

### Straw Bale

In this type of construction, straw bales are used as a component of the external wall of a building – either as a structural element or as infill within a timber frame.

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Extraction and manufacture	
<b>Impact of extraction</b>	When it's not used for construction, straw is often a waste product.
<b>Energy use</b>	Embodied energy of baled straw is quoted as 0.24 MJ/kg. Some energy is used in transport – it depends on distance of site from straw source.
<b>By-products/emissions</b>	None from straw bales. Cement, which may be used as a plaster finish to ensure weathertightness, emits CO2 during manufacture.
Sourcing	
<b>Material sources</b>	Straw is locally grown. Cement is made in NZ or imported. Sand can be obtained locally.
<b>Availability</b>	Straw is readily available in arable cropping regions of New Zealand.
<b>Cost</b>	Materials costs are relatively low. Labour costs are medium to high.
<b>Transport to site</b>	Straw is bulky to transport.
Construction/installation	
<b>Health and safety during construction/installation</b>	No issues identified
<b>Ease of construction</b>	Straw bale construction is simple but different from the norm. Once delivered, materials can be handled by site labour.
<b>Adaptability</b>	Straw bale construction is relatively easy to adapt, particularly where the straw is used as an infill to a timber structural frame. It's harder where the straw forms part of the structure.
Performance	
<b>Health and safety during life of building</b>	Straw bales are inert. There is a potential impact on health if the straw is affected by moisture.
<b>Structural capability</b>	Straw bale construction can be used as a structural wall. Most designs incorporate a structural timber frame.
<b>Expected durability</b> (assuming correct installation and maintenance)	Durability depends significantly on the building design and the integrity of the plaster finish and weatherproof coating applied to the bales.
<b>Maintenance rating</b>	Straw bales are high maintenance – regular maintenance of the weatherproof coating is essential.
<b>Moisture resistance</b>	Moisture resistance is poor where unprotected by a weatherskin.
<b>Rot, mould and corrosion</b>	Damp straw will rot.

<b>Thermal performance</b>	<p>The thickness of the wall and the R-value of the straw combine to give very good resistance to heat loss/gain.</p> <p>The applied internal finish to the straw may give a small amount of thermal mass.</p>
<b>Sound insulation</b>	<p>Straw bales provide good sound insulation due to the thickness of the wall.</p>
<b>Fire performance</b>	<p>Straw is combustible.</p>
<b>Waste disposal/recycling/re-use</b>	
<b>Re-use</b>	<p>Straw can't readily be re-used.</p>
<b>Recycling</b>	<p>Straw can't readily be recycled.</p>
<b>Waste disposal</b>	<p>Straw is biodegradable and non-toxic.</p>