

# GLULAM ENGINEERED STRUCTURES

*CARBON NEUTRAL BUILDING ELEMENTS FOR A  
SUSTAINABLE FUTURE*

## SUSTAINABLE BUILDING RESOURCES



**LINKING TOMORROWS NEEDS WITH  
TRADITIONAL CRAFTSMANSHIP**

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# SUSTAINABLE BUILDING RESOURCES P/L

## NEUE HOLZBAU AG, SWITZERLAND

 **GSA®** - TECHNOLOGY AND GLUED LAMINATES - A COMBINATION THAT BINDS



### GSA® Technology and CNC joinery

GSA® Technology provides the very latest, tried and tested timber connection solutions.

Our latest solution, which partly comprises of patented tensile steel plug-in elements, is acknowledged to be an excellent connection technique in modern timber construction.

The easy to install pin and socket connections provide high load bearing capacity and, using GSA® Technology, help to standardize and optimize the building structure without compromising the aesthetics of the design.

Using the latest CAD/CNC technology all load bearing structures are manufactured to the highest degree of precision possible. They are then cost effectively prefabricated using our speed cut or panel cutting machines.

Once delivered to site our high quality prefabricated construction elements are quickly erected using plug-in GSA® connections to form the large scale timber structural frames.

# SUSTAINABLE BUILDING RESOURCES P/L

## NEUE HOLZBAU AG, SWITZERLAND

### GOLF CLUB, DRIVING RANGE SEEDORF, SWITZERLAND

The architect's concept was to create an intricate timber structure incorporating concealed steel connectors. Neue Holzbau AG was able to provide the structural solution without compromising the aesthetics of the interiors and the architects concept. The roof truss bars were also further strengthened, in the corners of the frame, using the latest GSA® Technology.



Building category:	Golf Club
Building owner:	Golf Company AG, Seedorf
Place:	CH-6462 Seedorf, Switzerland
Year of construction:	2008-2009
System:	Two-hinged frame truss
Dimensions:	27 x 12 x 12m (LxBxH)
Services provided:	Engineering, production drawings, framework delivery



# INNOVATIVE AND DYNAMIC



## BOCCIODROMO ALLMEND LUCERNE, SWITZERLAND CITY OF LUCERNE BUILDING AUTHORITY

Using GSA® Technology a simple pin and socket system enabled the fast and convenient assembly of the corner frame roof truss of Bocciodromo Allmend, Lucerne. This solution met the stringent conditions set by the timber construction engineer.



Building category:	Public building
Building owner:	City of Lucerne
Place:	CH-6000 Lucerne, Switzerland
Year of construction:	2009
System:	two-hinged frame with GSA® Technology
Dimensions:	22.70 x 37.0 x 7.10m (LxBxH)
Services provided:	production drawings, framework delivery

# SUSTAINABLE BUILDING RESOURCES P/L

## NEUE HOLZBAU AG, SWITZERLAND

### AQUABASILEA PRATTELN, SWITZERLAND

The roof of the Aquabasilea Leisure Centre built for Credit Swiss is a high tech timber structure and consists partly of very rigid glued laminated timber. GSA® Technology allowed the engineers to optimise and reduce the number of supports and joints, thereby reducing the amount of steel used, which in turn led to cost optimisation. The glulam ring beam is the central piece of the whole timber structure having a cross section of 1.12m x 1.72m, an outer diameter of 10.84m and a weight of 36 tons. It is the largest timber ring ever built.



Building category:	Leisure Centre
Building owner:	Credit Suisse, Zürich
Place:	CH-4133 Pratteln, Switzerland
Year of construction:	2007-2010
System:	Framework truss with GSA® Technology
Dimensions:	114 x 114 x 18m (LxBxH)
Services provided:	Structural engineering, production drawings, delivery of framework



# INNOVATIVE AND DYNAMIC



# SUSTAINABLE BUILDING RESOURCES P/L

## NEUE HOLZBAU AG, SWITZERLAND

### CABLE TRAMCAR OVER THE RIVER RHINE FEDERAL GARDEN SHOW 2011 IN KOBLENZ, GERMANY

A cable tramcar was constructed as one of the main attractions of the Federal Garden Show 2011 in Koblenz, Germany. The cable tramcar connects the exhibitions on opposite banks of the river Rhine.

A timber structure, with a tensile fabric membrane, was chosen for the roofing over the stations. Due to the irregular building geometry, every load bearing timber element was designed and analysed separately. Although a challenging project in respect of engineering, production drawings, CNC joinery machines programming and assembly our experienced team delivered a solution to satisfy the client's requirements.



Building category:	Shell structure
Building owner:	Doppelmayr Seilbahnen GmbH
Place:	56068 Koblenz, Germany
Year of construction:	2009-2010
System:	Arched glued laminated frame
Dimensions:	44.6 x 23.6 x 11.2m (LxBxH)
Services provided:	Engineering, production and construction drawings, delivery and assembly supervision



# INNOVATIVE AND DYNAMIC



## CENTRO OVALE, SHOPPING CENTRE IN CHIASSO, SWITZERLAND

Designed by neue Holzbau AG this oval shape timber structure was used to form temporary concrete shuttering for the external shell of a shopping centre in Chiasso. The high quality precision joinery, forming the shuttering, met the stringent performance requirements set by concrete engineer. The testing for geometric accuracy of the framework was carried out using laser scanning.



Building category:	Retail
Building owner:	RC Vastgoed
Place:	CH-6830 Chiasso, Switzerland
Year of construction:	2010-2011
System:	Concrete shuttering with glue laminated shaped trusses
Dimensions:	92.8 x 51.80 x 22.30m (LxBxH)
Services provided:	Engineering, production and construction drawings, delivery to the site, assembly supervision



# SUSTAINABLE BUILDING RESOURCES P/L

## NEUE HOLZBAU AG, SWITZERLAND

### HORNBACH HARDWARE STORES

This project provided a challenge for neue Holzbau AG and the project engineers to find a quick and economical solution using timber. We were able to fulfil the clients and architects expectations by using an innovative and light timber structure. The connection details were designed using the GSA<sup>®</sup> steel connection system to reduce a bending moment within the load bearing frame. This solution also enabled us to significantly shorten the assembly time.



Building category:	Retail
Building owner:	Hornbach Baumarkt (Schweiz) AG, 6210 Sursee
Place:	CH-6014 Littau, CH-1163 Etay, CH-2504 Biel, Switzerland
Year of construction:	2002-2009
System:	Glue laminated frame structure
Dimensions:	75.6 x 43.2 x 11.4m (LxBxH)
Services provided:	Cost analyses, structural engineering, production, delivery

# INNOVATIVE AND DYNAMIC



## RESTAURANT ON MOUNT MÄNNLICHEN, SWITZERLAND (2230m mountain in the Swiss Alps)

This extension to the restaurant on Mount Männlichen incorporated GSA® Technology. Special knot connections (sphere and hemisphere) provided an aesthetically pleasing interior, and enabled a more open floor space by eliminating a number of columns. The GSA® Technology also provided structural stability of the building which is exposed to heavy snow loads.



Building category:  
Building owner:  
Place:  
Year of construction:  
System:  
Dimensions:  
Services provided:

Restaurant  
Bergrestaurant Männlichen  
CH-3818 Grindelwald, Switzerland  
2005  
Post and beam frame  
20.0 x 15.0 x 5.0m (LxBxH)  
Production and engineering of the load bearing structure, delivery

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# SUSTAINABLE BUILDING RESOURCES P/L

## NEUE HOLZBAU AG, SWITZERLAND

### BÄCHLIACKER TENNIS AND SPORTS CENTRE FRENKENDORF, SWITZERLAND

The TIF-Tennis Academy in Frenkendorf Basel wanted to provide players with an open air feeling and spacious court to emulate playing in an outdoor environment. In order to achieve that, a transparent foil of Ethylen-Tetrafluorethylen (ETFE-foil) was stretched over the filigree glued laminated timber arches, letting the natural light pass through the membrane.

A steel GSA® connecting system, installed during the production process, helped to shorten the assembly time and to reduce the price of the transport.



Building category:

Leisure Centre

Building owner:

Brismatt AG, Bächliacker Tennis and Sports Centre

Place:

CH-4402 Frenkendorf, Switzerland

Year of construction:

2009

System:

Two-hinged trusses with GSA® Connecting system

Dimensions:

48.0 x 27.03 x 11 m (LxBxH)

Services provided:

Engineering, production and construction drawings, logistics

Outer cover:

Air membrane made out of ETFE foil

## INNOVATIVE AND DYNAMIC



### VILLA MINUSIO, LAKE MAGGIORE, SWITZERLAND

Canadian Douglas timber was used for the visible load bearing timber structure of this residence overlooking Lake Maggiore located on the south side of the Alps, Switzerland. Prefabricated glue laminated columns and curved roof beams were delivered to the site and connected together with almost invisible GSA® steel connectors engineered by neue Holzbau AG. neue Holzbau AG is able to supply small scale building projects like this family home.



Building category:	Private house
Building owner:	Völkin-Schmid
Place:	CH-6645 Brione sopra Minusio, Switzerland
Year of construction:	2006
System:	Post and beam construction
Dimensions:	27.3 x 12.2 x 6.7m (LxBxH)
Services provided:	Production and engineering of the load bearing structure



# SUSTAINABLE BUILDING RESOURCES P/L

## NEUE HOLZBAU AG, SWITZERLAND

### SHELL STRUCTURE, REHA KLINIK HASLIBERGER HOF HASLIBERG, SWITZERLAND

While adding another storey for a conference room, the Reha Klinik Hasliberg wanted to incorporate a dome. The fine support structure of this timber dome solution appealed to the owners.

The complexity of the curved structure challenged even the most skilled timber engineers. It was indeed the flexibility and large load bearing capacity of the timber laminates that made a realization of this design possible.



Building category:	Extension to the existing building
Building owners:	Michel Gruppe AG, Willigen/Meiringen
Place:	CH-6083 Hasliberg, Switzerland
Year of construction:	2007
System:	Shell structure with curved glue laminated beams
Dimensions:	12.3 x 8.3 x 8.1 m (LxBxH)
Services provided:	Engineering and detailed drawings, framework delivery

## INNOVATIVE AND DYNAMIC



### ROOF RESTORATION OF MUND CHURCH, SWITZERLAND

The existing concrete roof of the Mund Church needed to be renovated. A new concrete roof was considered but a new pitched timber roof became the preferred selected option. Our engineering analyses based on highly detailed 3D timber building models convinced the client to tear down the old concrete roof and replace it with a timber framework. The crossed bowstring roof trusses give the church a light and special ambiance.



Building category:

Building owner:

Place:

Year of construction:

System:

Dimensions:

Services provided:

Additional storey to an existing church

Mund City Council

CH-3903 Mund, Switzerland

2007

Two hinged bowstring roof trusses with horizontal steel tie bar

25 x 16 x 14.5m (LxBxH)

Engineering, production and construction drawings, delivery to the job site



# SUSTAINABLE BUILDING RESOURCES P/L

## NEUE HOLZBAU AG, SWITZERLAND

### DOME, BAKU, AZERBAIJAN

A primary requirement of the owner of this building in Baku, Azerbaijan was for easy and simple assembly of the dome. The entire timber structure had to be shipped in 40 feet long containers therefore the curved glue laminated supports were divided into 11.80m long elements and connected on site.

In order to achieve this our innovative and easy to install plug in GSA® connecting system was used. All the glue laminated load bearing elements were produced in our factory in Switzerland.



Building category:	Private building
Building owner:	Bravotent, Azerbaijan
Year of construction:	2007
System:	Dome, arch with 3-hinged frame
Dimensions:	Diameter 46m, height 17.7m
Services provided:	Engineering, production and construction drawings, delivery to the job site, project management

## INNOVATIVE AND DYNAMIC



### NESTLÉ WAREHOUSE, KONOLFINGEN, SWITZERLAND

In 2009 Nestlé Switzerland built a new production hall and warehouse in Konolfingen, Switzerland. At neue Holzbau's suggestion, based on analyses that showed strong economic and sustainable benefits, Nestlé chose to develop the project using timber. Further, by incorporating the GSA<sup>®</sup> connecting system, our engineers were able to optimise the overall building structure and shorten the time required to construct the building.



Building category:	Warehouse
Building owner:	Nestlé Switzerland
Place:	CH-3510 Konolfingen, Switzerland
Year of construction:	2009
System:	Timber structure with some steel load bearing elements
Dimensions:	135 x 61 x 13.8m (LxBxH)
Services provided:	Engineering, production and construction drawings, delivery to the job site



# SUSTAINABLE BUILDING RESOURCES P/L

## NEUE HOLZBAU AG, SWITZERLAND

### PRESERVATION AND INTERVENTION CENTRE, FRUTIGEN, SWITZERLAND

Our engineers were required to design the hall structure so that it could be easily dismantled and at the same time support the superimposed loads as well as the structure itself. The roof, with its extensive greenery, was designed to withstand heavy loads which could create high horizontal forces and bending moments in the corner joints. We fulfilled the architect's vision by using highly rigid laminates and hardwood in the weak areas of the building structure as well as using a controlled pre stressing and GSA<sup>®</sup> connectors in the supports allowing the corner forces to be reduced.



Building category:	Public building/ transport
Building owner:	BLS Alptransit AG and BLS AG
Place:	CH-3714 Frutigen, Switzerland
Year of construction:	2005
System:	Two hinged glue laminated frame girders with GSA <sup>®</sup> connectors
Dimensions:	94.5 x 21.2 x 10 and 70 x 21.2 x 10 (LxBxH)
Services provided:	Engineering, construction and detailed drawings, delivery to the building site

# INNOVATIVE AND DYNAMIC



## GIRAFFE HOUSE KNIE'S CHILDREN'S ZOO RAPPERSWIL, SWITZERLAND

The giraffe house at the entrance of the Knie's Children's Zoo, stands out due to its unique curved overhanging roof structure and its high doors. To provide stability of the front elevation, the glue laminated horizontal and sidelong elements were tightened to roof the structure with specially designed complex steel connectors.



Building category:	Public building
Building owner:	Gebrüder Knie, Schweizer National-Circus AG
Place:	CH-8640 Rapperswil, Switzerland
Year of construction:	2006
System:	Glue laminated bowstring roof trusses
Dimensions:	23 x 15.4 x 11m (LxBxH)
Services provided:	engineering and construction drawings, delivery to construction site



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