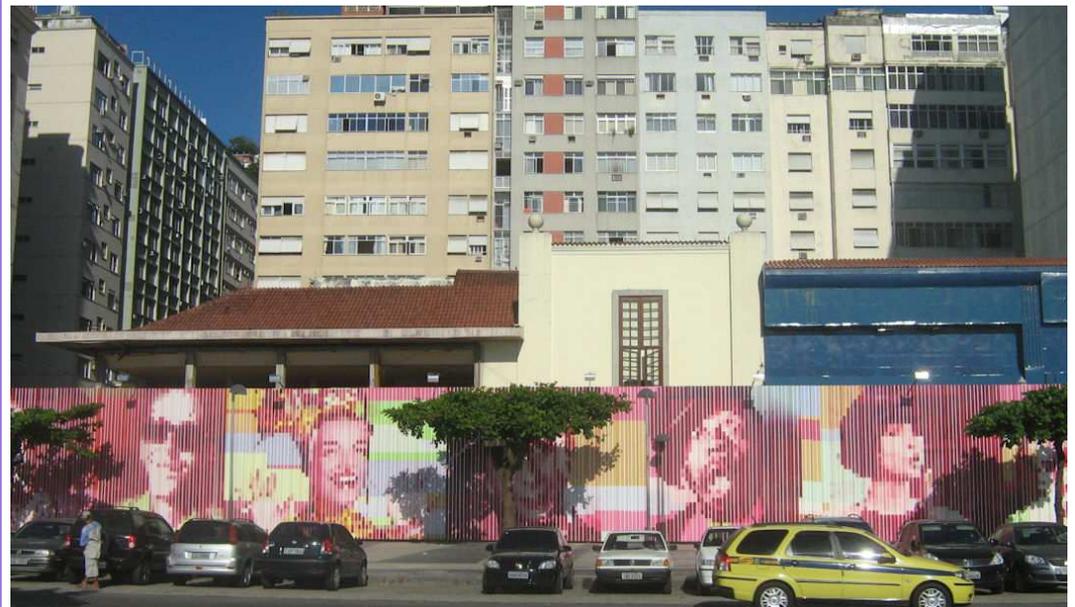


Brazilian construction and demolition company, Caenge Ambiental, is using lessons learned from a BRE pre-demolition audit to help meet its commitment to the sustainable management of demolition waste.

‘The audit demonstrated that 97% of materials by tonnage and volume arising from the Help nightclub demolition, could be diverted from landfill through a combination of recycling and reuse activities.’

Katherine Adams
Resource Efficiency
Team, BRE



The Help nightclub in the densely populated Copacabana borough of Rio de Janeiro in Brazil.

The project

BRE was commissioned by Caenge Ambiental, a Brazilian construction and demolition company, to undertake a pre-demolition audit of the Help nightclub. The club was located in Copacabana, a borough of Rio de Janeiro in Brazil which is famous around the world for its beautiful 4km beach.

The Help nightclub was built in the late 1970s and located in a densely populated area, with the front of the building facing the ocean and the back surrounded by high-rise building at close proximity to the site (see photograph above).

The club was selected for demolition as part of a programme to revamp the area ahead of the 2016 Olympic games, which Rio de Janeiro will host. The site will house a new development, the Museum of Sound and Image funded by Fundação Roberto Marinho.

The building had a concrete frame structure, with brick and blocks forming external and internal walls. One side of the roof’s structure was made of concrete covered in aluminium cladding, and the rest of the roof was covered with terracotta tiles.

The audit

Caenge Ambiental wanted a the pre-demolition audit to support its policy of sustainably managing waste materials arising from demolition works, and to provide the company with guidelines on establishing a best practice baseline for demolition works in Rio.

In a detailed survey of the nightclub site, the type and the condition of the materials encased in the building were assessed, and the quantities of materials that would be generated as a result of the demolition works were estimated.



Resource efficiency
 BRE's Resource Efficiency Team offers expertise in waste auditing, management and minimisation in construction, demolition, refurbishment, manufacturing and related industries. The Team has developed SMARTWaste Plan, a SWMP and waste management tool (www.smartwaste.co.uk) and a range of services to the construction industry, including training and consultancy, and pre-demolition and pre-refurbishment audits. SMARTWaste Plan membership is now available. It provides additional services including an environmental reporting 'add-on' called smartER, for capturing and monitoring onsite energy and water consumption and procuring certified timber.

The findings
 The audit findings showed that the total material arisings from the building would be around 2,500 m³, broadly equivalent to 5,261 tonnes (see table).
 The audit identified 24 key demolition products that would be generated. Seven were identified as suitable for reuse off site, ten for off site recycling, and three (in the timber and insulation categories) for energy recovery. Three products would have to be disposed of in landfill, and one sent off site as hazardous waste.
 Of the total materials arising by weight:
91%, including concrete, bricks and inert material, were suitable for off site recycling.
6%, including the internal floor coverings, ceramic roof tiles, timber wall partitions, mirrors and red granite floor coverings, could be reused.
2% were identified as only suitable for landfill disposal.
1%, fibre cement sheet cladding, had to be disposed of as hazardous waste.
Use of the materials
 Caenge Ambiental worked in partnership with a non-governmental organisation (NGO) to ensure that the reclaimed materials were given to social projects operating in the local area. Prior to the demolition a

Waste category	Reuse	Recycle	Energy from waste	Dispose	Total
Asphalt and tar				37	37
Binders		211			211
Ceramics	13	737			751
Concrete		3,308		4	3,313
Fibre cement sheet				1	1
Floor coverings	50				50
Glass	17				17
Gypsum		35			35
Inert	139	65			204
Insulation			8	14	22
Metals	79	459			538
Mixed waste				36	36
Plastic	3				3
Timber	16	2	25		43
Total	317	4,817	33	92	5,261

Quantities of materials (tonnes) by recovery option

representative from the NGO went on site to co-ordinate the collection and distribution of the materials. This activity provides job opportunities and raises the profile of reuse and recycling within the community.

Reclaimed materials

Selected reclaimed items were taken to workshops where they were used to create arts and craft items to sell. Those materials not suitable for this use were reused within the community.

Recycled off site

As the building was located in a densely populated tourist

area, all of the materials not suitable for reuse were recycled off site.

The risk of a high calcium chloride content (as a result of the building being near the sea) in the concrete structure meant that this could only be used in lower grade applications such as recycled aggregate (RA). In this case it was used as RA and spread on the roads around the Caenge Ambiental's recycling site.

Energy from waste

A small amount of timber and insulation material was sent to a nearby energy from waste recovery plant.