

When You Build a House

Laying Out the Excavation---Basement Wall Construction---Details of Carpenter Work

The purpose of this article is to give a few simple pointers on housebuilding.

In selecting a site, remember that water runs down hill. If the house can be located where the water from rains and melting snow will drain away naturally there will be less mud around it. This may save scrubbing the kitchen floor several thousand times during the lifetime of a housekeeper. But do not locate the house too far from the barn for the purpose of getting it on a few inches higher ground. Every unnecessary foot between the buildings wastes steps and time. Suppose the house and barn are 100 feet further apart than sanitary conditions warrant and members of the family make 10 round trips a day between them. That means unnecessary walking of 2,000 feet per day, 138 miles per year or nearly 7,000 miles in 50 years, supposing that is the life of the house. People on farms don't need the exercise. It will pay to grade the earth up around the house for a foot or two rather than to place it too far from the barn. Place the buildings so that the prevailing wind in summer will not blow from the barn to the house. Stable odors are alright in the barn. They are out of place in the parlor.

Begin laying out for the excavation by stretching a chalk line or piece of binder twine exactly where the front wall will come to. Make this parallel with the road allowance. Then stretch another line where one of the side walls will come to. Have the lines longer than the walls of the house in each case so that the crossed lines will come at the corner of the proposed building and the stakes holding will be away from the excavation. Use good stout stakes. Drive them in firmly when they are properly located in case the excavation or foundation has to be lined up again. To square the corners measure from the place where the two lines cross, six feet on one and eight feet on the other. When the corner measures 10 feet across from these two points the lines are running at right angles, the lines for the other sides of the house, including projections, can be located by measurement.

The sides of an excavation in ordinary prairie clay will stand for some time. They can, therefore, be used for building the foundation wall against, in case concrete is used. There is no settling of soil afterwards when it is undisturbed. It pays to excavate with team and scraper as much as possible but where the walls will stand as described above it is best to do considerable trimming around the sides with the shovel. Do not make the common mistake of digging the cellar too deep.

Building a Concrete Basement Wall

The method of putting in the forms for building a concrete basement wall is shown in Fig. 1 in cross section. Note how the concrete is built against the soil. A shallow trench about 16 to 18 inches wide, carefully cleaned out and filled up to about eight inches deep with concrete will form a suitable foundation, where drainage is not required, for a frame house. For the inside form 2 x 4 studs are set at 24 inch centres are used. Be sure and cut these the exact length they will be required for use in partitions afterward. Cutting studding splattered with concrete soon plays hob with a hand-saw. Plates 2 x 4 are nailed to the top and bottom of these and the whole is raised to position. It is held in place by the stakes and braces as shown. A few scantling placed right across the excavation from one form to another will help to prevent the concrete from forcing the forms inward. You can't have them braced too firmly. If the wall is, say ten inches thick, have the inside studding placed 11 inches in from the outside of the proposed basement wall to allow for the concrete and one ply of inch lumber. If the original stakes are still standing the lines may be stretched again and the form placed by them. Line this

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Drawings by George Johns

form up with inch lumber to a few inches higher than the wall will be. This lumber will afterwards be used for rough flooring or sheathing the roof.

The outer form is then placed in position, as shown.

The top may be secured the proper distance apart with cleats. The bottom is kept from spreading out by wires around the studding. Short strips cut 10 inches long may be placed in temporarily and the wire twisted until these are held in place by the strain. They are removed when the concrete gets that high. The wires are built into the wall and cut off flush after the forms are removed. The bracing is all on the inside leaving the outside free for working in the concrete.

Mixing Concrete

The proportions of cement and gravel used depends upon the nature of the gravel, but the following can be taken for a guide: 5 parts coarse gravel over one quarter inch and under 2 inches; 2 1/2 to 3 parts sand under one quarter inch; one part cement. This takes about a bag of cement to 6 cubic feet of wall. Mix thoroughly the cement, sand and gravel dry and then add water enough so that when you squeeze a handful of the cement it will "stand up" and show moisture on the outside. This needs to be tamped in the form until the water shows on the top. Thorough tamping strengthens the concrete. Of course, slop concrete can be used but I prefer moist concrete. Tamping is what tests the strength of the forms and the bracing. Watch to see that there is no give anywhere. If the form gives you are in for trouble. Seven feet clear from the cellar floor to the bottom of the first floor joist is about right.

The wall plate, made of straight, strong 2 x 4 scantling, is imbedded in the wall at the top on the outside. This is the beginning of the frame work and must be perfectly straight and level or it may throw the whole building out. The mud sill, a beam supported at the ends by the wall and in one or two other places by posts should be level with the top of this bed plate or crowned a little in the middle to allow for settling.

On the left Figs. 2 to 5 show sections of the wall of a house from foundation to roof. Fig. 2 represents a T-shaped foundation used when wall is not built against the earth side of the excavation. A section of the cellar floor is shown. This should be at least three inches thick. Fig. 3 shows a section of the wall at the ground floor. Note the end view of the wall sill imbedded in the concrete. The ends of the joist must be cut square so that they will line up from the edge of the wall sill.

The bottom plate of the outer wall rests on the rough floor. The wall is sheathed both inside and out with shiplap, that on the outside beginning about half an inch or so below the wall plate, nailed to this and the joist and then on up the studding. The beam filling between the ends of the joist stops all the cracks. This should be done very carefully or a lot of cold air will leak through. The outside shiplap is covered with two-ply building paper, the inner white and the outer tar paper. In place of the paper, sheathing felt may be used. Fig. 3 also shows how the baseboard and drip cap are nailed in place and how lap or novelty siding is then carried up. The shiplap lining on the inside of the studs is covered with two-ply building paper held in place with lath strapping running up and down at 16 inch centres. On this strap the lath are nailed. The figure also shows the finished flooring, under which one or two-ply building paper is laid. The plaster, baseboard and the quarter round in the corner completes the construction at this point.

A section at the first floor or ceiling joist is shown in Fig. 4. The girts in the studding, which take the 1 x 4 ribbon, are framed in before the studding are nailed in position. The ribbon is nailed in position. The ribbon also keeps the studding at 16 or 24 inch centres as the case may be. The various features of the construction at this point are shown in the cut.

Fig. 5 shows the construction where the

roof rests on the wall of the building. In this case the ceiling joist are carried out the width of the eave and support the rafters. The outside finish at this point is shown in detail. The frieze board is nailed in place and the siding finishes up to it. The soffit is of V-joint nailed on the under side of the projecting ceiling joist, a bed mould being used in the corner. The fascia is nailed on the end of the ceiling joist. It supports the eave trough and should project down about three-quarters of an inch below the soffit. The shingles should lie snugly on the upper outside corner of the fascia. A layer of white building paper covered with a layer of tar paper is laid on the sheathing under the shingles.

Another form of roof construction is shown in Fig. 6. In this case the angle of the roof shows in the upper room. The collar ties are of 2 x 4 nailed on the side of the rafters. In this case the heels of the rafters are trimmed off to two inches in depth as shown. The soffit consists of a board nailed with a bevelled edge to fit snugly against the fascia and nailed on the underside of the rafter heels.

Fig. 6

Trimming the Openings

The manner in which the openings for windows are trimmed is shown in Fig. 7. Where two-light windows are used the opening should be trimmed seven inches wider than the width of the glass to allow for the sash, the window frame and some play for plumbing the frame. In depth, the openings should be the depth of the two lights, plus nine inches to allow for the sash and top and bottom of the window frame. Both head and sill should be double and also the side trimmers so that when the inside finish is put on there will be something to take the nails.

In cutting the studs it is necessary, of course, to make an allowance for the space taken up by the top and bottom trimmers. As the scantling commonly used is dressed on one side it is less than two inches in thickness. A double trimmer will take up about 3 1/2 inches so that seven inches must be allowed for the head and sill in marking the studs for cutting. From where the bottom cut is made to the top of the finished window stool is about seven inches. If therefore the cut is made two feet from the rough floor the window will finish about 2 ft. 6 ins. from the finished floor. Some difficulty may be experienced by the amateur in making these cuts. It is best to tack a strip which will reach across several studs to hold everything in place. Put a square line on both the edge and side of the stud and cut to the line so that when the stud is sawn off it will be level to take the sill. It is good practice where more than one stud is to be cut to get the height for one by measurement and then use the level in marking the other studs. This insures that the sills will be level and may save trouble in levelling the window frame.

When trimming the opening for an outside door make it four inches more than the depth of the door and about three inches in the width clear, to accommodate the door frame and leave play for plumbing. As in the case of the window opening 3 1/2 inches must be allowed at the top for the trimmers. It is well not to trust entirely to the spikes in the ends of the trimmers to take the weight of the building above. In case the

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Fig. 1

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