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An Update of the Tidewater Apprenticeship Information Handbook

Claud R. Divers III
Old Dominion University

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AN UPDATE OF THE

TIDEWATER APPRENTICESHIP

INFORMATION HANDBOOK

A STUDY

PRESENTED TO

THE FACULTY OF THE SCHOOL OF EDUCATION

OLD DOMINION UNIVERSITY

IN PARTIAL FULFILLMENT

OF THE REQUIREMENTS FOR THE DEGREE

MASTERS OF SCIENCE IN EDUCATION

by

Claud R. Divers, III

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This research paper was prepared by Claud R. Divers, III under the direction of Dr. John M. Ritz in Vocational and Technical Education 696, Problems in Education. It was submitted to the Graduate Program Director as partial fulfillment of the requirements for the Degree of Master of Science in Education.

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Date  

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CHAPTER I

INTRODUCTION

Apprenticeships were perhaps the oldest form of vocational education. In the Tidewater Virginia area, apprenticeships have been used since the early 1600's when the area's shipbuilding and repair industry was just beginning. Through the years, apprenticeships have expanded into other trade areas and have enjoyed moderate interest as a means of entering a trade career. Since the mid-1970's, there has been an increase in interest in apprenticeships as an alternative to college for career entry. Each year there has been an increase in the number of apprentices in Tidewater. A comparison of the variety of apprentice programs may help the person who desires to become an apprentice choose a program that best fits his or her career goals.

STATEMENT OF THE PROBLEM

The problem of this study was to revise the Tidewater Apprenticeship Information Handbook to update information about the apprentice programs and employment outlooks for the various trade areas. This information was compiled for the use of guidance and vocational education personnel for local high schools and community colleges.

RESEARCH OBJECTIVES

To answer the problem of this study, the following objectives
were used as a guide:

1. To determine the characteristics and employment outlook for Tidewater area apprenticeship programs.
2. To compile this information so that it may be used as a reference source by guidance and vocational education personnel.

BACKGROUND AND SIGNIFICANCE

In the Tidewater area, there were 61 trades offering apprenticeships with over 3,600 apprentices enrolled (Broughton, 1979). Apprentice programs were sponsored by private companies, trade unions, and local federal installations. The majority of apprenticeships in Tidewater were in the construction or maritime trades with an increasing number of apprenticeships being registered in the service area, such as beautician, florist, or legal secretary. The Virginia Employment Commission (VEC) sponsored an Apprenticeship Information Center that maintained general information on many area apprentice programs. Due to a lack of funding, this center was discontinued on September 30, 1981. No up-to-date comprehensive guide to Tidewater apprenticeship programs was available for reference by guidance or vocational education personnel.

LIMITATIONS

This study was limited to post-secondary apprentice programs in the Tidewater Virginia area. All programs contacted were registered with the Virginia Department of Labor and Industries in 1981.
ASSUMPTIONS

This study was based on the following assumptions:

1. That there were operating characteristics common to apprentice programs in Tidewater.

2. That apprentice program administrators recognized a need for a guide to apprenticeships and were willing to respond to a survey about their programs.

PROCEDURES

The apprentice program contacts listed in the 1978 Handbook were interviewed by telephone to obtain up-to-date program information. The Federal and State Departments of Labor were also contacted by telephone for information on new apprentice programs in Tidewater. Employment outlook information for the craft areas was obtained from a state occupational publication. The information collected was compiled in a format that provided a listing by the general trade area of each apprenticed craft.

DEFINITION OF TERMS

To clarify the meaning of terms associated with this study, the following definitions were provided:

1. apprenticeship: a program in which a person (the apprentice) enters into a written agreement with a master craftsman (or a company) and trades his labor for the opportunity to learn and practice a craft.

2. craft: an occupation or trade requiring manual dexterity or artistic skill.
This study was presented in five chapters. This first chapter included an introduction to the study, statement of the problem, research objectives, background and significance of the study, limitations, procedures, definition of terms, and an overview of chapters. Chapter Two contained a review of literature related to apprentices and apprenticeship programs. The third chapter described how the data was collected and compiled. Chapter Four represented the compiled information. The last chapter related a summary, conclusion, and recommendation of this study.
CHAPTER II

REVIEW OF THE LITERATURE

Apprenticeships are possibly the oldest form of vocational education, having been used by the early Egyptians. The number of apprenticeships declined during the Dark Ages, but they were still used even when almost all other education was stopped. The Middle Ages saw a renewed interest in apprenticeships and saw the beginning of government involvement in their administration. The American Colonies organized apprenticeships based on the English programs of that time. Apprenticeships are still in use today to train craftsmen in the arts of modern industry. Throughout history, apprenticeship has proven to be one of the best methods of training new craftsmen and technicians.

The basic form of the apprenticeship has remained the same through history. Essentially, an apprenticeship is a program in which a person (the apprentice) enters into a written agreement with a master craftsman (or a company) and trades his labor for the opportunity to learn and practice a trade. The length of time and the wages, if any, in the apprenticeship has varied with time and craft, but the central idea of trading labor for knowledge continues today.

Some sources refer to the decline of apprenticeships with the coming of the Industrial Revolution, leaving one with the impression that apprenticeships ceased to exist at that time (Roberts, 1971, p.43).
It would be more accurate to say that apprenticeships began a period of evolution from the one-to-one approach of apprentice to master-craftsman into the more diversified approach of apprentice-to-shop used today (Colvin, 1947, p.15).

Due to increased mechanization and mass production, apprentices no longer could be assigned to one craftsman for the duration of the apprenticeship. It became the responsibility of the shop foreman to direct the experience of the apprentice by rotating the apprentice through various areas of the shop's work.

The number of apprentices remained low until the New Deal days of the mid-1930's when the Federal government took an interest in apprenticeships as a means of easing the unemployment crunch of the time. In 1934, a committee on apprentice training was established in the National Recovery Administration to coordinate and stimulate apprentice programs nationwide. This committee became part of the U. S. Department of Labor in 1937. The war production effort and the returning World War II veterans sparked renewed interest in apprentice programs that has continued through today.

**FEDERAL ADMINISTRATION**

The Fitzgerald Act of 1937 (Public Law 75-308) organized the Federal Committee on Apprenticeship. This national body was composed of representatives from management and labor plus a representative from the Department of Labor and the Department of Education. The purpose of this group was to establish standards to guide industry in the employment and training of apprentices (Roberts, 1971, p. 383). The U. S. Department of Labor, Bureau of Apprenticeship and Training (BAT)
was established as the national administrative agency to enforce and apply the apprenticeship law and the policies of the Federal Committee on Apprenticeship. The Tidewater representative of BAT was John A. Cutchin, whose office was in room 426 of the Federal Building in Norfolk.

STATE ORGANIZATION

The state of Virginia, following the national example, had passed the Virginia Voluntary Apprenticeship Act to provide for a statewide system of apprenticeship training. The Act established the Virginia Apprenticeship Council with representatives from employers and employee organizations. It is the responsibility of the Council to formulate policies for the effective administration of the Apprenticeship Act. The Division of Apprenticeship Training under the guidance of the Council, is responsible for administering the Act (Virginia Department of Labor, 1980). The Division employs locally assigned representatives who maintain direct contact with local apprenticeship sponsors. These field representatives provide services such as counseling apprentices, advising sponsors on sound training practices, resolving differences between sponsors and apprentices, and assisting in securing related instruction for apprentices (Virginia Department of Labor, 1980).

The Apprentice Division works with the Virginia Department of Education, Vocational Education and Continuing Education Department, Administrative Services-Apprenticeship Division to coordinate the academic instruction that apprentices receive in Virginia apprentice programs. Local apprentices receive their academic instruction at the Norfolk Vocational Technical Center with William Davis as supervisor.
of apprentice programs for Norfolk public schools. The Department of Education is involved only with the academic portion of apprenticeship and has no involvement with on-the-job training for apprentices.

The Virginia Employment Commission (VEC) coordinated the recruitment of apprentices. In Tidewater, the VEC maintained an Apprentice Information Center and would administer an aptitude test to potential apprentices. However, due to federal and state budget cuts, on December 31, 1981 the VEC's involvement with apprentice programs ceased, except for the administration of the aptitude test. The function of apprentice recruitment fell to local apprentice program sponsors, the Federal and State Departments of Labor, and non-government agencies such as the Tidewater Builders Association.

IN TIDEWATER

Apprenticeships have gained popularity in Tidewater, which results in competition for the positions which become available each year. Only one out of every four applicants for apprenticeship will be accepted, and often that is only after being on a waiting list for months for an opening (Boughton, 1979). Some high school vocational students avoid the competition and the waiting lists by enrolling in apprenticeships through their high school Industrial Cooperative Training program before they graduate from high school. Through such an arrangement, the student/apprentice may have completed a significant portion of his or her apprenticeship by the time of their high school graduation (Virginia Department of Labor, 1980).

There are 750 apprenticeable trades in the state of Virginia with over 7,000 registered apprentices, and that number increases by
one percent each year. In Tidewater, there are 61 trades offering apprenticeships with over 3,600 apprentices enrolled. The majority of trades are in the construction industry, although a large number are in the shipbuilding and repair industry. The service industry, a traditionally non-apprenticed area, is beginning to register apprenticeships. Apprenticeships are now available for such skills as beautician/barber, florist, X-ray technician, and legal secretary (Boughton, 1979).

Most local apprenticeships are four-year programs although some, such as beautician/barber are two-year programs. These are comprehensive programs that involve on-the-job training, trade theory instruction, and academic instruction. For local apprentices, classroom instruction is conducted at the Norfolk Vocational Technical Center two nights a week during the school year for the duration of the apprenticeship. The trade theory instructors are from industry. The academic instructors are often Norfolk public school teachers hired part-time. For construction trades, the academic subjects include shop mathematics and technical English. Trade theory subjects include blueprint reading and building codes. Norfolk Shipbuilding and Drydock Company (Norshipco) and Norfolk Naval Shipyard conduct their own in-yard apprentice school and import teachers from Tidewater Community College for the classes. Their apprentices attend classes during the day and are paid for their time in class.

Most apprentices begin at a wage equivalent to 40 percent of the journeyman's wage and receive increases every six months. Upon completion of the apprenticeship, graduates are issued journeyman's papers by the Virginia Department of Labor and Industries. Most apprentice
graduates are hired by the sponsoring industry without having to reenter the job market. Those new journeymen who may decide to seek employment outside their sponsoring industry will find the prospect of employment good in the Tidewater area. Trades employment in Tidewater had been projected to increase at least through 1985 (Southeastern Virginia Regional Planning Commission, 1969). As the number of jobs requiring special skills continues to increase, apprenticeships will remain popular as earn-as-you-learn paths to careers.

PUBLICATIONS

The Tidewater Apprenticeship Information Handbook was the only local reference publication that students and educators had access to that contained specific information on area apprenticeship programs. The Handbook contained listings by program and included information about the program sponsor, a brief job description, length of the apprenticeship, wages, application information, educational requirements, and who to contact for more information. It was last published in 1978 by William Davis, who was the Apprentice Supervisor at the Norfolk Vocational and Technical Center. Because of the everchanging job market, wage changes, and area training requirements, much of the information in the 1978 Handbook had become obsolete. While Mr. Davis had planned to update the Handbook for Norfolk Public Schools, other local schools were referring to copies of the Handbook that were older than Mr. Davis' 1978 revision. There was no printing date listed in these copies, however the wage scales listed dated from the mid to late 1960's.
The state of Virginia, through the Virginia Occupational Information Coordinating Committee, published Apprenticeship Occupations in Virginia. This was a directory of apprenticeable trades in Virginia in which at least twenty persons were enrolled in 1981. The listings were by specific craft name and included a job description, training description, education requirements, employment outlook and wage information. This publication was available to local school systems, but it did not contain specific local information for guidance reference. Those who sought local information were referred to their area representatives of the Department of Labor who were listed in the back of the booklet.

SUMMARY

Apprenticeships were probably the oldest form of vocational education, having been used by the early Egyptians. The basic form of the apprenticeship had remained the same through history. Terms and wages had changed but the central concept of trading labor for experience continued.

There were government agencies to regulate apprentice programs. The Federal Committee on Apprenticeship and the Virginia Apprenticeship Council established the policies that regulated Virginia apprenticeship programs. There were local representatives of both the Federal and State Departments of Labor to coordinate Tidewater programs.

At the time of the study there were over 3,600 apprentices enrolled in Tidewater programs. The majority of these were in the construction industry with another large portion in shipyard trades. Most Tidewater apprentices received their classroom instruction at the Norfolk Vocational and Technical Center, although the major shipyards
maintained schools within the shipyards for their apprentices.

The number of apprentices had been increasing in Tidewater and employment projections indicated that jobs would be readily available for new apprentice graduates. Apprenticeship should continue to be an attractive path to a career for many people.

The only publication that contained specific information about Tidewater apprentice programs was the Tidewater Apprenticeship Information Handbook that was printed in 1978. A state publication, Apprenticeship Occupations in Virginia was printed in 1981. It was of general nature and did not contain references to local apprentice programs.
CHAPTER III

METHODS AND PROCEDURES

INTRODUCTION

The purpose of this study was to update the Tidewater Apprenticeship Information Handbook and expand its listings to include trade theory and employment outlook information. This chapter described which apprentice programs were sampled, what information was collected, how it was collected, and how it was compiled.

POPULATION

The comparison was limited to state registered post-secondary apprentice programs in the Tidewater Virginia area. One exception was the Newport News Shipbuilding and Drydock Company's apprentice school. It was included in this comparison because of the large number of apprentices that it drew from the South Hampton Roads cities.

TYPE OF DATA THAT WAS COLLECTED

To provide for the completeness of the listings the following information was collected from the program sponsors:

1. What craft or crafts were in the program?
2. What was a job description for the craft?
3. How long was the apprenticeship?
4. What was an apprentice's starting wage?
5. What was a journeyman's starting wage?
6. What were the application requirements?
7. What were the educational requirements?
8. Where and when were the trade theory courses given?
9. Who was the contact person for the program?

Employment outlook information was obtained from the booklet Apprenticeship Occupations in Virginia by the Virginia Occupational Information Coordinating Committee.

METHOD OF DATA COLLECTION

Those people (or their successors) who were listed as apprentice program contacts in the 1978 Handbook were interviewed by telephone to obtain the most current information about their programs (see Appendix A). The local representatives of the Federal and State Departments of Labor were also contacted by telephone to obtain information about apprentice programs registered in Tidewater since the 1978 printing of the Handbook. In addition, employment outlook information was obtained from Apprenticeship Occupations in Virginia, a 1981 publication of the Virginia Occupational Information Coordinating Committee.

METHOD OF COMPILING DATA

The information that was gathered was compiled in a format that listed the general craft areas alphabetically. Each listing included the craft or crafts apprenticed in the program, the sponsor's name and address, characteristic information about the program, and the contact person for the program (see Appendix B). The listings were preceded by
an index of apprenticed crafts that indicated by page number the listing for each craft, which provided the *Handbook* user with a quick craft cross reference.
CHAPTER IV

FINDINGS

The problem of this study was to update the Tidewater Apprenticeship Information Handbook. The Handbook was last printed in 1978 by William Davis at the Norfolk Vocational Technical Center. In addition to updating the information in the Handbook, a new section was included in each listing that described the employment outlooks for journeymen working in the crafts covered by the Handbook.

This study was able to identify sixty-one separate apprenticeable crafts in the Tidewater area. The 1978 Handbook listed forty-nine apprenticeable crafts. The new listings that were included in the 1982 Handbook are:

- Boatbuilder
- Coppersmith
- High Voltage Electrician
- Electrical Equipment Mechanic
- Fabric Worker
- Heavy Metal Fabricator
- Millwright
- Molder
- Mold Loftsman
- Patternmaker
- Quality Assurance/Control Inspector
- Shipwright

Of the new crafts listed, only the Quality Assurance/Quality Control program did not exist in 1977-78. A complete listing of apprentice crafts in Tidewater and their term of apprenticeship is shown in Table One.

The apprentice program contacts listed in the 1978 Handbook were contacted to update the information about their programs. Three
<table>
<thead>
<tr>
<th>TRADE</th>
<th>APPRENTICE TERM IN YEARS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air conditioning Equip.</td>
<td>3-4</td>
</tr>
<tr>
<td>Aircraft Electrician</td>
<td>4</td>
</tr>
<tr>
<td>Aircraft Engine Mechanic</td>
<td>4</td>
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<tr>
<td>Aircraft Instrument Mechanic</td>
<td>4</td>
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<tr>
<td>Aircraft Mechanic</td>
<td>4</td>
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<tr>
<td>Auto Mechanic</td>
<td>4</td>
</tr>
<tr>
<td>Auto Body Repairer</td>
<td>4</td>
</tr>
<tr>
<td>Blacksmith</td>
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</tr>
<tr>
<td>Boatbuilder</td>
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<tr>
<td>Boilermaker</td>
<td>3-4</td>
</tr>
<tr>
<td>Boilerplant Operator</td>
<td>4</td>
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<tr>
<td>Bricklayer (Mason)</td>
<td>4</td>
</tr>
<tr>
<td>Cabinetmaker</td>
<td>4</td>
</tr>
<tr>
<td>Carpenter (Construction)</td>
<td>4</td>
</tr>
<tr>
<td>Carpenter (Ship)</td>
<td>3-4</td>
</tr>
<tr>
<td>Coppersmith</td>
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<tr>
<td>Cosmetician</td>
<td>2</td>
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<tr>
<td>Dockmaster</td>
<td>3</td>
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<tr>
<td>Draftsman</td>
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<tr>
<td>Electrician (Construction)</td>
<td>4</td>
</tr>
<tr>
<td>Electrician (High Voltage)</td>
<td>4</td>
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<tr>
<td>Electrician (Marine)</td>
<td>3-4</td>
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<tr>
<td>Electrical Equip. Mechanic</td>
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<td>Electromotive Equip. Mechanic</td>
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<tr>
<td>Electronics Mechanic</td>
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<tr>
<td>Electroplater</td>
<td>4</td>
</tr>
<tr>
<td>Fabric Worker</td>
<td>4</td>
</tr>
<tr>
<td>Fire Control Mechanic</td>
<td>4</td>
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<tr>
<td>Glazier</td>
<td>3</td>
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<tr>
<td>Heat Treater</td>
<td>4</td>
</tr>
<tr>
<td>Heavy Metal Fabricator</td>
<td>3-4</td>
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<tr>
<td>Heavy Mobile Equip. Mechanic</td>
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<tr>
<td>Heavy Mobile Equip. Operator</td>
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</tr>
<tr>
<td>Instrument Mechanic</td>
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<tr>
<td>Insulator</td>
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<tr>
<td>Ironworker</td>
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<td>Joiner</td>
<td>4</td>
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<tr>
<td>Machinist (Inside)</td>
<td>3-4</td>
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<tr>
<td>Machinist (Maintenance)</td>
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<tr>
<td>Machinist (Outside)</td>
<td>3-4</td>
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<tr>
<td>Millwright</td>
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<td>Molder</td>
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<td>Mold Loftsmans</td>
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<tr>
<td>Painter</td>
<td>3-4</td>
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<tr>
<td>Patternmaker</td>
<td>4</td>
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<tr>
<td>TRADE</td>
<td>APPRENTICE TERM IN YEARS</td>
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<td>-------------------------------------------</td>
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<tr>
<td>Pipefitter (Construction)</td>
<td>4</td>
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<tr>
<td>Pipefitter (Marine)</td>
<td>3-4</td>
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<tr>
<td>Plasterer</td>
<td>4</td>
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<tr>
<td>Plumber</td>
<td>4</td>
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<tr>
<td>Quality Assurance/Quality Control Insp.</td>
<td>4</td>
</tr>
<tr>
<td>Rigger</td>
<td>3-4</td>
</tr>
<tr>
<td>Sheet Metal Mechanic</td>
<td>3-4</td>
</tr>
<tr>
<td>Sheet Metal Mechanic (Aircraft)</td>
<td>4</td>
</tr>
<tr>
<td>Shipfitter</td>
<td>3-4</td>
</tr>
<tr>
<td>Shipwright</td>
<td>3-4</td>
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<tr>
<td>Sign Painter</td>
<td>4</td>
</tr>
<tr>
<td>Toolmaker</td>
<td>5</td>
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<tr>
<td>Toolroom Mechanic</td>
<td>4</td>
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<tr>
<td>Welder</td>
<td>3-4</td>
</tr>
<tr>
<td>Wharfbuilder</td>
<td>4</td>
</tr>
<tr>
<td>Woodcraftsman</td>
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</table>
of the contacts listed were no longer in those positions and their listings were corrected for the 1982 Handbook. There was only one current contact that would not respond to inquiries for this study. All other contacts, listed in Appendix A, responded to the telephone interviews. The Virginia Employment Commission was deleted from the 1982 Handbook as a source of apprenticeship information. Except for the administration of the aptitude test, all Commission functions were to be handled by the individual program sponsors and the Federal and State Divisions of Apprenticeship and Training. A complete 1982 Tidewater Apprenticeship Information Handbook was included in this study as Appendix C.
CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

SUMMARY

Background

Apprenticeships had been used in the Tidewater area since the early 1600’s when the area’s shipbuilding and repair industry was beginning to develop. Since that time Tidewater’s industries had continued to evolve and expand, allowing for the development of apprentice programs in the areas of construction, manufacturing, and public service. At the time of the study, there were over 3,600 apprentices enrolled in sixty-one different trade areas, and the number of apprentices was increasing each year. The Tidewater Apprenticeship Information Handbook was a guide to which the potential apprentice or guidance personnel could refer to for information describing Tidewater apprenticeship programs and the procedure for application to any particular program. The purpose of this study was to update the Handbook so that the information it contained would be current and accurate and to add an employment outlook description to each program listing.

Administration

Apprentice programs could be sponsored by local companies, local labor unions, or a combination of both. All programs, regardless of the sponsor, come under the ultimate authority of the Federal Committee on Apprenticeship. This committee was organized in 1937 and its purpose
was to establish standards to guide industry in the employment and training of apprentices. The U. S. Department of Labor through the Bureau of Apprenticeship and Training enforced and applied the policies of the Federal Committee on Apprenticeship.

Virginia apprenticeship programs were also covered by the Virginia Voluntary Apprenticeship Act through the Virginia Apprenticeship Council. The Division of Apprenticeship Training under the guidance of the Council, was responsible for administering the Act. The local representatives of the federal Bureau of Apprenticeship and Training and the state Division of Apprenticeship Training have been listed in Appendix A.

Until December 31, 1981, the Virginia Employment Commission (VEC) was responsible for the recruitment and testing of apprentices in Virginia. After that date the VEC ended all recruitment functions. These duties became the responsibility of the individual program sponsors, which emphasized the need for all information in the Tidewater Apprenticeship Information Handbook to be up-to-date and accurate.

Apprenticeship Publications

The state of Virginia printed a booklet titled Apprenticeship Occupations in Virginia. This publication provided information about apprentice programs in Virginia, but, because of its wide scope, it did not provide information on local programs. The only publication that contained specific information on local apprenticeships was the Tidewater Apprenticeship Information Handbook. The Handbook was last printed in 1978 by William Davis of the Norfolk Vocational Technical Center. Since the 1978 printing, some of the information in the Handbook had changed,
such as wages, program contacts, and apprenticed trades, all of which needed to be revised. Also, employment outlook information was added to benefit Handbook users making a career choice.

Procedure

The apprentice program contacts listed in the 1978 Handbook were interviewed by telephone to obtain up-to-date program information. The Federal and State Departments of Labor were also contacted by telephone for information on new apprentice programs in Tidewater. Employment outlook information for the craft areas was obtained from a state occupational publication. The information collected was compiled in a format that provided a listing by the general trade area of each apprenticed craft. A complete Tidewater Apprenticeship Information Handbook was included in this study as Appendix C.

CONCLUSIONS

All people who were contacted for the study were willing to discuss their apprentice programs. All of the programs followed the three-phase model of on-the-job training paralleled by trade theory and academic classroom instruction. With the exception of the shipyard and operating engineer programs, all classroom instruction for apprentices was given at the Norfolk Vocational Technical Center. The shipyards maintained apprentice schools within the shipyards and the operating engineers shared a facility in Wakefield, Virginia with the Richmond area operating engineer apprenticeship program.

Wages earned by apprentices and beginning journeymen in Tidewater were consistently higher than the statewide averages reported by the Department of Labor and Industries. Employment outlooks for the trades
listed in the Handbook ranged from fair to very good. Construction trades were rated as fair employment prospects whereas shipyard trades were rated very good.

The only new craft listed in the new Handbook that did not exist at the time of the Handbook's last printing was Quality Assurance/Quality Control Inspector. Apprenticing this craft may be a reflection of American industry's raised quality consciousness. The other new listings were shipyard trades that were apprenticed before the 1978 Handbook was printed. Their omission was possibly due to an oversight by the Handbook editor or to the shipyards providing an incomplete listing of their apprentice trades.

RECOMMENDATIONS

Following the withdrawal of the Virginia Employment Commission from apprentice recruitment functions, these functions have become the responsibility of the individual apprentice program sponsors and the State Division of Apprenticeship Training, with the Division being the clearinghouse for apprenticeship information. There are programs contained in the Handbook that list Thomas Kavanaugh, the Division's area representative, as the program contact. The researcher for this study was never able to personally contact Mr. Kavanaugh. He did not take calls when he was in his office and he did not return calls when messages were left requesting him to do so. The secretaries in his office were very helpful but they had only limited access to apprentice information. If Mr. Kavanaugh or his office is to be effective in apprentice recruitment, he will need to make himself or his information more accessible for public reference.

Old Dominion University could take part in the apprentice
recruitment effort by printing the 1982 edition of the *Tidewater Apprenticeship Information Handbook*. The Vocational and Technical Education Department could distribute copies to the local school systems as a public service.


APPENDIX A

APPRENTICE PROGRAM CONTACTS

Mr. C. C. Robbins
Apprenticeship Committee for Bricklayers and Tile Setters
2509 1/2 Granby Street
Norfolk, VA 23517
625-2458

Mr. B. H. Craig
Carpenters Apprentice Training Program
6 Koger Executive Center
Norfolk, VA 23502
461-4175

Mr. J. D. Holloman
JAC, Tidewater Electrical Industry
1500 E. Little Creek Road
Suite 307
Norfolk, VA 23518
480-2812

Mr. Michael Thebarge
Glazier's Joint Apprenticeship Committee
587-6316

Mr. Richard A. Redd
JAC, Tidewater Ironworkers, Local 79
5307 Virginia Beach Boulevard
Suite 132
Norfolk, VA 23502
461-8927

Mr. Darold Kemp
JAC, Operating Engineers, Local 147
5847 Poplar Hall Drive
Norfolk, VA 23502
461-0305

Mr. R. W. Cash
Painter's Local 1100
7442 Tidewater Drive
Norfolk, VA 23502
587-0010

Mr. William Hathaway
Plumber-Pipefitter Apprentice Program
5200 Naval Base Road
Norfolk, VA 23502
480-1027
Mr. R. L. Smithson
JAC, Sheetmetal Worker's, Local 87
7442 Tidewater Drive
Norfolk, VA 23502
Norfolk, VA 23502
587-5566

Newport News Shipbuilding, Apprentice School
4101 Washington Avenue
Newport News, VA 23607
(804) 380-3809

Mr. H. M. Williams
Personnel Director, NORSHIPCO
P.O. Box 2100
Norfolk, VA 23501
545-3551

Employee Development Division
(Code 180)
Norfolk Naval Shipyard
Portsmouth, VA 23709
393-7376

Mr. J. A. Cutchin
U. S. Department of Labor
Bureau of Apprenticeship and Training
Federal Building, Room 426
200 Granby Mall
Norfolk, VA 23510
441-3150

Mr. T. E. Kavanaugh
Virginia Department of Labor and Industry
Division of Apprenticeship Training
1500 E. Little Creek Road
Norfolk, VA 23518
480-2457

Mr. William Davis
Apprentice Supervisor
Norfolk Vocational Technical Center
1300 N. Military Highway
Norfolk, VA 23502
461-5516
APPENDIX B
SAMPLE HANDBOOK PAGE FORMAT

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<th>PAINTERS</th>
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<td>Painter's Local 1100</td>
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<tr>
<td></td>
<td>7442 Tidewater Drive</td>
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<tr>
<td></td>
<td>Norfolk, VA 23502</td>
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<tr>
<td>JOB DESCRIPTION:</td>
<td>The painter prepares the surfaces of buildings and other structures and then applies paint, varnish, enamel, lacquer and similar materials on the inside of the structures. The apprentice will learn to properly prepare surfaces by sanding, scraping and cleaning in preparation for the final finish. He will also become skilled in handling brushes and other painting tools in order to apply paint quickly, thoroughly and uniformly to various types of surfaces. As the apprentice progresses, he learns to mix paints, match colors, and provide color harmony. He will also learn the characteristics of paints and finishes and their application for different purposes.</td>
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<tr>
<td>TERM OF APPRENTICESHIP:</td>
<td>3 years</td>
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<tr>
<td>APPRENTICE'S STARTING WAGE:</td>
<td>$5.75</td>
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<tr>
<td>JOURNEYMAN'S STARTING WAGE:</td>
<td>$10.55</td>
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<tr>
<td>APPLICATION INFORMATION:</td>
<td>Applications are accepted all year. Applicants must be between the ages of 18 and 26 years, in good physical condition.</td>
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<tr>
<td>EDUCATIONAL REQUIREMENTS:</td>
<td>High School Diploma or G.E.D.</td>
</tr>
<tr>
<td>RELATED INSTRUCTION:</td>
<td>Classes are held at Norfolk Technical Vocational Center two evenings each week from September through April.</td>
</tr>
<tr>
<td>EMPLOYMENT OUTLOOK:</td>
<td>On the national level, employment for painters is expected to grow more slowly than the average employment in other occupations through the 1980’s. In</td>
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</table>
Virginia there were about 6,610 painters employed in 1976, the projected employment for 1982 is 8,160. An average of 510 job openings is expected annually with 260 due to growth and 250 needed to replace those who quit working.

CONTACT:
Mr. Robert W. Cash
Painter's Local 1100
7442 Tidewater Dr.
Norfolk, VA 23502
Phone: 587-0010
APPENDIX C

TIDEWATER APPRENTICESHIP

INFORMATION HANDBOOK
TIDEWATER APPRENTICESHIP
INFORMATION HANDBOOK

REVISED AND COMPiled
AS A GRADUATE RESEARCH PROJECT

BY
CLAUD R. DIVERS, III
DEPARTMENT OF VOCATIONAL AND TECHNICAL EDUCATION
OLD DOMINION UNIVERSITY

MAY 1982
He that hath a trade, hath an estate.

Ben Franklin
PREFACE

Apprenticeships are becoming increasingly popular as a means of entering a career. More people are attracted to apprenticeships each year by the opportunity to earn a good wage while learning the skills used in their selected trade. Yet, as apprenticeships are becoming more widely used in Tidewater, information about the programs is becoming increasingly more difficult to find. The Virginia Employment Commission no longer maintains the Apprenticeship Information Center that it once sponsored, and, because of budget cuts, has had to drop its new apprentice recruitment functions as well. The purpose of this Handbook is to try to bridge the information gap that now exists between the person considering an apprenticeship and the apprentice program sponsors.

Special thanks to William Davis, Jr. of the Norfolk Technical Vocational Center and editor of the previous Tidewater Apprenticeship Information Handbook for his advice in the preparation of this edition of the Handbook.
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INTRODUCTION

Apprenticeships are perhaps the oldest form of vocational education. In the Tidewater Virginia area, apprenticeships have been used since the early 1600's when the area's shipbuilding and repair industry was just beginning. Through the years, the use of apprenticeships has expanded into other trade areas where it has enjoyed moderate interest as a means of entering a trade career. Since the mid-1970's, there has been an increase in interest in apprenticeships as an alternative to college for career entry. Each year there has been an increase in the number of apprentices in Tidewater. A comparison of the variety of apprentice programs may help the person who desires to become an apprentice choose a program that best fits his or her career goals. The first part of this handbook contains information about apprenticeships in general. The last part of this handbook contains specific information about apprenticeship programs in Tidewater.
GENERAL APPRENTICESHIP INFORMATION

What is apprenticeship?

Apprenticeship is a system for teaching highly technical manual skills through a combination of on-the-job training and related classroom instruction. National apprenticeship standards approved by the Bureau of Apprenticeship and Training and the State Apprenticeship Council governs the scope of work, courses of instruction, length of training, and amount of pay. Apprentices who complete an apprenticeship program are given certificates which show that they are fully qualified as highly skilled "journeymen" in their craft or trade.

What is the training like?

Apprenticeship training includes on-the-job training as well as classroom instruction which teaches apprentices the theoretical as well as practical aspects of the job. In addition, apprentices are taught all craft skills associated with the trade, and not just a few related to specific segments of work in the trade. Most apprenticeship programs last from 2 to 5 years with 4 years being the average. Apprentices work on actual job sites under the supervision of certified journeymen. They take courses in mathematics, sciences, and other technical subjects related to the craft at local trade, technical, or vocational schools. The majority of Tidewater apprentices take their
classroom instruction at the Norfolk Technical Vocational Center two nights a week during the school year.

How much are apprentices paid?

Apprentices usually start earning 40 to 50 percent of the journeyman wage for their trade, and receive increases every six months if their progress is satisfactory. Apprentices nearing the end of their programs are generally earning 90 to 95 percent of the journeyman wage. Most apprentice entry-level wages range from about $4.00 to approximately $6.50 an hour.

What are the advantages of apprenticeship?

An apprenticeship offers job satisfaction, marketable skills, good wages, economic security, and opportunity for advancement. Most skilled craft workers get great satisfaction from working with their hands and seeing the results of their work take shape in specific products. Statistics show that former apprentices earn higher wages, have more stable work records and are promoted sooner and more often than workers who have not been trained through apprenticeship programs.
DEFINITIONS

APPRENTICE: A person (at least 16 years old) who is learning a trade through on-the-job training and classroom instruction in accord with Federal and State apprenticeship standards.

APPRENTICESHIP AGREEMENT: A written agreement, registered with the Virginia Apprenticeship Council and recorded with the U. S. Department of Labor, providing for not less than 4,000 hours of reasonably continuous employment and for the participation in an approved schedule of work experience through employment.

APPRENTICEABLE OCCUPATIONS: Those recognized by the Virginia Apprenticeship Council that have been learned in a practical way through two or more years of training and on-the-job experience.

JOINT APPRENTICESHIP COMMITTEE (J.A.C.): A group equally represented by management and labor established to supervise and administer the operation of apprenticeship training programs.

JOURNEYMAN: A worker who has satisfactorily completed his or her apprenticeship and is classified as a skilled worker in his or her trade.

ON-THE-JOB TRAINING: The learning of each operation by an apprentice by performing it step by step under the close supervision of a skilled craftsman.
PROGRAM SPONSOR: An individual employer or a joint apprenticeship committee who has established and operates a formalized apprenticeship program to develop operational skills.

RELATED INSTRUCTION: Classroom instruction in the technical and theoretical aspects of the trade and other areas deemed essential for the mastery of the trade. Apprentices are required to attend related instruction classes, and 144-160 hours of related instruction is normally required. Most programs request the Norfolk Technical Vocational Center to establish classes which are held two evenings a week from 7:00 p.m. to 10:00 p.m. The school year is from mid-September through April.

VIRGINIA APPRENTICESHIP COUNCIL: A governor appointed council that establishes minimum standards for apprenticeship training, promotes interest in the establishment of apprenticeship training, and acts as a clearinghouse for all matters pertaining to apprentice training in the state of Virginia.

WORK EXPERIENCE: The time an apprentice spends on the job learning under the supervision of a journeyman the skills and work processes of his or her occupation.
GENERAL QUALIFICATIONS

1. Age - generally 18 to 26 years.

2. Good health and physical features for a specific trade.

3. High school completion (or equivalent).

4. Satisfactory completion of an aptitude test.

5. Passing interview with employer or Joint Apprenticeship Committee.

6. A willingness to work regularly, attend evening classes if the program requires it, and study.

7. Satisfactory completion of probation period.

DOCUMENTS NEEDED BY APPLICANTS

It would be advisable for apprenticeship applicants to have or arrange to have the following documents:

1. High school diploma or G.E.D. certificate.

2. High school transcript (and college if attended). These may be sent to the employer from the school.


5. DD-214 Military Service Discharge (if a veteran).
1. Select a trade for which he or she has an interest, aptitude, and physical ability to perform.

2. Determine if he or she meets the minimum qualifications for the trade.

3a. For non-civil service apprenticeships: apply to the selected trade's J.A.C. through the program contact listed in the back of this handbook, or to a firm that employs journeymen and apprentices in the applicant's selected trade.

3b. Take the aptitude test. This may be administered by the J.A.C. itself or the Virginia Employment Commission. (Note: the Employment Commission does not handle applications for apprenticeships.)

3c. If the J.A.C. has a waiting list, the applicant will need to determine whether he or she is sufficiently interested to wait for an opening or whether he or she should seek employment elsewhere.

4. For civil service apprenticeships: apply to take the apprentice examination through the Federal Job Information Center. Local Federal installations select apprentices from the list of applicants who make the higher scores on the exam.
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Program for: Aircraft Maintenance

Program Sponsored by:
Naval Air Rework Facility
Norfolk, VA

Job Description:
Mechanics at the Naval Air Rework Facility perform a complete range of rework, overhaul and modernization operations on designated naval aircraft, missiles, aircraft engines and a multitude of weapons components.

The following apprenticeable trades are available at the facility and will be offered when vacancies exist:

- Aircraft Electrician
- Aircraft Engine Mechanic
- Aircraft Instrument Mechanic
- Aircraft Mechanic
- Electrician
- Electronics Mechanic
- Electroplater
- Fire Control Mechanic
- Heat Treater
- Machinist
- Machinist (Maintenance)
- Painter
- Sheet Metal Mechanic
- Sheet Metal Mechanic (Aircraft)
- Toolmaker (Selected from 3rd year machinist apprentices on merit)

Term of Apprenticeship: 4 years

Apprentice's Starting Wage: $5.44

Journeyman's Starting Wage: $8.04 (average)

Application Information:
The minimum age requirement is 16 for high school graduates and 18 for others. No specific training or experience is required to enter the first year of apprenticeship.

Educational Requirements:
Acceptance into the program is based on the results of a written test and an aptitude and interest questionnaire.

Related Instruction:
The Naval Air Rework Facility maintains its own apprentice school. Apprentices attend for two academic quarters on a full time basis during their first year of apprenticeship.
EMPLOYMENT OUTLOOK:

The number of aircraft maintenance mechanics is expected to increase about as fast as the average for all occupations through the 1980's. Job opportunities in general aviation are expected to be good. Competition for airline jobs will be keen because the higher wages attract more applicants. Little change in the number of mechanics employed by the Federal Government is expected. Opportunities will fluctuate with changes in defense spending.

CONTACT:

Federal Job Information Center
Office of Personnel Management
Federal Office Building
200 Granby Mall
Norfolk, VA 23510
Phone: 441-3355
It is the responsibility of the automotive mechanic to determine the trouble, repair, and maintain the mechanical and electrical systems in the automobile. Typical repair jobs are engine tune-up and overhaul, front-end alignment and brake work. In making repairs, the mechanic uses specialized tools, gauges, and expensive machines in analyzing and adjusting the many units that make up the automobile. Several examples of the equipment used are wheel alignment machines, brake testers, engine analyzers, headlight aligners, and wheel balancers.

The body repairman straightens, repairs, reassembles, and refinishes auto bodies. His training also involves alignment and electrical work as well as specialities in sheet metal repair. The journeyman is skilled in using dolly hammers, dolly blocks, body files, and disc sanders. Welding is another important part of his trade. Glasswork and refinishing are the final steps in the body repair industry. The skilled craftsman has thorough knowledge of painting materials and their application.

4 years

Wages vary with each employer

Wages vary with each employer. Mechanic: $9.30 average Body Repairer: $9.85 average

Apprentices are hired directly by the employer when a job opening exists within his shop.

Qualifications vary with each employer.

Given at Norfolk Technical Vocational Center for two evenings each week from September through April.
Auto Mechanic: On the national level, employment for auto mechanics is expected to increase as fast as the average employment in other occupations through the 1980's. In Virginia there were 16,660 auto mechanics employed in 1976. The projected employment for 1982 is 19,830. An average of 900 job openings is expected annually with 530 due to growth and 370 needed to replace those who quit work.

Auto Body Repairer: On the national level, employment for automobile body repairers is expected to increase faster than the average employment in other occupations through the 1980's. In Virginia there were 2,190 auto body repairers employed in 1976. The projected employment for 1982 is 2,690. An average of 120 job openings is expected annually with 80 due to growth and 40 needed to replace those who quit working.

Mr. Thomas E. Kavanaugh, Apprenticeship Representative
Virginia Dept. of Labor & Industry
Division of Apprenticeship Training
1500 E. Little Creek Road
Norfolk, VA 23518
Phone: 480-2457
Program for: Bricklayers

Program Sponsored by: Joint Apprenticeship Committee
Bricklayers and Tile Setters
2509 1/2 Granby Street
Norfolk, VA 23517

Job Description: The Journeyman's work consist of constructing walls, partitions, fireplaces, chimneys and prefabricated masonry wall sections. Some welding is required at times. Some of the more common materials used are: brick, concrete block, cinder block, glass block, terra cotta and concrete mortar. When building a wall partition or similar structure, it is necessary to break or chisel the material to the size needed. Care must be taken to see that the structure is square and level as the building goes up.

The Craftsman in the masonry trade must have the ability to work with his hands and have a good eye for lines and proportions. The work is active and sometimes strenuous. It involves stooping, moderately heavy lifting and prolonged standing. The Journeyman cannot work during wet or freezing weather.

Term of Apprenticeship: 4 years (2 years of related training)

Apprentice's Starting Wage: 50% of Journeyman's rate

Journeyman's Starting Wage: $12.08

Application Information: Applicants are accepted periodically as job openings become available. Interested persons should call the apprentice office listed below. Applicants must be between the ages of 17 and 26 with no physical handicaps.

Educational Requirements: High School Diploma, G.E.D. or a minimum of six months work experience in Bricklaying and a minimum of 15 credits toward a High School Diploma.

Related Instruction: Given at Norfolk Technical Vocational Center for two evenings each week from September through April.
EMPLOYMENT OUTLOOK:

On the national level, employment for bricklayers is expected to grow more slowly than the average employment in other occupations through the 1980's. In Virginia there were about 3,360 bricklayers employed in 1976. The projected employment for 1982 is 4,420. An average of 260 job openings is expected annually with 180 due to growth and 80 needed to replace those who quit working.

CONTACT:

Mr. C. C. Robbins
Apprenticeship Committee for Bricklayers and Tile Setters
2509 1/2 Granby Street
Norfolk, VA 23517
Phone: 625-2458
PROGRAM FOR: CABINETMAKERS

PROGRAM SPONSORED BY: Independent Cabinet and Mill Working Shops

JOB DESCRIPTION: Set-up and operates a variety of woodworking machines and uses various hand tools to fabricate and repair wooden articles such as store furniture, office equipment, cabinets, and high grade furniture. Uses blueprints and drawings of articles to be constructed. Matches materials for color, grain, or texture. Sets up and operates wood working machines, such as power saws, jointer, molder, shaper, tenoner, mortiser to cut and shape parts from wood stock. Glues, fits, and clamps parts. Finishes by sanding and applying protective and decorative material such as paints, stains, varnish or shellac.

TERM OF APPRENTICESHIP: 4 years

APPRENTICE'S STARTING WAGE: 50% of Journeyman's scale

JOURNEYMAN'S STARTING WAGE: Wages vary with each employer ($6.48 - $7.90 average range)

APPLICATION INFORMATION: Should be in good physical condition and have ability to work with your hands.

EDUCATIONAL REQUIREMENTS: Qualifications vary with each employer (normally high school diploma or G.E.D. required)

RELATED INSTRUCTION: Given at Norfolk Technical Vocational Center two evenings each week from September through April.

EMPLOYMENT OUTLOOK: In Virginia there were about 1,370 cabinetmakers employed in 1976. The projected employment for 1982 is 1,530. An average of 90 job openings is expected annually with 30 due to growth and 60 needed to replace those who quit working.

CONTACT: Mr. Thomas E. Kavanaugh, Apprenticeship Representative Virginia Dept. of Labor & Industry Division of Apprenticeship Training 1500 E. Little Creek Road Norfolk, VA 23518 Phone: 480-2457
CONSTRUCTION CARPENTRY

Tidewater Carpenter's Apprentice Training Program
6 Koger Executive Center, Room 122
Norfolk, VA 23502

Carpentry work is divided into two main divisions. These are rough carpentry and finish carpentry. A skilled journeyman is expected to be able to do both. In some cases a carpenter may specialize within the trade. He may spend all of his time doing trim work or he may concentrate on building forms for concrete. However, before specializing, an apprentice must become skilled in all aspects of the trade.

Rough Work - In this area the carpenter erects the wood frame of the structure including subfloors, sheathing, floor joists, studwork, rafters and partitions. It also includes the construction of forms for supporting concrete, building scaffolds, and the construction of temporary buildings.

Finish Work - The journeyman installs the exterior and interior trim, door frames, window frames and sashes and wood panelling. The carpenters also install linoleum, asphalt and vinyl tile, and other types of resilient floor coverings as well as acoustical ceilings.

4 years

$6.75

$11.85

Applications are accepted all year. Interested persons must be between the age of 18 and 28 years, in good physical condition and have the ability to work with their hands. Applicants must also pass an aptitude test administered by the Training Program.

High School Diploma or G.E.D. A background in industrial arts, woodworking, and general mathematics is recommended.
Classes are held at Norfolk Technical Vocational Center two evenings each week from September through April.

On the national level, the employment for carpenters is expected to increase faster than the average employment in other occupations through the 1980's. In Virginia there were about 15,340 carpenters employed in 1976. The projected employment for 1982 is 19,650. An average of 1,300 job openings is expected annually with 720 due to growth and 610 needed to replace those who quit working. The number of job openings may fluctuate from year to year because employment in this trade is sensitive to changes in construction activity.

Mr. B. H. Craig
Tidewater Carpenter's Apprentice Training Program
6 Koger Executive Center, Room 122
Norfolk, VA  23502
Phone: 461-4175
PROGRAM FOR: COSMETICIAN

PROGRAM SPONSORED BY: Individual Beauty Salons

JOB DESCRIPTION: Provides beauty services for customers: Analyzes hair to ascertain condition of hair. Applies bleach, dye, or tint, using application or brush, to color customer's skin to determine if customer is allergic to solution. Shampoos hair and scalp with water, liquid soap, dry powder, or egg, and rinses hair with vinegar, water, lemon, or prepared rinses. Massages scalp and gives other hair and scalp-conditioning treatments for hygienic or remedial purposes. Styles hair by blowing cutting, trimming, and tapering, using clipper, scissors, razors, and blow-wave gun. Suggests coiffure according to physical features of patron and current styles, or determines coiffure from instructions of patron. Applies water or waving solutions to hair and winds hair around rollers, or pin curls and finger waves hair. Sets hair by blow-dry or natural-set, or presses hair with straightening comb. Suggests cosmetics for conditions, such as dry or oily skin. Applies lotions and creams to customer's face and neck to soften skin and lubricate tissues. Performs other beauty services, such as massaging face or neck, shaping and coloring eyebrows or eyelashes, removing unwanted hair, applying solutions that straighten hair or retain curls or waves in hair, and waving or curling hair. Cleans, shapes, and polishes fingernails and toenails.

TERM OF APPRENTICESHIP: 2 years

APPRENTICE'S STARTING WAGE: Wages vary with each employer (minimum wage is average)

JOURNEYMAN'S STARTING WAGE: Wages vary with each employer ($110 to $145 a week beginning average)

APPLICATION INFORMATION: Apprentices are hired directly by the employer when a job opening exist within his/her salon.

EDUCATIONAL REQUIREMENTS: Qualifications vary with each employer.
RELATED INSTRUCTION: Classes held at Norfolk Technical Vocational Center two evenings each week from September through April.

EMPLOYMENT OUTLOOK: On the national level, the employment for cosmeticians is expected to increase as fast as the average employment in other occupations through the 1980's. In Virginia there were about 6,130 cosmeticians employed in 1976. The projected employment for 1982 is 6,430. An average of 260 job openings is expected annually with 50 due to growth and 210 needed to replace those who retire or quit working.

CONTACT: Mr. Thomas E. Kavanaugh, Apprenticeship Representative Virginia Dept. of Labor & Industry Division of Apprenticeship Training 1500 E. Little Creek Road Norfolk, VA 23518 Phone: 480-2457
PROGRAM FOR: ELECTRICIAN (Construction)

PROGRAM SPONSORED BY: Joint Apprenticeship Committee
Tidewater Electrical Industry
1500 E. Little Creek Road, Suite 307
Norfolk, VA 23518

JOB DESCRIPTION: The electrician performs the various tasks related to electrical work on new construction and maintenance or repair. He lays out, assembles, installs, and tests electrical fixtures and wiring used in air conditioning, heating, lighting, power and other electrical systems in new and old facilities such as factories, schools, public buildings and other commercial structures. He also connects electrical machinery, equipment, controls and electronically operated devices. The electrician must read and follow blueprints as well as know the electrical code in order to perform his job. He must know how to bend and install conduit (pipe and tubing) through which electrical wires are pulled. Splicing and connecting wires is also part of the work.

Generally, only small tools such as power drills, pliers, wire cutters, light wrenches, screw drivers and hammers are used. In some cases it may be necessary to use testing instruments to check the electrical circuits.

TERM OF APPRENTICESHIP: 4 years

APPRENTICE’S STARTING WAGE: 35% of journeyman’s wage

JOURNEYMAN’S STARTING WAGE: $12.35

APPLICATION INFORMATION: Applicants are accepted all year. Interviews are held from February through June 15 of each year. Applicants must be between the ages of 18 and 25 years, in good health and physically fit for the trade.

EDUCATIONAL REQUIREMENTS: High School Diploma and one year of algebra
Classes are held at Norfolk Technical Vocational Center two evenings each week from September through April.

On the national level, employment of electricians is expected to increase as fast as the average employment in other occupations through the 1980's. In Virginia there were 10,660 electricians employed in 1976. The projected employment for 1982 is 12,690. An average of 580 job openings is expected annually with 340 due to growth and 240 needed to replace those who quit working.

Mr. J. D. Holloman, Director
Joint Apprenticeship & Training Committee
Tidewater Electrical Industry
1500 E. Little Creek Rd.
Suite 307
Norfolk, VA 23518
Phone: 480-2812
PROGRAM FOR: GLAZIERS (Construction)

PROGRAM SPONSORED BY: Glaziers Joint Apprenticeship Committee
7316 E. Sewells Point Road
Norfolk, VA 23513

JOB DESCRIPTION: Installs glass in windows, skylights, store fronts, and display cases, or on surfaces, such as building fronts, interior walls, ceilings, and table tops. Marks outline or pattern on glass, and cut glass, using glass cutters. Breaks off excess glass by hand or with notched tool. Fastens glass panes into wood sash with glazier’s points, and spreads and smooths putty around edge of panes with knife to seal joints. Installs mirrors or structural glass on building fronts, walls, ceilings, or tables using mastic, screws, or decorative molding. May install metal window and door frames into which glass panels are to be fitted. Adheres or sprays tinting to glass to prevent glare.

TERM OF APPRENTICESHIP: 3 years

APPRENTICE’S STARTING WAGE: $4.50

JOURNEYMAN’S STARTING WAGE: $11.10

APPLICATION INFORMATION: Applications are accepted periodically as job openings become available. Applicants must be between the ages of 18 and 26.

EDUCATIONAL REQUIREMENTS: High School Diploma or Equivalent

RELATED INSTRUCTION: Classes held at Norfolk Technical Vocational Center two evenings each week from September through April.

EMPLOYMENT OUTLOOK: Employment of construction glaziers is expected to increase faster than the average for all occupations through the 1980’s. Some openings also will arise as experienced glaziers retire, die, or leave the trade for other reasons. Because this occupation is fairly small, only a limited number of openings will become
available, and people interested in the trade may face competition for apprenticeships. Also, the number of job openings may fluctuate from year to year because employment in this trade is sensitive to changes in construction activity.

CONTACT:

Mr. Michael Thebarge
Glaziers Joint Apprenticeship Committee
7316 E. Sewells Point Rd.
Norfolk, VA 23513
PROGRAM FOR: IRONWORKERS

PROGRAM SPONSORED BY: Joint Apprenticeship Committee
Tidewater Ironworkers, Local 79
5307 Virginia Beach Blvd., Suite 132
Norfolk, VA 23502

JOB DESCRIPTION: The Ironworker's work encompasses four categories: structural, ornamental, heavy hoisting and reinforcement.

1. Structural: fabricating, assembling and fastening of steel buildings, bridges, powerhouses, etc. Tools used include cutting torches, electric welders, cranes, derricks, rigging systems.
2. Ornamental: fabrication and installation of wrought iron and aluminum stairs, railings, store-fronts, sash and building utilizing curtain wall (glass-aluminum).
3. Heavy Rigging/Hoisting: the use of cables, blocks, falls and power equipment to hoist large machinery.
4. Reinforcement: rod placement techniques used in concrete forms and structures, post-tensioned and pre-stressed.

TERM OF APPRENTICESHIP: 3 years

APPRENTICE'S STARTING WAGE: $7.08

JOURNEYMAN'S STARTING WAGE: $12.40

APPLICATION INFORMATION: Applications are accepted all year; interviews are held from June 1 through August 31 of each year. Applicants must be between the ages of 18 and 30 years, in good physical condition.

EDUCATIONAL REQUIREMENTS: High School Diploma or its equivalent.

RELATED INSTRUCTION: Classes held at Norfolk Technical Vocational Center two evenings each week from September through April.
EMPLOYMENT OUTLOOK:

On the national level, employment for ironworkers is expected to increase faster than the average employment in other occupations through the 1980's. In Virginia there were about 850 ironworkers employed in 1976. The projected employment for 1982 is 1,110. An average of 60 job openings is expected annually with 40 due to growth and 20 needed to replace those who quit working.

CONTACT:

Mr. Richard A. Redd, Coordinator
Joint Apprenticeship Committee
Tidewater Ironworkers, Local 79
5307 Virginia Beach Blvd.
Suite 132
Norfolk, VA 23502
Phone: 461-8927
Office Hours: 8 a.m. - 12 p.m. and 1 p.m. - 5 p.m.
PROGRAM FOR: MACHINIST
PROGRAM SPONSORED BY: Individual Machine Shop

JOB DESCRIPTION: Because of the various operations that must be performed in a machine shop, there are many different types of machines. Each is designed to do a specific job. Precision of operation is the most outstanding characteristic of today's machine tools and accuracy of the operation is extremely important.

A qualified machinist will possess skills and technical knowledge relating to lathes, shapers, milling machines, surface grinders, metal cutting band saws, cylindrical grinders and heat treating. He must keep abreast of the latest changes and be willing to accept automation as it becomes more a part of the industry.

A skilled technician must:
1. Learn machine tool operations and set-ups
2. Have a strong background in mathematics
3. Have a knowledge of the workability of materials
4. Be able to read drawing and blueprints

TERM OF APPRENTICESHIP: 4 years

APPRENTICE'S STARTING WAGE: Average $5.40

JOURNEYMAN'S STARTING WAGE: Average $8.00

APPLICATION INFORMATION: Apprentices are hired directly by the employer when job openings exist within a shop.

EDUCATIONAL REQUIREMENTS: High School Graduate or its equivalent. Courses in mathematics and mechanical drawing are recommended.

RELATED INSTRUCTION: Classes held at Norfolk Technical Vocational Center two evenings each week from September through April.

EMPLOYMENT OUTLOOK: On the national level, employment for machinists is expected to increase as fast as the average employment
in other occupations through the 1980's. In Virginia there were about 6,350 machinists employed in 1976. The projected employment for 1982 is 7,490. An average of 360 job openings is expected annually with 190 due to growth and 170 needed to replace those who quit working.

CONTACT:
Mr. Thomas E. Kavanaugh, Apprenticeship Representative
Virginia Dept. of Labor & Industry
Division of Apprenticeship Training
1500 E. Little Creek Rd.
Norfolk, VA 23518
Phone: 480-2457
PROGRAM FOR: Naval Facilities Maintenance

PROGRAM SPONSORED BY: Navy Public Works Center
Norfolk, VA 23511

JOB DESCRIPTION: The mechanics working for the Navy's Public Works Center perform various construction, maintenance, and repair jobs at the local Naval facilities. Working together they both maintain and improve both the facilities and their equipment. The following trades are listed by the Public Works Center.

<table>
<thead>
<tr>
<th>WG-9</th>
<th>WG-10</th>
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<tbody>
<tr>
<td>Carpenter</td>
<td>Automotive Mechanic</td>
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<tr>
<td>Painter</td>
<td>Air Conditioning Equip. Mechanic</td>
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<tr>
<td>Plasterer</td>
<td>Boilermaker</td>
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<tr>
<td>Wharf Builder</td>
<td>Boilerplant Operator</td>
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<tr>
<td>Sign Painter</td>
<td>Electrician</td>
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<tr>
<td>Toolroom Mechanic</td>
<td>Electromotive Equip. Mechanic</td>
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<tr>
<td>WG-11</td>
<td>Insulator</td>
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<tr>
<td>Instrument Mechanic</td>
<td>Heavy Mobile Equip. Mechanic</td>
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<td></td>
<td>Mason</td>
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<td>Pipefitter</td>
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<td>Sheet Metal Mechanic</td>
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<td>Wood Craftsman</td>
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</tbody>
</table>

TERM OF APPRENTICESHIP: 4 years

APPRENTICE'S STARTING WAGE: WG-9 $5.21
WG-10 $5.44
WG-11 $5.69

JOURNEYMAN'S STARTING WAGE: Average ($8.37)

APPLICATION INFORMATION: Write or call the Federal Job Information Center for an occupational interest form (PN-AO-1).

Acceptance in the program is based on the results of a written test and an aptitude and interest questionnaire.
CONTACT: Federal Job Information Center
Office of Personnel Management
Federal Office Building
200 Granby Mall
Norfolk, VA  23510
Phone:  441-3355
PROGRAM FOR: OPERATING ENGINEERS

PROGRAM SPONSORED BY: International Union Operating Engineers, Local 147
Joint Apprenticeship Committee
5847 Poplar Hall Dr.
Norfolk, VA 23502

JOB DESCRIPTION: The operating engineer operates and maintains heavy equipment in the fields of heavy construction and erection.

Bulldozers, tractors, loaders and other similar pieces of equipment are used in the construction of dams, highways and other forms of excavation.

While working with structural steel in the erection of buildings and placing heavy pre-formed concrete sections, the operator would use cranes, front-end loaders and sidebooms.

The heavy equipment operator is also called in to lay pipe lines across miles of rugged terrain. To do this he will use trenching machines, shovels and backhoes.

TERM OF APPRENTICESHIP: 4 years

APPRENTICE'S STARTING WAGE: $7.31

JOURNEYMAN'S STARTING WAGE: $11.95

APPLICATION INFORMATION: Applications are accepted from January 1 through March 31 of each year. Times and dates will be posted with all school districts, local Virginia Employment Commissions, Out-Reach Programs, Human Resource Programs, STOP Programs, Vocational and Technical schools. Applicants must be between the ages of 18 and 27, in excellent physical condition.

EDUCATIONAL REQUIREMENTS: High School Diploma or G.E.D.

RELATED INSTRUCTION: Classes held at the International Union of Operating Engineers facility in Wakefield, VA on the first three Saturdays of each month.
Job opportunities for operating engineers should be fairly plentiful over the long run. Employment in the occupation is expected to grow faster than the average for all occupations through the 1980's. Population and business growth will lead to the construction of more factories, mass transit systems, office buildings, powerplants, and other structures. More operating engineers also will be needed in maintenance work on highways and for materials movement in factories and mines.

Mr. Donald Kemp
Operating Engineers J.A.C.
5847 Poplar Hall Dr.
Norfolk, VA 23502
Phone: 461-0305
PROGRAM FOR: PAINTERS

PROGRAM SPONSORED BY: Painter's Local 1100
7442 Tidewater Drive
Norfolk, VA 23502

JOB DESCRIPTION: The painter prepares the surfaces of buildings and other structures and then applies paint, varnish, enamel, lacquer and similar materials on the inside of the structures.

The apprentice will learn to properly prepare surfaces by sanding, scraping and cleaning in preparation for the final finish. He will also become skilled in handling brushes and other painting tools in order to apply paint quickly, thoroughly and uniformly to various types of surfaces.

As the apprentice progresses, he learns to mix paints, match colors, and provide color harmony. He will also learn the characteristics of paints and finishes and their application for different purposes.

TERM OF APPRENTICESHIP: 3 years

APPRENTICE'S STARTING WAGE: $5.75

JOURNEYMAN'S STARTING WAGE: $10.55

APPLICATION INFORMATION: Applications are accepted all year. Applicants must be between the ages of 18 and 26 years, in good physical condition.

EDUCATIONAL REQUIREMENTS: High School Diploma or G.E.D.

RELATED INSTRUCTION: Classes are held at Norfolk Technical Vocational Center two evenings each week from September through April.

EMPLOYMENT OUTLOOK: On the national level, employment for painters is expected to grow more slowly than the average employment in other occupations through the 1980's. In
Virginia there were about 6,610 painters employed in 1976, the projected employment for 1982 is 8,160. An average of 510 job openings is expected annually with 260 due to growth and 250 needed to replace those who quit working.

CONTACT:
Mr. Robert W. Cash
Painter's Local 1100
7442 Tidewater Dr.
Norfolk, VA 23502
Phone: 587-0010
PROGRAM FOR: PLUMBERS-PIPEFITTERS

PROGRAM SPONSORED BY: Joint Apprenticeship Committee
                      Plumbing, Heating & Air-Conditioning Industry
                      520 Naval Base Road
                      Norfolk, VA  23502

JOB DESCRIPTION:
The work of the plumber and pipefitter consists of installing or repairing pipe systems used for carrying water, air, gas, steam, waste, and other types of liquids used in residential and commercial structures. The mechanic must lay out, cut, prepare and install pipe. In the installation process, various joints are used to connect the pipes together. These include soldered, threaded, no-hub and caulked joints. The installation and maintenance of plumbing fixtures for kitchens, baths, washrooms and the installation of appliances and heating units in homes and commercial establishments is part of the plumber's or pipefitter's work.

Many of the tools and equipment used in the trade are hand-operated. They include hammers, pipewrenches, reamers, drills, saws, chisels, power machines to cut, bend and thread pipe. In some cases these operations are done by hand. The pipefitter installs heating and air-conditioning systems in industrial establishments. In most cases, these systems are much larger and are more complex than those in the plumbing field.

TERM OF APPRENTICESHIP: 4 years

APPRENTICE'S STARTING WAGE: $4.82

JOURNEYMAN'S STARTING WAGE: $12.05

APPLICATION INFORMATION: Applications are accepted all year and interviews are conducted when job openings exist. There usually is a waiting list. Applicants must be 18 and in good physical condition. A strong math background is recommended.

EDUCATIONAL REQUIREMENTS: High School Diploma or its equivalent.
Classes are held at Norfolk Technical Vocational Center two evenings each week from September through April.

On the national level, employment for plumbers and pipefitters is expected to increase as fast as the average employment in other occupations through the 1980's. In Virginia there were about 8,060 plumbers and pipefitters employed in 1976. The projected employment for 1982 is 9,830. An average of 500 job openings is expected annually with 300 due to growth and 200 needed to replace those who quit working. However, the number of job openings may fluctuate from year to year because employment in these trades is sensitive to changes in construction activity.

Mr. William Hathaway, Coordinator
Plumber-Pipefitter Apprentice Program
Plumbing, Heating & Air-Conditioning Industry
520 Naval Base Rd.
Norfolk, VA 23502
Phone: 480-1027
PROGRAM FOR: SHEET METAL WORKER

PROGRAM SPONSORED BY:
Joint Apprenticeship Committee
Local Union #87
7442 Tidewater Drive
Norfolk, VA 23502

JOB DESCRIPTION:
The craftsman fabricates and installs a wide variety of products made of sheet metal. First, he must plan the job, determine the size or gauge of metal to be used, lay out the pattern according to specification, cut the metal and then fabricate the product.

When doing layout work, the journeyman uses dividers, calipers, hammers, punches and various other marking and measuring devices.

While cutting the metal, the worker will use hand snips and power shears.

In fabrication work, the craftsman forms the metal with power and hand brakes, hammers and anvils of various sizes and shapes. The fabrication is usually done in the shop, but in some cases it may be done at the job site.

In some cases during the fitting and installation of hangers and brakes, the journeyman must work high above the ground or be forced to work in cramped positions.

TERM OF APPRENTICESHIP: 4 years

APPRENTICE'S STARTING WAGE: 4.5% of journeyman's wage.

JOURNEYMAN'S STARTING WAGE: $10.80 average

APPLICATION INFORMATION:
Applications are accepted all year. Applicants must be between the ages of 17 and 26.

EDUCATIONAL REQUIREMENTS: High School Diploma or G.E.D.

RELATED INSTRUCTION:
Classes held at Norfolk Technical Vocational Center two evenings each week from September through April.
EMPLOYMENT OUTLOOK:
On the national level, employment for sheet metal workers is expected to increase faster than the average employment in other occupations through the 1980's. In Virginia there were about 4,990 sheet metal workers employed in 1976. The projected employment for 1982 is 6,100. An average of 290 job openings is expected annually with 190 due to growth and 100 needed to replace those who quit working.

CONTACT:
Mr. Robert L. Smithson, Business Manager
Sheet Metal Workers, Local 87
7442 Tidewater Dr.
Norfolk, VA 23502
Phone: 587-5566
PROGRAM FOR: SHIPYARD TRADES

PROGRAMS
SPONSORED BY:
Norfolk Naval Shipyard
Newport News Shipbuilding
Norfolk Shipbuilding & Drydock Corporation (Norshipco)

JOB DESCRIPTION:
Shipbuilding and repair is an industry that employs craftsmen of many trades that work together in the construction and repair of seagoing vessels.

The following is a combined listing of the trades apprenticed by the three shipyards.

2. Auto Mechanic
3. Blacksmith
4. Boatbuilder
5. Boilermaker
6. Carpenter (Ship)
7. Coppersmith
8. Dockmaster
9. Draftsman
10. Electrician (High Voltage)
11. Electrician (Marine)
14. Fabric Worker
15. Fire Control Mech.
16. Heavy Metal Fabricator
18. Insulator
19. Joiner
20. Machinist (Inside)
21. Machinist (Maint.)
22. Machinist (Outside)
23. Millwright
24. Molder
25. Mold Loftsmen
26. Painter
27. Patternmaker
28. Pipefitter (Marine)
29. QA/QC Inspector
30. Rigger
32. Shipfitter
33. Shipwright
34. Welder
35. Wharfbuilder
| **TERM OF APPRENTICESHIP:** | Norfolk Naval Shipyard: 4 years  
Newport News Shipbuilding: 4 years  
Norshipco: 3 years |
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<tbody>
<tr>
<td><strong>APPRENTICE'S STARTING WAGE:</strong></td>
<td>Wages vary with each employer. ($5.27 average)</td>
</tr>
<tr>
<td><strong>JOURNEYMAN'S STARTING WAGE:</strong></td>
<td>Wages vary with each employer ($8.46 average)</td>
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</tbody>
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| **APPLICATION INFORMATION:** | Applicants should phone or write the shipyard of their choice and request an application form.  
Applicants should generally be between 18 and 25 years old and in good health. |
| **EDUCATIONAL REQUIREMENTS:** | High School Diploma; additional requirements such as high school units in physics, chemistry, drawing, industrial arts, algebra, geometry, or advanced mathematics will vary with each shipyard. |
| **RELATED INSTRUCTION:** | Each shipyard maintains an apprentice school within the shipyard. Apprentices will attend classes during the day on a rotational basis with on-the-job training assignments. College credit may be offered for some courses. |
| **EMPLOYMENT OUTLOOK:** | With the establishment of the Tidewater area as a major shipbuilding and repair center, the demand for shipyard tradesmen is expected to increase through the 1980's. In addition, increased Department of Defense spending is expected to create a need for craftsmen to fulfill contracts for the construction and maintenance of U.S. Navy warships through the 1980's. |
| **CONTACTS:** | Norfolk Naval Shipyard Employment Office  
Norfolk Naval Shipyard  
Portsmouth, VA 23709  
Phone: 393-5657  
or  
Federal Job Information Center  
Office of Personnel Management  
Federal Office Building  
200 Granby Mall  
Norfolk, VA 23510  
Phone: 441-3355 |
Applications for Federal apprenticeships should be made early. The apprentice exam is generally given in April for the class to be admitted the following September.

Newport News Shipbuilding:

Admissions Director
The Apprentice School
Newport News Shipbuilding and Drydock Company
4101 Washington Avenue
Newport News, VA 23607
Phone: (804) 380-3809

Norfolk Shipbuilding & Drydock Corp.:

NORSHIPCO
Employment Office
P.O. Box 2100
Norfolk, VA 23501
Phone: 545-3551