

讲义

Sustainable construction

可持续建筑

Growing **timber** town

木制城市正在兴起

Sweden plans to build a city made
from cheap, green, **fireproof** wood

瑞典计划建造一座由廉价、绿色、防火木材制成的城市

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There is a global race to build the tallest wooden **skyscraper**. The record was held by **Mjostarnet**, an 85-metre tower on the shore of Lake Mjosa in Norway, which hosts flats, a hotel and a swimming pool—until **Ascent**, an 87-metre structure, was completed in **Wisconsin** in July 2022. And it will be **put in the shade** in turn by other buildings: a 90 metre tower is planned for **Ontario**, and a 100 metre one for Switzerland. (By way of comparison, **St Paul's cathedral** in London is 110 metres tall.)

全球各国都在竞相修建最高的木质摩天大楼。这一纪录由 Mjostarnet 保持，这是一座位于挪威 Mjosa 湖岸边的 85 米高的塔，里面有公寓、酒店和游泳池——这一最高纪录一维持到 2022 年 7 月，一座 87 米高的建筑楼 Ascent 在美国威斯康星州竣工。而这座建筑物的高度将依次被其他即将修建的建筑物超过：加拿大安大略省计划建造一座 90 米高的塔、瑞士计划建造一座 100 米高的塔。（可以以 110 米高的伦敦圣保罗大教堂为参照比较。）

【词汇】

1. **timber** /'tɪmbər/ n. 四级/雅思/GRE/考研 trees that are grown to be used in building or for making things (用于建筑或制作物品的) 树木，林木；用材林

例：the timber industry

林木业

<同义替换> wood; log

2. **proof** /pru:f/ adj. 四级/考研 (in compounds 构成复合词) that can resist or protect against the thing mentioned
防...的；抗...的

例：rainproof/windproof clothing

防雨 / 防风服装

<同义替换> resistant

3. **fireproof** adj. 防火的

4. **skyscraper** /'skaiskreɪpər/ n. a very tall building in a city 摩天大楼

例：People's attitude towards the skyscrapers varies widely.

人们对这些摩天大楼的态度很不相同。

【短语】

1. **put in the shade** : to be so good or impressive that other similar things or people seem much less important or interesting 使某人/某事物黯然失色

例：I tried hard but her work put mine in the shade.

我费了很大力气，但她的成果让我相形见绌。

【背景信息】

1. **Mjostarnet** : 米约萨塔。曾经是世界上最高的木制大楼。位于挪威的 Mjøstårnet, 一共有 18 层, 高度为 85.4 米。

2. **Ascent** : Ascent, 是一座位于威斯康星州密尔沃基市中心的 25 层豪华公寓, 高达 86.6 米, 超越此前挪威的纪录保持者——85.4 米高的 Mjstrnet, 成为全球最高的重木 (Mass Timber) 建筑。

3. **Wisconsin** /wɪs'kɑ:nsɪn/ a northern US state which has borders with Lake Michigan and Lake Superior. Its popular name is the Badger State. The largest city is Milwaukee and the capital city is Madison. 威斯康星 (美国中北部的州, 与密歇根湖和苏必利尔湖接界。最大城市密尔沃基, 首府麦迪逊)

4. **Ontario** /ɑ:n'teriəʊ/ a province of eastern Canada, between Hudson Bay and the Great Lakes. The capital is Toronto. 安大略 (加拿大东部省份, 位于哈得孙湾和五大湖之间, 首府多伦多)

5. **St Paul's cathedral** : a large cathedral in London. It was designed in the late 17th century by Sir Christopher Wren to replace a previous cathedral destroyed in the Fire of London, and was completed in 1710. 圣保罗大教堂：伦敦的大型大教堂。它是由克里斯托弗·雷恩爵士 (Christopher Wren) 于 17 世纪后期设计的, 用来取代先前在伦敦大火中毁坏的大教堂, 并于 1710 年完工。

This week, though, a Swedish firm announced it was

然而, 本周, 一家瑞典公司宣布, 它将

going for a different sort of record. It **unveiled** plans to build what could be the world's biggest wooden city. Stockholm Wood City will be built in Sickla, an area in the south of the Swedish capital. Construction on the 250,000 square-metre site will begin in 2025. When complete, ten years later, it will contain 2,000 homes and 7,000 offices, along with restaurants and shops. The 12bn-**krona** (\$1.4bn) project is led by Atrium Ljungberg, a Swedish urban development company.

创造一种不同的记录。瑞典公布了建造可能是世界上最大的木制城市的计划。斯德哥尔摩木城将建在位于瑞典首都南部的西克拉（Sickla）。该城占地面积为25万平方米，并将于2025年开始修建。十年后完工时，这个地方将会有2000个住宅房、7000个办公室、以及餐馆和商店。这个价值120亿克朗（合14亿美元）的项目将由瑞典城市开发公司Atrium Ljungberg负责完成。

【词汇】

1. **unveil** /ˌʌn'veɪl/ v. **托福/专八** to show or introduce a new plan, product, etc. to the public for the first time (首次展示, 介绍, 推出; 将...公之于众)

例: They will be unveiling their new models at the Motor Show.

他们将在汽车展上首次推出自己的新型汽车。

<同义替换> debut

2. **krona** /'krɒnə/ n. the unit of money in Sweden and Iceland 克朗 (瑞典和冰岛货币单位)

By using wood the company hopes to reduce the project's **carbon footprint** by up to 40%, compared with building in **concrete** and **steel**, says Annica Anäs, the company's boss. Wood is a sustainable material that can be produced from renewable forests, which Sweden has in plenty. When used for building, it **locks up** the carbon that the trees absorbed from the atmosphere while growing. As with other modern construction projects using timber, Wood City will still use some concrete and steel in places like the **foundations**, but the overall amounts will be greatly reduced. As wooden buildings are much lighter, their foundations can be smaller.

该公司的老板安妮卡·阿纳斯（Annica Anäs）说，他们会使用木材完成此次修建项目，而且与钢筋混凝土建筑相比，以木材为原材料可以使碳足迹减少40%。木材是一种可持续材料，可以从可再生森林中生产，而瑞典拥有大量的可再生森林资源。当用于建筑时，它能贮存树木在生长过程中从大气中吸收的碳。与其他使用木材的现代建筑项目一样，“木城”将在地基等建筑部位仍旧采用一些混凝土和钢材，但其总量将大大减少。由于木制建筑要轻得多，它们

的地基面积可以更小。

【词汇】

1. **carbon footprint** /ˌkɑːrbən ˈfʊtprɪnt/ a measure of the amount of carbon dioxide that is produced by the activities of a person or company 碳足迹（日常活动所产生的碳排放量的量度方式）

例：Flying is the biggest contribution to my carbon footprint.

乘坐飞机在我的碳足迹中占有的比例最大。

2. **concrete** /ˈkɒːnkri:t/ n. building material that is made by mixing together cement, sand, small stones and water 混凝土

例：a slab of concrete

混凝土板

3. **steel** /sti:l/ n. 四级/考研 a strong, hard metal that is made of a mixture of iron and carbon 钢

例：the iron and steel industry

钢铁工业

4. **foundation** /faʊnˈdeɪʃn/ n. 四级/考研 a layer of stone, concrete, etc. that forms the solid underground base of a building 地基；房基；基础

例：The explosion shook the foundations of the houses nearby.

爆炸震撼了附近房屋的地基。

<同义替换> base

【短语】

1. **lock up** : to put something in a safe place that can be locked 把...收好并锁起来

例：All the valuables were safely locked away.

所有贵重物品都已妥善锁好。

【长难句】

As with other modern construction projects using timber, Wood City will still use some concrete and steel in places like the foundations, but the overall amounts will be greatly reduced.

句子的主干部分是：Wood City will still use some concrete and steel in places like the foundations, but the overall amounts will be greatly reduced, 是有 but 连接的并列句，but 后表转折。

As with other modern construction projects using timber 为状语，意思是：与其他使用木材的现代建筑项目一样

The Swedish project will, as existing wooden skyscrapers do, employ large **prefabricated** sections made from what is called “engineered timber”. Instead of ordinary **lumber**, **chipboard** or **plywood**, engineered timber is a **composite** in which layers of wood are **laminated** together in specific ways.

瑞典的项目将像现有的木制摩天大楼一样，采用由所谓的“工程木”制成的大型预制构件。与普通木材、刨花板或胶合板不同，工程木是一种复合材料，其中木材层以特定的方式层压在一起。

【词汇】

1. **prefabricated** /ˌpriːˈfæbrɪkeɪtɪd/ adj. (especially of a building 尤指建筑) made in sections that can be put together later 预制的；用预制构件组装的

例：Prefabricated houses were quickly put up after the war.

预制房屋在战后迅速被盖起来。

2. **lumber** /ˈlʌmbər/ n. wood that is prepared for use in building, etc. (建筑等用的) 木材，木料

例：a lumber mill

木材厂

3. **chipboard** /ˈtʃɪpbɔːrd/ n. a type of board that is used for building, made of small pieces of wood that are pressed together and stuck with glue 刨花板；碎木胶合板

例：They had nailed chipboard across the broken window.

他们把碎木板钉在破了的窗户上。

4. **plywood** /ˈplaɪwʊd/ n. board made by sticking thin layers of wood on top of each other 胶合板；压合板；夹板

例：plywood furniture

胶合板家具

5. **composite** /kəmˈpɔːzət/ adj. 六级/雅思/GRE/考研/专八 made of different parts or materials 合成的；混成的；复合的

例：a composite picture (= one made from several pictures)

合成照片

<同义替换> synthetic

6. **laminated** /ˈlæmɪneɪtɪd/ adj. (of wood, plastic, etc. 木材、塑料等) made by sticking several thin layers together 由薄层粘制成的；层压的；黏合的

例：laminated glass

夹层玻璃

The wood grains in each layer are **aligned** to provide individual components of the building, such as floors, walls, cross **braces** and **beams**, with extremely high levels of strength. And because these parts can be manufactured in a factory, where **tolerances** are finer and quality control is easier to maintain than on a building site, the use of prefabricated sections **cuts down** on the delivery of raw materials and allows construction to **proceed** more quickly.

工程木的每一层木纹都是对齐的，以保证有极高强度的建筑构件，如地板、墙壁、横撑和横梁。由于这些部件可以在公差更小、质量把控更稳定的工厂中制造，因此使用预制部件可以减少原材料的运输，并缩短建筑工期。

【词汇】

1. **align** /ə'laɪn/ v. to arrange something in the correct position, or to be in the correct position, in relation to something else, especially in a straight line 排列整齐；使对齐；（尤指）成一直线

例：Make sure the shelf is aligned with the top of the cupboard.

务必使搁架与橱柜顶端对齐。

2. **brace** /breɪs/ n. 六级/雅思/托福/GRE/考研/专八 a device that holds things together or holds and supports them in position 箍子；夹子；支架

例：a neck brace (= worn to support the neck after an injury)

矫治用的颈箍

3. **beam** /bi:m/ n. 四级/六级/雅思/GRE/考研 a wooden bar that is used in the sport of gymnastics for people to move and balance on 平衡木

例：The gymnast performed a somersault on the beam.

体操运动员在横梁上进行了空翻。

4. **tolerance** /'tɔ:lərəns/ n. the amount by which the measurement of a value can vary without causing problems 公差；容限

例：They were working to a tolerance of 0.0001 of a centimetre.

他们在按 0.0001 厘米的公差加工。

5. **proceed** /prəʊ'si:d/ v. 四级/雅思/托福/考研 to continue doing something that has already been started; to continue being done 继续做（或从事、进行）

例：Work is proceeding slowly.

工作进展缓慢。

【短语】

1. **cut down** : to reduce the size, amount or number of something 削减，缩小（尺寸、数量或数目）

例：The doctor told him to cut down on his drinking.

医生劝他少喝酒。

【长难句】

And because these parts can be manufactured in a factory, where tolerances are finer and quality control is easier to maintain than on a building site, the use of prefabricated sections cuts down on the delivery of raw materials and allows construction to proceed more quickly.

句子的主干部分为：the use of prefabricated sections cuts down on the delivery of raw materials and allows construction to proceed more quickly，意思是：使用预制部件可以减少原材料的运输，并缩短建筑工期

because these parts can be manufactured in a factory 为原因状语从句，意思是：由于这些部件可以在工厂中制造

where tolerances are finer and quality control is easier to maintain than on a building site 为定语从句，补充说明 factory，意思是：公差更小、质量把控更稳定的

Another advantage is that construction will not be as noisy as it would be if the town were built from concrete and **bricks**, adds Ms Anäs. This makes wooden buildings particularly suitable for urban redevelopment in general, since putting them up is less likely to annoy the neighbours. It should also be profitable. Ms Anäs is looking for a return on investment of 20% or better. "Sweden is **progressive** when it comes to wood construction," she says. "But I don't see any reason why it shouldn't work elsewhere."

与使用混凝土和砖块建造的建筑物相比，木质建筑的另一个优势是施工噪音较小，阿纳斯补充道。这使得木质建筑特别适合城市的再开发项目，因为在修建过程中不会使惹怒邻居。而且它还能带来收益。阿纳斯希望获得 20% 或更高的投资回报率。“瑞典在木材建筑方面是领先的，”她说。“但我认为它在其他地方也能起作用。”

【词汇】

1. **burning** /'bɜːnɪŋ/ adj. a very important problem that requires immediate attention 重大迫切的问题；当务之急

例：one of the burning issues of the day

当今最迫切的问题之一

2. **brick** /brɪk/ n. baked clay used for building walls, houses and other buildings; an individual block of this 砖；砖块

例：a pile of bricks

一摞砖

3. **progressive** /prə'gresɪv/ adj. 四级/考研 in favour of new ideas, modern methods and change 进步的；先进的；开明的

例： progressive and forward-looking policies

有前瞻性的进步政策

The biggest concern most people have about wooden buildings is the risk of fire. The buildings in Wood City will be fitted with several fire-protection systems, such as **sprinklers** and **flame-resistant** layers, as would also be found on their concrete or brick **counterparts**.

大多数人对木制建筑最大的担忧是火灾风险。和混凝土或砖砌建筑物的防火系统配置一样，“木城”也将配备一些防火系统，如洒水器和防火层。

【词汇】

1. **sprinkler** /'sprɪŋklər/ n. GRE a device inside a building that sprays out water if it detects a rise in temperature because of a fire （建筑物内的）喷洒装置，消防喷淋，自动喷水灭火装置

2. **resistant** /rɪ'zɪstənt/ adj. 四级/考研 (in adjectives 构成形容词) not damaged by the thing mentioned 抗...的；耐...的

例： disease-resistant plants

抗病植株

3. **flame-resistant** adj. 耐火的；防火的

4. **counterpart** /'kaʊntərpɑ:rt/ n. a person or thing that has the same position or function as somebody/something else in a different place or situation 职位（或作用）相当的人；对应的事物

例： The women's shoe, like its male counterpart, is specifically designed for the serious tennis player.

像同类的男款鞋一样，这款女鞋是专为认真从事网球运动的人设计的。

At the same time, researchers are coming to believe that engineered timber is, by its nature, extremely fire resistant. To help win approval for the construction of the Ascent building, the us Forest Service carried out tests on the laminated timber **columns** it would use. After finding them difficult to burn, the columns were awarded an **exemplary** three-hour fire-resistance rating because they maintained

与此同时，研究人员开始相信，工程木本质上就具有极强的耐火性。为了获得 Ascent 大楼的建设批准，美国国家森林局对其将使用的层压木柱进行了测试。经测试，研究人员发现这些木材难以被燃烧，而且能保持结构完整性。于是，这些柱子的耐火等级

their structural **integrity**.

被认定为三小时。

【词汇】

1. **column** /'kɔ:ləm/ n. 四级/雅思/考研 a tall, solid post, usually round and made of stone, that supports or decorates a building or stands alone as a monument 柱；（通常为）圆形石柱；纪念柱

例：The temple is supported by marble columns.

这座庙宇由大理石柱支撑。

2. **exemplary** /ɪg'zempləri/ adj. 托福/专八 excellent and providing a good example for people to follow 模范的，可作楷模的

例：a company with an exemplary record on environmental issues

在处理环境问题方面可作为楷模的公司

3. **integrity** /ɪn'tegrəti/ n. 六级/雅思/托福/GRE/考研/专八 the state of being whole and not divided 完整；完好

例：to respect the territorial integrity of the nation

尊重该国的领土完整

Without a sustained heat source the **charring** of the outer layer of a big piece of timber protects the structure inside—try lighting a camp fire when you only have **logs**. Many of the large urban fires of old, like **the Great Fire of London** in 1666, were mostly fuelled by small sections of timber acting as **kindling**. So when it comes to building in wood, it is best to think big.

在没有持续的热源的情况下，大块木材外层的炭化可以保护内部结构——当你只有原木的时候，你可以试着点燃篝火就知道了。许多旧时的大型城市火灾，如1666年的伦敦大火，其引火物主要是小块木材。因此，当涉及到木材建筑时，最好从大处（此处是双关，也指“大块木材”）着眼。

【词汇】

1. **char** /tʃɑ:r/ v. to become black by burning; to make something black by burning it（使）烧黑，烧焦

例：The flame licked through the paper, which charred and crinkled.

火舌把纸烧得焦黑起皱。

2. **log** /lɔ:g/ n. 四级/六级/雅思/托福/GRE/考研 a thick piece of wood that is cut from or has fallen from a tree 原木

例：logs for the fire

烧火用的木材

3. **kindling** /'kɪndlɪŋ/ n. small dry pieces of wood, etc. used to start a fire 引火柴；引火物

例：There were neat piles of kindling wood against the wall.

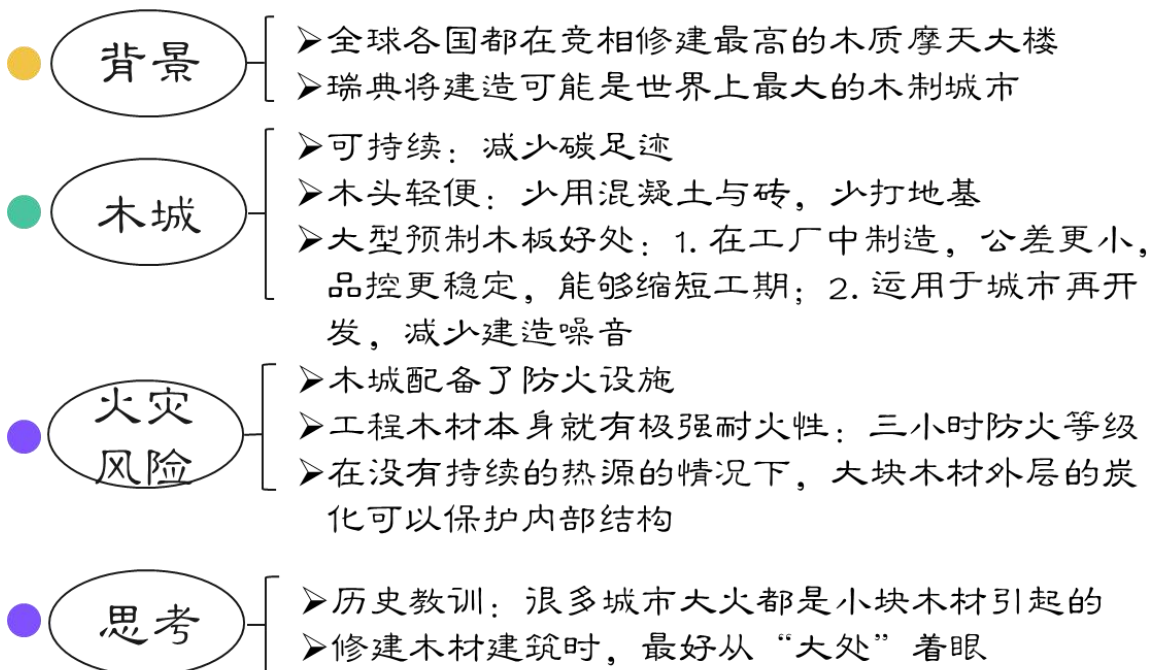
墙边整齐地放着几堆引火柴。

【背景信息】

1. **the Great Fire of London** : a very serious fire that destroyed most of the city of London, including the old St Paul's Cathedral, in September 1666. Most British people know that the fire started in a baker's shop in Pudding Lane. In spite of all the damage it caused, very few people were killed in the fire. 伦敦大火（Great Fire of London），发生于1666年9月2日~5日，是英国伦敦历史上最严重的一次火灾，烧掉了许多建筑物，包括圣保罗大教堂。

总结

1) 文章架构



2) 同义替换

✓ 防...; 抵御...

proof

Sweden plans to build a city made from cheap, green, fireproof wood

瑞典计划建造一座由廉价、绿色、防火木材制成的城市

resistant

...such as sprinklers and flame-resistant layers...

...如洒水器和防火层...

其他: repellent

例: water-repellent cloth

防水布

✓ 木材

log

...try lighting a camp fire when you only have logs.

...你可以试着点燃一堆木柴，然后观察一下情况。

timber

Growing timber town

木制城市正在兴起

lumber

Instead of ordinary lumber, chipboard or plywood...

与普通木材、刨花板或胶合板不同...

其他: wood

例: He chopped some wood for the fire.

他劈了些木柴烧火。

3) 一词多义

✓ brick

✓ 文章原句: ...as would also be found on their concrete or brick counterparts. ...

和混凝土或砖砌建筑物的防火系统配置一样。

✓ 释义:

① **baked clay used for building walls, houses and other buildings; an individual block of this**
砖; 砖块

The school is built of ~.

那所学校是用砖建造的。

② **a friend that you can rely on when you need help** 可靠的朋友

You were a ~, a real friend in need.

你足够朋友，是真正的患难之交。

③ **You can use bricks and mortar to refer to houses and other buildings, especially when they are considered as an investment.** (尤指视为投资的) 房产

As an investment, ~ and mortar are not what they were.

作为一种投资，房产不再是从前意义上的房产。

✓ tolerance

✓ 文章原句：...where tolerances are finer and quality control is easier to maintain... ..公差更小，质量把控更稳定...

✓ 释义：

① **the amount by which the measurement of a value can vary without causing problems** 公差；容限

They were working to a ~ of 0.0001 of a centimetre.

他们在按 0.0001 厘米的公差加工。

② **the ability to suffer something, especially pain, difficult conditions, etc. without being harmed** 忍耐力；忍受性；耐力；耐量

~ to cold

耐寒力

③ **the quality of being willing to accept or tolerate somebody/something, especially opinions or behaviour that you may not agree with, or people who are not like you** 忍受；容忍；宽容；宽恕

She had no ~ for jokes of any kind.

她容不得开任何玩笑。

4) 仿写训练

✓ 描述修建计划

✓ 文章原句：

It unveiled plans to build what could be the world's biggest wooden city. Stockholm Wood City will be built in Sickla, an area in the south of the Swedish capital. Construction on the 250,000 square-metre site will begin in 2025. When complete, ten years later, it will contain 2,000 homes and 7,000 offices, along with restaurants and shops.

✓ 句型及表达：

It unveiled plans to... ..公布...的计划

it will contain...along with... 它将会包括..., 以及...

✓ 仿写示例：

The government unveiled plans to build what could be the tallest building in this city. A new landmark will be built in the downtown. Construction on the 250,000 square-metre site will begin in 2023. When complete, five years later, it will contain 7,000 offices, along with commercial entertainment centers.

✓ 仿写作业——描述城市修建计划

成都公布了一项计划，即修建一栋可能是该市最高的建筑，这栋大楼也将是中国第四高的建筑。成都绿地中心将建位于省会城市市中心的锦江区。这个占地 138 万平方米的项目将很快开工。在五年的工期完毕后，它将包含许多办公和购物中心，以及商业场所、星级酒店和娱乐公园。

5) 主题词总结

今日主题——建筑	
1. timber	木材
2. log	原木
3. fireproof	防火的
4. concrete	混凝土
5. construction	建筑