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Abstract A CIVIL ENGINEER MANPOWER STUDY GROUP WAS ESTABLISHED DEC 1963, TO DETERMINE THE DISTRIBUTION, ALIGNMENT, RELIABILITY, CREDIBILITY, AND SKILLS REQUIRED IN THE CIVIL ENGINEERING MANPOWER RESOURCE TO PERFORM ESSENTIAL CIVIL ENGINEER FUNCTIONS IN SUPPORT OF THE AIR FORCE MISSION. THE NEED FOR THIS STUDY WAS DICTATED BY THE LACK OF A MILITARY RESOURCE SPECIFICALLY DESIGNED TO MEET COMBAT SUPPORT REQUIREMENTS AND OTHER EMERGENCY CONDITIONS. IT WAS ALSO RECOGNIZED, THAT DUE TO THE VARYING MILITARY/CIVILIAN MANNING RATIOS AND UTILIZATION POLICIES AMONG THE COMMAND, THE POSITION OF THE MILITARY AND CIVILIAN IN THE DAY TO DAY WORK FORCE REQUIRED BETTER DEFINITION. THE FINDINGS WILL ENABLE THE AIR FORCE TO DEFINE ITS CIVIL ENGINEERING MANPOWER REQUIREMENTS IN TERMS OF QUANTITY, QUALITY, AND CIVILIAN/MILITARY MIX AT A TIME WHEN AEROSPACE POWER AND RELATED TECHNOLOGY ARE UNDERGOING RADICAL CHANGES. THIS IS THE MOST COMPREHENSIVE STUDY EVER MADE OF THE QUANTITATIVE AND QUALITATIVE REQUIREMENTS AND CAPABILITIES OF OUR CIVIL ENGINEER FORCE AND OF PRESENT AND POSSIBLE IMPROVED PROCEDURES IN THE AREAS OF SELECTION, TRAINING, CAREER DEVELOPMENT AND FORCE CONTROL.

Descriptive Notes: CONTAINS NARRATIVE WITH GRAPHS, CHARTS AND OTHER SUPPORTING DOCUMENTS.

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INDEX

PREFACE

A. GENERAL REMARKS

B. ACKNOWLEDGEMENTS

C. AUTHORITY

THE FORMAL REPORT

I. STATEMENT OF THE PROBLEM

II. DEFINITIONS

III. ASSUMPTIONS

IV. FACTORS BEARING ON THE PROBLEM

V. DISCUSSION

A. PHASE I - QUANTITATIVE

B. PHASE II - QUALITATIVE

C. PHASE III - MANAGEMENT OF THE AIR FORCE

VI. CONCLUSIONS

VII. RECOMMENDATIONS

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ATTACHMENTS

1. Ltr, "Civil Engineer Manpower Study" dtd 2 December 1963
2. Conference Minutes, 5 December 1963, dtd 13 December 1963
3. Ltr, "Civil Engineering Manpower Study" dtd 20 December 1963
4. Msg AFOMOBD 375-64, dtd 16 January 1964
5. Basic Data Sheets
6. Standard Manning Guide
7. Initial Prime BEEF Military Manning Program
8. Ltr, "Civil Engineering Manpower Study" dtd 25 March 1964
9. Prime BEEF Military Manning Program
10. Ltr, "Civil Engineering Training and Career Development Workshop" dtd 6 February 1964
11. Ltr, "Civil Engineering Training and Career Development Workshop" dtd 14 February 1964
12. Minutes of Civil Engineer Training and Career Development Workshop, w/attachments
13. New Career Structure and Revised Airman Specialty Descriptions

FORMAL REPORT OF THE CIVIL ENGINEERING MANPOWER STUDY GROUP (PROJECT PRIME BEEF)

PREFACE

A. GENERAL REMARKS: A Civil Engineering Manpower Study Group was established in December 1963, to determine the distribution, alignment, reliability, credibility, and skills required in the Civil Engineering Manpower resource to perform Essential Civil Engineer functions in support of the Air Force mission. The need for this study was dictated by the lack of a military resource specifically designed to meet combat support requirements and other emergency conditions. It was also recognized, that due to the varying military/civilian manning ratios and utilization policies among the Commands, the position of the military and civilian in the day-to-day work force required better definition. The findings will enable the Air Force to define its Civil Engineering manpower requirements in terms of quantity, quality, and civilian/military mix at a time when aerospace power and related technology are undergoing radical changes. This study is the most comprehensive ever made of the quantitative and qualitative requirements and capabilities of our Civil Engineer force and of present and possible improved procedures in the areas of selection, training, career development and force control.

To insure maximum authenticity and practicability the study group was composed of officers and civilians possessing a broad span of related experience and formal knowledge. The basic group was composed of personnel of the Directorate of Civil Engineering. However, in recognition of the important implications of the study, consultants were made available "on call" by the Director of Manpower and Organization, the Director of Personnel Planning and the Director of Personnel Procurement and Training, Hq USAF. During the conduct of the study a one week seminar was held at the Department of Civil Engineering Training, Sheppard Air Force Base, Texas, where inputs were received from representatives of the major commands. Each major command provided the study group material and data peculiar to their individual operations which was used as a basis for arriving at consensus positions.

The guiding theme throughout this report reflects a need for (1) reorientation and redistribution of the Civil Engineer force from a peace-time posture to one prepared to meet Air Force requirements in time of emergency (2) improved training and career opportunities for the Civil Engineer force, and (3) a single manager within the Directorate of Civil Engineering, Hq USAF, for the reoriented and redistributed force.

Only a token portion of the massive amount of data which was compiled and analyzed by the Study Group is included in the report as exhibits. It

is believed, however, that these exhibits as presented will enable understanding and establish authenticity of findings.

B. ACKNOWLEDGEMENTS: The study group desires to express special appreciation for the consulting services of Lt Col Wm. Elias and Mr. Harry Goldman of AFOMO and Lt Col E. F. Rodriguez and Major George H. Roos, Jr., of AFPDP. These individuals gave so extensively of their time and counsel as to have been for all practical purposes members of the study group. Special appreciation is also extended to Lt Col Harris and Mr. Ted Byars of Hq ATC and to Lt Col Talbot of the Department of Civil Engineering Training, Sheppard AFB, Texas. These men made possible the unusually successful seminar at Sheppard Air Force Base. The study group is indebted to many other individuals in Headquarters USAF and the major command headquarters.

C. AUTHORITY: Letter from Brig Gen Oran O. Price, Deputy Director for Civil Engineering Operations, Hq USAF, dated 2 December 1963, subject: "Civil Engineer Manpower Study." (Attachment 1) This letter and subsequent conference guidance (Attachment 2) directed the creation of a study group composed of representatives from each Division in AFOCE.

THE FORMAL REPORT

I. STATEMENT OF THE PROBLEM

Is the present Civil Engineer Force properly aligned and is the distribution of this resource adequate to perform the essential real property facility functions in support of the Air Force mission today and tomorrow?

II. OBJECTIVE

To create a capability, within existing resources, to respond to emergencies.

III. DEFINITIONS

A. Air Force Civil Engineer Force: Those Air Force military and civilian personnel responsible for the development, operation and maintenance of Air Force real property.

B. Development: The determination of increments of Air Base programming, design, and construction.

C. Real Property: Air Base grounds, pavements, structures, utilities, and equipment normally attached thereto.

D. Alignment: The organization of the Force to meet all functional requirements.

E. Distribution: Proper military/civilian mix of the force.

F. Adequate: The reliability, credibility, and skill of the force necessary to fulfill the functional requirements.

G. Reliability: The readiness of the force to fulfill the functional requirements.

H. Credibility: The capability of the force to fulfill the functional requirements.

I. Skill: The proficiency required to insure credibility.

J. Prime BEEF: Prime Base Engineer Emergency Forces.

K. BEET: Base Engineer Emergency Team.

1. (L) Large base
2. (S) Small base
3. (ST) Site

L. MCST: Mobile Combat Support Team.

1. (F) Flying Unit Support
2. (C) Contingency Support
3. (M) Missile Support

M. RPIE: Real Property Installed Equipment.

IV. ASSUMPTIONS

A. Air Force weapon and control systems will become more and more sophisticated requiring progressively higher skill levels on the part of civil engineering support personnel. Continuous improvements in training and career potentials are mandatory.

B. The Air Force basic mission requires military support personnel on constant duty at every installation world-wide to assure continuity of utility services and conservation of life and property in case of enemy attack or other extreme emergency. Civilians cannot be forced to remain at duty stations during extreme emergencies.

C. Continuous duty during extreme emergencies for a duration of 36 hours can be obtained with a two shift military force.

D. International tensions or war will necessitate the emergency deployment of flying units to unoccupied air bases. Military civil engineering support teams must be identified, trained and equipped for concurrent deployment to provide essential emergency support. In case of extended deployment this military force could be augmented with indigenous civilians.

E. A force of military civil engineers must be identified and be given special training to satisfy the unpredictable exingencies of special air warfare and contingencies.

F. Satisfying the numerical, skill, skill level and location requirements of the above assumptions combined with staff requirements would total out all requirements for the military civil engineering force within the Department of the Air Force. No part of this military civil engineer force would be overhead to validated workload requirements. Each airman would occupy a valid position in an approved Unit Manning document. Civilian employees would occupy the remaining Unit Manning document positions.

G. In reposturing the world-wide civil engineering force, minimum disruption and adverse actions of U. S. civilian employees should take place.

H. Quantitative considerations involved in the study will be based upon current Civil Engineering manpower authorizations and programs. The identification of current and future quantitative and qualitative requirements will not be effective until end FY 65 at the earliest and full realization of the findings of this study will cover a span of some four years.

I. The basic requirements both qualitative and quantitative as they are set forth in this study will not change appreciably in the next 10 to 15 years, even though there may be a change in systems or airbase closures.

V. FACTORS BEARING ON THE PROBLEM

A. The role of the civil engineer has changed to one of Direct Combat support:

(1) For the first time major weapon systems became dependent on Civil Engineering support to get off the ground or to exist in their ground environment until required to perform their basic military functions, i.e., missiles, SAGE, BMEWS, AC&W, etc. Civil Engineering entry into the integral sphere of the weapon system was generated by a requirement for operation and maintenance of facilities using exotic fuels, critical electric power and sensitive temperature and humidity controls.

(2) Secondly, the complexity of our facilities, as they relate to the weapon systems, requires maximum assurance of continuing operation.

B. The civil engineer manpower resource totals approximately 100,000 people which is comprised of some 2,000 officers; 41,000 airmen; and 57,000 civilians.

C. The alignment, distribution, and utilization of the force reveals:

(1) No appreciable rapid mobile response capability for Tactical Air, Special Air Warfare, or contingencies. This was demonstrated in the "Berlin Build-Up", Cuba and South Vietnam where the Civil Engineering requirement was met by the random selection of individuals, with unassured skills, from bases all over the command to form emergency "pick-up" teams.

(2) The civilian/military mix has developed without any uniformity between major commands, or between similar type installations within the same major command. For instance, many installations have acquired a complete imbalance of civil engineer airmen while at other installations there are not sufficient civil engineer airmen to assure continuity of essential operations during emergency conditions.

(3) There is little or no relationship between the skills identified for military authorizations and the tasks which this "hard core" resource must perform in its combat support role, i.e., grass mowing, painting, custodial work, trash collection, etc.

(4) The career progression in many areas is inadequate. For example, there are five dead-end career ladders at the 5 level.

(5) The skill level requirements in many cases are not adequate to meet the skill requirements of the job. For example, in several of our basic skills, our airmen Air Force specialty job standards do not spell out the requirement to interpret and accomplish work from plans and specifications.

D. Political Implications: The Air Force has experienced a continuous flow of Congressional inquiries relative to the use of civil engineering manpower resources. The Air Force has not been in the position to provide substantive replies to the satisfaction of members of Congress on the role and use of our military and our civilian manpower.

E. At many installations there is an insufficient military capability to provide continuity of essential services under emergency conditions. At other installations there is considerably more military capability than is required for those conditions. Military and civilians are in competition for the top technical and supervisory job and, there is a lack of proper training and career development for both. Because of no single manager at Hq USAF level, the situation is becoming progressively worse.

F. As is common practice in industry, in large consolidated housing developments, and to a more limited extent in municipalities, the Air Force accomplishes maintenance, minor repair of facilities and operation of utility services at airbases, depots and stations with "in-house" forces. Under normal circumstances this force could consist of civilian residents in the adjacent community. However, the Air Force is a military organization with a war mission, and a certain portion of the force must be military. This is referred to as a civilian/military mix.

G. While skill levels in the civilian/military mix should be comparable for similar duty, the nature of job placement and compensation varies of necessity. Civilians are initially job-placed on the basis of previous experience and demonstrated skill, and are compensated on the basis of related hourly wage scales. Military counterparts normally enter the service as basic airmen with little or no background of skilled labor experience. They must be trained at government expense and be compensated on the basis of military pay and allowances fixed by rank, rather than accumulated skill. While rank can only be acquired by attrition in the force, promotions to fill military vacancies are usually made on the basis of accrued skill. On the contrary, certain higher grade positions in the force may not be occupied by military personnel until they have acquired stipulated levels of military rank. Every effort should be made toward equal opportunity for equal service, but this is most difficult. The civilian advances his career up a single ladder of acquired skill and longevity. The airman must advance up both a ladder of acquired skill and a ladder of military rank, longevity affecting both to a major degree, but not simultaneously.

H. Further peculiarities in the employment of a civilian/military mix result from "tours of duty". The civilian employee can enjoy a lifetime career at a single air base. However, military personnel must serve "tours of duty", being transferred from one air base to another on a schedule varying from 12 to 36 months. A certain number of these

"tours" must be served at locations outside the continental United States, so that counterparts may return from overseas duty. Since it is almost essential that promotions to vacancies be made from the work force present, the "tour of duty" procedure reduces career potentials in the work force for individual military personnel in comparison to those available to civilian employees. On the other hand, overseas tours being only one-third as long as stateside tours, sufficient military must be employed in the civilian/military mix to preclude every other tour being overseas. This enhances the military career potential in two ways. The length of time that an airman remains under control of a single CONUS command is increased, and by numbers alone it permits a military career ladder to be established in certain specialty areas which could not be justified from the standpoint of wartime necessity.

I. Traditionally the Civil Engineering tasks have been categorized as civilian type crafts. The increased requirement for Civil Engineering skills in the Combat Support area negates this generality. Because of this misconception the military element of the Civil Engineering force is not capable of providing reliable Combat Support.

VI. DISCUSSION

General Thomas D. White, former Chief of Staff of USAF, once stated: "Preeminance in air power has been the goal of American airmen since the military potential of air operations was first recognized - - Today, however, as air power evolves into aerospace power our position is being seriously challenged in an area in which we have been supreme for years - - - Technology." This quotation is the best possible description of the mission with this problem included.

The "forces in being" concept of warfare, the present state of technology and the increase in complexity and magnitude of Air Force real property facilities requires a Civil Engineering military combat support capability that is reliable, credible and mobile and provides maximum assurance that on-the-job performance will be achieved regardless of events. This requires a complete analysis of the problem. Is the present Civil Engineering force properly aligned? We are not addressing ourselves to the AFR 23-33 organization for daily operation and maintenance of real property, but rather to the posture which we have or should have to provide support of our Air Force missions, whether on the installation proper or under combat and mobile conditions world-wide. Is the distribution of this resource adequate to perform? Do we have the proper alignment of our military manpower resources to satisfy this requirement? Do they have the proper skills, and are they properly oriented with appropriate career development patterns? Along the same line we must assure that our civilian resources are adequate and that we are making proper use of contract resources to back up the aforementioned capabilities. We must assure ourselves that whatever the answer to this distribution problem is, we are capable of meeting every Air Force mission requirement today and tomorrow under all conditions. To set this problem in perspective, it is essential that we consider certain basic factors. First, the real property inventory of the Air Force has grown from a value of 6 billion dollars in 1955 to an estimated 16.0 billion dollars in 1964. Simultaneously, the complexity of this inventory has increased from that of the conventional type of WWII facilities to one of missiles, early warning systems, and other sophisticated systems. During this same period, the limitations on funds and personnel as compared to the growth in inventory has required the maximum utilization of every manpower authorization available. There has been a resultant intermarriage of the military and civilian resources without direct consideration to the skill and career requirements, and with no clear determination made between military and civilian job assignments. During this same period we moved from the era of the manned aircraft to the mixture of the manned aircraft and the more complex missile systems. For the first time the Civil Engineer airman became a part of the crew on a weapon system. There was a resultant bleed-off of many top skills and grades to support the missile system. Further, it is disturbing to note that, as we stand today, the Civil Engineer force is not aligned to support the national objective of limited war.

In the past and as it stands today, DOD directives have given special emphasis or credence to the use of civilians. For example, DOD Directive 1100.4, dated 20 August 1954, which is still in effect, states in part that "civilian personnel will be used in positions that do not require military incumbents for reasons of law, training, ability, discipline, rotation, or combat readiness, which do not require a military background for successful performance of the duties, and which do not entail unusual hours not normally associated or compatible with civilian employment." This approach to the manpower policy has been echoed in Air Force directives until only recently when an Air Force directive, AFR 25-10, for the first time took a positive approach and stated that the military will be used in combat and direct combat support and civilians will be utilized in indirect combat support. Specifically, military will be used in combat and direct combat support units and positions and in the exercise of command and control; in units with mobility requirements; for essential experience in combat support; for ZI overseas ratio; and to provide career progression. This criteria was followed as a basic premise in approaching the problem.

The study group recognized that the approach to the problem required a phasing in order to get the proper perspective. As a result the following phases were established.

PHASE I.

The Immediate or Quantitative Phase was established to determine the alignment and distribution of the Civil Engineer manpower resources. Full implementation of this phase may require a period of 4 to 5 years.

PHASE II.

The Long Range or the Qualitative Phase was established to determine the reliability, credibility and skill requirements of Civil Engineer manpower resources. Implementation of the phase necessitated the development of a completely new career progression program and a realignment of training programs to insure the skill proficiency required to support Phase I. Realization of tangible benefits from this phase will not occur before 3 to 5 years.

PHASE III.

Management of the Force was established to determine those continuing actions necessary to assure the retention of the alignment, distribution, and adequacy of the Civil Engineer Force.

A. PHASE I - QUANTITATIVE PHASE

The initial action on Phase I considered the alignment and distribution of the total manpower resource. It was initially determined that the basic need for the military component of the force was paramount in determining the military-civilian mix. The criteria in AFR 26-10 was used to determine the Civil Engineering combat support requirements. Additionally, ZI/overseas ratios and career progression factors were considered. Following these criteria it became readily apparent that the Civil Engineer Force must be aligned to perform three military missions; therefore, the group initially adopted three working postulates as a basis for the Base Engineer Emergency Forces (Prime BEEF):

(1) A minimum force of military civil engineers must be maintained at each air base, missile squadron/wing, depot or station, world-wide to maintain essential O&M services during and immediately following enemy attack, periods of imminent attack, major fires, floods and other emergency conditions.

(2) A force of military civil engineers must be attached to each flying unit which is designated for performance of emergency missions from an unoccupied, bare or dispersed operating base. This force of civil engineers must maintain its integrity and be prepared to proceed or accompany the flying unit for which it will provide essential O&M services under emergency conditions.

(3) A force of Military Civil Engineers must be trained in pioneer environments and be prepared to participate in unforeseen Contingencies and Special Air Warfare operations such as occurred during the Berlin, Cuba, and Southeast Asia crises.

These postulates were set forth in a letter to all major commands, Subject: "Civil Engineer Manpower Study", dated 20 December 1963 (Attachment 3). The major commands were requested to comment on the postulates and provide estimates of military personnel, skills and grades required by installation for postulate "1"; flying unit for postulate "2"; and force for postulate "3". Simultaneously, AFOMO requested major commands to send in copies of their present UMD's so that the command submittals when returned on 31 January 1964 could be evaluated against the present authorization. (See Attachment 4).

The next step was to develop criteria upon which manning guides for each of the postulates could be developed. Accordingly, bases were categorized for the application of postulate 1 (BEET-L, BEET-S, and BEET-ST), based upon data which considered installation acreage, population, improvement costs, area of pavements, number of structures, etc. (See Attachment 5). The Prime BEEF concept, consisting of the three postulates, was developed into two major operational concepts:

A. The Base Engineer Emergency Team Concept (BEET).

1. Primary Mission:

A minimum force of military civil engineer personnel will be identified at each air base, missile squadron/wing, depot or station, world-wide, to maintain essential operation and maintenance services during and immediately following enemy attack, periods of imminent attack, major fires, floods, storms, strikes, and other emergency conditions. These services will be limited to:

a. Work Control
b. Structural and Crash Fire Protection
c. Water Supply and Distribution
d. Sewage Collection and Disposal
e. Heat Production and Distribution Including Gas
f. Liquid Fuel Systems
g. Electric Power, Production and Distribution
h. Refrigeration and Distribution of Coolants for Other Than Comfort Cooling
i. Debris Removal, Snow Removal, and Pavements and Railroad Repair
j. Structural Damage Control

2. Utilization (Day-to-Day):

a. The emergency team will be a part of the authorized civil engineer work force for an installation and will be assigned and utilized only in the respective work centers for which it is authorized and designated for emergency operations. Individuals of this team will perform day-to-day work as authorized, scheduled, and directed by the control center on all types of facilities so long as the work requirement has been levied on the respective work center. No part of this team will be assigned to a specific category or type of facility unless that facility encompasses the total work requirements of the work center. Within the total Civil Engineer work force there will be no differentiation between the military and civilian elements in assigning jobs except where skill proficiency is the deciding factor.

b. The emergency team will be exercised under simulated conditions in accordance with the installation emergency plan at least once every quarter. More frequent exercises may be conducted if required to assure the highest degree of performance of this team to accomplish its primary mission.

3. Organization:

The emergency team will be organized as the Base Engineer Emergency Team (BEET) at installation level and will be assigned as follows:

a. At installations having a requirement for a Base Engineer Mobile Combat Support Team (MCST) (See Concept B), the military portion of the civil engineer squadron will consist of the BEET and MCST and other military personnel required to support ZI/overseas ratios, career progression, etc.

b. At installations having no requirement for a Mobile Combat Support Team, the Base Engineer Emergency Team, and other military personnel will comprise the military portion of the Civil Engineering Squadron.

4. Command and Control:

a. At installations where a civil engineer squadron is authorized the base civil engineer will exercise control of the unit. Upon deployment of the Mobile Combat Support Team, the second ranking or a fully qualified civil engineer officer will accompany and control this team. The base civil engineer will remain at the installation and exercise control of the civil engineer squadron.

5. Manning:

In manning for this concept, the following assumptions apply:

a. That a twelve (12) hour "Strategic Warning" will prevail and that an "All Clear" will be sounded not more than thirty-six (36) hours after warning.

b. Some civilian employees will leave their duty stations upon "Warning" but will return upon sounding of "All Clear".

c. That the nature and duration of attack will be such that the installation will be heavily damaged but not destroyed.

d. Best possible utility services and structures maintenance will be provided during the emergency period subject to essentiality and amenability of damage to expedient type repairs.

e. That only two shifts of military civil engineers will be available for duty during the thirty-six (36) hour period.

B. The Mobile Combat Support Team Concept (MCST)

1. Primary Mission:

A team of military civil engineers will be attached to designated installations and be identified as Mobile Combat Support Teams (MCST) to perform one of the following type mobile combat support missions:

a. A Mobile Combat Support Team (MCST-C) for support of unforeseen contingencies or special air warfare operations. This team of civil engineers must maintain its integrity, be trained in pioneer environments, and be prepared for deployment, in whole or in part, in order to establish and provide minimum essential operations and maintenance services applicable to the emergency situation. For extended occupation, this team will train and supervise indigenous civilians to augment its forces as required.

b. A Mobile Combat Support Team (MCST-F) to be attached to each flying unit which is designated for performance of a mission from an unoccupied, bare, or dispersed operating base (DOB). This team of civil engineers must maintain its integrity and be prepared to precede or accompany, in whole or in part, the flying unit for which it will provide essential operation and maintenance services under emergency conditions. These services will normally be limited to:

a. Work Control
b. Structural and Crash Fire Protection
c. Water Supply and Distribution
d. Sewage Collection and Disposal
e. Heat Production and Distribution Including Gas
f. Liquid Fuel Systems
g. Electric Power Production and Distribution
h. Refrigeration and Distribution of Coolants for Other Than Comfort Cooling
i. Pavement and Railroad Repair
j. Snow Removal
k. Buildings and Structures

For extended occupation, the Mobile Combat Support Team (F) will be augmented by indigenous civilians.

c. A Mobile Combat Support Team (MCST-M) to provide maintenance on facilities beyond the capability of the missile maintenance organization and to provide depot level maintenance for RPIE.

2. Utilization (Day-to-Day)

a. Personnel of a Mobile Combat Support Team will be assigned and utilized only in the respective work centers for which they are authorised and designated for emergency operations. Individuals of this team will perform day-to-day work as authorized, scheduled, and directed by the control center on all types of facilities, so long as the work requirement has been levied on the respective work center. No part of this team will be assigned to a specific category or type of facility unless that facility encompasses the total requirements of the work center. There

will be no differentiation between military and civilian elements of the work force in assigning jobs, except where skill proficiency is the deciding factor.

3. Readiness:

A Mobile Combat Support Team will be exercised under simulated conditions, at least once every quarter. More frequent exercises may be conducted if required to assure the highest degree of performance, readiness, and mobility of the unit to accomplish its primary mission.

4. Organization:

Mobile teams will be identified as Base Engineer Mobile Combat Support Teams (MCST), will retain their identify, and will join with the Base Engineer Emergency Team (BEET), other military and civilian employees to form the Civil Engineer Squadron. The Mobile Combat Support Teams (MCST-F&M) will be identified with a specific unit.

The Base Civil Engineer will exercise command and control of the Civil Engineer Squadron, including the Mobile Combat Support Team.

The second ranking or a fully qualified base civil engineering officer will accompany the Mobile Combat Support Team upon deployment. The Base Civil Engineer will remain at the parent installation and exercise command and control of the Civil Engineering Squadron including the remaining Base Engineer Emergency Team.

5. Materiel Support (MCST-C):

Fly-away kits, consisting of tools, minimum essential light equipment and critical supplies will be established and maintained in an up-to-date state of readiness. These kits will be assigned and readily accessible to the Civil Engineer Contingency Team to accompany the deploying unit on a two-hour notice.

6. Personnel Administration:

Base civil engineers will insure that personnel identified for Mobile Combat Support Teams will have current shot records, appropriate clothing, and passports if required. Current personnel rosters will be maintained for the Mobile Teams.

C. The Quantity

The Study Group prepared its own estimate of the gross number of Military Civil Engineers required for minimum support of each of the concepts. The current military strength of MCST-M organizations was accepted as adequate.

The Hq USAF letter of 20 December 1963 requested all commands to submit comparable estimates and to identify each individual with an AFSC. There was general agreement in the estimates among the commands with the USAF estimates. As a result, standard manning guides were adopted for each of the concepts as follows:

	OFF	AM
A. BEET (L)	6	160
B. BEET (S)	6	97
C. BEET (ST)	1	32
D. MCST (F)	1	59
E. MCST (M)	*	*
F. MCST (C)	1	59

*No change from current base authorizations, as reported.

The manning guides (Sample, Attachment 6) were developed for average conditions; however, they are structured for "building block" application, either vertically or horizontally. The manning for the MCST (F) and (C) are identical so as to provide interchangeability.

These manning guides were applied individually to each Air Force installation identified in PD 66-II. Concurrently, a review of each UMD was conducted. In cases where requirements were stated which were below or not commensurate with those stated in the manning guide, the actual authorizations on the UMD's were acknowledged, such as in the case of Sondrestrom and Thule, certain AC&W sites, and power production units of AF Communications Services Command.

This resulted in the preparation of military manning guide documents for each Air Force installation. Consequently, for the first time, Air Force Civil Engineering had a Military manning program based upon combat support requirements. (Attachment 7).

An initial estimate of the Military Civil Engineer force was prepared as follows:

	Present Force	Estimated Required Force
Overseas	10,106	10,171
ZI	31,132	25,238
Total	41,238	35,409

(Figures do not include staff requirements above base level)

At that stage, the Directorate of Civil Engineering was not prepared to say that there were 6,000 too many Military authorizations which could be converted to civilian spaces. It was considered that once the refined minimum number of highly skilled and trained airmen required to insure support of the Air Force missions, ZI and overseas, was determined there might be approximately 6,000 airmen spaces that could be considered for conversion to civilian spaces. The initial results of this also indicated another important factor; the Air Force ZI/overseas ratio of 2:3 would be accommodated within the total military manning and within the AFSC structure. In addition to a review of the active forces, a review of the reserve forces was accomplished. As a result, a manning guide (MCST(F)) was established to more clearly orient a standard pattern of Civil Engineering support of the national guard TAC fighters, Air Defense and the troop carrier units. The same was applied to the Air Force Reserve troop carrier units. In addition, MCST(C) units were established for some 500 reserves to provide augmentation in the event of an escalating situation. Two MCST(C) teams were provided in the Tennessee reserve for the Arnold Engineering Development Center because it is predominately a contract operation.

At this point the Study Group presented its concepts and proposals to Major General B. O. Davis, Director of Manpower and Organization who agreed with the basic philosophies of the approach and directed his staff to take further exploratory action. Accordingly on 25 March 1964 a letter was issued to all major commands, Subject: "Civil Engineering Manpower Study" which outlined the plans that had been prepared by the Study Group. (See Attachment 8). Once again the commands were requested to review the proposals and to identify and justify unusual requirements that would cause deviations from the proposed manning guides. The major commands were also requested to identify their civilian and military manpower resource authorizations by skill level and by installation to provide a basis for evaluations of current manning authorizations vs. proposed manning guides.

A review of the major command inputs began on 1 May. With minor exceptions, the commands were in general agreement with the program. The Study Group then proceeded with a review, tabulation, and analysis of the manning guides, Air Force wide. There is now, then a basis for further development and implementation of the program.

The following tabulation, excluding Hq USAF and special activities, summarizes the final results of the Group analysis and its effects on Phase I of the study:

ZONE OF INTERIOR

COMMAND	PRESENT FORCE (End FY 65) (Officers)	(Airmen)	REQUIRED FORCE (Officers)	(Airmen)
SAC	366	14,093	389	9,227
ADC	257	5,436	256	4,737
TAC	134	2,829	120	3,266
USAFSS	12	46	14	105
USAFA	8	5	6	134
HQ COMD	31	538	19	376
AFCS	3	208	3	208
ACIC	3	0	3	0
AU	7	160	9	252
CONAC	8	7	9	58
AFLC	69	171	67	1,601
AFSC	67	787	61	1,201
ATC	153	3,455	137	2,689
MATS	44	1,670	63	1,412
TOTALS	1,162	29,605	1,156	25,266

OVERSEAS

COMMAND	PRESENT FORCE (End FY 65) (Officers)	(Airmen)	REQUIRED FORCE (Officers)	(Airmen)
USAFE	158	3,101	177	3,772
ADC	24	280	24	280
AFCS	0	696	0	696
MATS	4	187	13	359
SAC	37	1,210	38	966
USAFSOUTH	3	135	7	220
USAFSS	44	326	35	334
PACAF	128	2,067	114	2,601
AAC	66	1,523	55	1,062
TOTALS	464	9,525	463	10,290

As previously stated this portion of the program can be implemented overall since we have identified our current military manpower requirements for use in case of emergencies within current resources. However, it must also be recognized that considerable time will be required to overcome the many hurdles such as political factors, career development problems, training mission changes, etc., before the program can be fully implemented.

B. PHASE II - QUALITATIVE PHASE

In approaching Phase II, it was considered basic that a complete and thorough understanding of Civil Engineering training and career development programs and systems was necessary. A complete review of the training centers, OJT programs, skill levels and career ladders was required prior to development of a new career progression program. In addition, there was a need to consider special training requirements for the Mobile Combat Support Teams which would be operating in all areas of the world under all conditions. In an endeavor to achieve the earliest and best possible solution to the training and career development aspects of this problem, Hq USAF scheduled and held a workshop at Sheppard AFB, Texas on 1 - 6 March 1964 (See Attachment 10), with representatives from the major ZI commands and training representatives of Hq ATC. The purpose was to review the existing training centers' programs, career development structures, and training curricula to develop a revised program that would be effective under the new proposed concepts. Prior to the workshop, the commands were advised of the most obvious areas of deficiencies in the skills and career development program. (See Attachment 11). The commands were requested to be prepared to revise and develop new career fields, job specialty descriptions, and training requirements. The workshop (consisting of the study group plus command representatives) was divided into five committees to consider the following problem areas:

1. Civil Engineering Airmen Career Areas

2. Civil Engineering Resident Training Programs

3. Civil Engineering Career Development Courses and OJT Programs

4. Civil Engineering Special Warfare Training

5. Civil Engineering Proposed Standard Manning Guides

The USAF Study Group opened the seminar with the stipulation that for military civil engineers to perform in a satisfactory manner, under emergency conditions and without civilian augmentation, it was essential that they occupy positions throughout the entire spectrum of each career ladder. It was further stipulated that neither the career ladders in use or the training programs associated therewith would provide a military civil engineer force which could perform unilaterally in a satisfactory manner under emergency conditions. After a complete and thorough discussion and understanding of the concepts of operation, it was a consensus of the workshop that the Civil Engineer Military Force must now be:

Reliable

Credible

Skilled

To delineate and define the problem, a review was made of the Civil Engineering Airmen Career Areas. These areas were: -54 Facilities; -55 Construction; -56 Utilities; -57 Fire Protection.

The -54 career area included the following: Missile Facilities; Electricians; Electrical Power Production; Cryogenics Fluids Production; Refrigeration and Air Conditioning; and Liquid Fuel Systems. This career area provided for all five levels to proceed to 7 levels with further progression to three 9 levels. This career area was basically satisfactory.

The -55 career area included the following: Roads and Grounds; Construction Equipment Operators; Masonry Workers; Woodworkers; Painters; Entomologists; and Building Maintenance Mechanics. These eight 5-level specialists proceed up a career ladder to two 7-levels, and progress to one 9-level. Because of inadequate career progression, homogeneous grouping of career specialties, and recognition of skill requirements for job specialties, the -55 career area was totally unacceptable. For example, the term "roads and grounds" does not express the technical requirements of pavements, soils, subgrades, and drainage. Secondly, construction equipment operators, one of the most specialized Civil Engineering Career Areas provided progression only to the 5-level. Thirdly, the masonry worker is a specialist at the 5-level, but is titled a "worker". As an example of the total inadequacy of skill requirements and recognition, this job description commenced with the statement, "He mixes mortar by putting cement into a container, and adds water to the proper consistency and removes foreign objects."

The -56 career area consisted of the following: Water and Waste; Plumbing; Heating; and Work Control. The first three progressed individually from 5-level to 7-level and consolidated to one 9-level. Work Control was a 3/7/9 career ladder. The -56 career area did not have a compatible grouping, particularly as pertains to Heating and Work Control.

The -57 career area was recently reviewed and found to be in good condition.

The Civil Engineering career area which is responsible for the construction, design, maintenance and operation of all Air Force real property had no provision for an engineering technician. Draftsmen and surveyors, to meet civil engineering basic technical requirements, were drawn from the -22 career area, Photomapping, and returned to their career area for the 9-level Photomapping Superintendent.

In January 1961, the Comptroller of the Air Force requested Civil Engineering to assume cost accounting responsibility for Real Property. Airmen specialists for cost accounting were drawn from the -67 career area, Accounting, and were basic accountants who served one or two tours with Civil Engineering, but subsequently were reassigned to the Comptroller's functional area. This did not provide for development

of the technical skill required in Civil Engineering resource accounting, nor did it enhance the career progression of the individuals involved. In addition, the function of accounting for real property must be accomplished even under the conditions envisioned in the concepts. Military personnel serving in this function were 70250 clerks from the Administrative Career area, which necessitated continuous on-the-job training because of no prior experience or training in this specialized area. This situation was further aggravated by the reassignment of these personnel to other clerical duties on subsequent tours of duty.

It was unanimously concluded that under the conditions of the present Civil Engineering Career structure, the Reliability, Credibility, and Skill required in the force could not be achieved. As a result, a completely revised career structure and matching training program was mandatory. Therefore, the following was accomplished by the workshop (See Attachment 12).

New career ladders were developed.

Airman Air Force Specialty Descriptions were completely revised and updated, since this is the basic document from which the grades, skill levels and training requirements are developed.

The impact on training programs was considered, but a new training program could not be developed until the new Specialty Descriptions and Career Structure were approved. Specifically, homogeneous groupings of knowledges and skills, from an occupational standpoint and a more realistic career development program, was developed by realignment of the Airmen's Civil Engineering Career Field. Specialty descriptions were updated to reflect the complexity of today's sophisticated facilities, tools, equipment, and materials. An objective in each specialty change was to improve airmen utilization by expanding the scope of duties and responsibilities for increased efficiencies and greater unit productivity. The -54 career area, formerly the Facilities career field, was renamed the Civil Engineering Mechanical/Electrical career field. The -55 career field, formerly the Construction career field, was renamed the Civil Engineer Structural/Pavements career field. The -56 career field, formerly the Utilities career field, was renamed the Civil Engineering Sanitation career field. The -57 career area, Fire Protection, remained unchanged. A resume of the major changes includes:

Civil Engineering Mechanical/Electrical Career Field (54):

This career field has been revised to recognize the homogeneous grouping of skills, increased requirements for technical knowledge, and to more clearly define the duties and responsibilities of airmen in the mechanical/electrical trades.

Career Ladder AFSC (54190), Missile Facilities Superintendent: This career field remains unchanged.

Career ladder AFSC (54290), Electrical Superintendent: This career area has been revised to provide a separate Electrical Lineman Career ladder (542x1). The Electrical Power Production career ladder (543x0) has been removed from this career area and established separately to provide a Superintendent (90) level.

Career ladder AFSC (54690), Mechanical Superintendent: The title for this career ladder has been changed from Refrigeration and Propellant Systems to the more compatible and descriptive one of Mechanical. The Cryogenic Fluids Production ladder (544x0) remains unchanged. The Refrigeration and Air Conditioning ladder (545x0) has been revised by the establishment of a 3/5/7 Refrigeration and Air Conditioning Plant Operator shredout (A). This provides the identification, training, and development of specialized skills to operate and maintain complex and diversified refrigeration and air conditioning plants. The Liquid Fuel Systems Maintenance ladder (546x0) remains unchanged. The Heating Systems ladder (547x0) was moved from the utilities career field (56) to provide a more homogeneous grouping of knowledges and skills from an occupational standpoint. This ladder has been revised by the inclusion of steamfitters from the Plumbing ladder (564x0) and the establishment of a 3/5/7 Heating Plant Operator shredout (A). This provides for the identification, training, and development of specialized skills to operate and maintain complex and diversive heating plants.

Civil Engineering Structural/Pavements Career Field AFSC (55):

The Structural/Pavements career field encompasses pavement maintenance, construction equipment operation, protective coating, the structural skills of carpentry and masonry; the complete centralized work control function to include a general maintenance mechanic, and cost and real property accounting, and an engineering site developer. These revisions have been made to recognize highly technical skills; to provide proper grouping of related skills; to adequately define the skills; to establish career ladders in Civil Engineering for which functional requirements and responsibilities exist, but no supporting military career ladder had previously been developed (viz, cost and real property accounting and site development); to permit standardization; to provide for proper career progression; and to establish a career field around which the Civil Engineering function can identify, train, and deploy a group of skilled military personnel to carry out its wartime or other type emergency responsibilities.

Career ladder AFSC (55190), Pavements Superintendent: This career area has been revised to remove masonry, and entomology. It now consists of Pavement Maintenance, and Construction Equipment Operator career ladders and provides for progression through the 3/5/7/9 skill levels. This career structure will provide (at the 7 and 9 levels) technically qualified supervisors with compatible construction careers.

Career ladder AFSC (55290), Structural Superintendent: This career area has been revised to remove the Building Maintenance Mechanic career

ladder and to include only those technical skills that are generally recognized to be within a family grouping of compatible construction knowledge. The previous Painter job specialty description 552x1 has been rewritten to require the specialized technical knowledge in the field of protective coatings, corrosion control and the effects of electrolysis.

Career ladder AFSC (55390), Work Control Superintendent: This career area has been revised to recognize the compatibilities of the Work Control career ladder within the -55 career field; to recognize the skill and knowledge required of the General Maintenance Technician career ladder as a primary source of input into the work control career area at the 9-level; and to recognize the newly developed Cost and Real Property Accounting ladder as a source of resource data input into the Work Control career area. The Cost and Real Property Accounting career ladder was developed to satisfy a civil engineering requirement of long standing. Previously, the input in this field was outside the civil engineer functional area and came primarily from the comptroller and administrative fields. As a result, no civil engineer military personnel have been specifically qualified in this area. By statutory law and in-service regulations, there is imposed on the Civil Engineering function a strict requirement for real property and cost accounting and preparation of reports thereto. The need for this career area has been recognized in Civil Engineering, but it was not until "Operations Stair Step" in USAFE that it was clearly demonstrated how operations break down when qualified personnel in the management areas are not available. The career ladder as developed will provide for career progression and provide the Civil Engineering function with personnel trained to be responsive to a highly professionalized requirement, particularly for the overseas bases and the mobile combat support forces. The General Maintenance Technician career ladder has been rewritten to recognize the higher skilled level required, i.e., input from related skill areas at the 5-level entry. The Work Control career area remains unchanged with the exceptions of a numerical change of the AFSC from the -56 to the -55 career field and the addition of Cost and Real Property Accounting.

Career ladder AFSC (55590), Site Development Superintendent: This is a new career ladder developed to recognize the need for highly trained airmen to satisfy the need for subprofessional military engineering knowledge. This need is recognized by Civil Service standards. Today we have on board an appreciable number of civilian employees satisfying this requirement in the construction and design function of the Base Civil Engineer organization. Airmen assigned in the Base Civil Engineer engineering and construction function today are there for the primary purpose of providing inspection of Air Force work being accomplished by contract. Their career background is in one of the trade areas. This career field establishes the requirements for airmen to be trained and qualified to design and engineer civil engineering construction/maintenance type projects under the supervision of professional engineers, employing the

techniques, knowledges, and, equally important, the Air Force know-how of getting projects processed through to completion. The need again was demonstrated during "Stair Step" in USAFE. Military and civilian personnel were not available and/or qualified to engineer and process the projects required to make the French bases combat operationally ready. Only on a crash basis, and to the neglect of other important command tasks, was it possible to meet minimum engineering requirements. This problem is becoming more acute in areas such as USAFE because indigenous people do not desire employment with the United States to the degree that they have in the past. For example, the closing down/opening of French bases offers no job security for French personnel. In West Germany USAF employees hold no civil service status with their own Government or accrus civil service benefits. Therefore, in Germany we have employees who are generally in an older age group. The need for an airman specialty in this area will ideally satisfy the world-wide requirement. The career ladder will provide a very distinguished and challenging career area for airmen desiring to be associated with the engineering profession. One of the other side benefits to be gained from this career area is that an airman having one to two years of college prior to entry in this career field, could complete college through Bootstrap or other means, and be considered for direct appointment as a civil engineering officer under the OTS program. This will assist in our officer retention program.

Civil Engineering Sanitation Career Field (56):

The Heating Systems ladder (565x0) has been moved to the Mechanical career field (54690) and the Engineer Entomology ladder (566x0) has been brought over from the -55 career field. The Water Waste Processing ladder (563x0) remains unchanged. The Plumbing ladder (564x0) was relocated to the -55 career field. Additionally, the steamfitters have been removed and included in the Heatings Systems ladder (544x0) to provide a more homogeneous grouping of skills and to more clearly delineate technical knowledge and skill requirements. The Engineering Entomology ladder (565x0) has been upgraded from 3/5 to 3/5/7 ladder to require the specialized technical knowledge for the control of insects, rodents, fungi, and the diversified conditions to be dealt with under the new concepts.

In an endeavor to posture the entire Civil Engineering military force, commensurate with the new concepts, at the earliest time, and in recognition of the Air Staff support of this project, the Directorate of Personnel Planning, Hq USAF, took cognizance of these factors and expedited Air Staff approval. The new Civil Engineering Career Structure will be included in the September, 1964 revision to AFM 39-1, at which time implementation will commence. (See Attachment 13). By September, a new TPR (Trained Personnel Requirements Program) for Civil Engineering will have to be developed, job training standards revised, training courses must be reviewed, and revised at all of the training centers and a new

PTT (Program Technical Training) will have to be developed. These actions are essential to tie in the September implementation date of the new career fields.

C. PHASE III - MANAGEMENT OF THE FORCE

This phase considered the continuing actions that are required by Civil Engineering to assure the attainment and maintenance of the Reliability, Credibility, and Skill of the force as established in Phases I and II, as well as the balance of the Civilian/Military Mix. Failure on the part of Civil Engineering to exercise the highest degree of management of its manpower resource will result in the degradation of the force and the loss of immeasurable effort and skill to provide combat support to the Air Force mission. The management of the force must encompass:

A. Maintenance of the posture of the force to insure that the alignment and distribution are consistent with the missions and programs of the Air Force and the needs and demands of the facility requirements world-wide.

B. Continuous review and monitoring of training and manpower requirements to insure that, within the limited resources, the most effective application is made which will provide the most beneficial and productive product for the force.

C. Monitoring career development to insure effective and timely implementation of the new Civil Engineering career structure, and maintain continuous surveillance on the skill, proficiency, advancement, utilization, and promotional opportunities of Civil Engineer airmen. This end-product is one of the prime elements in achieving real quality and espirit de corps in the force for both military and civilians.

D. Review and recommending policies on rotation of personnel possessing critical skills. Also, recommendations for assignment of 7-level and above NCO/s for those filling foreman and superintendent level jobs.

E. Review and determination on the use of manpower resources to insure the proper application of the required resource consistent with established policies and procedures. Reasonable standardization must be maintained if we are to assure the maintenance of our military posture and validate its requirement. At the same time, the utilization of contract services must be monitored to guard against the misuse of this element of the manpower resource to avoid criticism by higher officials.

The management of the forces should include in all phases the proper career development, assignment, and training of the officer corps. In addition, standardization of civilian job descriptions and the maintenance of an equitable skill balance between the military/civilian elements of the force must be established.

Management of the force within the Directorate of Civil Engineering, Hq USAF, cannot be accomplished as a functional segment of any division,

because other functional requirements will, by necessity of priority, erode the emphasis and capability required to perform this function. Since the results of the study show the lack of management of the forces in the past, combined with the emphasis and investment by the Air Force in the new proposals, it is now mandatory that a management unit be established to carry out the above functions.

VII. CONCLUSIONS

A. There is a continuing need for a Civil Engineering military force to provide combat support for Air Force missions.

B. The military/civilian mix has developed over the years without any uniformity between major commands or between similar types of installations within a command resulting in a heterogeneous mix of the force.

C. The Civil Engineering military forces are not aligned to meet the exigencies of war or other emergencies.

D. The present Civil Engineer military force is not reliable, credible or sufficiently skilled to effectively perform a wartime mission.

E. The Civil Engineering military force must be realigned consistent with the new concepts of operation.

F. The present Civil Engineering Career Development Structure is inadequate.

G. The new Civil Engineering Career Development Structure, if properly implemented is sophisticated, enhances career progressions, and will provide the skilled capability to support the new concepts.

H. Standard military manning is required to provide a manageable force, a broad base for career progression, and an equitable distribution of the force to support the new concepts of operation and to provide a satisfactory ZI/Overseas ratio.

I. Training programs must be revised to produce military personnel qualified to support the new concepts.

J. Since all facets of the new concepts will require continuous monitoring a single manpower management office in the Directorate of Civil Engineering, Hq USAF, is required.

K. A capability has been developed, within existing resources, to respond to emergencies.

VII. RECOMMENDATIONS

It is recommended that:

(1) A Manpower Management Office be established within the Directorate of Civil Engineering, Headquarters USAF, for the purpose of implementing the findings of this study and to provide a continuing monitorship of the Civil Engineering force. Such Office to be established and to report directly to the Director of Civil Engineering or the Deputy Director for Civil Engineering Operations.

(2) The Civil Engineering Manpower Study Group be relieved of further actions on this matter and that the permanent office assume all of the study group responsibilities.

STUDY GROUP MEMBERS

DIRECTORATE OF MANPOWER AND ORGANIZATION

Lt Colonel William Elias

Mr. Thomas P. Hasbrouck

Mr. Harry Goldman

DIRECTORATE OF PERSONNEL TRAINING AND EDUCATION

Lt Colonel Thomas A. Cavanagh

DIRECTORATE OF PERSONNEL PLANNING

Lt Colonel E. F. Rodriguez

Major George H. Roos, Jr.

NATIONAL GUARD BUREAU

Major Raymond C. Gagnon

DIRECTORATE OF CIVIL ENGINEERING

Lt Colonel Francis A. Sanders

Lt Colonel Charles V. Liebscher

Lt Colonel Richard A. Perez

Major Lloyd A. Easterling

Major Kenneth A. Jacobson

Captain David G. Kestner

Mr. John Burton

Mr. James G. Moore

Lt Colonel W. T. Meredith
Chairman

C O P Y

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON 25, D.C.

REPLY TO ATTN OF: AFOCE-GA

SUBJECT: Civil Engineer Manpower Study 2 DEC 1963

TO:

AFOCE-B	AFOCE-E	AFOCE-H	AFOCE-K
AFOCE-C	AFOCE-F	AFOCE-I	AFOCE-L
AFOCE-D	AFOCE-G	AFOCE-J	

1. The Base Maintenance Division will present a briefing on the background and objectives of a proposed Civil Engineer manpower structure study 0900 5 Dec 63 in Room 5D 421. Attachment 1 outlines in general terms the scope of the proposed study.

2. A discussion following the briefing will solicit your recommendations for detailing the objectives of the study and proposals on study procedures.

3. It is requested that each division chief be accompanied by an individual from his division who will serve as a member of a task force to implement recommendations of the meeting.

1 Atch
CE Manpower Structure Study

ORAN O. PRICE
Brigadier General, U. S. Air Force
Deputy Director for Civil Engineering Operations
Directorate of Civil Engineering

C O P Y

ATTACH 1

CIVIL ENGINEER MANPOWER STRUCTURE STUDY

In recent years, Civil Engineering has assumed increasing importance as a function in direct support of the Air Force mission. This shift in emphasis requires a reexamination of the civil engineering resource to insure its adequacy. We need to study and recommend appropriate revisions in the entire civil engineer manpower and personnel field to insure proper long range development of the civil engineer force.

At the present time we have varying military/civilian ratios between commands, varying utilization policies, "dead-end" career ladders, and a lack of definition of the place of the civil engineer in regard to new weapon systems and their uses.

The purpose of the proposed study is to review the direction of the Air Force in the next several years and then revaluate where the civil engineering force fits into the overall picture. This revaluation should consider such factors as functions and types of facilities and weapon systems to be supported, best mix of civilian and military personnel to meet operational and contingency requirements, the overall requirement for airmen and officers, proficiency and/or hardship pay, training objectives, and career specialty areas and revisions.

It is felt that the study might evolve into two basic phases. Phase I would involve an appraisal of the needed characteristics of the CE force in terms of Air Force weapon systems and their possible employment and the development of criteria by which these CE requirements could be measured. Phase II would involve an application of the criteria developed in Phase I.

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Atch #1

DIRECTORATE OF CIVIL ENGINEERING
HEADQUARTERS USAF

13 December 1963

MEMORANDUM FOR RECORD

SUBJECT: Civil Engineer Manpower Study

1. The Base Maintenance Division presented a briefing on the background and objectives of a proposed Civil Engineer manpower structure study at 0900, 5 Dec 63, in Room 4D-421.

2. The following personnel attended:

Major General R. H. Curtin	AFOCE
Brig General Oran O. Price	AFOCE-C
Colonel James A. Barnett	AFOCE-H
Colonel James A. Caples	AFOCE-K
Colonel Guy J. Hugunin	AFOCE-I
Colonel Ben Scarbrough	AFOCE-E
Colonel Gayle L. Smith	AFOCE-J
Colonel Henry J. Stehling	AFOCE-G
Lt Colonel Charles V. Liebscher	AFOCE-D
Lt Colonel William T. Meredith	AFOCE-C
Lt Colonel Richard A. Perez	AFOCE-LA
Lt Colonel Francis A. Sanders	AFOCE-KA
Mr. John R. Gibbens	AFOCE
Mr. Rufus L. Crockett	AFOCE-C
Mr. Linwood B. McCloud	AFOCE-L
Mr. Henry F. Ulinski	AFOCE-B
Mr. John C. Burton	AFOCE-B
Major James H. Blair	AFOCE-GA
Major Ernest R. Baur, Jr.	AFOCE-EB

3. After introductory remarks by General Curtin and Colonel Stehling, Lt Colonel Meredith presented a briefing which outlined in general terms the background and scope of the proposed study. An abstract of the briefing is contained in Attachment 1.

4. A discussion following the briefing proceeded substantially as follows:

a. General Curtin:

The key to the problem is what are our overseas requirements, by skills, types and numbers. How can we support exercises and situations like Berlin with in-being forces? We need to consider reserve forces potentials for more involved, long-term situations.

Over and above overseas requirements, what are Z.I. problems due to security, control, responsiveness, etc.

ATTACH 2

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HEADQUARTERS USAF

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Over and above overseas requirements, what are Z.I. problems due to security, control, responsiveness, etc.

ATTACH 2

We must emphasize, whatever the solution, the need to retain control of necessary CE operations within Civil Engineering.

Some possibilities to examine are: (1) manning certain skills with military only, such as power plant operations; (2) manning certain commands with military only; (3) establishing reserve carpentry flights, masonry flights, etc.

We must carefully examine our objectives. Is taking over a "bare base" in time of emergency and operating same with military what we need to be ready for?

b. General Price:

"Native Son" has had an adverse effect upon USAFE contingency plan capabilities.

We need to establish the minimum level of support the CE will be called upon to provide under emergency situations, as the basis for determining requirements. Emergency situations within the Z.I., such as hurricanes in southeastern U.S., may require special manning to insure the availability of key people.

We should investigate experiences of our French bases under strikes - how they operate, what is the effect on capability, etc.

c. General Curtin:

Are we equipped to cope with "convential" war - 20 wings, 3 or 4 Army divisions. How would we pick up supporting CE units to move, and where would they come from?

We are faced with the problem of a continuing decline in personnel strengths through FY 65 and 66. Our study should be cognizant of this.

d. Colonel Barnett:

Are we wasting resources by sending CE people to Britain? Bases there are operated by the Air Ministry. Perhaps we should have one UK base completely USAF staffed. This would require changes in existing governmental agreements.

e. General Curtin:

Study must also consider long range impact of project Clearwater.

At some remote bases, we might want to go completely contract - e.g., Pt. Barrow. We must consider whether we would really keep an interest in Pt. Barrow if the chips are down. If we do go contract in an area however, we must insure that we keep USAF CE firmly in control of the operation.

f. Colonel Smith:

I am impressed with the way the communications people use airmen. In Z.I., they do actual work, rather than supervise, and become supervisors over indigenous personnel overseas.

We will never have the number of people we want since our total resources are limited. Thus, we will have to supplement our resources by contract.

50% 50%

We will never get the work force better than 50% apprentice level, due to the system, needs in other career areas, etc. Therefore, we must learn to live with this.

Today, couldn't any Z.I. base be manned either all military, all civilian, or any mix of the two and still operate? The real problem occurs when the balloon goes up. We will never have adequate capability to meet such situations from our normal, regular forces; hence, we must look to Reserves and National Guard. We should build cadre type organizations, with qualified people, tool kits, light equipment on hand - but not duplicate Army engineer troops. We will always have instances such as unqualified airmen heating plant operators coming into Thule since these are unique situations, and airmen would have no experience or chance to train for this.

We will have to apply Air Force personnel planning policies to our situation first and then apply CE policies.

g. Lt Colonel Meredith:

Regarding the Thule situation, we could at least identify at an early time the airman programmed to go, and provide him with the needed specialized orientation.

h. Colonel Stehling:

Maybe we need to ask for changes in DOD/USAF personnel policies if our study so indicates.

i. General Curtin:

This study should solve the peacetime manning situation first. Our CE squadrons may have to be functionally organized - maybe put a 2nd Lt in charge of a power production flight, a Captain to run a carpentry flight, etc. We need to give our young officers the right kind of experience and incentive.

j. Lt Colonel Sanders:

The policy for Army support of USAF needs revision.

We have experience of having authorized spaces, but being unable to man the spaces with qualified people. Also, we have the problem of training people who don't stay - thus training time is largely wasted.

k. General Curtin:

This problem is Air Force-wide, not just in CE. We need to promote airmen retention - by enhancing career progression.

l. General Price:

We need to improve CE career field position from that reflected by the totem pole. This has a direct effect upon the priority for training and procurement of personnel. Improvements here could lower our apprentice level rate. I believe that emphasizing military supervision would help raise our relative position on the totem pole - establish a supervisory cadre for overseas.

m. General Curtin:

We need to give better support to the Training School at Sheppard AFB by visits and participation. We should help develop courses, and advise on the need and adequacy.

We should consider the possibilities of putting airmen overseas returnees into training with industry when no USAF Z.I. spot exists where their skills can be maintained.

n. Colonel Scarbrough:

In Korea and Viet Nam, we drew personnel to support the operation from the very PACAF bases whose workloads had increased, and who were least able to support this.

o. General Curtin:

Perhaps we could set up 150 man units - self-sufficient - at such places as Randolph, Wright-Patterson, etc., and use these units in daily operations, but pull them out for exercises, brush-fire situations, etc. Such areas could absorb the loss of these units.

p. Colonel Caples:

We should identify areas within USAF where there is prospect of interchange of personnel - where we can swap skills with other staff agencies when varied ZI/OS ratios make this mutually advantageous, e.g., aircraft maintenance/equipment maintenance.

q. Lt Colonel Liebscher:

In many areas and particularly overseas the Fire Department must be military manned due to security problems. This establishes the basic requirement, but then we have the problem of how to use these airmen back in the Z.I.

r. Colonel Smith:

Maybe we should consider building up cadres in commands that deploy; i.e., TAC, MATS, etc. Pulling 150 man cadre out of Wright-Patterson or San Antonio wouldn't kill them because they have a large civilian base to draw upon.

s. Colonel Scarbrough:

Identify tasks on overseas bases which you would ignore under wartime conditions. Don't try to provide military capability for these.

t. Mr. Crockett:

Suggests dual manning may be necessary and acceptable to AFOCE. Could we afford this, and get manpower support in an austere climate?

u. General Curtin:

First send letters to USAFE and PACAF soliciting their thoughts on this subject. Let's find out what are their current plans for contingencies, training, escalation, etc. Get statistics on what we have overseas in numbers and types by AFSC.

In the meantime consider, should we try to organize a couple of typical units here to cope with contingency situations.

Also consider to what extent we could use the Civil Engineer Center and/or seminars in attacking the problem.

I would like for this discussion to be recorded, an approach to the problem be developed, and further discussion be held in 10 days.

The study must carefully consider that cost savings, reductions, etc., will be stressed more and more in the future.

As the initial step, let's clear out deadwood at bases.

v. Mr. Gibbens:

Study should consider reserve commitments of portion of civilian labor force in emergencies. They may not always be there if balloon goes up.

WILLIAM T. MEREDITH
Lt Colonel, U. S. Air Force
Special Assistant
Dep Dir for Civil Engineering Operations
Directorate of Civil Engineering

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON 25, D.C.

REPLY TO
ATTN OF: AFOCE-C

SUBJECT: Civil Engineer Manpower Study 20 December 1963

TO:

AAC	AFLC	ATC	MATS	USAFSS	USAFE
ADC	AFSC	CONAC	SAC	USAFA	PACAF
AFCS	AU	HQCOMD	TAC	ACIC	USAFSOUTHCOM

1. A comprehensive study of Civil Engineering manpower, its utilization and the potentials for career improvement has been initiated by this Headquarters. One phase of this study concerns the civilian/military mix which has developed over the years without any uniformity between Major Commands or between similar type installations within the same Major Command.

2. In the above connection, a review group has been established in this Headquarters; this group has initially adopted three working postulates as follow:

a. A minimum force of military civil engineers must be maintained at each air base, missile squadron/wing, depot or station, world-wide, to maintain essential O&M services during and immediately following enemy attack, periods of imminent attack, major fires, floods, and other emergency conditions. These services will be limited to:

(1) Work Control.

(2) Structural and crash fire protection.

(3) Water supply and distribution.

(4) Sewage collection and disposal.

(5) Heat production and distribution including gas.

(6) Liquid fuel systems.

(7) Electric power production and distribution.

(8) Refrigeration and distribution of coolants for other than comfort cooling.

(9) Debris removal, snow removal and pavement and railroad repair.

ATTACH 3

b. A force of military civil engineers will be attached to each flying unit which is designated for performance of an emergency mission from an unoccupied air base. This force of civil engineers must maintain its integrity and be prepared to proceed or accompany the flying unit for which it will provide essential O&M services under emergency conditions. For extended occupation, the military civil engineer force will be augmented with indigenous civilians.

c. A force of military civil engineers will be trained in pioneer environments and be prepared to participate in unforeseen Contingencies and Special Air Warfare Operations such as Berlin, Cuba and Southeast Asia.

3. It is requested that your command comment on the postulates set forth above and provide estimates of military personnel, skills and grades required by installation for postulate "a"; flying unit for postulate "b"; and force for postulate "c". Submit this report of Civil Engineer Manpower Utilization Postulates, RCS: AF-074(OT), to arrive this Headquarters (AFOCEC) no later than 31 January 1964. ZI and overseas estimates will be stated separately.

4. Lt Colonel W. T. Meredith, Special Assistant, Deputy Directorate for Civil Engineering Operations, extension 69353, is the project officer for this study.

FOR THE CHIEF OF STAFF

ORAN O. PRICE
Brigadier General, U. S. Air Force
Deputy Director for Civil Engineering Operations
Directorate of Civil Engineering

JOINT MESSAGEFORM

SECURITY CLASSIFICATION: UNCLASSIFIED

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Reference AFCCE-C letter to AIMAJCOM, subject: CE Manpower Study, dated 20 December 1963. AFOMO is working jointly with AFCCE in conducting this study. Requirement exists for current detailed CE manpower authorizations; therefore, request that one copy of the UMD for each CE activity of your command be furnished this hq (AFOMOBD) by 24 January 1964. Documents will be utilized by work groups in developing the military/civilian mix and the working postulates enumerated in referenced AFCCE-C letter. For AFCS and OAR, this message is information only.

16 JAN 1964

DATE	TIME
15	1420
MONTH: January	YEAR: 1964

WRITER

SYMBOL: AFOMOBD

TYPED NAME AND TITLE (Signature, if required): Mr. Henry Coldman

PHONE 76516 | PAGE NR. 1 | NR OF PAGES 1

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RELEASER

SIGNATURE: Walter W. Gresham

TYPED (or stamped) NAME AND TITLE

WALTER W. GRESHAM JR.
Colonel, USAF
Chief, Organization & Requirements Div
Dir of Manpower & Organization, DCS/P&R

881

DD FORM 1 MAY 58 173 REPLACES DD FORM 173, 1 OCT. 49, WHICH WILL BE USED UNTIL EXHAUSTED

ATTACH #4

AFSC

	BASE	LOCATION	EXT	MST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY)	#BLDG.
								Off	Ann	Civ					
1.	Arnold Eng Dev Center	Tenn					AFSC				40,484	235	272.0	0	129
2.	Brooks	Texas	150				AFSC				1,331	2,268	19.6	0	256
3.	Holloman	N. M.	150	100		L	AFSC				8,830	5,816	57.1	2.9	1,005
4	L. G. Hanscom	Mass	150			L	AFSC				1,574	5,741	59.3	.52	353
5.	Patrick	Florida	150		50	L	AFSC				2,108	7,318	70.4	.91	1,123
6.	Edwards	Calif	150			L	AFSC				300,722	6,244	170.7	2.95	2,346
7.	Elgin	Florida	150		100	L	AFSC	12	408	489	460,188	10,107	110.3	4.03	1,875
8.	KIRTLAND	N.M.	150			L	AFSC				1,747	4,575	47.6	1.1	598

BASIC DATA SHEETS

ATTACH 5

SAC

	BASE	LOCATION	EDT	MDST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY)	#BLDG.
								Off	Amn	Civ					
1.	Altus AFB (ATLUS "F")	Oklahoma	150	M95		L	SAC	6	372	123	2,487	5,001	55.4	1.43	835
2.	Barksdale	LA	150			L	SAC	5	353	154	21,837	8,041	73.7	2.59	712
3.	Beale AFB (TITAN I)	California	150	M70		L	SAC	5	351	132		4,578			
4.	Bergstrom	Texas	150			L	SAC	4	256	114	3,176	3,972	44.1	2.55	543
5.	Biggs	Texas	150		50	L	SAC	4	299	108	6,034	3,922	47.6	2.34	1,086
6.	Blythville	Arkansas	150			L	SAC	4	188	107	3,077	3,512	42.8	1.49	559
7.	Bunker Hill	Indiana	150		50	L	SAC	4	278	102	2,732	4,781	62.0	1.16	632
8.	Carswell	Texas	150			L	SAC	4	279	123	2,391	4,008	59.7	1.59	864
9.	Castle	California	150			L	SAC	4	276	115	2,549	6,743	50.1	2.16	750
10.	Clinton Sherman	Oklahoma	150			L	SAC	4	221	117	3,338	3,463	41.6	1.47	590
11.	Davis Monthan (TITAN 2)	Arizona	150	M100		L	SAC	6	416	162	6,262	6,164	56.7	2.95	812
12.	Dow (BOMARK A)	Maine	150			L	SAC	4	325	103	2,051	4,817	66.9	2.86	236
13.	Dyess (ATLUS "F")	Texas	150	M95 61		L	SAC	7	436	131	5,186	6,795	60.4	1.85	865
14.	Ellsworth (TITAN I MINUTEMAN ATLUS "D & E")	S. D.	150	M120		L	SAC	8	540	199	4,834	6,672	100.6	2.0	864
15.	F.E. Warren (MINUTEMAN	Wyoming	150	M150		L	SAC	6	390	226	7,460	5,502	33.0		870
16.	Fairchild (ATLUS "E")	Washington	150	M70		L	SAC	6	473	215	3,302	6,043	102.5	2.3	1,368
17.	Forbes (ATLUS "E"	Kansas	150	M70		L	SAC	6	427	151	3,153	6,628	75.2	2.1	992
18.	Glasgow	Montana	150			L	SAC	4	275	119	5,582	3,953	83.1	1.4	589

Attach 5a

	BASE	LOCATION	ECT	MOST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPRCV.	PAVEMENT (SY)	#BLDG.
								Off	Ann	Civ					
19.•	Grand Forks (MINUTEMAN)	N. D.		M105		L	SAC	6	397	119	5,267	5,587	92.5	1.4	493
20.	Homestead	Florida	150	100		L	SAC	4	325	107	2,793	6,398	66.0	2.0	924
21.	K. I. Sawyer	Michagan	150		50	L	SAC	7	292	119	5,795	4,479	78.6	1.45	608
22.•	Larson (TITAN I)	Washington	150	165		L	SAC	5	403	133	8,936	4,414	93.4	3.5	1285
23.•	Lincoln (ATLAS F)	Nebraska	150	495		L	SAC	7	391	138	3,336	7,014	67.3	1.96	814
24.•	Little Rock (TITAN I)	Arkansas	150	1100		L	SAC	7	452	129	6,329	6,218	73.3	1.84	1030
25.	Lockbourne	Ohio	150	100		L	SAC	5	343	133	4,130	7,687	93.9	2.7	824
26.	Loring	Maine	150		50	L	SAC	5	368	239	9,373	6,833	166.6	1.88	660
27.•	Malmstrom (MINUTEMAN)	Montana	150	M110		L	SAC	9	416	134	3,093	5,316	79.5	1.52	599
28.	March	California	150			L	SAC	4	323	143	7,954	7,524	72.9	3.0	1013
29.•	McConnel (TITAN 2)	Kansas	150	(195 (200		L	SAC	8	403	240	2,472	5,254	53.7	2.2	507
30.	McCoy	Florida	150			L	SAC	4	257	108	3,841	4,267	55.3	2.42	544
31.•	Minot (MINUTEMAN)	N. D.	150	M110		L	SAC	5	380	100	4,576	6,139	94.8	1.41	567
32.•	Mt. Home (TITAN I)	Idaho	150	(165 (100		L	SAC	5	382	150	6,381	5,400	71.8	2.3	935
33.•	Offutt (ATLAS D)	Nebraska	150	170		L	SAC	3	518	240	1,990	13,062	79.7	1.22	643
34.	Pease	N. H.	150			L	SAC	5	337	109	4,081	6,679	78.5	2.1	504
35.•	Plattsburgh (ATLAS F)	N. Y.	150	495		L	SAC	6	453	117	3,249	5,630	93.4	2.0	1354
36.•	[illegible] (ATLAS F)	Kansas	150	435		L	SAC	6	409	123	3,324	4,850	79.9	3.62	632

Hth 5/6

	BASE	LOCATION	EDT	MOST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY	#BLDG.
								Off	Ann	Civ					
37.	Columbus	Miss	150			L	SAC	4	218	108	4,606	3,470	48.3	1.63	608
38.	Turner	Georgia	150		50	L	SAC	4	269	124	2,657	6,336	48.0	1.67	938
39.	Vandenberg	Calif	300	M300			SAC	12	902	206	65,694	10,494	197.6	.57	2997
40.	Walker (ATLAS F)	N. M.	150	M95			SAC	6	418	152	4,913	5,261	67.0	3.1	1138
41.	Westover	Mass	150		50		SAC	6	429	213	4,717	9,967	101.8	2.1	1167
42.	Whiteman (MINUTEMAN)	Mo.	150	M110			SAC	6	345	116	3,738	3,306	56.7	1.76	748
43.	Wurtsmith	Michagan	150		50		SAC	4	262	103	4,538	4,119	67.6	1.53	551

Attach

ADC

	BASE	LOCATION	RST	MOST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY)	#BLDG.
								Off	Amn	Civ					
1.	Adair AFS	Oregon	40			S	ADC				314	642	12.4	0	127
2.	Duluth IAP (BOMARC'S)	Minn	86	M25		S	ADC				1024	2573	20.0	.51	132
3.	Ent	Colo	150			L	ADC	6	137	154	36	5815	2.7	0	175
4.	Ft. Lee	Va.	40			S	ADC					895			
5.	Hamilton	Calif	150			L	ADC	11	137	136	1988	4650	38.7	.99	746
6.	Hancock	N. Y.	86			S	ADC				1135	2187	23.2	.2	317
7.	Kinchaloe (BOMARK'S)	Michigan	150	M20		L	ADC	7	294	114	3653	4384	59.5	1.46	915
8.	Kingsley	Oregon	86			S	ADC				367	1668	13.4	.5	84
9.	Niagara Falls (BOMARK)	N. Y.	86			S	ADC				1152	1140	23.9	1.52	456
10.	Otis (BOMARK'S A & B)	Mass	150	M20		L	ADC	16	229	259	20904	6344	93.0	1.2	1374
11.	Oxnard	Calif	86			S	ADC				773	1561	16.0	.43	95
12.	Paine	Washington	86			S	ADC				1187	1720	11.6	.62	227
13.	Perrin	Texas	100			S	ADC	9	143	159	1877	3245	26.6	1.1	460
14.	Portland IAP	Oregon	86			S	ADC				400	1859	10.1	.4	267
15.	Richards Gebaur	MO.	150			L	ADC	8	159	127	2080	3918	39.4	.83	524
16.	Selfridge	Michigan	150		50	L	ADC	8	291	192	3124	5539	56.7	1.33	512

5

atch 5d

	BASE	LOCATION	EST	MST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY)	#BLDG.
								Off	Amn	Civ					
17	Spokene	Wash	40			S	ADC				938	290	7.4	.30	227
18	Stewart	N. Y.	86			S	ADC				1892	2594	60.8	1.90	288
19	Suffolk CTY(SCHARK'A')	N. Y.	86			S	ADC	6	164	84	1923	2466	12.4	.61	301
20	Topsham	Me.	40				ADC				125	719	13.4		83
21	Truax	Wisconsin	86				ADC				638	3203	1.8	.77	194
22	Tyndall	Florida	150		50			5	362	104	28614	5912	60.7	1.4	1038
23	Custer AFS	MICH.	40			S	ADC					979	13.2	0	122
24	Mc Chord	WASH.	150			L	ADC	9	225	215	4,511	7,878	60.1	1.38	906

Attach 5a

(AFLC)

	BASE	LOCATION	ECT	MCST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY)	#BLDG.
								Off	Amn	Civ					
1.	Brookley	Ala	150			L	AFLC				1,974	14,154	60.0	1.12	564
2.	Hill	Utah	150			L	AFLC				5,666	14,234	85.5	1.7	756
3.	Kelly	Texas	150			L	AFLC				3,949	20,713	107.0	2.6	665
4.	McClelland	Calif	150			L	AFLC				2,589	18,567	99.4	1.78	542
5.	Mira Loma	Calif	40			S	AFLC				530	642	8.26	0	79
6.	Norton	Calif	150			L	AFLC				2,001	11,647	61.8	1.17	384
7.	Olmstead	Pa.	150			L	AFLC				1,130	11,384	57.4	.72	318
8.	Robbins	Ga.	150			L	AFLC				6,707	20,053	104.5	1.93	1094
9.	Tinker	Oklahoma	150			L	AFLC				3,405	21,422	119.7	1.95	507
10.	Wright-Patterson	Ohio	150				AFLC				7,720	15,371	209.7	2.75	1292
11.	Scott AFB	Ohio										180			
12.	Griffis	N.Y.	150			L	AFLC				3,475	11,267	119.1	1.9	747

AFLSC

MATS & USAFA

	BASE	LOCATION	ECT	MOST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY)	#BLDG.
								Off	Amn	Civ					
1.	Dover	Del	150	140		L	MATS	7	338	183	2,752	9,765	96.3	1.67	675
2.	McChord	Wash	150	[illegible]	[illegible]	L	MATS	9	223	215	4,511	7,878	60.1	1.38	906
3.	McGuire (Formerly "B")	N.J.	150	M20	50	L	MATS	6	398	267	3,490	14,540	116.4	2.38	802
4.	Orlando	Florida	86			S	MATS	2	131	166	1,253	3,473	16.1	0	442
5.	Scott	Illinois	150			L	MATS	5	172	405	2,306	6,844	66.3	.66	891
6.	Travis	Calif	150	100	100		MATS	5	465	278	5,006	16,565	138.4	2.8	1829
7.	Hunter	Ga.	150	100		L	MATS	4	195	202	5,323	5,246	52.8	1.4	639
8.	Charleston	S.C.	150	81		L	MATS	3	273	149	2,945	7,378	49.9	1.47	525
	USAF Academy	Colorado	150				USAFA				17,947	6,129	143.5		916

-29-

Att 59

HQ COMD & USAFSS & AU

	BASE	LOCATION	EDT	MOST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY)	#BLDG.
								Off	Amn	Civ					
1.	Andrews	MD	150		100	L	HQCOMD	20	428	545	4,378	11,989	118.6	2.68	499
2.	Bolling	Wash, D.C	86			L	HQCOMD	5	156	146	604	3,206	24.4	0	301
3.	Goodfellow	Texas	86			S	USAFSS				1,585	3,832	9.9	.55	264
4.	Gunther	Ala	86			S	AU				1,163	2,804	20.8	.57	221
5.	Maxwell	Ala	150			L	AU				2,799	7,700	50.0	1.51	684

TAC & CONAC

	BASE	LOCATION	EOT	MOST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY)	#BLDG.
								Off	Amn	Civ					
1.	Cannon	N.M.	150	(2) 200		L	TAC	8	190	130	3,481	4,215	25.0	.99	420
2.	Elgin	Florida	86			S	TAC	6	134	106	1,092	2,910	27.3	.73	322
3.	England	La.	150	(2) 200		L	TAC	6	155	110	2,241	3,544	25.6	1.4	443
4.	George	Calif	150	100		L	TAC	6	193	117	4,790	5,402	39.2	1.87	578
5.	Langley (REMARKED)	Va.	150	(M28 100		L	TAC	7	148	346	3,195	8,443	50.1	1.25	585
6.	Luke	Ariz	150			L	TAC	6	171	187	2,432	5,400	52.4	1.84	837
7.	Myrtle Beach	S.C.	86	100		S	TAC	7	151	147	4,428	3,241	34.3	.87	594
8.	Nellis	Nev	150	..		L	TAC	5	213	250	4,425	4,768	44.7	1.2	1269
9.	Sewart	Tenn	150	100		L	TAC	8	168	156	2,790	4,721	41.6	1.32	613
10.	Semour-Johnson	N.C.	150	100		L	TAC	8	176	188	3,110	6,440	61.1	1.64	1096
11.	Shaw	S.C.	100			L	TAC	9	147	195	3,024	6,594	36.8	.98	886
12.	MACDILL	FLA.	150	200		L	TAC	8	317	129	5,693	7,214	87.5	3.21	530
13.	POPE	N.C.	86	100		S	TAC	10	234	85	1,696	3,561	15.1	.43	109
1.	Dobbins	Ga.	86			S	CONAC				2,134	846	19.6	.89	211
2.	Ellington	Texas	89			S	CONAC				2,066	1,295	24.6	1.3	522

54

1144 JI

ACIC & ATC

	BASE	LOCATION	ECT	MEST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY)	#BLDG.
								Off	Enn	Civ					
1.	Aeor Chart & Info Cntr	Mo.	60			S	ACIC				25	3,392	6.0	0	18
2.	Amarillo	Texas	150		50	L	ATC	13	275	269	4,852	13,832	77.8	1.43	735
3.	Chanute	Illinois	150		50	L	ATC	12	250	330	2,162	5,797	76.7	.67	1081
4.	Craig	Ala					ATC				2,042	1,759	17.3	.98	354
5.	Greenville	Miss	86			S	ATC				2,037	2,322	13.2	.94	279
6.	James Conally	Texas	150			L	ATC	7	194	172	2,092	4,572	39.7	1.22	1045
7.	Keesler	Miss	150		50	L	ATC	10	372	289	1,467	21,015	95.8	.57	1740
8.	Lackland	Texas	150		50	L	ATC	13	390	324	2,777	23,500	76.0	0	1355
9.	Laughlin	Texas	86			S	ATC				3,910	2,465	26.7	1.44	416
10.	Lowry (TITAN I)	Colo	150	M140		L	ATC	10	229	334	2,039	12,344	51.2	.92	684
11.	Mather	Calif	150			L	ATC	7	236	272	6,126	5,600	77.1	2.39	1516
12.	Moody	Ga.	86			S	ATC				8,631	2,085	21.0	1.1	361
13.	Randolph	Texas	150		50	L	ATC	8	247	384	2,517	7,435	38.9	1.55	838
14.	Sheppard	Texas	150	100		L	ATC	12	325	294	3,885	15,634	91.4	1.93	1589
15.	Stead	Nev	86			S	ATC	7	150	149	5,913	3,098	30.5	.70	1114
16.	Vance	Oklahoma					ATC	Contract			1,821	923	23.3	1.26	589
17.	WEBB	TEXAS	86			S	ATC				1,846	1,747	9.0	1.35	213
18.	REESE	TEXAS	86			S	ATC				2,408	2,734	22.8	1.10	549

Con't of ACIC & ATC

	BASE	LOCATION	ECT	MCST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY)	#BLDG.
								Off	Amn	Civ					
17	Waco	Texas					ΔTC					507			
18	Webb	Texas	86				ΔTC				2,311	2,771	27.3	.87	479
19	Williams	Ariz	86				ΔTC				3,848	2,614	32.0	1.43	962

AAC

	BASE	LOCATION	EOT	MOST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY)	PERSONNEL
								Off	Enl	Civ					
1	Eielson	Alaska	150			L	AAC	10	372	232	33,910	3,500	175.82	1,900,000	451
2	Elmendorf	Alaska	150		200	L	AAC	16	574	473	13,200	8,200	240.00	2,250,000	936
3	Galena	Alaska	86			S	AAC				74	280	11.0	157,000	37
4	King Salmon	Alaska				S	AAC				413			518,318	82
5	Shemya	Alaska	86			S	AAC				3,520	690	40.8	1,136,000	147

ADC

	BASE	LOCATION	MCT	MOST	CT	SZ	CMD	CE S&D SIZE			AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY)	# BLDG
								Off	Enl	Civ					
1	Sondrestrom	Greenland	86			S	ADO	6	103	0		818		606,000	181
2	Thule	Greenland	340			L	ADO	17	340	0	338,884	2,494	416.1	1,192,000	549

MATS

	BASE	LOCATION	ECT	MCST	CT	SZ	CND	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY)	# BLDG
								CET	Amm.	Ctw					
1	Kindley	Bermuda	150			L	MATS	3	154	238	1,465	2,729	59.3	862,000	395
2	Lajes	Azores	150			L	MATS	3	78	448	885	376	64.0	1,673,000	303
3.	Prestwick	UK	86			S	MATS				44	661	2.2		100

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PACAF

	BASE	LOCATION	ECT	MCST	CT	SZ	CMD	CE SOD SIZE Off.	CE SOD SIZE Amn.	CE SOD SIZE Civ.	AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY)	# BLDG.
1.	Bien Hoa	Vietnam	86			S	PACAF					761			
2.	Clark	Philippine	150		100	L	PACAF	5	176	1150	157,371	8,054	84.90	1,070,000	1,900
3.	Da Nang	Vietnam	86			S	PACAF					660			
4.	Don Muag	Thailand	86			S	PACAF					306			
5.	Fuchu	Japan	60			S	PACAF				149	2,226	2.22	None	199
6.	Hickam	Hawaii	150			L	PACAF	5	139	416		6,400		1,860,000	1,500
7.	Itazuki	Japan	150			L	PACAF	7	107	762	1,582	4,100	21.08	900,000	1,027
8.	Kadena	Okinawa	150		100	L	PACAF	7	218	1900	5,266	7,100	99.88	2,050,000	1,744
9.	Kimpo	Korea	75			S	PACAF				1,557	660	1.95	34,000	142
10	Kunsan	Korea	86			S	PACAF				2,219	1,522	12.6	616,000	372
11	Misawa	Japan	150			L	PACAF	6	91	802	3,932	6,637	18.8	615,000	876
12	Naha	Okinawa	150			L	PACAF	6	112	493	1,820	5,924	45.7	580,000	1,001
13	Osan	Korea	150		100	L	PACAF	9	237	343	1,492	4,294	19.2	627,000	626
14	Tachikawa	Japan	150		100	L	PACAF	15	234	3080	1,402	15,885	16.8	677,000	1,192
15	Tainan	Taiwan	86			S	PACAF				131	640	20.5	1,546	146
16	Taipei	Taiwan	86			S	PACAF				6	641	.5	None	25
17	Tanson-Nhut	Vietnam	86			S	PACAF					2,217			
18	Wheeler	Hawaii	60			S	PACAF				1,404	1,591	13.7	898,000	305
19	Yakota	Japan	150			L	PACAF	4	88	1002	1,715	8,853	17.0	1,180,000	1,119
20															

A150

SAC

	BASE	LOCATION	ECT	MCST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY)	# BLDG
								Off	Amn	Civ					
1.	Anderson	Guam	150			L	SAC	4	328	307	11,085	4,358	96.45	2,539,518	1,336
2.	Ramey	Puerto Rico	150		150	L	SAC	4	344	166		4,489		1,616,889	1,396
1.	Brize Norton	UK	86			S	SAO	2	102	109	1,188	16,035	19.72	1,000,000	429
2.	Ernest Harmon	Canada	150			L	SAO	5	29	511	7,920	3,200	131.69	2,100,000	397
3.	Goose	Canada	150			L	SAO	5	53	499	6,303	3,800	174.32	2,600,000	490
4.	Moron	Spain	150			L	SAO	1	198	198	2,801	3,001	43.5	1,110,000	182
5.	Torrejon	Spain	150			L	SAO	1	205	224	3,250	6,119	64.3	1,544,000	265
6.	Upper Heyford	UK	86			S	SAO	2	102	5	1,193	1,359	15.7	1,033,000	473
7.	Zaragoza (DOB)	Spain	86			S	SAO				2,982	908	42.8	1,222,000	320
8.	Highwycomb	UK	60			S	USAFE	2	35	10	79	1,006	3.79	None	141

USAFE

	BASE	LOCATION	ECT	MCST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY)	# BLDG.
								Off.	Amn.	Civ.					
1	Alconbury	UK	86			S	USAFE	3	102	31	1,160	2,753	22.19	763,875	386
2	Athenai	Greece	86			S	USAFE				172	1,210	3.57	139,000	89
3	Aviano (TAO)	Italy	86			S	USAFE				936	1,548	1.23	594,952	166
4	Bentwaters	UK	150			L	USAFE	3	155	40	787	3,200	11.27	540,000	463
5	Bitburg	Germany	150			L	USAFE	5	175	743	1,071	4,040	2.04	530,000	360
6	Burderop (HOSP)	UK	50			S	USAFE				33	356	2.27	None	144
7	Chambley (DOB)	France	86			S	USAFE	2	55	32	1,423	436	14.29	850,000	346
8	Chateauroux	France	150			L	USAFE				1,747	21,088	51.66	793,478	445
9	Chaumont (DOB)	France	86			S	USAFE	2	55	32	1,252	494	13.25	460,000	230
10	Cigli (TAO)	Turkey	86			S	USAFE				1,800	1,450	12.12	250,000	521
11	Croughton	UK	65			S	USAFE				694	590	3.88	None	113
12	Dreux (DOB)	France	86			S	USAFE	2	55	32	1,291	273	21.41	980,000	389
13	Etain (DOB)	France	86			S	USAFE	2	55	32	1,168	450	11.35	470,000	300
14	Evreux	France	150			L	USAFE	2	162	86	1,750	2,600	27.62	860,000	468
15	Hahn	Germany	150			L	USAFE	5	174	350	1,231	3,400	3.58	530,000	428
16	Highwycomb	UK	60			S	USAFE	2	35	10	79	1,006	3.79	None	141

USAFE

	BASE	LOCATION	ECT	MCST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV	PAVEMENT (SY)	# BLDGS
								Off	Amn	Civ					
18	Incirlik	Turkey	86			S	USAFE				3,396	1,600	47.75	3,233,000	511
20	Lakenheath	UK					USAFE	3	115	5	1,728	2,978	12.2	1,061,000	690
21	Laon	France	150			L	USAFE	5	165	116	1,251	2,912	19.3	696,000	384
22	Phalsbourg (DOB)	France	86			S	USAFE	2	55	32	851	570	11.4	408,000	175
23	Ramstein	Germany	150			L	USAFE				3,015	7,341	4.14	754,000	581
24	Rhein-Main	Germany	150			L	USAFE				1,015	4,726	16.7	1,000,000	331
25	Ruislip (London area)	UK	60									2,021			
26	Sculthorpe	UK	150			L	USAFE	3	125	5	2,000	1,436	11.2	1,417,000	788
27	Sembach-	Germany	86			S	USAFE	6	130	296	583	1,361	1.2	378,000	85
28	Spangdahlem	Germany	150			L	USAFE	6	108	383	1,209	3,980	5.5	1,055,000	315
29	Templehof	Germany	150			L	USAFE				884	1,894	.23	1,035,000	60
30	Toul-Rosiers	France	150			L	USAFE	6	176	116	1,351	3,178	21.0	558,000	439
31	Wheelus	Libya	150			L	USAFE				2,226	4,353	72.2	1,766,000	751
32	Wiesbaden	Germany	150		150	L	USAFE				599	9,452	1.2	393,000	167

USAFSOUTHCOM

	BASE	LOCATION	DCT	MCST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV.	PAVEMENT (SY)	#BLDG.
								Off	Amn	Civ					
1	AllBrook	Canal Zone	86			S	SC				2,696	2,688	32.71	543,361	426
	Howard										4,242	59	30.81	442,794	380

USAFSS

	BASE	LOCATION	ECT	MCST	CT	SZ	CMD	CE SQD SIZE			AREA (AC)	POPULATION	COST IMPROV	PAVEMENT (SY)	ASSIG.
								Off	Ann	Civ					
1	Chicksands	UK	60			S	AFSS				411	1,615	4.12	None	213
2	Peshawar	Pakistan	60				AFSS				380	1,527	6.8	None	166
3	Wakkanai		86			S	AFSS				311	895	1.9	None	86
4	Hof	Germany	60			S	USAFE				24	820	1.64	None	16
5	Kirknewton	UK	60				USAFE				269	764	2.3	None	101

STANDARD MANNING GUIDE

BASE NAME _____ DATE:

COMMAND _____

WORK AREA	JOB TITLE	AFSC	BASE (L)	BASE (S)	BASE (ST)	MCSO (F)	MCSO (M)	MCSO (C)	HAVE Mil	HAVE Civ	NEED Mil	NEED Civ	CHANGE Mil	CHANGE Civ	AUTH M.D. Mil	AUTH M.D. Civ
COMMAND AND ADMINISTRATION (4400)	Civil Engineer Director	5596														
	Staff Civil Engineer	5536														
	Base Civil Engineer	5526	2	1												
	Construction Engineer	5534	1	1		1		1								
	Maintenance Engineer	5544	1	2	1											
	Industrial Engineer	5574	1	1												
	Squadron Commander	7024	1	1												
	First Sergeant	01090	1	1												
	Administrative Supervisor	70270	1	1												
	Administrative Specialist	70250	2	1	1	*		*								
WORK CONTROL (4430)	Work Control Superintendent	55690	1													
	Work Control Technician	55670		1		1		1								
	Work Control Specialist	55630	3	2	2											
	Supply Superintendent	64790														
	Organizational Supply Supervisor	64670	1	1												
	Organizational Supply Specialist	64650	1			1		1								
PERSONAL ENGINEERING ANALYSIS (4420)	Cost & Real Property Supervisor	55470	1													
	Cost & Real Property Specialist	55450	1	1	1	1		1								
	App Cost & Real Property Accountant	55430	1	1												
ENGINEERING AND CONSTRUCTION (4430)	Site Development Superintendent	55390				1		1								
	Site Development Technician	55370	1	1												
	Site Development Specialist	55350	1	1	1	1		1								
	App Site Developer	55330	1	1	1											

*Taken from Parent Organization

ATTACH 6

BASE NAME_____

COMMAND_____

DATE:

WORK AREA	JOB TITLE	AFSC	CEET (L)	CEET (S)	CEET (ST)	MCST (F)	MCST (M)	MCST (C)	HAVE Mil	HAVE Civ	NEED Mil	NEED Civ	CHANGE Mil	CHANGE Civ	NEW U.M.D. Mil	NEW U.M.D. Civ
MAINTENANCE & REPAIR (4450) (4460)																
Electrical	Electrical Superintendent	54290	1													
	Electrical Technician	54270	1	1		1		1								
	Electrician	54250	2	1	1	1		1								
	App Electrician	54230	2	1												
	Electric Power Line Technician	54271			1	1		1								
	Electric Power Line Specialist	54251	2	1	1	1		1								
	App Electric Power Line Specialist	54231	2	2												
Mechanical	Mechanical Superintendent	54790	1													
	Refrigeration & Air Cond Tech	54570	1	1		1		1								
	Refrigeration & Air Cond Spec	54550	1	1	1	1		1								
	App Refrigeration & Air Cond Spec	54530	2	1												
	Liquid Fuel Systems Maint Tech	54670	1			1		1								
	Liquid Fuel Systems Maint Spec	54650	2	2		1		1								
	App Liquid Fuel Systems Maint Spec	54630	1	2												
	Heating Systems Technician	54770	1	1	1	1		1								
	Heating Systems Specialist	54750	3	1	1	2		2								
	App Heating Systems Specialist	54730	4	2												
	Mechanical/Electrical Helper	54010														

BASE NAME_____

COMMAND_____

DATE:

WORK AREA	JOB TITLE	AFSC	GEEM (L)	GEEM (S)	GEET (ST)	MCST (F)	MCST (M)	MCST (C)	HAVE Mil	HAVE Civ	NEED Mil	NEED Civ	CHANGE Mil	CHANGE Civ	NEW U.M.D. Mil	NEW U.M.D. Civ
Pavements	Pavements Superintendent	55190				1		1								
	Pavement Maintenance Supervisor	55170	1	1		1		1								
	Pavement Maintenance Specialist	55150	7	3		1		1								
	App Pavement Maint Specialist	55130	4	2		1		1								
	Construction Equipment Supervisor	55171	1	1		1		1								
	Construction Equipment Operator	55151	5	2	2	2		2								
	App Construction Equip Operator	55131	4	3		1		1								
Structural	Structural Superintendent	55290	1													
	Structural Technician	55270	1	1	1	1		1								
	Carpentry Specialist	55250	3	2	1	2		2								
	App Carpenter	55230	2	2		1		1								
	Masonry Specialist	55253	1	1		1		1								
	App Mason	55233	2	1		1		1								
	Protective Coating Technician	55274	1	1		1		1								
	Protective Coating Specialist	55254	2	1	1											
	App Protective Coater	55234	1	1												
	Plumbing Supervisor	55275	1	1	1	1		1								
	Plumbing Specialist	55255	5	2	2	2		2								
	App Plumber	55235	4	3		1		1								
	Structural & Pavements Helper	55010														
	Machine Shop Technician	53170														
	Machinist	53150														
	App Machinist	53130														
	Metals Processing Technician	53270	1	1												
	Metals Processing Specialist	53250	1	1		1		1								
	App Metals Processing Spec	53230	1													

(Cont'd)

68

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BASE NAME_____

COMMAND_____

DATE:

WORK AREA	JOB TITLE	AFSC	GRADE (L)	GRADE (S)	GRADE (SS)	MOST (F)	MOST (M)	MOST (C)	HAVE MIL	HAVE CIV	NEED MIL	NEED CIV	CHANGE MIL	CHANGE CIV	NEW U.M.D. MIL	NEW U.M.D. CIV
Structural (Cont'd)	Sheet Metal Supervisor	53370														
	Sheet Metal Worker	53350														
	App Sheet Metal Worker	53330														
	Metal Working Helper	53010														
	General Maintenance Technician	55570	1			1		1								
	General Maintenance Mechanic	55530	3	2		1		1								
UTILITIES OPERATION (4470) Electric Power	Electric Power Prod Supt	54390	1													
	Electric Power Prod Technician	54370	2	1	1	2		2								
	Electric Power Prod Specialist	54350	2	2	2	2		2								
	App Elec Power Prod Specialist	54330	2	2	2											
Cryogenic Fluids	Cryogenic Fluids Prod Technician	54470														
	Cryogenic Fluids Prod Specialist	54450														
	App Cryogenic Fluids Prod Spec	54430														
Refrigeration & Air Cond Plants	Refrigeration & Air Cond Tech	54570A	1													
	Refrigeration & Air Cond Spec	54550A	1	1	1											
	App Refrig & Air Cond Spec	54530A														
Heating Plants	Heating Systems Technician	54770A	1													
	Heating Systems Specialist	54750A	2	1	1	1		1								
	App Heating Systems Spec	54730A	2	1	1											

BASE NAME _____

COMMAND _____ DATE:

WORK AREA	JOB TITLE	AFSC	CEET (L)	CEET (S)	CEET (ST)	MCST (F)	MCST (M)	MCST (C)	HAVE Mil	HAVE Civ	NEED Mil	NEED Civ	CHANGE Mil	CHANGE Civ	NEW U.M.D. Mil	NEW U.M.D. Civ
Sanitation	Sanitation Superintendent	56690	1													
	Water & Waste Process Supv	56370	1	1		1		1								
	Water & Waste Process Spec	56350	4	3	1	2		2								
	App Water & Waste Processor	56330	4	2		1		1								
	Engineer Entomology Tech	56670				1		1								
	Engineer Entomology Spec	56650	1	1	1	1		1								
	App Engineer Entomologist	56630	1	1												
	Sanitation Helper	56010														
FIRE PROTECTION & CRASH RESCUE (4440)	Fire Protection Superintendent	57190	1													
	Fire Protection Supervisor	57170	3	2		1		1								
	Fire Protection Specialist	57150	14	9	2	6		6								
	App Fire Protection Spec	57130	20	9		3		3								
	Fire Protection Helper	57010														
	TOTALS		166	103	33	60 59		60 59								

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON 25, D.C.

19 February 1964

THE INITIAL Prime BEEF

MILITARY MANNING PROGRAM

1. Documents comprising this attachment are on file in the Directorate of Civil Engineering, Headquarters USAF.

2. This program reflects the initial estimate for Prime BEEF by AFSC, skill level, installation and command, ZI and OS.

PROJECT OFFICER: Lt. Colonel W. T. Meredith

ATTACH 7

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON 25, D.C.

REPLY TO ATTN OF: AFOMOBD

25 March 1964

SUBJECT: Civil Engineering Manpower Study

TO:

AAC	AFCS	AU	OAR	USAFA
ACIC	AFIC	CONAC	PACAF	USAFE
ADC	AFSC	HQCOMD USAF	SAC	USAFSO
AFAFC	ATC	MATS	TAC	USAFSS

1. In the interest of optimizing the distribution and utilization of military, civilian and contract resources available to the Air Force to accomplish the Civil Engineering function, world-wide, an AFOMO/AFOCE study group has been established in this headquarters. Preliminary research has revealed little uniformity between major commands in the distribution and utilization of these resources. In many instances, there appeared little or no relationship between the skills identified for military authorizations and the tasks which this "hard core" resource must perform during emergencies.

2. The following related inquiries have been released to all major commands:

a. AFOCE letter of 30 December 1963, subject as above.

b. AFOMO message 375/64 dated 16 January 1964.

On the basis of replies to these inquiries, consensus functional distributions of military manpower requirements have been developed for every operational Air Force installation world-wide. Copies applicable to your command are inclosed as Attachment 5.

3. It is requested that each of these documents be reviewed and extended in accordance with instructions inclosed as Attachment 1, consistent with Concepts inclosed as Attachments 2 and 3, and the Explanation of Columnar Headings inclosed as Attachment 4. It is anticipated that proposed military manning will meet with your approval in most cases. However, recognizing weather, political, and other unusual conditions prevailing at some locations, revisions for which strong justification can be provided should be recommended by your command.

4. Three important considerations of this study are: (a) Recognition that realignment of civilian and military resources cannot be accomplished overnight; (b) There will be repercussions as the study progresses into the manpower programming cycles; and (c) Specified military requirements must be achieved within the total Civil Engineer manpower resources authorized. We will establish an "as of"

ATTACH 8

73.

date for formal implementation of manpower actions upon receipt and study of requested reports. Emphasis must be placed on the need for cooperative effort and clear understanding at every echelon in the Air Force as well as outside interested activities.

5. Request your inputs for this portion of the study be submitted by 1 May 1964 under the Report of Civil Engineering Manpower Authorization Resources, RCS: AF-077 (OT). Extension of this reporting date cannot be approved because of the critical timing imposed on this study.

FOR THE CHIEF OF STAFF

B. O. Davis, Jr

B. O. DAVIS, JR
Maj Gen, USAF
Director
Manpower & Organization, DCS/P&R

5 Atchs
1. Information Guide
2. Emergency Force Concept
3. Mobile Support Concept
4. Explanation of Form
5. Base Information Sheet

74

CIVIL ENGINEER MANPOWER STUDY

1. Background: In the preliminary efforts to achieve a realistic military-civilian mix, the first step was to define essential requirements for military authorizations in the Civil Engineer work force. Accordingly, concepts of military utilization were developed to identify specific mission requirements. These requirements are: (a) A military force to maintain continuity of essential utility services at air bases in event of imminent attack; (b) A military force capable of establishing, operating, and maintaining forward air bases in support of mobile tactical operations; (c) A deployable force capable of being immediately relocated, in part or in whole, to augment the forces in situations (a) and (b) above; and (d) A military force for unforseen emergency conditions requiring immediate Civil Engineer response world wide. Attachments 2 and 3 provide further details of the proposed operating concepts, with the understanding that they form a basis for the stable assignment, training, and rotation of the military segment of the Civil Engineer work force. In reviewing the sub-functional activities of the military requirements to support the proposed concepts, an investigation was also conducted into the areas of airman career training, career structuring in AFM 39-1, the CONUS/overseas ratio, and functions and work centers which require continuous and constant attention under emergency conditions. Revisions to AFM 39-1 are in the process of being staffed in this headquarters.

2. Requirement:

a. It is evident that any changes in the military-civilian manpower force will generate some impact at each Air Force base which can best be evaluated by your command.

b. Accordingly, request the following information be furnished this headquarters (Attn: AFOMOBD), including return of Attachment 5:

(1) Review and comment on the draft of career manning for each of your bases. These drafts are Attachment 5 to basic letter and, in general, indicate the functional distribution of military requirements for each of your bases in consonance with concepts outlined in Attachments 2 and 3. Skill levels shown have been developed to indicate the degree of responsibility which may be associated with the respective sub-function or work center.

(2) Request you indicate present authorizations (FY 3/65) (MAV 66-1) that can be utilized to fulfill each base's military requirements, by officer, airman, and civilian, by grade and AFSC. Bases supporting Missile Civil Engineer requirements in Function Code 44XO will identify those resources under the "MCST (M)" column. Manpower spaces so identified will be in addition to the spaces identified under the "HAVE" column of Attachment 5.

(3) Request you update the base listings and military requirements, within the intent of appropriate concepts, if different from

Tab 1

75

those shown. Columns having no red lines drawn through are those tentatively applicable for the base shown. Indicate any base omissions at the end of the report, with applicable current authorizations in line with Attachment 5. NOTE: Columns CEET (L) through MCST (C) of Attachment 5 show a military requirement based upon replies received from commands to AFOCE-C letter dated 20 December 1963, subject: Civil Engineer Manpower Study.

(4) In addition to the military-civilian mix and the justification therefore at base level, the need for military and civilian authorizations in Civil Engineering in headquarters units is recognized by Function Code 17XO in AFM 20-3. Since these authorizations may also generate an impact on this study, request you identify each headquarters unit in your command by reflecting officer, airman and civilian authorizations in Function Code 17XO, with the authorized grade and AFSC, as of FY 3/65 (MAV 66-1).

3. Limitations: It is emphasized that military authorizations will be an integral part of the day-to-day work forces and in no case will requirements for any additional manpower over and above the substantiated base workload be considered for purposes of this study. The grade authorizations of airmen shown in the requirements will not exceed the scope, intent, and limitations of AFM 26-1.

4. Project Officers: AFOMOBA, Lt Colonel William Elias, extension 79464; AFOMOBD, Mr. Harry Goldman, extension 73663; and AFOCEC, Lt Colonel William T. Meredith, extension 69353.

5. Due date and RCS: Request the information be furnished by 1 May 1964 under RCS: AF-077 OT. Extension of this reporting date cannot be approved because of the critical timing imposed on this study.

THE EMERGENCY FORCE CONCEPT

1. Primary Mission:

A minimum force of military civil engineer personnel will be identified at each air base, missile squadron/wing, depot or station, world-wide, to maintain essential operation and maintenance services during and immediately following enemy attack, periods of imminent attack, major fires, floods, storms, strikes, and other emergency conditions. These services will be limited to:

a. Work Control

b. Structural and Crash Fire Protection

c. Water supply and distribution

d. Sewage collection and disposal

e. Heat production and distribution including gas

f. Liquid fuel systems

g. Electric power production and distribution

h. Refrigeration and distribution of coolants for other than comfort cooling.

i. Debris removal, snow removal, and pavements and railroad repair.

j. Structural damage control

2. Utilization (Day-to-Day):

a. The Emergency Force will be a part of the authorized civil engineer work force for an installation and will be assigned and utilized only in the respective work centers for which it is authorized and designated for emergency operations. Individuals of this force will perform day-to-day work as authorized, scheduled and directed by the control center on all types of facilities so long as the work requirement has been levied on the respective work center. No part of this force will be assigned to a specific category or type of facility unless that facility encompasses the total work requirements of the work center. Within the total C.E. work force there will be no differentiation between the military and civilian elements in assigning jobs except where skill proficiency is the deciding factor.

b. The Emergency Force will be exercised under simulated conditions in accordance with the installation emergency plan at least once every quarter. More frequent exercises may be conducted if required to assure the highest degree of performance of this force to accomplish its primary mission.

3. Organization:

The Emergency Force will be organized as the Civil Engineer Emergency Team at installation level and will be assigned as follows:

a. At installations having a requirement for a civil engineer mobile combat support team, the civil engineer squadron will consist of the emergency team and the mobile combat support team. Other military personnel required to support CONUS/Oversea ratios, career progression, etc will be assigned to the Emergency Team.

b. At installations having no requirement for a civil engineer mobile combat support team, the civil engineer emergency team will be the C.E. squadron.

4. Command and Control:

a. At installations where a civil engineer squadron is authorized the base civil engineer will exercise control of the unit. Upon deployment of the mobile civil engineer combat support team, the second ranking civil engineer officer will accompany and control this team. The base civil engineer will remain at the installation and exercise control of the civil engineer squadron headquarters and the civil engineer emergency team.

5. In manning for this concept, the following assumptions apply.

a. That a twelve (12) hour "Strategic Warning" will prevail and that an "All Clear" will be sounded no more than thirty-six (36) hours after warning.

b. With only isolated exceptions civilian employees will leave their duty stations upon "Warning" but will return upon sounding of "All Clear."

c. That the nature and duration of attack will be such that the installation will be heavily damaged but not destroyed.

d. Best possible utility services and structure maintenance will be provided during the emergency period subject to essentiality and amenability of damage to expedient type repairs.

e. That only two shifts of military Civil Engineers will be available for duty during the thirty-six (36) hour emergency period.

76

THE MOBILE COMBAT SUPPORT CONCEPT

1. Primary Mission:

A force of Military Civil Engineers will be attached to designated installations and be identified as Mobile Combat Support Teams (MCST) to perform one of the following type Mobile Combat Support Missions:

a. A Mobile Combat Support Team (MCST-C) for support of unforseen contingencies or special air warfare operations. This force of Civil Engineers must maintain its integrity, be trained in pioneer environments, and be prepared for deployment in order to establish and provide minimum essential operations and maintenance services applicable to the emergency situation.

For extended occupation, this team will train and supervise indigenous civilians to augment its forces as required.

b. A Mobile Combat Support Team (MCST-M) to provide maintenance on facilities beyond the capability of the missile maintenance organization and to provide depot level maintenance for RPIE.

c. A Mobile Combat Support Team (MCST-F) to be attached to each flying unit which is designated for performance of a mission from an unoccupied, bare base, or dispersed operating base (DOB).

This force of civil engineers must maintain its integrity and be prepared to proceed or accompany the flying unit for which it will provide essential operation and maintenance services under emergency conditions. These services will normally be limited to:

a. Work Control

b. Structural and crash fire protection

c. Water supply and distribution

d. Sewage collection and disposal

e. Heat production and distribution including gas

f. Liquid fuel systems

g. Electric power production and distribution

h. Refrigeration and distribution of coolants for other than comfort cooling.

i. Pavement and railroad repair

j. Snow removal

k. Buildings and structures

For extended occupation, the civil engineer mobile combat support team will be augmented by indigenous civilians.

2. Utilization (Day-to-Day)

a. Personnel of a Mobile Combat Support Team will be assigned and utilized only in the respective work centers for which they are authorized and designated for contingency operations. Individuals of this force will perform day-to-day work as authorized, scheduled, and directed by the control center on all types of facilities, so long as the work requirement has been levied on the respective work center. No part of this force will be assigned to a specific category or type of facility unless that facility encompasses the total requirements of the work center. There will be no differentiation between military and civilian elements of the work force in assigning jobs, except where skill proficiency is the deciding factor.

3. Readiness:

A Mobile Combat Support Team will be exercised under simulated conditions, at least once every quarter. More frequent exercises may be conducted if required to assure the highest degree of performance, readiness, and mobility of the unit to accomplish its primary mission.

4. Organization:

Mobile teams will be identified as Civil Engineer Mobile Combat Support Teams (MCST), will retain their identity, and will be joined with the Civil Engineer Emergency Force to form the Base Civil Engineer Squadron. The Mobile Combat Support Teams (MCST-F&M) will be identified with a specific unit.

The Base Civil Engineer will exercise command and control of the Civil Engineer Squadron, including the Mobile Combat Support Team.

Upon deployment of a Mobile Combat Support Team, the second ranking base civil engineering officer will accompany the deployed team. The Base Civil Engineer will remain at the parent installations and exercise command and control of the Civil Engineering Squadron Headquarters and the remaining Civil Engineer Emergency Force.

5. Materiel Support (MCST-C):

Fly away kits, consisting of tools, minimum essential light equipment and critical supplies will be established and maintained in an up-to-date state of readiness. These kits will be assigned and readily accessable to the Civil Engineer Contingency Team [redacted] to accompany the deploying unit on a one hour notice.

6. Personnel Administration:

Base Civil Engineers will insure that personnel identified for Mobile Combat Support Teams will have ~~current shot~~ records, ~~appropriate clothing~~, and passports if required. Current personnel rosters will be maintained for the Mobile Teams.

81

EXPLANATION OF COLUMNAR HEADINGS OF ATTACHMENT 5

Work Area: Identifies broad groupings of work centers for purposes of the military-civilian mix study. The titles shown are not to be confused with or interpreted to change the organization set forth in AFR 23-33.

Job Title: Present titles assigned under AFM 39-1. Proposed revisions to the career ladders may result in changes to these titles at a later date.

AFSC: Present AFSCs under AFM 39-1. Proposed revisions to the career ladders may result in changes to the AFSCs at a later date. AFSCs shown are representative and apply only to the purposes of the study. For example, the "HAVE" column will show authorized resources military and civilian.

CEET (L) Civil Engineer Emergency Team for a large base - authorized base population over 3,000 spaces.

CEET (S) Civil Engineer Emergency Team for a small base - authorized base population under 3,000 spaces.

CEET (ST) Civil Engineer Emergency Team for a site - e. g., AC&W.

MCST (F) Mobile Combat Support Team for deployable flying units.

MCST (M) Mobile Combat Support Team for missile facilities real property installed equipment (RPIE).

MCST (C) Mobile Combat Support Team for deployable conditions.

HAVE Identify present base authorized manpower resources opposite AFSCs and titles shown, by grade. Identify other manpower authorizations by AFSC, position title, and grade at end of report, by base. Authorizations for bases inadvertently omitted from the attached list should be submitted in similar format.

NEED For Hq USAF use only.

CHANGE For Hq USAF use only.

NEW UMD For Hq USAF use only.

tch 4

82

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON 25, D.C.

19 May 1964

THE Prime BEEF

MILITARY MANNING PROGRAM

1. Documents comprising this attachment are on file in the Directorate of Civil Engineering, Headquarters USAF.

2. This program reflects the Prime BEEF posture by AFSC, skill level, installation and command, ZI and OS.

3. This program is proposed for initial implementation in September 1964.

PROJECT OFFICER: Lt. Colonel W. T. Meredith

ATTACH 9

C O P Y

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON 25, D.C.

REPLY TO ATTN OF: AFOCE-C

6 FEB 1964

SUBJECT: Civil Engineer Training and Career Development Workshop

TO: ATC

1. Reference is made to letter AFPTRTC, dated 30 January 1964, Subject: "Review of Civil Engineer Training."

2. A comprehensive study of Civil Engineering Manpower, its utilization and the potentials for career improvement has been initiated by this Headquarters. One phase of this study concerns the training and career development of Civil Engineer airmen and civilian counterparts.

3. In an endeavor to achieve the earliest and best possible solution to the training and career development aspects of this problem, this Headquarters desires to hold a Workshop at Sheppard Air Force Base, Texas, during the period of 1 - 6 March 1964. It is planned that there will be approximately 20 to 25 participants representing interested staff elements of this Headquarters, your Headquarters and Major Commands. It is requested that on-base billeting accommodations be provided to the extent possible. The specific agenda will be developed with your representatives while in this Headquarters on 11 February 1964.

4. This letter confirms informal discussions on this subject between Mr. T. Byars of your Headquarters and Lt Colonel W. T. Meredith of this Headquarters.

ORAN O. PRICE
Brigadier General, U. S. Air Force
Deputy Director for Civil Engineering Operations
Directorate of Civil Engineering

ATTACH 10

C O P Y

85

HEADQUARTERS AIR TRAINING COMMAND
UNITED STATES AIR FORCE
RANDOLPH AIR FORCE BASE, TEXAS

REPLY TO
ATTN OF: ATTMS-S

SUBJECT: Civil Engineer Training and Career Development Workshop 17 FEB 1964

TO: Hq USAF (AFOCE-C)

1. Reference is made to your letter AFOCE-C, 6 Feb 64, subject same as above.

2. Necessary arrangements are being made for Sheppard TTC to host the Workshop as requested in referenced correspondence.

3. Names of personnel that will attend this Workshop should be furnished to Sheppard TTC at the earliest possible date.

FOR THE COMMANDER

W. D. CEELY
Colonel, USAF
Director, Military & Support Tng

PREPARE THE MAN

84

DEPARTMENT OF THE AIR FORCE
HEADQUARTERS UNITED STATES AIR FORCE
WASHINGTON 25, D.C.

REPLY TO
ATTN OF: AFOCE-C

SUBJECT: Civil Engineer Training and Career Development Workshop 14 February 1964

TO: ADC, AFSC, SAC, AFIT (CEC)
ATC, CONAC, TAC, HQ COMD USAF
AFLC, MATS, USAFSS

1. Reference is made to letter this headquarters (AFOCE-C), subject: Civil Engineer Manpower Study, dated 20 December 1963.

2. The initial phase of subject study, concerning the Civilian/Military mix, is now coming into focus, based upon an analysis of replies to referenced letter.

3. The second phase of this study concerns the training and career development of Civil Engineer airmen and civilian counterparts. To achieve the earliest and best possible solution to this phase, a workshop to study five specific problem areas (see Attachment #1) will be held at Sheppard AFB, starting on 2 March 1964 for five days.

4. The Major Commands indicated above are hereby assigned the responsibility for reviewing and revising, as deemed necessary, the job descriptions for the Civil Engineer Airman Career Areas, contained in AFM 39-1, with the objective of more clearly delineating the technical and skill level requirements of each job. Specific emphasis must be given the attached draft revisions to the job descriptions and proposed career ladder for the 55 Career Area to enhance the career progression of this area (Attachment #2). Your representative will submit your proposals at the Workshop and be authorized to exercise final approval for your Command. Also, your representative must be thoroughly familiar with the problem areas outlined in Attachment #1 and be prepared to discuss their effect on your Command.

5. The Workshop will be organized into five Working Groups. Each Working Group will be assigned a specific problem. Attachment #3 indicates the Working Group to which your representative(s) has been assigned.

6. Participation in the Workshop will be limited to one Civil Engineer representative from each addressee, except:

a. TAC will provide added representation for Special Air Warfare Consideration.

ATTACH 11

51

b. ATC will provide added representation as necessary to cover the training and career development of Civil Engineer Airmen.

7. A complete Workshop agenda is described in Attachment #4. The host project officer is Lt Colonel G. E. Talbot, extension 2067, Sheppard AFB, Texas. The Headquarters USAF project officer is Lt Colonel W. T. Meredith, AFOCE-C, extension 69353 or 69535. The project officers must be advised by 24 February 1964, the name of your representative(s), date and time of arrival at Sheppard AFB, mode of travel, and requirements for BOQ space.

FOR THE CHIEF OF STAFF

ORAN O. PRICE
Brigadier General, U. S. Air Force
Dep Dir for Civil Engineering Operations
Directorate of Civil Engineering

4 Atch
1. Workshop Problems
2. Draft Job Descriptions
3. Working Group Assignments
4. Agenda

88

WORKSHOP PROBLEM AREAS

1. Revaluate Civil Engineering Airman Career Areas. A comprehensive review will be made of each C.E. job description as contained in AFM 39-1 or as proposed. Command proposals will be considered and final job descriptions will be reviewed and new proposals drawn up and finalized with the assembled Workshop.

2. Revaluate Civil Engineer Airman resident training programs. The resident training programs will be revaluated to consider the impact of increased training requirements of other Civil Engineer areas. Impact of a reduction in resident training and a new training program will be developed taking into account proposed career advancements developed in the Workshop. Each training course will be reviewed to determine its adequacy. Recommendations will be presented to the assembled Workshop.

3. Revaluate Civil Engineering Career Development Courses and OJT Programs. A complete review will be made to determine effectiveness and applicability to insure effective progression of skills and skill levels. Each package will be reviewed and revised to include the technical and skill requirements of the particular trade. Recommendations will be presented to the assembled Workshop.

4. Study application of Special Air Warfare Training to Civil Engineering missions. A thorough review will be made of the Special Air Warfare Training Course now established under TAC to form a basis of understanding. The application of Special Air Warfare Training to the forces under Postulates B and C will be studied. This will include the basic need, the degree, the impact on the existing training capability, applicability to OJT type training and the development of a phased training program. Recommendations will be presented to the assembled Workshop.

5. Review proposed manning templets for Postulates A, B and C. Manning templets have been developed for each postulate based upon Command replies to Headquarters USAF letter, subject: Civil Engineer Manpower Study, dated 20 December 1963. A review will be made to gain a broader professional engineering perspective and consideration. Recommendations will be submitted to the Workshop Chairman.

Atch #1

AIRMAN AIR FORCE SPECIALTY

CONSTRUCTION EQUIPMENT TECHNICIAN

1. SPECIALTY SUMMARY

Operates and provides technical surveillance over all types of heavy construction equipment required to construct and maintain airfield pavements, roads and grounds.

2. DUTIES AND RESPONSIBILITIES

a. Levels, grades and fills surfaces: Prepares surfaces for construction and maintenance of airfield pavements, roads, grounds, recreation and parking areas to critical tolerances by clearing and grubbing, ditching, backsloping, shaping, compacting and leveling.

b. Lifts and moves materials, sand, gravel and other materials: Loads and unloads sand, gravel, coal and other loose aggregates, lifts and moves objects such as heavy salvage items and other supplies or equipment too heavy or in position inaccessible to material-handling equipment by operating trucks and cranes.

c. Excavates, ditches, moves earth and prepares aggregates: Strips, slopes, cuts drainage channels, sink shafts and removes obstructions. Excavates trenches for sewer, water, gas and oil line construction. Erect fences, telephone and electric high line poles.

d. Stabilizes and compacts soil: Stabilizes soil in preparation of subgrades and base courses for construction of roads, runways, parking areas, etc. Compacts surfaces composed of materials such as earth, coral, sand and crushed rock using water and bituminous materials.

e. Removes snow and ice: Determines the proper techniques and equipment to plow and clear surfaces free of snow and ice, evacuates snow to dump areas, and maintains the maximum clearance possible on roads, runways, parking areas, etc., to provide aircraft and personnel safety.

f. Maintains and prepares equipment for use: Schedules and coordinates heavy construction equipment repair and overhaul with vehicle maintenance activity. Inspects, cleans, lubricates and performs operator [illegible] maintenance on all heavy construction equipment. Adjusts and changes operating attachments such as dozer and grader blades, clamshell, buckets, backhoe and draglines.

g. Supervises construction equipment operator personnel: Serves as [illegible] ator technician assigned to specific tasks or projects and provides assistance planning and scheduling of operations, materials and equipment; establishes

work standards and job priorities. Estimates work output and assignment and use of equipment required. Indoctrinates newly assigned personnel. Conducts on-the-job training.

h. Inspects completed work to insure adequate standards and quality.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of characteristics, capabilities, operator techniques and maintenance of heavy construction equipment such as crawler tractors, graders, rollers, loaders, ditching equipment, scrapers and cranes and shovels; practical application of surveying principles of earth filling and compaction, grading and leveling and principles of equipment management for maximum work output.

(2) Knowledge of operations performed by construction equipment pertinent to dust and erosion control, general masonry and concrete and bituminous surfacing methods.

b. Education: Completion of high school with courses in subjects pertaining to soil composition, blue print and site plan reading and personnel management is desirable.

c. Experience: Experience in operating heavy construction equipment, employment of special techniques in using construction equipment expediently in preparing areas for construction and maintenance of roads, grounds, runways, etc., is mandatory.

d. Training: Completion of courses in construction equipment characteristics, capabilities and operation is mandatory.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Tractor Operator	7-36.510
Caterpillar Crane Operator	5-73.050
Scraper Operator III	7-23.050
Blade-Grader Operator	7-23.050
Power-Shovel Operator	5-73.210

AFM 39-1
AFSC 55151
Semiskilled AFSC 55131

AIRMAN AIR FORCE SPECIALTY

CONSTRUCTION EQUIPMENT OPERATOR

1. SPECIALTY SUMMARY

Operates all types of heavy construction equipment to maintain roads and grounds.

2. DUTIES AND RESPONSIBILITIES

a. Levels, grades, and fills surfaces: Prepares surfaces for roads, runways, walks, and recreation and parking areas by ditching, backsloping, level blading, and scarifying, using motorized or tow type of graders. Smooths gravel or earth surfaces by adjusting blade controls to maintain desired cut or fill.

b. Lifts and moves heavy objects and sand, gravel, and other materials. Lifts and moves objects such as heavy salvage items and other supplies or equipment too heavy or in position inaccessible to material-handling equipment by operating truck or tractor-mounted cranes. Loads and unloads sand, gravel, coal, and other loose material, using cranes with dragline or clamshell attachments.

c. Excavates, ditches, moves earth, and prepares aggregate: Strips, slopes, cuts drainage channels, sinks shafts, and removes obstructions, using heavy earth-moving machinery such as cranes with dragline or clamshell attachments, power shovels, bulldozers, angledozers, carryall scrapers, turnpulls, and crushing and screening plants. Digs trenches for sewer, water, gas, and oil pipes, using wheel and ladder-type ditching machines. Drills holes for fence-posts and telephone and highline poles, using powered earth auger.

d. Stabilizes and compacts soil: Stabilizes soil in preparation of subgrades and base courses for construction of roads, runways, and parking areas, using tractor-towed equipment such as rotary tillers, harrows, rooters, and plows. Compacts surfaces, composed of materials such as earth, coral, and crushed rock, using sheepsfoot rollers and towed or engine-driven road rollers. Operates bituminous distributor.

e. Removes snow and ice: Moves and carries away snow and ice, using equipment such as graders, bulldozers, angledozers, carryall scrapers, and rotary or displacement type snowplows.

f. Maintains and prepares equipment for use: Inspects, cleans, lubricates, and tightens loose connections. Performs other preventive maintenance on all heavy construction equipment. Adjusts and changes operating attachments such as dozer and grader blades, clamshells, buckets, and draglines. Connects wire rope rigging to row-type power-operated equipment such as carryalls, rooters, and cranes. Replaces worn steel cables and wire ropes.

g. Supervises construction equipment operator personnel: Serves as leader of crews assigned to specific tasks or projects. Assigns workers to tasks and

97

checks work to determine progress being made. Arranges for tools and materials and controls use to insure full utilization and to prevent damage or waste. Indoctrinates newly assigned personnel. Conducts on-the-job training.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of use, operation, and capacity of standard heavy construction equipment; practical application of surveying principles of earth leveling, grading, and filling; strength and characteristics of ropes, wire, and cables; and techniques for lifting and moving heavy objects by machine, is mandatory. Possession of mandatory knowledge will be determined in accordance with AFM 35-1.

(2) Knowledge of operations performed by construction equipment pertinent to dust and erosion control and general masonry, concrete and asphalt surfacing methods; knowledge of concrete, and bituminous surfacing methods is desirable.

b. Education: Completion of high school with courses in subjects pertaining to soil composition and blueprint and site plan reading is desirable.

c. Experience: Experience in operating standard heavy construction equipment in preparing areas for construction and maintaining roads, runways, and grounds, is mandatory.

d. Training: Completion of course in constructing equipment operation is mandatory.

e. Other: A minimum aptitude level of Mechanical 40 is desirable.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Tractor Operator	7-36.510
Caterpillar Crane Operator	5-73.050
Scraper Operator III	7-23.050
Blade-Grader Operator	7-23.010
Power-Shovel Operator	5-73.210

93

PAVEMENT TECHNICIAN

1. SPECIALTY SUMMARY

Exercises technical supervision on activities pertaining to maintenance and repair of pavements and railroad trackage.

2. DUTIES AND RESPONSIBILITIES

a. Plans and schedules pavement and railroad trackage maintenance and repair activities: Plans workloads and schedules work assignments from work orders and engineering field data collected from condition surveys. Establishes work standards and job priorities. Improves work methods for effective, efficient and economical use of personnel and equipment. Reviews condition surveys, failure and damage reports compiled by subordinates, makes decisions on corrective methods. Provides for control use of equipment and supplies. Ensures that layout plans on all pavements and railroads are up to date indicating type and condition of various components. Maintain up to date technical manuals and other publications pertaining to pavements and railroads. Become thoroughly familiar with the policy and procedures and keep subordinates properly informed. Sets up organizational structure to indicate personnel requirements, show lines of authority, and place specific responsibilities.

b. Supervises maintenance and repair activities pertaining to airfield pavements, roads, streets, walks, parking and storage areas and railroad trackage. Assigns specific duties to persons and groups. Determines that proper supplies, equipment, and tools are used. Observes work performance to determine compliance with directives, policies, instructions, and safety precautions. Makes immediate corrections of noted work deficiencies and unsafe practices. Takes followup actions on work assignments to determine

progress made. Maintains records of time spent and materials used for purpose of cost accounting and establishment of production standards. Rates subordinates for efficiency, schedules leaves, recommends promotions, and accomplishes other personnel actions. Coordinates work schedules and activities with other affected sections.

c. Pavements and Railroad Personnel: Orients and adjusts newly assigned personnel. Provides on-the-job instruction to individuals and groups; and conducts formal and informal conferences and discussions. Observes completed work to determine training requirements for persons or groups and provides for specific training. Maintains charts to indicate degree of development of each worker. Assigns on-the-job training phases to senior workers and evaluates effectiveness and adequacy of instruction. Insures that all workers are familiar with applicable directives and procedures.

d. Inspects and evaluates pavements & railroad maintenance activities: Performs inspections to detect deficiencies in maintenance of airfield pavements, roads, streets, walks, parking and storage areas and railroad trackage. Inspects and tests pavement surfacing for adequacy of design, material, and drainage. Inspects to determine adequacy and condition of culverts and drains. Inspects to determine defects in railway roadbeds, cross-ties, rails, and switching gear. Inspects heavy construction equipment to detect need for repair and overhaul. Periodically inspects activity to determine degree of compliance with regulations and policies. Inspects for proper usage, maintenance, and storage of machinery, tools, equipment, and supplies; and observance of fire and safety precautions. Inspects

completed work to insure adequate standards and quality. Discusses findings of inspections with immediate supervisor and recommends action to improve operation or correct deficiencies.

e. Performs technical pavement and railroad maintenance functions: Adapts and implements plans, specifications, policies, and regulations to fit requirements of activity. Prescribes work procedures when precedent has not been established. Makes decisions regarding types of equipment and materials to be used. Operates construction equipment, pours concrete, and performs general pavement and railroad maintenance duties. Makes sketches for use in proposed pavements and railroads.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of use and capacity of construction and maintenance equipment; construction rigging and demolition techniques; railway track maintenance; surveying and testing techniques; and general concrete work is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

(2) Knowledge of structural design and building blueprints, plans and specifications is desirable.

b. Education: Completion of high school with courses in soil mechanics, and blueprint reading is desirable.

c. Experience: Qualification as Pavements Specialist, Construction Equipment Operator, Concrete Worker, is mandatory. In addition, experience in supervising functions such as construction equipment operations, concrete work and pavements maintenance is mandatory.

d. Training: Completion of appropriate maintenance courses are mandatory.

4. SPECIALTY DATA

a. Grade Spread: Technical sergeant and master sergeant.

b. Related D.O.T. Jobs:

Construction Inspector---------- 0-79-01

Cement Finishing Foreman---------- 5-26.200

AFSC 55150
Semiskilled AFSC 55130

PAVEMENTS SPECIALIST

1. SPECIALITY SUMMARY

Maintains and repairs pavements and railroad trackage.

2. DUTIES AND RESPONSIBILITIES

a. Maintains and repairs airfield pavements, roads, streets, walks parking and storage areas, and related drainage: Inspects pavements for surface and base or subbase defects. Inspects drainage facilities for blockage, breaks, eroded ditches and other obstructions. Takes necessary action to secure necessary material to maintain or repair the failures in pavements and correct defects in the drainage facilities. Have working knowledge of the guidance contained in Air Force technical manuals and other official publications. Understand the basic fundamentals of blueprint readings and become familiar with the plans for base pavements. Take samples of soil to be used in the maintenance and repair work. Be familiar with and take soil density tests when directed. Be familiar with procedures for taking slump test and test samples for concrete beams. Inspects joints and cracks in rigid and flexible pavements, removes deteriorated material and place proper material. Inspect surface of flexible pavements and apply surface seals as required. After storm, remove debris or ice from drainage structures and open ditches.

b. Inspects, maintains and repairs railroad bed and tracks: Becomes familiar with technical Manuals and other Air Force publications on maintenance of Railroad Trackage. Becomes familiar with structural make-up of railroad

bed. Ensures that the roadbed is adequately drained. Check and maintain slopes in good condition to eliminate erosion. Inspect maintain and repair switches, turnouts and crossovers. Replace damaged rails and ties, maintain ballast, uses such tools as track guage and lineal board, drilling machines, tamping machines and other railroad maintenance equipment.

c. Performs rigging work: Raises and moves heavy equipment, using derricks, gin poles, A-frames, cableways, and chain blocks. Sets up braces and rigs hoisting equipment; splices rope and steel cable; and reeves rope and guy wire, using equipment such as hooks, snatch blocks, pulleys, axes, sledges, wrenches, and knives.

d. Performs demolition work: Determines size, type, and placement of explosives to be used according to object to be demolished. Places and sets off explosive charges such as TNT, dynamite, and black powder in quarrying operations and for destruction or removal of objects such as stumps and rocks in road construction; and underwater debris in construction of docks and clearance of harbors, using equipment such as cap crimper, fuse lighter, mining drills and spoons, galvanometer, and blasting machine.

e. Maintains tools and equipment: Lubricates, services, and adjusts tools and equipment. Cleans dirt from tools immediately after using and applies rust preventive oil coating to all metal parts. Sharpens edges of cutting tools.

f. Supervises pavement maintenance personnel: Assigns work to subordinates, checks completed work for accuracy, and evaluates individual performance. Instructs in techniques and equipment operation for functions such as maintenance of pavement and railroad beds, construction rigging and demolition.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Characteristics of road surfacing materials and common construction explosives; principles of construction rigging; and techniques for repairing asphalt and concrete pavements, is mandatory. Possession of mandatory knowledge will be determined in accordance with AFM 35-1.

(2) Knowledge of railway tracks and bed maintenance and concrete work is desirable.

b. Education: Completion of high school with courses in mechanics, and blueprint reading and interpretation, is desirable.

c. Experience: Experience in using construction tools and equipment, or construction demolition and rigging is mandatory.

d. Training Completion of a pavement maintenance course is mandatory.

e. Other: A minimum aptitude level of Mechanical 40 is desirable.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Blaster ---------- 5-74.020

Rigger ---------- 5-88.020

Construction Worker ---------- 9-32.01

100

AFSC 55270

AIRMAN AIR FORCE SPECIALTY

STRUCTURAL TECHNICIAN

1. SPECIALTY SUMMARY

Supervises the construction, erection, assembly, maintenance, alteration, rehabilitation and repair of buildings and structures.

2. DUTIES AND RESPONSIBILITIES

a. Work layout and preparation: Prepares working drawings for maintenance alteration, rehab and repair of buildings and structures. Interprets lines, designs, and symbols from drawings or blueprints and prepares quantity take-off of materials and labor to complete projects as assigned. Capable of cutting lumber to dimensions specified and mixing of mortar and laying of reinforcement steel and cutting stone, brick, glazed and ceramic tiles and installing of framework as necessary to receive poured concrete. Finishes concrete steps, platforms, ramps, etc., to the grades as specified. Inspects the cutting of lumber and operation of carpentry equipment such as hand tools and power driven saws, planers, sanders, trowels, screeds, floats, cutting torches and other tools and equipment used by the carpentry and masonry trades and as used in the cutting of reinforcing steels and meshes.

b. Constructs, erects, alters and repairs buildings: Supervises the construction, alteration, erection and repair of buildings and structures as pertains to the carpentry and masonry crafts connected with but not limited to wooden framework, sills, joists, rafters, siding, shingling, framework, doors and other materials using such fasteners as clamps, nails, screws and bolts. Assures proper installation of reinforcing steels and meshes prior to

the pouring of concrete steps, slabs, loading docks, ramps, etc.

c. Forms structures: Advises masons in the placement of framework and reinforcing steels for ramps, foundations, platforms and other phases of construction work where poured concrete is predominent. Further, advises carpenters in the construction, erection, maintenance, and repair of facilities which are basically of wood or wooden members. Must be familiar with the methods of the trades assuring that the most feasible and economical practices are being used by subordinate personnel with regard to time and materials. Must assure that waste is being held at an absolute minimum throughout project accomplishment.

d. Familiarity with materials and strengths: Familiar with the various materials used in construction and readily capable of determining the structural qualities of materials to assure sufficient strength for the job. Must be familiar with the various characteristics of lumber and pavement with regard to strength, moisture content, grade, mix, curing, etc. Further knowledge is necessary concerning the tools used in the trades such as saws, planers, sanders, trowels, screeds, mixers and other tools and equipment used in the trades of carpentry and masonry.

e. Supervises carpentry and masonry personnel: Serves as supervisor of carpenters and masons engaged in construction, erection, alteration and repair of wood and steel frame facilities. Supervises crews engaged in pouring of concrete, laying bricks, stone and plastering and stuccoing of interior and exterior surfaces. Inspects the work of subordinates to assure complete and meritorious workmanship pointing out as needed the ways and means of improving the quality and efficiency of the carpenters and masons.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of standard nomenclature, types, and sizes of masonry and concrete materials; batching formulas and methods of curing concrete, mortar, plaster, and lime mixtures; and use and care of hand and power-driven masonry and concrete tools, is mandatory. Knowledge of building maintenance, repair and construction; properties of fine wood; processing and molding wood by steaming, laminating, and gluing; nomenclature of woodworking materials and methods of storing wood; theory of squaring by equivalent measurement; application of simple mathematics; and use of carpentry and woodworking hand and power tools, is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

(2) Knowledge of use and capacity of construction and grounds maintenance equipment is desirable; also the tests and characteristics as pertaining to reinforcing steels and meshes. Should have extensive knowledge in the operation and assembly of various pavement laying machines and related equipment.

b. Education: Completion of high school with courses in subjects pertaining to blueprint reading and interpretation is mandatory.

c. Experience: Experience in functions such as laying and shaping blocks and stones; or mixing and applying cement, plaster, and mortar for forming, maintaining, and finishing structures or roads, is mandatory. Experience in functions such as construction and repair of buildings and heavy structures; fabrication and repair of models and patterns; or fine woodworking is mandatory.

d. Training: Completion of a course in masonry and concrete construction and woodworking is mandatory.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Bricklayer----------5-24.010

Stonemason----------5-24.210

Cement Finisher, Highways and Streets----------5-26.200

AFSC 55250
Semiskilled AFSC 55230

AIRMAN AIR FORCE SPECIALTY

CARPENTRY SPECIALIST

1. SPECIALTY SUMMARY

Constructs, maintains, and repairs buildings, models, mockups, and patterns and assembles prefabricated structures.

2. DUTIES AND RESPONSIBILITIES

a. Lays out work and prepares materials: Prepares working drawings for maintenance, minor repairs and alterations. Interprets lines, designs, and symbols on drawings or blueprints. Determines from blueprints, sketches, or other specifications, type, dimensions, and quantity of materials required. Marks cutting and assembly lines and location of fittings. Arranges materials to conduce efficient work procedures. Measures, marks, shapes and cuts lumber as specified to complete assignments, using hand or power driven saws and equipment. Joins and fastens lumber by cutting tenons, mortises, bevels, miters, grooves, and curves using such tools and equipment as tenoner, mortiser, variety saw, and coping saw.

b. Constructs, modifies, and repairs buildings: Erects wooden framework by placing sills, joists, rafters, and sheathing in proper position and joining and fastening, using nails, screws and bolts. Installs subflooring, flooring, roofing, and siding. Installs window frames, sashes, and doors. Cuts and installs framework necessary in forming poured concrete steps, foundations, etc. Erects steps, staircases, and porches, and constructs coal chutes

and openings for heating, plumbing, or ventilating equipment. Seals interiors by installing board, plywood, fiberboard, or other finish materials. Alters buildings by installing or removing partitions, finishing attics or basements, or by adding porches or rooms. Repairs siding and roofing. Repairs floors, ceilings, and other wood parts of building by removing damaged lumber and installing new sections. Installs and repairs doors, windows and screens and installs glass in sashes. Installs and repairs interior and exterior trim such as moldings and facings. Builds framework as needed to install doors, windows, louvres, etc.

1. SPECIALTY SUMMARY

2. DUTIES AND RESPONSIBILITIES

c. Constructs and repairs heavy timber structures and erects scaffolding and prefabricated structures: Erects heavy timber structures, such as warehouse loading docks, boat docks, and wharves. Positions and levels timbers, using peavey or heavy construction equipment and checks alignment by use of spirit level or plumb bob. Erects scaffolding for use of himself and other workers, as needed. Erects prefabricated wooden or steel structures. Builds forms for concrete and masonry structures. Repairs wharves, loading platforms, and piling by replacing fenders, sills, braces, and planking.

d. Builds mockups, models, and patterns: Constructs and assembles wooden mockups and models and other objects for use as training aids, using woodworking tools, such as circular saw, lathe, and disk sander. Constructs models from soft wood, veneers, and other materials, using woodworking tools and such precision instruments as vernier caliper and weight scales. Builds wooden patterns and match plates.

e. Constructs and repairs articles of fine woodwork and interior furnishings: Selects woods or other materials; matches according to texture, grain, and color, and constructs articles of fine woodwork such as cabinets,

home furniture, carved paneling or molded sections, requiring use of precision woodworking machinery and cabinetmaking handtools. Shapes wood to specific design and proportions, cuts intricate fittings to join delicate items, and fastens parts together by use of screws, dowel pins, nails, or glue. Repairs cabinetwork by replacing parts or sections with properly matched woods. Constructs facilities such as shelves, bins, and pallets for storage of supplies or equipment. Constructs shop equipment such as workbenches, work-tables, and tool cabinets. Builds interior appurtenances such as lockers, closets, and utility cabinets. Installs interior paneling and prefabricated articles such as cabinets and bookcases.

f. Constructs packing and shipping containers: Constructs containers such as crates, boxes, or cases for use in storage or shipment of materials. Builds crates for special packing by installing separators, special mountings, hinges, screws in lids, felt on saddles, and protective or waterproof linings. Builds bracing and framing to hold boxes or crates in place. Blocks and braces material in containers to prevent damage during shipment. Constructs crates for shipment of aircraft. Constructs special devices for transportation of acids and explosives. Prepares household goods for domestic and oversea shipment or for storage.

g. Repairs wood sections of boats and automotive equipment bodies: Repairs floors, stakes, seats, and other wood parts of trucks, trailers and other vehicles. Repairs wood sections of boats such as bow, stern, or keel, and replaces damaged planks, ribs, or deckboards.

h. Maintains woodworking tools and installs and repairs building hardware: Cleans and oils metal parts of tools and equipment to prevent

rusting. Repairs and adjusts turning belts and oils bearings of woodworking machinery. Sharpens edges of cutting tools. Installs items of building hardware such as hinges, hasps, and locks. Makes minor repairs to door locks such as replacing springs and screws.

i. Supervises woodworking personnel: Lays out work and assigns tasks to subordinates when serving as leader of workcrews, performing such duties as repairing roofs, constructing loading platforms, and fabricating or repairing cabinetry items. Prepares performance ratings of subordinates, recommends changes in assignment, and schedules leaves. Conducts on-the-job training phases.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of building maintenance, repair and construction; properties of fine wood; processing and molding wood by steaming, laminating, and gluing; nomenclature of woodworking materials and methods of storing wood; theory of squaring by equivalent measurement; application of simple mathematics; and use of carpentry and woodworking hand and power tools, is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

(2) Knowledge of paint properties and painting techniques is desirable.

b. Education: Completion of high school with courses in shop mathematics and blueprint reading and interpretation, are desirable.

c. Experience: Experience in functions such as construction and repair of buildings and heavy structures; fabrication and repair of models and patterns; or fine woodworking is mandatory.

d. Training: Completion of a woodworking course is desirable.

e. Other: A minimum aptitude level of Mechanical 40 is desirable.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Cabinetmaker 1----------4-32.100

Carpenter----------5-25.110

Carpenter, Finish----------5-25.150

Carpenter, Maintenance----------5-25.830

AFSC 55152
Semiskilled AFSC 55132

AIRMAN AIR FORCE SPECIALTY

MASONRY SPECIALIST

1. SPECIALTY SUMMARY

Erects, maintains, and repairs masonry and concrete structures

2. DUTIES AND RESPONSIBILITIES

a. Prepares mortar: Determines types of mortar required and prepares material in the proportions and amounts required to complete each assignment. Measures aggregates such as sand and cement in proper proportions and adds other ingrediants to obtain required consistency, and mixes, using handtools or power mixers.

b. Lays brick, building block and stone, and other materials to form structures: Cleans surface and prepares bed for mortar. Cuts, trims, faces and surfaces stones and blocks to proper size and shape, using masonry tools such as napping hammer, chisel, and bricklayer's hammer. Positions bricks or building blocks, using trowel, hammer, mallet, and crowbar. Checks horizontal and vertical alignment, using mason's spirit level and plum bob. Shapes mortar joints between courses with jointer or trowel point. Seals openings, using oakum and caulking compound. Waterproofs and dampproofs walls exposed to wet soil by applying compounds such as bituminous mastic, cement plaster, metallic powder. Preceding work requires extensive knowledge of pertinent information from construction drawings, etc. Estimates manhours and materials needed to accomplish the work assigned.

110

c. Forms structures of poured concrete: Advises carpenters and roads and grounds specialists in placement and building of forms for concrete walls, floors, walks, roads, and runways. From design drawings, blue-prints, sketches, etc. installs reinforcement steel, such as bars, stirrups, and spacer rods by bending and spacing according to specifications. Pours concrete into forms, using concrete surfaces, float, straightedge, template, trowel, or other device. Cures concrete structures, using water, sand, fabric, paper, and other curing compounds. Places reinforcement steel rods and meshing as needed in the accomplishment of work assignments.

d. Plasters interior and exterior of buildings: Prepares surfaces and applies plaster to walls and ceilings assuring a neat and smooth finish. Finishes and floats surfaces to obtain finish, free from blemishes, and float marks. Checks all corners, angles, and horizontal edges to insure plumb, level finish. Repairs cracks and breaks in plastered surfaces by applying new plaster and matching existent surfaces leaving a smooth and true surface for other craftsmen.

e. Cleans surfaces: Cleans finished concrete, masonry, or plastered surfaces, using carborundum stone, sand blasting machine, wire brush, or acid treatment.

f. Maintains equipment and tools: Performs preventive maintenance, lubricates, and makes minor repairs and adjustments to tools and equipment. Removes cement and mortar from tools and equipment immediately after using to prevent hardening, and oils all metal parts to prevent rust.

g. Supervises masonry and concrete personnel: Serves as crew leader of masonry and concrete workers engaged in laying brick and stone, forming concrete structures, and plastering interior and exterior surfaces. Instructs subordinates in phases of masonry and concrete construction and repair. Examines

111

the work accomplished by others to assure complete and meritorious workmanship pointing out to others ways in which to improve in the quality and efficiency in the trade.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of standard nomenclature, types, and sizes of masonry and concrete materials; batching formulas and methods of curing concrete, mortar, plaster, and lime mixtures; and use and care of hand and power-driven masonry and concrete tools, is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

(2) Knowledge of use and capacity of construction and grounds maintenance equipment is desirable.

b. Education: Completion of high school with courses in subjects pertaining to blueprint reading and interpretation is desirable.

c. Experience: Experience in functions such as laying and shaping blocks and stones; or mixing and applying cement, plaster, and mortar for forming, maintaining, and finishing structures or roads, is mandatory.

d. Training: Completion of a course in masonry and concrete construction is desirable.

e. Other: A minimum aptitude level of Mechanical 40 is desirable.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Bricklayer - 5-24.010

Stonemason - 5-24.210

Cement Finisher, Highways and Streets - - - - - - - - - - - - - 5-26.210

112

AFSC 55271

AIRMAN AIR FORCE SPECIALTY
PROTECTIVE TREATMENT TECHNICIAN

I SPECIALTY SUMMARY

Inspects, troubleshoots, surveys, and estimates protective coating and corrosive situations and applies the appropriate preservative treatment and demarcations to structural surfaces or pertinent equipment components comprising Air Force real property facilities, weapons system support and pavement markings.

II DUTIES AND RESPONSIBILITIES

a. Advises on technical aspects of application, equipment requirements and types of materials, rigging or support items to be used in the preservative treatment of structural and supporting equipment components. Selects and applies the appropriate type of material system required to adequately protect or identify the surface or object upon which the product is being applied. Solves unusual maintenance or treatment problems by surveying conditions pertinent to extenuating enviornmental conditions and analyzes or recognizes coating failures caused by structural defects. Lays out work and devises intricate adjustment and operating procedures to assure maximum operating efficiency of application equipment and observance of safety precautions. Devises economical but adequate maintenance short cuts and recommends full utilization of personnel and equipment. Interprets maintenance procedures and policy related to corrosion control, coatings application and activity in hazardous areas. Analyzes recurring defective workmanship or defects and recommends corrective actinn by initiation of unsatisfactory reports, proposed changes in operating procedures or other appropriate measures.

b. Surface Preparation: Understands the necessity for and principles of adequate surface preparation and requirements to accommodate various coating systems. Is capable of using all types of surface preparation equipment to eliminate, minimize or neutralize the existing deteriorated film or surface and provide the type of substrate for best material adherance. Removes dirt from surfaces with brush, doth, chemicals and is qualified to remove mill scale, rust and existing coatings from surfaces by scraping, sanding, sand-blasting, wirebrushing, burning or with mechanical abrasion equipment and the correct chemical paint remover. Is able to make minor surface repairs or patch cracks or holes in wood, masonry or concrete surfaces with the appropriate putties, fillers or sealants. Applies neutralizing and conditioning chemical solutions to bare metal surfaces. Understands the need for protecting surfaces not to be treated and the sensitivity of equipment and operations in which personnel will be working. Can apply protective masking types, compounds polyethylene or other plastic and fibrous materials to areas requiring accurate delineation or protection.

c. Application: Applies the appropriate materials to building structures, related equipment and weapons system support items. The complete coating systems or component parts are applied to a prepared substrate as primer, intermediate and finish coats after the proper curing period for each segment has elapsed. Materials shall be applicable as selected to exterior or interior surfaces of wood, metal, concrete, masonry, plastics, plaster, etc. Applies coating as directed to falsify outline of buildings, structures, and equipment and blends items of construction and equipment with the surrounding

terrain to prevent identification by the enemy.

d. Inspects work: Inspects previously accomplished work periodically to determine effectiveness and deterioration of previous preservative treatments. Checks treated surfaces accomplished by contract or by in-service forces to insure compliance with technical requirements and conditions in which coatings are exposed. Interprets inspection findings and determines adequacy of corrective action. Designated areas to be retouched or entirely recoated and determines deviations from the type of application required.

e. Supervises painting personnel: Serves as a working leader of crews engaged in such preservative treatment and corrosion control operations. Conducts on-the-job training in techniques of preparing surfaces, mixing and applying coatings and the safety techniques involved in application of materials operation of equipment or use of rigging. Orients newly assigned personnel concerning regulations and procedures and interprets directives and policies. Assigns specific duties to subordinate specialists and inspects completed work for accuracy and completeness.

III SPECIALTY QUALIFICATION

a. Knowledge: Knowledge of function of different preservative treatments in different environments on varied substrates. Understands some fundamental chemistry about products used and capabilities and limitations of materials and application equipment. Is acquainted with methods for preparing different substrates under varied conditions and has an accurate knowledge about the operation of all types of staging and application equipment. Has ability to survey and estimate work to be accomplished to determine manpower, equipment and material requirements. Recognizes corrosion control problems and can perform the necessary tasks to eliminate and correct conditions causing structural deterioration. Is familiar with all aspects of specialist activity and manuals or texts indicating guidelines in performing work. Knows power plants, petroleum and utility identification standards as indicated in MIL-STD-101A, MIL-STD-161B.

b. Education: Completion of high school with courses in chemistry and physics desirable.

c. Experience: Has 3 to 5 years experience in all phases of preservative treatment of structures and support equipment. Has a thorough working knowledge in painting steel towers, elevated tanks, wood surfaces, concrete treatment and is experienced in handling application equipment. Is proficient in the handling of hazardous chemicals and familiar with the safety precautions required in their use. Rigging and respiratory apparatus is used in areas and under conditions requiring special attention because of accessibility and health hazards.

d. Training: Completion of all specialist level courses and advance courses in product and equipment use and adaptability qualified by headquarters USAF. Completes an appropriate base level management course.

e. Other: Has accurate color vision and can define predominant hues in full color spectrum.

IV SPECIALTY DATA

a. Grade Spread: Technical sergeant and master sergeant.

AFSC 55251

Semiskilled AFSC 55231

AIRMAN AIR FORCE SPECIALTY
PROTECTIVE COATING SPECIALIST

I SPECIALTY SUMMARY

Applies the appropriate preservative treatment and demarcations to structural surfaces or pertinent equipment components comprising Air Force real property facilities, weapons system support and pavement markings.

II DUTIES AND RESPONSIBILITIES

a. Background knowledge: Applies the type of material system required to adequately protect or identify the surface or object upon which the product is being applied obtaining maximum adherance and resistance to environmental conditions. Adjusts viscosity of materials within scope of specification and formulative requirements to compensate for the application of material under varying climatic conditions and with the use of different types of application equipment.

b. Surface Preparation: Understands the necessity for and principles of adequate surface preparation and requirements to accommodate various coating systems. Is capable of using all types of surface preparation equipment to eliminate, minimize or neutralize the existing deteriorated film or surface and provide the type of substrate for best material adherance. Removes dirt from surfaces with brush, cloth, chemicals and is qualified to remove mill scale, rust and existing coatings from surfaces by scraping, sanding, sand-blasting, wirebrushing, burning or with mechanical abrasion equipment and the correct chemical paint remover. Is able to make minor surface repairs or patch cracks or holes in wood, masonry or concrete surfaces with the appropriate putties, fillers or sealants. Applies neutralizing and conditioning chemical solutions to bare metal surfaces. Understands the need for protecting surfaces not to be treated and the sensitivity of equipment and operations in which personnel will be working. Can apply protective masking tapes, compounds polyethylene or other plastic and fibrous materials to areas requiring accurate delineation or protection.

c. Application: Applies the appropriate materials to building structures, related equipment and weapons system support items. The complete coating systems or component parts are applied to a prepared substrate as primer, intermediate and finish coats after the proper curing period for each segment has elapsed. Materials shall be applicable as selected to exterior or interior surfaces of wood, metal, concrete, masonry, plastics, plaster, etc. Applies coating as directed to falsify outline of buildings, structures and equipment and blends items of construction and equipment with the surrounding terrain to prevent identification by the enemy.

d. Signs and identification: Applies background finish in laminate or fluid form to sign materials and is able to stencil or reasonably letter information over the prepared substrate. Applies lettering and identifying insignia using the appropriate equipment and materials.

e. Traffic and airfield markings: Applies the required pavement or airfield marking patterns with appropriate equipment. Prepares reflectorized paint for traffic markings by apportioning out reflectorized media in a pigmented binder material in accordance with current guidelines. Is familiar with the application of solid adhesive backed laminates for application to pavements and walkways.

f. Maintains equipment: Cleans and maintains equipment using cleaning solutions or solvents and applying preservative materials or lubricants to prevent deterioration or damage from wear, rust or corrosion. Lubricates and performs minor adjustments or repairs on painting equipment such as spray gun or compressor and is familiar with the mechanical operation of steam cleaning and sandblasting equipment.

g. Erects and operates staging: Fabricates working platforms by using sectional ladders and extension boards or by fastening scaffolding to rafters, roofs, walls or other sections of buildings and structures. Is able to climb open structures in excess of 150 feet to anchor lines and provide support for the necessary implements to prepare surfaces for corrosion treatment priming and painting. Uses the appropriate staging beds, ladders, stirrips, boatwain's chairs, turnbuckles, wireclamps and arranges rope falls. Is able to tie several basic knots such as the bowline, square, half hitch, etc., and work with cable rope.

h. Maintains inspection and maintenance records: Posts entries on applicable maintenance and inspection records. Indicates areas or surfaces at which work was performed and type of materials and treatment used. Furnishes information about types of noncompatible systems observed in the field and defective material and equipment procedures.

III SPECIALTY QUALIFICATIONS

a. Knowledge: Is familiar with various types of coating and wood preservatives and basic vehicles formulated in a variety of products. Therefore can determine compatible products to be combined in a composite system. Is acquainted with methods for preparing wood, metal, glass, fiber, plaster, cement and other surfaces for painting and has some knowledge of camouflage painting techniques. Understands the operations of preparation, painting and finishing equipment such as mechanical abraders, sandblasting, air and hydraulic spray equipment buffing, sanding and steam cleaning apparatus, and highway marking devices. Is able to calculate quantities, thickness and area measurements and read calibrated instruments. Has some fundamental corrosion control, chemistry and physics knowledge. A working knowledge of woodworking, masonry and steel fabrication methods and the use of related hand and power tools is desirable. Is familiar with painting guidelines in AFM 85-4 and appropriate OJT requirements.

b. Education: Completion of high school with courses in chemistry and physics desirable.

c. Experience: Knowledge in practical use of various type brushes, rollers, glove, spray, and surface preparation equipment. Familiar with safety precautions required in the use of hazardous chemicals, respiratory and rigging equipment.

116

d. Training: Completion of basic course in corrosion control and structural coatings application qualified by headquarters USAF is mandatory. Obtains instruction in proper use of mechanical devises, high pressure, hot spray and electrostatic spray equipment.

e. Other: A minimum aptitude level of mechanical 50 is desirable. Has accurate color perception.

IV SPECIALTY DATA

a. Grade Spread: Airman Second Class through Staff Sergeant.

b. Related D.O.T. Jobs None.

(PROPOSED)

AFSC 55173

AIRMAN AIR FORCE SPECIALTY
ENGINEER ENTOMOLOGY TECHNICIAN

I. SPECIALTY SUMMARY

Supervises activities engaged in controlling and preventing insects, rodents, other arthropods, anti-social pests and fungi; and inspects, troubleshoots, and operates spraying and dusting equipment. Conducts special tests with pesticides.

II DUTIES AND RESPONSIBILITIES

a. Plans and Schedules Work of Entomological Activities: Plans and schedules work assignments with regard to prevention and control measures to be applied, operation, calibration and storage of tools and equipment. Sets up scheduled preventive operations. Prepares and analyzes reports and charts with regard to man-hour utilization and pesticide consumption for purpose of improving work methods and to obtain better personnel utilization. Establishes work standards and job priorities. Provides for requisitioning of equipment and supplies, and determines most effective method of their utilization. Sets up organizational structure of pest controllers to indicate lines of authority and personnel requirements, and to place specific responsibilities on operating personnel. Establishes personnel work schedules to regulate duty assignments and intra-activity transfers.

b. Supervises Engineer Entomology Personnel: Inspects workers during performance of duties to insure compliance with specifications and established methods and procedures. Assigns special or specific duties to operating personnel. Determines that proper toxic solutions, equipment and tools have been selected for accomplishment of work. Makes immediate corrections of unsafe practices or malfunctioning equipment during work processes. Takes follow-up actions on work assignments to determine progress in line with schedule. Maintains records of time spent on dividual jobs for purpose of cost accounting and to provide information to establish work standards. Checks use of solutions and equipment to correct wasteful practices. Promotes harmonious relationships and resolves personal problems. Rates subordinates for efficiency, schedules leave, recommends promotions, and accomplishes other personnel actions. Coordinates work schedules with other affected sections.

c. Establishes and Conducts On-the-job Training for Entomological Personnel: Orients and adjusts newly assigned personnel. Gives on-the-job training to persons and groups and conducts formal and informal conferences and discussions. Observes completed work to determine training requirements of persons or groups and provides for specific training. Maintains charts of other records to indicate degree of development of each worker. Assigns on-the-job training phases to senior workers and evaluates effectiveness and adequacy of instruction. Insures that all workers are familiar with applicable directives and procedures.

d. Supervises and Evaluates Engineer Entomological Activities: Periodically inspects buildings, materials, supplies, equipment, shops, and grounds. Determines efficacy of entomological procedures required for prevention and control of insects, rodents, other arthropods, and fungi. Inspects spraying, dusting and

fumigating work to insure that safety and quality standards have been fulfilled and are adequate. Inspects activities and checks areas of toxic applications if endangerous to health. Inspects for safe storage and transportation of toxic solutions and supplies and proper storage and maintenance of equipment and tools and for presence of safety hazards. Inspects completed work orders to prevent misuse of materials and to insure that costs are charged to proper cost codes. Discusses findings of inspections with immediate supervisor and recommends action to improve protection or correct control and prevention deficiencies.

e. Performs Technical Entomological Functions: Makes decisions regarding toxic solution type, content and application procedures. Prescribes application cycles for spraying, dusting and fumigating activities. Operates, maintains, and calibrates equipment, prescribes procedures for jobs not covered by precedent. Adapts and implements plans, specifications, policies, and regulations to fit requirements of activity. Determines formula and quantity of toxic solutions applied. Accomplishes tasks beyond capabilities of senior workers.

III SPECIALTY QUALIFICATIONS

a. Education: Knowledge of principles of toxic solution formula, application and storage; safety codes and practices; capacity and technical operating procedures of dusting, spraying and fumigating equipment; techniques of entomological collecting and testing; characteristics and habits of insects, rodents, other arthropods, anti-social pests and fungi; techniques to control and prevent degeneration of buildings, equipment, vegetation and land by destructive insect or fungi is mandatory. Attaining a qualifying score on the APT applicable to the specialty described herein satisfies these mandatory knowledge requirements.

b. Experience: Qualification as an Entomology Specialist is mandatory. In addition, experience in supervising functions such as testing, controlling and preventing insects, rodents, other arthropods, anti-social pests and fungi or inspecting, troubleshooting and operating spraying, dusting and fumigating equipment is mandatory.

c. Training:

1. Completion of a basic management course is desirable.

2. Completion of an engineer course in control and prevention of pests and insects is desirable.

d. Other:

1. Physical profile serial . . . . . is desirable for field or base assignment.

2. Only male airmen will be awarded this AFS.

IV SPECIALTY DATA

a. Grade Spread: Technical Sergeant and Master Sergeant.

b. Source Jobs (D.O.T.):

919

(PROPOSED)

AFSC 55153

Semi-skilled AFSC 55133

AIRMAN AIR FORCE SPECIALTY
ENGINEER ENTOMOLOGY SPECIALIST

I. SPECIALTY SUMMARY

Performs work for implementing, conducting and evaluating programs and plans for effective control and prevention of insects, rodents, other arthropods, anti-social pests and fungi.

II DUTIES AND RESPONSIBILITIES

a. Performs Entomological Work: Conducts operations, including tests, to ascertain degree of engineer entomology operations for control of insects, other arthropods, rodents and fungi that are pests of the area. Collects specimens of disease and germ bearing anti-social and destructive pests, such as, mosquitoes, flies, termites, rodents and other pests. Studies specimens as directed to establish identity, confirm breeding habits or appearance cycle and observe special characteristics. Reviews local data to determine cyclical characteristics not otherwise available.

b. Application of Toxic Pesticides: Applies toxic pesticides on interiors and exteriors of buildings and other structures and foundations above and below the surface. Selects toxic mixtures non-destructive to buildings, paints and vegetation, such as trees, grass, bushes, and plants. Maintains control over toxic mixtures used, such as lindane, chlordane, nicotine-sulfate, methyl bromide, calcium cyanide, and others. Identifies and measures quantities of solutions needed for maximum safe control. Perform observations to determine qualitative effectiveness of solutions used. Conducts periodic observations to determine effectiveness of pesticides applied.

c. Performs Control Operations: Selects appropriate toxic solution for control and prevention of pests. Selects proper procedure to provide effective, economical and safe application. Organizes and accomplishes preventive pest control on a scheduled cycle. Insures health of individuals and safety of property will not be adversely affected or impaired by application of toxic solution. Fumigates supplies, equipment, buildings, houses and other structures. Provides support for aerial dispersal of insecticides. Operates precision pesticide dispersal equipment; such as, thermal insecticide generators, turbine mist sprayers, power driven hydraulic sprayers, power and hand operated dusters, compressed air sprayers, fumigation chambers, and wood preservative application equipment.

d. Performs Preventive Operations: Performs scheduled preventive pest control operations, such as, soil poisoning for termites, residual sprays, and outdoor area controls. Detects incipient pest populations and takes eradication action. Checks for changes in pest activity during preventive cycle to prevent destructive outbreaks. Treats the soil for subterranean pest control. Selects chemical formulas to provide the most effective residual treatments. Maintains records of preventive controls applied.

120

e. Operates and Calibrates Dispersal and Safety Equipment: Operates precision dispersal equipment, such as thermal insecticide generators, turbine mist sprayers, power driven hydraulic sprayers, power and hand dusters, compressed air sprayers and fumigation chambers. Checks and calibrates equipment mixing mechanisms. Tests and adjusts dispersal equipment and isolates areas of malfunction and performs field maintenance. Selects equipment for spraying, dusting, indoor, outdoor, underground, above ground and fumigation work. Provides safety equipment, such as synthetic or rubber gloves, respirators, goggles and gas masks.

f. Maintains Tools and Equipment: Cleans pesticides, dirt and other debris from tools and equipment. Inspects and repairs items in operation and eliminates those damaged or unsafe. Applies rust preventive oil coatings and other protection to metal parts.

g. Supervises Engineer Entomology Personnel: Serves as leader of engineer crews engaged in applying pesticides, and other toxic solutions. Instructs operating personnel on safety precautions of fumigating, poison baiting, spraying and dusting procedures. Supervises mixture, transportation, storage and safe handling of toxic solutions by operating personnel. Instructs personnel in operating, maintaining and storing of equipment and tools.

III SPECIALTY QUALIFICATIONS

a. Education:

1. Knowledge of principles and methods employed in control and prevention of such pests as rodents, insects and other arthropods, and fungi; knowledge of chemicals used in the mixing of toxic pesticide solutions; and directions prescribed for use. Storage of toxic solutions, spraying and dusting equipment and other tools. Attaining a qualifying score on the APT applicable to the specialty described herein satisfies these mandatory requirements.

2. High school level courses in chemistry, general agriculture or blueprint reading and interpretation are desirable.

b. Experience: Experience in operating and maintaining insect and rodent control equipment or application of toxic pesticides is mandatory.

c. Training: Completion of an engineer entomological training course is desirable.

d. Other:

1. Physical profile serial desirable for field or base assignment.

2. Only male airmen will be awarded this AFS.

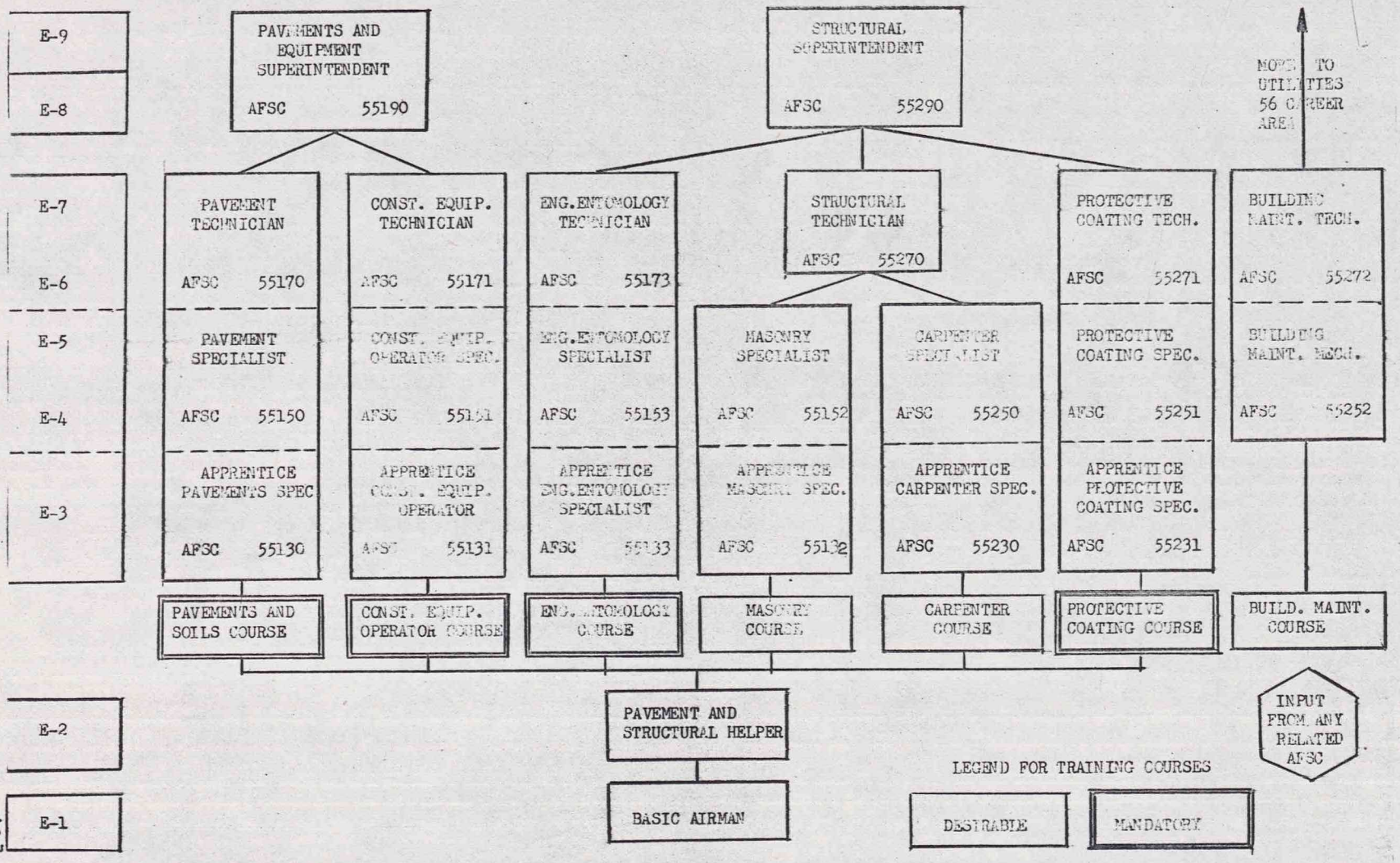
121

IV SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Source Jobs (D.O.T.):

Termite Treater ---------- 5-59.950


E-9
E-8
E-7
E-6
E-5
E-4
E-3
E-2
E-1
PAVEMENTS AND EQUIPMENT SUPERINTENDENT
AFSC 55190
STRUCTURAL SUPERINTENDENT
AFSC 55290
MOVE TO UTILITIES 56 CAREER AREA
PAVEMENT TECHNICIAN
AFSC 55170
CONST. EQUIP. TECHNICIAN
AFSC 55171
ENG.ENTOMOLOGY TECHNICIAN
AFSC 55173
STRUCTURAL TECHNICIAN
AFSC 55270
PROTECTIVE COATING TECH.
AFSC 55271
BUILDING MAINT. TECH.
AFSC 55272
PAVEMENT SPECIALIST
AFSC 55150
CONST. EQUIP. OPERATOR SPEC.
AFSC 55151
ENG.ENTOMOLOGY SPECIALIST
AFSC 55153
MASONRY SPECIALIST
AFSC 55152
CARPENTER SPECIALIST
AFSC 55250
PROTECTIVE COATING SPEC.
AFSC 55251
BUILDING MAINT. MECH.
AFSC 55252
APPRENTICE PAVEMENTS SPEC
AFSC 55130
APPRENTICE CONST. EQUIP. OPERATOR
AFSC 55131
APPRENTICE ENG.ENTOMOLOGY SPECIALIST
AFSC 55133
APPRENTICE MASONRY SPEC.
AFSC 55132
APPRENTICE CARPENTER SPEC.
AFSC 55230
APPRENTICE PROTECTIVE COATING SPEC.
AFSC 55231
PAVEMENTS AND SOILS COURSE
CONST. EQUIP. OPERATOR COURSE
ENG. ENTOMOLOGY COURSE
MASONRY COURSE
CARPENTER COURSE
PROTECTIVE COATING COURSE
BUILD. MAINT. COURSE
PAVEMENT AND STRUCTURAL HELPER
BASIC AIRMAN
INPUT FROM ANY RELATED AFSC
LEGEND FOR TRAINING COURSES
DESIRABLE
MANDATORY

WORK GROUP ASSIGNMENTS

1. Steering Committee
   L/C W. T. Meredith - HQ USAF Chairman
   L/C G. E. Talbot
   Mr. H. Goldman

2. Revaluate Civil Engineering Airman Career Areas
   Monitors: L/C Liebscher, AFOCE
   Major Roos, AFPDP
   SAC, AFIT(CEC), ATC

3. Revaluate Civil Engineering Airman Resident Training Programs
   Monitors: Mr. Byars, ATC
   Major Jacobson, AFOCE
   ADC, MATS, AFLC

4. Revaluate Civil Engineering Career Courses and OJT Programs
   Monitors: Mr. Rudd, ATC
   Capt Kestner, AFOCE
   HQ COMD, USAFSS, AFSC

5. Study Application of Special Air Warfare Training
   Monitors: TAC Specialist
   Mr. Moore, AFOCE
   TAC, CONAC
   Mr. Burton, AFOCE

6. Review Proposed Manning Templets
   Monitors: Mr. Burton, AFOCE
   Mr. Goldman, AFOMO
   HQ COMD, USAFSS, AFSC, TAC, CONAC

Atch #3

AGENDA

2 MARCH 1964

0800 - 0815	Opening	
0815 - 0900	Civil Engineer Manpower Study	Lt Col W. T. Meredith
0900 - 1000	The Civil Engineer Training Program Today	Lt Col G. E. Talbot
1000 - 1015	Coffee Break	
1015 - 1700	Review Training Facilities	Lt Col Talbot

3 MARCH 1964

0800 - 0830	Special Air Warfare Training	TAC
0830 - 0900	Career Development Courses & OJT Programs	ATC
0900 - 0930	Proposed Manning Templets & Career Development	Lt Col W. T. Meredith
0930 - 0945	Coffee Break	
0945 - 1600	Working Groups Meet	
1600 - 1700	Working Groups Status Report	

4 MARCH 1964

0800 - 1600	Working Groups Meet	
1600 - 1700	Working Groups Status Report	

5 MARCH 1964

0800 - 1600	Working Groups Meet	
1600 - 1700	Working Groups Status Report	

Atch #4

AGENDA (Cont'd)

6 MARCH 1964

0800 - 1600	Working Groups Meet
1600 - 1700	Working Groups Final Written Report with all Proposals
1700	Adjourn

MINUTES OF CIVIL ENGINEERING WORKSHOP
AT SHEPPARD AFB
WEEK OF 2 MARCH 1964

2 MARCH

1. The Civil Engineering Workshop convened at 0800 in Room 101, Building 400. See Attachment 1 for list of members. Major General Robert M. Stillman, Commander, Sheppard AFB, welcomed the group to Sheppard. Following General Stillman's remarks, Lt Colonel George E. Talbot, Director of the Department of Civil Engineering Training, 3750th Technical School, Sheppard AFB, briefed the members on the Civil Engineer school, illustrating his talk with slides.

2. Lt Colonel W. T. Meredith, Directorate of Civil Engineering, Hq USAF, explained the reasons for the Civil Engineer Manpower study, the new concepts for organizing and utilizing Civil Engineer airmen, and the need for the workshop and the lines along which it would proceed. See Attachment 2 for agenda. Essentially, the purpose of the workshop was to study the training and career development of Civil Engineer airmen and civilian counterparts. Career field revisions are required for proper airman career ladder development and to support the proposed emergency force and mobile combat support team concept now being developed for a wartime or other type emergency posture.

3. Lt Colonel Talbot conducted the workshop on a tour of the Civil Engineering school's facilities to give the members an increased understanding of the education and training the school is capable of giving its airmen students.

3 MARCH

4. Lt Colonel Meredith introduced the following members of the workshop who spoke briefly on certain aspects of their specialties which would assist the workshop in conducting the study:

a. Mr. Harry Goldman, Directorate of Manpower, Hq USAF, outlined the following manpower guidelines:

(1) No promises on grades.

(2) No duplication of supervisory authorizations.

(3) Adjustments to be made by attrition.

(4) Commands to be given opportunity to review proposed military manning before final USAF approval.

b. Lt Colonel J. C. Fullilove, Hq TAC, spoke on TAC's role in STRICOM and its special air warfare mission.

c. Lt Colonel J. L. Harris, Sheppard AFB, Texas, explained the new Career Development Course program which replaces the OJT program.

5. Lt Colonel Meredith presented the proposed organizational concepts and manning templets which were based upon inputs and recommendations from the major commands. These templets covered the following propositions; however, the workshop was cautioned that while these were guides, peculiarities of bases, career progression, and other factors had to be considered:

a. A Civil Engineer Emergency Team of 166 men for a large base.

b. A Civil Engineer Emergency Team of 101 men for a small base.

c. A Civil Engineer Emergency Team of either 58 or 32 men for a site, depending on its size.

d. A Mobile Combat Support Team of 56 men.

e. Organizational structures for each of the above postulates.

6. Following the presentation of the templets, the workshop split into five panels for the following purposes:

a. Revaluate Civil Engineering airman career areas.

b. Revaluate Civil Engineering airman resident training program.

c. Revaluate Civil Engineering career courses and OJT programs.

d. Study application of special air warfare training.

e. Review proposed manning templets.

7. Almost immediately after the panels convened, it was discovered that they could not function until the career areas and associated job descriptions in AFM 39-1 were updated. It thus became necessary to restructure the 54, 55, and 56 career fields. The remainder of the day was devoted to the consideration of various recommended changes. An impasse was reached in considering a combination of the refrigeration and heating fields. Colonel Meredith appointed a midnight committee under the chairmanship of Major Darnell, Hq ATC, to reach a conclusion and to present it to the workshop the following morning.

4 MARCH

8. Major Darnell presented the special committee's recommendation for the combined refrigeration-heating career field, and it was accepted by the workshop. See Attachment 3. A similar proposition was made to combine the interior and exterior electricians with the electric power production field, but this was rejected by close vote. During the remainder of the day, proposals on various organizational structures were presented and voted on. See Attachment 3 for approved structures.

9. Major Roos, Directorate of Personnel Plans, Hq USAF, and Lt Colonel Turner, Hq ADC, emphasized that an airman at the 9 level should be given managerial responsibility over related career fields even though he has not specialized in one of the related fields.

10. A job summary was prepared for two new positions. One provides for a combined Civil Engineering cost accountant and real property records specialist. The other provides for a sub-professional engineer as an Engineering Aid.

11. The workshop was obliged to go into a night session to complete the changed job summaries resulting from the reorganized career structures. Additionally, separate AFSC's for Plant Operators in large central heating, air conditioning plants were proposed and AFM 39-1 job standards were written.

5 MARCH

12. As a result of the overtime work of the night before, the workshop was able to break up into the panels designated in paragraph 6. After the morning's discussions, Mr. Byars, Hq ATC, presented the recommendations of the group revaluating the Airman Resident Training Program (See Attachment 4).

13. Lt Colonel Harris presented the recommendations of the group revaluating the Civil Engineering career courses and OJT programs. The OJT programs are being written off since no more work is contemplated in this area. Major revisions will be made in the following areas: interior and exterior electrician, mason, and general maintenance. Minor revisions will be necessary in the remaining areas. New packages will be required for the combined cost accountant and real property records specialist and Engineering Aid. Funds for training will be scarce, and the CDC system must be exploited at local level. See Attachment 5.

14. A general discussion followed chaired by Lt Colonel Meredith and Lt Colonel Talbot. The latter emphasized that a special effort should be made to rate the NCO's and get them promoted. Colonel Talbot also explained how courses in the Civil Engineering school are established under AFR 50-9 and cited the establishment last January of the back-to-back cost accountant and real property courses. AFR 50-9 also tells what the commands can request and how to process their requests. He advised the major commands to let their sub-commands know about the training available and how to process their requests under AFR 50-9. TDY funds under this regulation are provided by ATC. Colonel Meredith introduced the question of the availability of career development courses for blue collar personnel. Resident special training is required for civilians in certain areas, and it is recommended that maximum utilization be made by civilians of the Career Development Courses. AFM 50-23, to be published in April, spells out the civilian educational program. This should be brought to the attention of first line supervisors. The discussion also brought out the fact that airmen should be given some training in overseas field conditions - the difference in electrical voltage and the metric system were cited as examples of what they need to know. This would be particularly applicable to the proposed mobile units.

15. Recommendations and proposals contained herein are also applicable to the reserve force to insure its credibility.

*

5 Atch
1. List of Attendees
2. Agenda (See ATTACH 11)
3. Career Charts (See ATTACH 13)
4. Revaluated Airman Resident Training Program
5. CDC Proposal

CIVIL ENGINEERING TRAINING
AND
CAREER DEVELOPMENT WORKSHOP ATTENDEES

2-6 March 1964

Col R. B. Moore	SAC
Lt Col W. T. Meredith	USAF
Lt Col R. E. Harris	ATC
Lt Col J. F. Fullilove	TAC
Lt Col E. L. Turner	ADC
Major E. S. Moller	TAC
Major W. L. Darnell	ATC
Major K. A. Jacobson	USAF
Major George Roos	USAF
Major L. A. Easterling	USAF
Major M. J. Jensen	AFIT
Capt David Kestner	USAF
Capt F. E. Prete	MATS
Capt Blackshear	Natl Guard (Kelly AFB)
Capt A. J. Hartman	ATC
Capt W. H. Parker	Security Service
Capt Samuel Butler	SAC
Lt R. Allen	SAC
SMSgt A. Lane	SAC
Mr. John Burton, GS-14	USAF
Mr. Harry Goldman, GS-13	USAF
Mr. T. D. Byars, GS-13	ATC
Mr. J. P. Sotherland, GS-13	AFLC
Mr. P. B. Welliver, GS-12	CONAC
Mr. James Moore, GS-12	USAF
Capt J. H. Bowden	Kirtland
Lt Col George Talbot	Sheppard AFB

WORK GROUP NR. 3, SUMMARY SHEET

1. The following recommendations are the working group's findings guided by the Proposed Changes to AFM 39-1 (Atch 1).

2. Recommended course changes resulting from the Proposed Revision of AFM 39-1:

a. AER 54230 - Electrician: Course revision is necessary to support 30 Sep 64, AFM 39-1 Revision.

b. AER 54231 - Power Lineman: Present AER 54230 Electrician Course revision is necessary to support 30 Sep 64, AFM 39-1 Revision.

c. AFSC 551X0 - Pavement Maint Specialist: A Basic Airman Pavement Maint Course may be required.

d. AFSC 552X1 - Protective Coating Specialist: A Basic Airmen Course may be required. Also Courses AZR 56000-1, Scale and Corrosion Control Maint; and 56000-2, Cathodic Protection Maint, may require revision, as applies to multiple changes in Revised AFM 39-1.

e. AFSC 55230 - Const Equipment Oper - A Basic Airmen Course may be required.

f. AFSC 5623X0 - Engineering Entomology Specialist: A Basic Airmen Entomology Course may be required. Also courses AZN 56350-1 and 56350-2, Disease Vector Control, may require extensive revision and/or deletion.

g. AER 56430Z - Plumbing Specialist Other, may require revision.

h. AEA 56330 - Water and Waste Processing Specialist: Extensive changes may be required. Due to proposed changes, recommend ATC consider

the feasibility of establishing command training capability. This training is currently provided by the U.S. Army at Fort Leonard-Wood.

i. AFSC 569X0 - Work Control Specialist: Type III Lateral Course may be required instead of present Type II Special Training Course.

j. AFSC XXXX - Real Property Accounting: Type III Training may be required instead of Type II Special Course.

3. Other Civil Engineering Courses within 54, 55, 56 Career Areas will maintain current status.

CDC Committee Joint Proposal

5 March 1964

Application of CDCs and OJT Packages

to

Civil Engineering Conference Proposals

1. OJT packages are being replaced by Career Development Course; therefore, no revision of OJT packages is necessary.

2. Career Development Courses in various stages of planning and preparation were evaluated against Civil Engineering conference proposals for career field structural changes and proposed job descriptions.

3. Final job descriptions and training standards will determine Career Development Course content for a specific AFS.

4. Proposed job descriptions indicate major revision for CDCs in the following areas:

a. 54250/70, Interior Elec/Spec/Tech

b. 54251/71, Exterior Elec/Spec/Tech

c. 55130/50, Pavement Maint/Spec

d. 55132/52, Masonry/Spec

e. 55232/72, Gen/Maint/Mech

5. Minor revisions will be required for Career Development Courses for the remaining Air Force Specialties in the Civil Engineering Career Field.

6. Proposed structural changes and proposed job descriptions indicate initial preparation for CDCs in the following areas:

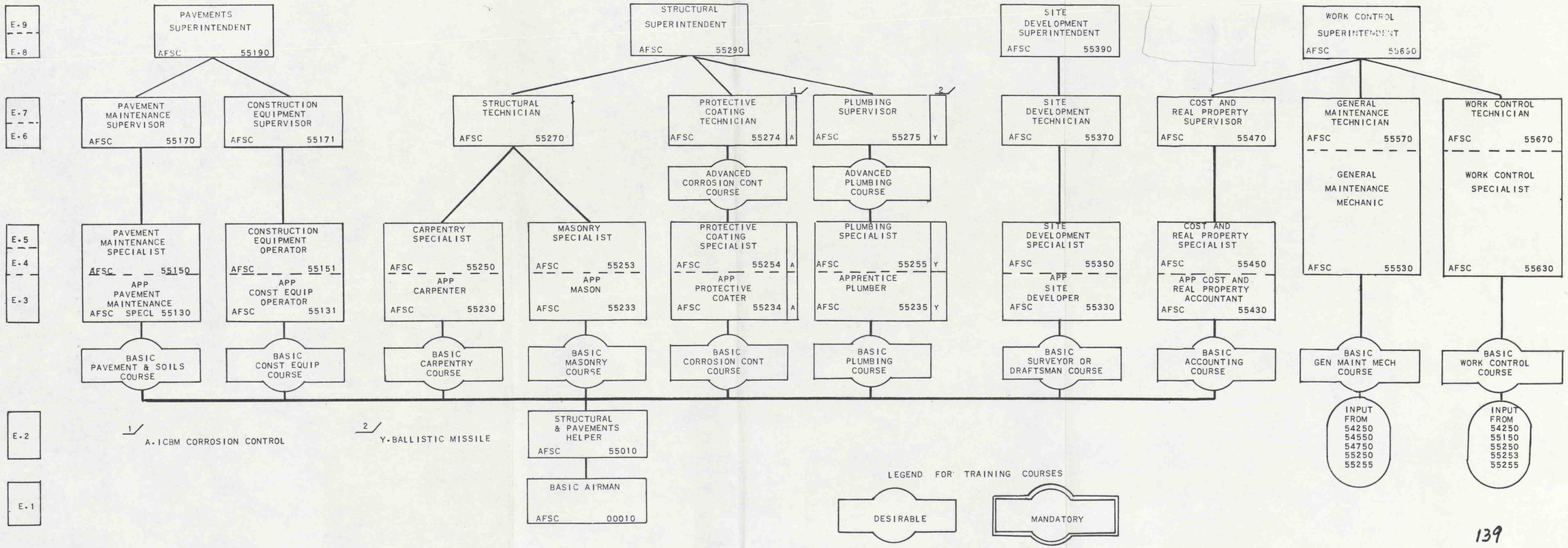
a. 54731/71, Heat Plan Spec/Tech

b. 54531/71, Refrig Plant Spec/Tech

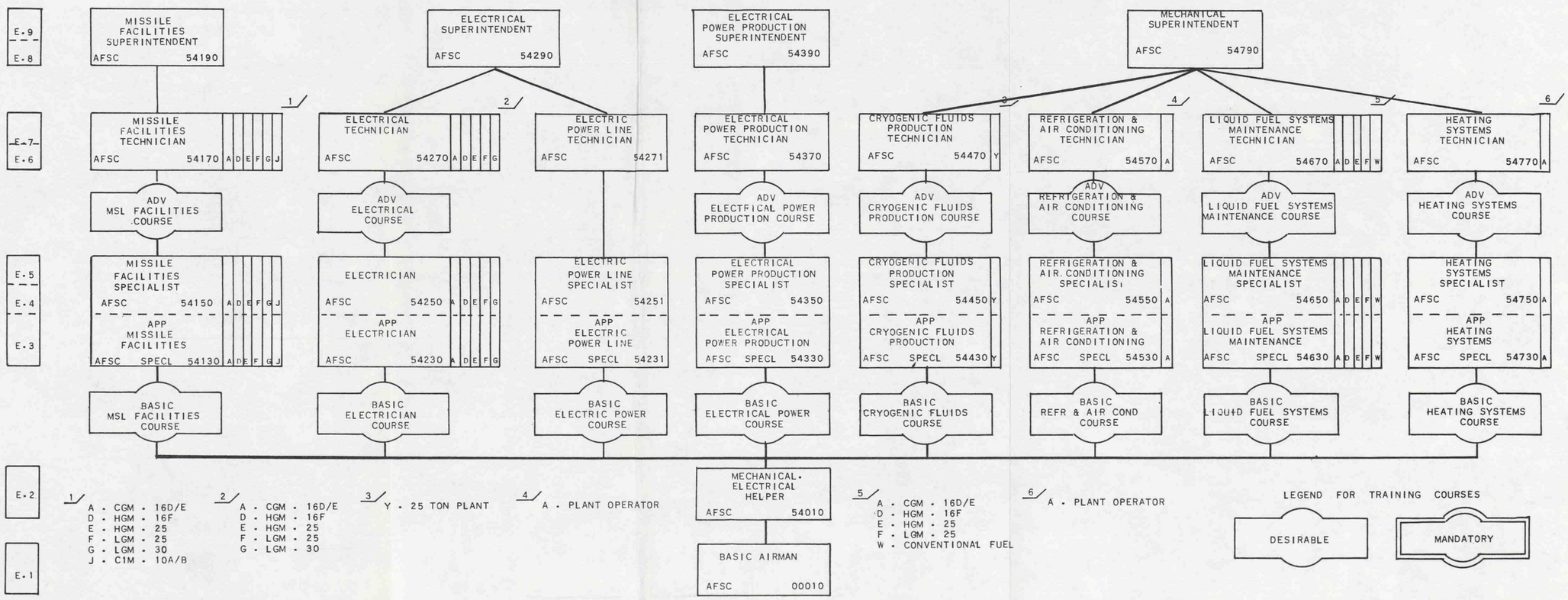
c. 55X5X/7X, Site Development Spec/Tech

d. 55X5X/7X, Cost and Real Property Acct/Spec

7. Career Development Course preparation or revision will continue to provide knowledge requirements to the level indicated in present and future Job Training Standards.

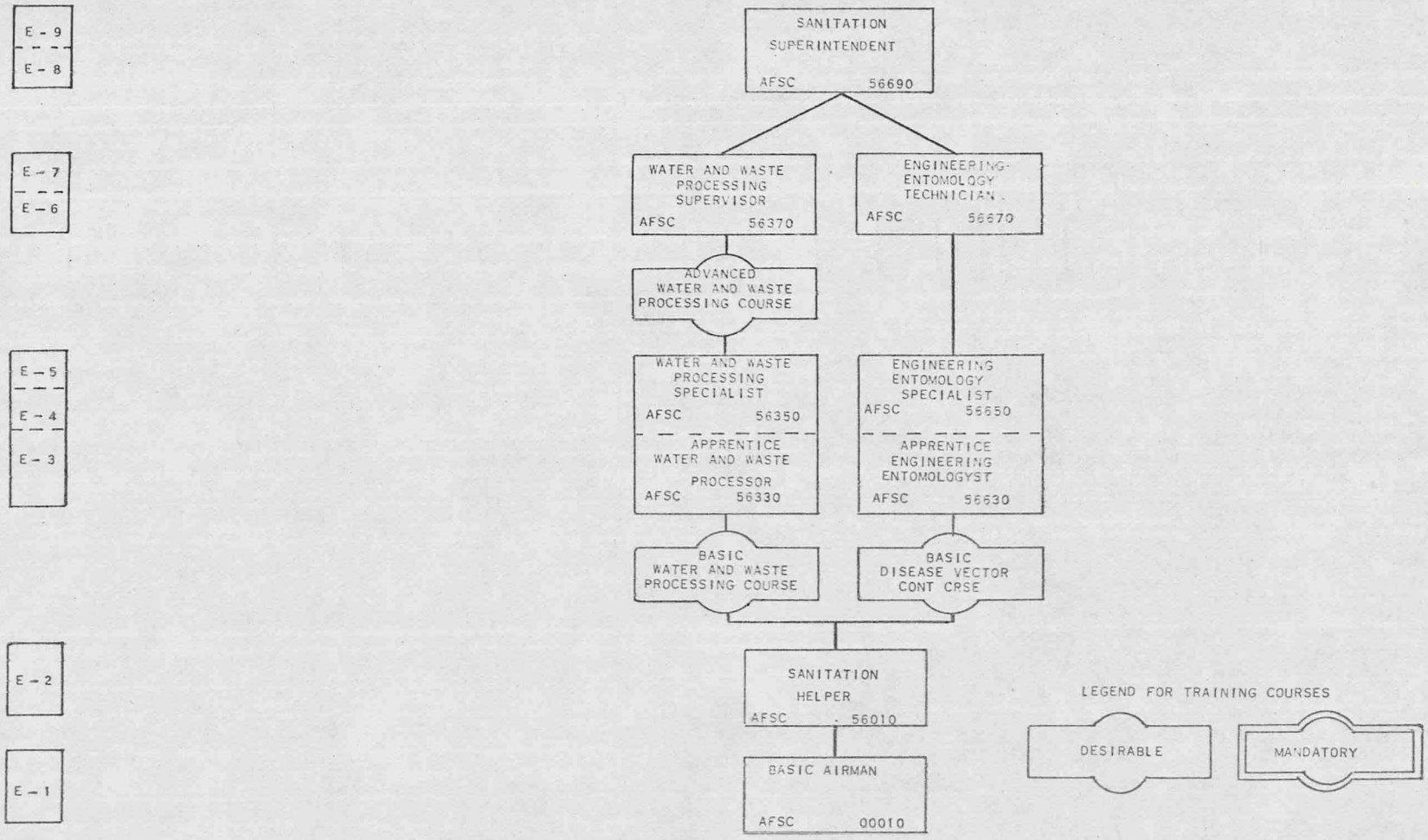


AIRMAN CIVIL ENGINEERING STRUCTURAL/PAVEMENTS CAREER FIELD CHART



AIRMAN CIVIL ENGINEERING MECHANICAL/ELECTRICAL CAREER FIELD CHART

ATTACH 13



AIRMAN CIVIL ENGINEERING SANITATION CAREER FIELD CHART

Effective 30 September 1964

AFM 39-1E

AFSC 54290

AIRMAN AIR FORCE SPECIALTY

ELECTRICAL SUPERINTENDENT

1. SPECIALTY SUMMARY

Superintends activities engaged in installation, operation, and repair of interior and exterior electrical distribution and control systems and equipment.

2. DUTIES AND RESPONSIBILITIES

a. Plans and organizes utility electrical activities: Plans workloads and schedules work assignments. Establishes performance standards and work procedures to insure effective personnel utilization and to increase efficiency and economy of operation. Provides for and controls use of equipment, space, and supplies. Develops organizational structure to define lines of authority and assigns specific responsibilities. Resolves personnel problems and rates subordinates for efficiency. Accomplishes personnel actions such as recommending promotions and scheduling leaves. Coordinates electrical distribution and systems maintenance and repair with related activities.

b. Directs installation, operation, and repair of electrical interior and exterior distribution and control system activities: Directs

utility electrical power installation, operation, and maintenance activities to include high voltage work accomplished by power lineman, airfield lighting and approved lighting systems, underground distribution lines, interior electrical work, and electrical work in support of missile weapon systems. Establishes teams or shifts and assigns airmen to duty in accordance with grade and skill level. Controls workflow and assigns special projects to persons or teams. Assigns electrical technicians to specific functions such as installation, maintenance, repair, and modification of electrical power distribution and control systems and equipment, and equipment operated by such power. Evaluates work performance in terms of compliance with policies, directives, and technical publications. Analyzes productivity and work quality. Insures compliance with appropriate safety regulations and practices. Supervises preparation and maintenance of records and reports incident to operation and maintenance of utility electrical systems.

c. Establishes and conducts on-the-job training for electrical personnel: Directs on-the-job training of electrical personnel and reviews progress charts to insure completion of required training. Plans and conducts conferences and classes of instruction to inform personnel of new projects, work requirements, and equipment. Arranges for attendance of selected individuals at formal and special

training courses. Indoctrinates newly assigned personnel in local policies and procedures.

d. Inspects and evaluates electrical activities: Makes periodic and special inspections of utility electrical activities to insure compliance with policies, regulations, and technical publications; and to provide assistance in solving maintenance, supply, and personnel problems. Interprets inspection findings and recommends corrective action.

e. Performs technical electrical functions: Resolves technical problems encountered by subordinates and interprets technical publications applicable to installation, operation, maintenance, repair, and modification of utility electrical systems. Isolates unusual malfunctions, examines faulty components and material and determines need for repair, replacement, and/or need for submission of unsatisfactory reports. Evaluates operational effectiveness of utility electrical systems and recommends modification of equipment and material.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of principles of electricity and electrical circuitry and distribution systems; characteristics, capabilities, and applications of electrical equipment and material such as wire,

conduit, motors, generators, transformers, regulators, solenoids, switches, relays, and fuses; special procedures for repair of high voltage circuitry and equipment; and safety rules and practices is mandatory.

b. Education: Completion of high school with courses in physics, mathematics, and blueprint reading is desirable.

c. Experience: Qualification as an Electrical Technician or Electric Power Line Technician is mandatory. In addition, experience in directing such functions as inspection, maintenance and repair of electrical systems is desirable.

d. Training: Completion of appropriate base level management course is desirable.

e. Other:

(1) Normal color vision as defined in AFM 160-1 is mandatory.

(2) Physical requirements for missile duties as defined in AFM 160-1 apply.

4. SPECIALTY DATA

a. Grade Spread: Senior master sergeant and chief master sergeant.

b. Related D.O.T. Jobs:

Electrician Foreman (Construction) --- 4-97.101

Electric-Repair Supervisor (Light, Heat, and Power)---------- 4-97.510

Line Foreman (Light, Heat, and Power)---------- 5-95.320

Effective 30 September 1964

AFM 39-1E

AFSC 54270*

AIRMAN AIR FORCE SPECIALTY

ELECTRICAL TECHNICIAN

1. SPECIALTY SUMMARY

Inspects, installs, services, troubleshoots, repairs, and modifies all low voltage electrical equipment and systems associated with generation, distribution, utilization and control systems; and supervises electrical activities.

2. DUTIES AND RESPONSIBILITIES

a. Advises on technical problems of installation, modification, and repair of electrical real property installed equipment and systems: Solves complex installation, control, modification, and repair problems by studying wiring and schematic diagrams and technical publications; and determining capability, capacity, and limitations of equipment, tools, and materials. Determines procedures for maintenance, installation, modification, and repair of electrical real property installed equipment and systems. Recommends revised maintenance, repair, and installation procedures to facilitate full utilization of personnel and equipment. Diagnose recurring malfunctions and recommends corrective action by initiation of unsatisfactory reports, proposed modifications, or other appropriate means.

b. Installs, services, modifies, and repairs electrical equipment and systems: Performs difficult tasks involving inspection, troubleshooting, servicing, assembly, installation, connecting, adjusting,

147

and testing of all electrical generation, distribution, control and utilization equipment and systems rated 600 volts or less; such as, fire and gas detection and warning systems, security systems, equipment control systems, system protective devices, explosion proof lighting and wiring systems, high-bay and industrial shop lighting systems, security lighting, street and flood lighting, traffic controllers, electric heating and cooking systems, electrical ground detection systems, station batteries and charging systems, generators and excitors, motors and starters, and power protective relaying systems. Performs unusual testing, installation, and repair tasks; such as, testing and calibrating electric power system relays and meters, troubleshooting equipment control circuits, laying out and installation of complex conduit and wiring systems and repair and adjustment of electrically operated circuit breakers. Also, although 600 volts is the normal voltage limit, installs, services, and repairs unenergized high voltage equipment associated with power generation and interior distribution systems.

c. Inspects electrical systems and equipment: Inspects completed or in-progress work to insure compliance with standing operating procedures, safety standards, and technical publications. Performs periodic inspections to determine the safety and operational condition of electric power and control systems. Detects potential malfunctions by examining for loose connections; improper insulation; overheating of electrical systems components; and undesirable collections of dirt, grease, moisture, and corrosion on electrical equipment wiring and

enclosures. Interprets inspection findings and determines adequacy of corrective action.

d. Supervises electrical personnel: Plans and schedules work assignments. Establishes work methods, production controls, and performance standards for subordinates. Insures availability of required maintenance equipment, tools, test instruments, and spare parts. Evaluates performance of subordinates performing installation, repair, servicing, and test functions in terms of compliance with policies, directives, and technical manuals and orders. Orients newly assigned personnel and assigns individuals to duty positions. Conducts on-the-job training of electrical personnel in installation, servicing, test, and repair of electrical distribution and utilization equipment and control systems.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of principles of electricity to include computation and measurement of common properties (resistance, inductance, capacitance, electric potential, and current flow); magnetism; electric circuit analysis; rotating machinery operation and control; repair, servicing, and installation of high voltage equipment; industrial electronics (operation and elements of rectifiers, voltage regulators, photo-electric and amplifier circuits); motor controls, circuits, and protective devices (synchronous and induction motor controllers, over-current and over-voltage protection); transformer operations and connections; electrical equipment control circuits

(servo-mechanisms, temperature sensing devices, types and functions of relays); lightning and system grounding systems and equipment (lightning arrestors, shielding means, power and utilization equipment grounding schemes); cathodic protection; reading and interpretation of electric schematic and one-line diagrams; safety rules and practices; rescue and resuscitation of electric shock victims; operation of test instruments; and use of hand and power tools used in installation and repair of electric equipment and systems is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

b. Education: Completion of high school with courses in electricity, physics, mathematics, and blueprint reading is desirable.

c. Experience: Qualification as an Electrician is mandatory. In addition, experience in performing or supervising functions such as installation, maintenance, troubleshooting, and repair of electrical distribution and utilization equipment and systems is mandatory.

d. Training:

(1) Completion of an advanced electrician course is desirable.

(2) Completion of an appropriate base level management course is desirable.

e. Other:

(1) Normal color vision as defined in AFM 160-1 is mandatory.

(2) Physical requirements for missile duties as defined in

AFM 160-1 apply.

4. SPECIALTY DATA

a. Grade Spread: Technical sergeant and master sergeant.

b. Related D.O.T. Jobs:

Electrician Foreman (Construction) ----------4-97.101

Electric Repair Supervisor (Light, Heat, and Power) ----------4-97.501

5.* SPECIALTY SHREDOUTS

Suffix	Portion of AFS to Which Related
A	HGM-16D/E
D	HGM-16F
E	HGM-25
F	LGM-25
G	LGM-30

151

Effective 30 September 1964

AFM 39-1E
AFSC 54250*
Semiskilled AFSC 54230*

AIRMAN AIR FORCE SPECIALTY

ELECTRICIAN

1. SPECIALTY SUMMARY

Installs, services, troubleshoots, and repairs all low voltage electrical equipment and systems associated with generation, distribution, utilization, and controls.

2. DUTIES AND RESPONSIBILITIES

a. Installs, services, modifies, and repairs electrical equipment and systems: Inspects, troubleshoots, services, assembles, installs, connects, repairs, adjusts, and tests low voltage electrical generation, distribution, control, and utilization equipment and systems. Examines electrical equipment and systems for damage, corrosion, and operation. Connects and utilizes test equipment and meters; such as, voltmeters, ammeters, megohmeters, and oscillographs for locating equipment, distribution, and control systems malfunctions and faults. Cleans and adjusts relay timing mechanism and contacts, rotating machinery brushes, circuit breaker and disconnect contacts, and control sensing mechanisms. Although 600 volts is the normal dividing line between high and low voltage systems, repairs and services de-energized high voltage equipment (rotating machinery, circuit breakers, and associated high voltage interior power systems) under direct supervision and guidance. Cuts, threads, and bends conduit. Assembles and replaces conduit, conduit fittings, junction boxes, and supports. Pulls conductors into conduits and raceways. Splices conductors. Installs and connects distribution,

generation, and utilization equipment components; such as control sensing devices, relays, switches, panel boards, transformers, voltage regulators, battery chargers, motor speed controllers, motors, receptacles, lightning fixtures, heating elements, battery banks, generators, circuit breakers, surge protection, ground rods, counterpoises, lightning air terminals, and ground lamps. Uses common hand tools, tubing and conduit benders, hand and motor operated conduit threading machines, soldering irons, and hand drills.

b. Repairs electrical circuits and equipment: Corrects hazardous conditions by replacing defectively insulated conductors, repairing defective equipment and lightning arrestor ground conductors. Replaces defective armature and field windings. Refaces commutators. Cleans aramature windings. Replaces defective lamps, lighting fixture ballasts and starters. Replaces defective electronic tubes and parts in power rectifiers, photoelectric light sensors, and voltage and current regulators.

c. Supervises electrical personnel: Assigns work and reviews completed repairs to insure compliance with National Electrical Code, safety codes and instructions, and applicable technical publications. Instructs subordinates in techniques and procedures for such functions as installation, inspection, maintenance, and repair of electric power distribution. Evaluates work performed and keeps immediate supervisor informed on job status. Indoctrinates newly assigned personnel.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of principles of electricity to include

computation and measurement of common properties (resistance, inductance, capacitance, electrical potential, and current flow); magnetism; electric circuit analysis; rotating machinery operation and control; industrial electronics (operation and elements of rectifiers, voltage regulators, photo-electric, and amplifier circuits); transformer operations and connections; electric equipment control circuits (servo-mechanisms, temperature sensing devices, types and functions of relays); lighting and system grounding systems and equipment (lightning arrestors, shielding, utilization equipment grounding schemes); cathodic protection; reading and interpretation of electric schematic and one-line diagrams; safety rules and practices; rescue and resuscitation of electric shock victims; operation of test instruments; and use of hand and power tools used in installation and repair of electric equipment and systems is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

b. Education: Completion of high school with courses in electricity, physics, mathematics, and blueprint reading is desirable.

c. Experience: Experience in installation, repair, and servicing of electrical generation, distribution, and utilization equipment and systems is mandatory.

d. Training: Completion of a basic electrician course is desirable.

e. Other:

(1) A minimum aptitude level of Electronic 50 is mandatory.

(2) Normal color vision as defined in AFM 160-1 is mandatory.

(3) Physical requirements for missile duties as defined in AFM 160-1 apply.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Electrician 4-97.010

Powerhouse Repairman
(Light, Heat and Power).....5-53.374

Electrical Repairman.....4-97.420

5.* SPECIALTY SHREDOUTS

Suffix	Portion of AFS to Which Related
A	HGM-16D/E
D	HGM-16F
E	HGM-25
F	LGM-25
G	LGM-30

Effective 30 September 1964

AFM 39-1E
AFSC 54271

AIRMAN AIR FORCE SPECIALTY

ELECTRIC POWER LINE TECHNICIAN

1. SPECIALTY SUMMARY

Inspects, installs, services, troubleshoots, repairs, and modifies all high voltage electric distribution and utilization equipment and systems; and supervises electric power line activities.

2. DUTIES AND RESPONSIBILITIES

a. Advises on technical problems of operation, installation, repair, and modification of electric power utility systems and equipment: Determines procedures, equipment, and line crew composition (manpower requirements), for installation, repair, and servicing of electric power systems. Solves complex rigging problems for moving or in-placing heavy pieces of equipment; resolves requirements for work on energized lines and equipment; advises on safety and emergency repair requirements; and coordinates on joint pole use for power and communications.

b. Performs installation, repair, and servicing of electric power systems and components: Installs, repairs, and services electric power systems and components such as, overhead and underground distribution conductors, pole installation or replacement, transformers, lightning arrestors, street-lighting, runway lighting, circuit breakers, guys and anchors, potheads, high voltage splices, voltage regulators, capacitors, substation and equipment grounding systems, and overhead shield wires.

c. Inspects electric power systems: Inspects completed or

in-progress work to insure compliance with standing operating procedures, safety standards, and technical publications. Performs periodic inspection to detect deficiencies or possible system component failures; such as damaged fireproofing on high voltage underground cables, excessively corroded down guys on overhead power lines, broken crossarms and insulators, damaged lightning arrestors, decayed or splintered wood poles, substation housekeeping, and defective protective barriers to high voltage equipment areas.

d. Supervises electric power line personnel: Plans and schedules work assignments. Establishes work and safety methods and standards. Insures availability and physical condition of all tools and equipment (climbers, pole pikes, cant hooks, rubber goods, lines, winches, A-frames, mechanical diggers, pole trailers, etc.). Evaluates performance of subordinates performing installation, repair, and maintenance functions in terms of compliance with safety standards, directives, and technical manuals. Orients newly assigned personnel and assigns individuals to duty positions. Conducts on-the-job training for personnel assigned to electric utility line crews.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of principles of electricity to include computation and measurement of common properties (resistance, inductance, capacitance, electrical potential, and current flow); transformers and voltage regulators, operations, and connections; lightning protection as applied to overhead lines; insulation coordination;

rigging and moving of heavy objects and loads; working on energized lines; knowledge and analysis of all safety requirements applying to installation and maintenance of electric supply overhead and underground lines; reading and interpretation of electric schematic and one-line diagrams; and rescue and resuscitation of electrical shock victims is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

b. Education: Completion of high school with courses in electricity, physics, mathematics, and blueprint reading are desirable.

c. Experience: Qualification as Electric Power Line Specialist is mandatory. In addition, experience in performing or supervising installation, repair, servicing, and troubleshooting of electric power systems rated above 600 volts is mandatory.

d. Training:

(1) Completion of a basic course in installation, repair, and servicing of high voltage equipment and systems; handling and rigging heavy loads, and operation of motorized pole hole diggers, winches, and boom trucks or A-frames is desirable.

(2) Completion of appropriate base level management course is desirable.

e. Other: Normal color vision as defined in AFM 160-1 is desirable.

(2) Normal color vision as defined in AFM 160-1 is mandatory.

(3) Physical requirements for missile duties as defined in AFM 160-1 apply.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Electrician 4-97.010

Powerhouse Repairman
(Light, Heat and Power).....5-53.374

Electrical Repairman.....4-97.420

5.* SPECIALTY SHREDOUTS

Suffix	Portion of AFS to Which Related
A	CGM-16D/E
D	HGM-16F
E	HGM-25
F	LGM-25
G	LGM-30

Effective 30 September 1964

AFM 39-1E
AFSC 54251
Semiskill AFSC 54231

AIRMAN AIR FORCE SPECIALTY

ELECTRIC POWER LINE SPECIALIST

1. SPECIALTY SUMMARY

Inspects, installs, services, troubleshoots, repairs, and modifies all high voltage electric distribution and utilization equipment and systems.

2. DUTIES AND RESPONSIBILITIES

a. Installs, repairs, and services electric power utility systems and equipment: Lays direct buried cables; installs cables in underground ducts, overhead line conductors, transformers, poles, crossarms, insulators, guys, anchors, voltage regulators, disconnect switches, capacitors, potheads, lightning arrestors, ground rods, street-lighting systems, airfield lighting systems, constant current transformers, and substation circuit breakers and equipment. Uses tools and equipment such as mechanical hole diggers, A-frames, power winches, pole jacks, pike poles, pole tongs, hoists, lines, wire grips, utility platforms, line sagging blocks, swivel hook maintenance ladders, snatch blocks, rope blocks, and gin poles. Installs and splices high voltage cables using equipment and tools such as reels, pulling and cable grips, hydraulic connector compressors, lead melting and pouring devices, soldering torches, feeding tubes, mandrels, and cable splicing compounds and materials. Although 600 volts is the normal dividing level between high and low voltage systems, exterior

161

low voltage systems that are in close proximity and an extension of high-voltage distribution (such as secondary and service drops) and street lighting and navigational aids systems are also installed and maintained.

b. Works on energized circuits: When unusual, critical, or emergency conditions prevent interruption of electric power, overhead lines and equipment are repaired while energized or installed in close proximity to energized lines. In addition to common tools and line equipment, uses special insulating guards such as insulator and conductor hoods, rubber blankets, rubber gloves and leather protectors, and insulated stands. On energized lines rated above 5000 volts, uses special types of hot stick tools, disconnect sticks, and fuse pullers, to work on such circuits.

c. Repairs and troubleshoots electrical circuits and equipment: Uses special meters to locate faults in underground cables; repairs or replaces defective cables and splicers; repairs damaged cable fire-proofing; pumps water from and cleans electrical manholes; tests air in manholes for dangerous concentrations of combustible or toxic gases and/or oxygen deficiency. Filters power transformer oil. Adjusts and checks contacts on step voltage regulators.

d. Inspects electric power systems: Inspects power line structures for termite infestation, ground line rot, abnormal checks and splits in poles and crossarms, cracked insulators, loose insulator tie wires, defective guys, and loose equipment brackets.

Inspects power line right-of-ways for brush, weeds, and trees; checks substation grounds for debris, weeds, and other fire hazards. Checks equipment grounding conductors and fittings for continuity.

*e. Supervises electric power line personnel: Directs other crew members in maintenance of electric power systems. Instructs subordinates in techniques and procedures for such functions as working on energized circuits, and installation, inspection, repair, and servicing of electric power systems.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of principles of electricity to include computation and measurement of common properties (resistance, inductance, capacitance, electric potential, and current flow); transformers and voltage regulators, operations, and connections; lightning protection as applied to overhead lines; insulation coordination; rigging and moving of heavy objects and loads; working on energized lines; knowledge and analysis of all safety requirements applying to installation and maintenance of electric supply overhead and underground lines; reading and interpretation of electric schematic and one-line diagrams; and rescue and resuscitation of electrical shock victims, is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

b. Education: Completion of high school with courses in electricity, physics, mathematics, and blueprint reading is desirable.

c. Experience: Experience in functions such as installing, maintaining, and repairing overhead and underground high voltage electrical distribution systems is mandatory.

d. Training: Completion of a basic course in installation, repair, and servicing of high voltage equipment and systems; handling and rigging heavy loads, and operation of motorized pole hole diggers; winches, and boom trucks or A-frames is desirable.

e. Other:

(1) Normal color vision as defined in AFM 160-1 is desirable.

(2) A minimum aptitude level in electronic 50 is mandatory.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Lineman
(Light, Heat and Power) ---------- 5-53.420

Electrician
Substation (Light, Heat, and Power) ---------- 5-53.361

Effective 30 September 1964

AFM 39-1E

AFSC 54390

AIRMAN AIR FORCE SPECIALTY

ELECTRICAL POWER PRODUCTION SUPERINTENDENT

1. SPECIALTY SUMMARY

Superintends activities associated with generating electrical power and maintaining generating equipment.

2. DUTIES AND RESPONSIBILITIES

a. Plans and organizes electrical power production activities: Supervises, plans, and schedules work and training assignments. Establishes performance standards and work procedures to insure effective, efficient, and economical operation. Provides for and controls use of equipment, space, and supplies. Develops organizational structure, defines lines of authority, and assigns specific responsibilities. Resolves personnel assignment problems, rates subordinates, and accomplishes personnel actions as necessary. Coordinates electric generating activities through Civil Engineering Control Center with using agencies and related activities.

b. Directs operation and maintenance of electrical power production activities: Supervises work accomplishment by assigning technicians to specific functions such as: maintenance, repair, and overhaul of equipment to include complete disassembly, testing,

replacement of parts, fabrication, and reassembly of electrical power generating equipment to include gasoline, diesel, gas turbine, and steam; and operation and maintenance of electric generators and associated electric power generating control, regulating, recording, monitoring, and primary plant equipment. Identifies and controls requisitioning of replacement parts, systems, fuels, lubricants, bench stock, and necessary technical publications. Evaluates subordinates work and training performance under applicable policies, directives, manuals, and technical publications. Insures subordinates comply with safety practices and regulations. Monitors electric power generating unit records and analyses for organizational, field, or depot level maintenance. Monitors preparation of maintenance forms, reports, and records.

c. Establishes and conducts on-the-job training for electric power production personnel: Directs on-the-job training of personnel.. Monitors progress and motivates personnel to complete training. Plans and conducts conferences and classes of instruction to inform personnel of new projects, work requirements, and equipment. Manages scheduling of personnel for lateral, supplemental, and advanced technical training through unit training control function. Indoctrinates newly assigned personnel in local policies and procedures.

d. Inspects and evaluates electric power production activities: Performs periodic and special inspections of electrical power generating activities to assure compliance with policies, regulations,

and technical publications; and to provide assistance in solving maintenance, supply, and personnel problems. Interprets inspection findings and initiates corrective action.

e. Performs technical electrical power production functions: Resolves technical problems encountered by subordinates and interprets manuals and technical publications applicable to operation, installation, maintenance, repair, overhaul, and modification of electric power generating systems or units. Isolates unusual malfunctions, examines faulty components and material, and determines need for repair, replacement, and/or need for submitting material deficiency reports under Air Force regulations. Evaluates operational effectiveness of electric power generating systems and recommends, when necessary, engineering studies or modification of equipment and materials.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of principles of internal combustion engines and other prime movers for electric power generating systems or units; electricity and electrical circuitry, generation, and distribution; operations, maintenance, and repair procedures for electrical power generating equipment; and high voltage circuitry, equipment, and safety procedures is mandatory.

b. Education: Completion of high school with courses in physics, mathematics, and blueprint reading is desirable.

c. Experience: Qualification as an Electrical Power Production Technician is mandatory. In addition, experience in directing such functions as inspection, operation, maintenance, and repair of electric power production equipment is mandatory.

d. Training: Completion of appropriate base level management course is desirable.

e. Other:

(1) Normal color vision as defined in AFM 160-1 is mandatory.

(2) Physical requirements for missile duties as defined in AFM 160-1 apply.

4. SPECIALTY DATA

a. Grade Spread: Chief master sergeant and senior master sergeant.

b. Related D.O.T. Jobs:

Substation Operator	5-51.210
Electrician, Substation	5-53.361
Substation Operator, Chief	9-95.320
Powerhouse Repairman	5-53.374
Diesel Mechanic	5-83.931

Effective 30 September 1964

AFM 39-1 E

AFSC 54370

AIRMAN AIR FORCE SPECIALTY

☆ELECTRICAL POWER PRODUCTION TECHNICIAN

1. SPECIALTY SUMMARY

Inspects, maintains, troubleshoots, repairs, and modifies fixed electrical generating plants and equipment; and supervises electrical power production activities.

2. DUTIES AND RESPONSIBILITIES

a. Advises on technical problems of repair of electrical power production equipment: Solves complex maintenance problems by studying lay-out drawings, wiring diagrams, and schematic diagrams, and analyzing construction and operating characteristics of electrical generating plants and equipment. Devises and establishes maintenance and operating procedures to insure maximum efficiency of operation of electrical power production plants. Diagnoses recurring malfunctions and recommends repair procedures necessary to correct defective equipment. Establishes maintenance shortcuts and operating procedures.

b. Repairs, maintains, and modifies electrical power production equipment: Performs difficult repair of such components as fixed gasoline or diesel engines, generators, centrifuges, starter motors, and associated generating and distributing equipment.

169

Conducts tests of equipment using voltmeters, ammeters, ohmmeters, continuity tester, feeler gage, and other test equipment. Adjusts and calibrates components to assure optimum operating efficiency within design limitations. Modifies equipment in accordance with manufacturer's specifications and other technical publications. Accomplishes difficult operating and repair tasks beyond capability of senior workers.

c. Inspects electrical power production equipment: Analyzes malfunctions by visual or auditory inspection, observation of operation, and use of test equipment. Interprets inspection findings and determines adequacy of corrective action. Inspects completed or in-progress work to assure compliance with standing operating procedures and technical publications.

d. Maintains and repairs electric generating equipment: Performs inspection, maintenance, and major modification; troubleshoots complex repair situations; and performs other maintenance on electric power generating equipment. Bench checks reparable components and sub-assemblies of electric power generating equipment by using test equipment, standards, and other equipment as may be required by technical data. Determines extent of repair/rebuild and accomplishes same. Tests and calibrates repaired items to assure adequacy or repair action and to determine

reliability of repair action. Interprets maintenance malfunction data related to electrical power generating systems to prevent potential weapon systems failure.

e. Supervises electrical power production personnel: Plans and schedules work assignments. Establishes work methods, production controls, and performance standards. Assigns operating and repair functions to subordinates and establishes priorities for work accomplished. Assures compliance with published directives, work standards, and technical publications. Evaluates performance of electrical power production specialists. Orients newly assigned personnel and assigns individuals to unit positions. Conducts on-the-job training. Assures availability of tools and assignment of personnel to enable opportunity for full qualification and to improve utility of assigned airmen.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of internal combustion engines; interpretation of technical publications, blueprints, and schematic diagrams; and principles of management, operation, and repair of electrical power production systems is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

b. Education: Completion of high school with courses in physics, mathematics, and blueprint reading is desirable.

c. Experience: Qualification as an Electrical Power Production Specialist is mandatory. In addition, experience in performing or supervising functions such as operation and repair of electrical power production equipment is mandatory.

d. Training:

(1) Completion of an advanced electrical power production course is desirable.

(2) Completion of appropriate base level management course is desirable.

e. Other:

(1) Normal color vision as defined in AFM 160-1 is mandatory.

(2) Physical requirements for missile duties as defined in AFM 160-1 apply.

4. SPECIALTY DATA

a. Grade Spread: Technical sergeant and master sergeant.

b. Related D.O.T. Jobs:

Substation Operator ----------5-51.210

Electrician, Substation ----------5-53.361

Substation Operator, Chief -------9-95.320

Powerhouse Repairman ----------5-53.374

Diesel Mechanic ---------- 5-83.931

Effective 30 September 1964

AFM 39-1E

AFSC 54350

Semiskilled AFSC 54330

AIRMAN AIR FORCE SPECIALTY

ELECTRICAL POWER PRODUCTION SPECIALIST

1. SPECIALTY SUMMARY

Installs, operates, maintains, and repairs fixed electrical power production plants and equipment.

2. DUTIES AND RESPONSIBILITIES

a. Installs and operates electrical power source and distribution equipment: Uncrates equipment and checks for serviceability prior to installation. Positions and installs equipment such as gasoline and diesel engines, generators, centrifuges, starter motors, waste heat recovery equipment, and air compressors. Checks installed equipment to insure compliance with technical publications and maintenance policies and directives. Performs prerunning inspection, testing, and servicing of component systems such as fuel, lubrication, cooling, air pressure, pumps, regulators, governors, and fuel injection. Starts and operates engines and accessory equipment such as air compressors, fuel transfer pumps, centrifuges, coolant units, and battery generator sets. Observes and interprets instruments such as ammeters, voltmeters, frequency

meters, synchroscopes, automatic temperature and pressure recording tapes, and engine oil, fuel, and coolant gages. Adjusts engine and generator controls to maintain proper engine power, voltage, amperage, cycling, and synchronization. Synchronizes generators in multiple operations. Unloads and stops engine and accessory equipment. Operates manual and remote switches, circuit breakers, rheostats, and other controls on switchboards and distribution panels to perform necessary electrical power control and distribution functions such as connecting and disconnecting generator units to and from load; adjusting cycling and synchronization of generators to meet electrical load requirements; energizing and de-energizing circuits; and controlling distribution of electrical power to busses and feeder lines.

b. Maintains, inspects, repairs, and modifies electrical power generation and distribution equipment: Accomplishes periodic and other inspections as required by applicable technical orders. Places equipment in operation and adjusts it in accordance with factory specifications or technical publications. Identifies and records engine and generator operating malfunctions such as lack of power, smoky exhaust, engine slowdown, starting failures, high oil and water cooling temperatures, high lubricating and/or fuel oil consumption, armature overheating, electrical insulation failures,

and vibration caused by misalignment. Isolates malfunctions by visual and aural examination and use of test equipment. Examines parts for excessive wear and other conditions causing deviation from specifications, using feeler gages and micrometers. Removes, repairs, and/or replaces defective engine and auxiliary equipment components such as fuel injectors, valves, pistons, bearings, cylinder heads, connecting rods, drive belts, pumps, piping, gages, filters, brushes, commutators, meters, switches, rheostats, circuit breakers, and electrical wiring harnesses. Tunes and adjusts engines and components, using test instruments such as timing lights and dial indicators. Removes sludge, scale, and other harmful residue by cleaning equipment such as lubricating oil and water coolers, air filters, strainers, sump tanks, injection spray nozzles, and exhaust mufflers. Reviews accumulated performance data and maintenance records to determine adequacy of maintenance procedures and activities.

c. Maintains operation, inspection, and maintenance records: Posts entries on operation, inspection, and maintenance records. Records meter readings, fuel consumption, and other pertinent data in equipment performance logs. Furnishes information required for unsatisfactory reports and recommends changes to correct defective equipment or to improve operating procedures.

d. Maintains and repairs electric generating equipment: Performs inspection, maintenance, and major modification; trouble-shoots complex repair situations; and performs other maintenance on electric power generating equipment. Bench checks reparable components and sub-assemblies of electric power generating equipment by using test equipment, standards, and other equipment as may be required by technical data. Determines extent of repair/rebuild and accomplishes same. Tests and calibrates repaired items to assure adequacy and reliability of repair action. Interprets maintenance malfunction data related to electrical power generating systems to prevent potential weapon systems failure.

e. Supervises electrical power production personnel: Instructs subordinates in techniques of installation, operation, maintenance, and repair of electrical power production and distribution equipment. Indoctrinates personnel in safety procedures. Assigns work and reviews completed repairs to insure compliance with local procedures and applicable technical publications.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of principles of electricity, including generation, conversion, transformation, distribution, and utilization;

kind, capacity, and purpose of high and low voltage circuits, circuit breakers, switches, fuses, regulators, relays, instruments, and meters associated with electric energy generation and distribution; interpretation of instrument and meter readings, wiring diagrams, schematic drawings, blueprints, and technical orders; techniques of operating and maintaining heavy internal combustion engines, generators, distribution panels and accessory equipment used in electrical energy generation and distribution; use and purpose of operator and maintenance test equipment; and safety rules and practices is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

b. Education: Completion of high school with courses in physics, mathematics, and blueprint reading is desirable.

c. Experience: Experience in functions of operation and maintenance of engines, generators, and distribution components of electric power production equipment is mandatory.

d. Training: Completion of a basic course in operation and maintenance of electric power production equipment is desirable.

e. Other:

(1) Normal color vision as defined in AFM 160-1 is mandatory.

(2) A minimum aptitude level of Mechanical 50 is mandatory.

(3) Physical requirements for missile duties as defined in AFM 160-1 apply.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Substation Operator ----------5-51.210

Electrician, Substation ----------5-53.361

Powerhouse Repairman ----------5-53.374

Diesel Mechanic----------5-83.931

Substation Operator, Chief---------5-95.320

Effective 30 September 1964

AFM 39-1

AFSC 54790

AIRMAN AIR FORCE SPECIALTY

MECHANICAL SUPERINTENDENT

1. SPECIALTY SUMMARY

Superintends activities engaged in installation, operation, maintenance, plant operation, and repair of refrigeration, air conditioning, heating, propellant systems, and cryogenic fluids production.

2. DUTIES AND RESPONSIBILITIES

a. Plans and organizes mechanical activities: Plans workloads and schedules work assignments. Establishes performance standards and work procedures to insure effective personnel utilization and to increase efficiency and economy of operation. Provides for and controls use of equipment, space, and supplies. Develops organizational structure to define lines of authority and assigns specific responsibilities. Resolves personnel problems and rates subordinates for efficiency. Accomplishes personnel actions such as recommending promotions and scheduling leaves. Coordinates mechanical systems operation and maintenance with other activities.

b. Directs mechanical activities: Establishes teams or

shifts and assigns personnel to duty in accordance with grade and skill level. Controls workflow and assigns special projects to persons or teams. Assigns technicians and specialists to specific functions such as operation and maintenance of heating, air conditioning, refrigeration, cryogenic fluids, and propellant plants and systems. Evaluates work performance in terms of compliance with policies, directives, and technical publications. Analyzes productivity and work quality. Insures compliance with appropriate safety regulations and practices. Supervises preparation and maintenance of records and reports incident to operation and maintenance of mechanical systems and equipment.

c. Establishes and conducts on-the-job training for mechanical personnel: Directs on-the-job training and reviews progress charts to insure completion of required training. Plans and conducts conferences and classes of instruction to inform personnel of new projects, work requirements, and equipment. Arranges for attendance of selected individuals at formal and special training courses. Indoctrinates newly assigned personnel in local policies and procedures.

d. Inspects and evaluates mechanical operation and maintenance activities: Makes periodic and special inspections of heating, air conditioning, and refrigeration activities to insure compliance with policies, regulations, and technical publications; provides

assistance in solving operation, maintenance, supply, and personnel problems. Interprets inspection findings and recommends corrective action.

e. Performs technical mechanical functions: Resolves technical problems encountered by subordinates and interprets technical publications applicable to operation and maintenance of air conditioning, refrigeration, and heating plants and systems. Establishes local operation and maintenance policies and procedures.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of physics, electricity, refrigeration cycle, thermodynamics, and chemistry as applied to heating, refrigeration, and air conditioning systems is mandatory.

b. Education: Completion of high school is desirable.

c. Experience: Qualification as a Cryogenic Fluids Production Technician, Refrigeration and Air Conditioning Technician, Heating Systems Technician, or Liquid Fuel Systems Maintenance Technician is mandatory. In addition, experience in directing such functions as inspection, operation, and maintenance of mechanical systems is desirable.

d. Training: Completion of appropriate base level management course is desirable.

e. Other: Physical requirements for missile duties as defined in AFM 160-1 apply.

4. SPECIALTY DATA

a. Grade Spread: Senior master sergeant and chief master sergeant.

b. Related D.O.T. Jobs:

Gas Plant Operator - - - - - - - - - - - 6-52.371

Mechanical Inspector - - - - - - - - - 5-76.310

Boilerhouse Foreman - - - - - - - - - 5-95.320

Refrigeration Foreman - - - - - - - - 5-72.310

AIRMAN AIR FORCE SPECIALTY

REFRIGERATION AND AIR CONDITIONING TECHNICIAN

1. SPECIALTY SUMMARY

Inspects, installs, repairs, and modifies refrigeration, air conditioning, and ventilation equipment, plants, and systems; and supervises refrigeration and air conditioning activities.

2. DUTIES AND RESPONSIBILITIES

a. Advises on technical problems of installation, modification, and repair of refrigeration, air conditioning, ventilation, and temperature control systems and equipment: Solves complex installation, modification, and repair problems by studying blueprints, technical publications, and schematic diagrams; determines capability, capacity, and limitations of equipment, tools, and material. Determines procedures for installation, modification, and repair of refrigeration, air conditioning, ventilation, and temperature control systems and equipment. Devises maintenance procedures to facilitate full utilization of personnel and equipment. Diagnoses recurring malfunctions and recommends corrective action by initiation of unsatisfactory reports, proposed modifications, or other appropriate means.

b. Installs, modifies, and repairs refrigeration, air conditioning, ventilation, and temperature control systems and equipment: Performs difficult installation tasks involving assembly, testing, calibrating, and adjusting of temperature control and environmental control systems such as air conditioning plants and air distribution systems; complex

dual equipment cooling installations; specialized refrigerated warehouses and facilities; and evaporative, mechanical ventilation, and dehumidification systems. Diagnoses and isolates unusual malfunctions to individual systems components. Calibrates and uses special pressure, temperature, and analyzation test equipment to determine efficiency and effectiveness of refrigeration and equipment cooling systems. Diagnoses malfunctions of electrical power and control components using voltmeters, ammeters, ohmmeters, and test lights. Performs difficult repair of systems components such as compressors, condensers, heat pumps, regulators, fluid and refrigerant gas lines, valves, meters, gages, thermostats, servomechanisms, pumps, linkage, and electrical sensing, switching, and controlling devices. Adjusts and calibrates components to assure optimum operating efficiency within design limitations. Installs new or repaired components and performs complex modifications of systems and components in accordance with applicable technical publications.

c. Inspects refrigeration, air conditioning, ventilation, and temperature control systems and equipment: Inspects completed or in-progress work to insure compliance with standing operating procedures, safety standards, and technical publications. Performs periodic inspections to determine operational condition of refrigeration, environmental control, and equipment cooling systems and equipment. Detects potential malfunctions by examining for leaking gases and fluids, unusual vibration and noises, unusual temperature and pressure readings, loose wiring, and overheating of mechanical, electrical, electronic, and pneumatic components and control devices. Performs safety

inspections to insure elimination of fire hazards from vicinity of refrigerating equipment and air and fluid distribution equipment. Interprets inspection findings and determines adequacy of corrective action. Evaluates practicability of proposed and suggested equipment modifications and operational procedure changes.

d. Performs inspection, maintenance, major modifications, trouble-shoots complex repair situations and other maintenance on refrigeration and air conditioning equipment: Bench checks reparable component parts and sub-assemblies of refrigeration and air conditioning equipment by using test equipment, standards, and other equipment as may be required by technical data. Determines extent of repair/rebuild and procedures to accomplish same by fabricating parts or using new parts. Tests and calibrates repaired items to assure adequacy of repair actions and to determine reliability of repaired item. Interprets maintenance malfunction data related to refrigeration and air conditioning equipment to eliminate potential weapons system failure.

e. Supervises refrigeration and air conditioning personnel: Plans and schedules work assignments. Establishes work methods, production controls, and performance standards. Assigns installation, repair, and maintenance functions to subordinates. Insures availability of required maintenance equipment, tools, and spare parts. Evaluates performance of subordinates performing installation, repair, and maintenance functions in terms of compliance with policies, directives, and technical orders. Orients newly assigned personnel and assigns individuals to duty positions. Conducts on-the-job training of refrigeration personnel in installation, operation, and maintenance of refrigeration, air conditioning,

ventilation, and temperature control systems and plants.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of principles of refrigeration, thermodynamics, psychrometrics, and mathematics as applied to refrigeration; characteristics, chemical properties, and utilization of refrigerants; techniques of installation, operation, maintenance, and automation of refrigeration, air conditioning, and equipment cooling systems and plants; nomenclature, types, and sizes of refrigeration and air conditioning systems and equipment, and associated electrical materials such as wire, fuses, and cables; interpretation of schematic and wiring diagrams, blueprints, and technical publications; and safety codes, practices, and procedures is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

b. Education: Completion of high school with courses in mathematics, physics, chemistry, and blueprint reading is desirable.

c. Experience: Qualification as a Refrigeration and Air Conditioning Specialist is mandatory. In addition, experience in performing or supervising such functions as installation, operation, maintenance, troubleshooting, and repair of refrigeration, air conditioning, and ventilation systems and plants is mandatory.

d. Training:

(1) Completion of an advanced refrigeration and air conditioning course is desirable.

(2) Completion of appropriate base level management course is desirable.

(3) Physical requirements for missile duties as defined in AFM 160-1 apply.

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(1) Knowledge of building maintenance, repair, and construction; properties of fine wood; processing and molding wood by steaming, laminating, and gluing; nomenclature of woodworking materials and methods of storing wood; theory of squaring by equivalent measurement; application of simple mathematics; use of carpentry and woodworking hand and power tools and paint and wood treatment properties and application is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

b. Education: Completion of high school with courses in shop mathematics, mechanical drawing, and blueprint reading and interpretation is desirable.

c. Experience: Experience in functions such as construction and repair of buildings and heavy structures and erection of prefabricated structures is desirable.

d. Training: Completion of a basic carpentry course is desirable.

e. Other: A minimum aptitude level of Mechanical 40 is mandatory.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Carpenter ----------5-25.110

Carpenter, Finish ----------5-25.150

Carpenter, Maintenance ----------5-25.830

4. SPECIALTY DATA

a. Grade Spread: Technical sergeant and master sergeant.

b. Related D.O.T. Jobs:

Refrigeration Mechanic 5-83.941

Refrigerator Tester 4-94.512

5. *SPECIALTY SHREDOUTS

Suffix	Portion of AFS to Which Related
A	Plant Operator

Effective 30 September 1964

AFM 39-1E
AFSC 54550*
Semiskilled AFSC 54530*

AIRMAN AIR FORCE SPECIALTY

REFRIGERATION AND AIR CONDITIONING SPECIALIST

1. SPECIALTY SUMMARY

Installs, maintains, and repairs refrigeration, air conditioning, and ventilation equipment, plants, and systems.

2. DUTIES AND RESPONSIBILITIES

a. Installs refrigeration, air conditioning, ventilation, and temperature control systems and equipment: Installs, aligns, and adjusts components and equipment such as compressors, condensers, electric motors, gasoline engines, hermetic contrifugal refrigerating machines, steam or gas absorption refrigeration plants, heat exchangers, heat pumps, evaporators, regulators, fans, pumps, tubing, valves, ducts, electrical wiring harnesses, and mechanical, pneumatic, electronic, and electrical controls of environmental air conditioning and cooling systems; air and liquid equipment cooling systems; and facility, walk-in, reach-in, portable , and vehicular refrigeration systems. Installs mechanical, pneumatic, electronic, and electrical sensing and switching devices designed to control flow and temperature of air, refrigerants, or working fluids. Connects wiring harnesses to electrical equipment such as motors, switches, thermostats, fuses, and circuit breakers. Shapes, sizes, and connects tubing to components, meters, valves, gages, traps, and filter assemblies using special bending, flaring, and coupling tools and oxyacetylene torches for soldering. Connects and adjusts

refrigeration equipment to source of power such as gasoline engines and electric motors. Conducts tests of installed equipment for proper assembly of components and compliance with technical orders, manufacturer's handbooks, and local procedures.

b. Operates and maintains refrigeration, air conditioning, ventilation, and temperature control systems and plants. Actuates mechanical and electrical controls to start and adjust output of power source engines and motors and place systems in operation. Observes and interprets temperature and pressure gages and recorders. Adjusts manual and automatic controls to produce required refrigeration, and/or flow of refrigerant fluids, gases, water, air, and special component heating and cooling fluids. Services components such as electric motors, compressors, valves, servo-mechanisms, and moving mechanical parts with appropriate lubrication. Refaces, adjusts, or replaces brushes and contact points on electrical equipment. Adjusts control components such as thermostats, manual and automatic valves, solenoids, servo-mechanisms, pumps, regulators, air handlers, dampers, vanes, and mechanical linkage to maintain maximum systems efficiency. Disassembles, cleans, and reassembles moisture, oil, and sedimentation traps, filters, and strainer assemblies. Removes and replaces cartridge and filter elements. Performs preventive maintenance of systems components. Detects scale and corrosion and applies preventive treatment. Applies precautionary procedures required in handling toxic refrigerant gases and in maintaining high pressure lines and components.

c. Tests, troubleshoots, repairs, and modifies refrigeration, air conditioning, ventilation, and temperature control systems and equipment: Analyzes and isolates systems malfunctions. Tests pressure and temperature of refrigeration and distribution systems using pressure gages, recorders, and thermometers. Tests systems operation and detects component malfunctions using test equipment such as electrolytic moisture testers, anemometers, psychrometers, hydrometers, and halide and audio leak detectors. Detects, by auditory means, malfunctions of engines and compressors such as worn or maladjusted pistons, valves, bearings, seals, connecting rods, mounts, and supports. Isolates electrical malfunctions by use of voltmeters, ohmmeters, ammeters, and test lights. Removes, repairs, and/or replaces systems components or component parts such as condensing, chiller, and cooling tower units; thermostatic, motorized, or manually operated valves; fans, actuators, dampers, and linkage; dehydrators, strainers, and filters; and mechanical, pneumatic, electrical, or electronic controls. Performs operator and minor maintenance of engines and electric motors. Resolders joints and repacks or replaces valves. Cleans, dries, purges, and recharges components and lines with appropriate refrigerants and fluids. Checks installed safety devices for operation. Tests systems components for static and dynamic balance and applies corrective procedures.

d. Maintains tools and equipment: Cleans, repairs, and calibrates special tools and testing devices used in analyzation and maintenance of refrigeration systems.

e. Supervises refrigeration and air conditioning personnel: Assigns work and reviews completed repairs to insure compliance with local procedures, safety procedures, and applicable technical publications. Instructs subordinates in techniques and procedures for such functions as installation, operation, inspection, maintenance, and repair of refrigeration, air conditioning, and equipment cooling systems and equipment. Arranges for placement of materials and directs work when serving as refrigeration crew leader. Evaluates work performed and keeps immediate supervisor informed on status of projects. Indoctrinates newly assigned personnel.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of principles of refrigeration, thermodynamics psychrometrics, and mathematics as applied to refrigeration; characteristics, chemical properties, and utilization of refrigerants; techniques of installation, plant operation, maintenance, and automation of refrigeration, air conditioning, and equipment cooling and heating systems; nomenclature, types, and sizes of refrigeration and air conditioning systems and equipment and associated electrical materials such as wire, fuses, and cables; interpretation of schematic and wiring diagrams, blueprints, and tehcnical publications; and safety codes, practices, and procedures is mandatory. Possession of mandatory knowledge will be determined in accordance with AFM 35-1.

b. Education: Completion of high school with courses in mathematics, physics, chemistry, and blueprint reading is desirable.

c. Experience: Experience in functions such as installing, operating, maintinaing, and repaoring refrigeration and/or environmental control equipment or plant operation is mandatory.

d. Training: Completion of a basic course in refrigeration and air conditioning is desirable.

e. Other:

(1) A minimum aptitude level of Mechanical 50 is mandatory.

(2) Physical requirements for missile duties as defined in AFM 160-1 apply.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Refrigeration Mechanic 5-83.941

Electric Refrigerator Serviceman 5-83-031

5. *SPECIALTY SHREDOUTS

Suffix	Portion of AFS to Which Related
A	Plant Operator

Effective 30 September 1964

AFM 39-1E
AFSC 54770*

AIRMAN AIR FORCE SPECIALTY

HEATING SYSTEMS TECHNICIAN

1. SPECIALTY SUMMARY

Inspects, installs, repairs, and modifies heating equipment, plants, and systems; and supervises heating activities.

2. DUTIES AND RESPONSIBILITIES

a. Advises on technical problems of installation, modification, and repair of heating equipment, plants, and systems: Solves complex installation, modification, and repair problems by studying blueprints, technical publications, and schematic diagrams; and determines capability, capacity, and limitations of equipment, tools, and material. Determines procedures for installation, modification, and repair of heating equipment, plants, and systems including steamfilling. Devises maintenance procedures to facilitate full utilization of personnel and equipment. Diagnoses recurring malfunctions and recommends corrective action by initiation of unsatisfactory reports, proposed modifications, or other appropriate means.

b. Installs, modifies, and repairs heating equipment, plants, and systems: Performs difficult installation tasks involving assembly, testing, calibrating, and adjusting of temperature control and environmental control systems such as heating plants and air distribution systems: complex central heating plants; specialized facilities; and conduction, convection, and reflection systems.

Diagnoses and isolates unusual malfunctions to individual systems components. Calibrates and uses special pressure, temperature, and analyzation test equipment to determine efficiency and effectiveness of heating systems. Diagnoses malfunctions of electrical power and control components using coltmeters, ammeters, ohmmeters, and test lights. Performs difficult repair of systems components such as furnaces, boilers, heat exchangers, oil burners, stokers, valves, meters, gages, thermostats, pumps, linkage, and electrical sensing, switching, and controlling devices. Adjusts and calibrates components to assure optimum operating efficiency within design limitations. Installs new or repaired components and performs complex modifications of systems and components in accordance with applicable technical publications.

c. Inspects heating equipment, plants, and systems: Inspects completed or in-progress work to insure compliance with standing operating procedures, safety standards, and technical publications. Performs periodic inspections to determine operational condition of heating equipment, plants and systems. Detects potential malfunctions by examining for leaking gases and fluids, unusual vibration and noises, unusual temperature and pressure readings, loose wiring, and overheating of mechanical, electrical, electronic, and pneumatic components and control devices. Performs safety inspections to insure elimination of fire hazards from vicinity of heating equipment and air and fluid distribution equipment. Interprets inspection findings and determines adequacy of corrective action. Evaluates practicability of proposed and suggested equipment modifications and operational procedure changes.

d. Performs inspection, maintenance, major modifications, trouble-shoots complex repair situations and other maintenance on heating equipment: Bench checks reparable component parts and sub-assemblies of heating equipment by using test equipment, standards, and other equipment as may be required by technical data. Determines extent of repair/rebuild and procedures to accomplish same by fabricating parts or using new parts. Tests and calibrates repaired items to assure adequacy of repair actions and to determine reliability of repaired item. Interprets maintenance malfunction data related to heating equipment to eliminate potential weapons system failure.

e. Supervises heating systems personnel: Plans and schedules work assignments. Establishes work methods, production controls and performance standards. Assigns installation, repair, and maintenance functions to subordinates. Insures availability of required maintenance equipment, tools, and spare parts. Evaluates performance of subordinates performing installation, repair, and maintenance functions in terms of compliance with policies, directives, and technical orders. Orients newly assigned personnel and assigns individuals to duty positions. Conducts on-the-job training of heating systems personnel in installation, operation, and maintenance of heating equipment, plants, and systems.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of principles and theory of pressure, vacuum, vaporization, condensation and heat conduction, radiation, and convection as applied to air, steam and water; nomenclature, types, and sizes of boilers and component parts; and techniques of installation, operation, maintenance, and repair of heating systems and equipment is mandatory.

Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

b. Education: Completion of high school with courses in shop, mathematics, and blueprint reading is desirable.

c. Experience: Qualification as a Heating Systems Specialist is mandatory. In addition, experience in supervising functions such as installing, operating, or maintaining heating systems or plants is mandatory.

d. Training:

(1) Completion of appropriate base level management course is desirable.

(2) Completion of an advanced course in heating systems is desirable.

4. SPECIALTY DATA

a. Grade Spread: Technical sergeant and master sergeant.

b. Related D.O.T. Jobs:

Furnace Installer and Repairman, Hot Air ----------5-83.023

Heating and Ventilating Man ----------7-72.420

Steamfitter Foreman ----------5-30.410

5. *SPECIALTY SHREDOUTS

Suffix	Portion of AFS to Which Related
A	Plant Operator

Effective 30 September 1964

AFM 39-1 E
AFSC 54750*
Semiskilled AFSC 54730*

AIRMAN AIR FORCE SPECIALTY

* HEATING SYSTEMS SPECIALIST

1. SPECIALTY SUMMARY

Installs, maintains, and repairs heating plants, systems, and equipment.

2. DUTIES AND RESPONSIBILITIES

a. Installs and maintains heating systems components and equipment: Interprets detailed blueprints, drawings, and specifications for heating plants, systems, and components. Installs air, steam, and water heating and distribution systems components and equipment such as furnaces, boilers, stoves, heat exchangers and pumps, burners, blowers, fans, strainers, and radiant heating fixtures; oil, gas, or coal fuel handling and storage facilities and equipment; demineralizers, deaerators, and proportioning feed pumps; air distribution ducts; water and steam distribution and pneumatic control pipes, tubes, and valves; pressure and temperature gages and recording devices; and electrical, mechanical, and pneumatic sensing and control devices. Shapes, sizes, and connects high and low pressure piping and tubing. Welds heating systems components and supporting devices using oxyacetylene and electric arc-welding equipment. Uses special tools, materials, and procedures for coupling and insulating high pressure and high temperature piping and components. Mounts, connects, and adjusts electrical components such as transformers, motors, electrodes, relays, solenoids,

switches, and thermostats. Conducts tests of installed equipment for proper assembly of components and compliance with technical orders, manufacturers' handbooks, and local procedures.

b. Operates and maintains central heating plants: Operates and maintains plant components and equipment such as boilers, burners, pumps, blowers, fans, steam turbines, and stokers; oil, gas, or coal fuel handling equipment and storage facilities and fly ash collectors; demineralizers and deaerators; temperature and pressure indicating and recording devices; feed water and flue-gas analyzation equipment; and electrical, pneumatic, and mechanical control devices. Operates oil, gas, or coal-fired boilers. Determines fuel requirements. Inspects shipments of coal and other fuels to verify conformance to specifications. Where required, collects and prepares coal samples in accordance with Bureau of Mines recommended procedures. Fires, blows off, and cleans boilers. Operates manual controls or sets automatic controls to supply oil or gas to burners or to operate stokers and chain grates for coal-fired boilers. Hand fires coal-burning boilers as required to maintain efficient operation. Adjusts draft and fuels to load for efficient operation. Operates oil-fired and gas-fired boilers for efficient combustion by visual analysis and by use of flue gas analyzing equipment, draft gages, and stack thermometers. Checks and adjusts safety valves. Observes water and steam gages and adjusts controls to maintain appropriate pressures and levels. Synchronizes operation of electric, pneumatic, and mechanical sensing, control, and recording devices. Operates water feed systems. Performs chemical analysis of

boiler water and calculates chemical feed rates. Operates and regulates demineralizers, deaerators, and proportioning feed pumps in conjunction with water feed systems to prevent scale and corrosion damage and maintain safe operation of boilers. Posts entries in operation, inspection, and maintenance records. Records meter readings, fuel consumption, and other pertinent data in equipment performance logs.

c. Maintains and repairs building heating systems: Maintains and repairs warm air, hot water, and low or medium pressure steam heating systems. Maintains heating systems components such as furnaces, water and steam boilers, stoves, and radiant heating fixture; steam, hot water, and warm air distribution systems, pipes, and ducts; and heat exchangers and pumps. Performs oilburning unit maintenance functions such as test and adjustment of starting, timing, recycling, and safety switches; calibrating thermostat and airstat; and cleaning, adjusting, or replacing nozzle, atomizing cup, needle valve, motor, blower, transformer, and protecto-relay. Performs gas burning unit maintenance functions such as cleaning, adjusting, or replacing pressure regulators, solenoid and diaphram valves, and pilostats; and detection, repair, or replacement of leaking fuel lines. Performs coal-burning unit maintenance functions such as cleaning, repairing, or replacing of doors, baffles, plates, stovepipes, firebrick, and stoker mechanisms; and lubrication of motors and fans. Tests, calibrates, and adjusts electrical, pneumatic, and mechanical pressure and temperature sensing and recording devices; and fuel, air, water, and steam flow control servo-mechanisms. Uses and interprets instruments and equipment such

as pyrometers, voltmeters, velometers, ammeters, anemometers, flue-gas analyzers, hydrometers, pressure gages, and recording thermometers to detect heating systems malfunctions and adjust system components for efficient and safe operation.

d. Maintains tools and equipment: Removes dirt and grease from tools and equipment and makes minor repairs. Lubricates metal parts to prevent rusting and corrosion. Sharpens edges of cutting tools.

e. Supervises heating systems personnel: Instructs subordinates in techniques of installation, operation, maintenance, and repair of heating systems, plants, and equipment. Assigns work and examines completed repairs to insure compliance with local procedures and applicable technical orders.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of principles and theory of pressure, vacuum, vaporization, condensation, heat conduction, radiation, and convection as applied to air, steam and water; nomenclature, types, sizes, and purpose of furnaces, boilers, heat exchangers and pumps, and heating systems components; standard types and specifications of fuel such as coal, oil, and gas; techniques for installing, operating, and repairing heating equipment, systems, and fixtures; blueprint reading; and safety codes and practices is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

b. Education: Completion of high school with courses in shop, mathematics, and blueprint reading is desirable.

c. Experience: Experience in functions such as operation of high-pressure boilers or installation, repair, and maintenance of heating systems, equipment, and fixtures is mandatory.

d. Training: Completion of a basic course in ~~utility~~ Systems heating is desirable.

e. Other: A minimum aptitude level of Mechanical 40 is mandatory.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Furnace Tender	4-91.571
Gas Appliance Servicemen	7-83.051
Oil Burner Installer and Service Man	5-83.024
Heating and Ventilating Man	7-72.420
Furnace Installer Apprentice	7-99.010
Steamfitter Apprentice	7-96.300
Boilermaker Helper	8-93.45
Master Mechanic-Maintenance	5-83.621

5. *SPECIALTY SHREDOUTS

Suffix	Portion of AFSC to Which Related
A	Plant Operator

AIRMAN AIR FORCE SPECIALTY

PAVEMENTS SUPERINTENDENT

1. SPECIALTY SUMMARY

Superintendent for maintenance, repair, alteration, and construction of airfield pavements, railroads, roads, and other surfaced areas and appurtenances, and construction equipment activities engaged in maintenance, repair, alteration, minor construction, snow removal, and ice control.

2. DUTIES AND RESPONSIBILITIES

a. Plans and organizes pavements and maintenance equipment activities: Plans and schedules work from work orders, drawings, and other specifications. Verifies requirements for materials and equipment, and expedites procurement. Establishes work standards and priorities of work. Improves work methods to effect better utilization of personnel and economy of operation. Provides and accounts for equipment, space, and other necessary facilities. Sets up organizational structure to indicate personnel requirements, show lines of authority, and place specific responsibility. Acquaints pavements and equipment maintenance supervisors with project requirements, coordinates and outlines detailed plans, and disseminates instructions and information.

b. Directs pavement, railroad, and appurtenances maintenance, repair, alteration, and construction activities: Checks on work performed and methods employed. Analyzes work to insure compliance with plans, specifications, policies and regulations. Continuously reviews work

progress and institutes changes in schedules to keep within established time limits and to overcome work lags. Checks workmanship, accuracy, and completeness of work accomplished by pavement and equipment sections. Confers with immediate supervisors to report on progress of work, discusses solutions to problems encountered, and receives instructions.

c. Establishes and conducts on-the-job training for pavement and maintenance equipment personnel: Indoctrinates newly assigned personnel concerning local work methods and procedures. Plans and conducts conferences and classes of instruction in operational methods and use of equipment and tools and in review and updating of E-AID's. Coordinates arrangements for off-base training of personnel when required. Establishes systems for control of duty assignments and intra-activity transfers. Promotes harmonious relationships and resolves personnel problems. Rates subordinates for proficiency, recommends promotions, and initiates other personnel actions.

d. Inspects and evaluates pavements and maintenance equipment utilization activities: Performs continuous preventive maintenance inspections and issues directives for correction of deficiencies. Periodically inspects pavements and maintenance equipment activities to determine status of compliance with regulations and policies. Discusses findings of inspections with immediate supervisors and recommends or directs corrective action. Advises pavement and equipment maintenance supervisors regarding methods of solving technical and complex work problems.

e. Performs technical pavements and maintenance equipment: Advises supervisors on status, maintenance, and adequacy of equipment, training of personnel, and operating efficiency and economy. Reviews proposals

for pavements and equipment improvements. Makes engineering sketches. Develops and implements base snow removal plan with immediate supervisor and other base staff agencies.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of general construction and repair methods with primary experience in repair of pavement, grounds, railroads, and drainage facilities; use and capacity of construction and snow and ice removal equipment; nomenclature and use of materials; and administrative procedures, blueprints, plans and specifications is mandatory.

(2) Knowledge of operation of all light, medium, heavy, and special types of equipment is desirable.

b. Education: Completion of high school with courses in soil mechanics and blueprint reading is desirable.

c. Experience: Qualification as Pavements Supervisor or Construction Equipment Supervisor is mandatory. In addition, experience in directing erection of structures, construction equipment operations, or roads maintenance is desirable.

d. Training: Completion of appropriate base level management course is desirable.

4. SPECIALTY DATA

a. Grade Spread: Senior master sergeant and chief master sergeant.

b. Related D.O.T. Jobs:

Construction Inspector	0-79.01
Cement Finishing Foreman	5-26.200
Bricklayer Foreman	5-24.010

Effective 30 September 1964

AFM 39-1E
AFSC 55170

AIRMAN AIR FORCE SPECIALTY

PAVEMENTS MAINTENANCE SUPERVISOR

1. SPECIALTY SUMMARY

Supervises construction, maintenance, and repair of pavements, railroads, subgrades, drainage, structures, and erosion control, and development and operation of quarries and borrow pits.

2. DUTIES AND RESPONSIBILITIES

a. Plans and schedules pavements maintenance activities: Prepares sketch plans and outline specifications, material lists, and work schedules for necessary maintenance, repair, and minor new construction. Controls the use of manpower materials, equipment, and supplies. Maintains a file and keeps familiar with current technical manuals and periodicals relating to construction and maintenance of pavements and railroads. Keeps subordinates informed of pertinent Air Force policy and procedures.

b. Supervises pavements maintenance personnel: Makes specific daily work assignments to assure proper supplies, equipment, and tools are used; Observes work of labor force to assure compliance with sketch plan, outline specifications, and safety requirements. Evaluates work effectiveness of individuals and maintains records for reference in promotion and disciplinary actions.

c. Establishes and conducts on-the-job training for pavements maintenance personnel: Provides on-the-job instruction to individuals and groups and conducts conferences and discussions. Observes completed work to determine training requirements for persons or groups and provides

for specific training. Maintains charts to indicate degree of development of each worker. Assigns on-the-job training phases to senior workers and evaluates effectiveness and adequacy of instruction.

d. Inspects and evaluates pavements maintenance activities: Performs inspections to determine deficiencies. Advises supervisors and recommends corrective action.

e. Performs technical pavements maintenance functions: Determines size, type, and placement of explosives to be used according to object to be demolished. Places and sets off explosive charges such as TNT, dynamite, and black powder in quarrying operations and for destruction or removal of objects such as stumps and rocks in road construction; and underwater debris in construction of docks and clearance of harbors, using equipment such as cap crimper, fuse lighter, mining drills and spoons, galvanometer, and blasting machine. Opens quarrys and gravel pits. Re-sizes culverts and minor bridges where obviously inadequate in waterway opening and supervises installation of replacement structures including head walls, wing walls, and erosion control facilities.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of pavements, railroads, and appurtenant drainage and erosion control, soils mechanics, hydraulics, surveying equipment utilization, and agronomy; preparation of field designs, plans, and specifications for embankments, rigid and flexible pavement, railroad trackage, drainage structures, and cover; procedures utilized in evaluating adequacy of local pit and quarry aggregates to meet job specifications; and a working knowledge of use of explosives in construction and demolition work is mandatory.

b. Education: Completion of high school with courses in soil mechanics, and blueprint reading is desirable.

c. Experience: Qualification as Pavements Specialist is mandatory. In addition, experience in supervising functions such as concrete work, soil stabilization and rigid and flexible pavement maintenance is mandatory.

d. Training: Completion of appropriate base level management course is desirable.

4. SPECIALTY DATA

a. Grade Spread: Technical sergeant and master sergeant.

b. Related D.O.T. Jobs:

Construction Inspector	0-79.01
Cement Finishing Foreman	5-26.200
Blaster	5-26.020

AIRMAN AIR FORCE SPECIALTY

PAVEMENTS MAINTENANCE SPECIALIST

1. SPECIALTY SUMMARY

Constructs, maintains, and repairs pavements, railroads, roads, subgrades, and drainage structures, and performs erosion control.

2. DUTIES AND RESPONSIBILITIES

a. Constructs, maintains, and repairs airfield pavements, roads, streets, walks, parking and storage areas, and related drainage; Inspects pavements for surface and base or sub-base defects. Inspects drainage facilities for blockage, breaks, eroded ditches, and other obstructions. Takes necessary action to secure necessary material to maintain or repair failures in pavements and correct defects in drainage facilities. Understands basic fundamentals of blueprint readings and is familiar with plans for base pavements. Takes samples of soils and makes soil density test for construction, maintenance, and repair work. Performs slump tests and takes test samples for concrete testing. Inspects joints and cracks in rigid and flexible pavements, removes deteriorated material, and replaces with proper material. Inspects surface of flexible pavements and applies surface seals as required. After storm, removes debris or ice from drainage structures and open ditches. Determines type of concrete or bituminous required, designs mix, and prepares material in proportions and amounts required to complete each assignment.

55-9

b. Inspects, maintains, and repairs railroad bed and tracks: Becomes familiar with technical manuals and other Air Force publications on maintenance of railroad trackage. Becomes familiar with structural make-up of railroad bed. Insures roadbed is adequately drained and properly sloped to eliminate erosion. Inspects, maintains, and repairs switches, turnouts, and crossovers. Replaces damaged rails and ties and maintains ballast. Uses tools such as a track guage, lineal board, drilling machines, tamping machines, and other railroad maintenance equipment.

c. Maintains equipment and tools: Performs preventive maintenance, lubricates, and makes minor repairs and adjustments to tools and equipment. Removes asphalt or cement and mortar from tools and equipment immediately after using to prevent from hardening, and oils all metal parts to prevent rust.

d. Supervises pavements maintenance personnel: Serves as crew leader of pavements maintenance workers engaged in forming simple concrete work, laying concrete and asphaltic materials, and performing maintenance and repair work on railroad facilities. Instructs subordinates in phases of pavement construction and repair.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of characteristics of pavement surfacing materials and techniques for repairing asphalt and concrete pavements is mandatory. Possession of mandatory knowledge will be determined in accordance with AFM 35-1.

(2) Knowledge of basic principles of soils mechanics, railway tracks, and bed maintenance is desirable.

b. Education: Completion of high school with courses in mechanics and blueprint readings and interpretation is desirable.

c. Experience: Experience in use of construction tools and equipment and the mixing and placing of concrete and bituminous materials is mandatory.

d. Training: Completion of pavement maintenance, soils mechanics and drainage course is desirable.

e. Other: A minimum aptitude level of Mechanical 40 is mandatory.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Blaster 5-74.020

Rigger 5-88-020

Construction Worker 9-32.01

AIRMAN AIR FORCE SPECIALTY
CONSTRUCTION EQUIPMENT SUPERVISOR

1. SPECIALTY SUMMARY

Supervises construction equipment activities engaged in constructing and maintaining airfield pavements, roads, grounds, and structures.

2. DUTIES AND RESPONSIBILITIES

a. Plans and schedules construction equipment work activities: Determines requirements for use of construction equipment, and plans and schedules work assignments. Sets up equipment maintenance schedules and procedures. Prepares and analyzes reports and charts regarding such factors as manhour utilization and job time rates. Establishes work standards, production controls, and job priorities. Improves work methods to effect better utilization of personnel and economy of operation. Organizes equipment operations, and determines proper supplies and materials have been scheduled for accomplishment of work projects. Sets up organizational structure to show personnel requirements, and to indicate lines of authority and specific responsibilities. Coordinates job priorities, work schedules, and construction equipment activities with other agencies and organizations.

b. Supervises construction equipment operator personnel: Serves as technical supervisor for specific tasks or projects relating to construction equipment activities. Assigns specific duties to equipment operators and crews engaged in accomplishment of various operational phases of maintenance and construction projects. Acquaints technicians with project requirements, coordinates and outlines detailed plans, and

disseminates instructions and information. Establishes job priorities and observes work performance to determine compliance with technical instructions, safety regulations, and precautions. Makes immediate correction of deficiencies or unsafe practices in work processes. Estimates work output and takes follow-up actions on work assignments to determine progress. Maintains records of time spent on individual jobs for purpose of cost accounting and to provide information for establishment of production standards. Promotes harmonious relations and resolves personnel problems. Rates subordinates for efficiency, schedules leaves, and accomplishes other personnel actions.

c. Establishes and conducts on-the-job training for construction equipment operator personnel: Orients and adjusts newly assigned personnel. Gives on-the-job training to persons or groups and conducts formal and informal conferences and discussions. Observes completed work to determine training requirements and provides specific training. Maintains charts to indicate degree of development of each worker. Assigns on-the-job training phases to senior workers and evaluates effectiveness and adequacy of instruction. Insures all workers are familiar with applicable directives and procedures.

d. Inspects and evaluates construction equipment activities: Performs operator maintenance inspections to determine condition and operational reliability of equipment. Inspects, cleans, lubricates, and performs first echelon maintenance on all heavy construction equipment. Adjusts and changes operating attachments such as dozer blades, clamshell, buckets, back hoe, draglines, and snow blowers. Determines extent of equipment repair/overhaul required and procedures to accomplish

same. Evaluates findings and schedules and coordinates heavy equipment repair and overhaul with vehicle maintenance activity.

e. Performs technical construction equipment functions: Advises on technical aspects pertaining to utilization and operation of equipment. Advises on performance capability and limitations of various pieces of equipment under given set of conditions. Determines most efficient type and application of engineer equipment to be used in various construction operations such as: clearing and grubbing, light stripping, ditching and diking, trenching, backfilling, bituminous surface treatment, structural excavation and embankment work, grading and compacting, scarifying and shaping, quarrying, loading and hauling aggregate, flexible and rigid pavement construction, snow removal, and field drainage construction. Interprets construction surveys and utilizes information such as subgrade contours, grade alinement, slope ratio, profiles, cross section, and earthwork volume computations to determine haulage requirements and insure roads, runways, taxiways, and other miscellaneous projects are built within definite limits of grade, alinement, and provisions of pertinent plans and specifications. Adapts and implements plans, specifications, policies, and regulations to fit requirements of activity. Makes technical decisions regarding repair and replacement of damaged equipment. Evaluates machinery capability and determines rigging material necessary to accomplish lifting of heavy objects. Operates heavy machinery in difficult and dangerous circumstances where utmost skill and technical knowledge of specific type of equipment is mandatory. Prescribes technical procedures for jobs not covered by precedent.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of characteristics, capabilities, operator techniques, and maintenance of construction equipment such as crawler tractors, graders, rollers, scrapers and cranes, loaders, shovels and snow removal equipment; practical application of surveying principles of earth filling and compaction, grading and leveling; principles of equipment management for maximum work output; operations performed by construction equipment pertinent to dust and erosion control; concrete and bituminous surfacing methods; and snow and ice control is mandatory.

b. Education: Completion of high school with courses in industrial arts. blueprint reading, and personnel management is desirable.

c. Experience: Qualification as a Construction Equipment Operator is mandatory. In addition, experience in supervising function such as operating heavy construction equipment, employment of special techniques in using construction equipment expeditiously in preparing areas for construction and maintenance of roads, grounds, runways, etc., is mandatory.

d. Training: Completion of appropriate base level management course is desirable.

4. SPECIALTY DATA

a. Grade Spread: Technical sergeant and master sergeant.

b. Related D.O.T. Jobs:

Tractor Operator	7-36.510
Caterpillar Crane Operator	5-73.050
Scraper Operator III	7-23.050
Blade-Grader Operator	7-23.010
Power Shovel Operator	5-73.210
Rigger	5-88.020

Effective 30 September 1964

AFM 39-1E
AFSC 55151
Semiskilled AFSC 55131

AIRMAN AIR FORCE SPECIALTY

CONSTRUCTION EQUIPMENT OPERATOR

1. SPECIALTY SUMMARY

Operates construction equipment to maintain pavements and drainage, and perform erosion control.

2. DUTIES AND RESPONSIBILITIES

a. Levels, grades, and fills surfaces: Prepares surfaces for roads, runways, walks, and recreation and parking areas by ditching, backsloping, level blading, and scarifying, using motorized or tow type graders. Smooths gravel or earth surfaces by adjusting blade controls to maintain desired cut or fill.

b. Lifts and moves heavy objects and sand, gravel, and other materials: Lifts and moves objects such as heavy salvage items and other supplies or equipment too heavy or in position inaccessible to materials-handling equipment by operating truck or tractor-mounted cranes. Loads and unloads sand, gravel, coal, and other loose material, using cranes with dragline or clamshell attachments.

c. Excavates, ditches, moves earth, and prepares aggregate: Strips, slopes, cuts drainage channels, sinks shafts, and removes obstructions, using heavy earth-moving machinery such as cranes with dragline or clamshell attachments, power shovels, bulldozers, angledozers, carryall scrapers, and turnpulls. Operates crushing and screening plants. Digs trenches for sewer, water, gas and oil pipes, using wheel and ladder-type ditching machines. Drills holes for fence posts and telephone and highline poles, using powered earth auger.

d. Stabilizes and compacts soil: Stabilizes soil in preparation of subgrades and base courses for construction of roads, runways, and parking areas, using tractor-towed equipment such as rotary tillers, harrows, rooters, and plows. Compacts surfaces, composed of materials such as earth, coral, and crushed rock, using sheepsfoot rollers and towed or engine-driven road rollers.

e. Operates other miscellaneous equipment: Performs pavement sweeping operations using large vacuum airfield sweepers, small rotary and/or towed sweepers, or self-propelled magnetic sweepers. Performs refuse collection functions using front or rear loading self-propelled refuse collection equipment. Operates industrial tractors when engaged in maintenance and repair of real property using backhoe, ditch digger, earth auger, front loader, sweeper or rotary snow removal attachments. Hauls maintenance materials using dump trucks and tractor-towed scrapers. Operates water and asphalt distributing equipment as required for pavement and road construction or repair work.

f. Removes snow and ice: Operates snow removal equipment such as displacement type plows, rotary blowers, dump trucks equipped with snow removal attachments, snow hauling vehicles, graders, bulldozers, angledozers, carryall scrapers, belt type snow loaders, and snow air blast sweepers. Applies salts, calcium chloride, and other abrasive for surface ice control.

g. Maintains and prepares equipment for use: Inspects, cleans, lubricates, and tightens loose connections. Performs other preventive maintenance on all heavy construction equipment. Adjusts and changes operating attachments such as dozer and grader blades, clamshells, buckets, and draglines. Connects wire rope rigging to row-type power-operated equipment such as carryalls, rooters, and cranes. Replaces worn steel cables and wire ropes.

h. Performs rigging work: Raises and moves heavy equipment, using derricks, gin poles, A-frames, cableways, and chain blocks. Sets up braces and rigs hoisting equipment; splices rope and steel cable; and reeves rope and guy wire, using equipment such as hooks, snatch blocks, pulleys, axes, sledges, wrenches, and knives.

i. Supervises construction equipment operator personnel: Serves as leader of crews assigned to specific tasks or projects. Assigns workers to tasks and checks work to determine progress being made. Arranges for tools and materials and controls use to insure full utilization and to prevent damage or waste. Indoctrinates newly assigned personnel. Conducts on-the-job training.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of use, operation, and capacity of standard heavy construction equipment; practical application of surveying principles of earth leveling, grading, and filling; strength and characteristics of ropes, wire, and cables; and techniques for lifting and moving heavy objects by machine is mandatory. Possession of mandatory knowledge will be determined in accordance with AFM 35-1.

(2) Knowledge of operations performed by construction equipment pertinent to dust and erosion control and general masonry, concrete, and asphalt surfacing methods; and concrete and bituminous surfacing methods is desirable.

b. Education: Completion of high school with courses in industrial arts and blueprint and site plan reading is desirable.

c. Experience: Experience in operating standard heavy construction equipment in preparing areas for construction and maintaining roads, runways, and grounds is mandatory.

d. Training: Completion of course in construction equipment operation is desirable.

e. Other: A minimum aptitude level of Mechanical 40 is mandatory.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Tractor Operator ----------7-36.510

Caterpillar Crane Operator ----------5-73.050

Scraper Operator III ----------7-23.050

Blade-Grader Operator ----------7-23.010

Power-Shovel Operator ----------5-73.210

AIRMAN AIR FORCE SPECIALTY

STRUCTURAL SUPERINTENDENT

1. SPECIALTY SUMMARY

Superintends construction, maintenance and repair activities engaged in protective coating, carpentry, plumbing, masonry, and concrete work on structures and systems.

2. DUTIES AND RESPONSIBILITIES

a. Plans and organizes structural activities: Plans and schedules work from work orders, drawings, and other specifications. Verifies requirements for materials and equipment, and expedites procurement. Establishes work standards and priorities of work. Improves work methods to effect better utilization of personnel and economy of operation. Provides and accounts for equipment, space, and other necessary facilities. Sets up organizational structure to indicate personnel requirements, show lines of authority, and place specific responsibility. Acquaints technicians with project requirements, coordinates and outlines detailed plans, and disseminates instructions and information.

b. Directs structural activities: Checks on work performed and methods employed. Analyzes work to insure compliance with plans, specification, policies, and regulations. Continuously reviews work progress and institutes changes in schedules to keep within established time limits and to overcome work lags. Checks workmanship, accuracy, and completeness of work accomplished by various construction and maintenance sections. Establishes system for control of duty assignments

and intra-activity transfers. Promotes harmonious relationships and resolves personnel problems. Rates subordinates for efficiency, recommends promotions, and initiates other personnel actions. Confers with immediate supervisors to report on progress of work, discuss solutions to problems encountered, and to receive instructions.

c. Establishes and conducts on-the-job training for structural personnel: Indoctrinates newly assigned individuals concerning local work methods and procedures. Plans and conducts formal and informal conferences and classes of instruction in operational methods and use of equipment and tools. Arranges for offbase training of individuals when required.

d. Inspects and evaluates structural activities: Performs continuous preventive maintenance inspections and issues directives for correction of deficiencies. Periodically inspects structural activities to determine status of compliance with regulations and policies. Discusses findings of inspections with immediate supervisors and recommends or directs corrective action. Serves on, or directs, survey and inspection teams organized to evaluate base and command structural activities.

e. Performs technical structural functions: Advises supervisors regarding methods of solving technical and complex work problems. Interprets plans, specifications, policies, and regulations to subordinates or other interested personnel, and effects changes necessary to meet unforeseen requirements. Advises superiors on status, maintenance, and adequacy of equipment, training of personnel, and

operating efficiency and economy. Constructs and repairs buildings, structures, models, and patterns, using structural steel, concrete, brick, and masonry, and carpentry, plumbing, electrical, and painting tools. Reviews proposals for building maintenance alterations or installations, and suggests additions or deletions. Makes engineering sketches.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of general structural construction and repair methods and procedures, including use and capacity of construction equipment; nomenclature and use of building materials; carpentry, plumbing, and masonry techniques; protective coatings for woods, masonry, and concrete; and prevention, identification, and eradication of surface corrosion of metals is mandatory.

(2) Knowledge of limitations and requirements of military camouflage is desirable.

b. Education: Completion of high school is mandatory.

c. Experience: Qualification as Structural Technician, Protective Coating Technician, or Plumbing Supervisor is mandatory. In addition, experience in directing such functions as erecting structures and building maintenance is mandatory.

d. Training: Completion of appropriate base level management course is desirable.

e. Other: Physical requirements for missile duty as defined in AFM 160-1 apply.

4. SPECIALTY DATA

a. Grade Spread: Senior master sergeant and chief master sergeant.

b. Related D.O.T. Jobs:

Construction Inspector - - - - - - - 0-79.01

Foreman, Woodworking - - - - - - - - 5-91.501

Plumber, Pipefitting - - - - - - - - 5-30.010

Plumber Foreman - - - - - - - - - - - -5-30.210

Effective 30 September 1964

AFM 39-1E
AFSC 55270

AIRMAN AIR FORCE SPECIALTY

STRUCTURAL TECHNICIAN

1. SPECIALTY SUMMARY

Performs functions involving construction, erection, assembly, maintenance, alteration, rehabilitation, and repair of buildings and structures.

2. DUTIES AND RESPONSIBILITIES

a. Prepares and supervises work layout: Prepares working drawings for maintenance, alteration, and repair of buildings and structures. Prepares from working drawings, materials and labor required to complete job assignments. Lays out prefabricated trusses and structures to dimensions specified, mixes mortar, erects steel, cuts stone, lays brick and ceramic tiles, and installs form work as necessary to receive concrete. Finishes concrete to grades as specified. Inspects operation of carpentry and masonry equipment such as hand tools, power driven saws, planers, sanders, trowels, screeds, floats, cutting torches, and other tools and equipment used by carpentry and masonry trades and tools used in cutting of reinforcing steels and meshes. Assures adherence to standard shop safety practices and rules.

b. Constructs, erects, alters, and repairs buildings: Supervises construction, alteration, erection, and repair of buildings and structures, as pertains to carpentry and masonry crafts connected with, but not limited to, framework, sills, joists, rafters, siding, shingling, doors, and other materials using carpentry and masonry hardware and fastening devices.

Assures proper installation of reinforcing steels and meshes prior to pouring of concrete. Forms structures and advises masons in placement of forms and scaffolds and reinforcing steels for ramps, foundations, platforms, and other phases of construction work where use of concrete or masonry units are predominent. Advises carpenters in construction, erection, maintenance, and repair of those facilities other than masonry. Must be familiar with methods of trades assuring most feasible and economical practices are being used by subordinate personnel with regard to time and materials. Must assure waste is being held at absolute minimum throughout project accomplishment.

c. Identifies and selects materials: Selects various materials used in construction and determines structural qualities of materials to assure sufficient strength for job. Determines characteristics of lumber and concrete with regard to strength, moisture content, grade, mix, and curing.

d. Supervises carpentry and masonry personnel: Serves as supervisor of carpenters and masons engaged in construction, erection, alteration and repair of wood, masonry, and steel frame facilities, and prefabricated structures. Supervises crews engaged in placing concrete, laying masonry units, and plastering and stuccoing of interior and exterior surfaces. Inspects work of subordinates to assure complete and meritorious workmanship, pointing out as needed ways and means of improving quality and efficiency of carpenters and masons.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of standard nomenclature, types, and sizes of structural materials; batching formulas and methods of curing concrete, mortar, plaster, and lime mixtures; use and care of hand and power-driven masonry and concrete tools; building maintenance, repair, and construction; properties of fine wood; processing and molding wood by steaming, laminating, and gluing; nomenclature of woodworking materials; methods of storing and chemically treating wood; theory of squaring by equivalent measurement; application of simple mathematics; and use of carpentry and woodworking hand and power tools is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

(2) Knowledge of use and capacity of construction equipment and tests and characteristics pertaining to reinforcing steels and meshes is desirable.

b. Education: Completion of high school with courses in mechanical drawing, blueprint reading and interpretation, and mathematics is desirable.

c. Experience: Qualification as a Carpentary Specialist or a Masonry Specialist is mandatory. In addition, experience in performing functions such as laying and shaping of masonry units, plastering, and carpentry; or functions such as construction and repair of buildings and heavy structures, and pre-fabricated structures is mandatory.

d. Training: Completion of appropriate base level management course is desirable.

4. SPECIALTY DATA

a. Grade Spread: Technical sergeant and master sergeant.

b. Related D.O.T. Jobs:

Bricklayer ----------5-24.010

Stonemason ----------5-24.210

Cement Finisher, Highways and Streets ----------5-26.200

Carpenter ----------5-25.110

Effective 30 September 1964

AFM 39-1 E
AFSC 55250
Semiskilled AFSC 55230

AIRMAN AIR FORCE SPECIALTY

CARPENTRY SPECIALIST

1. SPECIALTY SUMMARY

Constructs, maintains, and repairs buildings, structures, models, mockups, and patterns and assembles prefabricated structures.

2. DUTIES AND RESPONSIBILITIES

a. Lays out work and prepares materials: Prepares working drawings for maintenance, repairs, and alterations. Interprets lines, designs, and symbols on drawings or blueprints. Determines from blueprints, sketches, or other specifications, types, dimensions, and quantity of materials required. Marks cutting, assembly lines, and location of fittings. Arranges materials to effect efficient work procedures. Fabricates building materials to exacting specifications to prescribed dimensions in working drawings, using all forms of hand or power driven cutting and finishing tools and equipment. Cuts, joins, and fastens lumber by cutting tenons, mortises, bevels, miters, grooves, and curves using such tools and equipment as tenoner, mortiser, variety saw, and coping saw.

b. Constructs, modifies, and repairs buildings: Erects wooden framework by placing sills, joists, rafters, and sheathing in proper position and joining and fastening, using carpentry hardware and fastening devices. Installs subflooring, flooring, roofing, and siding. Installs window frames, sashes, and doors. Constructs forms for poured concrete steps, foundations, etc. Erects steps, staircases, and porches; constructs chutes and openings for heating, plumbing, or

55-19
233

ventilating equipment. Seals interiors by installing board, plywood, fiberboard, or other finish materials. Alters buildings by installing or removing partitions, finishing attics or basements, or by adding porches or rooms. Repairs siding and roofing. Repairs floors, ceilings, and other wood parts of building by removing damaged lumber and wearing surfaces such as asphalt tile and linoleum and installing new sections. Installs and repairs doors, windows, and screens, and installs glass in sashes. Installs and repairs interior and exterior trim such as moldings and facings. Builds framework as needed to install doors, windows, and louvers.

c. Assembles and erects prefabricated or portable structures: Constructs, erects, and repairs heavy timber structures such as warehouse loading docks, boat docks, wharves, and piling. Positions and levels timbers using peavey or heavy construction equipment and checks alignment by use of spirit level of plumb bob. Erects scaffolding as required. Builds forms for concrete and masonry structures.

d. Builds mockups, models, and patterns: Constructs and assembles wooden mockups and models and other objects for use as training aids, using woodworking tools, such as circular saw, lathe, and disk sander. Constructs models from soft wood, veneers, and other materials, using woodworking tools and such precision instruments as vernier caliper and weight scales. Builds wooden patterns and match plates. Shapes wood to specific design and proportions, cuts intricate fittings to join items, and fastens parts together by use of screws, dowel pins, nails, or glue. Repairs cabinets by replacing parts or sections with properly

matched woods. Constructs facilities, such as shelves and bins, for storage of supplies or equipment. Builds interior appurtenances such as lockers, closets, and utility cabinets. Installs prefabricated articles such as cabinets and bookcases. Applies laminated plastics.

e. Constructs packing and shipping containers: Constructs containers such as crates, boxes, or cases for use in storage or shipment of materials. Builds crates for special packing by installing separators, special mountings, hinges, screw in lids, felt on saddles, and protective or waterproof linings. Builds bracing and framing to hold boxes or crates in place. Blocks and braces material in containers to prevent damage during shipment. Constructs special devices for transportation of acids and explosives.

f. Maintains woodworking tools and installs and repairs building hardware: Cleans and oils metal parts of tools and equipment to prevent rusting. Repairs and adjusts turning blets and oils bearings of woodworking machinery. Sharpens edges of cutting tools. Installs items of building hardware such as hinges, hasps, and locks and hydraulic door stops. Makes minor repairs to door locks such as replacing springs and screws.

g. Supervises carpentry personnel: Lays out work and assigns tasks within workcrews; prepares performance ratings of subordinates; recommends changes in assignment; schedules leaves; and conducts on-the-job training phases.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

~~-2-~~

d. Training:

(1) Completion of appropriate base level management course is desirable.

(2) Completion of an engineering entomologist course is desirable.

(3) Completion of an advanced preventive medicine course is desirable.

4. SPECIALTY DATA

a. Grade Spread: Technical sergeant and master sergeant.

b. Related D.O.T. Jobs:

Vermin Exterminator	7-89.123
Termite Treator	5-59.950
Sanitary Inspector	0-96.16
Sanitary Technician	0-66.41
Entomologist	0-35.30

Effective 30 September 1964

AFM 39-1E
AFSC 55253
Semiskilled AFSC 55233

AIRMAN AIR FORCE SPECIALTY

MASONRY SPECIALIST

1. SPECIALTY SUMMARY

Constructs, maintains, and repairs masonry and concrete buildings and structures.

2. DUTIES AND RESPONSIBILITIES

a. Forms structures of concrete: Advises carpenter specialists in placement and building of forms for concrete walls, floors, etc. From design drawings, blue-prints, sketches, etc., installs structural and reinforcement steel, such as bars, stirrups, spacer rods, and mesh by bending and spacing according to specifications. Places concrete into forms; uses concrete working tools, such as vibrators, floats, straight edges, templates, and other devices. Cures concrete in structures, using water, sand, fabric, paper, and chemical mixtures.

b. Lays brick, building block, stone, and other materials including ceramic and quarry tile: Lays material to form structures in accordance with blueprints, building plans, or other directives. Cleans surface and prepares bed for mortar. Cuts, trims, faces, and surfaces masonry materials to proper size and shape, using masonry tools such as power saws, napping hammer, chisel, and brick layer's hammer. Positions masonry materials, using trowel, hammer, mallet, and crowbar. Checks horizontal and vertical alignment, using mason's spirit level and plumbbob. Shapes mortar joints between courses with jointer or trowel point. Seals openings, using sealers oakum and caulking compound. Waterproofs and dampproofs walls extending into wet soil

by applying compounds such as bituminous mastic cement plaster and metallic powder. Estimates manhours and materials needed to accomplish work assigned.

c. Prepares mortar and concrete: Determines types of mortar or concrete required and prepares material in proportions and amounts required to complete each assignment. Measures aggregates, such as gravel and cement, in proper proportions; adds other ingredients to obtain required consistency; and mixes, using handtools or power mixers. Applies test and analysis data of water and aggregates to mixes.

d. Plasters interior and exterior of buildings: Prepares surfaces and applies plaster to walls and ceilings assuring neat and smooth finish. Finishes and floats surfaces to obtain finish, free from blemishes and float marks. Checks all corners, angles, and horizontal edges to insure plumb, level finish. Repairs cracks and breaks in plastered surfaces by applying new plaster and matching existent surfaces leaving smooth and true surface for other craftsmen.

e. Cleans surfaces: Cleans finished concrete, masonry, or plastered surfaces, using carborundum stone, sand blasting machine, wire brush, or acid treatment.

f. Maintains equipment and tools: Performs preventive maintenance, lubricates, and makes minor repairs and adjustments to tools and equipment. Removes concrete and mortar from tools and equipment immediately after using to prevent hardening, and oils all metal parts to prevent rust.

g. Supervises masonry and concrete personnel: Serves as crew leader of masonry and concrete workers engaged in laying masonry units, forming concrete structures, and plastering interior and exterior surfaces. Instructs subordinates in phases of masonry and concrete construction and repair. Examines work accomplished by others to assure complete and meritorious workmanship pointing out to others ways in which to improve quality and efficiency in trade.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of standard nomenclature, types, and sizes of masonry and concrete materials; batching formulas and methods of curing concrete, mortar, plaster, and lime mixtures; and use and care of hand and power-driven masonry and concrete tools is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

(2) Knowledge of use and capacity of construction equipment is desirable.

b. Education: Completion of high school with courses in mechanical drawing, mathematics, and blueprint reading and interpretation is desirable.

c. Experience: Experience in shaping and laying masonry units; mixing and applying concrete, plaster, and mortar; and erecting steel is mandatory.

d. Training: Completion of a basic masonry course is desirable.

e. Other: A minimum aptitude level of Mechanical 40 is mandatory.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Bricklayer ----------5-24.010

Stonemason ----------5-24.210

240

Effective 30 September 1964

AFSC 55274*

AIRMAN AIR FORCE SPECIALTY

PROTECTIVE COATING TECHNICIAN

1. SPECIALTY SUMMARY

Inspects, troubleshoots, maintains, repairs, surveys, and evaluates protective coatings, deterioration, and corrosive conditions, and applies preservative treatment and demarkations to structural surfaces or equipment components comprising Air Force real property facilities.

2. DUTIES AND RESPONSIBILITIES

a. Advises on technical problems of protective coatings: Solves complex problems on deterioration or potential deterioration of all structural materials and supporting equipment components. Determines unusual maintenance or treatment problems by surveying pertinent environmental conditions. Analyzes or recognizes coating failures causing structural defects Devises maintenance procedures to facilitate full utilization of personnel and equipment. Diagnosis recurring deterioration, analyzes defects, and recommends correction action by initiation of unsatisfactory reports, proposed changes in operating procedures, or other appropriate measures.

b. Performs corrosion detection and control for metal surfaces: Establishes corrosion detection and control procedures and techniques for metal surfaces. Diagnosis and isolates cause of corrosion, i.e., electrolysis, chemical, soil, or climatic conditions, and institutes corrective action, including removal of existing deteriorated materials, application of primer or surface preperant and corrosive resistant materials.

741

Determines compatability and non-compatability of materials and establishes controls and inspections to prevent occurrence or reoccurrence. Performs difficult repair of structures and systems affected by corrosion such as structural steel, metal tankage, metal siding and roofing, retaining walls, overhead and underground piping and equipment.

c. Performs technical application: Determines and is capable of using all types of surface preparation equipment to eliminate, minimize, or neutralize deteriorated surface or corrosion except installation of cathodic protection. Coordinates installation of cathodic protection by electrician. Directs removal of mill scale, rust, and existing coatings from surfaces by scraping, sanding, sand blasting, burning, or chemicals; and application of neutralizing and conditioning chemical solutions to base metal surfaces. Directs erection of scaffolding and rigging.

d. Inspects facilities: Inspects facilities to determine effectiveness and deterioration of previous preservative treatments; completed or in-progress work to insure compliance with standard operating procedures, technical requirements, and safety standards. Performs safety inspection to insure elimination of fire hazards. Interprets inspection findings and determines adequacy of corrective action or need for corrective action. Evaluates practicability of proposed and suggested protective coating and corrosion control techniques.

e. Supervises protective coating personnel: Plans and schedules work assignments. Establishes work methods, production controls, and performance standards. Assigns installation, repair, and maintenance functions to subordinates. Insures availability of required maintenance equipment, tools, and materials. Evaluates performance of subordinates performing installation, repair, and maintenance functions in terms of compliance with policies, directives, and technical orders. Conducts on-the-job training in techniques involved in application of materials, operation of equipment, or use of rigging. Orients newly assigned personnel concerning regulations and procedures and interprets directives and policies. Assigns specific duties to subordinate specialists and inspects completed work for adequacy and completeness.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of fundamental chemistry, capabilities, and limitations of materials and application equipment; function of different preservative treatments in different environments or surfaces; methods for preparing different surfaces under varied conditions; operation of all types of staging and application equipment; and fundamental causes of corrosion and basic methods of prevention, treatment, and eradication are mandatory.

(2) Knowledge of basic principles of cathodic protection is desirable.

b. Education: Completion of high school with courses in chemistry and physics is desirable.

c. Experience:

(1) Qualification as a Protective Coating Specialist is mandatory. In addition, experience in performing functions such as handling of hazardous chemicals, safety precautions, and the use of safety equipment is mandatory.

(2) Experience in working on elevated and underground structures is desirable.

d. Training:

(1) Completion of an advanced corrosion control and protective coating course is desirable.

(2) Completion of appropriate base level management course is desirable.

e. Other:

(1) Normal color vision as defined in AFM 160-1 is mandatory.

(2) Physical requirements for missile duty as defined in AFM 160-1 apply.

4. SPECIALTY DATA

a. Grade Spread: Technical sergeant and master sergeant.

b. Related D.O.T. Jobs:

Painter Foreman ---------- 5-27.010

Painter, Aircraft ---------- 5-16.940

Painter, Inspector ---------- 9-09.21

5. *SPECIALTY SHREDOUTS

Suffix	Portion of AFS to Which Related
A	ICBM Corrosion Control

AIRMAN AIR FORCE SPECIALTY

PROTECTIVE COATING SPECIALIST

1. SPECIALTY SUMMARY

Applies appropriate preservative treatment to structural surfaces, utility lines, and equipment components comprising Air Force real property facilities to meet requirements for preservation, eliminate deterioration, and effect corrosion control.

2. DUTIES AND RESPONSIBILITIES

a. Prepares surface: Uses all types of surface preparation equipment to eliminate, minimize, or neutralize existing deteriorated film or surface and provide type of surface for best material adherence. Removes corrosive materials from surfaces with brush, cloth, or chemicals. Removes mill scale, rust, and existing coatings from surfaces by scraping, sanding, sandblasting, wirebrushing, burning, or with mechanical abrasion equipment or correct chemical. Makes surface repairs or patch cracks or holes in wood, metal, masonry, or concrete surfaces with appropriate fillers or sealants. Applies neutralizing and conditioning chemical solutions to bare metal surfaces. Applies protective masking tapes, compounds, polyethylene, or other plastic and fibrous materials to areas requiring accurate delineation or protection.

b. Performs application: Applies appropriate materials to building structures and related equipment. Applies complete coating systems or component parts to prepared surface as primer, intermediate, and finish coats

after proper curing period for each segment. Selects materials applicable to exterior or interior surfaces of wood, metal, concrete, masonry, plastics, plaster, etc. Applies coating as directed to falsify outline of buildings, structures, and equipment and blends items of construction and equipment with surrounding terrain to prevent identification by enemy. Applies required pavement or airfield marking patterns with appropriate equipment. Prepares reflectorized paint for traffic markings by apportioning reflectorized media in pigmented binder material in accordance with current guidelines. Is familiar with application of solid adhesive backed laminates for application to pavements and walkways.

e. Maintains equipment: Cleans and maintains equipment using cleaning solutions or solvents and applying preservative materials or lubricants to prevent deterioration or damage from wear, rust, or corrosion. Lubricates and performs minor adjustments or repairs on painting equipment such as spray gun or compressor and is familiar with mechanical operation of steam cleaning and sandblasting equipment.

f. Erects and operates staging: Fabricates working platforms by using sectional ladders and extension boards or by fastening scaffolding to rafters, roofs, walls, or other sections of buildings and structures. Climbs open structures, anchors lines, and provides support for the necessary implements to prepare surfaces for corrosion treatment priming and painting. Uses appropriate staging bed, ladders, stirrups, boatwain's chairs, turnbuckles, and wireclamps, and arranges rope falls. Ties several basic knots such as the bowline, square, half hitch, etc., and works with cable rope.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of types of coating, preservatives, and basic vehicles formulated in variety of products; compatible products to be combined in composite system; methods for preparing wood, metal, glass, fiber, plaster, cement, and other surfaces for painting; camouflage painting techniques; operation of preparation, painting, and finishing equipment such as mechanical abraders, sandblasting, air and hydraulic spray equipment, buffing, sanding, and steam cleaning apparatus, and highway marking devices; methods used to calculate quantities, thickness, and area measurements and read calibrated instruments; fundamental corrosion control, chemistry, and physics; woodworking, masonry, and steel fabrication methods; and the use of related hand and power tools is desirable.

b. Education: Completion of high school with courses in chemistry and physics is desirable.

c. Experience: Experience in practical use of various type brushes, rollers, glove, spray, and surface preparation equipment and safety precautions required in use of hazardous chemicals, respiratory, and rigging equipment is mandatory.

d. Training: Completion of course in corrosion control and structural coatings application, and proper use of mechanical devices, high pressure, hot spray, and electrostatic spray equipment is desirable.

e. Other:

(1) A minimum aptitude level of Mechanical 50 is mandatory.

(2) Normal color vision as defined in AFM 160-1 is mandatory.

(3) Physical requirements for missile duty as defined in AFM 160-1 apply.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Painter ---------- 5-27.010

Painter, Aircraft ---------- 5-16.940

5. *SPECIALTY SHREDOUTS

Suffix	Portion of AFS to Which Related
A ----------	ICBM Corrosion Control

AIRMAN AIR FORCE SPECIALTY

PLUMBING SUPERVISOR

1. SPECIALTY SUMMARY

Supervises activities engaged in installation and repair of pipe sytems, plumbing fixtures and appurtenances, and scale and corrosion treatment.

2. DUTIES AND RESPONSIBILITIES

a. Plans and schedules work of plumbing activities: Plans and schedules work assignments with regard to installation, maintenance, and repair of pipe and plumbing fixtures. Sets up preventive maintenance teams. Prepares and analyzes reports and charts with regard to man-hour utilization and job time rates. Establishes work standards, production controls, and job priorities. Improves work methods to effect better utilization of personnel and increase economy of operation. Provides for equipment, supplies, and space, and determines most effective methods of use. Sets up organizational structure to show lines of authority and to indicate personnel requirements.

b. Supervises plumbing personnel: Verifies selection of proper materials and equipment for accomplishment of work. Determines workmen are performing duties correctly by observing work performance. Insures on-the-spot corrections are made when deficiencies in techniques and procedures are noted. Assigns individual workmen to specific duties and observes progress to determine work is carried out in accordance with instructions. Maintains records of time spent on each job for purpose of cost accounting and to provide information for establishment of production standards. Analyzes use of

plumbing materials to correct wasteful practices. Promotes harmonious relationships and resolves personnel problems. Rates subordinates for efficiency, schedules leaves, recommends promotions; and initiates other personnel actions. Coordinates work schedules with other affected sections.

c. Establishes and conducts on-the-job training for plumbing personnel: Orients and adjusts newly assigned personnel. Gives on-the-job instruction to individuals and groups and conducts formal and informal conferences and discussions. Observes completed work to determine training requirements of individuals or groups. Establishes or provides for specific training and maintains progress charts to indicate degree of proficiency and advancement of each worker. Assigns specific phases of on-the-job instruction to senior workers and evaluates effectiveness and adequacy of instructions. Insures all workers are familiar with applicable directives and regulations.

d. Inspects and evaluates plumbing activities: Performs preventive maintenance inspections of plumbing fixtures and initiates workorders to prevent breakdowns and to correct deficiencies. Periodically inspects activity to determine degree of compliance with regulations and policies. Inspects completed work to insure quality standards have been met and such standards are adequate. Inspects pipes and metals for scale and corrosion. Inspects for proper maintenance of tools and equipment, proper storage of supplies, and for presence of safety hazards. Inspects completed workorders to prevent misuse of materials and to insure costs are charged to proper cost codes. Discusses findings of inspections with immediate supervisor and recommends action to improve operation or correct deficiencies.

e. Performs technical plumbing functions: Adapts and implements blueprints, specifications, policies, and regulations to fit requirements. Performs specific tasks to determine need for revision of procedures and to establish performance standards. Makes decisions with regard to changes in plans and work procedures. Plans and sketches plumbing layouts. Determines types and quantities of materials required. Determines preventive and corrective anti-corrosion treatment measures. Installs pipe and plumbing fixtures. Repairs and replaces damaged plumbing fixtures. Accomplishes tasks beyond capabilities of senior workers.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of installation, operation, and repair of water, gas and waste systems; types, sizes, and use of plumbing materials; corrosion preventive measures; cathodic techniques; use of plumbing tools; techniques of cutting and fitting pipes and installing and repairing plumbing fixtures; and safety rules and practices is mandatory. Possession of mandator knowledges will be determined in accordance with AFM 35-1.

b. Education: Completion of high school with courses in shop. mathematics and blueprint reading is desirable.

c. Experience: Qualification as a Plumbing Specialist is mandatory. In addition, experience in supervising functions such as installation, maintenance, or repair of piping systems, associated equipment, and plumbing fixtures is mandatory.

d. Training:

(1) Completion of an advanced course in plumbing is desirable.

(2) Completion of appropriate base level management course is desirable.

c. Other: Physical requirements for missile duty as defined in AFM 160-1 apply to Suffix Y.

4. SPECIALTY DATA

a. Grade Spread: Technical sergeant and master sergeant.

b. Related D.O.T. Jobs:

Plumber Foreman ----------5-30.210

5. *SPECIALTY SHREDOUTS

Suffix	Portion of AFS to Which Related
Y	Ballistic Missile

353

Effective 30 September 1964

AFM 39-1E
AFSC 55255
Semiskilled AFSC 55235

AIRMAN AIR FORCE SPECIALTY

PLUMBING SPECIALIST

1. SPECIALTY SUMMARY

Installs and repairs pipe systems, and plumbing fixtures and appurtenances.

2. DUTIES AND RESPONSIBILITIES

a. Plans and lays out work: Reads and interprets blueprints, drawings, plans, and other specifications and determines dimensions and quantities of materials required. Selects type of materials such as, cast, wrought, and galvanized iron, steel, or copper pipe and tubing; iron, steel, copper, and brass fittings; and tin, bronze, zinc, and lead for brazing, welding, and soldering. Determines method of installing pipe in walls, floors, buildings, and systems. Selects entry and exit points of pipe connections. Determines connecting places and type connections, fittings, joints, or union. Determines depth of underground installations and type connections.

b. Install and repairs pipe systems, plumbing fixtures, and equipment: Installs, tests, troubleshoots, and repairs pipe systems designed to conduct flow of hot and cold water, sewage, and industrial wastes. Installs and maintains pipe systems located above, under, and on the ground; in, on, and between buildings, structures, and systems; between walls, floors, and ceilings and at mobile and stationary missile facilities. Installs plumbing and fixture for applicances, potable and non-potable water, sewage, industrial waste, and

air and gas systems. Connects pipe sections using appropriate fittings and by welding or packing oakum and lead wool or hot lead. Insulates pipe and equipment using material such as prefabricated fixture covering, asbestos cement, asbestos cloth and tape, and asbestos impregnated muslin. Installs plumbing fixtures such as heating devices, sinks, toilets, showers, water heaters, radiators, sterilizers, and laundry machinery. Installs devices such as traps, vents, drains, siphons, pumps, meters, fittings, couplings, and unions. Fits valves, couplings, and other fittings to pipe sections by screwing, bolting, soldering, and sweating. Determines condition of connections and makes repairs or corrections. Adjusts connections and pipe circuitry to correct such conditions as air lock, water hammer, expansion contraction, and friction.

c. Evaluates and corrects scale and corrosion damage: Applies preventive and corrective anti-corrosion measures. Selects and installs material least likely to be affected by corrosion. Installs and maintains cathodic protection devices. Applies protective coatings and wrappings.

d. Tests and inspects piping systems: Installs pressure gages, fills systems with water, and manipulates control valves to produce desired pressure. Inspects all parts of pipe systems for leaks, noting gage readings for loss of pressure. Reseals leaking joints.

e. Supervises plumbing personnel: Instructs subordinates in techniques and procedures for such functions as installation and repair of pipe systems and plumbing fixtures. Assigns work and reviews completed repairs to insure compliance with local procedures, safety procedures, and applicable technical publications. Arranges for placement of materials and directs work when serving as plumbing crew leader.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of nomenclature, types, sizes, and use of plumbing materials such as pipes, valves, fittings, metals, calking, packing, and gaskets; shop mathematics; reading and interpreting shop drawings, blueprints, and specifications; maintenance of water, gas, and waste distribution and collection systems; use of hand and powered plumbing tools; and safety procedures and methods is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

b. Education: Completion of high school with courses in shop mathematics and blueprint reading is desirable.

c. Experience: Experience in functions such as cutting, fitting, and installing pipes or pipe systems, or installing and repairing plumbing fixtures is mandatory.

d. Training:

(1) Completion of a basic course in plumbing is desirable.

(2) Completion of a course in corrosion control is desirable.

e. Other: Physical requirements for missile duty as defined in AFM 160-1 apply to suffix Y.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Plumber, pipefitting ----------5-30.010

Plumber, repair ----------5-30.210

5. SPECIALTY SHREDOUTS

Suffix	Portion of AFS to Which Related
Y	Ballistic Missile

AIRMAN AIR FORCE SPECIALTY

SITE DEVELOPMENT SUPERINTENDENT

1. SPECIALTY SUMMARY

Superintends subprofessional work in research, development, test, design, plans and programs, engineering drawings and specifications, surveying, drafting, cost estimates, and inspection of construction and maintenance projects in the civil engineering activity.

2. DUTIES AND RESPONSIBILITIES

a. Plans and organizes engineering works for inspection, investigation, and project preparation for utility plants and systems, pavements, structures, and buildings: Plans and supervises preparation of layout and detailed engineering drawings for both preliminary and final contract drawings for construction, modification, or repairs to existing or proposed new utility plants and systems, pavements, structures, and buildings. Using standard engineering methods, supervises preparation of project cost estimates and specifications for contract type work as well as for work to be performed by C.E. personnel. Designs pavements of various kinds, not subject to extreme conditions of climate or loading, to include base, subbase, and proper drainage. Supervises design of other type slabs, embankments, foundations, and drainage structures. Prepares or supervises preparation of specifications pertaining to mixing, sampling, placing, testing, curing, and workmanship on concrete. Supervises proper grade

preparation to include soil compaction. Develops and or supervises plans and specifications for new construction, modification, and repair of structures and buildings specifying conventional material and construction methods. Prepares simple load calculations for beams, columns, floors, and roofs to insure construction of safe facilities.

b. Directs site development activities: Provides daily check on work being performed by subordinates to insure standards of performance, compliance with instructions, meeting of time schedules, and development of each project is within the approved scope and estimated costs for each specific project being engineered. Rates personnel on their ability to perform efficiently and on professional basis. Indoctrinates new personnel concerning local work methods and procedures.

c. Establishes and conducts on-the-job training for site development personnel: Establishes and conducts on-the-job training for individuals under supervision. Insures subordinates are proficient in use of engineering and drafting equipment to include operation reproduction machines.

d. Inspects and evaluates site development activities: Performs continuous inspection on projects being accomplished by contract. Invites contractor's attention to non-conformance with project drawings and specifications. Refers only unusual or unresolved problems to superiors. Prepares inspection reports denoting work progress, slippages, or other problems that will interfere with proper

accomplishment of project.

e. Performs technical site development functions: Supervises preparation of projects, ot include scope, cost, and justification, for inclusion in annual military construction or operation and maintenance progran. Performs technical on-site surveys to gather information for adequate project preparation. Supervises development and maintenance of base development plan. Develops special engineering studies to support more efficient maintenance and operation of base facilities and equipment, or other one-time engineering requirements for technical analysis other than required for formal project preparation. Typical studies would include analyzing heat loads versus heating plant capacity to determine unusual heat losses and corrective action required; or an unusual maintenance item such as corrosion of underground natural gas distribution lines to determine extent, cause and effect, and corrective action required.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of engineering principles, materials, specification writing, Air Force contracting procedures, engineering equipment, surveying, and drafting is mandatory.

(2) Knowledge of engineering law is desirable.

b. Education:

(1) Completion of high school with courses in algebra and geometry is mandatory. Courses in trigonometry, drafting, physics, and chemistry are desirable.

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(2) Completion of two years of college in an engineering curriculum is desirable.

c. Experience: Qualifications as a Site Development Technician is mandatory. In addition, experience in superintending functions such as surveying, preparation of cost estimates, and program development is mandatory.

d. Training: Completion of appropriate base level management course is desirable.

4. SPECIALTY DATA

a. Grade Spread: Senior master sergeant and chief master sergeant.

b. Related D.O.T. Jobs:

Technical Assistant (Engineering)---------- 0-67

AIRMAN AIR FORCE SPECIALTY

SITE DEVELOPMENT TECHNICIAN

1. SPECIALTY SUMMARY

Performs technical investigations and engineering surveys; prepares cost estimates, specifications, programming documents, and design drawings for civil, mechanical, or electrical engineering facilities and utilities project activities; and supervises site development activities.

2. DUTIES AND RESPONSIBILITIES

2. Prepares field facility surveys: Makes site location surveys and preliminary engineering investigations under field conditions. Evaluates work performed and plans and designs site layout, taking into consideration such data as topography, soils, and survey data of area involved, location of existing structures, and availability of utilities. Under direction of professional engineering officer, prepares engineering drawings for emergency installation of facilities and utilities.

b. Interprets and compiles technical data: From information in form of sketches and guidance as to design criteria, prepares layouts, detail, assembly, and installation drawings of mechanical and electrical equipment and miscellaneous facilities and utilities systems, and on basis of knowledge of similar items and information furnished, performs calculations and prepares detailed design. Exercises

judgment in making engineering determinations such as type of materials and equipment which should be utilized and most efficient method of installation; most practical method of constructing facilities; sizes of various members to give required strength; clearances required; and simplicity of design to reduce cost.

c. Assembles and reviews project specifications: Reviews assigned sections of project specifications pertaining to variety of materials and construction methods such as roofing, flooring, reinforced concrete elements, foundation dampproofing and waterproofing, caulking, and glazing. Selects and adopts guide specifications and previously approved project specifications to projects under design. Writes items describing materials or methods by analyzing and extracting information from drawings, notes, and other sources.

d. Develops preliminary cost estimates: Evaluates project plans to determine quantity of materials to be utilized and prepares detailed cost estimate from standard pricing guides and industrial equipment catalogues.

e. Reviews contract drawings: Reviews designated portions of plans submitted by contractors to determine basis of design and design analysis for conformance to established engineering standards and criteria set forth in manuals, codes, and other guides, and specific project requirements. Checks accuracy of calculations of loads, illumination, conductor sizes, etc., and adequacy of switches, controls, and other equipment selected by contractor. Reviews required plans to assure correction of deficiencies.

f. Supervises site development personnel: Plans and schedules work assignments. Establishes work methods and controls. Supervises preparation of site location plans and assembles preliminary technical requirements and cost data required to support COI and MCP programming documents.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of college mathematics, including algebra, geometry, plane and special geometry, logarathmic tables, engineering tables, slide rules, surveying and drafting, and blueprint reading is mandatory. Possession of mandatory knowledge will be determined in accordance with AFM 35-1.

(2) Knowledge of engineering principles, specifications, cost estimating, and site development procedures is desirable.

b. Education:

(1) Completion of high school with courses in algebra and geometry is mandatory. Courses in trigonometry, drafting, physics, and chemistry are desirable.

(2) Completion of two years of college in an engineering curriculum is desirable.

c. Experience: Qualification as a Site Development Specialist is mandatory. In addition, experience in performing or supervising functions such as surveying, drafting, and cost estimating is desirable.

d. Training: Completion of appropriate base level management course is desirable.

4. SPECIALTY DATA

a. Grade Spread: Technical sergeant and master sergeant.

b. Related D.O.T. Jobs:

.Technical Assistant (Engineering)---------- 0-67

Effective 30 September 1964

AFM 39-1E
AFSC 55350
Semiskilled AFSC 55330

AIRMAN AIR FORCE SPECIALTY

SITE DEVELOPMENT SPECIALIST

1. SPECIALTY SUMMARY

Performs construction materials tests; prepares plans, graphs, charts, and overlays; performs general classes of surveying; assists professional engineer on projects design; and performs other general engineering tasks.

2. DUTIES AND RESPONSIBILITIES

a. Prepares engineering plans where standards and procedures are established: Performs draftsman duties in support of design engineer and assumes engineer tasks of routine considerations to maximum extent possible. Exercises judgment in selection of alterations for standard devices to satisfy performance, cost, safety, size, strength, durability, and other requirements.

b. Performs tests: Performs variety of standardized analysis tests on soils, concrete, and concrete aggregates. These tests include sieve analysis, slump tests, and density and moisture content determinations. Performs standardized tests to determine physical properties of steel samples, and tests electrical cables to determine their electrical and mechanical properties. Tests involve use and knowledge of both common and special machines for measuring properties of tested materials.

165

c. Performs survey: Performs general classes of surveying including determination of latitude, longitude, and azimuth; interprets ephemerides for astronomic observations. Develops triangulation systems to prescribed accuracy; establishes elevations and level nets. Runs cross section and profile levels and determines cut and fill. Calculates, adjusts, and prepares surveying data. Knows use, care, and maintenance of survey equipment.

d. Performs drafting: Draws plans, graphs, charts, and overlays from sketches, notes, work orders, models, and oral instructions. Using standard drafting instruments, prepares drawings and plans of roads, buildings, and miscellaneous construction projects, mechanical and electrical devices, equipment, and parts. Makes reproductions of plans and drawings using blueprinting, vandyke, and ozalid printing machines. Selects and prepares chemical solutions, paper, and other related items used in support of drafting and reproduction of plans and specifications.

e. Supervises site development personnel: Supervises subordinates. Orients newly assigned personnel. Conducts phases of on-the-job training. Assigns specific tasks to individuals.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of procedures for surveying, surveying computations, and data reduction of all phases of mechanical and engineering drafting techniques, and finished drafting practices and blueprinting is mandatory.

(2) Knowledge of elementary engineering principals and materials testing procedures is desirable.

b. Education:

(1) Completion of high school with courses in algebra and geometry is mandatory. Courses in trigonometry, drafting, physics, and chemistry are desirable.

(2) Completion of two years of college in an engineering curriculum is desirable.

c. Experience: Experience in performing functions such as drafting, surveying, estimating and material testing is mandatory.

d. Training: Completion of Basic Surveyor or Draftsman Course is desirable.

e. Other: A minimum aptitude level of General 65 is mandatory.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Technical Assistant (Engineering)---------- 0-67

AIRMAN AIR FORCE SPECIALTY

WORK CONTROL SUPERINTENDENT

1. SPECIALTY SUMMARY

Superintends activities engaged in work and material control in base maintenance, repair, and construction activities; and acquisition, utilization and disposal of real property and civil engineering cost accounting.

2. DUTIES AND RESPONSIBILITIES

a. Plans and organizes work and material control activities and real property accounting: Plans and organizes work and material control for base maintenance, repair, and construction activities. Plans and organizes material requirements. Plans and organizes accounting for real property activities. Provides for use and control of space, equipment, time, and supplies allotted to work and material control activities. Improves work measures and procedures to insure full productive utilization of maintenance, repair, construction, work, and material control activities. Develops organizational and functional charts to show lines of authority and placement of responsibilities. Develops performance standards for work and material control personnel.

b. Directs work and material control and real property accounting activities: Assigns subordinates specific functions such as work control and scheduling, materials control, estimation, and cost and real property accounting. Evaluates work control schedules and compliance with schedules, directives, costs, and work standards. Directs and evaluates work scheduling and accounting procedures. Supervises preparation and maintenance of records and reports incident to work, material control, and real property

accounting activities.

c. Establishes and conducts on-the-job training for work control personnel: Plans and conducts on-the-job training for subordinates. Conducts individual and group training on inspection, material control and estimating, procurement of material and equipment, and real property and cost accounting. Maintains records of training accomplished and arranges for additional training where required.

d. Inspects and evaluates work control activities: Conducts periodic inspections to insure compliance with policies and regulations, and to maintain even workflow. Discusses inspection findings with supervisory personnel and recommends action to correct deficiencies.

e. Performs technical work control functions: Resolves technical problems encountered in work control of shop maintenance work. Evaluates status of work facilities, manpower, workload, training, and operating efficiency. Interprets shcedules, directives, and work policies. Integrates management engineering and accounting systems into over-all civil engineering program.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: (1) Knowledge of work control, material specifications, inspection, procurement, and Air Force supply procedures; directives, policies, and procedures, including interpretations and applications, pertaining to real estate management and Civil Engineering cost accounting; methods and procedures pertaining to real property accounting activities; and familiarity with data automation processes is mandatory.

(2) Knowledge of personnel and industrial management and administrative techniques is desirable.

b. Education: Completion of high school is desirable.

c. Experience: Qualification as Work Control Technician, General Maintenance Technician, or Cost and Real Property Supervisor is mandatory. In addition, experience in directing functions such as scheduling of work orders, determining stock requirements, or preparing manhour and cost estimates is desirable.

d. Training: Completion of appropriate base level management course is desirable.

4. SPECIALTY DATA

a. Grade Spread: Senior master sergeant and chief master sergeant.

b. Related D.O.T. Jobs:

Production Controller----------1-18.66

Accountant, Cost----------0-01.10

Accountant, General----------0-01.20

Manager, Credit and Collection----------0-85.10

Valuation Engineer----------

Maintenance Mechanic----------5-83.641

AIRMAN AIR FORCE SPECIALTY

COST AND REAL PROPERTY SUPERVISOR

1. SPECIALTY SUMMARY

Supervises acquisition, utilization, and disposal of real property, and maintenance of real property records and civil engineering cost accounting activities.

2. DUTIES AND RESPONSIBILITIES

a. Plans and schedules work of acquiring, utilizing, disposing, and accounting for real property: Plans and schedules work assignments pertaining to acquisition, utilization, outleasing, and disposal of real property, establishment and maintenance of real property records and Civil Engineering cost accounting sustems, the preparation and maintenance of costs and manhours data and civil engineering cost ledgers. Establishes production controls and work standards for basic documentation either initiated by or received by Base Civil Engineer. Serves as focal point between Comptroller and Civil Engineering in flow of accounting information between two agencies. Monitors implementation and advancement of data automation program.

b. Supervises cost and real property accounting personnal: Reviews work of subordinate personnel for accuracy, completeness, and compliance with regulations, directives, policies, established procedures, and Comptroller General decisions. Supervises preparation and justification of requests for approval of acquisition, utilization, and disposal of real property.

Rates subordinates for efficiency and recommends individuals for promotion, schedules leaves, and accomplishes other personnel actions.

c. Inspects and evaluates functions of accounting for real property: Establishes production controls and work standards for real property acquisition, management, recording, and accounting activities. Reviews and analyzes real property accounting reports to determine accuracy and completeness, adequacy of personnel assigned, status of training of individuals, and effectiveness of operations.

d. Establishes and conducts on-the-job training for cost and real property accounting personnel: Conducts training in systems, methods, and procedures relating to real property accounting functions. Orients and trains newly assigned personnel.

e. Performs technical cost and real property functions: Develops and negotiates real estate legal instruments resulting in addition, utilization, or deletion of real property interests. Makes or reviews appraisals of land and structures to determine current estimated values. Maintains office of record for all real property holdings. Supervises preparation of real property record cards, posting of basic information, and recording of all changes in description of real property and amount of US investment. Supervises preparation and forwards real property and cost reports required by higher headquarters or for management purposes. Schedules and supervises annual inventories of current real property holdings. Initiates requests for approval of acquisition and disposal of real property and for any changes in utilization. Develops and analyzes cost reports and studies. Advises staff and operating personnel on procedures applied to cost data and significance of results obtained. Devises factors

for computing and interpreting cost data as related to programs and operations. Interprets regulations, directives, policies, and procedures. Prepares budget estimates and financial plans. Examines and processes reports of survey. Composes and reviews correspondence pertainin to unit activities.

3. SPECIALTY SUMMARY

a. Knowledge:

(1) Knowledge of legal instruments used in acquisition of various interests in real property and of Air Force rights and obligations involved in acquiring and holding real estate; principles of real estate appraisal; principles of commercial law; construction methods and practices, and types of construction; cost accounting; budget and financial plans; directives, policies and procedures pertaining to real estate management and civil engineeing cost accounting; and familiarity with data automation processes is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

(2) Knowledge of interpretation and application of general accounting laws, finance laws, and Comptroller General decisions is desirable.

b. Education: High-school-level courses in real estate principles, mathematics, statistics, and operation of business machines are desirable.

c. Experience: Qualification as Cost and Real Property Specialist is mandatory. In addition, experience in supervising functions such as budget preparation; cost and capital property accounts; development and preparation of real property cost studies and analyses; and prepration of financial reports is mandatory.

d. Training: Completion of appropriate base level management course is desirable.

e. Other: Ability to operate accounting machines such as adding machines, comptometers, or calculators is mandatory.

4. SPECIALTY DATA

a. Grade Spread: Technical sergeant and master sergeant.

b. Related D.O.T. Jobs:

Accounting Clerk.....1-01.31

Accountant, Cost.....0-01.10

Accountant, General.....0-01.20

Manager, Credit and Collections.....0-85.10

Budget Clerk.....1.01.05

Paymaster.....1-26.01

Valuation Engineer.....

Effective - 30 September 1964

AFM 39-1 E

AFSC 55450

Semi-Skilled 55430

AIRMAN AIR FORCE SPECIALTY

COST AND REAL PROPERTY SPECIALIST

1. SPECIALTY SUMMARY

Establishes and maintains records and accounts for real property and civil engineering cost accounting activities.

2. DUTIES AND RESPONSIBILITIES

a. Establishes and maintains real property accountable records: Receives, evaluates, and maintains real property accountable records for all real estate holdings under real property jurisdiction, control, and accountability of primary installation; records includes deeds, titles, leases, easements, licenses, permits, rights of way, rights of entry, metes and bounds descriptions, maps, plans, and documents from foreign countries evidencing availability for Air Force use of host-nation owned or procured real property, construction drawings, and pertinent real property data. Prepares requests for acquisition and disposal of real property, furnishing full information and justification to approving officials. Requests publication of special orders announcing assignment, designation, classification, activation, inactivation, transfer, or disposal of Air Force installations.

b. Prepares reports and performs inventories involving real property: Prepares reports showing current inventory, both quantity and cost, acquisition, utilization, and disposal actions, as well as various characteristic changes affecting Air Force real property. Reviews data

277

pertaining to construction, alteration, and repair of real property, records capital improvement changes to property, and amount of the Air Force investment, and prepares required reports. Records changes involving installed property and maintains current records of equipment.

c. Maintains cost ledgers and files of supporting documents: Collects and summarizes cost and manhour data expended in operation and maintenance of real property facilities, and posts to applicable cost ledgers such costs as labor, materials, purchased utilities, construction, equipment, and real estate rentals. Validates cost account codes applied to base civil engineerwork orders and posts cost data. Furnishes supporting documents for maintenance of real property accountable records. Provides cost information for development of O&M programs. Continuously evaluates cost, work units, and quantities for accuracy and to identify and effect technical and manpower improvements, conservation, and other measures needed to promote maximum economy and efficiency. From cost ledgers, prepares financial plans and annual budget estimates.

d. Prepares accounting reports: Prepares accounting reports and documents necessary to validate cost data accrued in operation, maintenance, and construction of real property. Processes daily labor time reports. Provides cost data for preparation of Civil Engineer Cost Report.

e. Reviews work of cost and real property personnel: Reviews work performed by subordinates for accuracy of computation, completeness, and compliance with prescribed directives. Conducts on-the-job training in techniques of maintaining accounts and files, cost data, compiling reports,

and preparation, processing, and computing of real property forms and records.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of leases, deeds, and other real estate legal instruments; Air Force real property accounting policies and procedures pertaining to establishment and maintenance of real property accountable records; general bookkeeping procedures and principles; business arithmetic; techniques of cost analysis; and key punch card operations is mandatory. Possession of mandatory knowledge will be determined in accordance with AFM 35-1.

b. Education: High-school-level courses in real estate principles, mathematics, statistics, and operation of business machines are desirable.

c. Experience: Experience in maintaining real property and general ledger records is mandatory.

d. Training: Completion of real property records and accounting and finance courses is desirable.

e. Other: (1) A minimum aptitude level of Administrative 80 is mandatory.

(2) Ability to operate accounting machines such as adding machines, comptometers, or calculators is mandatory.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Accounting Clerk----------1-01.31

Bookkeeper II----------1-01.02

Cost Accountant_____0-01.10

Payroll Clerk_____1-26.02

Valuation Engineer_____

Effective 30 September 1964

AFM 39-1E
AFSC 55570
Semiskilled 55530

AIRMAN AIR FORCE SPECIALTY

GENERAL MAINTENANCE TECHNICIAN

1. SPECIALTY SUMMARY

Inspects, determines, and makes repairs on electrical and mechanical systems in, or pertinent to utility and structural type facilities; performs necessary maintenance and repairs on structural facilities; and supervises general maintenance activities.

2. DUTIES AND RESPONSIBILITIES

a. Plans and lays out work: Determines from blueprints, drawings, plans, sketches, and other specifications, or from personal knowledge, type and quantities of material and equipment required. Supervises selection and arrangement of material and equipment and determines work sequences and methods to facilitate efficient work procedures and accomplishment. Prepares materials to exacting specification by using appropriate hand and power tools. Determines type and amount of materials required to perform repair or maintenance work on masonry structures. Determines type, amount, color, and exacting specifications of materials for protective coating requirements.

b. Repairs buildings and utility equipment: Repairs floors, ceiling, sills, joists, rafters, siding, roofing, staircases, porches, loading docks, and other frame parts of buildings by removing unserviceable lumber and replacing or installing new sections. Repairs doors, door hardware, windows, and screens and installs glass. Repairs interior and exterior trim as required. Determines need for repair

and replacement of piping systems and fixtures. Cuts, threads and bends pipe and fittings, using appropriate hand tools. Fits and seals valves, couplings, and other fittings to pipe sections by screwing, bolting, soldering, and sweating. Repairs broken pipes or leaks by soldering, caulking, or capping. Opens clogged drains, and repairs or replaces damaged fixtures, faucet washers, valve seats, etc. Tests low pressure (100 p.s.i.) pipe systems and reseals leaking joints. Examines and repairs 110-220 voltage electric circuits. Repairs conduit and armored cable for connecting various outlets, switches, panels, and boxes. Replaces original defective equipment with same or similar equipment not requiring change of power. Repairs, or replaces, and connects defective outlets, lighting fixtures, doorbells, doorbell transformers, and similar electrical components.

c. Repairs plaster, and masonry and applies protective coating: Repairs damaged plaster surfaces of walls and ceilings, including cracks and breaks, by removing loose materials and applies new plaster to match existing surfaces. Repairs damaged walks and other masonry defects by removing and replacing sections, or removing loose material and making fill-type repairs. Prepares repaired and joining surfaces for painting by scraping, sanding, feather-edging, brushing, or applying paint remover. Patches cracks and holes in wood surfaces with putty or other filler. Applies neutralizing and conditioning chemical solutions to bare metal surfaces. Covers sections or parts not to be painted, such as glass, using mask or masking tape. Applies primer and finish coats of paint to prepared surfaces of wooden, metal,

or concrete material, using paintbrush, roller, or spray gun. Applies special protective coating materials and wrappings when required.

d. Supervises general maintenance personnel: Serves as leader of crew engaged in utility and construction type maintenance duties, and conducts on-the-job training.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of building construction and repair; plumbing materials and systems; capability and limitations of common electrical circuits, materials, and appliances; types of masonry and concrete materials and mixing, applying, and curing procedures therefor; mixing, blending, application, and storage of paints, enamels, varnishes, shellacs, driers, solvents, fillers, sealers, and special type protective coating materials; and use of hand and portable power tools pertinent to trades type work in manner prescribed by safety rules and practices is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

(2) Knowledge of carpentry, plumbing, principles of electricity, heating, air conditioning, and protective coating is mandatory.

b. Education: Completion of high school with courses in shop work, shop mathematics, principles of electricity, blueprint reading, and chemistry is desirable.

c. Experience: Qualification as Electrician, Refrigeration and Air Conditioning Specialist, Heating Systems Specialist, Carpentry Specialist, or Plumbing Specialist is mandatory. In addition,

experience in performing or supervising functions such as scheduling of a maintenance crew is mandatory.

e. Other: A minimum aptitude level of Mechanical 40 is mandatory.

4. SPECIALTY DATA

a. Grade Spread: Airman first class through master sergeant.

b. Selected D.O.T. Jobs:

Maintenance Man	5-83.611
Maintenance Mechanic	5-83.641
Carpenter, Maintenance	5-25.830
Cement Finisher	5-26.100
Painter, Maintenance	5-27.010
Electrician	4-97.010
Plumber, Repair	5-30.210
Pipe Fitter, Maintenance	5-30.010
Plasterer, Maintenance	5-30.010

Effective 30 September 1964

AFM 39-1E
AFSC 55670
Semiskilled AFSC 55630

AIRMAN AIR FORCE SPECIALTY

WORK CONTROL TECHNICIAN

1. SPECIALTY SUMMARY

Schedules and controls workload of base, maintenance, construction, and repair; estimates material requirements, labor hours, and related costs; supervises flow of material; analyzes maintenance and repair data to facilitate control, efficiency, and continuity of base maintenance program; and supervises maintenance analysis and work control activities.

2. DUTIES AND RESPONSIBILITIES

a. Schedules and controls workload of base maintenance and repair shops: Establishes controls and schedules priorities on all work, materials, and labor utilization by analysis of work orders and requests, material availability and manpower resources. Evaluates deviations from standards, plans, and estimates to determine causes and effects on maintenance and repair functions. Prepares method improvement studies. Identifies deficiencies in training, workload, scheduling, material, and material consumption. Authorizes, directs, routes, and controls work flow through base repair and maintenance facilities. Performs coordination and liaison between various repair and utility shops and material activities. Provides continuous follow-up of buildings, structures, facilities, utility

systems, roadways, runways, parking aprons, and taxi areas undergoing maintenance, repair, construction, and improvements. Investigates project-type work to ascertain layout, measurements, material, modifications, and substitutions; prepares sketches to detail actual work.

b. Analyzes base maintenance, repair, and construction data; and prepares summaries: Extracts, analyzes, collates, and prepares summaries from maintenance, repair, and construction work orders and requests; and labor utilization, material, and discrepancy reports. Interprets and summarizes significant data and relates it to plans, standards, and workload estimates. Analyzes maintenance, repair, and construction performance data to develop determining factors for capability, manpower, and facility requirements. Studies completed data to develop manhour standards. Isolates trends and determines standards for evaluating effectiveness and efficiency of maintenance and repair efforts.

c. Develops job performance standards: Determines requirement for and develops individual manhour or total time job performance standards. Evaluates manning, equipment, material, and facility limitations to determine effect on established standards.

d. Develops charts, tables, graphs, and other visual presentation media: Develops visual media for most effective presentation of data. Prepares narration summaries in conjunction with visual media in order to compare past performance and current accomplishments with planned objectives.

Effective 30 September 1964

AFM 39-1 E
AFSC 56690

AIRMAN AIR FORCE SPECIALTY

SANITATION SUPERINTENDENT

1. SPECIALTY SUMMARY

Superintends activities engaged in installation control, operation, and maintenance of water and waste systems and equipment; and manages and coordinates entomology control program.

2. DUTIES AND RESPONSIBILITIES

a. Plans and organizes sanitation activities: Plans workloads and schedules work assignments. Establishes performance standards and work procedures to insure effective personnel utilization and to increase efficiency and economy of operation. Provides for and controls use of equipment, space, and supplies. Develops organizational structure to define lines of authority and assigns specific responsibilities. Resolves personnel problems and rates subordinates for efficiency. Accomplishes personnel actions such as recommending promotions and scheduling leaves. Coordinates sanitation operation with other activities. Plans and implements insect, rodent, pest, and fungi prevention and control programs.

b. Directs sanitation activities: Establishes teams or shifts and assigns airmen to duty in accordance with grade and skill level. Controls workflow and assigns special projects to persons or teams. Assigns technicians and specialits to specific functions such as operation and maintenance of water processing, industrial waste, and sewage plants, and to programs for controlling insects and rodents. Evaluates work

performance in terms of compliance with policies, directives, and technical publications. Analyzes productivity and work quality. Insures compliance with appropriate safety regulations and practices. Supervises preparation and maintenance of records and reports incident to operation and maintenance of entomology systems and equipment.

c. Establishes and conducts on-the-job training of sanitation personnel: Directs on-the-job training and reviews progress charts to insure completion of required training. Plans and conducts conferences and clssses of instruction to inform personnel of new projects, work requirements, and equipment. Arranges for attendance of slected individuals at formal and special training courses. Indoctrinates newly assigned personnel in local policies and procedures.

d. Inspects and evaluates sanitation activities: Makes periodic and special inspections of sanitation activities to insure compliance with policies, regulations, and technical publication, and to provide assistance in solving operation, maintenance, supply, and personnel problems. Interprets inspection findings and recommends corrective action. Conducts periodic inspections and performs surveys in cooperation with medical activities covering control and prevention of insect, rodent, pest, and fungi damage to health and property, and for effects of radioactive contamination on, and usability of, domestic and industrial water.

e. Performs technical sanitation functions: Resolves technical problems encountered by subordinate and interprets technical publications applicable to operation and maintenance of water processing, sewage, and industrial waste processing plants and systems. Establishes local operation and maintenance policies and procedures.

e. Supervises maintenance analysis and work control personnel: Supervises maintenance analysis, work control, job estimating and material control activities. Plans and schedules work. Assigns work and establishes priorities. Maintains personnel job performance requirements for each position, outlining quantity, quality, accuracy, and volume standards to be attained. Accomplishes personnel efficiency reports. Orients newly assigned personnel and assigns personnel to organizational positions. Conducts on-the-job training of subordinate personnel.

3. SPECIALTY QUALIFICATIONS

a. Knowledge:

(1) Knowledge of base maintenance and operation crafts, equipment, methods, manufacturing procedures, material, reading and interpretation of blueprints, and Air Force supply procedures is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

(2) Knowledge of Air Force management methods is desirable.

b. Education: Completion of high school is desirable.

c. Experience:

(1) Qualification as Electrician, Pavements Maintenance Specialist, Carpentry Specialist, Masonry Specialist, or Plumbing Specialist is mandatory. In addition, experience in performing or supervising functions such as scheduling of work orders, determining stock requirements, or preparing manhour and cost estimates is mandatory.

d. Training:

(1) Completion of a work control course is desirable.

(2) Completion of appropriate base level management course is desirable.

e. Other: A minimum aptitude level of Mechanical 40 is mandatory.

4. SPECIALTY DATA

a. Grade Spread: Airman first class through master sergeant.

b. Related D.O.T. Jobs:

Production Controller---------- 1-18.66

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of physics and chemistry as applied to water supply, water and waste products processing, pest control procedures, and sewer systems is mandatory.

b. Education: Completion of high school with courses in basic physics, biology, chemistry, and blueprint reading is desirable.

c. Experience: Qualification as a Water and Waste Processing Supervisor or Engineering Entomology Technician is mandatory. Experience in directing such functions as inspection, operation, and maintenance of sanitation systems is desirable.

d. Training: Completion of appropriate base level management course is desirable.

e. Other: Physical requirements for missile duty as defined in AFM 160-1 apply.

4. SPECIALTY DATA

a. Grade Spread: Senior master sergeant and chief master sergeant.

b. Related D.O.T. Jobs:

Sewer and Waterworks Foreman	5-94.180
Foreman (Waterworks)	5-95.340
Entomologist	0-35.30

AIRMAN AIR FORCE SPECIALTY

WATER AND WASTE PROCESSING SUPERVISOR

1. SPECIALTY SUMMARY

Supervises activities engaged in operation, maintenance, and repair of water supply, water processing, and waste processing plants and systems.

2. DUTIES AND RESPONSIBILITIES

a. Plans and schedules work of water supply and water and waste processing activities: Plans and schedules work assignments. Sets up preventive maintenance teams. Prepares and analyzes reports and charts regarding such factors as man-hour utilization and job time rates. Establishes work standards, production controls, and job priorites. Improves work methods to effect better utilization of personnel and increased economy of operation. Provides for equipment, supplies, and space, and determines most effective mthod of use. Sets up organizational structure to show personnel requirements, to indicate lies of authority, and to place specific responsibilities. Regulates duty assignments and intra-activity transfers.

b. Supervises water and waste processing personnel: Assigns specific duties to persons and groups. Determines proper supplies, materials, and tools have been slected for accomplishment of work. Observes work performance to determine compliance with techanical instructions and safety regulations and precautions. Makes immediate corrections of deficiencies or unsafe practices in work processes. Takes follow-up actions on work assign-

ments to determine progress made. Maintains records of time spent on individual jobs for purpose of cost accounting and to provide information for establlshment of production standards. Checks use of materials to correct wasteful practices. Promotes harmonious relationships and resolves personnel problems. Rates subordinates for efficiency, schedules leaves, recommends promotions, and accomplishes other personnel actions. Coordinates work schedules and activities with other affected sections.

c. Establishes and conducts on-the-job training for water and waste processing personnel: Orients and adjusts newly assigned personnel. Gives on-the-job training to persons and groups and conducts formal and informal conferences and discussions. Observes completed work to determine training requirements of persons or groups and provides for specific training. Maintains charts to indicate degree of development of each worker. Assigns on-the-job training phases to senior workers and evaluates effectiveness and adequacy of instructions. Insures all workers are familiar with applicable directives and procedures.

d. Inspects and evaluates water supply and water and waste processing activities: Performs preventive maintenance inspections, maintains inspection records, and initiates work orders to prevent breakdowns, remove fire hazards, and correct deficiencies. Periodically inspects activities to determine degree of compliance with regulations and policies. Inspects completed work to determine quality standards have been met and such standards are adequate. Inspects for proper care and maintenance of tools, equipment, and supplies. Discusses findings of inspection with immediate supervisor and recommends action to improve operation or correct deficiencies. Perfomrs in-plant tests of water and wastes and monitors treatment efficiency and conformance to criteria.

e. Performs technical water and waste processing functions: Adapts and implements plans, specifications, policies, and regulations to fit requirements of activity. Operates water supply system and water and waste processing plants. Plans and sketches additions or alterations to water supply and sewage systems and industrial waste processing systems. Coordinates all radioactive waste handling, storage and disposal with Base Medical Services. Performs inspection, maintenance, major modification, trouble shoots complex repair situations, and other maintenance on industrial water treatment equipment in support systems. Bench checks reparable component parts and sub assemblies of industrial water treatment equipment by using test equipment, standards, and other equipment as may be required by technical data. Determines the extent of repair/rebuild and accomplishes same by fabricating parts or using new parts. Tests and calibrates repaired items to assure adequacy of repair action and to determine reliability of repair action. Interprets maintenance malfunction data related to water treatment systems to prevent failure of the system being supported.

3. SPECIAL QUALIFICATIONS

a. Knowledge: Knowledge of principles of chemistry and physics as applied to water procurement, purifying, and distribution; and waste products processing and disposal is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

b. Education: Completion of high school with courses in basic physics, biology, chemistry and blueprint reading is desirable.

c. Experience: Qualification as Water and Waste Processing Specialist is mandatory. In addition, experience in supervising functions such as

operation and maintenance of water and waste processing systems.

d. Training:

(1) Completion of an advanced course in water waste processing is desirable.

(2) Completion of appropriate base level management course is desirable.

e. Other: Physical requirements for missile duty as defined in AFM 160-1 apply.

4. SPECIALTY DATA

a. Grade Spread: Technical sergeant and master sergeant.

b. Related D.O.T. Jobs:

Sewer and Waterworks Foreman.....5-94.180

Foreman (Waterworks).....5-95-340

Purification Plant Operator.....0-16-01

content, and physical characteristics to determine appropriate treatment methods and chemical dosages for water purification, softening, and stabilization, and scale and corrosion control. Applies chemicals to water using equipment such as dry gravimetric and volumetric feed machines, solution and slurry mixing devices, automatic gas proportioners, and chlorinators. Operates water treatment equipment such as electrodialysis demineralizers, cation and anion exchangers, hot and cold process water softeners, vapor-compression water distillation units, pressure and gravity filters and photometric controls and all allied industrial water processing equipment.

c. Operates waste processing plants and systems and performs waste processing functions: Operates sewage and industrial waste treatment and disposal facilities, systems, and equipment to control effluent quality. Operates or monitors equipment such as sewage lift pumps, ejector stations, distributors, meters and metering flumes and weirs, sedimentation tanks, aeration tanks, waste gas boilers, flame safety units, communitors, shredders, screens rotary sludge collectors, sludge pumps, chlorinators, and electrical, mechanical, hydraulic, and pneumatic control devices. Monitors sewage and industrial wastes for detection and measurement of radioactive, chemical, and biological contaminants. Conducts laboratory testing of waste products, using special test equipment and materials, to determine purification and disposal processes. Tests and analyzes incoming sewage and plant effluents to evaluate plant performance. Determines proper methods and materials for treatment of liquid wastes, amounts of materials and chemicals required, point for application, and time scheduling of treatment phases. Devises

Effective 30 September 1964

AFM 39-1 E
AFSC 56350
Semiskilled AFSC 56330

AIRMAN AIR FORCE SPECIALTY

★ WATER AND WASTE PROCESSING SPECIALIST

1. SPECIALTY SUMMARY

Operates, maintains, and repairs water supply, water processing, and waste processing plants and systems.

2. DUTIES AND RESPONSIBILITIES

a. Operates water supply systems: Operates water pumping, storage, and distribution components and equipment such as pumps, engines, motors, valves, and associated mechanical and electrical measuring and control devices. Operates valves and switches or adjusts automatic controls to pump water from wells, surface supplies, water mains, or storage tanks and supply water to potable water treatment and distribution systems; or non-potable industrial and fire protection systems. Locates and calculates quantity of water sources. Calculates water requirements and tank capacities. Locates water system lines, valves, and controls by use of maps, blueprints, and schematic diagrams. Interprets gages and meters to control pumping, storage, and distribution of water. Maintains logs and submits reports on water usage and operation of systems equipment. Advises and issues instructions on water conservation. Maintains file or current maps and plans of water distribution systems and equipment manufacturer's instructions.

b. Operates water processing plants and equipment: Monitors raw water supply for detection of chemical, biological, and radiological contaminants. Analyzes both raw and treated water by use of chemicals and water testing apparatus to detect contaminants, determine chemical

methods and means for disposal of solid wastes. Collects, packages, stores, and prepares radioactive wastes for dispatch to proper disposal area or agency.

d. Performs organizational and field maintenance of water and waste processing equipment systems and controls: Assists in major overhaul of above equipment; services power source engines with fuel, oil, coolants, and lubricants. Performs maintenance and repair of water plant and systems components such as pumps, engines, motors, valves, tanks, condensers, cooling towers, chlorinators, flouridators, and distillation, demineralizing, and softening units. Performs maintenance and repair of waste products plant and systems components such as pumps, ejector stations, distributors, tanks, boilers, communitors, shredders, screens, rotary sludge collectors, chlorinators, and wood, metal, masonry, and concrete structures. Locates pipe lines, valves, and fittings by use of current maps and electronic locator equipment. Calibrates, adjusts, and performs minor repair of electrical, mechanical, hydraulic, and pneumatic control devices. Maintains special water and waste products testing and analyzing equipment and materials.

e. Supervises water and waste processing personnel: Instructs subordinates in techniques of operation and maintenance of water and waste processing plants, systems, and equipment. Assigns and monitors work to insure compliance with local procedures and applicable technical orders.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of principles of chemistry and physics as applied to water procurement, purifying, and distribution; and waste products processing and disposal is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

b. Education: Completion of high school with courses in basic physics, biology, chemistry, and blueprint reading is desirable.

c. Experience: Experience in functions such as operation of water supply and distribution systems, testing and processing of water, and collection, processing, and disposal of sewage and industrial waste products is mandatory.

d. Training: Completion of a basic course in water and waste processing is desirable.

e. Other: (1) A minimum aptitude level of Mechanical 40 is mandatory.

(2) Physical requirements for missile duty as defined in AFM 160-1 apply.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Water Filterer----------7-54.621

Purification Plant Operator----------0-16.01

Effective 30 September 1964

AFM 39-1E
AFSC 56670

AIRMAN AIR FORCE SPECIALTY

ENGINEERING ENTOMOLOGY TECHNICIAN

1. SPECIALTY SUMMARY

Performs activities engaged in controlling and preventing insects, rodents, arthropods, pests, and fungi; inspects, trouble-shoots, and operates spraying and dusting equipment; conducts special tests with pesticides, and supervises engineering entomology activities.

2. DUTIES AND RESPONSIBILITIES

a. Advises on technical problems for prevention and control of insects, pests and rodents: Solves complex problems by determining the prevention and control measures to be applied. Establishes scheduled preventative operations; types and amounts of application, and coordinates with medical activities in surveying, testing and planning corrective programs to provide for control of insects, pests and rodents.

b. Performs technical entomological functions: Makes decisions regarding toxic solution type, content and application procedures. Prescribes application cycles for spraying, dusting and fumigating activities. Operates, maintains, and calibrates equipment, prescribes procedures for jobs not covered by precedent. Adapts and implements plans, specifications, policies, and regulations to fit requirements of activity. Determines formula and quantity of toxic solutions

301

applied. Accomplishes tasks beyond technical capabilities of Entomologist Specialist.

c. Inspects and evaluates entomology activities: Inspects buildings, materials, supplies, equipment, shops, and grounds. Determines efficacy of entomological procedures required for prevention and control of insects, rodents, other arthropods, and fungi. Inspects spraying, dusting, and fumigating work to insure that safety and quality standards have been fulfilled and are adequate. Inspects activities and checks areas of toxic applications if endangerous to health. Inspects for safe storage and transportation of toxic solutions and supplies and proper storage and maintenance of equipment and tools and for presence of safety hazards. Inspects completed work orders to prevent misuse of materials and to insure that costs are charged to proper cost codes. Discusses findings of inspections with immediate supervisor and recommends action to improve protection or correct control and prevention deficiencies.

d. Supervises engineering entomology personnel: Inspects workers during performance of duties to insure compliance with specifications and established methods and procedures. Determines that proper toxic solutions, equipment and tools have been selected for accomplishment of work. Makes immediate corrections of unsafe practices or malfunctioning equipment during work processes. Takes follow-up actions on work assignments to determine progress in line with schedule. Maintains records of time spent on individual jobs for purpose of cost accounting and to provide information to establish work standards.

Checks use of solutions and equipment to correct wasteful practices. Promotes harmonious relationships and resolves personnel problems. Rates subordinates for efficiency, schedules leave, recommends promotions, and accomplishes other personnel actions. Coordinates work schedules with other affected sections. Orients newly assigned personnel. Conducts on-the-job training and insures that all applicable directives and procedures are adhered to.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of principles of toxic solution formula, application, and storage; safety codes and practices; capacity and technical operating procedures of dusting, spraying, and fumigating equipment; techniques of entomological collecting and testing; characteristics and habits of insects, rodents, arthropods, pests, and fungi; and techniques to control and prevent degeneration of buildings, equipment, vegetation and land by destructive insect or fungi is mandatory.

b. Education: Completion of high school with courses in chemistry, biology, general agriculture, or blueprint reading is desirable.

c. Experience: Qualification as an Engineering Entomology Specialist is mandatory. In addition, experience in performing or supervising functions such as testing, controlling, and preventing insects, rodents, other arthropods, antisocial pests, and fungi or inspecting, trouble shooting, and operating spraying, dusting, and fumigating equipment is mandatory.

d. Training:

(1) Completion of appropriate base level management course is desirable.

(2) Completion of an engineering entomologist course is desirable.

(3) Completion of an advanced preventive medicine course is desirable.

4. SPECIALTY DATA

a. Grade Spread: Technical sergeant and master sergeant.

b. Related D.O.T. Jobs:

Vermin Exterminator---------- 7-89.123

Termite Treator---------- 5-59.950

Sanitary Inspector---------- 0-96.16

Sanitary Technician---------- 0-66.41

Entomologist---------- 0-35.30

Effective - 30 September 1964

AFM 39-1 E

AFSC 56650

Semiskilled AFSC 56630

AIRMAN AIR FORCE SPECIALTY

ENGINEERING ENTOMOLOGY SPECIALIST

1. SPECIALTY SUMMARY

Performs work for implementing, conducting, and evaluating programs and plans for effective control and prevention of insects, rodents, other arthropods, pests, and fungi.

2. DUTIES AND RESPONSIBILITIES

a. Performs entomological work: Conducts operation, including tests, to ascertain degree of engineer entomology operations for control of insects, other arthropods, rodents, and fungi that are pests of area. Collects specimens of disease and germ bearing and destructive pests, such as mosquitoes, flies, termites, and rodents. Studies specimens as directed to establish identity, confirm breeding habits or appearance cycle, and observe special characteristics. Reviews local data to determine cyclical characteristics not otherwise available. Coordinates with medical activities in surveying, testing, and planning corrective programs to provide for control of insects and pests.

b. Applies toxic pesticides: Applies toxic pesticides on interiors and exteriors of buildings and other structures and foundations above and below surface. Selects toxic mistures non-destructive to buildings, paints, and vegetation, such as trees, grass, bushes, and plants. Maintains control over toxic mixtures use, such as lindane, chlordane, nicotine-sulfate, methyl bromide, calcium cyanide, and others. Identifies and measures quantities of solutions needed for maximum safe control. Performs observa-

305

tions to determine qualitative effectiveness of solutions used. Conducts periodic observations to determine effectiveness of pesticides applied.

c. Performs control operations: Selects appropriate toxic solution for control and prevention of pests. Selects proper procedure to provide effective, economical, and safe application. Organizes and accomplishes preventive pest control on scheduled cycle. Insures health of individuals and safety of property will not be adversely affected or impaired by application of toxic solution. Fumigates supplies, equipment, buildings, houses, and other structures. Provides support for aerial dispersal of insecticides. Operates precision pesticide dispersal equipment, such as thermal insecticide generators, turbine mist sprayers, power drive hydraulic sprayers, power and hand operated dusters, compressed air sprayers, fumigation chambers, and wood preservative application equipment.

d. Performs preventive operations: Performs scheduled preventive pest control operations, such as soil poisoning for termites, residual sprays, and outdoor area controls. Detects incipient pest populations and takes eradication action. Checks for changes in pest activity during preventive cycle to prevent destructive outbreaks. Treats soil for subterranean pest control. Selects chemical formulas to provide most effective residual treatments. Maintains records of preventive controls applied.

e. Operates and calibrates dispersal and safety equipment: Operates precision dispersal equipment, such as thermal insecticide generators, turbine mist sprayers, power driven hydraulic sprayers, power and hand dusters, compressed air sprayers, and fumigation chambers. Checks and calibrates equipment mixing mechanisms. Tests and adjusts dispersal equipment and isolates areas of malfunction and performs field maintenance. Selects

equipment for spraying, dusting, indoor, outdoor, underground, above ground, and fumigation work. Provides safety equipment, such as synthetic or rubber gloves, respirators, goggles, and gas masks.

f. Maintains tools and equipment: Cleans and maintains all associated tools and equipment, evaluates authorized equipment for performance and ease of maintenance, and recommends modifications or changes. Recommends and justifies new equipment for inclusion on Engineer E-AID as required.

g. Supervises engineering entomology personnel: Serves as leader of engineer crews engaged in applying pesticides and other toxic solutions. Instructs operating personnel on safety precautions of fumigating, poison baiting, spraying, and dusting procedures. Supervises mixture, transportation, storage, and safe handling of toxic solutions by operating personnel. Instructs personnel in operating, maintaining, and storing of equipment and tools.

3. SPECIALTY QUALIFICATIONS

a. Knowledge: Knowledge of principles and methods employed in control and prevention of such pests as rodents, insects, and other arthropods, and fungi; knowledge of chemicals used in mixing of toxic pesticide solutions, and directions prescribed for use; and storage of toxic solutions spraying and dusting equipment, and other tools is mandatory. Possession of mandatory knowledges will be determined in accordance with AFM 35-1.

b. Education: Completion of high school with courses in chemistry, general agriculture, or blueprint reading and interpretation is desirable.

c. Experience: Experience in operating and maintaining insect and rodent control equipment or application of toxic pesticides is mandatory.

d. Training: Completion of a basic disease vector control course is desirable.

e. Other: A minimum aptitude level of General 60 is mandatory.

4. SPECIALTY DATA

a. Grade Spread: Airman second class through staff sergeant.

b. Related D.O.T. Jobs:

Vermin Exterminator----------7-89.123

Termite Treater----------5-59.950

Sanitary Inspector----------0-96.16

Sanitary Technician----------0-66.41