



MASONRY ASSOCIATION OF GEORGIA

APPRENTICESHIP TRAINING

PHYSICAL STAGE TESTING LEVELS

1 – 8

**Masonry Association of Georgia “Apprenticeship Training”
2501 Lantrac Court
Decatur, GA 30035
678-518-1104**



**MASONRY ASSOCIATION OF GEORGIA, INC.
APPRENTICE PHYSICAL STAGE TEST**

STAGE # _____

Category	Maximum Points		Apprentice Score		
	ITEMS EVALUATED	BLOCK	BRICK	BLOCK	BRICK
Height		10	10		
Level		10	10		
Plumb		10	10		
Neatness		3	3		
Correct Design		5	5		
Square and Range		2	2		
Tool Manipulation		4	4		
Full and Uniform Joints		4	4		
Production		2	2		
Total for Stage Physical Test		50	50		

Apprentice Name _____

Date ____/____/____

Instructor Signature _____

Judge Signature _____

Comments/Observations:

STAGE 1 – GENERAL MASON TENDING

Objectives:

- Learn to properly mix mortar in a mechanical mixer and with a mortar box and hoe.
- Learn how and when to temper mortar.
- Learn to properly set up a work station for the masons.
- Learn how to build safe scaffolding.

Practice Sessions:

Mix mortar in mechanical mixer using the following formula: 3/4 water, 1/2 sand, cementitious materials, 1/2 sand, balance of the water, mix 3 to 5 minutes.

Mix mortar with a mortar box and hoe putting the sand in the box covered by the cementitious material, chop together until well blended, and add water while mixing to the proper consistency. Agitate further with the hoe to generate the air in the mortar. Sand to be measured by C.F. box, 5 gallon pails, or shovels that have been measured.

Deliver mortar and set up work stations for those further along in the program being sure they have all they need to work with.

Build safe scaffold as needed and in a timely manner so as not to disrupt the masons as little as possible. Use proper base for the scaffold legs.

STAGE 1 - Test for Advancement:

Set up a block and brick wall 8'-0" long and 6'-0" high with no more than two (2) blocks left over including those under the mortar boards.

Mix mortar, by either means, which meets the above specifications.

Build a scaffold, one jack high, on uneven ground that is considered safe by the instructor and OSHA Standards.

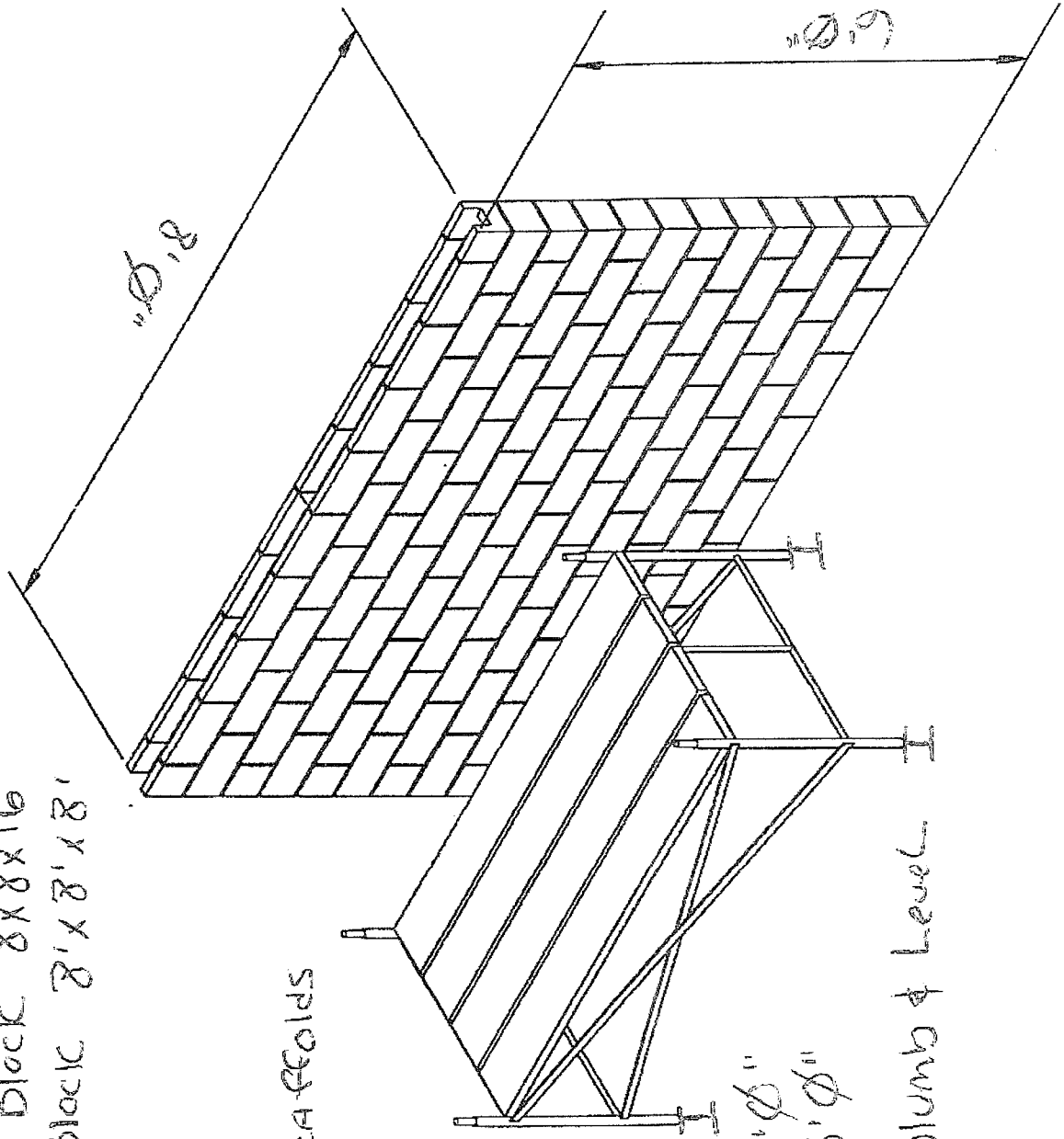
Fix mortar, on the board, that is too wet and too dry.

NOTE TO INSTRUCTOR:

For these apprentices, this is probably their first introduction to masonry construction and possibly even to the world of work. Patience is a must here. These are possibly our future masons who can and should be productive employees while preparing for their opportunity.

STAGE 1 - TEST FOR ADVANCEMENT

- ① Set up for a wall 8'0" Long x 6'0" High
49 whole Block 8'x8'x16'
10 half Block 8'x8'x8'



- ② Erect one set of scaffolds

- 2- Frames
- 2- Braces
- 4- Screw legs
- 2- Outriggers
- 7- 8" Boards
- 4- Safety Posts
- 6- Safety Rails
- 2 - 7'0"
- 4 - 6'

* Scaffold must be Plumb & Level

SET UP A BLOCK WALL

STAGE 2 – MORTAR SPREADING

Objectives:

- Roll Spread and Drop Spread mortar for brick.
- Drop Spread and Swipe Spread mortar for block.
- Apply full head and bed joints.

Practice Sessions:

Set up 2 X 4's at various heights to learn to Roll Spread and Drop Spread on the 4" width.

Same as above for Drop Spread and Swipe Spread on the 2" width. Practice putting on full head and bed joints for both brick and block. A full head joint for block is face shell thickness.

STAGE 2 - Test for Advancement:

Spread enough mortar with one trowel full to four (4) standard size brick. Lay the four (4) brick with full 3/8" head and bed joints.

Lay three (3) brick on top of the four (4) already laid with another trowel full of mortar with full 3/8" head and bed joints.

DROP SPREAD

Spread, by any means enough mortar, with two (2) trowels full, to lay two (2) blocks with full 3/8" head and bed joints. The mortar shall be spread and the block laid on top of the existing block. Mortar shall be cut clean, i.e. no smears, and no mortar shall fall either to the inside or the outside of the block being laid.

SWIPE SPREAD

Swipe spread enough mortar to lay two (2) blocks with 3/8" bed joints using only four trips to the mortar board. The head joint shall be put on the block in place and the block to be laid with additional mortar from the mortar board.

NOTE TO INSTRUCTOR:

This Stage will demand the most attention of all the Stages. It goes without saying that until the apprentice learns how to spread mortar properly he/she cannot advance. It may be boring to all concerned but it is absolutely necessary to the apprentices' education and must not be hurried or neglected.

STAGE 3 – LAYING BRICK AND BLOCK TO A LINE TWO WEEK TEST – Production & Stage

Objectives:

- Learn to lay brick and block to a line keeping the faces in a vertical plane while allowing for irregularities of the units.

Practice Sessions:

Spread mortar using any of the methods learned in Stage 2 and lay brick and block to a line pulled from pre-established leads. **Install flashing and weep holes.**

Practice putting head joints on the unit to be laid and the unit already in place.

Practice spreading just the right amount of mortar to allow the placing of the unit with minimal tapping, however being sure there is enough mortar to fill the joints. Mortar should be furrowed slightly and beveled away from the air space or cavity. Strive to keep air space or cavity clean.

Practice cutting, not smearing the excess mortar and capturing it to be used on the head joint of the succeeding unit.

STAGE 3 - Test for Advancement:

The Apprentice will set up a work station for a brick and block cavity wall 4' – 8" long and 3' – 4" high. The apprentice will help the instructor set up and mark for height, pre-established leads or "dead men" set well outside the ends of the wall.

Build the above wall and plumb the end jambs. Leave head joint out every 16" as weep holes. Strike the block with a concave jointer. Wall will be judged on diagonal plane, (+/- 1/8" in 2'-0"), plumb jamb ends, (+/- 1/8" in 2' – 0"), clean cavity (within reason) and final appearance.

ALL BRICK AND BLOCK HEAD JOINTS WILL BE FULL OR THE TEST IS FAILED.

PRODUCTION TEST: Apprentice must *pass the Production Test PRIOR to Stage Test.*

This is a **4 hour test** with **FULL HEAD** Joints. **TWO hours for Block, TWO hours for Brick.** Apprentice will have someone tending for him while testing.

8" CMU BLOCK – must lay 40-50 block in two hours. (20-25 per hour)

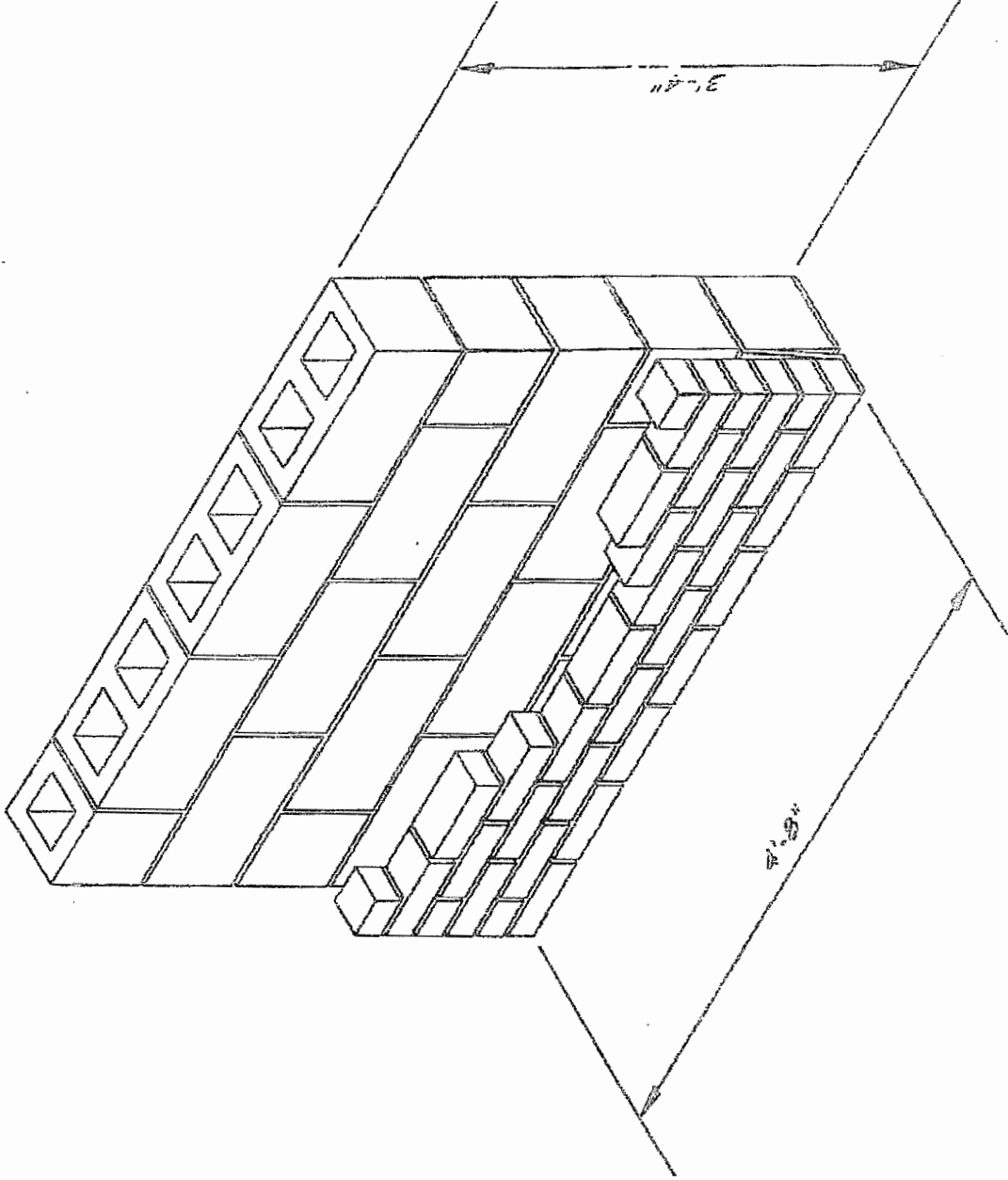
BRICK – must lay 160 brick in two hours. (80 per hour)

NOTE TO INSTRUCTOR:

This is probably the second most important Stage to the apprentice and considered the most important by the contractors. It is their first introduction to the level and its use. ***If the apprentice can pass this Stage successfully, the apprentice can pay his way on the job.***

- Set up dead men leads with apprentices help.
- Speed is not important, but they should be able to finish the test easily in three (3) hours.

STAGE 3 - TEST FOR ADVANCEMENT



LAYING BRICK AND BLOCK TO A LINE

STAGE 4 – BUILDING CORNERS AND LEADS WITH A LEVEL TWO WEEK TEST – Production & Stage

Objectives:

- Learn to build cavity wall corners and leads with various sized brick and block. (A corner is two leads forming an angle of 90 degrees). Install flashing around corner and weep holes.

Practice Sessions:

- Build corners with 4", 6", 8" and 12" block on half bond.
- Practice building block corners and leads on half bond with any cuts buried in the corner.
- Practice holding a height of 8" per course.
- Practice building corners and leads with standard and jumbo utility brick. No toothing is allowed.

STAGE 4 - Test for Advancement:

The apprentice will build a cavity wall corner that is 12" wide in one direction and 14" wide in the other. Use standard sized brick on the face and whatever sized block are required on the backup that will allow for a 2" cavity (+/- 1/8").

All units must be on half bond.

Install flashing and weep holes in both directions. Place flashing on top of first course of block and below second course of brick. Weep holes to be open head joints 16" O.C.

Place horizontal joint reinforcing every 16" O.C. vertically. Tool all joints with a concave jointer.

Corner must be square, plumb (+/- 1/8" in 32") and level (+/- 1/16" in 16") and in plane (+/- 1/8"). Wall width will be 12" and 14" respectively (+/- 1/8") with a 2" cavity. Total height of the corner will be 40" (+/- 1/8") and the top of every third course of brick will correspond with top of the backup block course.

ALL HEAD AND BED JOINTS MUST BE FULL OR TEST IS FAILED!

PRODUCTION TEST: Apprentice must *pass the Production Test PRIOR to Stage Test.*

This is a 4 hour test with FULL HEAD Joints. TWO hours for Block, TWO hours for Brick.

Apprentice will have someone tending for him while testing.

8" CMU BLOCK – must lay 30 block in one hour.

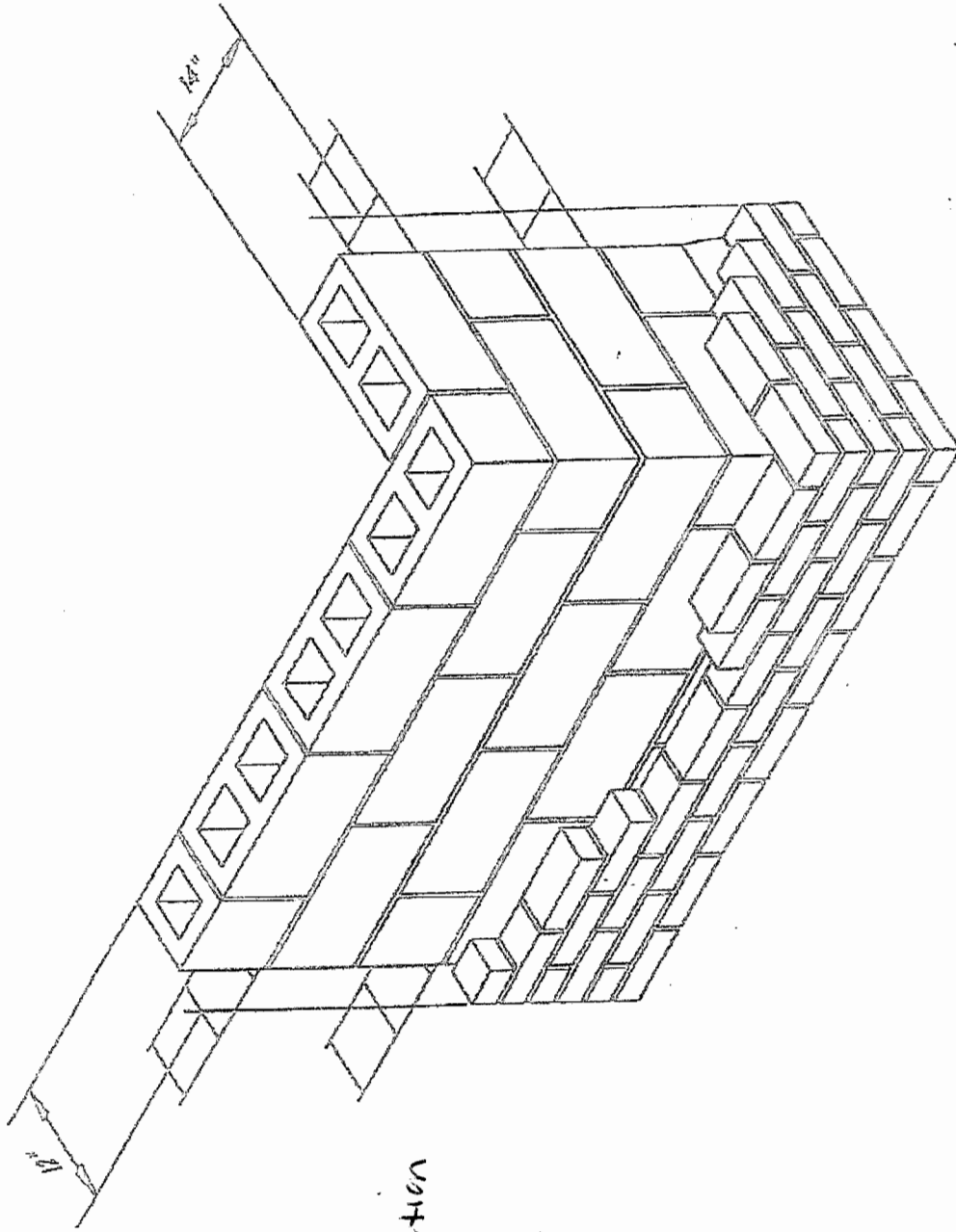
BRICK – must lay 110 brick in one hour.

Then Leads test.

NOTE TO INSTRUCTOR:

This Stage will need constant monitoring. Again, speed is not important, but it is important that the apprentice learn to do it right. Special attention should be given to height stressing the importance of meeting sill, lintel and beam heights. **Flashing and weeping holes must be done properly.**

STAGE 4 - TEST F.C.R ADVANCEMENT



25 Block
165 Beick

Need Flashing Installation

3 Hour Test

BUILDING CORNERS AND LEADS

WITH A LEVEL

STAGE 5 – BUILDING A COMPOSITE WALL TWO WEEK TEST – Production & Stage

Objectives:

- Learn to build a composite wall including leads.
- Learn to set a door frame.

Practice Sessions:

Each apprentice should build a composite wall corner and/or lead using modular brick and 8" block.

- Help instructor set door frame properly, 3" inside the face of the brick.
- Lay out brick and block bond as if they were going over the door.

STAGE 5 - Test for Advancement: - Crew 2 or 3 apprentices

Build a composite wall 10'- 8" not including door (+/- 1/4") long, 3'- 4" (+/- 1/8") high and 12 3/4" wide with a door frame set with a center line of the right end of the wall and the door frame face 3" in from the face of the brick. (Note: If a door frame is unavailable, leave a 40" opening in place of the door).

Lay brick on 1/2 bond.

Wall will also be judged on correct design, joint uniformity, neatness, general appearance, plumb and level to +/- 1/8" in 24".

ALL HEAD AND BED JOINTS MUST BE FULL OR THE TEST IS FAILED!

PRODUCTION TEST:

Apprentice must *pass the Production Test PRIOR to Stage Test*.
Apprentice will have someone tending for him while testing.

8" CMU BLOCK – 40 @ 30 Blocks per hour	1.15 hours
BRICK – 245 @ 100 Brick per hour	<u>2.45 hours</u>
	4.0 hours Total

WEEK ONE – Lay-out & set Frame

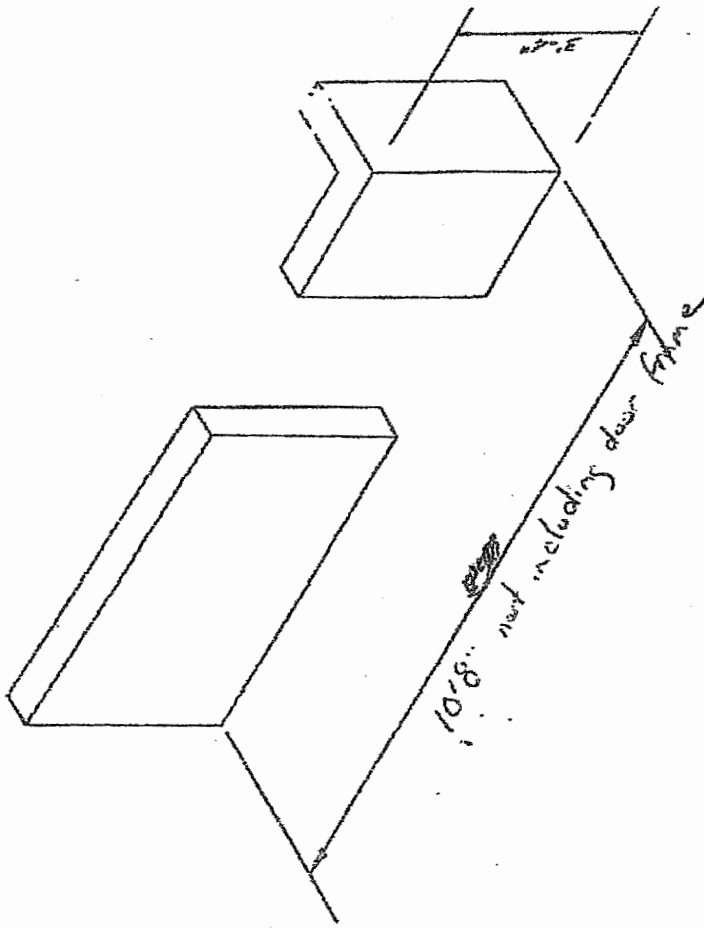
WEEK TWO – Build Project

~~~~FLASHING INSTALLATION WITH END DAMS~~~~

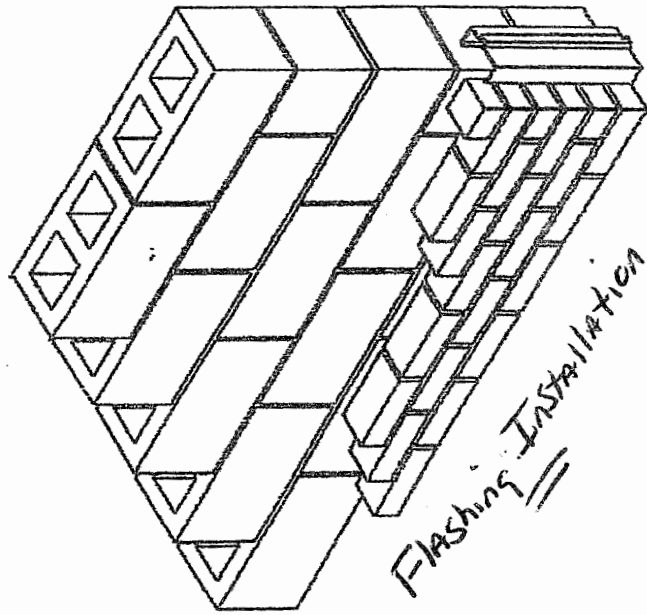
### NOTE TO INSTRUCTOR:

It is at this point that we start to allow the apprentices to figure thing out for themselves. During the practice sessions you should show them how to set a door frame and how to layout the bond. During the test they should not receive assistance other than the initial instructions.

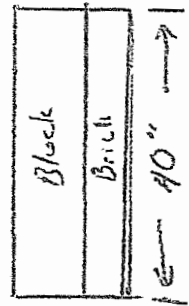
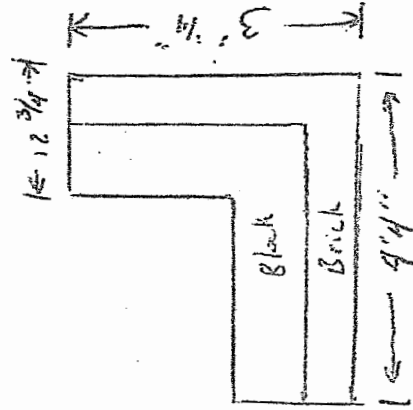
# STAGE 5 - TEST FOR ADVANCEMENT



COMPOSITE WALL



DETAIL AT DOOR JAMB



INSTALL DOOR JAMBS IN COMPOSITE WALL

## **STAGE 6 – BUILD A SINGLE WIDTH ARCHITECTURAL CMU WALL**

### **Objectives:**

- Learn to build an Architectural CMU corner with saw cut mitered or factory made corner units.
- Learn to build a wall with ACMU's without smearing the faces and still maintaining full head and bed joints.
- Learn proper joint treatment to reduce water penetration.

### **Practice Sessions:**

Build corners with both split ribbed and split faced ACMU's using saw cut and factory made corners.

Spread mortar properly to support heavier face side of the units but not fall off and smear the face of the unit.

Put head joint on in such a way that it will make a full joint without smearing the face of the unit.

Remove excess mortar at the proper time so as not to smear the face but in time to tool the joint without affecting the color of the mortar.

### **STAGE 6 - Test for Advancement:**

Build a Split Faced Block wall 28'-0" long by 2' high with a return on each end forming an inside and an outside corner. Strike the smooth side with a concave jointer and rake and point the face side. Rake shall be as deep as the base of the ribs and tooled smooth with a tuckpointer to match the manufactured unit's rib base.

Build a Split Ribbed Block wall on top of and to the same dimensions and configuration as above. Tool both sides with a concave jointer.

The above walls shall be built to +/- 1/8" in 2'-0" in level, plumb and total height of 4'-0" +/- 1/8".

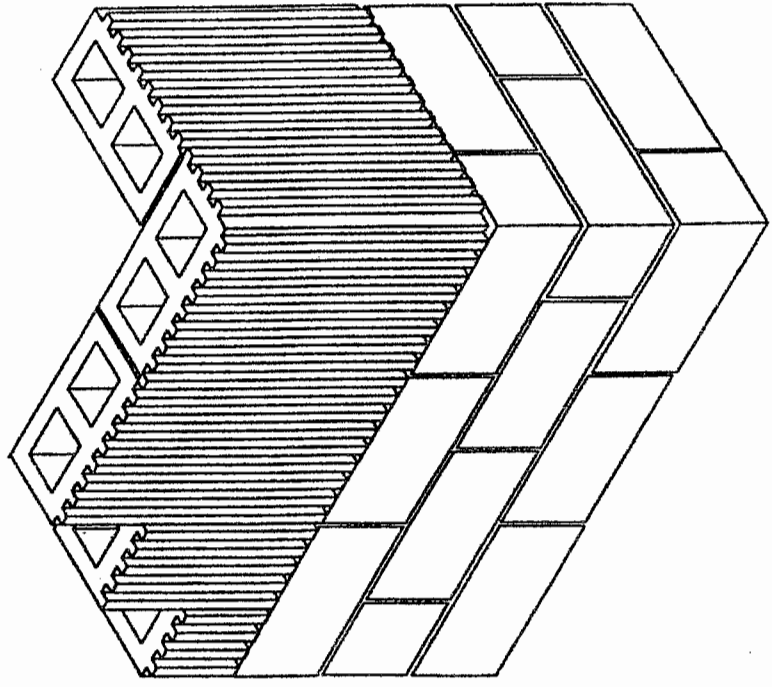
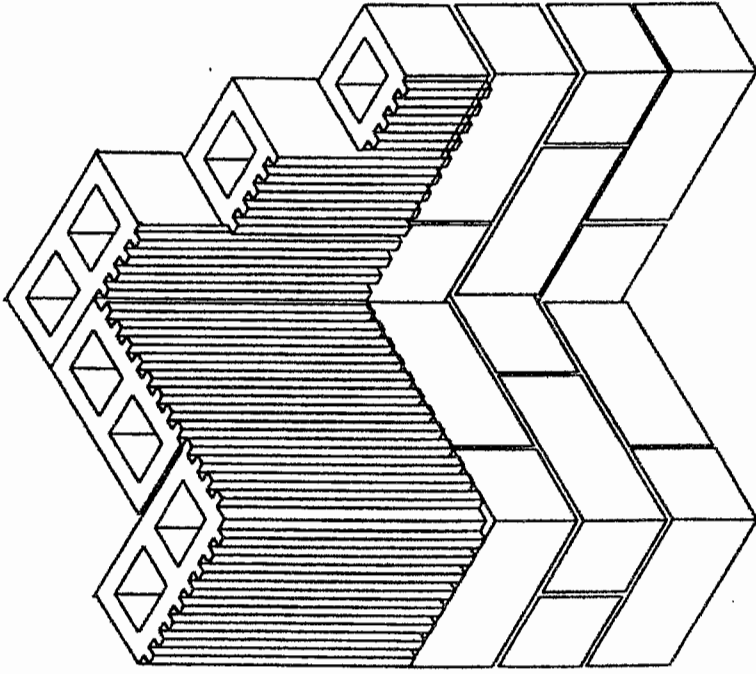
**ONLY MINOR SMEARING WILL BE ALLOWED ON THE FACES OF THE ACMU'S.  
ALL HEAD AND BED JOINTS MUST BE FULL OR TEST IS FAILED.**

**\*This test was designed for three (3) apprentices to complete in three (3) hours. For fewer apprentices shorten wall proportionately. One (1) apprentice – 8'-0". Two (2) apprentices 16'-0".**

### **NOTE TO INSTRUCTOR:**

This should be a fairly simple Stage to monitor. Corner details and instruction for proper spreading of mortar for head and bed joints will be critical, especially for the split ribbed units.

STAGE 6 - TEST FOR ADVANCEMENT



BUILD A SPLIT-FACE - Ribbed Block Wall

## **STAGE 7 – REINFORCED CAVITY WALL USING ACMU AS A FACE**

### **Objectives:**

- Build reinforced CMU wall with reinforcing steel and grout. Place pineal and eye type joint reinforcing.
- Veneer with 4" ACMU's

### **Practice Sessions:**

Practice building an 8" CMU wall with reinforcing steel and grout properly placed 32" O.C. horizontally and 2'-0" O.C. vertically in a lintel or "knockout" block. Use grout stop as needed and pour with a simulated grout (sand) at 2'-0" height intervals. Spread cross webs where grout (sand) is to be placed to prevent waste.

Practice placing "Dur-O-Eye" type horizontal joint reinforcing 16" O.C. vertically.  
Note: Width of joint reinforcing to be determined by the total width of the wall.

Practice keeping work and cavity clean.

### **STAGE 7 - Test for Advancement:**

Build a cavity wall (with leads – no corners) 20'-0" long X 14" wide with one #5 rebar 2'-0" O.C. horizontally and a bond beam with one #5 horizontal rebar 2'-0" O.C. vertically. Place joint reinforcing 16" O.C. Simulate a grout pour using dry sand after wall is 4'-0" high with no grout (sand) going where not intended.

Veneer wall with 4" X 8" X 16" glazed or architectural faced units.

Reinforcing steel, joint reinforcing, grout, and ties must be properly placed to advance. Work must be fairly clean and level and plumb (+/- 1/4" in 10'-0") and to the correct height (+/- 1/8" in 4'-0").

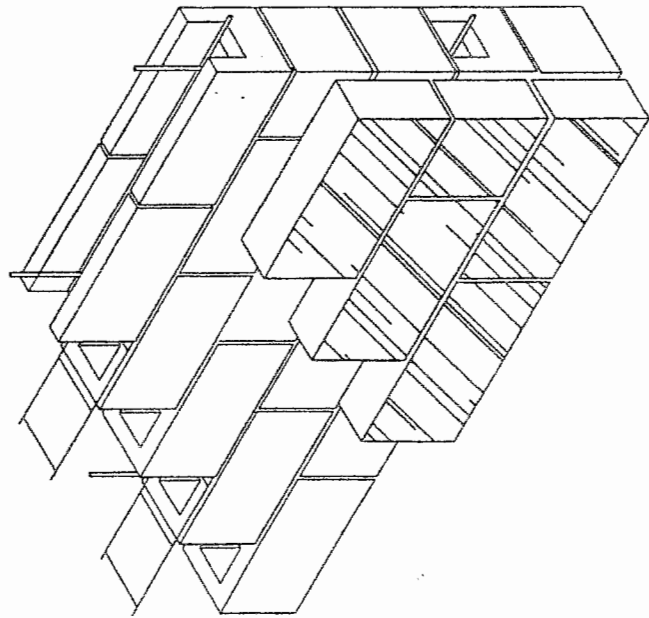
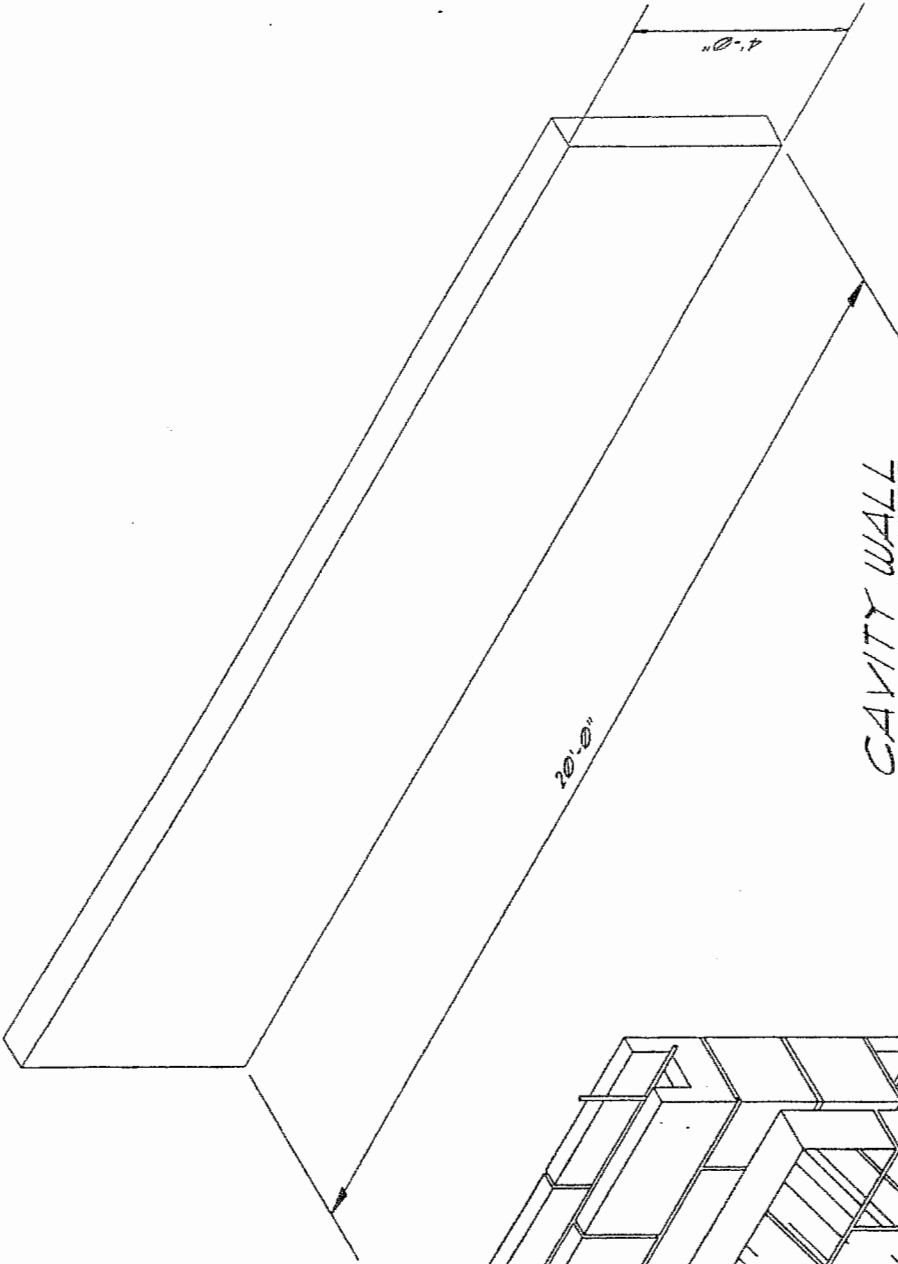
### **ALL HEAD AND BED JOINTS MUST BE FULL OR TEST IS FAILED.**

This test was designed for two (2) or three (3) apprentices to complete in three (3) hours. For more or fewer apprentices, lengthen or shorten wall proportionately. Three (3) apprentices 28'-0", one (1) apprentice 10'-0".

### **NOTE TO INSTRUCTOR:**

This will be one of the most demanding Stages but this type of work is one of the most used in the masonry industry so it is absolutely necessary the apprentice learn this method of construction.

STAGE 7 - TEST FOR ADVANCEMENT



DETAIL AT END OF WALL

BUILD A REINFORCED CAVITY WALL

8-0 Long Per Apprentice

## **STAGE 8 – CAVITY WALL**

### **Objectives:**

- Learn to build a cavity wall including leads, joint reinforcing, with weep holes to a specific dimension in a fixed amount of time.
- Learn to build both the brick and block wall at the same time.
- Learn how to install “thru wall” flashing and weep holes.

### **Practice Sessions:**

Practice building corner(s) for 14” wide cavity wall using standard sized brick and 8” CMU. Place 14” joint reinforcing at 16” O.C.

After corner(s) is built, practice building two courses of block, six course of brick, place joint reinforcing, and repeat.

### **STAGE 8 - Test for Advancement: Crew – 3 Apprentices and 1 Tender\***

Time allowed – Three (3) hours. **12’ LONG PER APPRENTICE.**

Build a cavity wall 36’-0” long \*, 2’-0” high, and 14” wide. Use 8” block and standard or modular size brick with an outside corner at each end. Place Thru-wall flashing below the first course of brick and on top of the first course of block. Leave every third head joint in the first course of brick out for a weep hole.

Place 14” joint reinforcing 16” O.C. vertically.

Keep cavity and faces of masonry work clean.

Build both widths of the wall together.

Strike block with a “V” jointer and the brick with a concave jointer.

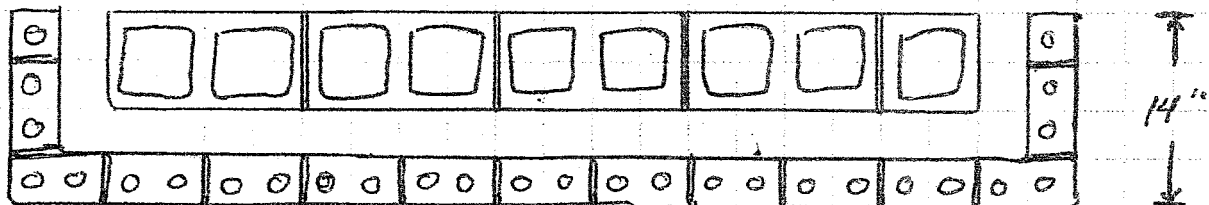
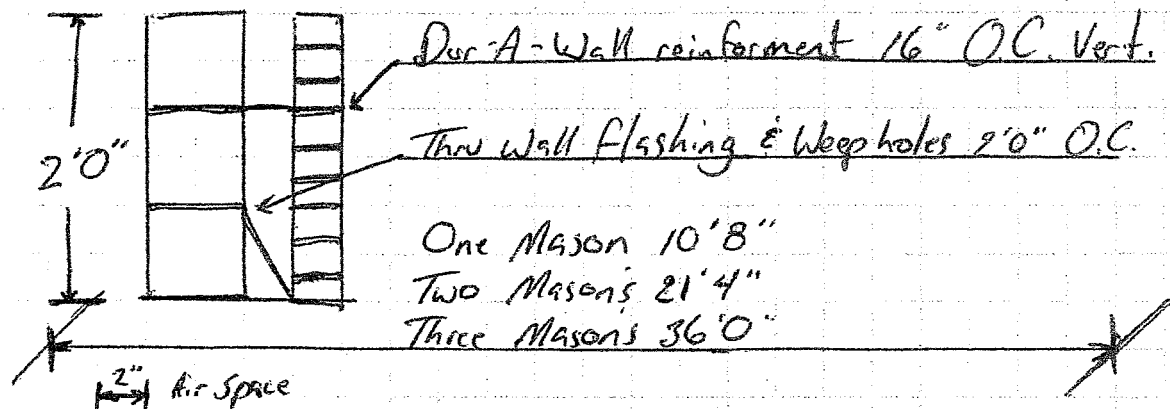
This project will be graded for plumb (+/- 1/8” in 2’-0”), level (+/- 1/8” in 4’-0”), height (+/- 1/8”), length (+/- 1/4”), neatness, general appearance and speed.

**ALL HEAD AND BED JOINTS MUST BE FULL OR TEST IS FAILED.**

### **NOTE TO INSTRUCTOR:**

There is some instruction required prior to this test, but after test is started, no instruction is permitted.

- \* For two (2) Apprentices and one (1) Tender make the wall length 21’-4”.
- \* For one (1) Apprentice and one (1) Tender make the wall 10’- 8” long with single leads on each end instead of corners.



STAGE 8"