CA Consultants Limited ISO 9001:2008 Certified Company

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HUMIDITY PROBLEMS IN BUILDINGS: CAUSES, EFFECTS AND SOLUTIONS

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High humidity in buildings is not desirable owing to their effects on building occupants' health and comfort, as well as damages to interior finishes. High humidity occurs when there is excessive moisture in a building which may be due to many causes. These causes if not addressed from the outset of a building design and construction, produce effects that are very difficult and expensive to correct.

Major causes of high humidity in buildings are attributed to:

- Untreated outdoor air injection into buildings
- Infiltration of humid outdoor air into buildings through opening and crevices around building envelope
- Over and under sizing of air-conditioning units
- Clogged outdoor air filters, e.t.c.

The consequences of high humidity in buildings ranges from a smell of musty odor, which is an evidence of mold and mildew growth, corrosion, dust mites and insects, bacteria and viruses which affect human health, e.t.c. In addition, when the excess moisture in the building comes in contact with cold surfaces, the moisture in the air condenses and film of water are deposited on the floor of the building, which may cause accident through floor slippage.

Often times, most of the causes of high humidity problems can be avoided through air-conditioning and ventilation systems design provided by the HVAC designer. However, it is a known fact that buildings leaks air through crevices and openings in walls as a result of poor construction methods, lack of attention to details, and improper sealing of spaces around penetrations of services through the walls into or outside the building. Therefore, the architect also has a tremendous influence over the cost and effectiveness of humidity control through the design of the building envelope and supervision of its construction.

Solutions

To avoid undesirable high humidity in buildings, the HVAC designer has to ensure that:

- Outdoor air required for ventilation is pretreated
- He specifies tight duct work
- He avoids over-sizing cooling equipment
- The right type of air-conditioning equipment is recommended
- · He also avoids supplying outdoor air directly into the building
- · He uses ducted return as much as possible rather than using ceiling as return plenum, e.t.c

In addition, to avoid high humidity in buildings, the architect, and in some cases, the interior designer has to:

- Avoid double vapor retarders. It can restrict not only the entry of moisture into the building, but the escape of any moisture as well.
- Avoid vinyl wall covering on exterior walls this means that you should avoid using wall papers on any wall adjacent to the outside. Rather consider using vinyl wall covering on internal walls separating two spaces.
- Ensure exterior walls do not absorb or store liquid water this element requires careful design and detailing and the maintenance of the wall over its life.
- Avoid air infiltration into the building.

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Engineering Facts

- The largest wind turbine in the world is in Denmark. It is 720 feet tall, has 260-foot blades, and can generate 8 megawatts of power (enough to supply electricity for 7,500 average European households or about 3,000 American households).
- 2. Valdemar Poulsen, a Danish engineer, invented an arc converter as a generator of continuous-wave radio signals in 1902.
- 3. On 9 June 1906, the Winnipeg Electric Railway Company transmitted electric power from the Pinawa generating station on the Winnipeg River to the city of Winnipeg at 60,000 volts. It was the first year-round hydroelectric plant in Manitoba and one of the first to be developed in such a cold climate anywhere in the world.

Source: www.reliableplant.com www.thinkprogress.org

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TECHNICAL

ENSURING FUNCTIONAL FIRE PROTECTION SYSTEMS IN BUILDINGS

Most business and property owners are now conscious of the devastating consequences that a fire outbreak may bring to their businesses and properties. Hence, they strive to protect their buildings, property, company and employees by installing high quality fire safety equipment such as fire extinguishers, fire sprinklers, smoke detectors, automatic gaseous fire suppressant, etc. However, it is important to know that fire protection does not end here. Proper care and maintenance is necessary to ensure that the safety of life, property and business will not be compromised by faulty or defective firefighting devices.

The maintenance of this equipment involves professional services alongside, the business or property owners' involvement. Some of the effective ways to ensure a functional fire protection system include the following:

Regular Maintenance

It is important to carry out routine checks and visual inspection of fire protection systems. Fire extinguisher for example, must be inspected serviced at least every six months. The maintenance or facility personnel should carry out frequent checks on fire protection devices for dents, cracks, rusts, pressure gauge operation, anti-tamper seals, weights, head-cap degradation, discharge test dates, leaks and so on. Inspect the external fire department connections to verify that they are visible and accessible, couplings or swivels are not damaged and rotate smoothly, plugs or caps are in place and not damaged, gaskets are in place and in good condition, identification signs are in place, the check valve is not leaking, the automatic drain valve is in place and operating properly.

Test the water flow alarm on wet pipe sprinkler systems by opening the inspector's test connection. This simulates the opening of a sprinkler head. Test the water flow alarm on dry pipe sprinkler systems by using the bypass connection. Once the regular checking is done, the facility personnel should give a detailed written report about the inspection as well as fill in the fire log book. This way, one will have an overview of the status of the fire protection equipment.

Monthly Inspections

Professional maintenance is important here for a functional fire protection system. The maintenance or facility personnel and the business or property owner are also responsible for carrying out regular inspections of the fire safety devices. For example, standalone smoke detectors should be tested once a month so you know if the batteries need replacement. Go around the business or property vicinity to see if the fire safety devices are in the correct locations and check if signs point to the right direction. Visually inspect gauges on wet pipe systems to verify that they are in good condition and that normal water pressure is being maintained.

Visually inspect gauges on dry pipe systems to verify that they are in good condition and that normal air and water pressure are being maintained. Record your inspections in the fire log book. If you prefer not to do the work, assign someone reliable and trustworthy to do all of these for you and see to it that he does the job correctly.

Annual Servicing

Business and property owners should follow the National Fire Safety code 2013 of Federal Republic of Nigeria. In addition, the fire protection equipment should be maintained according to the recognized international and local fire safety standard e.g. NFPA (National Fire Protection Association). A professional servicing company recognized and certified by the fire protection regulatory body should do the maintenance of fire extinguishers. Apart from the fire extinguishers, servicing of fire safety devices such as automatic gaseous fire suppressant, fire hose reel, fire alarm, fire hydrant and sprinkler systems based on the duration stipulated by the manufacturer of the equipment must be adhered to. Spare parts of fire protection devices or equipment must be stored to ensure that the system is ready for fire protection after a fire incident. Damaged parts of systems should be replaced immediately without any delay.

It takes a lot of work to maintain fire safety equipment but, because of their precious ability in providing optimum protection for your business and property, one should be dedicated to the maintenance tasks. For building and business owners, it is imperative that their employees partake as well. Business owners should train them and ensure they understand and can operate the fire protection system in incipient fire situations. It is also important to carry out regular fire drills.

In conclusion, fire safety equipment requires proper maintenance to ensure they serve their designed and installed purposes. Safety is everyone's business, therefore property and business owners should ensure fire protection systems are maintained when due. Consultants must ensure a detailed operation and maintenance manual is handed over to the client for keep and reference after the completion of any fire protection system installation.

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CEO'S COLUMN



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Dear Reader,

Welcome to the current edition of our newsletter. This issue provides us with a chance to discuss on ways of protecting life, properties and businesses in our society.

This is reflected in our current edition articles on fire protection systems and the use of internet protocol technology as a security system in our buildings.

In order to include issues/articles that are important to you and your industry, we would love to hear from you, email us at <u>info@cacons.com</u> with your suggestions.

If you will require reprints of previous newsletter, kindly visit our website www.cacons/newsletters to download the newsletter.

Your active support is crucial. We thank you for staying with us all these years and we do sincerely look forward to hearing from you.

Engr. Charles 'Yele Akindayomi Founder

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TECHNICAL INTERNET PROTOCOL TECHNOLOGY APPLICATION; SECURITY SYSTEMS IN FOCUS

With increasing rate of crime in our society, it is now a common feature in commercial and public buildings to have the following security systems installed among others; Closed Circuit Television (CCTV), Access Control, Biometric Data Capturing, Intruder Alarm, Walk-through Metal detector and Baggage Scanner as part of measures to keep our buildings safe and the properties therein secured. The concept of data communications between computers and devices began in the late 1960s and early 1970s, when researchers began developing a way of connecting computers and exchanging information by way of packets of data. Soon, the concept of a local area network (LAN) took hold, replacing the previous model of a central computing node and the so-called "dumb" terminals connected to it. In this conventional analog network system, video systems use point-to-point cabling from device location to viewing/recording station. This limits the extent/distance over which information can be carried due to attenuation/weakening of signals over long distances. This is illustrated below.



Figure 1: Analog Network Systems

In addition, the conventional analog system is usually a one-directional signal carrier that ends at the recording device. That is, it only allows signals (audio, video and other data) to be sent from devices to the user.

In the emerging world of technology, security threat and challenges have outpaced the conventional method of information processing and crime detection. Therefore, enhanced intelligence gathering cannot be overemphasized considering the crime rate and the strategies used to define identified security formations. Thus, it is expedient to have security systems integrated together, such that one system could activate the other. For instance, an access control system could be linked to a CCTV system such that once the system detects a Read-In/Out, for a particular door, an appropriate camera is activated and it starts recording and all required data is sent to a central station monitored by just one person. In these situations, a multi-layered approach to security is crucial. Thankfully, with progressive advancements in technology, it is now possible to integrate all parts of a security system together with everything reporting back to a central station or operator. This has been made possible with the use of IP Technology. IP (Internet Protocol) is the primary network protocol developed in the 1970s and it is used together with the Transport Control Protocol (TCP). It is referred to interchangeably as TCP/IP. The information on the networked systems is transported in form of data organized into packets and run on top of different data link interface including Ethernet and Wi-Fi.

Some of the advantages of networked security are flexibility, cost savings and ease of installation. Integrating IP Access control and CCTV into an existing network will of course curtail costs with dramatically less cabling and reduced installation time. There are huge benefits to be derived with IP Access control and IP CCTV systems. We shall briefly look into some of these benefits.

The Benefits of IP Networked Communication and Security Systems

1. Easy and future-proof Integration and Information management

A fully integrated IP networked system can be used for a multitude of applications simultaneously: for instance, access control, building management, point-of-sales systems, ATMs, as well as fire alarms, intruder and visitor management. All the information of the aforementioned systems can be monitored and controlled from a single computer system or any other dedicated device for such function. Consequently, all the data can be easily stored in a single hard-disk and this can be accessed from any location via the internet by authorized persons.

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In IP based security systems, information conveyed by all integrated systems can be accessed by authorized persons over the internet from any location. This is very useful, for example, in situations where the Managing Director or any other authorized staff of a company is on leave or out of office, he can still monitor activities in the office over the internet regardless of his location. Therefore, movement and activities of staff can be monitored even when not physically present in the office. IP-based systems provide a means for networking video products and other types of applications to share the same wired or wireless network for communicating data, video, audio Input/output commands, power and other data can be carried over the same cable. In addition, any number of network video products can be added to the system without significant or costly changes to the network infrastructure. Since a network video system is based on standard IT equipment and protocols, it can benefit from those technologies as the system expands. For instance, video can be stored on redundant servers placed in separate locations to increase reliability, and tools for automatic load sharing, network management and system maintenance can be used-none of which is possible with analog video.

2. Superior image quality

In a fully digital IP surveillance system, images from a network camera are digitized once and they stay digital with no unnecessary conversions and no image degradation due to distance traveled over a network. In addition, digital images can be more easily stored and retrieved than in cases where analog systems are used.

3. Easy and reliable installation

An IP surveillance system is fast and easy to install. Network cameras and encoders offer Power over Ethernet support. Power over Ethernet or PoE describes any system which passes electrical power along with data on Ethernet cabling. This allows a single cable to provide both data connection and electrical power to devices such as wireless access points or IP cameras. This simplifies installation since only one cable is needed for power and video. Digital pan/tilt/zoom, remote zoom and remote focus enable convenient adjustment of the camera's angle of view and focus over the network from a computer.

In conclusion, the benefits of IP access control, CCTV and other networked security systems depend on the unique needs of an organization. However, most businesses can make the most of this technology provided all the details are fully considered and everyone involved in the set up and operation work together. IP based security will continue developing, and will soon completely replace the traditional wired systems. There are also future possibilities that IP based Security systems will incorporate other security systems such as gate control, site surveillance and baggage scanners, to mention a few.

Interesting Projects

Dubai Water Canal

Dubai Water Canal is one of the top 10 Engineering Projects in the world and set for completion in 2017. The Dubai Water Canal which will connect the Business Bay with the Arabian Gulf passing through the heart of

Dubai. is estimated to cost about A E D/Dhs 2b(540 m U S D). Plans show that the Dubai Canal would be suitable for yachts and small ships with its width of 120 meters and depth of 6 metres.



Source: http://interestingengineering.com, www.emirates247.com



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Our Services

FEASIBILITY STUDIES:

Technical and economic surveys, comparative cost evaluations and recommendations into various methods of resolving a problem. Preparation of project reports.

DESIGN:

Design of air-conditioning, electrical, extra low voltage, lighting, plumbing & drainage systems.

CONTRACT:

Preparation of specification, functional and layout drawings for tender action.

DOCUMENTATION:

Preparation of Bills of Quantities as required.

COST CONTROL:

Budget estimating. Evaluation of Tenders. Valuation of Variations. Certification of interim payments and final accounts.

TROUBLE SHOOTING:

Investigation, reporting and recommendations on faults or lack of performance, on Mechanical and Electrical systems.

ADVISORY SERVICE:

The company advises on refurbishment and remedial works and provides supervisory site staff as required. The company is completely independent of any manufacturing, supply or construction company and its advice is completely professional and unbiased in anyway.

About Us

In just 27 years, CA Consultants Limited, an ISO 9001:2008 Certified, Mechanical, Electrical and Piping consulting engineering firm has grown to a professional and technical staff of 25 out of our 44 employees. In 2000-2014, we completed more than 155 projects for diverse clients.

We appreciate your comments, suggestions and recommendations, please send them to any of our addresses above.





On-going Heritage Place Office Building at Lugard Road, Ikoyi, Lagos

CA Consultants Limited in conjunction with CAPITA Properties and Infrastructure UK was engaged in the Design Development and Construction Supervision of the HVAC, Electrical, Extra Low Voltage, Fire Fighting, Plumbing, Lift and Building Management Systems of the Heritage Place Office development building located in the heart of Ikoyi, Lagos Nigeria. It is a 14 storey office building, five level car parking with a gross area of 18,000m2.

Services design and equipment specifications among others has put into consideration basic requirement for the certification of the building as one of the buildings in Nigeria to be certified by the United States Green Building Council, (USGBC). One of the bodies responsible for Leadership in Energy and Environmental Design (LEED) certification for green Buildings.

The LEED rating system offers four certification levels for new construction: Certified (40-49 points), Silver (50-59 points), Gold (60-79 points) and Platinum (80 -110). The LEED rating being targeted for this project is 44 (Certified). Thermal comfort and ventilation effectiveness were considered for the project using ASHRAE energy standard 90.1-2010 as design guide. The air-conditioning systems in the building are a combination of various systems. Ventilation fans were also selected to achieve specific fan power within agreed values with the LEED expert.

Piped services installations in the building include plumbing, drainage as required under storm water management, firefighting systems, lifts and cleaning cradles. Electrical power supply to the building will be from 11KV public network and distributed into the building via two transformers while sound proof generators are provided as a backup power for the building. The lighting systems are controlled by daylight/presence detectors for energy efficiency as required by LEED. Building Management System (BMS) is also provided to monitor and control some selected Mechanical, Electrical and Piping system equipment. This will optimize energy performance and assist with seamless system integration.

Quality Policy

"To be trusted advisers in Building Engineering System and Infrastructure who satisfy customers' expectations through active customer listening, deployment of highly competent and motivated workforce, use of advance technology, nurturing of long term mutually beneficial customer relationship and the continual improvement of our Quality Management System while complying with applicable national & international statutes and regulations".