CONSTRUCTION FACILITY MANAGEMENT

SEMINAR II

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INTRODUCTION

The university textbook broadens understanding in the areas of facility management, building upkeep, and building operations. It is designed for students enrolled in a range of study programs at both undergraduate and graduate levels within the Faculty of Civil Engineering at different universities. Additionally, the information is applicable to students taking various classes, workshops, and seminars. The textbook addresses the responsibilities of the facility and building manager, as well as the processes within the building that they must oversee and control. The textbook emphasizes the consistent selection of the supplier of facility management services, and not to underestimate the time for the preparation of the selection. The textbook also deals with a part of facility management, namely spatial management. In the phase of using the building, there are many requirements for changing the space, which we must ensure efficiently and always with respect to the employee with the help of facility management. Through the creation of facility management documents, which aim to maintain the quality of indoor environments in buildings and thereby provide a high-quality workspace.

Facility management is a multidisciplinary field that deals with the management and optimization of support activities in organizations to ensure the efficient functioning of real estate, infrastructure, and the working environment. It is important to see FM as a strategic function that contributes to the success of the organization not only in terms of efficiency and cost, but also in the terms of **employee satisfaction, safety, sustainability**, and overall value. Facilities management is an important part of modern management of organizations and contribute to their effective functioning and **success**. Facility managers play a key role in ensuring the smooth operation of the real estate and infrastructure in an organization. They are responsible for the management of the facilities, maintenance, and support services in the organization. The FM industry is growing rapidly, and the COVID-19 pandemic made safety and health a top priority. From an FM perspective, it is important to understand and optimize processes in three main areas: working environment, support processes, FM management. Effective management of FM processes contributes to the creation

of an **optimal working environment and reducing costs, increasing the value of real estate and improving the image of the organization**.

Building management is the process of planning, organizing, managing, and controlling the use of spaces to optimize their efficiency, functionality, and economic profitability. Space management plays a vital role in creating an **efficient and harmonious environment**, whether it is in a home, office, or public setting. It is an important part of facility management and **strategic management** of organizations. In today's dynamic environment, it is important for organizations to pay sufficient attention to space management and use modern tools and technologies for its effective management. Space management is an essential part of effective facility management. It deals with the effective planning, organization and use of spatial resources in buildings and premises. Its correct application brings several benefits, from cost optimization and increased **work efficiency to improved comfort and well-being of employees**.

Space management involves strategically planning, organizing, and managing physical spaces to optimize their efficiency, functionality, and economic profitability. This process applies to various types of spaces including offices, warehouses, retail, and public buildings. The primary goals of space management include **maximizing space utilization, creating ergonomic and productive work environments**, reducing costs, fostering flexibility and adaptability, **improving communication**, and enhancing the attractiveness of premises. Key aspects of space management include needs analysis, space planning, allocation, utilization, and the maintenance and management of premises, often utilizing technologies like CAFM systems. Various methods such as workplace and occupancy analysis, hot desking, and activity-based working are employed to improve space management. Current trends influencing space management include hybrid working models, emphasis on employee wellbeing, digitization, and **sustainability.** Effective space management is crucial within facility and strategic management, contributing to cost optimization and the creation of quality work environments.

FM plays a key role in ensuring the efficient operation and long-term sustainability of buildings. The purpose of FM is to create, improve, plan and

maintain the indoor environment of the building with **minimum resource requirements** in such a way as to strengthen the main activities of the company, both the investor and the tenants of the buildings. Building maintenance is a part of the technical management of buildings that provides maintenance of building construction and maintenance of technical equipment installed in the building. The building **maintenance manual** is an indispensable tool for effective maintenance management within facility management. This allows facility managers to efficiently **plan preventive maintenance**, minimize the risk of breakdowns, and extend the life of building.

1 TERMINOLOGY

1.1 FACILITY MANAGEMENT

Facility management (FM) is a multidisciplinary field that deals with the management and optimization of support activities in organizations to ensure the efficient functioning of real estate, infrastructure, and the working environment. Its goal is to integrate processes and services that support and increase the efficiency of the organization's core business and contribute to its economic growth and success.
FM takes care of everything that is not directly related to the main business of the organization but is necessary for its smooth operation.

The scope of facility management is broad and includes several areas, including:

1. **Property management:** Ensuring the operation, maintenance and repair of buildings and their technical equipment (e.g. heating, air conditioning, lighting, electrical installations, elevators).
2. **Operation and maintenance:** Planning and implementation of preventive maintenance, emergency repairs, revisions and inspections of technical equipment.
3. **Energy management:** Optimizing energy consumption, finding savings and implementing energy-efficient solutions.
4. **Safety and Security:** Ensuring the physical safety of buildings, fire protection, safety systems and occupational health.
5. **Cleaning and hygiene services:** Ensuring cleanliness and hygiene in and around buildings.
6. **Logistics and postal services:** Managing postal services, transporting materials and people.
7. **Catering:** Provision of catering services for employees.
8. **Space management:** Optimizing the use of workspaces, planning and implementing changes in the interior.
9. **Environmental management:** Minimizing the environmental impact of activities, waste management and recycling.

1.1.1 Goals of Facility Management

The main goals of facility management are:

1. **Increase efficiency and productivity:** Create an optimal work environment that supports employee performance.
2. **Cost optimization:** Efficient management of operating costs and the search for savings.
3. **Ensuring health and safety:** Creating a safe and healthy working environment.
4. **Increasing the value of real estate:** Taking care of real estate and its technical equipment in order to preserve its value.
5. **Supporting the organization's core business:** Ensuring that support processes run smoothly so that the organization can fully focus on its core business.

1.1.2 Advantages of Facility Management

The implementation of facility management brings a number of benefits to organizations, including:

1. **Cost savings:** Efficient management and optimization of operating costs.
2. **Increase productivity:** Create an optimal working environment.
3. **Improving service quality:** Professional management of support services.
4. **Increasing employee satisfaction:** Creating a comfortable and safe working environment.
5. **Increasing the value of real estate:** Taking care of real estate and its technical equipment.

Facility management is an important part of modern management of organizations and contributes to their effective functioning and success.

According to the International Facility Management Association (IFMA), Facility Management (hereinafter referred to as FM) is the "way in which organizations coordinate workers, work activities and work environments in organizations,

including the architecture, business administration, technical and human science."[1]

Standard STN EN ISO 41011 defines facility management as: "Integration of processes within an organization to help ensure and develop agreed services that help and streamline the organization's core business."[2]

According to the BIFM: "The British National Association" currenly IWFM (Institute of Workplace and Facilities Management)is FM: "By integrating many disciplinary activities into the building environment and diluting their impact on people and the workplace as part of the building"

According to the "GEFMA": "German National Organization of Facility Managers", FM is defined as: "analysis and optimization of all processes relevant to the costs associated with the building that are not part of its core business."[3]

The goal of FM is: "to reinforce all processes, with the help of which workers work with the highest efficiency in the workplace, thus ensuring the overall economic growth and success of the organization."[12]

Facility management is the management and maintenance of buildings and their surroundings, including the provision of all support services that are necessary for their effective functioning. This definition is concise and understandable to the general public.

Definition with an emphasis on strategy: Facility management is the strategic management of all aspects of the built environment in order to optimize costs, **minimize risks and maximize value** for the organization. This definition emphasizes the strategic importance of facility management for the success of an organization.

[1] SOMOROVÁ, V.: Building maintenance. Facility management. 2010.
Publisher SUT Bratislava. ISBN 978-80-227-3372-4
[2] STN EN 15221-1. Facility management. Terms and definitions. Bratislava. SÚTN.
[3] SOMOROVA, V.: Facility management. 2014. Professional publishing Prague. ISBN 978-80-7431-141-3.

Definition with sustainability in mind: Facility management is a holistic approach to the management of the built environment that takes into account **environmental, social and economic** aspects in order to achieve **sustainable development**. This definition emphasizes the importance of sustainability in the context of facility management.

Management is: "a dynamic process in which managers in the context of an ever-changing environment endeavor, through the human potential of an organization, to achieve its goals in the efficient and efficient use of scarce resources."[4]

1.1.3 Comparison of Definitions and Key Elements

When comparing these definitions, we can identify several key elements that are repeated in them:

1. **Integration:** Facility management integrates various activities and processes to ensure the efficient functioning of the organization.
2. **Support:** Facility management supports the core business of an organization by ensuring that support processes run smoothly.
3. **Efficiency:** Facility management focuses on optimizing costs and maximizing value for the organization.
4. **Environment:** Facility management deals with the management and maintenance of the built environment, including buildings and their surroundings.
5. **People:** Facility management takes into account the needs of the people who work in a given environment.

Different definitions of facility management emphasize different aspects of this multidisciplinary field. Together, however, they form a comprehensive picture of what facility management is and what importance it has for modern organizations. It is important to see FM as a strategic function that contributes to the **success of the organization** not only in terms of efficiency and cost, but also in terms of **employee satisfaction, safety, sustainability**, and overall value.

[4] PAPULA, J., PAPULOVÁ, Z.: Strategy and strategic management. 2013. Publishing Iura Edition Bratislava. ISBN 978-80-8078-655-7.

According to FM, the processes that take place in a building are divided into main and supportive. Building maintenance in facility management is one of the dominant support activities.

1.1.4 Facility Manager

A facility manager is responsible for planning, managing, coordinating and controlling all activities related to facility management. He must have a broad knowledge of various fields such as technology, economics, law, safety and environmental management. Communication and management skills are also important.

A facility manager plays a crucial role in the efficient functioning of organizations by ensuring the smooth operation of real estate, infrastructure, and support services. His tasks are extensive and multidisciplinary, ranging from technical management of buildings to contract management and communication with suppliers.

In general, the tasks of a facility manager can be summarized in several key areas:

1. **Property and infrastructure management:** Ensuring the operation, maintenance, repair and modernization of buildings, technical equipment (heating, ventilation, air conditioning, electrical installations, elevators, fire protection systems, etc.) and outdoor areas.
2. **Operating cost management:** Optimize costs for energy, water, waste, maintenance, cleaning, and other operational services.
3. **Contract management with suppliers:** Searching, selecting, concluding contracts and checking the performance of contracts with service suppliers (cleaning, guarding, maintenance, revisions, etc.).
4. **Health and safety:** Ensuring compliance with safety regulations, fire protection, occupational health and crisis management.
5. **Space and Work Environment Management:** Optimizing the use of space, planning and implementing changes in the interior, ensuring a comfortable and productive working environment.

6. **Energy management:** Monitoring and optimizing energy consumption, implementing energy-efficient solutions and reducing environmental impact.
1. **Communication and reporting:** Communication with the organization's management, employees, suppliers and other stakeholders, regular reporting on the status and performance of FM.

Specific activities that a facility manager performs include, for example:

1. **Planning and budgeting:** Developing annual plans and budgets for the FM department.
2. **Keeping records of real estate and technical equipment:** Recording information on condition, maintenance and inspections.
3. **Organizing and coordinating maintenance and repairs:** Planning preventive maintenance, dealing with emergency situations, and quality control of the work performed.
4. **Developing and implementing safety regulations and procedures:** Ensuring the safety of persons and property.
5. **Monitoring and evaluation of key performance indicators (KPIs):** Monitoring the effectiveness of FM processes and identifying areas for improvement.
6. **Project Management:** Carrying out minor construction modifications, refurbishments, and other projects related to property management.
7. **Collaboration with internal departments:** Communication and coordination with other departments in the organization (e.g., IT, HR, finance).

A successful facility manager should have a combination of technical, managerial and interpersonal skills. Important requirements include:

1. **Technical knowledge:** Knowledge in construction, technical equipment, energy and security.
2. **Management skills:** The ability to plan, organize, manage, and control.
3. **Communication and interpersonal skills:** The ability to communicate effectively with different groups of people.
4. **Analytical and decision-making skills:** The ability to analyze data, identify problems, and make the right decisions.

5. **Knowledge of legislation:** Knowledge of applicable laws and regulations in the field of property management, health and safety.

A facility manager plays a key role in ensuring the effective functioning of an organization. Its benefits consist of:

1. **Reducing operating costs:** By optimizing energy consumption, maintenance and other operational services.
2. **Increasing employee productivity:** By creating a comfortable and productive work environment.
3. **Increasing the value of real estate:** By taking care of real estate and its technical equipment.
4. **Ensuring health and safety:** Minimising risks and ensuring compliance with safety regulations.

Facility manager is responsible for the comprehensive management and operation of properties and support services, contributing to the efficient functioning and success of the organization. Its role is becoming increasingly important in the modern business environment, where the emphasis is on efficiency, sustainability and the quality of the working environment.

1.1.5 Key Performance Indicators

KPI "Key Performance Indicators" are: "Criteria that provide substantial information on the quality of the Facility Management Facility service."[13]

KPIs play a key role in facility management in measuring, evaluating and improving the performance of services provided and the overall effectiveness of property management and support processes. They are measurable metrics that provide objective information about the achievement of set goals and allow you to track progress over time.

KPIs in FM are defined as measurable values that demonstrate how effectively an organization is achieving key goals in building management, infrastructure, and support services. Their main purpose is:

1. **Performance measurement:** They provide quantifiable data on the efficiency of various FM processes and services.

2. **Progress assessment:** They allow you to monitor whether the organization is getting closer to the set goals and identify areas where improvement is needed.
3. **Decision-making:** They provide the basis for informed decision-making about resource allocation, process optimization, and change implementation.
4. **Communication:** They serve as a tool to communicate the performance of the FM department to the organization's leadership, clients, and other stakeholders.
5. **Benchmarking:** They allow you to compare your organization's performance with other organizations in the industry and identify best practices.

KPIs in FM can be divided into several categories according to the area they focus on:

1. **Financial KPIs:** They focus on the cost and efficiency of managing funds. Examples: Operating costs per square meter, maintenance costs, return on investment for FM projects.
2. **Operational KPIs:** They focus on the efficiency and quality of the services provided. Examples: the level of user satisfaction with cleaning services, the number of emergency interventions, the response time to requests.
3. **Technical KPIs:** They focus on the condition and functionality of technical equipment and infrastructure. Examples: energy consumption of a building, failure rate of technical equipment, maintenance efficiency.
4. **Environmental KPIs:** They focus on the environmental impact of activities. Examples: CO2 emissions, water consumption, amount of waste produced.
5. **Human Capital Focused KPIs:** They focus on employee satisfaction and productivity. Examples: FM staff turnover rate, number of training and training sessions.

Examples of specific KPIs in FM:

1. **Energy costs per square metre (EUR/m2):** Energy management efficiency indicator.

2. **User satisfaction rate with cleaning services (%):** An indicator of the quality of cleaning services.
3. **Average Request Response Time (hours):** An indicator of the effectiveness of the helpdesk or service department.
4. **Failure rate of the heating system (%):** An indicator of the reliability and condition of technical equipment.
5. **Recycled share of waste (%):** Environmental responsibility indicator.

When selecting and implementing KPIs, it is important to observe the following principles:

1. **SMART criteria:** KPIs should be Specific, Measurable, Achievable, Relevant, and Time-Bound (SMART).
2. **Link to strategic objectives:** KPIs should directly support the achievement of the organisation's strategic objectives.
3. **Data availability:** Ensure that relevant data is available to measure KPIs.
4. **Regular monitoring and reporting:** KPIs should be regularly monitored and reported to the organization's leadership.
5. **Review and update:** KPIs should be reviewed and updated regularly to reflect the changing needs of the organization.

KPIs are a key tool for continuous improvement in FM. Regular monitoring and analysis of KPIs allows you to identify areas where improvement is needed and implement corrective actions. Subsequent measurement of KPIs after the implementation of changes makes it possible to verify their effectiveness and monitor the progress made. This cycle of continuous improvement leads to process optimization, cost reduction, increased service quality, and overall FM efficiency.

KPIs are essential for effective facility management. They provide objective performance information, track progress, and support data-driven decision-making. Their correct selection, implementation and regular monitoring are key to achieving the set goals and continuous improvement in FM.

1.1.6 Maintenance Process Sheets

Maintenance process sheets are: "thoroughly defined process parameters as well as a detailed description of the process. The process sheets also include an analysis of how the service works for the organization's core activities."[5]

Process sheets play an important role in facility management (FM) in standardizing, documenting and managing individual activities and processes. These are detailed descriptions of individual workflows that ensure the consistency, efficiency and quality of the services provided.

A process sheet is a document that details the sequence of steps required to perform a particular activity or process. It contains information on:

1. **Purpose of the process:** What the process is intended to achieve.
2. **Process input and output:** What resources are needed to start the process and what is its outcome.
3. **Process steps:** A detailed description of each step in chronological order.
4. **Responsibilities:** Who is responsible for each step of the process.
5. **Resources and tools used:** What materials, equipment, or software are used in the process.
6. **Success criteria and measurements:** How the success of the process is evaluated and what indicators are monitored.
7. **Related documents and regulations:** What standards, regulations, or internal guidelines apply to the process.

Process sheets have several key benefits in facility management:

1. **Standardization of processes:** They ensure a uniform procedure in performing the same activities, minimizing deviations and errors.
2. **Increase efficiency:** A detailed description of steps and responsibilities allows you to optimize processes and reduce waste of time and resources.
3. **Improve quality of service:** Standardized procedures ensure consistent quality of service delivery.

[5] STN EN 15221-3 Facility management. Part 3: Guidelines for quality in facility management. Bratislava. SÚTN.

1. **Facilitate the onboarding of new employees:** Process letters serve as teaching material and facilitate the onboarding of new employees.
2. **Improved communication:** A clear description of processes facilitates communication between employees, suppliers, and clients.
3. **Audit and control support:** Process letters serve as a basis for internal and external audits and controls.
4. **Risk management:** By identifying critical points in the process and establishing control mechanisms, the risk of problems is reduced.

Process sheets can be used for a wide range of activities in facility management, such as:

1. **Maintenance and repairs:** Procedure for replacing a light bulb, repairing a faucet, checking the heating system.
2. **Cleaning:** The procedure for cleaning offices, sanitary facilities, common areas.
3. **Safety and Security:** Procedure for evacuating a building, dealing with fire, checking security systems.
4. **Energy management:** Procedure for reading energy levels, monitoring consumption, optimizing heating settings.
5. **Space management:** Procedure for moving offices, changing the layout of spaces, managing meeting rooms.

Although the structure of a process letter may vary slightly depending on the specific organization and type of process, it typically includes the following sections:

1. **Process ID:** Process name, version number, date created/updated.
2. **Purpose of the process:** A brief description of the purpose and objective of the process.
3. **Scope:** Which departments, buildings, or locations are affected by the process.
4. **Definitions:** Explanation of important terms used in the process.
5. **Process Input:** A description of the input information, materials, or resources.
6. **Process procedure:** A detailed description of each step in chronological order, including responsibilities, tools used, and success criteria.

7. **Process output:** A description of the process result.
8. **Related documents and regulations:** A list of relevant standards, regulations, directives and other documents.
9. **Attachments (optional):** For example, forms, checklists, diagrams.

When creating process letters, it is important to involve the employees who carry out the process in order to take into account their practical experience. Once the process sheets have been created, they need to be implemented, employees trained and complied with. Regularly reviewing and updating process letters is essential for their continued relevance and efficiency.
Process sheets are a valuable tool for effective facility management. Their correct creation, implementation and compliance contribute to the standardization of processes, improvement of service quality, increased efficiency and reduction of risks.

1.2 BUILDING MANAGEMENT

Building management is a complex activity that includes all actions related to maintaining a building in good technical and functional condition. This is a long-term process that requires a systematic approach and expertise. Building management is important, especially from a financial point of view.
Regular maintenance and repairs extend the life of the building and delay the need for costly renovations or even new construction.
Energy efficiency, optimization of water consumption and regular revisions of technical equipment significantly reduce operating costs.
Good building management increases the value of the property and improves its attractiveness to potential tenants or buyers.
Regular inspections and repairs ensure the safety of building occupants and increase their comfort.
The management of the building must comply with the legislation in force to avoid penalties.

Key areas of building management from a financial point of view:

8. **Energy efficiency:** Implementation of energy-saving measures such as insulation, replacement of windows, installation of solar panels or heat pumps.
9. **Maintenance and repairs:** Regular inspections and repairs of all technical equipment, such as heating systems, air conditioning, electrical installations, etc.
10. **Refurbishment:** Planning and executing major renovations that are essential to maintain the functionality and value of a building.
11. **Insurance:** Ensuring comprehensive insurance of the building and its facilities against various risks.
12. **Facility management:** Comprehensive management of all services related to the operation of the building, such as cleaning, security, management of green areas, etc.

Financial aspects of building management:

8. **Budgeting:** Drawing up a detailed budget for maintenance, repairs, and refurbishments.
9. **Evaluating the return on investment:** Analysis of the costs and benefits of individual measures.
10. **Cost optimization:** Finding the most advantageous suppliers and materials.
11. Financing: Raising funds for the implementation of investment actions.

Building management is a strategic activity that has a significant impact on the economy of the owner or operator of a building. A well-managed building is a long-term investment that brings savings, increases the value of the property and ensures the comfort and safety of its users.

Building management is **the procurement of services** and goods by which the BM or community provides the owners of apartments and non-residential premises in the building:

- **operation, maintenance, repairs, reconstruction and modernization** of common parts of the house, common facilities of the house, adjacent land and accessories,
- **services** related to the use of an apartment or non-residential premises,
- **maintaining** a house account in a bank,
- **recovery of damages, arrears** in the operation, maintenance and repair fund and other receivables and claims,
- other **activities that are directly related to the use of the** building as a whole by individual owners of apartments and non-residential premises in the building.

Several forms of building management must not be agreed at the same time for the administration of the building. For administration in one building, there may be a contract with only one BM or only one contract of community.

1.2.1 Building manager

Building manager (BM) may be a legal entity or a natural person entrepreneur who has **the** management and maintenance of the housing stock in the scope of **business or in the subject of activity**; manager who manages apartment buildings must also meet the conditions under special regulation 246/2015 Coll. The activity of the building manager may be performed only in accordance with Act 182/1993 Coll.
Any change, cancellation, merger or merger of building managers cannot be to the detriment of the owners. The building manager is obliged to immediately inform the owners of apartments and non-residential premises in the building about this fact.

Building manager is obliged **to keep** separate analytical accounts separately for each house he manages. The funds obtained from payments for services from the owners of apartments and non-residential premises in the building and the funds of the operation, maintenance and repair fund (hereinafter referred to as the "property of the owners") must be kept **separately** by the BM from the BM's bank accounts, separately **for each managed building**. The owners of the house account opened by the BM in the bank are the owners. The BM is competent to dispose of the funds in the account of the building and to exercise

the rights and obligations of the depositor to this account according to Act 118/1996 Coll. on Deposit Protection.

The property of the owners is not part of the property of the BM.

The property of the owners may not be used by the BM to cover or pay liabilities that are not directly related to the activity associated with the building management.

The BM may not use the property of the owners for his own benefit or for the benefit of third parties.

The property of the owners cannot be part of the bankruptcy estate of the BM or the subject of enforcement of a decision under special regulations directed against the property of the building manager.

The building manager is liable to the owners of apartments and non-residential premises in the building **for all damages** incurred **as a result of non-fulfilment** or insufficient performance **of his obligations** arising from Act 182/1993 Coll. or from the contract on the performance building management.

1.2.2 Obligations of a building manager

When managing a building, the BM is obliged to:

1. **manage the property** of the owners with professional care in accordance with the terms of the contract on the performance of building management,
2. ensure the **protection** of the rights of owners and prioritize their interests over their own,
3. **represent** the owners **in the recovery of damage** caused to them by the activities of third parties or by the activity of the owner,
4. **exercise rights** to the property of the owners only in the interest of the owners,
5. **monitor payments** for performances and payments of advances to the maintenance and repair operation fund from the owners and recover the arrears that have arisen,

6. **convene a meeting of** owners as needed, at least once a year, or when requested by the owners who have at least a quarter of the votes,
7. **to prepare** and submit annually by 30 November to the owners **a repair plan** for the following calendar year, which will take into account in particular the wear and tear of materials and the condition of the common parts of the building and the common facilities of the building, and to propose the amount of the fund for the operation of maintenance and repairs of the building for the calendar year,
8. submit a proposal for a voluntary auction of an apartment or non-residential premises in a building to satisfy claims on the basis of a decision,
9. file an **application for enforcement proceedings**,
10. to ensure **all other activities** necessary for the proper performance of the building mabagement in accordance with the contract on the performance of building management and Act 182/1993 Coll,
11. to publish on an ongoing basis on the spot in the building usual in the common parts of the building or on the website of the BM, if he has one, the procedure for the procurement of goods and services, as part of ensuring the operation, maintenance, repair, reconstruction and modernization and all other activities related to the building management, including individual price offers.

When procuring **services** and goods, **the BM is obliged to negotiate the most favorable conditions** that could be negotiated for the benefit of the owners. **The BM is obliged to follow the decision** of the owners on the selection of a supplier, unless it is a matter of ensuring professional inspections and tests of technical equipment, which the BM is obliged to perform during the building management.[6]

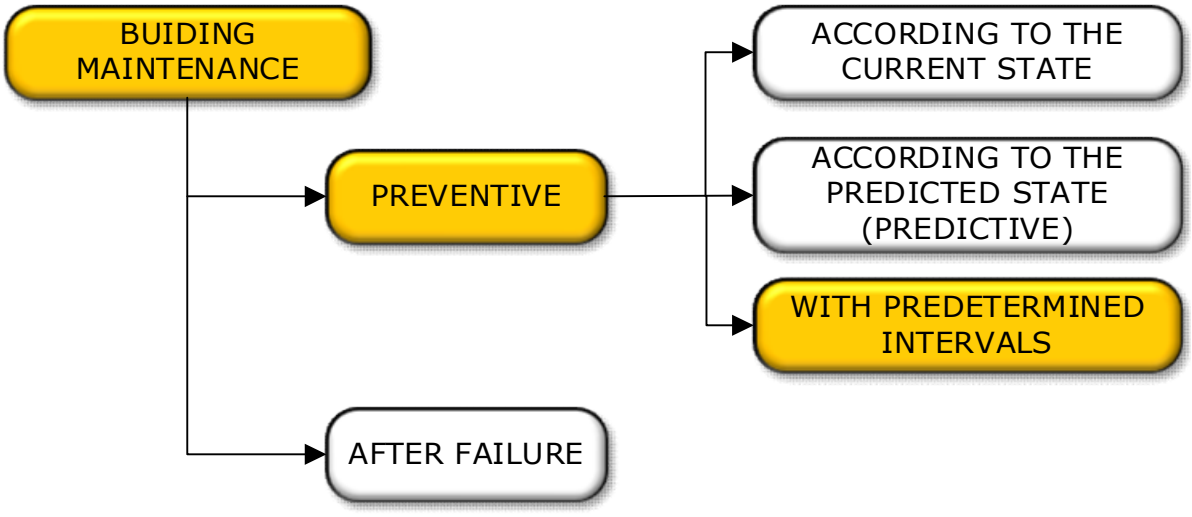
[6] Act 182/1993 Coll. on ownership of apartments and non-residential premises, as amended.

1.3 BUILDING MAINTENANCE

Wear and change of function is compensated by the maintenance of building structures, which leads to the maintenance of the desired building characteristics.

Building maintenance is "a part of the technical management of buildings that provides maintenance of building construction and maintenance of technical equipment installed in the building."
Building maintenance in terms of facility management: "represents a complex of services designed to ensure the safe operation of buildings and their technologies. It's a continuous process."[7]

According to STN EN 13306 maintenance is "a combination of all technical administrative and management activities throughout the life cycle of a building to maintain or restore the condition in which it can perform the required function."[8]
The standard defines the types of maintenance that are displayed on Scheme 1.1.



Scheme 1.1 Types of Maintenance by STN EN 13306

[7] SOMOROVÁ, V.: Building maintenance. Facility management. 2010. Publisher SUT Bratislava. ISBN 978-80-227-3372-4
[8] STN EN 13306. Maintenance. Maintenance terminology. Bratislava. SÚTN.

Maintenance: activities that are necessary to maintain the original standard and quality of the common parts of the building, the common facilities of the building and the accessories of the building, as well as the elimination of deficiencies detected by the service inspection. [9]

We recognizes types of maintenance such as: "regular preventive, evoked and emergency services"

1. **Preventive maintenance is planned:** "at regular intervals to reduce the amount of failure or deterioration of the building elements and structures."

2. **Involuntary maintenance is an activity that**: "performs outside the maintenance schedule on the basis of an administrator's request"

3. **Emergency services are activities:** "with the highest time priority in order to eliminate damage and restore the core function"

Preventive maintenance of building structures ensures reduced failure rate, extended service life.[10]

Types of maintenance of building structures are defined in terms of the quality of its execution:

1. **Very good maintenance:** "is planned, it is done regularly at specified times. It is necessary to periodically renew protective coatings, treat all minor faults, clean construction structures. "

2. **Normal maintenance:** "scheduled, regular repair cycles followed. The technical state of construction corresponds to its age. Smaller defects and failures, which do not affect the functionality of the construction, are rarely reflected in the construction. "

3. **Neglected Maintenance**: "It is done exceptionally hardly at all. The construction is visibly covered. Visible disturbances begin to appear before reaching the basic life. In emergency situations, construction works are repaired."[11]

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[9] Act 182/1993 Coll. on ownership of apartments and non-residential premises, as amended.

[10] SOMOROVÁ, V.: Building maintenance. Facility management. 2010.
Publishing SUT Bratislava. ISBN 978-80-227-3372-4

[11] MV a VP SR. The service life of building materials and apartment building structures. Bratislava. MV a VP SR in cooperation with the VVÚPS-NOVA, 1999. ISBN 80-88997-02-X.

1.4 SERVICE LIFE

According to the Construction Act, the service life of a building is defined as: "the period over which the building's performance characteristics correspond to the main building requirements."[12]

STN EN 13306 defines lifetime as: "The layout of a building fulfills the required task according to the defined use and maintenance conditions until the state of confinement is reached".[13]

Service life is defined as: "a period of time from the putting into operation of the building up to a situation where the required properties do not fall below the minimum that is defined as acceptable."[14]

The technical life of the building is: "the estimated number of years through which the building will fulfill its functions in accordance with the defined performance standards. Standards determine the requirements and level of the required operation. It is extended with regular maintenance of the building "

The economic life of the building is: "the estimated number of years through which the building will fulfill its functions with the expense that is appropriate."
The moral life of the building is: "the estimated number of years through which the social and scientific and technological increase will cause the obsolescence of the building to be extended through its modernization and renewal."[15]

Building structures of buildings are divided into two main fractions, depending on the lifetime impact of the building on: "elements of long and short term life."

In violation or loss of features, elements of long-life functionality affect in principle the life of the building or end the life of the building, and their replacement or repair is extremely costly often unrealizable.
Elements of "long-term life" of buildings are:

[12] Act 50/1976 Coll., On Spatial Planning and Building Regulations (Building Act), as amended
[13] STN EN 13306. Maintenance. Maintenance terminology. Bratislava. SÚTN.
[14] MV a VP SR. The service life of building materials and apartment building structures. Bratislava. MV a VP SR in cooperation with the VVÚPS-NOVA, 1999. ISBN 80-88997-02-X.
[15] TRÁVNIK, I. et al.: Construction value management. 1998Publishing SUT. Bratislava. ISBN 80-227-1084-9

- "foundation,
- vertical bearing structures,
- horizontal load bearing,
- construction of stairs and lifts (carrying),
- roof-carrying structures. "

The elements of the building's short life have to be refurbished or replaced during its lifetime (even several times). They have the function of protecting elements with a long life and thus affecting the overall life of the building.

The elements of "short-term life" of buildings are:

- "external finishes,
- interior finishes,
- insulation: thermal, moisture and water, acoustic and special,
- tiles, floors,
- coatings, paintings,
- windows, doors,
- locksmith,
- plumbing,
- roof covering,
- joystick elements. "[16]

1.5 PROJECT DOCUMENTATION

Project documentation is:

1. "complete documentation of a building that is necessary for the preparation and construction of a building. The definition of the project documentation is consistent with the definition of the building documentation, the concept of building documentation more specifically determines the progress and progress of the building. "[17]

[16] FERENCIK, K.: Renovation of apartment buildings, repairs and insulation. Service life of building structures. [accessed at 2021-08-13]. Available at: http://www.k.ferencik.szm.com/ferencik_obnova_bd_zivotnost.html

[17] Available at: http://www.novedomy.sk/stavebne-pojmy/

2. "consisting of a complex of 2D diagrams and drawings and a text part that serves to describe the buildings, machines and devices that serve the process of production and execution."
Drawing documentation is printed on paper or stored as a digital file.
Plans and drawings are mainly used in industry and construction."[18]

Designing buildings is "activity which handles documentation of buildings and the design of buildings is necessary to act in accordance with the Building Act."[19]
Project activity in the construction sector: "the project documentation is processed with which the building is implemented. The author in the field of copyright supervision monitors compliance with the project documentation."[20]

The implementation of buildings is: "construction work whereby manufacturing inputs are transformed into production outputs. The production inputs are: building materials, workers, construction machines, energy, and production outputs are: new buildings, modernization, reconstruction, repairs and maintenance."[21]

Project documentation is a **set of documents that comprehensively describes the building, its technical solutions, functional properties and requirements for implementation.** It serves as a basis for a building permit, construction and subsequent operation. It is a comprehensive document that combines architectural, construction, engineering and legal aspects.

The main purpose of the project documentation is:

1. **Obtaining a building permit:** It serves as a basis for the building authority to assess the compliance of the building with the applicable legislation and zoning plan.

[18] Available at: http http://sk.wikipedia.org/wiki/Projektov%C3%A1_dokument%C3%A1cia
[19] Act 50/1976 Coll., On Spatial Planning and Building Regulations (Building Act), as amended
[20] PETRÁKOVÁ, Z.: Project management. Construction project management. 2011. Publishing SUT Bratislava. ISBN 978-80-227-3437-0
[21] SOMOROVÁ, V.: Civil engineering in practice. 2011. Publishing SUT Bratislava. ISBN 978-80-227-3589-6 [accessed at 2021-08-13]. Available at: http://www.svf.stuba.sk/docs//dokumenty/skripta/stavebne_inzinierstvo_v_praxi_viera_v_smorova.pdf

2. **Construction Execution:** Provides accurate and detailed information for construction companies and craftsmen on how the construction is to be implemented.
3. **Quality Control:** It serves as a reference document for quality control of works during construction.
4. **Operation and Maintenance:** Contains information about the technical equipment and maintenance of the construction after its completion.
5. **Construction change:** Serves as a basis for any changes to the building during its life cycle.

Project documentation is usually prepared in several stages, which differ in the level of detail:

1. **Architectural Study :** It represents the initial design of the building, which takes into account the investor's requirements and urban aspects. It contains a basic layout solution, visualizations and a preliminary cost estimate.
2. **Documentation for zoning proceedings:** It is used to obtain a zoning decision that determines the location of the building in the area. It contains basic information about the building and its impact on the surroundings.
3. **Documentation for a building permit:** It is the basis for obtaining a building permit. It contains detailed technical solutions of the building, static calculations, fire solution, energy assessment and other expert opinions.
4. **Construction Implementation Documentation:** It is used for the actual implementation of the construction. It contains detailed drawings, technical specifications and work procedures.
5. **Actual Construction Documentation:** Records the actual condition of the construction after its completion and serves the needs of operation and maintenance.

The content of the project documentation can vary depending on the type and scope of the construction, but it usually includes the following sections:

1. **Accompanying report:** It contains basic information about the building, its purpose and description.

2. **Summary technical report:** It describes the technical solutions of the construction, the materials and technologies used.
3. **Drawing documentation:** It contains drawings of the construction such as floor plans, sections, views, details, and drawings of technical equipment.
4. **Structural Design:** Contains structural calculations and assessment of load-bearing structures.
5. **Fire solution:** Describes the fire protection measures in the building.
6. **Energy Assessment:** Evaluates the energy performance of the building.
7. **Construction budget:** Contains an estimate of the cost of construction implementation.
8. **Documentation of technical equipment:** It contains diagrams and descriptions of technical equipment such as heating, ventilation, electrical installations, plumbing and sewerage.

High-quality project documentation is **a basic prerequisite for the successful implementation of the construction.** It ensures clarity, predictability and minimizes the risks associated with construction.

Currently, the digitization of project documentation is becoming more and more popular, which brings a number of benefits, such as easier management, sharing and updating of documents, better coordination between individual professions and the possibility of using BIM (Building Information Modeling) technologies.
In short, project documentation is a comprehensive and crucial document for the successful implementation of a construction. It ensures clarity, predictability and minimizes the risks associated with construction.

1.6 BUILDING

According to the Construction Act, the construction is defined as: "a constructional structure built by construction works of construction products which is firmly connected to the ground or whose installation requires the modification of the substrate."

The building is: "A spatially centered roofed building, including underground spaces that is technically suitable for construction and intended to protect people, animals or things, does not have walls but has a roof."
The construction design is: "produced by construction works of construction products"[22]

1.6.1 Key Characteristics of the Building

1. **Durability and stability:** The building is designed and built to withstand external influences and ensure long-term stability and durability.
2. **Spatial boundary:** A building defines an interior space that is separated from the outside environment by walls, roof, and floor.
3. **Functionality and purpose:** A building serves a specific purpose that defines its design, layout, and amenities. It can be housing, work, commerce, education, entertainment, storage, and many other purposes.
4. **Architectural and aesthetic aspect:** The building is not only a functional but also an aesthetic work that takes into account architectural principles, proportions, materials and visual impression.
5. **Engineering solutions:** The construction of a building requires engineering solutions in the field of statics, structures, technical equipment (heating, ventilation, electrical installations, plumbing) and safety.

Buildings can be divided according to various criteria, such as:

1. **Purpose:**
    1. **Residential buildings:** Family houses, apartment buildings, villas.
    2. **Non-residential buildings:** Administrative buildings, commercial buildings, industrial buildings, schools, hospitals, cultural buildings.
2. **Construction system:**
    1. **Brick buildings:** Made of bricks, blocks, stone.
    2. **Reinforced concrete buildings:** With a load-bearing structure made of reinforced concrete.
    3. **Steel buildings:** With a supporting structure made of steel.
    4. **Wooden buildings:** With a supporting structure made of wood.
3. **Sizes and heights:**

[22] Act 50/1976 Coll., On Spatial Planning and Building Regulations (Building Act), as amended

1. **Low buildings:** With one or two floors.
2. **Medium-rise buildings:** With several floors.
3. **Tall buildings (skyscrapers):** With tens of floors.

Examples of buildings:

1. **Family house:** A building intended for living for one family.
2. **School:** A building intended for education.
3. **Hospital:** A building designed to provide health care.
4. **Office building:** A building intended for administrative and office purposes.
5. **Shopping center:** A building with a lot of shops and services.

Buildings play a key role in the life of society. They provide us with space for living, working, education, relaxation and many other activities. They are an integral part of the urbanized environment and reflect culture, technical progress and societal needs.

It is important to distinguish between the terms "construction" and "building". According to the Building Act**, a building is a subcategory of construction**. This means that every building is a building, but not every building is a building. Construction is a broader term that includes, in addition to buildings, civil engineering structures (bridges, roads, tunnels, dams) and other construction works.

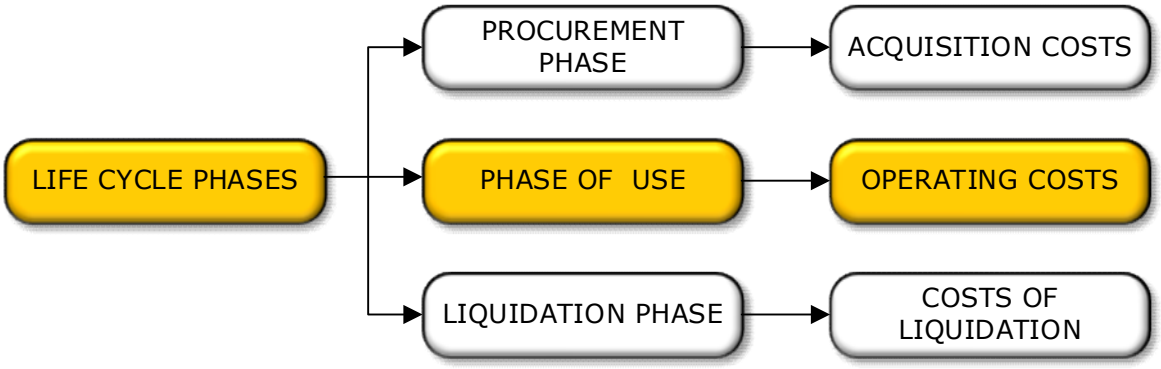
In short, a building is a complex and multifunctional space that combines architectural, engineering and functional aspects. It is an integral part of our environment and plays a key role in the life of society.

1.6.2 Lifecycle of a Building

The lifecycle of a building is defined as: "the period from defining the purpose of the building over the design phase, the realization, the use phase and the possibility of terminating it by physical destruction of a building, renovation or sale."[23]

[23] SOMOROVÁ, V.: Building maintenance. Facility management. 2010. Publisher SUT Bratislava. ISBN 978-80-227-3372-4

The basic phases of the building's life cycle and the costs associated with it are shown in Scheme 1.2.[24]



Scheme 1.2 Costs of Building Life Cycle Phases

Operating costs are: "associated with the use phase of buildings and the sum of costs incurred for the operation of the building provided by supporting activities"[25] or maintenance of buildings.

The cycle is: "a series of changes, stages, events, workings that repeat themselves with a certain regularity."[26]

The term "construction life cycle" refers to **the time period from the initial idea of a building to its demise and liquidation, including all phases between these two extremes.** It is a holistic approach that considers all stages of the building's existence and their interconnection. Understanding the life cycle of a building is crucial for the effective planning, implementation, operation and maintenance of buildings, as well as for minimizing their environmental impact.

The life cycle of a building is usually divided into several phases, with the exact breakdown varying slightly depending on the specific context. Some of the most cited phases include:

1. **Pre-investment phase (Planning and design):** This phase includes the definition of needs, the preparation of studies, the design of the

[24] SOMOROVA, V.: Facility management. 2014. Professional publishing Prague. ISBN 978-80-7431-141-3.
[25] SOMOROVA, V.: Facility management. 2014. Professional publishing Prague. ISBN 978-80-7431-141-3.
[26] Available at: http://sk.wikipedia.org/wiki/Cyklus

construction concept, project documentation, obtaining a building permit and the preparation of documents for implementation. It is important to consider functional, aesthetic, economic and environmental aspects.

2. **Implementation phase (Construction):** This phase includes the construction of the building itself according to the approved project documentation. It includes earthworks, foundation of the building, implementation of load-bearing structures, external cladding, roof, installation of technical equipment and finishing work.
3. **Operational phase (Use and maintenance):** This phase represents the period during which the building is used for its intended purpose. It includes routine operation, maintenance, repairs, refurbishments, and upgrades. It is important to ensure the safety, functionality and comfort of use of the building.
4. **End-of-life phase (Disposal/Recycling):** This phase occurs after the end of the operational phase, when the building ceases to fulfil its purpose or is destined for extinction for other reasons (e.g. technical condition, change of the zoning plan). It includes the demolition of the building, the sorting and recycling of building materials, and the remediation of the area.

When assessing the life cycle of a building, various aspects are taken into account, including:

1. **Technical aspects:** Durability of materials, structural stability, energy efficiency, maintenance and repairs.
2. **Economic aspects:** Investment costs, operating costs, maintenance, renovation and disposal costs.
3. **Environmental aspects:** Environmental impact at all stages of the life cycle, energy and resource consumption, greenhouse gas emissions, waste production.
4. **Social aspects:** Impact on users' health and well-being, safety, accessibility and aesthetics.

Understanding the life cycle of a building is essential to:

1. **Cost optimization:** Considering costs throughout the life cycle allows for more efficient management of funds and minimization of overall costs.
2. **Increasing the quality and durability of buildings:** Emphasis on the quality of materials, structures and implementation extends the life of the building and reduces the need for repairs and reconstructions.
3. **Minimizing environmental impact:** Taking environmental aspects into account during all phases of the life cycle makes it possible to reduce the negative impact of buildings on the environment.
4. **Sustainable construction:** The concept of the life cycle of a building is closely linked to the principles of sustainable construction, which seeks to minimize environmental impact, use resources efficiently and ensure long-term sustainability.

The lifespan of a building is an important aspect of the life cycle. There are several types of service life:

1. **Physical lifespan:** The time during which a building retains its physical and mechanical properties.
2. **Functional life:** The time during which a building fulfills its intended purpose.
3. **Economic lifetime:** The period of time during which the operation of a construction is economically advantageous.
4. **Moral lifespan:** The time during which a building meets current requirements for comfort, aesthetics and technical equipment.
5. **Legal lifetime:** The period from the occupancy approval to the decision to remove the building.

The Life Cycle Assessment (LCA) method is used to comprehensively assess the environmental impacts of a product or service throughout its life cycle, including in the case of buildings. LCA makes it possible to identify critical points in terms of environmental impact and look for ways to reduce it.

In short, the life cycle of a building represents a comprehensive view of the existence of a construction work from its inception to its demise. Understanding and taking it into account is crucial for the effective planning, implementation,

operation and maintenance of buildings, as well as for minimizing their environmental impact and achieving sustainable construction.

1.6.3 Project

The project is:

1. "a set of resources and activities to ensure the change of the building by means of learned resources and within a specified time. It is the sum of activities spanning the clear goal, which has the beginning, the end, and the limited resources intended for its realization. "
2. "An original and durable and resource-bound complex of technologically and organizationally ongoing work that is necessary to create a product for a particular client. The client requires access to the project to achieve goals and intentions within a defined time period."[27]

The term "project" is now commonly used in a variety of fields, from construction and IT to science and research to arts and culture. In general, we can define a project as **a unique, temporary effort, aimed at achieving a predefined goal, with a clearly defined beginning and end, limited by resources and time.** This definition highlights the key characteristics that distinguish a project from normal, repetitive activities (operations).

Key features of the project:

1. **Uniqueness:** Each project is unique and differs from other projects in its goals, scope, environment and implementation conditions. While some activities may be repetitive, the overall context of the project is always new.
2. **Temporality:** The project has a clearly defined beginning and end. It is a limited effort that ends once the goal is reached. This temporality distinguishes the project from the organization's permanent operations.
3. **Goal-oriented:** The project is aimed at achieving a specific, pre-defined goal. This goal defines the direction and meaning of the entire project and serves as a criterion for success.

[27] PETRÁKOVÁ, Z.: Project management. Construction project management. 2011. Publishing SUT Bratislava. ISBN 978-80-227-3437-0

4. **Limited resources:** Project implementation is limited by available resources such as funds, human resources, materials, and technology. Effective management of these resources is crucial for the successful completion of the project.
5. **Time frame:** The project has a set time frame within which the goal is to be achieved. This time frame is usually expressed through a timeline that defines the deadlines for each stage of the project.
6. **Sequence and stages:** A project is usually divided into smaller, logically consequential stages that make it easier to manage and control the progress of the project. Each stage has its own goals and outputs.

Projects can be classified according to various criteria, such as:

1. **Content:** Construction projects, IT projects, research projects, marketing projects, etc.
2. **Sizes:** Small projects (e.g. organization of a corporate event), medium projects (e.g. development of a new website), large projects (e.g. construction of a motorway).
3. **Complexity:** Simple projects (with clearly defined goals and procedures), complex projects (with unclear goals, a lot of variables, and a high degree of uncertainty).

Examples of projects:

1. **Construction of a single-family home:** A unique effort aimed at constructing a house according to specific requirements, with a clearly defined beginning (start of construction) and end (final approval).
2. **New software product development:** A unique effort aimed at creating software with specific functionalities, within a set time, and with limited resources.
3. **Organizing a cultural festival:** A unique effort aimed at organizing a festival with a program, on a set date, and with a budget.

Project management is a discipline that deals with planning, organizing, managing, and controlling projects in order to achieve their successful completion. It includes several methods, techniques, and tools that help to efficiently manage the resources, time, cost, and risks of a project.

The term project plays a key role in the modern world, where more and more tasks and challenges are being solved through a project-based approach. Effective project management is important for the success of organizations, institutions and individuals.
In short, the project is a complex and dynamic concept that is applied in many areas. Understanding it and managing it effectively are key to achieving goals and succeeding in various areas of human activity.

1.7 PROCESS

The process is: "a set of sub-activities transforming inputs into outputs with the consumption of specific resources in restrictive requirements. Inputs that are supplied by internal / external suppliers are completely consumed for outputs in the process. Material / information outputs are the result / product of a process that has a defined customer. Resources are not gradually consumed in the process, but are a requirement for its implementation, for example: workers and technicians."[28]

The term "process" occurs in many scientific disciplines and areas of human activity, and its exact definition may vary slightly depending on the context. In general, however, we can define a process as **a sequence of consecutive events, operations, or actions that lead to a certain outcome.** This sequence is characterized by the dynamics, change and transformation of inputs into outputs.

Characteristic features of the process:

1. **Dynamics and change:** Processes are inherently dynamic and involve a change in state, transformation of inputs, and a gradual evolution to the target state.
2. **Sequence and continuity:** The individual steps or stages of the process logically follow each other and form a coherent sequence. The order and interconnection of these steps is key to achieving the desired result.

[28] Poling.sk: Process model according to STN EN ISO 9001. 2016. [accessed at 2021-08-13]. Available at: http://www.poling.sk/procesny-model.php

3. **Inputs and outputs:** Every process has inputs (materials, information, resources) that are transformed into outputs (products, services, results) during the process.
4. **Goal and purpose:** Processes are aimed at achieving a specific goal or purpose. This goal defines the direction and meaning of the whole process.
5. **Time course:** Processes take place in time and last for a certain period. The duration of the process can vary depending on its complexity and nature.

The term process is applied in various fields, taking on specific meanings:

1. **In computer science:** A process is a running program or an instance of it that uses system resources (CPU, memory, I/O). Processes in computer science allow for multitasking and simultaneous execution of multiple tasks.
2. **In management and business:** A process is **a set of activities that an organization performs to deliver value to customers**. These include, for example, production processes, business processes, logistics processes, etc. Effective process management is crucial to **the success of an organization.**
3. **In natural sciences:** Processes describe changes and transformations in natural systems, such as geological processes, biological processes, chemical reactions.
4. **In law:** A process refers to a judicial or administrative procedure, i.e. a sequence of acts that lead to a decision in a legal matter.

Examples of processes:

1. **Production process:** Transformation of raw materials into a finished product.
2. **Software development:** Design, implementation, testing, and deployment of software.
3. **Hiring process:** Posting an advertisement, selecting candidates, interviews, starting a job.
4. **Digestive process:** The processing of food in the body.

Understanding the concept of process is important for effective management, optimization, and improvement of various activities and systems. The process approach allows you to analyze, model and manage complex systems, identify bottlenecks and look for opportunities to improve efficiency and quality.
In short, the term process is a dynamic and complex concept that is applied in many areas. Understanding it is crucial for effective management, optimization, and understanding of the world around us.

1.8 SPACE MANAGEMENT

Space management is the process of planning, organizing, and managing the use of spaces in order to optimize their efficiency, functionality, and economic profitability. It applies to various types of premises, from offices and administrative buildings, through production halls and warehouses, to retail premises and public buildings.

Space management refers to the **strategic organization, utilization, and control of physical spaces.** It involves thoughtful planning and execution to make the most of the available area, ensuring it is utilized effectively to meet the desired objectives. Proper space management takes into account the alignment of spaces with the specific needs and requirements of individuals or organizations.
Space management plays a vital role in creating an efficient and harmonious environment, whether it is in a home, office, or public setting. Optimizing the use of available space can lead to a host of benefits, including increased productivity, improved functionality, and enhanced aesthetics.[29]

The main goals of space management are:

1. **Maximize space utilization:** Ensure efficient use of available space and minimize unused or inefficiently used space.
2. **Optimizing the working environment:** To create an ergonomic, comfortable and productive working environment that promotes the well-

[29] getjoan.com: What is space management? [accessed at 2024-09-18]. Available at: https://getjoan.com/space-management-guide/?srsltid=AfmBOopAkaXI9WUCEMjoOOSQajoFBynJzxCB25uBLPR0oB5wGHQO8o6z

being and performance of employees. Well-organized and aesthetically pleasing spaces positively impact psychological well-being. By incorporating natural light, ergonomic furniture, and breakout zones, organizations can create a work environment that fosters employee satisfaction, happiness, and overall well-being.

3. **Cost reduction:** Optimize rental, utilities, maintenance, and other operating costs associated with the premises. Utilizing available space effectively reduces the need for additional real estate, saving on rental or purchase costs. Furthermore, optimizing resource consumption reduces operational expenses and allows organizations to allocate their budget more efficiently.
4. **Encourage flexibility and adaptability:** Create spaces that can be easily adapted to the changing needs of the organization.
5. **Improve communication and collaboration:** Create spaces that encourage interaction and collaboration among employees.
6. **Increasing the attractiveness of the premises:** To create representative and modern spaces that contribute to the positive image of the organization.

Space management includes several **key aspects**:

1. **Needs Analysis:** Identifying an organization's current and future space needs, including staffing, types of work, equipment and technology requirements.
2. **Space planning:** Creating a layout solution that takes into account the needs of the organization, ergonomic principles, safety regulations and aesthetic considerations.
3. **Space allocation:** Assign spaces to individual departments, teams, or individuals based on their needs and requirements.
4. **Space utilization:** Managing space utilization, including scheduling meetings, booking spaces, and monitoring occupancy.
5. **Maintenance and management of premises:** Ensuring the maintenance, cleanliness and safety of premises.
6. **Technologies for space management:** Use of software tools for planning, allocating, monitoring and managing premises (e.g. CAFM systems).

Various methods and tools **are used in space management**, such as:

1. **Space planning:** Planning the layout of the premises using 2D and 3D models.
2. **Workplace analysis:** Analysis of the work environment to identify opportunities for improvement.
3. **Occupancy analysis:** Analysis of space occupancy in order to optimize their use.
4. **Hot desking/hotelling:** A system of shared workstations that employees book as needed.
5. **Activity-based working (ABW):** A concept of a work environment that offers different types of spaces for different activities.
6. **CAFM (Computer-Aided Facility Management) systems:** Software tools for property and space management.

Effective space management brings a number of benefits to organizations:

1. **Reduction of rental and operating costs:** By optimizing the use of space and reducing energy consumption.
2. **Increase employee productivity:** By creating a comfortable and ergonomic working environment.
3. **Improving communication and collaboration:** By creating spaces that encourage interaction and collaboration.
4. **Increase flexibility and adaptability:** By creating spaces that can be easily adapted to changing needs.
5. **Improving the image of the organization:** By creating representative and modern spaces.

Currently, space management is influenced by **several trends**, such as:

1. **Hybrid working model:** A combination of working from home and the office, which requires flexible space solutions.
2. **Emphasis on employee wellbeing:** Creating a healthy and supportive work environment.
3. **Digitization and automation:** The use of technology for more efficient space management.
4. **Sustainability:** Taking environmental aspects into account in the planning and use of spaces.

Space management is an important part of facility management and strategic management of organizations. Its effective application contributes to cost optimization, increased productivity and the creation of a quality working environment.

2 PROCESSES IN ORGANISATION

Facility management performs a key role in **ensuring the efficient functioning** of organizations. It does not only deal with the management of buildings and their technical equipment, but above all with the **management of support processes** that allow the organization to focus on its core business. From an FM perspective, it is important to understand and optimize processes in three main areas: working environment, support processes, FM management.

2.1 PROCESSES RELATED TO THE WORK ENVIRONMENT

1. **Spatial planning and management:** Efficient use of space is crucial for employee productivity and well-being. FM deals with optimizing the layout of workspaces, ensuring sufficient daylight, ventilation, acoustics and ergonomics of workplaces. It also includes management of moving, relocation and changes in the layout of the premises.
2. **Maintenance and operation of buildings:** Ensuring the smooth functioning of technical building systems (heating, ventilation, air conditioning, lighting, electrical wiring, fire protection systems, etc.) is the basic task of FM. This includes preventive maintenance, repairs, revisions and energy management to minimise operating costs and ensure safety.
3. **Cleaning and hygiene:** Cleanliness and hygiene of the working environment have a direct impact on the health and productivity of employees. FM provides regular cleaning, disinfection and hygiene services.
4. **Safety and Security:** Ensuring the physical safety of employees and organizational assets is a priority. FM deals with access control, monitoring, protection against fires, theft and other risks.
5. **Environmental management:** Reducing the environmental impact of building operations is becoming increasingly important. FM focuses on saving energy and water, minimizing waste, and promoting sustainable solutions.

2.2 PROCESSES ASSOCIATED WITH ANCILLARY SERVICES

1. **Reception services:** Ensuring the smooth operation of the reception, visitor service and communication.
2. **Postal and courier services:** Ensuring the receipt, sorting and distribution of mail and parcels.
3. **Catering services:** Catering for employees, operation of canteens and restaurants.
4. **Parking:** Managing parking areas and ensuring smooth parking for employees and visitors.
5. **Document archiving and management:** Ensuring that documents are stored and managed in accordance with applicable legislation.

2.3 FM CONTROL PROCESSES

1. **Planning and budgeting:** Setting goals, planning activities, and budgeting FM costs.
2. **Supplier Management:** Selecting, managing, and controlling external service providers.
3. **Monitoring and reporting:** Monitoring the performance of FM processes, data collection and reporting on achieved results.
4. **Process optimization:** Continuous improvement of the efficiency and effectiveness of FM processes.

2.4 INTERCONNECTION OF PROCESSES

It is important to remember that these processes are interconnected and influence each other. For example, poor spatial planning can lead to reduced productivity, increased energy costs, and a deterioration in the working environment. Effective management of FM processes therefore requires a holistic approach and close cooperation with other departments of the organization.

Effective management of FM processes brings several benefits to organizations:

1. **Increase employee productivity:** Creating an optimal work environment promotes employee satisfaction and performance.
2. **Reduction of operating costs:** Optimization of energy consumption, efficient maintenance and supplier management lead to savings.
3. **Increase in the value of real estate:** Taking care of buildings and their technical equipment contributes to maintaining and increasing their value.
4. **Improving the image of the organization:** Representative premises and quality services contribute to a positive perception of the organization.
5. **Ensuring compliance with legislation:** FM ensures compliance with applicable safety, health and environmental regulations.

Facility or facilities management (FM) is a profession dedicated to supporting people. It ensures the functionality, comfort, safety, sustainability and efficiency of the built environment - the buildings we live and work in and their surrounding infrastructure.
According to International Facility Management Association (IFMA) Facility Management is an organizational function which integrates people, place and process within the built environment with the purpose of **improving** the **quality of life** of **people and the productivity** of the **core business.**[30]

Combination of job responsibilities supports the operations of each organization to create an environment where the systems work together seamlessly, from the parking lot to the executive suite. **Facility managers** are the people who make sure we have the safest and best experience possible, by coordinating the **processes** that make the built environment succeed.

Whether the space is a **factory, office, hospital, shopping mall, airport, museum or stadium,** someone makes sure the building and all of its components work properly. That person is a facility manager. Facility managers (FMs) make sure systems in the built environment work together as they should, that buildings fulfill their intended purposes, and that personnel are healthy and productive.

[30] Ifma.org: What is Facility Management? [accessed at 2023-11-13]. Available at: https://www.ifma.org/about/what-is-fm/

Facility managers have many different titles and career paths. They often aren't called facility managers even though they are responsible for aspects of facility management, including planning, evaluating and maintaining building systems.

Facility managers hold a variety of roles, including:

- Building operations like cleaning, security, maintenance and grounds management.
- Return-to-work processes and policies.
- Emergency and disaster mitigation and response.
- Sustainability planning.
- Project management and budgeting.
- Real estate management and space planning.
- Business continuity planning.

The FM industry is growing rapidly, and the COVID-19 pandemic made safety and health a top priority. Changes to technology, green initiatives and other current trends are changing how FM teams conduct business and respond to everyday challenges.

Facility managers are a crucial part of every organization because they ensure that the places where we work, play and live are safe, comfortable, sustainable and efficient. Facility managers contribute to an organization's strategy and bottom line in a variety of ways.

- Contribute to operational efficiencies
- Plan and deliver infrastructure needs to support productivity
- Manage risks including those to facilities, employees, suppliers and business reputation
- Mitigate and reduce environmental impact
- Promote sustainable tactics for long-term cost management
- Leverage technological solutions
- Mitigate and overcome effects of natural disasters
- Guarantee compliance
- Leverage security

FM continues to be an important part of returning to the office after the pandemic. Ensuring that offices meet the needs of changing organizations and evolving workforces, and guaranteeing the safest workplaces possible, has become the focus of many facility managers. The profession is also starting to impact environmental, social and corporate governance issues. Facility managers help support how each organization works toward social goals, including responsible and ethical investing, sustainability and overall impact, instead of only focusing on the bottom line.

Composition and description of processes in facility management by company CBRE [31]

- **Technical Services**: Optimise operating cost in organisation, reduce risk, improve safety, compliance, and enhance uptime through industry-leading technical talent, technology, tools, and maintenance strategies.

- **Smart FM Solutions**: Achieve increased efficiency and operational reliability while reducing carbon and lowering cost with connected building automation, IoT and data analytics solutions that leverage people, processes, and integrated technology.

- **Asset Optimisation**: Reduce asset lifecycle costs, improve performance and reliability, and reduce carbon emissions by upgrading, optimising, retrofitting, and monitoring the building systems across your building or portfolio.

- **Sustainability Solutions**: Strategically action client goals for carbon abatement, energy efficiency, water conservation, biodiversity and waste reduction across your entire operations.

- **Workplace Experience Services**: Transform your workplace into a destination of choice through people-centric, technology-enabled experience services to increase employee engagement, optimise

[31] Cbre.sk: Facilities management. [accessed at 2023-11-13]. Available at: https://www.cbre.sk/en-gb/services/manage-properties-and-portfolios/facilities-management

performance and deliver meaningful workspace insights.

- **Project & Principal Delivery**: With turnkey delivery contracts for every engagement, we are your single-point-of-contact for the entire delivery team, managing every element of the supply chain, driving efficiency in the project process, and compressing the delivery schedule to safely produce results faster.

International Facility Management Association[32] defined 11 core processes in facility management. These processes become support processes for organizations that use facility management services. These core processes are:

- Project Management.
- Leadership & Strategy.
- Operations & Maintenance.
- Finance & Business.
- Sustainability.
- Communication.
- Occupancy & Human Factors.
- Performance & Quality.
- Facility Information Management & Technology Management.
- Real Estate.
- Risk management.

In conclusion, facility management is a complex discipline that plays a key role in supporting the effective functioning of organizations. Effective management of FM processes contributes to the creation of an optimal working environment, reducing costs, increasing the value of real estate and improving the image of the organization.

[32] Ifma.org: 11 Core Competencies of FACILITY MANAGEMENT. [accessed at 2023-10-10]. Available at: https://ifmacdn.azureedge.net/sfcdn/docs/default-source/marketing/pd-pages/11-core-competencies_oct2020.pdf?sfvrsn=2

2.5 LETTER OF ASSIGNMENT

Name: …….
Academic Year: ……

Facility Management

Assignment No. 1

Processes in Organisation

Input data:

1. The Hospital – Children´s Department
2. Faculty of Civil Engineering
3. Theatre
4. Restaurant
5. Ministry of Education
6. Volkswagen – Car Factory
7. Hotel

Required solutions and outcomes:

Determine what processes take place in your company.

Core activities:

Supporting activities:

2.6 EXAMPLE ASSIGNMENT 1.

Name: …….
Academic Year: ……

Facility Management

Assignment No. 1

Processes in Organisation

Input data:

1. The Hospital – Children´s Department
2. Faculty of Civil Engineering
3. Theatre
4. **Restaurant**
5. Ministry of Education
6. Volkswagen – Car Factory
7. Hotel

Required solutions and outcomes:

Determine what processes take place in your company.

The core activities of the restaurant: **Dining**

Supporting activities:

1. Customer Service

1. **Taking orders**: Waiters interact with customers, write down orders, and ensure that they are accurate.
2. **Recommendations**: Waiters provide advice on specialties and wine, which improves the customer experience.
3. **Troubleshooting**: Resolve customer complaints and queries quickly and efficiently.

2. Preparing meals

1. **Kitchen process**: Recommendation of raw materials and preparation technology, ensuring compliance with hygiene standards.
2. **Menu planning**: Regularly updating the menu to adapt to seasonal ingredients and trends.
3. **Presentation of dishes**: Aesthetic treatment of plates before serving.

3. Storage and purchase of raw materials

1. **Inventory**: Periodic inventory checks to determine the necessary orders.
2. **Suppliers**: Maintaining good relationships with suppliers and negotiating prices.
3. **Cost optimization**: It is monitored which raw materials are the most efficient and how waste is minimized.

4. Maintenance and cleaning

1. **Hygiene standards**: Ensuring compliance with hygiene regulations that are essential for operation.

2. **Equipment maintenance**: Regularly inspect and maintain kitchen appliances to avoid malfunctions.

5. Financial management

1. **Sales tracking**: Daily recording of sales and analysis of financial statements.
2. **Budgeting and planning**: Planning a budget for future periods and evaluating costs and revenues.

6. Marketing and promotion

1. **Social media**: Using platforms like Instagram and Facebook to share photos and actions.
2. **Discounts and promotions**: Organizing special events such as theme nights or happy hour.
3. **Collaborate with influencers**: Collaborate with local influencers to increase visibility, if applicable.

7. Personnel management

1. **Recruitment**: Finding talent for a variety of positions, such as cooks, waiters, and managers.
2. **Training and Development**: Providing training for employees on products, services, and customer service.
3. **Employee Motivation and Satisfaction**: Tracking employee satisfaction and engagement.

8. Customer Reviews and Feedback

1. **Collect reviews**: Monitor online reviews on platforms like TripAdvisor or Google.
2. **Feedback analysis**: Evaluating customer feedback on improving services and meals.
3. **Customer interaction**: Responding to reviews and communicating with customers for relationship building.

9. Technological tools

1. **Booking Systems**: Use of booking management and session management software.
2. **POS systems**: Modern cash registers that make it easy to track sales and process payments.
3. **Inventory Management Systems**: Tools for tracking inventory and optimizing the purchasing process.

10. Event management

1. **Organizing events**: Planning private events such as weddings or corporate parties, including developing special menus and services.
2. **Coordination**: Communicating with suppliers and ensuring that actions run smoothly.

Each of these processes is important for the success of the restaurant, and their effective coordination ensures a high level of service and customer satisfaction.

2.7 EXAMPLE ASSIGNMENT 2.

Name: …….
Academic Year: ……

Facility Management

Assignment No. 1

Processes in Organisation

Input data:

1. The Hospital – Children´s Department
2. Faculty of Civil Engineering
3. Theatre
4. Restaurant
5. Ministry of Education
6. Volkswagen – Car Factory
7. **Hotel**

Required solutions and outcomes:

Determine what processes take place in your company.

The core activity of the Hotel is the **accommodation** of guests.

Supporting activities:

Main functions needed for the functioning of the **hotel**
In order for a hotel to run smoothly and provide guests with an enjoyable stay, it needs to provide a few essential features. These features intertwine and complement each other to create a comprehensive guest experience.

Accommodation is the cornerstone of any hotel. Includes:

• **Bookings:** Receiving, confirming and managing bookings through various channels (phone, email, online).

• **Check-in:** Formal acceptance of the guest upon arrival, identification, drafting of the accommodation contract and allocation of the room.

• **Stay:** Ensuring the cleanliness of the rooms, maintenance of the technical equipment of the rooms and the entire hotel, provision of additional services (room service, minibar, laundry).

• **Check-out:** Making a final account, settling accounts with the guest, picking up room keys, and recording check-out.

Eating is another important function. Includes:

• **Restaurant:** Preparing and serving food and drinks.

• **Bar:** Offer alcoholic and non-alcoholic drinks.

• **Room service:** Delivery of food and drinks directly to the rooms.

The services provided by the hotel significantly affect the overall impression of the guest. Includes:

• **Reception:** Providing information about the hotel and its surroundings, currency exchange, organizing excursions, booking tickets, etc.

• **Cleaning:** Ensuring that rooms and common areas are clean.

• **Maintenance:** Repair and maintenance of technical equipment.

• **Safety:** Protecting property and people.

• **Wellness and fitness:** Providing relaxation and fitness services.

• **Conferences and events:** Organizing various events.

Marketing and sales are key to maintaining the competitiveness of a hotel. Include:

• **Promotion:** Raising awareness of the hotel through various marketing tools.

• **Sales:** Attracting new customers and building long-term relationships.

• **Feedback:** Collecting and evaluating guest opinions.

Finances and accounting ensure the smooth operation of the hotel from an economic point of view. Include:

• **Pricing:** Pricing for accommodation and services.

• **Payments:** Accepting payments from guests.

• **Accounting:** Keeping accounting records.

Personnel management is focused on the management of human resources in a hotel. Includes:

• **Recruitment:** Finding and selecting new employees.

• **Training:** Improving the qualifications of employees.

● **Evaluation:** Evaluating employee performance.

IT systems support the efficient operation of the hotel. Includes:

● **Reservations:** Reservation management systems.

● **PMS:** Property Management System – a comprehensive hotel management system.

● **POS:** Point of Sale – a system for recording sales.

A successful hotel must carefully coordinate and continuously improve all of these features. The aim is to provide guests with the highest possible comfort and ensure the long-term prosperity of the business.

3 SERVICE PROVIDER SELECTION

Choosing the right facility management (FM) service provider is crucial for the **successful** functioning of any **organization**. FM plays a vital role in ensuring an efficient and safe environment for employees, visitors, and the overall functioning of the organization. The wrong choice of supplier can have negative impacts on operations, costs, image and even safety. Therefore, it is important to pay sufficient attention to the selection and follow proven procedures.

Choosing an FM service provider is very important and has an impact on:

1. **Impact on operating costs:** Efficient management of buildings and infrastructure has a direct impact on operating costs. An experienced FM supplier can optimize energy consumption, extend equipment life, and efficiently manage maintenance, resulting in significant savings.
2. **Impact on employee productivity:** A quality working environment, provided through FM services, directly affects employee productivity and satisfaction. Clean, safe and functional premises create optimal working conditions.
3. **Impact on the image of the organization:** The appearance of the buildings and the quality of the FM services provided create the first impression for visitors and clients. Representative premises and professional services contribute to the positive image of the organization.
4. **Impact on safety:** Ensuring the safety of people and property is a critical part of FM. A supplier with the necessary knowledge and experience can effectively manage security risks and minimize their impact.
5. **Impact on compliance:** FM services must comply with applicable legislation in the field of safety, health and the environment. An experienced contractor will ensure that all regulations are complied with.

3.1 CRITERIA FOR CHOOSING AN FM SERVICE PROVIDER

When choosing an FM service provider, it is important to consider the following criteria:

1. **Experience and references:** Verify the supplier's experience in the industry and request references from existing clients.
2. **Scope of services provided:** Find out if the supplier offers all the services you need (maintenance, cleaning, security, energy management, etc.).
3. **Staff expertise and qualifications:** Ensure that the supplier has qualified personnel with the necessary expertise and certifications.
4. **Technological equipment:** Find out what technologies the supplier uses (CAFM systems, monitoring systems, etc.) and how this contributes to the efficiency of the services provided.
5. **Financial stability:** Check the financial stability of the supplier to avoid any potential problems with meeting obligations.
6. **Price:** Price should not be the only criterion, but it is important to get an overview of price offers from multiple suppliers and compare them with the scope and quality of the services offered.
7. **Communication and approach:** Open communication and a proactive approach to problem solving by the supplier are important.
8. **Flexibility and adaptability:** The supplier should be able to adapt to the specific needs and requirements of your organization.
9. **Certifications and standards:** Verify that the supplier meets the relevant standards and has the necessary certifications (e.g. ISO 9001, ISO 14001, ISO 45001).

3.2 FM SERVICE PROVIDER SELECTION PROCESS

Recommended procedure for choosing an FM supplier:

1. **Define needs:** Clearly define your needs and requirements for FM services.
2. **Search for potential suppliers:** Search for potential suppliers through the internet, professional associations, references and other sources.

3. **Request for Proposal:** Prepare a detailed Request for Proposal that contains all the relevant information about your requirements.
4. **Bid evaluation:** Evaluate the bids received according to predetermined criteria.
5. **Face-to-face meetings:** Hold face-to-face meetings with selected vendors to validate their competencies and approach.
6. **Choosing a supplier:** Choose the supplier that best meets your requirements and offers the best price/quality ratio.
7. **Conclusion of the contract:** Conclude a contract that defines in detail the scope of services provided, responsibilities and terms of cooperation.

The right choice of a facility management service provider is **a strategic decision** that has a significant impact on the functioning of the entire organization. Carefully considering all relevant criteria and following a proven selection process will help you choose a partner that will help you achieve your FM goals and contribute to the success of your organization.

3.4 THE PROCEDURE FOR DEVELOPING THE ASSIGNMENT

When deciding on the most optimal service provider, you will develop criteria that are important to you. Three were selected in the assignment, namely income, the offer price and the number of workers. In practice, these criteria would be sent out as a questionnaire to companies that provide FM services. Completed questionnaires from companies represent a variant, three variants are entered in the assignment, which represent answers from three different service providers.

In the first step of the assignment, students assign points for each value to a matrix. They assign points according to whether the criterion is minimizing or maximizing, in such a way that they give the highest value of points (3) to the most suitable value. In the maximization criterion, the largest value is the most satisfactory, and in the minimization criterion, the smallest value is the most satisfactory. The minimization criterion is, for example, the offer price, on the contrary, the number of employees and turnover is the maximization criterion. Subsequently, after the points are assigned, the sum of points for individual

variants is made, the points compiled in this way represent a comparison such that all criteria have the same weight.

In the next step, we determine the order of importance by assigning the first order to the criterion that is most important to us and assigning the third order to what is least important to us (since we have only three criteria). Then we assign weighting to the criteria according to the relationship:
Weight of the i-th criterion:
$v_i = m + 1 - p_i$, where m is the number of criteria, p_i is a natural number, indicating the order of importance of criteria K_i , i = 1, 2, ... m , given at the time of decision-making by the needs of the organization.
For each criterion, the following applies: v_i x number of points for individual variants.

In the next step, we will overwrite the calculated weights in the following table and assign a weight for each point. This is calculated by multiplying the points from the previous table by the weight value of the criteria. Consequently, we add up the points with the assigned weights for the individual variant (individual suppliers) and compare the result.

The most optimal supplier is the supplier with the highest number of points. In the case of two identical values, it is important to pay attention to the criterion with the highest yield and choose according to it.

3.5 LETTER OF ASSIGNMENT

Name: …….

Academic Year: ……

Facility Management

Assignment No. 2

Provider Selection

Input data:

Decision matrix

Criteria	Variant of supplies V1	Variant of supplies V2	Variant of supplies V3
Income (th.Euro/year)	xxxxxx	xxxxx	xxxxx
Offer prices (Euro)	xxxxxx	xxxxx	xxxxx
Number of workers	xx	xx	xx

The resulting evaluation matrix C1- without specifying the weights

Criteria.	V1	V2	V3
Income (th.Eur/year)			
Offer prices (Eur)			
Number of workers			
Total			

Result ranking:

Determination of Weight

Criteria	Order of importance p_i	Weight v_i
Income (th.Eur/year)		
Offer prices (Eur)		
Number of workers		

Weight of the i-th criterion:

$v_i = m + 1 - p_i$, where m is the number of criteria, p_i is a natural number, indicating the order of importance of criteria K_i , i = 1, 2, ... m , given at the time of decision-making by the needs of the organization.

For each criterion, the following applies: v_i x number of points for individual variants

The resulting evaluation matrix C2- with specifying the weights

Criteria	Weight v_i	V1	V2	V3
Income (th.Eur/year)				
Offer prices (Eur)				
Number of workers				
Total				

Result ranking:

Comment:

3.6 EXAMPLE ASSIGNMENT 1.

Name: xxxxxx zzzzzz

Academic Year: 202s/2s

Facility Management

Assignment No. 2

Provider Selection

Input data:

Decision matrix

Criteria	Variant of supplies V1	Variant of supplies V2	Variant of supplies V3
Income (th.Euro/year)	2 550	2 480	1 320
Offer prices (Euro)	4230	6 201	7 550
Number of workers	9	6	15

The resulting evaluation matrix C1- without specifying the weights

Criteria.	V1	V2	V3
Income (th.Eur/year)	3	2	1
Offer prices (Eur)	3	2	1
Number of workers	2	1	3
Total	8	5	5

Result ranking: V1 is the variant I choose as the supplier

Determination of Weight

Criteria	Order of importance p_i	Weight v_i
Income (th.Eur/year)	3	1
Offer prices (Eur)	1	3
Number of workers	2	2

Weight of the i-th criterion:

$v_i = m + 1 - p_i$, where m is the number of criteria, p_i is a natural number, indicating the order of importance of criteria K_i , $i = 1, 2, ... m$, given at the time of decision-making by the needs of the organization.

For each criterion, the following applies: v_i x number of points for individual variants **The resulting evaluation matrix C2**- with specifying the weights

Criteria	Weight *vi*	V1	V2	V3
Income (th.Eur/year)	1	3	2	1
Offer prices ((Eur)	3	9	6	3
Number of workers	2	4	2	6
Total		16	10	10

Result ranking: V1 is the variant I choose as the supplier

Comment: Offer prices is the key element to choosing a provider

3.7 EXAMPLE ASSIGNMENT 2.

Name: xxxxxx zzzzzz

Academic Year: 202s/2s

Facility Management

Assignment No. 2

Provider Selection

Input data:

Decision matrix

Criteria	Variant of supplies V1	Variant of supplies V2	Variant of supplies V3
Income (th.Euro/year)	4500	5000	5500
Offer prices (Euro)	9000	8000	10000
Number of workers	19	20	15

The resulting evaluation matrix C1- without specifying the weights

Criteria.	V1	V2	V3
Income (th.Eur/year)	1	2	3
Offer prices (Eur)	2	3	1
Number of workers	2	3	1
Total	5	8	5

Result ranking: V2 is the variant I choose as the supplier

Determination of Weight

Criteria	Order of importance p_i	Weight v_i
Income (th.Eur/year)	2	2
Offer prices (Eur)	1	3
Number of workers	3	1

Weight of the i-th criterion:

$v_i = m + 1 - p_i$, where m is the number of criteria, p_i is a natural number, indicating the order of importance of criteria K_i , $i = 1, 2, ... m$, given at the time of decision-making by the needs of the organization.

For each criterion, the following applies: v_i x number of points for individual variants **The resulting evaluation matrix C2**- with specifying the weights

Criteria	Weight *vi*	V1	V2	V3
Income (th.Eur/year)	2	2	4	6
Offer prices (Eur)	3	6	9	3
Number of workers	1	2	3	1
Total		10	16	10

Result ranking: V2 is the variant I choose as the supplier

Comment: Offer prices is the key element to choosing a provider

4 PROCESS SHEETS

Process sheets are an important tool **in effective process management**, and this also applies to the area of facility management. In this context, they help to structure, document and optimize the various activities related to the management and operation of buildings.

A process sheet is a document that describes in detail the sequence of steps within a certain process. Simply put, it is a **guide on how to perform a given activity**. It contains information on:

1. **Purpose of the process:** Why the process is being performed and what its goal is.
2. **Input and output:** What is needed at the beginning of the process and what is its outcome.
3. **Individual steps:** A detailed description of the sequence of activities, including responsibilities and necessary resources.
4. **Success criteria:** How the efficiency and success of a process are measured.
5. **Risks and their mitigation:** Identifying potential problems and proposing measures to prevent them.

4.1 THE IMPORTANCE OF PROCESS SHEETS IN FM

In the field of FM, process sheets are applied in various areas, such as:

1. **Maintenance and repairs:** Process sheet for carrying out regular inspections, troubleshooting and revisions of technical equipment (heating, ventilation, air conditioning, wiring, etc.). This letter defines the sequence of steps, the frequency of inspections, the persons responsible and the necessary tools.
2. **Cleaning and hygiene:** Process sheet for cleaning the premises, disinfection, hygiene standards and frequency of cleaning work.
3. **Safety and security:** Procedures for securing the building, fire protection measures, evacuation plans, monitoring of security systems.
4. **Energy management:** Procedures for monitoring energy consumption, optimizing energy efficiency, implementing saving measures.

5. **Premises management:** Procedures for allocating space, moving, changes in layouts.
6. **Supplier Management:** Procedures for selecting, contracting, and controlling supplier services.

Specific benefits of process sheets for FM:

1. **Standardization of processes:** Ensuring a uniform procedure in the execution of activities, thus minimizing errors and deviations.
2. **Increase efficiency:** Process optimization leads to time and cost savings.
3. **Improved communication:** Clearly defined procedures facilitate communication between employees and suppliers.
4. **Improve service quality:** Standardized procedures ensure consistent quality of service delivery.
5. **Risk reduction:** Identifying and mitigating risks reduces the likelihood of adverse events occurring.
6. **Simplifying the onboarding of new employees:** Process letters serve as learning material and facilitate the onboarding of new employees.
7. **Audit and control support:** Documented processes facilitate both internal and external audits and controls.

4.2 IMPLEMENTATION OF PROCESS SHEETS

When implementing process sheets, it is important to:

1. **Involve relevant employees:** Those who carry out the process have the best knowledge of how it is going.
2. **Use understandable language:** Procedural letters should be written clearly and concisely, without unnecessary technical terms.
3. **Update them regularly:** Processes are evolving, so process sheets need to be reviewed and updated regularly.
4. **Use the right tools:** Various software tools (CAFM systems) can be used to create and manage process sheets.

Process sheets are an effective tool for managing and optimizing processes in facility management. Their implementation brings several benefits, from

standardization and increased efficiency to risk reduction and improvement of service quality. Therefore, they should be an integral part of modern FM.

4.3 DETERMINATION OF PROCESS SHEETS OF BUILDING STRUCTURES

Maintenance planning and evaluation is crucial for the **quality maintenance** of building structures. For each building structure, the manual shall specify the specific maintenance activities and their periodicity. The periodicity of some maintenance activities is determined by legislative requirements that must be complied with. The frequency of activities not specified by legislation can be adapted to the requirements of the facility manager, designer and investor and distribute the activities evenly over time. These not specified periodicities are processed precisely in process sheets, which thus become part of the manual for the maintenance of building structures. By including the facility manager in the design phase of the building, future operating costs can be minimized, and thus also the costs of maintaining the building structures. Facility managers have valuable tracked information from the use phase of various types of buildings, according to which they are able to define the conditions for future maintenance of building structures. The efficiency of the investment process is determined by the optimal life cycle costs of the building (LCC), namely investment costs and operating costs.

For maintenance quality control, the maintenance manuals of construction structures define process sheets setting out the units of measure by which key performance KPIs are determined. The content of process sheets for construction structures is processed in tab. 4.1.

The KPI can continuously check the performance of individual maintenance processes of building structures. The criteria must be specifically defined in order to be monitored and evaluated. These criteria may be:

- completion of the process according to the planned time limit,
- the duration of the process,
- execution of the process,
- the quality of the process carried out,
- implementation of the process according to the technological regulation,

- the duration of arrival and repair in the event of an emergency.

It is also possible to measure the quality of the process also using the satisfaction of the users of the building.

Rules for the maintenance of structures and the process sheets, that have a direct impact on the determination of future operating costs.

Tab. 4.1: Content of Process Sheets[33]

Subject of the Maintenance Process:	Basic Definition of the Subject of Activities.
Maintenance Periodicity:	How often the maintenance process is repeated.
Maintenance Duration:	Process preparation and implementation time.
Responsible Person:	The worker who manages the implementation of the process.
Provider / Performer's Professional Competence Required:	Minimum education, certificates from educational programs, authorizations, certificates, professional examinations, characteristic profile of the provider.
Legislative and Normative Requirements:	National, international, internal regulations.
Technical Equipment:	Instruments, machines, equipment.
Description of Maintenance Activities:	Detailed, precise description of the process, process steps.
KPI:	Units of measure - reaction time, implementation time.

[33] SOMOROVA, V.: Facility management. Professional publishing Prague. 2014. ISBN 978-80-7431-141-3.

4.4 LETTER OF ASSIGNMENT

Name: …….

Academic Year: ……

Facility Management

Assignment No. 3

Process sheet

Input data:

12 Central heating system

12.1

-measurement of isolates statuses of pumps

-measurement of of current consumptions of pumps

-measurement of vibrations, surge current at the starting of pump

12.2

- control of function of regulation and closing armatures
- control of joint tightness of regulation and closing armatures
- control of adjusting of regulation and closing armatures
- cleaning of regulation and closing armatures

12.3

- control of thermal insulation breakage of pipes
- control of corrosion of pipes
- control of pipe paint
- test sampling and chemical analyse of water in system (in pipes)

12.4

- control of tightness of heating elements
- control of corrosion of heating elements
- control of function of the closing armatures (of heating elements)

- control of function of air eliminators (of heating elements)

Required solutions and outcomes:

Process name	
Process area	Facility management (Support activities - Services)

1. **The administration**					
Processor		Date		Signature	

2. **Basic parameters of the process**	
Object of process	

3. **Other Parameters**	
Specialized skills of provider	
Standards and prescripcions	
Intern standards and prescripcions	

of client	
Technical and technological equipment	
Software provision	
Auditing body of provider	
Auditing body of client	

4. **Performance parameters of the process (activities)**	
The frequency of the given activity	
Time consumption of the process	
Duration of the process	
Cost (month)	

5. **Measurment of the performance and quality**	
Unit of measure	
KPI	3
	2

	1
	0
Recommended procedure of measurement	

6. **Detailed description of the process**

4.5 EXAMPLE ASSIGNMENT 1.

Name: xxxx zzzzzz

Academic Year: 2024/2025

Facility Management

Assignment No. 3

Process sheet

Input data:

12.2

- control of function of regulation and closing armatures
- control of joint tightness of regulation and closing armatures
- control of adjusting of regulation and closing armatures
- cleaning of regulation and closing armatures

Required solutions and outcomes:

Process name	**Control of a central heating system**
Process area	Facility management (Support activities - Services)

1. **The administration**

Processor	**Xxxxx zzzz**	**Date**	**14/10/2024**	**Signature**
2. Basic parameters of the process				
Object of process	Routine inspection, maintenance, and adjustment of regulation and closing armatures (valves) within the central heating system to ensure optimal functionality and safety.			

3. Other Parameters	
Specialized skills of provider	- Educational Qualifications: Associate or bachelor's degree in mechanical engineering, HVAC Technology, or a related field. - Certifications: Certified HVAC Technician. - Technical Skills: Proficiency in using valves testing

	equipment, familiarity with PLC (Programmable Logic Controllers) for automated systems.
Standards and prescripcions	- International Standards: ISO 9001 for Quality Management Systems, ISO 14001 for Environmental Management. - Manufacturer Specifications: Adherence to specific guidelines provided by valve manufacturers (e.g., Emerson, Siemens).
Intern standards and prescripcions of client	- Safety Procedures: Compliance with internal safety guidelines, use of personal protective equipment (PPE). - Documentation Standards: Accurate recording of maintenance activities
Technical and technological equipment	- Inspection Tools: Digital mustimeters, pressure gauges, vibration analysers. - Maintenance Tools: Torque wrenches, valve actuators, cleaning solvents. - Testing Equipment: Hydraulic testers for pressure testing, leak detection devices. - Safety Equipment: PPE such as gloves, safety glasses, and hearing protection. - Automation Tools: PLC programming tools for automated valve control systems.
Software provision	- Maintenance Management Software for scheduling and tracking maintenance tasks. - Diagnostic Software: Software for analysing vibration data and pressure readings (e.g., Fluke Connect, Vibration Analyzer Pro).
Auditing body of provider	
Auditing body of client	
4. Performance parameters of the process (activities)	

The frequency of the given activity	- Routine Inspections: Monthly visual inspection and functional testing of the valves. - Full Maintenance: Bi-annual (every 6 months) in-depth inspection, including cleaning, calibration, and testing of regulation and closing armatures.
Time consumption of the process	- Inspection: Routine checks generally take about 30 minutes per valve. - Maintenance: Comprehensive maintenance takes 1 to 3 hours per valve set

Duration of the process	**The full maintenance process takes approximately 1 to 3 days**
Cost (month)	

5. Measurement of the performance and quality		
Unit of measure	Number of regulation and closing armatures inspected and maintained per month.	
KPI	3	All armatures are functioning perfectly with no issues detected.
	2	Minor adjustments or cleaning required on some armatures.
	1	Significant issues found that require immediate repair.
	0	Armatures are non-functional and require replacement.
Recommended procedure of measurement	Visual Inspection: Checking for leaks, corrosion, and physical damage. Functional Testing: Operating armatures to ensure they open and close correctly. Pressure Testing: Verifying the tightness and integrity of joints under pressure.	
6. Detailed description of the process		

The Control of Regulation and Closing Armatures in a central heating system involves a systematic approach to ensure that all valves operate efficiently and reliably. The process should begin with a monthly inspection where the maintenance technician visually examines each armature for signs of wear, leaks, or corrosion. Using specialized tools such as digital multimeters and pressure gauges, the technician performs functional tests to verify that each valve responds correctly to control signals, whether automated or manual.

During the bi-annual maintenance, a more thorough examination must be conducted. This includes pressure testing to ensure the tightness of joints, vibration analysis to detect any anomalies in pump operations affecting the armatures, and cleaning to remove any debris or buildup that could impede valve performance. If any issues are identified, the technician should proceed with adjustments or repairs, following manufacturer specifications and safety standards.

All maintenance activities are documented meticulously in the CMMS, ensuring traceability and accountability. The process also involves coordination with quality assurance teams and adherence to both international and internal standards to maintain high operational standards.

Regular audits by both internal and external bodies must ensure that the maintenance practices remain effective and compliant with all relevant regulations. This comprehensive approach not only prolongs the lifespan of the armatures but also ensures the overall efficiency and safety of the central heating system.

4.6 EXAMPLE ASSIGNMENT 2.

Name: ……...

Academic Year: ……

Facility Management

Assignment No. 3

Process sheet

Input data:

12 Central heating system

12.1 -measurement of isolates statuses of pumps

-measurement of of current consumptions of pumps

-measurement of vibrations, surge current at the starting of pump

12.2 - control of function of regulation and closing armatures

- control of joint tightness of regulation and closing armatures
- control of adjusting of regulation and closing armatures
- cleaning of regulation and closing armatures

12.3 - control of thermal insulation breakage of pipes

- control of corrosion of pipes
- control of pipe paint
- test sampling and chemical analyse of water in system (in pipes)

12.4 - control of tightness of heating elements

- control of corrosion of heating elements

- control of function of the closing armatures (of heating elements)

- control of function of air eliminators (of heating elements)

Required solutions and outcomes:

Process name	Heating elements of the central heating system
Process area	Facility management (Support activities - Services)

Processor	xxxx	Date	9/10/2024	Signature	Xxx
2. Basic parameters of the process					
Object of process	Tightness of heating elements Corrosion of heating elements Function of the closing armatures (of heating elements) Function of air eliminators (of heating elements)				
3. Other Parameters					
Specialized skills of provider	Advanced technical knowledge, to be demonstrated with a degree. Knowledge of regulations. Knowledge of software that may be required for a heating plant, even if it is not specifically the software that you normally use.				
Standards and prescripcions	Standard for central heating in Slovakia or EU: Energy Efficiency Directive (2012/27/EU) Renewable Energy Directive (2018/2001/EU) Ecodesign Regulation (2009/125/EC) F-Gas Regulation (517/2014) ISO 9001				
Intern standards and prescriptions of client	When carrying out the work, you will not have any contact with clients. However, in common areas where they may encounter clients, they must always be respectful of them and take care not to disturb them with the machinery that they are carrying. They must also always give them priority when passing through.				
Technical and technological equipment	They must have all the necessary equipment. If there is a specific and more serious problem at the plant, they must ensure that they have sufficient equipment to solve the problem.				

Software provision	**Building Management Systems (BMS), Supervisory Control and Data Acquisition (SCADA), Computerized Maintenance Management Systems (CMMS), Energy Management Software, Building Automation Protocols**

(BACnet or Modbus)	
Auditing body of provider	-
Auditing body of client	-
4. Performance parameters of the process (activities)	
The frequency of the given activity	-
Time consumption of the process	It will depend on the distance to the company, but in total it should not take more than the duration of an 8-hour workday to complete the work and all the associated activities.
Duration of the process	It will depend on the size of the central unit. If it is not excessively large, between 1 and 3 hours would be enough to check the heating elements. However, if it is a larger system, it could take between 6 and 8 hours.
Cost (month)	-

5. Measurment of the performance and quality		
Unit of measure How many failures occur and the reaction time		
KPI	3	0 failure
	2	1-2 failures, reaction time for each failure 1h
	1	3-5 failure, reaction time for each failure 2h
	0	More than 5, reaction time for each failure 4h
Recommended procedure of measurement	Once a company is hired, a one-year period will be given to see how effective their work is. The work will be reviewed every three months, a total of four times a year.	

7. Detailed description of the process

12.4

Control of tightness of heating elements

This process verifies that there are no leaks in the parts where the fluid (water or gas) circulates, which could jeopardize safety or cause performance losses. The steps to follow in this control are:

1.Visual Inspection. The process begins with a visual inspection to identify signs of wear, corrosion, or damage. The condition of the system's unions, seals, and connections is checked.

2.System Isolation. The system is isolated by closing valves and blocking potential fluid escape points. The system must be empty.

3.Pressurization with Gas or Compressed Air. Air or gas is injected at controlled pressure into the system or specific parts being tested. A pressure gauge is used to verify that the pressure remains stable for a set period. If the pressure drops, it may indicate a leak.

4.Leak Detection. If pressure loss is observed during the test, a leak detector is used to locate the leak.

5.Inspection of Joints and Seals. After performing the pressure tests, the joints and seals of the heaters are inspected to ensure they have not suffered deformation or damage. This is essential to ensure that the seal remains effective over time.

6.Repair or Replacement. If a leak or sealing failure is detected, the affected part, such as seals, valves, or pipes, is repaired or replaced. The tightness test is then repeated to confirm the system is fully sealed.

7.Final Report. A detailed report of the process and test results is prepared.

Control of corrosion of heating elements

It is essential to ensure the durability, efficiency, and safety of heating systems. The steps of the corrosion control process are:

1.Identification of the Type of Corrosion. The first step is to identify the types of corrosion that may affect the system. It is crucial to determine the type of corrosion to choose the most appropriate control measures.

2. Visual Inspection. A visual inspection of all exposed surfaces of the heater is then carried out, looking for visible signs of corrosion, such as discoloration,

stains, rust, or pitting on metal components. Critical points such as joints, connections, valves, and areas exposed to water or steam are also checked.
3.Chemical Water Control. One of the key factors contributing to corrosion in heaters is water quality. To reduce corrosion, it is necessary to: control the water's pH, perform water demineralization, and, if necessary, add corrosion inhibitors.
4.Cathodic Protection. In some systems, a method of cathodic protection is implemented to prevent corrosion.
5.Protective Coatings. An effective way to prevent corrosion is by applying protective coatings to exposed metal surfaces, such as epoxy or polymer coatings, galvanization, or anti-corrosive paints.
6. Preventive Maintenance. A key aspect of corrosion control is preventive maintenance and regular cleaning of the system. This includes regular draining, cleaning of scale deposits, and checking and replacing anodes.
7. Continuous Monitoring. To ensure that corrosion control measures are effective, continuous monitoring of the system is required. This includes periodic water quality tests to ensure that pH levels, hardness, and corrosion inhibitors are maintained.
Control of function of the closing armatures (of heating elements)
The closure fittings, such as valves, taps, and gates, are the components responsible for controlling the flow of fluids (water, steam, or gas) in heating systems. Malfunctions in these parts can cause leaks, system failures, or even dangerous situations. Therefore, it is important to perform regular checks and keep these parts in optimal condition. The steps of the closure fittings control process are:
1.Initial Visual Inspection. Before proceeding with more thorough tests, a visual inspection of the closure fittings is carried out. The valves and taps must be in good condition, with no signs of corrosion on the body or seals.
2.Seal Tightness Verification. The tightness of the closure fittings must be checked to prevent leaks.
3.Mechanical Operation Check. The mechanical operation of the fittings is then verified. This process includes: Full Opening and Closing and Review of the Full Open and Closed Position.

4.Lubrication of Moving Parts. To ensure proper mechanical operation, the moving parts of the closure fittings, such as handles, shafts, or levers, must be properly lubricated. This prevents excessive wear and ensures that the valves and taps can be operated smoothly.
5.Seal and Gasket Check. The seals and gaskets of the closure fittings are critical points in controlling their function. These components must be inspected.
6.Flow Check. Once the mechanical operation and tightness of the fittings have been verified, it is important to check that the fluid flow through them is correct.
7.Preventive Maintenance. It is important to carry out preventive maintenance to ensure proper functioning. Some actions include regular cleaning and inspection of internal parts.
8.Replacement of Defective Parts. If any part of the closure fitting is defective, it must be replaced immediately.
9.Final Testing. After all inspections, repairs, or replacements, final tests are conducted to ensure that the closure fittings work optimally and without leaks.
10.Documentation. Finally, the entire process is documented, recording inspections, repairs, and test results.
Control of function of air eliminators (of heating elements)
These devices are designed to release trapped air in the pipes or tanks of the system, as the accumulation of air can cause blockages, reduce heat transfer, and damage system components. They help improve the energy efficiency of the heater and prevent issues such as noise, corrosion, or fluctuations in water or steam flow. The steps of this process are:
1.Visual Inspection. The air eliminators must be in good physical condition, without cracks or oxidation, as their location in the higher parts of the system makes them vulnerable to the accumulation of moisture and air.
2.Ensure Proper Functioning. It is important to ensure that the air eliminator is working correctly.
3.Tightness Tests. The tightness test focuses on verifying that there are no water leaks through the purge valve when the system is under pressure. If leaks are observed, the internal float or sealing mechanism may be defective.
4.System Pressure Test. Excess air in the system can cause a drop in pressure or abnormal fluctuations. During these tests, the stability of the pressure is

checked, and any noises in the system are observed.

5.Cleaning of Air Eliminators. Automatic eliminators can become clogged due to the accumulation of dirt, rust, or debris present in the water. To maintain proper functioning, they must be cleaned regularly.

6.Replacement of Defective Components. In some cases, it may be more efficient to replace the entire eliminator.

7.Continuous Monitoring. Continuous monitoring of the system is necessary to ensure that air does not accumulate in the pipes. Some more advanced heating systems may have sensors that monitor the presence of air and automatically alert when purging is necessary.

8.Documentation. Finally, the entire process must be documented.

5 SPACE MANAGEMENT

Space management is a key part of facility management and deals with the effective planning, organization and use of spatial resources in buildings and premises. Its goal is to optimize the use of space to meet the needs of the organization, promote productivity, reduce costs and ensure comfort for users.
Space management encompasses a wide range of activities, including:

1. **Space planning:** Defining the spatial needs of an organization based on its strategy, organizational structure, number of employees and their job descriptions.
2. **Space allocation:** Assigning space to individual departments, teams, or individuals with respect to their needs and relationships with each other.
3. **Interior design:** Creating functional and aesthetic work environments that promote employee efficiency and well-being.
4. **Occupancy management:** Monitoring and optimizing space utilization, for example through meeting room booking systems or occupancy sensors.
5. **Relocation and layout changes:** Planning and executing employee relocations or changes to the layout of the premises.
6. **Spatial data management:** Keeping records of spaces, their dimensions, equipment and use.

5.1 THE IMPORTANCE OF SPACE MANAGEMENT IN FM

Efficient space management brings several benefits to FM:

1. **Cost optimization:** Better use of space can lead to reduced rental, energy, and maintenance costs. For example, if some premises are found to be unused, they can be rented or sold.
2. **Increase work efficiency:** A well-designed work environment that considers the needs of employees can help to increase their productivity and satisfaction. For example, creating spaces for collaboration and meetings can encourage teamwork.
3. **Improve communication and collaboration:** Properly arranging spaces can facilitate communication and collaboration between employees. For

example, the placement of departments that work closely with each other, close to each other.

4. **Flexibility and adaptability:** Space management allows the organization to respond flexibly to changes in its needs, such as growth or changes in the organizational structure.
5. **Improving the company's image:** Representative and functional spaces can positively influence the perception of the company by clients and partners.
6. **Promoting employee well-being:** An emphasis on an ergonomic and comfortable working environment contributes to the health and well-being of employees.

5.2 TOOLS AND TECHNOLOGIES FOR SPACE MANAGEMENT

Nowadays, there are a number of tools and technologies that facilitate space management:

1. **CAFM (Computer-Aided Facility Management) systems:** Software systems that integrate information about premises, assets, maintenance, and other aspects of FM.
2. **IWMS (Integrated Workplace Management Systems):** Comprehensive platforms for managing the work environment, which include other functions such as project, maintenance and energy management in addition to space management.
3. **BIM (Building Information Modeling):** A digital model of a building that contains detailed information about its geometry, materials and systems.
4. **Occupancy sensors:** Devices that monitor the occupancy of spaces and provide data to optimize their use.
5. **Reservation systems:** Systems for booking meeting rooms, desks, or parking spaces.

There are several space management strategies that can be adapted to the needs of the organization:

1. **Hot-desking:** Employees are not assigned a permanent job, but book it as needed.

2. **Activity-based working:** The work environment is designed to support different types of activities, such as individual work, collaboration, or meetings.
3. **Flexible working:** Employees can work from different places and at different times.

Space management is an essential part of effective facility management. Its correct application brings several benefits, from cost optimization and increased work efficiency to improved comfort and well-being of employees. In today's dynamic environment, it is important for organizations to pay sufficient attention to space management and use modern tools and technologies for its effective management.

5.3 PROCEDURE FOR DRAWING UP THE ASSIGNMENT

The assignment is based on the processing of the space of any floor **of the administrative** building. As part of the assignment, the student will design **the premises** in the first step according to **the organizational structure of** the organization. The assignment focuses on a space that has already been designed and changes for another user during use. In the premises, they solve the furnishings of the premises, draw furnishings, mark the purpose of the rooms, and process the legend of the rooms.

In the next steps, students process various devices, always in such a way as to focus on the worker in the space, his comfort and so that he can effectively work and give the best possible work performance.

Marking of additional furnishings: students mark additional furnishings such as a data projector, drawer box, projection screen, water dispenser, coffee machine, coffee machine, printer, multifunctional device. The designation on the drawing will be explained in the legend.

Marking of electrical equipment: electrical equipment such as sockets, lighting must be marked in such a way that, for example, the worker does not have to cross cables, so that he has an illuminated work area and does not shade himself

at work. Data nests, data switchboards, wifi are marked so that they do not cause problems in operation. The designation on the drawing will be explained in the legend.

The designation of the information and direction boards is drawn with a simple mark, which is written in the legend. The marking is important for the facility manager, in the event of a breakdown, for example, it will make it easier to orient oneself in the space. Every door, information on the façade and directional signs in the corridors must be marked.

Airflow: the airflow is indicated in the drawing so that the worker in the space does not suffer, for example, from drafts, the supply of fresh air and the exhaust of polluted air are marked with a simple loop, which is explained in the legend, the floor plan processed in this way is also used, for example, for air conditioning and air conditioning designers.

The designation of OHS and FP in the drawing is marked with simple marks, which are explained in the legend according to the proposal of specialists in the given issues. It is important for the facility manager to know about the signage, to know where it is located in the space and to ensure that it is undamaged and fulfills its purpose.

5.4 LETTER OF ASSIGNMENT

Name: …….

Academic Year: ……

Facility Management

Assignment No. 4

Space Management

Input data:
floor plan of the object

Required solutions and outcomes:

Powerpoint presentation of the space management assignment:

1. Title sheet

2. Description of the type of company

- (what company, number of employees, m2, ...) for which you solved the space!!!

- **define the main activity of the company for which the space is designed !!!**

3. Floor plan + (legend)description

  - furniture, equipment (coffee machines, water machines,...), greenery,
  - electrical, IT sockets,
  - navigation, designation (markings),
  - ventilation,

4. Pictures: furniture, office equipment and etc.

Note: try to follow the principles according to the explanation of the assignment.

5.5 EXAMPLE ASSIGNMENT 1.

Name: …….

Academic Year: ……

Facility Management

Assignment No. 4

Space Management

Input data:
floor plan of the object

Required solutions and outcomes:
Rebuild: renovation company

It's a small company, with just 5 employers, who is encharge to renovate any part of your house that you would like to.

The company offers any service related with interior houses renovation. Since doing the entire reform of your kitchen until changing an air conditioner.

Beside the five employers, they work with some other companies to guarantee the best results.

Some work the company can do: Plumbing, electricity, paint, air conditioning, flooring, kitchens, drains, tiling.

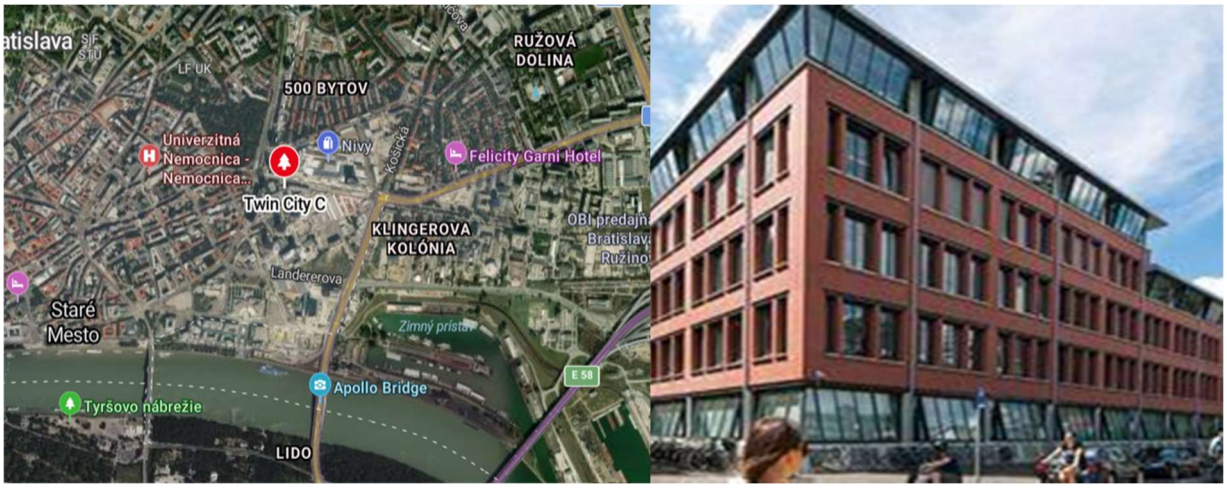
Office Name: Rebuild Company

Location: Twin City C, Bratislava, Slovakia.

Aim of office: Working place

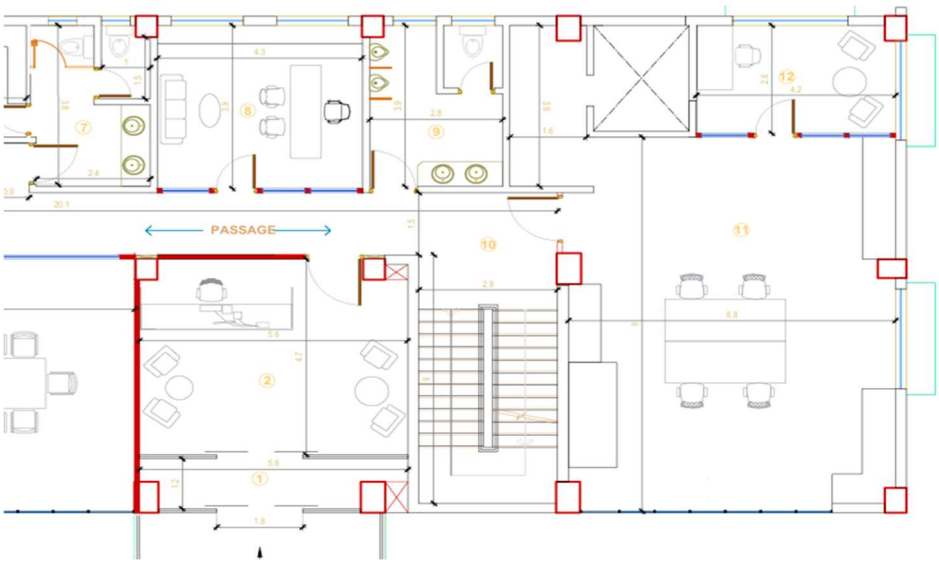
Area of office: 304,74 m^2

Number of employers: 5 workers, 1 secretary, 1 accountant, 1 cleaning lady.



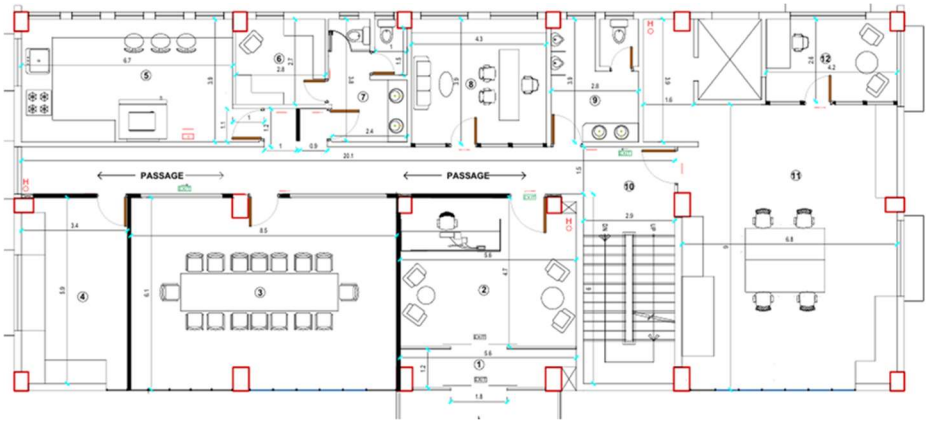
How is the space distribution in the office ?

Floor plan



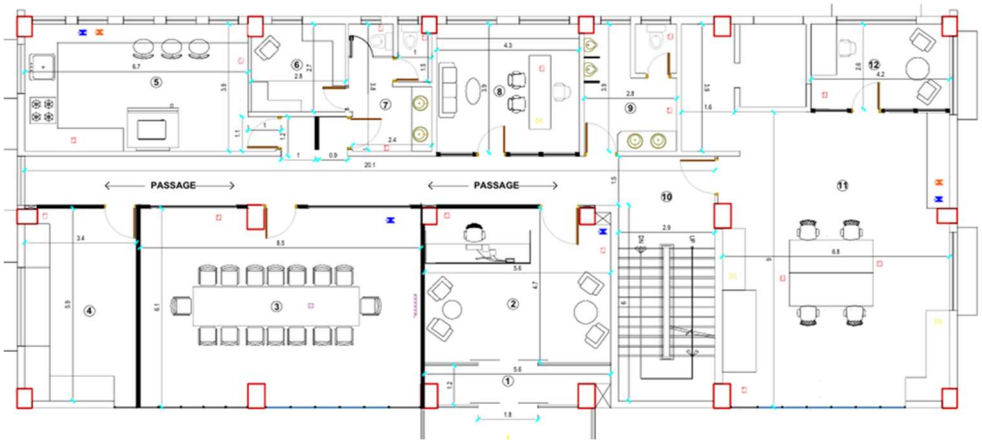
LEGEND		
Room No.	Name of Rooms	m^2
1	Entrance	6,7200
2	Reception	26,3200
3	Conference Room	51,8500
4	Storage	20,0600
5	Kitchen	27,2300
6	Cleaning Room	7,5600
7	Ladies Toilet	9,1200
8	Boss Office	16,7700
9	Mens Toilet	10,9200
10	Passage	49,8300
11	Working Office	67,4400
12	Private Office	10,9200
		304,7400

Floor plan Marking



LEGEND
First aid box
Fire extinguisher
Guideboard
EXIT Emergency exit

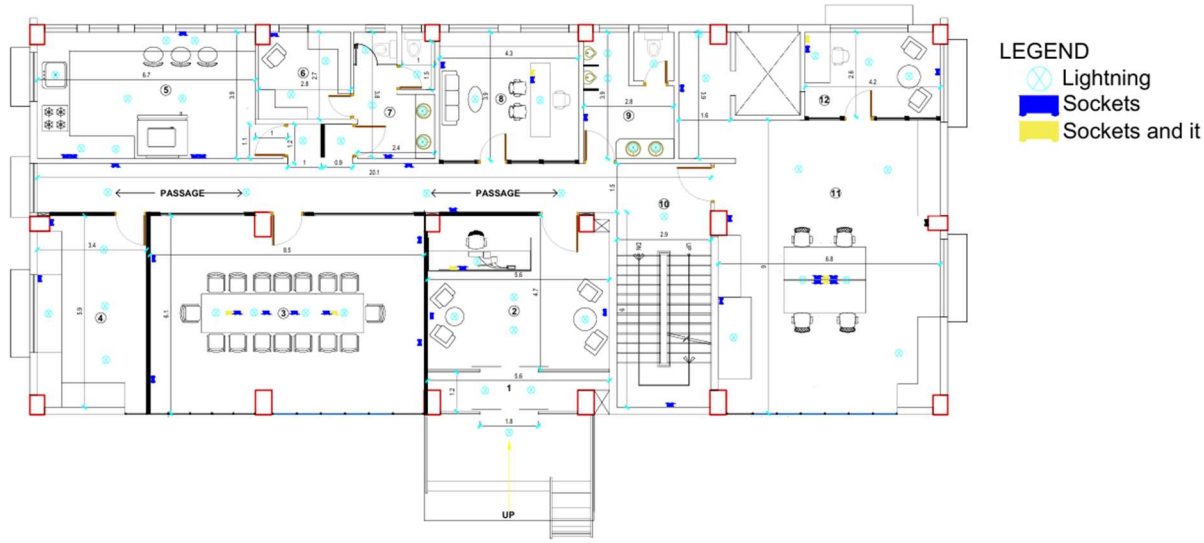
Floor plan - Additional Equipment



LEGEND
Trash
Copy and print
Projector
Canvas
Water storage
Coffe machine

Floor Plan – Air flow

Floor Plan – electrical equipment



Furniture and office equipment

5.6 EXAMPLE ASSIGNMENT 2.

Name: .....

Academic Year: .....

Facility Management

Assignment No. 4

Space Management

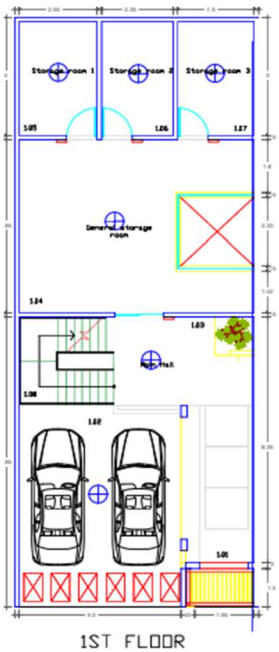
Input data: floor plan of the object

Required solutions and outcomes:

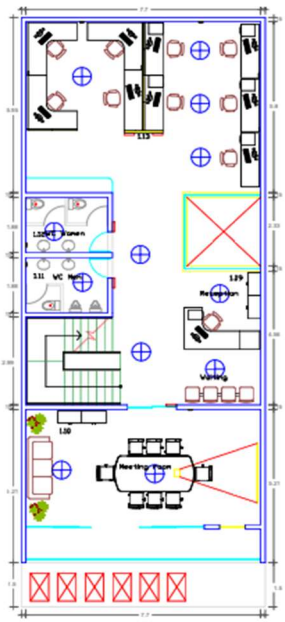
SolarWave Innovations is a pioneering company in renewable energy solutions, specializing in solar panel installations for residential and commercial buildings. Our mission is to make clean energy accessible by providing high-quality, efficient, and cost-effective solar technology. SolarWave Innovations not only installs but also monitors and maintains solar energy systems to ensure optimal performance.

- **Building Name:** SolarWave Headquarters
- **Location:** Av. de la Energía 45, Seville, Spain
- **Building Type:** Renovated Historical Building
- **Building Purpose:** Office Space and Customer Service Center
- **Building Area:** 400 m²
- **Number of Employees:** 30

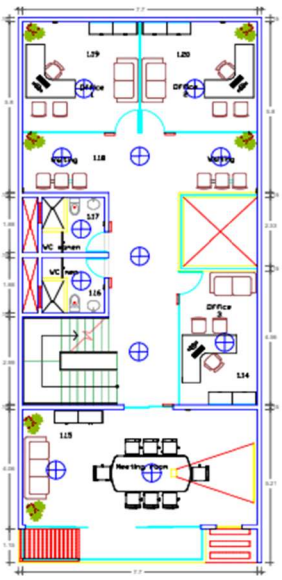
Floor Plan – electrical equipment, marking



1ST FLOOR



2ND FLOOR



3RD FLOOR

NUMBER	NAME	AREA[M^2]
1.01	ENTRANCE	9.37
1.02	GARAGE	29.55
1.03	MAIN HALL	12.34
1.04	MAIN STORAGE ROOM	38.11
1.05	STORAGE ROOM 1	9.82
1.06	STORAGE ROOM 2	9.82
1.07	STORAGE ROOM 3	9.82
1.08	STAIRS	
1.09	RECEPTION	27.7
1.10	MEETING ROOM	30.3
1.11	WC MEN	5.05
1.12	WC WOMEN	5.05
1.13	OFFICES	44.66
1.14	OFFICE 3	11.6
1.15	MEETING ROOM	30.3
1.16	WC MEN	3.83
1.17	WC WOMEN	3.83
1.18	WAITING PLACE	15.7
1.19	OFFICE 1	14.26
1.20	OFFICE 2	14.26
	TOTAL	340,5000

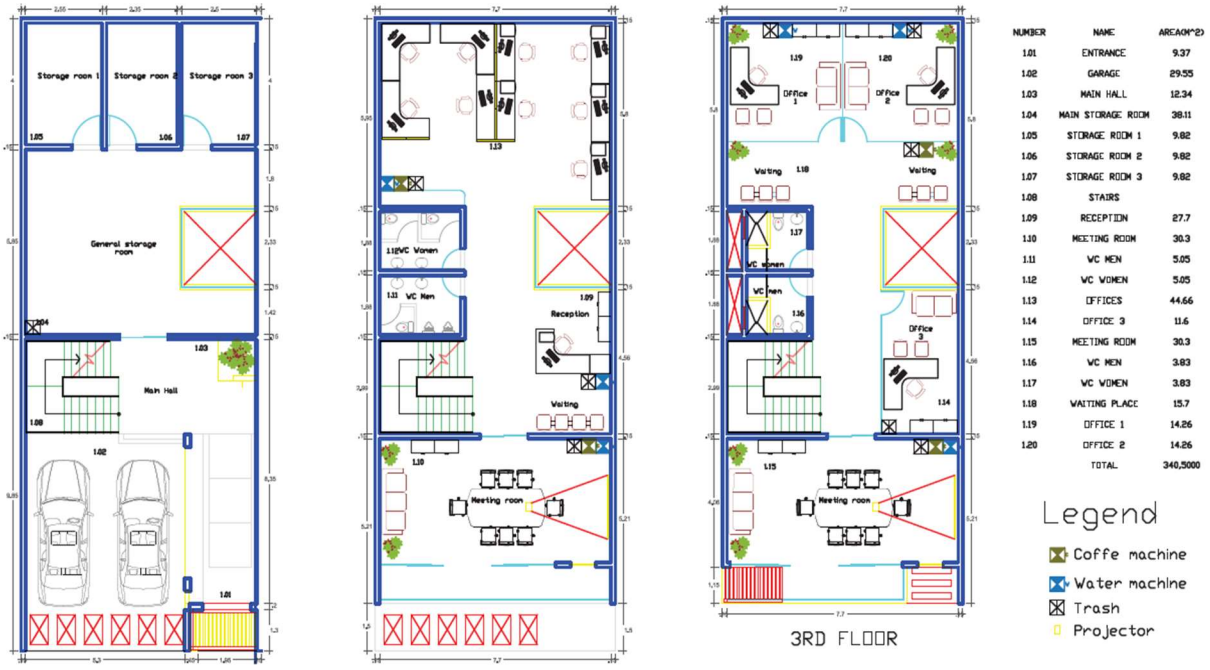
Legend

LIGHT

Guideboard

Socket

Floor plan - Additional Equipment



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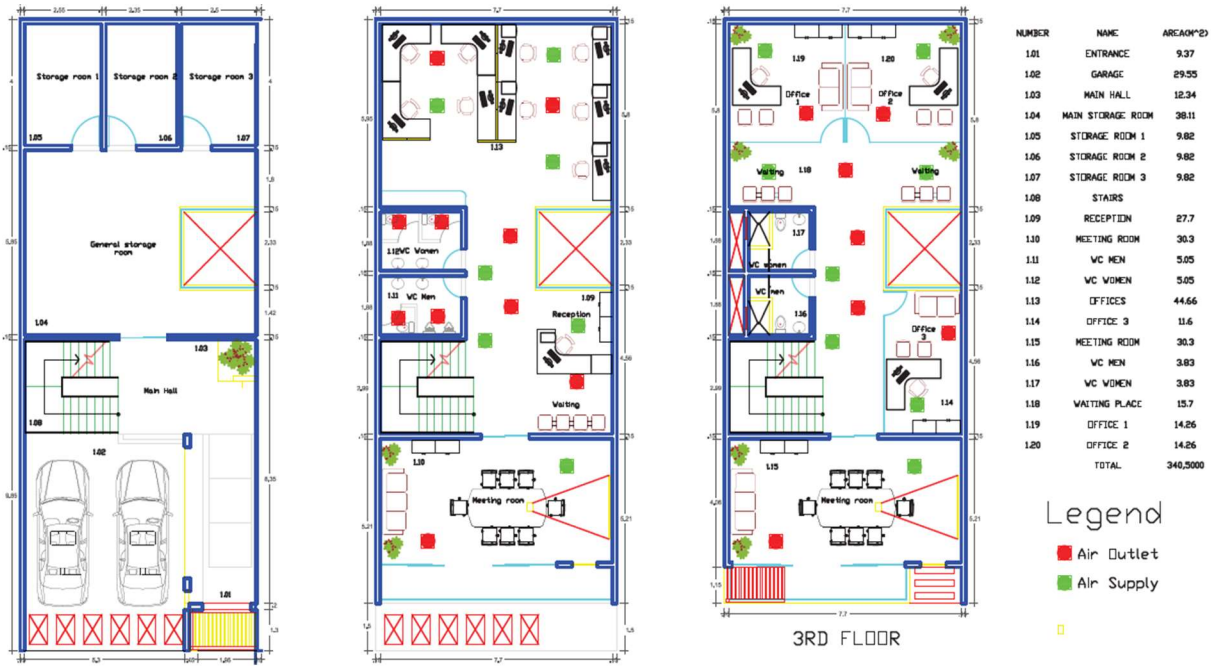
1.18	WAITING PLACE	15.7
1.19	OFFICE 1	14.26
1.20	OFFICE 2	14.26
	TOTAL	340,5000

Floor Plan – Air flow



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1.17	WC WOMEN	3.83
1.18	WAITING PLACE	15.7
1.19	OFFICE 1	14.26
1.20	OFFICE 2	14.26
	TOTAL	340,5000

6 BUILDING MAINTENANCE MANUAL

In the current dynamic environment of construction and property management, FM plays a key role in ensuring **the efficient operation** and long-term sustainability of buildings. One of the important tools within FM is the building maintenance manual. This document is a comprehensive source of information that serves as a basis for planning, implementation and control of maintenance activities throughout the life of the building. A building maintenance manual is a detailed document that contains all relevant information about a building in terms of its maintenance. It includes technical data, maintenance procedures, inspection frequencies, spare parts lists, supplier contacts and other important information. It can be processed in printed or electronic form and should be updated over the lifetime of the building. One of the prerequisites for improving the maintenance of building structures is the creation of a maintenance manual which sets out the maintenance rules as defined in the plan for the use of public works. Wear and change of function is compensated by the maintenance of building structures, which leads to the maintenance of the desired building characteristics.

Building maintenance is a part of the technical management of buildings that provides maintenance of building construction and maintenance of technical equipment installed in the building. Building maintenance in terms of facility management represents a complex of services designed to ensure the safe operation of buildings and their technologies. It's a continuous process.[34] According to STN EN 13306 maintenance is a combination of all technical administrative and management activities throughout the life cycle of a building to maintain or restore the condition in which it can perform the required function.[35] Standard STN EN ISO 41011 defines facility management as ntegration of processes within an organization to help ensure and develop agreed services that help and streamline the organization's core business.[36] The goal of FM is to reinforce all processes, with the help of which workers work with the

[34] SOMOROVÁ, V.: Building maintenance. Facility management. 2010. Publisher SUT Bratislava. ISBN 978-80-227-3372-4

[35] STN EN 13306. Maintenance. Maintenance terminology. Bratislava. SÚTN.

[36] STN EN ISO 41011. Facility management. Terms and definitions. Bratislava. SÚTN.

highest efficiency in the workplace, thus ensuring the overall economic growth and success of the organization.[37]

6.1 THE IMPORTANCE OF THE MAINTENANCE MANUAL IN FM

The maintenance manual plays an irreplaceable role in FM in several respects:

1. **Efficient maintenance planning:** The manual provides precise information about the maintenance requirements of individual devices and systems in the building. This allows facility managers to efficiently plan preventive maintenance, minimize the risk of breakdowns and extend the life of the building.
2. **Cost optimization:** With accurate maintenance information, service and repair costs can be optimized. Preventive maintenance, based on information from the manual, is generally less costly than reactive fault management.
3. **Increased safety:** Regular inspections and maintenance, carried out according to the instructions in the manual, contribute to increasing the safety of the building for its users. This prevents accidents caused by neglected maintenance.
4. **Improved uptime:** A well-maintained building with functional systems ensures smooth operation and minimizes downtime caused by failures.
5. **Increase in property value:** A building with a demonstrable maintenance history and complete documentation, including a maintenance manual, has a higher value in the real estate market.
6. **Support for audits and inspections:** The maintenance manual serves as an important basis for audits and inspections, demonstrating compliance with maintenance regulations and standards.
7. **Facilitate the transfer of information:** The manual facilitates the transfer of information between individual members of the FM team and between suppliers. It ensures continuity and effective communication.

[37] SOMOROVÁ, V.: Building maintenance. Facility management. 2010. Publisher SUT Bratislava. ISBN 978-80-227-3372-4

6.2 CONTENTS OF THE BUILDING MAINTENANCE MANUAL

The maintenance manual should contain the following information:

1. **General information about the building:** Basic information about the building, its layout, building materials, etc.
2. **Technical data on equipment and systems:** Description of individual devices and systems (e.g. heating, ventilation, air conditioning, wiring, plumbing), their technical parameters, diagrams and drawings.
3. **Maintenance procedures:** Detailed descriptions of maintenance activities for individual equipment and systems, including the frequency of maintenance, necessary tools and materials.
4. **Spare parts lists:** Lists of recommended spare parts for each device, including order numbers and supplier contacts.
5. **Contacts for suppliers and service organizations**: A list of contacts for equipment suppliers and service organizations that provide maintenance and repairs.
6. **Preventive Maintenance Plans:** Schedules for preventive inspections and maintenance activities.
7. **Review and control documentation:** Records of the revisions and controls performed, including dates, results, and any deficiencies found.

The Building Maintenance Manual is an indispensable tool for effective maintenance management within facility management. Its implementation brings several benefits, from cost optimization and increased safety to extending the life of the building and increasing its value. Therefore, the maintenance manual should be considered an integral part of the documentation of any building and should be updated regularly.

6.3 CURRENT SITUATION IN LEGISLATION AND THE USE OF THE MANUAL

Unlike the Slovak Republic in the Czech Republic, the legislation does not require the obligation to draw up a plan for the maintenance of public works. Paradoxically, many large-scale buildings and residential homes have a

processed manual of building use under different names, such as: the standard user guide, the user guide, and building managers.

According to the Finnish National Construction Standards, the "Building and Construction Manual" is mandatory for the construction project to draw up a "Use and maintenance manual", ie a manual of use and maintenance for residential and work buildings, also to be developed when changing the purpose of an existing building. The manual must include the planned lifetime of the building and the building structure. The building will not pass through the building approval unless the manual is completed and handed over to the investor.[38]

At present, sustainable building management is a stable part of Dutch governmental environmental policy. Research in the Netherlands focuses on new construction projects and "sustainable maintenance" of buildings.

In Slovakia Building Act 50/1976 Coll. obliges the owner of the building to keep the building in good condition so that there is no risk of fire and hygiene defects, so as not to impair or jeopardize its appearance and maximize its usefulness.[39] Under Act 254/1998 Coll. on public works[40], the builder must ensure that the plan for the use of public works is drawn up. The planner and the contractor must work together. The plan must be designed so that during the use phase "there is no danger to persons, property" or that the public building is not damaged or that it is not "prematurely worn". The law defines the content of the plan: "rules of use, rules of technical inspections, maintenance rules, correction rules." The plan is processed during construction. The Ministry of Construction and Regional Development of the Slovak Republic published in 2001 a practical manual for the elaboration of the plan. The contents of the Maintenance Manual of Buildings is proposed in Table 5.1.

For large building projects, the investor may entrust the designer with a building maintenance manual that is being processed during the implementation phase. The manual for private work does not have the content given by the legislation. Private investors consider building construction to be maintenance-free at extra

[38] Ym.fi: Use_and_maintenance_manual. [accessed at 2022-12-10]. Available at: http://www.ym.fi/enUS/Land_use_and_building/Legislation_and_instructions/The_National_Building_Code_of_Finland/Use_and_maintenance_manual

[39] Act 50/1976 Coll., On Spatial Planning and Building Regulations (Building Act), as amended

[40] Act 254/1998 Coll. on public works, as amended

costs, neglecting their need, and thus increasing repair costs, often damaging objects.

6.4 PROCESSING OF THE MAINTENANCE MANUAL OF BUILDING STRUCTURES

Most building maintenance is currently being implemented as so-called "Induced maintenance". Such a maintenance task can cause triple to four times the cost increase than the same repair if implemented with a maintenance plan. This practice is ineffective. The roles of maintenance that are being invoked are mostly focused on repairing existing phrases, not on the cause of the failure, thereby increasing frequency and repair and maintenance costs. As a result, it is necessary to focus on preventive maintenance (planned). Maintaining and storing reliable information about the state of the building and its structures is essential for quality maintenance planning.

The optimal functioning of the building is conditional on the application of FM, which has an impact on the efficiency of maintenance of building structures.

The purpose of facility management is to create, improve, plan and maintain the indoor environment of the building with minimum resource requirements in such a way as to strengthen the main activities of the company, both the investor and the tenants of the building.

Tab. 6.1: Proposed contents of Buildings Maintenance Manual[41]

Parts	Definition	Contents	
Terms of Use of Buildings	Define the requirements for adequate use to prevent early wear and damage to	Construction part	bearing capacity, cleaning and management work
			education of users
			building structures resistance to the action of chemicals
			proposal manipulation of doors, windows and fastening objects on building structures

[41] SOMOROVÁ, V.: Facility management. 2014. Professional Publishing. Praha. ISBN 978-80-743-1141-3

	health and property		communication for the transport of specific equipment
		Technical and technological part	define requirements for secure, cost effective and trouble-free operation
			regulations, instructions, manuals
The Technical Inspection	Their task is to determine the current condition and the severity of defects in structures and technical and technological equipment in order to prevent future failures		Inspections are focused on:
			discovery of deficiencies and defects during the warranty period and the subsequent application of remedies by the manufacturer / contractor
			finding faults at an early phase, where correction could result in increased financial costs
Rules for Building Maintenance	Define the course of planning. Their output is maintenance schedule	Maintenance Schedule	elements with long service life: foundations, vertical loadbearing structures, horizontal load-bearing structures and roofs, staircase
			elements with short-lived: treated wall surfaces, floors, filling the openings, metalwork, plumbing and joinery
		Repair and Maintenance	defined time intervals for preventive maintenance
			provides employment and financial resources
			setting standards of maintenance

6.5 LETTER OF ASSIGNMENT

Name: …….

Academic Year: ……

Facility Management

Assignment No. 4

Building Maintenance Manual of the Apartment Building

Input data:

Details for Istruction of Building Maintenance and Use are:
Ground plane of typical floor.
Skiagraphy (cross-secttion) of the buiding.

Required solutions and outcomes:

Work out the Istruction of Building Maintenance and Use.
Your task is design the material of:
Roof
External walls
Transoms (interiour wall)
Floors in rooms of the flat
Floors on common space
Windows
Doors
.
.
.
.

In your work you should work out, how to maintenance this building to avoid damage of the building.

The seminar paper will contain these parts:

1. **Identification data of building:**

characteristics and purpose of construction

2. **Maintenance of construction**

a) *Description of construction* (structure composition, layer thickness and material composition)
b) *Rules of use of the construction* (who is responsible, what we must not do with the building structure, how we should use the structure, what needs to be done)
c) *Construction maintenance rules* (who is responsible, how we take care of the construction, how we clean it, and planned repairs in the future and the periodicity of repairs)
d) Inspection rules (who is responsible, subject to control and how often he performs it)
e) What to do in case of failure, who to contact (supplier, apartment building manager,
emergency service (in case of technological equipment)

Point b) and c) can be together because sometimes it is difficult to determine what is use and what is maintenance of building structure.

6.6 EXAMPLE ASSIGNMENT 1.

Name: …….

Academic Year: ……

Facility Management

Assignment No. 4

Instructions for Maintenance and Use of the Apartment Building

Building identification data

Construction name: Office Tower

Place of construction: Lexington

District: Fayette Region:

Kentucky Parcel number: 802/6, 802/7, 1001/3, 1001/5

Plot area: 10,450.89 m2 Built-up area: 1,200.75 m2

Character of the building: Renovation and expansion

Purpose of construction: Office space and commercial units

Investor: XYZ Corporation, 123 Main Street, Lexington

Designer: JD Architecture Firm

Start of construction: May 2024

Construction time: 18 months

Building manager: Sarah Johnson, contact

Characteristics of the site: The building plots selected for the construction of the new office tower are located in the heart of downtown Lexington. The tower will be situated on parcels numbered 802/6 and 1001/5, while surrounding landscaped areas will be developed on plots 802/7 and 1001/3. Access to the tower will be provided via existing roadways, with additional pedestrian pathways integrated into the design for ease of access. Parking facilities for tenants and visitors will be accommodated in a nearby parking garage. Adjacent to the property, a green space spanning approximately 3,500 m2 will be preserved and enhanced for recreational use. The site, characterized by gently sloping terrain, will undergo minimal grading and preparation before construction begins. Existing vegetation will be protected

and incorporated into the landscaping plan. During construction, temporary fencing will be erected to secure the site, with monitored access points provided for construction personnel and authorized personnel only. Basic project information will be displayed at these entry points. Utilities will be connected to the site from existing infrastructure along nearby streets.

Geological Survey: A comprehensive geological survey has been conducted, evaluating soil conditions to a depth of 15 meters below ground level. Groundwater levels have been determined to be approximately 8 meters below ground level, at an elevation of 210 meters above sea level. No significant groundwater issues are anticipated during construction. Soil on the site has been categorized as belonging to the 2nd class of mining. Characteristics and Purpose of the Construction Office Tower Purpose of the building: The tower will serve as a hub for office space and commercial activities.
Dimensions of the object:
Built-up area: 1,200.75 m2
Total enclosed space: 25,000 m3

2. USE AND MAINTENANCE

TRANSOMS (INTERIOR WALL)

Interior walls can be made from a variety of materials, each with its own characteristics and considerations:
1. Drywall (Gypsum Board): This is the most common material for interior walls. It's easy to install, cost-effective, and provides a smooth surface for painting or wallpapering. However, it's not very durable and can be prone to damage from impacts or moisture.
2. Plaster: Traditional plaster walls offer a smooth and durable finish. They're more labor-intensive to install compared to drywall but provide excellent sound insulation and fire resistance.
3. Wood Paneling: Wood panels can add warmth and character to interior spaces. They come in various styles, from traditional tongue-and-groove to modern

reclaimed wood. Maintenance involves occasional cleaning and refinishing to preserve the wood's appearance.

4. Metal Studs with Drywall: Metal studs are lightweight and resistant to moisture and pests, making them a popular choice for commercial buildings. They're often combined with drywall for interior walls.

5. Insulation: Interior walls can be insulated to improve energy efficiency and soundproofing. Common insulation materials include fiberglass, cellulose, and foam board. These are installed between wall studs or within wall cavities.

Aerated concrete fittings Porfix 250mm with a gypsum plaster finish and a water-washable coating make up the interior partitions. The business that installed the plaster will be contacted to guarantee that the same technology is used in the event of contamination or damage to the coating and plaster. Maintenance will be performed in this manner once a year, along with inspections. To assure the renovation, it is imperative to notify the building manager in the case of a wall breakdown from the inner (residential) side.

Use and maintenance of interior walls:

1. Regular Cleaning: Dust and dirt can accumulate on walls, especially in high-traffic areas. Regularly dust or vacuum walls to keep them looking clean.

2. Painting and Wallpapering: If your walls are painted or wallpapered, periodically inspect for signs of wear or damage. Touch up paint as needed and repair any tears or bubbles in wallpaper.

3. Moisture Control: Keep interior humidity levels in check to prevent mold and mildew growth. Use exhaust fans in kitchens and bathrooms and address any plumbing leaks promptly.

4. Preventive Maintenance: Inspect walls for cracks, holes, or water damage. Repair any damage promptly to prevent it from worsening.

5. Furniture Placement: Be mindful of where you place furniture against walls to avoid scuffing or damaging the surface.

6. Soundproofing: If noise is a concern, consider adding additional insulation or soundproofing materials to interior walls.

FLOORS IN ROOMS OF THE FLAT

Floors in rooms of a flat can be made from a variety of materials, each with its own characteristics and considerations:

1. Hardwood: Hardwood floors are timeless and durable, adding warmth and elegance to a room. They require periodic refinishing to maintain their appearance and may be susceptible to scratching and water damage.
2. Laminate: Laminate flooring offers the look of hardwood at a more affordable price. It's easy to install and maintain but may not be as durable as hardwood and can be damaged by moisture.
3. Vinyl: Vinyl flooring is versatile, durable, and available in a wide range of styles and colours. It's resistant to moisture and easy to clean, making it ideal for kitchens and bathrooms.
4. Tile: Tile floors are durable, waterproof, and come in various materials such as ceramic, porcelain, or natural stone. They're ideal for high-traffic areas and are easy to clean, but grout lines may require periodic maintenance to prevent staining.
5. Carpet: Carpeting provides warmth and comfort underfoot and can help reduce noise levels. It requires regular vacuuming and occasional deep cleaning to remove dirt and allergens.

Laminate flooring is used in the bedrooms and living areas. Ceramic tiles are utilized in the restroom, bathrooms and kitchens.

Use and maintenance of floors in rooms of a flat:

1. Regular Cleaning: Sweep or vacuum floors regularly to remove dirt and debris. For hard surfaces, mop with a damp cloth or appropriate cleaner as needed. Use a vacuum cleaner with a brush attachment for carpets.
2. Area Rugs and Mats: Place rugs or mats in high-traffic areas to protect the flooring from wear and tear. Be sure to shake out or vacuum rugs regularly to prevent dirt buildup.
3. Spills and Stains: Clean up spills promptly to prevent staining or damage to the floor. Use a damp cloth or appropriate cleaner for the type of flooring.

4. Furniture Pads: Attach felt or rubber pads to the bottom of furniture legs to prevent scratching and scuffing of the floor surface.
5. Avoid Harsh Chemicals: Use cleaning products specifically designed for the type of flooring to avoid damage. Avoid using harsh chemicals or abrasive cleaners that could strip away finishes or cause discoloration.
6. Inspect for Damage: Periodically inspect floors for signs of damage, such as scratches, chips, or water damage. Address any issues promptly to prevent further damage.

WINDOWS

Rules of Use of the Windows

Responsibility:
Responsibility divides between owner and occupants. The owner is typically responsible for the overall maintenance and upkeep of the building's structure, including windows. This includes ensuring that windows are installed correctly, regularly inspected, and repaired or replaced when necessary. Occupants are responsible for using windows responsibly and reporting any issues or concerns to the building owner or property manager.

What Not to Do:
Do not modify windows or their frames without proper authorization, as this could compromise their structural integrity or violate building codes. Avoid hanging heavy objects on windows or window frames, as this can damage the structure and pose safety hazards. Do not block or obstruct windows, as they serve as emergency exits and sources of natural light and ventilation.

Proper Use of the Structure:
Use windows for their intended purposes, such as providing natural light, ventilation. Ensure that windows are securely closed and locked when not in use to prevent unauthorized entry and maintain energy efficiency. Follow manufacturer guidelines for operating and maintaining windows, including regular cleaning and lubrication of moving parts.

Maintenance and Care:

Regularly inspect windows for signs of damage, wear, or malfunction, such as cracked glass, deteriorating frames. Promptly repair or replace damaged or malfunctioning windows to prevent further deterioration and maintain the building's structural integrity. Keep window tracks, sills, and frames clean and free of debris to prevent moisture buildup and damage to materials.

Maintenance rules of windows

Responsibility:

The building owner is typically responsible for the maintenance and upkeep of windows. This includes ensuring that windows are installed correctly, conducting regular inspections, and arranging for necessary repairs or replacements. While tenants are responsible for day-to-day care, they should report any issues or concerns regarding windows to the building owner or property manager promptly.

Care and Cleaning:

Schedule routine inspections of windows to check for signs of wear, damage, or malfunction. Inspections should include examining frames, seals, hardware, and glass for any issues. Cleaning: Clean windows regularly to remove dirt, dust, and debris. Use a mild detergent or window cleaner and a soft cloth or sponge to avoid scratching the glass or damaging the frames. Additionally, clean window tracks, sills, and hardware to ensure smooth operation.

Planned Repairs and Periodicity:

Develop a maintenance schedule for windows that includes planned inspections and repairs. The frequency of maintenance may vary based on factors such as the age of the windows, environmental conditions, and usage. Based on inspection findings, plan for necessary repairs or replacements of windows components such as seals, weatherstripping, hardware, or damaged glass. Address issues promptly to prevent further damage and maintain energy efficiency. The periodicity of window repairs depends on their condition and usage. Some repairs, such as resealing or lubricating hardware, may be

conducted annually or biannually. However, repairs for more significant issues may be needed on an asneeded basis.

Inspection rules of windows

Responsibility:
The primary responsibility for window inspections typically lies with the building owner or property manager. They are responsible for ensuring that windows are inspected regularly and maintained in good condition. In some cases, qualified professionals such as maintenance staff, window technicians, or building inspectors may be tasked with conducting window inspections under the supervision of the building owner or property manager.

Subjects to Control:
Inspections should assess the overall condition of windows, including frames, seals, hardware, and glass. Look for signs of wear, damage, deterioration, or malfunction that may affect the functionality or performance of the windows. Check the operation of windows to ensure that they open, close, and lock securely. Test the functionality of hardware such as handles, hinges, latches, and locks to ensure smooth operation. Assess the effectiveness of weatherproofing measures such as seals, caulking, and weatherstripping to prevent air leakage, water infiltration, and energy loss. Verify that windows meet safety and security standards, including requirements for emergency egress, tempered glass in hazardous locations, and child safety features where applicable.

Frequency:
Schedule routine inspections of windows at regular intervals to assess their condition and performance. The frequency of inspections may vary based on factors such as the age of the windows, environmental conditions, and usage patterns. Generally, window inspections should be conducted annually as part of a comprehensive building maintenance program. However, windows in high-traffic areas or exposed to harsh weather conditions may require more frequent inspections, such as semi-annually or quarterly.

Failure of windows

If the window failure is due to a defect in the window itself or its components, such as faulty hardware, broken seals, or defective glass, contact the supplier or manufacturer of the window. Provide details of the issue, including the nature of the failure, any visible damage, and the location of the affected window(s). The supplier or manufacturer may provide guidance on troubleshooting the issue, scheduling repairs, or arranging for replacements under warranty, if applicable. Inform the apartment building manager or property management company about the window failure as soon as possible. Provide specific details about the nature of the problem and its potential impact on safety, security, or comfort. The building manager or property management team can coordinate with maintenance staff, contractors, or service providers to address the issue and schedule repairs or replacements as needed. If the window failure poses an immediate safety hazard or requires urgent attention, contact emergency services or relevant authorities. Emergency services may include fire departments, building code enforcement agencies, or specialized technicians equipped to handle emergencies involving technological equipment.

6.7 EXAMPLE ASSIGNMENT 2.

Name: …….

Academic Year: ……

Facility Management

Assignment No. 4

Instructions for Maintenance and Use of the Apartment Building

1. Identification data of building:

Land area: 4 084 m 2

Built up area: 396 m 2

Paved area: 735 m 2

Green area: 2 965 m 2

Max. height of building: +17,180 m

Floors: 1 Underground floor

5 Above ground floor

Green coefficient : 72,3 %

Structural height: 3,2 m

Number of parking spaces in the underground floor: 25

Number of parking spaces outside the building: 5 + 1 for disabled

Usable area of the building: 2 800 m 2

Types and number of apartments on one typical floor:

– Apartment A: Two-bedroom - floor area 61,9 m 2

– Apartment B: Two-bedroom - floor area 85,5 m 2

– Apartment C: Two-bedroom - floor area 61,9 m 2

– Apartment D: Two-bedroom - floor area 85,5 m 2

2. Maintenance of construction

DOORS

Occupants should operate doors with care, avoiding excessive force or misuse that could lead to damage. Doors should be used only for their intended purpose,

such as entering and exiting rooms or providing access to designated areas. Slamming doors or blocking them open with objects should be avoided to prevent wear and tear. It is essential to keep doors always clear and unobstructed to ensure ease of movement and access within the building. This includes refraining from propping doors open with objects or obstructing doorways with furniture or other items.

Doors should be inspected regularly for signs of wear, damage, or malfunction. This includes checking for loose hinges, worn-out door handles or locks, and damage to the door frame or surrounding areas. Any issues identified during inspections should be addressed promptly to prevent further deterioration and ensure the safety of occupants. Cleaning of doors should be conducted regularly to remove dirt, dust, and grime that may accumulate over time. Special attention should be paid to door hardware such as handles, locks, and hinges, which should be lubricated as needed to maintain smooth operation.

Inspections may include checks for proper alignment and operation of doors, ensuring that locks and latches are functioning correctly, and verifying that fire doors are following safety regulations. The frequency of inspections may vary depending on factors such as the age and condition of the doors, the level of usage. However, the inspections should take place on a quarterly basis.

In the event of a door failure or malfunction, swift action is necessary to ensure the safety and security of occupants. The following protocol should be followed:
Reporting Procedure: Employees and visitors should report any door issues promptly to the designated maintenance contact.
Emergency Situations: In emergency situations where a door poses an immediate risk to safety or security, occupants should follow established evacuation procedures and notify emergency services if necessary. Maintenance Response: Upon receiving a report of a door failure, maintenance staff will assess the issue, prioritize repairs based on severity, and communicate updates to affected parties.

BATHROOM AND RESTROOM

In apartments, the design and materials used for bathrooms can vary depending on factors like budget, location, and architectural style.

The design and materials used in restrooms and bathrooms prioritize functionality, durability, and ease of maintenance, while still providing a pleasant and functional space for residents and guests.

Here we can see the main characteristics in a bathroom:

1. *Flooring*: Tile flooring is the main used because of its durability and high resistance to water. The most common options are ceramic, porcelain, or vinyl tiles.
2. *Walls*: The walls of the bathroom are typically covered with moisture-resistance material such as the ceramic tiles or the waterproof paint or moisture-resistant drywall (like cement board). These kinds of walls are usually used because of their ease of cleaning and resistance to water damage.
3. *Fixtures:* Standard bathroom fixtures in apartment buildings usually include a toilet, sink, and bathtub or shower. These fixtures are typically made of porcelain or fiberglass. In higher-end apartments, you might find fixtures made of more luxurious materials like marble or granite.
4. *Countertops:* Bathroom countertops are often made of materials like laminate, granite, marble, or quartz, materials used for the durability and functionality.
5. *Cabinetry*: Bathroom cabinets are typically made of materials like plywood, MDF (medium-density fiberboard), or solid wood. The cabinets may be covered with laminate or wood veneer for a finished look.
6. *Lighting*: Lighting in apartment bathrooms usually consists of overhead fixtures such as recessed lights or flush mounts, along with vanity lighting above the mirror. LED lighting is becoming increasingly popular due to its energy efficiency and longevity.
7. *Additional features*: Towel bars, toilet paper holders, and other accessories are often made of metal (such as stainless steel or chrome) for durability and resistance to moisture.

Rules and use of construction:

To ensure the functionality, safety, and cleanliness of these areas, certain guidelines and considerations must be followed by both tenants and property management. There are two main character that have some kind of responsibilities for this type of facility:

1. Landlords/Property Management:

They have to do regular inspections to ensure the structural integrity of bathroom facilities, identifying issues like leaks or deterioration. In addition, the inspection of plumbing systems for proper functionality, including pipes, drains, and fixtures. Finally, it is essential to check for ventilation effectiveness and adherence to safety regulations, such as the presence of grab bars and non-slip surfaces.

2. Tenants:

Tenants have the Responsibility for maintaining cleanliness and promptly addressing any spills or messes. It is also essential the prompt reporting of any maintenance concerns or issues to the landlord or property management. The Adherence to rules and regulations set forth by the landlord regarding bathroom facility use and maintenance.

Finally, the tenant is required to maintain an environment of privacy for those who use the bathroom and restroom, avoiding situations of discomfort or chaos within the room.

Maintenance rules

To ensure correct management of the bathroom in all its parts, it is necessary to observe some rules and standards:

- The compliance with local building codes ensures that bathrooms meet minimum size requirements, ventilation standards, and safety regulations for fixtures.
- Properly installed plumbing systems guarantee water supply, drainage, and waste removal, following guidelines for pipe sizing, venting, and connections.
- Adequate ventilation prevents moisture buildup and mold growth, requiring exhaust fans or windows meeting specific size and placement criteria.

- Bathrooms must accommodate individuals with disabilities, featuring wider doorways, grab bars, and clear floor space as per accessibility standards.
- Designing bathrooms with slip-resistant flooring, proper lighting, and ground fault circuit interrupters (GFCIs) ensures safety against accidents and electrical shocks.
- Waterproofing surrounding shower, bathtub, and sink areas prevents water damage to building structures, utilizing appropriate membranes, sealants, and installation methods.
- Strategically placing toilets, sinks, and showers optimizes space and functionality while ensuring ease of access.
- Durable, moisture-resistant materials like ceramic tiles and non-porous countertops are chosen for bathroom construction.
- Incorporating energy-efficient fixtures like low-flow toilets and LED lighting reduces water and energy consumption.
- Compliance with permit requirements and inspections ensures adherence to building codes and safety standards during construction or renovation.

Frequency of Inspections:

- Routine Maintenance: Regular inspections conducted by property management to address maintenance issues promptly, with the frequency based on building age and condition.

- Response to Reports: Immediate response to tenant reports of maintenance issues, conducting inspections as needed to assess and address reported problems.

Emergency Response Procedures:

1) Turn off water or power supply in case of immediate safety hazards like leaks or electrical malfunctions.
2) Notify building management or property management to report the issue, providing detailed information.
3) Contact emergency services if the issue poses an immediate threat to health or safety, such as gas leaks or major water leaks.
4) Coordinate with specialized suppliers or contractors for repairs, such as plumbers or electricians.

5) Implement temporary measures to address the issue until permanent repairs can be made.
6) Document the issue through photos, videos, and communication records for insurance claims and record-keeping purposes.
7) Follow-up with building management to ensure timely resolution of the issue and preventive measures for future incidents.

BALCONIES AND LOGGIAS

Balcony design and materials in apartment buildings can vary based on architectural style, budget, and local building regulations. Nonetheless, there are common features and materials often employed in balcony construction:

1. *Flooring*: Balcony flooring options span from concrete to various decking materials. While concrete is sturdy and low maintenance, it may lack visual appeal. Wood decking, like pressure-treated lumber or composite alternatives, offers a warmer aesthetic but demands more upkeep. Porcelain tiles or stone pavers are additional choices, offering durability and an elegant appearance.
2. *Railings*: Essential for both safety and aesthetics, balcony railings are commonly crafted from metal (such as aluminium or steel), glass, or wood. Metal railings are favored for their durability and modern look, while glass options provide clear views and contemporary style. Wooden railings offer a more classic appearance that can complement specific architectural designs.
3. *Privacy Screens*: Depending on the building's layout, balconies may feature privacy screens or partitions to create separation or shield occupants from neighboring views. These screens come in various materials such as wood, metal, glass, or composites.
4. *Outdoor Furniture*: Balcony furniture enhances functionality and comfort. Rattan, wicker, metal, or wood are popular materials for outdoor furniture, which should be weather-resistant to endure outdoor conditions and maintain longevity.

5. *Lighting*: Essential for safety and ambiance, balcony lighting options include wall-mounted fixtures, pendant lights, string lights, or integrated LED lighting. Solar-powered lights are also favoured for their energy efficiency and simple installation.
6. *Greenery*: Many residents incorporate plants and greenery into balcony design to introduce natural beauty and create a welcoming outdoor space. Planters made from terracotta, metal, or composite materials can hold an array of plants, flowers, and herbs.

Rules and use of construction

Balconies and loggias in apartment buildings offer residents valuable outdoor spaces for relaxation and enjoyment. However, to maintain safety, structural integrity, and a pleasant living environment, specific rules and responsibilities govern their use and maintenance.

1. Landlord:

They bear the responsibility for structural maintenance and repairs, including ensuring railing safety and waterproofing. In addition, they may conduct periodic inspections to check for issues like water leaks or surface deterioration.

2. Tenant:

They are accountable for maintaining cleanliness and orderliness on their balconies and loggias, including sweeping, or washing. In addition, they must avoid overloading balconies or loggias with excessive weight, which could compromise structural integrity and ensure that all furniture or fixtures placed on balconies or loggias are securely anchored and stable to prevent accidents.

Tenants should also furnish balconies and loggias with weather-resistant outdoor furniture and decor made of materials like metal or wood and refrain from activities that could damage the balcony or loggia structure, such as drilling holes or using corrosive cleaning agents without permission.

Tenants are encouraged to promptly report any maintenance concerns related to their balcony or loggia to the landlord or property management: issues such as loose railings or signs of structural damage should be reported immediately for prompt action.

Tenants should be mindful of noise levels, especially during late hours, to avoid disturbing neighbours while using their balconies or loggias. Respect for

neighbours' privacy, particularly in shared spaces or apartments with adjoining balconies, should be maintained.

Maintenance rules

- Regular inspection and maintenance of balcony railings are essential to prevent falls and ensure safety.
- Prohibited activities encompass hanging heavy objects or installing fixtures without proper authorization to prevent damage.
- Use of flammable materials or storing hazardous items is generally prohibited due to safety concerns.
- Barbecuing or grilling may be prohibited due to fire safety concerns and local regulations.

Frequency of Inspections:

The frequency of inspection for balconies and loggias changes depending on several conditions: at first the age of the balconies is something to observe, because older balconies or those with a history of maintenance issues may require more frequent inspections. Then, the balconies exposed to harsh weather conditions, such as coastal areas prone to salt exposure or regions with extreme temperatures, may require more frequent inspections to monitor for corrosion, deterioration, or water damage. Finally, the Property management may adjust inspection frequencies based on tenant feedback or reports of issues related to balconies.

In the event of a failure or emergency concerning balconies and loggias within a building, tenants or residents should promptly take appropriate actions to address the issue. Below are the recommended steps to follow and whom to contact:

1) If there's an immediate safety concern, such as structural damage or collapse, evacuate the area and ensure occupants' safety: block off access to areas with hazards like loose railings, unstable furniture, or broken glass to prevent accidents.
2) Notify the building or property management company promptly to report the issue. They are responsible for coordinating repairs and maintenance

for the building's exterior and common areas. Provide detailed information about the problem, including observed damage or safety hazards.

3) If the issue poses an immediate threat to health or safety, such as structural instability or the risk of falling objects, contact emergency services (e.g., fire department or local authorities) immediately. Emergency services can provide immediate assistance and take necessary actions to mitigate risks and ensure occupants' safety.
4) Building management may need to contact specialized suppliers or contractors depending on the issue's nature. For structural damage, they may engage a licensed contractor or engineer. For safety hazards like loose railings, a construction or maintenance company may be contacted.
5) Implement temporary measures, if necessary, until permanent repairs can be made. This may include placing barriers or warning signs to restrict access to unsafe areas. Follow instructions provided by building management or emergency services to ensure safety and minimize risk.
6) Documentation is essential for insurance claims and demonstrating that appropriate actions were taken to address the issue. Document the problem by taking photos or videos and keep records of communication with building management or emergency services.
7) Follow up with building management to ensure repairs are completed promptly and satisfactorily. Request updates on repair progress and any preventive measures needed to prevent similar issues in the future.

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CONCLUSION

The primary goals of FM include increasing efficiency and productivity, optimizing costs, ensuring health and safety, and supporting the core business by maintaining a **smooth operation of support processes**. FM provides several advantages, including cost savings, enhanced productivity, improved service quality, increased employee satisfaction, and real estate value preservation. Multiple definitions and views from different organizations and institutions highlight FM's strategic importance in optimizing processes and increasing efficiency, sustainability, and organizational value. FM involves integrating various activities, supporting core operations, and addressing the needs of the built environment and its occupants. Facility managers play a crucial role in planning, coordinating, and controlling FM activities, requiring knowledge in various fields such as technology, law, safety, and sustainability. Their tasks include property and cost management, contract handling, safety assurance, and communication, which altogether contribute to the efficient functioning and success of an organization. FM is essential for the efficient operation of organizations by focusing on optimizing support processes rather than just managing buildings and technical equipment. Key areas include the working environment, support processes, and FM management, which encompass spatial planning, building maintenance, cleaning, safety, and environmental management. FM also involves ancillary services like reception and catering, control processes such as planning and budgeting, and interconnection of all processes which affect each other, highlighting the need for a holistic approach.

Selecting the right facility management service provider is critical for an organization's operations and image. Key areas impacted by FM include operating costs, employee productivity, organizational image, safety, and compliance with regulations. To choose an FM provider, consider their experience, service scope, staff expertise, technology use, financial stability, pricing, communication approach, flexibility, and certifications. The selection process involves defining needs, searching for suppliers, preparing a Request for Proposal, evaluating bids, holding meetings with vendors, choosing the best fit, and finalizing a contract. To determine the most suitable provider, criteria such

as income, offer price, and employee count are measured. Points are assigned based on whether criteria maximization or minimization is desired, with higher points reflecting more suitable values. Criteria are weighted by importance in decision-making, and the provider with the highest weighted score is chosen. In cases of ties, focus on the criterion with the highest benefit.

FM services aim for cost optimization, risk reduction, and technological integration to support organizational productivity. The International Facility Management Association identifies core processes like operations, finance, sustainability, communication, and risk management. Ultimately, effective FM enhances the working environment, reduces costs, increases property value, and improves organizational reputation. Key Performance Indicators (**KPIs**) in FM serve as **measurable metrics to manage, evaluate, and improve FM services**, supporting strategic objectives and decision-making. Maintenance Process Sheets further standardize and document FM activities, enhancing process consistency, efficiency, service quality, and risk management. Overall, FM is integral to modern organizations, offering strategic benefits by optimizing support functions, ensuring sustainability, and contributing to economic success.

Process sheets are crucial for effective process management in facility management (FM), offering a structured approach to **optimize building operations**. They outline process purposes, steps, inputs, outputs, success criteria, and risk mitigation. In FM, process sheets guide maintenance, cleaning, safety, energy management, premises and supplier management, offering benefits like standardization, efficiency, improved communication, service quality, risk reduction, and streamlined employee onboarding. Implementing process sheets requires **employee involvement, clear language, regular updates**, and appropriate software tools. These sheets are integral to FM, promoting standardization, efficiency, risk reduction, and service quality improvement. For building structures, process sheets are essential in maintenance planning and evaluation, specifying activity periodicity based on legislative needs and providing guidelines for quality maintenance. They help determine optimal life cycle costs and performance KPIs, covering criteria like process completion, execution time, quality, and user satisfaction. Additionally, maintenance manuals include process sheets detailing equipment needs,

responsibilities, and technical requirements, directly affecting future operating costs.

Space management is a crucial component of facility management, focusing on efficient spatial resource planning to enhance organizational productivity, reduce costs, and ensure user comfort. Key elements include space planning, allocation, interior design, occupancy management, and relocation. Effective space management offers **cost reductions, improved work efficiency, better communication, adaptability, enhanced company image**, and well-being for employees. Modern tools facilitating space management include CAFM systems, IWMS, BIM, occupancy sensors, and reservation systems. Strategies like hot-desking, activity-based working, and flexible working accommodate organizational needs. Proper space management is vital in the dynamic environment for optimizing resources and increasing employee productivity. Assignments in space management involve designing layouts, marking furnishings and equipment, considering airflow, and ensuring effective signage for safety and operational efficiency.

In the context of construction and property management, FM is crucial for efficient operation and sustainability of buildings, with a building maintenance manual as a key tool. This manual contains detailed information for planning, implementing, and controlling maintenance activities, encompassing technical data, maintenance procedures, inspection schedules, and supplier contacts. A well-maintained building benefits from **optimized costs, increased safety, improved uptime, higher property value, and support for audits**. Essential contents of the manual include general building information, technical equipment data, maintenance procedures, spare parts lists, and supplier contacts. Legislation varies across regions regarding the requirement of maintenance manuals. For example, in Finland, completion and submission of a maintenance manual are mandatory for building approval, whereas in Slovakia, legislation emphasizes keeping buildings in good condition to prevent risks. Preventive rather than reactive maintenance is recommended to reduce costs and improve efficiency. Overall, FM aims to create and maintain building environments supporting organizational efficiency and service continuity, emphasizing the continued importance and updating of maintenance manuals.

CONSTRUCTION FACILITY MANAGEMENT

SEMINAR II

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