Air Quality

- **Mapping Duct Layouts for Cleaner Airflow in Mobile Homes**
  Mapping Duct Layouts for Cleaner Airflow in Mobile Homes Inspecting Vent Connections for Improved Air Quality Minimizing Drafts Through Sealed Mobile Home Duct Systems Scheduling Regular Cleanings for Mobile Home Ventilation Evaluating Filter Efficiency for Enhanced Mobile Home Air Quality Addressing Mold Risks in Mobile Home Ductwork Installing Air Purification Systems in Mobile Homes Checking Air Pressure to Reduce Allergens in Mobile Home Interiors Identifying Common Leaks in Flexible Mobile Home Ducts Balancing Humidity Levels for Healthier Mobile Home Air Considering UV Technology for Mobile Home Air Treatment Using Diagnostic Tools to Assess Air Quality in Mobile Homes
- **Preparing Mobile Home HVAC Units for Intense Summer Heat**
  Preparing Mobile Home HVAC Units for Intense Summer Heat Protecting Mobile Home Furnaces During Low Temperature Periods Coping with Storm Related Damage to Mobile Home Air Conditioners Adjusting Climate Control in Mobile Homes for Coastal Humidity Handling Power Outages in Mobile Home Heating Systems Planning Winterization Steps for Mobile Home HVAC Equipment Adapting Mobile Homes to Rapid Seasonal Swings in Temperature Evaluating Wind Exposure Factors for Mobile Home AC Placement Addressing Extended Rainy Periods in Mobile Home Ventilation Considering Local Building Codes for Mobile Home Climate Adaptations Balancing Heat Needs in Mobile Homes Across Different Regions Checking Insurance Coverage for Storm Damaged Mobile Home AC Units
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Addressing Extended Rainy Periods in Mobile Home Ventilation

Importance of Efficient Duct Layouts for Airflow

The topic of "Understanding the Impact of Extended Rainy Periods on Mobile Home Ventilation" is both timely and crucial, especially given the increasing unpredictability of weather patterns due to climate change. Mobile homes, often more vulnerable to environmental conditions than traditional houses, face unique challenges when it comes to maintaining proper ventilation during extended rainy periods. Drainage systems prevent moisture buildup around mobile home HVAC units **mobile home hvac repair** allergen. Addressing these challenges is essential not only for the comfort of the occupants but also for their health and safety.

Extended rainy periods can significantly affect the ventilation systems within mobile homes. Unlike conventional houses, mobile homes typically have less robust construction materials and insulation, making them more susceptible to moisture accumulation. This moisture can lead to a host of problems, including mold growth, which poses serious health risks such as respiratory issues and allergies. The damp environment created by prolonged rain can exacerbate these issues if not properly managed through effective ventilation strategies.

Proper ventilation in mobile homes during rainy seasons is crucial for several reasons. Firstly, it helps control indoor humidity levels. High humidity can contribute to condensation on windows and walls, creating an ideal breeding ground for mold and mildew. Secondly, adequate airflow prevents the build-up of volatile organic compounds (VOCs) from household products that tend to linger longer in closed environments typical of mobile homes.

One effective strategy for addressing ventilation during rainy periods is the installation of energy-efficient exhaust fans in key areas like kitchens and bathrooms where moisture generation is highest. These fans help expel humid air outside rather than allowing it to circulate throughout the home. Moreover, ensuring that vents are not blocked by furniture or other obstructions is critical to maintaining consistent airflow.

Another approach is using dehumidifiers strategically placed throughout the home. These devices are particularly useful when natural ventilation options like opening windows are not feasible due to ongoing rain. Dehumidifiers can help maintain optimal indoor humidity levels even during lengthy wet spells.

Additionally, regular maintenance checks on existing HVAC systems ensure they function correctly throughout adverse weather conditions. This includes replacing filters frequently and checking ductwork for leaks or blockages that could hinder performance.

In conclusion, addressing extended rainy periods in mobile home ventilation requires a proactive approach combining structural adjustments with routine maintenance practices aimed at promoting healthy indoor air quality despite challenging weather conditions. By implementing effective solutions tailored specifically towards mitigating moisture-related issues common among mobile homes during heavy rains-such as strategic fan placement or utilizing portable dehumidifiers-occupants not only enhance their living comfort but also safeguard their health against potential hazards associated with inadequate ventilation systems exacerbated by prolonged rainfall events.

The Role of Proper Ventilation in Maintaining Indoor Air Quality During Prolonged Rainy Seasons is a crucial consideration, especially for those residing in mobile homes. Extended rainy periods can pose significant challenges to maintaining healthy indoor air quality, as increased humidity levels and limited air circulation often accompany the relentless downpours. In such conditions, proper ventilation becomes not just a matter of comfort but a necessity for health and well-being.

Mobile homes are particularly susceptible to the adverse effects of poor ventilation during prolonged rainy seasons. These structures often have limited natural airflow due to their design and construction materials, which may trap moisture inside. This trapped moisture can lead to elevated humidity levels, creating an ideal environment for mold growth and dust mites. Both mold spores and dust mite droppings are known allergens that can exacerbate respiratory problems and lead to allergic reactions.

Proper ventilation, therefore, plays an integral role in mitigating these risks by ensuring that damp air is effectively expelled from the home while fresh air circulates freely within. The key is to establish a balance between removing excess humidity and introducing sufficient outdoor air without compromising energy efficiency or comfort. One effective strategy involves utilizing exhaust fans in critical areas such as kitchens and bathrooms where moisture tends to accumulate most rapidly. These fans help vent moist air directly outside before it has a chance to spread throughout the home.

In addition to mechanical solutions like exhaust fans, incorporating passive ventilation techniques can also be beneficial. For instance, installing vents at strategic locations around the home allows natural airflow by promoting cross-ventilation when weather permits. During breaks in rainfall, opening windows briefly can refresh indoor air quality substantially by diluting any build-up of pollutants or allergens.

Moreover, dehumidifiers serve as valuable allies during extended rainy periods by actively removing excess moisture from the air within mobile homes. By maintaining optimal humidity levels-typically between 30% and 50%-dehumidifiers reduce the likelihood of mold growth while also improving overall comfort.

Lastly, regular maintenance checks on HVAC systems ensure they function efficiently throughout the rainy season. Clean filters facilitate better airflow while preventing recirculation of dust particles indoors-a vital aspect when external options might be limited due to inclement weather conditions outside.

In conclusion, addressing extended rainy periods requires proactive measures focused on achieving proper ventilation within mobile homes-a task essential not only for preserving structural integrity but more importantly safeguarding inhabitants' health against potential hazards posed by high humidity environments indoors. Through combined efforts involving mechanical aids like exhaust fans alongside passive techniques such as strategic vent placement-and perhaps aided further through thoughtful use of dehumidification equipment-residents stand poised effectively counteracting challenges brought forth during those long stretches dominated by incessant rains thereby securing healthier living spaces even amidst nature's wetter whims!

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Techniques for Mapping Duct Layouts

Mobile homes, often cherished for their affordability and flexibility, present unique challenges when it comes to ventilation, especially during extended periods of wet weather. Unlike traditional homes, mobile homes are typically more compact and may not be as robustly constructed to withstand prolonged moisture exposure. This can lead to a series of common ventilation problems that require careful attention and strategic solutions.

One of the primary issues faced by mobile home dwellers during extended rainy periods is inadequate airflow. Limited space and fewer windows can result in poor circulation, trapping moisture inside the home. This trapped moisture can create a breeding ground for mold and mildew, which not only pose health risks but also threaten the structural integrity of the home. To combat this problem, it is crucial to ensure that ventilation systems are functioning optimally. Regular maintenance checks on exhaust fans in kitchens and bathrooms can help facilitate better air movement and reduce humidity levels.

Another challenge is condensation build-up on windows and walls. When warm indoor air meets cooler surfaces, particularly glass or metal components commonly found in mobile homes, condensation occurs. Over time, this excess moisture can seep into walls and flooring, leading to rot or weakening materials like wood or particle board. Installing double-pane windows or using thermal curtains can help reduce temperature disparities that cause condensation. Additionally, employing dehumidifiers during rainy seasons can effectively manage indoor humidity levels.

Roof leaks are also a frequent concern during heavy rainfalls for mobile homeowners. Poorly sealed roofs or damaged shingles allow water ingress that may go unnoticed until significant damage has occurred. Regular roof inspections before the onset of wet weather are vital in identifying potential leak sources early on. Applying waterproof sealants or ensuring proper drainage systems around the roof area can mitigate leak risks substantially.

Furthermore, many mobile homes lack adequate underfloor ventilation due to their design positioned close to the ground with limited crawl space access. This deficiency leads to moisture accumulation beneath the home structure itself-culminating in musty odors indoors or even subfloor deterioration over time if left unchecked. Installing vents around skirting boards or utilizing vapor barriers underneath your mobile home will improve airflow beneath your property while protecting against ground dampness rising upwards into living areas above.

Lastly-and perhaps most importantly-education plays an integral role in managing these common ventilation problems effectively within mobile homes during extended wet weather conditions; understanding how different components interact within one's environment allows residents informed decision-making regarding best practices specific not just towards prevention but remediation efforts too when necessary circumstances arise unexpectedly later down line!

In conclusion: while dealing with persistent rain presents its own set obstacles regardless housing type involved therein ultimately overcoming them boils down proactive measures combined well-informed strategies tailored suit individual needs respective situations encountered along way!

Tools and Technologies for Accurate Duct Mapping

Mobile homes, while providing affordable and flexible living options, often face unique challenges when it comes to maintaining proper ventilation. This becomes particularly evident during extended periods of rainfall, which can exacerbate moisture problems, leading to poor air quality and potential health risks. Effective strategies for improving ventilation in mobile homes amidst continuous rainfall are essential to ensure a healthy living environment.

One of the most critical steps in enhancing ventilation is understanding the airflow dynamics within a mobile home. Due to their construction, these homes may have limited natural ventilation pathways. During rainy seasons, relying solely on open windows or vents might be impractical due to water ingress concerns. Therefore, implementing mechanical ventilation systems becomes vital. Installing exhaust fans in key areas such as the kitchen and bathroom can significantly help expel moist air outside, reducing humidity levels inside the home.

Additionally, incorporating dehumidifiers can play a crucial role in managing indoor moisture levels. These devices work by extracting excess moisture from the air and are particularly useful in smaller spaces like mobile homes where high humidity can quickly lead to condensation issues. Selecting energy-efficient models ensures that they can run continuously during prolonged rainy spells without causing a significant spike in energy consumption.

Moreover, ensuring that the mobile home is well-sealed against external elements is another strategy that cannot be overlooked. Regular maintenance checks for leaks around windows, doors, and roofing materials are essential preventive measures against water intrusion during heavy rains. Proper insulation not only helps maintain temperature but also acts as a barrier against unwanted moisture entry.

Another effective approach is utilizing passive design strategies tailored for mobile homes. This involves optimizing window placement and using reflective roofing materials to facilitate natural air circulation even when mechanical means are not viable due to power outages or other constraints during storms.

It's also beneficial for residents of mobile homes to adopt lifestyle practices that contribute positively toward managing indoor air quality during rainy periods. Simple actions like avoiding drying clothes indoors or using lids while cooking can significantly reduce internal moisture accumulation.

Lastly, education plays an instrumental role in equipping homeowners with knowledge about maintaining their environments effectively under adverse weather conditions. Workshops or community seminars focused on best practices for home maintenance during rainy seasons could empower residents with practical skills and insights.

In conclusion, improving ventilation in mobile homes amidst continuous rainfall requires a multifaceted approach combining technology with proactive maintenance and informed lifestyle choices. By employing mechanical solutions alongside passive techniques and regular upkeep practices, occupants can create healthier living conditions despite challenging weather patterns. As climate variability continues to influence local precipitation trends globally, these strategies become increasingly important for ensuring sustainable habitation solutions within vulnerable housing forms such as mobile homes.

Best Practices for Cleaner Airflow

Selecting and installing appropriate HVAC solutions for optimal performance in wet conditions is a crucial consideration, particularly when addressing the unique challenges posed by extended rainy periods in mobile home ventilation. Mobile homes, characterized by their compact design and often limited insulation, are particularly vulnerable to moisture-related issues. As such, ensuring efficient ventilation during prolonged rainy seasons is not merely a matter of comfort but also one of health and structural integrity.

The primary challenge in these scenarios is managing humidity levels that can lead to mold growth, condensation, and deterioration of building materials. In mobile homes, where space is at a premium and construction often involves lighter materials than traditional houses, these issues can quickly escalate if not appropriately managed. Therefore, selecting an HVAC system that can effectively handle high humidity while maintaining energy efficiency is paramount.

One solution lies in choosing systems with integrated dehumidification capabilities. These systems are designed to reduce indoor humidity levels efficiently without excessively cooling the space-a common side effect of conventional air conditioning units operating in humid environments. By balancing temperature control with humidity management, these HVAC systems help maintain indoor air quality while protecting the structural components of the mobile home from moisture damage.

Moreover, installing smart thermostats with sensors that monitor both temperature and humidity allows homeowners to customize their climate control settings according to real-time needs. This technological integration ensures that the HVAC system operates optimally under varying weather conditions typical of extended rainy periods. Such adaptability not only enhances comfort but also reduces energy consumption by avoiding unnecessary heating or cooling cycles.

Another critical aspect is ensuring proper installation and maintenance of ventilation systems within mobile homes. Given the potential for rapid moisture buildup during prolonged rainfall, it's essential that exhaust fans are strategically placed in areas prone to dampness-such as kitchens and bathrooms-to expel excess moisture efficiently. Regular maintenance checks should be conducted to ensure that these fans operate correctly and are free from obstructions like dust or debris that could impede airflow.

Additionally, attention must be given to sealing gaps around windows, doors, and other entry points where moisture might infiltrate the living space. Proper insulation can play a significant role here; however, it should be noted that insulation alone cannot substitute for a well-designed HVAC system tailored for high-humidity environments.

In conclusion, selecting and installing suitable HVAC solutions for mobile homes during extended rainy periods requires careful consideration of several factors: efficient dehumidification capabilities, adaptive technology such as smart thermostats, strategic placement of exhaust fans for optimal ventilation, and diligent maintenance practices. By addressing these elements head-on, homeowners can ensure their living spaces remain comfortable and healthy regardless of external weather conditions-ultimately safeguarding both their investment in property and personal well-being against the challenges posed by sustained wet weather patterns.

Case Studies of Improved Air Quality in Mobile Homes

Ensuring the efficiency and longevity of HVAC systems in mobile homes during extended rainy periods is a task that demands attention to detail and proactive maintenance. Rainy seasons can pose unique challenges for mobile home ventilation, potentially impacting both the functionality of HVAC units and the indoor air quality. Therefore, understanding how to maintain these systems under such conditions is essential for comfort and energy efficiency.

Firstly, it is crucial to regularly inspect and clean the HVAC system's components. Rain brings moisture, which can lead to rusting or corrosion of metal parts if not properly managed. Homeowners should routinely check outdoor units for debris buildup like leaves or twigs that might obstruct airflow. It's also important to ensure that drainage lines are clear so that accumulated water can escape without causing damage.

Moreover, changing filters more frequently during rainy seasons can prevent blockages caused by increased humidity levels that encourage mold growth. A clogged filter not only reduces indoor air quality but also forces the system to work harder, leading to higher energy consumption and wear on components.

Next, checking insulation around ductwork can help maintain efficiency. Moisture from persistent rain can penetrate improperly sealed ducts, which might lead to loss of conditioned air and increased energy usage as the system compensates for the inefficiency. Sealing any leaks with appropriate materials ensures that conditioned air flows efficiently throughout the home.

Furthermore, utilizing dehumidifiers can be beneficial during rainy periods to control indoor humidity levels, preventing mold growth and maintaining a comfortable environment. By reducing humidity levels inside the mobile home, HVAC systems don't have to work as hard to regulate temperature and moisture levels.

Regular professional maintenance checks are vital in ensuring optimal performance of HVAC systems during extended rainy periods. Professional technicians have the expertise necessary to identify potential issues before they become significant problems. Scheduling bi-annual or annual inspections allows for comprehensive evaluations of all system components.

Lastly, homeowners should consider investing in smart thermostats or other advanced technology that optimizes HVAC operations based on weather conditions. Such technologies adjust settings automatically during different weather patterns, maximizing energy efficiency while maintaining comfort levels inside the home.

In conclusion, maintaining HVAC efficiency and longevity during extended rainy periods in mobile homes involves a combination of routine inspections, timely component replacements like filters, proper sealing of ductwork, use of dehumidifiers, regular professional maintenance checks, and leveraging advanced technology for optimal system performance. These proactive measures not only ensure comfort but also extend the life span of HVAC systems while conserving energy resources amidst challenging weather conditions.

In recent years, the issue of effective ventilation in mobile homes during extended rainy periods has gained significant attention. Mobile homes, often constructed with less robust materials than traditional houses, are particularly vulnerable to moisture-related problems. The persistent rain can exacerbate these issues, leading to increased humidity levels inside the home, which in turn can cause mold growth and exacerbate respiratory conditions for inhabitants. However, through innovation and strategic planning, several communities have successfully implemented improved ventilation systems that serve as exemplary case studies.

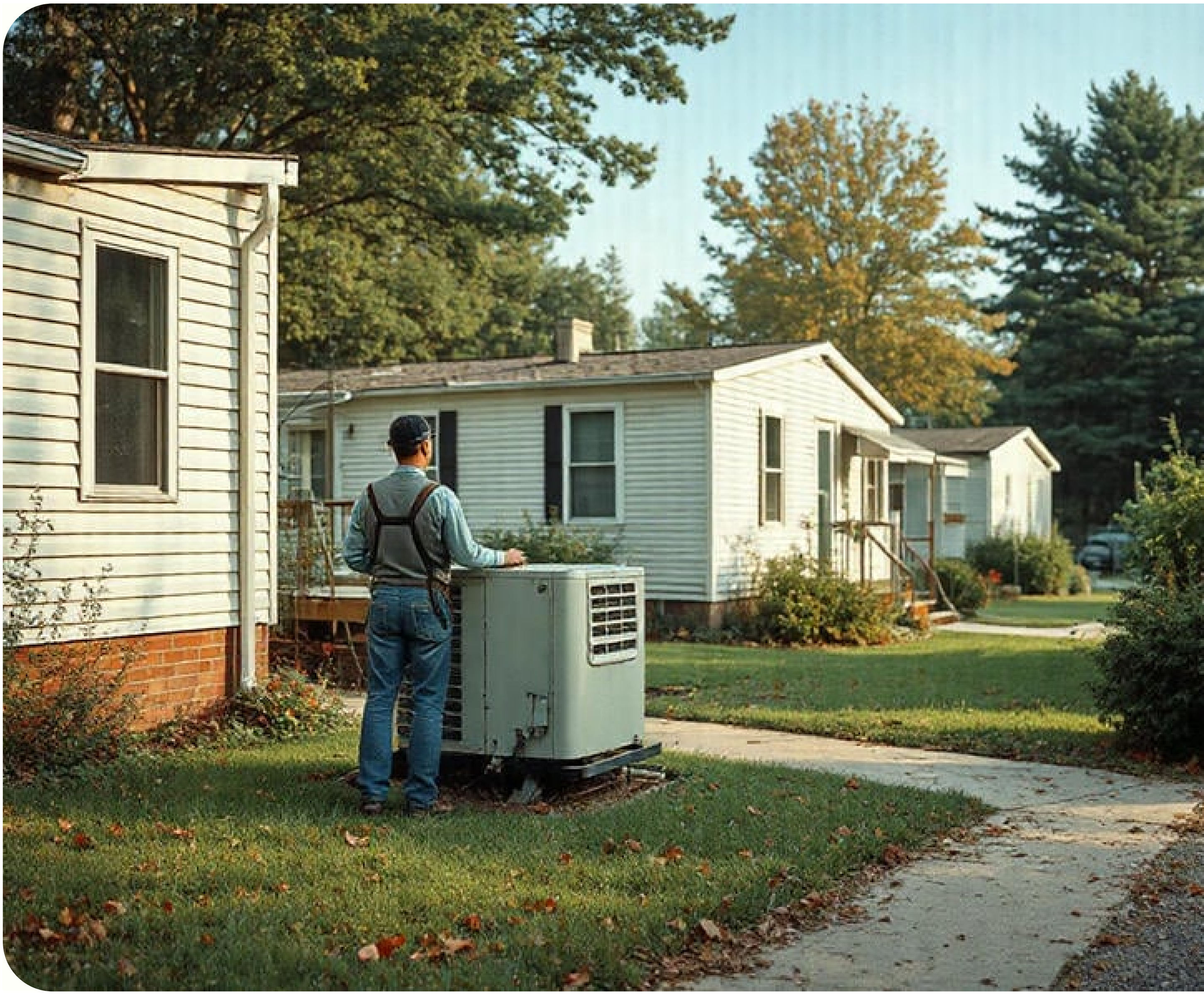
One such success story is from a community in the Pacific Northwest, known for its relentless rainfall. Residents faced frequent mold outbreaks due to inadequate ventilation systems that could not cope with prolonged exposure to moisture-laden air. The solution came through a community initiative that installed energy-efficient ventilation units designed specifically for high-moisture environments. These units included advanced features such as humidity sensors and automatic fans that activate when predetermined humidity levels are reached. As a result, there was a significant reduction in mold incidence reports, and residents noted an immediate improvement in indoor air quality.

Another notable case comes from the Gulf Coast region where heavy rains are common during hurricane season. Here, a collaborative effort between local government and housing manufacturers led to the development of an innovative roof venting system tailored for mobile homes. This system was engineered to facilitate better airflow while preventing water ingress during heavy rains. By incorporating specially designed vent covers that allowed moisture to escape but not enter, this initiative effectively mitigated the dampness problem without compromising structural integrity.

In Florida's Panhandle region, a mobile home park experimented with integrating passive solar ventilation techniques alongside traditional mechanical systems. By strategically placing reflective panels around vents and using translucent roofing materials, they maximized natural light and heat to drive warm air out through higher vents while cool air entered lower openings. This approach proved both cost-effective and energy-efficient, reducing reliance on electricity-driven devices during prolonged cloudy periods.

These success stories illustrate several key principles applicable across different climatic challenges: understanding environmental specifics, harnessing technology suited to those conditions, and fostering collaboration among stakeholders including residents, engineers, and policymakers.

In conclusion, addressing extended rainy periods in mobile home ventilation requires tailored solutions that balance practicality with innovation. As highlighted by these case studies from diverse regions facing similar challenges yet implementing unique strategies successfully - it is clear there isn't one-size-fits-all answer but rather adaptable approaches grounded in comprehensive assessment of local needs coupled with creative engineering solutions can lead us towards healthier living spaces even amidst persistent rain events.



About Prefabrication

Not to be confused with Preproduction.

"Prefab" redirects here. For other uses, see Prefab (disambiguation).

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Prefabrication is the practice of assembling components of a structure in a factory or other manufacturing site, and transporting complete assemblies or sub-assemblies to the construction site where the structure is to be located. Some researchers refer it to "various materials joined together to form a component of the final installation procedure".

The most commonly cited definition is by Goodier and Gibb in 2007, which described the process of manufacturing and preassembly of a certain number of building components, modules, and elements before their shipment and installation on construction sites.[1]

The term *prefabrication* also applies to the manufacturing of things other than structures at a fixed site. It is frequently used when fabrication of a section of a machine or any movable structure is shifted from the main manufacturing site to another location, and the section is supplied assembled and ready to fit. It is not generally used to refer to electrical or electronic components of a machine, or mechanical parts such as pumps, gearboxes and compressors which are usually supplied as separate items, but to sections of the body of the machine which in the past were fabricated with the whole machine. Prefabricated parts of the body of the machine may be called 'sub-assemblies' to distinguish them from the other components.

Process and theory

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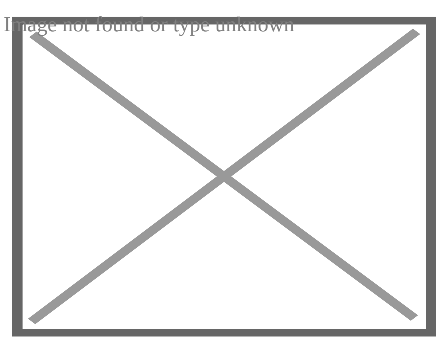

Levittown, Puerto Rico

An example from house-building illustrates the process of prefabrication. The conventional method of building a house is to transport bricks, timber, cement, sand, steel and construction aggregate, etc. to the site, and to construct the house on site from these materials. In prefabricated construction, only the foundations are constructed in this way, while sections of walls, floors and roof are prefabricated (assembled) in a factory (possibly with window and door frames included), transported to the site, lifted into place by a crane and bolted together.

Prefabrication is used in the manufacture of ships, aircraft and all kinds of vehicles and machines where sections previously assembled at the final point of manufacture are assembled elsewhere instead, before being delivered for final assembly.

The theory behind the method is that time and cost is saved if similar construction tasks can be grouped, and assembly line techniques can be employed in prefabrication at a location where skilled labour is available, while congestion at the assembly site, which wastes time, can be reduced. The method finds application particularly where the structure is composed of repeating units or forms, or where multiple copies of the same basic structure are being constructed. Prefabrication avoids the need to transport so many skilled workers to the construction site, and other restricting conditions such as a lack of power, lack of water, exposure to harsh weather or a hazardous environment are avoided. Against these advantages must be weighed the cost of transporting prefabricated sections and lifting them into position as they will usually be larger, more fragile and more difficult to handle than the materials and components of which they are made.

History

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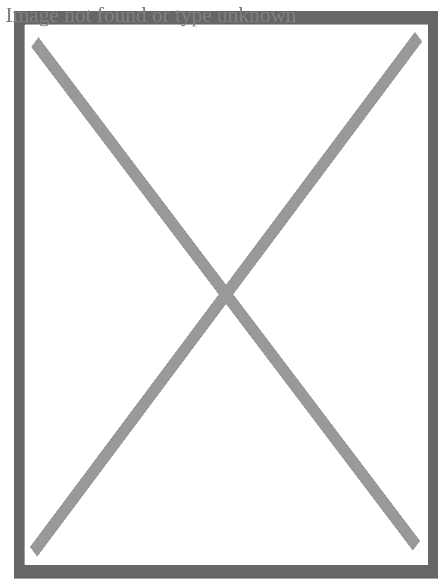

"Loren" Iron House, at Old Gippstown in Moe, Australia

Prefabrication has been used since ancient times. For example, it is claimed that the world's oldest known engineered roadway, the Sweet Track constructed in England around 3800 BC, employed prefabricated timber sections brought to the site rather than assembled on-site.[*citation needed*]

Sinhalese kings of ancient Sri Lanka have used prefabricated buildings technology to erect giant structures, which dates back as far as 2000 years, where some sections were prepared separately and then fitted together, specially in the Kingdom of Anuradhapura and Polonnaruwa.

After the great Lisbon earthquake of 1755, the Portuguese capital, especially the Baixa district, was rebuilt by using prefabrication on an unprecedented scale. Under the guidance of Sebastião José de Carvalho e Melo, popularly known as the Marquis de Pombal, the most powerful royal minister of D. Jose I, a new Pombaline style of architecture and urban planning arose, which introduced early anti-seismic design features and innovative prefabricated construction methods, according to which large multistory buildings were entirely manufactured outside the city, transported in pieces and then assembled on site. The process, which lasted into the nineteenth century, lodged the city's residents in safe new structures unheard-of before the quake.

Also in Portugal, the town of Vila Real de Santo António in the Algarve, founded on 30 December 1773, was quickly erected through the use of prefabricated materials en masse. The first of the prefabricated stones was laid in March 1774. By 13 May 1776, the centre of the town had been finished and was officially opened.

In 19th century Australia a large number of prefabricated houses were imported from the United Kingdom.

The method was widely used in the construction of prefabricated housing in the 20th century, such as in the United Kingdom as temporary housing for thousands of urban families "bombed out" during World War II. Assembling sections in factories saved time on-site and the lightness of the panels reduced the cost of foundations and assembly on site. Coloured concrete grey and with flat roofs, prefab houses were uninsulated and cold and life in a prefab acquired a certain stigma, but some London prefabs were occupied for much longer than the projected 10 years.[2]

The Crystal Palace, erected in London in 1851, was a highly visible example of iron and glass prefabricated construction; it was followed on a smaller scale by Oxford Rewley Road railway station.

During World War II, prefabricated Cargo ships, designed to quickly replace ships sunk by Nazi U-boats became increasingly common. The most ubiquitous of these ships was the American Liberty ship, which reached production of over 2,000 units, averaging 3 per day.

Current uses

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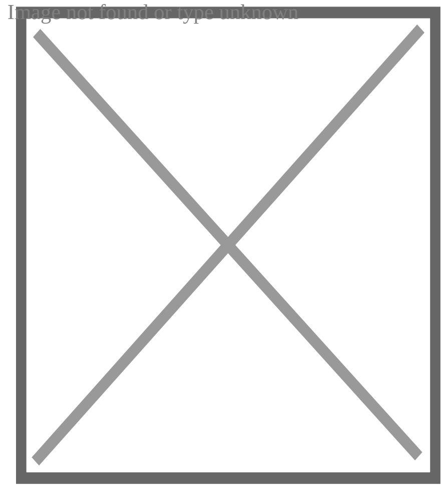


A house being built with prefabricated concrete panels.

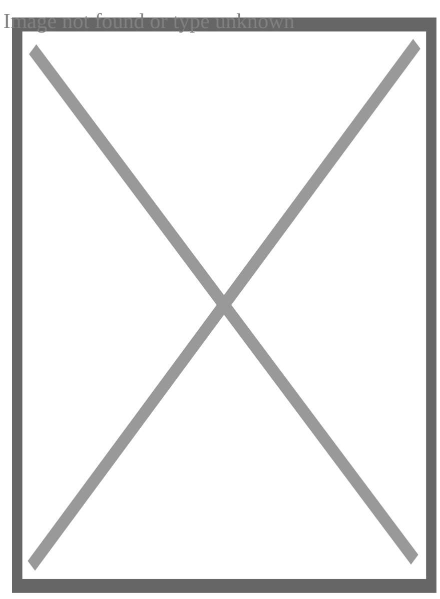
The most widely used form of prefabrication in building and civil engineering is the use of prefabricated concrete and prefabricated steel sections in structures where a particular part or form is repeated many times. It can be difficult to construct the formwork required to mould concrete components on site, and delivering wet concrete to the site before it starts to set requires precise time management. Pouring concrete sections in a factory brings the advantages of being able to re-use moulds and the concrete can be mixed on the spot without having to be transported to and pumped wet on a congested construction site. Prefabricating steel sections reduces on-site cutting and welding costs as well as the associated hazards.

Prefabrication techniques are used in the construction of apartment blocks, and housing developments with repeated housing units. Prefabrication is an essential part of the industrialization of construction.[3] The quality of prefabricated housing units had increased to the point that they may not be distinguishable from traditionally built units to those that live in them. The technique is also used in office blocks, warehouses and factory buildings. Prefabricated steel and glass sections are widely used for the exterior of large buildings.

Detached houses, cottages, log cabin, saunas, etc. are also sold with prefabricated elements. Prefabrication of modular wall elements allows building of complex thermal insulation, window frame components, etc. on an assembly line, which tends to improve quality over on-site construction of each individual wall or frame. Wood construction in particular benefits from the improved quality. However, tradition often favors building by hand in many countries, and the image of prefab as a "cheap" method only slows its adoption. However, current practice already allows the modifying the floor plan according to the customer's requirements and selecting the surfacing material, e.g. a personalized brick facade can be masoned even if the load-supporting elements are timber.

Today, prefabrication is used in various industries and construction sectors such as healthcare, retail, hospitality, education, and public administration, due to its many advantages and benefits over traditional on-site construction, such as reduced installation time and cost savings.[4] Being used in single-story buildings as well as in multi-story projects and constructions. Providing the possibility of applying it to a specific part of the project or to the whole of it.

The efficiency and speed in the execution times of these works offer that, for example, in the case of the educational sector, it is possible to execute the projects without the cessation of the operations of the educational facilities during the development of the same.



Transportation of prefabricated Airbus wing assembly

Prefabrication saves engineering time on the construction site in civil engineering projects. This can be vital to the success of projects such as bridges and avalanche galleries, where weather conditions may only allow brief periods of construction. Prefabricated bridge elements and systems offer bridge designers and contractors significant advantages in terms of construction time, safety, environmental impact, constructibility, and cost. Prefabrication can also help minimize the impact on traffic from bridge building. Additionally, small, commonly used structures such as concrete pylons are in most cases prefabricated.

Radio towers for mobile phone and other services often consist of multiple prefabricated sections. Modern lattice towers and guyed masts are also commonly assembled of prefabricated elements.

Prefabrication has become widely used in the assembly of aircraft and spacecraft, with components such as wings and fuselage sections often being manufactured in different countries or states from the final assembly site. However, this is sometimes for political rather than commercial reasons, such as for Airbus.

Advantages

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- Moving partial assemblies from a factory often costs less than moving pre-production resources to each site
- Deploying resources on-site can add costs; prefabricating assemblies can save costs by reducing on-site work
- Factory tools - jigs, cranes, conveyors, etc. - can make production faster and more precise
- Factory tools - shake tables, hydraulic testers, etc. - can offer added quality assurance
- Consistent indoor environments of factories eliminate most impacts of weather on production
- Cranes and reusable factory supports can allow shapes and sequences without expensive on-site falsework

- Higher-precision factory tools can aid more controlled movement of building heat and air, for lower energy consumption and healthier buildings
- Factory production can facilitate more optimal materials usage, recycling, noise capture, dust capture, etc.
- Machine-mediated parts movement, and freedom from wind and rain can improve construction safety
- Homogeneous manufacturing allows high standardization and quality control, ensuring quality requirements subject to performance and resistance tests, which also facilitate high scalability of construction projects. [5]
- The specific production processes in industrial assembly lines allow high sustainability, which enables savings of up to 20% of the total final cost, as well as considerable savings in indirect costs. [6]

Disadvantages

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- Transportation costs may be higher for voluminous prefabricated sections (especially sections so big that they constitute oversize loads requiring special signage, escort vehicles, and temporary road closures) than for their constituent materials, which can often be packed more densely and are more likely to fit onto standard-sized vehicles.
- Large prefabricated sections may require heavy-duty cranes and precision measurement and handling to place in position.

Off-site fabrication

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Off-site fabrication is a process that incorporates prefabrication and pre-assembly. The process involves the design and manufacture of units or modules, usually remote from the work site, and the installation at the site to form the permanent works at the site. In its fullest sense, off-site fabrication requires a project strategy that will change the orientation of the project process from construction to manufacture to installation. Examples of off-site fabrication are wall panels for homes, wooden truss bridge spans, airport control stations.

There are four main categories of off-site fabrication, which is often also referred to as off-site construction. These can be described as component (or sub-assembly) systems, panelised systems, volumetric systems, and modular systems. Below these categories different branches, or technologies are being developed. There are a vast number of different systems on the market which fall into these categories and with recent advances in digital design such as building information modeling (BIM), the task of integrating these different systems into a construction project is becoming increasingly a "digital" management proposition.

The prefabricated construction market is booming. It is growing at an accelerated pace both in more established markets such as North America and Europe and in emerging economies such as the Asia-Pacific region (mainly China and India). Considerable growth is expected in the coming years, with the prefabricated modular construction market expected to grow at a CAGR (compound annual growth rate) of 8% between 2022 and 2030. It is expected to reach USD 271 billion by 2030. [7]

See also

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Wikimedia Commons has media related to ***Prefabrication***.

- Prefabricated home
- Prefabricated buildings
- Concrete perpend
- Panelák
- Tower block
- St Crispin's School — an example of a prefabricated school building
- Nonsuch House, first prefabricated building
- Agile construction
- Intermediate good

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Sick building syndrome	
Specialty	Environmental medicine, immunology Image not found or type unknown Edit this on Wikidata

Sick building syndrome (**SBS**) is a condition in which people develop symptoms of illness or become infected with chronic disease from the building in which they work or reside.[1] In scientific literature, SBS is also known as **building-related illness (BRI)**, **building-related symptoms (BRS)**, or **idiopathic environmental intolerance (IEI)**.

The main identifying observation is an increased incidence of complaints of such symptoms as headache, eye, nose, and throat irritation, fatigue, dizziness, and nausea. The 1989 Oxford English Dictionary defines SBS in that way.[2] The World Health Organization created a 484-page tome on indoor air quality 1984, when SBS was attributed only to non-organic causes, and suggested that the book might form a basis for legislation or litigation.[3]

The outbreaks may or may not be a direct result of inadequate or inappropriate cleaning.[2] SBS has also been used to describe staff concerns in post-war buildings with faulty building aerodynamics, construction materials, construction process, and maintenance.[2] Some symptoms tend to increase in severity with the time people spend in the building, often improving or even disappearing when people are away from the building.[2][4] The term *SBS* is also used interchangeably with "**building-related symptoms**", which orients the name of the condition around patients' symptoms rather than a "sick" building.[5]

Attempts have been made to connect sick building syndrome to various causes, such as contaminants produced by outgassing of some building materials, volatile organic compounds (VOC), improper exhaust ventilation of ozone (produced by the operation of some office machines), light industrial chemicals used within, and insufficient fresh-air intake or air filtration (*see* "Minimum efficiency reporting value").[2] Sick building syndrome has also been attributed to heating, ventilation, and air conditioning (HVAC) systems, an attribution about which there are inconsistent findings.[6]

Signs and symptoms

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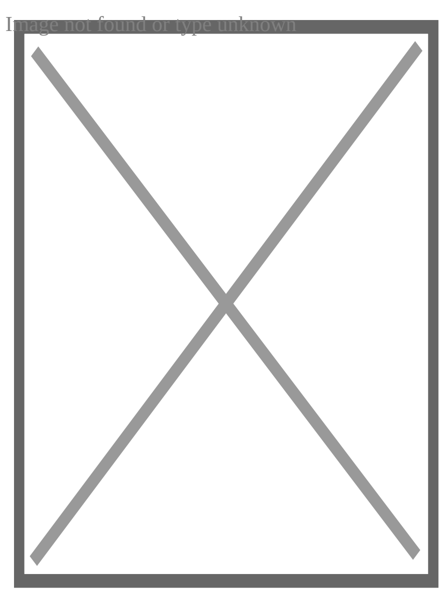

An air quality monitor

Human exposure to aerosols has a variety of adverse health effects.[7] Building occupants complain of symptoms such as sensory irritation of the eyes, nose, or throat; neurotoxic or general health problems; skin irritation; nonspecific hypersensitivity reactions; infectious diseases;[8] and odor and taste sensations.[9] Poor lighting has caused general malaise.[10]

Extrinsic allergic alveolitis has been associated with the presence of fungi and bacteria in the moist air of residential houses and commercial offices.[11] A study in 2017 correlated several inflammatory diseases of the respiratory tract with objective evidence of damp-caused damage in homes.[12]

The WHO has classified the reported symptoms into broad categories, including mucous-membrane irritation (eye, nose, and throat irritation), neurotoxic effects (headaches, fatigue, and irritability), asthma and asthma-like symptoms (chest tightness and wheezing), skin dryness and irritation, and gastrointestinal complaints.[13]

Several sick occupants may report individual symptoms that do not seem connected. The key to discovery is the increased incidence of illnesses in general with onset or exacerbation in a short period, usually weeks. In most cases, SBS symptoms are relieved soon after the occupants leave the particular room or zone.[14] However, there can be lingering effects of various neurotoxins, which may not clear up when the occupant leaves the building. In some cases, including those of sensitive people, there are long-term health effects.[15]

Cause

[edit]

ASHRAE has recognized that polluted urban air, designated within the United States Environmental Protection Agency (EPA)'s air quality ratings as unacceptable, requires the installation of treatment such as filtration for which the HVAC practitioners generally apply carbon-impregnated filters and their likes. Different toxins will aggravate the human body in different ways. Some people are more allergic to mold, while others are highly sensitive to dust. Inadequate ventilation will exaggerate small problems (such as deteriorating fiberglass insulation or cooking fumes) into a much more serious indoor air quality problem.[10]

Common products such as paint, insulation, rigid foam, particle board, plywood, duct liners, exhaust fumes and other chemical contaminants from indoor or outdoor sources, and biological contaminants can be trapped inside by the HVAC AC system. As this air is recycled using fan coils the overall oxygenation ratio drops and becomes harmful. When combined with other stress factors such as traffic noise and poor lighting, inhabitants of buildings located in a polluted urban area can quickly become ill as their immune system is overwhelmed.[10]

Certain VOCs, considered toxic chemical contaminants to humans, are used as adhesives in many common building construction products. These aromatic carbon rings / VOCs can cause acute and chronic health effects in the occupants of a building, including cancer, paralysis, lung failure, and others. Bacterial spores, fungal spores, mold spores, pollen, and viruses are types of biological contaminants and can all cause allergic reactions or illness described as SBS. In addition, pollution from outdoors, such as motor vehicle exhaust, can enter buildings, worsen indoor air quality, and increase the indoor concentration of carbon monoxide and carbon dioxide.[16] Adult SBS symptoms were associated with a history of allergic rhinitis, eczema and asthma.[17]

A 2015 study concerning the association of SBS and indoor air pollutants in office buildings in Iran found that, as carbon dioxide increased in a building, nausea, headaches, nasal irritation, dyspnea, and throat dryness also rose.[10] Some work conditions have been correlated with specific symptoms: brighter light, for example was significantly related to skin dryness, eye pain, and malaise.[10] Higher temperature is correlated with sneezing, skin redness, itchy eyes, and headache; lower relative humidity has been associated with sneezing, skin redness, and eye pain.[10]

In 1973, in response to the oil crisis and conservation concerns, ASHRAE Standards 62–73 and 62–81 reduced required ventilation from 10 cubic feet per minute (4.7 L/s) per person to 5 cubic feet per minute (2.4 L/s) per person, but this was found to be a contributing factor to sick building syndrome.[18] As of the 2016 revision, ASHRAE ventilation standards call for 5 to 10 cubic feet per minute of ventilation per occupant (depending on the occupancy type) in addition to ventilation based on the zone floor area delivered to the breathing zone.[19]

Workplace

[edit]

Excessive work stress or dissatisfaction, poor interpersonal relationships and poor communication are often seen to be associated with SBS, recent[*when?*] studies show that a combination of environmental sensitivity and stress can greatly contribute to sick building syndrome.[15][*citation needed*]

Greater effects were found with features of the psycho-social work environment including high job demands and low support. The report concluded that the physical environment of office buildings appears to be less important than features of the psycho-social work environment in explaining differences in the prevalence of symptoms. However, there is still a relationship between sick building syndrome and symptoms of workers regardless of workplace stress.[20]

Specific work-related stressors are related with specific SBS symptoms. Workload and work conflict are significantly associated with general symptoms (headache, abnormal tiredness, sensation of cold or nausea). While crowded workspaces and low work satisfaction are associated with upper respiratory symptoms.[21] Work productivity has been associated with ventilation rates, a contributing factor to SBS, and there's a significant increase in production as ventilation rates increase, by 1.7% for every two-fold increase of ventilation rate.[22] Printer effluent, released into the office air as ultra-fine particles (UFPs) as toner is burned during the printing process, may lead to certain SBS symptoms.[23][24] Printer effluent may contain a variety of toxins to which a subset of office workers are sensitive, triggering SBS symptoms.[25

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Specific careers are also associated with specific SBS symptoms. Transport, communication, healthcare, and social workers have highest prevalence of general symptoms. Skin symptoms such as eczema, itching, and rashes on hands and face are associated with technical work. Forestry, agriculture, and sales workers have the lowest rates of sick building syndrome symptoms.[[26]]

From the assessment done by Fisk and Mudarri, 21% of asthma cases in the United States were caused by wet environments with mold that exist in all indoor environments, such as schools, office buildings, houses and apartments. Fisk and Berkeley Laboratory colleagues also found that the exposure to the mold increases the chances of respiratory issues by 30 to 50 percent.[[27]] Additionally, studies showing that health effects with dampness and mold in indoor environments found that increased risk of adverse health effects occurs with dampness or visible mold environments.[[28]]

Milton et al. determined the cost of sick leave specific for one business was an estimated $480 per employee, and about five days of sick leave per year could be attributed to low ventilation rates. When comparing low ventilation rate areas of the building to higher ventilation rate areas, the relative risk of short-term sick leave was 1.53 times greater in the low ventilation areas.[[29]]

Home

[edit]

Sick building syndrome can be caused by one's home. Laminate flooring may release more SBS-causing chemicals than do stone, tile, and concrete floors.[[17]] Recent redecorating and new furnishings within the last year are associated with increased symptoms; so are dampness and related factors, having pets, and cockroaches.[[17]] Mosquitoes are related to more symptoms, but it is unclear whether the immediate cause of the symptoms is the mosquitoes or the repellents used against them.[17]

Mold

[edit]
Main article: Mold health issues

Sick building syndrome may be associated with indoor mold or mycotoxin contamination. However, the attribution of sick building syndrome to mold is controversial and supported by little evidence.[30][31][32]

Indoor temperature

[edit]
Main article: Room temperature § Health effects

Indoor temperature under 18 °C (64 °F) has been shown to be associated with increased respiratory and cardiovascular diseases, increased blood levels, and increased hospitalization.[33]

Diagnosis

[edit]

While sick building syndrome (SBS) encompasses a multitude of non-specific symptoms, building-related illness (BRI) comprises specific, diagnosable symptoms caused by certain agents (chemicals, bacteria, fungi, etc.). These can typically be identified, measured, and quantified.[34] There are usually four causal agents in BRi: immunologic, infectious, toxic, and irritant.[34] For instance, Legionnaire's disease, usually caused by *Legionella pneumophila*, involves a specific organism which could be ascertained through clinical findings as the source of contamination within a building.[34]

Prevention

[edit]

- Reduction of time spent in the building
- If living in the building, moving to a new place
- Fixing any deteriorated paint or concrete deterioration
- Regular inspections to indicate for presence of mold or other toxins
- Adequate maintenance of all building mechanical systems
- Toxin-absorbing plants, such as sansevieria[35][36][37][38][39][40][41][*excessive citation*
- Roof shingle non-pressure cleaning for removal of algae, mold, and *Gloeocapsa magma*
- Using ozone to eliminate the many sources, such as VOCs, molds, mildews, bacteria, viruses, and even odors. However, numerous studies identify high-ozone shock treatment as ineffective despite commercial popularity and popular belief.
- Replacement of water-stained ceiling tiles and carpeting
- Only using paints, adhesives, solvents, and pesticides in well-ventilated areas or only using these pollutant sources during periods of non-occupancy
- Increasing the number of air exchanges; the American Society of Heating, Refrigeration and Air-Conditioning Engineers recommend a minimum of 8.4 air exchanges per 24-hour period
- Increased ventilation rates that are above the minimum guidelines[22]
- Proper and frequent maintenance of HVAC systems
- UV-C light in the HVAC plenum
- Installation of HVAC air cleaning systems or devices to remove VOCs and bioeffluents (people odors)
- Central vacuums that completely remove all particles from the house including the ultrafine particles (UFPs) which are less than 0.1 μm
- Regular vacuuming with a HEPA filter vacuum cleaner to collect and retain 99.97% of particles down to and including 0.3 micrometers

- Placing bedding in sunshine, which is related to a study done in a high-humidity area where damp bedding was common and associated with SBS[17]
- Lighting in the workplace should be designed to give individuals control, and be natural when possible[42]
- Relocating office printers outside the air conditioning boundary, perhaps to another building
- Replacing current office printers with lower emission rate printers[43]
- Identification and removal of products containing harmful ingredients

Management

[edit]

SBS, as a non-specific blanket term, does not have any specific cause or cure. Any known cure would be associated with the specific eventual disease that was cause by exposure to known contaminants. In all cases, alleviation consists of removing the affected person from the building associated. BRI, on the other hand, utilizes treatment appropriate for the contaminant identified within the building (e.g., antibiotics for Legionnaire's disease).[*citation needed*]

Improving the indoor air quality (IAQ) of a particular building can attenuate, or even eliminate, the continued exposure to toxins. However, a Cochrane review of 12 mold and dampness remediation studies in private homes, workplaces and schools by two independent authors were deemed to be very low to moderate quality of evidence in reducing adult asthma symptoms and results were inconsistent among children.[44] For the individual, the recovery may be a process involved with targeting the acute symptoms of a specific illness, as in the case of mold toxins.[45] Treating various building-related illnesses is vital to the overall understanding of SBS. Careful analysis by certified building professionals and physicians can help to identify the exact cause of the BRI, and help to illustrate a causal path to infection. With this knowledge one can, theoretically, remediate a building of contaminants and rebuild the structure with new materials. Office BRI may more likely than not be explained by three events: "Wide range in the threshold of response in any population (susceptibility), a spectrum of response to any given agent, or variability in exposure within large office buildings."[46]

Isolating any one of the three aspects of office BRI can be a great challenge, which is why those who find themselves with BRI should take three steps, history, examinations, and interventions. History describes the action of continually monitoring and recording the health of workers experiencing BRI, as well as obtaining records of previous building alterations or related activity. Examinations go hand in hand with monitoring employee health. This step is done by physically examining the entire workspace and evaluating possible threats to health status among employees. Interventions follow accordingly based on the results of the Examination and History report.[46]

Epidemiology

[edit]

Some studies have found that women have higher reports of SBS symptoms than men.[17][10] It is not entirely clear, however, if this is due to biological, social, or occupational factors.

A 2001 study published in the Journal Indoor Air, gathered 1464 office-working participants to increase the scientific understanding of gender differences under the Sick Building Syndrome phenomenon.[47] Using questionnaires, ergonomic investigations, building evaluations, as well as physical, biological, and chemical variables, the investigators obtained results that compare with past studies of SBS and gender. The study team found that across most test variables, prevalence rates were different in most areas, but there was also a deep stratification of working conditions between genders as well. For example, men's workplaces tend to be significantly larger and have all-around better job characteristics. Secondly, there was a noticeable difference in reporting rates, specifically that women have higher rates of reporting roughly 20% higher than men. This information was similar to that found in previous studies, thus indicating a potential difference in willingness to report.[47]

There might be a gender difference in reporting rates of sick building syndrome, because women tend to report more symptoms than men do. Along with this, some studies have found that women have a more responsive immune system and are more prone to mucosal dryness and facial erythema. Also, women are alleged by some to be more exposed to indoor environmental factors because they have a greater tendency to have clerical jobs, wherein they are exposed to unique office equipment and materials (example: blueprint machines, toner-based printers), whereas men often have jobs based outside of offices.[48]

History

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In the late 1970s, it was noted that nonspecific symptoms were reported by tenants in newly constructed homes, offices, and nurseries. In media it was called "office illness". The term "sick building syndrome" was coined by the WHO in 1986, when they also estimated that 10–30% of newly built office buildings in the West had indoor air problems. Early Danish and British studies reported symptoms.

Poor indoor environments attracted attention. The Swedish allergy study (SOU 1989:76) designated "sick building" as a cause of the allergy epidemic as was feared. In the 1990s, therefore, extensive research into "sick building" was carried out. Various physical and chemical factors in the buildings were examined on a broad front.

The problem was highlighted increasingly in media and was described as a "ticking time bomb". Many studies were performed in individual buildings.

In the 1990s "sick buildings" were contrasted against "healthy buildings". The chemical contents of building materials were highlighted. Many building material manufacturers were actively working to gain control of the chemical content and to replace criticized additives. The ventilation industry advocated above all more well-functioning ventilation. Others perceived ecological construction, natural materials, and simple techniques as a solution.

At the end of the 1990s came an increased distrust of the concept of "sick building". A dissertation at the Karolinska Institute in Stockholm 1999 questioned the methodology of previous research, and a Danish study from 2005 showed these flaws experimentally. It was suggested that sick building syndrome was not really a coherent syndrome and was not a disease to be individually diagnosed, but a collection of as many as a dozen semi-related diseases. In 2006 the Swedish National Board of Health and Welfare recommended in the medical journal *Läkartidningen* that "sick building syndrome" should not be used as a clinical diagnosis. Thereafter, it has become increasingly less common to use terms such as *sick buildings* and *sick building syndrome* in research. However, the concept remains alive in popular culture and is used to designate the set of symptoms related to poor home or work environment engineering. *Sick building* is therefore an expression used especially in the context of workplace health.

Sick building syndrome made a rapid journey from media to courtroom where professional engineers and architects became named defendants and were represented by their respective professional practice insurers. Proceedings invariably relied on expert witnesses, medical and technical experts along with building managers, contractors and manufacturers of finishes and furnishings, testifying as to cause and effect. Most of these actions resulted in sealed settlement agreements, none of these being dramatic. The insurers needed a defense based upon Standards of Professional Practice to meet a court decision that declared that in a modern, essentially sealed building, the HVAC systems must produce breathing air for suitable human consumption. ASHRAE (American Society of Heating, Refrigeration and Air Conditioning Engineers, currently with over 50,000 international members) undertook the task of codifying its indoor air quality (IAQ) standard.

ASHRAE empirical research determined that "acceptability" was a function of outdoor (fresh air) ventilation rate and used carbon dioxide as an accurate measurement of occupant presence and activity. Building odors and contaminants would be suitably controlled by this dilution methodology. ASHRAE codified a level of 1,000 ppm of carbon dioxide and specified the use of widely available sense-and-control equipment to assure compliance. The 1989 issue of ASHRAE 62.1-1989 published the whys and wherefores and overrode the 1981 requirements that were aimed at a ventilation level of 5,000 ppm of carbon dioxide (the OSHA workplace limit), federally set to minimize HVAC system energy consumption. This apparently ended the SBS epidemic.

Over time, building materials changed with respect to emissions potential. Smoking vanished and dramatic improvements in ambient air quality, coupled with code compliant ventilation and maintenance, per ASHRAE standards have all contributed to the acceptability of the indoor air environment.[49][50]

See also

[edit]

- Aerotoxic syndrome
- Air purifier
- Asthmagen
- Cleanroom
- Electromagnetic hypersensitivity
- Havana syndrome
- Healthy building
- Indoor air quality
- Lead paint
- Multiple chemical sensitivity
- NASA Clean Air Study
- Nosocomial infection
- Particulates
- Power tools

- Renovation
- Somatization disorder
- Fan death

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Further reading

[edit]

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- Michelle Murphy, *Sick Building Syndrome and the Problem of Uncertainty*, 2006.
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- Bulletin of the Transilvania University of BraÃÆ'Ãâ€™Ãâ€ Ã¢â‚¬â„¢ÃÆ'Ã¢â‚¬Â ÃÂ¢Ã¢â€Â¬Ã¢â€Â¢ÃÆ'Ãâ€™ÃÂ¢Ã¢ Series I: *Engineering Sciences* • Vol. 5 (54) No. 1 2012 "Impact of Indoor Environment Quality on Sick Building Syndrome in Indian Leed Certified Buildings". by Jagannathan Mohan

External links

[edit]

- Best Practices for Indoor Air Quality when Remodeling Your Home, US EPA
- Renovation and Repair, Part of Indoor Air Quality Design Tools for Schools, US EPA
- Addressing Indoor Environmental Concerns During Remodeling, US EPA
- Dust FAQs, UK HSE Archived 2023-03-20 at the Wayback Machine
- CCOHS: Welding - Fumes And Gases | Health Effect of Welding Fumes

Classification	◦ **MeSH**: D018877	D
External resources	◦ **Patient UK**: Sick building syndrome	

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Heating, ventilation, and air conditioning

Fundamental concepts	◦ Air changes per hour ◦ Bake-out ◦ Building envelope ◦ Convection ◦ Dilution ◦ Domestic energy consumption ◦ Enthalpy ◦ Fluid dynamics ◦ Gas compressor ◦ Heat pump and refrigeration cycle ◦ Heat transfer ◦ Humidity ◦ Infiltration ◦ Latent heat ◦ Noise control ◦ Outgassing ◦ Particulates ◦ Psychrometrics ◦ Sensible heat ◦ Stack effect ◦ Thermal comfort ◦ Thermal destratification ◦ Thermal mass ◦ Thermodynamics ◦ Vapour pressure of water

Technology	◦ Absorption-compression heat pump ◦ Absorption refrigerator ◦ Air barrier ◦ Air conditioning ◦ Antifreeze ◦ Automobile air conditioning ◦ Autonomous building ◦ Building insulation materials ◦ Central heating ◦ Central solar heating ◦ Chilled beam ◦ Chilled water ◦ Constant air volume (CAV) ◦ Coolant ◦ Cross ventilation ◦ Dedicated outdoor air system (DOAS) ◦ Deep water source cooling ◦ Demand controlled ventilation (DCV) ◦ Displacement ventilation ◦ District cooling ◦ District heating ◦ Electric heating ◦ Energy recovery ventilation (ERV) ◦ Firestop ◦ Forced-air ◦ Forced-air gas ◦ Free cooling ◦ Heat recovery ventilation (HRV) ◦ Hybrid heat ◦ Hydronics ◦ Ice storage air conditioning ◦ Kitchen ventilation ◦ Mixed-mode ventilation ◦ Microgeneration ◦ Passive cooling ◦ Passive daytime radiative cooling

- Air conditioner inverter
- Air door
- Air filter
- Air handler
- Air ionizer
- Air-mixing plenum
- Air purifier
- Air source heat pump
- Attic fan
- Automatic balancing valve
- Back boiler
- Barrier pipe
- Blast damper
- Boiler
- Centrifugal fan
- Ceramic heater
- Chiller
- Condensate pump
- Condenser
- Condensing boiler
- Convection heater
- Compressor
- Cooling tower
- Damper
- Dehumidifier
- Duct
- Economizer
- Electrostatic precipitator
- Evaporative cooler
- Evaporator
- Exhaust hood
- Expansion tank
- Fan
- Fan coil unit
- Fan filter unit
- Fan heater

Measurement and control	◦ Air flow meter ◦ Aquastat ◦ BACnet ◦ Blower door ◦ Building automation ◦ Carbon dioxide sensor ◦ Clean air delivery rate (CADR) ◦ Control valve ◦ Gas detector ◦ Home energy monitor ◦ Humidistat ◦ HVAC control system ◦ Infrared thermometer ◦ Intelligent buildings ◦ LonWorks ◦ Minimum efficiency reporting value (MERV) ◦ Normal temperature and pressure (NTP) ◦ OpenTherm ◦ Programmable communicating thermostat ◦ Programmable thermostat ◦ Psychrometrics ◦ Room temperature ◦ Smart thermostat ◦ Standard temperature and pressure (STP) ◦ Thermographic camera ◦ Thermostat ◦ Thermostatic radiator valve

Professions, trades, and services	◦ Architectural acoustics ◦ Architectural engineering ◦ Architectural technologist ◦ Building services engineering ◦ Building information modeling (BIM) ◦ Deep energy retrofit ◦ Duct cleaning ◦ Duct leakage testing ◦ Environmental engineering ◦ Hydronic balancing ◦ Kitchen exhaust cleaning ◦ Mechanical engineering ◦ Mechanical, electrical, and plumbing ◦ Mold growth, assessment, and remediation ◦ Refrigerant reclamation ◦ Testing, adjusting, balancing
Industry organizations	◦ AHRI ◦ AMCA ◦ ASHRAE ◦ ASTM International ◦ BRE ◦ BSRIA ◦ CIBSE ◦ Institute of Refrigeration ◦ IIR ◦ LEED ◦ SMACNA ◦ UMC
Health and safety	◦ Indoor air quality (IAQ) ◦ Passive smoking ◦ Sick building syndrome (SBS) ◦ Volatile organic compound (VOC)

See also

- ASHRAE Handbook
- Building science
- Fireproofing
- Glossary of HVAC terms
- Warm Spaces
- World Refrigeration Day
- Template:Home automation
- Template:Solar energy

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Employment

Classifications

- Academic tenure
- Casual
- Contingent work
- Full-time job
- Gig worker
- Job sharing
- Part-time job
- Self-employment
- Side job
- Skilled worker
  - Journeyman
  - Technician
  - Tradesperson
- Independent contractor
- Labour hire
- Temporary work
- Laborer
- Wage labour

Hiring

- Application
- Background check
- Business networking
- Cover letter
- Curriculum vitae
- Drug testing
- Employment contract
- Employment counsellor
- Executive search
    - list
- Induction programme
- Job fair
- Job fraud
- Job hunting
- Job interview
- Letter of recommendation
- Onboarding
- Overqualification
- Person–environment fit
- Personality–job fit theory
- Personality hire
- Probation
- Realistic job preview
- Recruitment
- Résumé
- Simultaneous recruiting of new graduates
- Underemployment
- Work-at-home scheme

Roles

- Cooperative
- Employee
- Employer
- Internship
- Job
- Labour hire
- Permanent employment
- Supervisor
- Volunteering

Working class

- Blue-collar
- Green-collar
- Grey-collar
- Pink-collar
- Precariat
- White-collar
- Red-collar
- New-collar
- No-collar
- Orange-collar
- Scarlet-collar
- Black-collar
- Gold-collar

Career and training

- Apprenticeship
- Artisan
    - Master craftsman
- Avocation
- Career assessment
- Career counseling
- Career development
- Coaching
- Creative class
- Education
    - Continuing education
    - E-learning
    - Employability
    - Further education
    - Graduate school
    - Induction training
    - Knowledge worker
    - Licensure
    - Lifelong learning
    - Overspecialization
    - Practice-based professional learning
    - Professional association
    - Professional certification
    - Professional development
    - Professional school
    - Reflective practice
    - Retraining
    - Vocational education
    - Vocational school
    - Vocational university
- Mentorship
- Occupational Outlook Handbook
- Practice firm
- Profession
    - Operator
    - Professional

Attendance	◦ Break ◦ Break room ◦ Career break ◦ Furlough ◦ Gap year ◦ Leave of absence ◦ Long service leave ◦ No call, no show ◦ Sabbatical ◦ Sick leave ◦ Time clock
Schedules	◦ 35-hour workweek ◦ Four-day week ◦ Eight-hour day ◦ 996 working hour system ◦ Flextime ◦ On-call ◦ Overtime ◦ Remote work ◦ Six-hour day ◦ Shift work ◦ Working time ◦ Workweek and weekend

Wages and salaries	◦ Income bracket
	◦ Income tax
	◦ Living wage
	◦ Maximum wage
	◦ National average salary
	    ◦ World
	    ◦ Europe
	◦ Minimum wage
	    ◦ Canada
	    ◦ Hong Kong
	    ◦ Europe
	    ◦ United States
	◦ Progressive wage
	    ◦ Singapore
	◦ Overtime rate
	◦ Paid time off
	◦ Performance-related pay
	◦ Salary cap
	◦ Wage compression
	◦ Working poor

Benefits	◦ Annual leave ◦ Casual Friday ◦ Child care ◦ Disability insurance ◦ Health insurance ◦ Life insurance ◦ Marriage leave ◦ Parental leave ◦ Pension ◦ Sick leave ◦ United States ◦ Take-home vehicle

Safety and health

- Crunch
- Epilepsy and employment
- Human factors and ergonomics
- Karoshi
- List of countries by rate of fatal workplace accidents
- Occupational burnout
- Occupational disease
- Occupational exposure limit
- Occupational health psychology
- Occupational injury
- Occupational noise
- Occupational stress
- Personal protective equipment
- Repetitive strain injury
- Right to sit
    - United States
- Sick building syndrome
- Work accident
    - Occupational fatality
- Workers' compensation
- Workers' right to access the toilet
- Workplace health promotion
- Workplace phobia
- Workplace wellness

Equal opportunity

- Affirmative action
- Equal pay for equal work
- Gender pay gap
- Glass ceiling

- Corporate collapses and scandals
    - Accounting scandals
    - Control fraud
    - Corporate behaviour
    - Corporate crime
- Discrimination
- Exploitation of labour
- Dress code
- Employee handbook

Infractions

- Employee monitoring
- Evaluation
- Labour law
- Sexual harassment
- Sleeping while on duty
- Wage theft
- Whistleblower
- Workplace bullying
- Workplace harassment
- Workplace incivility

Willingness

- Boreout
- Careerism
- Civil conscription
- Conscription
- Critique of work
- Dead-end job
- Job satisfaction
- McJob
- Organizational commitment
- Refusal of work
- Slavery
    - Bonded labour
    - Human trafficking
    - Labour camp
    - Penal labour
    - Peonage
    - Truck wages
    - Unfree labour
    - Wage slavery
- Work ethic
- Work–life interface
    - Downshifting
    - Slow living
- Workaholic

Termination	◦ At-will employment
	◦ Dismissal
	    ◦ Banishment room
	    ◦ Constructive dismissal
	    ◦ Wrongful dismissal
	◦ Employee offboarding
	◦ Exit interview
	◦ Layoff
	◦ Notice period
	◦ Pink slip
	◦ Resignation
	    ◦ Letter of resignation
	◦ Restructuring
	◦ Retirement
	    ◦ Mandatory retirement
	    ◦ Retirement age
	    ◦ Retirement planning
	◦ Severance package
	    ◦ Golden handshake
	    ◦ Golden parachute
	◦ Turnover

Unemployment

- Barriers to entry
- Discouraged worker
- Economic depression
  - Great Depression
  - Long Depression
- Frictional unemployment
- Full employment
- Graduate unemployment
- Involuntary unemployment
- Jobless recovery
- Phillips curve
- Recession
  - Great Recession
  - Job losses caused by the Great Recession
  - Lists of recessions
  - Recession-proof job
- Reserve army of labour
- Structural unemployment
- Technological unemployment
- Types of unemployment
- Unemployment benefits
- Unemployment Convention, 1919
- Unemployment extension
- List of countries by unemployment rate
- Employment-to-population ratio
  - List
- Wage curve
- Youth unemployment

Public programs	○ Workfare ○ Unemployment insurance ○ Make-work job ○ Job creation program ○ Job creation index ○ Job guarantee ○ Employer of last resort ○ Guaranteed minimum income ○ Right to work ○ *Historical:* ○ *U.S.A.:* ○ Civil Works Administration ○ Works Progress Administration Comprehensive Employment and Training Act

See also

- Bullshit job
- Busy work
- Credentialism and educational inflation
- Emotional labor
- Evil corporation
- Going postal
- Kiss up kick down
- Labor rights
- Make-work job
- Narcissism in the workplace
- Post-work society
- Presenteeism
- Psychopathy in the workplace
- Sunday scaries
- Slow movement (culture)
- Toxic leader
- Toxic workplace
- Workhouse

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- Aspects of corporations
- Aspects of jobs
- Aspects of occupations
- Aspects of organizations
- Aspects of workplaces
- Corporate titles
- Critique of work
- Organized labor

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About Durham Supply Inc

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Things To Do in Tulsa County

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Gathering Place

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Tours of Tulsa

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Streetwalker Tours

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The Outsiders House Museum

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Driving Directions From Woodward Park and Gardens to Durham Supply Inc

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Driving Directions From Oxley Nature Center to Durham Supply Inc

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Reviews for Durham Supply Inc

Durham Supply Inc

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Ethel Schiller

(5)

This place is really neat, if they don't have it they can order it from another of their stores and have it there overnight in most cases. Even hard to find items for a trailer! I definitely recommend this place to everyone! O and the prices is awesome too!

Durham Supply Inc

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B Mann

(5)

I was in need of some items for a double wide that I am remodeling and this place is the only place in town that had what I needed (I didn't even try the other rude place)while I was there I learned the other place that was in Tulsa that also sold mobile home supplies went out of business (no wonder the last time I was in there they were VERY RUDE and high priced) I like the way Dunham does business they answered all my questions and got me the supplies I needed, very friendly, I will be back to purchase the rest of my items when the time comes.

Durham Supply Inc

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Dennis Champion

(5)

Durham supply and Royal supply seems to find the most helpful and friendly people to work in their stores, we are based out of Kansas City out here for a few remodels and these guys treated us like we've gone there for years.

Durham Supply Inc

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Ty Spears

(5)

Bought a door/storm door combo. Turns out it was the wrong size. They swapped it out, quick and easy no problems. Very helpful in explaining the size differences from standard door sizes.

Durham Supply Inc

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Gerald Clifford Brewster

(5)

We will see, the storm door I bought says on the tag it's 36x80, but it's 34x80. If they return it.......they had no problems returning it. And it was no fault of there's, you measure a mobile home door different than a standard door!

Addressing Extended Rainy Periods in Mobile Home Ventilation**View GBP**

Frequently Asked Questions

How can I prevent moisture buildup in my mobile home during extended rainy periods?

To prevent moisture buildup, ensure your HVAC system includes a dehumidifier to control humidity levels. Regularly check and clean air vents to maintain airflow, and use exhaust fans in kitchens and bathrooms to expel moist air. Additionally, consider using moisture absorbers or desiccants in enclosed areas.

What steps can I take to improve the efficiency of my HVAC system during rainy weather?

Improve HVAC efficiency by sealing any leaks around windows, doors, and ductwork to prevent humid air from entering. Replace or clean air filters regularly to ensure optimal airflow. Use programmable thermostats to maintain consistent temperatures and reduce strain on the system during fluctuating weather conditions.

Are there specific features I should look for in an HVAC system for better performance during prolonged rain?

Look for an HVAC system with a built-in dehumidification feature that efficiently manages humidity levels. Systems with variable-speed technology offer better control over temperature and humidity fluctuations. Additionally, choose systems with high SEER (Seasonal Energy Efficiency Ratio) ratings for greater energy efficiency during diverse weather conditions.

Royal Supply Inc

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Company Website : **https://royal-durhamsupply.com/locations/oklahoma-city-oklahoma/**

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