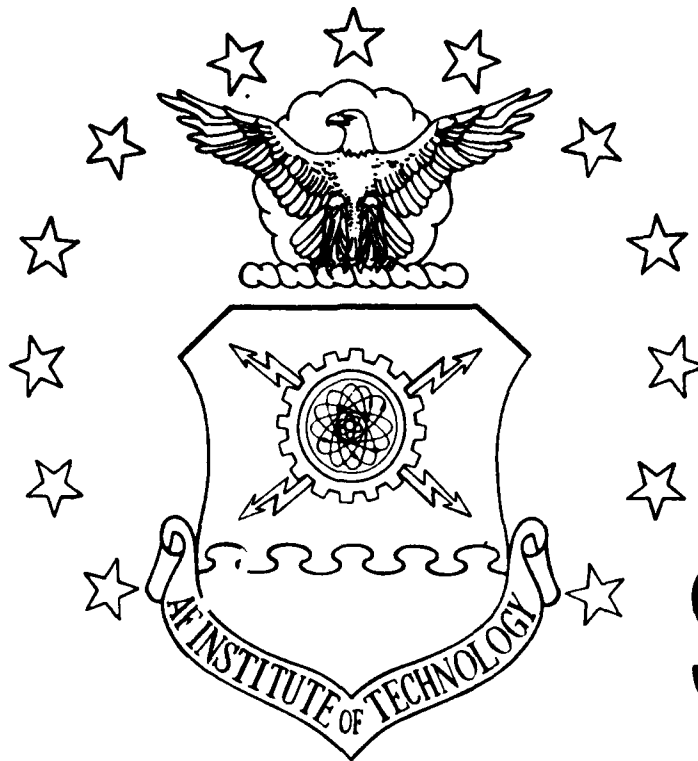


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AN ANALYSIS OF THE PERCEIVED ADEQUACY OF
 CURRENT PROGRAMS TO PREPARE CIVIL
 ENGINEERING OFFICERS TO ASSUME THE
 RESPONSIBILITIES OF BASE CIVIL ENGINEER

THESIS

Mary L. Vroman
 Captain, USAF

AFIT/GEM/I.SH/86S-28

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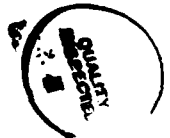
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Abstract

The purpose of this thesis was to determine the perceived adequacy of current programs to prepare civil engineering officers to assume the responsibilities of Base Civil Engineer. Research questions consisted of determining which existing civil engineering positions and AFIT short courses were most useful to Base Civil Engineers, and gathering suggestions for improvement to the existing system. A survey questionnaire was developed and distributed to Base Civil Engineers in the Continental United States. Analysis of survey responses indicated that almost all respondents believed they had been adequately prepared to become Base Civil Engineers. Experience in four areas was considered to be of high value - operations, engineering (with an emphasis on programming), management consultant services, and readiness. A variety of experience at all levels, with a strong background at base level, was also perceived as beneficial. It was concluded that current programs are adequate to prepare civil engineering officers for the responsibilities of Base Civil Engineer; however, Base Civil Engineers seemed to place a higher value on previous assignments than on AFIT short courses. Additional emphasis was recommended in the areas of commander responsibilities, fire protection, and financial management.

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THE RESPONSIBILITIES OF BASE CIVIL ENGINEER

THESIS

Presented to the Faculty
of the School of Systems and Logistics
of the Air Force Institute of Technology
Air University.

In Partial Fulfillment of the
Requirements for the Degree of
Master of Science in Engineering Management

Mary L. Vroman
Captain, USAF

September 1986

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The contents of the document are technically accurate, and no sensitive items, detrimental ideas, or deleterious information is contained therein. Furthermore, the views expressed in the document are those of the author and do not necessarily reflect the views of the School of Systems and Logistics, the Air University, the United States Air Force, or the Department of Defense.

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I. Introduction

General Issue

The most visible civil engineering job at base level is that of Base Civil Engineer. His or her performance affects the quality of day-to-day service provided to base customers by the civil engineering work force, civil engineering readiness capability, and concurrently the customer's perception of civil engineering as a whole.

Most career civil engineers will be selected to become Base Civil Engineers at some point in their career; however, it is not clear if current career development patterns provide the training and background necessary for success in this critical and highly visible position.

Specific Problem

The specific problem to be addressed is to determine if current career development patterns and training adequately prepare civil engineering officers to assume the responsibilities of Base Civil Engineer, and to identify areas requiring changes, if any.

Investigative Questions

In order to investigate the adequacy of the existing career development program, to prepare civil engineering officers to assume the responsibilities of Base Civil Engineer, five investigative questions must be answered.

1. What responsibilities and duties are required of a Base Civil Engineer?

2. Do most new Base Civil Engineers feel well-prepared to assume the responsibilities/duties associated with their new position?

3. What types of jobs or short courses are perceived by current Base Civil Engineers as most useful in preparing civil engineering officers to assume the responsibilities/duties of Base Civil Engineer?

4. Which responsibilities/duties do Base Civil Engineers identify as requiring training or preparation additional to that currently found in the normal career path of a civil engineering officer?

5. What options to better prepare junior civil engineering officers to assume the responsibilities of Base Civil Engineer are recommended by those currently filling that position?

Once these five investigative questions are answered, it can be determined if the existing career development program for junior civil engineering officers to prepare them to assume the responsibilities of Base Civil Engineer is

perceived to be adequate or in need of improvement. If improvement is deemed necessary, potential options to better prepare junior officers to become Base Civil Engineers will be identified.

II. Literature Review

Background

Career development is an organized system of planning future career paths for employees within an organization (2:52, 8:78, 9:29). Organizational and individual needs must be balanced in any career development program, resulting in two different, yet related, perspectives for study (2:52, 9:29).

Career management looks at the formal career development programs established by an organization. Organizational needs and characteristics play the greatest role in determining the types of programs established, although management should also be sensitive to the individual needs of their employees (2:52, 9:29).

In contrast, the career perspective view analyzes individual career paths through an organization in relation to individual needs, capabilities and experiences (2:52, 13:40).

Both perspectives are important to insure successful career development. Although the ultimate responsibility for career development falls upon the individual (1:8, 4:9, 9:32, 15:18), management must define career progression ladders and establish programs to develop employees capable of performing tasks typical of positions higher in the organizational structure (3:15-16, 4:9, 10:81).

If an organization does not define guidelines for career progression, it is difficult for managers to plan their own careers or to develop themselves to move into positions of greater responsibility (2:54, 3:15-16, 4:9).

Since the health of an organization in the long run is dependent on the quality of its leadership, it is important that an organization provide for career development through the different organizational levels to insure that qualified individuals are trained and available to move into leadership positions when vacancies occur (2:59, 3:15, 10:81).

Researchers have also noted that organizations which provide career development programs for their employees find it easier to attract high quality individuals (11:46).

Programs

Organizations have established many different types of career development programs in their attempts to develop future corporate leaders. Some approaches identified in the literature review are career pathing (2:59, 4, 11), action profiles (3), and career counseling or assessment centers (2:59, 4, 11:46, 13:41).

Career Pathing. Career pathing identifies guidelines for expected progression through the organization (2:59, 11:46). Paths can be classified as traditional/political, job/behavior, or a combination of the two (11:46).

The traditional/political approach relies heavily on the past to predict future requirements and potential avenues of career progression. Movement is confined within similar job types or professional groups (11:46). Since the organization accepts established relationships between jobs and traditional movement patterns as norms, it is easy for management to develop and maintain paths. However, many managers do not publicize job opportunities, but instead seem to rely on subordinates' initiative in networking or politics to discover the avenues appropriate for them (11:46). The organization tends to assert that career development is the responsibility of the employee; however, managers often determine the pattern and timing of the employee's movement from one job to another (1:6, 11:46). Although the rate of movement upward is frequently based on tenure in the organization, the opportunity and ability to interact with upper-level managers increases the employee's chances for early recognition and quicker progression up the career ladder (11:46). Traditional/political paths work best in an organization with few jobs and one function (11:48).

In contrast, job/behavior pathing is developed based on a study of similar and dissimilar attributes of jobs within the organization (11:47). Management first identifies the jobs to be analyzed, then defines the jobs in terms of attributes required by the employee to successfully accomplish tasks assigned. Attributes include knowledge,

skills, experience, and job behavior of the employee (2:59, 3:16, 11:47). Management then consolidates jobs with similar attributes into job families. It then uses these job families to develop paths for both horizontal and vertical movement of employees (11:47).

Since jobs requiring similar skills and abilities are identified, career paths can include movement between jobs that appear to be different but that require similar skills and abilities, as well as movement between similar jobs which require many of the same skills and capabilities (11:47). This capacity to develop career paths that progress at different rates lets employees move through an organization at the rate with which they feel most comfortable yet still show career progression. One drawback to this approach is that the development process must be reaccomplished each time a job changes or when a new job is added, which is time-consuming and expensive (11:46-48). Job/behavior paths are best used in an organization with many different functions and levels (11:48).

The Air Force combines elements of both these approaches in its career development programs, although the career progression guides given in AFR 36-23, Officer Career Development, fit most closely under the traditional/political model (4, 11:46).

Career progression guides are provided for all primary groupings of officer specialities. The guides cover five

main areas important in insuring that experience gaps in an officer's development are filled and that overall performance matches the requirements of the position occupied (4:9). The five areas are (1) years of military service, (2) grade, (3) assignments, (4) professional military education, and (5) formal and continuous technical education (4:41). The guides identify goals that indicate typical progression for each phase of an officer's career, but do not limit career movement to one narrow path (4:41). Each level lists many potential assignments, so that the opportunity to progress is not restricted to the few assigned to the "best" jobs (4:122). The Air Force encourages movement between career fields to expand the experience of selected officers and to allow interested officers the opportunity to move to new career fields. Movement can aid career development when upper level positions in the first fields are not open to officers on their way up (4:11).

The regulation also advises the individual officer to take the initiative in planning future career steps (4:9). Officers should use the career progression guides to determine deficiencies in their career paths and plan corrective actions in the appropriate areas (4:41).

AFR 36-23 and its career progression guides are reviewed every second year by functional managers and the Air Force Military Personnel Center to insure career development

information provided to officers is current and thus beneficial to both the officer and the Air Force (4:41).

Action Profile. An action profile is a description of the managerial skills, capabilities, and individual characteristics required to perform well in a specific position (3:16). Senior managers develop a profile through a series of discussions on the ingredients necessary for success in the position identified (3:16).

Alcan Aluminium Limited used an action profile to describe the job of Field Vice President. They selected this position because of its importance, visibility, permanence, and because its corporate position required a description of line and staff positions under it and their interrelationships. In addition to the actual action profile, management provided an in-depth description of the position, its varying roles, and its responsibilities, as well as an analysis of the incumbents' backgrounds to determine similarities in career progression patterns which could aid career development through on-the-job training (3:18).

The action profile is divided into three categories: senior management capabilities, management skills, and individual characteristics (3:18-21). Senior management capabilities describe thought patterns and attitudes toward the environment that differentiate the job under study from subordinate jobs. Some examples are thinking in strategic

terms, processing data quickly, making decisions under uncertain conditions, sensitivity to political, cultural, and societal matters, and knowledge of the organization (3:18-19). Management skills are required at all management levels and include structuring work, arbitration, personal diplomacy, and briefing ability (3:19-20). Individual characteristics are always important, but especially so when dealing with the top executives of an organization. Some key assets described are good health, bearing, humor, general knowledge, and the ability to learn (3:20-21).

Burnett identified three benefits of using the action profile. Since the focus is on desired behavior patterns, it is easier to identify individual strengths and weaknesses and then plan to enhance strengths and correct weaknesses. Next, since the perspective is common throughout the organization, information also flows through the whole organization. Finally, since a top management position is described, employees tend to focus more on their own long-term goals (3:21).

In summary, the main concepts of the action profile appear to fit well into the job/behavior approach to career pathing. Both profess that increased knowledge of the capabilities necessary to assume positions of greater responsibility will result in greater opportunities for junior managers to move into those positions successfully (3:21, 11:48).

Career Counseling. Career counseling is a means of connecting organizational goals and opportunities with employee aspirations and capabilities (14:22). There are several stages to a typical counseling session: preparation; general introductory comments; review of subordinate performance, skills, and desires; agreement on choice of next job and a list of the skills required for that job; discussion of long-term goals and possible paths to achieve those goals; determination of specific actions required for each path; closing comments; and follow-up (14:22).

Many organizations use career counseling in conjunction with career pathing and/or action profiles. Supervisors use formal career paths to identify and discuss with subordinates available upward or lateral moves, requirements for each potential move, and the degree to which employees meet the requirements stated (2:59, 4:41). Other managers use an action profile for a particular job to identify employee strengths and weaknesses relative to the employee's desired progression through the organization (2:59, 3:21).

A new concept combining counseling and pathing is the "human resource broker" (13:41). This individual is responsible for developing future corporate leaders by monitoring career plans for top executives (13:41). One of his or her key functions is "creating cross-functional and cross-divisional rotational assignments" (13:41).

In the Air Force, "management must provide guidance and opportunities for career development, and create a climate that engenders growth" (4:9). Career management teams assigned to the Military Personnel Center analyze and compare Officer Career Objective Statements (AF Form 90) against the officer's job and performance history to develop the career path that will best benefit officer and Air Force needs (4:12). Immediate supervisors are also key in career counseling efforts. They evaluate performance, insure the subordinate grows in the ability to accomplish increasingly difficult tasks, and recommend the officer for further training, career broadening or higher level assignments (4:17).

Base Civil Engineer Responsibilities

Within the 55xx career field, the position of Base Civil Engineer is the most senior at base level. The career progression of young civil engineering officers should include jobs and training that will familiarize them with and prepare them for the responsibilities and tasks associated with this position.

Responsibilities of the Base Civil Engineer are listed here as excerpted from AFR 85-10, Operation and Maintenance of Real Property. The Base Civil Engineer

plans, directs, supervises, and coordinates all civil engineer activities in the broad areas outlined below, regardless of source of funds or method of accomplishment:

- Management of Air Force real property.
- Provision of utilities.
- Maintenance and repair of structures and equipment.
- Provision of custodial, sanitation, and entomological services.
- Fire protection and rescue.
- Recovery from damage to facilities from any cause, including decontamination assistance in recovery from chemical, biological, or radiological incidents or attacks.
- Management of the Base Engineer Emergency Force (BEEF) Program, as required by AFR 93-3. Accomplishes disaster preparedness actions and provides assistance in disasters according to the AF 355 series of directives.
- Reports, through the Air Force Operational Reporting System (AFM 55-11), installation damage, assistance, and funding required to recover airbases.
- Environmental Protection
- Natural Resources
- Construction and Alteration of Structures [5:9].

Conclusion

Career development is concerned with fulfilling both organizational and individual needs (2:52, 9:29). Although development is primarily the responsibility of the individual, the organization must define guidelines and provide assistance for employees to move into jobs that will prepare them for future high-level jobs (1:8, 3:15-16, 4:9, 9:32, 10:81, 15:18).

Pathing is the most common type of career development program. It can be used independently or in conjunction with action profiles and/or career counseling.

Pathing can be traditional/political, job/behavior, or a combination of both (11:46). The best approach combines managerial support (traditional/political) and ready availability of data on key jobs (job/behavior) (11:48).

Career paths in the Air Force offer individual officers a variety of job assignments, but not necessarily ones that will train them in the skills required at the next level.

In civil engineering, most lieutenant colonels are operations branch chiefs, Base Civil Engineers, or in staff positions. The highest position in the engineering branch is usually filled by a major or a civilian. Despite this future placement pattern, most lieutenant and captain positions are in the engineering branch -- an average of six in engineering compared to two in operations.

The Base Civil Engineer is responsible for all areas of civil engineering. Experience in as many of those areas as possible would be of great benefit. It would appear that adequate opportunity is provided to young civil engineering officers to gather experience in the engineering branch; however, it is not clear that sufficient opportunity to gather experience in other areas of civil engineering is as readily available.

Research should be conducted to determine if current career development patterns adequately prepare civil engineering officers for the Base Civil Engineer position and identify what changes, if any, would enhance current efforts.

III. Methodology

Overview

This chapter describes the methodology used to answer the research questions stated in Chapter I. Five areas are covered: justification of use of a survey to collect data, the survey instrument development, population description, data collection plan, and an explanation of the statistical methods used to analyze the data gathered.

Justification

Since data was currently not available to answer the research question, data had to be gathered. There were two options to gather data: questioning and observation. Since answers to the investigative questions would rely primarily on the perceptions of individuals currently in the Base Civil Engineer position, questioning was the obvious choice as perceptions could not be observed.

Personal interviews were not practical because of the wide geographical dispersion of the population. A mailed survey was chosen over telephone interviews because of the large amount of information being requested and because a survey would insure that all of the individuals in the selected population would be contacted and in a more timely manner than by phone.

Survey Instrument

The survey instrument used to gather data consisted of a cover letter and a four part questionnaire. The entire survey is reproduced in Appendix A.

The cover letter was designed to provide the survey recipients with some background on the research topic and explain the purpose of the survey sufficiently to encourage their interest and response. The Dean of the School of Systems and Logistics signed the cover letter to emphasize the importance of the survey. Anonymity was assured to encourage true and open responses to questionnaire items.

Part I of the questionnaire gathered demographic data to include the major command and base size of the respondent, an assessment of how well prepared the respondent felt to assume the responsibilities of Base Civil Engineer, and the respondents' opinion of the value of previous assignments and classes attended in helping them to function successfully in the Base Civil Engineer position. Multiple choice answers to these five questions were provided to cover all possible responses, including "other," where appropriate. Base size categories were selected based on a review of previous AFIT surveys designed for distribution to Civil Engineering personnel at CONUS bases. A three-point scale was used to rate the degree of overall preparation as assessed by respondents, from "not well prepared" to "well prepared." Value assessments of previous assignments and AFIT short

courses were scaled from "not related" to "very high value," with one additional entry for those who had not taken any AFIT short courses for the question pertaining to the value of the short courses. These five demographic questions were used to provide a profile of the responding group for the data analysis portion of the research.

In Part II, civil engineering positions were rated in terms of their perceived value in preparing the respondents to assume Base Civil Engineer responsibilities. Positions were separated into four sections defined by the level of authority. Section I listed positions found at base level; Section II, major command level; Section III, positions at the Engineering and Services Center; and Section IV, air staff positions. Positions were identified from several different sources. Base and major command level positions were drawn from AFR 85-10 (5), major command directories, and the personal experiences of the researcher and fellow Engineering Management graduate students. Positions at the Engineering and Services Center and Air staff were gathered from the 1986 Directory Issue of The Military Engineer (16:19). To insure that all possible positions were covered, a category for "other" was included in each section. A six-point scale was used to rate the perceived usefulness of each position by each respondent who had held the position. Possible ratings for the perceived value of each position ranged from "not related" (0) to "very high value" (5). A

six-point scale allowed for meaningful differentiation between ratings. An additional point on the far right side of the scale (6) was included to indicate if the respondent had never held the position and so could not realistically assess its value.

To validate the ratings given for the positions listed in Sections I through IV of Part II and to further refine ratings by ranking, the respondents were asked to select and rank from high to low the five positions which they felt had been most beneficial in preparing them to assume Base Civil Engineer responsibilities.

Since it would have been extremely unlikely for any member of the responding population to have held all positions identified in the first four sections of Part II, Section VI was included in the questionnaire to gather the respondents' opinions as to which positions would have proved most beneficial if held. Respondents were asked to identify five positions and rank them from high to low. Since the intent was to gather opinions as to which positions would best prepare civil engineering officers for success as Base Civil Engineers, Section VI was open-ended to allow respondents to write in suggestions for new jobs that might provide experience in areas not covered by existing positions.

Sections V and VI together provided a listing of positions respondents thought were or would have been

beneficial to them as Base Civil Engineers. A maximum of five positions were identified by each respondent in section V and Section VI and ranked within each section from high to low.

Part III of the survey contained a list of Air Force Institute of Technology School of Civil Engineering short courses. This list was taken from Professional Continuing Education Program Information FY 86 (6). In section I, respondents were asked to rate each course for its relative usefulness in preparing them to assume Base Civil Engineer responsibilities. Ratings ranged from "not related" (0) to "very high value" (5). A six-point scale was used to allow for meaningful differentiation between scores. The rating value of six was included to identify those who had not attended the class being rated. In Section II, respondents were asked to select five courses which they would recommend to new Base Civil Engineers and rank them from high to low. This section was open-ended to permit respondents to suggest ideas for new courses to cover areas not currently taught in any of the short courses, but that were thought to be important in preparing Base Civil Engineers for the job. These rankings were used to validate the ratings given for those courses which respondents had attended and provide some indication of the perceived value of other courses which respondents had not attended but were aware of.

Part IV of the survey was an open-ended section designed to gather comments from the respondents on how to better prepare civil engineering officers for the position of Base Civil Engineer. The Base Civil Engineers who responded to this question had to invest additional time and effort to think of and then summarize their ideas on paper. This expenditure on their part would imply that the recommendations given in this part covered areas they believed were very important to their success as Base Civil Engineers. The comments provided by respondents in Part IV were not included in the statistical analysis. Since they did indicate areas where respondents felt additional training and/or exposure would have been beneficial to them as Base Civil Engineers, however, they are reproduced in Appendix B in their entirety.

The questionnaire was reviewed by fellow Engineering Management graduate students and the thesis advisor. Based upon their inputs, some revisions were made in the wording of the questions, the content of the items provided for response, and the format. The questionnaire was then submitted to and approved by the Research and Measurement Division, Air Force Manpower and Personnel Center, Randolph AFB, Texas. It was assigned USAF Survey Control Number 86-66, which was valid until 31 December 1986. Survey questionnaires were distributed on 30 May 1986. All completed questionnaires had been received by 15 July 1986.

Population

The population of interest consisted of all officers currently assigned to a Base Civil Engineer position at one of 73 Air Force bases in the continental United States. Base Civil Engineers were identified by name through an Atlas Variable Inquiry for all individuals, second lieutenant through colonel, holding the DAFSC, A55xx. A census was taken because of the small size of the population.

Officers who had previously held a Base Civil Engineer position, but were not currently assigned to that position, were excluded due to difficulty in identifying them within the time constraints of this research project.

Data Collection Plan

Questionnaires were mailed to the 73 individuals identified as members of the population. The current squadron and address for each individual were obtained from the Atlas Variable Inquiry.

In addition to the questionnaire and cover letter explaining the purpose of the research, a pre-addressed return envelope was enclosed in the package to make returns more convenient for the respondent. Survey recipients were also instructed to make their responses directly on the questionnaire in an effort to simplify the completion process and so encourage returns.

Responses given in the returned questionnaires were encoded manually by line item, using the numerical value associated with the response to allow for statistical analysis of the data provided.

Data Analysis

Since a census was attempted for a relatively small population, descriptive statistics were appropriate to analyze the data. Although a 100 percent return rate was not achieved, the actual rate of 66 percent was greater than the 60 percent return rate considered average for Air Force surveys (12:48).

The response identifying the major command of the respondent was nominal level data. All other data collected was ordinal level. The number and percentage of responses in each category were computed for both nominal and ordinal data collected in Part I. The number, percentage of total responses, median, and range of responses; excluding responses of "not held" and "not attended;" were calculated for ordinal data gathered in Parts II and III. The mean and variance were also calculated to provide additional information where medians were identical. Although these last two measures are appropriate only where data is of at least interval level, if the assumption is made that the intervals between the scale responses are of equal value, which the wording of the scales was intended to portray, then

the ordinal data gathered can be treated as interval level (7:88-91). This assumption was made solely to distinguish between identical medians.

The median response was calculated for each position listed in Part II (Sections I-IV) and for each short course listed in Part III (Section I). Two separate lists were then made, one ranking positions from the highest to the lowest median, the other ranking short courses in the same manner. The mean was used to break ties when two or more responses within one of the parts had identical medians. Those positions at the top of the list were considered most valuable by Base Civil Engineers who responded and who had held those positions. The short courses ranked on top were considered most valuable by the respondents who had attended the courses identified. The perceived value of the positions or short courses identified decreased in proportion to their proximity to the bottom of their respective lists.

To validate and further refine the individual ratings of positions in Part II, a section (Section V) to select and rank the top five positions was included. Respondents were asked to list in order of importance five positions that they believed had been most beneficial to them as Base Civil Engineers. Since this section required the respondent to have held the position in order to rate it in his top five, an additional open-ended section (Section VI) was added to identify in priority order the five positions which the

respondent felt would have proved most beneficial to him as a Base Civil Engineer if held. Respondents could also identify optional positions or positions not currently part of the Civil Engineering organizational structure in their response for this section.

In Part III, an open-ended section (Section II) to rank the top five courses was included to validate ratings given in the previous section, provide respondents an opportunity to indicate if they perceived high value for courses which they had never attended, and offer suggestions for the establishment of new courses to fill current voids in training if applicable. Respondents were asked to list the five courses which they would recommend to new Base Civil Engineers starting with the most beneficial.

All three sections requesting respondents to rank order their top five inputs were scored in the following manner. The first input was assigned the numerical value of "5," the second a "4," and so forth. Scores were summed for each position and course. Positions and courses were then listed separately in order from high to low. Those at the top of their respective list were considered to be of most benefit by the Base Civil Engineers who had responded to the survey.

Again, the perceived value of the positions and courses identified decreased in proportion to their nearness to the bottom of their respective list.

In the next chapter, survey results will be presented and analyzed.

IV. Findings and Analysis

This chapter is divided into two sections. The first section provides a summary of the demographic data collected in Part I of the survey. The second section presents an analysis of the data collected in Parts II and III of the survey.

Section A: Demographic Information

This section presents a limited profile of the respondents based on demographic data provided in Part I of the survey. Data are given in table form for ease of interpretation.

Command and Base Data

Survey Question 1. Table 4-1 shows the number and relative percentage of respondents by command.

TABLE 4-1
Command Data

Command	Surveys Returned	Percent of Total Returned
AFLC	4	8.3
AFSC	2	4.2
ATC	5	10.4
MAC	9	18.8
SAC	15	31.2
TAC	11	22.9
Other Commands	2	4.2
Total	48	100.0

Survey Question 2. Table 4-2 presents the number and relative percentage of respondents by base size.

TABLE 4-2

Base Size Data

Base Size	Surveys Returned	Percent of Total Returned
Less than 5000	11	23.4
5000 - 7500	16	34.0
7500 - 10000	7	14.9
More than 10000	13	27.7
Total	47*	100.0

*One respondent did not provide an answer to this question

Value Assessment Data

Survey Question 3. Table 4-3 summarizes the respondents' assessments of the adequacy of their preparation to assume the responsibilities of Base Civil Engineer by number and relative percentage. 91.7 percent of the respondents believed they were adequately or well prepared to become Base Civil Engineers.

TABLE 4-3

Overall Assessments of Adequacy of Preparation

Assessment	N	Percent
Not well prepared	4	8.3
Adequately prepared	19	39.6
Well prepared	25	52.1
Total	48	100.0

Survey Question 4. Table 4-4 presents the respondents' opinions of the value of previous assignments in helping them to prepare to become Base Civil Engineers by the number and relative percentage of responses in each category. 81.3 percent of the Base Civil Engineers responding believed previous assignments were of high or very high value.

TABLE 4-4

Perceived Value of Previous Assignments

Value	N	Percent
Not related	1	2.1
Very low value	1	2.1
Low value	3	6.2
Moderate value	4	8.3
High value	19	39.6
Very high value	20	41.7
Total	48	100.0

TABLE 4-5

Perceived Value of AFIT Short Courses

Value	N	Percent
Not related	1	2.1
Very low value	2	4.2
Low value	4	8.3
Moderate value	16	33.3
High value	16	33.3
Very high value	6	12.5
No course taken	3	6.3
Total	48	100.0

Survey Question 5. Table 4-5 provides the respondents' opinions of the value of AFIT short courses in helping to prepare them to become Base Civil Engineers by the number and relative percentage of responses in each category.

6.3 percent of the respondents had not attended any AFIT short courses. 45.8 percent of those responding attached high or very high value to AFIT short courses attended.

Section B: Analyses Results

This section presents analyses results in tabular form. Tables are abbreviated for easy interpretation. Complete tables are provided in Appendix C.

Background Data

Respondents were asked to evaluate the usefulness of the positions they had held and the courses they had attended in Parts II and III of the survey questionnaire. The numbers of responses rating each position and course, respectively, were tallied and converted to percentages of respondents who had held each position and attended each course. Positions which were held by 25 percent or more of the respondents are shown in Table 4-6. No positions at the Engineering and Services Center or Air Staff were held by at least 25 percent of the respondents, indicating a potential for bias toward base and major command positions in the analyses. Courses which were attended by at least 20 percent of the respondents are listed in Table 4-7. Only four courses were attended by at least 20

percent of the respondents. Since there will be only a small number of ratings for most courses, ratings based on descriptive statistics may not portray the value actually perceived by respondents.

TABLE 4-6

Positions Which Had Been Held by a Minimum of Twenty-five Percent of the Base Civil Engineers Responding

Rank	Position	Level	Percent Assigned
1	Chief, Operations	Base	81.3
2	Design Engineer	Base	70.8
3	Contract Programmer	Base	66.7
4	Chief, Resources	Base	58.3
5	Requirements	MAJCOM	54.2
6	Program Development	MAJCOM	50.0
7	Contract Management		
	Inspector	Base	45.8
8	CESMAT/CESMET/IG	MAJCOM	43.8
9	Chief, Design	Base	43.8
10	Chief, Contract		
	Management	Base	43.8
11	Chief, Engineering and		
	Environmental		
	Planning	Base	39.6
12	Readiness/Force		
	Development	MAJCOM	37.5
13	Chief, Environmental		
	and Contract		
	Planning	Base	37.5
14	Chief, Industrial		
	Engineering	Base	33.3
15	Chief, Readiness	Base	33.3
16	Operations and		
	Maintenance	MAJCOM	31.3
17	Engineering	MAJCOM	31.3
18	Management and		
	Resources	MAJCOM	29.2

The percentages of respondents who had been assigned to each position and had attended each course are given in

Appendix C for all positions by command level and for all courses by course title.

TABLE 4-7

Courses Which Had Been Attended by a Minimum of Twenty Percent of the Base Civil Engineers Responding

Rank	Course Title	Percent Attended
1	Introduction to Base Civil Engineering	70.8
2	Base Civil Engineer	66.7
3	Operations Management	39.6
4	Environmental Protection Committee Members	20.8

Usefulness of Positions

Respondents were asked to evaluate the usefulness of positions they had held at a base, a major command, the Engineering and Services Center, and the Air Staff. To insure maximum coverage of available positions, respondents were given the opportunity to include and rate positions not listed in the questionnaire. Positions with a median response of 4.0 or higher are listed in Table 4-8. A median of 4.0 or higher indicates the respondents attached high value or very high value to the position so evaluated.

Of the 36 positions identified as having high or very high value, 14 are at base level, 13 are at major command level, two are at the Engineering and Services Center, and eight are at Air Staff level. One position with a median response of "5" is located at both the Engineering and

TABLE 4-8

The Most Useful Positions as Perceived by
Responding Base Civil Engineers

Rank	Position	Level
1	Commander*	Base
2	Joint Tour	ESC/Air Staff
3	Engineering Advisor (MACV)	Air Staff
4	Chief, Field Technology	ESC
5	Maintenance Management	MAJCOM
6	Executive Officer	MAJCOM
7	Chief, Operations	Base
8	CESMAT/CESMET/IG	MAJCOM
9	Chief, Resources	Base
10	Management and Resources	MAJCOM
11	CESMET/IG	Air Staff
12	Requirements	MAJCOM
13	Operations and Maintenance	MAJCOM
14	Contingency Plans	Air Staff
15	Chief, Environmental and Contract Planning	Base
16	Program Development	MAJCOM
17	Chief, Engineering	Base
18	Readiness	MAJCOM
19	Chief, Contract Management	Base
20	Contract Programmer	Base
21	Programs	Air Staff
22	Environmental Planning	MAJCOM
23	Plans - XP	MAJCOM
24	Plans - Combined Forces	Air Staff
25	Plans - Personnel	Air Staff
26	Palace Blueprint	Air Staff
27	Acquisition	MAJCOM
28	Chief, Auxiliary Fields Branch	Base
29	Flying Operations	Base
30	Contract Management Inspector	Base
31	Chief, Readiness	Base
32	Engineering	MAJCOM
33	Chief, Design	Base
34	Environmental Coordinator	Base
35	Construction	MAJCOM
36	Squadron Section Commander	Base

*includes responses for Base Civil Engineer (Small Base and Remote), Red Horse Detachment Commander and Customer Squadron Commander

Services Center and the Air Staff, resulting in a double count. Only five positions had a median response below 3.0, indicating that the respondents attached low value to those positions. All five positions are at the Engineering and Services Center. A complete list giving the ranking of all positions is shown in Appendix C. Descriptive statistics for each position are also provided by command level in Appendix C.

To validate and further refine the ratings and subsequent rankings determined from the respondents' evaluations of the positions, two open-ended questions were added to this part of the questionnaire. The first question asked respondents to list five positions that they felt had been most beneficial in preparing them for Base Civil Engineer responsibilities. Responses were tallied and scored in accordance with the methodology described in Chapter III. The positions which were determined to be most beneficial by those respondents who had held them are listed in Table 4-9. All positions shown in this table had a minimum score of 20. Sixty-seven percent were at base level with the remaining 33 percent at major command level. A complete list ranking all of the positions identified in this section is given in Appendix C.

All positions listed in Table 4-9 were also listed in Table 4-8. Four positions listed in the questionnaire and seven positions identified through write-in responses had a

median value greater than "4" (indicating very high value was perceived by the respondents for these positions) but were

TABLE 4-9

The Most Beneficial Positions Held by Respondents
(Determined by Open-ended Evaluation)

Rank	Position	Level
1	Chief, Operations	Base
2	CESMAT/CESMET/IG	MAJCOM
3	Chief, Resources*	Base
4	Chief, Engineering and Environmental Planning	Base
5	Program Development	MAJCOM
6	Requirements	MAJCOM
7	Contract Programmer	Base
8	Chief, Contract Management	Base
9	Commander**	Base

*also includes responses for Chief, Programs
**includes responses for Base Civil Engineer (Small Base and Remote), Red Horse Detachment Commander, and Customer Squadron Commander

not included in Table 4-9. The four "standard" positions are: Operations and Maintenance (MAJCOM), Management and Resources (MAJCOM), CESMET/IG (Air Staff), and Chief of Environmental and Contract Planning (base). All four positions were mentioned by at least three respondents in the open-ended section, but did not receive the 20 points required to be included in Table 4-9. One reason for this was the relatively low number of respondents who had held these positions. Another reason may have been that although high value was attached to these positions, respondents who had held them viewed other positions as more beneficial.

The seven positions identified by write-in responses are: Commander (base), Executive Officer (MAJCOM), Maintenance Management (MAJCOM), Chief of Field Technology (ESC), Joint tour (ESC/Air Staff), Engineering Advisor (HQ MACV), and Contingency Plans (Air Staff). The first five positions listed were also identified as being one of the five most beneficial positions by at least one respondent. This implies that although few people have held these positions, their value is high to those who had been assigned to them, even in relation to other positions more commonly held. Again, the low number of respondents assigned to these positions and the limit imposed to identify at most five positions in this section may have resulted in the exclusion of six of these positions from Table 4-9. The position of commander received a score of 22, which was sufficient to include it in the table. Since only seven respondents identified this position, it is obvious ratings were extremely high. This would be expected since the Base Civil Engineer job is a commander position, also, and the experiences in any commander's position would be very similar and very helpful in succeeding assignments of similar type.

Overall, a comparison of the two tables indicates basic agreement in rankings and supports the validity of the responses. A seven-point scale might have encouraged finer delineation between ratings than the five-point scale used, which in turn might have resulted in a closer comparison.

However, the scale used was considered adequate to narrow the field of positions for an exploratory study.

Since responses to the first question would tend to bias the rankings in favor of positions held by a majority of the respondents, a second question was included to gather value perceptions of positions which had not been held by respondents. This question asked respondents to identify five positions which they had not held but felt would have proved beneficial to them in their present job. Responses were not limited to the positions listed in the questionnaire. Respondents were given the opportunity to list positions not currently part of the civil engineering organizational structure, optional positions within civil engineering and positions outside of civil engineering. Responses were tabulated and scored as for the previous table. The positions which received a score of 20 or higher are shown in Table 4-10. Of the ten positions perceived as most beneficial by respondents who had not held those jobs, 70 percent were at base level, 20 percent at major command level, and ten percent at Air Staff level. All positions identified in this section are listed by rank in Appendix C.

All positions, except for Chief of Industrial Engineering, were listed in Table 4-8 as possessing high or very high value. Although the Chief of Industrial Engineering position had a median response of 3.5, the mean value was 3.938; indicating a perception of higher value by

respondents who had held that position than the median alone would indicate. Four positions listed in Table 4-10 were

TABLE 4-10

The Most Beneficial Positions as Perceived by Respondents
Who Had Not Held the Positions
(Determined by Open-ended Evaluation)

Rank	Position	Level
1	Chief, Operations	Base
2	Chief, Resources	Base
3	Operations and Maintenance	MAJCOM
4	Chief, Engineering and Environmental Planning	Base
5	Programs	Air Staff
6	Chief, Readiness	Base
7	Program Development	MAJCOM
8	Squadron Section Commander	Base
9	Chief, Industrial Engineering	Base
10	Chief, Design Section	Base

also ranked as most beneficial by respondents who had held the positions (Table 4-7). Those positions are: Chief of Operations (base), Chief of Resources (base), Chief of Engineering and Environmental Planning (base), and Program Development (MAJCOM).

To determine the overall benefit of each position as perceived by all respondents, whether or not they had held a specific position, the scores and frequencies of each group were combined by position and ranked from high to low. A complete list ranking every position identified in either of the two open-ended sections by the combined score is presented in Appendix C. The positions perceived as most

beneficial by all respondents are shown in Table 4-11. All ten positions had scores of 35 or higher.

TABLE 4-11

The Most Beneficial Positions Overall
(Determined by Open-ended Evaluation)

Rank	Position	Level
1	Chief, Operations	Base
2	Chief, Resources*	Base
3	CESMAT/CESMET/IG	MAJCOM
4	Chief, Engineering and Environmental Planning	Base
5	Program Development	MAJCOM
6	Operations and Maintenance	MAJCOM
7	Programs	Air Staff
8	Chief, Readiness	Base
9	Chief, Industrial Engineering	Base
10	Requirements	MAJCOM

*includes responses for Chief of Programs

All positions included in Table 4-11 were listed in either Table 4-9 or Table 4-10 and so their relationship to Table 4-8 has already been discussed. The four positions found in both of the previous tables are in the top five in this combined table. Two of the positions (CESMAT/CESMET/IG and Requirements) were included in this table based primarily on the strength of the responses by those Base Civil Engineers who had held those positions. The other four positions (Operations and Maintenance, Programs, Chief of Readiness, and Chief of Industrial Engineer) received the majority of their support from respondents who had not held

those positions but felt they would have proved most beneficial if held.

A comparison of the ranking presented in all three tables shows that the perceptions of the respondents as to which positions are most beneficial are reasonably similar whether respondents had held those positions or not. Of the ten positions listed as most beneficial overall, fifty percent are at base level, forty percent at major command and ten percent at Air Staff. All five at base level are branch or section chiefs. The Chief of Operations is clearly a significant position, with a score twice that of the second ranked position, the Chief of Resources, which is also in the Operations Branch. One major command position (Operations and Maintenance) provides experience in Operations at a policy level. Two of the positions (CESMAT/CESMET/IG and Chief of Industrial Engineering) give an overall view of the entire civil engineering organization without the responsibilities of also being the commander. Only one position in the Engineering branch was ranked in the top ten, the branch chief position; however, three positions concerned with programming and requirements at major command level are included in this list, implying that engineering experience at policy level is more beneficial. The inclusion of the Chief of Readiness position reflects the growing importance of readiness in civil engineering and the Air Force as a whole.

Since high scores were somewhat dependent on the number of responses identifying a position as one of the respondents' top five choices, and since most respondents used the positions listed in the questionnaire as the basis for their responses to the open-ended questions, it was highly unlikely that write-in responses would receive high enough scores to be included in the tables identifying the most beneficial positions. However, since many respondents took the time and effort to make suggestions for new positions which they thought would prove valuable to future Base Civil Engineers, those positions are identified in Table 4-12. Scores and frequencies for each new position are also given in this table.

TABLE 4-12

Ranking of New Positions Suggested In Open-ended Section
As Possessing Value to Future Base Civil Engineers

Rank	Position	Score	Frequency
1	Funds Management	9	3
2	System Engineer	5	1
3	Experience in Operations with Superintendents	4	1
4	Heavy Repair Chief	4	1
5	Crafts Team Chief	3	1
6	Military Deputy Base Civil Engineer	2	1

Funds management, operations experience, and an overall view of the civil engineering function at base level are some

of the areas addressed in the respondents' suggestions for new positions.

Usefulness of Courses

Base Civil Engineers were asked to rate each AFIT short course for its usefulness in preparing them for the responsibilities of their current position. A response of "not attended" was included on the scale for those respondents who had not attended the course being evaluated. Courses with a median response of 4.0 or greater are listed in Table 4-13. A median of 4.0 or 5.0 indicates the respondents rated the course as having high or very high value.

TABLE 4-13

The Most Useful Courses as Perceived by Responding Base Civil Engineers

Rank	Course
1	Contract Preparation and Management
2	Base Civil Engineer
3	Project Programming
4	Fire Protection Management
5	Contingency Engineering
6	Operations Management
7	Hazardous Waste Management
8	Financial Management
9	Environmental and Contract Planning
10	Commanders Engineering and Services Orientation

Ten courses had a median response less than 3.0, indicating respondents attached low value to those courses

(in relation to their usefulness in preparing them to become Base Civil Engineers). It should be noted, however, that the number of responses for each of these ten courses was very low and that these courses do have value in preparing officers for other positions in the civil engineering organization. Descriptive statistics for all courses are given in Appendix C. These statistics were used to rank the courses in order of perceived usefulness to Base Civil Engineers. This rank order listing is presented in its entirety in Appendix C.

Respondents were then asked to select five courses which they would recommend to new Base Civil Engineers. Their responses were not limited only to courses they had attended. They could list courses they had never attended if they felt that the course would have been useful or add their own recommendations for new courses. This open-ended section provided additional information to evaluate courses currently available and to indicate where changes in emphasis might be considered, if necessary, to better prepare officers to be Base Civil Engineers. Responses were tabulated and scored as described in the previous chapter. Courses were ranked from most beneficial to least based on respondents' scores. The seven most beneficial courses are listed in Table 4-14. All seven courses had a minimum score of 20. The complete list ranking all courses based on this open-ended evaluation is provided in Appendix C.

TABLE 4-14

The Most Beneficial Courses as Determined
by Open-ended Evaluation

Rank	Course
1	Base Civil Engineer
2	Operations Management
3	Commanders Engineering and Services Orientation
4	Financial Management
5	Project Programming
6	Fire Protection Management
7	Contingency Engineering

All seven courses listed in Table 4-14 are also listed in Table 4-13. Three courses ranked high in individual course evaluations were not ranked high in the open-ended evaluations. Contract Preparation and Management was ranked first in Table 4-13 based on a median response of "5," but was ranked 15th in the open-ended evaluation. The variance between responses for this course from the individual course evaluations was large, indicating disparity in perceived value. Hazardous Waste Management and Environmental and Contract Planning courses were also ranked relatively low on the open-ended evaluations compared to their high rating based on median response. Responses to both of these courses also had a fairly large variance, especially considering the small number of responses for each position.

Overall, the two tables are in reasonable agreement in their selection of courses perceived as being most beneficial. Table 4-14 appears to be a refinement of the

broad ranking arrived at through use of median responses for Table 4-13. Courses selected also fall within the areas identified in the previous section analyzing the usefulness of positions as being of benefit to BCE's - commander responsibilities: broad overview of the civil engineering organization, operations management, financial management, project programming, fire protection management and readiness.

V. Conclusions and Recommendations

This chapter includes a short summary of the research project, a listing of the conclusions based on the results presented in the previous chapter, and recommendations for improvement and further research.

Project Summary

The purpose of this research project was to determine if current career development patterns and training adequately prepare civil engineering officers for the responsibilities of Base Civil Engineer and to identify areas requiring changes, if any.

Surveys were developed and distributed to all Base Civil Engineers at Air Force bases in the Continental United States. Analysis of the data provided in the returned surveys was presented in Chapter IV. Conclusions derived from the analysis are given in the next section.

Conclusions

Conclusions are presented under the related research question.

1. What responsibilities and duties are required of a Base Civil Engineer?

Base Civil Engineer responsibilities are listed in AFR 85-10, Operation and Maintenance of Real Property, and reprinted in Chapter II of this study. Responsibilities encompass all areas of base civil engineering to include

maintenance and repair of facilities and equipment, providing utilities, custodial, sanitation and entomological services, fire protection, readiness and contingency functions, protecting the environment, and construction.

All of these Base Civil Engineer responsibilities, except fire protection, are also the responsibility of a subordinate position in the civil engineering organization to which an officer could be assigned. A civilian or senior non-commissioned officer is authorized and assigned as Fire Chief. Each area of responsibility, including fire protection, is also covered in at least one AFIT short course.

Civil engineering positions currently authorized at base, major command, the Engineering and Services Center, and Air Staff and all current AFIT short courses are listed in the questionnaire to evaluate the perceived usefulness of the positions and courses in relation to Base Civil Engineer responsibilities.

2. Do most new Base Civil Engineers feel prepared to assume the responsibilities associated with their new position?

Most Base Civil Engineers (91.7 percent) felt they were prepared for the responsibilities associated with their position. 52.1 percent rated themselves to the far right on the three-point scale as well-prepared. Only 8.3 percent believed they had not been well-prepared to become Base Civil

Engineers. If rated supplements were excluded, this figure drops to 4.2 percent.

Previous assignments were perceived by 81.3 percent of the Base Civil Engineers as having high or very high value in helping to prepare them for Base Civil Engineer responsibilities. Only 10.4 percent rated previous assignments below moderate value or as not related. All those who had not felt they were well-prepared fell into this category, accounting for 8.3 percent of the 10.4 percent. 45.8 percent rated AFIT short courses as possessing high or very high value, a figure just slightly over half the percentage of Base Civil Engineers who gave the same ratings to previous assignments.

14.6 percent felt AFIT short courses were not related or had less than moderate value in preparing them for Base Civil Engineer responsibilities. 6.3 percent had not taken any AFIT short courses. All those who had never taken any courses had rated themselves as at least adequately prepared overall. One of the rated supplements felt AFIT short courses possessed high value in helping him to perform successfully as a Base Civil Engineer.

Overall, Base Civil Engineers seemed to place a higher value on previous assignments than on AFIT short courses in helping to prepare them for Base Civil Engineer responsibilities.

3. What types of jobs or short courses are perceived by current Base Civil Engineers as most useful in preparing civil engineering officers to assume the responsibilities/duties of Base Civil Engineer?

The positions identified as most useful through open-ended evaluation are given in Table 5-1.

TABLE 5-1

The Most Beneficial Positions Overall
(Determined by Open-ended Evaluation)

Rank	Position	Level
1	Chief, Operations	Base
2	Chief, Resources*	Base
3	CESMAT/CESMET/IG	MAJCOM
4	Chief, Engineering and Environmental Planning	Base
5	Program Development	MAJCOM
6	Operations and Maintenance	MAJCOM
7	Programs	Air Staff
8	Chief, Readiness	Base
9	Chief, Industrial Engineering	Base
10	Requirements	MAJCOM

*includes responses for Chief of Programs

To compensate for any bias in favor of positions which had been held by a greater number of Base Civil Engineers, ratings of positions which had not been held were requested and combined with ratings of positions which had been held.

The ten positions listed in the table can be categorized into four main areas: operations and maintenance, engineering, readiness, and management consulting services. The positions responsible for each of the four areas at base level are included in the table, with the two base positions

associated with operations and maintenance (Chief, Operations and Chief, Resources) gathering a significant 42 percent of the total points allocated to the ten positions listed. At least one major command position in each functional area except readiness was also included in the list of the ten most beneficial positions. Both positions in the engineering area at major command (program development and requirements) are in the directorate of programs. This emphasis on programs is continued at the Air Staff level with programs being the only Air Staff position ranked in the top ten.

Scores for all positions within each area were then added together resulting in the following ranking: operations and maintenance (49 percent), engineering (29 percent), management consulting services (16 percent), and readiness (6 percent).

Although these ten positions were ranked as most beneficial, an additional 45 positions were also identified by Base Civil Engineers as beneficial in open-ended evaluation. 17 of these additional positions were write-in responses and so would not be expected to receive as many total points as those positions listed in the original questionnaire. Six of the 17 positions identified by write-ins are new positions and will be discussed further in research questions #4 and #5. All positions identified in the open-ended sections as beneficial in preparing civil engineers for Base Civil Engineer responsibilities are listed

in Table C-8. All but six positions which had been held by at least one of the Base Civil Engineers were perceived as of at least moderate value to them in their present job (based on median response). It should be noted, however, that evaluations were requested in relation only to the job of Base Civil Engineer and so do not reflect on the intrinsic value of any position, but only on its helpfulness in preparing a civil engineering officer for one specific position.

The AFIT short courses identified as most useful through open-ended evaluation are given in Table 5-2.

TABLE 5-2

The Most Beneficial Courses Overall
(Determined by Open-ended Evaluation)

Rank	Course
1	Base Civil Engineer
2	Operations Management
3	Commanders Engineering and Services Orientation
4	Financial Management
5	Project Programming
6	Fire Protection Management
7	Contingency Engineering

The four general areas encompassing the ten positions identified as most useful by Base Civil Engineers are also covered by at least one of the seven courses identified as most useful. Three additional areas can be identified through the courses listed as most beneficial: commander responsibilities, financial management, and fire protection.

Although no positions in these three areas received enough points to be ranked as one of the ten most beneficial positions, all three had one position in the top 30 in Table C-8. Commander and financial management positions were write-in responses, which indicates the high value of positions in these two areas is recognized by more than one individual.

Ten of the 34 courses were perceived as having low value in preparing civil engineering officers for the responsibilities of Base Civil Engineer. However, these courses are primarily technical courses intended for specialists and lower management. Although of great value to these individuals, the Base Civil Engineer does not require such in-depth knowledge in these areas.

4. Which responsibilities/duties do Base Civil Engineers identify as requiring training or preparation additional to that currently found in the normal career path of a civil engineering officer?

The positions perceived as most beneficial by Base Civil Engineers who had not been assigned to those positions are listed in Table 5-3.

The positions identified in Table 5-3 are currently part of the civil engineering career field but had not been held by a significant number of Base Civil Engineers who felt they would have proved beneficial if held. Two of the positions (Programs and Squadron Section Commander) had been held by less than 25 percent of the Base Civil Engineers. All

positions listed, except Squadron Section Commander and Chief of Design, were also perceived as one of the ten most beneficial positions overall. The CESMAT/CESMET/IG and

TABLE 5-3

The Most Beneficial Positions as Perceived by Respondents Who Had Not Held the Positions (Determined by Open-ended Evaluation)

Rank	Position	Level
1	Chief, Operations	Base
2	Chief, Resources	Base
3	Operations and Maintenance	MAJCOM
4	Chief, Engineering and Environmental Planning	Base
5	Programs	Air Staff
6	Chief, Readiness	Base
7	Program Development	MAJCOM
8	Squadron Section Commander	Base
9	Chief, Industrial Engineering	Base
10	Chief, Design Section	Base

Requirements positions which were identified on the list of most beneficial positions had been held by approximately half of the Base Civil Engineers, and evidently those who had not held these two positions rated other positions higher on their "had not held" list.

The areas of interest remain approximately the same as those identified under the previous research question, with a switch in emphasis from management consulting services at major command to commander experience at base level and from programming at major command to design at base level. Experience at a variety of jobs within the base civil

engineering organization was viewed as desirable, with the emphasis on branch and section chief positions.

Several new positions were also suggested by Base Civil Engineers to satisfy a perceived lack in current career development opportunities. All recommended positions are at base level and would provide additional opportunities for experience in financial management, operations and maintenance, and commander/management responsibilities. A complete list of the positions is provided under research question #5.

AFIT short courses which were identified as most beneficial in the previous chapter but which had been attended by less than 20 percent of the Base Civil Engineers are listed in Table 5-4.

TABLE 5-4

Courses Identified as Most Beneficial But
Attended by Less Than Twenty Percent
of the Base Civil Engineers Responding

Commanders Engineering and Services Orientation
Financial Management
Project Programming
Fire Protection Management
Contingency Engineering

Both the Base Civil Engineer course and the Operations Management course were rated as possessing high value but had been attended by approximately 67 percent and 40 percent of the Base Civil Engineers, respectively.

An executive engineering course and a course concerned with commander responsibilities were also recommended by several Base Civil Engineers.

In the open-ended section requesting ideas from Base Civil Engineers on ways to better prepare civil engineering officers for the Base Civil Engineer position, the majority of responses dealt with commander responsibilities. Civilian personnel management, motivating the troops, career counseling, public relations, politics, leadership, management, and communication were some of the areas mentioned. The value of experience in a variety of jobs was also perceived as being very valuable; a high level of experience at base level was specifically advised by several Base Civil Engineers. Experience in operations, fire protection, financial management and readiness was also highly recommended.

Overall, Base Civil Engineers felt additional emphasis was needed in the following areas: commander responsibilities, operations and maintenance, fire protection, financial management, readiness, programming, and overall knowledge of civil engineering based on a variety of jobs primarily as branch or section chiefs at base level. Additional training or preparation could be provided either through on-the-job experience or classroom training.

5. What options to better prepare junior civil engineering officers to assume the responsibilities of Base Civil Engineer are recommended by those currently filling that position?

Base Civil Engineers suggested several new jobs be added to the current base civil engineering organization. These positions are listed in Table 5-5.

TABLE 5-5

New Positions Suggested By Base Civil Engineers

Funds Management
System Engineer
Experience in Operations with Superintendents
Heavy Repair Chief
Crafts Team Chief
Military Deputy Base Civil Engineer

All six positions are at base level, which agrees with the perception that a high level of base experience is valuable. Four of the six positions would be in the Operations Branch, which also agrees with assessments of value given to that area by Base Civil Engineers. Funds Management was mentioned by several Base Civil Engineers in the open-ended section requesting ideas on ways to better prepare civil engineers for the Base Civil Engineer position. Most Deputy slots are now civilian authorizations; converting some of these to military would provide an increased opportunity for civil engineering officers to tackle commander responsibilities without being responsible for the entire organization initially.

Many other suggestions were made in response to the final open-ended section of the questionnaire. These responses are included in their entirety in Appendix B. Some options which were suggested by several Base Civil Engineers are summarized below.

New jobs were not specifically identified in this section; instead, Base Civil Engineers identified areas where experience in existing positions and branches would provide the best preparation for the Base Civil Engineer position. A high level of base experience was desired with emphasis in operations, engineering, and readiness. Earlier exposure to the operation and management of the fire department was also recommended. Variety was viewed as important, with a specific recommendation to rotate new officers through each branch at base level during their first tour. Experience at base, major command, and Air Staff levels in various commands was also perceived as valuable. The bottom line seemed to be that the wider one's background, the more prepared one would be to assume Base Civil Engineer responsibilities. Put simply, experience was viewed as the best teacher and the more experience, the better. One Base Civil Engineer recommended that civil engineers fill the executive officer position instead of the administrative officers now authorized in those positions.

Specific topics to be included in existing short courses or added to the AFIT curriculum as new courses were addressed

by several Base Civil Engineers. A one-week executive level Base Civil Engineer course was mentioned in several responses. This course would deal with politics, leadership, civilian personnel management, motivational techniques, funds management, and other topics related to Base Civil Engineer responsibilities. Options would be to run group sessions with experienced civil engineering officers who had been on CESMET or IG teams or had been assigned as Base Civil Engineers at large bases, or to use their inputs to create a text for use in classroom discussions and future reference.

Formal AFIT training in base level readiness skills was believed to be adequate; however, actual experience in planning for and participating in large-scale deployments was believed to be necessary. Since this is not always possible, one recommendation was made to make a film available to field units showing an actual deployments, and including tips on actions to take and pitfalls to avoid.

Although courses in funds management, fire protection management, family housing management, and contracting are already available most Base Civil Engineers had not attended these courses and felt a course or several short courses addressing these functions on an executive level would be more beneficial.

In conclusion, most Base Civil Engineers feel prepared to assume the responsibilities of Base Civil Engineer and current career development opportunities seem adequate to

provide the training and preparation required. Few recommendations were made to establish new jobs; however, almost all of those that were recommended were related to responsibilities of the Operations Branch. Access to a wider variety of existing jobs was also viewed as desirable by many Base Civil Engineers. Recommendations for new courses addressed many topics already covered by AFIT short courses. A change in emphasis to cover primarily executive level details and commander responsibilities was the main thrust of Base Civil Engineer suggestions.

Recommendations

General areas of concern were identified as a result of this study, resulting in the following recommendations.

1. Recommend a short course in commander responsibilities be established by the Air Force Institute of Technology School of Civil Engineering (SOCE). Many Base Civil Engineers had attended the one-week Executive Engineering Course and felt it was more beneficial to them than all the other staff courses combined. Specific topics could include, but not be limited to, the UCMJ, civilian personnel management, public relations, career counseling of younger officers, funds management for executives, and the basics of fire protection and military family housing. The course should be short so Base Civil Engineers would not be away from their bases for too long, but should be in

residence at AFIT to insure Base Civil Engineers from different commands and from bases with different missions are present in each class. Although most of these areas are already covered in AFIT short courses, these courses are structured primarily for individuals assigned to that functional area and attendance is usually limited to personnel currently assigned in that area. If a course can not be established, a handbook of executive level tips in the areas mentioned above should be compiled and distributed to Base Civil Engineers in the field for use as reference. Experienced civil engineers from CESMAT, CESMET, and IG teams, and Base Civil Engineers from each command could be gathered together as part of Project IMAGE to put together this handbook based on their own experiences.

2. Recommend selected AFIT SOCE courses be open to attendance by all civil engineering officers regardless of present assignment. This should be done at the discretion of AFIT SOCE management; however, management courses in Family Housing, Fire Protection, and Financial Management and Operations should definitely be considered. If the scope of the courses or attendance limitations preclude this action, then consideration should be given to providing an executive overview of each of these courses either in the resident or nonresident program.

3. Recommend Base Civil Engineers consider converting the squadron executive officer authorization from an

administrative AFSC to a civil engineering AFSC.

Coordination with the Manpower Engineering Team and Personnel will be required, but if approved, this conversion would provide a civil engineering officer the opportunity to practice commander skills at an earlier point in his or her career. Junior officers could be rotated through this position every six months or whatever period was determined to be adequate by the Base Civil Engineer. In this way, civil engineers would not be out of their career field for too long, but would still be provided a valuable experience in working with and managing people.

4. Base Civil Engineers should be encouraged to rotate their junior officers through as many positions as possible during their first tour, including the Industrial Engineer and Squadron Section Commander (or Executive Officer) positions. In addition to providing a variety of job experiences for young officers, Base Civil Engineers should also encourage and allow junior officers to attend as many AFIT SOCE short courses as possible. Career counseling and guidance is important to develop the leaders of tomorrow and Base Civil Engineers should insure that their junior officers receive the benefit of their experience and also are given every opportunity to practice leadership and communication skills.

5. The position of Base Civil Engineer is only one of many senior level positions, and although preparation for

this position is important, there are other, equally important positions. For instance, research addressing preparation and training for a DCS position at MAJCOM might also prove valuable to civil engineering officers.

APPENDIX A: Survey Questionnaire

The next seven pages contain the survey approval and the survey as approved and distributed. The survey was approved by the Research and Measurement Division of the Air Force Manpower and Personnel Center and given a survey control number (USAF SCN 86-88).

The survey consisting of a cover letter and five pages of questionnaire. The title of the questionnaire was "Survey of Perceived Adequacy of Current Programs to Prepare Civil Engineering Officers to Assume the Responsibilities of Base Civil Engineer".

14 MAY 1986

DPHYOS

Request for Approval of Survey (Your Ltr, 17 Apr 86)

AFIT/XFX

1. Capt Vroman's request to conduct the survey of current programs to prepare civil engineering officers has been approved and assigned USAF Survey Control Number (SCN) 86-66. This SCN expires 31 Dec 86 and should be printed in the upper right-hand corner of each survey booklet.

2. As agreed upon by Lt Ashley and Capt Vroman on 8 May 86, the statistical analyses to be performed on the resulting survey data will be limited to descriptive statistics as factor analysis would be inappropriate considering the small number of people to be surveyed.

3. Any comments or questions regarding this correspondence can be directed to 2d Lt Kevin Ashley, HQ AFMPC/DPHYOS, Randolph AFB TX 78150-6001, AUTOVON 487-5680.

FOR THE COMMANDER

SIGNED

CHARLES H. HAMILTON, GM-13
Chief, Personnel Survey Branch

cc: AFIT/LSH
AFIT/GEM/86S-4
(Capt Vroman)

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permit fully legible reproduction



DEPARTMENT OF THE AIR FORCE
AIR UNIVERSITY
AIR FORCE INSTITUTE OF TECHNOLOGY
WRIGHT-PATTERSON AIR FORCE BASE OH 45433-6583

21 MAY 1966

REPLY TO
ATTN OF LS

SUBJECT Research Questionnaire

TO Base Civil Engineers

1. Most career civil engineering officers will be selected to become Base Civil Engineers at some point in their career; however, it is not clear if current career development patterns provide the training and background necessary for success in this position.

2. The intent of this survey is to determine if officers now in the Base Civil Engineer positions consider current career development patterns and training adequate preparation for Base Civil Engineer responsibilities, to identify specific positions and short courses which are perceived as being most beneficial to you as a Base Civil Engineer, and to obtain any comments and recommendations you may have for improvement of on-the-job training and/or AFIT short courses.

3. Your participation is voluntary, and your responses will be completely anonymous. Please do not put your name or social security number anywhere on the survey booklet. When the results of the study are published, readers will not be able to identify the responses of specific individuals.

4. Please complete the survey and return it to AFIT/LSG in the enclosed envelope within ten working days. If you have any questions, please contact Capt Mary Vroman at AUTOVON 785-4437. Thanks for your cooperation and participation.

LARRY L. SMITH, Colonel, USAF
Dean
School of Systems and Logistics
Envelope

2 Atch
1. Survey
2. Return

STRENGTH THROUGH KNOWLEDGE

Survey of Perceived Adequacy of Current Programs to Prepare Civil Engineering Officers to Assume the Responsibilities of Base Civil Engineer

PART I

The following questions will serve to categorize groups of respondents for statistical analysis. Your anonymity is assured since your responses will not be identified by respondent or base. Please circle the appropriate number for each item.

1. To which major command do you belong?
 1. AFLC
 2. AFSC
 3. ATC
 4. MAC
 5. SAC
 6. TAC
 7. Other _____

2. What is your base size (military and civilian assigned)?
 1. Less than 5000
 2. 5000 - 7500
 3. 7500 - 10000
 4. More than 10000

3. How well prepared do you feel you were to assume the responsibilities of Base Civil Engineer (BCE) when you were first assigned to this job?
 1. Not well prepared
 2. Adequately prepared
 3. Well prepared

4. After the initial adjustment to becoming a BCE, what is your opinion of the value of previous assignments in helping to prepare you to become a BCE?
 1. Not related
 2. Very low value
 3. Low value
 4. Moderate value
 5. High value
 6. Very high value

5. After the initial adjustment to becoming a BCE, what is your opinion of the value of AFIT short courses in helping to prepare you to become a BCE?
 1. Not related
 2. Very low value
 3. Low value
 4. Moderate value
 5. High value
 6. Very high value
 7. Haven't taken any AFIT short courses

PART II

This portion of the survey contains a list of possible civil engineering positions at base, major command, and air staff level. Please rate each position for its relative usefulness in preparing you to assume BCE responsibilities. Circle the appropriate number to the right of the position identified using the scale given below. If you have never held the position, please circle number 6.

0	1	2	3	4	5	6
Not Related	Very Low Value	Low Value	Moderate Value	High Value	Very High Value	Not Held

SECTION I - Base Level Positions

1. Chief, Industrial Engineering Branch	1	2	3	4	5	6
2. Squadron Section Commander	1	2	3	4	5	6
3. Design Engineer	1	2	3	4	5	6
4. Contract Programmer	1	2	3	4	5	6
5. Environmental Coordinator	1	2	3	4	5	6
6. Contract Management Inspector	1	2	3	4	5	6
7. Chief, Design Section	1	2	3	4	5	6
8. Chief, Environ and Contr Planning	1	2	3	4	5	6
9. Chief, Contract Management	1	2	3	4	5	6
10. Chief, Engineering Branch	1	2	3	4	5	6
11. Chief, Readiness Section	1	2	3	4	5	6
12. Chief, Resources Section	1	2	3	4	5	6
13. Chief, Operations Branch	1	2	3	4	5	6
14. Other	1	2	3	4	5	6
(please specify)						

SECTION II - MAJCOM Level Positions

1. Operations and Maintenance	1	2	3	4	5	6
2. Management and Resources	1	2	3	4	5	6
3. Program Development	1	2	3	4	5	6
4. Requirements	1	2	3	4	5	6
5. Environmental Planning	1	2	3	4	5	6
6. Engineering	1	2	3	4	5	6
7. Construction	1	2	3	4	5	6
8. Readiness/Force Development	1	2	3	4	5	6
9. Housing and Services	1	2	3	4	5	6
10. CESMAT/CESMET/IG	1	2	3	4	5	6
11. AFRCE	1	2	3	4	5	6
12. Other	1	2	3	4	5	6
(please specify)						

0	1	2	3	4	5	6
Not Related	Very Low Value	Low Value	Moderate Value	High Value	Very High Value	Not Held

SECTION III - Engineering and Services Center Positions

1. Information Management Systems	1	2	3	4	5	6
2. Operations and Maintenance	1	2	3	4	5	6
3. Housing and Services	1	2	3	4	5	6
4. Engineering and Services Lab	1	2	3	4	5	6
5. Environmental Planning	1	2	3	4	5	6
6. Readiness	1	2	3	4	5	6
7. Fire Protection	1	2	3	4	5	6
8. Energy	1	2	3	4	5	6
9. Construction Cost Management	1	2	3	4	5	6
10. Other _____ (please specify)	1	2	3	4	5	6

SECTION IV - Air Staff Level Positions

1. Plans	1	2	3	4	5	6
2. Programs	1	2	3	4	5	6
3. Housing and Services	1	2	3	4	5	6
4. Engineering	1	2	3	4	5	6
5. Construction	1	2	3	4	5	6
6. Real Property	1	2	3	4	5	6
7. Environmental	1	2	3	4	5	6
8. CESMET/IG	1	2	3	4	5	6
9. Other _____ (please specify)	1	2	3	4	5	6

SECTION V

Please select five positions from those listed above (including any you may have added) that you feel have been most beneficial in preparing you to assume BCE responsibilities. Indicate your ranking of the five positions by inserting the section and item numbers in the appropriate blanks below. Place the most beneficial in the first slot, the second in the second slot, etc.

 First Second Third Fourth Fifth

SECTION VI

Please list the jobs (in priority order from highest to lowest) which you never held, but feel would have proved beneficial to you as a BCE. You may identify positions not currently part of the Civil Engineering organizational structure or optional positions if you feel they would have value to future BCE's (i.e., the Systems Engineer proposed through Project IMAGE). If you do, please explain.

 First Second Third Fourth Fifth

PART III

Section I

This portion of the survey contains a list of AFIT School of Civil Engineering short courses. Please rate each course for its relative usefulness in preparing you to assume BCE responsibilities. Circle the appropriate number to the right of the course identified using the scale given below. If you have never attended the course, circle number 6.

		0	1	2	3	4	5	6			
		Not Related	Very Low Value	Low Value	Moderate Value	High Value	Very High Value	Not Attended			
1.	MGT 001 - Intro to Base Civil Engr					1	2	3	4	5	6
2.	MGT 002 - Cmdrs E & S Orientation					1	2	3	4	5	6
3.	MGT 003 - Systems Manager					1	2	3	4	5	6
4.	MGT 004 - Env Prot Comm Members					1	2	3	4	5	6
5.	MGT 023 - Project Programming					1	2	3	4	5	6
6.	MGT 400 - Base Civil Engineer					1	2	3	4	5	6
7.	MGT 403 - IE Mgt Applications					1	2	3	4	5	6
8.	MGT 406 - Family Hsg Mgt Appl					1	2	3	4	5	6
9.	MGT 416 - Financial Mgt Appl					1	2	3	4	5	6
10.	MGT 420 - Eng & Env Plan Mgt Appl					1	2	3	4	5	6
11.	MGT 427 - Fire Protection Mgt Appl					1	2	3	4	5	6
12.	MGT 430 - Operations Mgt Appl					1	2	3	4	5	6
13.	MGT 424 - Real Property Mgt					1	2	3	4	5	6
14.	MGT 425 - Contract Prep & Mgt					1	2	3	4	5	6
15.	MGT 435 - Logistics Management					1	2	3	4	5	6
16.	MGT 438 - Readiness Management					1	2	3	4	5	6
17.	MGT 520 - Env and Contract Plan					1	2	3	4	5	6
18.	MGT 521 - Hazardous Waste Mgt					1	2	3	4	5	6
19.	ENG 400 - Constr Cost Estimating					1	2	3	4	5	6
20.	ENG 440 - Built-Up Roofing					1	2	3	4	5	6
21.	ENG 460 - Mech Eng for Supervisors					1	2	3	4	5	6
22.	ENG 470 - Elec Eng for Supervisors					1	2	3	4	5	6
23.	ENG 471 - Shielded Constr Fundament					1	2	3	4	5	6
24.	ENG 472 - Eng for EMCS					1	2	3	4	5	6
25.	ENG 480 - Building Systems					1	2	3	4	5	6
26.	ENG 485 - Contingency Engineering					1	2	3	4	5	6
27.	ENG 490 - Architectural Planning					1	2	3	4	5	6
28.	ENG 500 - Env/Sanitary Eng					1	2	3	4	5	6
29.	ENG 550 - Pavement Engineering					1	2	3	4	5	6
30.	ENG 561 - Heat, Vent, Air Cond					1	2	3	4	5	6
31.	ENG 563 - HVAC Control Systems					1	2	3	4	5	6
32.	ENG 571 - Electrical Engineering					1	2	3	4	5	6
33.	ENG 590 - Corrosion Control					1	2	3	4	5	6
34.	ENG 595 - Industrial Water Treatment					1	2	3	4	5	6

SECTION II

Please select five courses which you would recommend to new BCE's. Indicate your ranking of these courses from highest to lowest by placing the most beneficial course in the first slot, the second in the second slot, etc. You may select courses from those listed in Section I or add your own recommendations. If they are listed in Section I, please use the item number given to identify them. If you add personal recommendations, please explain them.

----- First	----- Second	----- Third	----- Fourth	----- Fifth
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----
-----	-----	-----	-----	-----

PART IV

This portion of the survey is intended to gather your ideas on how to better prepare civil engineering officers for the Base Civil Engineer position. If there are any specific areas of responsibility where you feel more training and/or exposure would have been beneficial, please identify that area and make any recommendations or comments you feel appropriate.

Thank you for completing this survey. If you have any questions concerning the survey or the research project of which it is a part, please contact Capt Mary Vroman at AUTOVON 785-5437. Please return the survey booklet in the enclosed envelope, preaddressed to:

AFIT/LSG (Capt Vroman)
Wright-Patterson AFB, OH
45433

B: Written Responses to Part IV of the Survey

The comments written by the Base Civil Engineers in response to Part IV of the survey are given in the following five pages. The responses have been edited only for spelling and grammar.

Comments are in response to the following request:

"This portion of the survey is intended to gather your ideas on how to better prepare civil engineering officers for the Base Civil Engineer position. If there are any specific areas of responsibility where you feel more training and/or exposure would have been beneficial, please identify that area and make any recommendations or comments you feel appropriate."

Need a course in "Commandership" i.e. how to deal with drugs, alcohol, article 15's etc. How to be a Commander and First Sergeant. How to deal with civilian personnel. Also how to motivate the troops and how to have a positive attitude.

1. Fire protection.
2. Environmental issues.

1. BCE is command more than engineering slot.
2. BCE must keep a spread of experience in both military and civilian staff so that as people are promoted, moved, or retired, others can be moved up.
3. Young officers must get both DEE and DEM experience.

- Need base and MAJCOM/HQ USAF experience
- Stay in CE career field
- Need a variety of jobs
- Do your best - work for your boss!

I was very fortunate - my career all led to BCE from the very beginning. The most important jobs/courses which helped me were:

1. BCE at a small base
2. Teaching at AFIT
3. Mentorship by one special BCE and a super wing commander
4. CESMET and IG experience

Need to emphasize to our young officers our readiness responsibilities and provide more exposure to fire fighters and the activities associated with the fire station. Most people problems as a Sq Cmdr are found in the fire station.

- 1) Fire department operations and tech services
- 2) Increased awareness of the need for good public relations
- 3) Funds management
- 4) Civilian personnel mgmt

It is a mistake assigning rated supplements, with no prior base level CE experience, to a BCE position. I've worked for one once and took over as BCE from one - they just don't have the depth or knowledge to run a CE squadron without causing ruination of the people and organization. A high level of base experience, preferably as Ops Chief, is a definite prerequisite to being a knowledgeable BCE.

I didn't get to very many courses - should have gotten to more of them - they would have helped - my Lts are going and getting good feedback.

- (1) How to be a squadron commander. We have nothing on UCMJ. Discharge regulations, military, civilian personnel mgt.
- (2) More in fire protection and family hsg management

There are four main areas in which the BCE is involved on a daily basis: operations, programming, financial management and readiness. He is expected to be the wing's expert advisor on what can or cannot be done in operations and programming. These two areas can be learned through present formal courses and previous assignments. To manage one of the largest budgets on base, the BCE must have a good working knowledge of the financial system. Of all the responsibilities in civil engineering, we are least prepared to manage funds. There is very little formal training and very few jobs which provide the required experience. The fourth area, readiness, operates on two levels - base level training and large scale employments. Base level basic skills training is fairly cut and dry. There are formal AFIT classes which teach this information. Planning for large scale deployments and actually deploying must be experienced to really gain sufficient knowledge. When this is not possible, formal training should be available. At the very least, films of the planning and actual employment should be produced and made available with pitfalls, hints, and preparations required as key ingredients of the film.

Need to do something outside the 55xx career a few years - an intense rated sup to career broaden. ACSC/FI, LMDC, ROTC (BUT NOT AFIT as an engineering instructor - short or long schools).

Financial Management - executive level details
Military Family Housing - management, programming,
AFSCAG contracts
Contracting - from the LGC perspective
Civilian Personnel Management - ins and outs
"Squadron Commander Duties" - tough decisions, handling
problems
Basics on Fire Protection - enough to speak the
language, be comfortable
Dealing with Deputy BCEs - general techniques
Career Counseling/Guidance - for younger officers

Officers should fill various positions and then balance that with AFIT courses. Suggest senior Capt's, Majors, and Lt Col be permitted to take AFIT courses regardless of positions to which they are assigned.

A big concern is the lack of commander and fire protection training and [curricula] we have available for growing officers - Also the turmoil in DEM reorganization has taken out much of the prior org growth that did prepare officers (design - chief prog - chief O&M). Now there are many scattered "Little Lt." jobs in operations and Lt design jobs then a big jump to Chief of Ops - our Lt's are rightfully scared of the future.

There are no AFIT courses which teach potential BCE's the tricks of the trade. The paper has entirely missed the point. 80% of our job is politics and leadership; not technical application. Mgmt is a close third, but again not technically oriented. What is needed is a text or group session with (A) several CESMET old-heads, (B) old CE IG, or (C) several old BCE's.

Further, to suggest that most jobs in the AF for CE types are to prepare us to BCE is utter nonsense. Over 50% of all jobs are not related to Base level resp. Besides only maybe 250 officers out of 2000 CE positions ever get to be Big-Base BCE's, which suggests no need for lots of "BCE prep". We need an executive level BCE course that deals w/reality not theory.

I'm a rated supplement engineer. My rated management and aircraft engineering experience helped greatly in my BCE responsibilities. I recommend all the educational courses possible and assignments in all areas of BCE organization. Sorry I can't be more specific - but I am not the "standard" BCE. I've been very successful due to my broad management background and interpersonal skills. Leadership is the key to being a good BCE.

Don't keep them away from the base too long - I had 13 yrs away from the typical base - too long

Get officers rotated into as many mgt positions as possible

Need earlier exposure to operation and management of the fire department. Most knowledge/exposure must come from school of hard knocks!

Let them practice being a BCE and make their mistakes before you throw them into the arena alone.

Absolutely must have an appreciation and understanding of our major customer.

Absolutely must learn your commander priorities.

Absolutely must know how to get \$ \$ \$ to do your job well.

Programming

Need experience at various Base level CE positions. Ideal BCE experience is in Ops, Engineering and readiness.

Base level Chief of Operations experience should be pre-requisite to becoming a BCE. IG experience also of value for career broadening.

Get rid of the executive officer and fill the position with an engineer. (The Air Force is over 100% manned; let's use them). That experience will do more to prepare our young officers to become BCE's than almost anything else, and will provide the BCE an opportunity to evaluate each of his officers in a high pressure, demanding job he was ill-prepared to assume.

I came to Civil Engineering as a career broadening experience when I was a Captain (1976). I have returned after completing 2 years as a flying squadron commander. The basics of learning to be a commander are not applicable to me as I had 2 years of command experience prior to becoming a BCE. I think that anything you can do to give the career civil engineering officer exposure to jobs challenging his leadership and communication skills is the best preparation for this job.

Broad exposure to as many facets of the business as possible - nothing like having been there.

Just take on as many jobs as possible no matter what level of command and do absolutely the best job you can. Everything one does helps prepare them to be a BCE.

- More Ops experience is needed
- More young officers around

Financial mgt
Readiness

Every career officer should serve a joint tour. Should have at least one tour in ops, preferably two or three and moving up the ranks, ie: readiness to logistics to resources and should definitely serve as a chief of ops. A tour in IE early on would be very beneficial. Every officer should be rotated thru each branch during their first tour which should be at base level. All Officers need to move up and down and thru various commands for broadening prior to Lieutenant Colonel. Then stick with one MAJCOM after that to be competitive for General.

Bring back Rick Johnson's old Executive Engineering Course. I attended the 4-week version in 1972, and it had the most positive impact on my leadership and management style than any other single thing I have done or attended.

C. Statistics and Tables

TABLE C-1

Descriptive Statistics--Usefulness of Previous Assignments
Base Level Positions

Position	Median	Range	N	Percent	Mean	Variance
Chief, Industrial Engineering Branch	3.5	2	16	33.3	3.938	0.996
Squadron Section Commander	4	3	11	22.9	3.636	1.055
Design Engineer	3	4	34	70.8	3.118	0.955
Contract Programmer	4	3	32	66.7	4.031	0.612
Environmental Coordinator	4	2	10	20.8	3.700	0.233
Contract Management Inspector	4	3	22	45.8	3.955	0.617
Chief, Design Section	4	3	21	43.8	3.810	0.662
Chief, Environmental and Contract Planning	4.5	2	18	37.5	4.444	0.379
Chief, Contract Management	4	2	21	43.8	4.048	0.748
Chief, Engineering Branch	4	2	19	39.6	4.316	0.450

TABLE C-1 -- Continued

Position	Median	Range	N	Percent	Mean	Variance
Chief, Readiness Section	4	3	16	33.3	3.875	0.783
Chief, Resources Section*	5	2	28	58.3	4.536	0.406
Chief, Operations Branch	5	1	39	81.3	4.897	0.094
Red Horse Detachment Commander	5	0	1	2.1	5.000	0.000
Chief, Auxiliary Fields Branch	4	0	1	2.1	4.000	0.000
Squadron Commander - Customer	5	0	1	2.1	5.000	0.000
Flying Operations	4	0	1	2.1	4.000	0.000
BCE - Small Base	5	0	2	4.2	5.000	0.000
BCE - Remote Base	5	0	1	2.1	5.000	0.000

**includes ten responses for Chief of Programs

TABLE C-2

Descriptive Statistics--Usefulness of Previous Assignments
Major Command Positions

Position	Median	Range	N	Percent	Mean	Variance
Operations and Maintenance	5	3	15	31.3	4.267	1.067
Management and Resources	5	2	14	29.2	4.429	0.571
Program Development	4	3	24	50.0	4.333	0.580
Requirements	5	3	26	54.2	4.423	0.814
Environmental Planning	4	2	6	12.5	4.000	0.800
Engineering	4	3	15	31.3	3.867	0.981
Construction	4	3	10	20.8	3.700	0.900
Readiness/Force Development	4	2	18	37.5	4.111	0.575
Housing and Services	3.5	2	6	12.5	3.333	0.667
CESMAT/CESMET/IG	5	3	21	43.8	4.619	0.648
AFRCE	3	5	9	18.8	2.333	2.500
AFIT Staff/Instructor	3	2	2	4.2	3.000	2.000
Plans (XP)	4	0	2	2.1	4.000	0.000
OSD Staff (Rated)	2	0	1	2.1	2.000	0.000
Maintenance Management	5	0	1	2.1	5.000	0.000

TABLE C-2 -- Continued

Position	Median	Range	N	Percent	Mean	Variance
Director, Civil Engineering (TUSLOG)	3	0	1	2.1	3.000	0.000
Executive Officer	5	0	1	2.1	5.000	0.000
Acquisition, Civil Engineering	4	0	1	2.1	4.000	0.000

TABLE C-3

Descriptive Statistics--Usefulness of Previous Assignments
Engineering and Services Center Positions

Position	Median	Range	N	Percent	Mean	Variance
Information Management Systems	3	4	4	8.3	2.500	3.000
Operations and Maintenance	3	5	5	10.4	3.000	3.500
Housing and Services	2	3	4	8.3	1.750	1.583
Engineering and Services Lab	2	2	4	8.3	1.500	1.000
Environmental Planning	2.5	4	4	8.3	2.250	2.917
Readiness	3	4	6	12.5	2.833	2.167
Fire Protection	3	4	4	8.3	2.500	3.000
Energy	2	3	4	8.3	1.750	1.583
Construction Cost Management	2.5	4	4	8.3	2.250	2.917
Chief, Field Technology	5	0	1	2.1	5.000	0.000
Joint Tour	5	0	1	2.1	5.000	0.000
PQ	3	0	1	2.1	3.000	0.000

TABLE C-4

Descriptive Statistics--Usefulness of Previous Assignments
Air Staff Positions

Position	Median	Range	N	Percent	Mean	Variance
Plans	3	2	4	8.3	3.500	1.000
Programs	4	2	7	14.6	4.000	0.667
Housing and Services	3.5	2	4	8.3	3.750	0.917
Engineering	3	2	5	10.4	3.200	0.700
Construction	3.5	2	6	12.5	3.667	0.667
Real Property	3	0	4	8.3	3.000	0.000
Environmental	3	2	4	8.3	3.500	1.000
CESMET/IG	5	2	7	14.6	4.429	0.619
Contingency Plans	4.5	1	2	4.2	4.500	0.500
Palace Blueprint	4	0	1	2.1	4.000	0.000
OSD Staff	2	0	1	2.1	2.000	0.000
Plans, Combined Forces	4	0	1	2.1	4.000	0.000
Joint Tour	5	0	1	2.1	5.000	0.000
Engineering Advisor (HQ MACV)	5	0	1	2.1	5.000	0.000
Personnel Plans	4	0	1	2.1	4.000	0.000

TABLE C-5

Ranking of Positions by Usefulness

Rank	Position	Level	Median	Mean	Frequency
1	Commander	Base	5	5.000	5
2	Joint Tour	ESC/Air Staff	5	5.000	2
3	Engineering Advisor (MACV)	Air Staff	5	5.000	1
4	Chief, Field Technology	ESC	5	5.000	1
	Maintenance Management	MAJCOM	5	5.000	1
6	Executive Officer	MAJCOM	5	5.000	1
7	Chief, Operations	Base	5	4.897	39
8	CESMAT/CESMET/ IG	MAJCOM	5	4.619	21
9	Chief, Resources	Base	5	4.536	28
10	Management and Resources	MAJCOM	5	4.429	14
11	CESMET/IG	Air Staff	5	4.429	7
12	Requirements	MAJCOM	5	4.423	26
13	Operations and Maintenance	MAJCOM	5	4.267	15
14	Contingency Plans	Air Staff	4.5	4.500	2

TABLE C-5 -- Continued

Rank	Position	Level	Median	Mean	Frequency
15	Chief, Environmental and Contract Planning	Base	4.5	4.444	18
16	Program Development	MAJCOM	4	4.333	24
17	Chief, Engineering	Base	4	4.316	19
18	Readiness	MAJCOM	4	4.111	18
19	Chief, Contract Management	Base	4	4.048	21
20	Contract Programmer	Base	4	4.031	32
21	Programs	Air Staff	4	4.000	7
22	Environmental Planning	MAJCOM	4	4.000	6
23	Plans - XP	MAJCOM	4	4.000	2
24	Plans-Combined Forces	Air Staff	4	4.000	1
25	Plans - Personnel	Air Staff	4	4.000	1
26	Palace Blueprint	Air Staff	4	4.000	1
27	Acquisition	MAJCOM	4	4.000	1
28	Chief, Auxiliary Fields Branch	Base	4	4.000	1

TABLE C-5 -- Continued

Rank	Position	Level	Median	Mean	Frequency
29	Flying Operations	Base	4	4.000	1
30	Contract Management Inspector	Base	4	3.955	22
31	Chief, Readiness	Base	4	3.875	16
32	Engineering	MAJCOM	4	3.867	15
33	Chief, Design	Base	4	3.810	21
34	Environmental Coordinator	Base	4	3.700	10
35	Construction	MAJCOM	4	3.700	10
36	Squadron Section Commander	Base	4	3.636	11
37	Chief, Industrial Engineering	Base	3.5	3.938	16
38	Housing	Air Staff	3.5	3.750	4
39	Construction	Air Staff	3.5	3.667	6
40	Housing	MAJCOM	3.5	3.333	6
41	Plans	Air Staff	3	3.500	4
42	Environmental	Air Staff	3	3.500	4
43	Engineering	Air Staff	3	3.200	5
44	Design Engineer	Base	3	3.118	34

TABLE C-5 -- Continued

Rank	Position	Level	Median	Mean	Frequency
45	Operations and Maintenance	ESC	3	3.000	5
46	Real Property	Air Staff	3	3.000	4
47	AFIT Instructor	MAJCOM	3	3.000	2
48	Director, Civil Engineering (TUSLOG)	MAJCOM	3	3.000	1
49	PQ	ESC	3	3.000	1
50	Readiness	ESC	3	2.833	6
51	Information Management	ESC	3	2.500	4
52	Fire Protection	ESC	3	2.500	4
53	AFRCE	MAJCOM	3	2.333	9
54	Environmental Planning	ESC	2.5	2.250	4
55	Construction Cost Management	ESC	2.5	2.250	4
56	OSD	Air Staff/ MAJCOM	2	2.000	2
57	Housing	ESC	2	1.750	4

TABLE C-5 -- Continued

Rank	Position	Level	Median	Mean	Frequency
58	Energy	ESC	2	1.750	4
59	Engineering and Services Lab	ESC	2	1.500	4

*includes response for Base Civil Engineer (Small and Remote), Red Horse Detachment Commander, and Customer Squadron Commander

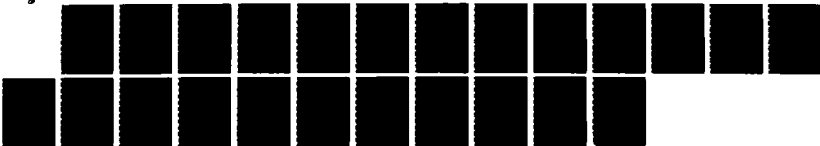
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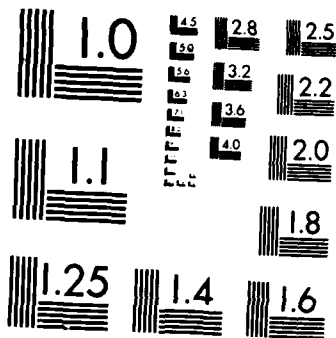
AN ANALYSIS OF THE PERCEIVED ADEQUACY OF CURRENT
PROGRAMS TO PREPARE CIVI (U) AIR FORCE INST OF TECH
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TABLE C-6

Ranking of Positions Which Had Been Held By Respondents
In Order of Perceived Benefit (Open-ended Section)

Rank	Position	Level	Score	Frequency
1	Chief, Operations	Base	158	36
2	CESMAT/CESMET/IG	MAJCOM	62	16
3	Chief, Resources*	Base	56	18
4	Chief, Engineering and Environmental Planning	Base	34	12
5	Program Development	MAJCOM	30	10
6	Requirements	MAJCOM	30	10
7	Contract Programmer	Base	23	8
8	Chief, Contract Management	Base	22	10
9	Commander	Base	22	7
10	Programs	Air Staff	18	5
11	Chief, Industrial Engineering	Base	17	7
12	Chief, Readiness	Base	15	6
13	Operations and Maintenance	MAJCOM	13	5
14	Readiness/Force Development	MAJCOM	12	6

TABLE C- 6 -- Continued

Rank	Position	Level	Score	Frequency
15	CESMET/IG	Air Staff	12	4
16	Chief, Environmental and Contract Planning	Base	12	4
17	Engineering	MAJCOM	10	5
18	Design Engineer	Base	8	4
19	Squadron Section Commander	Base	8	3
20	Instructor	AFIT	8	3
21	Construction	MAJCOM	7	3
22	Management and Resources	MAJCOM	5	3
23	Construction	Air Staff	5	2
24	Plans - XP	Air Staff	5	2
25	AFRCE	MAJCOM	5	1
26	Plans	Air Staff	5	1
27	OIC, Prime Beef	Base	5	1
28	Chief, Auxiliary Fields Branch	Base	5	1
29	Flying Operations	Base	5	1

TABLE C-6 -- Continued

Rank	Position	Level	Score	Frequency
30	Chief, Design Section	Base	4	2
31	Plans	MAJCOM	4	2
32	Housing and Services	Air Staff	4	1
33	Executive Officer	MAJCOM/ Air Staff	4	1
34	Joint Tour	ESC	4	1
35	Environmental Coordinator	Base	3	1
36	Contract Management Inspector	ESC	3	1
37	Maintenance Management	MAJCOM	2	1
38	Chief, Field Technology	ESC	2	1
39	Environmental Planning	MAJCOM	1	1
40	Housing and Services	MAJCOM	1	1
41	Environmental Planning	ESC	1	1

*includes ten responses for Chief, Programs

**includes responses for Base Civil Engineer (Small Base and Remote), Red Horse Detachment Commander, and Customer Squadron Commander

TABLE C-7

Ranking of Positions Which Had Not Been Held By Respondents
In Order of Perceived Benefit (Open-ended Section)

Rank	Position	Level	Score	Frequency
1	Chief, Operations	Base	46	10
2	Chief, Resources	Base	43	12
3	Operations and Maintenance	MAJCOM	37	12
4	Chief, Engineering and Environmental Planning	Base	35	10
5	Programs	Air Staff	32	12
6	Chief, Readiness	Base	30	9
7	Program Development	MAJCOM	26	8
8	Squadron Section Commander	Base	24	8
9	Chief, Industrial Engineering	Base	22	6
10	Chief, Design Section	Base	20	5
11	Environmental Planning	MAJCOM	19	5
12	Readiness/Force Development	MAJCOM	15	4
13	Operations and Maintenance	ESC	13	6
14	CESMAT/CESMET/IG	MAJCOM	13	4

TABLE C-7 -- Continued

Rank	Position	Level	Score	Frequency
15	CESMAT/IG	Air Staff	12	6
16	Housing and Services	MAJCOM	12	5
17	Environmental Coordinator	Base	12	3
18	Plans	Air Staff	11	4
19	Management and Resources	MAJCOM	11	3
20	Contract Programmer	Base	10	4
21	Engineering	MAJCOM	10	4
22	Information Management Systems	ESC	10	4
23	Chief, Environmental and Contract Planning	Base	10	3
24	Fire Protection	ESC	9	4
25	Funds Management	Base	9	3
26	Chief, Contract Management	Base	8	3
27	Requirements	MAJCOM	6	2
28	Contract Management Inspector	Base	5	2
29	Design Engineer	Base	5	1

TABLE C-7 -- Continued

Rank	Position	Level	Score	Frequency
30	Executive Officer	MAJCOM/Air Staff	5	1
31	System Engineer	Base	5	1
32	Construction Cost Management	ESC	4	2
33	Readiness	ESC	4	2
34	Construction	Air Staff	4	1
35	Experience in Operations with Superintendents	Base	4	1
36	Heavy Repair Chief	Base	4	1
37	Environmental	Air Staff	3	2
38	Engineering and Services Lab	ESC	3	1
39	Crafts Team Chief	Base	3	1
40	Deputy BCE	Base	2	1
41	Housing and Services	ESC	2	1
42	AFRCE	MAJCOM	1	1

TABLE C-8

Combined Ranking of Positions Listed in Open-ended Sections
In Order of Benefit

Rank	Position	Level	Score	Frequency
1	Chief, Operations	Base	204	46
2	Chief, Resources*	Base	99	30
3	CESMAT/CESMET/IG	MAJCOM	75	20
4	Chief, Engineering and Environmental Planning	Base	69	22
5	Program Development	MAJCOM	56	18
6	Operations and Maintenance	MAJCOM	50	17
7	Programs	Air Staff	50	17
8	Chief, Readiness	Base	45	15
9	Chief, Industrial Engineering	Base	39	13
10	Requirements	MAJCOM	36	12
11	Contract Programmer	Base	33	12
12	Squadron Section Commander	Base	32	11
13	Chief, Contract Management	Base	30	13
14	Readiness/Force Development	MAJCOM	27	10
15	CESMET/IG	Air Staff	24	10
16	Chief, Design	Base	24	7

TABLE C-8 -- Continued

Rank	Position	Level	Score	Frequency
17	Chief, Environmental and Contract Planning	Base	22	7
18	Commander**	Base	22	7
19	Engineering	MAJCOM	20	9
20	Environmental Planning	MAJCOM	20	6
21	Management and Resources	MAJCOM	16	6
22	Plans	Air Staff	16	5
23	Environmental Coordinator	Base	15	4
24	Housing and Services	MAJCOM	13	6
25	Operations and Maintenance	ESC	13	6
26	Design Engineer	Base	13	5
27	Information Management Systems	ESC	10	4
28	Fire Protection	ESC	9	4
29	Construction	Air Staff	9	3
30	Funds Management	Base	9	3
31	Executive Officer	MAJCOM	9	2
32	Instructor	AFIT	8	2
33	Construction	MAJCOM	7	3
34	Readiness	ESC	7	3
35	AFRCE	MAJCOM	6	2

TABLE C-8 -- Continued

Rank	Position	Level	Score	Frequency
36	Contract Management Inspector	Base	5	2
37	Plans - XP	Air Staff	5	2
38	OIC, Prime Beef	Base	5	1
39	System Engineer	Base	5	1
40	Chief, Auxiliary Fields Branch	Base	5	1
41	Flying Operations	Base	5	1
42	Construction Cost Management	ESC	4	2
43	Housing and Services	Air Staff	4	1
44	Plans - XP	MAJCOM	4	2
45	Joint Tour	ESC	4	1
46	Operations Experience with Superintendents	Base	4	1
47	Heavy Repair Chief	Base	4	1
48	Environmental	Air Staff	3	2
49	Engineering and Services Lab	ESC	3	1
50	Crafts Team Chief	Base	3	1
51	Housing and Services	ESC	2	1
52	Maintenance Management	MAJCOM	2	1
53	Chief, Field Technology	ESC	2	1

TABLE C-8 -- Continued

Rank	Position	Level	Score	Frequency
54	Military Deputy BCE	Base	2	1
55	Environmental Planning	ESC	1	1

*includes responses for Chief, Programs

**includes responses for Base Civil Engineer, Red Horse Detachment Commander and Customer Squadron Commander

TABLE C-9

Descriptive Statistics--Usefulness of AFIT Short Courses

Course Title	Median	Range	N	Percent	Mean	Variance
Introduction to Base Civil Engineering	3	3	34	70.8	3.529	1.287
Commanders Engineering and Services Orientation	4	5	8	16.7	3.500	2.257
Systems Manager	2	1	3	6.3	2.333	0.333
Environmental Protection Committee Members	3.5	1	10	20.8	3.500	0.278
Project Programming	4.5	5	6	12.5	3.667	3.867
Base Civil Engineer	4.5	3	32	66.7	4.375	0.565
Industrial Engineering Management	3	2	9	18.8	3.556	0.528
Family Housing Management	3	2	5	10.4	3.000	0.500
Financial Management	4	1	3	6.3	3.667	0.333
Engineering and Environmental Planning Management	3	3	7	14.6	3.286	1.238

TABLE C-9 -- Continued

Course Title	Median	Range	N	Percent	Mean	Variance
Fire Protection Management	4	2	9	18.8	4.222	0.694
Operations Management	4	2	19	39.6	4.105	0.655
Real Property Management	3	13	3	6.3	2.667	0.333
Contract Preparation and Management	5	3	7	14.6	3.857	2.143
Logistics Management	2.5	1	2	4.2	2.500	0.500
Readiness Management	3	0	2	4.2	3.000	0.000
Environmental Contract Planning	4	3	5	10.4	3.600	1.300
Hazardous Waste Management	4	3	4	8.3	3.750	1.583
Construction Cost Estimating	2	2	3	6.3	2.667	1.333
Built-Up Roofing	2.5	2	4	8.3	2.750	0.917
Mechanical Engineering for Supervisors	3.5	3	8	16.7	3.375	1.125
Electrical Engineering for Supervisors	2	3	7	14.6	3.000	1.667

TABLE C-9 -- Continued

Course Title	Median	Range	N	Percent	Mean	Variance
Shielded Construction Fundamentals	2	0	2	4.2	2.000	0.000
Engineering for EMCS	2	0	2	4.2	2.000	0.000
Building Systems	3	3	3	6.3	3.333	2.333
Contingency Engineering	4	3	9	18.8	4.111	1.111
Architectural Planning	3	2	2	4.2	3.000	2.000
Environmental/ Sanitary Engineering	3	1	4	8.3	2.750	0.250
Pavement Engineering	3	3	8	16.7	3.125	0.982
Heat, Ventilation, Air Conditioning	3	2	4	8.3	3.000	1.333
HVAC Control Systems	2	0	2	4.2	2.000	0.000
Electrical Engineering	2	0	2	4.2	2.000	0.000
Corrosion Control	3	2	5	10.4	2.800	0.700
Industrial Water Treatment	2	0	2	4.2	2.000	0.000

TABLE C-10

Ranking of Courses by Usefulness

Rank	Course	Median	Mean	Frequency
1	Contract Preparation and Management	5	3.857	7
2	Base Civil Engineer	4.5	4.375	32
3	Project Programming	4.5	3.667	6
4	Fire Protection Management*	4	4.222	9
5	Contingency Engineering	4	4.111	9
6	Operations Management	4	4.105	19
7	Hazardous Waste Management	4	3.750	4
8	Financial Management	4	3.667	3
9	Environmental and Contract Planning	4	3.600	5
10	Commanders Engineering and Services Orientation	4	3.500	8
11	Environmental Protection Committee	3.5	3.500	10
12	Mechanical Engineering for Supervisors	3.5	3.375	8
13	Industrial Engineering Management	3	3.556	9
14	Introduction to Base Civil Engineering	3	3.529	34
15	Building Systems	3	3.333	3
16	Engineering and Environmental Planning Management	3	3.286	7

TABLE C-10 -- Continued

Rank	Course	Median	Mean	Frequency
17	Pavement Engineering	3	3.125	8
18	Readiness Management	3	3.000	2
19	Family Housing Management	3	3.000	5
20	Heat, Ventilation, Air Conditioning	3	3.000	4
21	Architectural Planning	3	3.000	2
22	Corrosion Control	3	2.800	5
23	Environmental/Sanitary Engineering	3	2.750	4
24	Real Property Management	3	2.667	3
25	Built-Up Roofing	2.5	2.750	4
26	Logistics Management	2.5	2.500	2
27	Electrical Engineering for Supervisors	2	3.000	7
28	Construction Cost Estimating	2	2.667	3
29	Systems Manager	2	2.333	3
30	Shielded Construction Fundamentals	2	2.000	2
31	Engineering for EMCS	2	2.000	2
32	HVAC Control Systems	2	2.000	2
33	Electrical Engineering	2	2.000	2
34	Industrial Water Treatment	2	2.000	2

*includes responses rating the Fire Protection Course at Chanute AFB.

TABLE C-11

Ranking of Courses in Open-ended Section

Rank	Course	Score	Frequency
1	Base Civil Engineer	163	35
2	Operations Management	88	23
3	Commanders Engineering and Services Orientation	45	12
4	Financial Management	39	13
5	Project Programming	33	14
6	Fire Protection Management	29	11
7	Contingency Engineering	23	10
8	Engineering and Environmental Planning Management	14	6
9	Introduction to Base Civil Engineering	13	5
10	Environmental Protection Committee Members	12	5
11	Readiness Management	11	5
12	Industrial Engineering Management	9	3
13	Family Housing Management	9	3
14	Electrical Engineering for Supervisors	5	4
15	Contract Preparation and Management	5	3
16	Mechanical Engineering for Supervisors	4	3

TABLE C-11 -- Continued

Rank	Course	Score	Frequency
17	Environmental and Contract Planning	3	2
18	Building Systems	3	1
19	Hazardous Waste Management	2	1
20	Logistics Management	1	1
21	Pavement Engineering	1	1
22	Heat, Ventilation, Air Conditioning	1	1

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Title: AN ANALYSIS OF THE PERCEIVED ADEQUACY OF CURRENT PROGRAMS TO PREPARE CIVIL ENGINEERING OFFICERS TO ASSUME THE RESPONSIBILITIES OF BASE CIVIL ENGINEER			
Thesis Chairman: Robert B. Weaver Assistant Professor of Communications			
<div style="text-align: right;"> Approved for public release LAW AFB 100-17 <i>John Weaver</i> 29 Sept 86 JOHN B. WEAVER Research and Professional Development Air Force Institute of Technology (AFIT) Wright-Patterson AFB OH 45433 </div>			
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→ The purpose of this thesis was to determine the perceived adequacy of current programs to prepare civil engineering officers to assume the responsibilities of Base Civil Engineer. Research questions consisted of determining which existing civil engineering positions and AFIT short courses were most useful to Base Civil Engineers, and gathering suggestions for improvement to the existing system. A survey questionnaire was developed and distributed to Base Civil Engineers in the continental United States. Analysis of survey responses indicated that almost all respondents believed they had been adequately prepared to become Base Civil Engineers. Experience in four areas was considered to be of high value - operations, engineering (with an emphasis on programming), management consultant services, and readiness. A variety of experience at all levels, with a strong background at base level, was also perceived as beneficial. It was concluded that current programs are adequate to prepare civil engineering officers for the position of Base Civil Engineer; however, Base Civil Engineers seemed to place a higher value on previous assignments than on AFIT short courses. Additional emphasis was recommended in the areas of commander responsibilities, fire protection, and financial management.

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