3151C COMFLOR COMPOSITE FLOOR SYSTEM

1. GENERAL

This section relates to the supply and installation of composite steel/concrete floor systems:
- **ComFlor 210 (CF210)**
- **ComFlor 80 (CF80)**
- **ComFlor 60 (CF60)**

1.1 RELATED WORK

Refer to ~ for ~

Documents

1.2 DOCUMENTS REFERRED TO

Documents referred to in this section are:

AS 1397	Steel sheet and strip - hot-dipped, zinc-coated, or aluminium/zinc-coated
AS/NZS 1554.2	Structural steel welding - Stud welding (steel studs to steel)
NZS 3101	Concrete structures standard
NZS 3104	Specification for concrete production
NZS 3114	Concrete surface finishes
NZS 3121	Water and aggregate for concrete
NZS 3122	Portland and blended cements (General and special purpose)
NZS 3404 (1997)	Steel Structures Standard
NZS 3631	New Zealand timber grading rules
AS/NZS 4671	Steel reinforcing materials
AS/NZS ISO 9001	Quality management systems - Requirements
HERA Report	R4-107:2005

Composite Floor Construction Handbook, Part 2: Composite Construction Aspects and Steel Advisor updates CMP 1004 and 1005

Documents listed above and cited in the clauses that follow are part of this specification. However, this specification takes precedence in the event of it being at variance with the cited document.

1.3 MANUFACTURER'S DOCUMENTS

Manufacturer's and supplier's documents relating to work in this section are:

ComFlor Building Systems brochure: Composite Floor Decking - **ComFlor 210**
ComFlor Building Systems brochure: Composite Floor Decking - **ComFlor 80**
ComFlor Building Systems brochure: Composite Floor Decking - **ComFlor 60**

Copies are available from Corus New Zealand Limited
Telephone: 0-9-271 1780
Website: www.comflor.co.nz

For specific technical information call Steve Stickland, Product Manager, or Brett Pocock, Construction Sales Engineer, **ComFlor** Building Systems.
Email: comflor@comflor.co.nz
Telephone: 0-9-271 1780

1.4 NO SUBSTITUTIONS

Substitutions are not permitted to any specified **ComFlor** composite steel/concrete floor systems, or associated components and products.

1.5 QUALIFICATIONS

Carry out work with experienced, competent installers familiar with the installation of composite floor decking systems.
ComFlor approved installers:
- Composite Floor Decks Ltd, telephone 09 273 1111
- Composite Floor Decks SI Ltd, telephone 09 273 1111

- email: info@studwelders.co.nz
- website: www.studwelders.co.nz

2. PRODUCTS

Materials

2.1 COMFLOR DECKING
Roll formed G500 high tensile galvanized steel sheet with Z275 zinc coating to AS 1397.

2.2 TIMBER FORMWORK
No. 2 framing and dressing or merchantable grade radiata pine boards to NZS 3631, to obtain the concrete finish specified for adjoining concrete work.

2.3 REINFORCING STEEL
Grade 430 mild steel deformed bars to AS/NZS 4671.

2.4 STEEL MESH
Hard drawn steel wire spot welded to AS/NZS 4671, deformed and to mesh dimensions shown on the drawings.

2.5 TYING WIRE
Mild steel drawn wire not less than 1.2mm diameter.

2.6 CONCRETE
The concrete producer is responsible for mix design and properties to NZS 3104.
Cement: To NZS 3122
Aggregate: To NZS 3121
Rate of sampling: For compressive strength testing - one sample per m^3 but not less than one for each day of use.

2.7 TEMPORARY BEARERS AND PROPS
No. 2 framing radiata pine. Refer to SELECTIONS/drawings for type.

Components

2.8 EDGE TRIM
ComFlor edge trim folded from G250, to thickness chosen (refer to the edge trim selector table in the **ComFlor** brochure), Z275 galvanized steel, in 3 metre lengths. Dimensions as scheduled/as shown on drawings.

2.9 DECKING FASTENERS
Heavy duty shot fired pins with cone washers or self drilling/tapping fasteners as scheduled/shown on the drawings.

Components - ComFlor 210

2.10 COMFLOR 210 END CLOSURE SUPPORT DIAPHRAGMS
ComFlor 210 end closure support diaphragms folded from G250, 1.5mm thickness, Z275 galvanized steel, in 2.4 metre lengths.

2.11 COMFLOR 210 SHEAR-BOND CONNECTOR CLIPS
1.2mm gauge galvanized steel as scheduled/as shown on the drawings.

2.12 COMFLOR 210 SIDE LAP FASTENERS
Self-drilling fasteners with a minimum diameter of 5.5mm at 350mm centres.

Components - ComFlor 80

2.13 COMFLOR 80 END CLOSURE STRIPS
ComFlor 80 end closure strips folded from G250, 0.55mm thickness, Z200 galvanized steel.

2.14 COMFLOR 80 SHEAR CONNECTORS
Welded shear studs as scheduled/as shown on the drawings.

2.15 COMFLOR 80 HANGER FIXINGS
Galvanized steel wedge nut fixings as suspension points supplied by Corus New Zealand Ltd.

2.16 COMFLOR 80 SIDE LAP FASTENERS
Use 5.5 - 16 x 16mm self drilling screws at 1000mm centres maximum, to **ComFlor** requirements.

2.17 COMFLOR 80 CONSTRUCTION JOINT FORMER
Galvanised profile to block the trough portion of **ComFlor 80** below the layer of mesh. Timber boxing is used to form the slab height.

Components - ComFlor 60

2.18 COMFLOR 60 END CLOSURE STRIPS
ComFlor 60 end closure strips folded from G250, 0.55mm thickness, Z200 galvanized steel.

2.19 COMFLOR 60 SHEAR CONNECTORS
Welded shear studs as scheduled/as shown on the drawings.

2.20 COMFLOR 60 HANGER FIXINGS
Galvanized steel wedge nut fixings as suspension points supplied by Corus New Zealand Ltd.

2.21 COMFLOR 60 SIDE LAP FASTENERS
Use 5.5 - 16 x 16mm self drilling screws at 1000mm centres maximum, to Corus New Zealand requirements.

2.22 COMFLOR 60 CONSTRUCTION JOINT FORMER
Galvanised profile to block the trough portion of **ComFlor 60** below the layer of mesh. Timber boxing is used to form the slab height.

3. EXECUTION

Conditions

3.1 DEFECTS
Discard material showing visual defects or damage affecting its structural integrity and/or appearance.

3.2 DELIVERY, STORAGE AND HANDLING
Keep all components dry in transit. Store on a level firm base, clear of the ground on timber bearers, protected from weather, contamination and damage and away from current work areas. Prevent water and condensation from being trapped between adjacent surfaces.

Do not drag sheets across each other or other materials. Protect edges and surfaces from damage and ensure that section shape is not damaged during handling, storage or installation.

3.3 CONFORM
Conform to NZS 3101, NZS 3404 and AS/NZS ISO 9001 in the design, materials and manufacture of the steel decking.

Application

3.4 MODIFICATIONS
Cutting, drilling or modification of steel decking unless shown on the drawings, may only be carried out after receiving written approval.

3.5 CUTTING
Cut steel decking with a grinder, nibbler or plasma only.

3.6 PROPPING
Locate bearers and props as shown on the drawings. Propping to be level, vertical and rigidly braced to fully support every trough of the steel decking and the construction work. Minimum bearing width 100mm. Do not remove the propping structure until the concrete has reached at least 70% of its required design strength.

3.7 FIX COMFLOR EDGE TRIM
Fit and fix galvanized steel edge trim, shot fired to the steel support structure, with the top of the trim connected to the decking with restraint straps at 600mm centres using pop-rivets or self-drilling fasteners. Prop unsupported edges.

Application - ComFlor 210

3.8 FIX COMFLOR 210 END CLOSURE SUPPORT DIAPHRAGMS
Fit and fix end closure support diaphragms to the supporting structure, using a minimum of 3 fixings per 2.4 metre length.

3.9 ERECT AND PLACE COMFLOR 210
Erect and place to **ComFlor** requirements. Manually place the **ComFlor** decking as shown on the drawings with 50mm minimum end bearing of the sheets on steel (75mm on other materials). The prepunched hole along the side lap should remain visible from above if the lap is to be correctly oriented. Lay sheets square and true to line and level. As each sheet is placed, fix crest section of the deck to the top of the end closure support diaphragm using one self - drilling screw per sheet end. For sheets over 6.5 metres in length installed with no propping in place, a shear bond clip and Tek screw must be installed in the centre of the span to maintain integrity during installation. Once the sheets for a whole bay are in place, secure the deck to the beams using one heavy-duty shot fired fixing or self drilling/tapping screw per trough. Fix crest section of the deck to the top of the end closure using one self-drilling screw per pan.

3.10 FIX SHEAR BOND CLIPS COMFLOR 210
Fit and fix shear bond clips along the bottom of the trough of each sheet at 350mm centres using 5.5mm diameter self-drilling fasteners through the prepunched hole locations.

3.11 FORM OPENINGS AND PENETRATIONS IN THE SLAB
Form openings and penetrations as detailed and to **ComFlor** requirements.

Application - ComFlor 80

3.12 ERECT AND PLACE COMFLOR 80
Erect and place the **ComFlor 80** decking as shown on the drawings with continuous seating at support lines. Lay sheets square and true to line and level and screw together using 5.5 - 16 x 16mm self drilling screws at 1000mm centres maximum, to **ComFlor** requirements. Decking sheets shown as continuous on the decking layout plan should never be cut into more than one sheet. Fasten to permanent support structure as detailed on the drawings.

3.13 FIX COMFLOR 80 EDGE FORMS AND END CAPS
Fit to Corus New Zealand requirements.

3.14 SITE WELDED SHEAR CONNECTORS
On site flash weld steel stud shear connectors where detailed on the drawings. Provide a Producer Statement confirming compliance with the procedural control procedures of AS/NZS 1554.2.

3.15 FORM OPENINGS
Form openings and penetrations as detailed and to **ComFlor** requirements.

3.16 CONSTRUCTION JOINTS
Position the **ComFlor 80** Construction Joint Former as shown on the drawings, fixed in place through every prepunched hole.

Application - ComFlor 60

3.17 ERECT AND PLACE COMFLOR 60
Erect and place the **ComFlor 60** decking as shown on the drawings with continuous seating at support lines. Lay sheets square and true to line and level and screw together using 5.5 - 16 x 16mm self drilling screws at 1000mm centres maximum, to **ComFlor** requirements. Decking sheets shown as continuous on the decking layout should never be cut into more than one sheet.

Fasten to permanent support structure as detailed on the drawings.

3.18 FIX COMFLOR 60 EDGE FORMS AND END CAPS
Fit to Corus New Zealand requirements.

3.19 SITE WELDED SHEAR CONNECTORS
Site flash weld steel stud shear connectors where detailed on the drawings. Provide a Producer Statement confirming compliance with the procedural control procedures of AS/NZS 1554.2.

3.20 FORM OPENINGS
Form openings and penetrations as detailed and to **ComFlor** requirements.

3.21 CONSTRUCTION JOINTS
Position the ComFlor 60 Construction Joint Former as shown on the drawings, fixed in place through every prepunched hole.

3.22 PLACE REINFORCEMENT
Place mesh and reinforcement as detailed and to the requirements of REINFORCEMENT FOR CONCRETE. Top cover 30mm, unless specifically detailed otherwise.

3.23 CONCRETE PLACEMENT
Before commencing the concrete pour, ensure the decking is clean, free of dirt, grease, debris and water.
Discharge concrete in a controlled manner from no higher than 300mm.
Spread the concrete evenly without excessive heaping.
Maintain a 1 metre working zone between workers in order to minimise local loading of any one part of individual sheets.
Never exceed a construction load of 1.5kPa.

NOTE: The following gets more critical as the **ComFlor** is used towards the maximum spanning capabilities as set out in the **ComFlor** design software.

Start the pour sequence over a line of support where the sheet is continuous over that support (ie not over a support where the sheet ends or butt join together).
Place the concrete from the centreline of the support outwards, approximately ⅓ into the span each side of the support.

If the sheet ends at the next support line (double span unpropped, single span with 1 prop line, or end span), the remainder of the exposed sheet can then be filled.
If the sheets are continuous over the next support (multiple or propped span configuration) then repeat the above (⅓) process before filling the remaining strip of exposed sheet.

Refer to HERA Report R4-107:2005, Composite Floor Construction Handbook, Part 2: Composite Construction Aspects and Steel Advisor updates CMP 1004 and CMP 1005 in addition to NZS 3109 for full instructions on placement and finishing of the concrete.

For comprehensive instructions as to pour sequence for individual projects, contact a ComFlor representative on 09 271 1780.

3.24 SLAB FINISHING
Screed and provide a U3 finish to NZS 3114: table 2, Classes of floor, exterior pavement, invert finishes, and CONCRETE PLACEMENT. Refer also to Steel Advisor updates CMP 1004 and CMP 1005 for specific comment regarding concrete finishes on suspended floor systems.

Finishing

3.25 CONCRETE CURING
To minimise cracking and shrinkage deflections, keep concrete damp for seven days. Keep time between placing and start of curing concrete to an absolute minimum.

3.26 PROP REMOVAL
Do not remove temporary props until the concrete has achieved 70% of the design strength and the written direction of the design engineer has been obtained.

Finishing - ComFlor 210

3.27 CUT COMFLOR 210 SIDE LAP FASTENERS
Cut side lap fasteners leaving 3mm minimum protruding below the deck.

Completion

3.28 CLEAN DOWN
At completion of concrete placement, clean the underside of the steel decking of any grout loss to ensure surface is not damaged or marked.

3.29 LEAVE
Leave work to the standard required by following procedures.

3.30 CLEAN UP
Clean up surrounding areas following completion of the concrete placement.

3.31 REMOVE
Remove debris, unused materials and elements from the site.

4. SELECTIONS

Substitutions are not permitted to the following, unless stated otherwise.

ComFlor 210

4.1 COMPOSITE FLOOR DECKING
Brand/type: **ComFlor 210**
Gauge: 1.25mm

ComFlor 80

4.2 COMPOSITE FLOOR DECKING
Brand/type: **ComFlor 80**
Gauge: ~mm
Sheet length: ~ metres minimum

4.3 SHEAR STUDS
Stud height: ~mm
Diameter: ~mm
Number per pan: ~

ComFlor 60

4.4 COMPOSITE FLOOR DECKING
Brand/type: **ComFlor 60**
Gauge: ~mm

Sheet length: ~ metres minimum

4.5 SHEAR STUDS
Stud height: ~mm
Diameter: ~mm
Number per pan: ~

Steel reinforcement and concrete

4.6 REINFORCING STEEL
Trough bar: ~mm diameter
Bottom cover: ~mm from base of trough
Bar grade: ~
Mesh size: ~
Mesh cover: ~mm

4.7 CONCRETE
Mix: ~
Strength: ~ MPa
Thickness: ~mm
Aggregate size: ~mm nominal max
Admixture: ~
Slump: ~ mm max

4.8 TEMPORARY BEARERS AND PROPS
Bearers: ~mm x ~mm
Props: ~mm x ~mm