1946

Low Cash Cost Housing From Native Materials

A Tuskegee Institute Self-Help Program

P. Herman F D

LOW CASH COST HOUSING

FROM NATIVE MATERIALS

A TUSKEGEE INSTITUTE SELF-HELP PROGRAM

Work Sheet

for

MAKING AND LAYING CONCRETE BLOCKS

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Early in December, 1946, a special story in the New York Times called attention, nationally, to Tuskegee Institute's Low Cash Cost Housing Program.

"The principal departure from usual low-cost housing projects," said the Times correspondent, "is the injection of the maximum amount of self-help." and the program "is attracting considerable notice from architects and builders."

A leaflet issued by Tuskegee Institute in the Spring of 1947, stated that during the past two years, experiments have been conducted here on materials and construction methods which may be utilized by the farm family. Continuing, the leaflet says:

> "The important advantage of this type of construction material is that the blocks may be made from sand and gravel, available as a by-product of erosion in ditch banks in the immediate surroundings, at almost no cost. Little technical skill is required for making and laying the blocks. This type of construction lends itself conveniently to small town and rural areas, where individuals may pool their efforts, during spare time. In this manner, the cash cost is held to a minimum, the actual cost being well within the means of the average farmer, and the major requirement being labor on the part of a small group of people working cooperatively."

Subsequently, newspaper stories and magazine articles describing the program brought many requests for more detailed information. This leaflet is designed to answer such questions and to provide information which will enable any individual or group to proceed with construction.

We are grateful to Mr. Royal Dunham, Head of the Masonry Division, for the detailed instructions contained in this leaflet, to his Assistant, Mr. O. L. McDonald, and Mr. Withro McEnge, Head of Department of Industrial Arts. For general assistance in working with farmers, we express appreciation to Mr. L. A. Locklair, Rev. E. T. Dixon, and other members of the Rural Life Council.

F. D. Patterson, President

Tuskegee Institute, Alabama
June 10, 1947

TUSKEGEE INSTITUTE LOW CASH COST HOUSING

WORK SHEET

MAKING AND LAYING CONCRETE BLOCKS

A. Materials Used.

1. PIT OR CREEK RUN SAND - A mixture of sand and gravel as found on stream bank or in banks as deposited by nature.

   a. Some pit run gravel contains from 10 to 30% gravel and 90% to 70% sand.
   This variation will affect the strength of the mixture.

   b. If only 10 to 15% gravel is found in sand, use a mixture of 1:5.
   This mixture will produce 20 blocks per sack of cement.

   c. If only 15 to 30% of gravel is found in sand, use a mixture of 1:6.
   This mixture will produce between 20 to 22 blocks per sack of cement.

2. PLAIN COARSE SAND WITH LITTLE OR NO GRAVEL MAY BE USED TO MAKE CONCRETE BLOCKS.

   a. Use a mixture of 1:4½.
   This mixture will produce approximately 18-20 blocks per sack of cement.

3. CINDERS - Cinders composed of only hard clinkers are to be used in making cinder blocks.

NOTE: The chafts and soft portions of cinders should be screened out and only the hard clinker portion is to be used.

a. Use a mixture of 1:3:3 (1 part cement, 3 parts sand and 3 parts cinders).
This mixture will produce 20 blocks per sack of cement.

4. PORTLAND CEMENT - The only cost outlay material.

5. WATER - Clean water, free from vegetable matter should be used.

a. Use an amount to produce an easy to work mixture that is not too soupy or stiff to be floated smoothly.

B. Making Concrete Block Forms and Platforms.

1. FORMS SHOULD BE MADE AS SHOWN ON DRAWING.
See Types 1 and 2 - page 2.

2. CONCRETE PLATFORMS SHOULD BE MADE LARGE ENOUGH TO ACCOMMODATE THE NUMBER OF MULTIPLES (Types 1 & 2 Forms) OF BLOCK FORMS TO BE POURED.

a. Make a wooden form for concrete flat. Forms to remain around flat during pouring of blocks.

b. Pour concrete and bring to a smooth finish, so as to prevent blocks from sticking to flat.
NOTE: A wooden flat may be used as a substitute for concrete flat.

c. After forms have dried, lubricate them with used motor oil.

1. Forms and flats should be lubricated after every fifth pouring.

C. Procedure of mixing Concrete to Make Blocks.

1. HAND POURING.

a. Make 1 cu. ft. measuring box. This box to be used in measuring materials according to mixtures being used.

b. Make mixing platforms 8'-0" x 8'-0".

c. Measure up 1/2 amount sand reouired for the batch and pour into mixing platform.

d. Pour 1/2 amount of cement on top of sand pile.
NOTE: 1 sack cement equals 1 cu. ft.

e. Continue Steps c and d until all dry materials have been measured out on mixing platform.

f. Mix dry materials thoroughly until a uniform color is developed in the mixture.

g. Cut a hole in the center of the pile of mixed material and pour in water.

h. Chop water into mixed material thoroughly to develop a workable consistency.

i. Pour concrete into prepared forms.

j. Level off blocks with wooden float.

2. SMALL CONCRETE MIXER METHOD.

a. Measure out required materials (accurately) and pour into machine.

b. Pour concrete into prepared forms.

c. Level off blocks with wooden float.

D. Removing Blocks from Forms.

1. Turn sectional forms on edge of platform. Type 1.

2. Tap top stringer (see Fig. 1) lightly to unloosen from cross piece.

3. Remove top stringer, holding blocks in place by cross piece.

4. Pull block forward out of form, with face side of block towards worker.
NOTE: As a measure of economy, it is suggested that two persons work together in removing blocks from forms.

5. Stack blocks - Blocks should be stacked only four high when being removed from forms.

Blocks should remain in forms at least 24 hours in summer and 36 hours in winter, or until such time as the blocks will not chip off and break when they are removed from form.

E. Laying of Blocks.

1. Layout Building.

a. Use 6-8-10 method of squaring building. See Fig. 1

2. Lay off Bond.

a. Use dry blocks. Place block on footing. 1 stretcher (16" long) 1/2" space for head joint and header (3" long). Continue process until opposite corner is reached.

3. Make a Course Rod - Using a piece of 1" x 2" x height of story of blocks.

a. Saw marks 8" apart on Rod. This helps to space courses at corner.

4. Lay Corner Blocks.

a. Level corner block.

b. Plumb corner block.

c. Check corners for squareness.

d. Build corner to window sill height. See Fig. 3(d)

1'. Check all corners, so that all have same number of courses to each required height.

5. Build Wall between Corners.

NOTE: Always cover walls after each work day or when stopping work for a given period.

EXTERIOR WALL SECTION

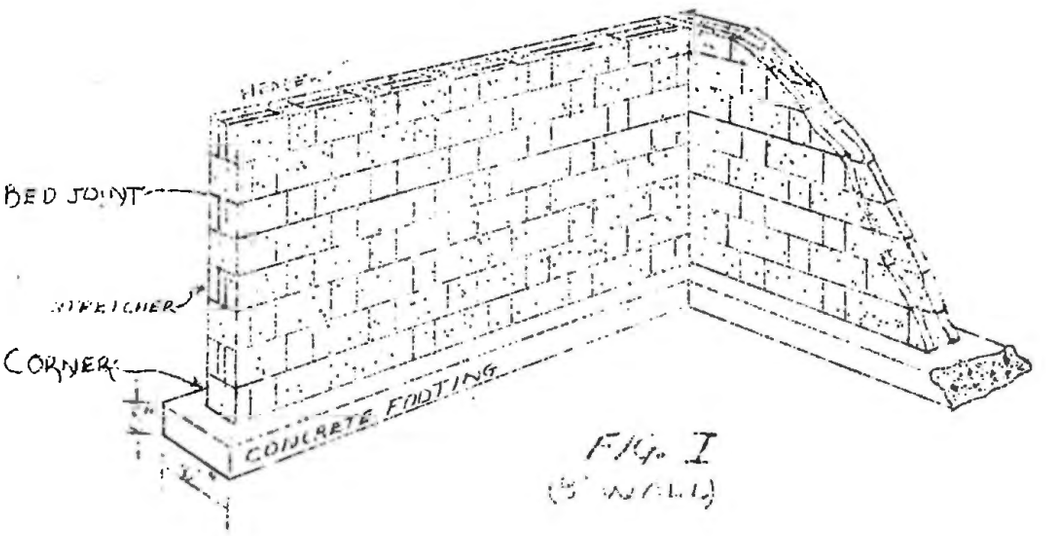


FIG. I
(12" WALL)

INTERIOR WALL SECTION

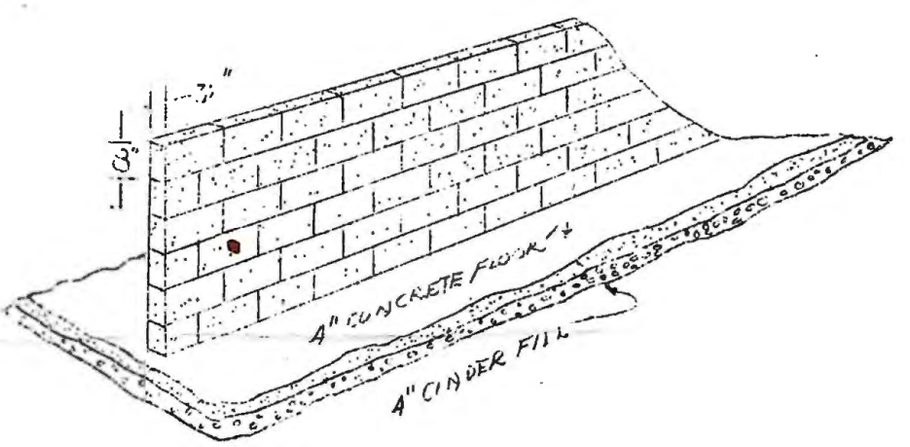


FIG. 2
(3 1/4" WALL)

TYPES OF BLOCKS & FORMS

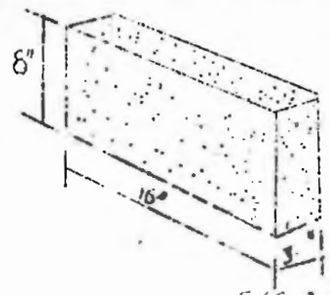


FIG 1

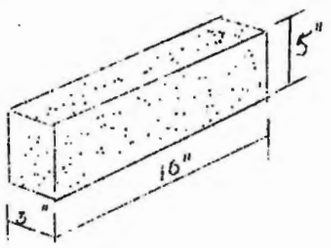
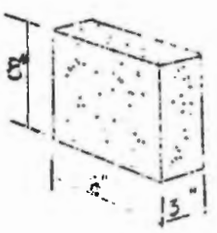


FIG 2.



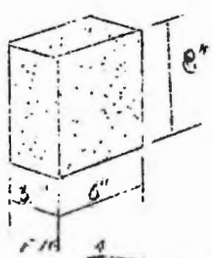
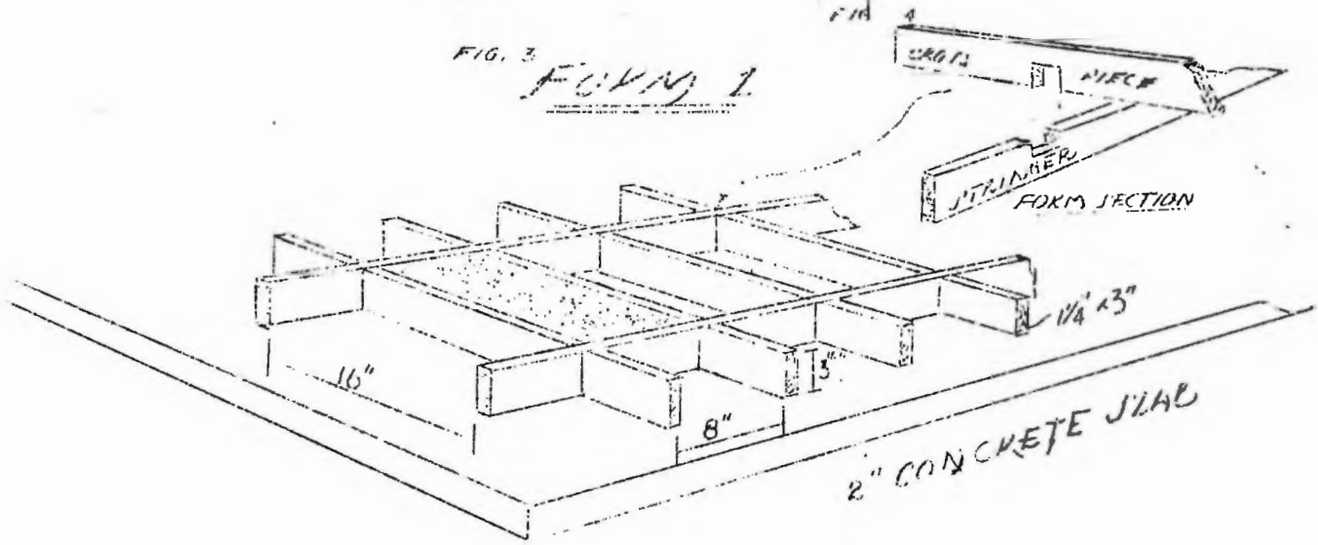
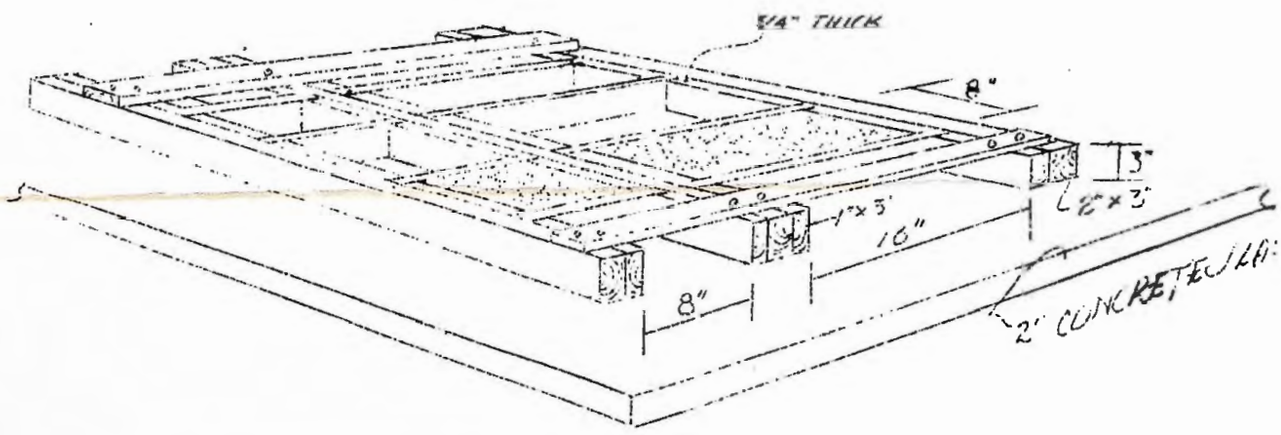


FIG. 3

FORM 1

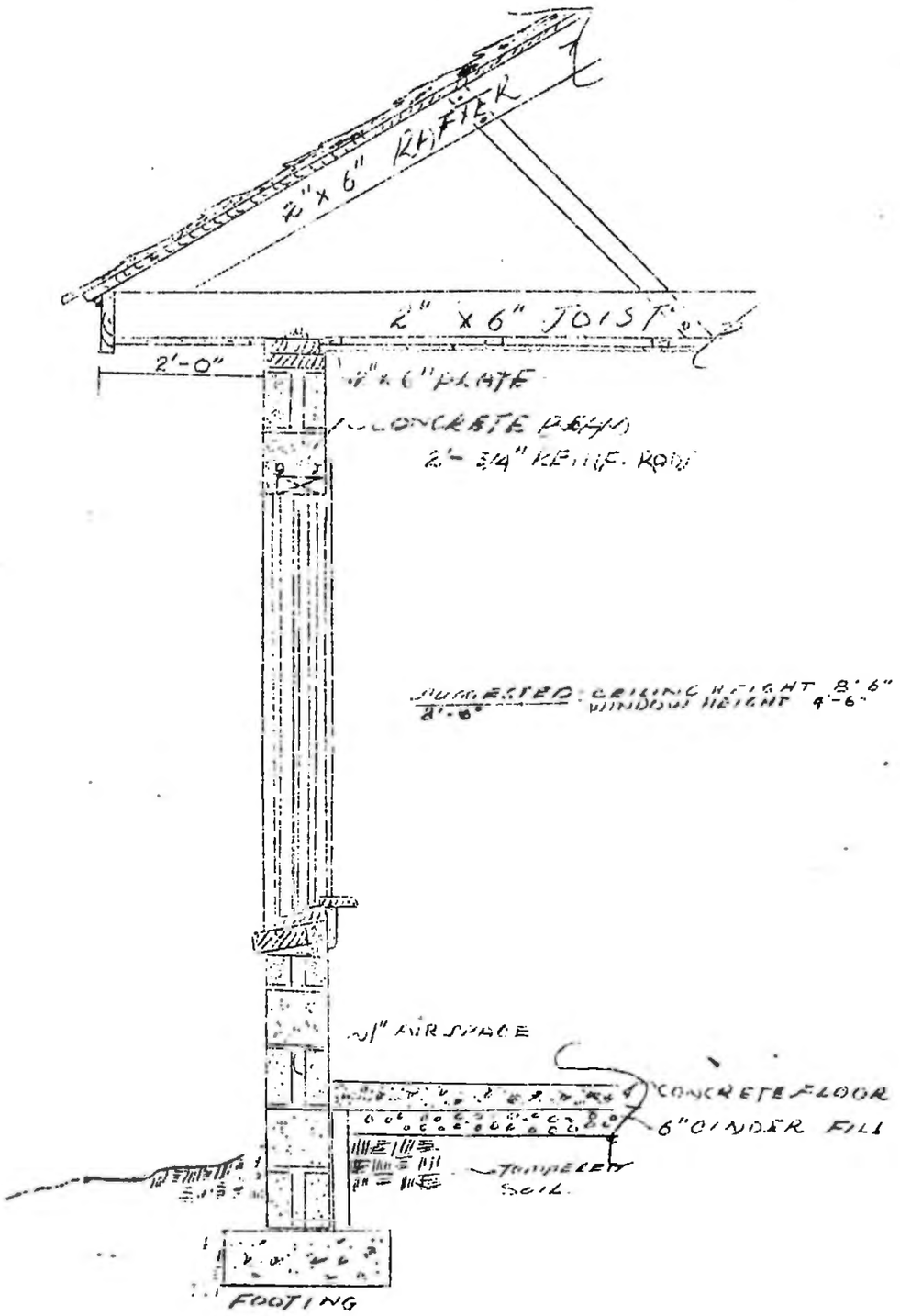


FORM 2



NOTE: CONCRETE SLABS TO BE OILED W/USED OIL

TYPICAL WALL SECTION



LAY OUT PLAN FOR
TUSKEGEE INSTITUTE LOW CASH COST HOUSING