THE STRENGTH OF VITRIFIED SEWER PIPE.

The results of recent experiments lead to the conclusion that the average ultimate tensile strength of the material composing American vitrified sewer pipe is, at least, 600 pounds per square inch.

2. That the average pipe will safely stand any ordinary shock or blow.

3. That the average pipe will support 2,000 pounds at its center when supported at points 16 inches apart.

4. That the average pipe will support 2,000 pounds per lineal foot when bedded in sand.

5. That cement joints made with the ordinary bell and spigot are not safe when subjected to pressure, unless the pipe is prevented from moving longitudinally.

6. That ring joints are but little stronger than the ordinary bell and spigot joints when the pipe is unconfined.

7. That the improved joint with grooves is stronger than the two mentioned above.

8. That if the pipe is confined, any of the three joints mentioned, if carefully made, will probably hold as long as the pipe remains whole.

A COSTLY EXPERIMENT WITH RUBBLE CONCRETE.

In building the Irvine branch of the Lanarkshire and Ayrshire Railways in Scotland recently, as described in a paper presented to the Institute of Civil Engineers, March 13, 1891, by William Archer Porter, Stud. Inst. C. E., rubble concrete composed of "irregular sized stones, set and packed solid on all sides with concrete," was used for the foundations, abutments and piers of bridges, retaining walls, culverts, etc.

The concrete, formed of cement, sand and broken stone (1 to 5), was first deposited in a 6-inch layer at the bottom within timber framing coated with soft soap. Large, rough stones up to 2 tons were then laid 3 inches from the frame and from each other, and the intervals packed with concrete; upon this course followed another 6-inch layer of concrete, then another course of stones, and so on, the concrete near the front boarding being specially rammed to form a smooth face. The framework was left on for two days after the completion of the work. The cost per yard is not given, but the statement is made that owing to the quantity of cement used it nearly equalled that of rubble masonry, notwithstanding that skilled labor was largely dispensed with, and although daily progress was rapid.

One of the bridges, the viaduct over the River Garnock, having seven semicircular arches of 50 feet span, was built on a gradient of $1\frac{54}{100}$ per cent., partly on a 3-foot curve, the rail level being 70 feet above the river. Soon after its completion a crack was observed in the higher abutments. It was found that both the abutment and the adjacent pier "had settled." The next pier, "which was standing on rock," had remained firm, and a forward movement of the abutment and first pier had contracted the second arch, causing it to rise 5 inches at the crown. After ineffectual attempts to depress the crown to its normal level by weighting it with 200 tons of rails and sawing through the bed-joints at the keystone, inverts were laid between the piers across the first three spans, which stopped the movement. The spaces in the haunches were then filled with concrete, and a bed of concrete 2 feet thick was laid over the first three arches. The inference is that the settlement was due to the abutment not being on rock, but the strong probability is that it was the result of the flimsy construction, the stones being far too large to be used in the way indicated on account of the difficulty of making bond between them and the concrete packing. *Engineering Record.*

Prices of Building Materials.

LUMBER.

CAR OR CARGO LOTS.

1¼ and thicker clear picks, Am. ins..	$30 00	@32 00
1¼ and thicker, three uppers, Am ins.		37 00
1¼ and thicker, pickings, 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	16 00
1 inch siding, common.....	11 00	12 00
1 inch siding, ship culls.....	$10 00	$12 00
1 inch siding, mill culls.....	8 00	9 00
Cull scantling.....	8 00	9 00
1¼ 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
1¼ inch flooring.....	14 00	15 00
1½ inch flooring.....	14 00	16 00
XXX shingles, sawn.....	2 30	@2 35
XX shingles, sawn.....	1 30	1 35

Metallic Roofing Co. of Canada:

	Per Square.	
Eastlake steel shingles (galvanized),	$3 25 to	$3 75
Eastlake steel shingles (painted).....	3 75	4 00
Improved Broad Rib Roofing, (galvanized).....	5 00	5 75
Improved Broad Rib Roofing (painted)	3 50	4 00
North Western steel siding (painted)..	3 25	3 50
Manitoba steel siding (painted).....	3 25	3 50
Metallic Finished Brick.....	3 25	3 50
Tower or Mansard shingles, (galvanized).....		6 25
Tower or Mansard shingles (painted)..		4 50
Metallic Terra Cotta Tiles.....		7 00

Price of Copper shingles according to weight, and "Hayes" Patent Metallic Lathing according to quantity.

Canada Galvanizing & Steel Roofing Co.:

Corrugated Iron, galvanized, 26 W.G., per lb.....	5 cts.
Corrugated Iron, galvanized, 28 W.G.,	5¼
Corrugated Iron, painted, 26 W. G., per square.....	4 00
Corrugated Iron, painted, 28 W. G.,	3 50
Broad Rib Roofing, galvanized, per square.....	5 50
Broad Rib Roofing, painted	4 00
Westlake shingles, steel, galvanized, per square.....	5 00
Westlake shingles, steel, painted ...	3 50
Standard shingles, "Walter's patent," galvanized, per square.....	5 50
Standard shingles, "Walter's patent," painted.....	4 00
Northwestern steel siding, patented, per square.....	3 50
Metallic Finish Brick, per square.....	3 25
Metallic Finish Clapboard, per square	3 50

YARD QUOTATIONS.

Mill cull boards and scantling.		10 00
Shipping cull boards, promiscuous widths.....		13 00
Shipping cull boards, stocks.....		12 00
Hemlock cantling and joist up to 16 ft.	11 00	12 00
" " " 18 "	12 00	13 00
" " " 20 "	13 00	14 00
Scantling and joist, up to 16 ft.....		14 00
" " 18 ft.....		15 00
" " 20 ft.....		17 00
" " 22 ft.....		19 00
" " 24 ft		21 00
" " 26 ft.....		23 00
" " 28 ft.....		25 00
" " 30 ft.....		27 00
" " 32 ft.....		27 00
" " 34 ft.....		29 50
" " 36 ft.....		31 00
" " 38 ft.....		33 00
" " 40 to 44 ft..		36 00
Cutting up planks, 1¼ and thicker, dry	25 00	26 00
" " board,	16 00	22 00
Cedar for block paving, per cord.... .		5 00
Cedar for Kerbing, 4 x 14, per M....		14 00

B. M.

1⅛ inch flooring, dressed, F. M.....	28 00	31 00
1⅛ inch flooring rough, B. M.....	18 00	22 00
1¼ " dressed, F. M. ...	25 00	28 00
" undressed, B. M...	18 00	19 00
" dressed.....	18 00	22 00
" undressed	12 00	15 00
Beaded sheeting, dressed	22 00	35 00
Clapboarding, dressed.....		12 00
XXX sawn shingles, per M, 16 in....	2 65	2 75
Sawn lath.....	2 00	2 20
Red oak.....	30 00	40 00
White.....	35 00	45 00
Basswood, No. 1 and 2	18 00	20 00
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 00
Sewer.....	8 50	9 00

Pressed Brick:

Plain brick, f. o. b. at Milton, per M...	$18 00
" " 2nd quality, per M ...	14 00
" " 3rd " "	10 00
Hard Building.....	8 00
Moulded and Ornamental, per 100	$3 to 10 00
Roof Tiles.	24 00
Diamond locking tile....	16 00
First quality, f.o.b. at Campbellville, per M	18 00
2nd " " " "	14 00
3rd " " " "	11 00
Ornamental, per 100	$3 to 10 00
Tiles	24 00

Stone.

Common Rubble, Per Toise, delivered	14 00
Large flat " " "	18 00
Foundation Blocks, " Cubic Foot..	50

Slate: Roofing (₱ *square*).

" red	18 00
" purple.....	9 00
" untading green.....	9 50
" black slate.....	7 75
Terra Cotta Tile, per sq....	25 00
Ornamental Black Slate Roofing..	8 25

Sand:

Per Load of 1½ Cubic Yards.....	1 25

PAINTS. (In oil, ₱ lb.)

White lead, Can.	6 25	6 50
" zinc, Can.....	6½	7 50
Red lead, Eng	5½	6¼
" venetian.	1 60	1 75
" vermillion.	90	1 00
" Indian, Eng...	10	12
Yellow ochre..	5	10
Yellow chrome.....	15	20
Green, chrome...	7	12
" Paris.....	25	40
Black, lamp.....	15	25
Blue, ultramarine.....	15	20
Oil, linseed, raw (₱ *Imp. gallon*).. .	65	68
" " boiled "	68	72
" " refined, "	78	85
Putty.....	2¼	2½
Whiting, dry	75	1 00
Paris white Eng., dry.....	90	1 25
Litharge, Am.....	6½	8
Sienna, burnt.....	15	20
Umber, "	8¼	12

CEMENT, LIME, etc.

Lime, Per Barrel of 2 bushels, Grey..	40
" " " White	55
Plaster, Calcined, New Brunswick..	2 00
" " Nova Scotia.....	2 00
Hair, Plasterers', per bag.....	1 00
Cement, Portland, per bbl.....	3 00 3 50
" Thorold, "	1 50
" Queenston, "	1 50
" Napanee, "	1 50
" Hull, "	1 50

HARDWARE.

Cut Nails:

American Pattern, 1¼ inch, per keg....	3 90
" " 1½ to 1¾ inch, per keg	3 15
Canadian Pattern, 1¼ inch, per keg...	3 40
" " 1½ to 1¾ inch, per keg	2 95
" " 2 to 2¾ inch, "	90
" " 2¾ to 2¾ inch, "	65
" " 3 inch and larger.....	2 40
Steel nails 10c. per keg extra.	
Finishing nails, 1 inch, per keg	5 40
" " 1¼ inch, "	4 65
" " 1½ " "	4 15
" " 1¾ " "	3 90
" " and larger. .	3 90