

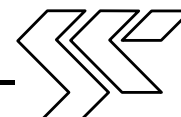


# Renovation of Buildings using Steel Technologies (ROBUST)

RFCS Project RFSR-CT-2007-0043

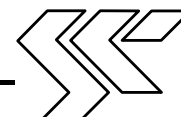
## WP 1.1 Drivers for renovation in various sectors

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## DRIVERS FOR RENOVATION IN VARIOUS SECTORS

Sector	Key Drivers	Opportunities for Steel
Commercial buildings	<p>Improvement in external appearance for business 'branding' reasons to increase the rental value.</p> <p>Improved layout and function of the existing space.</p> <p>Re-servicing to suit modern usage including IT, HVAC, etc.</p> <p>Building extensions (often vertical) to add value to the building.</p> <p>Retention of existing stone façades for architectural or planning reasons and construction of new structure internally.</p> <p>Change of use to commercial applications, including fire safety provisions.</p> <p>Removal of asbestos and other dangerous materials.</p>	<p>Re-cladding of the existing structure of commercial buildings (rather than over-cladding) is preferred, often using highly glazed façades with external steelwork.</p> <p>Existing heavy weight partition walls can be removed and replaced by light weight walls. Different layouts functions may lead to new fire compartmentation and means of escape provisions.</p> <p>Concrete frames are relatively inflexible for re-servicing and parts may be demolished and replaced by steel frames. Raised access floors for services may be introduced. Light steel infill walls replace existing heavy weight walls to save weight and space.</p> <p>Opportunities for primary steel frames and light steel infill walls in building extensions.</p> <p>Steel frames are used both to provide temporary support to the existing façade and for the new internal structure. The efficient use of space internally is achieved by using long span cellular beams. However, the floor-floor height is often dictated by the existing façade, which can lead to use of integrated beams of <i>Slimdek</i> to minimise floor depths. Façade retention is an existing and widely used technique which favours the use of steel as the support structure.</p> <p>Commercial buildings can be renovated by change of use for example from warehouse or industrial applications. This change of use may include increased loading and fire resistance periods, and also general fire safety aspects.</p> <p>Existing buildings may have asbestos insulation for thermal and fire reasons, which has to be carefully removed and replaced by inert materials. This may also be done as part of a comprehensive refurbishment for the reasons described above.</p>
Residential buildings	<p>Improvement of existing housing and residential buildings to meet new thermal insulation requirements and weather-tightness.</p>	<p>External insulation may be added, which is generally combined with new cladding and methods of improving the weather-tightness of the existing façade. This technique is more likely to be used in 3+ storey residential buildings than 2 storey housing. Opportunity for over-cladding using thin wall technology.</p>



	Concrete panel buildings built throughout Europe between the 1950s–70s require urgent upgrading.	More opportunities for steel in over-cladding, creation of new balconies etc in multi-storey apartments, especially social housing owners. Over-cladding may be combined with roof-top extensions in order to increase the return on the investment – see below.
	Internal refurbishment and new internal layouts.	Light steel partitions may replace existing heavy weight walls.
	Roof-top extensions to create new rooms or apartments is financially beneficial.	Opportunities for light steel framing and modular construction in roof-top extensions.
	Roof cladding (re-roofing) to improve weather-tightness and thermal performance.	Existing market which favours steel and lightweight cladding e.g. highly insulating composite panels and <i>Kalzip</i> .
	Removal of dangerous materials.	Existing buildings may have asbestos insulation for thermal and fire reasons which has to be carefully removed and replaced by inert materials.
	New balconies, lifts and external spaces.	Renovation often requires the creation of new circulation space, such as stairs, lifts and balconies, which can be made in steel and particularly in prefabricated or modular units.
Public Sector	Renovation of existing schools is an important requirement in many countries	Opportunity for modular construction in school building extensions. Opportunity for 'robust' lightweight cladding systems.
	Hospitals and medical buildings require high quality extensions for new facilities.	Over-cladding technologies used for residential buildings are equally applicable to the medical sector. Opportunity for modular construction for new medical facilities.
	Student residences are an important market (particularly in metropolitan areas).	Vertical extensions to existing buildings, particularly using modular construction. Over-cladding techniques are used to improve appearance and energy performance.
	Improved military accommodation.	Upgrading existing buildings is similar to residential sector and may involve over-cladding or use of light steel and modular construction.
	Transport network, including railway and airport terminals.	Improvement of railway and airport terminals often including extensions of existing buildings, and building over railway lines, is an important market for steel. Special measures may be required for blast resistance in sensitive public buildings.
	Sports halls and stadia.	Spots Halls and sports stadia may require extensions, which generally favour the use of steel.
	Car parks and building over car parks.	Renovation of existing c car parks is niche market for steel, which may include building over existing car parks.



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Industrial	<p>Improved appearance and function of industrial-type buildings to increase their rental value, including change of use.</p> <p>Warehouses and other enclosures require upgrading to satisfy new thermal insulation requirements without affecting their operation.</p> <p>Retrofitting of PVs on large plan roofs or other techniques to create energy and reduce energy consumption.</p> <p>Fire safety, especially in petrochemical facilities.</p> <p>Removal of dangerous materials</p>	<p>Many existing industrial buildings require comprehensive refurbishment, including new cladding and internal walls, and also fire safety measures in cases of change of use – see Commercial buildings.</p> <p>Improved thermal insulation and air-tightness using over-cladding and over-roofing techniques may be applied to existing concrete and steel frames in industrial-type buildings.</p> <p>Improvement in air quality may require new services and extract/heat exchange systems.</p> <p>Opportunity for bonded PVs to <i>Kalzip</i> and to composite panels.</p> <p>Double skin metal cladding may be used to extract/heat exchange warm air e.g. as in <i>Solarwall</i>.</p> <p>Special retrofit measures may be required to prevent explosions or fires damaging adjacent buildings. This may require fire protection and blasé resisting systems e.g. Corus' <i>Bi-Steel</i>.</p> <p>Existing industrial buildings may have asbestos insulation for thermal and fir reasons which has to be carefully removed and replaced by inert materials.</p>
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