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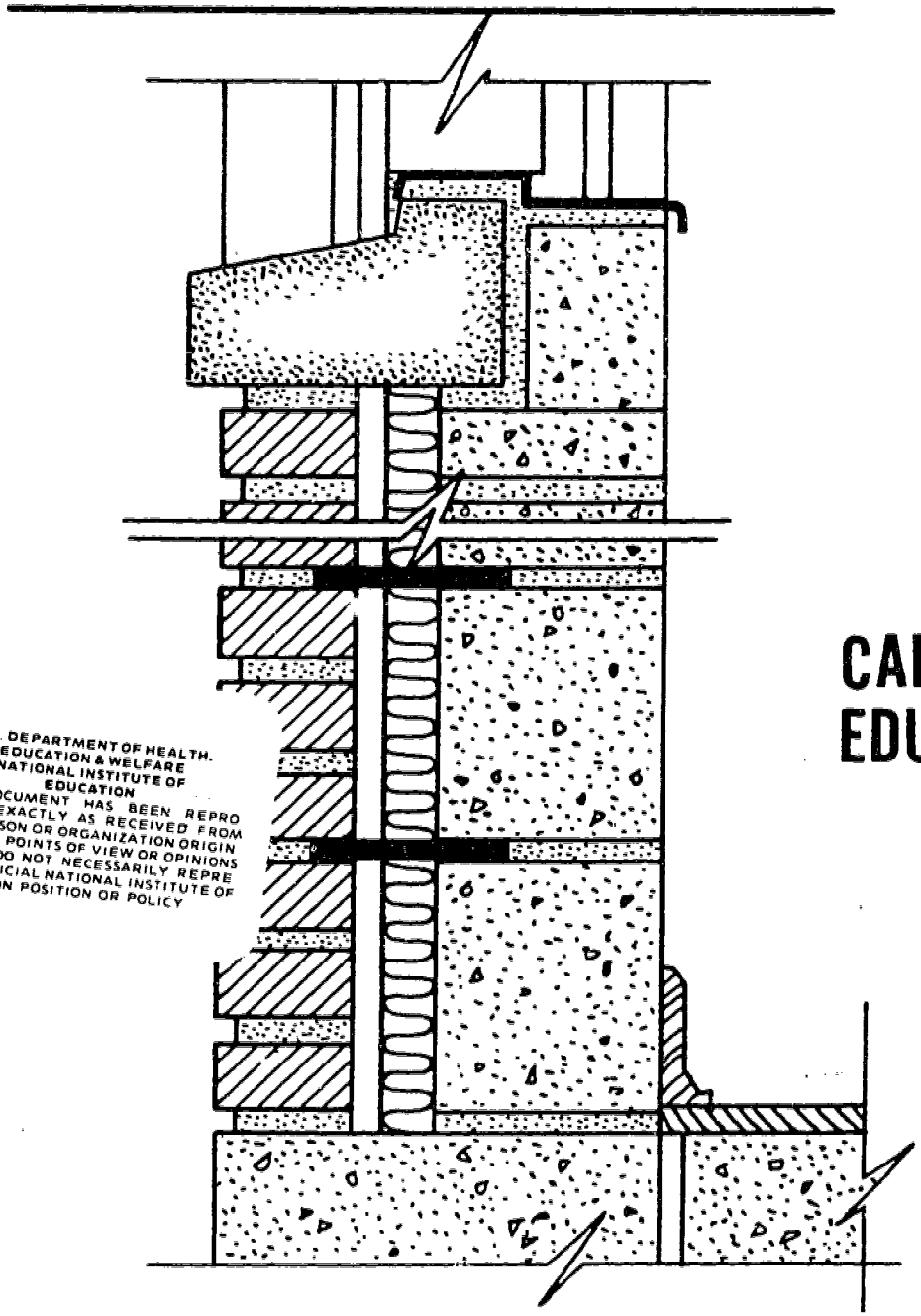
ABSTRACT

Several intermediate performance objectives and corresponding criterion measures are listed for each of 22 terminal objectives for a basic masonry course. The materials were developed for a 36-week course (2 hours daily). Organized subject matter and practical experiences are designed to prepare students for entry level skills in the masonry trade. Skill training is covered in the following areas: Masonry occupations, tools and equipment, classifications of brick and block, mortar mixing, laying brick and block, estimating, and building pilasters, steps, corners, and arches. Titles of the 22 terminal objectives sections are Orientation and Shop Procedures, Related Occupations, History of Bricklaying, Safety, Tools, and Equipment, V.I.C.A. (Vocational Industrial Club of America), Classifying Brick, Classifying Concrete Block, Mixing Mortar, Masonry Terms, Spreading Mortar, Buttering Brick and Block, Cleaning Masonry Work, Laying to the Line, Estimating Brick and Block, Pilasters, Door and Window Openings, Step Construction, Bonds, Corner Leads, Piers, and Arches. (This manual and 54 others were developed for various secondary level vocational courses using the System Approach for Education (SAFE) guidelines.) (HD)

MASONRY

BASIC COURSE



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Duval County Public Schools

July, 1973

A C K N O W L E D G E M E N T S

This manual was developed using System Approach For Education (SAFE) Guidelines.

Appreciation and recognition are extended to the following educators who have assisted in the preparation of this manual:

Writer: Oliver Muldrow, Instructor

Technical Assistance: Ernest L. Taylor, Coordinator

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Cover Design & Printing: Chester Sievert, Instructor

Typist: Catherine Boatright, Secretary

MASONRY- BASIC

Accreditation No. 9133

Length of Course: 36 weeks

Time Block: 2 hours daily

COURSE DESCRIPTION

Organized subject matter and practical experiences designed to prepare students for entry level skills in the masonry trade. This course includes skill training in the following areas:

a. masonry occupations

b. tools and equipment

c. classifications of brick & block

d. mortar mixing

e. laying brick & block

f. estimating

g. building pilasters, steps, corners, and arches

MASONRY - BASIC

#9133

Syllabus of Terminal Performance Objectives

1.0 Orientation & Shop Procedures

2.0 Related Occupations

3.0 History of Bricklaying

4.0 Safety

5.0 Tools and Equipment

6.0 V.I.C.A.

7.0 Classifying Brick

8.0 Classifying Concrete Block

9.0 Mixing Mortar

10.0 Masonry Terms

11.0 Spreading Mortar

12.0 Buttering Brick & Block

13.0 Cleaning Masonry Work

14.0 Laying to the Line

15.0 Estimating Brick and Block

16.0 Pilasters

17.0 Door & Window Openings

18.0 Step Construction

19.0 Bonds

20.0 Corner Leads

21.0 Piers

22.0 Arches

ACCREDITATION NUMBER 9133

COURSE TITLE: Masonry - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 1.0 ORIENTATION AND PROCEDURES

The basic masonry student will demonstrate his knowledge of shop procedures and management as evidenced by his ability to score at least 80% on a written test.

No.	Intermediate Performance Objectives	No.	Criterion Measures
1.1	Given a list of ten responsibilities six of which are student responsibilities and the remaining-teacher responsibilities, the learner will correctly identify these which are student responsibilities.	1.1	From the list below, circle those statements which describe student responsibilities: 1. Clean tools 2. Check roll 3. Mix mertar in groups 4. Outline firedrill procedures 5. Provide suitable work-clothes 6. Report all accidents 7. Schedule breaks 8. Assign Tool Clerks 9. Clean mertar mixer daily 10. Stack block and brick away from working area.
1.2	The learner will list in writing four duties of the Tool Clerk with 100% accuracy.	1.2	In the space provided, write four duties of the tool clerk: 1. _____ 2. _____ 3. _____ 4. _____
1.3	Given a list of five shop functions three of which are functions of the Shop Foreman, the learner will identify these which are not duties of the Shop Foreman with 100% accuracy.	1.3	From the list below, circle the statements which do not describe a function of the Shop Foreman. 1. Report to instructor students who fail to clean working area. 2. Report to instructor students who fail to use safe work practices.

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COURSE TITLE: Masonry - BASIC

TERMINAL PERFORMANCE
OBJECTIVE NO. 1.0 Cont'd. ORIENTATION AND PROCEDURES

No.	Intermediate Performance Objectives	No.	Criterion Measures
1.3		1.3	3. Pass out tools and equipment. 4. Replace displaced tools. 5. Make sure working areas are clean.
1.4	Given a list of four alternatives, the learner will correctly identify in writing or orally the most appropriate one for fire drill procedure.	1.4	Of the four alternatives, select the one which is most appropriate for fire drills: When Alarm is sounded 1. Continue to work until teacher gives the o.k. 2. Store tools before moving to safe area. 3. Stop work and walk to safe area. 4. Stop work and run to safe area.
1.5	The learner will correctly list in writing four functions of the student record folder.	1.5	Briefly list four functions of the student record folder: 1. _____ 2. _____ 3. _____ 4. _____

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COURSE TITLE: Masonry - BASIC

TERMINAL PERFORMANCE
OBJECTIVE NO. 1.0 Cont'd. ORIENTATION AND PROCEDURES

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
1.6	Given two lists, one of management terms and one of definitions, the learner will correctly match 80% of the terms.	1.6	Match the two lists below: ___1. Record folder ___2. Performance Objectives ___3. Fire Alarm ___4. Break time ___5. Dressing out ___6. Two-hour block ___7. Tool Clerk ___8. Shop Foreman ___9. Stored in tool room __10. Project sheet a. Pass out and collect tools b. Trowel, level, hammer c. Report all accidents immediately d. States what is to be done and how well e. Explains what is to be done in detail f. Check rool each day g. Changing into work clothes h. Time students are in class i. Inform teacher of pending danger j. Rest period k. Students will leave shop area.

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COURSE TITLE: Masonry - BASIC

TERMINAL PERFORMANCE
OBJECTIVE NO. 2.0

RELATED OCCUPATIONS

The basic masonry student will demonstrate his knowledge of the various related occupations as evidenced by a score of at least 80% on a written test.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
2.1	The basic masonry student will correctly list eight of ten related occupations.	2.1	List the ten related occupations: 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____
2.2	The basic masonry student will match the job classification with related information without error.	2.2	Match the two lists below. ___ 50,000 needed nationally ___ In little demand today ___ the newest addition to occupations ___ lowest paid of all occupations A. Welders B. Bricklayer C. Cleaner, pointer, and caulker D. Plasterer

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COURSE TITLE: Masonry - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 3.0

HISTORY OF BRICKLAYING

The basic masonry student will demonstrate his knowledge of the history of bricklaying by scoring at least 75% on a written test.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
3.1	The basic masonry student will identify the three products used to make brick and the three methods used to manufacture brick.	3.1	Name the three products formed through the geological ages which are used to manufacture brick. 1. _____ 2. _____ 3. _____ List the three methods used to manufacture brick. 4. _____ 5. _____ 6. _____
3.2	The learner will identify orally or in writing four of six known facts relative to the history of bricklaying.	3.2	1. What is the oldest manufacture building material known today? _____ 2. It is claimed that the bricklayers organization was formed _____ years ago. 3. What was the size of brick produced in ancient tim ? _____ 4. Brick manufact ed by machines came into being during what period in history? _____ 5. In what year was the first patent on a brickmaking machine issued. _____ 6. In what year was the Bricklayers, Masons and Plasterers International Union organized? _____

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COURSE TITLE: Masonry - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 4.0

SAFETY

The basic masonry student will demonstrate his knowledge of safe work practices as evidenced by a score of 80% on a written test, and by 80% proficiency in safety practices during all job assignments in the masonry course.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
4.1	The learner will identify from a list of clothing, those which are to be worn in the shop.	4.2	Circle the items which should be worn in the shop: 1. straw hat 2. boots or thick sole shoes 3. coverralls 4. mask 5. flare bottom trousers
4.2	The student will identify aminimum of five hazards involved in the bricklaying occupation.	4.2	List at least five hazards involved in the bricklaying occupation: 1. _____ 2. _____ 3. _____ 4. _____ 5. _____
4.3	The student will demonstrate desirable safety behavior on each assignment as evidenced by a score of a least 8 points on a 10 point rating scale concerning safety. (RATING SCALE ATTACHED)	4.3	You will be graded on safety on each job assignment during this course.

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COURSE TITLE: Masonry - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 5.0

TOOLS AND EQUIPMENT

The basic masonry student will demonstrate his knowledge of the tools and equipment used in the occupation as evidenced by a score of 80% on a written test.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
5.1	The learner will identify the basic tools used in the masonry trade when given the names in one list and the descriptions in another list with 80% accuracy.	5.1	Match the two columns below: ____ brick trowel ____ brick set ____ plumb bob ____ brick hammer ____ framing square ____ jointer ____ mortar hoe ____ level ____ cold chisel ____ tool bag ____ line block ____ building line ____ pocket rule ____ brick saw a. used for forming the outside edge of the mortar joints between the bricks. b. used to lay brick walls plumb and level. c. a flat triangular shaped blade tooled with a rounded point and an offset handle. d. used to obtain a vertical line. e. used to obtain 90^0 angles. f. a measuring device. g. used to hold building line to wall. h. used to make closures and bats. i. used to cut brick when more exact surfaces are required. j. used for trimming, cutting holes and for operations requiring a smaller tool than the bolster. k. used to hold the various small.. tools used by the bricklayer. l. a power tool used to cut brick. m. a guide to lay brick straight, level and plumb with the corners. n. used to mix mortar

RATING SCALE

S A F E T Y

1.	Observes rules concerning attire	2
2.	Observes rules relative to power machines	2
3.	Observes rules when using tools	2
4.	Observes rules when handling materials and equipment	2
5.	Reacts immediately to impending danger	2
		10

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COURSE TITLE: Masonry - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 5.0

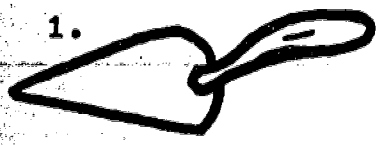
TOOLS AND EQUIPMENT

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
5.2	The learner will identify twelve of the basic tools used in the occupation in writing without error.	5.2	Identify each of the twelve tools in the diagram without error. (Attached)
5.3	The learner will list the criteria used in selecting a trowel in writing in orally without error.	5.3	List five criteria used in selecting a trowel. 1. _____ 2. _____ 3. _____ 4. _____ 5. _____

BASIC MASONRY

Date: _____ Name: _____
student

On the line provided, write the name of the tool or aid pictured below:

1. 

_____

2. 

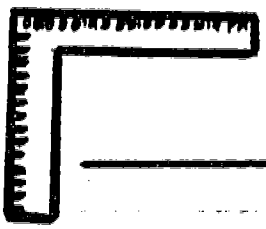
_____

3. 

_____

4. 

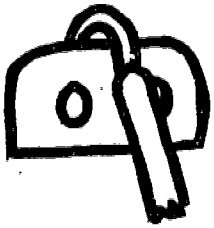
_____

5. 

_____

6. 

_____

7. 

_____

8. 

_____

9. 

_____

10. 

_____

11. 

_____

12. 

_____

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COURSE TITLE: Masonry - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 5.0

TOOLS AND EQUIPMENT

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
5.4	The learner will demonstrate his skill in cleaning tools and equipment as evidenced by a score of ten points on a rating scale concerning the proper care of tools.	5.4	Demonstrate skill in cleaning any five of the following: 1. trowel 2. level 3. jointer 4. mortar hoe 5. mortar mixer 6. mortar box 7. wheelbarrow 8. mortar board RATING SCALE Demonstrate skill in cleaning the following: _____ 2 name _____ 2 name _____ 2 name _____ 2 name _____ 2 name 10
5.5	The student will demonstrate skill in cutting a brick and concrete block to a specified size using correct tools with 80% accuracy according to the following rating scale:		

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COURSE TITLE: Masonry - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 5.0

TOOLS AND EQUIPMENT

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
	RATING SCALE:		
5.5	The students will be graded from the following point assignment: 1. Measurement (deduction of 5 points for every 1/16 off) ... . 20 2. Selection of proper tools and correct use of tools . . . . . 50 3. condition of finished product . . . 20 4. Safety measures 10	5.5	Select the proper tools, follow the proper safety rules and cut to size as follows: 1 common brick to 6"long. 1 concrete block to 13"long.

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COURSE TITLE: Masonry - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 6.0

VICA

The basic masonry student will demonstrate his knowledge of the Vocational Industrial Club of America as evidenced by his ability to score 80% on a written test.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
6.1	The student will list at least five programs sponsored by VICA for student enrichment.	6.1	List five programs sponsored by VICA for student enrichment: 1. _____ 2. _____ 3. _____ 4. _____ 5. _____
6.2	The student will list the entering criteria and the phases of competition sponsored each year by VICA without error.	6.2	List the phases of competition and a criteria for entering each phase: _____ _____ _____ _____ _____
6.3	The student will list at least two projects which can be sponsored by a local VICA organization. Success will be determine with the use of the following 100 point rating scale: RATING SCALE Student will be grades according to the following point assignment: 1. Uniqueness. . . . . 40 2. Cooperation. . . . . 30 3. Judgement (a mature assessment) . . . . . 20 4. Accomplishable. 20 100		

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COURSE TITLE: Masonry - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 6.0 VICA

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
		6.3	List two projects which can be sponsored by a local VICA organization.
6.4	The student will demonstrate affective behavior for VICA as evidenced by a score of 70 on a 100 point rating scale as follows: RATING SCALE Students will be graded according to the following point scale: 1. Joined VICA voluntarily. . . . . 20 2. Held office. . . . . 10 3. Worked om committees. . . . . .10 4. Interacted favorably with members. . 20 5. Cooperation. . . . . 20 6. Convinced others to join. 20 100	6.4	As a VICA club member your behavior in club activities will be graded by the instructor.

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COURSE TITLE: Masonry - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 7.0 Classifying Brick

The basic masonry student will demonstrate his knowledge of various brick used in the trade so that when given a list of the size and characteristics of 10 brick and their use in construction, each student will correctly write the name of the brick with at least 80% accuracy.

No.	Intermediate Performance Objectives	No.	Criterion Measures
7.1	When given the name of six brick, the learner will briefly describe at least five in writing or orally	7.1	Briefly describe the following brick: 1. Common brick: _____ 2. Pressed brick: _____ 3. Glazed brick: _____ 4. Fire brick: _____ 5. Paving brick: _____ 6. Face brick: _____

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COURSE TITLE: Masonry - BASIC

TERMINAL PERFORMANCE OBJECTIVE NO. 7.0 cont'd. Classifying Brick

No.	Intermediate Performance Objectives	No.	Criterion Measures
7.2	Given the name and classification of five brick, the learner will write the dimension of at least four without error.	7.2	Write the size of each brick classified: 4" thickness (bed depth) Name — size 1.)4" Norwegian ____ 2.)Jumbo Closure ____ 3.)Jumbo Utility ____ 6" thickness (bed depth) Name — Size 4.) 6" Norwegian ____ 8" thickness (bed depth) Name — Size 5.) 8" Jumbo ____

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COURSE TITLE: Masonry- Basic

TERMINAL PERFORMANCE OBJECTIVE NO. 7.0 cont'd. Classifying Brick

No.	Intermediate Performance Objectives	No.	Criterion Measures
7.3	Given two list, one of the classification of brick and one of description, the student will correctly match 75% of the terms.	7.3	Match the two list below: _____common brick _____face brick _____fire brick _____paving brick A. extremely hard, usually annealed or vitfified. B. Made of clay or shale and have natural surface. C. Made accurately to size and finished rough or smooth. D. Made from a mixture of flint clay and plastic clay. White mixed with brown.
7.4	Given the name of three brick, the student will write a brief description of each brick in terms of color, texture and size without error.	7.4	Write a brief description of the following brick. Include color, texture and size: 1. Roman brick 2. Norman brick 3. Engineer's brick

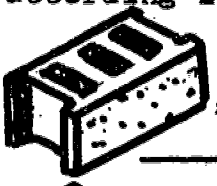
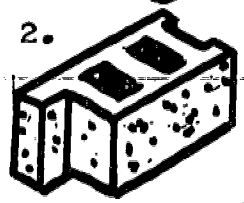
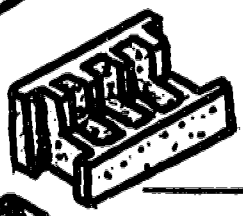
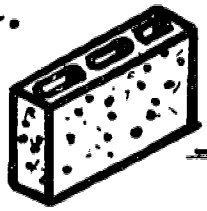
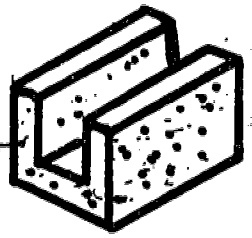
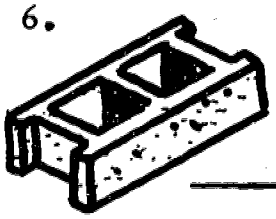
ACCREDITATION NUMBER 9133

COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE OBJECTIVE NO. 8.0

Classifying Concrete Block

The basic masonry student will demonstrate his knowledge of the names, classification and use of concrete block used in the trade with 80% accuracy.

No.	Intermediate Performance Objectives	No.	Criterion Measures
8.1	From the drawings of six concrete block, the student will write the name and dimensions of at least five without error.		Identify the concrete block below according to name and size: 1.  _____ 2.  _____ 3.  _____ 4.  _____ 5.  _____ 6.  _____

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 8.0 cont'd. Classifying Concrete Block

No.	Intermediate Performance Objectives	No.	Criterion Measures
8.2	The student will correctly match four concrete block when given the names in one list and the description in another list.	8.2	Match the two columns below. ____ Double corner ____ Lintel block ____ Partition block ____ Solid cap A. Used for construction of reinforced block beams. B. Used in constructing nonbearing partition walls. C. Used primarily as a facer unit in framing floor joists in a masonry wall. D. Designed for use in laying piers or pilasters.

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE OBJECTIVE NO. 9.0 Mixing Mortar

The basic masonry student will demonstrate his knoweldge of the specifications, proper mix and types of moratr by achieving a score of 80% on a written examination and will demonstrate his skill in mixing mortar to the correct texture for a 2:6 lime-sand mix.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
9.1	Given the mortar specification number, the learner will write the catagory with 100% accuracy.	9.1	Write the catagory for the ASTM specification below: 1. C 270 _____
9.2	Given a list of the five types of mortar proportions by volume for portland cement-lime mortars and the proportion of portland cemnet, the student will write-in the proportion of lime and sand with 80% accuracy.	9.2	Write the proportion of lime and sand for each of the types listed below:

Type	Portland cement	Lime	Sand
M	1	___	___
S	1	___	___
N	1	___	___
O	1	___	___
K	1	___	___

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE OBJECTIVE NO. 9.0 cont'd. Mixing Mortar

No.	Intermediate Performance Objectives	No.	Criterion Measures
9.3	Given a list of the four types of masonry cement mortar and the proportion of portland cement and masonry cement, the student will write-in the proportion of sand with 80% accuracy.	9.3	Write the proportion of sand for each of the types listed below: Type / Portland cement / Masonry cement / sand M / 1 / 1 / ____ S / ½ / 1 / ____ N / ____ / 1 / ____ O / ____ / 1 / ____ N and O; no portland cement needed.
9.4	Given the proper tools and materials the learner will mix mortar to the correct proportion and texture for shop use using a 2:6 lime-sand mix as determined by a 100 point rating scale: Students will be graded according to the following point scale: 1. Selection of tools. . . . . 10 2. Procedure. . . . . 20 3. Proper mix. . . . . 25 4. Finished product. . . . . 25 5. Safety measures. 20	9.4	Mix a batch of mortar to the correct proportion and texture for shop use; use a 2"6 lime sand mix.

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE OBJECTIVE NO. 10.0 — Masonry Terms

The basic masonry student will demonstrate his ability to communicate effectively using terms common to the masonry trade by defining 36 of 40 given masonry terms.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
10.1	The student will demonstrate his knowledge of masonry terms as evidenced by his abilir ability to define in writing or orally nine of ten given terms without error.	10.1	Define the following terms: 1. Bat 2. Header 3. Stretcher 4. Bed joint 5. Head joint 6. Bond 7. Buttering 8. Kiln 9. Rowlock course 10. Soldier course
10.2	The student will demonstrate his knowledge of masonry terms as evidenced by his ability to define in writing or orally nine of ten given terms without error.	10.2	Define the following terms: 1. Common bond 2. Stretcher bond 3. English bond 4. Flemish bond 5. Dutch bond 6. Herringnone 7. Basket weave 8. Pilaster 9. Story pole 10. English Cross bond
10.3	The student will demonstrate his knowledge of masonry terms as evidenced by his ability to define in writing or orally nine of ten given terms without error.	10.3	1. Pier 2. Blind header 3. Bull nose 4. Bull stretcher 5. Brick veneer 6. Wall tie 7. Closer 8. Rise 9. Tread 10. Pointing

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 10.0 cont'd. Masonry Terms

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
10.4	The student will demonstrate his knowledge of masonry terms as evidenced by his ability to define in writing or orally nine of ten given terms without error.	10.4	Define the following terms: 1. Belt course 2. Breaking joint 3. Batterboard 4. Scaffold 5. Coping 6. Foundation wall 7. Gothic Arch 8. Roman Arch 9. Flat Arch 10. Clipped Header

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 11.0 Spreading Mortar

The basic masonry student will demonstrate skill in spreading mortar so that when given the proper tools and materials, he will; (1) spread mortar the length of four concrete block and (2) spread mortar the length of four common brick with 90% accuracy as determined by a 100 point rating scale.

No.	Intermediate Performance Objectives	No.	Criterion Measures
11.1	The student will demonstrate skill in handling the trowel with 90% proficiency as determined with the use of a 100 point rating scale. Students will be graded according to the following point scale: 1. Knowledge of assignment.....20 2. Attitude toward assignment.....20 3. Accuracy.....50 4. Safety..... 10	11.1	Handle the trowel demonstrating the following as criteria: 1. Grip for picking up mortar from board. 2. Grip for spreading mortar on concrete block. 3. Grip for spreading mortar on common brick. 4. Grip for buttering block. 5. Grip for buttering brick
11.2	The student will demonstrate skill in picking up mortar with the trowel with 90% proficiency as determined with the use of a 100 point rating scale. Students will be graded according to the following point scale: 1.Knowledge of assignment.....20 2.Attitude toward assignment.....20 3. Accuracy.....50 4. Safety.....10	11.2	Using a preselected trowel, pick up mortar from board at least five times.

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 11.0 Cont'd. Spreading Mortar

No.	Intermediate Performance Objectives	No.	Criterion Measures
11.3	The student will demonstrate the technique of spreading mortar with 90% proficiency as determined with the use of a 100 point rating scale. Students will be graded according to the following point scale: 1. Knowledge of assignment.....20 2. Attitude toward assignment....20 3. Accuracy.....50 4. Safety.....10	11.3	Align four concrete block and four common brick and demonstrate technique of spreading mortar with the use of a trowel and mortar.

ACCREDITATION NUMBER 9133

COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 12.0 Buttering Brick and Block

The basic masonry student will demonstrate skill in buttering brick and concrete block so that when given the proper tools and materials, he will butter brick and concrete block with at least 80% proficiency as determined with the use of a 100 point rating scale.

NO.	Intermediate Performance Objectives	No.	Criterion Measures
12.1	The learner will demonstrate skill in handling brick to be buttered with at least 90% proficiency as determined by a 100 point rating scale.	12.1	Properly grip a minimum of five brick to be buttered.
12.2	The learner will demonstrate skill in handling concrete block to be buttered with at least 90% proficiency as determined by a 100 point rating scale.	12.2	Properly handle a minimum of twoconcrete block to be buttered.
12.3	The learner will demonstrate skill i in handling brick and trowel with mortar simultaneously with at least 90% proficiency as determined by a 100 point rating scale.	12.3	Properly grip brick for buttering and scoop mortar in same performance.
12.4	The learner will demonstrate skill in handling block and trowel with mortar simultaneously with at least 90% proficiency. Students will be graded from the following point assignment: 1. Knowledge of assignment.....20 2. Attitude toward assignment.....20 3. Accuracy.....50 4. Safety.....10	12.4	Properly handle block for buttering and scoop mortar in same performance.

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE OBJECTIVE NO. 13.0 Cleaning Masonry Work

The basic masonry student will demonstrate his knowledge of the methods and materials used to clean brick as evidenced by a score of 80% on a written test and score at least 80% on a performance test.

No.	Intermediate Performance Objectives	No.	Criterion Measures
13.1	The learner will correctly identify in writing or orally, three methods of keeping brick clean while laying with 100% accuracy.	13.1	List three methods of keeping brick clean while laying: 1. _____ 2. _____ 3. _____
13.2	The learner will identify from a list of five solutions the appropriate one to use for cleaning brick.	13.2	From the list of solutions listed below, circle the one which is appropriate to use for cleaning brick: 1. Muriatic acid solution 2. Alcohol solution 3. Household detergent 4. Hydrochloric acid 5. Chlorine-water solution

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE OBJECTIVE NO 13.0 Cleaning Masonry Work

No.	Intermediate Performance Objectives	No.	Criterion Measures
13.3	The learner will list in proper order the ten steps to follow when cleaning a brick wall with 100% accuracy.	13.3	In the order in which they must occur, list the ten steps to follow when cleaning a brick wall: 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____ 8. _____ 9. _____ 10. _____

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 13.0 Cont'd. Cleaning Masonry Work

No.	Intermediate Performance Objectives	No.	Criterion Measures
13.4	The learner will demonstrate skill in cleaning brickwork so that when given the proper materials, he will clean an eight course red brick wall section with 80% proficiency. Students will be graded according to the following point scale: 1. Knowledge of assignment....25 2. Attitude toward assignment.....10 3. Accuracy.....50 4. Safety.....15 100	13.4	Select the proper cleaning solution and equipment then clean an eight course red brick wall section.

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 14.0 Laying to the Line

The basic masonry student will demonstrate skill in laying to the line so that when given the proper tools and materials, he will lay six or more brick to the line and four concrete block to the line with at least 90% accuracy as determined with the use of a 100 point rating scale.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
14.1	The learner will demonstrate his knowledge of the building line by correctly answering four of six essay questions.	14.1	Answer the following questions: 1. How long should the wall be before the line is needed? 2. Of what material is the mason's line made? 3. Why is it made of a special kind of material? 4. What causes a line to sag on the wall? 5. When should the line be disturbed? 6. What is meant by "crowding the line?
14.2	The learner will demonstrate skill in tying grade line to line block with 90% proficiency as determined with the use of a 100 point rating scale. 1. Knowledge of assignment 25 2. Attitude toward assignment 10 3. Accuracy 50 4. Safety 15 100	14.2	Tie a grade line to line block.

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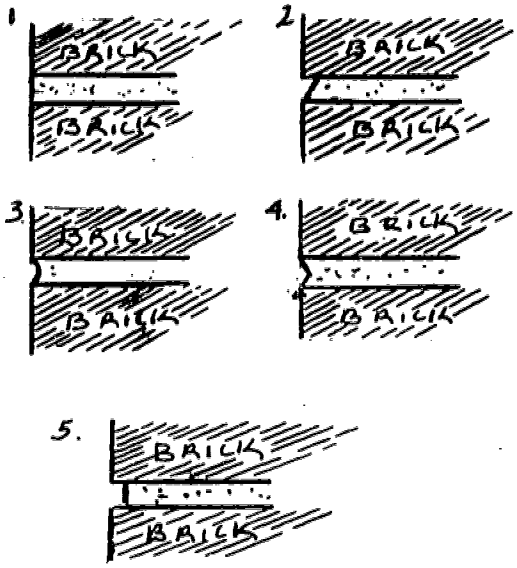
COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE OBJECTIVE NO. 14.0 Laying to the Line

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
14.3	The student will demonstrate skill in raising grade line with at least 90% proficiency as determined by rating scale used for IPO 14.2.	14.3	Raise the grade line accurately for the next course.
14.3	The student will demonstrate his knowledge of a twig by correctly answering 3 of 4 questions orally or in writing.	14.3	Briefly answer the following questions 1. What is the purpose of a twig? 2. What does the twig consist of? 3. What does the man do who carries the twig? 4. What determined the number of twigs a wall will have?
14.5	The student will demonstrate his knowledge of joints used in masonry work as evidenced by his ability to identify five joints in a diagram without error.	14.5	Identify the joints below by writing the name of each below the joint. 

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 14.0 Laying to the Line

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES		NO.	CRITERION MEASURES
14.6	The student will demonstrate his ability to strike each of the five joints in a masonry wall with 90% accuracy. This will be determined with the use of a 100 point rating scale: 1. Knowledge of assignment 10 2. Attitude toward assignmnet 05 3. Selection of tools 40 4. Accuracy 40 5. Safety 05 100		14.6	Strike one each of the following five joint finishes: 1. Concave 2. Flush 3. Raked 4. Bead 5. Weather

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 15.0 Estimating Brick and Block

The basic masonry student will demonstrate his ability to use given measuring tools to within a 1/16" tolerance, will demonstrate his knowledge of basic of basic mathematics by scoring 80% on written tests, and will estimate with 80% accuracy the number of brick and block needed to construct a given size masonry wall.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
15.1	The learner will demonstrate his knowledge of the 12" ruler by correctly measuring four of five given lines within 1/16 inch.	15.1	Measure the lines below and write results above the line: 1. _____ 2. _____ 3. _____ 4. _____ 5. _____
15.2	The learner will demonstrate his knowledge of the 6' mason's ruler by correctly measuring four of five objects to within 1/16 inch.	15.2	You are to select five objects either in the classroom or in the shop area and measure each object using the 6' mason's ruler. Record object measured and dimension in either length, width, or height.
15.3	The learner will demonstrate his knowledge of the 50' measuring tape by correctly measuring three or four objects to within 1/16 inch.	15.3	You are to select four objects in the shop area and measure each using the 50' measuring tape. Record objects measured and the dimension of each in length. *Students are to work in pairs*.

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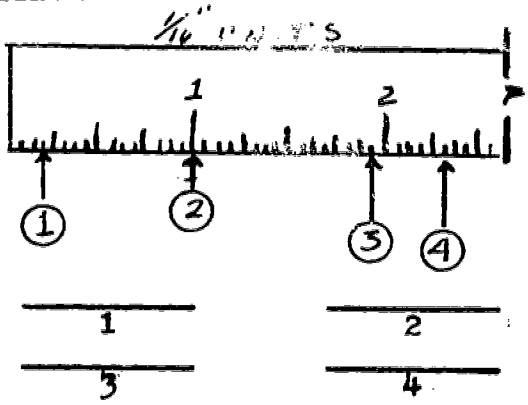
COURSE TITLE: Masonry - Basic

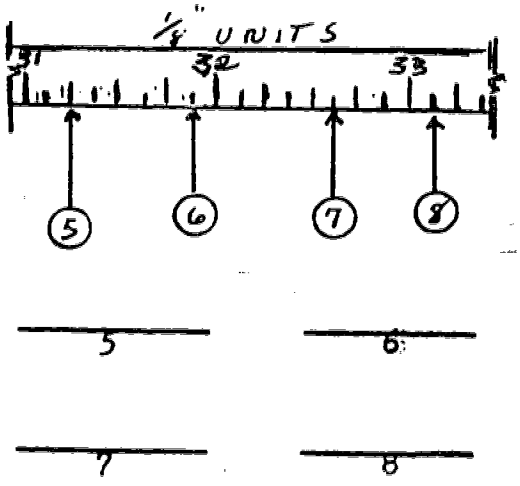
TERMINAL PERFORMANCE
OBJECTIVE NO. 15.0 Cont'd. Estimating Brick and Block

No.	Intermediate Performance Objectives	No.	Criterion Measures
15.4	The learner will demonstrate his knowledge in reading measuring instruments by correctly reading and recording eight given measures with 100% accuracy.	15.4	After reading a given measure record your answer on the appropriate line:

1.



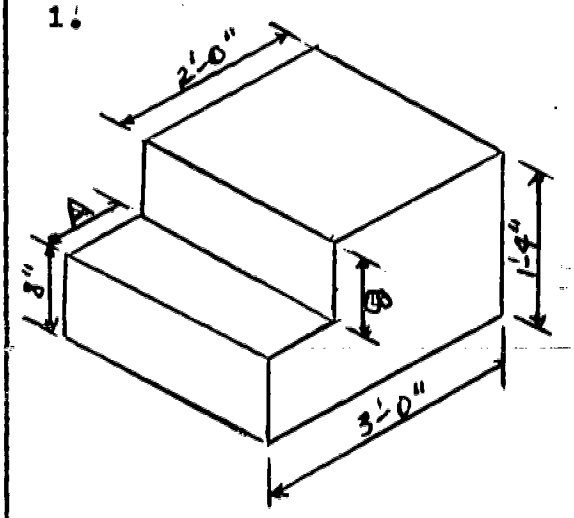
2.



ACCREDITATION NUMBER 9133

COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 15.0 Cont'd. Estimating Brick and Block

No.	Intermediate Performance Objectives	No.	Criterion Measures
15.5	The student will demonstrate his knowledge of operations with whole numbers by correctly answering each of 2 questions on a given diagram in writing.		Find the dimension of A and B in the diagram below: 1.  A = _____ B = _____

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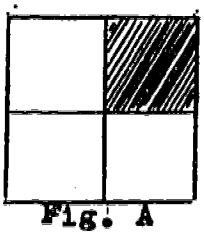
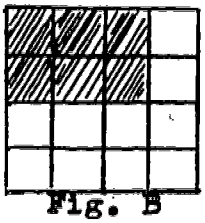
COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 15.6 Cont'd. Estimating Brick and Block

No.	Intermediate Performance Objectives	No.	Criterion Measure
15.6	The learner will demonstrate his knowledge of operations with common fractions as evidenced by a score of 80% on a written test.	15.6	Answer the questions below using fig. A and B as a reference:  Fig. A  Fig. B 1. Find the sum of the shaded region in Fig. A and B. _____ ans. 2. Subtract the unshaded regions in fig. B from the unshaded region in fig. A. _____ ans. 3. Find the sum of the unshaded region in fig. A and B. _____ ans. 4. Find the product of the shaded region in fig. A and the unshaded region in fig. B. _____ ans. 5. How many 1/8" units are there in three 1/4" units? _____ ans.

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 15.0 Cont'd. Estimating Brick and Block

No.	Intermediate Performance Objectives	No.	Criterion Measure
15.7	The student will demonstrate his knowledge of area measure as evidenced by a score of 75% on a written test.	15.7	Answer questions 1-4 using the figure below as a reference:  fig. A 1. What is the area of the rectangle in fig. A? _____ ans. 2. How many rectangles 16" long are there in the length of the rectangle in fig. A? _____ ans. 3. How many rectangles 8" high are there in the rectangle in fig. A? _____ ans. 4. How many rectangles 8"x16" are there in the entire rectangle shown in fig. A? _____ ans.

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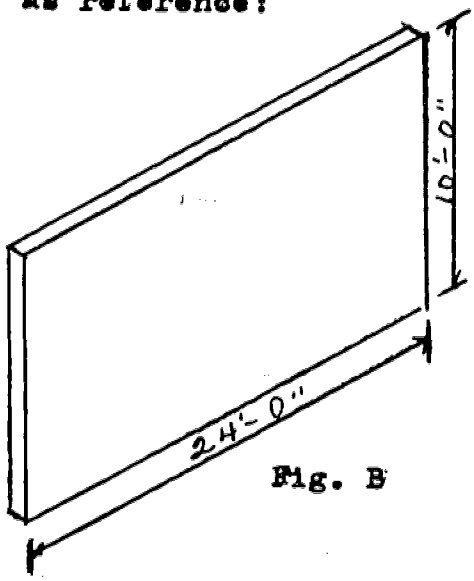
COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 15.0 Cont'd. Estimating Brick and Block

No.	Intermediate Performance Objectives	No.	Criterion Measure
15.8	When given a diagram of a proposed masonry wall, the student will correctly estimate the number of brick and block in the wall with 80% accuracy.	15.8	Answer the questions below using the diagram in fig. B as reference:  Fig. B 1. How many 6" Norwegian brick are there in the wall shown in fig. B? _____ ans. 2. How many 8"x8"x16" concrete block are there in the wall? _____ ans. 3. How many 4" common brick are there in the wall? _____ ans.

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 16.0 Pilasters

The basic masonry student will demonstrate his knowledge of pilasters as evidenced by his ability to score at least on a written test and to perform with at least 90% proficien on a performance test.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
16.1	The learner will correctly identify orally or in writing four types of pilasters pilasters; two of which are used in brick walls and two of which are used in concrete walls.	16.1	Identify four types of pilasters using the following criteria: 1. Two which are used in brick walls; (4", 8", 12" etc.) 2. Two inch are used in concrete block walls (8" x 8", 8"x24" etc.) 3.
16.2	The learner will correctly describe in writing or orally the method used to construct concrete pilasters in masonry walls.	16.2	Decsribe the method used in construct concrete pilasters in masonry walls. Include the following: 1. method and materials used to reinforce. 2. method and materials used to form. 3. method and materials used to pour. 4. footing specifications
16.3	Given the proper materials, the learner will lay out dry, a four course pilaster in a 4" brick wall and a four course pilaster in an 8" concrete block wall with at least 90% proficiency as determined with a 100 point rating scale. RATING SCALE 1. Knowledge of assignment. . . . . 25 2. Attitude toward assignment. . . . 10 3. Accuracy. . . . . .50 4. Safety. 15	16.3	Using dry materials, lay out a four course pilastic in an 8" concrete block wall and a 4" brick wall respectively.

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE OBJECTIVE NO. 16.0 Pilasters

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
16.4	Given the proper materials and four project sheets of different type pilasters, the student will select one ttpe and construct it in a four wall section with at least 80% proficiency as determined bya 100 point rating scale: 1. Knowledge of assignment. . . . . 30 2. Attitude toward assignment. . . . . 05 3. Accuracy. . . . . 50 4. Safety measures. 15	16.4	Select a type of pilaster and construct it in a four wall section.

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COURSE TITLE: Masonry- Basic

TERMINAL PERFORMANCE OBJECTIVE NO. 17.0 — Door and Window Openings

The basic masonry student will demonstrate his knowledge of door and window construction and his ability to lay out and plumb door and window openings as evidenced by a score of 80% on a written test and perform with at least 90% proficiency on a performance test.

No.	Intermediate Performance Objectives	No.	Criterion Measures
17.1	The learner will identify the three principal parts of the window from a list of ten terms associated with windows and define each with 100% accuracy.	17.1	From the list below, identify the three principal parts of the masonry window and define each: 1. Plaster 2. Apron 3. Head 4. Drip 5. Step 6. Jamb 7. Sill 8. Steel 9. Bead 10. Ground 1. _____ _____ 2. _____ _____ 3. _____ _____
17.2	Given a list of eight masonry terms, the student will identify four which are a part of window construction.	17.2	From the terms listed below, circle four which are related to window construction: 1. pre-cast lintel 2. flat iron 3. soldier course 4. herringbone 5. rowlock course 6. furring 7. jam block 8. steel rod

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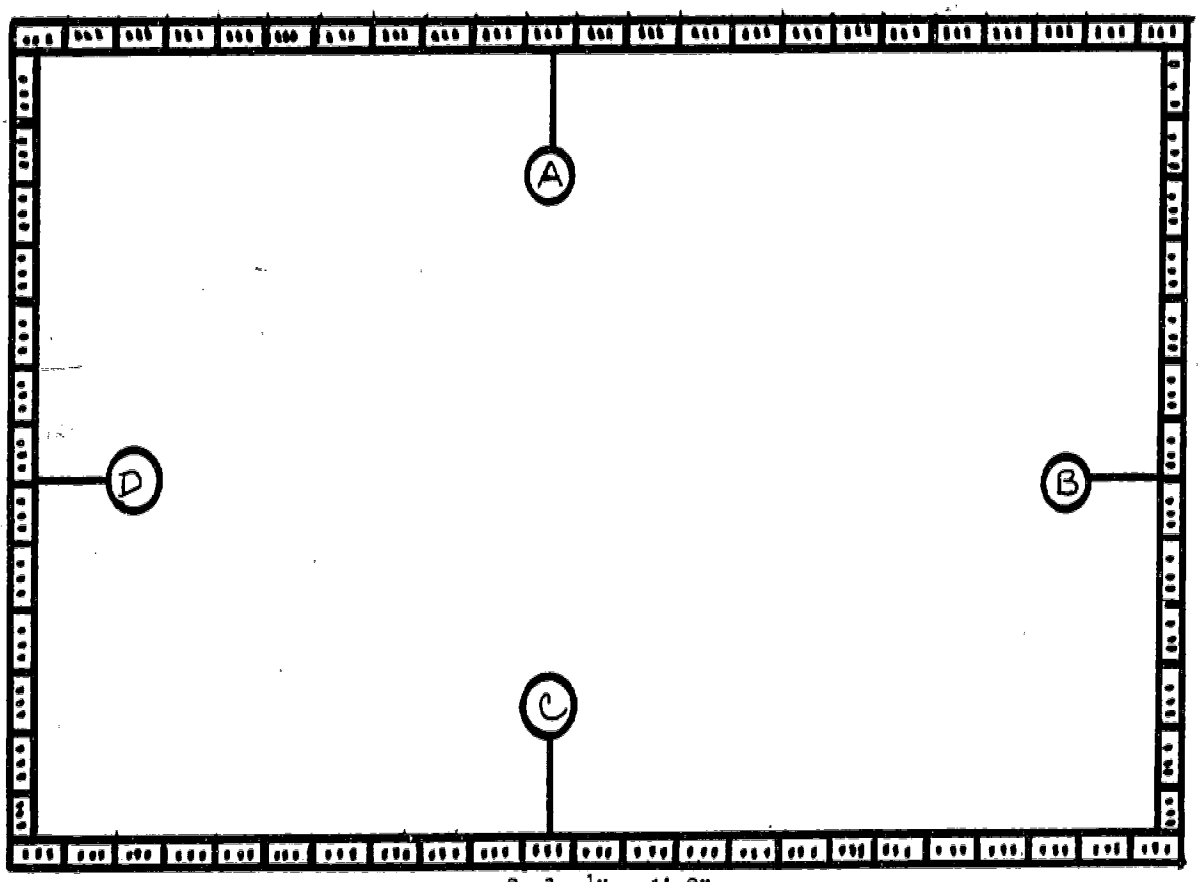
COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 17.0 Door & Window Openings

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
17.3	Given the diagram of a four wall concrete block structure, the student will lay two windows and two doors to bond with masonry with 100% accuracy.	17.3	Lay out two windows and two doors to bond with masonry in a four wall concrete block structure.
17.4	Given the proper tools and materials the learner will lay out and plumb four courses of a window jamb in a brick and a block wall with 80% proficiency as determine by a 100 point rating scale. 1. Knowledge of assignment 30 2. Attitude toward assignment 05 3. Accuracy 50 4. Safety measures 15	17.4	Lay out and plumb four courses of a window jamb in a concrete block and brick wall respectively. 1. Knowledge of assignment. . . . . 30 2. Attitude toward assignment. . . . 05 3. Accuracy. . . . . 50 4. Safety measures. 15
17.5	Given the proper tools and materials the learner will lay out and plumb four courses of a door jamb in a brick and a block wall with 80% proficiency as determined by a 100 point rating scale. 1. Knowledge of assignment 30 2. Attitude toward assignment 05 3. Accuracy 50 4. Safety measures 15	17.5	Lay out and plumb four courses of a door jamb in a concrete block and brick wall respectively.

Concrete Block Structure

18'8" x 30'-8"



Scale-$\frac{1}{4}$" = 1'-0"

Answer questions on following page

USE RED LEAD PENCIL

1. Mark-off door and window on wall A:
   a. door-3'-0"
   b. window- 3'-4"

2. Mark-off door and two windows on wall C:
   a. door-3'-0"
   b. windows-2'-8"

3. Mark-off window on wall D:
   a. Window-6'-8"

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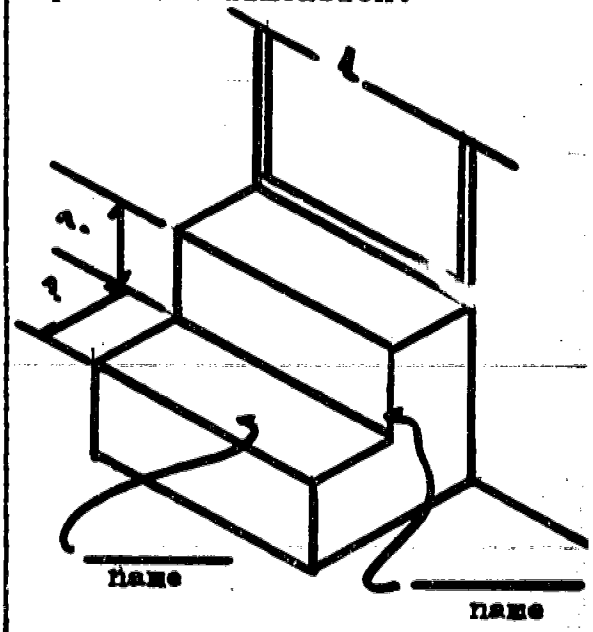
COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 18.0 Step Construction

The basic masonry student will demonstrate his knowledge of step construction and his skill in constructing steps by scoring at least 80% on a written test and by performing with at least 80% proficiency on a performance test.

No.	Intermediate Performance Objectives	No.	Criterion Measures
18.1	Given the diagram of a two-rise step, the learner will identify the two basic parts of the step and the specified dimension of each with 100% accuracy.	18.1	On the diagram below, name the parts indicated and the specified dimension: 

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE OBJECTIVE NO. 18.0 Step Construction

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
18.2	Given eight questions relative to step construction, the learner will correctly answer six orally or in writing.	18.2	Briefly answer the following questions 1. What is the function of treads? 2. What are tus? 3. For effective construction, what should be the relationship between the rise and tread? 4. What does the width of steps depend upon? 5. What is the minimum required width of steps? 6. Briefly explain why steps should be supported by a concrete base or footing:

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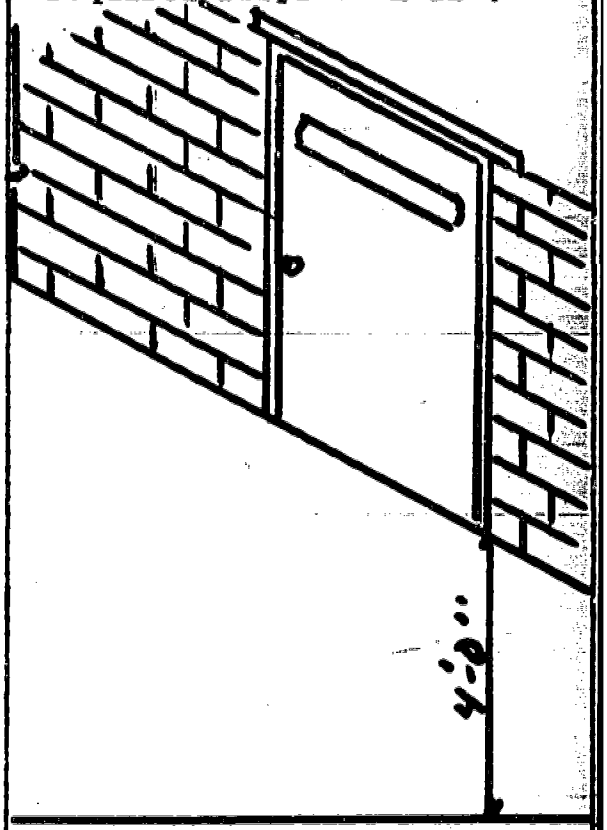
COURSE TITLE: _____ asonry - Basic _____

TERMINAL PERFORMANCE
OBJECTIVE NO. 18.0 Cont'd. Step Construction

No.	Intermediate Performance Objectives	No.	Criterion Measures
18.3	Given the diagram of the proposed location of a set of steps and the proper dimensions, the learner will correctly determine the length of the steps and the number of rises with 100% accuracy.	18.3	From the diagram below, determine the length of the steps and the number of required steps: 8" x 12".  1. Number of steps: _____ 2. Length of steps: _____

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE OBJECTIVE NO. 18.0 Step Construction

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
18.4	Given the proper tools and materials the learner will demonstrate skill by constructing a rowlock course in a two-foot length-straight, level and plumb with 80% proficiency as determined by a 100 point rating scale. RATING SCALE 1. Knowledge of assignment 20 2. Atttiude toward assignment 10 3. Safety Practices 10 4. Straight 10 5. Level 10 6. Plumb 10 Cleanliness 7. Working Area 10 8. Job or Project 10 9. Tools 10	18.4	Construct a rowlock course in a two foot length straight level and plumb. RATING SCALE 1. Knowledge of assignment. . . . . 20 2. Attitude toward assignment. . . . . 10 3. Safety Practices. . . . . 10 4. Straight. . . . . 10 5. Level. . . . . 10 6. Plumb. . . . . 10 Cleanliness 7. Working Area. . . . . 10 8. Job or Project. . . . . 10 9. Tools. 10
18.5	Given the proper tools and materials the learner will construct two-rise, eight mib steps with at least 80% proficiency as determined with the use of a 100 point rating scale.	18.5	Construct a two rise step, eight inches in height.

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 19.0 Bonds

The basic masonry student will demonstrate his knowledge of bonds and will demonstrate skill in constructing different bonds by scoring at least 80% on a written test and performing with at least 80% proficiency on a performance test.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
19.1	Given a list of the definitions of various bonds and the names of different bonds, the learner will correctly match the names with definitions with 80% accuracy.	19.1	Match the two list below: ____1. Bricks in all courses are laid as stretchers. ____2. Bricks in all courses are laid as headers. ____3. Every fifth or sixth course are headers and the intervening courses are stretcher ciurses. ____4. Produced by alternating a cours of stretchers with a course of headers. ____5. Laid using three-quarter and half closures together with regular headers and stretches. A. Dutch Bond B. Common Bond C. Header Bond D. Old English Bond E. Header Bond
19.2	Given the proper tools and materials the learner will lay out dry two given bonds in a four course brick wall with at least 80% proficiency as determined by a 100 point rating rating scale: 1. Knowledge of assignment 30 2. Attitude toward assignment 05 3. Accuracy 50 4. Safety 15	19.2	Using dry brick, lay out two given bonds in a four course brick wall.
19.3	Given the proper materials and a detailed pr project sheet, the learner will lay the Common bond in a four course brick wall with at least 80% proficiency determined with the use of a 100 point rating scale.	19.3	Construct a four course brick wall using the Common bond.

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE OBJECTIVE NO. 19.0 — Bonds

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
19.4.	Given the proper materials and a detailed project sheet, the learner will lay the English bond in a four course brick wall with at least 80% proficiency determined with the use of a 100 point rating scale.	19.4	Construct a four course brick wall using the English bond.
19.5	Given the proper materials and a detailed project sheet, the learner will lay the Dutch bond in a four course brick wall with at least 80% proficiency as determined with the use of a 100 point rating scale. (RATING SCALE ATTACHED)	19.5	Construct a four course brick wall using the Dutch bond.
19.6	Given the proper materials and a detailed project sheet, the learner will lay a basket weave pattern with at least 80% proficiency as determined with the use of a 100 point rating scale. 1. Knowledge of assignment. . . . . 30 2. Attitude toward assignment. . . 05 3. Accuracy. . . . . 50 4. Safety Practices. 15	19.6	Construct a two foot length of a 11 wall laying a soldier course:
19.7	Given the proper materials and a detailed project sheet, the learner will lay a basket weave pattern with at least 80% proficiency as determined with the use of a 100 point rating scale.	19.7	Lay a basket weave pattern, using detailed project sheet.

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 19.0 Bonds

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
19.8	Given the proper materials a four square foot area and a detailed project, the learner will layout dry, the Herringbone pattern with at least 80% accuracy as determined with the use of a 100 point rating scale.	19.8	Using dry brick, layout the Herringbon pattern in a four square foot area.

RATING SCALE

1.	Knowledge of Assignment.....20
2.	Attitude toward assignment.....10
3.	Safety practices.....10

ACCURACY

4.	Straight..... 10
5.	Level..... 10
6.	Plumb..... 10

Neatness-Cleanliness

7.	Working Area.....10
8.	Job or Project.....10
9.	Tools.....10

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 20.0 Corner Leads

The basic masonry student will demonstrate his knowledge of corner leads and will demonstrate skill in constructing corner leads by scoring at least 80% on a written test and by performing with at least 90% proficiency on a performance test.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
20.1	Given a list of the three methods used to layout corners, the student will correctly explain two of the three methods orally or in writing.	20.1	Briefly describe the three methods used for laying out corners listed below: 1. With lay out square: 2. With surveyor's instrument: 3. 6-8-10 method:
20.2	Given the proposed height of a foundation wall and the type of block and/or block to be used, the student will determine the number of courses required of each type to reach the building line with 75% accuracy.	20.2	A foundation wall is to be 2'-8 high. Write the number of courses required of each type brick or block listed below to reach the buikding line: 1. 8" x 8" x 16" conc. block. 2. 6" ans. 2. 6" Norwegian brick ans. 3. 4" Red common ans. 4. 4" x 8" x 16" Ashley. ans.

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE OBJECTIVE NO. 20.0 Corner Leads

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
20.3	Given the proper materials, the learner will constructan eight-course 4" brick lead in common bond with 90% proficiency. Success will be determined with the use of a 100 point rating scale.	20.3	Construct an eight-course 4" brick lead common bond.
20.4	Given the proper materials, the learner will constructan four-course 8" block lead with 90% proficiency. Success will be determined with the use of a 100 point rating scale.	20.4	Construct a four-course, 8" block lead.
20.5	Given the proper materials, the learner will constructan eight-course brick lead in English bond with 90% proficiency. Success will be determined with the use of a 100 point rating scale.	20.5	Construct an eight-course brick lead in English bond.
20.6	Given the proper materials, the learner will construct a five-course 12 inch brick lead in Common bond with 90% proficiency. Success will be determined with the use of a 100 point rating scale.	20.6	Construct a five course 12" brick lead in Common bond.
20.7	Given the proper materials, the learner will constructan eight-course 4" Ashley block lead with 90% accuracy. Success will be determined with the use of a 100 point rating scale.	20.7	Construct an eight-course 4" Ashley block lead.

RATING SCALE

KNOWLEDGE OF ASSIGNMENT	20
ATTITUDE TOWARD ASSIGNMENT	10
SAFETY PRACTICES	10

ACCURACY

STRAIGHT	10
LEVEL	10
PLUMB	10

CLEANLINESS-NEATNESS

WORKING AREA	10
JOB OR PROJECT	10
TOOLS	10

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 21.0 Piers

The basic masonry student will demonstrate his knowledge of masonry piers and will demonstrate skill in constructing piers by scoring at least 80% on a written test and by performing with ar least 90% proficiency on a performance test.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
21.1	The learner will demonstrate his knowledge of the classification of piers by correctlying answering each of three questions on a written test.	21.1	Answer the following questions: Piers may be classified: 1. With respect to construction, as a. _____ b. _____ 2. With respect to location, as a. _____ b. _____ 3. With respect to shape, as a. _____ b. _____
21.2	Given the proper materials, the learner will layout dry, four courses of a 12" x 12" solid pier and four courses of a 16" x 16" hollow brick pier with 80% proficiency as determined with the use of a rating scale. 1. Knowledge of assignment 30 2. Attitude toward assignment 05 3. Accuracy 50 4. Safety Practices 15	21.2	Using dry brick, layout four courses of 12" x 12" solid brick pier and four courses of a 16" x 16" hollow brick pier

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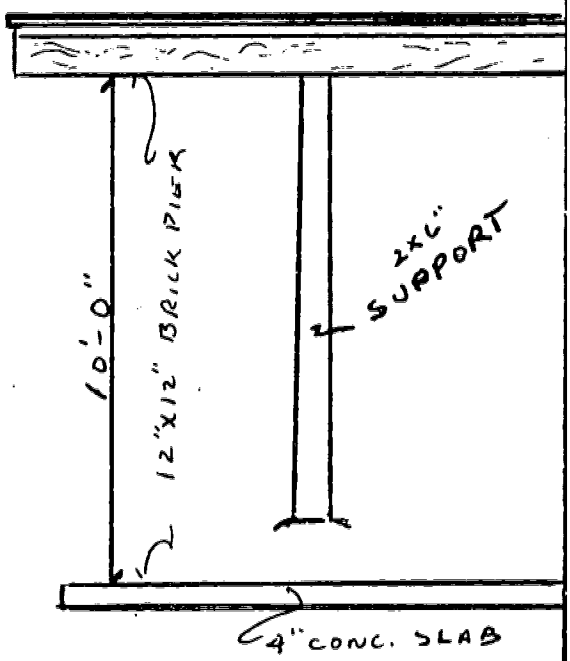
COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 21.0 Cont'd. Piers

No.	Intermediate Performance Objectives	No.	Criterion Measures
21.3	Given the diagram of the proposed height of a 12" x 12" brick pier and the type brick to be used, the learner will determine the number of courses of brick needed with 100% accuracy.	21.3	Using the diagram as a reference, answer the following questions.  Q. How many courses of 4" norwegian brick measuring 3-5/8 x 2-3/4 x 11-5/8 are required in the diagram above? A. _____

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COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 21.0 (cont'd) Piers

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
21.4	Given the proper tools and materials the student will prepare a story pole for a given pier with 100% accuracy.	21.4	Prepare a story pole using the following criteria: 1. 40 courses of 4" nerwegian brick measuring 3-5/8 x 2-3/4 x 11-5/8. 2. Allow for $\frac{1}{4}$" mortar joint.
21.5	Given the proper materials, the student will construct an 8" x 8" solid brick pier of 4" red common with 90% accuracy as determined with the use of a rating scale.	21.5	Construct an 8" x 8" solid brick pier of 4" red common brick.
21.6	Given the proper materials, the student will construct a 12" x 12" hollow brick pier with 90% accuracy as determined with the use of a rating scale.	21.6	Construct a 12" x 12" hollow brick pier.
21.7	Given the proper materials, the student will construct a 16" x 20" hollow brick pier with 90% accuracy as determined with the use of a rating scale.	21.7	Construct a 16" x 20" hollow brick pier.
21.8	Given the proper materials, the student will construct a 12" x 16" hollow brick pier with 90% accuracy as determined with the use a 100 point rating scale.	21.8	Construct a 12" x 16" hollow brick pier.

ACCREDITATION NUMBER 9133

COURSE TITLE: Masonry - Basic

TERMINAL PERFORMANCE
OBJECTIVE NO. 22.0 Arches

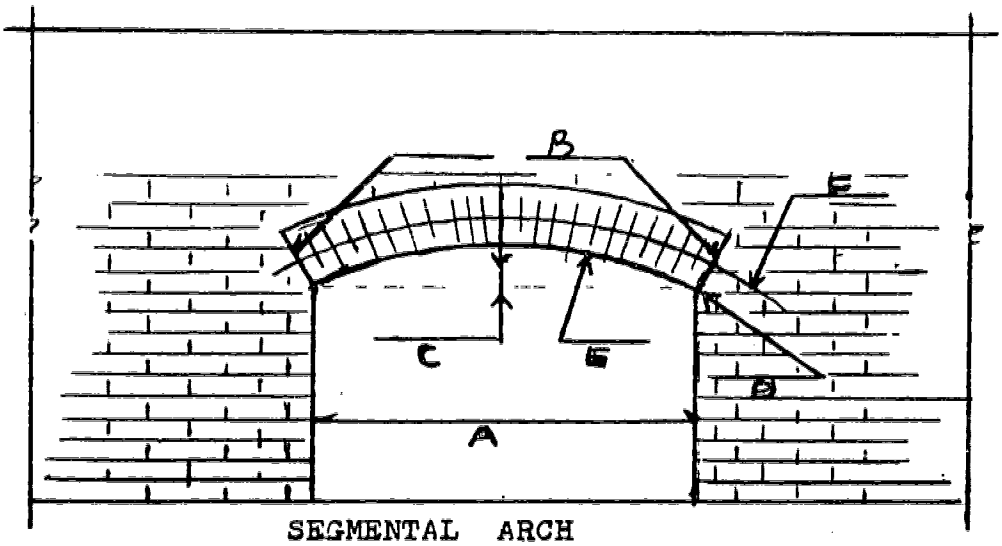
The basic masonry student will demonstrate his knowledge of arches and his skill in constructing arches by scoring at least 75% on a written test and performing with at least 80% accuracy on a performance test.

NO.	INTERMEDIATE PERFORMANCE OBJECTIVES	NO.	CRITERION MEASURES
22.1	The learner will identify in writing five of the seven known arches.	22.1	In the space provided, write the names of the seven known arches: 1. _____ 2. _____ 3. _____ 4. _____ 5. _____ 6. _____ 7. _____
22.2	Given the diagram of a Segmental Arch, the learner will correctly identify in writing each of the six known parts.	22.2	Diagramed Attached.
22.3	Given the proper tools, materials and a detailed project sheet, the learner will construct the Segmental Arch with at least 80% proficiency as determined with the use of a 100 point rating scale.	22.3	Construct the Segmental Arch as diagramed.

BASIC MASONRY

DATE: _____ NAME: _____
student

Write the name of the six parts of the arch below in the blank space provided:



SEGMENTAL ARCH

A. _____ B. _____ C. _____

D. _____ E. _____ F. _____