

STEEL DECK COMPOSITE FLOORS WITH SYNTHETIC STRUCTURAL FIBRE REINFORCEMENT

Grace Construction Products and the UK's leading steel deck supplier, Richard Lees Steel Decking Ltd, have joined forces to develop a composite floor system using STRUX® 90/40 synthetic structural fibres as a replacement for steel mesh reinforcement when used with all RLSD shallow deck profiles.

The use of STRUX® 90/40 provides the following:

Benefits to Engineers & Clients

- Heightened C(D & M) compliance through safer construction environment
- Reduced project costs through enhanced productivity
- Superior crack control - plastic shrinkage, drying shrinkage, post crack load-carrying capacity
- Doubles concrete longitudinal shear resistance for composite beams
- Up to 2 hour fire rating
- Non-corroding fibre

Benefits to Contractors

- Project time and cost
 - No mesh deliveries to co-ordinate
 - No crane time required for loading out mesh
- Safety
 - No mesh to lift and fix at height
 - No potential overloading of steel deck with stacks of mesh
 - No mesh as trip hazard
- Flexibility and ease of application
 - No site storage required for reinforcement
 - Reinforcement is poured with concrete - always in the right place
 - Excellent pumping characteristics - no clogging as with steel fibres
 - Eases difficulties associated with limited site access or constrained building footprints

Benefits to Concrete Suppliers

- Ease of addition - no special equipment to add STRUX to concrete
- Safe to handle - supplied in 2.3kg bags
- Only small dosage rate of fibres required - 5.3kg/m³
- Excellent dispersion characteristics

Composite Floor Fire Rating

Maximum achievable with STRUX® 90/40:

2 hours Holorib
1 hour Ribdeck AL, Ribdeck E60, Ribdeck 80

Points to Consider

- Superplasticiser required to offset increased water demand and maintain workability
- Fire ratings of 1.5 and 2 hours cannot be achieved using a trapezoidal profile (Ribdeck)
- Increasing fibre dosage does not enhance composite slab fire performance
- For composite edge beams, U-bars are still required
- Continuity reinforcement required at construction day joints
- Reinforcement around holes should follow standard guidelines for composite floors
- Dependent on the nature and severity of concentrated loads, additional distribution reinforcement may be required
- Correct concrete mix design is crucial - guidance provided by Grace Construction Products

Recent Projects

Project Name	Profile	Area (m ²)	Date	RLSD Client
Whitely Building Refurbishment, Stafford College	Holorib	1,429	Feb 04	B W Davis (Contractors) Ltd
Wymott, Garth & Lancaster Castle Prisons	Holorib	614	Mar 04	Orrell (Structural Engineers) Ltd
6th Form College, Derby	Holorib	6,677	May 04	Severfield-Reeve Structures
M & S store, Talbot Green, South Wales	Ribdeck E60	1,880	Aug 04	Solway Structural Steel
Xscape, Braehead, Renfrew	Ribdeck E60	33,637	Nov 04	BHC Ltd
St Johns Church, Tunbridge Wells, Kent	Holorib	513	Nov 04	Baxall Construction Ltd
Anchor, Granton Marina Plot 4, Edinburgh	Holorib	17,126	Jan 05	BHC Ltd
IKEA, Gemini Retail Park, Warrington	Holorib	4,734	Feb 05	Billington Structures
Tesco Store, Romford	Ribdeck E60	2,473	Feb 05	Costain Construction Ltd
Student Accommodation, Blackfriars Street, Edinburgh	Holorib	3,212	May 05	Mowlem Plc
Accrington College, Lancashire	Ribdeck E60	2,282	Jun 05	Thomas Barnes & Sons Plc
Casino, Rendevous Project, Glasgow	Holorib	7,512	Aug 05	Ardmore Construction Ltd
Council Offices, Westgate Development, Barnsley	Holorib	5,717	Sep 05	Caunton Engineering Ltd
IKEA, Lakeside Retail Park, Thurrock	Holorib	5,296	Oct 05	Billington Structures
Botchergate Residential Development, Carlisle	Holorib	2,291	Nov 05	York House Construction Ltd
Tesco, Stockton-on-Tees	Holorib	2,640	Feb 06	Barr Construction