STRATEGIES FOR DESIGN AND CONSTRUCTION

Responsible use of raw materials and resources > Avoid premature demolition > Keep materials in the cycle

A	B	C	D	E
minimise total **AMOUNT** of materials	minimise **ENVIRONMENTAL IMPACT** of materials	extend the **USEFUL LIFE** of buildings	maximise the **REUSABILITY** of elements	maximise the **REUSABILITY OR RECYCLABILITY** of materials
A1 **question needs for new construction** and/or fulfil them differently	**B1** gain insight into the environmental impact of the building (**materials & energy**) & optimise via TOTEM	**C1** design with potential for **future functions** (functional adaptability)	**D1** detailing with consideration for easy dismantling **(reversibility)**	**E1** choose elements that can be dismantled into pure **raw materials**
A2 preserve the value of **existing heritage**	**B2** focus on **reusing elements/materials** & assess environmental impact via TOTEM	**C2** design for **adaptability:** flexibility, versatility, "support-infill-principle "	**D2** design with consideration for **modularity, prefabrication, standardisation**	**E2** keep **harmful/toxic substances** out
A3 **share spaces** with third parties	**B3** invest in materials with **high recycled content** & assess environmental impact via TOTEM	**C3** design with consideration for **future extension**/ "in-fill"	**D3** consider **compatibility & interchangeability** when choosing construction elements	**E3** choose (raw) materials that are **biodegradable** or can be disposed of responsibly
A4 **share technical equipment** with third parties	**B4** focus on **bio-based structural elements/ materials** & assess environmental impact via TOTEM	**C4** design for future maintenance, upgrading & repair: include independent & accessible **functional layers**	**D4** choose elements with contractual agreements **regarding take-back schemes**	**E4** choose (raw) materials with **already existing, closed loops**
A5 make spaces **multifunctional**	**B5** avoid irresponsible management of **natural resources** (forest cover, arable farming, quarries, etc.)	**C5** choose **robust & high-quality** materials	**D5** identify **existing valuable parts** during renovation/ dismantling	**E5** choose elements/ materials with a **take-back guarantee and/or recycling guarantee**
A6 **dematerialisation at the structural level:** design lightweight structures	**B6** minimise **energy needs**	**C6** Building stock regularly **maintained** & optimally **managed**	**D6** **identify & record elements/ components** of the new building	**E6** **identify (raw) materials** in existing elements/ components
A7 **dematerialisation at the material level:** design with raw materials as finishing (without additional layers)	**B7** use **renewable energy sources**	**C7** contractually encourage the **extension of useful life**	**D7** **preserve elements that have cultural value (e.g. heritage)** in subsequent building cycles	**E7** identify **elements, materials & raw materials** during renovation and/or dismantling
A8 **dematerialisation at the technical level:** design smart-tech solutions	**B8** **meet remaining energy needs** as efficiently as possible			**E8** **tap into second-hand markets or platforms** for selective demolition and/or disassembly

ACTIONS APPLIED:
TARGET GROUP RESIDENTIAL BUILDING

Responsible use of raw materials and resources > Avoid premature demolition > Keep materials in the cycle

A	B	C	D	E
minimise total **AMOUNT** of materials	minimise **ENVIRONMENTAL IMPACT** of materials	extend the **USEFUL LIFE** of buildings	maximise the **REUSABILITY** of elements	maximise the **REUSABILITY OR RECYCLABILITY** of materials
A1 avoid new construction: consider alternative ways to meet (spatial) needs	**B1** carry out an LCA study (via TOTEM) & opt for construction solutions with a lower environmental impact	**C1** convert a home into a care home, into a coworking space	**D1** choose facade bricks + lime mortar, dry-stacking systems, planks with groove and clip, loose roof membranes, dry screed floors	**E1** opt for components made out of one/easily separable (raw) material
A2 give preference to repurposing & renovation of existing heritage	**B2** choose recovered bricks, roof tiles, floor tiles & other reclaimed material	**C2** design versatile homes (kangaroo living, mikado living) via removable walls ...	**D2** design with grid dimensions (e.g. kitchen cabinets)	**E2** choose low-emission paint or glue, untreated wood, unpainted wood
A3 provide communal areas: storage room, laundry room, shared space for staying over, working from home, etc.	**B3** choose: concrete with recycled aggregate & alternative binders; screeds with recycled sand & lime	**C3** provide increased load capacity to enable a rooftop extension; extra height to enable another function	**D3** opt for components that can be reassembled, plug & play techniques	**E3** opt for geo-based materials (e.g. clay, shell insulation) and for bio-degradable materials (e.g. hemp, jute)
A4 provide communal (district) heating & natural heat retention basins	**B4** opt for wooden mezzanine floors, for ground-level homes, bio-based insulation materials	**C4** include accessible pipe shafts & ducts, interchangeable technical parts	**D4** lease furniture, consider product-as-a-service (e.g. light-as-a-service)	**E4** choose materials with cradle-to-cradle certificate or equivalent
A5 divide residential units that have become too large into studios, kangaroo houses, etc.	**B5** choose FSC/PEFC label, quarries with a green reconversion plan	**C5** choose materials that are resistant to premature aging, wear, improper use, etc.	**D5** create an inventory for reuse during renovation and/or dismantling: materials that can easily be used again	**E5** negotiate a take-back agreement with a guarantee of recycling (roof membranes, mineral wool ...)
A6 choose load-bearing contours with light partitions (strength through geometry)	**B6** focus on insulation, day/night compartments	**C6** draw up maintenance contracts, post-intervention files, building maintenance booklets	**D6** draw up a fully documented "post-intervention" file as part of a building passport	**E6** draw up a fully documented "post-intervention" file as part of materials passport
A7 opt for directly finished load-bearing floors, unfinished walls & ceilings	**B7** choose PV panels, heat pumps, heat pump boiler, solar boiler	**C7** build quality houses with a long lifespan via, i.e. the "Design/Build/Finance/Maintain/Operate" procedure	**D7** integrate elements of special value: cast iron radiators, bluestone or cement tiles, platines, design furniture ...	**E7** draw up a: detailed demolition inventory; reuse inventory; asbestos inventory (if necessary)
A8 opt for ventilation C+ instead of D, oversized radiators at low temperature, climate-responsive design, passive cooling	**B8** choose to heat at a very low temperature			**E8** offer materials: on online second-hand platforms; at construction dealers, local material banks, social enterprise