

ARCHING AND VAULTING.

The tendency of any arch to overturn its abutments, or to destroy them by causing the courses to slide over each other, may be counteracted in three ways. 1, the arch may be continued through the abutment until it rests on a solid foundation; 2, by building the abutments so as to form a horizontal arch, the thrust being thrown on the wing walls, which act as buttresses; 3, where neither of these expedients is practicable, by jogging the courses together with bed-dowel joggles, so as to render the whole abutment one solid mass.

Where the wing walls of a bridge are built the pressure of the earth will always have a tendency to fracture them at their junction with the abutments. Equal strength with the same amount of material will be obtained by building a number of longitudinal and cross walls, by which means, the earth being kept from the back of the walls, there is no tendency to failure of this kind.

The ordinary forms of vaults may be classified under three heads, viz., cylindrical, coved, and groined.

A cylindrical vault is simply a semi-circular arch, the ends of which are closed by upright walls. When a vault springs from all the sides of its plan, it is said to be coved. When two cylindrical walls intersect each other, the intersections of the vaulting

surfaces are called groins, and the vault is said to be groined.

In the Roman style of architecture, and in all common vaulting, the vaulting surfaces of the several compartments are portions of a continuous cylindrical surface, and the profile of a groin is simply an oblique section of a semi-cylinder.

Gothic ribbed vaulting is, however, constructed on a totally different principle. It consists of a framework of light stone ribs supporting thin panels, whence this mode of construction has obtained the name of rib and panel vaulting. The curvature of the diagonal ribs or cross springers, and of the intermediate ribs, is not governed in any way by the form of the transverse section of the vault, and in this consists the peculiarity of ribbed vaulting.

Domes and vaults are on a circular plan. The equilibrium of a dome depends on the same conditions as that of a common arch, but with this difference, that, although a dome may give way by the weight of the crown forcing out the haunches, failure by the weight of the haunches squeezing up the crown is impossible, on account of the support the voussoirs of each course receive from each other.—*Granite Cutters' Journal.*

The Canadian Contractors Hand-Book, 50 cents to Record subscribers.

SEALED TENDERS

FOR HEATING THE NEW

General Hospital at Stratford, Ont.,

Will be received at the architect's office until **TUESDAY, APRIL 1ST.** Plans and specifications for both steam and hot water systems may be seen at above office. Lowest or any tender not necessarily accepted.

FRED HENRY, Architect,
Masonic Temple, London, Ont.

TENDERS

Will be received until 12 o'clock noon on **SATURDAY, APRIL 5TH,** for the erection of Two Dwellings and alterations to a third on John Street, near Queen Street.

Plans and specifications can be seen at the office of

WHITEHEAD & FAWELL,
S. E. Corner Queen and Yonge Sts., Toronto.



TO PLUMBERS.

Tenders addressed to the undersigned will be received through registered post up to noon on **Thursday, the 3rd day of April next,**

For constructing Water Closets in several city buildings.

Specifications may be seen and all further information obtained upon application at the office of the City Commissioner, City Hall.

Tenders must be accompanied by a cash deposit or a marked cheque, payable to the order of the City Treasurer, for five per cent. on the amount thereof.

Should any of the parties whose tenders are accepted fail to give satisfactory security for the due performance of the work their deposits will be forfeited.

The deposits of unsuccessful tenderers will be returned.

The names of two responsible sureties must accompany each and every tender.

The lowest or any tender not necessarily accepted.

FRANK MOSES,
Chairman Committee on Property.

City Clerk's Office, Toronto, March 25, 1890.

FOR SALE.

200,000 Bricks and One Brick and Tile Machine manufactured by Close & Son, of Woodstock, for sale cheap. Apply to
C. DENNE, Newmarket.

TENDERS

WILL BE RECEIVED FOR THE FOLLOWING

House on Gloucester Street,
Alterations on Carlton Street,
Block of Stores on College Street,
Stable on Sherbourne Street.

Apply to GEO. M. MILLER, Architect,
Corner Queen & Yonge Sts., Toronto.



NOTICE TO CONTRACTORS.

Tenders will be received by registered post, addressed to the City Engineer, up to 12 o'clock noon of the **8TH DAY OF APRIL, 1890,** for the construction of the following works:—Cedar block pavements—Peter street, from King street to Queen street; John street, from King street to Queen street; Morris street, from Spadina ave. to Huron street; Roxboro' street, from Yonge street easterly; Virtue street, from Sorauren ave. to East terminus. Scoria block pavement—Sherbourne street, from King street to Queen street. Grading—Sylvan avenue, from Dufferin street.

Plans can be seen, quantities and forms of tender obtained on and after Tuesday, the 1st day of April, 1890, at the City Engineer's office.

A deposit in the form of a marked cheque, payable to the order of the City Treasurer, for the sum of 5 per cent. on the value of the work tendered for under \$1,000, and 2 1/2 per cent. over that amount, must accompany each and every tender, otherwise it will not be entertained.

All tenders must bear the bona fide signatures of the contractor and his sureties (see specifications) or they will be ruled out as informal.

The Committee do not bind themselves to accept the lowest or any tender.

JOHN SHAW,
Chairman Committee on Works.

Committee Rooms, Toronto, March 26th, 1890.

Prices of Building Materials.

LUMBER.

CAR OR CARGO LOTS.

1 1/2 and thicker clear picks, Am. ins.	\$30 00	32 00
1 1/2 and thicker, three uppers, Am. ins.	37 00	
1 1/2 and thicker, picks, Am. ins.	27 00	
1 x 10 and 12 dressing and better.	18 00	20 00
1 x 10 and 12 mill run.	13 00	14 00
1 x 10 and 12 dressing.	14 00	16 00
1 x 10 and 12 common.	12 00	13 00
1 x 10 and 12 spruce culls.	10 00	11 00
1 x 10 and 12 maple culls.	9 00	
1 inch clear and picks.	28 00	30 00
1 inch dressing and better.	18 00	20 00
1 inch siding, mill run.	14 00	15 00
1 inch siding, common.	11 00	12 00
1 inch siding, ship culls.	10 00	11 00
1 inch siding, mill culls.	8 00	9 00

Cull scantling.	8 00	9 00
1 1/2 and thicker cutting up plank.	22 00	25 00
1 inch strips, 4 in. to 8 in. mill run.	14 00	15 00
1 inch strips, common.	11 00	12 00
1 1/2 inch flooring.	14 00	15 00
1 1/2 inch flooring.	14 00	16 00
XXX shingles, sawn.	2 30	2 35
XX shingles, sawn.	1 30	1 35
Eastlake galvanized steel shingles, 24 W. G., per square.	6 00	
Eastlake galvanized steel shingles, 26 W. G., per square.	5 50	
Eastlake painted steel shingles, per sq.	4 00	
Round pointed galvanized steel shingles, per sq.	6 00	
Round pointed painted steel shingles.	4 25	
Round pointed, unpainted, Terne tin shingles.	4 00	
Manitoba galvanized, steel siding, per square.	5 00	
Manitoba painted steel siding, per sq.	3 50	
Painted sheet steel pressed brick.	3 50	
Painted crimped steel sheeting.	3 40	
Price of Copper shingles according to weight.		

YARD QUOTATIONS.

Mill cull boards and scantling.	10 00
Shipping cull boards, promiscuous widths.	13 00
Shipping cull boards, stocks.	14 00
Hemlock cantling and joist up to 16 ft.	12 00
" " " " 18 "	13 00
" " " " 20 "	13 00
Scantling and joist, up to 16 ft.	14 00
" " " " 18 ft.	15 00
" " " " 20 ft.	16 00
" " " " 22 ft.	18 00
" " " " 24 ft.	20 00
" " " " 26 ft.	22 00
" " " " 28 ft.	24 00
" " " " 30 ft.	26 00
" " " " 32 ft.	26 00
" " " " 34 ft.	28 50
" " " " 36 ft.	30 00
" " " " 38 ft.	32 00
" " " " 40 to 44 ft.	35 00
Cutting up planks, 1 1/2 and thicker, dry board.	25 00
" " " " " "	18 00
Cedar for block paving, per cord.	5 00
Cedar for Kerbing, 4 x 14, per M.	14 00

B. M.

1 1/2 inch flooring, dressed, F. M.	28 00	32 00
1 1/2 inch flooring rough, B. M.	18 00	22 00
1 1/2 " " " " " " " " " "	25 00	28 00
1 1/2 " " " " " " " " " "	18 00	19 00
" " " " " " " " " "	18 00	22 00
" " " " " " " " " "	12 00	15 00
" " " " " " " " " "	22 00	35 00
Beaded sheeting, dressed	22 00	35 00
Clapboarding, dressed.	12 00	
XXX sawn shingles, per M. 16 in.	3 65	2 75
Sawn lath.	3 00	2 20
Red oak.	30 00	40 00
White.	35 00	45 00
Basswood, No. 1 and 2.	18 00	20 05
Cherry, No. 1 and 2.	70 00	70 00
White ash, No. 1 and 2.	25 00	25 00
Black ash, No. 1 and 2.	20 00	30 00
Dressing stocks.	16 00	22 00
Picks, American inspection.	40 00	
Three uppers, American inspection.	50 00	

BRICK—M

Common Walling.	\$ 7 50
Good Facing.	9 25
Sewer.	9 00

Pressed Brick:

Plain brick, f. c. b. at Milton, per M.	\$28 00
" " " " and quality, per M.	13 00
Ornamental brick, at Milton, per 100.	\$3 to 10 00