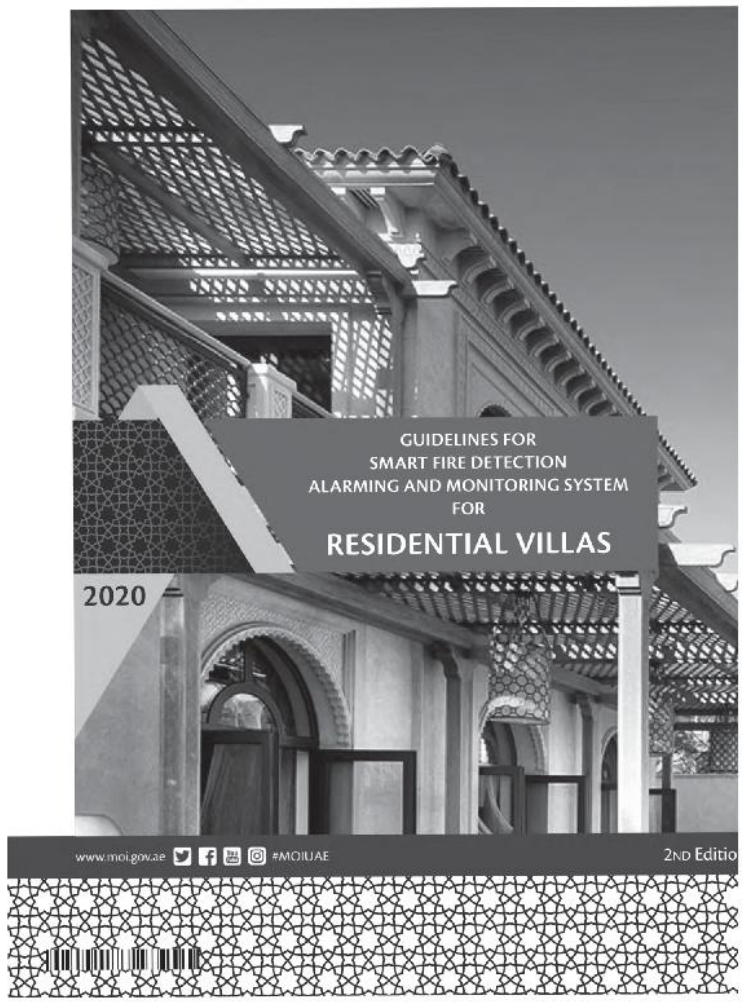
GUIDELINES FOR
SMART FIRE DETECTION
ALARMING AND MONITORING SYSTEM
FOR
RESIDENTIAL VILLAS
2020
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2ND Editio

Guidelines for
Smart Fire Detection
Alarming and Monitoring System
for
RESIDENTIAL VILLAS

GUIDELINES FOR SMART FIRE DETECTION ALARMING AND MONITORING SYSTEM FOR RESIDENTIAL VILLAS

PART I

INTRODUCTION TO HASSANTUK SYSTEM AND RECOMMENDED PROCEDURES FOR PLAN APPROVALS, SYSTEM COMISSIONING AND LINKING TO MONITORING NETWORKS

CHAPTER 1: INTRODUCTION
CHAPTER 2: DEFINITIONS
CHAPTER 3: CONCEPT AND IMPLEMENTATION
CHAPTER 4: ROLES AND RESPONSIBILITIES
CHAPTER 5: LISTING OF COMPANY AS AN APPRVED INSTALLER
CHAPTER 6: LISTING OF COMPANY AS MONITORING OPERATOR/SYSTEM INTEGRATOR
CHAPTER 7: PROPOSED PROCESSOR FOR APPROVALS IN NEW VILLA DEVELOPMENT

ANNEX A

RESPONSIBILITIES FOR TECHNICAL STANDARDS AND RECOMMENDED APPROVAL PROCESS FOR HASSANTUK SYSTEM IN RESIDENTIAL VILLAS

ANNEX B

MOI ON BOARDING AND ACCREDITATION PROGRAM FOR HASSANTUK APPROVED INSTALLERS

ANNEX C

RECOMMENDED RECORD OF COMPLETION AND MONITORING

ANNEX D

APPROVED INSTALLER: PROPOSED FEES SCHEDULE

PART II

FIRE AND LIFE SAFETY GUIDELINES FOR RESIDENTIAL VILLAS

CHAPTER 1: INTRODUCTION
CHAPTER 2: SCOPE AND APPLICABILITY
CHAPTER 3: DEFINITIONS
CHAPTER 4: CONSTRUCTION
CHAPTER 5: MEANS OF EGRESS
CHAPTER 6: FIRE AND LIFE SAFETY SYSTEMS
CHAPTER 7: LIQUEFIED PETROLEUM GAS (LPG) SYSTEMS
CHAPTER 8: EMERGENCY PREPAREDNESS
CHAPTER 9: RESPONSIBILITIES OF FAMILY MEMBERS

PART III

GUIDELINES FOR FIRE DETECTION, ALARMING AND MONITORING SYSTEMS RESIDENTIAL VILLAS

CHAPTER 1: INTRODUCTION
CHAPTER 2: DEFINITIONS
CHAPTER 3: GENERAL SYSTEM REQUIREMENT
CHAPTER 4: INITIATION DEVICES: SMOKE AND HEAT DETECTION SYSTEMS
CHAPTER 5: FIRE ALARM CONTROL UNIT (FACU)
CHAPTER 6: EXTERNAL NETWORKS AND THE MONITORING STATION FOR FIRE ALARM
CHAPTER 7: INSTALLATION, TESTING AND MAINTAINENCE

ANNEX A

ACCEPTABLE TEST STANDARDS AND CRITERIA FROM THE UAE FIRE CODE

ANNEX B

ADDITIONAL GUIDANCE AND RECOMMENDATIONS FOR THE FIRE ALARM CONTROL UNIT

In March 2018, the UAE Civil Defense embarked on an Initiative to introduce a SMART Fire Detection, Alarming and Monitoring System to every residential villa in the UAE. This involves the design and Installation of a Fire Detection System for early warning of a Fire outbreak, with the almost instantaneous alarming, to inform occupants to evacuate the premises immediately. At the same time, to better improve response times and also for an automatic early alarm, there will be a connection to a Signal Monitoring Centre who will receive the signal of a fire outbreak, verify with the owner on the current situation, before dispatching the necessary Fire response resources from Civil Defense as according to SOPs. This also helps cut down the possibility of false alarms so that CD crews will be better prepared on arrival. The objective is to reduce the overall incidents of deaths and injuries in any fire situation, especially in Villa homes, which have the highest incidence of fire calls in the UAE.

These Technical Documents are issued as Guidelines to the Civil Defense Directorates, relevant Government Depts. and agencies and private organizations involved in the implementation of this Initiative They are based on the agreements with the assigned Service Providers, including vendors, installers, Monitoring operators and system integrators, and sets the minimum standards for compliance. But it also allows variations where a higher level of safety is required to suit local conditions. As the principles for the various requirements are also detailed, to encourage innovation, it recognizes for progress and advances in Fire safety technology, thus allowing for alternative and latest solutions to be introduced, as far as these fire safety objectives are met. This should be in consultations with the relevant Authority having Jurisdiction, In the CD GHQ, and the respective CD Directorates.

These Technical Guidelines comprise 3 Parts:

PART I: RECOMMENDED PROCEDURES FOR PLAN APPROVALS, SYSTEM COMMISSIONING AND LINKING TO MONITORING NETWORKS

Suggested Procedures for overall System Installation and Commissioning between CD Directorates, Local Authorities, Building Owners and Service Providers mentioned above .

Further details on Full system requirements, Installation and monitoring of connected Residential Villas should be discussed with the relevant CD Directorates and the Service Providers.

PART II: FIRE AND LIFE SAFETY GUIDELINES FOR RESIDENTIAL VILLAS

Fire Safety Requirements for Villas and extracts from the UAE Fire and Life Safety Code

PART III: GUIDLINES FOR FIRE DETECTION, ALARMING AND MONITORING SYSTEMS IN RESIDENTIAL VILLAS

Technical Requirements for Smoke/Heat Detection, Fire Alarming Units, Network Connections and General Overall Maintenance.

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PART I

INTRODUCTION TO HASSANTUK SYSTEM AND RECOMMENDED PROCEDURES FOR PLAN APPROVALS, SYSTEM COMISSIONING AND LINKING TO MONITORING NETWORKS

2020

CHAPTER 1:
INTRODUCTION
Background
Principal Consideration

CHAPTER 2:
DEFINITIONS

CHAPTER 3:
CONCEPT AND IMPLEMENTATION

CHAPTER 4:
ROLES AND RESPONSIBILITIES
ROLES AND RESPONSIBILITIES OF GHQ CIVIL DEFENCE:
ROLES AND RESPONSIBILITIES OF EMIRATE CD DIRECTORATES:
ROLES OF MONITORING OPERATOR /SYSTEM INTEGRATOR
ROLES AND RESPONSIBILITIES OF APPROVED INSTALLERS

CHAPTER 5:
LISTING OF COMPANY AS AN APPRVED INSTALLER

CHAPTER 6:
LISTING OF COMPANY AS MONITORING OPERATOR/SYSTEM INTEGRATOR

CHAPTER 7:
PROPOSED PROCESSOR FOR APPROVALS IN NEW VILLA DEVELOPMENT
WHEN MUNICIPAL AUTHORITIES AGREE TO IMPOSE NEW REQUIREMENTS (PART II/III) ON NEW APPLICATIONS.
WHEN MUNICIPAL AUTHORITIES DO NOT AGREE TO IMPOSE NEW REQUIREMENTS (PART II/III) ON NEW BUILDING APPLICATIONS.
LINKING TO NETWORKS AND MONITORING CENTRE.
APPROVAL FOR INSTALLING OF FIRE DETECTION, ALARMING AND MONITORING SYSTEMS IN EXISTING VILLAS

ANNEX A:
RESPONSIBILITIES FOR TECHNICAL STANDARDS AND RECOMMENDED APPROVAL PROCESS FOR HASSANTUK SYSTEM IN RESIDENTIAL VILLAS
A.1 Application to be Approved Installer - Application Matrix: Approval of Approved Installer.
A.2 Approval of Devices for use in Hassantuk System: Approved List - Action Matrix: Approval of Devices for Hassantuk.
A.3 Installation of Hassantuk in Existing Villas - Action Matrix: Approval of Hassantuk System in Existing Villas.
A.4 Installation of Hassantuk in New Villas - Action Matrix: Approval of Hassantuk System in New Villas.

ANNEX B:
MOI ON BOARDING AND ACCREDITATION PROGRAM FOR HASSANTUK APPROVED INSTALLERS: TO IMPLEMENT SMART DETECTION, ALARMING AND MONITORING SYSTEM FOR RESIDENTIAL PREMISES

Executive Summary
Key Assumptions
Accreditation and on-boarding process
(Step 1) - Installer Qualification
(Step 2) – Product Evaluation
(Step 3) - Product Testing
(Step 4) - System On boarding, System Integration & Testing
(Step 5) – Operational On boarding & Governance
(Step 6) – Ready for Launch
Installer Capability on Hassantuk Platform

ANNEX C:
RECOMMENDED RECORD OF COMPLETION AND MONITORING
ANNEX D:
APPROVED INSTALLER: PROPOSED FEES SCHEDULE

BACKGROUND

1.1 HASSANTUK - The UAE has a Strategic Vision to be "One of the best countries in the world achieving safety and security". A prime indicator of public safety is that of fire outbreaks, casualties and injuries. In support of this Vision, the MOI CD had in 2016, embarked on its current 5 year Strategic Masterplan, committed with the KPIs of the lowest Numbers of Fires and Lowest Number of Fatalities by 2021. This had resulted in the HASSANTUK Project, led by MOI/Civil Defense, to introduce a Smart Detection, Alarming and Monitoring System in Residential Villas across the UAE. The detailed Roadmap to implement all system technology, components, devices, networks, and infrastructure has been developed with Etisalat in Jan 2019, committing to ensure HASSANTUK penetration across the whole UAE. This initiative offered business opportunities with the Ministry of Interior (MOI) for credible Companies to be appointed as Service Providers and partners for the service of various Design, Installation, Commissioning and Maintenance of Home Detection and Alarming systems in Residential Villas as part of the overall HASSANTUK program throughout the UAE and to operate the System for a minimum of 10 years.

1.2 The SMART Fire Detection, Alarming and Monitoring System Residential Villas (HASSANTUK) intends to enable a fire to be detected at a sufficiently early incipient stage so that people who are at risks can be made safe either by escaping from the fire or its toxic products of combustion, or extinguishing the fire. Neither of these measures can occur unless people are made aware at the earliest time of the fire taking place. This also promotes the early activation of Emergency Response by the Civil Defence in case of real fire outbreaks.
The effectiveness of fire detection and alarm system depends on the stage of the fire at which it is activated and operates. In order for all occupants to escape without too much difficulty, an early alarm should operate before the toxic effects of combustion affects the occupants, the available escape routes become obscured and smoke-logged to such an extent as to make it difficult to find their way out of the villas to safe areas.

1.3 The Fire Detection, Alarming and Monitoring System provides protection to the residential occupants by:

a. Detection the fire at the earliest stage;

b. Alerting the occupants to the dangerous situation and initiating evacuation if possible;

c. Notifying the relevant Authorities and Monitoring Companies of the developing hazardous situation, so that emergency response can be initiated automatically where necessary;

d. In some situations, activation of other fire protection and suppression systems functions, if available; and

e. Lastly, to help identify seat of fires and guiding fire fighters on their arrival.

1.4 The current Fire Detection, Alarming and Monitoring Systems in residential villa premises in the UAE consist essentially of:

a. Initiating Devices (Smoke, Heat Detectors, and others devices as required);

b. Alarm Panels/Fire Alarm Control Unit (FACU/ATE):

c. Notification Devices or Alarm Sounders (Bells, Buzzers, G Horns, Flashing Lights if necessary,

d. FACU/ATE (Fire Alarm Control Panel with Digital Transmission Devices) or an Interface at existing FACP to Transmit alarm signals to external Agencies; referred to the HASSANTUK I Internal Sub-System);

e. Network for Transmitting Signal (ATE) from FACP to Signal Receiving Centre Monitoring Centre (Civil Defense), refers to the HASSANTUK I External Sub- system);

f. Linkages by Monitoring Centre for activation of CD Resources to Fire Stations for activation. (System in-place today).

g. Uninterrupted Power supply for all systems (AC mains, Battery/Charger).

1.5 The UAE Civil Defence General Headquarters and the various Emirates Civil Defence Directorates have embarked on this enhanced safety monitoring initiative by integrating villas (exclusively residential homes within the UAE either owned or leased by Property Developers or privately owned by a person) using IOT Solutions and M2M technology to detect an incident at its very early stages in any villas across the United Arab Emirates. The Smoke/Heat Detection system is connected through an Intelligent Monitoring System to connect all villas (commercial and private), new and existing, to appropriate and strategic Civil Defence Monitoring Centre (MC). The objectives are two-fold: for immediate alarm and evacuation in case of a fire and also to alert first responders nearest to the site to respond in a timely manner to resolve the situation. This also involves the process of call verification, by the appointed Monitoring Operator , to the building owner when such an alarm is activated/received.

1.6 To meet the objective of Implementing these Technical Guidelines, the CD GHQ has reviewed the current Approvals processes and proposes THESE Recommended Procedures to assist the various Emirate CD Directorates on engagement with the various relevant building owners, Service Providers and Municipal Authorities. The actual level of compliance with PART II: Fire & Life Safety for Residential villas form the baseline requirements for fire safety, and can be moderated by the various Emirate Directorates to suit local context and limitations, PART III: Guidelines for the Detection, Alarming and Monitoring Systems in Residential Villas have been agreed between the GHQ, Emirates Directorates and the monitoring Operator/system integrator across all Emirates.

1.7 The introduction of this new Requirement thus places a responsibility for a formal Plan approval and Inspection Processes of the new installed SMART systems in the Residential Villas, to ensure that a proper level of safety has been achieved and sustained.

PRINCIPAL CONSIDERATIONS

1.8 In drafting these guidelines, the following Principal Considerations were taken into account:

a. As different Emirates have experienced different fire safety issues and situations, hence priorities for implementation may be different.

b. Also, there are currently different established working relationships and arrangements between the CD Directorates and their Local Authorities, with regard to enforcing standards and building approvals;

c. There is also varying capacities in the various CD Directorates to enforce Fire Safety standards, including inspections, and the handling of their increased workload and enforcement.

d. There is a need to allow for a wide field and scale of engagement from multiple vendors and supply agents and other professionals to ensure sufficient capacity on the private sector to meet the anticipated demands at the national level;

e. Need to allow for introduction of new technologies, which can meet the established standards in these guidelines throughout the implementation stage;

f. Need to have minimum standards for compliance at the National level, but also encouraging higher levels of safety where it can be afforded.

2.1 HASSANTUK SYSTEM: Comprehensive system of fire detectors and Alarms, installed in Residential Villas, to provide early warning to occupants in case of a fire outbreak, and also transmits a signal to a Manned call center, that allows for verification and activation of CD resources in cases of a real fire.

2.2 HASSANTUK HOME DETECTION AND ALARMING SUB-SYSTEM: Sub System of Hassantuk System found internally in the Residential Villas, whose purpose is the early detection and alarming of the Villa Residents to a possible fire hazard or fire outbreak in the home

2.3 HASSANTUK MONITORING AND VERIFICATION SUB-SYSTEM: Sub System of the Hassantuk System, found externally (to the Home) which connects the Home Alarming System and transmits the Alarm signals to a Monitoring and Receiving Centre, operated 7/24, where Calls are verified and if necessary, CD resources are activated. Also tracks operability of the whole system in the Home continuously for malfunction/fault.

2.4 DEVICE /COMPONENT VENDOR: Supplier of Approved Internal Home system components, including Smoke and heat detectors, ATEs, Sounders, Alarms, and their interconnectivity, whether wired or wireless. Vendors will need to be engaged by Approved Installers or System Integrators, who will evaluate and submit their devices for Listing on an Approved List. Only Approved devices can be offered to HASSANTUK customers by Installers.

2.5 NETWORK MONITORING AND ALARMING OPERATOR: Monitors all Residential Hassantuk ATEs through existing infrastructure networks and communication means and operates the Signal Receiving Centre. Point of verification with Residential owner for any alarm.

2.6 SYSTEM INTEGRATOR: Ensures the full interconnectivity of the HASSANTUK system from Point of Detection to Verification, to activation of CD Forces. Also tracks overall performance of the system and identifies problem areas or areas for Improvement on a regular basis. Responsible their sustained use and integrity after installing. Also, for trouble shooting in cases of malfunction.

2.7 MONITORING OPERATOR/SYSTEM INTEGRATOR: A service Provider who performs all the functions of a Monitoring Operator and System Integrator in the Hassantuk system in a particular Emirate.

2.8 HASSANTUK APPROVED INSTALLER: Approved Maintenance and Installer Companies (Type A/B) employed by Project Consultant/Building Owner to design, configure and install HASSANTUK system in the Homes. Responsible to ensure final connection from Home to Network Monitoring and Alarming Operator/Signal Receiving Centre. Can offer long term Maintenance contract with Villa Owner.

3.1 As this is a Nationwide effort to introduce the HASSANTUK Fire Detection, Alarming and Monitoring System in the UAE, the concept of implementation will be as follows:

a. There will be Central oversight and Guidance on minimum standards and arrangements by the GHQ Civil Defense, with on the ground Implementation and enforcement by the various Emirate Directorates.

b. GHQ will issue the relevant Technical Guidelines, supported by the latest UAE Fire and Life Safety Code.

c. Emirates CD Directorates are to adopt or develop local contextual Procedures /Guidelines (in accordance with the above) and establish working arrangements with their relevant Local Authorities for Plan approvals and inspections of Hassantuk Systems in new and existing Villas. These processes should be similar with current Building Plan approvals for new building projects and Installation of fire protection systems in buildings

d. At the Emirate level, CD Directorates are to appoint competent Approved Installers whom, building owners (for existing Villas) or Project Consultants (for new Villas projects) can engage to professionally design, install and commission the Hassantuk Home Sub system with the System Integrator. An Approved Listing shall be maintained and made public for Villa Owners.

e. Approved Installers and Monitoring Operators are to charge fees based on the range of mandatory and optional services provided by each. For Monitoring/System Integrator the fees are to be made Public.

f. Once connected and approved, Monitoring Operators are required to oversee the integrity and readiness of the overall system, by verifying alarms and also fault finding and managing false alarms. They are also to activate CD resources for real fires in accordance to the protocols agreed with the Emirates CD.

g. GHQ will monitor overall process and implementation centrally for reporting to MOI on regular basis, including meeting national KPIs.

3.2 As this is very much an Implementation Plan that will be carried out at the Emirate level, there needs to be considerable discussion and agreed arrangements made at the Emirate level between the CD Directorate, the Municipal Authorities, and Approved Installers with the Monitoring/System Integrator to develop the specific Implementation Plans for each Emirate. The actual Plan would depend on the profile of Villas and their current fire safety measures, different priorities, the process required by each Emirate for approvals, the resources available to the CD and Building Authority, and the ability of the Approved Installers/Monitoring and System Integrator to meet the demands of the various Building owners.

3.3 These PART I: Process Guidelines are meant to help Emirates CD Directorates in developing their specific Plans and Processes with their Building Authority and Approved Installers and Monitoring Operator and system Integrator to meet the objectives of the Initiative for Fire Detection, Alarming and Monitoring Systems in Villa Homes in the UAE.

4.1 ROLES AND RESPONSIBILITIES OF GHQ CIVIL DEFENCE:

a. Overall responsible to MOI for establishment and implementation of Hassantuk Initiative across the whole UAE according to issued Regulations and Guidelines:

b. Develop framework for engagement for the implementation of HASSANTUK at the national level to meet set National KPIs on Life and Fire Safety in Villas;

c. Set minimum standards for the Approved Installers and Monitoring Operator/System Integrator for appointment by the various CD Directorates in their respective Emirates according to agreed Service Performance levels;

d. Develop the general Guidelines for Fire and Life Safety in Residential Villas and also Fire Detection, Alarming and Monitoring Systems to be implemented in HASSANTUk as minimum standards to be adopted nationally.

e. Provide guidance on Recommended procedures on Implementation between Approved Installers, Monitoring Operators/System Integrators, CD Directorates, and the Local /Municipal Authorities;

f. Listing of Approved Devices, meeting minimum National standards, to be used, in consultation with System Integrator and CD Directorates; and

g. Appoint a Central Implementation Committee (with Emirate Fire Prevention Representatives) and Service Providers to oversee initiative to review Policies based on feedback received and improve customer satisfaction.

4.2 ROLES AND RESPONSIBILITIES OF EMIRATE CD DIRECTORATES:

a. Responsible for the successful Implementation of Hassantuk in their respective Emirates;

b. Adopt the Technical Guidelines as a baseline requirement and if necessary, contextualize additional requirements to suit local Emirate environment and governance;

c. Establish list of Approved Installers from existing Maintenance and Installation Companies in the Emirates, to implement Guidelines under CD Guidance; and regulate performance of such Approved Installers to meet set standards.

d. Engage the Monitoring Operator/System Integrator on the processes for Verification and handling of false alarms; where necessary, establish KPIs for Monitoring Operator to follow;

e. Establish List (if not already available) of Approved devices for use in Hassantuk Home Sub systems, in consultation with System Integrator;

f. Engage Local/Municipal Authorities to develop streamlined process to Implement the Approval System from Design, Plan Approvals to Commissioning, including issue of NOCs for Villa Owner.

g. Train Directorate Fire Prevention officers to enforce Hassantuk standards and monitoring implementation for sustainability among existing and new Villa project;

h. Track implementation of Hassantuk in each target audience, and if necessary, introduce new initiatives with Monitoring/System Integrator to engage Villa Owners;

i. Approve the Fees Schedule on Costing of Devices and Services provided by the various Approved Installers, and include the Listings to be made public, (eg on line Portal) and to monitor actual implementation and possible changes from Approved Installers where necessary.

j. Provide advisory services and respond to feedback/complaints to members or public and professionals on matters involving Hassantuk, including procedures to Implement Hassantuk in their Villas.

k. Engage the Monitoring Operator/System Integrator and Villa Owners in the management of false alarms to reduce to a reasonable level, through public education programs, and use of latest technology.

4.3 ROLES OF MONITORING OPERATOR /SYSTEM INTEGRATOR

a. Responsible for the establishment, infrastructure and functioning of the Hassantuk Monitoring and Verification Sub-system to meet System objectives of Monitoring, Verification and where necessary, including timely activation of CD forces.

b. Taking responsibility to ensure full technical integration of the Villa Hassantuk system and its components including the Home Detection and Alarming Sub-system, Monitoring and Verification Sub system, and the MOI's ICC System for CD activation.

c. Provide 7/24 Monitoring services at a manned Signal Receiving Centre for to all approved and installed Hassantuk system at Villas, including verification of alarms with Building owners, Activation of CD Forces in accordance with establish protocols and also ensure System Readiness and integrity, including alerting Building owners, where necessary.

d. Evaluation of all system components, including detectors, sounders, Alarm flashers, Automatic Transmission Equipment, and Home network components according to technical standards set by MOI and also compatibility with Monitoring Operators Networks

e. Ensuring full connectivity between the Home Detection and Alarming Subsystem's ATE and the Signal Receiving Centre for Call Alarming Verification

f. Monitoring and documentation of all Alarms on a 7/24 basis, including identification and management of False Alarms, to meet established KPIs set by MOI.

g. Managing Customer Satisfaction with the Hassantuk system including Customer complaints and Feedback,

h. Providing additional services to Villa Owners, other than Monitoring and Verification, to improve or support overall efficiency of Hassantuk system, for example, queries on alarms, Maintenance (if so requested), responding to Home Sub-system faults, advice on upgrading, etc. These services can be also be chargeable, where necessary.

i. To "do a 1st Level Approval for those applying to be appointed as Approved Hassantuk Installers; this is to ensure adequate knowledge of system components and capability in installing Home systems and integration with their external networks.

j. To do a 1st Level Approval for new devices (detectors, sounders, ATEs, etc.) to be introduced for Hassantuk, including ensuring compliance with both Technical Guidelines from the Civil Defence as well as own set Requirements for system integration.

k. To collate and keep necessary documentation and records of Hassantuk performance, including compliance of set KPIs by GHQ/Emirate Directorates including identification of problem areas, and to work with GHQ/Emirates to eliminate these problems or system faults, especially to minimize the number of false alarms

l. To establish a Fees schedule for Monitoring to be provided and seek approval from MOI/GHQ.

4.4 ROLES AND RESPONSIBILITIES OF APPROVED INSTALLERS

a. Responsible for the System Design, Configuration, Installation, Testing, and commissioning of the Hassantuk Home Detection and Alarming Sub-System.
b. To ensure that only approved system components including Detectors, Sounders, Alarms, and ATEs that are compatible with Monitoring /System Integrator's system are used. These components can be found on the Approved Listing kept by both the GHQ/Emirates CD and the Monitoring/System Integrator for each Emirate.

c. When engaged by the Villa Owner or Project consultant, depending on whether it is an existing villa or new project respectively, the Approved Installer is to survey, design, configure and install the full Hassantuk system, according to the standards set in the Guidelines,

d. To coordinate with the Monitoring Operators in connecting the Home Subsystem, with the Monitoring and Verification subsystem for testing and commissioning of the system on successful completion, to seek NOC from the relevant authorities, where necessary.

e. To prepare the appropriate plans and submit for the necessary approvals by the relevant Authorities, including Municipal Authorities/CD Directorates according to respective Emirate Plan Approval Process. minimum

f. To provide technical support, system fault back up and maintenance for an initial period of two years. This is mandatory for all newly installed Hassantuk systems. This is to be coupled with a minimum warranty period of 1 year for all system components. Approved Installers may offer short/long term maintenance services and system fault coverage to Villa Owner for the installed system.

g. Approved Installers are also required to meet the Accreditation and On Boarding Processes with the Monitoring Operator/System Integrator as found in Annex B.

5.1 Any knowledgeable and competent Company who wishes to be an "Approved Installer" is to apply for Approval from the relevant Emirates CD Directorate to be on the Approved List. This is a two-step process.

5.2 The Applicant, as a minimum is required to be an Approved Maintenance and Installation Company (Type A/B) in the Emirate, before they can be considered for such Listing.

5.3 The Applicant is required to be professional and technically competent in the design and configuration of the system as required by established Hassantuk Guidelines., including use of approved devices and components for the Hassantuk system. He is required to determine and also provide the approved devices for this service delivery to villa owners.

5.4 The applicant is first to seek contractual arrangements (Accreditation and Onboarding) with the Monitoring/System Integrator to be able to provide a full System to Villa Owners. This includes an understanding of the Monitoring and Verification sub Systems, and the installation and use of appropriate Approved components for system integrity and integration.

5.5 Second step is to approach the Emirate Directorate for final approval, where they are to submit the following:

a. Certification as an Approved Maintenance and Installation Company for the Emirate concerned;
b. Listing of approved components for the wired systems/ wireless systems to be provided in Villas;
c. Approval and accreditation by the Monitoring Operator/system Integrator as a partner of the Hassantuk system, and;
d. Sample Copy of Hassantuk Contract agreements with Villa Owners, including service conditions, warranties and operating Instructions and
e. A complete Fees Schedule of costs of Approved devices and services to be offered with details (see Annex D) to Villa Owners when engaged. This List is to be reviewed by the Emirate Directorate and made public on the Directorate On- Line Portal. Where necessary, the Approved Installer can subsequently request for cost amendments to be reviewed by the Emirate Directorate.
f. Any other document as required by Emirate Directorate.

5.6 Emirates CD are to register all the Approved Installers on a public Approved List. Emirates CD are to regulate that only these Approved Installers are to offer such services to villa Owners. Directorates also have the power to de-list/ de-register any Installer if they do not meet the set standards and guidelines of the CD Guidelines.

5.7 Where the Applicant has not been approved by the Monitoring Operator/system Integrator at the 1st level of approval, he can appeal his application to the relevant Emirates CD Directorate for review, with the necessary documentation and supporting justification. The Emirates CD Directorate shall engage and discuss with the Monitoring Operator/System Integrator before making a decision, which shall be final.

6. LISTING OF COMPANY AS MONITORING OPERATOR/SYSTEM INTEGRATOR

6.1 ETISALAT has been appointed by MOI as the single Monitoring Operator/System Integrator for the Hassantuk initiative in the UAE. Hence, all the Roles and responsibilities as stipulated in this Guidelines of the Monitoring operator/System Integrator, will be carried out by ETISALAT. For example, any Company wishing be an Approved Installer will need to approach ETISALAT, in accordance with the On Boarding and Accreditation program in Annex B. ETISALAT will also work closely with the GHQ, Emirates CD Directorates, and where necessary, municipal authorities for the successful implementation of Hassantuk to achieve the objective of a high level of fire safety in residential villas.

7.1 The proposed SOPs for such processes are dependent on the established working relationship with the Local Municipal Authorities. As far as possible, there should be minimal disruption and inconvenience to the general members of public, unless unavoidable. There are two possibilities:

a. Where the Building Authority agrees to impose the necessary PART II: Fire and Safety Guidelines and Part III: Technical Requirements for the Hassantuk Fire Detection. Alarming and Monitoring Systems on behalf of CD;

b. Where the Building Authority does not agree to regulate PART II and PART III Guidelines, and CD would need to do the necessary checks at all stages of the Plan Approval and Inspection Process.

7.2 Based on current practices, there are 4 stages of Contact and processes where these Requirements can be made known and imposed on the Building owner:

a. Plan Preparation: Initial Drawings to meet general requirements by all authorities;

b. Plan Submission for Approval: Seeking Approvals from all agencies, final Approval by Building Authority;

c. Building Completion and Inspection: Building completed, seeking approval for Occupation by Building owner;

d. Linking to Networks and Monitoring Centre; Linking the Home System to external networks provided by Monitoring Operator to the SRC and CD.

WHEN MUNICIPAL AUTHORITIES AGREE TO IMPOSE NEW REQUIREMENTS (PART II/III) ON NEW APPLICATIONS.

7.3 PLAN PREPARATION.

a. Owner will engage Project Consultant for submission procedures (as per norm).

b. Building Consultant, in his overall planning, design and include new requirements (as given by CD) to include Fire Safety measures for Villas and Fire detection/Alarming systems (as is done with other technical requirements of other Municipal Authorities) (PART II & III).

c. Project Consultant will need to engage professional/Approved Installer design for design of Hassantuk system in plan submission.

d. CD Directorate may need to provide initial advisory services for new Hassantuk requirements in initial years.

e. Approved Installer may approach the Monitoring Operator to give advice on technical details as well.

7.4 PLAN SUBMISSIONS AND APPROVAL.

a. Plans submitted to Municipal Authority according to SOP.

b. Municipal Authority to process according to Guidelines; where necessary, or complex proposal is made, may refer to CD or SP, for comments and specific advice.

c. When all in compliance, Plan is approved by Municipal Authority as per current process.

7.5 BUILDING COMPLETION AND INSPECTION.

a. Consultant applies to Municipal/Building Authority for Inspection, on completion of Building works. Approved Installer would have ensured that all necessary Installation and testing, including Linking to SRC has been done in accordance to approved plans.

b. Municipal Authority to check all in compliance to approved Plans. CD (or SP) to ensure all technical requirements are met and complied, before clearance to Municipal Authority that PART II/III are met. Where not in accordance to approved plans, to ensure that area of noncompliance is rectified.

c. Municipal Authority to issue Final Clearance for Completion and Occupation to Building Consultant/ Owner.

7.6 LINKING TO NETWORKS AND MONITORING CENTRE.

a. Building Owner to formally apply to Monitoring Operator to commission and link installed Fire Detection, Alarming and Monitoring System with Signal Receiving Centre and CD Monitoring Centre.

b. Basically, this would be an administrative procedure for linking/connection as all hardware/software systems installed in Villa before completion, and the Villa owner would have in principle, agreed to such a connection.

c. Monitoring Operator to carry out necessary site visit and data collation/system inputs for premises and also necessary procedures for connection, including testing for compliance.

d. Villa Owner to comply with licensing admin and fees payment for annual services. He also required to engage Approved Installers and sign a Maintenance contract to provide such services for a minimum of 2 years. Separate fees may be charged.

e. Monitoring Operator is to inform relevant Emirates CD Monitoring Centre for new specific additional Residential Villa has been added under Monitoring program.

f. Villa Owner is to carry out necessary monitoring, maintenance and regular system testing as required. he may choose to appoint an Approved Installer to provide such services, especially when there is system fault to be rectified.

g. Where any area of non-compliance or system fault, Monitoring Operator to advise Villa owner to rectify fault; Monitoring Operator to track and process rectification, and if no remedial action taken after established time frame, to report Noncompliance to Civil Defense for Enforcement Action under relevant Regulations.

WHEN MUNICIPAL AUTHORITIES DO NOT AGREE TO IMPOSE NEW REQUIREMENTS (PART II/III) ON NEW BUILDING APPLICATIONS.

7.7 PLAN PREPARATION.

a. Owner will engage Project Consultant for submission procedures (as per norm).

b. Building Consultant, in his overall planning, design and include new requirements (as given by CD) to include Fire Safety measures for Villas and Fire detection/Alarming systems (as is done with other technical requirements of other Municipal Authorities).

c. Project Consultant may need to engage Approved Installer for design in plan submission

d. CD Directorate may need to provide advisory services for new requirements in initial years.

e. Monitoring Operator may also be asked to give advice as well by Approved Installer.

7.8 PLAN SUBMISSIONS AND APPROVAL.

a. Plans submitted to Building Authority according to SOP.

b. Building Authority to direct Plans to CD; CD to process according to Guidelines; where necessary, or complex proposal is made, may engage Approved Installer, for comments and specific advice.

c. When all in compliance, clearance is issued to Municipal/Building Authority by CD. Whole Plan Submission is approved by Building Authority as per current process. III

7.9 BUILDING COMPLETION AND INSPECTION.

a. Consultant applies to Municipal/Building Authority for inspection, on completion of Building works.

b. Building Authority to check all in compliance to approved Plans. Inspection to be carried out by CD to ensure all technical requirements are met and complied, before clearance to Building Authority that PART I/II/III are met. Where not in accordance to approved plans, to ensure that area of noncompliance is rectified.

c. Building Authority to issue Final Clearance for Completion and Occupation to Building Consultant/ Owner.

LINKING TO NETWORKS AND MONITORING CENTRE.

(Refer to Annex B for more details)

7.10 Villa Owner to apply to Monitoring Operator to commission and link installed Hassantuk Fire Detection, Alarming and Monitoring System with Signal Receiving Centre and CD Monitoring Centre.

7.11 IN the first instance, the Approved Installer would have followed the administrative procedure for linking/ connection as all hardware/software systems installed in Villa before completion. This shall be in accordance with the Onboarding and Accreditation Program for Hassantuk Installers" as issued by the Monitoring Operator/System Integrator.

7.12 Monitoring Operator would have carried out necessary site visit and data collation/system inputs for premises and also necessary procedures for connection, including testing for compliance as above.

7.13 Villa Owner to comply with licensing admin and fees payment by the Monitoring Operator. It is mandatory that he signs an initial Maintenance/ contract for 2 years with an Approved Installer.

7.14 Monitoring Operator to inform relevant Emirates CD Monitoring Centre for new specific additional residential Villa has been added under Monitoring program.

7.15 Villa Owner to carry out necessary monitoring, maintenance and regular system testing as required under Guidelines. Initial Maintenance coverage of 2 years is required be to provide by the Approved Installer for the first two years and should be factored into the overall scope of work when employing the Approved Installer in the first instance.

7.16 Where any area of non-compliance or system fault, Monitoring Operator to advise Villa owner to rectify fault; Monitoring Operator to track and process rectification, and if no remedial action taken after established time frame, to report Noncompliance to Civil Defense for Enforcement Action under relevant Regulations.

APPROVAL FOR INSTALLING OF FIRE DETECTION, ALARMING AND MONITORING SYSTEMS IN EXISTING VILLAS

7.17 For existing Villas, PART II requirements may not be applicable, as these are existing villas, and generally, no building work is being done. Hence the process of Approval through the usual Municipal system may not be applicable. PART II requirements can only be imposed when new building works are being proposed by the owner, then the full requirements of PART II and PART III can then be applied. Hence, when there is new building works done on an existing Villa, e.g. additions and alterations to existing structures. CD may want to take this opportunity to impose the requirement for PART II/III.

7.18 For existing Villas, where no new building work is done, the Building Owner will need to engage an Approved Installer who will design and implement the necessary requirements of the Hassantuk system in accordance with the PART III: Technical Guidelines. Plans must be submitted accordingly to CD for Plan Approval, and on-site Inspection must be carried by Civil Defence before it can be commissioned. Links is with the Monitoring Operator as per procedures above.

7.19 This will enable a much swifter method of implementation with minimum disruption to the existing Villa Owners, but yet meet the minimum requirements.

7.20 In any case, a formal Record of Completion and Monitoring Form shall be submitted by the Monitoring Operator for Record to the Villa g Owner and the Emirate CD/Monitoring Centre.

Annex A

Responsibilities for Technical Standards and Recommended Approval Processes for Hassantuk System in Residential Villas

CENRAL GUIDANCE

GHQ UAE CIVIL DEFENCE

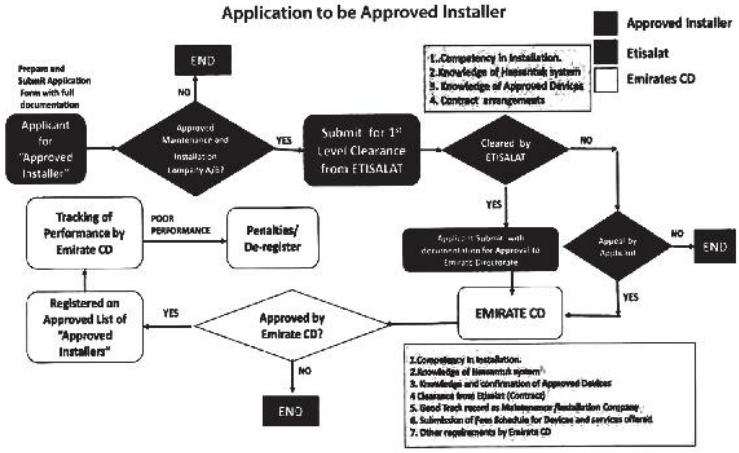
a. Develop framework for Hassantuk System and engagement or Monitoring Operator/System Integrator with RFP.
b. Appoint and Monitoring Operator/System Integrator according to agreed Service Performance levels.
c. Develop Technical guidelines for Home safety with Fire detection, Alarming and Monitoring system.
d. Develop Recommended Process for Implementation in Residential premises with CD Directorates Service Provider, Local Authorities.
e. Listing of Approved Devices to be used in Consultation with Monitoring Operator/system Integrator.
f. Appoint a Centralized Implementation Committee (with Emirate FP Representation) to oversee Initiative Hassantuk system.

LOCAL IMPLEMEN-TATION

EMIRATE CD DIRECTORATES

a. **Adopt Technical Guidelines as baseline requirements and if necessary, contextualize to suit local environment.**
b. **Establish List OF Approved Installers /contractors/agents/ suppliers to implement Guidelines under guidance by the CD.**
c. **Establish List of Approved devices for use in Specific Emirate.**
d. **Engage the local Authorities and develop a process to Implement the System from Design till Commissioning.**
e. **Engage Monitoring Operator/System Integrator In the above process and establish roles and responsibilities to match local SOP.**
f. **Enforcement of non-compliant Villa Owners.**
g. **Train Local FP officers to enforce the Standards and monitoring.**
h. **Develop program /plan with SP and priorities for implementation**
i. **Track implementation to reach target audience**
j. **Provide advisory to Professionals and Members of public.**

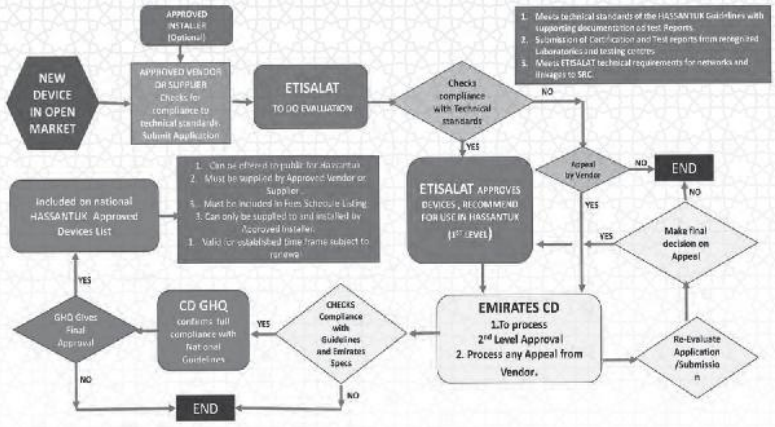
Annex A.1
Application to be Approved Installer



Application Matrix: Approval of Approved Installer

	APPROVAL OF APPROVED INSTALLER	Approved Installer	Etisalat	Emirates CD	GHQ CD
1	Submission of Application with Documentation for 1 st Stage approval	✓			
2	Review of Application Documentation and evaluate competency of Applicant and (1st Level Approval)		✓		
3	Establish process and contract between AI and SRC (ETISALAT) (including Onboarding Process)		✓		
4	Appeal by Applicant if unsatisfied with Etisalat's decision.	✓			
5	Submission of 1st Level approval/ Documentation. to Emirates CD , including Contract with SRC.	✓			
6	Review of Application and Documentation as Approved Installer , esp Emirates specific requirements			✓	
7	Review of Fees Schedule for Approved Devices and services offered by Approved Installer.			✓	
8	Approval as "Approved Installer" in Emirate.			✓	
9	Register as "Approved Installer " on Emirate Portal. /Listing for public Information			✓	

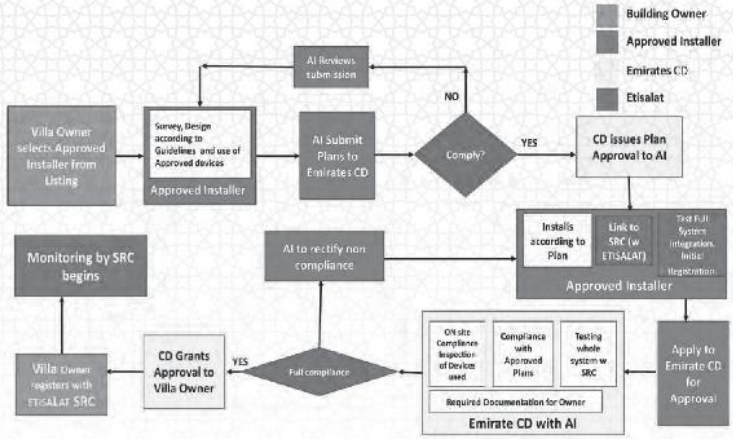
Annex A.2
Approval of Devices for use In Hassantuk System: Approved List



Action Matrix: Approval of Devices for Hassantuk

	APPROVAL OF DEVICES FOR USE IN HASSANTUK SYSTEM	Approved Installer/Vendor/ Supplier	Etisalat	Emirates CD	GHQ
1	Submission of devices with supporting Full Documentation for Listing	✓			
2	Evaluating the documentation /certification , compliance with Guidelines and also testing if necessary.		✓		
3	Issue of 1 st level approval if full compliance.		✓		
4	Application for Appeal if unsatisfied with Etisalat decision.	✓			
5	Final Decision of Appeal			✓	
6	Submission of Documentation , including 1st Level Compliance FOR EMIRATE Approval . (To also include proposal for new Fees Schedule of new Approved Devices)	✓			
7	Approval if in full compliance with Technical guidelines,			✓	
8	Listing on Approved List at Emirate Level.			✓	
9	Application for Listing at National Level., with full documentation from 1st Level approvals, Emirates approvals.				✓

Annex A.3
Installation of Hassantuk In Existing Villas

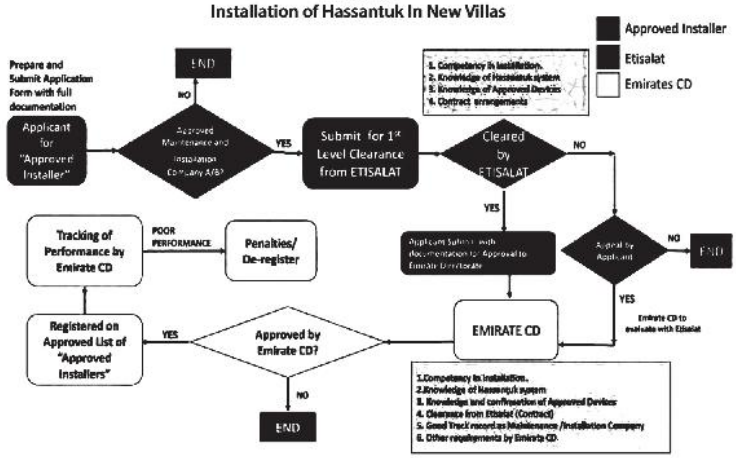


Action Matrix: Approval of Hassantuk System in Existing Villas

✓ Main Responsibility

	APPROVAL OF HASSANTUK SYSTEM IN EXISTING VILLAS	Villa Owner	Approved Installer	Etisalat SRC	Emirates CD
1	Engagement of AI for HASSANTUK system	✓			
2	Survey, Design , Installation of HASSANTUK Home system		✓		
3	Linking System to SRC and Testing		✓		
4	Issue of Completion of Work Certificate for HASSANTUK		✓		
5	Seeking Emirate CD Approval for system	✓			
6	On site Inspection and compliance checks				✓
7	Issue of Approval by Emirate CD				✓
8	Building Owner to apply for Monitoring to start after Approval.	✓			
9	System/Maintenance monitoring 24/7			✓	
10	Maintenance /fault rectification	✓			

Annex A.4
Installation of Hassantuk In New Villas



Action Matrix: Approval of Hassantuk System in New Villas

✔ Main Responsibility

	APPROVAL OF APPROVED INSTALLER	Approved Installer	Etisalat	Emirates CD	GHQ
1	**Submission of Application with Documentation for 1 st Stage approval**	✔			
2	**Review of Application Documentation and evaluate competency of Applicant and [1st Level Approval]**		✔		
3	**Establish process and contract between AI and SRC (ETISALAT)**		✔		
4	**Appeal by Applicant if unsatisfied with Etisalat's decision.**	✔			
5	**Submission of 1st Level approval/ Documentation. to Emirates CD , including Contract with SRC.**	✔			
6	**Review of Application and Documentation as Approved Installer , esp Emirates specific requirements**			✔	
7	**Approval as "Approved Installer"**			✔	
8	**Register as "Approved Installer " on Emirate Portal. /List**			✔	

Annex B

MOI ON BOARDING AND ACCREDITATION PROGRAM FOR HASSANTUK APPROVED INSTALLERS

To implement Smart Detection, Alarming & Monitoring System for Residential Premises

1 Executive Summary

Etisalat is pleased to present its Accreditation and Onboarding program for Smart Fire Detection, Alarming, and monitoring System for Residential Premises in order to support the UAE in achieving its objectives to improve safety, protect lives, and properties.

The accreditation and on-boarding process is designed to ensure that Installers are able to have their devices tested and certified as Interoperable with the Hassantuk system.

The purpose of this document is to outline Accreditation and on-boarding standards for Hassantuk Installers in response to MOI request to provide a nationwide platform for Monitoring all the villas connected with MOIs E-system.

This document will provide a high-level guidance on the steps required for the installers to be approved, integrated with Monitoring Operator and will be able to provide Installation and maintenance services to homeowners. Installers will be provided more comprehensive documentation for each step at the time of onboarding.

Etisalat will act on behalf of MOI as a system Integrator and Monitoring service provider for all the businesses who wish take part in providing a Fire alarm devices and installation services

2 Key Assumptions

Etisalat proposal designed based on key assumptions as follows:

- Installers will provide their own product (Fire alarm devices).
- If any system modifications are required including but not limited to functionality, devices, middleware etc., Installer will be needed to take the Accreditation program again to ensure the compliance.
- Any delays in the execution of the testing not attributed to Etisalat may result in a contract variation to cover the additional costs incurred by Etisalat during that period.
- Participation will also involve the commitment of resources and costs by the Installer as they will incur costs to complete the accreditation and on-boarding program.

3 Accreditation and on-boarding process

Following are the steps proposed for Installers to accredited and onboarded on Hassantuk program

Step 1	Step 2	Step 3	Step 4	Step 5	Step 6
Installer Qualification	**Product Evaluation**	**Product Testin**	**System on-boarding, System Integration & Testing**	**Operational Onboarding**	**Operational Onboarding**
Company Evaluation Installer Agreement	Product Technical Evaluation Product Compliance Solution Evaluation	Device Testing UAE Lab Device Certification	System Onboarding System Integration End-to-End Testing	Operations Workshop Operations Accreditation Testing Deployment & Acceptance	Ready for Launch Transition to Business As Usual

4 (Step 1) - Installer Qualification

This section details the specifications and the requirements for initial qualification of the Installer to be successfully onboarded and accredited for Smart Fire alarm program.
During the Installer qualification phase, Etisalat will assist prospective installers in understanding the Hassantuk service and provide information on how to connect to Hassantuk.

Once an Installer has decided to be on-boarded to Hassantuk, System Integrator will ask the Installer to submit a registration form that outlines its business details and key contacts.

System Integrator will also ask for financial and company information to be evaluated for long term relationship execution, ensuring quality of installation and customer experience.

The qualification process will then go on to company evaluation. An installer must execute a Hassantuk Installer agreement with Etisalat before Etisalat and commence product and solution evaluation.

Following agreement execution, Etisalat will work cooperatively with Installer to evaluate the product and solution. At this point, the Installer will also provide the required product certifications.

5 (Step 2) – Product Evaluation

Following agreement execution, Etisalat will work cooperatively with Installer to evaluate the product and solution. At this point, the Installer will be required to provide the required product certifications, technical data sheets of the various product components and compliance matrix as outlined in the UAE fire code. If the product meets the qualification criteria Installer will be notified to provide the physical hardware to be tested by Etisalat UAE lab.

6 (Step 3) - Product Testing

This section details the technical specifications and the requirements for the smart fire alarm systems along with the system individual components point by point compliances as set out in UAE fire code and the civil defense smart fire alarm system design guideline.

Sections 7.2 & 7.1 will comprehensively detail the technical specifications and compliances required for the smart fire alarm devices and peripherals which include but not limited to detectors, sirens, call points, radio signal repeaters ...etc., and will also furnish the complete requirements for the overall system interoperability, interfaces, and integration capabilities

Section 7.3 will list the standard system resiliency standards as set out in Etisalat operational code and the current agreed service level for Hassantuk program.

Section 7.4 will share the standard Etisalat software specifications for the system platform/middleware and/or any further software components that may be required as part from the smart fire alarm E2E system.

6.1 Specifications and features of Smart Fire Alarms Monitoring Devices

- Detectors/Sensors (Heat/Smoke/Gas & Carbon Monoxide and/or or any additional detectors that may provisioned and annexed during the Term of this Contract) shall be able to send alarm, supervisory, and fault condition messages to the Fire Alarm Control Panel cum Alarm Transmission Equipment (ATE) and through the ATE and the provided middleware to the Etisalat IoT platform

- Smoke Detectors shall function using the Optical principle. These could be using obscuration of light intensity over a light beam path or the scattering of the light beam.

- Detectors/Sensors shall have a tamper switch, which raises an alarm to be sent to the Monitoring Receiver if the unit is tampered/ removed from the mounting base.

- Detectors installed shall be able to sound locally when activated, as well as to send a signal to others in the same network through wireless means such that all detectors of the same type are activated within the residential unit, in accordance with the evacuation sequence required (Multi-Station Alarm). (One go – All go).

- The devices shall have temporary 'zone disable' feature, which means a user in house can disable a detector temporarily. Once disabled the device should send the information of disablement to command control centre.

- The alarm touch-screen panel shall be suitable for installation within homes/villas, featuring an easy to use

touch screen display.

- The touch screen shall feature a soft button on the home page for manual initiation of fire alarm
- The panel shall feature the capability to add additional soft buttons via software/firmware upgrade, including Police, Ambulance, as future (software upgrade).

- The User Interface (UI) of the panel shall be in Arabic and English, for all alarm buttons as well as navigation and other display screens.

- All wireless peripherals, including detectors, panic push buttons, manual call points and repeaters, shall be wireless and battery operated, with battery lifetime of five (5) years. The panel and the control unit shall be equipped with battery having backup time of at least 24 hours standby and 30 minutes alarm.

- The panel shall be capable of interfacing with peripheral devices including: Detectors/Sensors, Manual call points.

- Wireless communication between the panel and the peripherals shall be encrypted and immune to interference.

- The proposed system components shall utilize unlicensed frequency bands in UAE for inter communication and shall be approved by the concerned regulatory authority in UAE, wherever applicable.

- The panel shall be capable of accepting bilingual (Arabic/English) push messages (push notifications broadcast SMS) that will be displayed on the home screen along with the alarm buttons. The system shall be capable of mass messaging as well as individual messages to each panel. Message can be sent as per customer's location from all the Signal Receiving Centre/Monitoring Centres. In case such feature is not available at the time of project kick-off, this shall be performed via remote firmware upgrade to the ATE panels, under the Contractor's responsibility, within three (3) months' timeframe from first P.O. issuance, or Contract/LOA signature, whichever is later.

- All devices shall have Etisalat/UAE Authority (i.e. Civil Defence, Ministry of Interior) customized branding on the body of the device within four months from awarding.

- The panels shall feature 2G/3G/4G/LTE/Next GEN. mobile communication technology as primary communication, and Wi-Fi as backup communications.

- The ATE shall support all frequency bands of 2G, 3G, 4G/LTE/ Next Gen. used in UAE.

- The ATE panel shall support remote configuration of various system parameters and settings.

- It shall be possible to make voice calls to the panels over the cellular connectivity.

- All peripherals connected to the panel as well as the panels own status shall be accessible and visible on the touch screen interface.
- The devices shall be capable of transmitting all alarms and events to two (2) or more destinations/receivers via Etisalat's cloud.
- The devices shall support segregating emergency and maintenance alarms, and communicating the alarms to different destinations/receivers, based on alarm type, for proper handling.
- The peripheral fire alarm devices (sensors) shall feature built-in sounders. The panel also shall feature built-in sounder for the annunciation of fire alarm.
- In the event of fire alarm, the panel and all Detectors installed in the villa shall sound together, for proper notification to the owner and tenants for evacuation.
- The solution shall have a software-based middleware receiver for aggregating the alarms and messages generated from the alarm panels.
- The panels shall communicate with the alarm receiver platform using standard protocols like Contact ID.
- The devices shall be capable to integrate with Etisalat IoT platform via REST APIs, for alarm management, analytics and geo-location. Any customization/development required on the software receiver to integrate with Etisalat IoT platform shall be the responsibility of the Contractor.
- The data traffic between the panel and the IP receiver shall be encrypted.
- The devices configuration and management shall be possible by a middleware.
- The proposed devices shall be certified and approved by Civil Defense, relevant authorities/codes, including UL, EN, NFPA, etc. as per UAE Authority current standards.
- The proposed system shall be provided with home automation features through a user-friendly mobile application as part of the scope. However, such features shall currently be locked for the end-user, and can be activated later-on by Etisalat.
- The Contractor shall ensure that in case of activation of home automation features for the end-user, the end-user shall not be able to edit/modify settings and parameters related to the fire alarm devices.
- The devices provided should have the capability of self-diagnostics and remote testing, troubleshooting and maintenance.
- The ATE shall provide the required output to activate other fire protection and suppression systems functions,

limited to the specifications explicitly mentioned herein.

- The devices shall be capable to identify the location or seat of fires in the villa and provide the required guidance.

- ATE shall be "Plug and Play" capable to facilitate the discovery of detectors/peripherals without the need for physical device configuration or user intervention in resolving resource conflicts during installation, provisioning and maintenance.

- The Contractor shall ensure that all technical features included herein are certified and standardized in line with the prevailing international standards (UL/EN/ANSI). In case of any conflict between international standards and the UAE Authorities regulations or requirements in regard to features/functionalities, a waiver from the relevant UAE Authority shall be obtained by the Contractor.

6.1.1 Specifications for Smart Monitoring devices for Homes

- Voice chime by zone.
- At least three alarm panic functions.
- Wall mounted
- Case tamper
- LED screen to receive messages in English/Arabic
- RF interference detection
- Hinged cover for easy installation
- Real-time clock display
- Zones and Devices
- Not less than 64 zones
- Support for wireless bidirectional keypads
- Integrated standard wireless communication module between the ATE and the devices
- Support for not less than 40 wireless devices (Wireless panic buttons, Smoke/Heat sensors, Gas sensors etc.)

6.1.2 Wi-Fi

- IEEE 802.11 B/G/N radio
- Supports alarm reporting and interactive services

6.1.3 Communication

- 2G/3G/4G/LTE/Next Gen. mobile network radio protocols
- SIA Format Reporting
- Internet central station communication with GSM
- GSM radio signal strength display

6.1.4 Alarm Output

- Built-In 85 dB sounder
- Steady output for panic
- Temporal pulse output for fire alarms
- Long range radio/audio alarm verification

6.1.5 System Power

- Primary power: plug-in power supply, 220VAC to 9VDC, 2.7A output
- 24hour backup battery
- Operating temperature: °32 F – °122 F (°0 C – °50 C)

6.2 Specifications and guidelines for Smart Fire Alarm Monitoring System (System)

- The devices shall be based on M2M and IoT technologies and shall integrate seamlessly with real-time monitoring framework.

- The functioning of the devices consists of fire/smoke/gas alarm monitor detector/sensors, control panel cum Alarm Transmission Equipment (ATE). The sensors detect the alarm and transmit seamlessly to Etisalat cloud platform on real-time for continuous monitoring and notification to Etisalat and Etisalat to notify Civil Defense/ Ministry of Interior Monitoring Centres by its platforms.

- Typical System installation varies as per the type of villa, depending on the availability of existing fire alarm monitoring system in the villa, hence, villa is classified as Green-field or Brownfield.

- For villas in which no fire alarm monitoring is available (Green-field Villas), the Contractor shall install wireless detectors/sensors, repeaters (if required), control panel cum ATE, power up and configure the device to ensure proper communication between the detectors and the ATE panel, and between the ATE panel and the receiver (i.e. the provided middleware on Etisalat Cloud) and Etisalat IoT platform.

- For villas in which the fire alarm monitoring system exists (Brown-field Villas), the Contractor shall supply and install new ATE panel along with other required components, connect it via dry-contacts to the existing panel or exiting control unit, power up and configure the device.

- The Contractor shall survey the villa to identify the number of Fire Alarm Monitoring devices required and collect other data/information as per the requirement of Etisalat, Local Civil Defense and MOI, and generate bill of materials required for the villa and upload the survey findings in the automated system.

- The Contractor shall inspect, test and certify the installation and functioning of the devices in accordance with the technical standards set by the UAE Fire Code and system requirement.

- The Contractor, upon Certification, shall be responsible for the replacement of faulty devices during the warranty period.

- All maintenance alarms, fault alarms and fire alarm in activation stage shall be routed to Etisalat's platform for the timely follow up and action.

- Any required enhancements on the devices by Etisalat, Civil Defense and MOI shall be part of the contracted scope to the extend these are explicitly mention herein at time of signature.

- The devices shall conform to the technical standards set out by the UAE Fire Code and the Guidelines for Fire Detection and Alarming in Residential Premises attached hereto as Part II/III

- The devices shall support the following features:

- Capability to configure ATE to delay the alarm by 15 seconds or any time requested by the authorities.
- Trouble and failure signals shall be reported within 200 seconds to Etisalat and Etisalat platform will send it to the civil Defense.
- Capability to send alarm traffic from the ATE via both 2G, 3G, 4G/LTE/Next Gen. or Wi-Fi as main and fallover.
- Capability to configure the supervision connection between ATE and Etisalat platform for 90 second or any time requested by the authority.
- Silence and reset Control Panel Locally.
- Disable detector temporarily as per the rules in the UL or EN specifications.
- The devices shall support the following alarms/notification
- Fire alarm from ATE soft button.
- Fire alarm from particular zone (with zone definition indicated).
- ATE general fault alarm.
- ATE power loss alarm.
- ATE low battery alarm.
- ATE tamper alarm.
- ATE offline/disconnected alarm.
- Zone/sensor fault alarm.
- Zone/sensor low battery alarm.
- Zone/sensor tamper alarm.
- Zone/sensor disconnected with ATE.
- FW /HW information

6.3 System Redundancy and Resiliency

- The supplied middleware shall be capable of a very high degree of availability (%99.9999). Such middleware availability will be under the responsibility of Etisalat as it's hosted at its cloud.

- The supplied devices shall be designed and realized to provide high security, reliability, fault tolerance and

easy maintainability.

- All configuration/customizing functions shall be performable online with minimum service outage.

6.4 Software

- All supplied middleware upgrades, updates and patches available during the warranty period shall be provided at no additional cost to Etisalat.

- Any planned middleware upgrades shall be implemented with agreed service interruption period.

- The performance of the supplied middleware shall not be limited by/affected due to the hardware settings such as date, regions, language etc.

- The devices shall be delivered with the latest version of the software that are prevailing at the time of certifying the device ready for service, irrespective of the version that has been supplied/contracted Testing and Debugging.

- The Contractor shall, jointly with Etisalat, conduct tests on the supplied middleware installed. The Contractor shall also remove any bugs/discrepancies middleware and re-run the acceptance tests again until all the tests are successfully concluded.

- The Contractor shall provide all relevant middleware permanent Licenses, middleware maintenance releases etc., for the devices. All middleware provided by the Contractor under this Contract shall be licensed for unlimited number of Users unless otherwise agreed between the Contractor and Etisalat.

- Etisalat shall have the right to use for lifetime without paying any additional fees for renewing licenses for all middleware supplied by the Contractor, inclusive of that which is developed / modified specifically by the Contractor for Etisalat. All such middleware supplied by the Contractor shall remain at the disposal of the Etisalat on a perpetual license basis for the lifetime of the system and shall not be have any renewable license fee.

- For middleware that are contracted on renewable license basis there shall not have any additional middleware costs other than the license fees.

- Etisalat shall have access to the Contractor's technical support center in the country of origin and shall benefit from new middleware upgrades and releases.

7 (Step 4) - System Onboarding, System Integration & Testing

This section details the requirements for the smart fire alarm systems along with the system individual components for the integration.

Etisalat will provide detailed technical and operational documentation, procedures and support to installers to assist with their internal system integration. Etisalat will work collaboratively with Installer to onboard the Installer product and system on Hassantuk platform before moving on to conduct end to end testing.

Following section outlines the key requirement for Installers system to be able to successfully integrate with the Hassantuk platform.

7.1 System Integration requirements for Installers

- Installer will be required to integrate with Etisalat system for Registration and activation of end-customer prior to the installation of the Fire alarm system.
- Installer will also be required for hosting the middleware platform within Etisalat cloud for Monitoring service

7.2 Installer Onboarding requirements

- Middleware that supports the transmission of Fire and also the maintenance alarms should be hosted within Etisalat cloud to ensure minimum latency
- Middleware should be cloud based
- Approved Installer must comply with all specification for Fire and Maintenance alarms for Monitoring and Governance. This is subject to change as per guidelines from MOI from time to time.
- The data traffic shall be encrypted

7.3 Registration/Maintenance & Activation

- Installer middleware and device must be capable to integrate with Monitoring Operator's platform via Rest APIs for Customer provisioning & monitoring services. Monitoring Operators will share the detailed API prior to onboarding
- Account fulfilment and Activation
- Customer Registration information
- Installer must provide the following registration information of the end customer to Monitoring Operator via Rest APIs

Type	Details
Order Reference Number	Monitoring Operator -generated Order Reference No. (primary key for each request)
Villa Address	Villa Number, Street address, Building Name, State, Makani, PO Box. Information to be provided in the format specified by Monitoring Operator
Villa Location	Coordinates of Villa where Fire alarm service will be installed
Villa Status	Occupancy (occupied / not occupied)
Contact Person Details	Name, Email, EID, Primary & Secondary Numbers, Contact Type (owner / tenant)
Customer Category	Category of the customer (e.g. individual, developer, etc.)

7.4 Account Assurance

Installer must provide the following information of the end customer to Monitoring Operator via Rest APIs for assurance activities to track the installation and any related issues

Type	Details
Request Status	Installation, Pending Payment, Activate Villa, Deactivate Villa, New Room Provisioning, Replace Faulty Device(s), Villa New Tenant
Error Status	Status, Error code, type, description Monitoring Operator will provide the standard Error/Fault resolution codes for Registration, Activation, Maintenance and Monitoring that Approved Installer must comply

7.5 User acceptance

Installer must conduct testing with Monitoring Operator prior to villa being accepted to go live for monitoring. The test cases should be executed by Installer and information to be sent to Monitoring service provided with the following details:

Type	Details
Testing Details	Test Case ID, Device Test Category, Device Test Result, Remark
Device details and allocation	Device Type, Device ID, Device Serial Number (optional), Building ID, Floor ID & Name, and Room ID & Name

7.6 End Customer Activation

Once the UAT is successfully executed, Installer will send the activation information to monitoring Operator.

Installer should provide details on all devices operating in the Villa to Monitoring Operator as part of activation of the Villa for monitoring

Installer will be required to provide the following information to successfully activate the device for Monitoring:

Type	Details
Device details and allocation	Device Type, Device ID, Device Serial Number, Building ID, Floor ID, and Room ID

7.7 Device Amendment

Any change in the installed devices within villa will require the Installer to update the details of devices.
Following the details that are required to activate additional devices for the monitored villa

Type	Details
Account Number	Monitoring Operator -generated account number
Device details and allocation	Device Type, Device ID, Device Serial Number, Building ID, Floor ID, and Room ID

7.8 Real time monitoring

The functioning of the System consists of fire/smoke/gas alarm monitor detector/sensors, control panel and Alarm Transmission Equipment (ATE). The sensors detect the alarm and transmit seamlessly to Monitoring Operator cloud platform on real-time for continuous monitoring and notification to Monitoring Operator

7.8.1 Alarm aggregation

Installer shall have a software-based Middleware receiver for aggregating the alarms and messages generated from the alarm panel

7.8.2 Alarm Notification

Approved Installer should Integrate with Monitoring Operator platform via Rest APIs/MQTT, for Alarm management, analytics and Geo location. Any customization/development required on the software receiver to integrate with Monitoring Operator.

7.9 Alarm monitoring service

Installer will be required to install the system which is capable of transmitting the fire alarm and or maintenance alarm on the real time basis to IOT platform of Monitoring Operator.

7.9.1 Alarm transmission

The system shall be capable of transmitting all alarms and events to two (2) or more destinations/receivers
The system shall be capable of handle multiple categories of alarms including fire alarms and maintenance alarms including but not limited to:

1) Fire - Exact room, zone, Device category - Smoke Detector, Heat Detector, CO Detector, Manual Panic
2) Maintenance - AC Loss, System Trouble, ATE or Sensor Offline, Tamper, Battery Level Alerts, Heartbeat
3) Response from Monitoring Operator - Acknowledgement, Action Taken

7.9.2 Alarm categorization

The system shall support segregating emergency and maintenance alarms, logging all alarms sent and communicating the alarms to different destinations/receivers, based on alarm type, for proper handling

7.9.3 Alarm notification

Installed system must provide all alarms and not withhold any alarms. Alarm notification for detected alarms should be real-time with the following minimum information:

(1) Relevant fire/maintenance alarm status and classification code
(2) Full source name - Device ID, Building ID, Floor ID, Room ID
(3) Timestamp
(4) Take Action ID

8 (Step 5) – Operational Onboarding & Governance

At the successful conclusion of the end to end testing and integration completion, Etisalat will commence operational on-boarding that will culminate in production deployment and acceptance. As part of operation onboarding Etisalat will establish the Governance process with Installer.
Approved Installer will be required to meet the Set KPIs for system performance including customer complaints and requests. In order to effectively govern and report the KPIs to respective authorities Installer will be required to report on various aspects for the system installed such as and not limited to activations, false alarms etc.

In order to govern the KPIs following requirements should be fulfilled by the installer

- Ticketing system - Installer needs to have a ticketing system integrated with Monitoring Operator ticketing system for automated creation of Incident.
- Hotline support - An emergency hotline service should be provided by Approved Installer to respond to fault and maintenance calls from Villa owner.
- Escalation Matrix - Installer must provider should provide an Escalation matrix
- Standard operating procedures - Standard Operations procedures of Monitoring Operator will be applied for governance which will be provided at the time of Installer onboarding
- Data analysis and ownership - Installer must provide Monitoring Operator access to all data related to Fire and Maintenance alarm. Monitoring Operator will have the data ownership and data governance for all Fire and Maintenance alarms

9 (Step 6) – Ready for Launch

At this point the Installer can start ordering on the Hassantuk platform and process concludes with transition to business as usual.

10 Installer Capability on Hassantuk Platform

Etisalat will develop the Installer Capability on the Hassantuk platform in phases:

1. Phase 1 Construction - Design, Development and Testing
2. Phase 2 Trial Phase – Initial technical testing with selected Installers and end users
3. Phase 3 First Commercial Service – Launch with one of the selected Installer
4. Phase 4 Ready for Service – Ready for onboarding Installers

Annex C

RECOMENDED RECORD OF COMPLETION AND MONITORING

(Information/ Form to be handed over to Villa Owner and CD after each Installation by Approved Installer)

1. PROPERTY INFORMATION

Name of Property: _____

Address: _____

Description of Property: _____

Villa Type: _____

Name of Occupier (Person responsible) _____ (If rented out) _____

Name of Property Representative (Owner): _____

Address: (if different from above) _____

Phone: _____ Fax: _____ Email: _____

CD Authority for this Property: _____ (Station, Ops Room) _____

Phone/Contact Number/email:

Responsible persons in premises to be contacted in Alarm (Priority List)	Tel Number	Alt Telephone Number	Relationship

2. INSTALLATION, SERVICE AND TESTING CONTRACTOR INFORMATION

2.1 Approved Installer

Name of Installer: _____

Address: _____

License/Approval Number: _____

Contact Person: _____

Phone: _____ Fax: _____ Email: _____

2.2 Maintenance:

Name of Contractor: _____

Address: _____

License/Approval Number: _____

Contact Person: _____

Phone: _____ Fax: _____ Email: _____

Phone :7/24 Contact: _____

Effective Date of Maintenance Coverage: _____

3. DESCRIPTION OF SERVICES PROVIDED (Pl Tick)

- Fire Detection System:

Smoke _____ Heat _____ Carbon Monoxide _____ Gas _____

Wired: _____ Wireless _____

- Fire Alarming System

Fire alarm Panel _____

Automatic Transmitting Equipment _____

Combination Fire Alarm /Transmitting Equipment _____

- Fire Monitoring System

Connection from existing Detection system and Fire alarm Panel

to ATE _____

Connection of new Detection system to FACU/ATE _____

Connection from FACU /ATE to Signal Receiving Centre _____

Connection to CD Ops Room _____

4. CONTROL UNIT (FACU/ATE)

Manufacturer: _____

Model No: _____

Serial Number: _____

Location: (In premises): _____

Number of Initiating Devices connected to SRC for Verification: _____

5. SIGNAL TRANSMISSION AND MONITORING(SRC)

Name of company receiving signals from Control Unit: _____

Contact Number: _____ Email: _____

CD Monitoring Centre to which Alarms/verifications

are transmitted _____

Contact Number: _____ Email: _____

6. ALARM INITATING DEVICES

6.1. Automatic Initiating Devices;

6.1.1 Smoke detectors

Type and number of detectors: Addressable _____ Conventional _____

Type of coverage: Complete area _____ Partial Area _____ Non required _____

Type of Smoke Detector Sensing technology:

Photo electric: _____ Others: (If any) _____

Power source: _____

Model Type: _____

6.1.2 Heat Detectors

Type and number of detectors: Addressable _____ Conventional _____

Type of coverage: Complete area _____ Partial Area _____ Non required _____

Type of Heat sensing Technology:

Fixed Temp: _____ Rate of Rise: _____ Rate Compensated _____

Model Type: _____

6.1.3 Gas Detectors (If any)

Type of Detectors: _____

Manufacturer's Model: _____

Number: Addressable _____ Conventional: _____

Model Type: _____

6.1.4 Annunciators

Type: Built Alarms in Detectors _____ External Sounders _____

Location of Initiating Devices in Residential Villa							
Location Room/ Passageway/ open area etc.	Type	Model no	Serial Number	Date of Testing			

7. SYSTEM POWER

7.1 Control Unit

Primary Power: _____ Back up: _____

7.2 Initiating Devices:

Primary Power: _____ Secondary Power: _____

8. RECORD OF INSTALLATION

New system _____ Modification/Addition to an existing system _____

System Installation is in accordance with_ (state Guidelines/standard) _____

Any System Deviations: _____

9. RECORD OF SYSTEM OPERATIONAL ACCEPTANCE TEST

This system as, specified, has been installed and tested in accordance to the UAE Guidelines for Fire detection, Alarming and Monitoring for Residential Villas 2020.

9.1 System Installation

Name of Installer _____ Organization: _____

Signed: _____ Date of Test : _____

Results: _____

9.2: Alarm Signal receiving and verification Monitoring Operator:

This system, will be tracked and monitored by the undersigned according to the UAE Guidelines for Fire Detection, Alarming and Monitoring for Residential Villas 2018

Name of Monitoring Operator: _____

Organization: _____

Contact No: _____

Emergency Number: _____

Effective Date of Monitoring: _____

Annex D

APPROVED INSTALLER: PROPOSED FEES SCHEDULE
(Minimum X must be submitted)

	DESCRIPTION	APPROVED MODEL / CODE	UNIT CHARGE	ONE TIME CHARGE
	WIRELESS SYSTEM FOR EXISTING VILLAS			
1	Wireless FACU/ATE Device			
2	Wireless Smoke Detector		X	
3	Wireless Heat Detector		X	
4	Wireless Gas Detector		X	
5	Wireless Repeater		X	
6	Wireless Indoor sounder		X	
7	Wireless Indoor flasher		X	
8	Wireless I/o Module		X	
	(any other devices offered)	(if any the AI chooses to offer, will not be regulated)		
	WIRED SYSTEM FOR NEW VILLAS			
1	Wired FACU/ATE Device		X	
2	Wired Smoke Detector		X	
3	Wired Heat Detector		X	
4	Wired Gas Detector		X	
5	Wired Indoor Sounder		X	
6	Wired Indoor Flasher		X	
7	Cabling (Fire Rated 1 hr)		X	
	(any other devices offered)	(if any the AI chooses to offer, will not be regulated)		
	SERVICES OFFERED			
1	Design, Plan submission and Approval Fees			X
2	Installation Fees			X
3	Setup with Signal Receiving Centre including Testing and Commissioning full system			X
4	-2year Maintenance Fee (Mandatory)			X

PART II

FIRE AND LIFE SAFETY GUIDELINES FOR RESIDENTIAL VILLAS

2020

CHAPTER 1: INTRODUCTION

CHAPTER 2: SCOPE AND APPLICABILITY

CHAPTER 3: DEFINITIONS

CHAPTER 4: CONSTRUCTION
FIRE RESISTANCE RATING OF VILLA
WINDOWS
TENTS

CHAPTER 5: MEANS OF EGRESS
EXIT ARRANGEMENTS
STAIRWAY
DOORS
HALLWAY

CHAPTER 6: FIRE AND LIFE SAFETY SYSTEMS
FIRE EXTINGUISHERS
EMERGENCY LIGHTING
FIRE DETECTION AND ALARM SYSTEM
FIRE PROTECTION SYSTEM
SMOKE MANAGEMENT SYSTEM

CHAPTER 7: LIQUEFIED PETROLEUM GAS (LPG) SYSTEMS
GENERAL LDG SAFETY
INSTALLATION OF LPG CYLINDERS
INSTALLATION OF LPG CENTRAL TANKS

CHAPTER 8: EMERGENCY PREPAREDNESS
EMERGENCY ACTION PLAN
FIRE DRILLS

CHAPTER 9: RESPONSIBILITIES OF FAMILY MEMBERS

Fires in residential properties are one of the priority areas of concern in the UAE. The largest number of fires, and also the potential risk to the vulnerable and infirm such as young children and the aged who are physically impaired, makes villas as an area of high human loss potential. As most other occupancies are now well protected by Fixed Protection and Extinguishing Systems as part of essential requirements by the UAE Fire Code, it is now considered a priority to improve the overall level of safety in our residential houses, in particular our private villas. The mandatory requirement for private villas has recently been approved by ministerial decree for implementation across the UAE. Consequently, all new villas around UAE must be approved by Civil Defense. This guideline shall cover the new private villa fire and life safety requirements.

This Fire and Life Safety Requirements for Residential Villas are the minimum guidelines to be followed, principally by all the new villas in the UAE. These guidelines are derived and are excerpts from the UAE Fire and Life Safety Code of Practice, edition 2018, with some additional requirements to complement the new Guidelines for Fire Detection and Alarming and Monitoring Systems for Residential Premises introduced in 2018.

It should be mentioned that this Fire and Safety Requirements for Villas are generally applicable to both private and commercial villas. While these cover principally private villas, in the case of commercial villas, other additional and detailed requirements such as Fire Access Roads, means of egress, Fire protection systems, as found in the UAE Fire and Life Safety Code of Practice, Edition 2018, shall also be applicable.

This document provides the basic code requirements. Where applicable, the various CD Authorities from the relevant Emirates may choose to make additional measures and Regulations concerning overall Fire Safety in Residential villas, in addition to these Guidelines to meet local needs. For detailed design, system applications, Installation details and material test requirements UAE Fire and Life Safety Code of Practice, edition 2018 shall be followed.

3.1 Shall

It is a mandatory requirement from Civil Defense

3.2 Should

It is a suggested requirement recommended by Civil Defense but not mandatory.

3.3 Listed

Approved and registered by individual Emirates' Civil Defense material department.

3.4 Fire

A process in which substances combine chemically with oxygen from the air and typically give out bright light, heat, and smoke; combustion or burning.
Four elements must be present for fire to occur, fuel, heat, oxygen, and a chemical chain reaction. Removal of any one of these essential elements will result in the fire being extinguished.

3.5 Smoke

The airborne solid and liquid particulates and gases evolved when a material undergoes pyrolysis or combustion, together with the quantity of air that is entrained or otherwise mixed in to the mass.

3.6 Fire scenario

A fire scenario is a set of conditions and events that characterizes the development of fire, the spread of combustion products, the reactions of people, and the effect of combustion products.

3.7 Hazard

A condition that presents the potential for harm or damage to people, property, environment, mission, or cultural heritage.

3.8 Risk

The paired probabilities and consequences for possible undesired events associated with a given facility or process.

3.9 Emergency action plan

A pre written and agreed plan, procedure and strategy, particular to certain building or occupancy, where actions required by designated personnel and procedures to be followed is addressed and documented. Such an emergency action plan is usually jointly prepared by the building owner, occupants or responsible person (Residents) in the Villa.

3.10 Evacuation

Immediate transfer of people away from the emergency situation and location to a point of safety. In a safe and designated area outside the villa.

3.11 Occupant

A person occupying the building permanently or temporarily as a occupier, sheltered, resident, tenant, employee,

staff, user, visitor, lease holder, inhabitant and using the building for living or working or playing or occupation.

3.12 Responsible

The requirement of being liable to fulfill duties and answerable to fulfill accountability.

3.13 Stake holder

Stakeholder is a collective term involving investor, owner, participating parties, service providers (architects, consulting engineers, installation contractors, inspection agencies, maintenance contractors etc.), profit makers, interested parties, third parties and caretakers involved in the project development, design, construction, installation, inspection and maintenance.

3.14 Owner

A person who is the proprietor and possesses the legal authority from government to own the particular land, property, assets, structure, businesses or material.

3.15 Building Area

The total area within surrounding exterior walls (or exterior walls and fire walls) exclusive of vent shafts and courts. Areas of the building not provided with surrounding walls shall be included in the building areas if such areas are included within the horizontal projection of the roof or floor above.

3.16 Plot area

The plot area is the total area available under the 'Plot Number', including the ground floor area on which buildings and structures are built, set back areas, landscaping areas, parking areas and open spaces available part of such that plot area.

3.17 Built-up area

The total floor areas of the buildings and structures including carpet areas, wall thickness, column thickness, stair shafts, elevator and service shafts of all the floors, including mezzanines.

3.18 Property line

Line dividing one lot from another, or from a street or other public space.

3.19 Fire resistance rating

The period of time a building element, component or assembly maintains the ability to confine a fire, continues to perform a given structural function, or both.

3.20 Smoke compartment

A space within a building enclosed by smoke barriers on all sides, including the top and bottom.

3.21 Fire compartment

A space within a building enclosed by specific fire rated Fire Walls, fire rated opening protective on all sides, including the top and bottom.

3.22 Cladding

Cladding, other than thermal barrier and Sandwich Panels is a non-structural covering installed over structural surfaces. It is usually in Metal Composite Materials (MCM) but it is also available in a variety of building materials and made to tolerate extreme weather conditions.

3.23 Combustible material

A material that, in the form in which it is used and under the conditions anticipated, will ignite, burn, support combustion or release flammable vapors when subjected to heat and fire.

3.24 Non-combustible material

A material that, in the form in which it is used and under the conditions anticipated, will not ignite, burn, support combustion or release flammable vapors when subjected to heat and fire. And a non-combustible material is certified as "passes" when tested as per ASTM 136, Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 7500C.

3.25 Limited combustible material

A material which does not comply with "Non-Combustible Material" definition. And the Material in the form in which it is used when tested as per NFPA 259, Standard test Method for Potential Heat of Building Material, exhibits a potential heat value not exceeding 3500 Btu/ lb. (8141 Kj/kg).

3.26 Liquefied petroleum gas (LPG)

Liquefied petroleum gas is classified as flammable, liquefied, and fuel. Any material having a vapor pressure not exceeding that allowed for commercial propane that is composed predominantly of the following hydrocarbons, either by themselves or as mixtures: propane, propylene, butane (normal butane or isobutene), and butylene's. LPG is stored in liquid form at high pressures. Because the LPG is twice heavier than air, if leaked from container, flows back to lower levels and accumulates around container. Most commonly used cooking fuel in UAE is LPG.

3.27 Liquefied natural gas (LNG)

Liquefied natural gas is classified as flammable, cryogenic, and fuel. Any material having a vapor pressure not exceeding that allowed for commercial propane that is composed predominantly of the following hydrocarbons, either by themselves or as mixtures: propane, propylene, butane (normal butane or isobutene), and butylene's. LNG is stored in liquid form at high pressures.

3.28 Compressed natural gas (CNG)

Compressed natural gas (CNG) is natural gas, Methane stored at high pressure. CNG is stored in gas form at high pressures. CNG is lighter than air and when leaked from containers, disperses up into air above.

3.29 Substitute natural gas/ synthetic natural gas (SNG)

Synthetic Natural Gas (SNG) is a blend of Liquefied Petroleum Gas (LPG) and diluent. The possible diluents are Biogas, Digester Gas, Landfill Gas, Nitrogen and Compressed Air. However, the commonly used diluents is compressed Air. SNG provides direct replacement for Natural Gas. SNG is lighter than LPG and can only be supplied through piping network from a blending bulk plant.

3.30 LPG system

An assembly consisting of one or more containers with a means for conveying LP-Gas from a container to dispensing or consuming devices that incorporates components that control the quantity, flow, pressure, and physical state (liquid or vapor) of the LP-Gas.

3.31 LPG cylinder

An approved container designed to be moved readily, as opposed to a container designed for stationary installations

3.32 LPG Tank

An approved container either vertical or horizontal, designed for stationary and permanent installations.

3.33 Residential

An occupancy, other than Villa that provides sleeping accommodations with independent cooking and bathroom facilities where people live on a permanent basis.

3.34 Private Villa

Single family dwelling unit, generally ground with first floor, built and solely owned by individual on the individual plot.

3.34.1 Group A villa

A. Private Villa with basement and basement car park.

B. Private Villa with marine front.

C. Private Villa on island.

3.34.2 Group B villa

A. Private Villa without any basement.

3.35 Commercial Villa

One or Two family dwelling units built in a group by developer and sold, leased or rented to individual families. Mosques, community halls, recreation facilities may also be part of this development.

3.36 Tent

A temporary structure, the covering of which is made of pliable material that achieves its support by mechanical means such as beams, columns, poles, or arches, or by rope or cables, or both. Locally tents are occupied as Ramadan Tents, Exhibitions, Marriages, funerals, Party, entertainment, Dining or meetings.

3.37 Basement

Any story of a building wholly or partly below grade plane that is not considered the first story above grade plane.

3.38 Ramp

A walking surface that has a running slope steeper than %5 slope.

3.39 Occupied area

Area that is intended for occupancy.

3.40 Unoccupied area

Area that is intended only for equipment and machinery providing services with periodic visits by personnel for repair and maintenance. However, with respect to the use of clean agent systems, the LV rooms, transformer rooms, telephone rooms, generator rooms and other such equipment/ machinery rooms located in the occupied buildings or attached to occupied buildings, are not considered as unoccupied area because of the proximity of these rooms to public movement and the possible adverse effects of clean agents.

3.41 Means of egress

A continuous and unobstructed way of travel from any point in a building or structure to a public way consisting of three separate and distinct parts: (1) the exit access, (2) the exit, and (3) the exit discharge.

3.42 Exit access

That portion of a means of egress that leads to an exit.

3.43 Exit

That portion of a means of egress that is separated from all other spaces of the of building or structure by construction, location or equipment as required to provide a protected way of travel from Exit access to the exit discharge.

3.44 Means of escape

A way out of a building or structure that does not conform to the strict definition of means of egress but does provide an alternate way out.

3.45 Exit passageway

An Exit component that is separated from other spaces of a building or structure by fire resistance rated construction and opening protective, providing a protected path of egress travel in a horizontal direction to exit discharge or public way or outside building. Additional uses for the exit passageway include stair transfer in upper floors as well as to reduce travel distance to an exit by having an exit passageway lead to a stair of exit discharge.

3.46 Exit corridor

An Exit component that may or may not be separated from other spaces of a building or structure by fire resistance rated construction and opening protective, providing a path of egress travel in a horizontal direction to exit or exit passageway.

3.47 Exit access doorway

A door or access point along the exit path from an occupied room, area or space where the path of egress enters room, corridor, unenclosed exit access stair or unenclosed exit access ramp.

3.48 Exit stair

An Exit component that is separated from other spaces of a building or structure by fire resistance rated construction and opening protective, providing a protected path of egress travel in a vertical direction to exit discharge or public way or outside building.

3.49 Spiral Stairway

A stairway having a closed circular form in its plan view with uniform section-shaped treads attached to and radiating from a minimum-diameter supporting column.

3.50 Handrail

A horizontal or sloping rail intended for handhold and grasping by the hand for guidance or support.

3.51 Guard

A vertical protective barrier erected along elevated walking surfaces, exposed edges of stairways, balconies and similar areas that minimizes the possibility of fall from elevated surfaces to lower level.

3.52 Door

Any combination of a door panels, frame, hardware, and other accessories that is placed in an opening in a wall that is intended primarily for access or for human entrance or exit.

3.53 Common path of travel

The portion of exit access that must be traversed before two separate and distinct paths of travel to two exits are available.

3.54 Travel Distance to exits

The portion of exit access that must be traversed before reaching an exit, which is measured along the natural path of travel on the floor or walking surface.

3.55 Dead end corridor

The portion of corridor that when traversed leads to no exit at the end that portion has to be traversed back to get to reach a choice of exits and is measured along the natural path of travel, on the floor or walking surface.

3.56 Accessible

A site, building, a facility or portion thereof, exterior or interior, public or private spaces having features in their design and constructions that enable disabled people to maneuver as easily as abled people.

3.57 Accessible route

A continuous, unobstructed path that provides "accessibility" as defined above.

3.58 Portable fire extinguisher

Portable fire extinguishers are intended as a first line of defense to cope with fires of limited size. They are needed even if the property is equipped with automatic sprinklers, standpipe and hose, or other fixed protection equipment.

3.59 General use residential fire extinguisher

A fire extinguisher that has been specifically investigated, tested, and listed for use only in and around the home (one- and two-family dwellings and living units within multifamily structures) for the purpose of suppressing or extinguishing a fire.

3.60 WCarbon Dioxide

A colorless, odorless, electrically nonconductive inert gas that is a suitable medium for extinguishing Class B and Class C fires.

3.61 Dry Chemical

A mixture of finely divided solid particles, usually sodium bicarbonate-, potassium bicarbonate-, or ammonium phosphate–based with added particulate material supplemented by special treatment to provide resistance to packing, and moisture absorption (caking), and to promote proper flow characteristics.

3.62 Wet Chemical

Wet chemicals include, but are not limited to, solutions of water and potassium acetate, potassium carbonate, potassium citrate, or any combinations thereof.

3.63 Dry Powder

Solid materials in powder or granular form designed to extinguish Class D combustible metal fires by crusting, smothering, or heat-transferring means.

3.64 Exit Sign

An Exit Sign is a visual marking with text and pictorial sign in a facility denoting the identification of an exit in case of fire or other emergency.

3.65 Exit directional sign

A Directional Exit Sign is a visual marking with text and pictorial sign in a facility denoting the direction and route to reach the closest emergency exit in case of fire or other emergency.

3.66 Photo luminescent signs

Signs made up of Photo luminescent material where luminescence (visible light) results from the absorption of light or infrared or ultraviolet radiation.

3.67 Illumination

The intensity of light falling on a surface, the luminous flux incident per unit area, expressed in lumens per unit of area Intensity of lighted surface.

3.68 Lux level

The SI unit of illumination equal to a luminous flux of 1 lumen per square meter. 1 lux = 0.0929 foot-candle.

3.69 Emergency lighting

The lighting that is for use to illuminate means of egress when there is a mains power or circuit failure.

3.70 Self-contained emergency lighting

An emergency luminary that houses all the electrical components. Typically, a light source, control gear and battery.

3.71 Monitored type emergency lighting

A set of self-contained emergency lighting luminaries that is wired to control units to monitor and diagnose the health of the circuit and batteries.

3.72 Fire alarm

A signal activated by the alarm system to warn of emergency conditions that require immediate action by all occupants of the affected area.

3.73 Bell

An electro-Mechanical device used to produce audible signals.

3.74 Horn

A funnel-like device used for emitting audible signals different from bell sounds.

3.75 Decibels

Decibel (dB) is a measurement unit of sound pressure level, it equals one tenth of a Bell, which is the decimal logarithm of ratios between two quantities.

3.76 Smoke detector

A device used for detecting visible and invisible particles of smoke resulting from combustion. Several operating principles are used for detection; examples include; photoelectrical and Ionization spot-type detectors, Air-sampling type and optical beam-type smoke detectors.

3.77 Heat detector

A fire detector that detects either abnormally high temperature or rate of rise, or both.

3.78 Flame detector

A device used for detecting infrared and ultraviolet rays emitting from flames.

3.79 Multi sensor detector

A device that contains multiple sensors that separately respond to physical stimulus such as heat, smoke, or fire gases, or employs more than one sensor to sense the same stimulus. A device capable of generating multiple alarm signals from any one of the sensors employed in the design, independently or in combination. The sensor output signals are mathematically evaluated to determine when an alarm signal is warranted. The evaluation can be performed either at the detector or at the control unit. This device has listings for each sensing method employed.

3.8 Manual call point, manual pull station

Manual operation device used to activate the fire alarm.

3.81 Control Panel

A component of the fire alarm system, provided with primary and secondary power source, which receive signals from initiating devices or other fire alarm control units, and processes these signals to determine part or all of the required fire alarm system output functions.

3.82 Wireless control unit

A component that transmits/ receives and processes wireless signals.

3.83 Bar

Unit of measurement for pressure. Though it is not a SI unit, it is a common practice to use this unit of measurement in fire protection.

1 Bar = 14.5 psi.

1 psi = 0.0689 bar.

3.84 US Gallons

Unit of measurement for volume. Though it is not a SI unit, it is a common practice to use this unit of measurement for water volume in fire protection.

1 Gal. = 3.785 L (Liters)

1 L = 0.264 Gal.

1 Cubic Meter = 1000 L

1 Cubic Meter = 264.17 Gal.

3.85 Gallons per minute (GPM)

Unit of measurement for flow. Though it is not a SI unit, it is widely a practice to use this unit of measurement for water flow per square feet in fire protection. 1 GPM (GPM/minute) = 3.78 Liter/minute (LPM).

3.86 Automatic Sprinkler

A fire suppression or control device that operates (bursts) automatically when its heat-activated element is heated to its thermal rating or above, allowing water to discharge over a specified area.

3.87 Automatic sprinkler system

For fire protection purposes, the sprinkler system installation includes one or more automatic water supplies. The portion of the sprinkler system is a network of specially sized or hydraulically designed piping installed in a building, structure, or area, generally overhead, and to which sprinklers are attached in a systematic pattern. The valve controlling each system riser is located in the system riser or its supply piping. Each sprinkler system riser includes a device for actuating an alarm when the system is in operation. The system is usually activated by heat from a fire and discharges water over the fire area.

3.88 Hydraulically designed system

A calculated sprinkler system in which pipe sizes are selected on a pressure loss basis to provide a prescribed water density, in gallons per minute per square foot (mm/min), or a prescribed minimum discharge pressure or flow per sprinkler, distributed with a reasonable degree of uniformity over a specified area.

3.89 Pipe schedule system

A sprinkler system in which the pipe sizing is selected from a schedule that is determined by the occupancy classification and in which a given number of sprinklers are allowed to be supplied from specific sizes of pipe.

3.90 Smoke management

A smoke control method that utilizes natural or mechanical systems to maintain a tenable environment in the means of egress from a large-volume space or to control and reduce the migration of smoke between the fire area and communicating spaces.

3.91 Natural ventilation

A method of supplying or removing, air from a space through openings on the exterior of a building, using natural air movement from the outside.

3.92 Mechanical ventilation

A method of supplying or removing, air from a space with aid of mechanically operated equipment such as Fans and ductwork.

3.93 Smoke exhaust system

A mechanical or gravity system intended to move smoke from the smoke zone to the exterior of the building, including smoke removal, purging, and venting systems, as well as the function of exhaust fans utilized to reduce the pressure in a smoke zone. Achieving tenable environment for egress is not the scope of these kind of systems.

In this chapter you will find:

- Fire Resistance Rating of Villa
- Windows
- Tents

4.1 Fire Resistance Rating of Villa:

4.1.1 Villas shall be constructed of block work. Cement boards, concrete precast panels. However, construction type II (111) and type II (000) are acceptable.

4.1.2 Where two or more villas have common wall between them, such a wall shall be -2hour fire resistance rated if villas are not sprinkled and -1hour fire resistance rated if villas are sprinkler protected.

4.1.3 Where villas have commercial, retail or storage facilities attached to them, villa shall be separated from such attached facilities with -2hour fire resistance rated wall if villas are not sprinklered and -1hour fire resistance rated wall if villas are sprinkler protected. Such fire resistance rated wall shall be from foundation to roof.

4.1.4 Where cladding such as Aluminum composite panels, metal composite panels, Exterior Insulation and Finish Systems (EIFS), External Insulation Composite System (ETICS), polycarbonate panels, sandwich panels, GRC panels and such exterior combustible materials are used on the villa façade, they shall comply with UAE Fire and Life Safety Code of Practice, Chapter 1, Section 4 specifications.

4.1.5 Private Villas, Commercial Villas and Agricultural buildings are exempted from having fire rated/ listed roof assemblies or rooftop structures.

4.1.6 Villa facades having materials such as concrete panels and natural stones are acceptable without any material testing and listing by Civil Defense.

4.1.7 Villa construction types shall comply with UAE Fire and Life Safety Code of Practice, Chapter 1 specifications.

4.2 Windows:

4.2.1 Minimum Construction Requirements for Windows (Reconsider);

4.2.1.1 Window security grills and expendable security bars impede general escape in case of fire emergency and should only be used where necessary. If used, any security grills in bedroom windows should be openable from the inside, to allow occupants as a secondary means of egress.

4.2.1.2 Openable Windows shall not be located at (F), a height less than 865 mm from the finished floor surface level. If window base is present on the finished floor, the height (F) shall be measured from the top of such window base (See Figure 4.1).

4.2.1.3 The windowpane, if openable, shall not create a gap of more than (G), 125 mm from the wall, when opened (See Figure 4.2).

4.2.1.4 The window assembly, shall have reinforced or safety glass and shall be able to withstand a single concentrated load of 200 pounds (0.89 KN), applied in any direction at any point.

4.2.1.5 There should not be any construction features at the bottom of the window which can be exploited into 'ladder or climbing feature'.

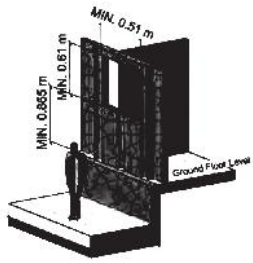


Figure 4.1

Figure 4.2

4.3 Tents:

4.3.1 Minimum horizontal separation between Tents and villa, including other tents shall not be less than 3m.

4.3.2 Such separation distance between tents shall not be required if tent area is less than 110m2.

4.3.3 Maximum height shall not exceed 2.8 m.

4.3.4 The finished ground level enclosed by the structure, and the surrounding finished ground level not less than 3 m outside of the structure, shall be cleared of all flammable or combustible material and vegetation.

4.3.5 Smoking, cooking, Flammable and combustible storage shall not be allowed inside the tents.

4.3.6 Tent material shall be tested, listed and approved by Civil Defense in compliance with UAE Fire and Life Safety Code of Practice, 2018, Chapter 1, Section 7.1.42.

In this chapter you will find:

- Exit arrangement
- Stairways
- Doors
- Hallways

5.1 Exits:

5.1.1 Number of exits;

5.1.1.1 Every villa shall have two exit doors at ground floor. Main entrance door is considered as one of the required two exits. Required second exit door shall be remote and shall have a separation distance from main entrance door of not less than one-half diagonal dimension of the entire ground floor area.

5.1.1.2 Where villa has first floor connected to ground floor by a stair, such a stair shall also continue and lead unobstructed to the roof, open to sky (See Figure 5.1).

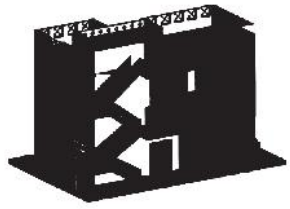


Figure 5.1

5.1.1.3 A means of egress through roof from where a fixed stair either steel or concrete or spiral stair leading to the ground is highly recommended as second primary means of escape.

Figure 6.ure 6.2

5.1.1.4 Every sleeping room and every living area of a private villa shall have primary, means of escape (Which can be a door, stairway or ramp providing a means of unobstructed travel to the outside and a secondary means of escape. Civil Defense highly recommends second primary escape from every sleeping room.

5.1.1.5 The secondary means of egress can be any of the following;

a. Door, Stairway or ramp, remote from primary exit, leading to outside.

b. A passage through an adjacent non lockable space, set back area, remote from primary exit and leading to outside.

c. A permanent stair reaching to roof and from roof an outside stair, either spiral, steel or standard, leading to level of discharge remote from primary exit.

d. An operable window on the exterior wall, measuring not less than 510 mm in width and 610 mm in height, with a clear opening not less than 0.53 m2, and having its bottom not more than 865 mm from finished ground floor (See Figure 4.1).

5.1.1.6 Where any floor within villa exceeds 500 m2, two primary means of escape remote from each other shall be provided.

5.1.1.7 Spiral stairs, winders and open stairs shall be permitted in other than access and exit from basements.

5.1.1.8 Every basement having parking spaces shall have standard enclosed exit stair leading to ground floor or discharge level. The parking driveway ramp shall be acceptable as the required second exit from the basement.

5.1.1.9 Where villa basement has no parking space and driveway ramp, a second means of egress shall be provided. Such a second exit from basement can be open steel stair way.

5.1.1.10 Any access to the required exits, primary or secondary, shall not pass through the kitchen, either open or enclosed.

5.1.2 Specification of Exit stair;

5.1.2.1 The minimum required width of the primary exit stair shall not be less than 1200 mm and shall satisfy the egress capacity. The secondary exit stair, where provided, shall not be less than 1000 mm.

5.1.2.2 Stair width shall not decrease in width along the direction of egress travel. The required width of a stair shall be measured from wall to the clear available width of the step. The maximum projections of handrails allowed in this required width is 100 mm on each side, at a height of 865 mm—965 mm.

5.1.2.3 Maximum height of riser shall not exceed 180 mm. Minimum height of riser shall not be less than 100 mm.

5.1.2.4 Riser heights shall be uniform throughout each stair flight between landings. Where riser heights are adjusted to comply with acceptable stair treads, flights and arrangements, the maximum difference of dimension allowed in a flight is 10 mm.

5.1.2.5 Minimum stair tread depth shall not be less than 280 mm. The tread slope shall not exceed 21 mm/meter (slope of 1 in 48). Tread depth shall be uniform throughout the stair. The maximum difference of dimension allowed in a flight is 10 mm.

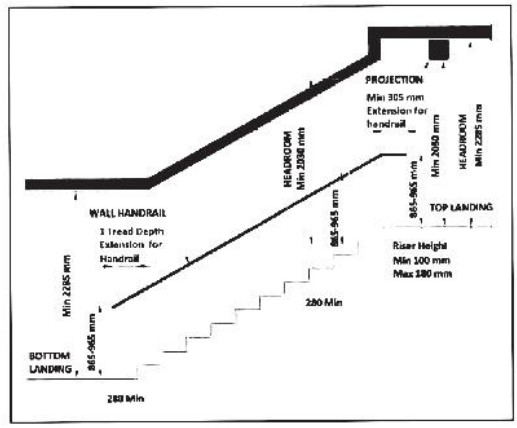
5.1.2.6 Head room on stairs shall not be less than 2030 mm, measured vertically above a plane, parallel to the most forward projection of the stair tread.

5.1.2.7 Maximum height between landings shall not be more than 3660 mm. Every stair shall have landing at the door opening and landing width shall not be less than the required stair width.

5.1.2.8 Maximum landing area a stair door can encroach in its swing is one half of the required landing width.

Where physically challenged people are part of the private villa families, the stair construction, railings, ramps, the doors, bathrooms, exits and the entire villa accessibility shall comply with UAE Fire and Life Safety Code of Practice, Chapter 15. Specifications.

5.1.2.9 Stairway shall comply with UAE Fire and Life Safety Code of Practice, Chapter 3 specifications.



Specification of Exit stair

5.1.3 Specification of Door;

5.1.3.1 Every door and door assembly shall be designed and constructed so that the way of egress travel is obvious and direct. Other features such as décor and windows that, because of their physical appearance or design or the materials used in their construction have the potential to be mistaken for doors shall be made inaccessible to the occupants by barriers or railings.

5.1.3.2 Minimum Door width shall not be less than 915 mm.

5.1.3.3 Where a pair of door leaves is provided, one door leaf shall provide not less than 810 mm clear width opening.

5.1.3.4 Exit access door assemblies serving a room not exceeding 6.5 m2 and not required to be accessible to persons with severe mobility impairments shall be not less than 610 mm in door leaf width.

5.1.3.5 The door assembly shall be readily operable from the egress side without special knowledge or effort.

5.1.3.6 The forces required to fully open any door leaf manually in a means of egress shall not exceed 67 N (15 lbf) to release the latch and 133 N (30 lbf) to set any door leaf in motion and 67 N (15 lbf) to open any door leaf to the minimum required width. (Is this necessary for Homes?)

5.1.3.7 Kitchen door shall be -1hour fire rated where kitchen is enclosed, and its door opens towards hallways or living rooms or circulation areas.

5.1.3.8 At all times, the villa is occupied, all locking devices that impede or prohibit egress or that cannot be easily disengaged shall be prohibited.

5.1.3.9 Doors shall comply with UAE Fire and Life Safety Code of Practice, Chapter 3, specifications.

5.1.4 Hallways

5.1.4.1 Exit corridors, enclosed corridors are not mandatory in villas.

5.1.4.2 However, a well-defined hallway leading unobstructed to required two exits shall be provided.

5.1.4.3 Hallway shall be minimum of 915 mm in width and a clear headroom of 2030 mm without obstructions.

In this chapter you will find:

- Fire extinguishers
- Emergency lighting
- Fire detection and alarm system
- Fire protection system
- Smoke management system

6.1 Fire extinguishers

6.1.1 Number, type and installation of fire extinguishers;

6.1.1.1 Every villa shall be provided with portable, handheld extinguishers at multiple locations. Check multiple or just specific location where flame/fire is expected, e.g. in kitchen, indoor fireplace etc.

6.1.1.2 One Multi-purpose Dry Powder, 3A, -20B, C type, 2Kg handheld extinguisher shall be provided in the kitchen at the kitchen exit door

6.1.1.3 One Multi-purpose Dry Powder, 3A, -20B, C type, 2Kg handheld extinguisher shall be provided next to the main entrance/exit door.

6.1.1.4 One Multi-purpose Dry Powder, 3A, -20B, C type, 2Kg handheld extinguisher shall be provided in the basement near the exit stair or exit way.

6.1.1.5 One Multi-purpose Dry Powder, 3A, -20B, C type, 2Kg handheld extinguisher shall be provided at the first-floor hallway.

6.1.1.6 Where above ground garage exists next to villa, one Multi-purpose Dry Powder, 3A, -20B, C type, 2Kg handheld extinguisher shall be provided at the entrance of such a garage.

6.1.1.7 Portable extinguishers shall be installed in an accessible spot, free from blocking by storage and equipment, and near room exits that provide an escape route.

6.1.1.8 The extinguisher should be easy to reach and remove and should be placed where it will not be damaged.

6.1.1.9 Portable fire extinguishers shall be maintained in a fully charged and operable condition and shall be kept in their designated places at all times when they are not being used.

6.1.1.10 Fire extinguishers shall be conspicuously located where they will be readily accessible and immediately available in the event of fire. Preferably, they shall be located along normal paths of travel, including exits from areas

6.1.1.11 Fire extinguishers shall be selected, installed, used and maintained in compliance with UAE Fire and Life Safety Code of Practice, Chapter 4 specifications.

6.2 Emergency Lighting

6.2.1 Number, type and installation of emergency lighting:

6.2.1.1 Every villa having basement shall be provided with emergency lighting as in 7.2.1.2.

6.2.1.2 Self-contained, non-maintained type emergency lighting units shall be acceptable and shall be provided throughout the basement as per lux coverage required.

6.2.1.3 Though it is not mandatory inside the villa, Civil Defence highly recommends having self-contained, non-maintained type emergency lighting to be installed in ground and first floor hallways.

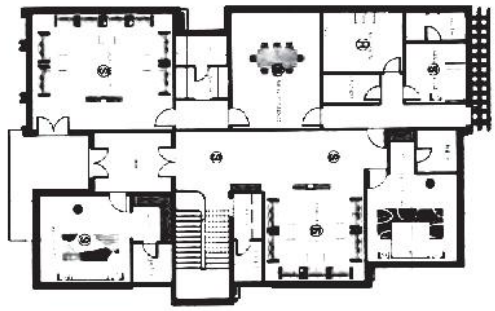
6.2.1.4 Emergency lighting shall be designed, selected, installed and maintained in compliance with UAE Fire and Life Safety Code of Practice, Chapter 6 specifications.

6.3. Fire Detection and Alarm Systems

6.3.1 Design and installation of Fire detection and alarm system;

6.3.1.1 Fire Detection and Alarm Systems are many a times despised and ignored because of frequent experience of false alarms, which can be nuisance and waste of time when unwanted evacuations take place. Reasons for false alarms are incorrect selection of type of detector for particular area, incorrect installation of the system and Poor maintenance or absence of maintenance.

6.3.1.2 Every villa shall be provided with addressable fire detection and alarm system.



6.3.2

6.3.2.1 Battery operated, stand-alone type fire detectors and sensors are not acceptable. The required fire detection and alarm system shall be either wired or wireless, complete with detection, control panel, power backup, audio devices and annunciations.

6.3.2.2 Every sleeping room, bedroom and maid room shall be provided with sounder based smoke detectors.

6.3.2.3 Every kitchen that is fully enclosed shall be provided with heat detectors.

6.3.2.4 Kitchens that are partially or fully open to living rooms or hallways shall be provided with multi sensor type smoke detectors.

6.3.2.5 Fire alarm sounders shall be provided throughout villa such that an audibility of 75 Db is achieved inside any room with its doors closed.

6.3.2.6 Each villa shall be provided with audio visual notification devices outside such that notification devices are visible from the common approach road.

6.3.2.7 Smoke detectors shall be provided throughout hallways, storerooms and circulation areas.

6.3.2.8 Every basement without sprinkler protection shall be provided with heat detectors. Where basement is protected with sprinkler system, heat detectors are not required.

6.3.2.9 Carbon monoxide alarms or carbon monoxide detectors shall be provided in residential premises where either of the following conditions exists: (1) Residential buildings with communicating attached garages (2) Residential buildings with fuel burning appliances.

6.3.2.10 Villas having elevators, shall be interfaced with fire detection and alarm system. During fire emergencies and fire alarm, elevators shall be inoperable and shall not be used.

6.3.2.11 The location of smoke detectors shall be based on an evaluation of potential ambient sources of smoke, moisture, dust, or fumes, and electrical or mechanical influences, to minimize nuisance alarms.

6.3.2.12 In addition to temperature, humidity, and velocity variations, smoke detectors are also affected by common environmental conditions as mechanical vibration, electrical interference, presence of aerosols and other environmental influences.

6.3.2.13 UAE Fire and Life Safety Code of Practice 2018, chapter 8 and Manufacturers' Installation guidelines shall be followed for location, design and installation and maintenance details.

6.3.2.14 Where physically challenged people are part of the private villa families, the fire detection and alarm system shall incorporate the sounders with flashers and vibrating devices to alert such people during emergencies. Such accessibility designs and provisions shall comply with UAE Fire and Life Safety Code of Practice, Chapter 15. specifications.

6.3.3 Wired fire detection and alarm systems (NEW VILLAS);

6.3.1.1 Fire Detection and Alarm Systems are many a times despised and ignored because

6.3.3.1 Wired Fire Detection and Alarm Systems shall be in accordance with the last edition of UAE Fire and Life Safety Code of Practice, chapter 8, Section 4.3.

6.3.3.2 The smoke and heat detectors, sounders and manual call points shall be hardwired to the fire alarm control panel.

6.3.3.3 The hardwired (cables) shall be fire rated and certified for 60 minutes.

6.3.3.4 The main fire alarm control panel shall be powered by both main power supply and backup power supply from batteries.

6.3.3.5 The fire alarm control panel shall be located in the hallway near the exit or security guard room or security at the main entrance.

6.3.3.6 The wired fire alarm control panel shall be capable of interfacing with Civil Defense smart monitoring systems.

6.3.4 Wireless Fire detection and alarm systems (EXISTING VILLAS);

6.3.4.1 Wireless Fire Detection and Alarm Systems shall be in accordance with UAE Fire and Life Safety Code of Practice 2018, chapter 8, Section 4.11.

6.3.4.2 Wireless Fire Alarm Systems shall be listed and approved by Civil Defense as a full system assembly including low power radio equipment, transmitters, receivers, Detectors, Control Units and accessories.

6.3.4.3 The Control Unit shall be capable of interfacing with wired Analogue addressable Fire Alarm Systems.

6.3.4.4 Single loss of transmission network shall not affect the communication and alarm signal transmission. The transmission network shall be backed up by series of loops and redundant alternate transmission paths.

6.3.4.5 The low-power radio transmitter/transceiver shall be specifically listed as using a communication method that is highly resistant to misinterpretation of simultaneous transmissions and to interference (e.g., impulse noise and adjacent channel interference).

6.3.4.6 The wireless fire alarm control panel shall be capable of interfacing with Civil Defense smart monitoring systems.

6.3.4.7 The wireless fire detection and alarm system shall be in compliance with the interfacing specifications of the telecommunication service providers

6.4 Fire Protection System

6.4.1 Automatic Sprinkler system;

6.4.1.1 It is highly recommended by Civil Defense, other than in Clause 6.4.1.3 ,6.4.1.2 and

6.4.1.2 To consider providing automatic sprinklers throughout private villas irrespective of built-up area.

6.4.1.3 Every villa, farmhouse having its total built-up area of 2000m2 and above, excluding detached service, store and kitchen blocks, shall be fully provided with automatic sprinkler system with dedicated fire pump and dedicated fire water tank in compliance with UAE Fire and Life Safety Code of Practice 2018, chapter 9.

6.4.1.3 Every villa, farmhouse having its basement floor area of 300m2 and above shall be provided with automatic sprinkler system for the basement as required by Section 7.4.13 to
of this document.

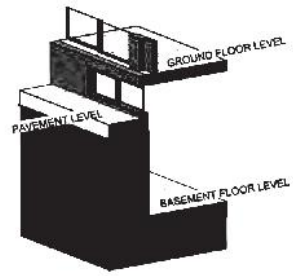
6.4.1.4 Where villas are attached to commercial, retail or business property and the ground floor of such commercial, retail or business occupancy is 900m2 and above, the commercial, retail or business facilities shall be fully protected by automatic sprinkler system with dedicated fire pump and dedicated fire water tank, in accordance with UAE Fire and Life Safety Code of Practice 2018, chapter 9.

6.4.1.5 The minimum operating pressure of any sprinkler for determining the water supply requirements shall be not less than 0.5 bar (7 psi) in the light hazard occupancy and 1.0 bar (14.5 psi) in the ordinary hazard occupancies.

6.4.1.6 Pipe sizes for an automatic sprinkler system shall be established using Hydraulic calculations but shall not be less than the minimum diameters mentioned in Table 9.7.4., UAE Fire and Life Safety Code of Practice 2018, chapter 9.

6.4.1.7 The water supply requirement for sprinklers only shall be calculated from the density/ area curves shown in Figure 9.10., UAE Fire and Life Safety Code of Practice 2018, chapter 9.

6.4.1.8 The operating temperature of the villa sprinklers shall be ordinary type with temperature rating of 57OC – 77OC.



6.4.2.

6.4.2.1 The complete sprinkler system piping shall be designed and installed in such a way that the entire water can be drained. A main drain valve shall be installed on each sprinkler system main riser on the downstream side of an Alarm Check valve. The system main drain valve can be a part of an alarm check valve.

6.4.2.2 The sprinkler system shall be fitted with an approved water motor alarm, which shall be located at a distance not exceeding 25 m from the alarm valve, and at a height not to exceed 6 m above the alarm valve.

6.4.2.3 Each sprinkler system shall be provided with a listed indicating valve in an accessible location, so located as to control all sources of water supply.

6.4.2.4 Hangers shall be designed to support five times the weight of the water filled pipe plus 250 lb (115 kg) at each point of piping support.

6.4.2.5 Domestic type and residential type sprinkler systems, with domestic water tank are acceptable where domestic booster pump serving the domestic roof water tank shall be connected to the sprinkler network.

6.4.2.6 Where roof top domestic water tank satisfactorily delivers required pressure, sprinkler network can be supplied with water directly from such roof water tanks.

6.4.2.7 Such domestic water pump connected to sprinkler network shall be monitored for fault, failure and inoperability with distinct fault alarm.

6.4.2.8 The design, installation, maintenance and materials for automatic sprinkler system shall comply with UAE Fire and Life Safety Code of Practice 2018, chapter 9.

6.4.3 Yard Fire hydrant system;

6.4.3.1 Every private villa developments, where private villa plots as townships are developed and sponsored by governments or private entities and the total plot area is 20,000 m2 or above, Yard Fire Hydrants shall be provided throughout the development as infrastructure provisions in compliance with UAE Fire and Life Safety Code of Practice 2018, chapter 9. Section 4.10.

6.4.3.2 Periodic inspection and maintenance of such infrastructure yard fire hydrants shall be the responsibility of the developer in coordination and contractual agreement with the government or private entities that sponsored the development.

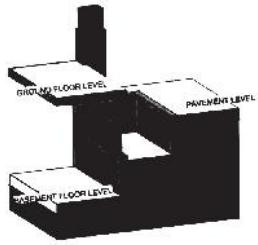
6.5 Smoke Management system

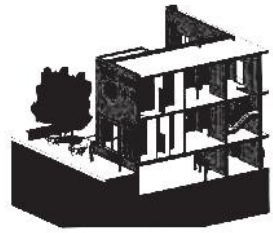
6.5.1 Natural smoke venting system for basement and roof;

6.5.1.1 It is estimated that %80–50 of fire deaths are the result of smoke inhalation injuries. The hot smoke kills by a combination of thermal damage, poisoning, pulmonary irritation and swelling, caused by carbon monoxide, cyanide and other combustion.

6.5.1.2 Every villa having basement shall have automatic open able window panels for natural ventilation, designed, installed and maintained in compliance with UAE Fire and Life Safety Code of Practice, 2018, Chapter 10.

6.5.1.3 Where natural venting is serving the stair enclosure, it shall be located on the roof of the stair core. Vent panels can also be installed on sky lights and roof glazing.





6.5.1.4 Openings intended for natural venting shall be permanent fixed openings or an automatically operable, fixed opening or vent or window.

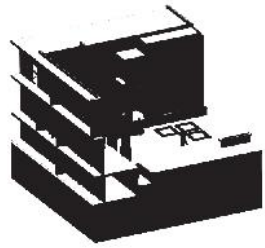
6.5.1.5 Such an opening shall provide minimum 1 m2 of open area and shall be located on the external wall of the area to be ventilated.

6.5.1.6 Openings shall be distributed evenly throughout the exterior wall of the basement such that no point in the area is more than 30 m, horizontally from the natural venting openings.

6.5.1.7 Natural Vents shall be triggered open automatic by electrical drivers through smoke detectors located within 3 m of the zone they are serving.

6.5.1.8 Such natural vent panels or windows shall be monitored by a control panel complete with zoning, manual override and reset features.

6.5.1.9 Natural vents shall be permitted to be achieved by open able windows with manual, electrical or pneumatic levers provided the open able windows provide the required %15 open area for Natural venting.



In this chapter you will find:

- **General LPG Safety**
- **Installation of LPG Cylinders**
- **Installation of LPG central tanks**

7.1 Liquefied Petroleum gas (LPG)

7.1.1 Infrastructure cooking fuel provision;

7.1.1.1 Where Cooking fuel is provided in the building infrastructure to the occupants, e.g. piping systems, in Buildings, these shall be preferred fuel to be used.

7.1.1.2 LPG is the most popular cooking fuel in UAE and this chapter addresses mainly the requirements for LPG in terms of Cylinders and Tanks. Other gases such as LNG, SNG and CNG are not directly covered in this chapter. However, the distribution, piping and fitting material, regulations regarding areas to be avoided in piping distribution and general safety requirements shall be as per LPG requirements and relevant international standards.

7.1.2 General LPG requirements;

7.1.2.1 However, where cooking fuel is not provided as infrastructure supply and where allowed by Civil Defense, the LPG cylinders shall comply with this section.

7.1.2.2 Smoking, live fires, pyrotechnics shall not be allowed in the vicinity of LPG storage

7.1.2.3 LPG cylinders and pipe installation or distribution shall not be permitted in the following areas.

a. In the ground under concrete flooring within building
b. Under building foundations
c. Within lift shafts and cavity walls
d. In compartments or ducts dedicated for electrical switchgears, transformers or generators, garbage rooms, garbage chutes, Refrigeration chambers, cold rooms, air handling rooms and ventilation or air-conditioning ducts.
e. Adjacent to pipes and vessels containing flammable, oxidizing, corrosive and other hazardous liquids and materials.
f. In fire-fighting lobby, fire command centers, smoke stop lobbies, fire pump rooms, fire-fighting water tank rooms, sprinkler control valve rooms, firefighting riser ducts, areas of refuge, protected corridors, protected staircases, bedrooms and other occupied area etc.

7.1.2.4 Electrical circuits shall not utilize gas piping or components as conductors.

7.1.2.5 A warning sign or notice of minimum size of 800mm x 600 mm shall be permanently and legibly displayed

at the front of the installation. In Arabic and English conveying, "LPG / HIGHLY FLAMMABLE / NO SMOKING / NO NAKED LIGHTS". Warning sign shall also have Emergency contact number of the LPG Contractor and concerned facility personnel.

7.1.2.6 LPG systems shall be designed, installed and maintained in compliance with UAE Fire and Life Safety Code of Practice, 2018, Chapter 11.

7.1.2.7 The materials, equipment including LPG cylinders, Tanks, piping, fittings, gauges, valves etc. shall be approved and listed by Civil Defense.

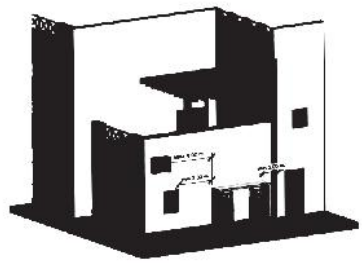
7.1.2.8 Other than exempted quantities, All LPG installations shall be inspected and maintained quarterly (Once every 3 months) by the Civil Defense approved installation and maintenance companies.

7.1.3 LPG Cylinder requirements;

7.1.3.1 LPG is the most popular cooking fuel in UAE and this chapter addresses mainly the requirements for LPG in terms of Cylinders and Tanks. Other gases such as LNG, SNG and CNG are not directly covered in this chapter. However, the distribution, piping and fitting material, regulations regarding areas to be avoided in piping distribution and general safety requirements shall be as per LPG requirements and relevant international standards.

7.1.3.2 Cylinders shall be located above ground and outdoors. Cylinders shall be placed on a firm, clean, dry and level base. Cylinders are not allowed on roof, terrace and basements. They shall be sited at ground level and a well-ventilated area. They shall not be placed close to any passageways or exits and shall not cause any obstruction or danger to the occupants during gas leakage or fire. Cylinders shall not be placed against glass walls and glazing.

7.1.3.3 3m distance shall be maintained between cylinders to any fire exit route, Exit Doors, Exit Stairs, Windows, Public roads. 6 m distance shall be maintained from cylinders to any Air Intake units, Window type and Split Type AC units, Air vents, balanced type flue outlets. 3 m distance shall be maintained from cylinders to any parking lot, parking ramp or road. 3 m distance shall be maintained between cylinders to Fire Access ways, Assembly points and Fire Truck parking slot. 3m distance shall be maintained from cylinders to drains, shaft openings, pits, opening to basements, ramp openings (See Figure 7.1).



7.1.3.4 10m distance shall be maintained from cylinders to Fire Hydrant.

7.1.3.5 For domestic residential usage, maximum quantity allowed is 2 cylinders of 24 kg is allowed in one group in the enclosure. 1 cylinder shall be main, and 1 cylinder shall be reserve in a common manifold with isolation valves (see figure 8.1).

7.1.3.6 Cylinders shall be installed in louvered steel enclosures and locked against tampering and accidental damage.

7.1.3.7 Cylinders located near parking lots, vehicle ramps and roads, shall be provided with steel barricades along with enclosures to safeguard cylinders from vehicular collisions.

7.1.3.8 There shall be no ignition source within 3 m from the cylinder installation.

7.1.3.9 An approved gas leak detection system shall be provided in the area or compartment where the internal LPG/CNG pipes and fittings are installed, with a local alarm connected to a main fire alarm panel.

7.1.3.10 Remote Emergency shut-off valve shall be located at least 3 m away from the edge of the installation. It shall be clearly marked and placed at a suitable height for easy access during emergencies.

7.1.4 LPG tank requirements;

7.1.4.1 Central tank LPG is preferred to be installed underground or above ground locations rather than roof top locations.

7.1.4.2 No liquid phase LPG is allowed to be piped into the building.

7.1.4.3 Two Stage pressure regulators are essential for all LPG installations. First regulator to reduce system pressure to 5 psi (0.350 bar) for large commercial customers or to 75 mbar for residential customers and second stage regulator to reduce it further to 0.5 psi (0.035 bar).

7.1.4.4 LPG distribution inside any low-rise building shall be through -1hour fire rated dedicated shafts

7.1.4.5 Pipe-in-Pipe (Containment) piping arrangement shall be provided where LPG piping is passing through basements, open kitchen where kitchen is open to living or circulation spaces.

7.1.4.6 LPG filling connection shall be at 1 m from finished ground level.

7.1.4.7 Fill connections shall not be obstructed such that delivery hose connections are executed without obstructions. Or wear and tear to the hose. LPG fill line and connection arrangement shall be fully exposed outside the building.

7.1.4.8 Where need arises to cover the fill line aesthetically, fully ventilated or fully perforated enclosure is acceptable.

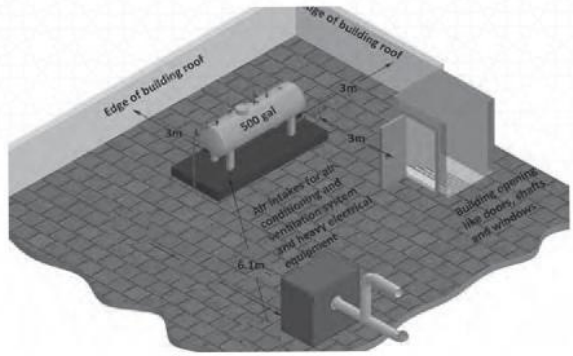
7.1.4.9 Fill connections shall be as close to the LPG Tank as possible.

7.1.4.10 LPG leak detectors shall be approved.

7.1.4.11 an industrial type, chain-link fencing of 1.8 m height shall be provided around the LPG tank installations. Such fencing shall have minimum of 2 exit gates of 1.2 m width available where LPG tanks are filled within the fenced enclosure.

7.1.4.12 Design, installation, maintenance, materials, LPG tank separation distances shall be in compliance with UAE Fire and Life Safety Code of Practice, 2018, Chapter 11.

LPG Installation Requirements on Villa's Roof



In this chapter you will find:

- **Emergency plan**
- **Fire drills**

8.1 Emergency Action Plan

8.1.1 Every family dwelling in the villa should have an emergency action plan drafted by a Responsible Family member, and all the family members should be aware of the actions to be taken during fire emergencies.

8.1.2 Emergency action plan shall clearly draft out the duties of family member's respective duties and responses during fire and emergency situations such as

- Confirmation of fire alarm by physically verifying at the location of the building or area before triggering evacuation alarm.
- Informing, reporting emergency incident to Civil Defense and coordinate with them when they arrive.
- Coordination and planning to manage evacuation and leading children and elderly to designated assembly points.
- Evaluation and assessment of initial stages of fire and usage of extinguishers, if it is assessed as safe to do so.

8.1.3 Family members should actively take part in familiarizing themselves with written Emergency action plans and their role during emergency situations.

8.1.4 For guideline on preparation of Emergency Action Plans and Emergency Drills, refer to UAE Fire and Life Safety Code of Practice, Edition 2018, Chapter 19. Emergency Evacuation Procedures

8.2 Emergency Fire drill

8.2.1 Emergency fire drills should be carried out with all family members on a regular basis, every occupant's participation in smooth and full evacuation as per Emergency Action Plan.

8.2.2 Such regular emergency drills prepare the children and family members of the fire situations to execute smooth and timely evacuation to the safety.

8.2.3 Drills are conducted to familiarize occupants of the available exits, location of the extinguishers, usage of escape features of the house and safe and orderly evacuation without panic where every second counts and it could be a matter of life and death.

In this chapter you will find:

- **Responsibilities of family members for fire safe homes**
- **For other responsibilities such as developers, consultants, contractors etc. see UAE Fire and Life Safety Code of Practice, Edition 2018, Chapter 18. Responsibilities of Stakeholders.**

9.1 Responsibilities of family members

9.1.1 It is every resident's responsibility to follow fire safety rules and regulations and participate actively in safeguarding the premises from fire accidents.

9.1.2 All residents shall be familiar with emergency evacuation plans of the villa to know their exits, exit access corridors, stairs to roof and outside to safety.

9.1.3 Residents shall familiarize themselves with building firefighting equipment such as location of extinguishers and usage of such extinguishers appropriately during initial stages of fire.

9.1.4 It is resident's responsibility to educate their children about potential fire risks and observing fie safety at home.

9.1.5 Residents shall never leave children, special needs people, mentally challenged and unstable or elderly people unattended and unsupervised at all times, nor lock or deny them egress in case of any emergency.

9.1.6 Residents shall observe fire safety during festivals and celebrations, where electrical decorative string lighting, open flames, candles, fireworks etc. when mishandled, can compromise building fire safety catastrophically.

9.1.7 Pyrotechnics, fireworks and open flames shall not be activated in balconies and terraces. Lighting of pyrotechnics and fireworks in places other than designated locations is illegal and punishable by law.

9.1.8 Lighting of open flames during festivals shall be carried out responsibly and under adult supervision in safe locations other than balconies and terraces.

9.1.9 Faulty wires, connections and devices of electrical decorative string lighting can cause fires. Care shall be taken to use approved and labeled materials which shall be installed only by professional electricians.

9.1.10 Burning of incense shall be done by adults responsibly.

9.1.11 BBQ is not permitted in balconies, basements, indoors and on flammable surfaces. Residents shall not cook and BBQ either with open flames or with electrical appliances at balconies, terraces, basements, parking and on flammable surfaces. Barbequing and cooking at balconies, terraces, basements and parking is against the Civil Defense regulation and is punishable.

9.1.12 Smoking in bedrooms and living rooms shall be forbidden. Discarding cigarette butts in public areas, on roads and throwing cigarette butts from balconies is against the Civil Defense regulation and is punishable.

9.1.13 LPG (Liquid Petroleum Gas) used for cooking is highly flammable and extreme care shall be taken to prevent fire accidents from kitchen.

9.1.14 Residents shall never attempt multi-tasking such as attending to children and babies while cooking. Children shall be prevented from playing in the kitchen and near cooking appliances. Cooking shall never be left unattended.

9.1.15 Faulty LPG piping, flexible hose connections and cooking appliances shall be replaced or repaired immediately.

9.1.16 Main valve for the LPG supply shall be closed every night after the use.

9.1.17 Pressurized aerosols, insect repellents, insect killers, sprays, air fresheners are highly flammable and explosive in the pressurized cans and shall never be applied on live cooking appliances and open flames.

9.1.18 LPG connections, transport or repair shall only be done by professionals.

9.1.19 Home makers shall be familiar with usage of fire extinguishers and fire blankets to tackle the initial stages of kitchen fires.

9.1.20 It is resident's responsibility to use the electrical appliances safely and responsibly. User manuals shall be followed for safe usage of electrical appliances.

9.1.21 Resident shall ensure that there is no Overloading of electrical sockets and extension cords, which causes electrical fires.

9.1.22 Faulty electrical appliances such as cooking range, microwave, grills, fryers, heaters, grinders, blowers, vacuum cleaners, ironing devices, air-conditioning units, lamps etc. can cause not only fires but can also be sources of electrical shocks. It is resident's responsibility to replace or repair such appliances immediately when they may pose such hazards due to overuse of age.

9.1.23 Water shall not be used on live electrical connections, sockets and wires.

9.1.24 It is resident's responsibility to maintain the vicinity clean and free of flammable materials. Unattended

garbage is a source of fuel for fire.

9.1.25 Flammable liquids and materials shall not be stored in bulk quantities or in unauthorized or unlabeled containers. Cleaning solvents are flammable and shall not be stored in bulk quantities.

9.1.26 It is resident's responsibility not to block exits, stairs and exit corridors with stored items. Exits, stairs and corridors shall be free of obstacles at all times for smooth evacuation during sudden emergencies.

9.1.27 Children play items, cycles, plants, unwanted furniture, exercise equipment, shoe racks etc. shall not be stored in the stair, at the exits and at exit access corridors.

9.1.28 Sprinkler, smoke and heat detectors heads shall not be tampered or blocked.

9.1.29 It is resident's responsibility to take every fire alarm and fire sounders seriously. Though there are false alarms sometimes, it is resident's responsibility to verify the fire alarm without neglecting and communicating with facility management.

9.1.30 Where there is a real fire alarm intimation, it is resident's responsibility to leave the home without delay and evacuate the building in an orderly and smooth manner without panicking or causing stampede or obstructing fire and rescue operations by Civil Defense.

PART III

GUIDELINES FOR FIRE DETECTION, ALARMING AND MONITORING SYSTEMS RESIDENTIAL VILLAS

2020

CHAPTER 1: INTRODUCTION

General

Intention

Fire Detection Concept

CHAPTER 2: DEFINITIONS

CHAPTER 3: GENERAL SYSTEM REQUIREMENT

REQUIREMENT/SPECIFICATION

Audible and Visual Alarm

MANAGEMENT INFORMATION SYSTEM AND REPORTS

CHAPTER 4: INITIATION DEVICES: SMOKE AND HEAT DETECTION SYSTEMS

This Section refers to the detailed requirements for the Initiating Devices (Smoke and Heat detectors) and their arrangements and linkages for Wired and Wireless Systems.

CHAPTER 5: FIRE ALARM CONTROL UNIT (FACU) AND SYSTEM PERFORMANCE

This Section refers to the detailed requirements for the Fire Alarm Control Unit (FACU) and System Performance.

CHAPTER6: EXTERNAL NETWORKS AND THE MONITORING STATION FOR FIRE ALARM (CIVIL DEFENCE)

REQUIREMENT/SPECIFICATION

Asset Link-Asset Building Connectivity Network

False Alarms Management

CHAPTER 7: INSTALLATION, TESTING AND MAINTAINENCE

ANNEX A: ACCEPTABLE TEST STANDARDS AND CRITERIA FROM THE UAE FIRE CODE

ANNEX B: ADDITIONAL GUIDANCE AND RECOMMENDATIONS FOR THE FIRE ALARM CONTROL UNIT

Introduction

Terms and Definitions

Solution Overview

Wireless Connectivity for Existing Villas

Wired Connectivity for New Villas

FACU Enclosure Requirements

REQUIREMENT/SPECIFICATION

General

1.1 Fires in residential properties are one of the priority areas of concern in the UAE. The largest number of fires, and also the potential risk to the vulnerable and infirm, like young children and the aged, who are also physically impaired, make it the home an area of high human loss potential. As most other occupancies are now well protected by fixed Protection and extinguishing systems as required by the UAE Fire Code, it is now a priority to improve the overall level of safety in our residential homes, in particular our private and commercial villas. The mandatory requirement, for the Installation of Automatic Fire Detection and Alarm systems, with early warning connection to the Civil Defense has now been approved for implementation across the UAE.

1.2 A Fire Detection and Alarm System is intended to enable a fire to be detected at a sufficiently early stage so that people who are at risks can be made safe either by escaping from the fire or its toxic products of combustion or extinguishing the fire. Neither of the measures can occur unless people are made aware of the fire.

1.3 The effectiveness of fire detection and alarm system depends on the stage of the fire at which it is activated and operates. In order for all occupants to escape without too much difficulty, an early alarm should operate before the toxic effects of the products of combustion affects the occupants, the available escape routes becomes obscured and smoke logged to such an extent as to make it difficult to find their way out of the building to safe areas.

1.4 The Fire Detection and Alarm System provides protection to the residential occupants by:

a. Detecting the fire at the earliest stage.
b. Alerting the occupants to the dangerous situation and initiating evacuation if possible.
c. Notifying the relevant Authorities and Monitoring companies of the developing hazardous situation, so that emergency response can be initiated automatically where necessary.
d. In some situations, activation other fire protection and suppression systems functions, if available.
e. To help identify seat of fires and guiding fire fighters on their arrival.

1.5 The Fire Detection and Alarm System in residential premises in the UAE usually consists essentially of:

a. Initiating Devices: (Smoke, Heat Detectors)
b. Alarm Panels/Fire Alarm Control Unit (FACU)
c. Notification Devices or Alarm Sounders :(Bells, Buzzers, G Horns, Flashing lights etc.)
d. FACU (including Digital Transmission Devices) or an interface at FACP to Transmit alarm signals to external Agencies.
e. Network for Transmitting Signal from FACP to Signal Receiving Centre /Monitoring Centre (CD)
f. Linkages by Monitoring Centre for activation of CD Resources to Fire Stations for activation. (Available today).
g. Power supply (AC mains, Battery/Charger).

h. Other systems which the Fire Detection and Alarm system could be attached to could include, but not limited to:

i. Gas detector systems

ii. Home sprinklers

iii. Other building services, like door closers, HVAC systems, etc.

1.6 Intention:

1.6.1 The objectives for these PART III Guidelines for Fire Detection and Alarm Systems for Residential Properties are as follows:

a. To provide a technical standard for Service Providers to make appropriate selection of Fire detection systems and their design, installation and maintenance to complement the overall Fire strategy in Residential villa and buildings to enhance the level of fire safety.

b. To ensure that there is early warning to residential occupants about the fire emergencies to take the necessary emergency action as necessary and enable them to evacuate to safety.

c. To ensure proper approved, listed material and equipment are selected, designed and installed by the Service Provider and their / contractors, so as maintain the quality and reliability of fire detection and alarm systems over its continued life span and to fulfill the design intent.

d. To ensure that the Civil Defense is automatically made aware of potential fire out breaks and threats to life in residential premises so that the status of the potential situation can be verified, and early response can be initiated without need for public intervention.

e. To ensure that the Detection, Alarm and monitoring system remains in a high level of integrity and operational readiness through the life span of the system and provides protection to the residential occupants on a 7/24 basis.

1.7 Fire Detection Concept

a. The purpose of fire alarm and signaling systems shall be primarily to provide notification of alarm, supervisory, and trouble conditions, to alert the occupants to evacuate, to summon aid and to control emergency control functions. It shall also alert the Civil Defense of a life-threatening situation in residential properties early so that appropriate Civil Defense resources can be dispatched.

b. Fire produces variety of reactions and characteristic signatures such as smoke, heat, radiant energy. However, different fires based on the fuel it is consuming, have different characteristic signatures such as some fires produce intense heat without smoke, some produce low heat with intense smoke and some burn without flame but produce smoldering smoke. The fire detectors are designed to identify and sense these various inputs and process the data to evaluate, compare and differentiate the environmental conditions or preset conditions to generate the output through control systems called "Fire Alarm".

c. As mentioned earlier, the fire detection and alarm system essentially consist of fire detectors, communicating with central control unit called fire alarm control Unit (FACU) through wiring or wireless signals to generate Alarm through sounders, bells and audio-visual alarm devices. The entire components are powered by primary power supply and secondary power supply through batteries.

d. Requirements of these Guidelines are primarily from the UAE Fire Code and are minimum guidelines. It is the Service Provider's responsibility to further refer to NFPA 70, NFPA 72, NFPA 75, NFPA 76, NFPA 110, NFPA 111 and Manufacturer's design specifications and guidelines for more details, where necessary.

1.8 Note that the mandatory requirements for a Fire Detector and Alarm System is just one of the many aspects of Home Fire Prevention and Safety. It does not eliminate the requirements and safety practices of other measures like:

a. Ensuring a high awareness of fire safety in the home by all occupants.
b. Provision and training in the use of simple Fire Safety equipment like extinguishers.
c. Having a proper escape plan for all occupants with regular drills by the residential owner and its occupants.
d. Proper fire safety housekeeping (like maintaining means of escape, and elimination of fire hazards in the home (removal of hazardous and flammable material).

1.9 All these practices, primarily the responsibility of the Villa owner, are necessary and should be combined to provide a comprehensive high level of fire safety in the home.

REQUIREMENT/SPECIFICATION

This Section is on the various Definitions of the terms used in these Guidelines. Where discrepancies exist, the definitions as found in the UAE Regulations and Fire Code shall take precedence:

2.1 Fire Detection Concept.

2.1.1 Addressable Device

A fire alarm system component with discrete identification that can have its status individually identified or that is used to individually control other functions.

2.1.2 Analogue Detector

A device that produces a quantitative signal as per status change in the protected zone, and it is unlike the traditional detectors that indicate the On/Off statuses only.

2.1.3 Combination Detector

A combination that either responds to more than one of the fire phenomena or employs more than one operating principle to sense one of these phenomena. Typical examples are the combination of a heat detector with a smoke detector or a combination rate of rise and fixed temperature heat detector.

2.1.4 Flame Detector

A device used for detecting infrared and ultraviolet rays emitting from flames.

2.1.5 Fixed Temperature Detector

A device that responds only when its sensitive element heated up reaches a predetermined temperature.

2.1.6 Heat Detector

A fire detector that detects either abnormally high temperature or rate of rise, or both.

2.1.7 Optical Beam-type Smoke Detector

A smoke detector comprising a light source and a receiver to detect the obscuration of light as a result of smoke alone a line. The transmitter and receiver may be at opposite ends or they may be incorporated into a single housing with a reflector at the opposite end.

2.1.8 Rate-of-Rise Detector

A device that responds when the temperature rate of rises is more than a predetermined level.

2.1.9 Smoke Detector

A device used for detecting visible and invisible particles of smoke resulting from combustion. Several operating principles are used for detection; examples include; photoelectrical and Ionization spot-type detectors, Air-sampling type and optical beam-type smoke detector.

2.1.10 Spot-type Smoke Detector

A device in which sensitive element is fixed in a certain location.

2.1.11 Gas Detector

A device that detects the presence of a specified gas concentration. Gas detectors can be either spot-type or line-type detectors.

2.1.12 Multi-sensor Detector

Such as heat, smoke, or fire gases, or employs more than one sensor to sense the same stimulus. A device capable of generating multiple alarm signal from any one of the sensors employed in the design, independently or in combination. The sensor output signals are mathematically evaluated to determine when an alarm signal is warranted. The evaluation can be performed either at the detector or at the control unit. This device has listings for each sensing method employed.

2.2 FIRE DETECTION SYSTEM.

2.2.1 Addressable System

A system, in which input and output devices have a unique address that can be read, recognized and controlled by the control panel.

2.2.2 Alarm Signal

A signal activated by the alarm system to warn of emergency conditions that require immediate action by all occupants of the affected area.

2.2.3 Alarm Warning

A signal activated by the alarm system to warn of emergency conditions that require action by particular people who may (or may not be) occupants of the affected area.

2.2.4 Alarm Zone

Geographical sub-division of the protected premises, in which the fire alarm warning or signal can be given separately, and independently, of a fire alarm warning or signal in any other alarm zone.

2.2.5 Analogue Addressable System

Addressable system that reports quantitative status signals rather than two state signal.

2.2.6 Annunciator

A unit containing one or more indicator lamps, alphanumeric displays or other equivalent means of indication that provides status information about circuit, condition or location information from the main control panel.

2.2.7 Notification Appliance

A Fire alarm system component such as a Bell, Horn, speaker, light, or text display that provides audible, tactile, or visible outputs or any combination thereof.

2.2.8 Automatic Alarm

Automatic alarm systems that activate auxiliary systems, such as firefighting system, elevators and fire safety system.

2.2.9 Bell

An electro-mechanical device used to produce audible signals.

2.2.10 Buzzer

A device used to produce low audible warning without causing panic.

2.2.11 Combined System

An alarm system consists of conventional, addressable and analogue systems.

2.2.12 Fire Alarm Control Panel

A component of the fire alarm system, provided with primary and secondary power source, which receive signals from initiating devices or other fire alarm control units, and processes these signals to determine part or all of the required fire alarm system output functions.

2.2.13 Decibel (dB)

Is a measurement unit of sound pressure level, it equals one tenth of a Bell, which is the decimal logarithm of ratios between two quantities.

2.2.14 Final Voltage of a Battery

The voltage at which the battery is considered depleted. This voltage may be at the point where the powered device no longer functions as intended by the manufacturer where further discharge may cause erratic operation or may cause irreversible damage to the battery or both.

2.2.15 Horn

A funnel like device used for emitting audible signals different from bell sounds.

2.2.16 Mimic Diagram

A topographic diagram of the protected buildings and its affiliate departments. It consists of electric circuits that activate visual alarm signals connected fire system to indicate alarm location.

2.2.17 Phased evacuation

A system of evacuation in which different parts of the premises are evacuated in a controlled sequence of phases, those parts of the premises expected to be at greatest risk being evacuated first. Generally, not practiced for Residential premises, as evacuation should be immediate for all occupants.

2.2.18 Staged Alarm

A fire alarm system in which two or more stages of alarm warning can be given within a given alarm zone before an alarm signal for that zone is triggered.

2.2.19 Standby Supply

An electrical automatic power supply connected to the fire alarm system and operated in case of main supply failure.

2.2.20 Voice Alarm system

Dedicated manual or automatic system for originating and distributing of voice instructions, alert and evacuation signals for the safe evacuation of occupants. This system to be used for emergency situation like fire.

2.2.21 Zone

A part of the protected building which contains one or more fire detectors, the zone is defined by a unique alphanumeric which is indicated at the control panel.

2.2.22 Alarm Repeater System

A device or system for the purpose of automatically retransmitting alarm information received by the alarm processing equipment.

2.2.23 Alarm Verification Feature

A feature of automatic fire detection and alarm systems to reduce unwanted alarms wherein smoke detectors report alarm conditions for a minimum period of time or confirm alarm conditions within a given time period after being reset, in order to be accepted as a valid alarm initiation signal.

2.2.24 Abnormal Condition

An abnormal condition that poses an immediate threat to life, property, or mission.

2.2.25 Pre-alarm Condition

An abnormal condition that poses a potential threat to life, property, or mission, and time is available for investigation.

2.2.26 Supervisory Condition

An abnormal condition in connection with the supervision of other systems, processes, or equipment.

2.2.27 Trouble Condition

An abnormal condition in a system due to a fault.

2.2.28 Normal Condition

Circuits, systems, and components are functioning as designed and no abnormal condition exists.

2.2.29 Wireless Control Unit

A component that transmits/ receives and processes wireless signal.

2.2.30 Fire Alarm Control Interface

The fire alarm control interface coordinates signals to and from the fire alarm system and other systems.

2.2.31 Single Station alarm

A detector comprising an assembly that incorporates a sensor, control components, and an alarm notification device in one unit operated from a power source either located in the unit of obtained at the point of installation.

2.2.32 Multi Station Alarm

A single station alarm (e.g. detector with audible alarm) capable of being interconnected to one or more additional alarms (detectors) so that the actuation of one causes the appropriate alarm signal to operate all interconnected alarms.

2.2.33 Digital Alarm Communicator Transmitter (DACT)

A system component at the Residential Premises to which initiating devices or groups of delces are connected. The DACT seizes the connected telephone line, dials a selected number to connect to a Digital Alarm Communicator Receiver and transmits signals indicating a status change of the initiating device.

2.2.34 Digital Alarm Radio Transmitter (DART)

A system component that is connected to an integral part of a digital alarm communicator Transmitter (DACT) that is used to provide an alternate radio transmission channel.

2.2.35 Automatic Transmitting Equipment (ATE):

A component of the Fore Alarm system, provided with primary and secondary power source, which receives signals from Imitating devices, or other fire alarm control panels, and processes these signals to determine part or all of the fire alarm system output functions, annunciates the signals locally and simultaneously transmit such signals to the Signal Receiving Centre.

2.2.36 Fire Alarm Control Unit (FACU):

A device, a component of the Fire Alarm System for Residential Villas, that has the functionalities, both as a Fire Alarm Panel and an Automatic Transmitting Equipment. It is applicable specially to wired systems.

2.2.37 Signal Receiving Centre:

A 7/24 Centre manned by trained staff of the Monitoring Operator , to automatically receive transmitted signals from the Fire Alarm Control Units or Automatic Transmission W Equipment from the Residential Villas, and verifies the nature of the calls, (e.g. Fire, false alarm, system fault etc.) for onward transmission to the Civil Defense Monitoring Centers, through the their own Activation/Dispatch network.

2.2.38 Civil Defense Monitoring Centers

A 7/24 Centre, appropriately located, manned by trained CD officers, who will receive and monitor the signals received from the Signal Receiving Centre, and which will activate the Civil Defense resources, in response to a fire situation, according to the Procedures as worked out with the Monitoring Operator through their own activation/ dispatch network.

2.2.38 Smart Monitoring System

Connection or annunciation of building fire and life safety systems that monitors the environment and where a fire hazard exists, signals directly to civil defense monitoring systems.

2.2.39 Wireless Control Unit

A component that transmits/receives and processes wireless signals.

2.2.40 Smart Fire/Gas Leak Alarm System

Self- Monitoring, Analysis and Reporting technology that detects the actual fire, smoke, heat, CO and LPG/SNG by auto learning the environment, based on pre-existing data, and programmable software. Thus, eliminating false alarms and performing accurate and early detection of fire/gas leak scenarios and triggering fire/gas leak alarm signal transmission to remote monitoring station/location, either through wired network or wireless network.

REQUIREMENT/SPECIFICATION

This Section refers to the overall design of the Fire Detection and Alarm System and addresses the main system requirements and its implementation at the Residential Premises.

3.1 All residential premises shall be provided with a smart addressable fire detection and alarm system as per Civil Defense Regulations. This means that each detector is provided with an address, so that identification of alarm status is by zone and by address. It also can indicate and record system events.

3.1.1 A Non-Addressable system, also known as a "Conventional system" has its detectors wired to the Panel in groups known as "Zone" and indication of alarm status is only be zone.

3.2 The addressable fire alarm system shall allow for all fire and smoke detection devices to be connected and communicate both with each other and also a central monitoring location, like a Fire Alarm Control Unit. This interconnectivity allows the control and responding personnel to identify the location where the initial detection occurred.

3.3 Through use of smart technologies, the addressable system shall quickly recognize Outbreak locations, initiate an evacuation process, reduce False alarms and increase reliability of such systems. It also allows for routine monitoring of the health of each connected device, and self-diagnose and repair the system to function properly, where necessary.

3.4 The requirement for provision of such a fire detection and alarm system in residential properties shall include coverage for every building, enclosed structure and enclosed occupy able spaces in the residential premises.

3.4.1 Detector coverage shall include all rooms, halls, storage areas, basements (unless protected by automatic sprinklers), attics, lofts and other enclosed usable spaces.

3.4.2 Detectors shall not be required to cover above false ceiling compartmented spaces in the residential villas unless combustible materials, as approved by Civil Defence, are used.

3.4.3 Detectors shall not be required below open grids/cloud ceilings if opening of the grid are 6.4mm or large and such openings constitute at least %70 of the ceiling or grid material. Detectors shall not be required at non-combustible spaces such as below raised floor or accessible trench areas, which do not consist service pipes, electrical wiring and communication cables.

3.4.4 At least one smoke detector shall be installed at the top of the stair of in any residential premises.

3.5 Where partitions within the spaces extend to within %15 of the ceiling height, the spaces separated by the partitions shall be considered as separate rooms and such separate rooms shall be provided with individual detector coverage.

3.6 If necessary, (based on design /layout of fire compartmentation of the residential premises,) for the effective detection of potential fire situations, the building shall be divided into a number of detection zones for easy recognition and short search time. Fire alarm systems shall be designed to suit the fire plan procedures planned and followed by occupants during emergency. Single open, short circuit or ground in one detection zone shall not affect the operation of other zones.

3.7 Indication of the detector device, detection zone status or alarm on the control panel is by LED and/or graphical text indicator.

3.8 Where necessary as above, Alarm zones shall be clearly defined in complex residential premises and villas:

a. Alarm zone may include of several detection zones and not vice-versa.
b. Alarm zone boundaries shall match those of fire compartments and/or detection zones.
c. The extent of any overlap of signals between alarm zones shall not be sufficient to result in confusion of occupants in any area of the building.
d. At no time shall conflicting alarm warning or alarm signals be broadcast within one alarm zone.

3.9 For system Conduits for wired systems, wiring shall be as follows:

3.9.1 All fire detection and alarm wiring shall be minimum -1hour fire rated and Civil Defense listed.

3.9.2 Metal conduits are not necessary where wiring is minimum -1hour fire rated and listed by Civil Defense.

3.9.3 Metal conduits are required where fire alarm wiring is in corrosive environment, irrespective of wiring fire rating.

3.9.4 Fire alarm system wiring and equipment, including all circuits controlled and powered by the fire alarm system, shall be installed in accordance with the requirements of the UAE Fire Code and of NFPA 70 Article 760.

3.9.5 Fire detection alarm wiring shall be Class A type where circuit redundancy is ensured and operational capability continues even when single open condition, single ground fault and single fault in the circuitry exists. And such faults are annunciated in the control panel.

3.9.6 Loop isolators shall be installed to monitor and maintain wiring integrity and safeguard from short circuits. Loop isolators shall be installed as per manufacturer's guidelines.

3.10 Smoke alarms are to be of the multiple-station type. The term single station means that, when a particular smoke alarm senses smoke, only that device sounds its integral sounding alarm. The term multiple-station refers to smoke alarms that are interconnected such that, when one alarm senses smoke, all the interconnected devices sound their integral alarms. Multiple-station smoke alarms are typically interconnected within individual residential premises, to alert sleeping occupants located in different rooms to a fire in the dwelling.

3.11 Notification signals for occupants to evacuate shall be audible and visible sign.

3.12 In premises where there are persons who are hearing impaired, in addition to the required audible alarms, visible alarm devices are recommended to ensure early warning and evacuation.

3.13 The general evacuation alarm signal shall operate throughout the entire building and premises.

Audible and Visual Alarm

3.14 Audible and visual alarm appliances shall be installed in a building so that alarm signals are clearly audible and visible throughout the building(s)/floor(s) in which they are installed. It is essential that audible and visual alarm signals are sufficient in nature and of the extent to warn and initiate evacuation of all persons for whom the alarm signals are intended.

3.14.1 Audible alarm notification appliances shall be of such character and so distributed as to be effectively heard above the average ambient sound level that exists under normal conditions of occupancy in residential villas.

3.14.2 Audible alarm notification appliances shall produce signals that are distinctive from audible signals used for other purposes in any Villa, if necessary.

3.14.3 Separate audible and visual alarm devices shall not be required where initiating devices have built in visual and audible alarm features.

3.15 In implementing the requirement for the Fire Detection and Alarm system in the residential premises, the Approved Installer /Main Consultant / Contractors shall discuss with the premises owner:

a. Level of protection required.
b. Determine any variations to requirements.
c. Detail the detection and alarm zones.
d. Sitting of individual smoke and heat detectors.
e. Need for any other form of detection.
f. Specify type of system and equipment.
g. Detail for on/off site links with other external systems.
h. Take into account and minimize the occurrence of false alarms.
i. Allow for the correct sound level for sounders and visual alarms.

3.16 The number of audible alarm sounders used shall be sufficient to produce a minimum sound in accordance to existing standards or at a level of 5 dBA above the ambient noise level likely to persist for a period longer than 30s, whichever is greater. In all parts of the building, the sound level produced by audible alarm sounders signalling shall not exceed 110 dBA.

a. To prevent excessive sound levels in some areas, it may be preferable to install a larger number of quieter alarm sounders rather than a few very loud sounders.
b. Generally, all alarm sounders in the building shall be activated simultaneously throughout the whole building in the event the fire alarm is activated.
c. Where audible appliances are installed to provide signals for sleeping areas, they shall have a sound level of 75 dBA. If ceiling heights allow, wall-mounted notification devices shall have their tops above the finished floors at heights of not less than 2.29m and below the finished ceilings at distances of not less than 150mm
d. The sound pressure levels that must be produced by the audible appliances in the coverage areas to meet the requirements shall be documented by the system designer during the planning and design of the notification system
e. The design sound pressure levels to be produced by the notification appliances for the various coverage areas shall be documented for use during acceptance testing of the system.
f. Where required by the Emirate CD Directorate, documentation of the design sound pressure levels for the various coverage areas shall be submitted for review and approval by the relevant CD authority.

3.17 The residential premises owner shall have the following responsibilities for Hassantuk:

a. Ensure that his Residential premises has an approved Fire Detection and Alarm system installed in accordance with the relevant Regulations by CD through the engagement of recognized Service Providers, especially an Approved Installer.
b. Providing access and relevant necessary information to assist the Approved Installer in the site survey, design and installation of the Fire and Detection system as required.
c. Understand the basic operation and procedures in the use of the Fire Detection and Alarm system, including simple maintenance and troubleshooting, as in the Operating Manual.
d. Do routine checks and tests as required on the various components to ensure working conditions.
e. Raise any trouble/fault issues with the Approved Installer immediately, when detected.
f. Minimize false alarms through the proper practice of good fire safety practices.
g. Have an Emergency Evacuation plan for all occupants so that they know the drill when the alarm is sounded and practice all occupants on a regular basis.
h. Bear the cost for the installation fees, maintenance fees and monitoring fees by the respective Service providers, including replacement of devices due to shelf-life.
i. Bear the annual monitoring fees imposed by the Monitoring Operator.
j. Be subject to penalties as imposed by the relevant authority for failure to comply to the technical standards and processes as specified by the relevant Regulation.

MANAGEMENT INFORMATION SYSTEM AND REPORTS

3.18 The Monitoring Operator/System Integrator shall produce the necessary Management Information Reports (monthly/Annually) on the performance of the Fire Alarm Detection and Alarm Systems, at the overall National Level, and also at the individual Emirate level. The actual details for Indicators and KPIs shall be worked out by GHQ/Directorates, but would include the following:

a. Breakdown of fire calls into actual fires, "Confirmed No Fire" situations and false alarms by locations/causes.
b. bGeneral Statistics to assist management decision making for future policies.
c. Analysis of Performance data on the Fire Detection and Alarm system.
d. Number of connections and percentage of coverage of required number of residential premises;
e. No of faults as reported by Customers (building owners).
f. Complaints by Building owners on poor performance etc.
g. Meeting implementation/Installation KPIs as established.

REQUIREMENT/SPECIFICATION

This Section refers to the detailed requirements for the Initiating Devices (Smoke and Heat detectors) and their arrangements and linkages for Wired and Wireless Systems

4.1 The performance, selection, use, and location of automatic initiating devices, including fire detection devices, and other supervisory signal-initiating devices (used to ensure timely warning for the purposes of life safety and the protection of a building, a space, structure, an area, in a residential premises shall comply with the minimum requirements of this Section.

4.2 The presence of suspended smoke particles generated during the combustion process affects the propagation of a light beam passing through the air. The effect is utilized to detect the presence of a fire in two ways:

a. Obscuration of light intensity over the beam path OR
b. Scattering of the light beam.

4.2.1 Smoke detectors that operate on the principle of light obscuration consist of a light source, a light beam collimating system, and a photosensitive device. When dense smoke obscures part of the light beam, or less dense smoke obscures more of the beam, the light reaching the photosensitive device is reduced and this initiates the alarm.

4.2.2 In Smoke detectors using Scattering of light principle, when smoke particles enter a light path, scattering results. Smoke detectors utilizing the photo-electric light-scattering principle are usually of the spot type. They contain a light source and a photosensitive device arranged so the light rays normally do not fall onto the device. When a smoke particle enters the light path, light strikes the particles and is scattered onto the photosensitive device, causing the detector to respond.

4.3 Purpose. Automatic initiating devices contribute to life safety, fire protection, and property conservation by providing a reliable means to signal other equipment arranged to monitor the initiating devices and to initiate a response to those signals by the building owner, occupants or the Emergency Services Hence the provision of such automatic detection systems in residential premises, primarily Smoke detection with Heat detection in certain areas, are to be provided in all residential villas.

4.4 The selection and placement of smoke detectors shall take into account both the performance characteristics of the detector and the areas into which the detectors are to be installed to prevent nuisance and unintentional alarms or improper operation after installation.

4.5 Initiating devices shall be installed in all areas, compartments, or locations where required by relevant Regulations and in accordance with appropriate codes, standards and manufacturers specifications.

4.6 Initiating devices shall be installed in a manner that provides accessibility for periodic inspection, testing, and maintenance.

4.7 Where subject to mechanical damage, an initiating device shall be protected. A mechanical guard used to protect a smoke or heat detector shall be listed for use with the detector.

4.8 Initiating devices shall be supported independently of their attachment to the circuit conductors.

4.9 Smoke detection systems shall be the primary detection system for all residential homes and shall be of the Optical type. Ionization type detectors are not to be used. Combination Smoke- Detector, (e.g. Smoke –Heat, Smoke-Carbon Monoxide) or Multi Criteria Detectors are also allowed, subject to product Listing or certification to recognized standards and specific approval from the CD authorities.

4.10 With current technology, the practice is to use multi sensors utilizing single or dual optical chambers, which are also connected with heat and/or carbon monoxide sensing elements. This creates a whole range of sensors suitable for detecting different types of fires and yet ignore signals that have previously led to false alarms. Such detectors used must have the appropriate certifications for detection using these multiple sensors.

4.11 These smoke detection systems shall be addressable, depending on the size of the premises. Generally, for most residential units, Zoning shall be in accordance with Manufacturer's specifications.

4.12 Detectors installed shall be able to sound locally when activated, as well as to transmit a signal to others in the same network, through a dedicated connected wire system such that all detectors are activated within the residential unit, in accordance with the evacuation sequence required. (Multi-Station Alarm).

4.13 For new residential homes (after Jan 2021), all detection systems are to be wired, with connection to an appropriate Fire Alarm Control Unit (FACU-See Section 5).

4.14 All detectors shall be provided with a tamper switch, which causes a trouble signal to be sent to the fire alarm control unit if the unit is tampered /removed from its mounting based. This can also be achieved through the use of smart technology by the FACU.

4.15 FACU/ATE shall be provided with a "zone disable" feature which enables a House owner to temporary disable a Detector/Detector zone temporarily. This is to provide an option to cover potential false alarms cover scenarios like Bakhoor, cleaning/dusting, incense stick burning etc. Once disabled the device/FACU/ATE should send the "DISABLED" information to the Signal Receiving Centre and Monitoring Centre. This "disable feature" is only allowed for a maximum of 15 minutes before the Device/system is pre-set to automatically come back online again, with an "ENABLE" signal sent to the SRC.

4.16 The use of this special Disablement button is to be acknowledged by the Villa Owner in his initial agreement with the Monitoring Operator when system is first installed so that Villa Owners are made aware of his responsibilities in the use of this system. During this time where system is "Disabled", the Villa Owner is responsible

to ensure that all necessary fire safety measures are followed, and various possible sources of ignition are well regulated and made safe in the Villa premises.

4.17 This "DISABLE" feature at the FACU/ATE is not to be available during the period of 12 am till 7 am the next morning.

4.18 Smoke Detectors/alarms in Residential Villas shall be in accordance with the following:

TYPE	CONNECTIVITY	SELF TESTING (with visual indication of status)	BATTERY	FIRE ALARM CONTROL UNIT
Smoke Detector (Ionization Type)	Not allowed			
Smoke Detector (Photoelectric type) Minimum Warranty 5 year	Wireless for existing homes. Hard Wired Interconnected with AC Mains New Homes Hard Wired for New Homes, Interconnected with AC Mains	Yes	Wireless: Minimum 5 years for Batteries for detector Unit. Wired: Primary: AC Mains Supply Back up:: Battery Minimum 5 years	To be provided with: a. Activation of Alarm through all Detectors/ sounders in whole premises. (Audio/ Visual if necessary). Multi Station Alarm. b. Local Activation at Panel (Audio/Visual) c. Local Disablement of detector alarm/ Linkage to SRC for Bakhoor in accordance with 4.15 d. 3 additional Connections for possible future linkages for the following: i. Police ii. Ambulance iii. Others Multiple Transmission of Activation Signal to Signal Monitoring Centre and Monitoring Station
Combined Smoke and Heat Detector (5Years warranty)	Same as above	Yes	Same as above	Same as above
Heat Detector (5 Years Warranty)	Same as above for New villas as part of the overall Detection system	Can be used but only in addition to Smoke detectors, which remain the primary detection and initiating Device in Homes. To be used mainly in Kitchens, bathrooms and other areas where Smoke detectors give rise to false alarms. Requirements for connectivity and Power same as above, to be connected to FACU.		Same as above

4.19 All Detectors shall have status Indictors (visual) to show the following:

a. Power: to indicate that unit is activated and working normally
b. Alarm; to indicate that a Fire situation has been detected
c. Fault: to indicate that the Unit is not working properly.

4.19.1 These status information signals should be transmitted and indicated at the Annunciator at the Fire Alarm Control Unit.

4.20 All Detectors shall be provided with a Test button to test the unit or to mute an alarm or fault signal, where necessary.

4.21 Detectors should be design and constructed so that they are tamper proof and maintenance free, with no parts to change, with a Warranty of 5 years.

4.22

4.22.1 The location of smoke detectors shall be based on an evaluation of potential ambient sources of smoke, moisture, dust, or fumes, and electrical or mechanical influences, to minimize nuisance alarms.

4.22.2 In addition to temperature, humidity, and velocity variations, smoke detectors are also affected by common environmental conditions as mechanical vibration, electrical interference, presence of aerosols and other environmental influences. The recognized testing laboratories in their listing program also conduct tests for these conditions. Manu-factures› installation guidelines shall be followed for location details.

4.22.3 Location and spacing of smoke detectors shall be based upon the anticipated smoke flows due to the plume and ceiling jet produced by the anticipated fire, as well as any pre-existing ambient airflows that could exist in the protected compartment.

4.23 Smoke alarms shall be installed in accordance the Manufacturer›s specifications. Generally, they should be fitted to the ceiling, close to the center of the room, at least 10 cm away from any wall or light fittings. It should avoid dead air in the corners of the room, where smoke might not reach, or possible obstructions from lightings or other fittings. Preferred locations are as follows:

a. All sleeping rooms.
b. Outside of each separate sleeping area, in the immediate vicinity of the sleeping rooms.
c. On each level of the dwelling unit, including basements [101:24.3.4.1.1]
d. Other occupy able areas, like the Living room, corridors, especially along routes of evacuation etc.
e. Kitchen and cooking areas (Heat detectors).

4.24 Smoke detectors shall not be installed where following conditions exist.

a. Temperature is below 0 deg C.
b. Temperature is above 38 deg C.
c. Relative Humidity is above %93.
d. Air velocity is greater than 1.5m/sec (300 ft./min).

4.25 Detector location and spacing shall take into consideration the following features.

a. Ceiling shape and surface.
b. Ceiling height.
c. Configuration of material content in the area.
d. Combustion characteristics of the fuel load in the area.
e. Compartment ventilation.
f. Ambient temperature, pressure, altitude, humidity and atmosphere.

4.25.1 If the intent is to protect against specific hazard, detectors shall be placed closer to the hazard, than required by the spacing guidelines.

4.26 SMOOTH CEILINGS.

4.26.1 Spot type detectors shall be placed on the ceiling.

4.26.2 Spot-type smoke detectors shall be located on the ceiling not less than 100mm from a sidewall to the near edge.

4.26.3 Detectors shall not be installed on sidewall as regular practice. Where whole areas are covered by ceiling mounted detectors and corner areas are desired to be protected, detectors shall be mounted on sidewalls at 3oomm down from the ceiling to the top of the detector.

4.26.4 The distance between smoke detectors shall not exceed a nominal spacing (S) of 9m.

4.26.5 There shall be detectors within a distance of one-half the nominal spacing, measured at right angles from all walls or partitions extending upward in sloped ceilings or towards center to within the top 15 percent of the ceiling height.

4.26.6 All points on the ceiling shall have a detector within a distance equal to or less than 0.7 times the nominal 9m spacing, 0.75) .5).

4.27 UNDER RAISED FLOORS.

4.27.1 Under raised floors having void height of 300 cm or more, or with cable runs and service piping and cuts

shall be provided with smoke detection system.

4.27.2 To minimize dust contamination, smoke detectors, where installed under raised floors, shall be mounted only in an orientation for which they have been listed.

4.27.3 Spaces beneath raised floors and above suspended ceilings shall be treated as separate rooms for smoke detector spacing purposes. Detectors installed beneath raised floors or above suspended ceilings, or both, including raised floors and suspended ceilings used for environmental air, shall not be used in lieu of providing detection within the room. Spacing shall be as per Smooth Ceiling requirements.

4.28 CEILINGS WITH SOLID JOISTS AND BEAM CONSTRUCTION.

4.28.1 Solid joists shall be considered equivalent to beams for smoke detector spacing guidelines.

4.28.2 For ceilings with beam pockets formed by intersecting beams including waffle or pan type ceilings, of depths of less than %10 of ceiling or ceilings with beam depths of less than 10 of the ceiling heights (0.1 H), smooth ceiling spacing shall be permitted. Spot- type smoke detectors shall be permitted to be located on ceilings or on the bottom of beams.

4.28.3 For ceilings with beam pockets formed by intersecting beams including waffle or pan type ceilings, of depths of equal to /more than %10 of ceiling height or ceilings with beam depths equal to or greater than %10 of the ceiling height (0.1 H), the following shall apply:

4.28.4 Where beam spacing is equal to or greater than 4o percent of the ceiling height (0.4 H), spot-type detectors shall be located on the ceiling in each beam pocket.

4.28.5 Where beam spacing is less than 4o percent of the ceiling height (0.4 H), the following shall be permitted for spot detectors:

a. Smooth ceiling spacing in the direction parallel to the beams and at one-half smooth ceiling spacing in the direction perpendicular to the beams.
b. Location of detectors either on the ceiling or on the bottom of the beams.

4.28.6 For corridors 4.6m in width or less having ceiling beams or solid joists perpendicular to the corridor length, the following shall apply: a. Smooth ceiling spacing shall be permit-ted. B. Location of spot-type smoke detectors on ceilings, sidewalls, or the bottom of beams or solid joists.

4.28.7 For rooms of 84m2 or less, the following shall be permitted:

a. Use of smooth ceiling spacing
b. Location of spot-type smoke detectors on ceilings or on the bottom of beams.

4.29 SLOPED CEILING, BEAMS RUNNING PARALLEL

4.29.1 For sloped ceiling with beams running parallel up slope, the following shall apply.

4.29.2 Spot-type detector(s) shall be located on the ceiling within beam pocket(s).

4.29.3 The ceiling height shall be taken as the average height over slope.

4.29.4 Spacing shall be measured along a horizontal projection of the ceiling.

4.29.5 Smooth ceiling spacing shall be permitted within beam pocket(s) parallel to the beams.

4.29.6 For beam depths less than or equal to %10 of the ceiling height (0.1 H), spot- type detectors shall be located with smooth ceiling spacing perpendicular to the beams.

4.29.7 For beam depths greater than %10 of the ceiling height (0.1 H), the following shall apply for spacing perpendicular to the beams:

a. For beam spacing greater than or equal to %40 of the ceiling height (0.4 H), spot-type detectors shall be located in each beam pocket.
b. For beam spacing less than %40 of the ceiling height (0.4 H), spot-type detectors shall not be required in every beam pocket but shall be spaced not greater than 50 percent of smooth ceiling spacing.

4.30 SLOPED CEILING, BEAM POCKETS FORMED BY INTERSECTING BEAMS.

4.30.1 For sloped ceilings with beam pockets formed by intersecting beams, the following shall apply:

a. Spot-type detector(s) shall be located at the bottom of the beams.
b. The ceiling height shall be taken as the average height over slope.
c. Spacing shall be measured along a horizontal projection of the ceiling.

4.30.2 For beam depths less than or equal to %10 of the ceiling height (0.1 H), spot- type detectors shall be spaced with not more than three beams between detectors and shall not exceed smooth ceiling spacing.

4.30.3 For beam depths greater than %10 of the ceiling height (0.1H), spot-type detectors shall be spaced with not more than two beams between detectors but shall not be required to be spaced closer than (0.4 H) and shall not exceed %50 of smooth ceiling spacing.

4.31 PEAKED CEILINGS.

4.31.1 Detectors shall first be spaced and located within 910mm of the peak, measured horizontally. The number and spacing of additional detectors, if any, shall be based on the horizontal projection of the ceiling.

4.31.2 For a roof slope of less than 30 degrees, all detectors shall be spaced using the height at the peak. For a roof slope of greater than 30 degrees, the average slope height shall be used for all detectors other than those located in the peak.

4.32 SHEDS

4.32.1 Detectors shall first be spaced and located within 910mm of the peak, measured horizontally. The number and spacing of additional detectors, if any, shall be based on the horizontal projection of the ceiling.

4.33 Smoke detectors shall not be installed:

a. Within 3m radial distance along horizontal path from cooking appliances.
b. Within 1m of the bathroom having shower or bathtub.
c. Within a 910mm horizontal path from the tip of the blade of a ceiling-suspended (paddle) fan.

ADDITIONAL REFERENCES TO OTHER REQUIREMENTS AS FOUND IN THE UAE FIRE CODE

4.34

4.34.1 Smoke detection and alarm system shall be provided in all Residential Villas in general compliance with regard to Design, Application, Installation, Inspection and Maintenance with the UAE Fire and Life Safety Code 2017, Chapter 8: Fire Detection and Alarm Systems unless otherwise provided for in these Guidelines. Throughout the building as per Section 4.3.

4.34.2 Smoke Detectors and alarm systems linked to a Monitoring Station are mandatory for all residential villas, private and commercial.

4.34.3 Hard-wired system shall be provided in each villa. For new Villas, only hard-wired Systems shall be installed.

4.35 PRIVATE VILLA

4.35.1 It is now mandatory by Civil Defense to provide Smoke detection and alarm system throughout private villas in compliance with Table 8.13.

4.35.2 Where fire detection and alarm system is provided, they shall be provided through-out the building as per Section 4.3.

4.35.3 Wireless/Low powered radio frequency-based Fire Detecting systems shall be pro-vided in each Villa as per Section 4.11

4.36 COMMERCIAL VILLAS

4.36.1 It is now mandatory by Civil Defense to provide Smoke Detection and Alarm system through commercial villas in accordance with Table 18.13.

4.36.2 Where provided, the Fire Detection and alarm system shall be provided throughout the building as per Section 4.3

4.36.3 Wireless/Low powered radio frequency-based Fire Detection systems shall be provided in each Villa as per Section 4.11

4.37 Auxiliary Rooms and Spaces Fire Detection and Alarm systems shall be provided as per Table 8.15

4.38 Main FACP or cluster radio hub, where installed, shall be located at the continuously attended location, such as the Facility Management Office or Main Guard House. The configuration and arrangement shall be under the responsibility of the Monitoring Operator.

4.39 OPEN KITCHEN

4.39.1 Detectors specifically listed for kitchen shall be provided as per their listing specifications. OR

4.39.2 Heat detector in the kitchen shall be provided as per Section 4.7. Along with smoke detector, 3m away from the kitchen counter, in the living room shall be provided as per Section 0 .4.3R

4.39.3 Multi sensors specifically listed for kitchen shall be provided as per Table 8.12.1.

4.40 BEDROOM

4.40.1 Smoke Detector shall be provided as per Section 4.3

4.41 LIVING ROOM

4.41.1 Smoke detector shall be provided as per Section 4.3.

4.42 USE OF HEAT DETECTORS

4.42.1 Heat detectors are generally recommended for y use in Kitchens or bathrooms, If necessary. Spot-type heat-sensing fire detectors shall be located on the ceiling not less than 4 in. (100mm) from the sidewall or on the sidewalls between 4 in. and 12 in. (100 mm and 300 mm) from the ceiling.

4.43 AUDIBLE NOTIFICATION REQUIREMENTS (See section 3.12)

4.43.1 An average ambient sound level greater than 105 dBA shall require the use of a visible notification appliance(s)

4.43.2 The total sound pressure level produced by combining the ambient sound pressure level with all audible notification appliances operating shall not exceed 110 dBA at the mini-mum hearing distance.

4.43.3 Sound from normal or permanent sources, having a duration greater than 60 seconds, shall be included when measuring maximum ambient sound level. Sound from temporary or abnormal sources shall not be required to be included when measuring maxi-mum ambient sound level.

4.44 CARBON MONOXIDE DETECTORS

4.44.1 Carbon monoxide alarms or carbon monoxide detectors shall be provided in residential premises where either of the following conditions exists:

a. Residential buildings with communicating attached garages.
b. Residential buildings with fuel burning appliances.

4.45 Where required, carbon monoxide alarms or detectors shall be installed in the following locations:

a. Outside of each separate sleeping area, in the immediate vicinity of the sleeping rooms
b. On every occupiable level of the dwelling unit, including basements, and excluding attics and crawl spaces.

4.46 Carbon monoxide alarms and carbon monoxide detectors as specified in shall not be required in the following locations:

a. In garages
b. Within residential buildings with communicating attached garages that are open parking structures.
c. Within residential buildings with communicating attached garages that are mechanically ventilated.

4.47 GAS DETECTORS

4.47.1 Gas detection (Other than LP Gas detection) shall be designed and installed as per manufacturers listed design guidelines.

4.47.2 LP Gas detection and Alarm system shall be as per Chapter 11. Fire Safety Guidelines for Liquefied Petroleum Gas Installations.

4.47.3 Gas detection equipment shall be listed for the specific gas or vapor it is intended to detect.

4.47.4 Any gas detection systems installed on a fire alarm system shall comply with all the applicable requirements of this Code.

4.47.5 The requirements of this Code shall not apply to gas detection systems used solely for process control.

4.47.6 The selection and placement of the gas detectors shall be based on an engineering evaluation.

4.48 DOCUMENTATION

4.48.1 Shop drawings, to be provided by Approved Installer should include, to an extent commensurate with the extent of the work being performed: floor plan drawings, detector location and layout, riser diagrams, control panel wiring diagrams, point-to-point wiring diagrams, conduit, conductor routing, typical wiring diagrams, and other information.

4.48.2 All shop drawings should be drawn on sheets of uniform size and should include the following information:

a. Name of protected premises, owner, and occupant (where applicable).
b. Name of installer or contractor
c. Location of protected premises
d. Date of issue and any revisions

4.49 Every system, when completed, shall include the following documentation, which shall be delivered by the Approved Installer to the owner or the owners representative upon final acceptance of the system:

1. An owners manual and manufacturers published instructions covering all systems. A detailed narrative description of the system inputs, evacuation signaling, ancillary functions, annunciation, intended sequence of operations, expansion capability, application considerations, and limitations
2. Operator instructions for basic system operations, including alarm acknowledgment, system reset, interpretation of system output (LEDs, CRT display, and printout), operation of manual evacuation signaling and ancillary function controls.
3. A detailed description of routine maintenance and testing as required and recommended and as would be provided under a maintenance contract, including testing and maintenance instructions for each type of device installed. This information should include the following:

a. Listing of the individual system components that require periodic testing and maintenance.
b. Step-by-step instructions detailing the requisite testing and maintenance procedures, and the intervals at which these procedures shall be performed, for each type of device installed
c. Simple troubleshooting instructions for most common trouble conditions that could be generally generated.

[These instructions should include a list of all trouble signals annunciated by the system, a description of the condition(s) that causes such trouble signals, and step- by-step instructions describing how to isolate such problems and correct them or how to call for service, as appropriate.

d. A service directory, including a list of names and telephone numbers of those who provide service for the system.

REQUIREMENT/SPECIFICATION

5.1 Fire alarm control Unit (FCAU) used in residential Fire Alarm systems shall be approved and listed by Civil Defense. Fire alarm main control Units installed in all residential buildings shall have high performance and stability, tested for redundancy (CPU, I/O cards, Display etc. should have redundancy features to ensure continuous operation in case of failure of any of these components and shall have hot swap features to repair and replace these components without turning off the main power supply and without compromising continuation of the fire alarm control panel.

PERFORMANCE

5.1.1 FACU architecture shall be such that circuit modules can easily be added to upgrade the capacity of the Control panel to monitor the additional detectors or additional loops of detectors and desired output functions. FACU shall be multi-functional, having features to monitor and supervise Fire Detection, Gas Detection and Fire Suppression activation simultaneously, where necessary. Generally, FACU should have spare capacity to add %20 more detectors with additional wiring and interface modules without adding additional circuit boards (modules) to upgrade, to enable alterations and up gradation to the facility.

5.1.2 FACP shall be installed in a location which is easily accessible, visible to residents in common areas, (preferably along routes of escape) and easily accessible by emergency response personal on arrival. FACP shall not be installed in an unattended room, service rooms, mechanical rooms etc.

5.2 The Fire Alarm Control Unit shall be compatible for use in an Addressable Fire Alarm system.

5.3

5.3.1 on activation of the Initiating devoices, notification signals in accordance with the building evacuation shall also be automatically and immediately activated.

5.3.2 Responsible people in the residential premises shall have hall have up to 15 seconds during the alarm investigation phase to evaluate the fire condition and reset the system. If the system is not reset during the investigation phase, notification signals in accordance with the building evacuation plan and remote signals shall be automatically and immediately activated.

5.3.3 If a second automatic fire detector is actuated during the alarm investigation phase, notification signals in accordance with the building evacuation plan and remote signals of «confirmed Fire» to the Signal Receiving Centre/Monitoring Centre shall be automatically and immediately activated.

5.4

5.4.1 An open or ground condition of any fire alarm circuits shall result in the annunciation of a trouble signal at the protected premise within 200 seconds.

5.4.2 System bandwidth is monitored to confirm that all communications between equipment that is critical to

the operation of the fire alarm system or fire safety functions take place within 10 seconds; failure shall be indicated within 200 seconds.

5.4.3 Failure of any equipment that is critical to the operation of the fire alarm system or fire safety functions is indicated at the master fire alarm control unit within 200 seconds.

5.4.4 A listed barrier gateway, integral with or attached to each control unit or group of control units, as appropriate, shall be provided to prevent the other systems from interfering with or controlling the fire alarm system.

5.4.5 Where there is more than one per premises, each interconnected fire alarm control unit shall be separately monitored for alarm, supervisory, and trouble conditions.

5.4.6 Interconnected fire alarm control unit alarm signals shall be permitted to be monitored by zone or by combined common signals

5.4.7 Protected presidential remises fire alarm control units shall be capable of being reset or silenced only from the fire alarm control unit at the protected residential premises. Or at the Monitoring Station through a computer-based front-end unit listed for use by the manufacturer of the fire alarm control unit.

5.4.8 All non-fire alarm components shall be listed for fire alarm use or for fire conditions.

5.5 Fire alarm and mass notification systems provided for evacuation residential occupants shall have one or more notification on each floor of the building.

5.6

5.6.1 At least two power supply sources shall be provided for any fire detection and alarm system, one primary and one secondary, fully supervised by FACU for failure, loss of power, trouble, short circuit conditions.

5.6.2 Each power supply shall be of adequate capacity for the full functionality of the System.

5.6.3 Primary Supply shall be directly from the Electric Utility Supply.

5.6.4 The supply from Electric Utility branch shall be direct to Fire Alarm System only and shall not serve any other loads.

5.6.5 The system circuit disconnecting means shall be permanently identified as to its purpose, shall be secured and shall be accessible only to authorized personnel.

5.6.6 Such disconnecting switch shall be clearly marked «FIRE ALARM/DO NOT DISCON-N ECT».

5.6.7 All wiring from Electric Utility branch to Fire Alarm Control Panel shall be protected from mechanical damages.

5.6.8 An over current protective device shall be provided in accordance with NFPA 70.

5.6.9 The secondary means of Power Supply shall be permitted to be either approved UPS in accordance with NFPA 111 or Batteries dedicated to the FACU.

5.6.10 Operation on secondary power shall not affect the required performance of a system or supervising station facility, including alarm, supervisory, and trouble signals and indications.

5.6.11 the secondary power supply capacity for supervising station facilities and equipment shall be capable of supporting operations for a minimum of 24 hours and then shall be capable of operating the system during a fire or other emergency condition for a period of 30 minutes at maximum connected load.

5.6.12 Battery calculations shall include a minimum 20 percent safety margin above the calculated amp-hour capacity required.

5.6.13 Batteries shall be marked with the month and year of manufacture using the month/year format.

5.6.14 Storage batteries shall comply with the requirements of Article 480 of NFPA 70.

5.6.15 Battery charging equipment shall be provided to recharge batteries within 48 hours after fully charged batteries have been subject to a single discharge cycle.

5.7

5.7.1 Notification appliances are used to initiate or alarm residents, direct evacuation the occupants, or for providing information to occupants as to the outbreak of fire. All notification devices shall be approved and listed by Civil Defense. Notification devices shall have nameplate indicating the electrical connection parameters, audible decibels or visible performance and installation methods.

5.7.2 Generally, for notification for residential premises, the building shall have a «one out-all out «evacuation procedure, i.e. immediate evacuation of all residents in the premises. If «Phased evacuation is a preferred option, then this shall be dis-cussed with the Civil Defense, and the system designed accordingly.

5.7.3 Notification devices shall be installed such that they are not mechanically damaged and shall be protected against mechanical damage where subjected to. Notification devices shall be mounted such that they are supported independently of their attachments to circuit conductors.

5.7.4 An average ambient sound level greater than 105 dBA shall require the use of a visible notification devices. The total sound pressure level produced by combining the ambient sound pressure level with all audible notification appliances operating shall not exceed 110 dBA at the minimum hearing distance.

5.7.6 Audible notification appliances for wide area signaling shall be installed in accordance with the approved design documents, and the manufacturers installation instruction to achieve the required performance.

5.7.7 Sound pressure levels that must be produced by the audible appliances in the coverage areas to meet the requirements of this Code shall be documented by the Approved Installer during the planning and design of the notification system. The design sound pressure levels to be produced by the notification appliances for the various coverage areas shall be documented for use during acceptance testing of the system. If required by the relevant authority, documentation of the design sound pressure levels for the various coverage areas shall be submitted for review and approval.

5.8

5.8.1 Visible notification devices shall be approved and listed by Civil Defense.

5.8.2 The flash rate shall not exceed two flashes per second (2 Hz) nor be less than one flash every second (1 Hz) throughout the listed voltage range of the appliance.

5.8.3 A maximum pulse duration shall be 0.2 second with a maximum duty cycle of %40.

5.8.4 The pulse duration shall be defined as the time interval between initial and final points of %10 of maximum signal.

5.8.5 Lights used for fire alarm signaling only or to signal the intent for complete evacuation shall be clear or nominal white and shall not exceed 1000 cd (effective intensity).

5.8.6 Lights used to signal occupants to seek information or instructions shall be clear, nominal white or other color as required by the emergency plan.

5.8.7 Visible notification devices shall be located not more than 4.57m from the end of the corridor with a separation not greater than 30.5m between visible notification devices.

5.8.8 Wall-mounted devices shall be mounted such that the entire lens is not less than 2m and not greater than 2.44m above the finished floor.

5.8.9 Where low ceiling heights do not permit wall mounting at a minimum of 2m, wall mounted visible appliances shall be mounted within 150mm of the ceiling.

5.8.10 Visual alarm signals (flashers) shall be used in areas where audio alarm signal is not effective, not feasible to type of occupancy (i.e. Noisy parking spaces, extremely noisy environment like engine room and plant rooms) or in areas where audio alarm requires the aid of visual alarm.

5.9 For other configurations, please refer to the UAE Fire & Life Safety Code.

5.10 Actuation Time. Actuation of alarm notification appliances emergency control function interface devices, and annunciation at the protected residential premises shall occur immediately.

5.11 The alarm sequence operation shall comply with the following:

a. To initiate the positive alarm sequence operation, the signal from an automatic fire detection device selected for positive alarm sequence operation shall be acknowledged at the fire alarm control unit immediately
b. Notification signals in accordance with the «Immediate Evacuation alarm» and remote signals to the Signal Receiving Centre and the Monitoring Centre) shall be automatically and immediately activated.
c. If the alarm sequence operation is initiated in accordance as above, and received at the SRC/MC, trained operators shall imitate an alarm investigation phase of up to 120 seconds to evaluate and confirm the actual fire conditions,
d. In these 120 secs. Alarm investigation phase, SRC operators shall attempt to contact the building owner/ responsible persons to establish the fire situation for confirmation. If unable to establish within the 120 sec, then necessary signal for the Activation of CD resources shall be sent to the CD Monitoring Centre. In any case of within 120 sec, even if there is no response from SRC, the MC will automatically dispatch the necessary appliances as per SOP.
e. If a second automatic fire detector is actuated during the alarm investigation phase, notification signals in accordance and remote signals shall be automatically and immediately activated, and received at both the SRC and MC, then a Fire situation is deemed to be confirmed and dispatch by the MC is immediate.
f. If there is a report of a fire situation through a mobile phone or PSTN line by external members of public, the dispatch is immediate by the Monitoring Centres, regardless of the signals from the SRC. No waiting for 120 sec is required.
g. Where the CD is activated and dispatched to an alarm by the SRC, the relevant CD Ops Centre shall feedback to the SRC whether the was a Confirmed, or a false alarm, when detected by resources on arrival. This record shall be documented at SRC.

5.12

5.12.1 Protected premises fire alarm control units shall be capable of being reset or silenced only from the fire alarm control unit at the protected premises, by the responsible building owner.

5.12.2 Remote resetting and silencing of a fire alarm control unit from other than the protected premises shall only be allowed from the SRC/MC, on establishment of the status of the alarm with the building owner.

5.13 The primary purpose of fire alarm system annunciation is to enable responding personnel to identify the location of a fire quickly and accurately and to indicate the status of emergency equipment or fire safety functions that might affect the safety of occupants in a fire situation.

5.14 Visible annunciation of the location of an operated initiating device shall be by an indicator lamp, alphanumeric display, printout, or other approved means the location of an operated initiating device shall be annunciated by visible means.

5.15 Supervisory and/or trouble conditions in the system shall be annunciated by visible means at the Monitoring Centre.

5.16 All required annunciation means shall be readily accessible to responding personnel. And shall be located as required by the CD to facilitate an efficient response to the fire situation. The FACU should be located in or near a public space, such as an entrance lobby, passageway so that trouble and supervisory signals will get the attention of any occupant or responsible person.

5.17 The FACU shall be located base on the following principles:

a. In an area of relatively low risk.
b. On the ground floor entrance, which he fires fighters will normally use.
c. Where ambient light levels ensure visibility at all times.
d. Easily accessible to the building occupants, and preferably along the route of evacuation.

5.18 It should have an integral LCD display with backlighting, and as a minimum, should provide indicators (LED) to indicate status of the various devices and circuits such as:

a. Power.
b. Fire Alarm.
c. Supervisory.
d. Trouble.
e. Optional Disablement of detectors/Linkage to SRC for Bakhoor.
f. Additional linkages to possible external connections to police/Ambulance etc.

5.19 The FACU shall be able to handle the required number of addressable points/ devices (any combination of addressable detectors and modules) for the residential premises, with capability for expansion by over %20.

5.20 It has an Integrated DACT / DART for off premises monitoring by a remote Monitoring Station on its circuit board.

5.21 The FACU with DACT/DART should be able to transmit system status to a Signal Receiving Centre (SRC) provided by the Monitoring Operator and the CD Monitoring station via the Public Switched Telephone Network and Wireless Radio network simultaneously.

5.22 The FACU should allow for remote or local programming of the Fire Detection and system Control devices, either through the Public Switched Telephone Network or Wireless Radio Network.

5.23 Where the Radio Network is the primary monitoring network for alarm signals, the secondary telephone lines shall act as a backup over the Public Switched Telephone Line.

REQUIREMENT/SPECIFICATION

6.1 All Fire alarms signals are transmitted from the Fire Alarm Control Unit at the residential premises, over Wireless Radio Networks or Public Switched Telephone networks provided by the Monitoring Operator through their own Signal Receiving Centre, the signal will also be electronically transmitted to the appropriate Monitoring Centre of the Civil Defense.

6.2 The Signal Receiving Centre (SRC) shall be operated by the Monitoring Operator on a 7/24 basis, to ensure the full availability of all the Detection systems at all protected premises and the transmission networks to achieve a high standard of reliability, including verification of alarms. This SRC oversees a system or group of systems in which the operations of circuits and devices are signaled automatically to, recorded in, maintained by, and supervised by their trained staff sand operators.

6.3 The communication links between the Residential FACUs and the SRC/MC consist of an Active connection, i.e. it is monitored on a 7/24 basis on a continual basis. And if communication between the monitored premises and the SRC is interrupted for any reason, the SRC is notified within seconds and the SRC operator can take immediate action. This can also be done using cellular monitoring, with a supervised connection every 90 sec to ensure communication.

6.4 This CD Ops /Monitoring Centers locations, as determined by CD, will have their necessary links and connections to receive the necessary alarms from the SRC, and also activate or dispatch the necessary Emergency Resources according to their SOPs through their Command and control Centre Frameworks.

6.5 The Monitoring Operator/System Integrator is to ensure the proper linkages and signal transmissions systems and networks of the SRC are compatible with the CD Monitoring Centers, to be able to receive such alarms activations, from their Signal Receiving Centers.

6.6 All fire alarm signals initiated by the Fire Alarm Control Unit at the Residential premises shall be immediately transmitted to the Signal Receiving Centre, and the Civil Defense Ops/Monitoring Station.

6.7

6.7.1 On receipt of such alarms, the Signal Receiving Centre (SRC) personnel shall attempt to immediately verify the alarm signals prior to activating or dispatching CD resources to respond, unless the following conditions exist:

a. Alarm signal verification is deemed not necessary by CD with no immediate response is to be carried out for a specific protected premise whenever an alarm is raised.
b. Documentation exists by an appropriate Authority (CD) for non-verification of any alarm from the identified residential premises.

6.7.2 If the requirement for verification changes, CD shall notify the Monitoring Station of the new procedure to be followed in writing.

6.8

6.8.1 Verification of the alarm signal must be by responsible or authorized person from the residential premises, once the alarm signal is received.

6.8.2 Verified alarm signals that confirm a fire outbreak or emergency are to result in the immediate dispatch of the required Fire resources and include information that that the signal was verified at the identified residential protected to be an emergency, together with the responsible person who confirmed the fire situation.

6.8.3 Where alarm verification is not possible or conclusive, as per agreed procedures, SRC are to activate the CD Ops Centre for fire resources are to be immediately dispatched in any case. The Signal Receiving Centre is to subsequently establish why such verification was not possible.

6.8.4 Alarm signals that are verified and confirmed as nuisance alarms should be recorded by the SRC, for follow up action by the SRC or relevant Authority having jurisdiction.

6.9

6.9.1 Alarm signals transmitted to the SRC shall be by addressable device location so as to allow direct identification of the site of the outbreak.

6.9.2 Information to be received by the Monitoring Centre are:

a. Location of call. (Address).
b. Identification of actual activated device.
c. Status of call verification.
d. Time of verified call or dispatch.
e. Contact number of Person responsible at Residential premises.
f. Digital map of indicated location.
g. Villa Coordinates.

6.9.3 This information, along with other data needed for System design and Installation, should be captured during the site surveys in the initial stages of system with the approved Installer on commissioning of system linkage to SRC.

6.10

6.10.1 After activation, all fire alarm systems shall be programmed to report restoral signals to the Monitoring Station upon restoration of the activation. This can be done locally at the FACU or remotely through the Monitoring Operator.

6.10.2 Any signal received by the Monitoring Station that has not been restored to normal condition within 24 hours of initial receipt shall be identified to the Monitoring Operator as a non-restored signal and shall be reported to the villa owner/subscriber and followed up by the SRC for restoration.

6.11

6.11.1 In the event of the failure of equipment at the communications channel to the central station, a backup shall be operational within 90 seconds.

6.11.2 Restoration of a failed unit shall be accomplished within 7 days. During this time, the SRC shall alert the Villa Owner to have a heightened awareness and take special attention to fire safety measures in the Villa.

6.11.3 Each communications channel shall be continuously supervised between the Unit and the Monitoring Station. When the communications channel between the FACU and the Monitoring Centre fails, the communications shall be switched to an alternate path. Public switched Telephone network shall only be used as an alternative.

ASSET LINK-ASSET BUILDING CONNECTIVITY NETWORK

6.12 All the assets monitored should be connected over 3G/4G Cellular Network.
The Monitoring Operator must use a secured and dedicated private Access Point Name (APN) network providing connectivity to the assets monitored.

6.13 The data signals delivered over the dedicated private 3G/4G network to the Signal Receiving Centre and CD Ops/Monitoring Centres, shall be over resilient, dual last mile circuits. The circuits, if routed to different Service Provider exchanges, wherever possible, shall ensure that any issue on one link or exchange does not affect operations. Strict admissions control policies and congestion control mechanisms to be applied on best effort basis to avoid any packet delays or congestions in the network. The cellular network shall be:

a. Scalable and highly available.
b. Fully manageable ensuring that cellular connectivity is always on.
c. Redundant connectivity to the Service Provider from the signal Receiving / Monitoring Centre Hubs.

6.14 The occurrence of an adverse condition on the transmission channels between a protected premise and the SRC/MC that prevents the transmission of any status change signal shall be automatically indicated and recorded at the SRC. This indication and record shall identify the affected portions of the system so that the operator at the SRC will be able to determine the location of the adverse condition by trunk or leg facility, or both.

6.15 Alarm annunciation at the SRC, must be by means of audible as well as visible indicators to capture the attention of the trained and dedicated attendant.

FALSE ALARMS MANAGEMENT

6.16 Increased False alarms are a possible outcome of having such Detection and alarms systems installed in homes. While part of this could be due to poor practices by the building owner, most such false alarms can be linked to system failure. The maintenance program in the next Section will ensure that not only is the system being maintained, serviced, and periodically tested by the Villa Owner and his approved maintenance service (Approved Installer). However, Service Providers, especially the Monitoring Operator/System Integrator and Civil Defense also needs to monitor and track such false alarms to ensure system integrity and have a program that would eventually reduce such nuisance or false calls to the SRC/MC in the long run.

6.17 The SRC is required to engage the Building/villa owner in the case of persistent false alarms call. In many situations, the problems can be corrected by ensuring the systems are maintained, serviced, and tested by an approved Installer. However, in some cases, the system problems may be attributed to aging for which suitable replacement parts are no longer available, or poor installation. The Monitoring Operator is to advise the building owner/Approved Installer to take the appropriate corrective action to ensure the system comes online again within the given time frame.

6.18 Impaired fire alarm systems shall include, but shall not be limited to, required systems that are not fully operational, are switched off temporarily by the building owner, or are under renovation or repair.

6.19 The system owner or designated representative shall immediately notify the Signal Monitoring Centre in an approved manner when a fire alarm system is impaired and indicate the time of impairment especially if it is intentionally switched off. He is also to inform the SRC when the system is switched back on. This should not be longer than 1 hour.

6.19 If the impairment is more than 1 hour, the SRC shall inform the Monitoring Centre who may require additional fire safety measures to be complied with. e.g., it may require standby fire personnel or an approved fire watch at the premises involved.

6.20 Fire alarm systems that have produced five or more false alarms in a -3month period shall be classified as chronic false alarm prone systems. This will require the system to be put under a systematic follow-up program under the control of the SRC and his authorized Approved Installer, if necessary. This corrective action may be charged to the Residential owner.

6.21

6.21.1 If in the exceptional case, after engagement to address the impairment with the building owner is unsuccessfully and the problem of false alarms still persists, The Signal Receiving Centre (SRC) shall immediately notify the relevant CD Monitoring Centre when any of the following conditions exists:

a. A fire alarm system is impaired and not repaired.
b. Required system monitoring is no longer available.
c. Required testing, service, and maintenance can no longer being provided.
d. A fire alarm system cannot be serviced or repaired to make it fully operational.
e. A fire alarm system cannot be serviced or repaired to eliminate chronic nuisance alarms.

6.21.2 The Monitoring Centre shall inform the relevant Emirate CD to take the necessary engagement action, including enforcement action, if necessary, with the Building Owner under the appropriate Regulations to ensure compliance with the Hassantuk regulations.

REQUIREMENT/SPECIFICATION

S/NO	REQUIREMENTS AND SPECIFICATIONS	REMARKS
7.1	Once installed and commissioned as operational, the Fire and Detection System requires consistent effort in maintaining its integrity and operational readiness., in particular its ability of detection, and also the uninterrupted transmission of the alarm signal to the required SRC and CD's Monitoring Station	
7.2	The objective of this Section is to ensure the continuous reliability of the fire alarm system, through its intended lifespan. In this, responsibility lies on the following as appropriate: a. Residential premises owner, or his assigned representatives; b. Service Providers of the system and its networks; c. Manufacturers of fire protection devices and system or his representatives; d. Approved Installer for Installation/maintenance	
7.3	The main activities for Maintenance shall be: a. To have a schedule for regular Testing and Inspection b. Have a process to deal with common maintenance problems and troubleshooting on a routine basis; c. Have procedures to identify and manage False Alarms.	
7.4	Design, specifications and submittals for each residential property to Civil Defense for approval of the fire detection and alarm system shall be the Approved Installers/Project Consultant's responsibility (See Part I). Approved Installer shall have competent and knowledgeable personnel to understand the Civil Defense requirements and codes and standards. Where this is a Third party, it shall be approved by the Civil Defense. Design submittals shall be complete with fire detection design objective, manufacturer's design specifications, battery calculations, detector spacing criteria, appropriate selection of types of systems and their components, in compliance with this Code.	
7.5	Installation of fire detection and alarm systems shall be carried out only by Civil Defense approved and licensed "Approved Installers". General contractors, MEP contractors, electrical contractors, BMS contractors, home automation contractors shall not be allowed to install fire detection and alarm systems. Installation contractor qualification and approvals from Civil Defense are based on their training from respective system manufacturers, experience, understanding of codes and standards and workmanship. This shall also be in accordance with the onboarding process with System Integrator. Installation contractors shall first, as a minimum, apply to Civil Defense and secure passing marks in Civil Defense examination to gain license and be qualified as "approved fire detection and alarm systems contractors" first as a minimum Requirement. They must engage and establish working arrangements/contracts with the Monitoring Operator, before approaching the Emirate Directorates for Approval as "Approved Installers". Installation contractor shall not commence work on site without receiving Civil Defense stamped and approved drawings from the Consultant. It is the Approved Installers responsibility to supervise them to adhere to consultant's Civil Defense approved drawings and manufacturer's installation guidelines and specification	

7.6	Inspection and acceptance of the full system installed in any Residential premises shall be Main consultant/Approved Installer 's responsibility. Main consultant/Approved Installer shall inspect contractor work during installation and ensure that all systems are installed, tested, commissioned and performing as per the Civil Defense approved drawings, manufacturer's design and installation guidelines, acceptance criteria and their intended purpose. Main Consultant/Approved Installer shall handover system inspection report, operating and maintenance manuals to the Residential Villa building owner for record and documentation.	
7.7	ACCEPTANCE TESTS **1. RESPONSIBILITY** Approved Installer shall carry out the following acceptance tests with fire detection and alarm system contractors and other relevant contractors. **2. POWER SUPPLY** • Primary power and secondary power are available and satisfactory. • Batterles/UPS are of right rating and installed properly. • Primary mains disconnect switch location and switch number is mentioned on drawing and inside FACP/FACU. **3. FACP/FACU** i. FACU location is as per approved drawings. ii. FACU controls are working, displays are satisfactory. iii. LAMP test of the FACU is satisfactory. iv. Remote annunciators are working, and displays are satisfactory. **4. VISUAL INSPECTION OF INITIATING DEVICES** i. Detectors are installed as per approved locations and spacing. ii. Detectors are free of obstructions. iii. Detectors are at satisfactory distance from air diffusers, air movement areas. iv. Manual call points are installed near exits satisfactorily. v. Manual call points are installed at acceptable height. **5. VISUAL INSPECTION OF NOTIFICATION DEVICES** i. Notification devices are installed at proper heights and location. ii. Visible notifications are free of obstruction iii. Alarm audibility and visibility is clear and understandable. iv. Alarm notification is both in English and Arabic. **6. OPERATIONAL/ FUNCTIONAL TESTS** • Notify 24 X 7 and Civil Defense of the Functional tests. • Disconnect any suppression systems monitored and triggered by the fire detection and alarm system to be tested. • The following operational and functional tests shall be conducted.	

	7. SECONDARY POWER i. Load voltage verification. ii. Discharge test. iii. Charger tests. **8. FACU** i. Functional tests of FACP Lamps, LEDS and LCD. ii. Fuses: Removal and normalization. iii. Disconnect switches operation. iv. Trouble signals initiation (open wire, loop, unlock detectors etc.) v. Trouble signal normalization. vi. Ground fault monitoring. vii. Annunciation to remote panels. **9. INITIATING DEVICES** i. Trigger alarm through smoke detectors using listed aerosol. ii. Trigger alarm through operating manual call points. iii. Trigger alarm through heat detectors by heat blower. iv. Verify alarm signal generation. v. Verify annunciator alarms and displays. vi. Verify the location displays and confirm addresses of initiating device. vii. Verify following interconnected systems upon alarm signal. **10. INTERCONNECTED SYSTEMS (If any)** i. Interconnected systems such as HVAC shut down, dampers, doors, and elevators are functioning satisfactorily. ii. The interconnected systems are monitored and supervised. iii. Disconnect, initiate trouble signal and normalize. **11. NOTIFICATION DEVICES** i. Audibility is clear. And within the acceptable strength. . ii. Visual notifications are satisfactory and convey the alarm, as necessary. iii. Verify supervision of notification devices. Initiate trouble and restore.	
7.8	**HANDING OVER** • DOCUMENTS TO BE HANDED OVER TO OWNER BY MAIN CONSULTANT/ APPROVED INSTALLER • Main Consultant/Approved Installer shall handover as built drawings, copy of approved and stamped drawings. System manufacturer's design, installation, inspection and maintenance manual. • Inspection report signed by Approved Installer, Consultant, Contractors and Owner's representatives.	
7.9	**REMOTE MONITORING OF FAULT CONDITIONS** • New technologies exist that are able to test equipment remotely. However, where the equipment is specifically listed to be able to be subject to automatic remote testing, this shall be deemed acceptable practice, with the maintenance of proper records by the Monitoring Operator. • Where such technology exists, and there is a high level of service monitoring by the Monitoring Operator, Maintenance and Inspection processes may be modified, in consultation with Civil Defense. However, this is also dependent on the level of false alarms and their frequency/ causes. In extreme cases, specific Maintenance/Inspections may be required for selected premises.	

7.10	**INSPECTION AND MAINTENANCE** **DAILY;** i. Verify that FACP /FACU is free of troubles, faults and is working with normal power in satisfactory Automatic condition. ii. Verify signal receiving to annunciators. iii. Take investigation and rectification action if there are fault signals or any abnormal conditions and displays present on FACP.	
	WEEKLY; • Check fuses. • Check primary power supply for normality. • Check interfaced systems and equipment • Perform Lamp test, LED, LCD Test. • Check for trouble signals. • Check for initiating devices LED blinking randomly. • Take investigation and rectification action if there are fault signals or any abnormal conditions and displays present on FACP.	
	MONTHLY; • Perform walk-through tests from FACP to verify all devices are communicating with FACP satisfactorily. • Perform tests to verify if FACU and linkages with Monitoring Centre are communicating satisfactorily.	
	QUARTERLY; • Verify that initiating devices are free from obstructions; dust, paint etc. verify orientation is intact. **SEMI ANNUALLY;** • Verify FACU and annunciator's functionality. • Verify working condition of notification devices. • Verify visible notification devices functionality. • Perform all other tests required daily, monthly and quarterly. • Take investigation and rectification action if there are fault signals or any abnormal conditions, loss of signals and displays are present on FACU	

	ANNUALLY; • Primary power supply shall be tested under maximum load with all devices in load, operating simultaneously. • Disconnect all primary power supply and verify power backup and trouble signals from secondary power supplies. • Complete test of FACU and annunciators as per acceptance tests. • Initiate and trigger fire alarms on all initiating devices and verify alarm signals, supervisory signals and trouble signals as per acceptance tests. • Verify all notification devices functionality as per acceptance test. • Verify, if any, interconnected system supervision, releasing mechanisms as per acceptance test. • Take investigation and rectification action if there are fault signals or any abnormal conditions and displays present on FACU/FACU to SRC/Monitoring Centre (MC.	
7.11	As this Guideline permits battery-powered smoke alarms in existing dwellings, occupants of residential properties that use such alarms must ensure that those alarms are tested and maintained properly. Approved Installer is to provide instructions and guidelines on simple and routine checks and maintenance as required. Monitoring Operatories to have an emergency Hot Line on a 7/24 basis for members of public who may have system problems.	
7.12	Where new SMART technology that allows for remote testing is available, and automatic testing is performed at least weekly by a remotely monitored fire alarm control unit specifically listed for the application, and the signals are tracked by the Signal Receiving Centre, the manual(on-site) testing frequency shall be permitted to be extended to annually. The records of such maintenance outcomes shall be documented.	

ANNEX A

Acceptable Test Standards and criteria from the UAE Fire Code

8.1.1 All the devices, controls, wiring, modules, materials, systems, assemblies, equipment, products, components and accessories, referred to in this chapter with respect to life safety, fire safety and emergency services shall be listed, approved and registered by the Civil Defense
Material Approval Department This list shall be updated at regular intervals by Civil Defense GHQ.

8.1.2 There is no year of edition mentioned against any test standards. It is the intent of
Civil Defense to convey to the customers seeking laboratory tests and the test laboratories to follow the "LATEST EDITION OF THE TEST STANDARD, AS AND WHEN THEY ARE UPGRADED/REVISED/ AMENDED, TO THE DATE".

8.1.3 Smoke Detectors

a. FM3230, Approval standard for smoke actuated detectors for automatic alarm signaling.
b. UL 268, Standard for smoke detectors for fire alarm systems.
c. EN 7-54, Fire detection and fire alarm systems. Smoke detectors. Point detectors using scattered light, transmitted light or Ionization.
d. EN 14604, Smoke alarm devices (Domestic)
e. ISO 7-7240, Fire detection and alarm systems- Part 7: Point-type smoke detectors using scattered light, transmitted light or ionization.
f. EN 12-54, Smoke detectors-line detectors using a transmitted optical beam
g. ISO 12-7240, Smoke detectors-line detectors using a transmitted optical beam.

8.1.4 Heat Detectors

a. UL 521, Standard for Heat detectors for fire protective signaling systems.
b. FM 3210, Heat detectors for automatic fire alarm signaling.
c. EN 5-54, Fire detection and fire alarm systems. Heat detectors. Point detectors
d. ISO 5-7240, Fire detection and alarm systems. Point-type heat detectors

8.1.5 Air Sampling Type Detectors

EN 20-54, Fire detection and fire alarm systems. Aspirating smoke detectors
FM 3230, Approval standard for smoke actuated detectors for automatic alarm signaling.

8.1.6 Flame Detectors

a. FM 3260, Radiant energy-sensing fire detectors for automatic fire alarm signaling.
b. EN 10-54, Flame detectors- Point detectors.
c. ISO 10-7240, Flame detectors- Point detectors.
d. BS ISO 19292, Ships and marine technology. Lifesaving and fire protection. Point-type resettable flame detectors for ships.

8.1.7 Multi-Sensor Fire Detectors

a. ISO 15-7240, Point type fire detectors using scattered light, transmitted light or ionization sensors in combination with a heat sensor.
b. EN 29-54, Multi-sensor fire detectors- Point detectors using a combination of smoke and heat sensors.
c. EN 30-54, Multi-sensor fire detectors- Point detectors using a combination of carbon monoxide and heat sensors.
d. EN 31-54, Multi-sensor fire detectors- Point detectors using a combination of smoke, carbon monoxide and optionally heat sensors.

8.1.8 Line Type Detectors

a. BS EN 22-54, Fire detection and fire alarm systems. Resettable line-type heat detectors.

8.1.9 Carbon Monoxide Detectors

a. LPS 1265, Requirements and testing procedures for the LPCB approval and listing of carbon monoxide fire detectors using electrochemical cells.
b. ISO 6-7240, Carbon monoxide fire detectors using electro-chemical cells
c. LPS 1274, Testing procedures for the LPCB approval and listing of carbon monoxide/ heat multi- sensor detectors using electrochemical cells
d. LPS 1279, testing procedures for the LPCB approval and listing of point multi-sensor fire detectors using optical or ionization smoke sensors and electro-chemical cell CO sensors and optically heat sensors.
e. EN 26-54, Carbon monoxide detectors- Point detectors.

8.1.10 Combustible Gases Detection

a. BS EN 50194, Electrical apparatus for the detection of combustible gases in domestic premises. Test methods and performance requirements.

8.1.11 Manual Call Points

a. UL 38, Standard for manual signaling boxes for fire alarm systems.
b. EN 11-54, Manual call points
c. ISO 11-7240, Manual call points
d. FM3010-, Approval standard for fire alarm signaling systems.

8.1.12 Duct Detectors

a. UL 268A, Standard for smoke detectors for duct application.
b. LPS 1280, Testing procedures for the LPCB approval and listing of duct smoke detectors using point smoke detectors.
c. EN 27-54, Fire detection and alarm systems. Duct smoke detectors
d. FM3230, Approval standard for smoke actuated detectors for automatic alarm signaling.

8.1.13 Video Image Smoke Detector

a. 268 B. Outline of Investigation for video image smoke detectors.
b. FM 3232, Video image fire smoke detectors for automatic fire alarm signalling.

8.1.14 Audible Notification Devices

a. UL 464, Audible signaling devices for fire alarm and signaling devices, including accessories.
b. UL 1480, Speakers for fire alarm and signaling systems, including accessories.
c. FM 3150. Audible notification appliances for automatic fire alarm signalling.
d. EN 3-54, Sounders.

8.1.15 Visible Notification Devices

a. UL 1638, visible signaling devices for fire alarm and signaling systems, including accessories.
b. EN 23-54, Fire alarm devices. Visual alarm devices
c. UL 1971, Standard for Signaling Devices for the Hearing Impaired

8.1.16 FACP (Fire Alarm Control Panel) Control Units

a. UL 864, Standard for control units and accessories for fire alarm systems.
b. FM 3010, Fire Alarm signaling systems.
c. FM 3011, Central station service for fire alarms and protective equipment supervision.
d. EN 2-54, Control and indicating equipment.
e. ISO 2-7240, Control and indicating equipment.

8.1.17 Door Closers-holders

a. UL 228, Standard for door closers-holders, with or without integral smoked detectors.
b. FM 4121, Fire and smoke door holder and/or release devices.

8.1.18 Wireless, Radio linked Fire Detection and Alarm System

a. EN 25-54, Components using radio links.
b. LPS 1257, Requirements and testing procedures for radio linked fire. Detection and fire alarm equipment.
c. UL 985. Standard for Household Fire Warning System Units

8.1.19 Line Isolators

a. EN 17-54, Short circuit isolators
b. EN 18-54, Input/output devices

8.1.20 Input/output Devices

a. EN 18-54, Input/output devices

8.1.21 Compatibility Testing of Components

a. EN 13-54, Compatibility assessment of system components
b. LPS 1054. Requirements and testing procedures for the LPCB approval and listing of component compatibility for fire detection and alarm systems.

8.1.22 Power Supply Equipment

a. EN 4-54, Power supply equipment.
b. ISO 4-7240, Power supply equipment.

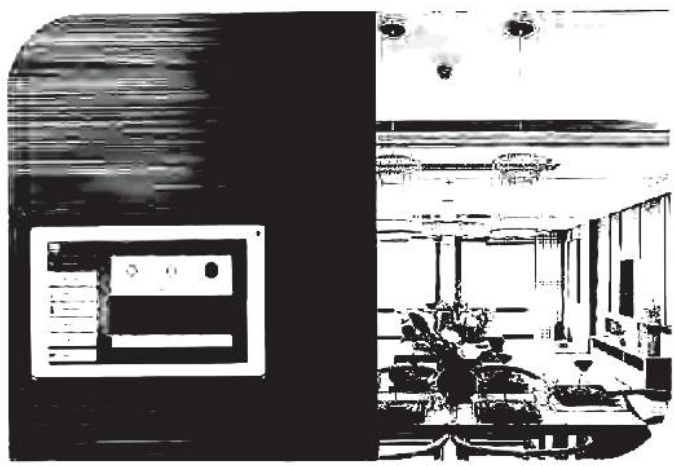
8.1.23 Fire rated Cable, Certified for 60 minutes for Villas

i. EN 50200, Method of test for resistance to fire of unprotected small cables for use in emergency circuits
ii. UL 219, Standard for Fire Test for Circuit Integrity of Fire-Resistive Power, Instrumentation, Control, and Data Cables
iii. BS 2-8434, Methods of test for assessment of the fire integrity of electric cables. Test for unprotected small cables for use in emergency circuits. BS EN 50200 with a °930flame and with water spray.
iv. BS 1-7629, Electric cables. Specification for 500/300 V fire resistant screened cables having low emission of smoke and corrosive gases when affected by fire. Multicore and multi pair cables.

v. BS 6387, Test method for resistance to fire of cables required to maintain circuit integrity under fire conditions.
vi. IEC 1-60331, Tests for electric cables under fire conditions.
vii. IEC 2-60331, Tests for electric cables under fire conditions.
viii. IEC 2-2-60332, Tests on electric and optical fiber cables under fire conditions.
ix. IEC 10-3-60332, Tests on electric and optical fiber cables under fire conditions.
x. IEC 2-60331, Tests for electric cables under fire conditions.
xi. UL 1724, Outline of Investigation for Fire Tests for Electrical Circuit Protective Systems.
xii. UL 1685, Standard for Vertical-Tray Fire-Propagation and Smoke-Release Test for Electrical and Optical-Fiber Cables.
xiii. UL 1666, Test for Flame Propagation Height of Electrical and Optical-Fiber
xiv. Cables Installed Vertically in Shafts.

Annex B

Additional Guidance and Recommendations for the Fire Alarm Control Unit (FACU)



1. Introduction

2. Terms and Definitions

3. Solution Overview

4. Wireless Connectivity for Existing Villas

5. Wired Connectivity for New Villas

6. FACU Enclosure Requirements

This Annex is to assist Approved Installers in the design, configuration and installation of the new Fire Alarm Control Unit (FACU) in residential Villas under the Hassantuk program by Ministry of Interior and Etisalat.

This Annex should be read together with the Guidelines Parts I, II and III and in conjunction with the existing UAE fire alarm code.

2. TERMS AND DEFINITIONS

Cat-6 Cable	Category 6 (Cat-6) cable is a standardized twisted pair cable used for Ethernet networking.
Dedicated Power Supply	Dedicated Fuse electrical socket, used to connect FACU equipment to the primary AC power supply in the premises with hardwire pins and no On/Off switch.
eNOC	Electronic No Objection Certificate System (eNOC) is Etisalat Online Portal, used for communication between buildings consultants & Etisalat to obtain the required NOCs for municipalities.
LMR-400 Cable	Land Mobile Radio (LMR) Cable is Low Loss Radio Frequency (RF) Coaxial Cable, used to connect the Fire Alarm Control Unit with the External Antenna.
MDB	Main Distribution Board (MDB) is a panel/enclosure that houses the fuses, circuit breakers and ground protection units, which is used to distribute the electrical power to individual circuits or consumer points. ONT Box Etisalat Optical Network Terminal (ONT) Box is the fiber network Consolidation/ Termination Point at customer premises.
Power Socket	Type (G) electrical socket/Outlet, used to connect electric equipment to the primary AC power supply in the premises.
RJ45 Connector	Registered Jack 45 (RJ45) Connectors are Commonly used for Ethernet networking.
SMA Female Connector	Sub Miniature version A (SMA) Connector is a Semi-Precision Coaxial RF Connector, used as a Coaxial RF Cable interface to provide the connectivity to the external antenna.

3. SOLUTION OVERVIEW

Following diagram highlights the end to end HASSANTUK solution architecture, where the Residential Villa Alarm unit (FACU) of the Alarming and Monitoring System is connected to Etisalat NOC and Civil Defense Monitoring Center through Mobile connection.

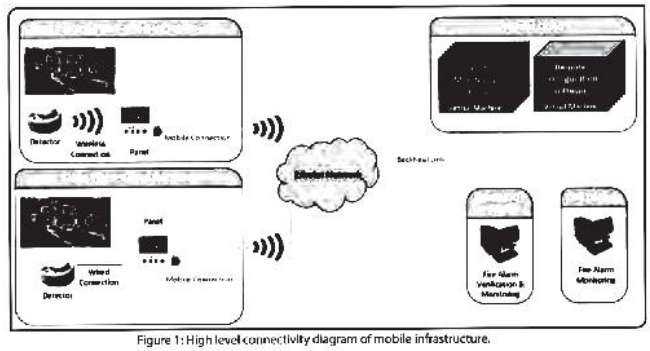


Figure 1: High level connectivity diagram of mobile infrastructure.

4. WIRELESS CONNECTIVITY FOR EXISTING VILLAS

Wireless connection between detectors and FACU are only allowed for alarm systems in existing residential villas; where the Building owner wants to use a wired system, it can be allowed, but must meet the relevant requirements accordingly.

1. Wireless Fire Detection and Alarm Systems shall be in accordance with UAE Fire and
2. Life Safety Code of Practice 2018, chapter 8, Section 4.11. And the Guidelines Parts I, II and III Where relevant.
3. As mentioned earlier, Wireless Fire Alarm Systems and components to be used shall be evaluated by the Monitoring Operator Etisalat and submitted for approval and Listing by Civil Defense as a full system assembly including low power radio equipment, transmitters, receivers, Detectors, Control Units and accessories.
4. The Control Unit shall be capable of interfacing with wired Analogue addressable Fire Alarm Systems.
5. Single loss of transmission network shall not affect the communication and alarm signal transmission. The transmission network shall be backed up by series of loops and redundant alternate transmission paths.
6. The low-power radio transmitter/transceiver shall be specifically listed as using a communication method that is highly resistant to misinterpretation of simultaneous transmissions and to interference (e.g., impulse noise and adjacent channel interference).
7. One dedicated 230V Power Socket for each FACU Panel power supply.

One dedicated 230V Power Socket for each wireless repeater that may need to get installed. For existing buildings

that already have an installed Fire alarming system (some even using Heat or Gas detectors for example), the existing system should be compatible to at least provide common fire alarm and common fault signal as potential free contacts. The existing system should be approved by Civil Defense. The FACU should be able to connect to the potential free contacts provided by the existing fire alarm system and signals to be transmitted to the SRC.

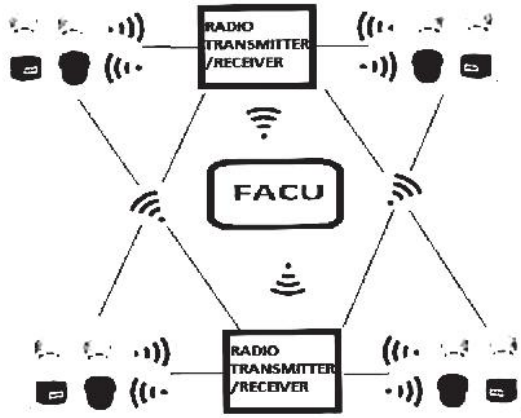


Figure 2: Wireless connection between detectors and FACU

5. WIRED CONNECTIVITY FOR NEW VILLAS

Only Wired connection between detectors and FACU shall be allowed for alarm systems in new residential villas;

1. Wired Fire Detection and Alarm Systems shall be in accordance with UAE Fire and Life Safety Code of Practice 2018, chapter 8, Section 4.3.and All Parts of the Guidelines.
2. Wired Fire Alarm Systems and components to be used shall be evaluated by Monitoring Operator and submitted for approval and Listing by Civil Defense as a full system assembly including low power radio equipment, transmitters, receivers, Detectors, Control Units and accessories
3. The smoke and heat detectors, sounders and manual call points shall be hardwired to the fire alarm control panel.
4. Fire resistant cables with minimum 60 minutes fire survival time shall be used for the wiring.
5. The main fire alarm control panel shall be powered by both main power supply and backup power supply from batteries.
6. To maintain high Alarm system availability, Class A loop topology shall be used for the wiring to provide a second path from the fire alarm control unit to all detectors as re Dunant wire loop goes around the broken wire. And alarms can still be detected, as per below diagram.

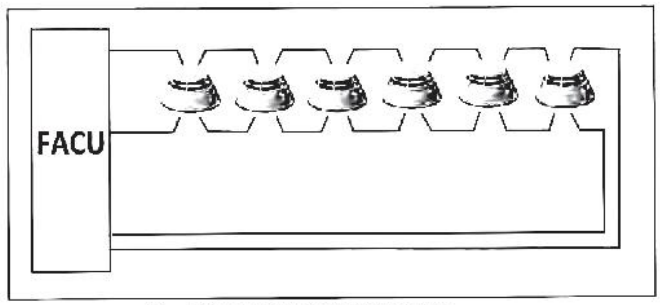


Figure 3: Wired connection between detectors and FACU

6. FACU ENCLOSURE REQUIREMENTS

This section provides general guidelines and recommendations for the telecommunication linkages to be deployed in all new and existing residential villas for Fire Alarm Control Unit (FACU):

1. The enclosure should be installed in flush mounted on wall.
2. The enclosure size should be: W: 50 x H: 70 x D: 15 cm
3. The FACU enclosure location should be in the main lobby at the entrance/exist area, should be installed in a location which is easily accessible, on 1.2 meters height form finished floor level visible to residents in common areas, (preferably along routes of escape) and easily accessible by emergency response personal on arrival
4. The Enclosure should not be installed in an unattended room, service rooms, mechanical rooms etc. It should be in a preferably air-conditioned area that is not subject to excessive vibration, shock, obstruction.
5. The location should be free from construction dust and debris, and immune to extreme temperature ranges and humidity.
6. All required conduits and wires from sensors, power sources, Ethernet and External antenna to be consolidated to the enclosure.
7. There should be an excellent 3G and 4G signal coverage at the location.
8. The fire alarm system: Sensors, Conduit, Wires, FACU, etc. should comply with UAE fire code and especially Parts II and III of the Guidelines.
9. The FACU and its LCD screen should be located within an enclosure, preferably with a hinged door. Enough floor and wall space shall be provided for FACU enclosure and LCD screen. The LCD space and conduit requirements will be shared at the time of design approval.
10. The enclosure should be equipped with:

a. Dual 230V Power Sockets.
b. One dedicated 230V Power Socket for FACU Panel power supply.
c. Dual RJ45- Sockets, Sockets should be connected through Cat6 Cables to Monitoring Operator's ONT Box.
d. One Antenna socket (SMA female connector) for mobile signal boosting;

• LMR8/3) 400-inch) Cable to be extended through 2 Inches PVC Conduit from antenna socket up to the rooftop antenna with max distance of 15m.

• Conduit end at the rooftop end shall be down bended to prevent water entering.

• High Gain Omni-directional antenna to be deployed on the rooftop (when required).

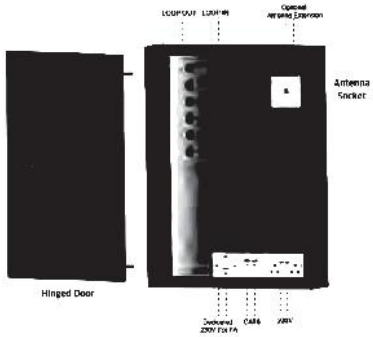


Figure 4: FACU Enclosure Sockets labels

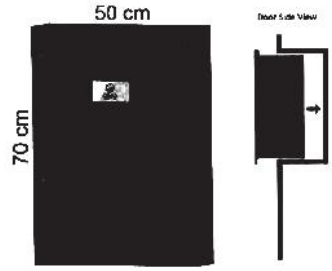


Figure 5: FACU Enclosure layout

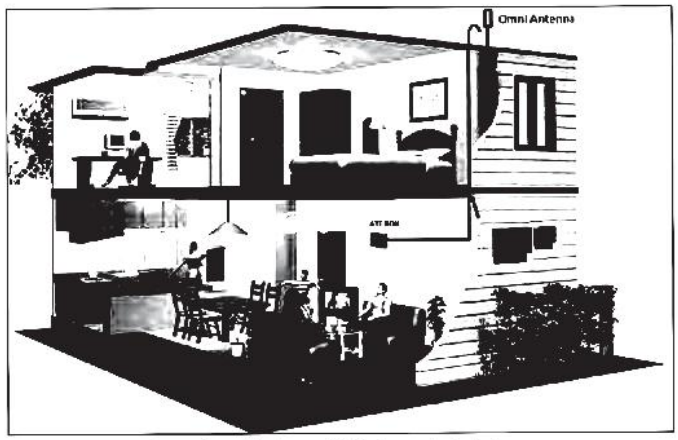


Figure 6: Connectivity between FACU Enclosure and external antenna

REFERENCE DOCUMENTS:

1. UAE FIRE AND LIFE SAFETY CODE OF PRACTICE 2018
2. NFPA 101: LIFE SAFETY CODE: Chapter 9 Building Services and Fire Protection Equipment
3. NFPA 101: LIFE SAFETY CODE 2018 Chapter 24: One and Two Family Dwellings
4. NFPA 72: NATIONAL FIRE ALARM AND SIGNALLING CODE 2019 Chapter 18: Notification Devices
5. NFPA 72: NATIONAL FIRE ALARM AND SIGNALLING CODE Chapter 29: Single and Multiple Station Alarms and Households Signaling systems
6. SINGAPORE STANDARD SS 1019 :645 CODE OF PRACTICE FOR THE INSTALLATION AND SERVICING OF ELECTRICAL FIRE ALARM SYSTEMS