Clay Brick

Clay bricks are moulded or cut to shape from selected clays and then fired at high temperature. The firing process transforms the clay into a building component with high compressive strength and excellent weathering qualities.

Bricks are a heavy, readily available, mass produced cladding manufactured in efficient factories. Bricks are regularly tested for quality. Brick veneer cladding is perceived as being safe in terms of the weathertightness risk of the cladding.

Extraction and manufacture	
Impact of extraction	Removal of clay creates a visual impact. Industrial waste products such as fly ash, glass, plastics, and even hazardous waste can be incorporated in the mix to make clay bricks.
Embodied carbon and embodied energy	Embodied carbon of clay brick is calculated at 0.26 kg CO_2eq/kg Embodied energy (total) is calculated at 4.13 MJ(NCV)/kg The figures are taken from BRANZ CO2NSTRUCT v1 June 2019. You can download the data and find explanatory details at: www.branz.co.nz/environment-zero-carbon-research/framework/branz-co2nstruct/ Substantially more data is embedded (but not visible) in the BRANZ tool LCA Quick: www.branz.co.nz/environment-zero-carbon-research/framework/lcaquick/
Sourcing	
Material sources	Clay bricks are made locally (Auckland, Huntly and Darfield) and imported by sea from Australia.
Availability	Clay bricks are readily available in most parts of New Zealand.
Cost	Clay bricks are a low to medium cost building material. Installation costs are relatively high. Maintenance costs are low.
Transport to site	Clay bricks are heavy and bulky to transport.
Construction/installation	
Health and safety during construction/installation	Safety equipment is required when handling cement for mortar (gloves, overalls) or cutting brickwork with a masonry saw (ear muffs, safety glasses, mask and overalls) to eliminate risk of skin irritation and lung damage.
Ease of construction	Clay bricks as a veneer cladding have a significant history of satisfactory use. Bricks can easily be handled by site labour. Foundation systems for bricks walls must accommodate the weight of the bricks (see NZS 3604). Brick veneer must be tied back to a structural frame or wall (double skin or solid brick construction is not common in new construction). There are limitations on the height of brick veneer walls (see NZS 3604). Brick veneer cladding doesn't need to be painted.
Adaptability	Once installed, bricks aren't easy to replace.
Performance	
Health and safety during life of building	Clay bricks are inert, non-toxic, and not prone to off-gassing of volatile materials.
Structural capability	Brick veneer construction in New Zealand is non-structural – the bricks are tied to a structural frame of timber, steel or masonry. Specific engineering design is required for more than single storey construction.

Durability*	80+ years
Maintenance rating	Low – all that's needed is regular washing and checks for corrosion of lintel bars.
Moisture resistance	Clay bricks will absorb moisture. Cavity construction has to incorporate damp-proofing, ventilation and drainage slots to deal with water entry through the brick and mortar joints.
Rot, mould and corrosion	Poorly protected steel structural components can corrode. Lichens and mosses will grow on damp, weathered surfaces.
Thermal performance	Clay brick veneer walls do not contribute significantly to the thermal performance (R-value) of a wall system. Exterior brick veneer won't generally provide any benefit because it is isolated from the interior by the insulated wall framing. Brick panels used internally as a feature can provide significant thermal mass. Solid brick construction which is not commonly used in NZ – e.g. double skin brick exposed on the inside – can add significant thermal mass to a building.
Sound insulation	The mass of clay bricks will moderate external sound transmission through walls.
Fire performance	Clay bricks won't burn and can be used as part of fire-resistance rated construction.
Waste disposal/recycling/re-use	
Re-use	Bricks can be re-used if they are able to be removed in good condition and the mortar removed.
Recycling	Crushed bricks can be used as basecourse or hardfill.
Waste disposal	Brick demolition material is inert and non-toxic. It's heavy to transport.

* with normal maintenance