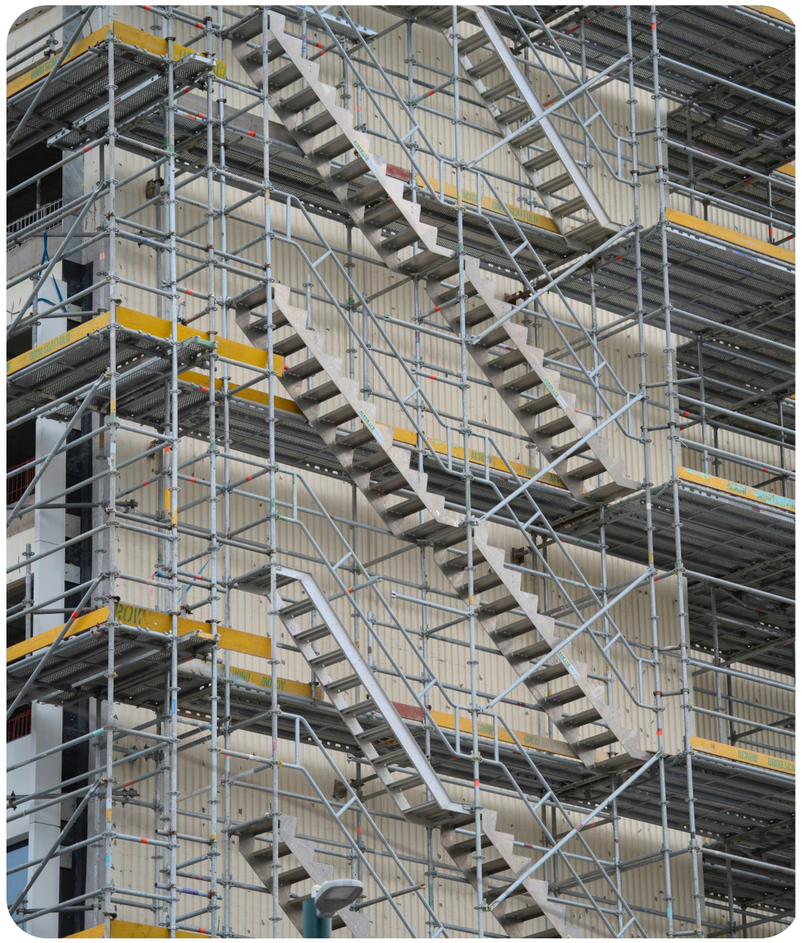
DESIGNING HEALTHY, INCLUSIVE, AND NATURE-CONNECTED BUILT ENVIRONMENTS

NEW DESIGN PARADIGM

Architecture and urban design play a critical role in shaping human well-being, behaviour, and mental health. Human-centred and nature-integrated design approaches aligned with the New European Bauhaus, Nature-Based Solutions (NBS), biophilic architecture, neuroarchitecture, and WELL Mind principles aim to create built environments that support emotional balance, cognitive performance, and social cohesion, counteracting the negative impacts of dense, car-oriented, and high-rise urbanisation.

SCORING

DIFFICULTY	COST OF IMPLEMENTATION
●●●●○	●●●○○
ENVIRONMENTAL IMPACT	**SOCIAL ACCEPTANCE**
●●●●○	●●●●●



TECHNICAL KNOWLEDGE

Human-centred architectural and urban design integrates environmental, social, and neurological principles to enhance mental well-being, comfort, and quality of life. It combines spatial design, material choices, natural systems, and sensory stimuli to reduce stress, improve focus, and strengthen the connection between people and their environment.

Key technical components include:

- Nature-Based Solutions (green roofs, urban trees, rain gardens, permeable surfaces)
- Biophilic design strategies (natural materials, daylight, water, vegetation, views)
- Neuroarchitecture principles addressing perception, stress reduction, and cognitive comfort
- Climate-responsive design (natural ventilation, shading, thermal comfort)
- WELL-aligned design for mental health and well-being
- Use of natural shapes, textures, and colours to support sensory balance
- Integration of architecture with landscape and public space design

KNOWLEDGE RECOMMENDATIONS

OVERALL GUIDANCE

- Prioritise pre-1980 buildings where envelope performance is weakest.
- Combine insulation with adequate ventilation to avoid moisture issues.
- Train installers to ensure correct detailing around edges, bridges, and junctions.
- Select vapour-open systems in humid climates to prevent condensation.
- Integrate aesthetic improvements and comfort benefits into renovation plans.

POTENTIAL CHALLENGES

- Unexpected structural issues in older buildings (moisture, cracks, asbestos).
- Poor installation causing thermal discontinuities.
- Cost barriers in low-income areas without subsidies.
- Resistance in multi-owner buildings due to aesthetics or cost-sharing.
- Higher maintenance needs for green façades and smart automated systems.

ADAPTATION ACROSS CITIES

- Cold climates: prioritise insulation thickness and airtightness.
- Warm climates: shading and solar control are critical.
- Heritage areas: use reversible or visually neutral solutions.
- Social housing: favour passive, low-maintenance solutions.

KEY CHALLENGES, RISKS, AND SYSTEM GAPS

RECURRENT RISKS

Human-centred and nature-integrated design faces risks related to fragmented implementation, insufficient interdisciplinary coordination, and limited technical expertise. Budget constraints and short-term cost optimisation may lead to reduced scope or superficial application of biophilic and NBS principles.

CITY ISSUES

Many cities suffer from dense, grey urban environments with limited access to green spaces, natural light, and restorative environments. High-rise and high-speed development patterns often prioritise efficiency over human well-being, increasing stress, isolation, and mental health pressures.

ENVIRONMENTAL PROBLEMS

Urban areas experience biodiversity loss, overheating, air pollution, and poor stormwater management. The lack of integrated nature-based design intensifies climate impacts and reduces urban resilience.

MANAGEMENT GAPS

Governance structures often separate architecture, health, environment, and urban planning, limiting holistic approaches. Insufficient data on well-being outcomes and limited post-occupancy evaluation weaken long-term optimisation.

OBSOLETE TECHNOLOGIES

Conventional design models relying on sealed buildings, artificial lighting, and minimal green integration fail to support mental well-being, climate resilience, and long-term sustainability. Transitioning to human-centred, nature-connected design paradigms is essential.

PHASES OF IMPLEMENTATION

Human-centred and nature-integrated design is implemented through clearly defined phases, progressing from visioning and assessment to long-term operation and community stewardship. This phased approach ensures coherence between environmental performance, social value, regulatory compliance, and long-term well-being outcomes.

P1 — PRE-DESIGN: VISIONING & ASSESSMENT	P2 — DESIGN DEVELOPMENT & PLANNING	P3 — CONSTRUCTION & IMPLEMENTATION	P4 — POST-OCCUPANCY OPERATION & MONITORING	P5 — COMMUNITY ENGAGEMENT & LONG-TERM STEWARDSHIP
P1.1 Define Integrated Goals: establish shared objectives addressing mental well-being, environmental quality, social inclusion, and climate resilience.	**P2.1 Integrated Spatial Planning**: develop architectural and urban layouts that balance built form, public space, and natural systems.	**P3.1 Site Preparation & Protection**: protect existing ecosystems, trees, and soils during construction activities.	**P4.1 Orientation & Community Introduction**: support users in understanding and engaging with spaces, systems, and green elements.	**P5.1 Local Stewardship Structures**: establish roles for community groups, facility managers, and local authorities.
P1.2 Environmental & Spatial Assessment: analyse site conditions, climate, biodiversity, daylight access, ventilation, noise, green infrastructure.	**P2.2 Nature-Based and Climate-Responsive Integration**: embed NBS, biophilic elements, and passive design strategies into buildings and public spaces.	**P3.2 Execution of Built and Ecological Elements**: implement architectural, landscape, and nature-based components according to design specifications.	**P4.2 Environmental & Social Performance Monitoring**: assess comfort, mental well-being indicators, biodiversity performance, and user satisfaction.	**P5.2 Periodic Review & Adaptation**: adapt spaces and systems over time based on performance data and user feedback.
P1.3 Social & Cultural Mapping: identify community needs, cultural patterns, behavioural dynamics, and vulnerable user groups.	**P2.3 Regulatory & Technical Alignment**: ensure compliance with planning regulations, health standards, environmental rules.	**P3.3 Quality Assurance & Safety Compliance**: verify construction quality, safety standards, and correct installation of ecological systems.	**P4.3 System Calibration & Maintenance Setup**: fine-tune systems and establish maintenance protocols for built and natural elements.	

UKRI Innovate UK
Co-Funded by The European Union