## HOW TO ESTIMATE.

By W. H. HODSON

FOLLOWING is a portion of the specification and bills of quantities accompanying the drawings of Public School on Gladstone Avenue, Toronto, appearing in this number. The balance of specification and quantities will be printed in next

## EXCAVATION, &C.

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Do all excavation required for the basement and foundation of building to the dimensions shown and figured on the drawings, making the same 12 clear of the ourside of footings of all outside walls. The excavation for basement and foundation walls, &c., to be takes out to the depth required, and level in all directions for footings and floor. The spaces outside of the outer walls to be kept clear of earth until the masonry has been properly pointed up and inspected and passed by the architects. The spaces around the outside of walls when directed by the architects are to be filled in with earth and the same well rammed and consolidated. The surface of ground around the building is to be cut and filled to the grade lines laid down by the architects, and in all cases so as to give a fall of at least 3 ins, in every 12 ft, outwards. The whole surface of lot as shown per block plan is to be cut and filled and graded to an uniform grade throughout, the earth arising from the exeavations and cuttings being used for that purpose, so far as may be required, and the surplus earth (if any) carted from the premises.

DRAINGE. DRAINAGE.

BRAINGE.

Provide and hy down all draininge as shown by the foundation plan, and in the most thorough and workmaniskin manner, complete in all respects. Provide for and pay for 9 in. sewer connection from street sewer to street line. Provide and hy down 9 in. drain from point shown on plan to sewer connection, and provide and lay down 9 in. drain from point shown on plan to sewer connection, and provide and lay down 4 in. and 6 in. drains from the points shown on plan sconnecing with the 9 in. main drain, and with all proper Ys, bends, elbows and junctions and trapts, &c., complete. Provide and ky down 3 x 4 in. common or weeping tile drains mader basement floor, and connect same to the leading drain from basement. The drains are to be hald with best quality of American salt glazed or Scotch vitrified drain piping, with socket joints connected with Protland centent, and to be kind with socket joints connected with Protland centent, and to be kind with an uniform and sufficient fall, in no case less time ½ in, per foot run of pips. Care must be taken that every pipe is firmtly bedded and packed so as to prevent settlement after the grade is fixed. The drains from water leaders are to turn up within 2 if. of the surface to receive the same, and to be firmly packed in possion and the mouth covered until the conductor pipes from conduction of the protect of the connections made in the most carefully hid in the broken brick and costs er gravel. Incl. of lave by packed around with fine host careful and thorough manner. No drain is to be covered up until inspected and approved by the architects.

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The stone for footing courses and rubble masonry is to be of best quality of large sized Lake and Humber stone, in about equal quantities, and the "coursing" above grade lines to be built with Credit Valley grey stone. The nortur is to be composed of the very best quality of fresh burnt stone lime and elean coarge sitanty grist sand in the proportion of 2½ parts of sand to one of lime, mixed with a proper quantity of clean water, and all well and thoroughly incorporated and tempered together. No "soft" or "loamy" sand will be allowed in the work. Lay the footing courses as shown and figured on sections with selected large fake stone thoroughly bonded and bedded firmly in mortar. Build up the foundation walls in good rubble massonry from top of footings to level of basement ceiling, to be 16 in, in thickness, built to a line on both sides and in 15 in, courses, in height corresponding to five courses of brickwork, and so as to bond with the inside brick liming to same as shown per plans and sections. The masonry is to be thoroughly bedded and bonded, each and every stone haid on its natural bed and "through-bonds" built in every 5 ft. on each course. The masonry is to be built plumb, square and trwe, on both sides of every wall, and to a fair face, and to be thoroughly flushed in at all beds and joints, and neatly pointed with the trovel. The outside face of all outside walls is to be plastered with a heavy coat of "cement mortar," composed of one part of best Portland cement to two parts of coarse and clean grit sand, properly tempered with water and hald on fresh as required, and not less than one-half inch in thickness, laid on evenly. The foundation walls above grade line will be faced with Credit Valley grey Coursing of selected large stones, built in random coursed work in four courses of one foot cach for the large blocks and the random work made up in from two three stones. Each and every ston

be built with the best of materials called for, and in the most substantial and workmanklike manner, complete in all respects.

CARPENTER AND JOINER WORK.

All the wood work used throughout the building, play sheds and fencing (except otherwise specified) is to be of the best quality and description of white pine, free from sap, shakes, dead, loose and large knots, wane and other defects, and to hold to the dimension specified and figured on drawings, and to be well seasoned. Immediately the contract is awarded, the contractor will proceed to and procure all joisting and other dimension stuff, and have same on the ground ready prepared for the building as the works progress. In same manner all door and window frames are to be prepared in proper time and made ready for setting in the work as the same progresses. All window sash to be made and fitted at same time as frames are made, and then delivered to the glazier at his shop for glazing, who at the proper time will deliver the same at the building ready for carpenter to hang. All doors are to be got out loosely knocked together and stacked away in a drying house until required in the building, when they are to be properly cramped up, wedged and glued, fitted and hung to all in best manner. All doors, such wainscouing, stairs, and other finished suff throughout the building including all door and window frames, exc., is to be of the best quality and description of clear and thoroughty kin-dried pine, all well eleaned up after passing through the machines; and when

fitted, to be left clean and in thoroughly good order to receive the painting. Ground and first floor joists to be 14" x 2" set 16" centres, the corridor and attic joists to be 12" x 2" set 10" centres. Provide and fix three sets of chain joists to the floors of the four upper class rooms [22 in all]), built of two 14" x 2" joists with 13" packing piece between, all well spiked together and with 13% joists with 13" packing piece between, all well spiked together and with 13% ion straining rod, 6"36" x" to each chain joist. Trinn for screw bolts, with nuts and washers, 12 bolts to each chain joist. Trinn for screw bolts, with nuts and washers, 12 bolts to each chain joist. Trinn for screw bolts, with nuts and washers, 12 bolts to each chain joist. Trinn for stair wells, wentilating stacks and hot air flue, with double 14" and 2"x 2" joists double usk frames and spiked together, and for stairwells to except the same, to be 2 in. x 4" in. x 3 tt. in length, turned up 6 in. at one end and built into brickwork, and the other end bolted to joists directly over the same, to be 2 in. x 4" in. x 3 tt. in length, turned up 6 in. at one end and built into brickwork, and the other end bolted to joists with two 3/ in. screw bolts. There will be 48 of these anchors required. Trinn the attic joists for manhole in same over the ceiling of teachers room, and provide and fix 2 in. iron stay-hook 3 ft. long. Provide neat dressed step ladder of 1½ in. strings and 2½ in. steps strongly made for access to above manhole. The joists throughout to be laid level for floors and ceiling, and to have not less than 4 in. bearing on walls, and well spiked to bond timber in wall. The basement and ground floor ceilings will be counter ceiled with 2 in. x 3 in. and 2 in. x 3 in. strapping, set 16 in. centres and properly levelled for ceilings of same and well spiked to under side of joists with 4 in. spike to each joist in the most secure manner. Provide and fix 4 in. x 3 ½ in. well seasoned pine limited to all windows pendings and for basement and a in. x a in. strapping, set 16 in. centres and property leveled for celings of same and well spiked to under side of joists with 4 in. spike to each joist in the most secure manner. Provide and fix 4 in. x 24 in. well seasoned bond timbers to receive floor joists, also across under all windows some of the provide and set 6 in. x 8 in. well seasoned prine lintels to all windows and door openings in outer walls except to basement windows which will have double lintel same size dressed on the under face and soffer. The doors in partition walls will have double 6 in. x 6 in. lintels, and in basement to be 6 in. x 6 in. and 6 in. x 8 in. latid together and dressed on the face and soffit to finish fair with face of pirickwork. Provide and set 2x ½ well seasoned bond strip to all door openings. 8 to each opening. Provide strapping and grounds, also provide and build in 9 in. x 14 in. x 2 jn. well seasoned bond strip to all door openings. 8 to each opening. Provide strapping and grounds, also provide and build in 9 in. x 14 in. x 2 jn. well seasoned bond strips in walls; the strapping set 16 in. centres and well spiked to bond strips in walls; the strapping to be set true and plumb to line on the face and strong in walls, the strapping to be set true and plumb to line on the face to receive the lathing. The sliding door between the two upper class rooms to have a 10 in. x 14 in. well seasoned and dressed pine lintel over same and trussed on top with 4 in. x 8 in. Queen truss with inch out and set 2 in. x 12 in. solid and moulded door fannes to the front and set 2 in. x 12 in. solid and moulded door fannes to the front and set 2 in. x 12 in. solid and moulded door fannes to the front and set 2 in. x 12 in. solid and moulded door fannes to the front and set 2 in. x 12 in. solid and moulded door fannes to the front and set 2 in. x 12 in. solid and moulded door fannes to the front and set 2 in. x 12 in. solid and moulded door fannes to the front and set 2 in. x 12 in. solid and moulded door fannes to the front and set