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Ramps as Performative Infrastructures: Obliqueness, Embodiment, and the Governance of Access

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Abstract. Within regulatory documents, technical manuals, and compliance-led architectural practice, ramps are predominantly described through measurable requirements such as gradient, width, landings, handrails, and surface characteristics. While these criteria establish essential minimum conditions of access, they may also encourage designers and approving authorities to treat the ramp as a compensatory addition to an already defined spatial arrangement. This paper does not attribute this instrumental understanding to disabled people or disability advocates; rather, it identifies a recurrent tendency within professional practice to separate accessibility from architectural conception. Drawing upon Claude Parent's *fonction oblique*, Le Corbusier's *promenade architecturale*, accessibility research, Disability Studies, and the theoretical contributions of Judith Butler and Bruno Latour, the paper interprets the ramp as a performative infrastructure: a spatial device that generates architectural form, organises embodied movement, and shapes participation.
The study adopts a critical interpretative methodology combining architectural theory, the social model of disability, the International Classification of Functioning, Disability and Health, Universal Design principles, and evidence-based accessibility standards. Selected projects are examined as architectural demonstrations rather than as models of regulatory compliance. The analysis distinguishes three interconnected but non-equivalent conditions: spatial generativity, measurable accessibility performance, and equitable participation. The paper argues that a ramp becomes an instrument of Universal Design only when architectural continuity is combined with equitable use, low physical effort, legibility, appropriate gradients, resting opportunities, and integration within the principal circulation system.

Keywords. Ramp; Performative Infrastructure; Universal Design; Accessibility; Embodied Movement; Architectural Promenade

1. Introduction

Within regulatory documents, technical manuals, and a substantial part of routine architectural practice, ramps are predominantly described through measurable requirements such as gradient, width, landing dimensions, handrail configuration, and surface characteristics. These requirements have been fundamental in establishing minimum conditions of access. Nevertheless, when accessibility is addressed after the

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principal spatial decisions have already been made, designers, clients, and approving authorities may treat the ramp as a compensatory element added to an otherwise complete project rather than as an integral component of architectural conception [1–3].

This paper does not attribute such an instrumental understanding to disabled people or disability advocates, whose experience and activism have been central to challenging exclusionary environments. The criticism concerns instead a recurrent tendency within compliance-led professional practice to separate accessibility from architectural authorship and to regard regulatory conformity as the conclusion, rather than the starting point, of inclusive design [2,3].

Such a perspective obscures the broader agency of the ramp. Beyond its technical function, the inclined plane influences bodily movement, perception, orientation, and participation. It organizes spatial continuity, structures circulation systems, and mediates relationships between individuals and the built environment. The ramp therefore operates simultaneously at architectural, experiential, social, and political levels.

This paper proposes that ramps should be understood as performative infrastructures: spatial devices that not only enable movement but actively participate in producing forms of accessibility, autonomy, and inclusion. Drawing on architectural theory, accessibility research, Universal Design principles, and the International Classification of Functioning, Disability and Health (ICF), the paper examines how ramps mediate between body, environment, and participation.

2. Methodology and Theoretical Framework

This conceptual study adopts a critical interpretative methodology combining four bodies of knowledge: architectural theories of inclined space and movement; Disability Studies and the social model of disability; Universal Design and the ICF; and evidence-based accessibility research. Selected projects are used as analytical demonstrations rather than as case studies or compliance assessments. They are examined to distinguish three interconnected but non-equivalent qualities: the capacity of the ramp to generate architectural space, its measurable accessibility performance, and its role in enabling participation.

Architectural discourse has often privileged the horizontal plane as the primary condition of inhabitation. Claude Parent's theory of the *function oblique* challenged this assumption by proposing inclination as an alternative spatial paradigm. Developed during the 1960s within the Architecture Principe [4] group, the theory suggested that inclined surfaces could transform the relationship between body and space, replacing static occupation with dynamic engagement.

For Parent, inclination was not simply a technical solution but a generative architectural principle. The oblique plane destabilized conventional distinctions between floor, wall, and circulation, producing new spatial configurations and new forms of bodily experience. Architecture became an active field in which gravity, movement, and perception continuously interacted.

The significance of this interpretation lies in its capacity to reposition the ramp from an auxiliary circulation element to a generator of architectural form. When incorporated from the earliest stages of design, ramps influence sectional organization, spatial hierarchy, and circulation systems. Rather than connecting pre-existing spaces, they actively contribute to their formation.

A complementary perspective emerges in Le Corbusier's concept [5] of the *promenade architecturale*. In projects such as Villa Savoye, movement becomes a primary instrument of architectural composition (Figure 1). Space is not perceived instantaneously but gradually unfolds through the displacement of the body. The ramp structures a sequence of visual and spatial events that transform circulation into architectural experience.

This process introduces a temporal dimension into architecture. The built environment is experienced through duration, progression, and anticipation. The architectural object is therefore understood not as a static composition but as a narrative sequence revealed through movement. In this sense, the ramp becomes one of the principal devices through which architecture engages with what has often been described as its "fourth dimension": time.

The Guggenheim Museum in New York further illustrates this principle (Figure 2). Here, the continuous spiral ramp constitutes the primary organizational structure of the building. Visitors experience the museum through a single uninterrupted movement, demonstrating how circulation can become the fundamental generator of architectural perception.

These canonical examples demonstrate the architectural potential of inclined circulation, but they should not be interpreted uncritically as models of contemporary accessible ramp design. Their gradients, uninterrupted lengths, resting conditions, edge protection, and handrail configurations may not satisfy current accessibility requirements. They demonstrate spatial integration and architectural experience, but not necessarily equitable usability.

The experiential implications of inclined movement have also been explored through phenomenological approaches to architecture. Pallasmaa [6] emphasizes the role of the body as the primary medium through which architecture is perceived and understood. Movement through space involves sensory, cognitive, and proprioceptive processes that connect physical action with spatial meaning. Inclined planes intensify this relationship because they make the presence of gravity, effort, and bodily orientation particularly evident.

The ramp therefore operates simultaneously as a spatial, temporal, and corporeal device. It generates form, structures experience, and mediates the relationship between body and environment.

2.1. Performativity and Socio-Technical Agency

The ramp can also be interpreted through performativity and Actor–Network Theory. Following Butler [7], accessibility is not a fixed property possessed by a building but an outcome repeatedly enacted through interactions between users and environments. Latour [8] similarly shows that such outcomes emerge from networks of human and non-human actors. Ramp usability therefore depends not only on geometry but on the interaction among bodies, materials, surfaces, climate, maintenance, regulations, assistive technologies, and institutional decisions. The ramp does not merely accommodate movement: it participates in producing particular conditions of mobility, autonomy, and participation.

This understanding is particularly relevant for Universal Design. Inclusive environments cannot be reduced to compliance with technical prescriptions. Instead, they require an integrated consideration of spatial, social, and environmental factors capable of supporting diverse forms of participation.

2.2. Accessibility Standards and Evidence-Based Design

While architectural theory highlights the spatial and experiential dimensions of ramps, accessibility research has focused on their measurable performance. Among the most influential contributions in this field are the studies conducted by Timothy Nugent [9], who investigated the relationship between slope gradients, wheelchair mobility, and physical effort.

Through experimental testing, Nugent translated subjective experiences of fatigue and difficulty into quantifiable design parameters. These studies played a significant role in establishing the foundations of contemporary accessibility standards. Their importance lies not only in the development of technical prescriptions but also in demonstrating that accessibility can be investigated through evidence-based methods.

Contemporary standards such as the ADA Standards for Accessible Design (2010) [10], ISO 21542:2021 [11], and EN 17210:2021 [12] continue this tradition by defining dimensional criteria intended to support usability and participation. Although the specific requirements vary according to context and jurisdiction, they share a common objective: reducing environmental barriers and facilitating independent movement.

However, standards should not be understood as neutral technical instruments. They embody assumptions regarding acceptable levels of effort, safety, autonomy, and participation. In this sense, they function as regulatory frameworks through which societies define conditions of access.

Applied to ramps, the Principles of Universal Design provide specific criteria rather than a generic aspiration [13,14]. Equitable Use requires the principal route to be shared rather than assigning disabled users to a secondary entrance or circulation system. Simple and Intuitive Use concerns legibility, continuity, and wayfinding. Low Physical Effort relates directly to gradient, total length, resting opportunities, surface resistance, and the effort required for walking or manual wheelchair propulsion. Size and Space for Approach and Use concerns width, turning areas, passing spaces, and the coexistence of users moving at different speeds. Flexibility in Use becomes relevant when the route supports walking, wheeling, pausing, orientation, and social encounter.

Architectural prominence is therefore insufficient. A ramp may be visually central and spatially generative while remaining too steep, too long, or insufficiently equipped for some users. Universal Design emerges only when architectural integration and evidence-based accessibility performance are conceived together.

3. Discussion

3.1. From Compensatory Device to Spatial Infrastructure

The preceding analysis suggests that neither architectural prominence nor regulatory compliance is sufficient in isolation. A generative ramp may remain physically demanding, while a technically compliant ramp may remain segregated, marginal, or spatially incoherent. The central issue is therefore the integration of architectural continuity, measurable performance, and equitable participation.

A clearer convergence between architectural experience and inclusive performance is found at the Hamaren Treetop Walk in Fyresdal, Norway (Figure 3), designed by EFFEKT [15]. Rather than treating accessibility as a secondary provision, the project develops a continuous elevated route through the forest, allowing visitors with different

physical abilities to share the same spatial and landscape experience. The gently sloping timber walkway gradually rises among the trees and culminates in a circular viewing structure, while rest points and a continuous, step-free route reduce physical effort and support a wide range of users, including wheelchair users, older visitors, families with strollers, and people with limited mobility. Here, the ramp is no longer perceived as an assistive device added to the landscape, but as the very means through which the landscape is experienced. Spatial sequence, equitable use, low physical effort, rest, orientation, and contact with nature are therefore conceived as a single design problem.

This distinction between additive and generative ramps is particularly important within Universal Design discourse. Accessibility is often associated with adaptation, whereas Universal Design promotes the integration of inclusive principles from the earliest stages of conception. The ramp therefore acquires a triple role: it is simultaneously an architectural generator, an accessibility infrastructure, and a shared setting for participation.

Such a position challenges the traditional separation between aesthetics and accessibility. If ramps are understood as spatial infrastructures rather than technical appendices, accessibility can become an opportunity for architectural invention rather than a limitation imposed by regulation.

3.2. Embodied Accessibility and Human Functioning

The relational interpretation adopted here draws first on the social model of disability, which distinguishes bodily impairment from the disabling effects produced by social and environmental barriers [1]. Disability is therefore not located exclusively within an individual body but emerges when spatial, institutional, and attitudinal conditions restrict activity and participation. Disability Studies have further shown that professional practices, design standards, and material environments actively contribute to determining which bodies can use and inhabit space autonomously [2,3].

Ramps make this relationship particularly visible. Movement along an inclined plane involves effort, balance, rhythm, orientation, and proprioception. Depending on gradient, length, resting opportunities, surface resistance, handrail configuration, and integration within the circulation system, the same ramp may facilitate participation or become a disabling environment.

This perspective aligns closely with the International Classification of Functioning, Disability and Health (ICF). Developed by the World Health Organization, the ICF shifted attention away from disability as an individual characteristic and toward the interaction between persons and environments. According to this framework, functioning is produced through relationships among body functions, activities, participation, and contextual factors.

Within the ICF model, architectural environments operate as environmental factors that may either facilitate or restrict participation. Ramps are particularly illustrative of this principle. Depending on their slope, length, surface characteristics, orientation, and integration within circulation systems, they may function either as facilitators or as barriers.

The social model and the ICF are related but not identical. The former foregrounds the social production of disability, whereas the latter describes functioning as an interaction among bodily conditions, activities, participation, and contextual factors. Read together, they support an understanding of the ramp not as a specialised response

to an exceptional body, but as an environmental condition through which mobility and participation are produced.

3.3. Governance, Standards, and Inclusion

Accessibility standards are not neutral descriptions of geometry: they embody collective decisions concerning acceptable levels of effort, safety, independence, and participation. The ADA Standards, ISO 21542, and EN 17210 translate empirical and political choices into minimum spatial conditions. In performative and socio-technical terms, these regulations participate—together with designers, users, materials, maintenance, and management—in producing the accessibility of the built environment.

The circulation systems of SESC Pompéia by Lina Bo Bardi exemplify this condition (Figure 4). The elevated ramps connecting different parts of the complex function simultaneously as accessibility infrastructures, architectural landmarks, and spaces of social interaction. Their significance cannot be reduced to movement alone; they contribute to shaping collective experience and participation.

This interpretation resonates strongly with Universal Design. Inclusive environments are not achieved solely through the elimination of barriers but through the creation of conditions that support diverse forms of participation. Accessibility becomes a social and spatial resource rather than a technical obligation.



Figure 1. Villa Savoye, Poissy (1928–1931), designed by Le Corbusier. The internal ramp structures the architectural promenade, transforming movement into a sequential spatial experience. (Source: Wikimedia Commons, Creative Commons licence).



Figure 2. Solomon R. Guggenheim Museum, New York (1959), designed by Frank Lloyd Wright. The continuous spiral ramp acts as the primary organizational structure of the museum, integrating circulation and perception. (Source: Wikimedia Commons, Creative Commons licence).



Figure 3. Hamaren Treetop Walk in Fyresdal, Norway (2023), designed by EFFEKT. A continuous step-free elevated route integrates accessibility, rest, orientation, and landscape experience within a single architectural sequence. (Credits: Rasmus Hjortshøj).



Figure 4. SESC Pompéia, São Paulo (1977–1986), designed by Lina Bo Bardi. Elevated circulation ramps function simultaneously as accessibility infrastructures and spaces of social interaction. (Source: Wikimedia Commons, Creative Commons licence).

Broadly, these considerations connect with sustainability agendas. Inclusive environments foster healthier, more resilient communities, making accessibility an essential component of sustainable development.

4. Conclusions

This paper argued that ramps should be understood neither solely as regulatory devices nor as expressive architectural forms. Their inclusive potential emerges from the integration of three conditions: spatial generativity, evidence-based accessibility, performance, and participation.

Canonical ramps such as those of Villa Savoye and the Guggenheim demonstrate how inclined movement can organise form, perception, and time, but architectural prominence does not automatically guarantee accessibility. Conversely, technically compliant ramps may remain segregated or spatially marginal. Universal Design requires these dimensions to be conceived together: the principal route should be shared, legible, physically usable, and integral to architectural experience.

The ramp can therefore be understood as a performative infrastructure: a socio-material system through which bodies, standards, surfaces, maintenance, spatial configurations, and institutional decisions collectively produce access. Repositioning the ramp in this way shifts accessibility from a late compensatory response to a generative condition of architectural design.

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