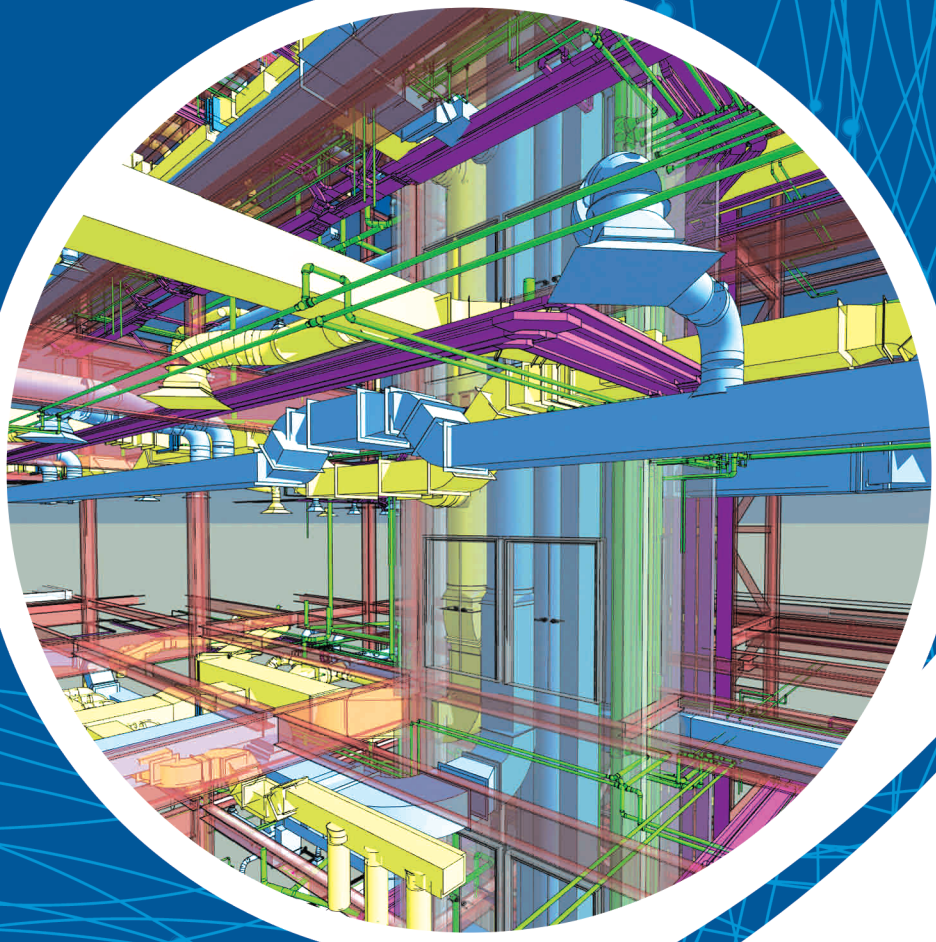


HANDBOOK FOR
M&E RE/RTO SUPERVISION

THE INSTITUTION OF ENGINEERS - SINGAPORE -

ASSOCIATION OF CONSULTING ENGINEERS SINGAPORE

Message from Er. Ong Ser Huan, IES Chairman, Joint Accreditation Committee (M&E RE/ RTO Registry) and Past President IES.

Only about 1 in 6 applied for registration could pass the basic interview, though the interviewing panels have tried to be as accommodating as possible. At the same time, whether pass or fail, on site they have already assumed their supervision duties. We can see how critical is the shortage for competent M&E REs and RTOs. Even when they are not ready, they are already absorbed into the industry.

As we know, due to the shortage of competent M&E RE/RTOs at present, any person can call himself an M&E RE/RTO while he still knows very little if he does not care to learn at site. Our Registry is to assist the industry and Professional Engineers to identify the competent ME RE/RTOs to promote good standards among the M&E RE/ RTOs.

I wish to congratulate those who have passed the interview, as the certificate that you obtained have differentiated you distinctly from those without the certificates. For those who have yet to obtain, keep it up. Just be more focused and follow what we advised you during the interviews. We hope to include you in as soon as possible so that you will continue to be upgraded with our M&E lectures and courses.

This book serves to facilitate and assist the M&E REs and RTOs in carrying out their jobs more effectively. Our appreciation is due to Er. Teo Yann and the committee for their selfless diligence in the compilation of this valuable book.

Er. Ong Ser Huan
IES Chairman, Joint Accreditation Committee
(M&E RE/RTO Registry)
Past President IES

CONTENTS

1. DUTIES OF AN M&E SERVICES SITE STAFF ——— 3

2. SITE DOCUMENT ——— 5

FORM REF.	DESCRIPTION
CC-01	Site Activity Report
CC-02	Incoming Document Record
QC-01	Material/Equipment Approval Schedule
QC-02	Shop Drawing Approval Schedule
CC-03	Schedule of AI
CC-04	Schedule of EI
CC-05	Site Memorandum Register
CC-06	Site Memorandum
QC-03	Material/Equipment Delivery Inspection
QC-04	Inspection Request & Record
CC-07	Overtime Request

3. INSTALLATION CHECKLISTS ——— 8

3.1 **Installation Checklist For Vertical Transportation**

1 Lift, CL-VT-01

2 Escalators/Moving Walks, CL-VT-01

3.2 **Installation Checklist For Fire Protection System**

1 External Hydrant, CL-FPS-01

2 Valve Chamber and Breeching Inlet, CL-FPS-02

3 Wet/Dry Riser, CL-FPS-03

4 Sprinkler Piping, CL-FPS-04

5 Hosereel Piping, CL-FPS-05

6 Tanks, CL-FPS-06

7 Pumps, CL-FPS-07

8 Electrical Works CL-FPS-08

9 Auto Fire Alarm CL-FPS-09

3.3 **Installation Checklist For Plumbing, Sanitation and Gas System**

1 Valve Chamber CL-PSG-01

2 Cold and Hot Water Piping, CL-PSG-02

3 Tanks, CL-PSG-03

4 Pumps, CL-PSG-04

5 Electrical Works CL-PSG-05

6 Internal Sanitation Piping CL-PSG-06

7 External Sanitation Piping CL-PSG-07

8 Ejector/Divertor Installation CL-PSG-08

9 Gas Piping CL-PSG-09

3.3 **Installation Checklist For ACMV System**

1 Checklist For Chiller Installation, CL-ACMV-01

2 Checklist For Cooling Tower Installation, CL-ACMV-02

3 Checklist For Pumps Installation, CL-ACMV-03

4 Checklist For Electrical Installation, CL-ACMV-04

5 Checklist For Pipes Installation, CL-ACMV-05

6 Checklist For Pipes Insulation Installation, CL-ACMV-06

7 Checklist For Expansion/Storage Tank Installation, CL-ACMV-07

8 Checklist For AHU Installation, CL-ACMV-08

9 Checklist For FCU Installation, CL-ACMV-09

10 Checklist For MV Fan Installation, CL-ACMV-10

11 Checklist For Duct Insulation Installation, CL-ACMV-11

12 Checklist For Air Cooled Split Installation, CL-ACMV-12

13 Checklist For Air Cooled Split Piping Insulation, CL-ACMV-13

14 Checklist For External Air-conditioning Condensate Drain Pipe, CL-ACMV-14

3.4 **Installation Checklist For Electrical Installation**

1 Checklist For Substation (Lead-in Pipes), CL-EI-01

2 Checklist For Substation (Switchroom), CL-EI-02

3 Checklist For Substation (Cable Chamber), CL-EI-03

4 Checklist For Substation (Transformer Room), CL-EI-04

5 Checklist For Substation (General), CL-EI-05

6 Checklist For Meter Compartment, CL-EI-06

7 Checklist For LT Turn On, CL-EI-07

8 Checklist For Generator, CL-EI-08

9 Checklist For Sub-Board Installation, CL-EI-09

10 Checklist For Distribution Board Installation, CL-EI-10

11 Checklist For Conduit/Trunking/Tray/ Ladder Installation, CL-EI-11

12 Checklist For Cable Installation, CL-EI-12

13 Checklist For SSO/Isolator/Switches/Fixtures, CL-EI-13

14 Checklist For Lighting Protection, CL-EI-14

Scope of Duties & Responsibilities

M & E SITE STAFF

1. **Objectives**
   Responsible to the Project Director/Engineer-in-charge to ensure the quality of the work on site are to contract, specification and drawings with necessary records.

2. **General**
   - 2.1 Maintain a Project Site Log Book to record the daily activities related to the supervision and progress of the construction work.
   - 2.2 Maintain a Project Document Control Book to record the issued Contract Spec and Drawings, Approved Equipment, Material, Shop Drawing, AI, EI, Site Note, Marking on Approved Drawing, Response to Site Note, Test Record, Test and Commissioning Record
   - 2.3 Ensure contractors use equipment, materials and shop drawings are as specified in the contract documents and approved by the Project Director/Engineer-in-charge and filed.
   - 2.4 Ensure M & E installation works are constructed in accordance to the contract specifications and approved shop drawings with consideration for maintenance.
   - 2.5 Ensure all inspection records are properly filed.
   - 2.6 Ensure all Site Notes issued and contractor responses are filed.
   - 2.7 Ensure all AI and EI are filed and also reflected on spec and drawings
   - 2.8 Assist the Project Manager/Engineer-in-charge to check and verify claims and variation orders on site.
   - 2.9 To liaise and assist Specialist M & E Contractors to resolve any site co-ordination problem with the Main Contractor to ensure progress of works in accordance to agreed schedules.
   - 2.10 Submit to the Project Director/Engineer-in-charge a weekly report on the progress of the construction works, including change orders/ instructions and directions for M & E work.
   - 2.11 Ensure all testing and commissioning results of the installation are properly recorded, witnessed and signed by the qualified personnel representing the Specialist Contractor, Consultant, and the representatives of the Main Contractor and the Developer/Client.

2.11 Assist the Project Director/Engineer-in-charge to check the progressive submission of as-built drawings and Operation & Maintenance Manuals by Specialist M & E Contractors.

2.12 To carry out any other duties related to the supervision and progress of the project as directed by the Project Director.

Updated – TY/9 Jan 2014

Duties of an M&E Services Site Staff

1 **Responsibility**

Responsible to the Project Director/Engineer-in-charge to ensure the quality of the work on site are to contract, specification and drawings with necessary records

2 **Duties**

2.1 Maintain a Project Activity Record to record the daily activities related to the progress and supervision construction work.

2.2 Maintain a Project Incoming Document Record to record the issued Contract Spec and Drawings, Approved Equipment, Material, Shop Drawing, AI and EI.

2.3 Maintain a Project Memo Register to record all Site Memo to Contractors

2.4 Attend to Equipment/Material Receipt Inspection

2.5 Attend to site inspection via Inspection Request Form

2.6 Familiar with code, regulations, good practice and contract requirements to ensure contractors use equipment, materials and installed as required and per approved by the Project Director/Engineer-in-charge and filed.

2.7 Familiar with sequence of work, relation of works with other trades and assist contractors to carry out their work in a productive manner

2.8 Effective and efficient in the discharge of duties, take responsibility of work and willingness to assist to ensure project complete with quality and timeliness

2.9 Communicate with others to ensure an effective management of the site

2.10 Assist the Project Director/Engineer-in-charge to check and verify variation and claims.

2.11 Attend all necessary meetings to assist the Project Director/Engineer to assist in site co-ordination, quality control and progress of works in accordance to agreed schedules.

2.12 Attend to witness of all testing and commissioning (T&C) of the installation, ensuring proper procedure by qualified personnel representing the Specialist Contractor and proper record of the T&C results

2.13 Assist the Project Director/Engineer-in-charge to check the progressive submission of as-built drawings and Operation & Maintenance Manuals by Specialist M & E Contractors.

2.14 To carry out any other duties related to the supervision and progress of the project as directed by the Project Director.

FORM CC-01

SITE ACTIVITY REPORT				
PROJECT:				
DATE	TRADE	LOCATION	ACTIVITIES	REMARK
RE's Acknowledgement:		RTO's Signature:		
Date:		Date:		

FORM CC-02

INCOMING DOCUMENT RECORD			
PROJECT:			
DATE	TRADE	DOCUMENT	REMARK

FORM QC-01

MATERIAL/EQUIPMENT APPROVAL SCHEDULE				
PROJECT:				
DATE	TRADE	REFERENCE	ITEM/SPEC	REMARK

FORM QC-02

SHOP DRAWING APPROVAL SCHEDULE				
PROJECT:				
DATE	TRADE	REFERENCE	DRAWING DESCRIPTION	REMARK

FORM CC-03

SCHEDULE OF AI				
PROJECT:				
DATE	TRADE	REFERENCE	DESCRIPTION OF AI	REMARK

FORM CC-04

SCHEDULE OF EI				
PROJECT:				
DATE	TRADE	REFERENCE	DESCRIPTION OF EI	REMARK

FORM CC-05

SITE MEMO REGISTER				
PROJECT:				
DATE	TRADE	REFERENCE	DESCRIPTION OF SITE MEMO	REMARK

SITE MEMORANDUM

FORM CC-06

PROJECT				SITE MEMO REF:	
TRADE				DATE	
To:					
Attn:					
SUBJECT:					
Prepared By: Designation:	_____ RE/RTO(M&E)	Signature:		Date:	
RESPONSE:					
Prepared By: Designation:		Signature:		Date:	

MATERIAL/EQUIPMENT DELIVERY INSPECTION

FORM QC 03

PROJECT		EMI REF:	
TRADE		DATE	

DELIVERY DETAILS

Item Descriptions:_____

Equipment/Material Approval Ref: _____

Brand:_____ Model No:_____ Serial No:_____

Supplier:_____

Arrived on ____/____/_____ at _____hrs Quantity Received:_____

INSPECTIONS

Inspected for identification that tally with approved material or equipment	☐ Checked OK	☐ Checked NOT OK
Inspected for dimensional correctness such as sizes, gauge thickness, No. of fins per inch, etc.	☐ Checked OK	☐ Checked NOT OK
Inspected for completeness in accordance with delivery order	☐ Checked OK	☐ Checked NOT OK
Inspected for equipment configuration and workmanship	☐ Checked OK	☐ Checked NOT OK
Inspected for physical damage such as cracks, dents, scratches, etc	☐ Checked OK	☐ Checked NOT OK
Inspected for condition such as corrosion, wetness or dampness, etc.	☐ Checked OK	☐ Checked NOT OK

RE/RTO (M&E)'S COMMENTS

_____

_____

_____

☐ ACCEPT ☐ REJECT ☐ HOLD

Inspected by:_____ Signature:_____

Date:_____

Issued to _____

SITE INSPECTION REQUEST & RECORD

FORM QC 04

PROJECT		SIRR REF:	
TRADE		DATE	

To RE/RTO (M&E): SITE INSPECTION REQUEST.

TRADE	REF/LOCATION	DESCRIPTION OF WORKS	
SUBMITTED BY:		SIGN:	DATE:

FIRST INSPECTION

Date/Time of Inspection:		Time inspection completed:	

~ I have checked the above works and certify that they are in order and satisfactory.

~ The completed test forms were endorsed and enclosed herewith.

~ The above works is generally in order/not in order with the following rectifications to be carried out:

_____

_____

Name of RE/RTO (M&E):_____Date:_____Signature:_____Acknowledged by Main Contractor:_____

The above rectifications have been carried out and the works is now in order and satisfactory.

Date/Time of Inspection:		Time inspection completed:	

Name of RE/RTO (M&E) :_____

Date :_____

Signature :_____

Acknowledged by Main Contractor:_____

REQUEST FOR OVERTIME INSPECTION

FORM CC 07

PROJECT		DATE	
TRADE		HOURS	

To RE/RTO (M&E): SITE INSPECTION REQUEST.

TRADE	REF/LOCATION	DESCRIPTION OF WORKS	
SUBMITTED BY:		SIGN:	DATE:

The above overtime inspection was carried out as per request.

Date/Time of Overtime Inspection:		Time inspection completed:	

Name of RE/RTO (M&E) :_____

Date :_____

Signature :_____

Acknowledged by Main Contractor:_____

INSTALLATION CHECK LIST FOR VERTICAL TRANSPORTATION

PROJECT :
CONTRACTOR :

CHECK LIST FOR LIFTS/DUMBWAITERS

LOCATION OF INSTALLATION: _____ INSP REQUEST NO:_____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Check vent louvre and LMR ventiltion is properly installed.			
2	Check lift motor room equipment and layout is in order.			
3	Mains failure sensing cables installed and terminated.			
4	Fire alarm summary signal wirings installed and terminated.			
5	EBOPS fully charged.			
6	Insulation test in order.			
7	Car intercom system installed.			
8	Check sprinklers are installed in lift shaft.			
9	Check all nails, formwork and protructing rebar are removed from the interior wall surface of the hoistway.			
10	Check all fasterners for guide rails are soundly secured.			
11	Check conduit installed in hoistway is in order.			
12	13A S/S/O and fixed lamp c/w wire guard installed on top of lift car.			
13	Alarm bell installed at every landing.			
14	Hall call indicator mounted at every lift lobby and correct height.			
15	Lift number and warning signages installed.			
16	Check car sill is levelled with the landing sill.			
17	Car lightings installed.			
18	Car minimun illumination with car doors opened (100 Lux).			
19	Ventilation fan installed.			
20	Car operating panel installed vertically and at correct height.			
21	Car speaker installed.			
22	All landing doors with PSB approved fire rating stickers.			
23	Car loading capacity plate installed.			
24	NO SMOKING' signage installed.			
25	Check pit equipment and layout is in order and hoistway S/S/O and light fittings are installed.			
26	Lift supervisory panel installed.			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.

_____
(Signature) R E

_____
Date

Form CL-VT-01
(Rev 3)

INSTALLATION CHECK LIST FOR VERTICAL TRANSPORTATION

PROJECT :
CONTRACTOR :

CHECK LIST FOR ESCALATORS/MOVING WALKS

LOCATION OF INSTALLATION:_____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Notices for users are affixed near entrances			
2	Permanent barriers are installed at landings where clearance between the balustrade exterior panelings or with wall exceeds 100mm and the vertical drop in level is 1.0m or more			
3	Anti-climbing devices are installed			
4	Anti-sliding devices are installed			
5	Vertical deflectors are installed at floor intersections and criss-cross escalators or moving walks			
6	Skirt deflectors are installed and yellow markings are provided on the sides of the step tread surface			
7	Floor plates and inspection covers are securely fastened by mechanical means			
8	Clear height above the steps of escalators or pallets of moving walks at all points is not less than 2.1m			
9	Additional emergency stop devices are provided for escalators with rises above 12m and moving walks longer than 40m			
10	Adequate and uniform lighting are provided at landings			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR FIRE PROTECTION SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR HYDRANT

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make used			
	a) Hydrant			
	b) Pipe			
	c) Valve			
2	Painting			
3	Labelling			
4	Verticallity and position of pillar			
5	Valve pits			
6	RC plinth and platform level for the base of pillar			
7	Location of hydrant			
8	Bland cap and chain of pillar			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR FIRE PROTECTION SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR VALVE CHAMBER AND BREECHING INLET

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make used			
	a) Pipe			
	b) Valve			
	c) Breeching Inlet & Housing			
2	Earthing system completed and earth resistance < 1 Ohm			
3	Tampered switches are provided for gate valves			
4	Strap and padlock for valve is provided			
5	Labelling of			
	a) Type of Breeching Inlet			
	b) Directional sign			
	c) Glass panel of housing			
6	Position of breeching inlets			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR FIRE PROTECTION SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR WET/DRY RISER

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make used for			
	a) Pipe			
	b) Landing valve			
	c) Air relief valve			
2	Pipe sizes are correct			
3	Painting			
4	Labelling			
5	a) Floor No			
	b) Landing Valve No			
	c) Directional			
6	Clearance of landing valve in riser			
7	Strap/padlock for landing valve			
8	PRV provided to wet riser landing valve			
9	Signage for riser with drain valve provided			
10	Standby hose of 30m length is provided			
11	Fire - rated board for pipes trespassing other areas			
12	Earthing of rising main provided (< 1 Ohm)			
13	Dry riser landing valves are painted yellow			
14	Sprinkler/Smoke detector provided in riser shaft			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:
_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR FIRE PROTECTION SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR SPRINKLER PIPING

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make used for			
	a) Pipe			
	b) Flowswitch			
	c) Sprinkler head			
	d) Correct sprinkler rating is used			
2	Flow switches provided correctly to each specific zone			
3	Sprinkler head installation (68 deg C for general area / 78 deg C for Kitchen)			
4	Centreline sidewall sprinkler installed at not more than 150mm and not less than 50mm from the wall face on which they are mounted			
5	Sprinkler spacing between soffit/wall/door/sprinkler			
6	Ceiling space exceeding 400mm depth is installed with concealed sprinklers			
3	Sprinkler provided under rectangular duct exceeding 800mm in width and under round duct exceeding in 1m diameter			
4	Wire guard for sprinkler head which are less than 2.1m AFFL and in plant room / lift pit / motor space			
5	Clear space of minimium 500mm provided below the sprinkler deflectors			
6	Baffle plates provided to pendent sprinkler exposed to upper level of sprinklers			
7	Recessed pendent sprinkler c/w decorative plate at false ceiling area			
8	Drain valve provided to the sprinkler pipe			
9	Spacing of sprinkler points as per approved drawings			
10	Pipe routing follow approved drawings			
11	Pipe size is correct			
12	Pipe support maximum span as per specification			
13	Mounting brackets/supports are in order			
14	Vibration isolators provided for pipe in the plant room			
15	Gate valve provided with strap & padlock			
16	Fire - rated board for pipe passing through unprotected area (4 Hours)			
17	Primer and Painting			
18	Pipe sleeve provided for wall penetration			
19	Weld pipe joints and fitting by certified welder			
20	Vitaulic coupling joints properly installed			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR FIRE PROTECTION SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR HOSEREEL PIPING

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make used			
	a) Pipe			
	b) HR (drum,nozzle & rubber hose)			
2	HR mounting bracket of PSB approved type with PSB label			
3	Length of rubber hose is 30m			
4	Swivel swing hosereel able to swing out from compartment			
5	Size of nozzle comply with specification			
6	Nozzle holder provided and properly anchored			
7	Gate valve position is correct and accessible			
8	Floor trap provided in HR shafts			
9	Drain valve at lower point is provided			
10	Operation instruction provided			
11	Physical damage to			
12	a) Housing			
	b) Nozzle			
	c) Rubber hose			
13	Painting			
14	Labelling & directional sign for pipe			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR FIRE PROTECTION SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR TANK

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make of tank			
2	Thickness of panel / Material of panel (pressed steel)			
3	Capacity of tank complies to approved drawings			
4	Pipe works and accessories installation are in order			
5	Position of tank follow approved drawing			
6	Approved brands/make of			
	a) Pipe			
	b) Gate/Check/Strainer Valve			
	c) Ball float valve			
	d) Air relief valve			
	e) Gauges			
	f) Stainless steel cat ladder (Internal / External)			
7	Strap & padlock for gate valves			
8	Vortex inhibitor provided			
9	Water level indicator			
10	Floatless level control electrodes			
11	Remote tank status (high/low level alarm) provided			
12	Overflow and warning pipe position comply with approval drawings			
13	Insect-proof netting for overflow & vent pipes			
14	No ball float valve for roof storage tank			
15	AMSL of highest pipe fitting or highest tank surface complies to requirement			
16	Tank partition			
17	Mounting detail for tank & skid base			
18	Maintenance space around tank is sufficient			
19	Access to tank from manhole			
20	Bracket/hanger for pipe			
21	Routing of pipe work			
22	Check physical damage			
23	Painting / Labelling			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR FIRE PROTECTION SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR PUMPS INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make used for			
	a) Pump			
	b) Valve, fitting, strainer			
	c) Flexible connection			
	d) Pipe			
	e) Cable (FR, FRT or MICC)			
	f) Sprinkler and wet riser main pumps are installed with listing name plates by Recognised Institution			
	g) Gauges & Pressure Switches			
2	Mounting of pump on the inertia block as per drawing			
3	Vibration isolator installed properly			
4				
5	Check alignment for pump motor assembly			
6	Check rotation of pump manually before start - up			
7	Check type of motor starter			
8	Control wire termination properly done			
9	Pipe connection are in order			
10	Pipe flexible connection installed properly			
11	Remote monitoring of pumps start/stop/trip at FCC			
12	Emergency start switch for each pump at FCC			
13	Interfacing between pumps and MV fan at pump room			
14	Labelling / Painting			
15	Pressure relief valve provided at pump discharge			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR FIRE PROTECTION SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR ELECTRICAL INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make of starter panel			
2	Pump control panels of weather proof type to IP 55			
3	Approved brand/make of			
	a) Cable			
	b) Conduit/trunking			
	c) Components			
4	Dimension of starter panel			
5	Thickness of panel sheet			
6	Size of			
	a) Cable			
	b) Conduit/trunking			
7	Copper link for metal trunking/tray			
8	Routing of trunking/tray/conduit			
9	Size/type of hanger bracket			
10	Spacing between hanger bracket			
11	Workmanship & alignment of trunking/tray/conduit			
12	Earthing for panel is provided			
13	Proper junction boxes are used at termination (no exposed wiring)			
14	Headroom for trunking sufficient			
15	No water pipe above starter panel			
16	Physical damage			
17	Labelling			
18	Electrical single line diagram			
19	Warning sign"Not to turn off power supply"to the sprinkler / wet riser/hosereel pumping system			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR FIRE PROTECTION SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR FIRE ALARM SYSTEM

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make			
	a) MFAP			
	b) SFAP			
	c) Mimic panel			
	d) Call point & bell			
	e) Smoke detector			
	f) Heat detector			
	g) Flow switch			
	h) Cable			
	I) Conduit/trunking			
	j) Computer			
	k) Printer			
2	MFAP/SFAP is of weather proof type to IP 55			
3	Interfacing with other services			
4	Labelling of call point , detector , SFAP , etc			
5	Mimic panel & Fire zone diagram for MFAP			
6	Fire zone diagram for SFAP is in order			
7	DECAM system is connected			
8	Location of equipment in accordance with approved plan			
9	Bracket/support of conduit is in order			
10	Primer coat painting			
11	Painting			
12	Spacing of smoke detectors between soffit / wall / detectors			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR WATER, SANITATION AND GAS SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR METER/VALVE CHAMBER INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make used			
	a) Pipe			
	b) Pipe fitting			
2	Pipe size			
3	Position of chambers			
4	Piping connection in chambers			
5	Spacing between pipe and wall			
6	Weep hole provided			
7	Checker plate cover in order			
8	Water test point			
9	Platform Level of chamber top			
10	Earth bonding			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR WATER, SANITATION AND GAS SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR COLD AND HOT WATER PIPING

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make used			
	a) Pipe			
	b) Pipe fitting			
	c) Water outlet fitting			
2	Pipe size and routing			
3	Check section of pipe to be concealed has been pressure tested			
4	Pipe support spacing is correct			
5	Painting and labelling			
6	Headroom meet requirement			
7	No sewer pipe run above cold water pipe			
8	No electrical panel below water pipe			
9	No water pipe passing through MDF,switch room & risers of other services			
10	Pipe sleeve provided for penetration			
11	Width of riser door is as per authorities requirement			
12	Isolating valve position follow approved drawing			
13	Flushing valve at lower point (FV for UR/public toilet WC unless otherwise			
14	Maintenance tap points provided in plant room			
15	Sub - meter (PUB or Private) provided as per approved drawings			
16	Insulation for hot water pipe provided			
17	Size of inlet / outlet pipe for storage type boiler is in order			
18	Break tank for storage type boiler (if applicable)			
19	Earthing of main water pipe < 1 Ohm			
20	Properly earth bonding for storage heater/boiler			
21	Surface to be cleaned , free from dirt , grease			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR WATER, SANITATION AND GAS SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR WATER TANK INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make of tank			
2	Thickness of panel / Material of panel (pressed steel)			
3	Capacity of tank complies to approved drawings			
4	Pipe works and accessories installation are in order			
5	Position of tank follow approved drawing			
6	Approved brands/make of			
	a) Pipe			
	b) Gate/Check/Strainer Valve			
	c) Ball float valve			
	d) Air relief valve			
	e) Gauges			
	f) Stainless steel cat ladder (Internal / External)			
7	Strap & padlock for gate valves			
8	Vortex inhibitor provided			
9	Water level indicator			
10	Floatless level control electrodes			
11	Remote tank status (high/low level alarm) provided			
12	Overflow and warning pipe position comply with approval drawings			
13	Insect-proof netting for overflow & vent pipes			
14	No ball float valve for roof storage tank			
15	AMSL of highest pipe fitting or highest tank surface complies to requirement			
16	Tank partition			
17	Mounting detail for tank & skid base			
18	Maintenance space around tank is sufficient			
19	Access to tank from manhole			
20	Bracket/hanger for pipe			
21	Routing of pipe work			
22	Check physical damage			
23	Painting / Labelling			
24	Lockable sampling tap to water tank			
25	Pressure tank with air bag pressure indication			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR WATER, SANITATION AND GAS SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR WATER PUMP SYSTEM INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____
PUMP NO. : _____

ITEM	REQUIRED STANDARD	COMPILED YES	COMPILED NO	REMARKS
1	Approved brand/make used for			
	a) Pump			
	b) Valve, fitting, strainer			
	c) Flexible connection			
	d) Pipe			
	e) Cable (FR, FRT or MICC)			
	f) Sprinkler and wet riser main pumps are installed with listing name plates by Recognised Institution			
	g) Gauges & Pressure Switches			
2	Mounting of pump on the inertia block as per drawing			
3	Vibration isolator installed properly			
4	Clean , free from dust , grease , protection			
5	Check alignment for pump motor assembly			
6	Check rotation of pump manually before start - up			
7	Check type of motor starter			
8	Control wire termination properly done			
9	Pipe connection are in order			
10	Pipe flexible connection installed properly			
11	Remote monitoring of pumps start/stop/trip at FCC			
12	Emergency start switch for each pump at FCC			
13	Interfacing between pumps and MV fan at pump room			
14	Labelling / Painting			
15	Pressure relief valve provided at pump discharge			
16	Check rotation of pump manually before start - up			
17	Check pressure switches / gauges installation			
18	Pump control panel of weather proof type to IP 55			
19	Interfacing with BAS (if applicable)			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR WATER, SANITATION AND GAS SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR ELECTRICAL INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make of starter panel			
2	Pump control panels of weather proof type to IP 55			
3	Approved brand/make of			
	a) Cable			
	b) Conduit/trunking			
	c) Components			
4	Dimension of starter panel			
5	Thickness of panel sheet			
6	Size of			
	a) Cable			
	b) Conduit/trunking			
7	Copper link for metal trunking/tray			
8	Routing of trunking/tray/conduit			
9	Size/type of hanger bracket			
10	Spacing between hanger bracket			
11	Workmanship & alignment of trunking/tray/conduit			
12	Earthing for panel is provided			
13	Proper junction boxes are used at termination (no exposed wiring)			
14	Headroom for trunking sufficient			
15	No water pipe above starter panel			
16	Physical damage			
17	Labelling			
18	Electrical single line diagram			
19	Warning sign"Not to turn off power supply"to the pumping system			

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR WATER, SANITATION AND GAS SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR INTERNAL SANITATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make used			
	a) Pipe			
	b) Fitting			
2	Pipe routing follow approved drawing			
3	Pipe size installed is correct			
4	Gradient of pipe is correct			
5	Flow Test			
6	Flood Test			
7	Position of FT/FW /UT and WC opening			
8	Alignment of pipe			
9	Headroom meet requirement			
10	Hanger/bracket installed properly			
11	Painting			
12	Labelling			
13	Cover of FT/FW/UT is correct			
14	Positon & AMSL of vent pipe (outdoor)			
15	Cleaning eye provided at designated location			
16	Cross venting provided at bends / designated location			
17	Anti mosquito breeding device provided to FT / FW			
18	Pipe sleeve provided for wall penetration			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR WATER, SANITATION AND GAS SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR EXTERNAL SANITATION INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make used			
	a) Pipe			
	b) Access cover			
	c) Fitting			
2	Pipe size			
3	Invert level			
4	Gradient			
5	Flood Test			
8	Pakau piling / rollers provided as per Civil Engineer's detail			
9	FormWork			
10	Size of BRC			
11	Grade of concrete			
12	Backfilling			
13	Type of IC			
14	Re -bar for base & wall of IC			
15	Plaster for wall & base of IC			
16	Routing and setting out of IC and pipe			
17	No acute flow direction			

Checked By: _____
Date Checked: _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR WATER, SANITATION AND GAS SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR SEWER PUMP INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make used			
	a) Pump			
	b) Receiver/collection tank			
	c) Valve & fitting			
	d) Pipe			
	e) Cable			
	f) Lifting appliance			
2	Check correct equipment is used at correct location			
3	Record Technical data of equipment and check with approved list			
4	Mounting of pump as per drawing			
5	Piping connection are in order			
6	Pipe flexible connection installed properly			
7	Bracket/hanger of pipe			
8	Control wire termination properly done			
9	Painting			
10	Labelling of pipe and panel			
11	Check for physical damage			
12	Electrical single line drawing provided at DB			
13	Cleaning water tap point provided			
14	Fencing/kerb for sump pit			
15	Sufficient headroom to remove the collection tank from sump pit by lifting appliance			
16	Cat ladderand sump cover installation			
17	Pad lock for fencing/ sump cover			
18	Pressure switch at discharge line			
19	MV system			
20	Monitoring of high level alarm			
21	Safe Working Load and certificate of fitness for lifting appliance			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR WATER, SANITATION AND GAS SYSTEM

PROJECT :
CONTRACTOR :

CHECK LIST FOR GAS PIPE INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand / make material used			
2	System installed as per Authorities approved plan			
3	Cutting edge of pipe and chanfered for welding			
4	Weld pipe joints and fittings by certified welder			
5	No welding on galvanised pipes			
6	Bracket support (Material , Spacing , Size , Washer , Nut) are in order			
7	Vibration isolator installed and adjust correctly (where applicable)			
8	Pressure testing of piping and record			
9	Apply primer coat painting			
10	Final painting and labelling			
11	Headroom of pipe is in order			
12	Position of valves follow approved drawing			
13	Ventilation for gas pipe riser is provided			
14	Solenoid and by -pass valve installation			
15	Interlocking of solenoid valve and MV system			
16	Gas leak detection system			
17	Interlocking of gas leak detection and MV system			
18	Control wire termination properly done			
19	Spool installation is correct and accessible			
20	Pipe support maximum span as per specification			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ACMV SYSTEM

PROJECT:
CONTRACTOR:

CHECK LIST FOR CHILLER INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

CHILLER NO. : _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/model			
2	Layout of chiller/pump follow approved drawing			
3	Routing of water pipe (chilled/condenser) and position of valves, strainers			
4	Pressure/compound gauges installed properly with stop cocks at supply / return pipe of each chiller			
5	Flow switches installed as per approved drawings			
6	Thermometer for chilled water supply and return pipes for each chiller and header installed			
7	Electrogmagnetic flow meter for chiller and header			
8	By - pass piping system c/w pressure differential controllers			
9	Refrigerant sensors and monitors installed for each chiller and interlocked with MV fan , breathing apparatus provided			
10	Ventilation of plant room provided			
11	Vibration isolator for chiller properly installed and of correct size			
12	Vibration isolator bracket and support for pipe in the plant room properly installed, such as steel rod is not in contact with spring assembly			
13	Insulation to chiller evaporator properly done			
14	BAS/Electrical wire termination properly done			
15	Conduit/trunking for control cable and hanger /bracket			
16	Automatic tube cleaning device installed properly for chiller			
17	Access for removal/ replacement of the large items of plant			
18	Painting			
19	Labelling of equipment			
20	Floor Trap provided at Chiller Plant Room			

Checked By : _____

Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ACMV SYSTEM

PROJECT:
CONTRACTOR:

CHECK LIST FOR COOLING TOWER INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____
COOLING TOWER : _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make used			
2	Check correct equipment is used at correct location			
3	Routing of condenser/drain/make-up/bleed-off pipe / equalising pipe			
4	Pipe flexible connection installed properly			
5	Mounting and Brackets/supports are in order			
6	Stainless steel bolts and nuts provided (check specs)			
7	Vibration isolator installed properly and of correct size			
8	Chemical treatment system for condenser water			
9	Control wire termination properly done			
10	Interface with BAS as per approved schedule			
11	Painting			
12	Labelling and directional sign			
13	Check for physical damage			
14	No fresh air intake near the location of cooling tower			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ACMV SERVICES

PROJECT:
CONTRACTOR :

CHECK LIST FOR CHILLED / CONDENSER WATER PUMP INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____
PUMP NO. : _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make used			
	a) Pump			
	b) Valves & fittings			
	c) Strainer			
	d) Flexible connection			
	e) Pipe			
	f) Cable			
2	Check correct equipment is used at correct location			
3	Mounting of pump on the inertia block as per approved drawing			
4	Vibration isolator installed properly			
5	Pipe flexible connection installed properly			
6	Clean , free from dust , grease , protection			
7	Positioning of equipment follow approved drawing			
8	Piping connection are in order			
9	Check alignment for pump motor assembly (Statically & Dynamically Balanced)			
10	Check rotation of pump manually before start - up			
11	Check type of motor starter			
12	Control wire termination properly done			
13	Labelling			
14	Painting			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ACMV SYSTEM

PROJECT:
CONTRACTOR:

CHECK LIST FOR ACMV ELECTRICAL INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make/size of			
	a) cable			
	b) conduit/trunking/cable tray/ladder			
	c) Starter Panel			
	d) Motor Starter			
	e) Breakers			
	f) Switchboard			
2	Gauge thickness of sheet metal for			
	a) Starter Panel			
	b) Switchboard panel			
3	Flexible conduit connection			
4	Routing of conduit/trunking/tray/ladder			
5	Size/type/spacing of hanger/ bracket			
6	Copper link for metal trunking/tray			
7	Cover for trunking			
8	Workmanship of conduct/trunking and cable tray/ladder			
9	Earthing for panel			
10	Patching of penetration			
11	Headroom of duct in order			
12	No water pipe above starter panel , switchboard and switches			
13	Position of panel/switch			
14	Mounting detail for starter panel and switch board			
15	Access to switch , starter panel & isolators			
16	Painting & labelling			
17	Electrical S L D			
18	Supervisory/Motor control panel for the central chilled water system			
19	BAS interfacing as per approved schedule			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ACMV SERVICES

PROJECT:
CONTRACTOR :

CHECK LIST FOR CHILLED / CONDENSER PIPE INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand / material / size used			
2	System installed as per approved plan			
3	Cutting edge of pipe are chamfered for welding			
4	Weld pipe joints and fittings by certified welder			
5	No welding on galvanised pipes			
6	Bracket support (Material, Spacing, Size, Waher, Nut) are in order			
7	Vibration isolator installed and adjust accordingly (where applicable)			
8	Pressure testing of piping and records			
9	Apply primer coat painting			
10	Final painting and labelling			
11	Headroom of pipe is in order			
12	Pipework connected to pumpsets, chillers and cooling towers isolated from building structure by flexible pipe hangers, anchors and pipe guides			
13	Position of valves follow approved drawings			
14	Pipe sleeves provided for pipe passing through walls, floors and partitions as per specification			
15	Clean, free from dirt, grease and rust			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ACMV SERVICES

PROJECT:
CONTRACTOR :

CHECK LIST FOR ACMV PIPE INSULATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Check section of pipe to be insulated has been pressure tested			
2	Surface to be cleaned , free from dirt ,grease			
3	Applied primer coat painting			
4	Use approved insulation material (48kg/m3 polyuethane c/w jacketing)			
5	Jacketing of pipe insulation is properly installed			
6	Proper insulation method / procedure has been used			
7	Bracket , clamp adjust properly			
9	Painting and labelling			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ACMV SERVICES

PROJECT:
CONTRACTOR :

CHECK LIST FOR EXPANSION / MAKE-UP WATER TANK INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____
TANK NO. : _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make of tank			
2	Thickness of panel			
3	Capacity of tank complies to approved drawings			
4	Pipe works and accessories installation are in order			
5	Approved brand/make of			
	a) Pipe			
	b) Gate valve			
	c) Check valve			
	d) Air relief valve			
	e) Ball float valve / Level sensor			
	f) Cat ladder (Internal / External)			
6	Quick fill pipe for expansion tank			
7	Water level indicator			
8	A M S L of highest pipe Fitting or highest tank surface complies to requirement			
9	Overflow and warning pipe position comply with approved drawing			
10	Insect - proof netting for overflow & vent pipe			
11	Routing of pipe work			
12	Bracket/hanger for pipe			
13	Mounting detail for tank & skid base			
14	Maintenance space around tank			
15	Access to tank from manhole			
16	Space between access cover to soffit (applicable to indoor tank)			
17	Tank partition (if applicable)			
18	Insulation material and weatherproof treatment for expansion tank			
19	Check physical damage			
20	Painting / Labelling			
21	Expansion tank pipe connect to the return chilled water header			
22	Interface with BAS as per approved schedule (if applicable)			

Checked By: _____
Date Checked: _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ACMV SERVICES

PROJECT:
CONTRACTOR:

CHECK LIST FOR AHU INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____
AHU NO. : _____

ITEM	REQUIRED STANDARD	COMPILED		REMARKS
		YES	NO	
1	Approved brand/make used			
2	Check correct equipment is used at correct location			
3	Total/Sensible Cooling (kW)			
4	Flow (lps)			
5	Fan Static Pressure (Pa)			
6	Fan Capacity (CMH)			
7	Fan Electrical Characteristic (Phase/Voltage/Starting & Running Current)			
8	Mounting bracket , support are in order (If ceiling suspended type)			
9	Vibration isolator installed properly and of correct size			
10	Silencer installation (if applicable)			
11	Dampers for Fresh Air , Return Air and Exhaust Air correctly installed			
12	Carbon dioxide monitor for AHU			
13	Smoke Detector for Fan Cut Off			
14	Correct filter installed and connected to AHU properly			
15	Duct connection/ transformation to the fan follow standard method			
16	Duct Test Holes provided for Instrumentation			
17	CHWP ,Valves, Checks, Strainer, Modulating Valves			
18	Flexible connection between pipe and equipment			
19	' U ' trap and gradient for condensate drain pipe			
20	Interfacing with BAS installed			
21	Control wire Termination properly done			
22	Labelling			
23	Check physical damage			
24	Clean , free from dust , grease			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:
_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ACMV SERVICES

PROJECT:
CONTRACTOR:

CHECK LIST FOR FCU INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____
FCU NO. : _____

ITEM	REQUIRED STANDARD	COMPILED YES	COMPILED NO	REMARKS
1	Approved brand/make used			
2	Check correct equipment is used at correct location			
3	Total/Sensible Cooling (kW)			
4	Flow (lps)			
5	Fan Static Pressure (Pa)			
6	Fan Capacity (CMH)			
7	Fan Electrical Characteristic (Phase/Voltage/Starting & Running Current)			
8	Mounting bracket , support are in order (If ceiling suspended type)			
9	Vibration isolator installed properly and of correct size			
10	Dampers for Fresh Air, Return Air and Exhaust Air correctly installed			
11	Carbon dioxide monitor for FCU			
12	Correct filter installed and connected to AHU properly			
13	Duct connection/ transformation to the fan follow standard method			
14	Duct Test Holes provided for Instrumentation			
15	CHWP ,Valves, Checks, Strainer, Modulating Valves			
16	Flexible connection between pipe and equipment			
17	' U ' trap and gradient for condensate drain pipe			
18	Thermostat Installation			
19	Interfacing with BAS installed			
20	Control wire Termination properly done			
21	Labelling			
22	Check physical damage			
23	Clean , free from dust , grease			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:
_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ACMV SYSTEM

PROJECT:
CONTRACTOR:

CHECK LIST FOR MV FAN INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____
FAN NO. : _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make used			
2	Check correct equipment is used at correct location			
a	Fan Static Pressure (Pa)			
b	Fan Capacity (CMH)			
c	Fan Electrical Characteristic (Phase/Voltage/Starting & Running Current)			
4	Mounting bracket/support are in order			
5	Vibration isolator installed properly and of correct size			
7	Air filter for fresh air intake fan			
9	Flexible connection between fan/duct			
10	Silencer installation (if applicable)			
11	Fan guard installation (if applicable)			
12	Electrical termination properly done			
13	MV Control provided as per requirement			
14	BAS Interfacing as per approved schedule (if applicable)			
15	Emergency stop or maintenance switch for fan motor			
16	Labelling of fan			
17	Check physical damage of fan /silencer			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ACMV SERVICES

PROJECT:
CONTRACTOR:

CHECK LIST FOR DUCT INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPILED		REMARKS
		YES	NO	
1	Approved brand/make G.I sheet used			
2	G.I Sheet thickness follow specification/Approved table			
3	Duct fabrication properly done as per approved shop drawing (follow standard size,Reinforcement , Applied Sealent , installed gasket , Tie rod)			
4	Duct installed follow approved coordination drawing (Height , Location)			
5	Hanger bracket support properly installed/adjusted,spacing and size follow standard table vertically			
6	Flexible connection between duct and equipment			
7	FD , access panel install properly , PSB No. record , seal up gap			Test record
8	Splitter damper,VCD,NRD installed correctly			
9	Test holes provided after AHUs , FCUs , VAVs and Fans			
10	Diffusion system installation			
11	VAV installation			
12	Power point for VAV			
13	Thermostat installation			
14	Masonry construction for duct trespassing designated areas			
15	Fire - rated board installed for duct passes trespassing designated areas			
16	Clealiness of Fabricated Duct(Clear of water , dust , grease)			
17	Painting and Labelling (if necessary)			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

_____
(Signature) R E

☐ Above installation is not acceptable.

_____
Date

INSTALLATION CHECK LIST FOR ACMV SERVICES

PROJECT:
CONTRACTOR:

CHECK LIST FOR DUCT INSULATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Surface of duct to be cleaned, free from dirt and grease			
2	Approved brand/make of insulation			
3	Thickness of insulation			
4	Apply of adhesive properly			
5	Sisalation Wrap			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ACMV SYSTEM

PROJECT:
CONTRACTOR:

CHECK LIST FOR AC SPILT INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____
CU NO. : _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make used			
2	Check correct equipment is used at correct location			
3	Total/Sensible Cooling (kW)			
4	Flow (lps)			
5	Fan Static Pressure (Pa)			
6	Fan Capacity (CMH)			
7	Fan Electrical Characteristic (Phase/Voltage/Starting & Running Current)			
8	Mounting bracket , support are in order			
9	Vibration isolator installed properly & neoprene pad provided			
10	Record Technical data of equipment and check with approved list			
11	Tray/Trunking of regrigerant pipe/cable provided			
12	Sight glass, filter dryer installation (if applicable)			
13	Flexible connection properly done.			
14	Control wire Termination properly done			
15	Condenser fan Air Blow direction clear from obstruction			
16	Sufficient space for fresh air intake for air cooled condenser			
17	Adequate maintenance space provided			
18	Jacketing for external pipe (if applicable)			
19	Painting of conduit/Tray/Trunking/Jacketing			
20	Labelling			
21	Check physical damage			
22	Clean , free from dust , grease			
23	No external pipe insulation exposed to sunlight			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR AIR CONDITIONING & MECHANICAL VENTILATION SYSTEMS

PROJECT:
CONTRACTOR:

CHECK LIST FOR EXTERNAL AIR-CONDITIONING CONDENSATE DRAIN PIPE

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make used			
	a) Pipe			
	b) Fitting			
2	Pipe size			
3	Flexible at joint			
4	Alignment of pipe			
5	Gradient			

Checked By: _____
Date Checked: _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ELECTRICAL INSTALLATION

PROJECT :
CONTRACTOR :

CHECK LIST FOR SUB - STATION (LEAD IN PIPE)

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved pipe material used			
2	Size of pipe			
3	Quantity of pipe			
4	Invert level of pipe			
5	Pipe haunching			
6	Water - tight end capping			
7	Draw pit and pit cover			
8	Drawn string			
9	Weep hole in drawn pit			
10	Provision of indicator before backfilling			
11	Backfilling			
12	Mandrel test			
13	As-built drawings			

Checked By: _____
Date Checked: _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ELECTRICAL INSTALLATION

PROJECT :
CONTRACTOR :

CHECK LIST FOR SUB - STATION (SWITCH ROOM)

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Height and dimension of room as per approved drawings			
2	Dimensions and location of floor openings			
3	Clear door opening width and height			
4	Door hook and eyes			
5	Dust - proofer for door socket			
6	Walking spacing is adequate			
7	Plaster ceiling is properly done			
8	Painting and labelling are properly done			
9	Access to cable chamber			
10	Guardrail and cover for access to cable chamber			
11	Electrical works such as power points, isolators and light fittings as per approved drawings			
12	Grating / cover for openings			
13	Smoke detector (if applicable)			
14	Electrical single line diagram provided			
15	Thickness of sheet metal for DB panel			
16	Natural lighting and glass blocks provision (if applicable) are adequate			
17	Harsp and stable			
18	Number of pipe sleevs provided as per approved drawings			
19	Non-louvre doors for switchroom is provided and standby 7 sets of keys for hand over to PowerGrid			
20	Earth pits for lightning protection system properly installed and earth resistance is less than 10 ohms			
21	Ventilation for switchroom is adequate as per approved drawings			
22	Earth pit for sub-station DB c/w label			
23	Earth resistance for electrical earth to be less than 1 ohm			
24	Approved lockset and master keys used for the sub-station's doors			
25	Shoot bolts for doors provided as per approved drawings			
26	Reinforcing strips provided as per approved drawings on Transformer Room doors			
27	As-built drawings			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ELECTRICAL INSTALLATION

PROJECT :
CONTRACTOR :

CHECK LIST FOR SUB - STATION (CABLE CHAMBER)

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Height and dimension of room			
2	Dimension of cable trench			
3	Door height			
4	Door hooks and eyes			
5	Dust - proofer for door socket			
6	Plaster ceiling			
7	Instruction signage "Push handle bar to open door" installed at inside of door			
8	Painting			
9	Grating / cover for openings / trench			
10	Electrical works & labelling			
11	Sand in trench c/w lean concrete			
12	Smoke detectors are installed			
13	Lighting fittings c/w wire guard			
14	Quantities of shoot bolts provided as per approved drawings			
15	Hard hat signage			
16	Red tapes provided at edges of beams			
17	As-built drawings			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ELECTRICAL INSTALLATION

PROJECT :
CONTRACTOR :

CHECK LIST FOR SUB - STATION (TRANSFORMER ROOM)

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Height & dimension of room			
2	Dimensions of cable trench are in order			
3	Door height			
4	Door hook and eyes			
5	Dust - proofer for door socket			
6	Plaster ceiling			
7	Painting			
8	Washed and fine sand in trench			
9	Grating for trench			
10	Groove line for transformer earthing			
11	Electrical work & labelling			
12	Smoke detector (if applicable)			
13	Louvre doors for transformer room			
14	As-built drawings			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ELECTRICAL INSTALLATION

PROJECT :
CONTRACTOR :

CHECK LIST FOR GENERATOR

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand / make used for			
	a) Engine			
	b) Alternator			
	c) Control panel			
	d) Battery			
2	Overall dimension of genset / housing			
3	Check correct equipment is used at correct location			
4	Record technical data of equipment and check with approved list			
5	Mounting of genset in order			
6	Vibration isolator for genset installed			
7	Hanger / bracket for exhaust pipe and silencer			
8	Exhaust discharge away from fresh air in - take			
9	MV system (if applicable) provided for Engine combustion and radiator cooling (Check capacity of MV Fan)			
10	Painting			
11	Labelling			
12	Wire Termination properly done			
13	Quantity of gauges & sensors are in order			
14	Fuel level in tank			
15	Earthing system properly installed			
16	Access for removal / replacement of the large item of plant			
17	Safety to cater for fuel leakage (Eg: bund walls and fuel leak detection system for outdoor generator sets)			
18	Sound proofing for generator room,supply / exhaust air opening			
19	Bund wall around fuel storage tank			
20	As-built drawings and Factory Acceptance Test (FAT) test reports			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ELECTRICAL INSTALLATION

PROJECT:
CONTRACTOR:

CHECK LIST FOR METER COMPARTMENT

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Meter board , wire , MCB & incoming cable are in order			
2	Lock in order			
3	Depth of meter compartment in order			
4	Space for meter in order			
5	Height of meter register and board AFFL follows approved drawings			
6	Tail wire for meter termination in order			
7	Mounting of meter board			
8	Material of meter board			
9	Access door to meter compartment in order			
10	Height of meter room in order			
11	Space in front of meter panel in order			
12	Space at side & back of free standing panel in order			
13	Labelling the area served by each meter			
14	Telephone points provided and commissioned			
15	Louvre provided for natural ventilation			
16	As-built drawings			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ELECTRICAL INSTALLATION

PROJECT :
CONTRACTOR :

CHECK LIST FOR INSPECTION PRIOR TO POWER TURN -ON (LT SWITCH ROOM)

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	All the switchboards are delivered to site , properly installed and supported			
2	All incoming phase and neutral cables are correctly sized , installed and tightly bolted to the bus - bar			
3	All outgoing phase and neutral cables are correctly sized , installed and tightly bolted to the bus - bar			
4	Bus - bar are clean and correctly sized as per approved drawings			
5	All monitoring equipment , ammeter , voltmeter and LED are correctly selected			
6	Overcurrent and earth fault relay operation test to be carried out			
7	Primary injection test on circuit breaker to be carried out			
8	Earth bar is provided and installed correctly			
9	Overall earth resistance to be less than 1 Ohm			
10	Earth cables connected at the earth bar are labelled			
11	Earth cables are correctly sized as per approved drawings			
12	Earth rods and pits are correctly installed and labelled			
13	Correct connector is used to join the earth cable / tape to the earth rods			
14	Earthing system test to be carried out			
15	Adequate lighting and socket outlets are provided			
16	Proper framed single line diagram (SLD) with LEW endorsement is displayed			
17	Rubber mat (at least 5mm thick and 600mm wide) is provided for the entire length			
18	To ensure that , first aid chart , fire extinguisher , cabinet for keys and log book are provided			
19	Danger signs in 4 official languages on the door (s) and removable panels of the switchboard			
20	To ensure that the low tension switchboard is kept clean			
21	All test reports to be submitted for LEW endorsement			
22	Resuscitation charts provided			
23	Washed and fine sand provided for cable trench			
24	As-built electrical single line drawings endorsed by LEW			

Checked By: _____
Date Checked: _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ELECTRICAL INSTALLATION

PROJECT :
CONTRACTOR :

CHECK LIST FOR DISTRIBUTION BOARD

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand used			
2	Dimension of panel box			
3	Thickness of sheet metal for panel			
4	Mounting detail in order			
5	Installation in accordance with SLD			
6	Position of DB from AFFL			
7	IP protection type in order			
8	Labelling of final circuits & No. of points			
9	Electrical single line drawing provided			
10	Colour code of cables			
11	Cable size is correct			
12	Ratings for MCBs / ELCBs are correct			
13	Separate circuit for aircon or water heater			
14	Ring circuits are installed correctly			
15	No of final circuit in one MCB way in order			
16	Neutral / Earth termination bars are accessible			
17	Live conductors are not exposed			
18	No sharing of CPC in final cets			
19	No water or sewage pipe joint directly above DB			
20	Source of power supply (from PowerGrid or Genset) in order			
21	Any spare space for future expansion (add Nos of MCBS to be introduced)			
22	Electric energy efficiency device			
23	Insulation test reports provided			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.
NCR & CAR to be issued as necessary.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ELECTRICAL INSTALLATION

PROJECT:
CONTRACTOR:

CHECK LIST FOR SUB - BOARD INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand used			
2	Dimension of panel box			
3	Thickness of sheet metal for panel			
4	Mounting detail in order			
5	Installation in accordance with SLD			
6	Labelling			
7	Colour code of cable in order			
8	Cable size is correct			
9	Rating for MCBs / ELCBs / ELRs are correct			
10	Electrical connection in order			
11	No water or sewage pipe joint directly above SB			
12	Source of power supply (Power Grid or Genset) in order			
13	IP protection type is correct			
14	Earthing			
15	IDMTL settings are correct			
16	Spare			
17	Electrical single line drawing provided			
18	Insulation test reports provided			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ELECTRICAL INSTALLATION

PROJECT :
CONTRACTOR :

CHECK LIST FOR DISTRIBUTION BOARD

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand used			
2	Dimension of panel box			
3	Thickness of sheet metal for panel			
4	Mounting detail in order			
5	Installation in accordance with SLD			
6	Position of DB from AFFL			
7	IP protection type in order			
8	Labelling of final circuits & No. of points			
9	Electrical single line drawing provided			
10	Colour code of cables			
11	Cable size is correct			
12	Ratings for MCBs / ELCBs are correct			
13	Separate circuit for aircon or water heater			
14	Ring circuits are installed correctly			
15	No of final circuit in one MCB way in order			
16	Neutral/Earth termination bars are accessible			
17	Live conductors are not exposed			
18	No sharing of CPC in final ccts			
19	No water or sewage pipe joint directly above DB			
20	Source of power supply (from PowerGrid or Genset) in order			
21	Any spare space for future expansion (add Nos of MCBS to be introduced)			
22	Electric energy efficiency device			
23	Insulation test reports provided			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ELECTRICAL INSTALLATION

PROJECT:
CONTRACTOR:

CHECK LIST FOR CONDUIT/TRUNKING/TRAY/LADDER INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand used			
2	Size and dimension as per approved drawings			
3	Routing of conduit/trunking/tray/ladder are in order			
4	Hanger/bracket are in order and spacing as per specification			
5	Applied primer coat painting			
6	Painting and labelling			
7	Alignment			
8	Ceiling rose/junction box are properly rated			
9	Spacing between hanger/bracket			
10	Headroom			
11	Height of K O box			
12	Cover for junction box			
13	No water/waste pipe joint above			
14	Earth bonding/continuity of metal trunking/cable tray			
15	No PVC conduit in A/C return air path			
16	Clearance space provided between power cables trays and ELV cable trays as per specification			
17	Galvanised iron conduits shall be used in walls and in ceiling spaces acting as return air plenums			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.
NCR & CAR to be issued as necessary.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ELECTRICAL INSTALLATION

PROJECT:
CONTRACTOR :

CHECK LIST FOR CABLE INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand / type used			
2	Size and type of cable as per specification			
3	Mechanical protection for wiring below 1.5m AFFL			
4	Single PVC - insulated cable embedded in cement plaster with conduits			
5	Wiring above false ceiling properly installed and protected			
6	Cables not in same conduit/trunking/duct with other services			
7	Earth bonding of metal casing at switches is properly connected			
8	Electrical joints are in order			
9	Cable laid underground with armour or metallic sheathed or installed with pipes			
10	Armour used as CPC for armour cable is properly terminated to earth			
11	Sub - main cable after revenue meter from Riser to DB shall be installed in separate conduit / trunking			
12	No sub -main cables trespassing office areas or computer areas			
13	Cables c/w cable trays installed above fire rated duct to be protected with fire rating material			
14	DC pressure test for HT cables {(2 x Voltage in KV)+ 2KV}			Test Records
15	Cables to be laid in galvanised iron conduits in the walls			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

☐ Above installation is not acceptable.
NCR & CAR to be issued as necessary.

_____
(Signature) R E

_____
Date

INSTALLATION CHECK LIST FOR ELECTRICAL INSTALLATION

PROJECT :
CONTRACTOR :

CHECK LIST FOR SSO / ISOLATOR / SWITCHES / FITTING

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand/make used			
2	Position and quantity			
3	No water/waste pipes joint directly above the isolator/SSO/switch			
4	No general purpose SSO/switches installed inside toilet			
5	Weather proof SSO/switches installed at places expose to water splashing			
6	Switch or SSO shall not installed directly above cooker			
7	Every fixed or stationary cooking appliance shall be controlled by a switch separate from the appliance and the switch shall be placed within 2m of the appliance			
8	Switches installed less than 1.4m AFFL			
9	SSO installed more than 150mm above floor or working surface			
10	SSO fed from different phases are more than 2m apart			
11	SSO installed at a location beyond reach shall be controlled by a switch readily accessible and not more than 3m away from the SSO			
12	SSO to water outlet shall be more than 1.2m apart			
13	Dimmable electric ballast for fluorescent light in carpark & office			
14	Non-dimmable fluorescent light shall c/w extra low loss ballast			
15	Diffuser for external light along facade			
16	Motion detector for toilet light			
17	Correct type of light fittings are used as per specification			
18	Corridor light fitting shall be provided with alternate circuit			
19	Lighting circuit switches control as per approved drawings and design			
20	SSOs of different phases must be at least 2.5 metres apart			

Checked By : _____
Date Checked : _____

Approved By:

☐ Above installation is acceptable

_____
(Signature) R E

☐ Above installation is not acceptable.
NCR & CAR to be issued as necessary.

_____
Date

CHECK LIST FOR LIGHTNING PROTECTION INSTALLATION

PROJECT :
CONTRACTOR :

CHECK LIST FOR LIGHTNING PROTECTION INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1	Approved brand / make of material used:			
	a) Air terminal			
	b) Air terminal Fitting/Base			
	c) Clip and Saddle			
	d) Connector-Bimetallic			
	e) Earth Rod Clamp			
	f) Earth Rod Coupling			
	g) Earth Rod Inspection Pit			
	h) Tape			
	i) Test and Junction Clamp			
2	Check downconductors spacing does not exceed 30m.			
3	Check base conductor of earth terminals are interconnected.			
4	Check combine resistance of earth electrodes do not exceed 10 ohms.			
5	Check earth termination tape is enclosed in conduit.			
6	Check test clamp mounting height is at minimum 1500mm AFFL.			
7	Check quantity of air terminals is as per approved drawings.			
8	Check earth pit installation is in order.			
9	As-built drawings and earth resistance reports provided			

Checked By : _____
Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____
(Signature) R E

_____
Date

CHECK LIST FOR RESIDENTIAL APARTMENT UNITS

PROJECT :
CONTRACTOR :

CHECK LIST FOR LIGHTNING PROTECTION INSTALLATION

LOCATION OF INSTALLATION: _____ INSP REQUEST NO: _____

ITEM	REQUIRED STANDARD	COMPLIED		REMARKS
		YES	NO	
1	**Electrical Installation in Meter Risers**			
	1.1 All earth cables are labelled			
	1.2 Gas and water pipes are bonded to the main earth bar inside Consumer's Switchroom			
	1.3 Earth links installed for cable trays and trunkings and bonded to the main earth bar.			
	1.4 Apartment unit numbers are clearly and permanently labeled, (refer to photo 1 for details).			
	1.5 The installed kWh meter shall not exceed 1.8m above finished floor level.			
	1.6 MCB before the kWh meter shall be of 2-Pole (for 1-phase supply) and 4-Pole (for three phase supply) and of Type C or 3 characteristic.			
	1.7 Isolating switch after the meter to be of 2-Pole (for 1-phase supply) and 4-Pole (for three phase supply) type.			
	1.8 Sub-mains cables from kWh meter to DB in apartment shall be installed in trunking. Each circuit shall be tied and labeled for easy identification.			
	1.9 kWh meters arrangement in the riser shall be such that to avoid crossing of sub-mains cables to enter the apartment units.			
2	**Distribution Board inside Apartment**			
	2.1 The installed location must be readily accessible and not obstructed at all time. (MEANS OF ISOLATION)			
	2.2 The top of the distribution board shall not exceed 2.0m above finished floor level. (Note: Means of isolation shall not exceed 1.8 m above finished floor level).			
	2.3 NO water, gas or drain pipe directly above the DB.			
	2.4 ELCB must be of 30mA rating.			
	2.5 Check the operating current and fault level rating of MCBs are correct, neither under-rating nor over-rating. Also check the number of pole for MCB is correct.			
	2.6 Double pole MCBs shall be provided for all outgoing sub-mains cables to Distribution Boards.			
	2.7 The name of the Distribution Board is labeled.			
	2.8 A copy of the as-built single line diagram is inserted in the Distribution Board.			
3	**Power Point Installation**			
	3.1 All switched socket outlets installed shall be installed below 1400mm above finished floor level, or 400mm above floor or table top for ease of plugging.			
	3.2 All switched socket outlets shall be easily accessible by users and no obstruction to the switches.			
	3.3 NO switched socket outlets shall be located behind big size home appliances, like fridges, washing machines or dryers, where users cannot access to. Otherwise a double pole switch for the switched socket outlets shall be provided from an accessible location.			
	3.4 Switched socket outlets located at balcony, court yard or areas subject to rain shall be either splash proof (if it is cover by the extended canopy with 45 degrees coverage) or weatherproof outlets.			
	3.5 Double pole switches complete with connection units to be provided for cooker hoods, convention ovens, cooker units etc as per enclosed sketch KIT/SK1.			
	3.6 Double pole switches shall be provided for water heaters.			
	3.7 Switched socket outlets shall not be located too close to the heat sources, like cooker.			

ITEM	REQUIRED STANDARD	COMPLIED		REMARKS
		YES	NO	
	3.8 Switched socket outlets feeding from different phases shall be located at least 2.5 m apart. Otherwise, permanent caution sign should be provided at the switched socket outlets. It is recommended same phase of supply be used in the same room.			
	3.9 No switched socket outlets shall be installed in bath room. If there is an electrical appliance to be installed in wardrobe in open bath room, double pole switch and connection unit shall be used.			
	3.10 No switched socket outlets shall be installed on carpeted / tiled floor without mechanical protection or protection again ingress of water.			
	3.11 All switched socket outlets shall be located at 0.8m away from the nearest water taps (in all directions).			
	3.12 If it is a open toilet concept (toilet without door to bed room), all switched socket outlets and switches shall be located 2.5m away from the nearest water points.			
	3.13 For toilet with attached bathrooms, switched socket outlets should also be 2.5m away from the bathroom entrance. The purpose is to reduce any convenience to bring in electrical appliances into the bathroom. Possible solution is to use switch fuse-units outlets.			
	3.14 Switches in kitchen cabinet shall be segregated from gas point by compartment, e.g. gas-pipes in upper compartment and switched socket outlet in lower compartment. This is to prevent arching during switching. As such, box up of switches within the same compartment is not adequate.			
	3.15 All switched socket outlets for cooker hobs shall be located away from the fire place.			
4	**Lighting Point Installation**			
	4.1 All lighting points shall be terminated with male / female connector units of appropriate rating for light fittings installation.			
	4.2 Check all earth conductors are 2.5mm sq and terminated properly to the connection unit.			
	4.3 uPVC Flexible conduits shall be used from junction box on slab to light fittings. A GI flexible conduit is not recommended. (However, GI conduits are required for ceiling area used for return air paths for air-conditioning)			
	4.4 Lighting cables installed underground shall be either complete with armour sheathed. If not, non-armour sheathed cables shall be installed in manhole and pipes throughout.			
	4.5 Cables installed above ceilings shall have mechanical protection, i.e. cables to be installed in trunking or flexible conduits.			
	4.6 Same phase of electricity supply is recommended for the same room, especially the lighting switches and other switches (i.e. water heater, fans, etc) are located nearby. Minimum keep 2.5 m apart.			
5	**Isolator Installation**			
	5.1 Isolators for air-conditioning condensing units shall be of double-pole (for 1 phase supply) or four-pole (for 3-phase supply) type.			
	5.2 Weatherproof type isolators shall be used if it is subject to weather or water splashing.			
6	**Equipotential Bonding**			
	6.1 Exposed metal pipes, i.e. water and gas pipes, shall be bonded to the earth bar in the Distribution Board.			
	6.2 Long bath shall also be bonded to the Distribution Board.			
	6.3 Any exposed metallic part of the building structure.			
7	**Labelling**			
	7.1 Miniature Circuit Breakers (MCBs) shall have label on operating current, fault level and type of characteristic curve.			
	7.2 All controlled goods, like switches, switched socket outlets, etc. (as per attached list) shall be complete with the batch test labels.			
	7.3 All phase conductors with black colours insulation shall be colour coded and label with ratings.			
8	**Accessibility**			
	8.1 Distribution Boards and switched socket outlets shall be easily accessible at all time.			
	8.2 Miniature Circuit Breakers and switched socket outlets shall be accessible without the aid of stool or ladder.			
9	**Others**			
	9.1 All controlled goods (as per attached list) must have approval stickers.			
	9.2 All concealed conduits in the wall shall be of galvanised iron (GI) type (unless otherwise approved by EMA).			

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
	9.3 All electrical switches or switched socket outlets shall be located at least 800mm away from the kitchen sink. If not splash proof covers shall be provided.			
	9.4 Wiring works above false ceiling shall have mechanical protection.			
	9.5 Look out for any exposed electrical cables.			
	9.6 NO sharing of electrical conduits with other services, like Extra Low Voltage (ELV) control cables, signal cables etc. (Note: IDA currently do not allow CATV cables be installed with other ELV cables in the same riser too)			
	9.7 Provision of rubber or PVC grommets / bushings around metallic / sharp edges to prevent damages of cable insulation.			
	9.8 Check the colours code for the cables: Brown - Line 1 Black - Line 2 Grey - Line 3 Blue - Neutral Green and Yellow - Earth			
	9.9 Check that cable terminations are properly done.			
	9.10 As-built drawings and test reports provided			

Checked By : _____

Date Checked : _____

☐ Above installation is acceptable

☐ Above installation is not acceptable.

Approved By:

_____

(Signature) R E

_____

Date

IES-ACES M&E Works Guide Check List

Check List 01-VT-01

Project:
Location:
System: **Date:**

ITEM	REQUIRED STANDARD	COMPLIED YES	COMPLIED NO	REMARKS
1.00	**Equipment/Material Check**			
1.01	Make of Equipment - Lift,Size,Drive,Speed,Control			
1.02	Door Provision			
1.03	Main/Typical Hall Provision			
1.04	Car Provision			
1.05	Motor Room			
1.06	Pit			
1.07	FCC			
2.00	**Equipment/Material Check**			
2.01	Shaft Check			
2.02	Rails, Cables Installation within Shaft			
2.03	Pit Equipment, Panel, Cables			
2.04	FCC Panels, Cables			
2.05	13A S/S/O and fixed lamp c/w wire guard installed on top of lift car.			
2.06	Alarm bell installed at every landing or top of car.			
2.07	Hall Button, Lantern, CPI, Lift Number No, Signage			
2.08	Jam, Door, FSB Certification and Floor Sill			
2.09	Car Wall, Floor, Ceiling, COP, CPI, Speaker, CCTV, Light, MV, Notice			
2.10	Certification			
2.11	Motor Room Equipment, Panel, Cables			
2.12	FCC Panels, Cables			
3.00	**Functional Check**			
3.01	Shaft Check			
3.02	Sprinkler Check			
3.03	Motor Room Ventilation			
3.04	DB and Cabling Check			
3.05	Power Failure Lift Homing			
3.06	Fire Safety Lift Homing			
3.07	EBPOS Charging and Function			
3.08	FCC Check			
3.09	Intercom Check			
3.10	Lift Call			
3.11	Lift Sending			
3.12	Manual Operation			
3.13	Fireman Operation			
4.00	**Safety and Maintenance Check**			
4.01	Overun			
4.02	Braking			
4.03	Car and Counterweight Buffers			
4.04	Car Door Safety			
4.05	Load Safety			
4.06	Maintenance Access			
4.07	Maintenance Programme and Contact			

Sub Contractor Check
Name/Signature

Main Contractor Check
Name/Signature

Site Staff Check
Name/Signature

This is our attempt to get the check list consolidated and would welcome improvement.
Please forward suggestion to **ies_aces_me@iesnet.org.sg**

