vided such walls are made solid and without cellular open spaces within them.

The external bin walls shall have a covering of brick, slate, metal or other incombustible materials. If brick is used for casing, it shall not be less than eight inches thick, and securely fastened to the woodwork by iron anchors. If the weight of the bins is independently carried on a skeleton construction of wood, steel or iron, and does not rest upon the enclosing walls, the enclosing walls as high as the bottom of the bins shall be made of brick not less than twenty inches thick, or stone not less than thirty inches thick.

The walls and roof of the copula, and the roof on the bins on such buildings, shall be covered with incombustible materials, also the road ways and the ground floor, together with the supporting timbers when detached. All the external openings in he copula shall be covered with wire netting made of No. 14 wire, with mesh not over ½ × ½ inch.

The engine and boiler used in connection with any such elevator shall be enclosed with solid brick walls, and the roof over the same shall be fireproof. Any opening between the engine room or boiler house and the elevator shall be fitted with fireproof doors as before described in this by-law.

Any elevator building lighted by gas shall have all the lights protected by a wire basket or cage.

Every such elevator building shall have two four inch stand pipes connected with the water mains, and carried up to the copulas, the lower end of each pipe to be fitted with a valve, and the end in the copula with a valve, and not less than 100 feet of hose and branch pipe, attached to same.

STABLES.

SECTION 114.—Stables for private use may be erected, provided that said building is not more than two storeys in height, and may be third class buildings provided that the walls of said buildings are built upon or about upon the line dividing two properties shall be made of solid brick not less than eight inches thick, and that said wall shall be carried above the roof to the height mentioned for party walls in this by-law.

SECTION 115.—No person shall hereafter erect or alter an existing building to be used as stable, having stall accommodation for more than eight horses, nor shall any person erect or use such building for the keeping of horses and carriages or other vehicles, commonly known as a livery stable, or for the board and treatment of horses commonly known as veterinary stables, without having complied with the following conditions, and obtained a permit from the inspector and the sanction of the council.

An applicant for such permit shall give at least ten days public notice of his or her intention to apply for the same to the council, in the newspapers in which the notices of the said council usually appear, which notice, stating the dimensions and purposes for which said proposed buildings are to be used, shall be placarded in legible type, the letters of which shall not be less than ½ inch in height, on the lot on which said building is to be erected, or on the building proposed to be used for said purposes, so that neighboring proprietors, residents and others interested may have an opportunity of opposing the granting of said application. and no such application shall be entertained by the council unless notice has been given as herein provided.

Upon the receipt of such application, the council shall refer it to the Fire and Health Committees, and the inspector shall examine the premises where such building is proposed to be erected, or the building proposed to be used for such purpose, and shall hear the interested parties, and report to the Fire Committee. Should the council sanction the erection or alteration of said building the inspector shall issue a permit therefor as provided in this by-law.

VAULTS UNDER PAVEMENTS.

SECTIONS 116.—Any person wishing to use the space under a sidewalk shall first make application for permission to do so to the City Surveyor, submitting proper plans of same, and if said application is granted, pay the fees for such privilage as determined by the Road Department.

Any person utilizing the space below the sidewalk shall enclose said space with stone or brick walls, of sufficent thickness and strength as to retain the roadway, and resist all lateral pressure, the roof of said vaults shall be constructed of incombustible material supported on steel or iron beams, or brick or stone arches.

The surface of said roof shall be finished with stone, asphalt, cement or other covering prescribed by and made under the direction of the City Surveyor.

Openings in the roofs of said vaults for the admission of light or coal shall be covered with lights of glass in iron frames with raised points, or with iron covers having a rough surface, and made flush with the sidewalk; such lights or covers must be approved of by the City Surveyor.

FLOORS OVER AREAS.

SECTION 117.—Any area of space in a yard or elsewhere, which is covered over, and on which there is to be traffic by pedestrians or wheeled vehicles, shall be covered with iron, iron and glass combined, or stone or other incombustible materials, and the beams or arch and supports of the same shall be of sufficent strength to safely carry the loads imposed thereon.

STRENGTH OF MATERIALS.

SECTION 118.—The dimensions of each piece or combination of pieces of materials required for a column of vertical support, shall be ascertained by computation according to rules given by "Haswell", "Troutwine", "Kidder" or other recognised authorities.

The strength of all columns and posts shall be computed according to Gordon's formulæ, and the crushing weights in pounds to the square inch of section, for the following materials shall be taken as the co-efficients in the said formulæ, namely:

Cast iron	80,000 pounds.
Rolled steel	48,000 "
Wrought or rolled iron	40,000 "
White oak	6,000 "
British Columbia Douglas fir	5,000 "
White pine and spruce	3,500 "

The breaking strength of wooden beams and girders shall be computed according to the formulæ in which the constants for transverse strains for central loads shall be as follows, namely:

Hemlock	400 pounds.
White pine	450 "
Spruce	450 "
Douglas fir, B. C	500 "
White oak	550 "

For wooden beams and girders carrying a uniformly distributed load, the constants should be doubled.

The factors of safety for all beams, girders and other pieces, subject to a transverse strain, when made of steel or iron shall be as one to four.

As one to four, for all posts, columns, and other vertical supports, when made of iron or steel.

As one to six for tie rods, tie beams and other pieces subject to a tensile strain, when made of steel or iron.

As one to five for other materials subject to a compression or transverse strain.

The following are the maximum loads to be imposed upon the after mentioned materials in tons of two thousand pounds per square foot:

First quality masonry, with squared beds and joints and laid in cement mortar.

Granite	60 tons.
Limestone on natural bed	40 "
Limestone where used on edge for columns and piers	20 "
Limestone rubble work in good lime mortar	15 "
Sandstone, Scotch or New Brunswick	40 "

Other stones one fourth of the crushing weight, as determined by satisfactory and recognized tests.

LOAD ON BRICKWORK.

First class brick work, of hard burned bricks, and including piers in which the height does not exceed six times the least dimensions if laid in the following manner:

One part cement, two or three parts sharp river sand	15 tons.
One part lime and three or four parts sharp river sand, and strengthened with one part of good approved cement.	12 "
Lime mortar, in the proportion of one part of lime and three or four parts of sharp river sand	8 "

Brick piers of hard burnt bricks, in which the height is from six to twelve times the least dimension:

One part cement, two or three parts sharp river sand	13 tons
One part lime, three parts or four parts sharp river sand, strengthened by one part good cement	10 "
Lime mortar, in the proportion of one part lime and three or four parts sharp river sand	7 "

Stresses for material and formulæ for calculating the same, not herein mentioned, shall be determined by the best modern authorities.

PRECAUTIONS AGAINST FIRE.

SECTION 121.—In all public buildings, every storey above the ground storey shall be supplied with means of extinguishing fire, such as pails of waters or other portable apparatus, or of hose attached to a suitable water supply all as approved by the inspector, and such apparatus must be kept at all times in good condition and ready for use.

SECTION 122.—Any person owning or occupying a workshop or other building, or building in course of erection, or premises in which shavings or other like combustible materials are made, shall keep the said shop, building, or premises, as free from accumulation of such shavings, or other like materials as practicable, and shall remove all such materials at least every two days from the said shop or building, or premises. No stove shall be used in a carpenter shop, or other shop or building, used for similar purposes, unless the same shall be surrounded with fire proof material and that the pipe from the same shall be set in conformity with the provisions of this by-law.

No building of which any part is used for storage or sale of hay, straw, hemp, flax, shavings, inflammable liquid or highly combustible substances other than as permitted by section 121 of this by-law, shall be occupied in any part as a dwelling, tenement or lodging house, except that rooms for coachman or groom may be allowed in connection with private stables authorized by this by-law, by permission of inspector.

No person shall store ashes on a wooden floor, or in close proximity to any wood partition, or to any woodwork whatever. Where ashes are stored in any building, it shall only be in enclosures or receptacles made of incombustible materials.

No person shall keep, sell or explode any fire crackers within the city, nor shall any person manufacture or keep for sale any fireworks without having applied for and obtained a license or permit from the council.

No person shall set fire to any fireworks in any square or street without having obtained permission from the inspector to do so,