NeoBuild Technical Notes

Report Title:

Glossary of LGSF industry



Discipline:

LGS

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1. What is LGSF:

Light gauge steel framed structures are structures made from thin sheets of steel, usually between 0.5 mm and 1.5 mm thick, that are formed into various shapes, such as beams, columns, and wall panels. They are commonly used in construction as an alternative to traditional building materials such as wood, brick, and concrete.

Light gauge steel structures are popular for a number of reasons:

- 1. Durability: Steel is strong and durable, and light gauge steel structures can last for many decades with little maintenance required.
- 2. Ease of Construction: The lightweight and flexible nature of light gauge steel structures makes them easier to work with and transport than heavy building materials. They can be easily cut, bent, and formed into various shapes and sizes, which reduces construction time and costs.
- 3. Energy Efficiency: Light gauge steel structures are often more energy efficient than other building materials, as steel has good thermal conductivity and can be easily insulated.
- 4. Sustainability: Steel is a recyclable material, and light gauge steel structures can be disassembled and recycled at the end of their useful life, reducing waste and promoting sustainability.
- 5. Design Flexibility: Light gauge steel structures can be designed to meet a wide range of structural requirements, making them suitable for a variety of building types and applications.

Light gauge steel structures are commonly used for low-rise buildings, such as single-family homes, apartment buildings, and commercial buildings, as well as for non-residential structures, such as storage sheds and agricultural buildings.

Steel structures are a common type of building construction used in Australia, particularly in the construction of commercial and industrial buildings.

Building codes and regulations in Australia dictate the design and construction of steel structures, ensuring they meet required standards for safety and durability. Steel structures are used in a variety of building projects, including offices, warehouses, bridges, and other structures. The popularity of steel structures in Australia is due in part to their versatility, strength, and cost-effectiveness, making them a popular choice for many building projects.



Technical report title:	FLEXURAL CAPACITY OF NEW LGS SECTION
Discipline:	⊠LGS □FRW □RCS □HRS ☑RDD □GMD

2. Which one is better, light gauge steel structures or wood structures?

The choice between light gauge steel structures and wood structures depends on various factors such as the specific use case, the local building codes, the availability of materials, and personal preferences.

Advantages of light gauge steel structures include:

- High strength-to-weight ratio, allowing for large spans and open floor plans
- Resistant to fire, pests, and rot
- Good durability and long lifespan
- High recyclability
- Consistent material properties and dimensional stability





3. What is a roll forming machine?

A roll forming machine is a machine used in the process of roll forming, which is a metal forming process where metal is shaped by passing it through a series of rolls. Roll forming machines typically consist of a series of rollers that progressively shape the metal into a desired cross-sectional profile. The rollers are mounted on a series of frames, and the metal is fed through the machine in a continuous strip, being shaped by each set of rollers until the final profile is achieved. Roll forming machines can be used to produce a wide range of metal products, including roofing panels, floor decking, wall panels, and purlins, among others.



4. What is a stud?

A stud is a vertical structural member used in building construction to support walls and roofs. Studs are typically made of wood or metal and are used to form the frame of a building. They are placed at regular intervals along the length of a wall, and are used to support the weight of the wall and any other loads that may be placed on it. In wood-framed construction, studs are typically spaced 16 or 24 inches apart, and are fastened to the top and bottom plates of the wall, as well as to each other, to form a solid, rigid frame. Metal studs, which are commonly used in commercial construction, are similar in function to wood studs, but are typically lighter and more fire-resistant. Studs play an important role in the structural stability and safety of a building, and it is important to use the appropriate type and size of studs based on the specific needs and conditions of the building.



5. What is a jamb stud?

A jamb stud is a vertical framing member used in construction, typically to provide support for door or window openings. Jamb studs are usually positioned at the sides of the opening, and are connected to the header and sill plates to create the frame. They help to transfer the weight of the structure above the opening to the foundation, and provide stability to the opening.

Jamb studs are typically made of wood, steel, or a combination of the two materials. They are used in both residential and commercial construction, and can be customized to suit the specific requirements of each project, such as load-bearing capacity and fire resistance. The size and spacing of the jamb studs are typically determined by building codes and engineering design standards.



6. What is a roof truss?

A roof truss is a structural component used in building construction to support the roof of a building. It is a triangulated framework made up of a series of interconnected beams, usually made of wood or steel, that are designed to distribute the weight of the roof evenly across the walls of the building. Roof trusses are used in a wide range of building types, from residential homes to commercial buildings, and are designed to be strong, stable, and cost-effective.

A roof truss is typically composed of individual members or components that are connected together to form a single unit. The members are arranged in a specific pattern and joined at points called nodes to create a truss-like shape. The shape of the roof truss and the size of the individual members are determined by the specific requirements of the building, including the size and shape of the roof, the span of the roof, the load requirements, and other factors.

Roof trusses are commonly used in building construction because they provide several benefits, including increased structural stability, cost-effectiveness, versatility, and reduced construction time. They are also easier to transport and handle than traditional roof supports, making them ideal for use in many different types of building projects. To ensure the stability and safety of a roof truss system, it is important to use the appropriate type and size of truss based on the specific needs of the building, and to work with experienced professionals for design, fabrication, and installation.



7. what is a webbed joist?

A webbed joist is a type of structural support member used in building construction, typically for floor and roof systems. It is similar in shape to a traditional joist, but has a web or an additional piece of material in the middle that provides additional strength and stability. The web is usually made of metal or engineered wood and is designed to provide increased resistance to bending and twisting.

Webbed joists are used in applications where the load requirements of the structure are greater than those of a traditional joist, such as in multi-story buildings or in buildings with heavy loads such as commercial kitchens. They are also used in cases where there is limited space between the joists and where a traditional joist would not provide enough stability, such as in basement construction. Webbed joists are manufactured in a variety of sizes and shapes to meet the specific needs of different projects, and they can be used in combination with other structural elements such as beams and columns to create a stable and robust structural frame.





8. What is a truss lintel

A truss lintel is a type of load-bearing structural element used in building construction. It combines the features of a truss and a lintel to provide support for a building's roof and walls. A truss lintel consists of a series of triangular shapes made from wood, steel, or other materials, which are connected and braced to create a rigid, load-bearing structure. The truss design allows the lintel to span large distances without sagging or collapsing, while the lintel provides a flat surface to support the load of the roof and walls above. Truss lintels are often used in building construction where a wide span is required, such as in industrial or commercial buildings.



9. What is sheet roof?

Sheet roofing refers to a type of roofing material that is made of sheets or panels, typically of metal or plastic, that are used to cover and protect a building or structure from the elements. Sheet roofing is typically used on low-slope or flat roofs, and the sheets or panels are installed over a waterproof membrane, insulation, or structural deck to provide a continuous and water-tight surface. Some common types of sheet roofing materials include metal (such as aluminum, steel, or copper), plastic (such as PVC or TPO), and asphalt or fiberglass-reinforced composites. Sheet roofing materials offer a variety of benefits, including durability, ease of installation, and resistance to water, wind, and fire. However, it is important to choose the right type of sheet roofing material based on the specific conditions and requirements of the building or structure.



10. What is a tile roof?

A tile roof is a type of roofing system that uses interlocking tiles made of clay, concrete, or other materials to provide a water-resistant and durable roof covering. Tile roofing has been used for thousands of years in many different cultures and is still widely used today, especially in regions with Mediterranean-style architecture. Tile roofing systems can be heavy, so they typically require a strong and sturdy roof structure, but they also offer a number of benefits. Tile roofing is known for its longevity, fire resistance, and ability to withstand extreme weather conditions, including high winds and heavy rain. In addition, tile roofing provides excellent insulation and can help to regulate the temperature inside the building. Tile roofing is also available in a variety of colors, styles, and shapes, allowing for a customized look to suit the style of the building.



11. what is a wind beam?

A wind beam, also known as a wind girder, is a structural component used in building design to resist wind loads on a structure. The wind beam is designed to transfer wind loads from the roof or walls of a building to the building's foundation or other load-bearing elements.

Wind beams are typically designed to be slender and elongated in shape, to reduce their structural weight and allow for efficient transfer of wind loads. They are usually made from steel and can be either a solid beam or an open structure, such as a truss.

The size, shape, and material of the wind beam will depend on the specific building design, wind loads, and local building codes and regulations. A wind beam is an important component in ensuring the stability and safety of a building in high wind conditions. The wind beam helps to reduce the risk of damage or collapse, and protects the building's occupants and contents.



12. What is FRL?

FRL stands for Fire Resistance Level, which is a measure of a building component's ability to resist the spread of fire. In Australia, the Building Code of Australia (BCA) sets out the minimum fire resistance levels required for various building components, such as walls, floors, and roofs.

FRL is expressed in minutes, and indicates the length of time that a building component can withstand fire exposure without collapsing or losing its structural integrity. The FRL of a building component is determined by a variety of factors, including its composition, thickness, and the materials used to construct it.

The BCA requires that building components be tested and rated for their FRL in accordance with Australian Standard AS 1530.4, which sets out the methods for determining the fire resistance of building elements. The BCA also sets out specific FRL requirements for different types of buildings, based on the occupancy and use of the building, as well as its location and fire protection systems.

In Australia, it is important to ensure that buildings are designed and constructed in accordance with the FRL requirements of the BCA, in order to provide adequate fire safety and protection for occupants.



Technical report title:	FLEXURAL CAPACITY OF NEW LGS SECTION
Discipline:	ØLGS □FRW □RCS □HRS ØRDD □GMD

13. What is roof eave?

The roof eave is the lower edge of a roof that extends beyond the side of a building. The eave provides protection to the walls and windows of the building from rain, snow, and other elements. The eave is usually lined with eave flashing and a drip edge, which direct water away from the building and prevent it from seeping into the walls and causing damage. Roof eaves can also be used to provide shade and ventilation to the building. In some architectural styles, the roof eave is an important design feature, and can be decorated with molding, brackets, or other decorative elements.



14. What is a load bearing wall?

Load-bearing walls are walls in a building that are designed to support the weight of the structure above, including the roof, floor, and other walls. These walls transfer the weight of the building down to the foundation and help to distribute the weight evenly throughout the building. Load-bearing walls are typically made from strong materials such as concrete, masonry, or heavy timber, and are constructed to withstand the forces generated by the weight of the building. In contrast, non-load bearing walls, also known as partition walls, do not support the weight of the building and are used primarily to divide interior spaces. The distinction between load-bearing walls is important in construction, as removing or altering a load-bearing wall can have a significant impact on the stability and safety of a building.



15. What is a non-load bearing wall?

A non-load bearing wall, also known as a partition wall, is a type of wall in a building that does not support the weight of the structure above or around it. These walls are used primarily to divide interior spaces and do not contribute to the stability of the building. Non-load bearing walls are typically made from lighter materials such as gypsum board (drywall), wood, or metal studs, and are not designed to withstand the forces generated by the weight of the building. Because they do not support the weight of the building, non-load bearing walls can often be removed or altered with minimal impact on the stability of the building. In contrast, load-bearing walls are designed to support the weight of the building and are typically made from stronger materials such as concrete, masonry, or heavy timber.



16. What is a joist binder?

A joist binder is a type of hardware used in construction to connect the ends of floor joists together and provide support to the structure. Joist binders are typically made of metal and are used to transfer loads between joists, helping to distribute weight evenly across the structure. They can be used to connect the ends of adjacent joists or to connect the ends of joists to a header or beam, creating a strong, stable structure. Joist binders are typically used in residential and commercial construction and play an important role in the stability and safety of the building. The type of joist binder used can depend on the size, span, and load requirements of the joists, as well as local building codes and regulations.



17. What is a web notch?

A web notch is a cutout or opening in the web of a structural element, such as a beam or column. Web notches are often used to accommodate penetrations, such as electrical or plumbing lines, without reducing the strength of the structural element.

Web notches are carefully designed to ensure that they do not weaken the structural element, and their size and location are determined based on the strength and stability requirements of the element. In some cases, web notches may require reinforcing with additional plates or beams to maintain the structural integrity of the element.

Web notches should be designed and specified by a qualified engineer, who will consider the loads and requirements of the structure, as well as relevant building codes and standards, when determining the size and location of the notches. It's important to properly design and construct web notches to ensure the stability and safety of the structure.



18. What is a service hole in steel structures?

A service hole in steel structures is an opening or cutout in a steel beam or column that provides access to the interior of the structure for maintenance or service purposes. Service holes are commonly used to provide access to electrical, plumbing, or mechanical systems, and are located in such a way as to minimize the impact on the strength and stability of the structural element.

Service holes are carefully designed and located to ensure that they do not weaken the structural element and that the element remains capable of supporting its intended load. The size, location, and configuration of service holes are determined based on the loads and requirements of the structure, as well as relevant building codes and standards.

Service holes should be designed and specified by a qualified engineer, who will consider the loads and requirements of the structure, as well as relevant building codes and standards, when determining the size and location of the holes. It's important to properly design and construct service holes to ensure the stability and safety of the structure.



19. What is a hip roof:

A hip roof is a type of roofing design where all sides of the roof slope downwards to the walls, with the exception of the hip ends, which form a ridge at the intersection of the sloping sides. A hip roof is typically more stable than a gable roof, as the forces of wind and weight are distributed evenly across the four sides of the roof. In contrast to a gable roof, where the roof structure is supported by two opposing sides, a hip roof is supported by all four sides, making it stronger and more resistant to wind damage. A hip roof also provides more usable attic space and is often used in residential and commercial buildings to provide a classic and elegant look.



20. What is a shop drawing?

A shop drawing is a detailed technical illustration or set of drawings used in the construction industry. It is created by a contractor, fabricator, or supplier and is used to provide specific information about a building component or system. Shop drawings are used as a guide for the manufacture and installation of various building components such as structural steel, concrete, masonry, and mechanical and electrical systems. The purpose of a shop drawing is to ensure that all the components of a building project are manufactured and installed according to the design specifications, codes, and standards. Shop drawings often include details about the size, material, and finish of the components, as well as any necessary information for assembly and installation.



3D VIEW

21. How much is the best roof slope?

The best roof slope, or pitch, depends on several factors, including climate, building codes, roofing material, and design preferences. Generally, roof slopes can range from a minimum of 1:12 (4.76 degrees) to a maximum of 12:12 (45 degrees). The most common roof slopes for residential buildings are 4:12 (18.43 degrees), 6:12 (26.57 degrees), and 8:12 (34.15 degrees).

For areas with heavy rain and snow, a steeper roof slope is often recommended to ensure proper drainage and prevent water damage. For example, a minimum slope of 4:12 is often required in areas with heavy rain and snow, while a minimum slope of 2:12 may be allowed in drier climates.

When selecting the best roof slope, it is important to consider the specific needs and requirements of the building, as well as the design aesthetic, cost, and maintenance considerations. It is also important to consult with a professional roofing contractor, engineer, or architect to determine the best roof slope based on the specific needs and requirements of the building.



22. What is cyclone?

A cyclone is a large-scale weather system characterized by a low-pressure center, strong winds, and rotating movement. Cyclones are known by different names in different parts of the world, including hurricanes and typhoons. The term "cyclone" is used most commonly in the Indian Ocean and South Pacific region.

Cyclones form over warm ocean waters and can bring heavy rainfall, strong winds, high waves, and coastal flooding. They can also cause widespread damage to buildings, infrastructure, and crops. The severity of a cyclone can range from a minor storm to a major natural disaster, depending on its strength and size.

It's important for people living in areas that are prone to cyclones to stay informed about the weather and to take necessary precautions, such as preparing emergency supplies, securing loose objects outside, and following evacuation orders if advised by local authorities.



23. What is tiny house?

A tiny house is a small, compact, and usually mobile dwelling that is typically less than 500 square feet in size. The tiny house movement is an architectural and social trend that emphasizes simple living, sustainability, and affordability. Tiny houses are designed to be energy-efficient and often use alternative building methods and materials, such as shipping containers or recycled materials. They are typically equipped with basic amenities, such as a kitchen, sleeping area, and bathroom, and often feature flexible and multi-functional spaces.

Tiny houses are often used as primary residences, second homes, or vacation homes, but can also be used for rental or guest accommodation, or as office or work spaces. The tiny house movement has gained popularity as a response to the high cost of housing, consumerism, and a desire for a simpler, more sustainable lifestyle.



24. What is floor vibration?

Floor vibration refers to the oscillations or shaking that occurs in a floor or structure, typically as a result of some kind of excitation, such as human activities, machinery, or traffic. Floor vibrations can cause discomfort or disturbance for occupants, and in some cases can lead to structural damage. The magnitude and frequency of floor vibrations are typically characterized by their dynamic response, which is influenced by factors such as the floor structure, its supporting system, and the excitation source. Floor vibrations can be reduced or controlled by various means, such as by adding mass to the floor structure, using dampers or isolators, or changing the excitation source. In some cases, floor vibration design criteria are specified in building codes or industry standards to ensure that floor vibrations are within acceptable levels for comfort and safety.



25. About AS4100?

AS4100 is a standard for the design of steel structures in Australia. It provides guidelines and requirements for the design, fabrication, and construction of steel structures, including loadings, materials, structural elements, connections, and members. The standard is used by engineers, fabricators, and contractors to ensure the safety, reliability, and quality of steel structures.

26. About AS4600?

AS 4600 is a standard for the design and construction of precast, prestressed concrete elements in Australia. It provides guidelines and requirements for the design, manufacture, and erection of precast concrete elements, such as beams, columns, walls, and floor systems. The standard covers aspects such as loadings, materials, reinforcement, prestressing, and dimensional tolerances, and is used by engineers, precast concrete manufacturers, and contractors to ensure the safety, reliability, and quality of precast concrete structures in Australia.

27. About NASH standard

The National Association of Steel-Framed Housing (NASH) is an organization that promotes and represents the steel-framed housing industry in Australia. They likely have guidelines and standards for the design, construction, and performance of steel-framed housing, which are followed by builders, engineers, and other professionals in the industry.

The National Association of Steel-Framed Housing (NASH) is an industry association that represents the steel-framed housing sector in Australia. The organization's main goal is to promote the use of steel-framed housing and to provide support, information, and guidance to its members and the broader community.

As part of this mission, NASH likely develops and publishes standards and guidelines for the design, construction, and performance of steel-framed housing. These standards would address various aspects of steel-framed housing, such as materials, loadings, structural systems, and fire safety, and would be based on current best practices and the latest research in the field.

Technical report title:	FLEXURAL CAPACITY OF NEW LGS SECTION
Discipline:	⊠LGS □FRW □RCS □HRS ☑RDD □GMD

By adhering to these standards, builders, engineers, and other professionals in the steel-framed housing industry can ensure that their projects are safe, efficient, and meet industry best practices. NASH may also provide training and educational resources for its members and the wider community to help them understand and apply these standards.

28. About AS4055

AS4255 is a standard in Australia that specifies the design and construction requirements for precast, prestressed concrete elements used in building construction. The standard covers the design of precast elements such as beams, columns, walls, and floor and roof systems, and provides guidelines for the production, handling, transportation, and installation of these elements. The purpose of AS4255 is to ensure that precast concrete elements are designed and constructed to meet required strength, serviceability, and durability requirements, and to provide a consistent level of quality in precast concrete construction in Australia.

29. ut AS1170

AS 1170 is a set of Australian Standards that provides guidelines for the structural design of buildings and structures in Australia. The standards cover a range of topics, including structural design actions, structural timber design, structural design of masonry, structural steel design, structural design of reinforced concrete, and seismic design. The purpose of AS 1170 is to provide a consistent and comprehensive approach to the structural design of buildings and structures in Australia, to ensure the safety and stability of these structures, and to promote uniformity in the design and construction practices throughout the country. The AS 1170 standards are updated regularly to reflect changes in technology, materials, and construction practices, and are widely used by engineers, architects, building contractors, and other construction professionals in Australia.