

## Office Buildings (High Rise Building)



Location: Shanghai, China  
 Project Completion: 2015  
 Site Area: 56,591.50 m<sup>2</sup>  
 Project Area: 396,772 m<sup>2</sup>  
 Number of Stories: 66  
 Building Height: 319.50 m  
 Market: Commercial + Office, Hospitality, Mixed Use  
 Service: Architecture, MEP, Structural + Civil Engineering, Tall Buildings  
[http://www.som.com/projects/white\\_magnolia\\_plaza#st-hash.ixlSXfOP.dpuf](http://www.som.com/projects/white_magnolia_plaza#st-hash.ixlSXfOP.dpuf)



General Scale and dimension of the project  
 The design for White Magnolia Plaza consists of a 320-meter office high-rise, two hotel towers, and a series of smaller scale mixed-use buildings. All of the structures are built with

## Hotel and Retail (Low Rise Building)



## Material and manufacture

Steel used for Beam Construction:  
 SS400

Density (kg/m<sup>3</sup>) 7860  
 Young's Modulus (GPa) 190-210  
 Tensile Strength (MPa) 400 - 510 MPa  
 Yield Strength (MPa) 205-245 MP

Construction Process:  
 Hot Rolling - process of heating up sheet of steel which are composed of Carbon and iron. The heated steel plates will be passed through a mechanical roll which shapes the steel into an "I-Beam" structural element

The curvature of the beams are achieved via a rolling process in which the steel beam is rolled forwards and backwards to be slowly bended into the right angle

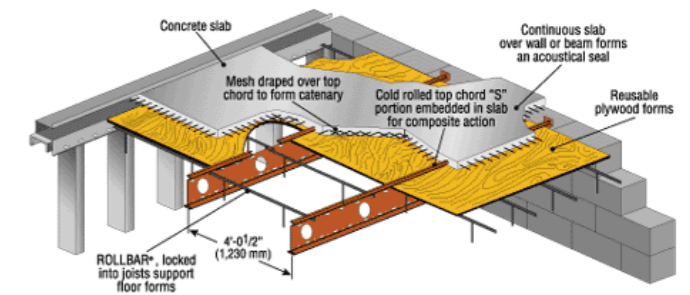
## Assembly process

Steel are known for their strength as well as flexibility to be able to be rolled (using hot or cold method) into different forms and curvature.

Using Steel Beam and Columns, a solid framework can be used for constructing concrete reinforcement for flooring or walls.

Therefore the requirement of the steel used in this beam are qualified to withstand a high amount of structural load and compression.

The assembly process consists of first the beam and a thin layer of steel plates which forms the base of a steel scaffolding in which concrete would be sprayed against in order to form a solid and secured surface.



## Post Assembly Treatment

Passive Fire Protection System

Method used: Sprayed Applied Fire Resistance Material (SFRM)

The application process consists of spraying the steel with fire resistance cementitious spray, insulating the core structure of the building to withstand at least 2 hours of intense fire around the beam.

Beams that brace a column or a wall are counted as unrestrained-beam which demands a thicker layer of fireproofing material. However if the steel are welded, riveted or bolted to other steel beams it is considered as restrained assembly which requires less resistance material

This process is only used for in-exposed steel structure, exposed structure will be treated with intumescent paint for fire proofing

