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## Section: Food Technologies

# ACCESSIBILITY AND COMFORT OF FOODSERVICE ENTERPRISES: PRINCIPLES OF INCLUSIVE ENGINEERING

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**Abstract.** The article is devoted to the analysis of the principles of inclusive engineering in the context of foodservice enterprises, focusing on the creation of accessible and comfortable environments for persons with disabilities, war veterans, and other groups with limited mobility. Practical recommendations are proposed for adapting workplaces, utilizing ergonomic equipment, and implementing barrier-free design. The article discusses the advantages of inclusivity, such as social integration, economic efficiency, and the improvement of a company's image, as well as challenges related to high costs and spatial constraints. The importance of an inclusive approach is emphasized as a key factor in the sustainable development of foodservice enterprises in Ukraine.

**Keywords:** inclusion, inclusive engineering, foodservice enterprises, restaurant facilities, accessibility, comfort, people with limited mobility, war veterans, design, architecture

**Introduction.** Foodservice enterprises that specialize in the production of unique, high-quality, and personalized restaurant products represent a vital segment of the modern economy. In a competitive environment, such businesses must continuously improve their operational processes to remain attractive to both consumers and employees. One of the key areas of development is the creation of an inclusive environment that takes into account the needs of all categories of workers, including

persons with disabilities, war veterans, and other groups with limited mobility [1–21]. Inclusive engineering, as a comprehensive approach to designing and organizing inclusive spaces, plays a crucial role in ensuring equal access, safety, and comfort for all users.

This approach involves the adaptation of workplaces and customer areas through the use of ergonomic equipment, the creation of barrier-free environments, and the implementation of staff training programs on inclusion. These measures not only align with the principles of social responsibility but also contribute to economic efficiency by reducing staff turnover, increasing productivity, and enhancing the public image of the foodservice enterprise [2]. Inclusive engineering is especially relevant in Ukraine, where the social reintegration of war veterans and persons with disabilities has become an important societal goal [3]. This article examines the principles, methods, and practical recommendations for implementing inclusive engineering in foodservice enterprises, as well as its benefits and challenges.

**Relevance of the topic.** Issues of inclusivity and accessibility are gaining increasing importance in the context of global societal and economic changes. Modern foodservice enterprises face the need to adapt to new social standards that require the creation of conditions for equal participation of all population groups in the workforce [4]. Buildings and facilities accessible to people with limited mobility are those that incorporate a set of architectural, engineering, ergonomic, structural, and organizational measures that comply with regulatory requirements for safety and accessibility for such groups [7]. Inclusivity not only aligns with ethical principles but also generates economic benefits by fostering employee loyalty, reducing recruitment costs, and enhancing a company's public image [3].

In Ukraine, the reintegration of war veterans – who often face physical and psychological challenges upon returning to civilian life – has become especially significant [5]. Research indicates that companies implementing rehabilitation and retraining programs for veterans and people with disabilities achieve higher employee engagement and enjoy a better reputation [6]. Furthermore, regulatory documents [7] set clear standards for building accessibility, compelling enterprises to adapt their infrastructure for people with limited mobility. Foodservice establishments are required to ensure accessibility for persons with disabilities, including safe stairways, ramps, handrails, and non-slip flooring [8]. While such adaptations present challenges for restaurant facilities operating in compact spaces, they also open up opportunities for innovative engineering solutions that enhance competitiveness.

An inclusive approach also attracts a wider customer base, as businesses demonstrating social responsibility become more appealing to ethically conscious consumers [4]. Therefore, inclusive engineering is not only a contemporary necessity but also a strategic tool for the sustainable development of foodservice enterprises.

**Research aim and objectives.** The aim of this article is to analyze the principles of inclusive engineering and develop recommendations for their implementation in

foodservice enterprises to create an accessible, safe, and comfortable environment that promotes social integration and enhances business efficiency.

The objectives of the article are as follows:

- to identify the key principles of inclusive engineering for foodservice enterprises;
- to analyze regulatory requirements for the accessibility of workplaces and areas for visitors with disabilities and limited mobility;
- to evaluate the methods and materials used to create a barrier-free environment;
- to develop practical recommendations for implementing inclusive engineering solutions;
- to discuss the advantages and challenges of integrating inclusive practices.

**Materials and methods.** To achieve the stated aim, the following research methods were applied:

- literature analysis – to determine the theoretical foundations of the study;
- data systematization – to summarize information on architectural planning and engineering measures.

The materials used to create an inclusive environment comply with national regulatory standards [7, 8].

**Results and discussion.** Inclusive engineering for foodservice enterprises is a modern approach in the context of Ukraine's recovery, integrating three key dimensions:

- technical aspects;
- social aspects;
- economic aspects.

Technical aspects are implemented through inclusive solutions that comply with national regulatory standards [7, 8], ensuring that the infrastructure of foodservice establishments is adapted for individuals with limited mobility. These solutions include:

- architectural and planning interventions, such as dedicated parking spaces; ramps with slopes up to 8% that are safe and convenient for wheelchair access; handrails and protective barriers suitable for personal mobility devices; and non-slip floor coverings to reduce the risk of injury;
- engineering and technical measures, including ventilation and air conditioning systems compliant with regulatory requirements [9]; energy-efficient heating systems with thermal insulation; and alternative energy sources to ensure uninterrupted equipment operation;
- ergonomic equipment, such as height-adjustable tables and chairs adapted to individual rehabilitation needs (Figures 1–2); and mechanical lifts for individuals with disabilities;
- informational tools, such as Braille signage for visually impaired individuals; and auditory navigation systems integrated into the overall interior design concept [8];

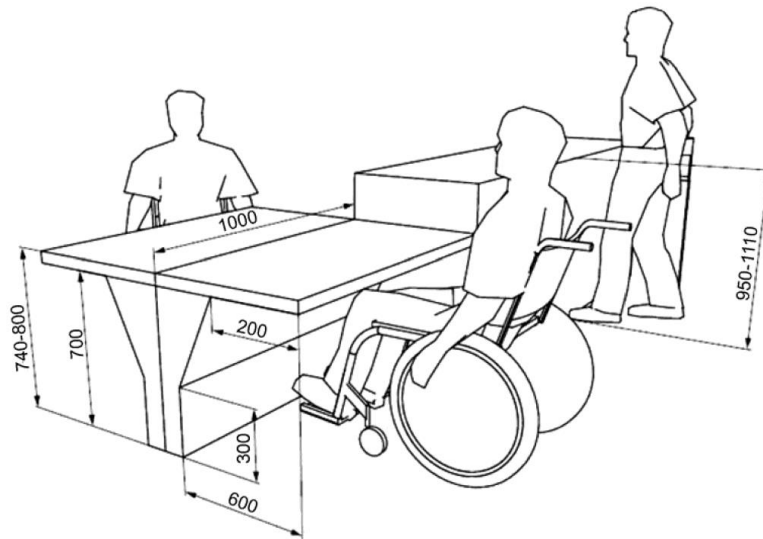


Figure 1. Parameters of workplace equipment [7]

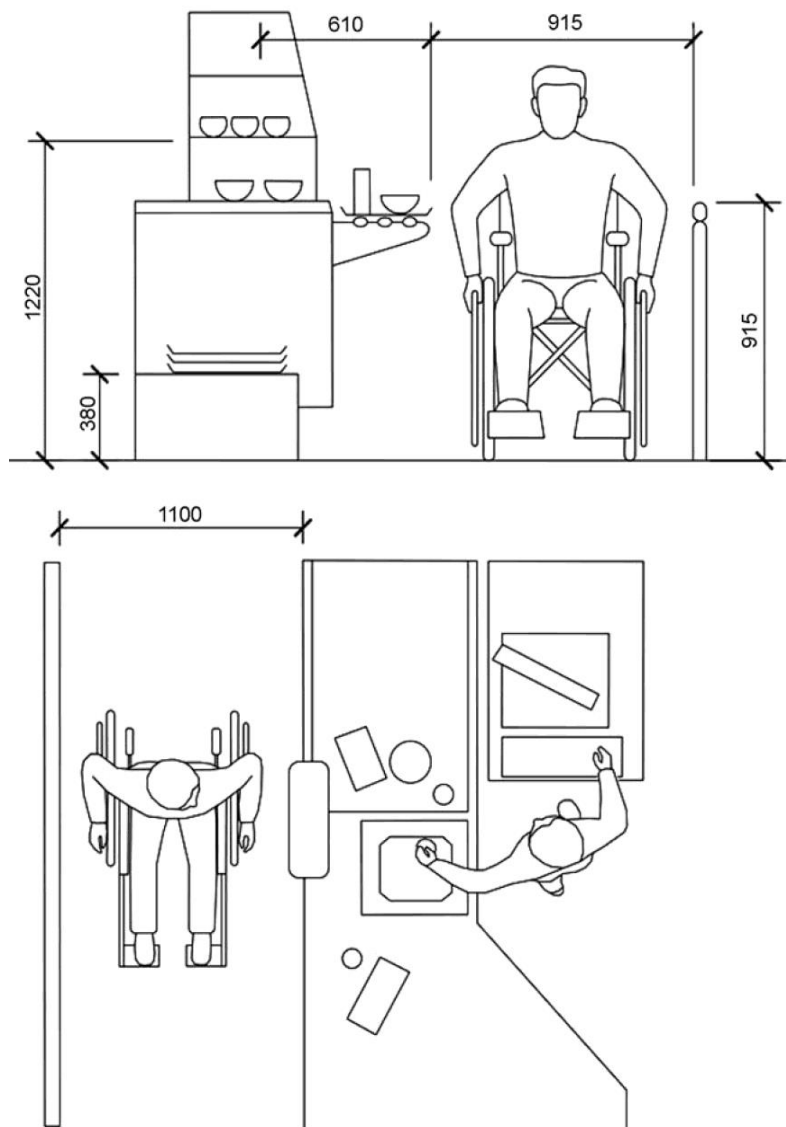


Figure 2. Dimensions of equipment at foodservice enterprises [7]

– specialized facilities, including entrance lobbies, accessible restrooms, and washbasins designed for people with reduced mobility [7]; and cloakroom counters adjusted for use by persons with disabilities [7] (Figure 3).

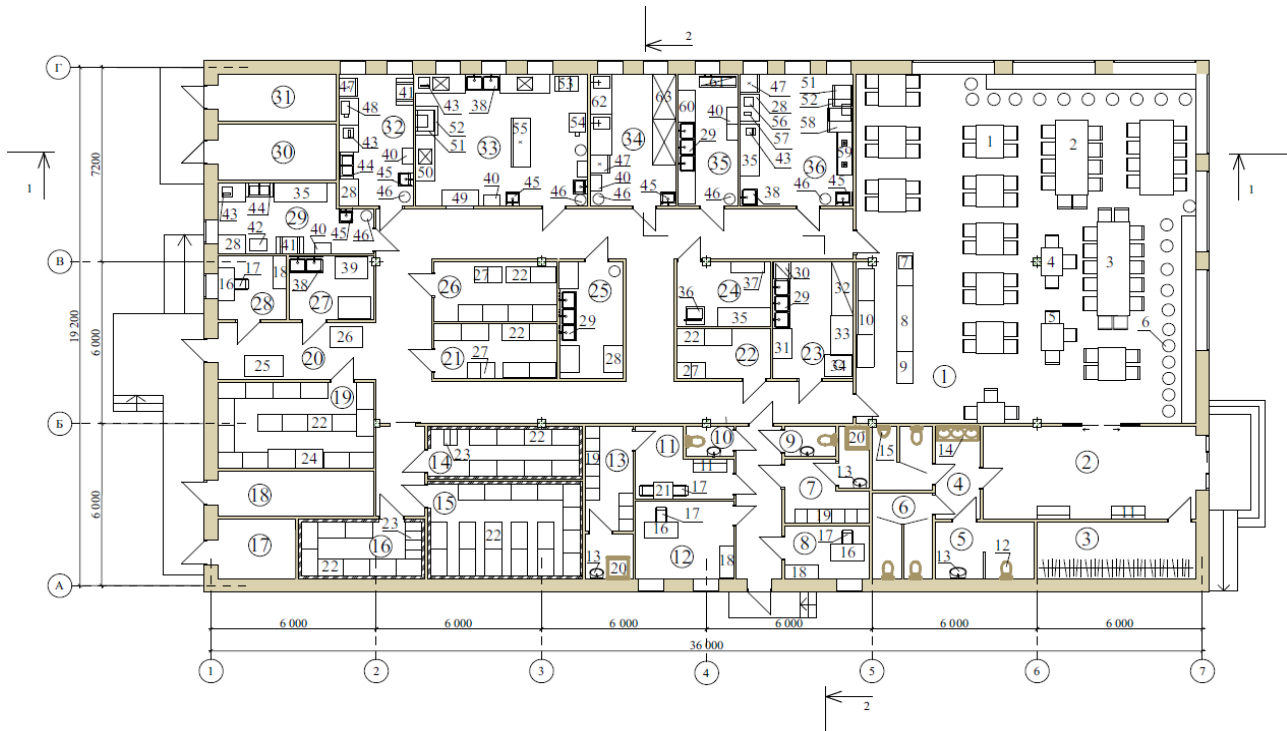


Figure 3. Floor plan at elevation 0.000 of a foodservice enterprise. Room legend:

1 – restaurant hall; 2 – vestibule; 3 – cloakroom; 4 – restroom; 5 – restroom for persons with reduced mobility; 6 – guest restrooms; 7 – male staff cloakroom; 8 – office; 9 – male staff restrooms; 10 – female staff restrooms; 11 – staff room; 12 – director’s office; 13 – female staff cloakroom; 14 – refrigerated room for meat and fish; 15 – refrigerated room for vegetables, fruits, and greens; 16 – refrigerated room for dairy, gastronomy, and eggs; 17 – exhaust ventilation room; 18 – heat station; 19 – dry goods storeroom; 20 – loading area; 21 – vegetable and root vegetable storeroom; 22 – janitorial inventory and equipment room; 23 – dishwashing area; 24 – bread slicing room; 25 – egg processing room; 26 – dry products storeroom; 27 – ware and inventory washing and storage area; 28 – storekeeper’s office; 29 – vegetable processing room; 30 – electrical room; 31 – supply ventilation room; 32 – meat and fish processing room; 33 – pastry room; 34 – cold kitchen; 35 – kitchenware washing area; 36 – hot kitchen

Social aspects are manifested through the adaptation of workplaces for persons with disabilities and war veterans, which facilitates their reintegration into society and represents an important step toward creating a just and equitable community [5]. Retraining programs for veterans enable them to acquire new skills, thereby increasing their confidence and engagement in the workforce. This also contributes to reducing social tension and fostering a more inclusive society. Enterprises that demonstrate social responsibility attract customers who value ethical principles, which promotes the formation of a loyal audience and enhances market competitiveness [4]. Food service establishments that ensure accessibility for people with limited mobility can attract consumers who prefer brands with a social mission.

Economic aspects relate to the reduction of staff turnover and the creation of a

comfortable environment, which lowers costs associated with recruiting and training new employees [3]. In food service enterprises, at least 5% of seats in dining areas served by waitstaff must be adapted for persons using wheelchairs, thereby attracting a wider audience and increasing profitability [8]. Furthermore, inclusive enterprises may receive government support for implementing accessible solutions.

Food service enterprises face several challenges in implementing inclusive engineering principles:

- high initial costs associated with adapting infrastructure, purchasing specialized equipment, and installing energy-efficient systems, which require significant investments. This can be a substantial barrier for small-scale dining establishments with limited customer capacity;

- limited space in food service facilities located in small premises complicates the creation of barrier-free environments, such as installing ramps or wide passageways for wheelchair users [3]. Renovation in older buildings may be restricted by architectural features and limited floor areas;

- the implementation of cultural and gender sensitivity, as well as training on ethical interaction with persons with disabilities, requires regular sessions, which can be difficult for small enterprises with constrained resources [1];

- in older buildings, installing modern engineering solutions such as ventilation or heating systems may be challenging due to structural limitations [9]. For example, locating production areas for persons with limited mobility in basement levels is prohibited unless medically justified [7].

To overcome these challenges, it is recommended to engage specialized engineering firms experienced in designing inclusive spaces. For instance, workplace design for persons with disabilities should consider individualized rehabilitation programs [7]. Government support programs, such as grants for workplace adaptation, can alleviate financial burdens. Informing employees and consumers about the benefits of inclusivity fosters positive perceptions. For example, accessibility information about the enterprise (type, class, menu) should be made understandable to persons with visual impairments, in compliance with regulatory requirements [8].

Integrating an inclusive approach at all stages of enterprise activity—from design to operation – reduces the need for subsequent modifications. Employing universal design that accommodates the needs of all users lowers long-term costs [7]. Cooperation with public organizations can help develop effective solutions, such as modular workstations or digital technologies (e.g., voice assistants for persons with visual impairments).

**Conclusions.** Inclusive engineering is a vital direction in the development of food service enterprises, ensuring the creation of accessible, safe, and comfortable environments. The adaptation of workspaces, use of ergonomic equipment, provision of optimal microclimate, and informational accessibility contribute to social integration and increased productivity. Despite challenges related to high costs and limited space, inclusivity opens new opportunities for engaging both consumers and employees, as well as for building a positive image.

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