



TATA STEEL



Case study

Tovi Eco Park Residual Waste Treatment Facility, Basildon, Essex

End Client: Essex Waste Partnership

Principal Contractor: Urbaser Balfour Beatty

Structural engineer: Atkins

Roofing contractor: Hathaway Roofing Ltd

Tata Steel Products: Trisobuild® R60 pre-finished steel roof profile using double-sided Colorcoat HPS200 Ultra® pre-finished steel. Double-sided Colorcoat HPS200 Ultra® also used for the wall cladding.

Year: 2014

The Tovi Eco Park Residual Waste Treatment Facility was built to provide mechanical and biological treatment of up to 417,000 tonnes of municipal residual waste annually. The facility includes three bio-stabilisation halls with large roofing spans and high imposed loadings – calling for a high-strength roofing product. The corrosive internal environment of the halls meant a super durable roofing material was needed.

Working closely with the roofing contractor, Tata Steel designed and developed a bespoke structural steel cladding solution to meet these challenges. The solution comprises a specially modified Trisobuild® R60 pre-finished steel roof profile for added strength. The roof

and wall cladding was produced in double-sided Colorcoat HPS200 Ultra® pre-finished steel for exceptional corrosion resistance. This product is also certified to BES 6001 Responsible Sourcing standard.



DELIVERING STRENGTH AND PROTECTION

The challenge

Following a lengthy and detailed procurement process, Essex County Council and Southend-on-Sea Council awarded Urbaser Balfour Beatty the contract to build and operate a mechanical biological treatment (MBT) facility with a visitor centre and education zone. Urbaser Balfour Beatty obtained planning permission to develop this facility which will reduce the environmental impact of waste being disposed of in landfill.

The facility will treat all of the residual household waste generated in Essex and Southend. This will make the county self-sufficient in terms of waste treatment capacity, keep 'waste miles' down and support recycling through recovery of recyclable materials.

The facility, known as Tovi Eco Park Residual Waste Treatment Facility, was built in 2013 - 2014 on an open site within 10km of the coast. Three, adjacent bio-stabilisation halls form the largest part of the treatment facility. Each one is 194m long by 42m wide. Two of the halls share a common line of internal columns that form one large double span portal frame.

The size of the halls dictated a roofing solution with substantial spanning capacity. In addition, the shape and height (13.30m at ridge) of the hall roofs, combined with the openness of the site, meant the roofs needed to withstand high imposed loading (snow drift loads up to 4kN/m² and wind suction up to -1.98kN/m²). The live load was 1.5kN/m². Close

overlapping of the roof deck was required for weather sealing whilst also accommodating roof lights.

The internal environment of the bio-stabilisation halls posed a further significant challenge. The halls were built for the composting of residual waste. This is a process that results in permanent humidity, high acidity and high temperatures. Within the halls there is a CX corrosivity classification – a category beyond the highest corrosivity category C5 as defined by ISO 12944-2. This extreme environment demanded exceptional performance from the pre-finished steel used for the roof and walls.





The solution

Tata Steel engineers worked closely with roofing contractor, Hathaway Roofing Ltd, to develop a unique roofing solution. To meet the structural design criteria of the contract, a very strong roof profile was required. To ensure fully effective sealing, this had to be a plain sheet without stiffening ribs. The requirement was met by a specially modified Trisobuild® R60 roof profile in a higher strength steel. The modified Trisobuild® R60 solution spans 2.65m and was installed using intermediate purlins proposed by Hathaway.

Tata Steel altered its production tooling to manufacture 26,000m² of the modified R60 roof profile in double-sided Colorcoat HPS200 Ultra®.

Colorcoat HPS200 Ultra® was chosen to optimise protection against the corrosive internal environment and external weather

side of the bio-stabilisation halls. Super durable Colorcoat HPS200 Ultra® provides exceptional corrosion resistance which has been proven in natural and accelerated testing. Colorcoat HPS200 Ultra® exceeds the requirements of CP15 (as per EN 10169.2010), demonstrating excellent barrier properties when used internally.

Successful build

Both Colorcoat HPS200 Ultra® and the Trisobuild® R60 profile for the bio-stabilisation halls were produced at Shotton in North Wales and delivered to meet Hathaway's build schedule. The roofs were installed safely, efficiently and on time between the spring and summer of 2014.

Andy Harrison, Technical Manager, of Hathaway, said: "Tata Steel's expertise in building envelope cladding systems helped to

ensure that we delivered the best possible solution. The support of Tata Steel's design team and the company's readiness to go the extra mile by investing in modified tooling were significant contributory factors to the success of this roofing project."

"Our constructive working relationship with Tata Steel enabled us to meet the challenges posed by this demanding project."
Andy Harrison, Hathaway's Technical Manager



Tata Steel products:

Trisobuild® specially modified R60 roof profile in higher strength steel. The roof profile was manufactured from 0.7mm structural cladding sheet in double-sided Colorcoat HPS200 Ultra® pre-finished steel.

Double-sided Colorcoat HPS200 Ultra® pre-finished steel has a nominal 200 micron organic coating thickness on the external face for proven weathering performance. A nominal 200 micron organic coating thickness to the interior provides exceptional corrosion resistance which has been proven in natural and accelerated testing. Colorcoat HPS200 Ultra® exceeds the requirements of CP15 (as per EN 10169.2010), demonstrating excellent barrier properties when used internally.



For more information on the durability of our Colorcoat® products, please contact the Colorcoat Connection® helpline on +44 (0) 1244 892434 or email colorcoat.connection@tatasteel.com

For design advice on our building envelope systems, please contact a member of our design team on +44 (0) 1244 892199 or email technical.theworks@tatasteel.com

Photographs: Images courtesy of UBB (Essex) Construction JV.

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