





## Architecture, Building and Construction

# Roll-Formed Stainless Steel Roofing Panels



Location	Macau, China
Environment	Subtropical coastal
Fabrication process	Roll-forming
Grade/surface	316, 2D, embossed
Dimensions	0.5 mm
Manufacturer	P&L Building Materials (Macau) Co., Ltd.
Date of completion	2014
Material supplier	Yieh United Steel Corporation
Source of information	Macau Society of Metal Structures, <a href="http://www.msmsmacau.org">www.msmsmacau.org</a>

For the regulatory periodical vehicle inspection, The Land, Public Works and Transport Bureau of Macau built a new Technical and Administrative Centre with a floor space of over 28,000 m<sup>2</sup>. The architects, PAL Asiaconsult Ltd. and Arquitectos Associados LAD, specified stainless steel for the 6,713 m<sup>2</sup> section of the roof that spans the vehicle testing hall. The elevated chloride content in the subtropical coastal climate of Macau and the frequency of typhoons had to be considered. The roof was tested to simulate 14 hours of exposure to a real typhoon. For this purpose, a roofing technique was applied that relies on tray-shaped roofing elements, which are roll-formed from coil material on site and can therefore be tailor-made for the building without the restrictions in length that road-transport would otherwise entail. Stainless steel sheet 0.5 mm thick was formed into trays of up to 47.7 m in length. The system embosses the metal to provide extra strength and stiffness. Together with the original moderately reflective 2D surface, the final surface pattern helps to reduce glare. The trays are fastened to their supports by stainless steel clips and mechanically interlocked. Unlike welded seams, this method of fastening allows for longitudinal movement to account for thermal expansion. Previously this roof laying technique had mainly been applied to light metals. Extending its use into stainless steel, this high-quality material which is otherwise mainly found in prestigious visual applications, becomes part of an affordable functional solution for technical buildings.