



Ministry of Higher Education and Scientific Research
Salahaddin University
College of Engineering
Architectural department



Lattice structure, Mid floor and Steel stair

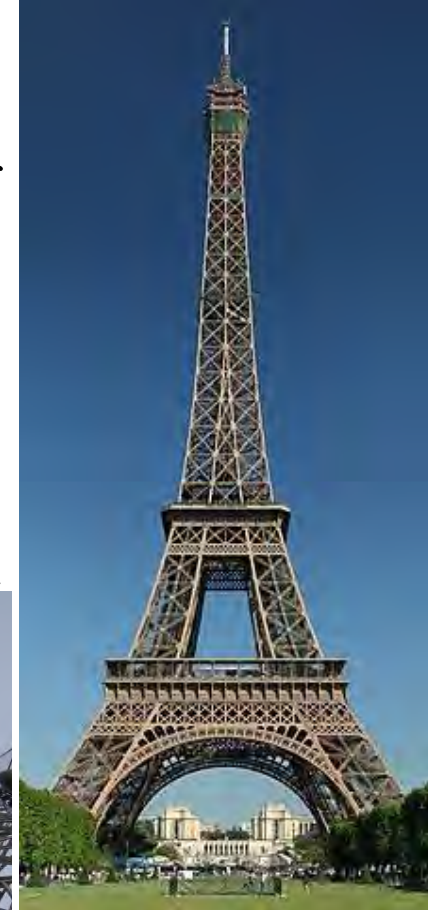
Prepared by: Assist. Lect. Sakar Yousif

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What is a lattice steel structure?

[Lattice steel structures](#), or steel structures with a lattice type design are **freestanding framework towers**, that consist of bolted connections, **main structural members and bracing systems**. Uses of lattice type steel structures include radio towers, observation towers, electricity transmission towers, pylons, monuments, lighthouses, wind turbines and more.

The **Eiffel tower** is a popular example of a **lattice** type steel structures, clearly portraying the structural characteristics of a lattice structure.



Some advantages of lattice steel structures include:

- Simple formulae are used to determine the capacity of latticed tower members and connections
- Design and construction is relatively **easy**
- Once the structure is designed, lattice structures **using angle sections** are very easy to fabricate, **offering a quick factory** setup
- The **ability to adjust the configuration** of lattice steel structures, allow the structures to accommodate a number of electric circuits and different types of conductor configurations
- The **transparent** design of lattice steel structures lessens the **visual effect** on the landscape and environment
- Steel is **100% recyclable**, making it an environmentally friendly construction option
- Steel sections are **easy** to transport
- Many tasks **during the construction** phase can be performed **parallel**, **offering quick and flexible erection of the steel structure**
- Efficient use of steel material and fast construction times make lattice steel structures **cost-effective**.



Mid floor or Mezzanine



Mid floor or Mezzanine

Mezzanine Floor Options

- **Standard Mezzanine Decking**
Consists of one layer of 3/4" T&G, OSB (oriented strand board) installed over 1-1/2" deep gauge corrugated steel deck. OSB provides good resistance to foot traffic and can handle random wheel loads up to 300 lbs.

Decking



Bar Grating – 1" x 1/8"

A strong and economical alternative, bar grating allows for air movement, light, and water from overhead sprinklers to pass through deck surface. Nominal 1" x 4" opening.



Mid floor or Mezzanine

Mezzanine Floor Options

- **Steel Tread Plate over OSB**
Heavy-duty steel tread plate has a diamond embossed non-skid surface. OSB is 3/4" tongue and groove over a 20 gauge corrugated steel deck. Provides greater durability with higher point load and wheel load capacities.



Steel Tread Plate over 20 gauge steel roof deck

Mezzanine flooring designed for projects that will not allow combustible materials, 12 gauge steel tread is provided directly over the steel roof deck. Steel tread plate is diamond-embossed for a non-skid surface. Top surface of tread plate can be shipped unfinished or painted. White underside of decking for light reflectance



Mid floor or Mezzanine

Mezzanine Floor Options

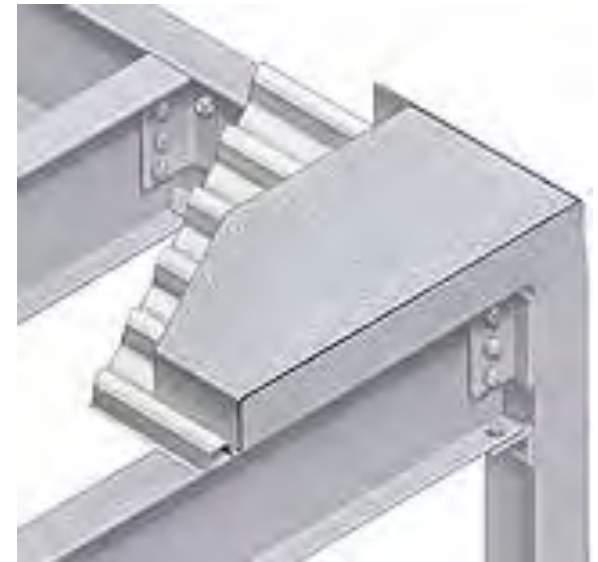
- **High Density Composite Flooring over 20 gauge steel deck**
- Recommended for mezzanines requiring a solid floor subject to heavy loads from the use of pallet jacks, carts or dollies. Flooring has an acryseal skid-resistant, cleanable surface. Standard **gray** finish. Clear finish available at additional cost.



Concrete

The strongest and most durable mezzanine surface available. Ideal when high point loading and capacity is required. Density minimizes transmission of noise through decking. Steel decking is provided with components needed to accept pour of 4-inch concrete floor.

Deck





Insitu concrete or grout fill along shear key

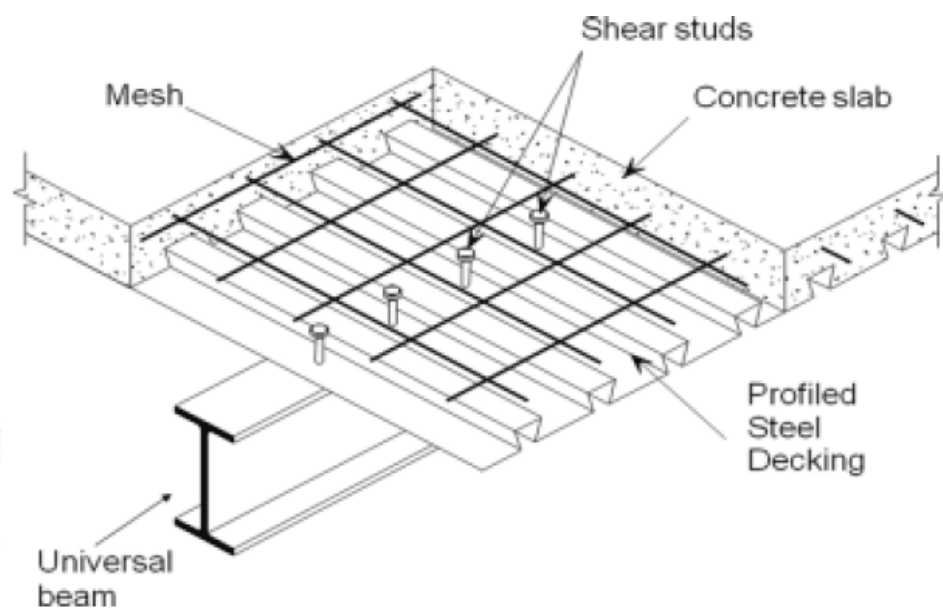
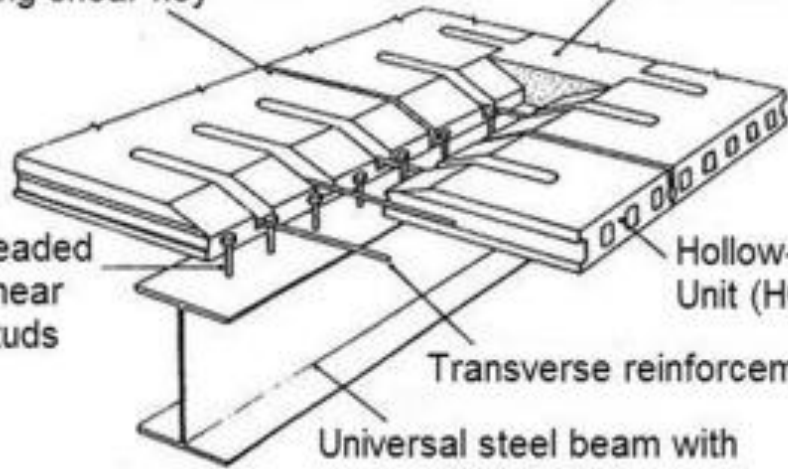
Insitu concrete fill

Headed Shear Studs

Hollow-core Unit (HCU)

Transverse reinforcement

Universal steel beam with pre-welded shear connectors



Shear studs

Mesh

Concrete slab

Profiled Steel Decking

Universal beam

CONNECTION ANGLES & BOLTS

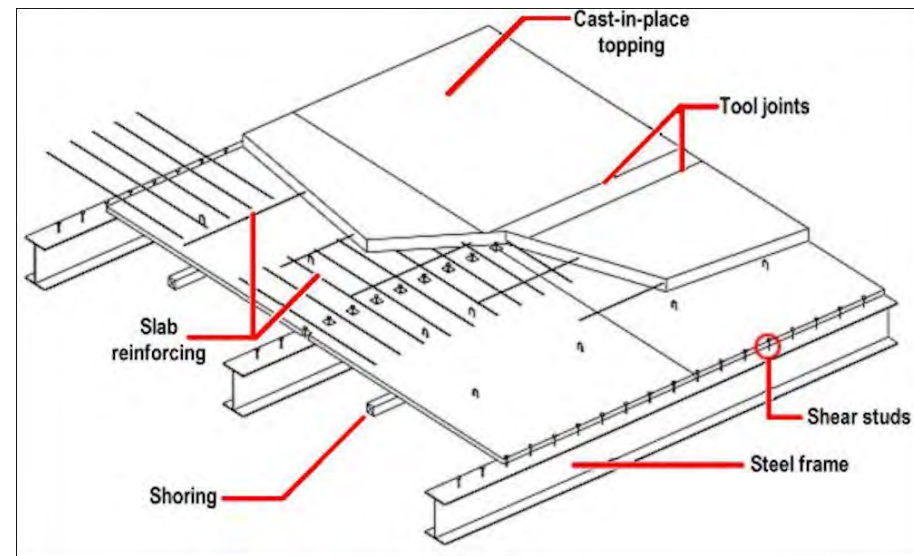
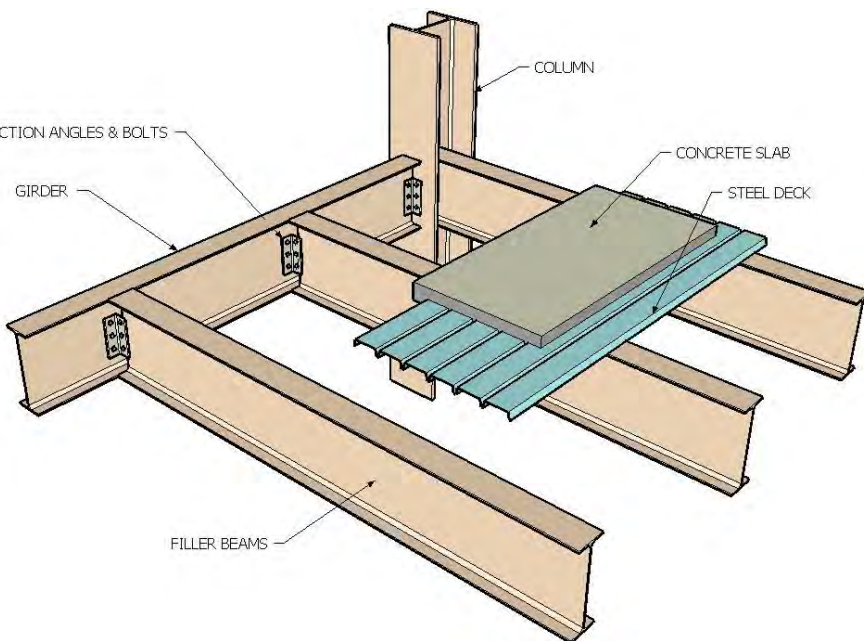
GIRDER

COLUMN

CONCRETE SLAB

STEEL DECK

FILLER BEAMS



Cast-in-place topping

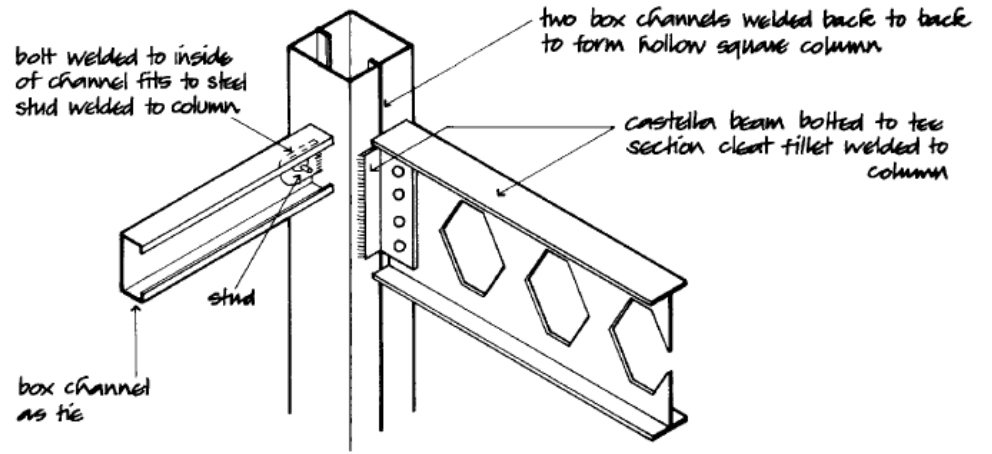
Tool joints

Slab reinforcing

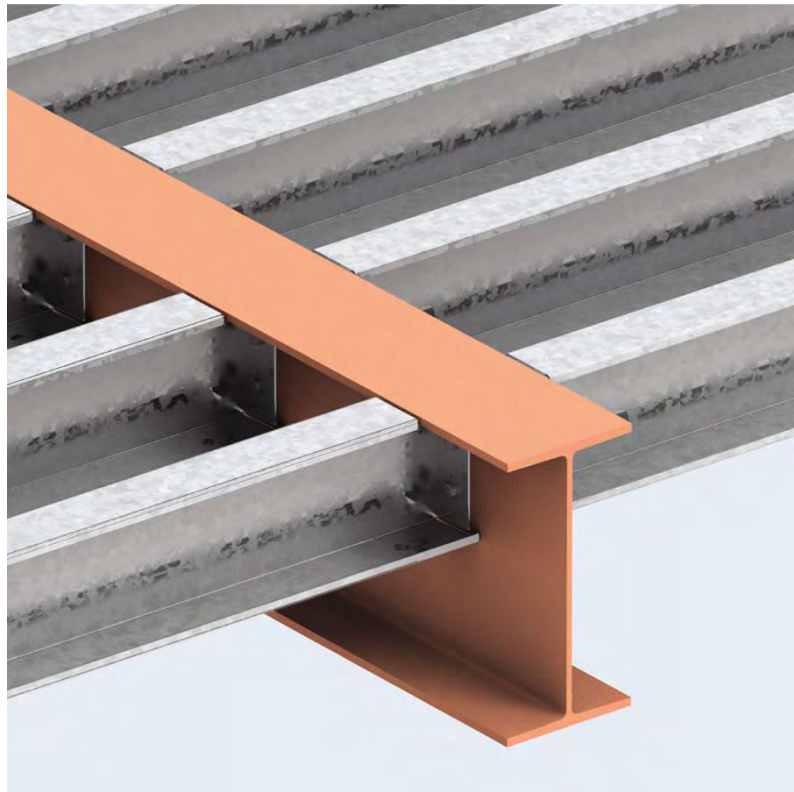
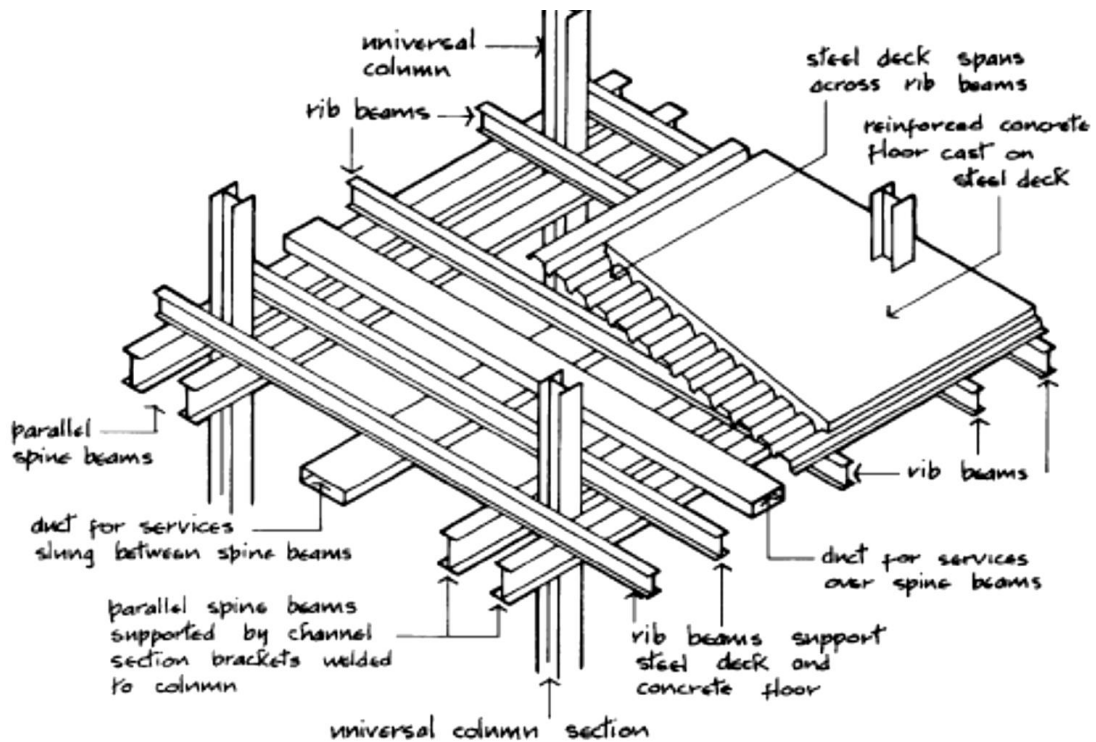
Shoring

Shear studs

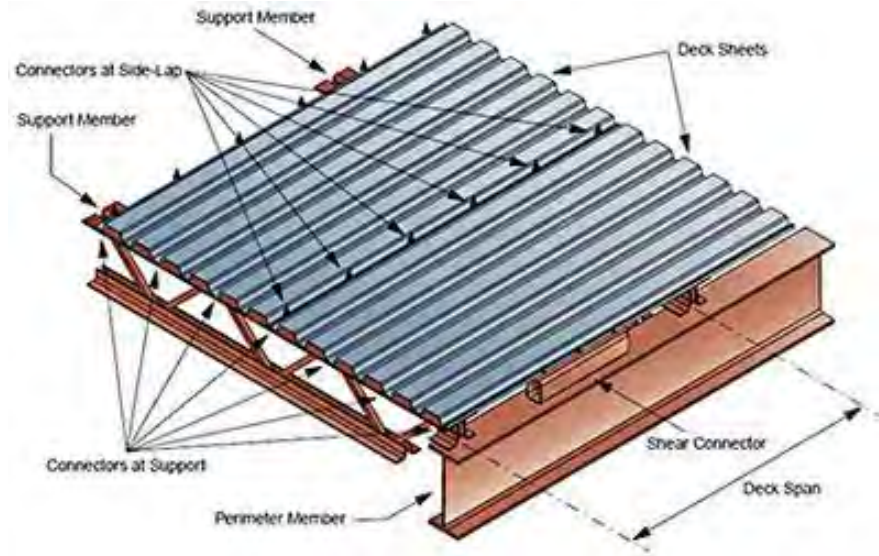
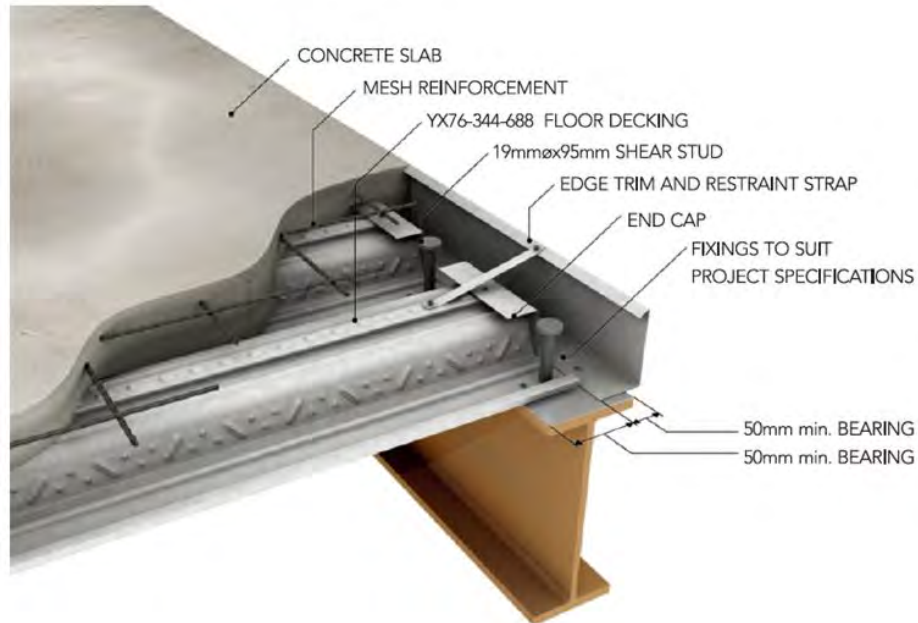
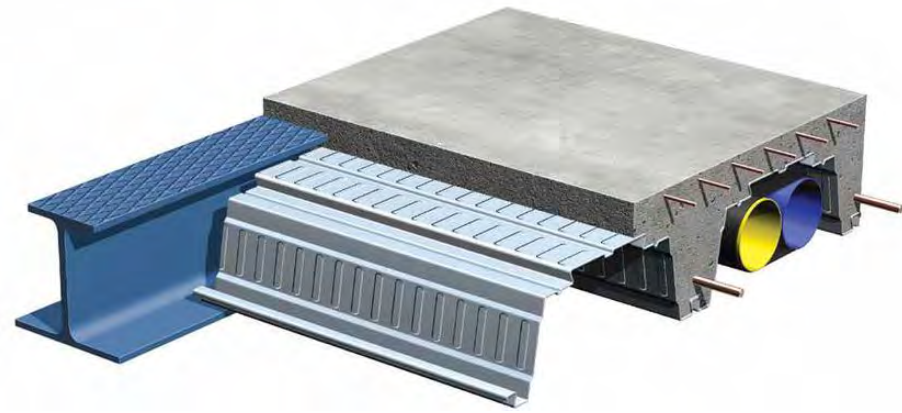
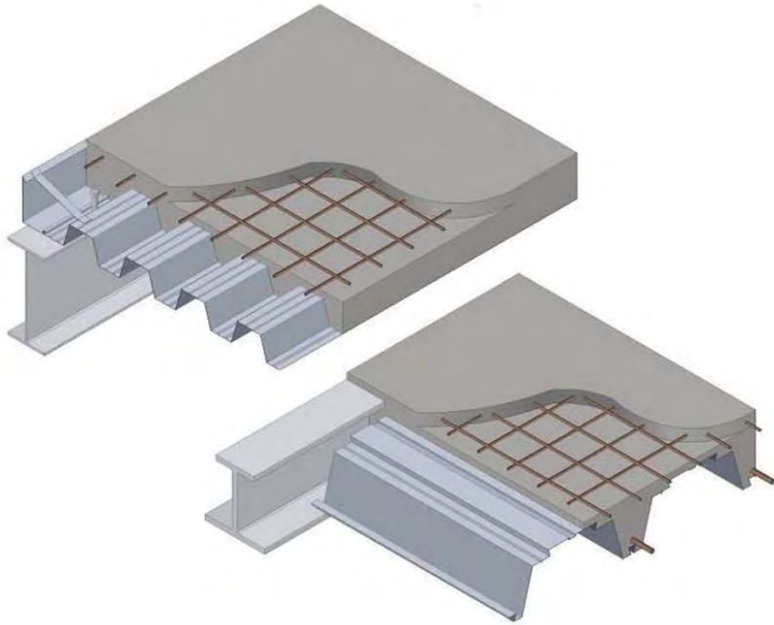
Steel frame



Cold roll-formed sections - connections



Parallel beam structural steel frame



Stairs





Steel stairs - Bottom of stair concreted in.
Note SS wire infills to the handrails one side and fixed FAC panes the other.



Steel stairs - External stair to a deck, steel structure with timber treads

Any steelwork that goes into the ground, **ALWAYS** must have concrete around it. Don't let the earth get filled in around steel. It holds the moisture and the steel rusts away quietly without being seen. put these collars around the top of the foundations, just to bring concrete above the surface, and with a slope away from the steel, even when the owner says that he will be concreting the full area at a later date. just tell them it is a simple job to remove the collars later. Protect that interface

Steel stairs - Transition from string to landing.



Steel stairs - Top landing channel runs through for architectural effect.

