance of equipment
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 34 List of Tools / Equipment and Testing Instruments for Video Electronics Installation Category

Item of Assessment	Minimum Requirements	Remarks
Digital voltage meter (DVM)	1	
Oscilloscope	1	
Video signal/pattern generator	1	
Video waveform monitor	1	
Light meter	1	
Test charts	1	
Test/Maintenance workbench	1	Suitably equipped with test equipment, power sockets, inspection lamp, etc. for ready set-up, testing, fine-tuning and maintenance of equipment
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by HOKLAS accredited laboratory or equivalent institutions	Required	At least yearly and as requested when the instrument is in doubt

Note : All equipment should be verified that they are all at sight or with other form of proof of ownership.

ANNEX 35 Minimum Personnel and Equipment Requirements for Landscaping Category, Class I : General Landscape Work

Minimum Requirements for Technical Staff

Position[a], [b]	Academic / Professional Qualifications	Experience[c]	No.	
			Group I	Group II
horticulturalist	Obtained a university degree in horticulture or related discipline[e]	Three years working experience in horticulture	1[d]	1[d]
	OR			
	Satisfactorily completed[f] a recognized diploma programme in horticulture or related field[g] equivalent to the standards of Level 3 or above in the Hong Kong Qualification Framework	Four years working experience in horticulture		
	OR			
	Obtained a qualification or certification from a professional institute or organization of horticulture[h] with standards equivalent to those of the Certified Horticulturist from the American Society for Horticultural Science or above	Five years working experience in horticulture		

Minimum Requirements for Technical Staff (Cont'd)

Position[a], [b]	Academic / Professional Qualifications	Experience[c]	No.	
			Group I	Group II
tree specialist	Obtained a university degree in arboriculture or related discipline[i]	Three years working experience in arboriculture	1[d]	1[d]
	OR			
	Satisfactorily completed[f] a recognized diploma programme in arboriculture or related field[j] equivalent to the standards of Level 3 or above in the Hong Kong Qualification Framework	Four years working experience in arboriculture		
	OR			
	Obtained a qualification or certification from a professional institute or organization of arboriculture[h] with standards equivalent to those of the Certified Arborist from the International Society of Arboriculture or above	Five years working experience in arboriculture		

Minimum Requirements for Technical Staff (Cont'd)

Position[(a), (b)]	Academic / Professional Qualifications	Experience[(c)]	No.	
			Group I	Group II
skilled worker	Satisfactorily completed[(f)] a total of not less than 60 hours of training courses in the past five years in the arboricultural and horticultural fields offered by the relevant organizations with standards equivalent to those of the Construction Industry Council Training Academy (CICTA) and the Vocational Training Council (including the courses offered under the Horticulture Skills Upgrading Scheme) or above, in which the Supervision of Tree Works Course offered by CICTA and course(s) on training of pruning techniques and use of basic arboricultural and horticultural tools and equipment such as chainsaws should be included.	Three years site working experience in arboriculture and horticulture	2	4

Minimum Requirements for Technical Staff (Cont'd)

Notes :

(a) All individuals must be full time employees of the applicant and must be resident Hong Kong Identity Card Holders or Work Visa Holders, and the practice must constitute their principal source of employment. Documentary evidence such as self-declaration letter specifying full-time employment with the company, bank payroll statement, Mandatory Provident Fund contribution record, Employer's Return of Remuneration and Pensions to Inland Revenue Department, etc. shall be produced.

(b) All individuals may fill only one of the positions at any one time, unless stated otherwise.

(c) The experience of all individuals must be full time experience gained in Hong Kong.

(d) The horticulturalist and the tree specialist can be the same person for Group I contractors but cannot be the same person for Group II contractors.

(e) Related disciplines of horticulture include agriculture, arboriculture, botany, landscape architecture, landscape management, landscape science, plant science, or equivalent.

(f) 'Satisfactorily completed' means achievement of satisfactory level of competency assessment through examination, assignment and/or class performance.

(g) Programme in related field of horticulture shall comprise core course module in subjects including botany, soil science and fertility, diagnosis, treatment and control of plant pests and diseases, nursery management, and landscape management, or equivalent.

(h) The qualification or certification shall be obtained through satisfactory passing of examination or assessment process within the institute or organization.

(i) Related disciplines of arboriculture include botany, forestry, horticulture, landscape architecture, landscape management, landscape science, plant science, or equivalent.

(j) Programme in related field of arboriculture shall comprise core course module in subjects including tree identification and biology, tree planting, protection and establishment, pruning, plant health care, diagnosis and disorder, tree risk assessment and management, and tree works safety, or equivalent.

Minimum Plant and Equipment Requirements for Group I and Group II Contractors

Plant and Equipment	Remarks
Advanced tree diagnostic equipment such as resistograph and tomograph, and auxiliary plant and tools for ready set-up, testing, fine-tuning and maintenance of the equipment.	Documentary proof of ownership of the equipment or ability to source the equipment from third party when required, should be produced.
Basic tools and equipment that are necessary to enable the contractor to perform effectively the works as defined in the Brief Scope of Category/Class, such as hoe, saw, shears, spade, mattock, shoulder sprayers, power chainsaw, tree climbing saddles, braided climbing ropes, carabiner, bow saw, pole saw, long-arm pruner	Documentary proof of ownership of the tools and equipment should be produced.
Personal protective equipment that are necessary to enable the contractor to perform safely the works as defined in the Brief Scope of Category/Class, such as safety steel toe cap boots, chainsaw gloves, chainsaw pants, safety helmet with face guard, safety glasses or goggles and ear defenders	Documentary proof of ownership of the equipment should be produced.

ANNEX 36 List of Tools / Equipment and Testing Instruments for the Plumbing Installation Category

Item of Assessment	Minimum Requirement		Remark
	Group I	Group II	
Flow meters & pressure gauges	1	1	Calibration is permanent, components to be replaced if damaged
Hydraulic pump with pressure gauge	1	2	
Insulation tester	1	2	
Multi-tester (AVO)	1	2	
Clamp-on ammeter	1	2	
Conduit bender	1	2	
Conduit cutter	1	2	
Welding machine	1	2	
Threading machine	1	2	
Bending machine	1	2	
Drilling machine	1	2	
Proof of regular calibration (for instrument only), e.g. calibration certificates issued by the Hong Kong Laboratory Accreditation Scheme (HOKLAS) accredited laboratory or equivalent institutions	Required	Required	At least yearly and as requested when the instrument is in doubt

Note: All equipment should be verified that they are all at sight or with other form of proof of ownership.