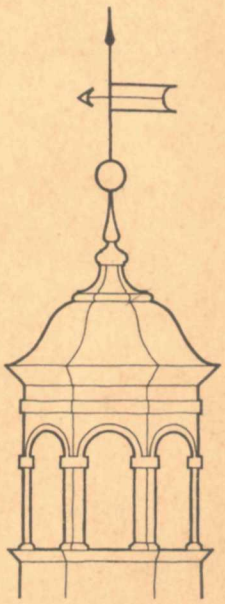
Manual of the

Historic American Buildings Survey



PART IX

MEASURED DRAWINGS

Revised illustrated draft 300cy 10/61
compiled by HARLEY J McKEE architect

eastern office/division of design & construction/national park service

PART VIII - MEASURED DRAWINGS

Page No.

A Measuring Party, Independence Hall, Philadelphia, Pa., July, 1961. Photo by Boucher.

PART IX. MEASURED DRAWINGS

A. GENERAL

A measured drawing is an accurate one, to scale, showing what is actually there, based upon measurements of the subject. Structures of outstanding interest should be recorded in this way whenever the means for doing so are available. Drawings provide a means of recording information impossible to set down in any other way. They are definite and explicit; a great deal of data can be recorded on one. They show proportions correctly, are measurable, and can be made to de-emphasize existing features--such as later additions--which are not important to the real interest of the structure. Drawings can be annotated--a fact of great importance. (see pp. 93, 95). Floor plans, general sections and details can present facts which cannot be described in photographs. (see pp.71, 87). Drawings are costly to make, however, and--like other works of man--subject to human errors.

The ideal record of a building would include such a large number of drawings, photographs and written material (see Part V, Photographs, and Part VI, Written Data) that it could be reproduced accurately in all details in case the original building were destroyed. Such a record is not usually feasible. "Completeness" is relative and the number of drawing sheets must be in accordance with the

money and/or time and personnel available. The importance of the structure being recorded is considered when planning its coverage.

Measuring may be done by hand--the conventional way--or by photogrammetry, which is especially convenient when measuring tall, large, or highly decorated buildings. (see p.107). Photogrammetry permits recording on glass plates quickly, and drawing at leisure. A general description of this method is given in Section C-6 beginning on page 41.

B. HOW TO PLAN A SET OF MEASURED DRAWINGS

1. First Steps

a. General

Operations can be done more intelligently and efficiently when planned in advance. The size of a set of drawings--number of sheets--is a basic decision to be made by the person in charge; from a preliminary survey his judgment and experience enable him to estimate what can be accomplished with the available resources. The cost of making each HABS drawing sheet in pencil by HABS employees generally varies from $85 to $150, or occasionally more for special work.

b. Mock-Up

Immediately, a full size study (mock-up) should be made of every sheet. This may be done on tracing paper, or some other kind of rough paper. Each drawing to be placed on the sheet is drawn in simple outline, and titles are lettered freehand. A

historical statement is composed and placed on the title sheet (sheet No. 1). In making the mock-up, a number of points are considered simultaneously: what features of the structure most deserve recording, scales at which drawings will be made, sheet composition, order of sheets and ultimate use to which the drawings will be put. Descriptions of these points will be found on pages 3 to 9.

2. Drawings to Include

a. A location plan is essential in all cases; this is placed on Sheet No. 1--the Title Sheet. An explanation is given on page 60.

b. Floor plans--one or more--are of primary importance. They record the shape, room layout, location of doors, windows and stairways, and indicate structural supports, with dimensions. Each significant level should be shown on a plan; a basement or foundation plan is to be included when needed to explain structural supports. (see p. 71).

c. General sections are invaluable for recording the construction of a building. They are the only kind of drawings which show the construction of floors and roofs effectively, as well as any unusual methods of support. Sections are particularly important when there are many floor levels. They can delineate stairways in a graphic way. Room elevations can often be included in a section, when it is not necessary to detail them at a larger scale. (see pp. 87,89).

Simple structures of conventional nature can generally be recorded adequately without general sections; in that case heights

are noted on plans or given on elevations (if any are included).

d. Exterior elevations. Buildings of exceptional importance call for all exterior elevations to be drawn; lesser examples and those of familiar or conventional design may dispense with some or all of them, depending upon photographs to record the essential exterior appearance. Sometimes the front or principal elevation will suffice.

e. Detail drawings. Details are of two kinds--structural and decorative. In order to present the first kind adequately, drawings are needed. Decorative details can often be recorded just as well in photographs, perhaps noting some key dimensions. Mouldings, as an exception, demand full size profile drawings.

The choice of details to record depends upon one's judgment as to their interest, uniqueness and importance, and the space available on drawing sheets. Formerly, when practicing architects followed period design extensively, abundant decorative features were measured and drawn. Today we tend to emphasize structural details in drawings, and leave the decorative ones to photography. When making a large set of drawings, however, we try to include traditionally favored items such as stairways, doorways, mantels, room elevations, paneling, mouldings and hardware, in addition to structurally revealing details of framing, bracing, etc. (see pp.91-95). Sometimes a detail may be the only feature worthy of measurement, as, for example, an unchanged room.

f. Other drawings. Buildings vary greatly; there will be times when drawings such as reflected ceiling plans, structural isometrics, exploded diagrams and mechanical details will be deemed appropriate.

3. Ultimate Use of HABS Drawings.

We hope that the HABS collection will be used widely and effectively, and we believe that thoughtful planning of measured drawings will help realize this aim. The needs of historians, authors, teachers, architects and restorationists, however, differ. It is necessary for us to reconcile or balance their divergent views. It is also necessary for us to make drawings as intelligible as possible even to persons without a technical background.

The selection of what to put on measured drawings involves a forecast of what will be of the greatest interest to the most people. Complete floor plans and sections, copiously dimensioned and annotated, appeal to the professional architect and the restorationist (who needs all these, and more). (see p. 71). However, historians teaching and writing about architecture prefer elevations with pictorial emphasis, and simple, undimensioned plans, which can be used primarily to illustrate lectures and books. (see p. 79). The decision of what to include and emphasize is related to a number of things--the importance of the structure, the reason the drawings are being made and the type of survey which is being carried on.

One must also balance opposing opinions about what is important. According to one view, function, plan and construction are the realities of architecture; in the opposite view appearance and style measure its true worth. Some consider a building in terms of its all-over unity, others as a collection of parts or details; still others study and compare details for themselves, without concern for the structures in which they are found. HABS aims to give each of these viewpoints its due.

4. Order of Sheets for HABS Drawings.

a. Every set has a Cover Sheet to protect the drawing sheets while they are being handled (no sheet number). Directions are given on page 60.

b. Next comes the Title Sheet (Sheet No. 1), which should contain a location plan, historical statement and credits. Directions are given on page 60.

c. The second and succeeding sheets contain, in the order given, floor plans, elevations, general sections, and then details.

d. Sometimes a small, simple structure is presented on two drawing sheets, or even a single sheet. Essential information, usually included on a separate title sheet, in these cases will be placed on the first (or only) drawing sheet.

e. A separate set of drawings is made for each auxiliary structure, or for each structure of a group. (Note: "Area Surveys"

as such represent a slightly different situation; even then it is important that each structure be clearly identifiable.)

5. Scale of the Drawings

The sheet size and number of drawings to be accommodated on each sheet will limit the maximum scale at which the subject can be drawn. Generally a uniform scale is to be used for all floor plans, elevations and general sections of a set. While "even" scales (1/4", 1/8", etc) have traditionally been favored by architects, one may use an "odd" scale (3/16", etc.) if necessary. Plans of houses and small buildings are preferably drawn at 1/4" scale.

Details are drawn at convenient scales; as a general rule one makes them as large as practicable. Many architects prefer the following conventions, but there are no fixed rules:

3/8" - interior wall elevations, if simple. This is a minimum scale for wall elevation.

3/4" - doors, doorways, stairways, interior elevations.

1 1/2" - window and door sections (if any).

Moulding profiles are almost invariably drawn full size, or if this is impossible, at 1/2 full size. When several details are placed on the same sheet it is desirable--but not necessary--to draw them at a uniform scale, for the sake of clarity.

Some typical cases are to be seen among the measured drawings illustrated in this manual, all of which have been reduced by one-half in reproduction. Attention is called particularly to the following:

pages 71, 95 plans at 1/4" scale.

pages 73, 75 plans at 1/8" scale.

page 79 elevation at 3/16" scale.

page 83 elevation at 1/4" scale.

page 85 elevation at 3/8" scale.

page 87 general section at 1/4" scale.

page 89 general section at 1/8" scale.

Note that room elevations are shown incidentally on these sections; in drawing room elevations for their own sake, a scale of 3/8" to one foot, or larger, would be used. This is shown on page 97.

page 99 details at 1 1/2" scale.

page 101 details at 3" scale.

6. Sheet Composition

Drawings are usually composed on the sheet according to taste, giving due attention to traditional conventions. One is referred to the illustrations in this manual, pages 69 & 109 which are good examples of their kind.

Clarity and legibility are important, in addition to a pleasing appearance. Intricate interlocking or overlapping effects are to be avoided, as is overcrowding of any kind. Crowding of drawings on a sheet does not represent economy, since it is the drafting itself which takes time, rather than the number of sheets on which it is done.

When drawings are spaced widely on the sheet, they lend themselves well to reproduction in books or articles, either to reproduce the sheet as a whole, or in portions. In general it is best to place only one plan on a sheet. Ample allowance should be made for dimensions, notes and titles; they should not crowd the drawing too closely.

Sheets are usually composed horizontally with the binding edge at the left; occasionally a vertical orientation is necessary, leaving the binding edge at the top. Consistency of appearance throughout the set is important, so that all sheets should be oriented the same way unless there is a good reason for not doing so. For the same reason related drawings on the same sheet should be aligned. (see pp.71, 85). Lettering and drafting styles should be as consistent as possible throughout the set.

C. HOW TO MEASURE

1. Equipment and Supplies Recommended for Measurement

Steel Tapes, 100' and/or 50', (and 6', optional), calibrated in feet, inches, and fractions.

6' folding wood rules, (preferably with 6" metal extension slide)

Plumb bob and line (sometimes combined with chalk line)

Chalk line

Spirit level for chalk line

Carpenter's level

Clip board

Profile gauge (also called moulding comb or moulding gauge) (see p. 32).

Scales, Architect's and Engineer's (decimal)

Triangles, including an adjustable triangle (or protractor)

Magnetic compass

Pocket knife

Flashlights

Ice pick or thin screwdriver, floor chisel, pliers, hammer, or other tools to aid in investigation of the building where authorized.

Ladders (scaffolding may be needed in some cases)

Field notebooks (HABS), or cross-ruled paper pad.

Pencils and erasers

Large sheets or roll of paper for rubbing inscriptions, full size profiles, etc.

Chalk or large soft pencils for rubbing

Large calipers (wall gauge) for measuring wall thickness, column diameters; this must usually be custom made by a carpenter or cabinet-maker. (see p. 32).

Carpenter's square or large triangle

A plane table is also useful, if available.

Some of the above items are illustrated on frontispiece.

2. Measuring Procedures, General

a. Permission to measure must be obtained from the owner of the structure. When a building is occupied by others, consent of the tenants must be obtained before proceeding to measure.

b. Composition of a measuring party. Measurements may be

taken by any given number of persons, but it is usually most efficient to work in organized groups. The Park Service prefers to assign three men to a field party, two to measure and the third to record. Details can often be measured most effectively in pairs, one measuring with a folding rule while the other records in the notebook. At times one or more persons must be used to hold a level, plumb line, flashlight, or ladder, in addition to those actually engaged in measuring.

c. Sequence. Each structure presents its own set of conditions but in general, one proceeds from larger aspects to smaller ones; one does plans, beginning on the exterior, elevations, and details. Contingencies such as bad weather can always upset preconceived ideas about a schedule of operations.

d. Use of HABS Field Notebooks

(1) General

Measurements taken in the field are most readily recorded on cross-rules paper. The HABS uses standard field notebooks, 8 1/2" x 10 1/2", with ten sheets bound into a heavy printed cover. Each page is ruled with 1/8" squares, the 1" lines being heavier.

A field notebook is used for each individual structure; never enter data for more than one structure in the same notebook. Sometimes it is necessary to use more than one notebook for a given structure. Details sketched on larger pieces of paper may be folded

and attached to the inside of the back cover. Loose notes, if any, should be attached in the same way.

HABS field notebooks are placed in the Library of Congress along with the measured drawings, photographs and written data. They should therefore be neat, orderly and understandable to others--qualities equally desirable for convenient reference in the drafting room.

(2) Data in the Field Notebook. In general the notebook should contain all the information necessary to complete the finished drawings as planned.

(3) Front cover. The following data should be recorded on the front cover: name and location of the structure, name of the person directing the measuring party, names of all persons in the measuring party, the dates of measurement and eventually, the dates when measured drawings were made. The printed form provides a place for each of these items.

3. Taking Measurements

a. General

Always include a sketch indicating the orientation of the structure and its location on the site, with relation to town or city, streets and principal roads. (see p.21). Include the most enduring features, for useful reference as long as possible in the future. In a group of buildings the mutual relations of the various units composing the whole should be shown.

Include complete, dimensioned sketches of floor plans, elevations, details and profiles, covering all of the measuring work. Accompany all sketches with thorough notes describing the existing conditions. Each sketch should be identified as to what it represents and how it is related to the whole. Scales should be noted. (see illustrations, pp. 21 - 29.)

Nothing should be entrusted to memory, or written in cryptic abbreviations.

More detailed instructions follow.

b. Exterior Plan Measurements. Upon measuring the over-all dimensions of the building perimeter, lay out the plan in the field notebook and proceed to obtain and record the smaller dimensions.

c. Exterior Elevation Measurements. Obtain the over-all heights from meaningful levels such as the top of the roof ridge, top of the cornice, floor lines and grade. In practice, some of these may not be reached or identified upon the exterior, and measurements are taken to other suitable lines. When the building is not perfectly level, snap a level chalk line at a convenient height, and measure up and down from it. Roof pitch should be indicated (as 8" rise in 12" horizontal, for example).

Smaller height dimensions include distances from bottom of the cornice to the top line of the sash, to the bottom line of

the sash (repeating for each floor as they occur), top and bottom of string courses, water table or base course, and finish grade. Correlated with these heights, the number of brick or stone courses should be recorded; in frame structures the size or exposure of clapboards is given (as clapboards 4" to the weather, sawed shingles 5" to the weather, etc.). Record the number of panes and glass sizes of windows (as 12/12, 8" x 10", etc.), giving the number of panes in upper and lower sash.

When floor lines are related exactly to exterior reference lines, indicate and dimension them on exterior elevation sketches. Record size of all openings, including spacing of columns, radius, center and spring line of arches, etc.

d. Notes on Exterior Materials. Complete notes on building materials should be made, including color and finish. Give the size of brick or stone units in bonds, patterns and courses; make detail sketches when necessary. Note the size of wood siding or of log construction; when this is irregular give the largest and smallest course dimensions. Note the composition, section and surface appearance of mortar joints, chinking stucco, adobe, plaster, etc. In log construction jointing is especially important to record.

Items such as flashing, cap flashing, chimney cap and detail, and roof covering, should be recorded.

In general it is important to note unusual conditions or use of materials, but one should not be so obsessed with searching

for the unusual that he neglects "commonplace" items of importance to the complete structure.

e. Interior Plan Measurements. By measuring the thickness of the exterior walls at openings, one can locate the inner faces on plan in the field notebook, and proceed then to locate the interior partitions with dimensions. The thickness of partitions is most readily obtained by using a pair of calipers (see illustration, on page 32.)

All rooms should be identified by number, and major rooms by name, on the plans. This provides a positive reference when details are recorded on another page of the field notebook.

Through over-all measurements are of great value; take them whenever possible. If in addition these can be carried through exterior openings to the outer surface of the walls, it is important to do so.

In measuring each room, to locate openings, fireplaces, breaks and projections, carry each string of measurements the entire distance across the room. To verify the rectangularity of a room measure the length of its diagonals.

Stairs, built-in cabinets and all other architectural features should be measured. The location of features which are above and below the level of measurement (the cutting plane of the plan) shall be determined and indicated on the sketch; exposed beams and apertures in the ceiling, galleries, balconies and hearths are

examples of such items.

f. Interior Height Measurements. As a rule these may be placed on the sketch plan but in some cases it is advantageous to record them on a section; if room elevations are going to be included a number of appropriate dimensions can be shown on them.

Floor to floor heights are of primary importance and should be measured directly wherever stair halls or other floor openings permit. Large calipers can be used here to measure the floor thickness directly between finish floor and plaster. Ceiling heights of each room are to be measured; where irregularities occur several such dimensions are necessary.

Other heights usually of value include heads of openings, top of window stools, top of mantels, cornices and chair rails or wainscots. The distance between levels of the first floor and the ground line (or a porch floor) is important to establish; it may be measured by reference to a level line stretched through a window or door opening, or even by passing a carpenter's level through the opening, if it will reach. In general, the combination of level and plumb line will usually enable one to measure difficult height differences of this kind.

g. Schedules and Notes. Information about interior materials and trim may be noted on plan, and window sash noted on elevation, or these data may be placed in schedules. Whichever method is followed for the interiors, it is desirable to record the wall surface material

and its treatment, cornice, base, wainscot, paneling, door and window trim, ceiling, and finish flooring.

Door sizes are sometimes noted on plan or given in tabular form; such a schedule should not become so inflated with modern and other uninteresting types that it assumes the character of a police "line-up". It is preferable to detail, at a larger scale, the doors (and windows) old enough to be interesting. If paneled the number of panels should be given, with characteristics such as beveled and sunk or beveled and moulded. For board and batten doors note type of batten, side on which battens occur, mouldings if they are present, etc. For all doors give width, height and thickness. For interiors as well as exteriors, full and complete notes on the actual state or condition of materials are important.

h. Details. The choice of details will have been made when planning what to record. Very important features--including unusual ones--and structural details deserve high priority. Whenever the construction and assembly of a feature can be determined it should be put into the record.

In taking measurements over-all sizes are determined first, then sizes of the separate elements. Since details vary greatly in nature, no single method suffices for all cases; contours of mouldings and details of decorative work offer problems of their

own, which are covered on pages 30 - 34.

4. Recommended Practices in Measuring

a. Fractions. For general measurements it is customary to take readings to the nearest 1/4", but for portions to be detailed smaller fractions are desirable.

b. Cumulative or "Running" Measurements, taken by holding the end of the tape at a corner or other appropriate datum point, and reading successively all desired points along the line without moving the tape, avoid accumulation of small errors. Choose "zero" points which will be convenient for later checking and drafting.

c. Keeping the tape level, or vertical, as the case may be, and tightly stretched, will obviously be necessary to secure accurate measurements. Unless lines of the structure are truly level or vertical, it will be necessary to mark chalk lines before measuring.

d. Checking measurements is essential and becomes a (good) habit in time. The person recording measurements should call the figures back to the person reading the tape; other members of the team can also be alerted to listen for discrepancies. Dimensions may be checked by comparing the total of separate units with the over-all figure. In fact, it is helpful to do this periodically, because the sooner errors can be discovered the easier it is to trace and correct them. A draftsmans' adding machine, with dials for inches and fractions, is a valuable aid when checking dimensions.

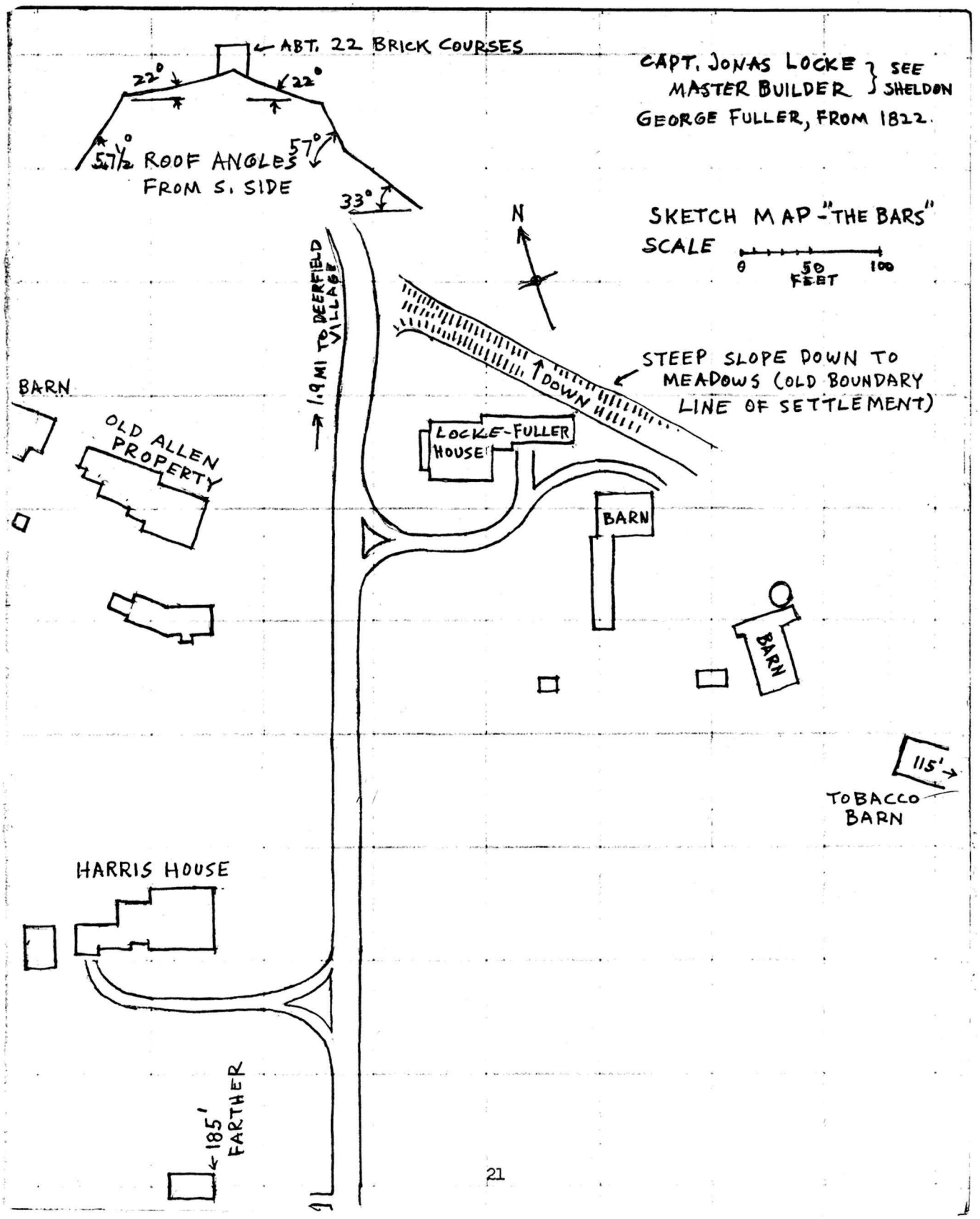
e. Check list of Equipment. When a measuring party leaves the job, a check list of the tools and equipment carried along can save time and avert loss.

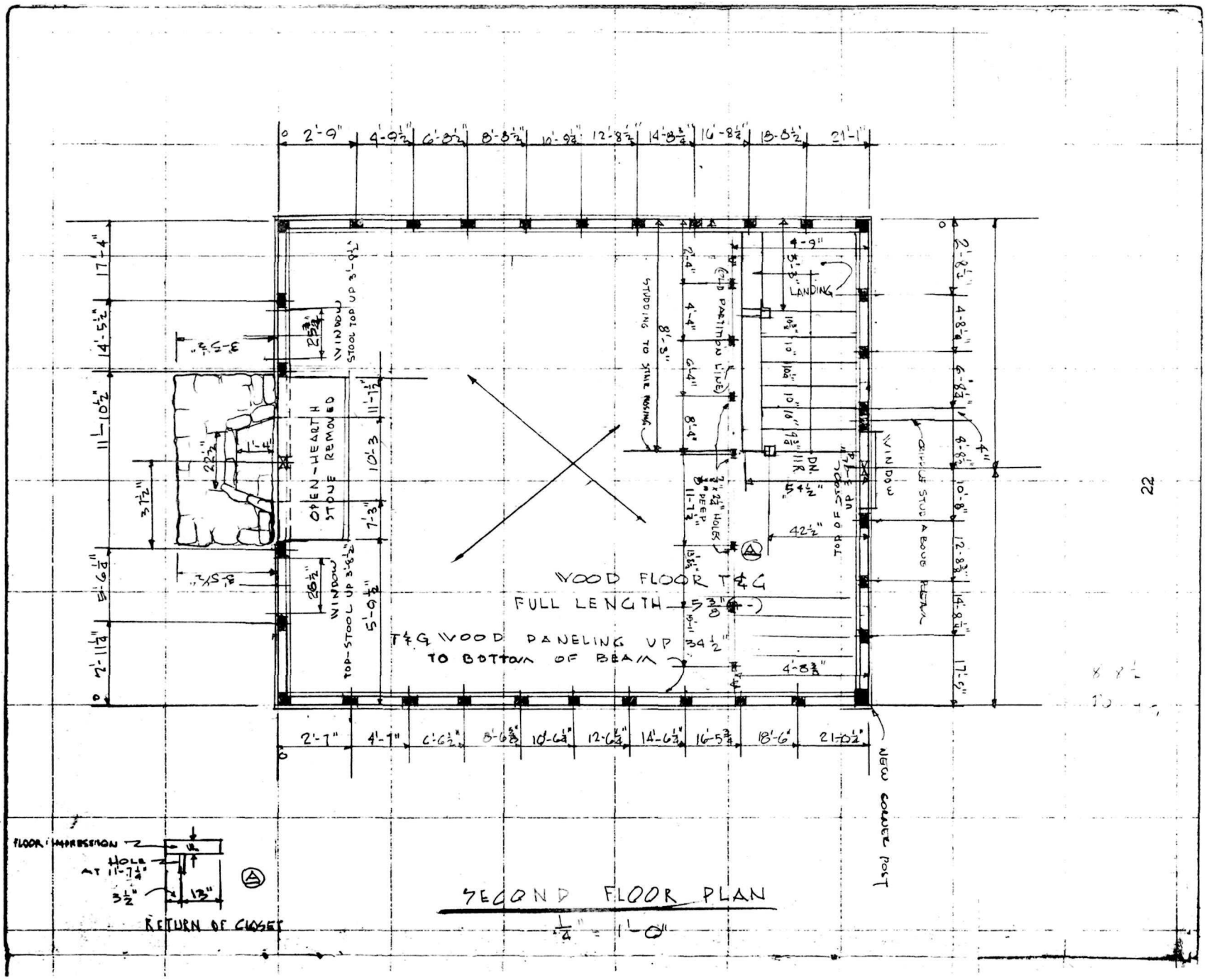
f. A final check of the information recorded in the field notebook, for completeness, before leaving the site, is good practice in general and will help avoid unnecessary time and travel in returning for data that was overlooked. A later check for completeness will automatically be made as drafting proceeds. Indeed, some problems of a tricky nature do not come to light until a layout is being made at the drafting board, but as a rule one should aim at making the field notes so complete that no more visits to the structure will be necessary.

A check list is helpful, particularly for items which should be included in the notes. With respect to dimensions, the final check should verify the compatibility of measurements made at different floor levels or in different parts of the structure, to assure that they can be correlated.

When the recorder can prepare field notebook sketches in advance of formal team measuring operations, he can place dimension lines (measurements to be filled in later) on the sketches for all desired dimensions; this tends to make for completeness. Similarly, the preparation of blank schedules, to be filled in when measuring, serves as a check list for the data pertinent to them.

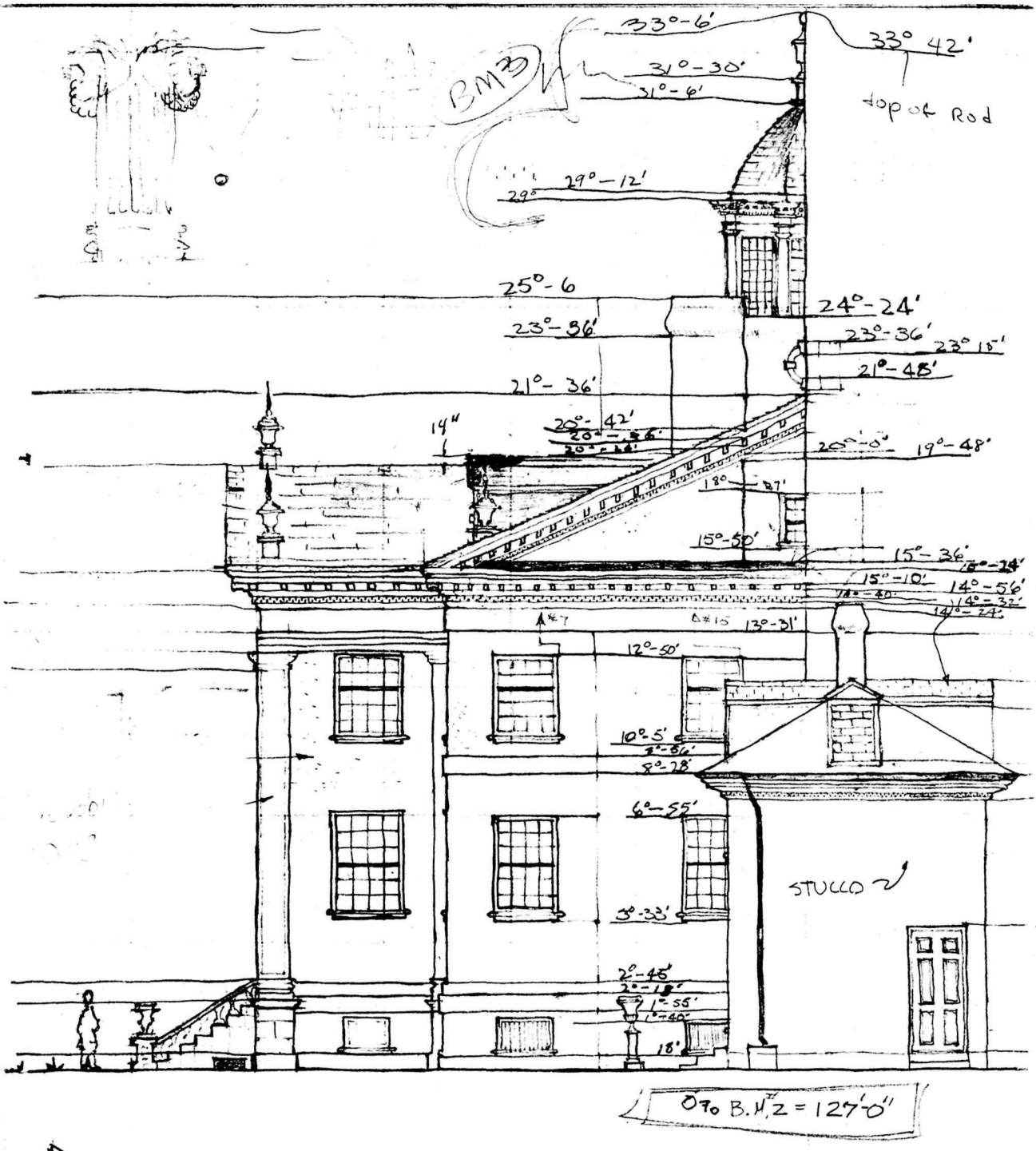
g. Avoid mental calculations while measuring. Write down the actual measurements taken, and indicate the exact points to which they were taken. On the final drawings dimensions may be given to other points, which can be calculated then without endangering the accuracy of field readings.


ABT. 22 BRICK COURSES
22°
22°
57½° ROOF ANGLES FROM S. SIDE
57°
33°
CAPT. JONAS LOCKE } SEE SHELDON
MASTER BUILDER
GEORGE FULLER, FROM 1822.
SKETCH MAP - "THE BARS"
SCALE
0
50 FEET
100
N
1.9 MI TO DEERFIELD VILLAGE
STEEP SLOPE DOWN TO MEADOWS (OLD BOUNDARY LINE OF SETTLEMENT)
DOWN
BARN
OLD ALLEN PROPERTY
LOCKE-FULLER HOUSE
BARN
BARN
115'
TOBACCO BARN
HARRIS HOUSE
185' FARTHER

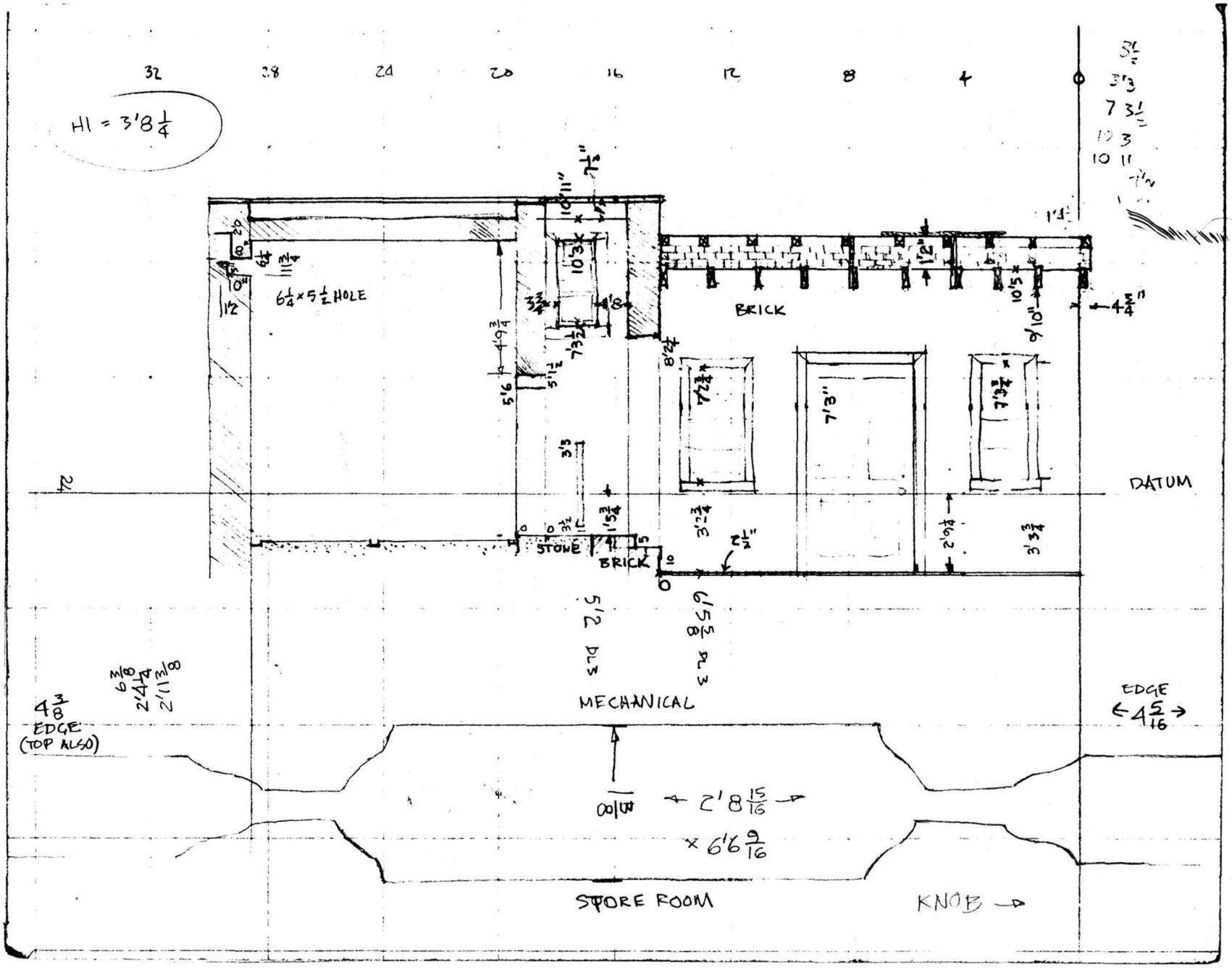


SECOND FLOOR PLAN

¼" = 1'-0"

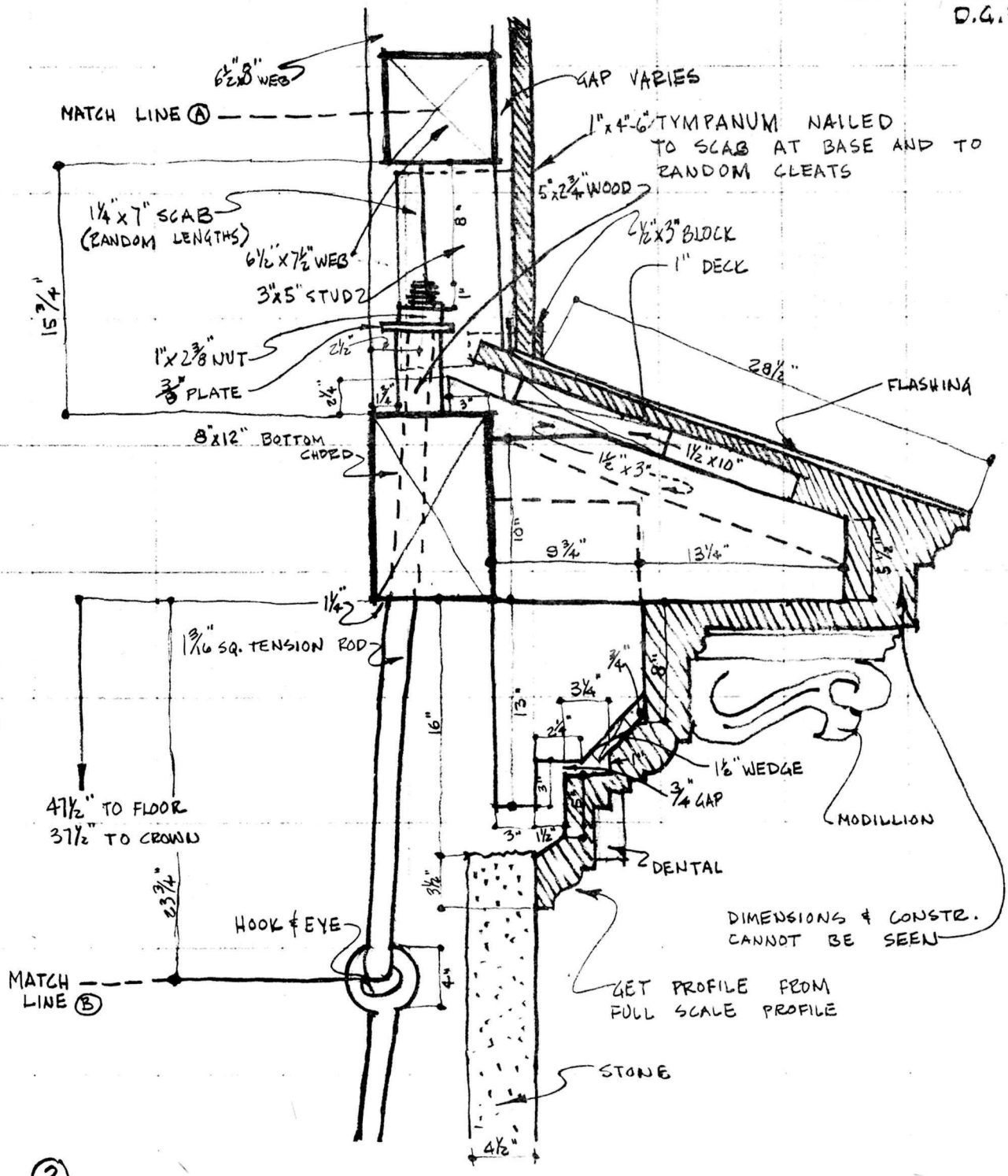


HAMPTON MANSION
WEST ELE.


H1 = 3'8 1/4
32
28
24
20
16
12
8
4
6 1/4 x 5 1/2 HOLE
BRICK
DATUM
STONE
BRICK
MECHANICAL
EDGE
(TOP ALSO)
EDGE
STORE ROOM
KNOB

7/18/60 SECTION THROUGH BOTTOM CHORD

D.G.E.



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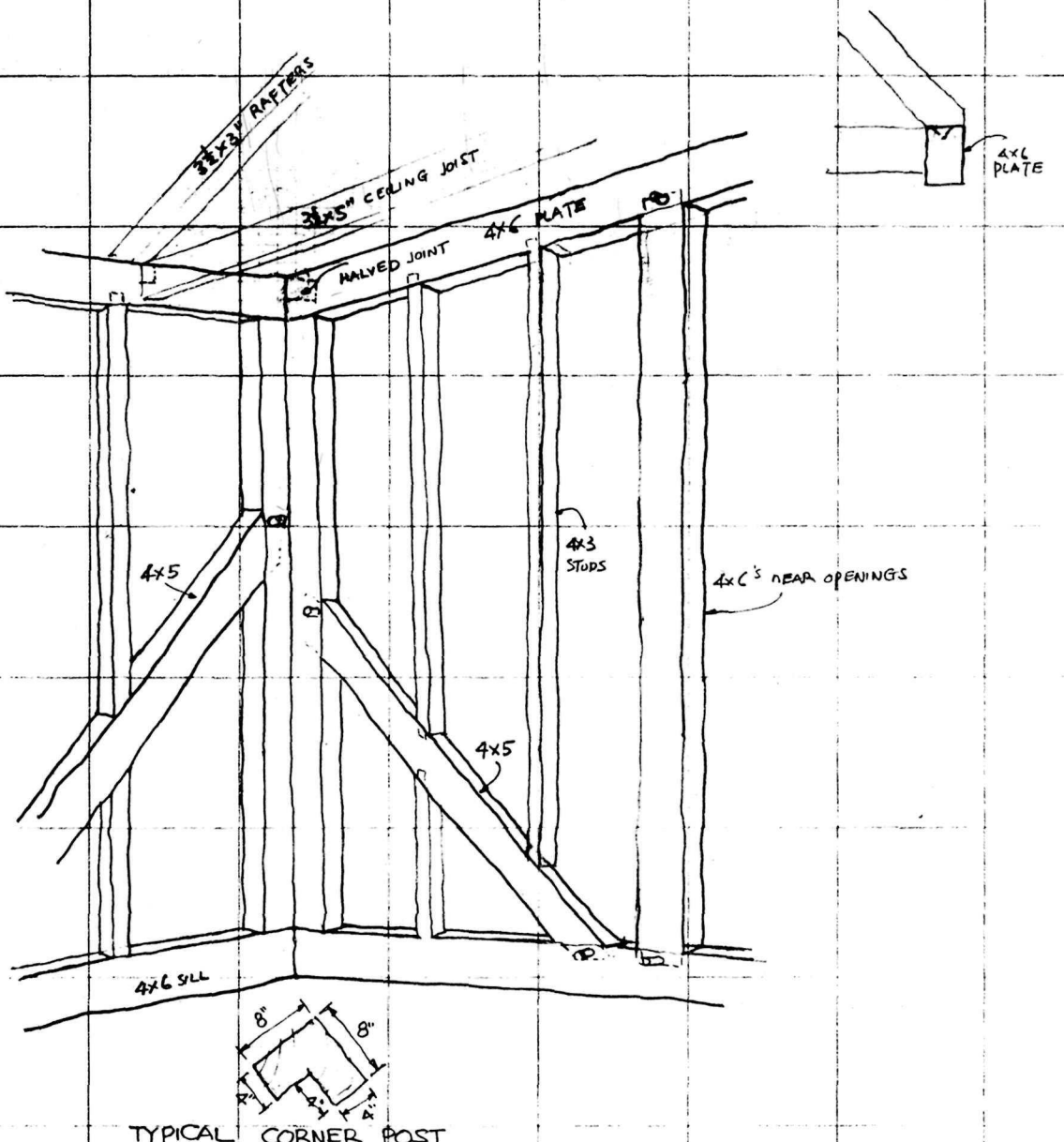
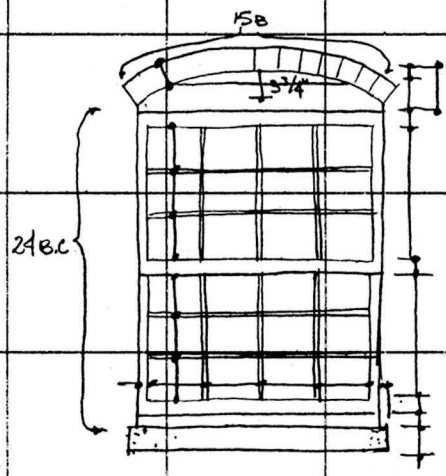


TYPICAL CORNER POST

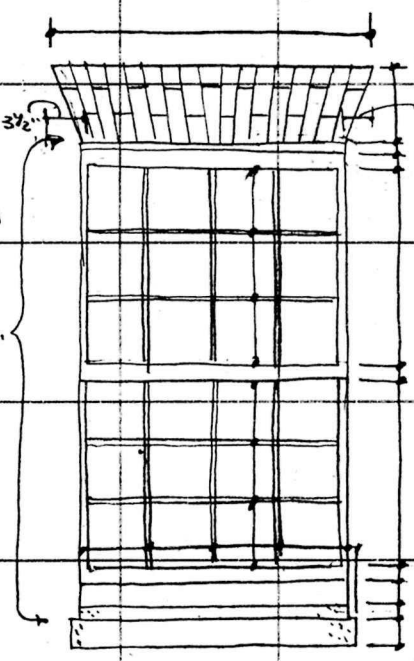
FRAMING DETAIL - SADLER'S SHOP

3RD FLOOR WINDOW

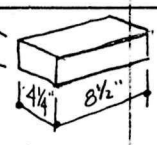


WINDOWS NOT MEASURED BECAUSE THEY ARE STEEL SASH WHICH WERE ADDED IN 1926

2ND FLOOR WINDOW

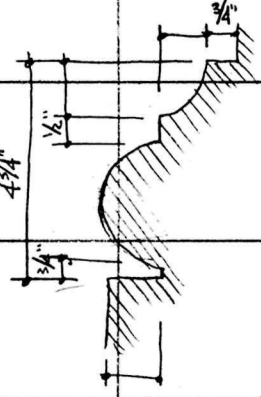


BRICK SIZE - 2¾"

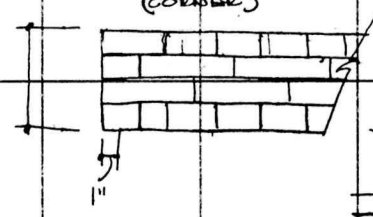


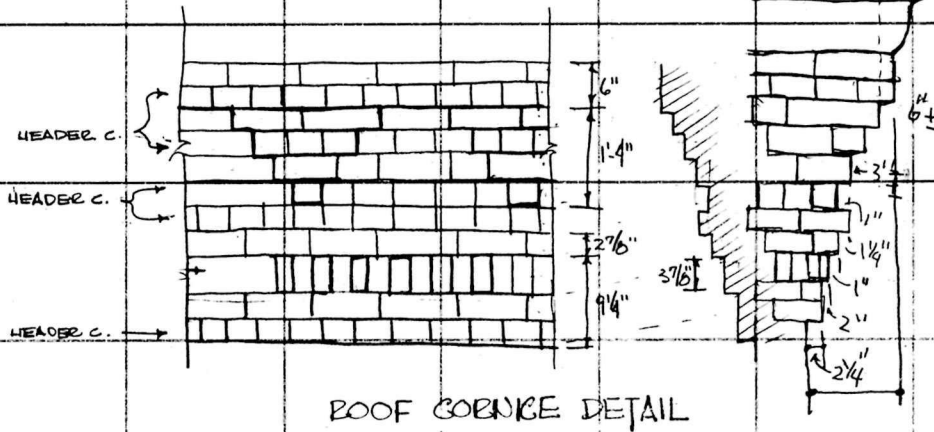
SOUTH ELEVATION IS FLEMISH BOND

WATER TABLE DETAIL (SECTION)



INTERMEDIATE BELT COURSE DETAIL (CORNER)



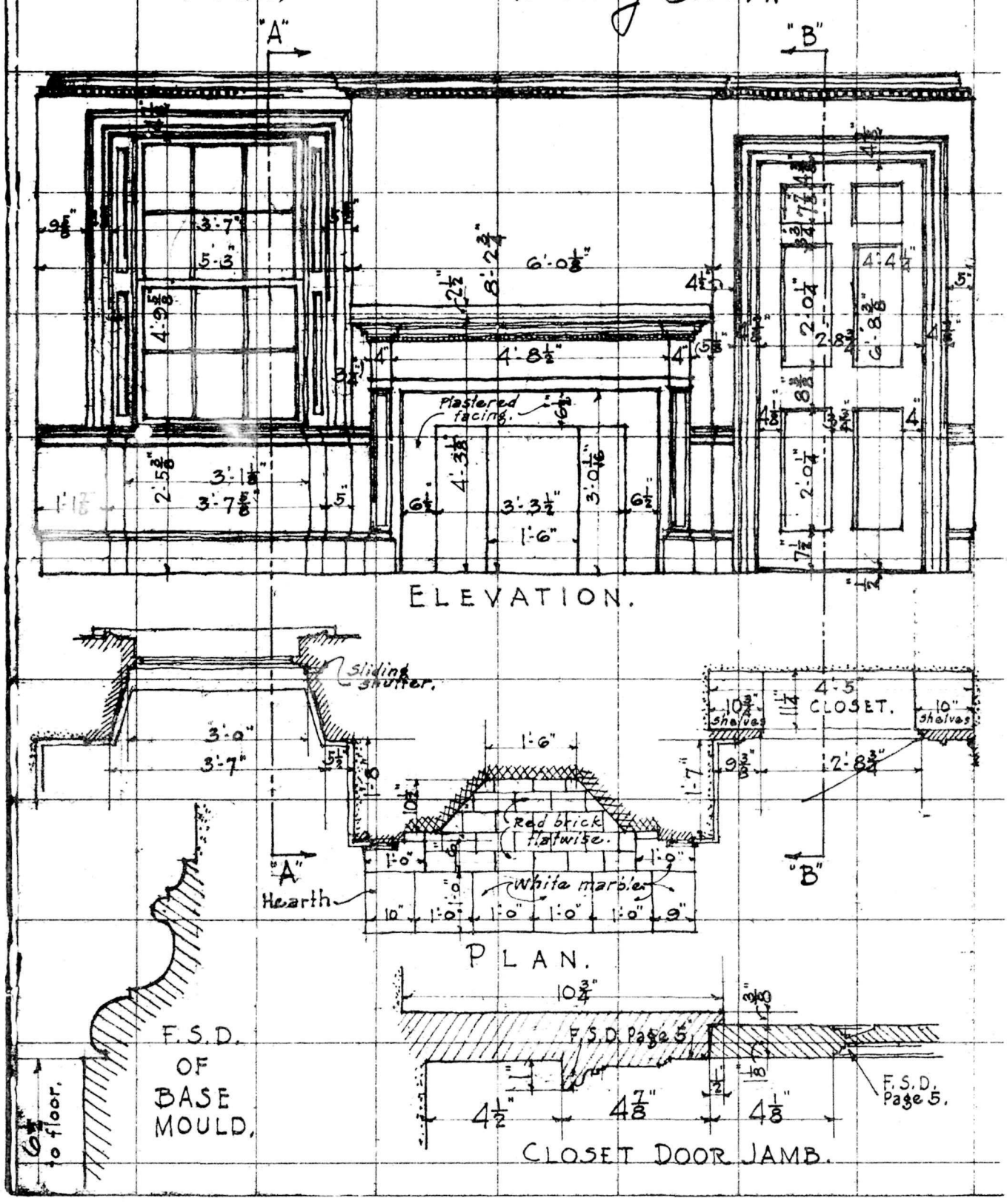


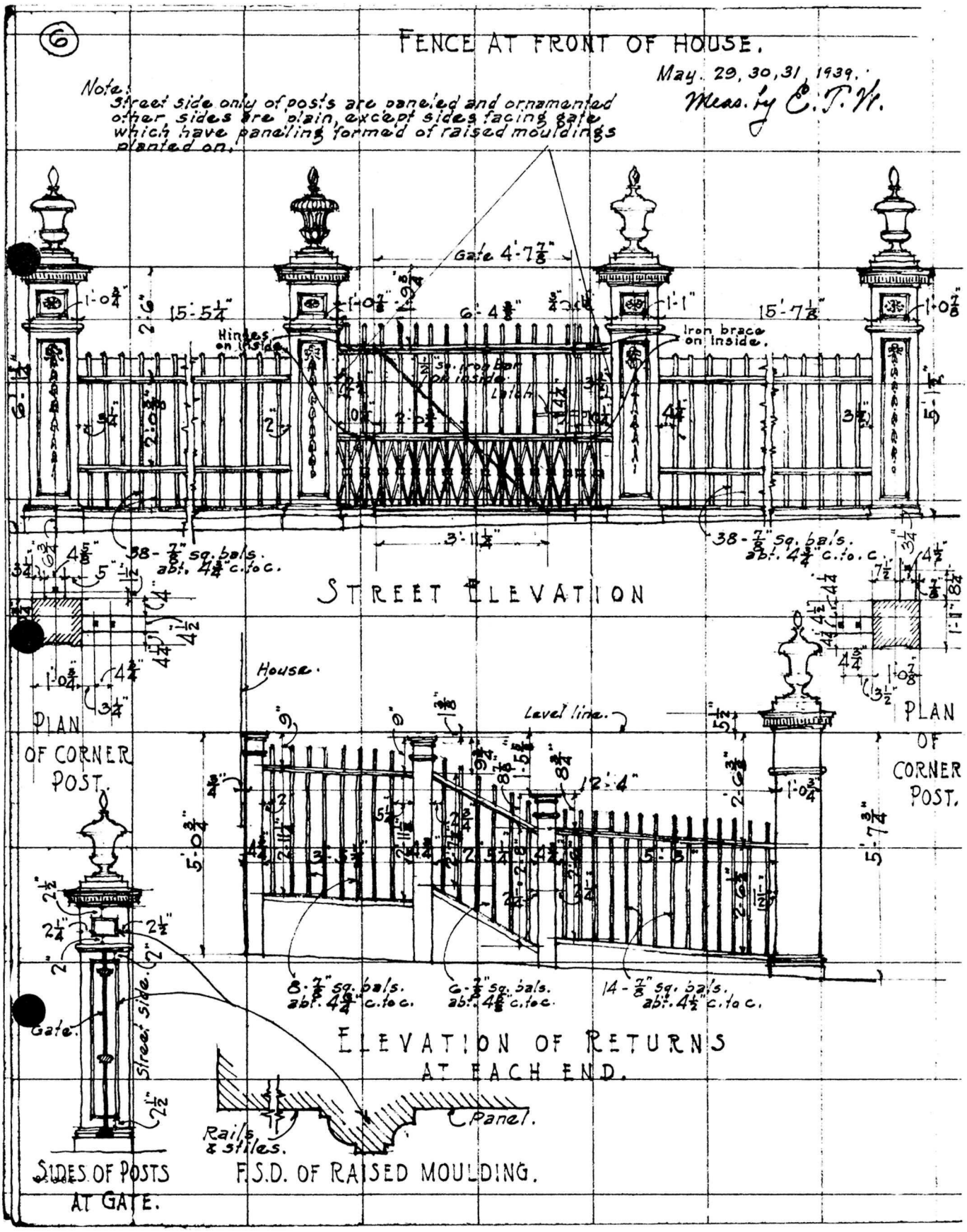
ROOF CORNICE DETAIL

(8) WEST SIDE OF ROOM No. 5.

Jan. 13, 16, 17, 18, 1939.

Meas. by E. T. W.




6
FENCE AT FRONT OF HOUSE.
May. 29, 30, 31, 1939.
Meas. by C. T. Vr.
Note: Street side only of posts are paneled and ornamented other sides are plain, except sides facing gate which have panelling formed of raised mouldings planted on.
Gate 4'-7 7/8"
15'-5 1/4"
6'-4 3/8"
15'-7 1/8"
Hinges on inside.
Iron brace on inside.
38-7/8" sq. bals. abt. 4 3/4" c. to c.
38-7/8" sq. bals. abt. 4 3/4" c. to c.
STREET ELEVATION
PLAN OF CORNER POST.
House.
Level line.
12'-4"
8-7/8" sq. bals. abt. 4 3/4" c. to c.
6-7/8" sq. bals. abt. 4 3/4" c. to c.
14-7/8" sq. bals. abt. 4 1/2" c. to c.
ELEVATION OF RETURNS AT EACH END.
PLAN OF CORNER POST.
Gate.
Street side.
SIDES OF POSTS AT GATE.
Rails & stiles.
Panel.
F.S.D. OF RAISED MOULDING.

5. Special Measuring Procedures

a. Obtaining Moulding Profiles. A time-honored method which is still applicable makes use of a flexible strip of metal; this is fitted to the moulding surface, removed, and the profile it retains is traced onto paper. Great care must be taken in fitting the metal strip into small depressions of the moulding and in removing it without bending it out of shape again. In former days lead foil was used; it is good today if obtainable. Sheet aluminum of the type commonly available in rolls in grocery stores, as a wrapping for food, is good for taking profiles when used in several thicknesses. The recorder can experiment to find the right thickness for his purpose--about eight laminations is suggested for a beginning.

An impression of mouldings can be taken with modeling clay; unless the mouldings are quite large this can be done with the clay in the form of a long strip, which is fitted to the surface in a manner similar to that described above, in the case of flexible metal.

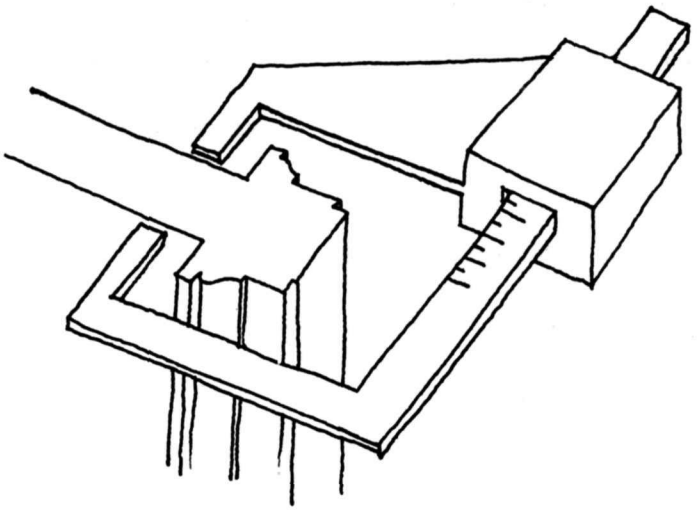
A profile gauge (see illustration on page 32) is very useful in recording architectural mouldings, and is widely used for industrial contours (such as automobile fenders) as well. Such a gauge is manufactured by the Zina Goodell Corporation, Salem, Massachusetts. It consists of a series of thin metal laminations

which can slide, held together by a long screw whose tension can be adjusted. Along one edge the laminations are bevelled to a point--This is the edge used to make contact with the surface of the moulding.

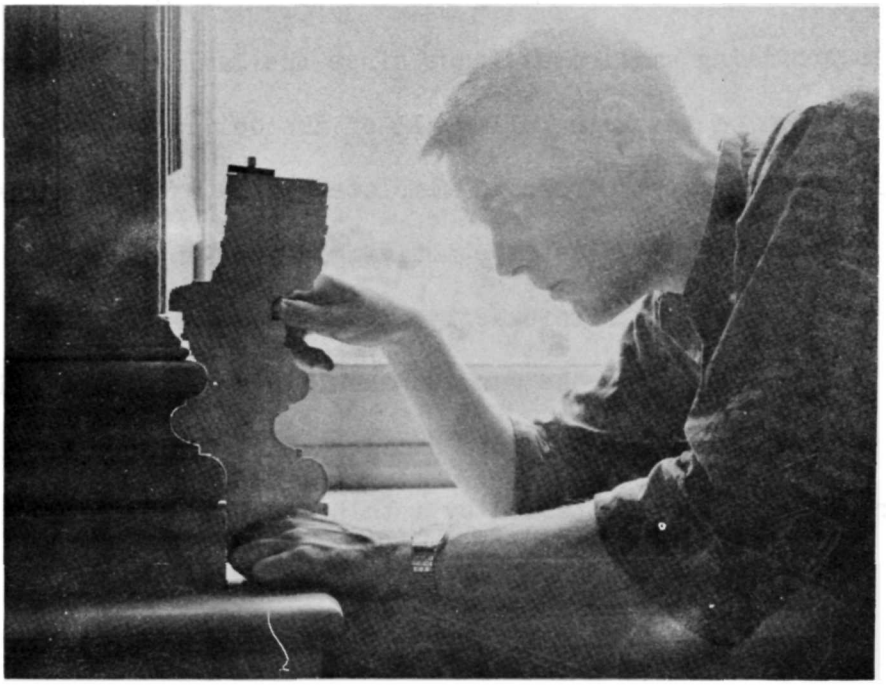
In determining the contour of a moulding, the tension screw is loosened slightly (not too loose, or the laminations will bend), and the gauge is pressed against the moulding. It is advisable to push each lamination into contact with the moulding surface individually, holding the whole gauge motionless until the operation is complete. Then the tension screw is tightened, the gauge removed, and the profile traced onto paper.

The result should be checked carefully by eye, in comparison with the moulding itself. This is particularly necessary when profiling small mouldings, since the laminations of the gauge are too thick to follow all of the delicate features. As a further check, a cardboard template may be made from the traced profile and held against the moulding. The template can be corrected until it fits exactly.

When using the gauge on mouldings of soft material, great care should be taken to avoid damage. Some finishes are also easily scratched, unless protected by a thin substance like drafting tape or plastic wrapping.



Wall Calipers



Use of Profile Gauge. Photo by Boucher.

Very accurate moulding profiles may be obtained by casting with Plaster of Paris. The moulding surface must first be coated with wax to prevent adhesion. After the cast has hardened it is removed and sawed along a plane perpendicular to the moulding, thus revealing the true profile. A very fine saw (comparable to a hack saw) is used, and the teeth cleaned frequently, to assure a sharply defined cut. The method of casting, itself, will depend on the location and size of the moulding.

Sometimes a moulding profile may be obtained directly at an exposed end, or at a joint open enough to allow insertion of a piece of paper on which the contours may then be drawn. This is preferred to all other methods when possible. As a special case, a building being restored or demolished may offer the opportunity to saw a set of mouldings at right angles, and trace their profiles directly.

Whatever device is used to get the profile, care must be taken to select a representative section of the moulding which is not worn nor distorted by many layers of paint. In the latter case, permission should be obtained, if possible, to remove the paint carefully before recording the profiles. To be meaningful, a profile must be true and accurate.

If the actual jointing and assembly of wooden mouldings can be seen clearly--in whole or in part--be sure to record the interior details of the joinery to the degree that they can be determined accurately.

b. Establishing Base Lines. For buildings with an irregular or crooked outline, and complicated groups of structures, a base line independent of the buildings should be established, from which offset measurements may be taken to determine the position and relationship of the various elements. In this sense the base line constitutes a reference on plan; a level chalk line is often necessary as a reference for measuring elevations, sections and details.

c. Approximating Inaccessible Features.

Various ways can be found to approximate the dimensions of parts which cannot be reached directly; if more than one method can be applied each will serve as a check on the other. In any case the resulting dimension should be labeled clearly as an approximation.

Counting brick, stone, or clapboard courses, or other units of known size, and the construction of similar triangles, have been found useful at least as long as history has been recorded. More sophisticated methods of calculation can be based upon the use of surveying instruments if they are available.

d. Use of Surveyor's Transit (Transit Theodolite).

When this equipment is available, it is very useful in measuring structures whose walls are not at right angles, which are not level, or in general where irregularities are present. To take advantage of the transit, the operator must be familiar with

its operation. Very accurate results can be obtained.

The Equipment. The transit consists essentially of a telescope, mounted on a tripod, which can be turned about either a vertical axis or a horizontal axis.

In the operations described here the transit is used as a level--i.e., the telescope is kept level and turned about a vertical axis. (see illustration, p. 38).

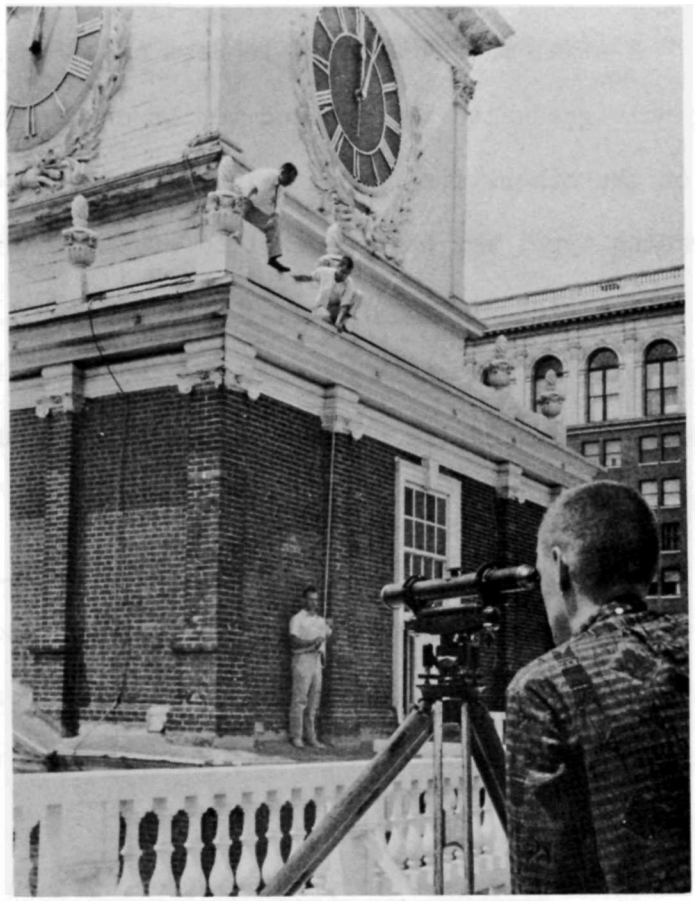
A steel tape graduated in feet and inches, and a carpenter's folding rule graduated in feet and tenths on one side, and feet and inches on the other, are used. A leveling rod, preferably of the self-reading type, may be used instead of the folding rule.

Examples of Measuring with the Aid of a Transit. Situations in which this instrument is helpful are indicated by the following brief descriptions of its use and illustrated in the diagrams on pages 37 and 38.

(1) Relating levels inside and outside a building. Set up the transit where one can sight through open doors or windows. While an assistant holds the end of the rule on desired points, successively, the operator reads the measurements through the telescope.

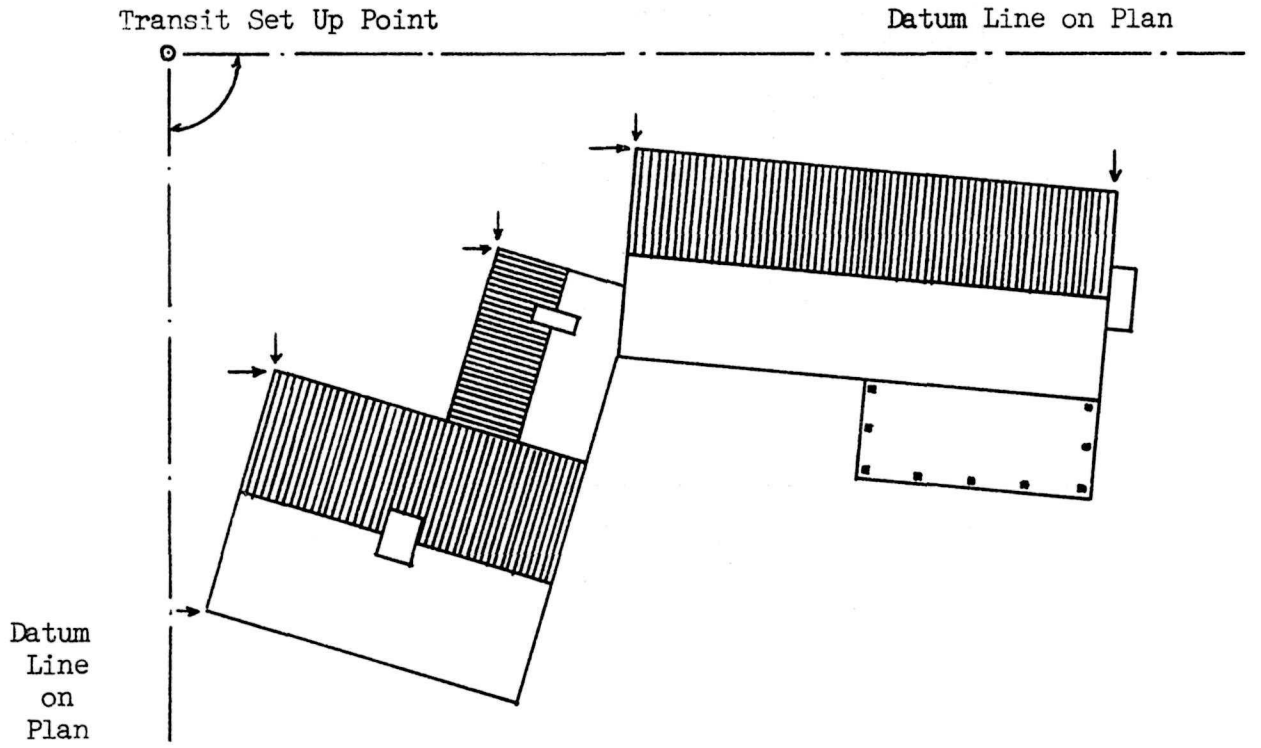
(2) Buildings on sloping sites, without good horizontals, and buildings settled out of line. In these cases the horizontal plane of the transit makes a convenient reference level. While

assistants hold a tape or rule vertically at the desired points, the operator can read (through the telescope) their height above or below this reference plane. Some heights can be read conveniently by the assistants, and called out to the operator.



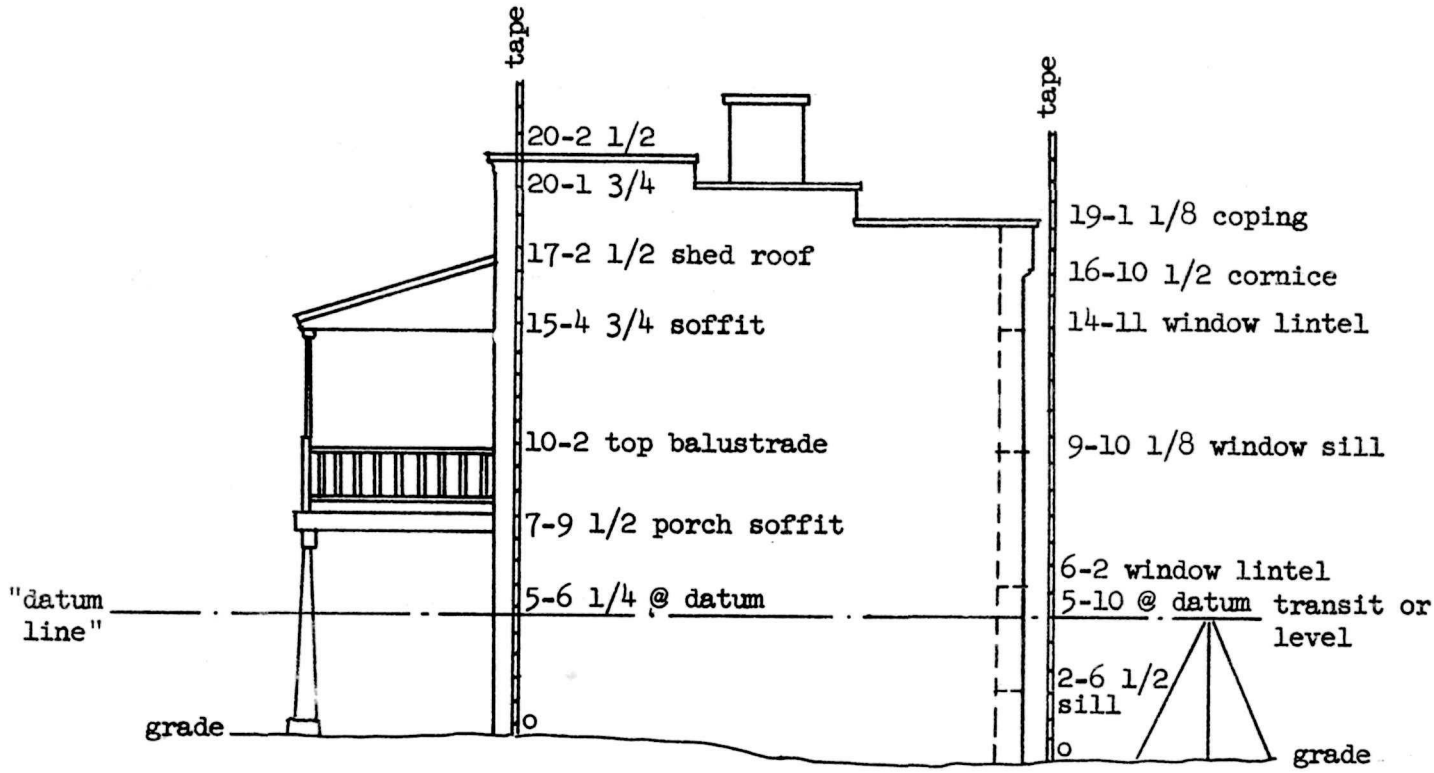
Use of a surveyor's level. Photo by Boucher.

(3) Irregularly shaped plans. Set up the instrument at a convenient point, and mark a reference line along the floor, extending from the transit as far as possible. Other reference lines perpendicular to it, at measured distances, can also be marked. From these, measurements may be made with a tape. Heights may also be obtained, in the manner described in (2).



USING THE TRANSIT FOR RECORDING THE ANGLE OR RELATIONSHIP OF PARTS OF AN IRREGULARLY SHAPED BUILDING

The datum line need not be parallel with any wall buildings measured conventionally--transit used only to estimate coordinate points for corners.



USING THE TRANSIT OR LEVEL FOR RECORDING BUILDING ELEVATIONS.

(Especially useful when [1]ground level is irregular, when [2]there is unusual settlement in the building, or when [3]no reliable horizontal reference line exists).

Requires: Minimum Party of three men:

1. Transit man and recorder (records elevations of datum line above various grade levels).

2. Man holding zero end of tape on grade.

3. Man on ladder reading heights of windows, doors, roof, and other desired features.

"Datum Line" should be marked at several points on the building for reference. (A chalk line can be "snapped"on the Datum Line). More than one transit "set up" will be required to do all four elevations. Record vertical difference between two or more datum lines for conversion of field notes. The Datum Line will also facilitate drafting.

(4) Ruined foundations or archaeological remains. From a conveniently chosen station point, one can take angular bearings, and measure horizontal distances with a tape, to all desired points on the structure. Heights can also be read from a vertical rule or rod. If desired, the structure can be related to known reference points, by turning angles and measuring distances.

(5) Site plans can be measured in the way described above, (4), or when a slightly lesser degree of accuracy is satisfactory, the distances to trees, corners of buildings, etc., can be obtained by stadia readings instead of using the tape.

e. Rubbings, Impressions, etc.

The outlines of inscriptions and low-relief ornamental features can be obtained quickly, at full size, by rubbing.

The supplies required include a roll of paper, Scotch drafting tape, and something which will make a good mark on the paper, such as charcoal, dark chalk, carpenter's pencil or wax crayon.

A piece of paper is secured in place with tape, over the detail to be rubbed. All edges or projecting corners are then rubbed (through the paper) with the crayon, leaving an impression on the paper at the points of contact.

Rubbings made with charcoal or chalk should be sprayed with fixatif to minimize smudging.

Impressions of small decorative features may be made with modeling clay as an aid to measurement and drafting. Photographs of ornamental details are also helpful when analyzing and sketching them; measurements must be taken directly from the subject, of course.

Photogrammetry is an ideal way of measuring intricate ornamental work; it is described in the following section, pages 41, ff.

6. Photogrammetry

Structures of many kinds can be measured by means of photographs, but the use of photogrammetric methods has generally been restricted to structures having complex form or detail, those difficult of access or dangerous to cover, and situations demanding speedy recording. From its nineteenth century beginnings, photogrammetry has developed greatly and its employment has become more common, but whether or not it will ever replace manual ways of recording for simple structures, remains to be seen.

There are three general ways in which measurements may be obtained from photographs:

(1) Single-picture measurement, used for surfaces which are essentially plane.

(2) Analytical, in which geometric calculations are made from two pictures taken from known camera positions.

(3) Stereophotogrammetry, in which drawings are made with a plotting machine.

The following section, written by Perry E. Borchers, who is acknowledged as the leading authority on photogrammetry in the United States, is for the information of persons seriously attempting to make recordings by such methods, with or without the most appropriate equipment.

An article prepared for the new Manual of the Historic American Buildings Survey of the National Park Service

Architectural Photogrammetry

by Perry E. Borchers
Professor of Architecture and
Research Supervisor
The Ohio State University

Photogrammetry is the science of measuring by means of photographs. As a beginning science in the nineteenth century, photogrammetry was used to record, measure and draw monuments of art and architecture.

The first major program of architectural photogrammetry was undertaken by the Prussian Staatliche Messbildstelle organized by Meydenbauer in Berlin in 1885. When the great files of the Messbildstelle in Potsdam were seized by the Soviet military administration and shipped to the east in 1945 the glass negative plates filled 929 chests weighing 36 tons and represented a priceless record of many buildings destroyed or damaged during the war. The legacy of the Messbildstelle has been its development of procedures in architectural photogrammetry. Since World War II major projects in the recording of historic architecture by means of photogrammetry are being carried out by the Ministry of the Interior within the Kingdom of Belgium and by the Institute Geographique Nationale of France among the ancient Egyptian monuments to be drowned by the Aswan Dam. There have been projects in several other European countries. In the United States since 1957, the Ohio State University has carried out a series of projects of architectural photogrammetry

for the Historic American Buildings Survey of the National Park Service.

There are three ways in which photographs are processed to yield measurements. First, there is single-picture measurement, employing a precise instrument known as the rectifier to project a single photograph with correction of the tilts, rotation and obliquity of the camera to major planes. This allows rapid measurement or direct drawing of detail such as mural painting and joints of essentially plane surfaces.

Analytical photogrammetry combines the measurement of two pictures--taken from two known camera positions--with geometric calculation of the major dimensions of the structure photographed. Though replaced by the more efficient methods of stereophotogrammetry in modern projects, the geometric procedures of analytical photogrammetry can be used for the reconstruction of damaged or vanished structures from a variety of photographic material; e.g., the actual use of amateur photographs to recreate the form and dimensions of a war-damaged tower in Munich, Germany.

The third method is that of stereophotogrammetry, which employs two photographs taken at successive camera stations, normally with camera axes parallel, for creation of a three-dimensional projected or optical model which can be scaled and measured in all directions and--in such plotting machines as the Wild A 7 Autograph--drawn directly in orthographic projection.

The process or orientation--which must precede plotting and measuring in the Wild A 7 Autograph--establishes criteria for

photographic equipment and procedures in the field. This process involves reproducing (1) the inner orientation of the camera used in photography, (2) the relative orientation between the two camera positions at the time of photography and (3) the absolute orientation of the camera axes at the time of photography with the vertical and horizontal coordinate system chosen for the orthographic projection.

The inner orientation of the camera is best established when using a photo-theodolite--a precise camera of negligible lens distortion precisely mounted on a surveying instrument. The inner orientation of the camera includes (a) the precise focal length--either fixed, or variable in photo-theodolites which record variations of the focal length upon the photographic plate, (b) the location of the camera axis, established by the recording of four fiducial markings upon the photographic plate, and (c) the determination of the residual distortion of the lens and camera. This is best done by actual photography of a grid of known dimensions to establish, also, that flat photographic glass plates are brought into flat, firm contact with contact points in the camera.

Again, the elements of relative orientation between the two camera positions at the time of photography are most easily recorded by the use of a photo-theodolite. The process of taking stereopairs consists in setting up two tripods at two camera stations, alternating the leveling of the photo-theodolite and a target at the two stations to permit turning angles to photograph

from each station preferably with the camera axes perpendicular to the base line between the stations. The choice of base width is one of the first decisions. Maximum depth of reasonably accurate plotting is twenty times the base width between tripods. An increase of base to depth of plotting, known as the base/distance ratio, increases accuracy but reduces the area of stereoscopic coverage in the stereopair.

The elements of relative orientation are:

a) The horizontal component of the base between camera axes

b) The vertical component of the base

c) The component of the base in depth--when camera axes are not perpendicular to the base line

d) The tilt of the camera axes upwards or downwards, at both camera stations

e) The swing inwards or outwards--convergence or divergence--of the two camera axes

f) The rotation of the camera around the camera axes, at both camera stations

Despite the provision of the surveying instrument to level the camera and turn angles, the accuracy of the orientation and plotting is improved by a careful choice of control points which are marked by the intersection of white or black tapes and are photographed in the stereopairs and which are recorded as data.

The most useful control points are a series of three or more at the horizon of the camera. These points--when displaced horizontally in the photograph--reveal any rotation of the camera around the camera axis and permit both a relative and an absolute orientation of the rotation. These points--when displaced in depth in the photograph--permit a relative and an absolute orientation of the tilt of the cameras upwards or downwards. A comparison of the two series of markings in the second photograph of a stereopair reveals the vertical component of the base. It is necessary to measure the distances between the control points and the angle formed by lines connecting the control points--very often the verifiable right angle of a building. Any discrepancy between distances and angles measured on the ground and those plotted in the A 7 Autograph will indicate further orientation of the elements (c) the component of the base in depth, and (e) the convergence or divergence of the two camera axes. A vertical dimension is desirable for scale.

Another useful element of survey control is an undoubtedly vertical line intersected by the camera axis. This permits an absolute orientation for the rotation of the camera around the camera axis and for the tilt upwards or downwards of the camera

axis. In the case of highly irregular or deformed structures--and when there is no wind--a weighted line can be lowered over the eaves from a papapet or cupola to establish a vertical line in the photographs. A dimensioned vertical line can be established by lowering a steel measuring tape with prominent marking of major dimensions. For such structures as the cliff dwellings of Colorado, carved into and built up under an overhanging rock face, the vertical dimensioned lines of three measuring tapes lowered over the cliff, with measurement of horizontal distances between them, can provide complete survey control.

The horizontal plane established by the first system of control points or the vertical established by the second system of control points is the basis of (3) the absolute orientation of the camera axes at the time of photography with the vertical and horizontal coordinate system chosen for the orthographic projection. The accuracy of the photogrammetric system should be easily to within one (1) part in one thousand (1,000) in determining such dimensions as the height of inaccessible towers. With extreme care this accuracy can be increased tenfold.

Lacking a photo-theodolite it is still possible to make a photogrammetric record of architecture, though of lesser accuracy.

The determination of the inner orientation of the camera is the first requirement. The focal length may be determined by a calibration--photographing a grid of known dimensions--which also determines lens distortions which can be eliminated from

the plottings by the calculation of corrections. The focal length may also be determined by careful measurement from the camera position--actually from what is known as the principal point of the lens--normal to a carefully measured dimension within the picture. The scale of this dimension in the photograph establishes the focal length at the time of photography of a lens of variable focus.

The location of the camera axis may be approximated--with a camera with fixed back and front--by the intersection of the diagonals of the photograph. Avoid the use of tilts, swings, or falling and rising lensboards or backs such as are found in large format view cameras--which completely displace the camera axis.

Film may be used only when some type of shrinkage markings are recorded on the film at the time of photography to determine shrinkage and distortion occurring later, requiring calculation of corrections to apply to the plottings. Photographic plates are preferred.

At the time of photographing architectural stereopairs one may use an optical square to turn approximate right angles from the base line and small level bubbles to approximately level the camera. However, accuracy depends entirely upon a system of control points in the photographs established by the use of a surveyor's level beside and at the height of the camera at each camera station. The basic control points are those which have already been described. Additional control points help to determine distortions of the lens, shrinkage of film, and general corrections

of the plotting and measurement.

Photographic coverage determines the number of stereopairs required to record a building. Stereopairs with bases parallel to the elevations of the building are convenient for the orthographic drawing of the elevations. Stereopairs on the diagonal of the building--with survey control in depth--provide the best orientation and the best determination of inaccessible dimensions on the building. A traverse may be surveyed around a building and white targets set to stakes as survey control for aerial photography to record concealed portions of the roof and for general site plan.

The use of photogrammetry in the Historic American Buildings Survey is most appropriate for the measurement of buildings which are complex in detail, sculptural or deformed, or dangerously tall and inaccessible.

July 27, 1961

D. HOW TO DRAW

1. Equipment and Supplies

Draftsmen are familiar with the items used in making drawings, but a brief description of the Standard Sheets of paper used by the HABS may be of interest. A standard, official sheet is required for all HABS drawings. It is a tough, opaque, white bond paper (100% rag content) made into sheets approximately 19" x 24", with a usable area approximately 15 1/2" x 20" inside the printed border and trim lines.

Since both the kind and size of the paper are sometimes questioned by draftsmen, it should be noted that when the HABS was begun, in the 1930's, this paper was the most durable substance available. Since all HABS drawings are destined for deposit in the Library of Congress as a permanent architectural archive, durability is of paramount importance.

The size was originally determined by doubling the dimensions of a typical plate from an architectural book of common size, in order to facilitate reducing for publication of HABS material, as then contemplated. The size has proven convenient in handling and storage, and with the large growth of the HABS collection, it is permanently fixed. Architect, archaeologist, scholars or others engaged in work on historic American structures often find it useful to know the standard HABS sheet size, so that the scale of their drawings can be established accordingly, to facilitate transfer onto the permanent sheets for contribution to the HABS.

In tracing onto this paper, the use of a light-table is very helpful. It is also suitable for drawing upon directly; in fact, a number of draftsmen prefer to work directly on this paper.

2. Drafting

a. In general, draftsmen of experience are well aware of the procedures involved in laying out and completing drawings, and to a large degree they agree as to what constitutes good draftsmanship. Drafting is conventional, but it leaves room for adequate personal expression without degenerating into unsuitable mannerisms. It will suffice here to point out the conditions and standards which characterize HABS work, and comment on some ways in which it differs from ordinary office practice. The drawings illustrated in this manual, pages 69 -109, are good examples of their kind and will be useful for reference.

b. Standards. We are happy to believe that some of the work in the HABS represents the finest draftsmanship in the country. High standards of accuracy, clarity, completeness, indication and expression are maintained. HABS measured drawings are adequate in quality to permit reconstruction of the structure if it is destroyed, within the limit of coverage imposed by the number of sheets in the set.

HABS drawings are also suitable for reproduction in books; the better the draftsmanship, the better it reproduces.

c. The difference between HABS measured drawings and architects' contract ("working") drawings arises from the difference in

the way each is used. Contract drawings are prepared to direct the construction of new buildings; their basic dimensions are given to points established early, and covered up as erection proceeds. They define and allocate construction to be bid competitively, with the completeness and rigidity of a legal document.

HABS measured drawings start from an existing structure; measurements for them are taken between material lines or points on the surface. When used for restoration they should be as complete as possible, but when used by historians for reproduction in books the dimensions and notes may be considered excessive. In elevation, HABS drawings tend to repeat elements and indication of materials more generously than do architects' contract drawings, giving a greater emphasis to pictorial quality. (See illustrations, pp. 79, 83, 85).

d. Drafting for Cronaflex Reproduction. From the beginning of the Survey until 1958 all HABS drawings were made in permanent waterproof drawing ink. The development of improved reproduction techniques, however, finally made it practicable to record permanently in pencil, and this medium is now used as the principal one.

(1) Reproduction. The finished pencil drawing, on HABS paper, is photographed full size on tough permanent-type photographic film, to make a "master negative". This negative is then contact printed in a vacuum frame, onto a DuPont Cronar (sensitized polyester plastic) sheet, to make the "master positive". This work is done under careful supervision.

(2) Handling Drawings in the Library of Congress. The original pencil drawing, master negative, and master positive, all become part of the HABS collection and are deposited in the Library of Congress. When prints of HABS drawings are requested from the Library, they are printed from the master positive without the necessity of handling the original drawings. Since opportunities to smear and smudge them are virtually eliminated, pencil drawings thus constitute a permanent record.

(3) Advantages. Drawings can be made in pencil at a lower cost than in ink; the saving per HABS sheet has been estimated as up to fifty dollars. Furthermore, ink drawing is rapidly becoming a lost art, and persons qualified to do it are becoming increasingly difficult to find.

(4) Drafting Technique. In comparing an original pencil drawing with the master positive, one notices that the character of the drafting has been altered. Contrast between lines and backgound has been increased, lines appear slightly wider to the eye, and tonal gradations (if any) have been lost. In short, the master positive looks like an ink drawing.

To make a pencil drawing which will reproduce well on Cronaflex, several points must be kept in mind. Line should be definite, crisp and clean. When lines have been drawn too close together they may reproduce as one heavy line or area--this is particularly true of the lines are at all "fuzzy". Keep drawings clean, because graphite smudges and fingerprints will show. When drafting, it is well to cover areas on the sheet which are not being

used at the moment, to keep them as clean as possible.

Use lead a little ~~softer~~ harder--about one grade--than when drawing for blueprint reproduction. ~~This in itself will call for extra caution to avoid smudging~~. Lines to be emphasized should be "built up" with a good graphite deposit, in a manner similar to that used when blueprinting is the objective. Avoid "fading" or "grading" of lines unless you are willing to have the lighter portions lost in the reproduction, or the heavier portions reproduced too coarsely.

If possible each draftsman should examine and compare an original pencil drawing with a print made from the master positive.

e. Drawing in outline is the usual HABS method of representing plans, elevations, general sections, and most details. In certain cases it may be desirable to "render" artifacts, hardware, or other special details, when such a treatment illustrates the material to best advantage. The delineation must be in line or stipple, in any case, since tones and gradations as such cannot be reproduced. The need for clarity, when the drawing is reduced for publication, should be kept in mind, in these cases as well as all others.

When altered features of the structure are indicated they should be shown with a thinner, unaccented line, so that they are clearly differentiated from the rest of the drawing. Portions which are not original, and lacking in interest, will be indicated very simply--perhaps only in the barest outline. In most cases of this kind an explanatory note will be added.

f. Weight of Lines. The apparent weight of lines, when reproduced on Cronaflex, varies only with their width, just as when drawn with ink. Silhouettes of elevations, cut portions of section, and large scale details are made heavy for accent. Outlines of openings should be moderately heavy, while joints in materials and dimension lines should be lighter than normal lines used for representation.

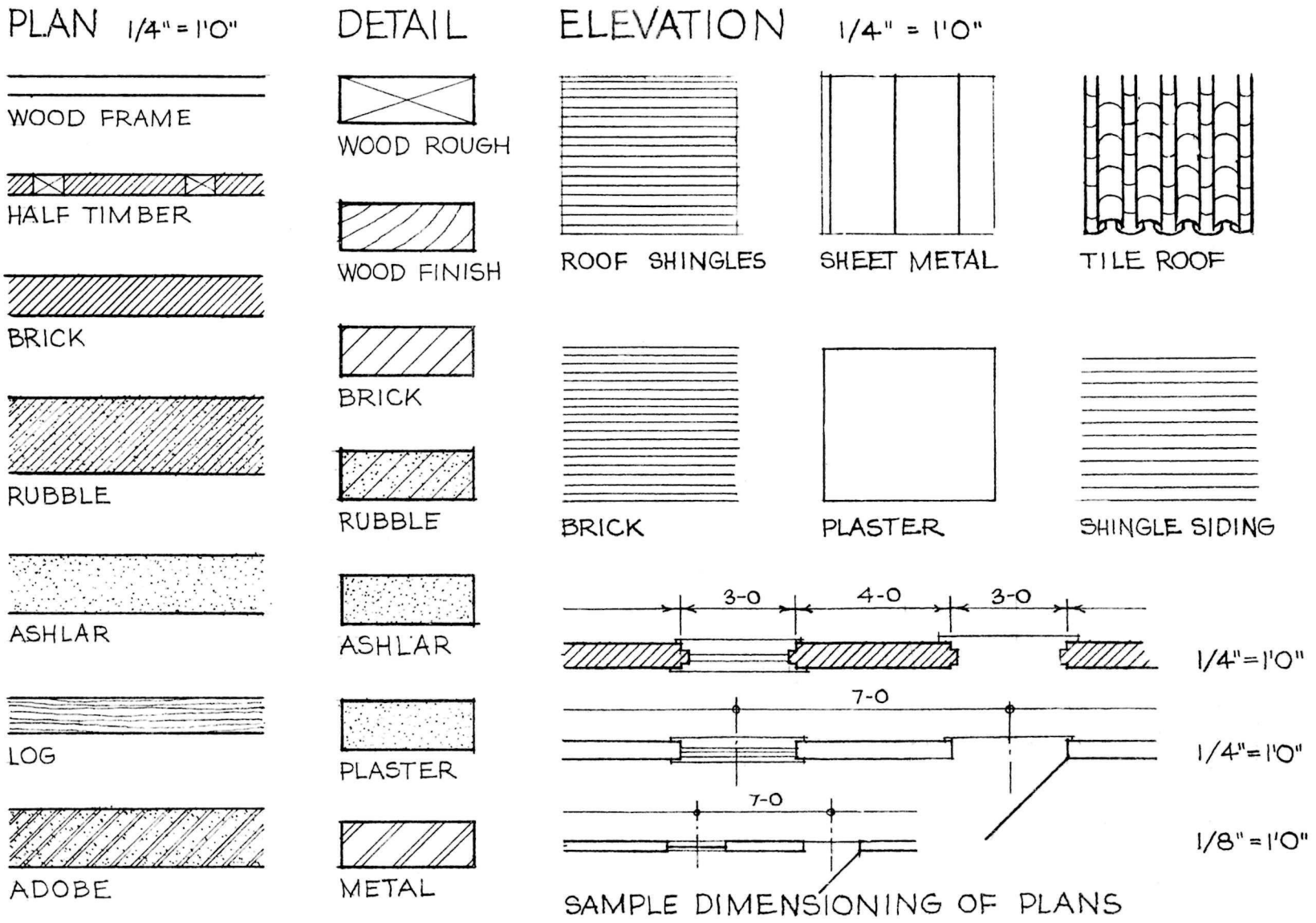
Close silhouettes can be heavier than more distant ones, to give the illusion of depth (see illustration, p.79). Sometimes one accents corner lines on the "shadow side". These are conventional tricks, but when they are done by a draftsman who really knows how they can be very effective.

The weight of all lines should be sufficient to permit them to reproduce well when drawings are reduced by one-half, as they may be when used to illustrate books. For the same reason lines should not be too close together.

g. Indication of Building Materials.

Standard architectural symbols are used for crosshatching the cut portions in plan to indicate building materials. On rare occasions such indication is also given on section drawings. Certainly, no indication of a material should be given unless it has been observed--spaces of unknown construction are to be left blank.

Building materials when indicated on elevation should be drawn to scale (or at least approximately to scale).



MATERIAL INDICATIONS FOR HABS MEASURED DRAWINGS

Cornice jointing, etc., when visible, should be shown on the drawings.

Some of the more common architectural symbols are illustrated on page 56 , for reference when making HABS drawings.

h. Dimensions. The number of dimensions to include is a matter of judgment. (See illustrations, pp. 71, 99, 101, 107). In any case, they should be consistent, and placed in a manner similar to those on architects' contract drawings, with figures at least a scant 1/8" high. Place dimension lines to avoid confusion with other--center lines, construction lines, lettering, etc., and in general to compose well with the drawings and notes. On plans, window and door openings are to dimensioned to the openings themselves, regardless of the type of construction (contrary to architects' conventional habit of dimensioning to the center of openings in frame walls and partitions). Note that openings in old buildings may vary considerably in size, even when they "look alike." Similarly, the face of a wall or partition is the normal dimensioning point for a measured drawing. Posts and columns are dimensioned to center lines as a rule, although some large posts or piers may demand a measurement to the face, by way of exception. The over-all size of a room or other major element should always be given even though a string of smaller dimensions is also placed between the same terminal points.

Give vertical dimensions as floor-to-floor heights, floor-to-ceiling heights, window sill and head height from floor,

on elevation or section sheets (or noted on plans, when elevation or section drawings are lacking).

Recurring dimensions are to be given with figures, and not noted "same" or "ditto." Approximate or computed dimensions must be distinguished from actual measurements by +plus-or-minus" signs placed before or after the figure.

i. Notes on Drawing Sheets. Annotation of drawings is of great importance. Information about building materials and construction can be given, alterations and additions explained, and facts of historic significance mentioned. One can also call attention to markings or traces of evidence which would be virtually impossible to record on a photograph, (see illustration, p. 105) and question features of doubtful authenticity. The composition of a note involves careful thought in order to convey information concisely and clearly.

One should avoid over-annotating with respect both to content and to appearance. Notes on a drawing should cover only points which must be located graphically to be clear; other information is given more appropriately in written data. The appearance of a drawing, and its potential use for illustrating published articles, should be taken into account when planning what notes to include and where to place them on the sheet. (See illustrations on pp. 79, 83, 91, 93, 109).

Notes should be lettered in a conservative style at least a scant 1/8" high, with a consistent style maintained throughout

the whole set of drawings. Legibility, uniformity, proportion and spacing are important, in addition to conciseness and clarity of expression. Notes--and all dimension figures and titles as well--must be of a size, weight and spacing which will be readable when the drawing is reduced by one-half. HABS drawings are desired which may be used as illustrations in "average sized" architectural books; the lettering and figured dimensions should "carry" as well as the drafting.

j. Titles on Drawing Sheets. Each drawing on a sheet is given its appropriate title in lettering 1/4" high; this includes a statement of the scale of the drawing. Elevation drawings are to be designated by compass directions (as North Elevation, Southeast elevation), or with a name and compass direction (as East Side Elevation, Front Elevation - East).

Each sheet shall contain the name of the structure in lettering 1/4" high, and its location in lettering 1/4" (or not less than a scant 1/8") high, to be well composed in the "Name of Structure" box on the standard HABS sheet. The box for the Survey Number is to be left blank (unless an official HABS Survey Number has been assigned by the Washington Office of Design and Construction, National Park Service).

Each sheet shall be numbered and the total number of sheets in the set noted; a box is provided for this purpose on the HABS sheets. The delineator's name is given in the lower left corner of each sheet, followed by the date (year). It is customary to

use either the expression "drawn by J. Doe" or the work "J. Doe, del." The name of each draftsman who worked on the sheet should be included. Initials and the last name may be given on drawing sheets, but the full first name (if it is not too long) should appear on the Title Sheet credits.

At the lower left corner of each sheet, in addition to the name (s) of the delineator (s), is placed an identification of the survey and the office administering it. Some examples will illustrate ways in which this may be done:

Lee H. Nelson, del., 1958
Fort McHenry Survey 1958

R. V. Keune, del., 1959
Middle Connecticut River Valley Survey
Deerfield Field Office

Richard C. Mehring, del.
Cape Cod Survey I, Eastham Field
Office, 1960, for EODC

k. Completing the Cover Sheet. Since the function of this sheet is to protect the original drawings of the set, it needs only a minimum of lettering. The name and location of the structure, provenance of the drawings, dates of measurement and drawing, and the name of the person who checked them, will suffice.

The HABS uses a tough, opaque tan paper with a printed border (GPO 95421), and letters the necessary data on the cover sheet mechanically, in ink. (See illustration, p.67).

l. Completing the Title Sheet (Sheet No. 1).

This sheet should contain a location plan, historical statement and credits. (See illustration, p. 69).

The location plan is a map which will enable one to find the structure now or in the future. It is drawn at any suitable scale and shows orientation, relation of the structure to principal landmarks, nearest roads or streets, other historic structures, approaches, enclosures, etc. If the building has been moved, show its original location in addition to the present one. At times, old maps of importance may be worked into the set of drawings.

It is important to distinguish between "location plan" and "plot plan"; the former, which is <u>always</u> provided, is for the purpose of <u>finding</u> structure. A plot plan, which may or may not be included in a set of drawings, shows features of interest in the immediate environment of the structure--usually within the lot lines of the property. In case the structure being recorded forms part of a group, or if there are gardens of historic importance, a plot plan should be drawn, in addition to the location plan. In some cases it may be placed on the Title Sheet, but the following sheet would be a more normal place for it.

The historical statement should be given in brief sentences, including such important items (when known) as year of erection, name of first owner, historic events connected with the structure, name of the architect or designer, builder, principal alterations, present occupants, etc. In a word, it should state why the structure was considered important enough to record. Care must be taken to avoid including mere conjecture in this historical statement. (See Part VI, Written Data, pp. 59 ff.).

The provenance of each set of measured drawings should be mentioned. Credit should be given to each person and institution which had a key responsibility in preparing for and executing the set. Dates of measuring and drawing (month and year) should be included. The list will naturally vary with the circumstances, as demonstrated by the following illustrative cases.

Example No. 1.

HABS measured drawings made by the National Park Service personnel as summer projects list the following:

Name and title of the Supervising Architect, Historic Structures

Name and title of Park Resident Architect (if any)

Name of Project Supervisor (and Assistant, if any)

Names of men in the measuring and drawing party.

For persons on temporary duty with the National Park Service, who are connected with a university, the name of the university is listed, following their own names.

Projects financed by the "MISSION 66" program mention the fact. (See illustration, p. 69).

Example No. 2.

A commissioned set listed the following:

Name of the Historical Society or other group which supervised the recording

Name and title of the President of the society

Statement that the work was commissioned by the National Park Service.

Name and title of the Supervising Architect, Historic Structures

Name of the architect who did the measuring and drawing, and the architectural firm with which he was affiliated

Example No. 3.

Student measured drawings should list the following:

Name of the university and the school (or college) of architecture

Name and title of the faculty member supervising the work

Title of the university course in which the work was done

Name of the student who did the measuring and drawing

Example No. 4.

Measured drawings originating through the initiative of the American Institute of Architects should list the following:

Name of the A.I.A. Chapter.

Name of the Chapter Preservation Officer.

Name of the person (s) who did the measuring and drawing.

Statement of the circumstances under which the work was done.

In all cases, the following information is placed in the lower left title block, on the title sheet (as well as on the other sheets):

Name of the office and survey, or other group or institution.

(as: Cape Cod Survey I, Eastham Field Office, 1960, for EODC.

School of Design, North Carolina State College.

Edgar T. P. Walker, A.I.A., for the Eastern Office, Division of Design and Construction, National Park Service).

m. Graphic Scales. Each drawing sheet should contain graphic scales, in feet and inches, corresponding to each scale appearing on the sheet, including full size. They should be placed in the lower right corner. Alternate spaces on the scales shall be black.

n. A Directional North Arrow or compass of simple design should be included on each drawing sheet which contains a map or plan.

o. What not to Include. HABS drawings record conditions existing at the time of measurement, and as a general rule show the whole of the structure. When portions of the structure being measured are not of interest, or are considered unsuitable for recording, the following procedure may be adopted:

Draw the plan of the entire structure according to existing conditions, showing in detail only those portions which have been selected for measurement and recording. The portions not considered suitable for recording shall be indicated only in outline, or with dotted lines. In some cases, where features such as overhanging roofs, porches or sheds added recently to the structure, block historic portions which are visible or measurable under or behind these additions, these additions may be omitted.

Whenever anything is omitted in drawing, a note explaining or justifying the omission is required (as "all portions except the original central unit were added later and are not considered significant," "wing completely rebuilt in 1921," or "modern shed in horse yard not shown, covering south wall.")

Drawings illustrated on pages 73, 89 include examples of omitted portions.

p. Restoration on Measured Drawings.

While it is basic policy for HABS to show what is on the structure, not attempting to show a restored state, there are some exceptions. In instances where there is direct physical evidence of something historic, such as a trace of a mantelpiece or partition wall, it is acceptable to dot in the historic outline. Features such as small-pane sashes and shutters may be "restored" on the drawings when there is definite proof of the historical condition.

In the case of a sugar factory, Estate Reef Bay, St. John, Virgin Islands, portions of the structure had been stabilized to a degree which amounted to a partial restoration. When measured drawings were made, it was readily possible to distinguish between undisturbed and stabilized work, which were clearly differentiated on the drawing sheets.

Still another kind of situation was encountered when measuring the aqueducts of the Chesapeake and Ohio Canal, which over the years had suffered a variety of deformations. To measure and draw these aqueducts exactly as they are would take an inordinate effort. Since the original form can readily be determined accurately, they are being drawn (1961) in a restored state.

It is mandatory, in all cases involving restoration on measured drawings, to explain exactly what has been done, with

annotations, as well as the kind of lines used in drafting.

q. Illustrations of Measured Drawings.

A great deal of recording theory is demonstrated by the drawings reproduced on the following pages. Much that might have been said above--precept--has been omitted in favor of presentation by example. The comments given opposite each sheet of drawings indicate some of the points it demonstrates, but only careful perusal will reveal all of them.

THE OLD SHIP CHURCH

(FIRST PARISH MEETING HOUSE)

88 MAIN STREET, HINGHAM, MASSACHUSETTS

HISTORIC AMERICAN BUILDINGS SURVEY U. S. DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE BRANCH OF PLANS AND DESIGN	MEASURED: DRAWN: EDGAR T. P. WALKER MEASUREMENTS CHECKED:	DRAWINGS APPROVED: , District Officer. DRAWINGS APPROVED: , Chief Architect. ACCEPTED FOR LIBRARY OF CONGRESS:		SURVEY NO. MASS-595 11 SHEETS	INDEX NO.

Illustration of a Title Sheet (Sheet No. 1).

Comments:

Location plan or map. This church is located in a small village, where streets are named but buildings are not numbered. A sizable part of the village is shown, with all buildings indicated. These may change some with time, but many are maintained as museums; the most enduring landmarks are noted -- academy, town hall, memorial hall, and cemetery.

Historic statement. This indicates date of erection and the function of the building, as well as its architectural character. Local historians have searched for the name of the architect but have so far been unable to discover it.

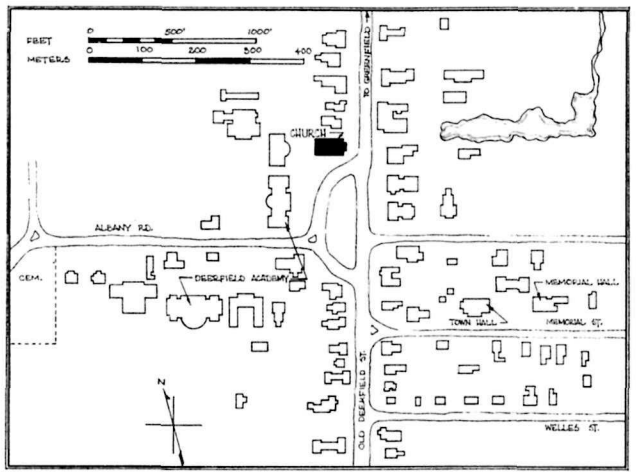
Credit lines. This was measured and drawn by sutdent assistant architects during a summer program directed by the Historic Structures Section of the Park Service. Names and universities of the measuring team and project supervisor are given, with the name of the general program supervisor. The delineator of this sheet is named. The "MISSION 66" program is noted.

Coverage of the whole set. Nine sheets included the Title Sheet (illustrated), two sheets of floor plans, four sheets of elevations, two sheets of general sections. Some full size moulding profiles were included on the sheets with general drawings. The building is approximately 55 ft. x 70 ft. in plan, with a tower 112 ft. high. Plans, sections and elevations were drawn at 1/8" scale.

Criticism. The name of the structure is lettered too compactly, in the bottom box.

THE FIRST CHURCH OF DEERFIELD

DEERFIELD, MASSACHUSETTS



MAP OF CENTRAL PART OF DEERFIELD VILLAGE SHOWING THE CHURCH IN RELATION TO OTHER BUILDINGS
FROM A MAP BY EDWARD AND MARCIA NORMAN. APPROX. SCALE 1"=500'-0"

THE OLD BRICK MEETING-HOUSE, FIFTH IN THE SERIES OF DEERFIELD MEETING-HOUSES, WAS ERECTED IN 1824, AND REMAINS SUBSTANTIALLY UNALTERED. THE INTERIOR IS FINELY PROPORTIONED AND CROWNED BY A LOW DOME. THE TOWER FORMS A LANDMARK IN THE VILLAGE AND THE VALLEY. THIS CHURCH IS NOW OCCUPIED BY A UNITED CONGREGATION OF UNITARIANS AND CONGREGATIONALISTS.

RECORDED BY THE UNITED STATES NATIONAL PARK SERVICE

THIS PROJECT WAS FINANCED FROM FUNDS OF THE "MISSION 66" PROGRAM OF THE NATIONAL PARK SERVICE —— MEASURED AND DRAWN JUNE, 1959, UNDER THE DIRECTION OF CHARLES E. PETERSON, SUPERVISING ARCHITECT, HISTORIC STRUCTURES AND HARLEY J. McKEE, (SYRACUSE UNIV.) PROJECT SUPERVISOR, BY STUDENT ASSISTANT ARCHITECTS RUSSELL V. KEUNE (UNIV. OF ILLINOIS), STEPHEN J. LEBOWITZ (UNIV. OF PENNSYLVANIA), AND GEORGE L. WRENN III (HARVARD), AT THE DEERFIELD, MASSACHUSETTS, FIELD OFFICE.

R.V. KEUNE, DEL. 1959

U.S. DEPARTMENT OF THE INTERIOR OFFICE OF NATIONAL PARKS, BUILDINGS, AND RESERVATIONS BRANCH OF PLANS AND DESIGN	NAME OF STRUCTURE THE FIRST CHURCH OF DEERFIELD DEERFIELD, MASSACHUSETTS	SURVEY NO. MASS-639	HISTORIC AMERICAN BUILDINGS SURVEY SHEET 1 OF 9 SHEETS	INDEX NO.

Illustration of a sheet of floor plans.

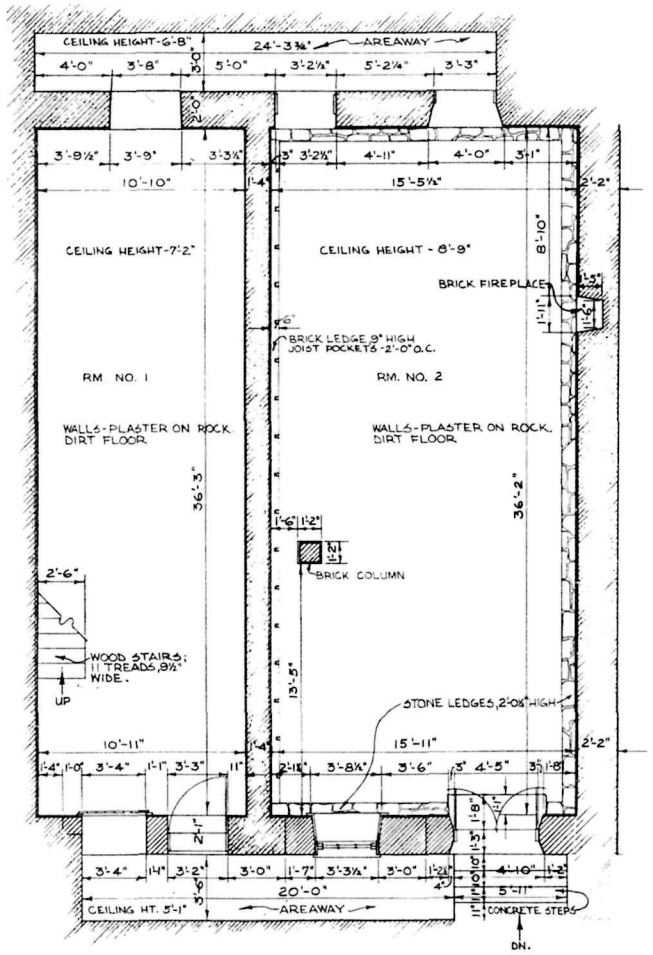
General. This building, relatively undistinguished in itself, forms part of a group in Harper's Ferry National Monument, and belongs to the U. S. Government. Measured and drawn during the summer of 1959 by student assistant architects under general supervision of the Resident Architect. A recording primarily for Park Service purposes, made on HABS sheets.

Floor plans. Two are given on the sheet, at 1/4" to 1 ft., which is usually the most desirable scale. The two plans are aligned horizontally. A plaster line is indicated on the drawings.

Dimensioning. Dimensions are given quite completely, as they would be on a set of architect's contract drawings. In this case, dimension lines run to the finished faces of both exterior masonry walls and interior frame partitions. Doorways in partitions are dimensioned to finished openings; exterior doors and windows are dimensioned both to masonry and finished opening sizes. Figures mostly in even inches, occasionally to nearest 1/4".

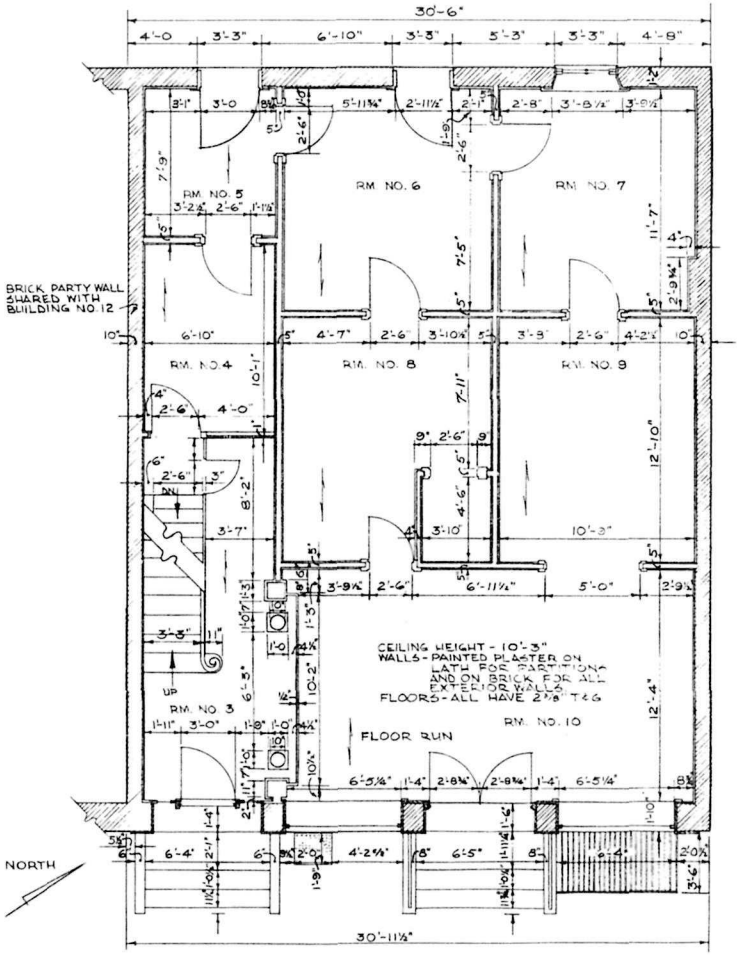
Building materials. These are indicated by plan symbols and by notations. Direction of floor boards is indicated.

Coverage of the whole set. Seven sheets were drawn; if it is decided later to restore the building undoubtedly more will be added. Title sheet, sheet with two plans, sheet with two more plans, sheet with one plan and details, sheet with roof plan and details, sheet with two elevations (other sides are party walls), sheet with stairway details.



BASEMENT FLOOR PLAN

SCALE - 1/4" = 1'-0"



FIRST FLOOR PLAN

SCALE - 1/4" = 1'-0"

C.H. LAVERS JR.
R.C. MEHRING
J.E. REPLOGLE 1959

HARPERS FERRY NATIONAL MONUMENT UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN	NAME OF STRUCTURE WILLIAM ANDERSON BUILDING HARPERS FERRY — JEFFERSON COUNTY — WEST VIRGINIA	SURVEY NO.	HISTORIC AMERICAN BUILDINGS SURVEY SHEET 2 OF 7 SHEETS	LIBRARY OF CONGRESS PRINTS AND PHOTOGRAPHS

Illustration of a sheet with one floor plan.

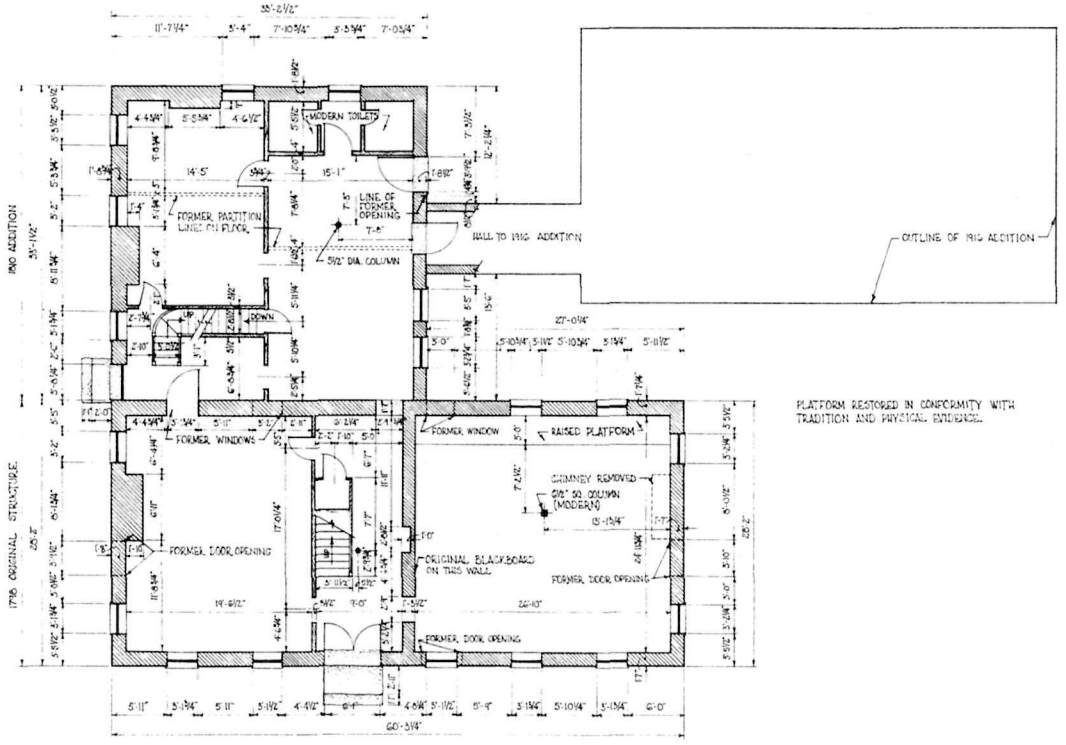
General. This building is of interest primarily for its uses, both being impressed on its character during a long time. The name recognizes both. Significant additions were made at three distinct periods. Drawings emphasize the building's history. They were made by a student assistant architect during the summer of 1959.

First floor plan. This is drawn at 1/8" scale because of its size, and the indication is made quite simple. The original portion, and the 1810 addition, are clearly labeled. The 1916 addition is not of historic interest and is given in simple outline. Evidence of other alterations is noted on the drawings.

Dimensions. These are given rather fully, in spite of the small scale of the drawing.

Notations. These deal with the status of features, rather than with building materials, in order to explain the chief points of interest -- what is original, what has been altered.

Coverage of the whole set. Four sheets:-title sheet, first floor plan, partial second-partial third floor plan, front elevation. Two details of interest were shown incidentally. On the elevation sheet, emphasis was also given to recording the original portion, the 1810 addition, and the 1879 cornice and roof, as well as other evidence of alterations.



FIRST FLOOR PLAN

SCALE: 1/8" = 1'-0".

R.V. KEUNE, DEL. 1959

U.S. DEPARTMENT OF THE INTERIOR OFFICE OF NATIONAL PARKS, BUILDINGS, AND RESERVATIONS BRANCH OF PLANS AND DESIGN	NAME OF STRUCTURE MEMORIAL HALL-OLD DEERFIELD ACADEMY DEERFIELD, MASSACHUSETTS	SURVEY NO. MASS-646	HISTORIC AMERICAN BUILDINGS SURVEY SHEET 2 OF 4 SHEETS	INDEX NO.

Illustration of a sheet with part of a floor plan.

General. A mid-18th century fort owned by the Insular Government of the Virgin Islands. This is a highly interesting structure of many levels and non-rectangular shapes, with alterations of various periods. Drawings were made by Park Service architects and student assistant architects, in 1957 and 1959.

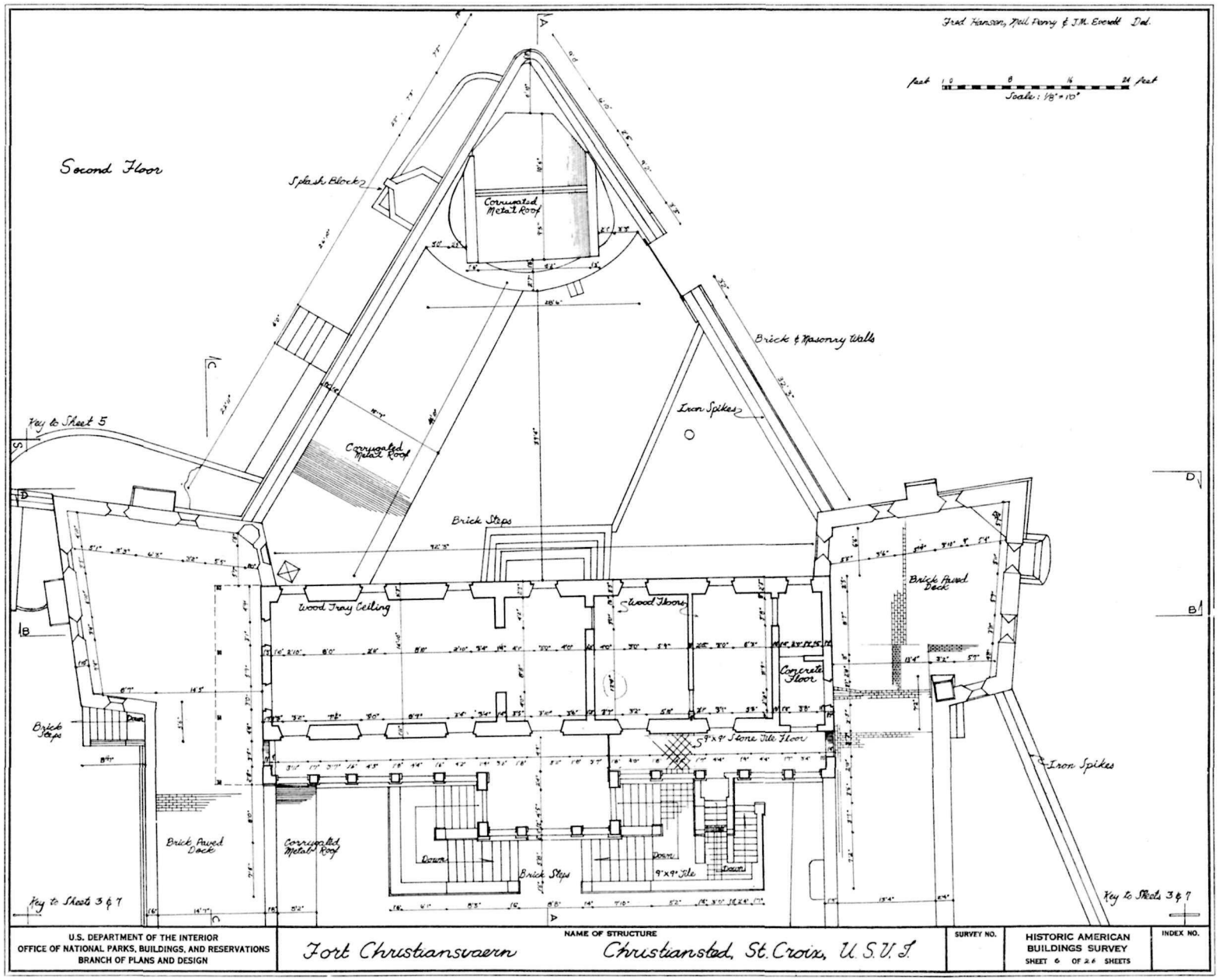
Partial floor plan. This is drawn at 1/8" scale, which is a minimum for indicating the characteristics of such a structure. It was necessary, therefore, to extend the whole plan over more than one sheet; key points show the continuity. For this reason the drawing extends to the margins. Outlines of main building are accented.

Dimensioning. Numerous dimensions are given, but not all points are fixed on this sheet; other sheets cover these dimensions. Figures are taken to the nearest inch.

Notations. Only a few simple notes on building materials are included, since primary emphasis of this sheet is on the form of the plan. Lines for the general section drawings are indicated and labeled.

Coverage of the whole set. 26 sheets:-title page, key plan at 1/16" scale, 5 sheets of partial plans at 1/8" scale, elevations at 1/16" scale, 4 sheets of general sections and elevations at 1/8" scale, key plans for openings and details, 13 sheets of details.

Criticism. Lettering is poor; dimension figures do not show up well.



U.S. DEPARTMENT OF THE INTERIOR OFFICE OF NATIONAL PARKS, BUILDINGS, AND RESERVATIONS BRANCH OF PLANS AND DESIGN	NAME OF STRUCTURE Fort Christiansvaern Christiansted, St. Croix, U.S.V.I.	SURVEY NO.	HISTORIC AMERICAN BUILDINGS SURVEY SHEET 6 OF 24 SHEETS	INDEX NO.

Illustration of a sheet with several elevations.

General. This house was measured and drawn in 1940; fifteen years later it was restored by the Park Service.

Elevations. These drawings indicate the deteriorated state of the building materials, and the irregularities of the structure. Varied weights of line help achieve a semi-rendered effect. The scale is small -- 1/8" to 1 ft.

Other drawings. The general construction and height dimensions are shown on the section. Some structural details, and notes on building materials, are also shown.

Lettering was done mechanically.

Sheet composition. A good margin of white paper is left around each drawing; despite the number of them, the sheet does not appear crowded. Drawings could have been shifted somewhat toward the right, however.

Coverage of the whole set. Four sheets:-First floor plan at 1/4" scale, elevations and section at 1/8" scale, and two sheets of details -- doors, windows, mantel, and full-size moulding profiles. (A title sheet would have been desirable, in addition).

FINISH SCHEDULE

FLOORS: WOOD, ALL ROOMS, 4½" TO 7" VARYING WIDTH.
WALLS: BEADED FLUSH BOARDS, 6½" TO 8", EXCEPT N.E. AND S.E. WALLS ROOM 5 (FIG. 1) AND N.W. WALL ROOM 4 (FIG. 2). WOOD PANELLED WAINSCOT, 3'-0" HIGH, IN ROOM 7. ALL WALLS PARTLY OR WHOLLY PAPERED.

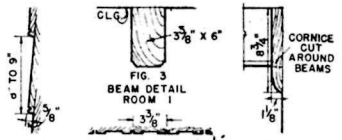
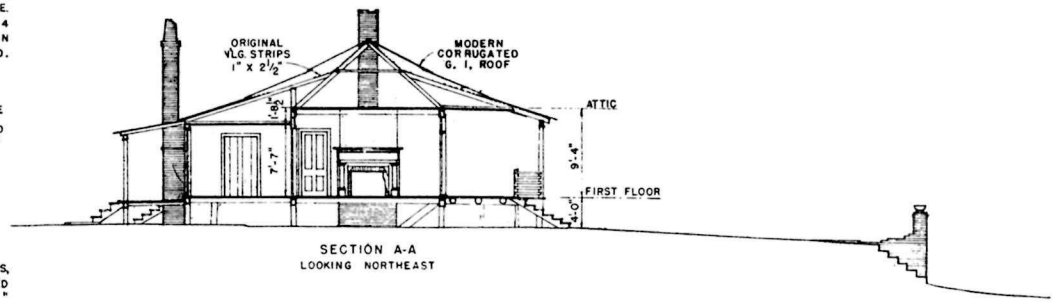


FIG. 1 SHIPLAP N.E. WALL RM. 5 — FIG. 2 VERTICAL SIDING N.W. WALL ROOM 4 — FIG. 3 BEAM DETAIL ROOM 1 — FIG. 4 CORNICE ROOM 1

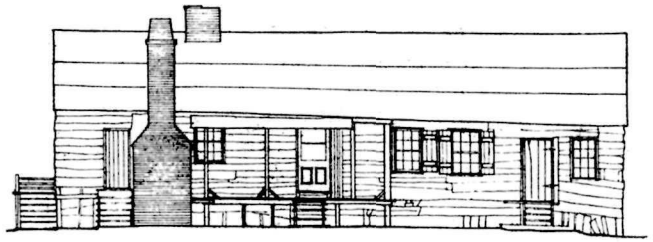
CEILINGS: WOOD, VARYING 4¼" TO 8¼" FLUSH BOARDS, BEADED BOARDS IN ROOMS 1, 3, 4, AND 6. CLG. PAINTED IN ROOMS 1, 2, 3, AND 4. EXPOSED BEAMS 2'-3½" ON CENTER IN ROOM 1 (FIG. 3). INT. WOOD CORNICE IN ROOM 1 (FIG. 4). CEILING HEIGHTS: 9'-3" IN ROOMS 1 AND 2, 7'-6" IN ROOMS 3, 4, 5, 6, 8'-8" IN ROOM 7. WOOD BASE IN ALL ROOMS.



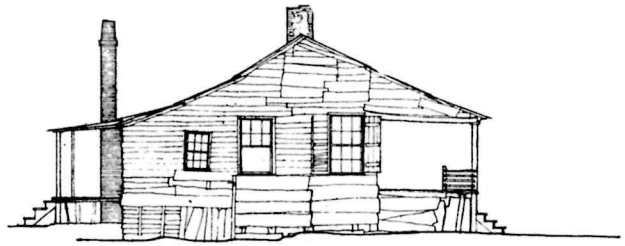
SECTION A-A
LOOKING NORTHEAST

SECTION AND ELEVATIONS

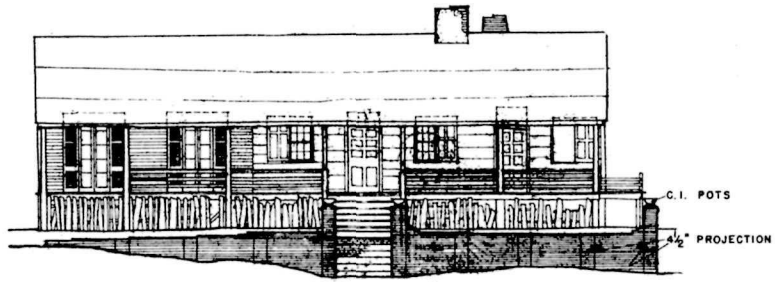
SCALE ⅛" = 1'-0"



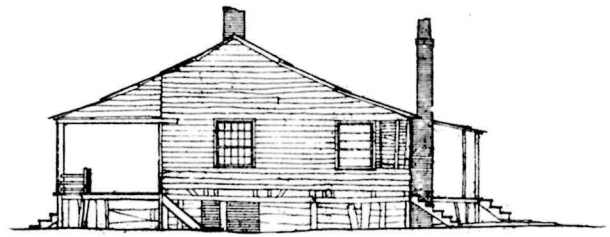
REAR (NORTHWEST) ELEVATION



SOUTHWEST ELEVATION



FRONT (SOUTHEAST) ELEVATION



NORTHEAST ELEVATION

SCALES
⅛" = 1'-0"
METRIC

DRAWN BY
ADOLPH H FELDER

1940 PUBLIC WORKS ADMINISTRATION PROGRAM
FEDERAL PROJECT 498-A
UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

NAME OF STRUCTURE: MOUND PLANTATION HOUSE
OLD NATCHEZ TRACE, CANNONSBURG VIC
JEFFERSON COUNTY, MISSISSIPPI

SURVEY NO. MISS-159

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 2 OF 4 SHEETS

Illustration of a sheet with a front elevation.

General. The Custom House and Public Stores is owned by the U. S. Government and is considered highly important, both on its own merits and as part of the group comprising the Salem Maritime National Historic Site.

Special care and attention were lavished on these drawings, which were made by student assistant architects during the summer of 1958.

South elevation (front). This drawing, at 3/16" scale, was made to show the facade accurately in all its details, with an emphasis on pictorial quality. Such a building, drawn in such a way, is highly attractive to historians and authors, and can be expected to be in demand for illustrating books.

Dimensions do not appear on this sheet, but can be obtained from other sheets in the set. Approximate sizes can be scaled from this drawing if desired.

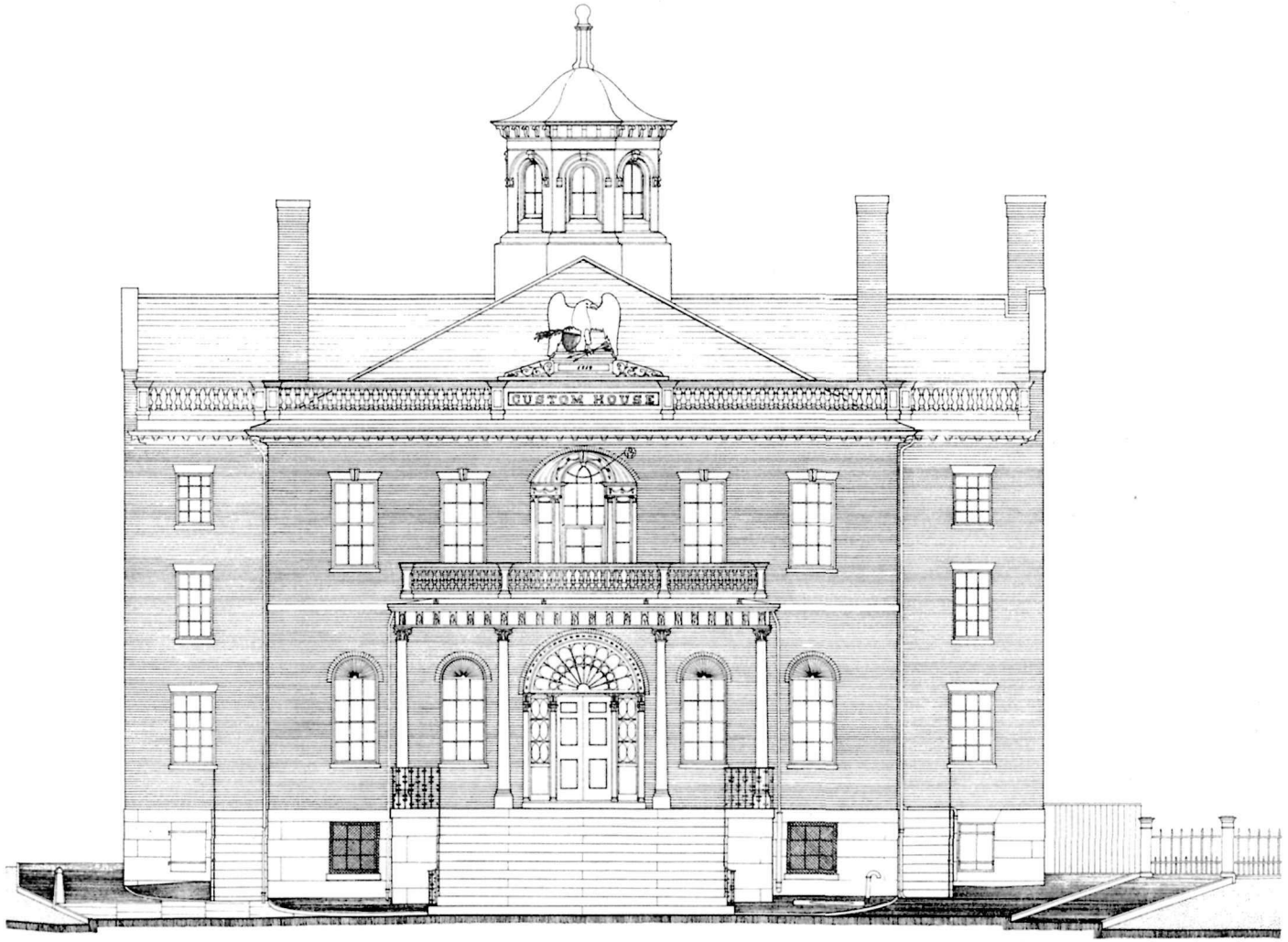
Notations are kept to a minimum.

Materials are drawn carefully, across the whole area, but only one inconspicuous note appears.

Weights of line. Heavier silhouettes make front portions appear to advance; on receding portions the lines indicating materials are also lighter. Openings are subtly accented with heavier outlines.

Lettering was done mechanically, to maintain the effect of precision.

Coverage of the whole set. 17 sheets. (See description facing page 85).



SOUTH ELEVATION

LARRY D. NICHOLS, DEL.

eagle carved by Joseph True – presented in 1826

window sills & lintels on front are marble

0 1 2 3 4 5 6 SCALE IN METERS

0 1 2 3 4 5 10 15 20 SCALE IN FEET

SUMMER STUDENT TEAM
FOR E.O.D.C., PHILADELPHIA
UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

NAME OF STRUCTURE
CUSTOM HOUSE AND PUBLIC STORES
178 DERBY STREET SALEM, MASSACHUSETTS

SURVEY NO.

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 5 OF 17 SHEETS

LIBRARY OF CONGRESS INDEX NUMBER

Illustration of a sheet with two elevations.

General. A simple mid-19th century building, measured and drawn in 1940.

Elevations. The variety and character of building materials on the two facades is admirably indicated in line. This extends across the whole area, and in addition to technical informativeness a very pleasing pictorial effect is achieved.

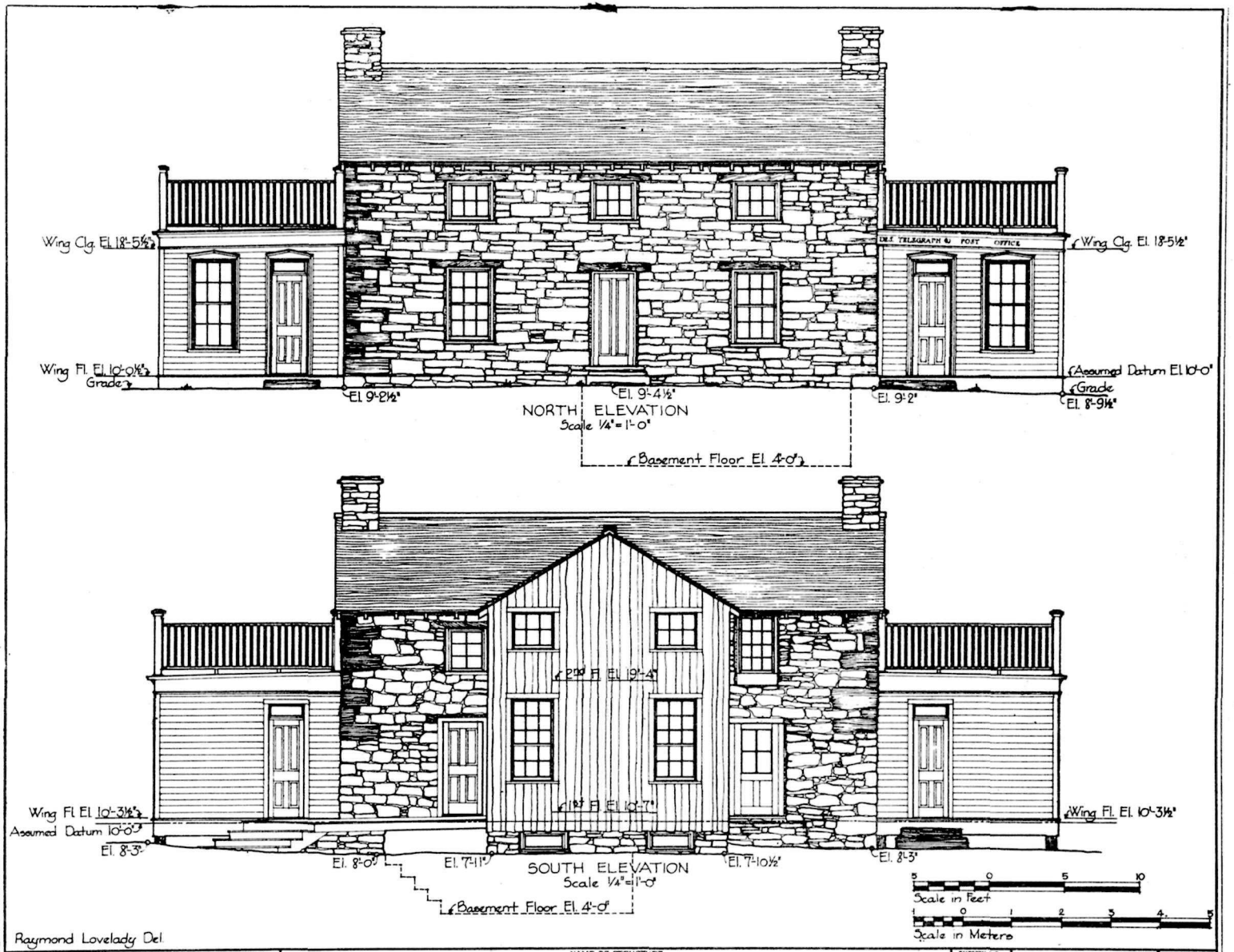
Floor and grade levels are given unobtrusively, by reference to a datum level.

Weights of line. Openings and silhouettes are accented with heavier lines.

Lettering. Notations are clear and well formed. Roman lettering in the "name of structure" box may be somewhat pretentious, but is done impeccably. The lettering in general reveals a quality that can only be attained by a highly competent draftsman, doing it freehand.

Sheet composition. Slightly crowded vertically, but the areas of white paper over the one-story portions at each end are large enough to save the over-all effect.

Coverage of the whole set. Seven sheets.



1940 PUBLIC WORKS ADMINISTRATION, PROGRAM.
FEDERAL PROJECT 493-A
RECORDED JUNE 24 1940
UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

NAME OF STRUCTURE

DESERET TELEGRAPH & POST OFFICE BUILDING

ROCKVILLE WASHINGTON COUNTY UTAH

SURVEY NO. U-4

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 3 OF 7 SHEETS

Illustration of a sheet with four elevations.

General. A simple two-room cabin, in a National Park, measured in 1941 and drawn in 1947 for Park Service purposes, on HABS sheets.

Elevations. Drawn in line, but suggestive of a rendered effect. Shingles and stones are indicated freely and spontaneously to give the character of the building materials. Heavy silhouettes and free variation of line contribute to the rendered quality. Scale: 1/4" to 1 ft.

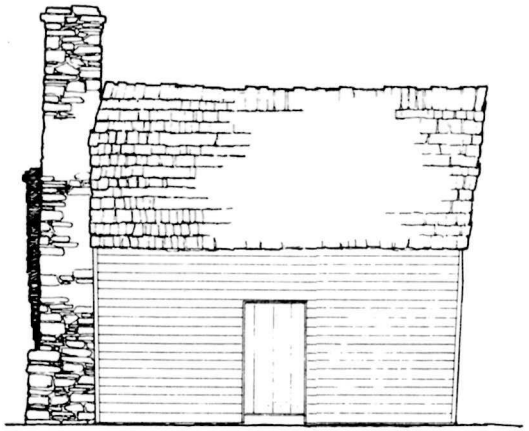
Dimensions are not placed on this sheet, but are covered elsewhere in the set.

Notations on building materials are placed at one side, visible but "out of the picture."

Sheet composition. There is enough room for all elevation drawings, arranged simply in two rows.

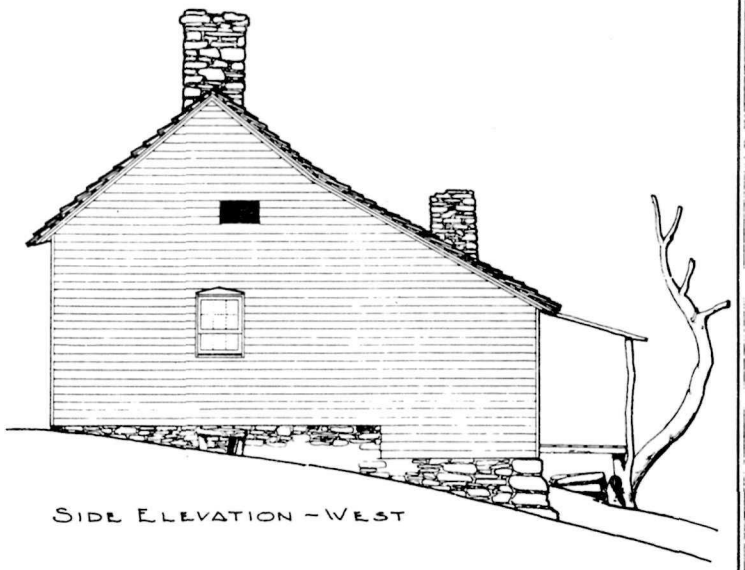
Glass areas are blacked in, except for the (altered) west window.

Coverage of the whole set. Three sheets:- 1)plan, two general sections, details; 2) four elevations; 3) two accessory structures. (Note: a title sheet would have been desirable).

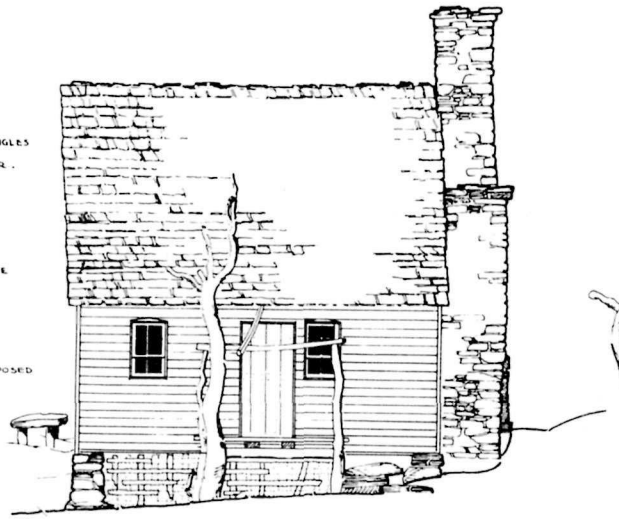


FIELD STONE LAID IN CLAY MORTAR.

FRONT ELEVATION - NORTH



SIDE ELEVATION - WEST



HAND RIVED BOARD SHINGLES 24" LONG - 9" TO WEATHER.

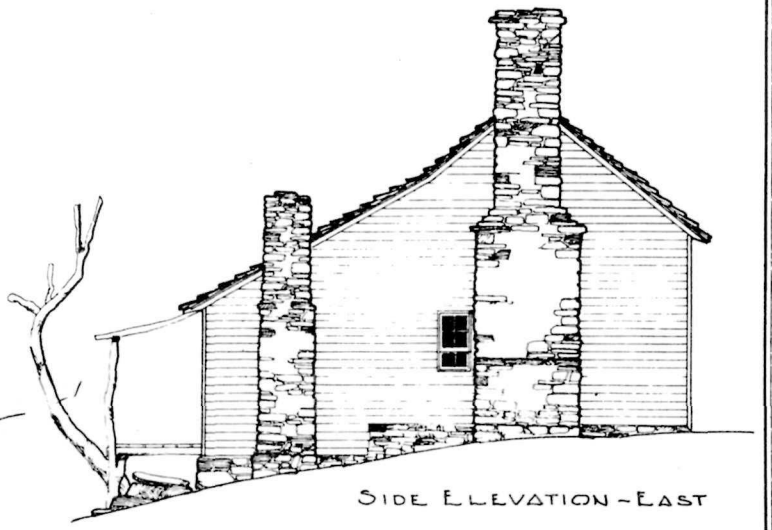
DOVETAILED LOG FRAME WITHOUT CHINKING.

½" POPLAR SIDING EXPOSED 5" TO WEATHER.

STAND FOR BEE-GUM

LATTICE REMNANT 1" x 3" RIVED BOARDS

REAR ELEVATION - SOUTH



SIDE ELEVATION - EAST

K.C. McCARTER, DRL.

U.S. DEPARTMENT OF THE INTERIOR OFFICE OF NATIONAL PARKS, BUILDINGS, AND RESERVATIONS BRANCH OF PLANS AND DESIGN	NAME OF STRUCTURE BRINEGAR CABIN BLUE RIDGE PARKWAY - WILKES COUNTY - NORTH CAROLINA	SURVEY NO. NC-188	HISTORIC AMERICAN BUILDINGS SURVEY SHEET 2 OF 3 SHEETS	INDEX NO.

Illustration of an intermediate scale elevation.

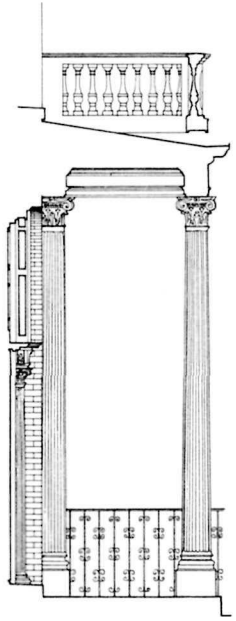
General. This is another part of the set illustrated on page 79, showing the portico, one of the main features of the building, by itself at a larger scale, 3/8".

Drafting. The comments given previously, referring to the elevation drawing on page 79, apply equally to this sheet. In the present case, however, the larger scale permits all elements to be drawn in greater detail (column fluting, pilaster capitals, vertical brick joints, etc.).

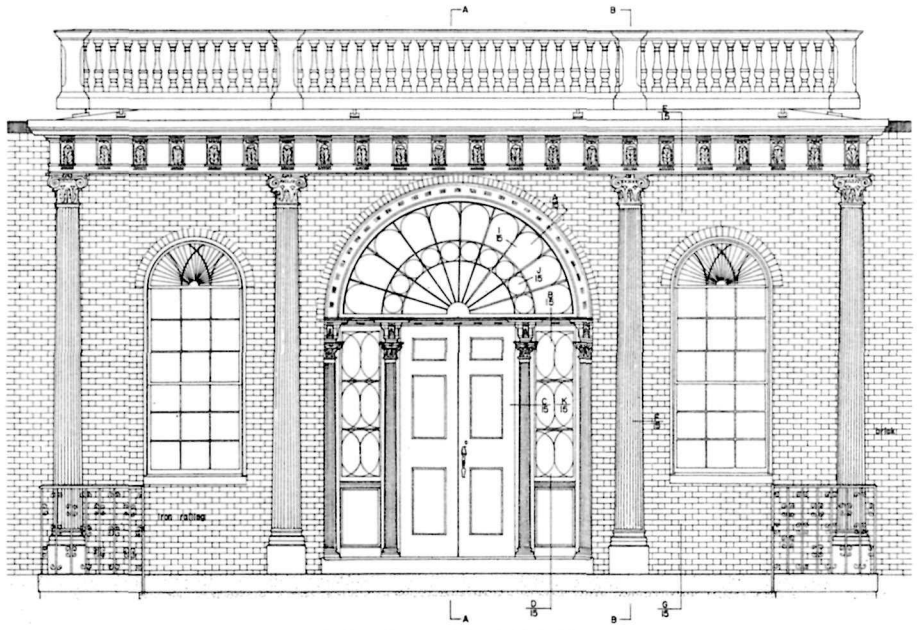
Sheet composition. This is formal and symmetrical, with plan and sections framing the elevation. Attractive pictorial character. The second sectional drawing is not necessary, except for symmetry; it is justified by the special importance of the building and is consistent with the extra attention given to the whole set.

Symbols. These refer to parts detailed at a larger scale on other sheets.

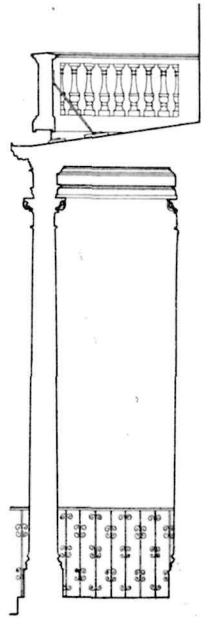
Coverage of the whole set. 17 sheets:-title sheet, basement plan, first floor plan, second floor plan, four sheets of elevations, two sheets of general sections, first floor framing plan, roof framing plan, structural details, portico, and three sheets of decorative details.



SECTION A-A

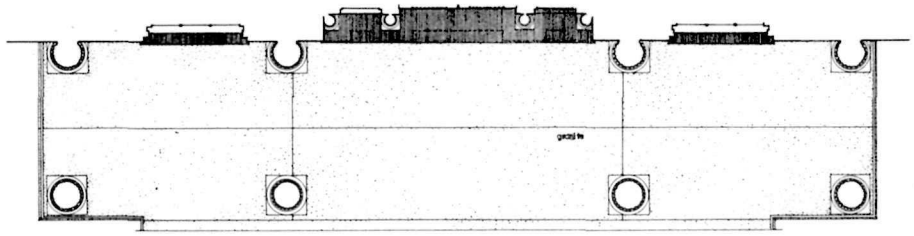


ELEVATION OF PORTICO

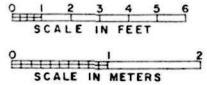


SECTION B-B

Balustrade, portico, and portal are constructed of wood.



PLAN



LARRY D. NICHOLS, DEL.

SUMMER STUDENT TEAM
FOR E.O.D.C., PHILADELPHIA
UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

NAME OF STRUCTURE
CUSTOM HOUSE AND PUBLIC STORES
178 DERBY STREET SALEM, MASSACHUSETTS

SURVEY NO.

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 14 OF 17 SHEETS

Illustration of a sheet with a general section.

General. This is an early 19th century building, an interesting and picturesque survival of early waterfront structures. It was measured and drawn in 1958 by student assistant architects.

Section. This is largely to show the construction of the building, but serves equally well in presenting the stairway and roof forms. 1/4" scale.

All of the construction which could be seen is included; the interior of the masonry walls is shown blank because it could not be seen. Brick and rubble stone walls at the end are indicated.

Dimensions. Most significant heights are given.

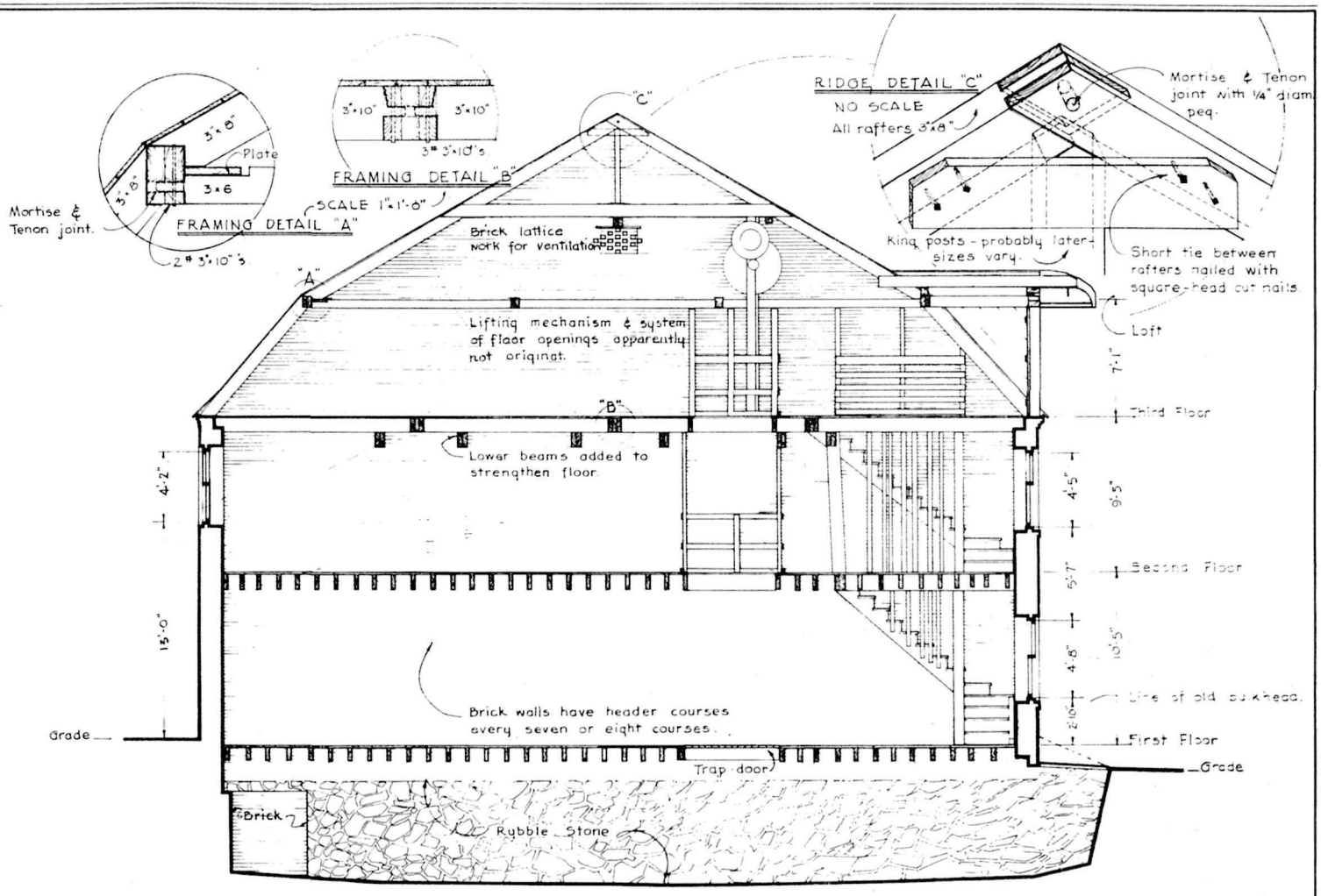
Notations. These point out building materials, explain details, and distinguish later additions from original work.

Details. These serve to explain several framing joints. Isometric projection is used for the ridge detail.

Sheet composition. The general section is centered on the sheet. Details are slightly crowded into upper corners.

Coverage of the whole set. Eight sheets:-title sheet, two sheets of floor plans, two sheets of elevations (one side is a party wall and does not show), general section, transverse section and details, dormer details (an unusual type).

Criticism. Weight of line on the cut portions is somewhat heavier than that recommended.



SECTION – "A-A"

JAMES GLEN CARR, DEL.

UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

NAME OF STRUCTURE
LATOUR WAREHOUSE 508 S WATER ST. *Philadelphia, Pa*

SURVEY NO.

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 6 OF 8 SHEETS

Illustration of a sheet with two general sections.

General. This is from the same set as the plan drawing illustrated on page 75.

Sections. Such drawings are the only feasible way of showing the numerous levels and ceiling heights in this structure. At the same time the character of many interior rooms appears incidentally, although the small scale of the drawings, 1/8", is much less than would be used in drawing room elevations for their own sake.

Low-pitched roofs, terraces and parapets appear; they could hardly be drawn on any other kind of a view.

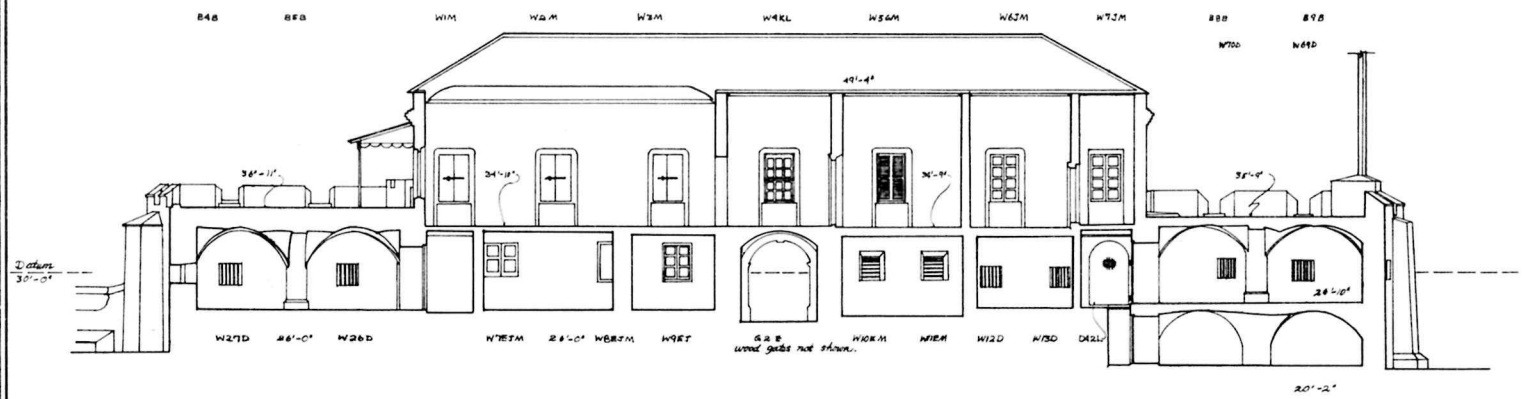
Dimensions. Heights are given effectively by figures which refer to a datum level.

Notations. Notes call attention to the omission of some features not considered significant. Code symbols refer to doors and windows, many of which are detailed on other sheets of the set.

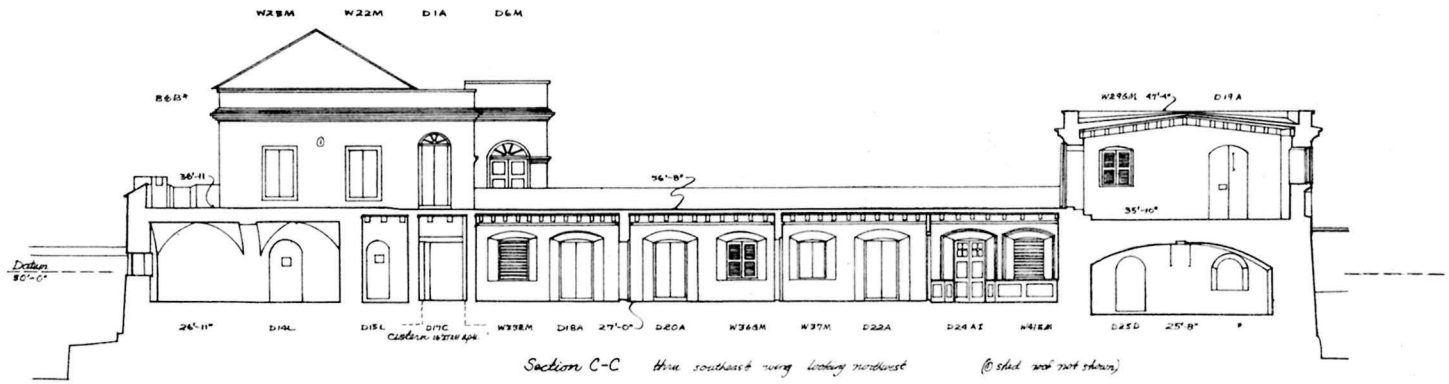
Sheet composition. The two drawings take up the sheet, although there is ample white space around them.

Coverage of the whole set. 26 sheets; their allocation has been described in connection with page 75.

Criticism. Lettering is poor; the drafting is only fair. The lower section drawing is rather close to the bottom; there would be plenty of room to raise it an inch or so. The scale of the drawing is not noted.



Section B-B thru southwest wing looking southwest



Section C-C thru southeast wing looking northwest (@ shed not shown)

J.M. Everett Del.

U.S. DEPARTMENT OF THE INTERIOR OFFICE OF NATIONAL PARKS, BUILDINGS, AND RESERVATIONS BRANCH OF PLANS AND DESIGN	NAME OF STRUCTURE Fort Christiansvaern — Christiansted, St. Croix, U.S.V.I.	SURVEY NO.	HISTORIC AMERICAN BUILDINGS SURVEY SHEET 10 OF 44 SHEETS	INDEX NO.

Illustration of a special drawing.

General. This refers to the same structure illustrated on page 77 . It was made in 1955 by a Park Service architect, for restoration purposes. It incorporates information obtained by dismantling the structure, and thus is a special, technically exact document.--one sheet of such a series.

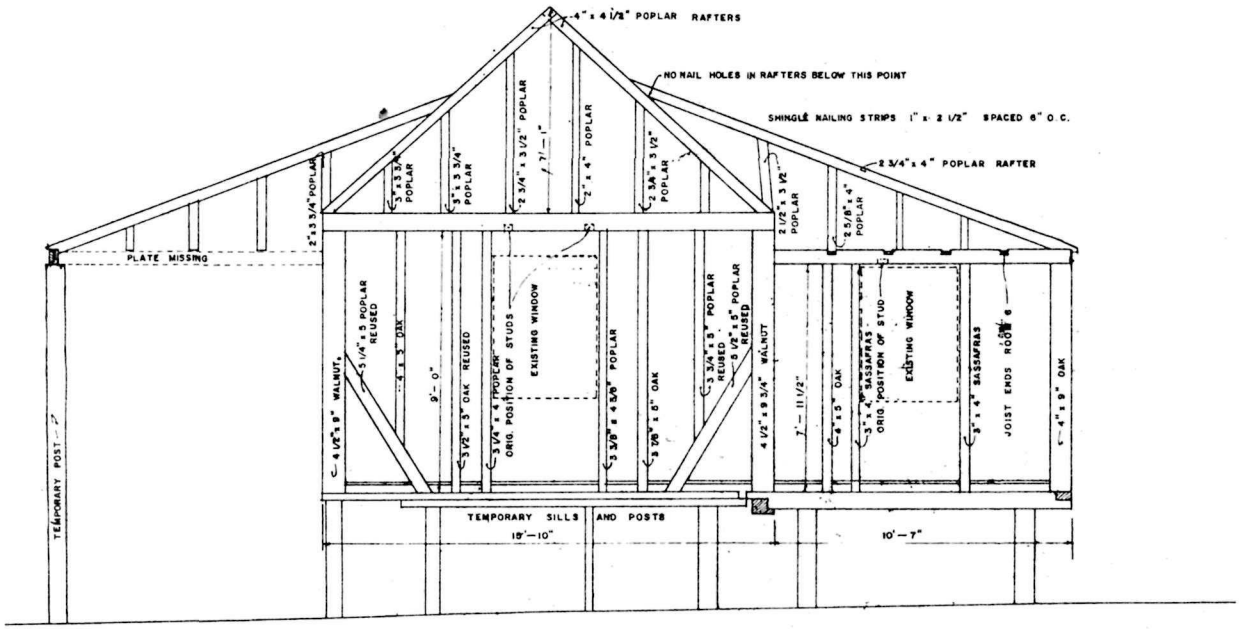
Framing elevation. This shows framing members only, together with evidence of missing parts. Dimensions are few, but establish the essential distances. Scale, 3/8" to 1 ft.

Notations. The size of each timber and the kind of wood are given. Temporary and re-used parts are also pointed out.

Lettering. This was done mechanically.

Sheet composition. One drawing, with plenty of white paper around it. For clarity, no other drawings are shown on the same sheet. The objective of this sheet is a limited one, and the composition reflects the fact.

Coverage of the whole set. Four sheets were drawn in 1940 (see comments referring on page 76); nine more were made in 1955 in connection with restoration study. Conjectural evolution of the structure, three sheets of wall framing, plan of ceiling joists, various framing details, details of chimney, and two sheets of various full size details.



FRAMING NORTHEAST ELEVATION

DRAWN BY H. A. JUDD 1958

NOTE: THIS HOUSE IS IDENTICAL WITH "MOUND PLANTATION" MISS.-159 (1940)

EASTERN OFFICE DESIGN AND CONSTRUCTION USNPS UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN	MOUNT LOCUST (MOUND PLANTATION HOUSE)	NAME OF STRUCTURE OLD NATCHEZ TRACE JEFFERSON COUNTY	CANNONSBURG VIC. MISSISSIPPI	SURVEY NO. MISS-159-A	HISTORIC AMERICAN BUILDINGS SURVEY SHEET 4 OF 9 SHEETS

Illustration of a sheet of construction details.

General. This is from the same set as the sheets illustrated on pages 79 and 85. Like them, it represents special care given to a building considered very important.

Details. These are given in a pictorial manner, making use of isometric projection in a number of cases to give the effect of the third dimension. "Exploded" views enable the full shape of each part to be seen clearly.

Shading is used in some places to make the form appear more clearly.

Scale. Because of the general pictorial objective, reference to scale of drawings does not appear. No dimensions are given.

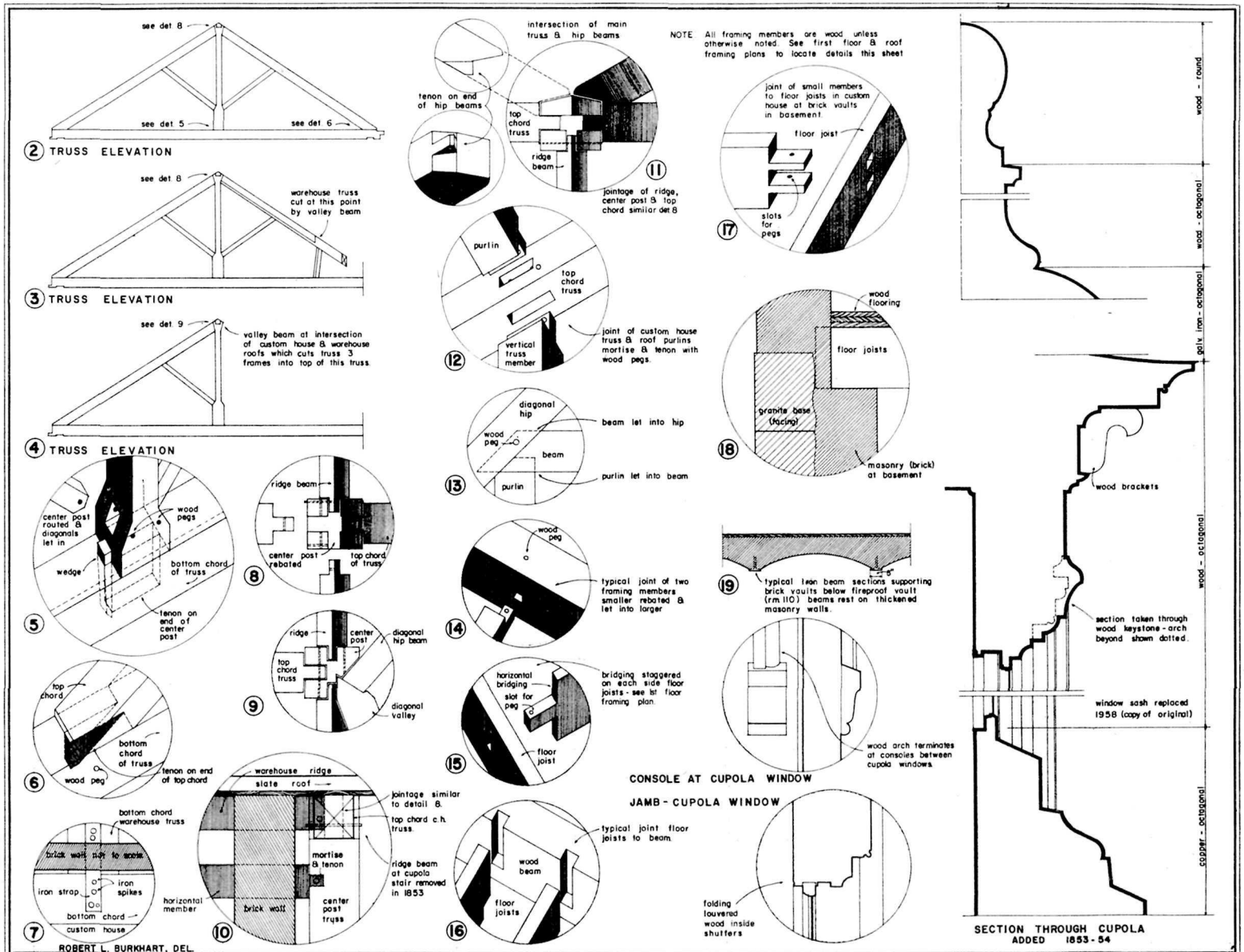
Notations. Notes are given profusely, to help make the details clear.

Explanatory character. The construction shown on this sheet should be understood by the average intelligent layman, yet it is also meaningful to the technical specialist. Devices of this sort reflect the HABS objective of making measured drawings useful to the most people, while maintaining high technical standards. In this case techniques widely used in other fields have been applied to architectural purposes.

Sheet composition. The page is filled--perhaps too much--with a series of details grouped in rows. Each is clearly identified by number.

Lettering. This was done mechanically.

Coverage of the whole set. This was described on page 84.



SUMMER STUDENT TEAM
FOR E.O.D.C., PHILADELPHIA
UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

NAME OF STRUCTURE
CUSTOM HOUSE AND PUBLIC STORES
178 DERBY STREET SALEM, MASSACHUSETTS

SURVEY NO.

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 13 OF 17 SHEETS

Illustration of a sheet of varied drawings.

General. This building contained a second-floor room of great interest, and unique character for the region. The measurements were taken in 1959 just prior to demolition of the structure. Drawings are by student assistant architects.

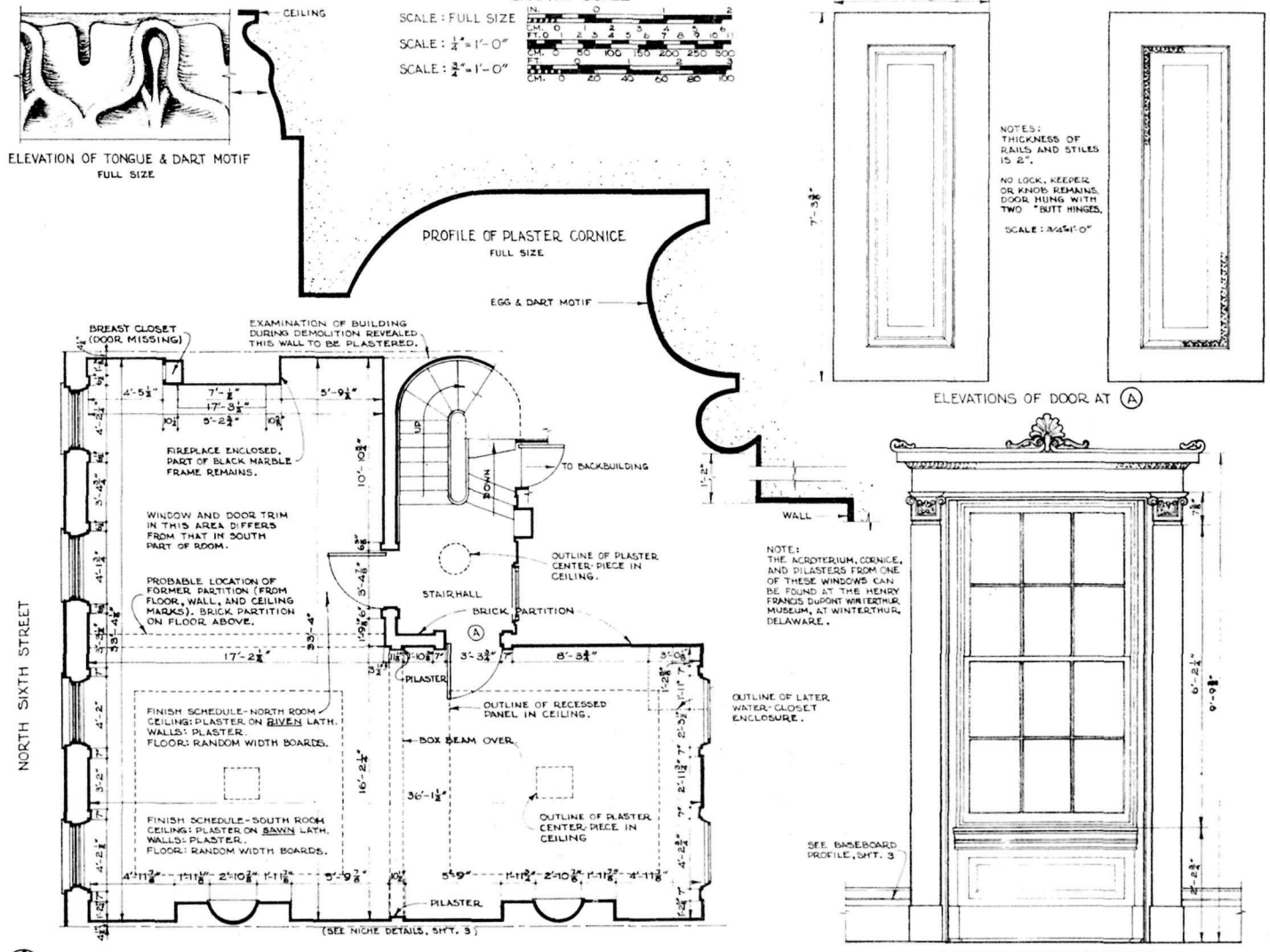
Coverage of the whole set. Three sheets:- 1) title sheet; 2)partial plan at 1/4" scale, two door elevations at 3/4" scale, interior window elevation at 3/4" scale, full size profile of cornice; 3) wall elevation at 1/2" scale, with a partial plan and section, and full size profiles of baseboard and corner detail. This represents a case in which a particularly attractive portion of a building, but not the whole building, is recorded.

Sheet composition. Drawings of varied shape and kind are fitted skillfully onto the sheet. This is not necessarily typical, because such cases vary greatly.

Dimensioning. These are given for the interior only, since it is the subject of the drawings. They are very thorough on plan. Key dimensions only are given on details, since they are large enough so that intermediate sizes can be scaled off with reasonable accuracy.

Notations. These indicate finish materials and evidence of alterations. Notes indicate portions detailed on another sheet.

Weight of line. Considerable variation in line gives a highly expressive quality to the drafting.



EASTERN OFFICE, PHILADELPHIA, PA. UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN	NAME OF STRUCTURE: ROBERT M. LEE HOUSE AND LAW OFFICE — 109-111 NORTH SIXTH ST., PHILADELPHIA, PENNSYLVANIA	SURVEY NO. PA 1052	HISTORIC AMERICAN BUILDINGS SURVEY SHEET 2 OF 3 SHEETS	LIBRARY OF CONGRESS BUILT NUMBER

Illustration of a sheet of room elevations.

General. This room is from a house measured and drawn in 1960 by student assistant architects. It is well proportioned, with refined details; all four walls are interesting.

Room elevations. These are drawn at 3/8" scale, which is considered the smallest satisfactory for such a purpose. This permits mouldings, panels, etc. to be indicated sufficiently to express their character.

Weight of line. Lines are kept thin, to show delicacy of the mouldings, but important outlines are accented.

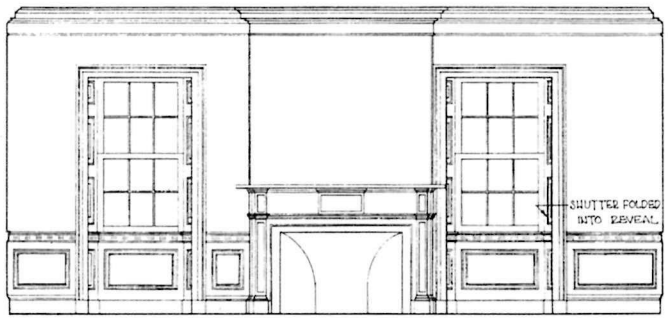
Dimensions. Only the ceiling height is given. Plans in the set give horizontal dimensions.

Notations. These are kept to a minimum.

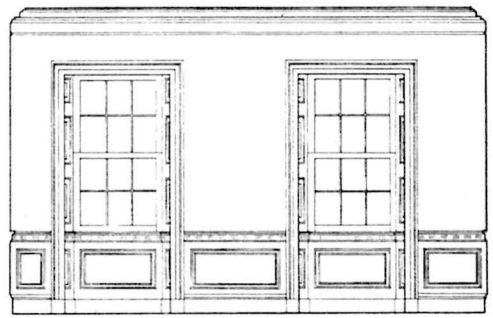
Pictorial character. Reliance on the drawing by itself, with a minimum of dimensions and notations, makes the sheet readily usable for reproduction. Any single wall can be reproduced by itself, since there is a good white area around each.

Sheet composition. This scale permits all four drawings to be placed on a single sheet. They are "lined up" formally, and fill out a simple rectangular area.

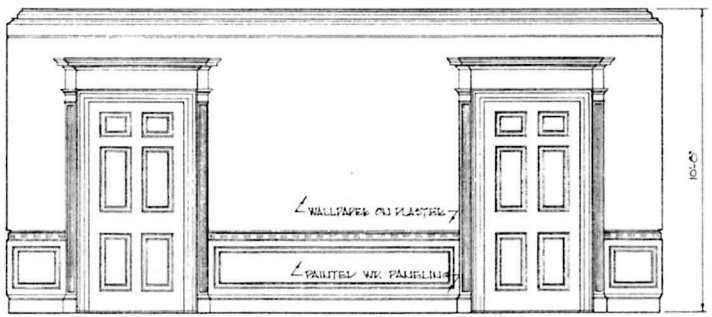
Coverage of the whole set. Seven sheets:-title sheet, two sheets of plans at 1/4" scale, two sheets of elevations at 1/4" scale, room elevations, details.



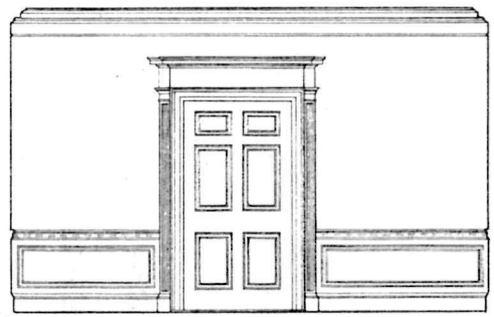
SOUTH WALL
NOTE: MANTEL IS ORIGINAL



EAST WALL



NORTH WALL



WEST WALL

ROOM ELEVATIONS - RM. 3

SCALE: 3/8" = 1'-0"

DEL. R.V. REUSE

ROCKLAND HABS. FIELD OFFICE MID-COAST MAINE SURVEY 1960 UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN	NAME OF STRUCTURE THE "SPITE (McCOBB-DODGE) HOUSE" ROCKPORT VICINITY KNOX COUNTY MAINE	SURVEY NO. ME-75	HISTORIC AMERICAN BUILDINGS SURVEY SHEET 6 OF 7 SHEETS	LIBRARY OF CONGRESS INDEX NUMBER

Illustration of a sheet of large-scale details.

General. This is from a set measured and drawn by student assistant architects in 1960. The house was built in 1853 and has a number of attractive Greek Revival details.

Details. Column and entablature details from the portico are given, along with antae, at 1 1/2" scale. Cut portions are heavily outlined. Partial plans explain the shape of columns and antae, and partial sections give moulding profiles (the undercuttings would not be shown, otherwise).

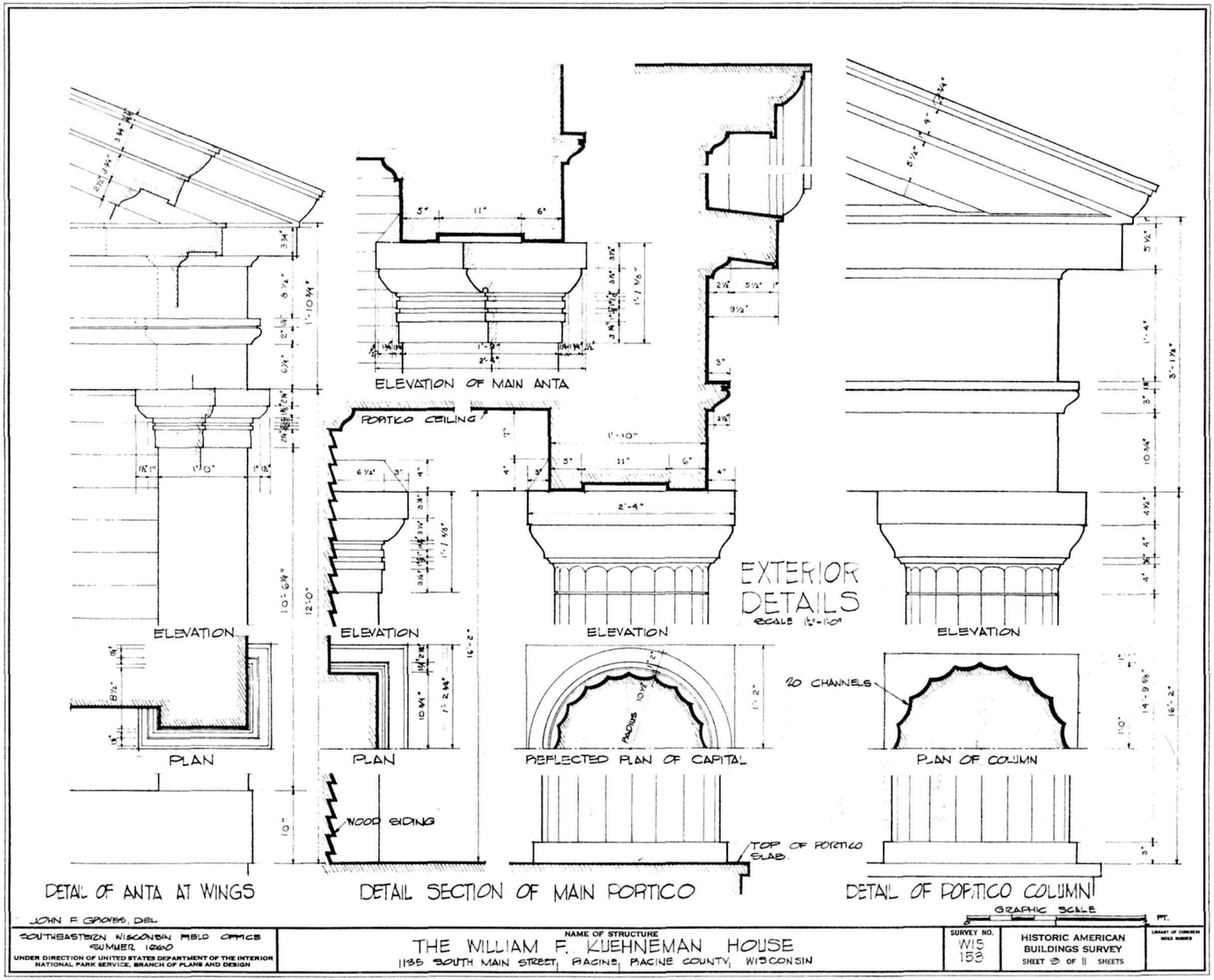
Dimensioning. This is quite complete.

Notations. These are confined to identification.

Character. These details are of interest for their decorative character, and the drawings emphasize this. It would have been of interest to show the jointing and assembly of the wooden parts, but these could not be determined without damaging the building.

Sheet composition. This is full, but not too crowded.

Coverage of the whole set. Eleven sheets:-title sheet, first floor plan at 1/4" scale, second floor plan, four sheets of elevations at 1/4" scale, general section at 1/4" scale, and three sheets of details.



JOHN F. GROVES, DEL.

SOUTHEASTERN WISCONSIN FIELD OFFICE
SUMMER 1960
UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

NAME OF STRUCTURE
THE WILLIAM F. KUEHNEMAN HOUSE
1135 SOUTH MAIN STREET, RACINE, RACINE COUNTY, WISCONSIN

SURVEY NO.
WIS
153

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 9 OF 11 SHEETS

LIBRARY OF CONGRESS
HABS RACINE

Illustration of a single detail at large scale.

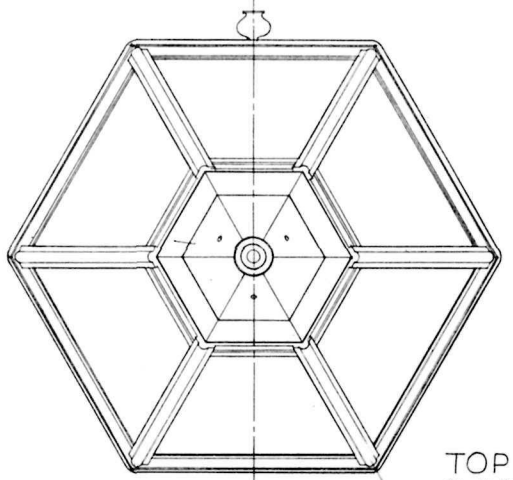
General. This is an important building, forming part of Independence National Park. Measurements and drawings were made by student assistant architects during the summer programs in 1958 and 1960, and some drawings, including this sheet, in 1959. Eventually the building will be restored.

Detail. A top view, bottom view and elevation are given at 3" scale. Only one dimension is given, since at this scale quite accurate measurements can be taken. Furthermore, many of the lines are oblique and do not show in true length. A full size detail is given of an angle.

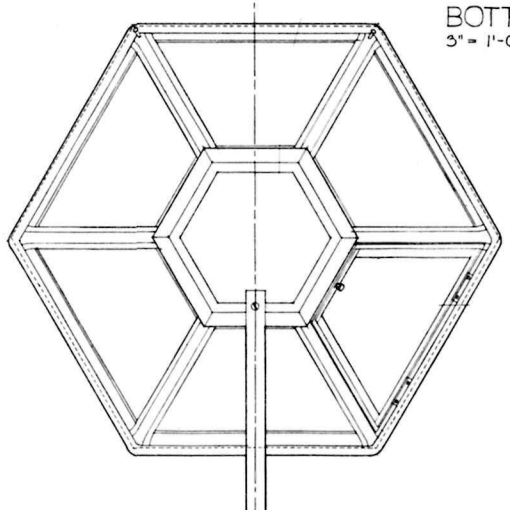
Notations explain the mounting of glass panels and the access door.

Sheet composition. Top and bottom view are lined up vertically, while the elevation occupies the other half of the sheet. There is ample space.

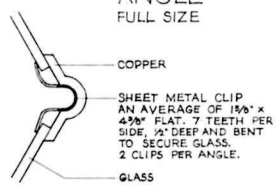
Coverage of the whole set. This will be extensive, but the exact number of sheets is indeterminate at present.



TOP VIEW
3" = 1'-0"

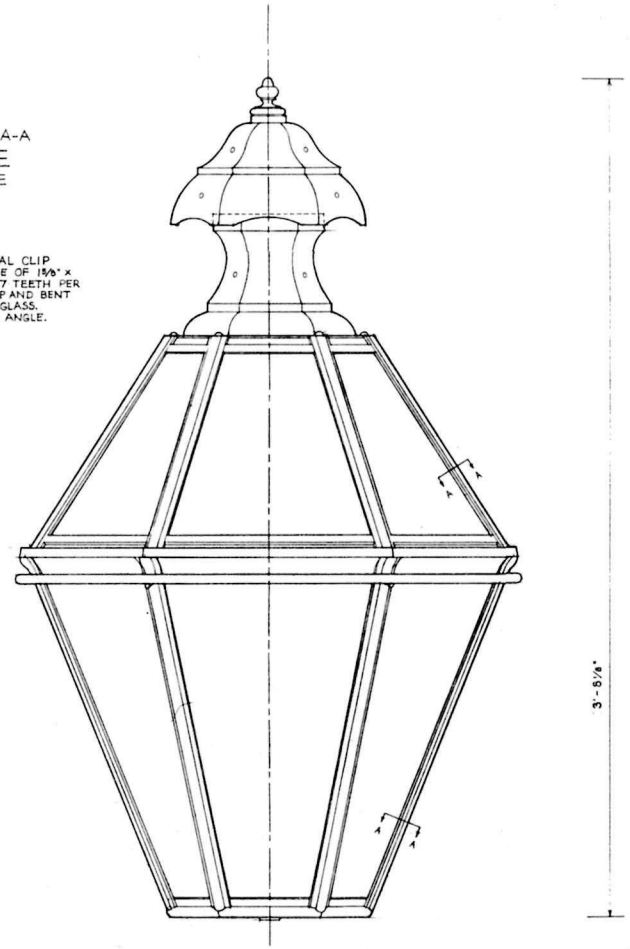


BOTTOM VIEW
3" = 1'-0"



SECTION A-A
ANGLE
FULL SIZE

ACCESS DOOR OF 1/32" SHEET METAL AND GLASS, HINGED AT TOP, SECURED AT BOTTOM WITH THUMBSCREW.



EAST ELEVATION 3" = 1'-0"

LANTERN OVER FRONT DOOR

DRAWN BY ROBERT COOPER 1959

EASTERN OFFICE PHILADELPHIA
UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

NAME OF STRUCTURE
FIRST BANK OF THE UNITED STATES
120 SOUTH THIRD STREET PHILADELPHIA PENNSYLVANIA

SURVEY NO.

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 17 OF 17 SHEETS

LIBRARY OF CONGRESS PRINTS DIVISION

Illustration of a sheet of door details.

General. This building is a stone farm house in Gettysburg National Military Park, measured and drawn in 1957 by student assistant architects.

Details. Three doors of particular interest are drawn at 3/4" scale, eight of lesser pretension at 1/4" scale. These are composed into a schedule. Full size sections of trim are also given.

Schedules may be descriptive, but in general the graphic ones are preferable. Usually there is no point in describing every door or window in a structure, regardless of their interest. It is better to concentrate on those which are known to be original, or which for some good reason are considered important; then if possible, draw them.

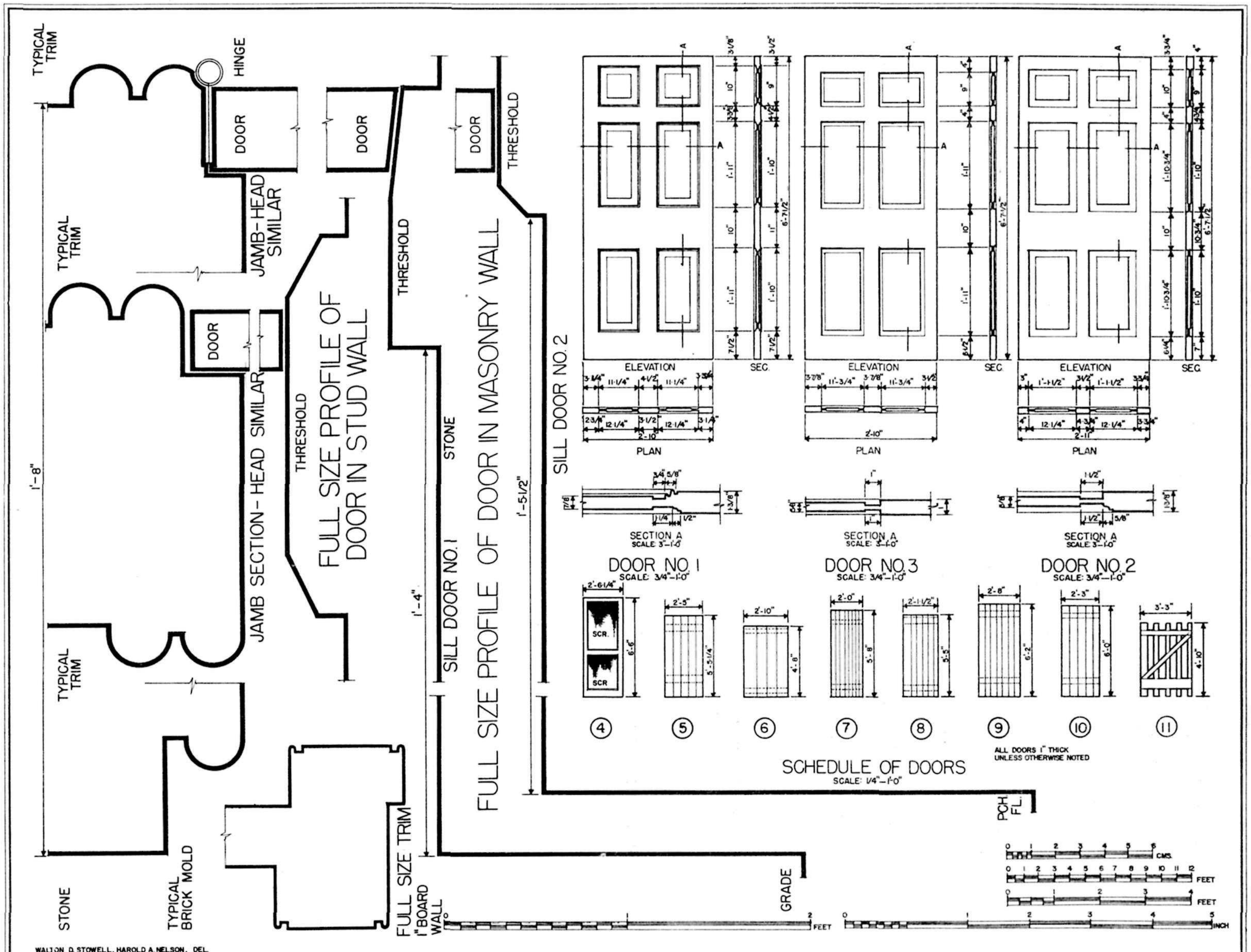
Dimensions are highly detailed for the three which are drawn at larger scale; overall measurements suffice for the others. As usual, no dimensions are given on the full size details, except where they are interrupted.

Sheet composition. The doors are lined up in rows and the full size sections are placed at one side. This is a sheet made for informational purposes, with little opportunity to emphasize its aesthetic appeal.

Part of the sheet reads horizontally, and the other part vertically. This is not particularly objectionable when it cannot be avoided.

Lettering was done mechanically.

Coverage of the whole set. Eight sheets.



WALTON D. STOWELL, HAROLD A. NELSON, DEL.

UNDER DIRECTION OF THE UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

NAME OF STRUCTURE
THE SLYDER FARM HOUSE
NEAR PLUM RUN, WEST OF BIG ROUND TOP, GETTYSBURG NATIONAL MILITARY PARK, GETTYSBURG VICINITY, ADAMS COUNTY, PENNSYLVANIA

SURVEY NO.

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 7 OF 9 SHEETS

Illustration of a sheet showing ruinous foundations.

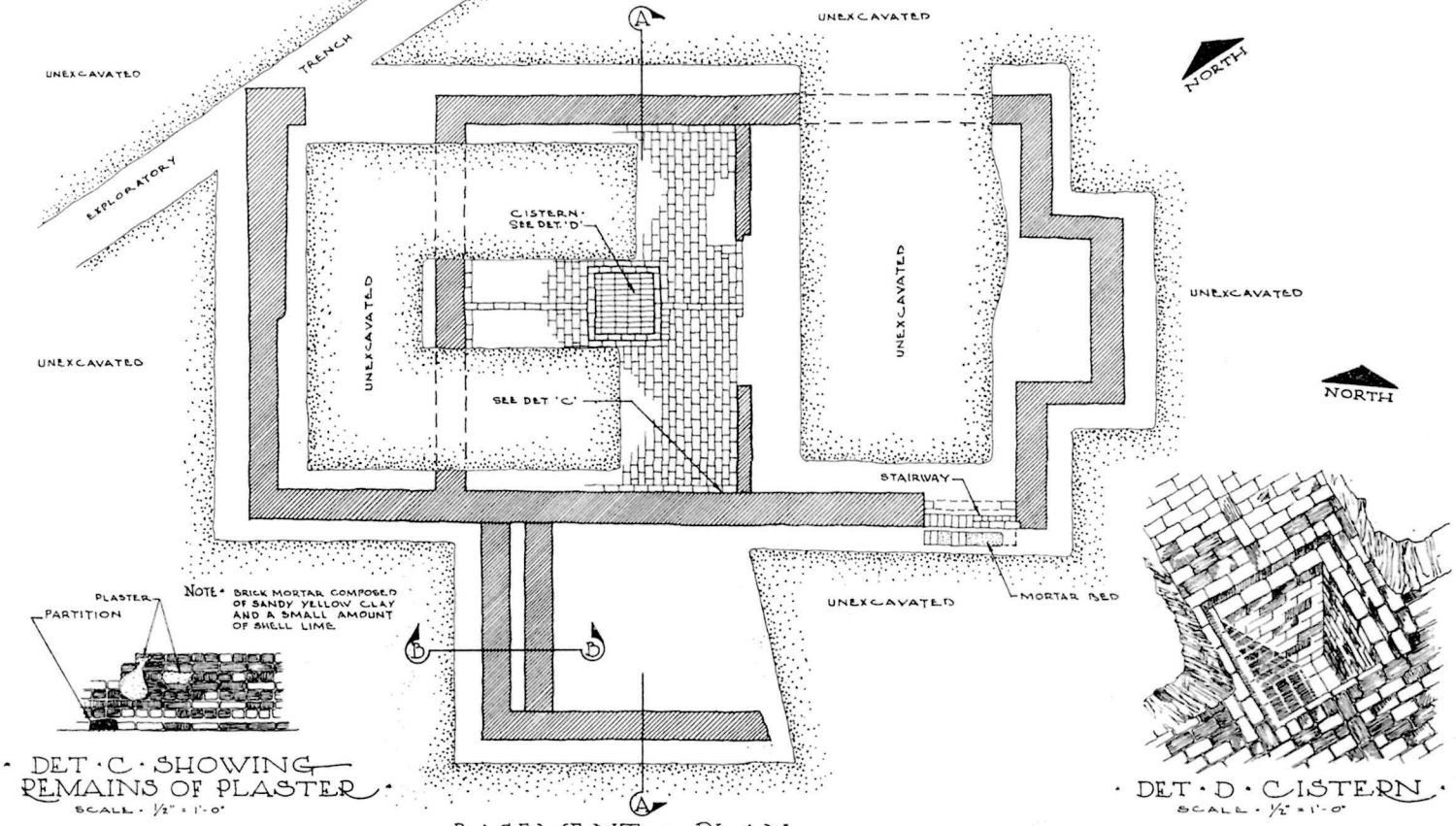
General. This represents a special kind of measured drawing, made in 1958 by an architect in the Park Service.

Drawings. These show the features uncovered in excavated areas and trenches. Notations and stippling point out the unexcavated portions. Two sections indicate the relationship of levels. All of these are at 1/4" scale.

Dimensions are not given, but can be approximated by measuring the drawing. As a general rule the irregularities of such ruins make precise dimensioning pointless.

Hatching, line shading, and stippling help to distinguish between various materials and parts.

Sheet composition. This sheet constitutes the entire set, and so is made up of varied drawings.

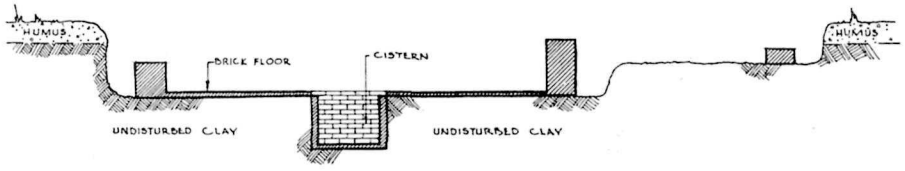


NOTE: BRICK MORTAR COMPOSED OF SANDY YELLOW CLAY AND A SMALL AMOUNT OF SHELL LIME.

· DET · C · SHOWING REMAINS OF PLASTER ·
SCALE · ½" = 1'-0"

· BASEMENT · PLAN ·
SCALE · ¼" = 1'-0"

· DET · D · CISTERN ·
SCALE · ½" = 1'-0"



· SECTION · AA ·
SCALE · ¼" = 1'-0"

· SECTION · BB ·
SCALE · ½" = 1'-0"

3690 1 2 3
FEET & INCHES · ½" = 1'-0"
60 1 2 3 4 5 6 7 8
FEET & INCHES · ½" = 1'-0"
2 4 6 8 0 1 2
METERS & DECIMETERS

· PLAN · SECTIONS & DETAILS ·

RUSSELL JONES, DEL · 1958

UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

NAME OF STRUCTURE
· ARCHITECTURAL REMAINS · PROJECT 103 · STRUCTURE 125 ·
JAMESTOWN ISLAND · JAMES CITY COUNTY · VIRGINIA ·

SURVEY NO.
VA
473

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET 1 OF 1 SHEETS

LIBRARY OF CONGRESS

Illustration of the use of photogrammetry.

General. This is a mid-19th century house whose measurements were plotted by photogrammetry in 1958.

Its extensive ornamental features were readily measured by this process. Other cases which are appropriate to this method would be:-

Buildings of broken or intricate masses.

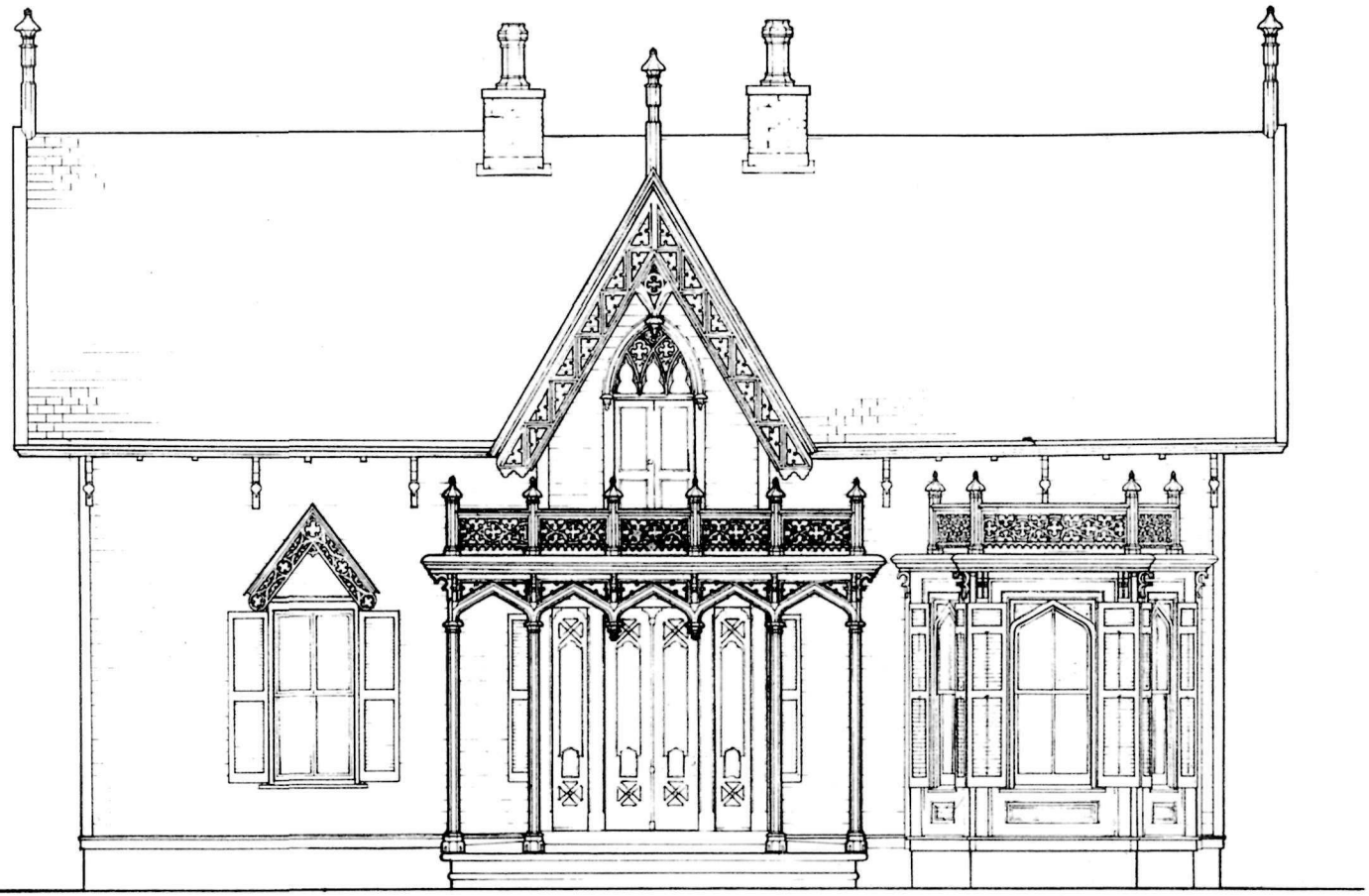
High buildings, or those inaccessible for ordinary measurement.

Elevation. This is drawn at 3/8" scale, permitting the ornamental parts to be drawn effectively. The whole effect emphasizes pictorial quality. Materials are indicated in an unobtrusive way. There are no dimensions, and notations are restricted to brief categorization of building materials.

Weight of line is varied for expressiveness. Outlines also vary in weight to give the appearance that projecting portions come forward.

Sheet composition. The single drawing is placed in the center of the sheet, which it nearly fills.

Coverage of the whole set. This is the only drawing made, so far at least.



SOUTH ELEVATION

SCALE : 3/8" = 1'-0"

MATERIALS:
FOUNDATION - STONE
COLUMNS - WOOD
TRACERY & RAILING - WOOD
ROOF - ASPHALT SHINGLES

SCALE IN FEET

SCALE IN METERS

DEL. - CHAS W TURNER 1958

William H Harder ARCHITECTURE Project Supervisor
THE OHIO STATE UNIVERSITY
UNDER DIRECTION OF UNITED STATES DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE, BRANCH OF PLANS AND DESIGN

NAME OF STRUCTURE
PETER NEFF COTTAGE (CA. 1830), KENYON COLLEGE - GAMBIER, OHIO
THIS DRAWING PRODUCED BY THE PROCESS OF ARCHITECTURAL PHOTOGRAMMETRY FROM PHOTOGRAPHIC STEREOPAIRS TAKEN MAY, 1970

SURVEY NO.

HISTORIC AMERICAN BUILDINGS SURVEY
SHEET OF SHEETS

LIBRARY OF CONGRESS

Illustration of a sheet given to the HABS.

General. This house was built in the mid-19th century by German immigrants, and is one of a very interesting series in Wisconsin, which bring mediaeval building traditions down almost to the present time. It was measured and drawn by Richard W. E. Perrin, and given to the HABS by him.

Draftsmanship is of superlative order in all respects, and only a few aspects can be pointed out here, such as varied weights of line, accents, and freehand lettering.

Scale. The drawing is at 1/2" to one foot, permitting forms to be indicated in some detail. Building materials are indicated throughout.

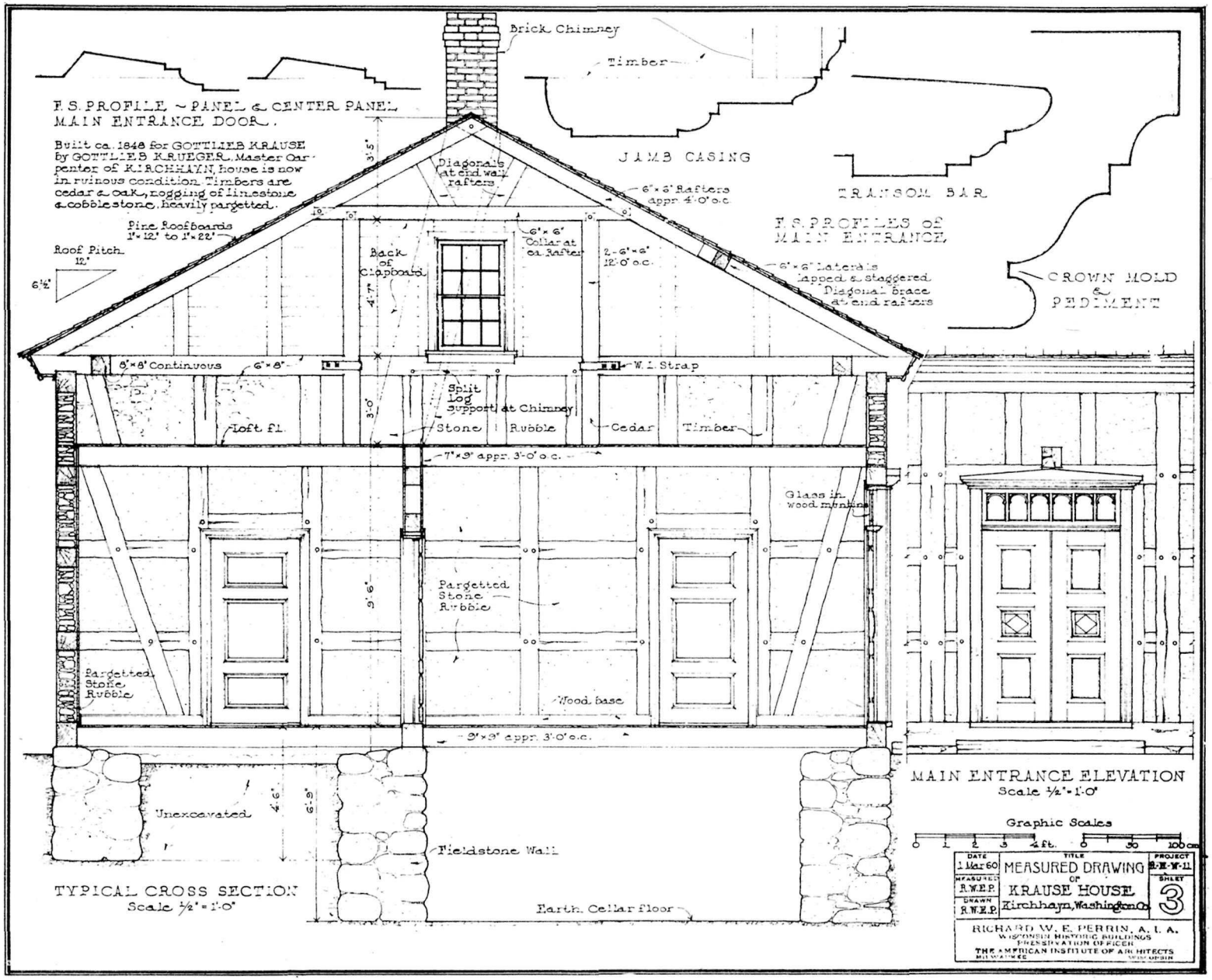
Dimensioning. Key heights only are given.

Notations explain building materials chiefly.

Sheet composition. The paper is filled completely, a device typical of practicing architects generally. Drawings are arranged primarily for explanatory purposes; for example, the entrance elevation is placed immediately alongside the point where it appears in section. The full size profiles are fitted into the corners.

Character. This sheet would be informative and attractive to historians, but only an architect would be able to appreciate in full the high quality it represents.

Coverage of the whole set. Three sheets:- 1) first floor at 1/4" scale, rear entrance at 1/2" scale, full size moulding profiles; 2) four exterior elevations at 1/4" scale; 3) general section and front entrance at 1/2" scale, full size moulding profiles.


F.S. PROFILE ~ PANEL & CENTER PANEL MAIN ENTRANCE DOOR.
Built ca. 1848 for GOTTLIEB KRAUSE by GOTTLIEB KRUEGER, Master Carpenter of KIRCHHAYN, house is now in ruinous condition. Timbers are cedar & oak, rogging of limestone & cobblestone, heavily pargetted.
Brick Chimney
Timber
JAMB CASING
TRANSOM BAR
F.S. PROFILES OF MAIN ENTRANCE
CROWN MOLD & PEDIMENT
Diagonals at end wall rafters
6"x 6" Rafters appr 4'-0" o.c.
Pine Roofboards 1"x 12' to 1"x 22'
Roof Pitch 12' 6½'
Back of Clapboard
6"x 6" Collar at ea. Rafter
2-6"x 6" 12'-0" o.c.
6"x 6" Laterals lapped & staggered Diagonal brace at end rafters
8"x 8" Continuous
6"x 8"
W.I. Strap
Split Log support at Chimney
Loft fl.
Stone Rubble
Cedar Timber
7"x 9" appr. 3'-0" o.c.
Glass in wood muntins
Pargetted Stone Rubble
Wood base
9"x 9" appr. 3'-0" o.c.
Unexcavated
Fieldstone Wall
Earth Cellar floor
TYPICAL CROSS SECTION
Scale ½" = 1'-0"
MAIN ENTRANCE ELEVATION
Scale ½" = 1'-0"
Graphic Scales
DATE 1 Mar 60
TITLE MEASURED DRAWING OF KRAUSE HOUSE Kirchhayn, Washington Co.
PROJECT H-B-M-11
SHEET 3
MEASURED R.W.E.P.
DRAWN R.W.E.P.
RICHARD W. E. PERRIN, A. I. A.
WISCONSIN HISTORIC BUILDINGS PRESERVATION OFFICER
THE AMERICAN INSTITUTE OF ARCHITECTS
MILWAUKEE WISCONSIN