ENGINEERING ASSISTANT
AFSC 553 X 0
TRAINING REQUIREMENTS ANALYSIS

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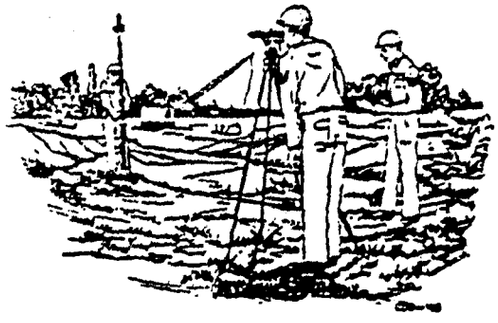

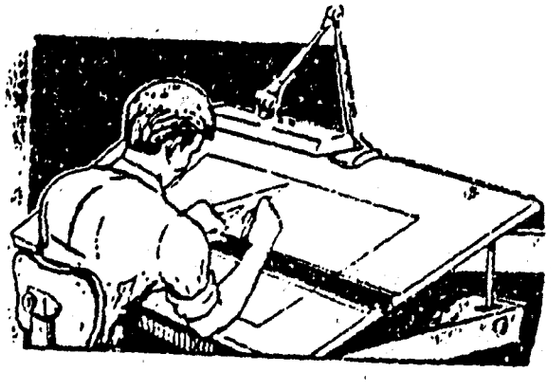

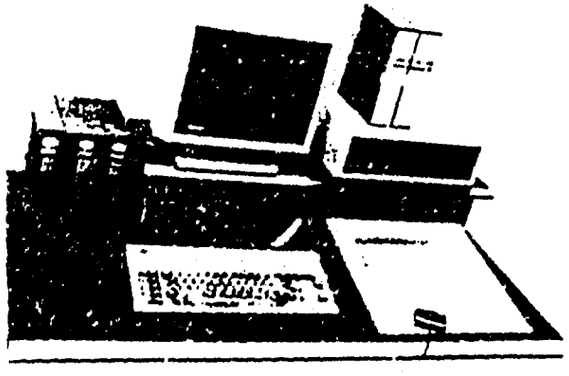

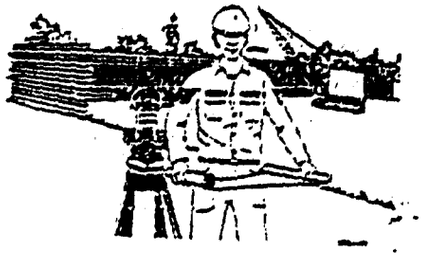

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VOLUME I
DECEMBER 1990

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LOWRY AFB	CO	HQ ARPC/DPMPO	1
MAXWELL AFB	AL	HQ AU/DE	1
MAXWELL AFB	AL	CCAF/AYX	1
McCLELLAN AFB	CA	2852 CES/CCQ	1
NELLIS AFB	NV	554 CES/DE	1
NELLIS AFB	NV	820 RHCES/DE	1
OFFUTT AFB	NE	HQ SAC/DE	1
PETERSON AFB	CO	HQ AFSPACECOM/DE	1
PETERSON AFB	CO	1003 CES/DE	1
RANDOLPH AFB	TX	HQ ATC/DE	1
RANDOLPH AFB	TX	HQ ATC/TTOA	1
RANDOLPH AFB	TX	USAFOMS/OMT/OMD/OMY	3
RANDOLPH AFB	TX	AFMPC/DPMRPQ2	2
RANDOLPH AFB	TX	AFMPC/DPMRAD5	1
ROBINS AFB	GA	HQ AFRES/DE	4
ROBINS AFB	GA	2853 CES/CCQ	1
SCOTT AFB	IL	HQ AFCC/DE	1
SCOTT AFB	IL	HQ MAC/DE	1
SCOTT AFB	IL	HQ MAC/DPATJ	1

DEPARTMENT OF THE AIR FORCE
USAF OCCUPATIONAL MEASUREMENT SQUADRON (ATC)
RANDOLPH AIR FORCE BASE TX 78150-5000

REPLY TO ATTN OF CC

11 March 1991

SUBJECT Training Requirement Analysis (TRA) Evaluation Program

TO All TRA Users

1. The TRA you received is a tool designed for your use. It describes the training requirements of your specialty, and can provide support for your training decisions. In order to improve future TPAs, we must evaluate the ones presently in the field. The key to this process is direct feedback from TRA users.

2. In the near future we will request your thoughts and opinions on this TPA. You can help us begin by completing and returning the attached AF Form 74. Thank you for your assistance.

BOBBY P. TINDELL, Colonel, USAF
Commander

1 Atch
AF Form 74

A-1

SHEPPARD AFB	TX	3700 TCHTW/TTGXD	1
SHEPPARD AFB	TX	3770 TCHTG/CC/TTOT (2)/ TTGIC (2)	5
SHEPPARD AFB	TX	DET 4 USAFOMS	1
SHEPPARD AFB	TX	3700 TCHTW/TTS	1
TINKER AFB	OK	2854 CES/CCQ	1
TYNDALL AFB	FL	HQ AFESC/DEMG	1
TYNDALL AFB	FL	325 CES/DE	1
USAF ACADEMY	CO	USAFA/DE	1
WASHINGTON	DC	NODAC WNY ANACOSTIA	1
WASHINGTON	DC	HQ USAF/DPPT	1
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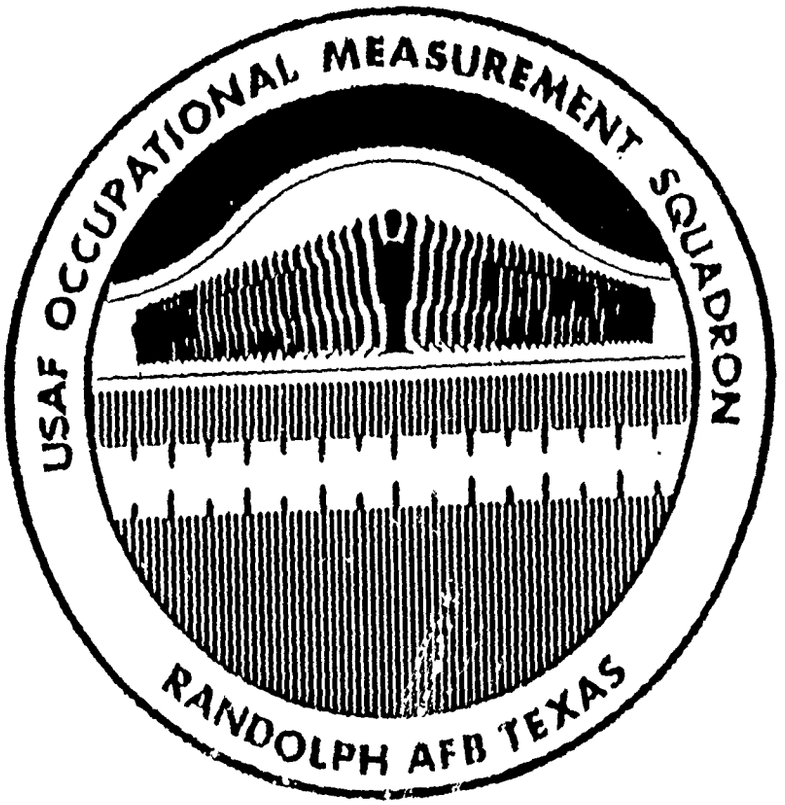

ENGINEERING ASSISTANT TRAINING REQUIREMENTS ANALYSIS
PREPARED BY

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A SPECIAL THANKS TO THE MANY HARD-WORKING ENGINEERING ASSISTANT PERSONNEL AND SUPERVISORS FOR THEIR EXPERTISE AND OUTSTANDING SUPPORT ON THIS PROJECT.

Preface

The United States Air Force Occupational Measurement Squadron (USAFOMS), Training Development Services Branch (OMT), is assigned primary responsibility for developing training requirements analyses (TRAs) for Air Force specialties. The TRA provides comprehensive data describing specialty training requirements for the 3-, 5-, and 7-skill levels. TRAs provide a basis for revision or development of specialty training standards (STSs), initial skill training, on-the-job training (OJT), and career development courses (CDCs). TRAs fulfill most requirements of Steps 1 and 2 of the Instructional System Development (ISD) model prescribed in AFR 50-8, Policy and Guidance for Instructional System Development, ISD. TRAs assist Air Force officials in making informed, data-based training decisions.

The TRA consists of three sections: (a) System Overview--an overall perspective of the career field; (b) Task Analysis--detailed training decision data; and (c) Training Recommendations--what should be trained, when training should occur, and where training should be provided. Data from the August 1990 Occupational Survey Report (OSR) are used to support the System Overview and Training Recommendations sections of this TRA.

Copies of this report are available to Air Staff sections, MAJCOMs, the OJT community, and other interested training and management officials upon request. Address requests to USAFOMS/OMT, Randolph AFB, TX 78150-5000 or Detachment 5 USAFOMS, Lowry AFB, CO 80230-5000.

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TABLE OF CONTENTS

EXECUTIVE SUMMARY

Overview

The Air Force Engineering and Services Center and HQ ATC Technical Training Combat Support Training Division, TTOC, requested this training requirements analysis (TRA) in order to provide a comprehensive data base of training requirements to support training decisions. The project was initiated to evaluate the adequacy, feasibility, and efficiency of the training being provided within this rapidly changing, highly technical career ladder. Current issues include the need to revise the specialty training standard (STS), rewrite the career development courses (CDCs), and keep up with changing technology.

Procedures

Data for this TRA were gathered by field interviews with Engineering Assistant personnel during Jan - Sep 90. Data from the August 1990 Occupational Survey Report (OSR) were also used. A TRA task list was organized by determining major task statements from the OSR, STS, and associated subtasks. A total of 109 subject matter experts (SMEs) at 10 Air Force locations, representing 9 MAJCOMs, were interviewed to gather task data and information on how to improve career field training. Further, extensive research was conducted on all Engineering Assistant course control documents, regulations, and manuals.

Results

Upon completion of data collection and task analysis, data were compiled and the following general and specific training recommendations resulted. (See the Training Recommendations section for detailed discussion.)

General Recommendations

1. Develop a specialized CDC encompassing material from the Engineering Assistant Technician and Contract Construction Inspector courses.

2. Change the current Mobile Training Team (MTT) course number to a 4AZT course number and include it in AFR 50-5, USAF Formal Schools, so that more personnel are aware of its availability.

3. Include more information in the J3AZR55370-001, Engineering Assistant Technician, course on preliminary electrical, plumbing, and mechanical design of proposed construction.

Specific Recommendations

Specific task-by-task training recommendations are provided in the form of a proposed STS. The major tasks from the TRA are cross-referenced with the STS items and the corresponding proficiency codes to indicate what to train, where to train, and to what level. The proposed STS contains numerous content and proficiency code changes. They are provided to assist the training managers and curriculum developers with revising the STS at the next 553X0 Utilization and Training Workshop (U&TW).

TRA Implications

Results of this study indicate the Engineering Assistant career ladder is healthy despite being in a constant state of change due to continuous technology upgrades. The 3770 TCHTG does an excellent job preparing graduates to perform a broad range of tasks. Job satisfaction is high in this diversified and challenging career ladder where customer requirements dictate they perform a different mission each day.

INTRODUCTION

Purpose

This document summarizes a detailed analysis of Air Force specialty code (AFSC) 553X0. The Training Recommendations section of this report is based upon analysis of OSR data, as well as detailed task, skill, and knowledge data collected during on-site interviews with SMEs.

The purpose of the Engineering Assistant TRA is to improve career ladder training, supply training requirements data to the on-the-job training (OJT) community, and provide input for training managers at all levels. This approach will provide useful information for developing the STS, job qualification standards (JQSs), OJT programs, and resident and nonresident curricula. This TRA will be especially useful during the U&TW where significant training decisions can be based on accurate task data and carefully developed training recommendations.

The TRA consists of three sections:

1. System Overview: This is a synopsis of the specialty that identifies mission objectives, training requirements, training issues and concerns, future plans, and special interest issues or observations.

2. Training Recommendations: Recommendations are based on a compilation and interpretation of the task analysis, system overview, and OSR data. This part of the TRA includes both general and specific recommendations. The general recommendations focus on improvements to the entire career field. The specific recommendations are provided in the form of a proposed STS and are based on a thorough analysis of each task.

3. Task Analysis: This is a detailed examination of career ladder tasks to identify equipment, references, conditions, cues, standards, activities, skills, and knowledge required for performing the tasks. The Task Analysis is provided as Volume II of this report.

This TRA is provided as a tool for the various MAJCOMs and training managers to use in developing the STS and subsequent course documents for resident and OJT programs. This document will be distributed to the addressees listed on the distribution list, including each Civil Engineering unit visited. TRAs should be disseminated from MAJCOM headquarters to local OJT units. This will maximize its use at all levels, to include OJT managers at the workcenters.

SYSTEM OVERVIEW

The System Overview provides a synopsis of the entire career ladder. It examines mission objectives, current training, issues, concerns, problems, and assignment data. It focuses specifically on training issues related to the present and future direction of career ladder needs. The System Overview provides up-to-date information on trends, issues, and projected changes in the specialty.

Mission Description

Engineering Assistant personnel perform a diversity of tasks based on the mission of their unit and major command. They:

1. Prepare drawings
2. Survey
3. Manage construction activities
4. Manage service contract activities
5. Perform related computer operator activities
6. Collect surface materials
7. Interpret laboratory test results

The military and civilian members of the Engineering Assistant community provide the Department of Defense with engineering products related to military and national defense issues and involvement.

According to the data collected, personnel in the 553X0 career ladder perform the following jobs:

1. Drafting Specialists
2. Surveying Specialists
3. Supervisory
4. Construction Contract Inspection Technicians
5. Service Contract Management Technicians
6. Base Survivability Technicians
7. Simplified Acquisition Base Engineering Requirements (SABER) Office Technicians
8. Ground Radar Evaluators
9. Material Testing Technicians

Current Training

Formal courses offered in the Engineering Assistant career ladder are listed below. Most courses are offered at Sheppard Technical Training Center. Other courses can be obtained through civilian schools, like Coast Community College, and equipment manufacturers, e.g., Sun Microsystems. For a complete description of course prerequisites and content consult AFR 50-5.

J3ABR55330 001-- Engineering Assistant Specialist--Sheppard/10 wk 2 days/AFSC 55330. Category A school.

Provides an introduction to surveying and drafting, and related skills and equipment operation.

J3AZR55370 001--Engineering Assistant Technician--Sheppard/8 wk 1 day.

Provides instruction in instrument adjustment, reconnaissance surveys, materials testing, and structural design.

J3AZR55370 101--Engineering Assistant Support--Sheppard/3 wk 3 days

Supports Harvest Bare training requirements. Provides instruction necessary to support deployment of a bare base bed-down force.

J3AZR55070 000--Contract Construction Inspector--Sheppard/6 wk 1 day

Provides instruction in interpreting construction plans and technical specifications and documenting activities related to base construction.

AFR 39-1 Requirements

The career ladder includes a mandatory requirement for normal color vision and completion of high school courses in algebra, trigonometry, and geometry. Individuals must also be able to lift 40 pounds waist high. A minimum General Armed Services Vocational Aptitude Battery (ASVAB) aptitude score of 48 is required. Additional specialty qualifications for the Engineering Assistant career ladder are listed in AFR 39-1, Airman Classification.

Training Issues

This section provides a summary of training issues, concerns, and problems identified during task analysis. Issues were identified from recommendations, comments, and concerns expressed within the Engineering Assistant community, and were consolidated during interviews with technicians at all levels of command.

Overall, job satisfaction is high. Most incumbents report they find their job interesting, and feel their talents and training are well utilized. Members performing ground radar duties expressed the least job satisfaction of those contacted. This dissatisfaction stemmed from their limited exposure to the entire career ladder. This is also supported by OSR data.

The training issues currently identified are directly related to initial skills training received before first assignment. These issues appear below and generate a corresponding formal recommendation in the Training Recommendations section:

Instruction on the Transit surveying equipment in the 3-skill level course needs to be deleted. Presently, students receive this training as well as training on the Theodolite surveying equipment. Upon arrival at their first duty station, personnel will only be required to use the Theodolite or the Total Station Electronic Distance Measurement instrument, to include the Electronic Field Notebook, a new technological piece of surveying equipment entering the Air Force inventory. The only exposure the graduates will receive to the Transit is through the mobility kit. Of the ten bases and nine MAJCOMs visited, only the Air Force Reserves (AFRES) use the Transit on a daily basis, during weekend duty and 2-week encampments. AFRES consists of only 28 percent of the student load at the schoolhouse. Training received on the Theodolite during the 3-skill level course can be easily adapted to familiarization on the Transit through Prime Beef and OJT to satisfy mobility requirements. The training time presently used to teach the Transit can be utilized to teach the relationship between the Total Station Electronic Distance Measurement instrument, Electronic Field Notebook, and Computer-Aided Drafting (CAD) computer programs and drafting technology.

Future Plans

Requirements for the future will cause the career ladder to constantly update equipment with advancements in technology. The computer, Computer-Aided Drafting (CAD) software (to include 3-D), Total Station Electronic Distance Measurement instrument, Electronic Field Notebook, and related accessories are entering the Department of Defense inventory and should be incorporated into each organization's equipment plan. The emphasis is now on having finished products produced quicker and readily available for a wide range of customers.

The technical school has ordered the required training equipment. However, the only training available at this time is through civilian sources.

Special Interest Issues

The following issues reflect concerns of field supervisors or observations made during visits that are not directly related to training but affect the Engineering Assistant career ladder:

1. Nonstandardization of equipment from location to location was a primary concern of supervisory personnel. Task analysis and system overview data suggest that the amount of equipment and software variation does not, in all cases, support a more efficient mission accomplishment. Variation in equipment and software requires relearning when people are transferred between locations. Interviews with various division chiefs showed an overall impression that the amount of leeway provided in the equipment requisition process will preclude any immediate standardization. If equipment and software were standardized, a greater level of consistency could be attained. However, room for exceptions must exist to ensure mission accomplishment.

2. Another concern from the field was assigning airmen with little to no career ladder and military experience to direct duty assignments (DDAs). The 3507th Airman Classification Squadron was contacted, and the practice of assigning DDAs and administering a bypass test at the school has ceased.

TASK ANALYSIS

The task analysis data are located in Vol II of this TRA. The following areas are included in the task analysis: task number; task statement; task notes; training recommendations; equipment, tools, and supplies; references; conditions; cues; constraints; standards; activities; skills; and knowledge.

1. The TASK NUMBER is a sequential number assigned to each TRA task.

2. The TASK STATEMENT is a meaningful unit of work. TRA tasks may be the same as OSR task statements, or may include several closely related tasks from the OSR. In some cases, TRA task statements do not correspond to OSR tasks. Numbers in parentheses that follow a TRA task statement are equivalent OSR task numbers.

3. The TASK NOTES section contains additional information that is pertinent to the task.

4. The TRAINING RECOMMENDATIONS section lists training recommendations. It indicates at what skill level training should be conducted for each task.

5. The EQUIPMENT, TOOLS, AND SUPPLIES section lists all equipment, tools, and supplies required to perform the task.

6. The REFERENCES section lists the governing directives required to do the task. This includes military directives, manufacturers' manuals, and local directives.

7. The CONDITIONS section states any special circumstances under which the task must be performed.

8. The CUES section lists what causes the task to be performed.

9. The CONSTRAINTS section lists factors that may hinder or prevent accomplishment of the task.

10. The STANDARDS section specifies the job performance evaluation standards.

11. The ACTIVITIES section lists the steps required to perform the task.

12. The SKILLS section lists the skills required to perform the task.

13. The KNOWLEDGE section lists the knowledge required to perform the task.

The task analysis is the data base on which significant career ladder training requirements and recommendations are based. This data base consists of a detailed analysis of job inventory (JI) tasks and tasks identified by SMEs to determine job performance requirements. The task analysis provides training and utilization decisionmakers with necessary data upon which to base objective decisions. These data will contribute to career ladder training improvements from apprentice to superintendent levels. Specifically, they are very useful in the following areas:

- Developing/revising AFR 39-1 description
- Developing/revising STSs
- Developing/revising formal resident courses
- Developing/revising specialty training
- Developing/revising CDCs
- Making decisions at U&TWs
- Developing and enhancing OJT programs

Further, the task analysis includes all necessary information to develop valid objectives (i.e. behavior, condition, and standard). The task analysis is an essential part of the implementation of Instructional System Development (ISD). The Air Force can improve its OJT program by using this up-to-date information. The task analysis will also be valuable for training plan development at the worker level. In addition, curriculum developers and CDC writers can use it to incorporate the training requirements into appropriate courses. Specifically, the skills and knowledge can be included into the body of the courses to ensure that students are adequately prepared for task accomplishment.

Task analysis data collection began in January 1990, with 435 JI tasks for the 553X0 career ladder. Three analysts, two from Detachment 5, USAFOMS, and one from USAFOMS/OMTQ, gathered data from the following locations:

1. Hill AFB, UT
2. Peterson AFB, CO
3. Falcon AFB, CO
4. Kirtland AFB, NM
5. Nellis AFB, NV
6. Barksdale AFB, LA
7. Hurlbut Field, FL
8. Eglin AFB, FL
9. Tyndall AFB, FL
10. Lowry AFB, CO

The team conducted one-on-one interviews with well-qualified Engineering Assistant SMEs selected by the supervisors at each location. They set up interview schedules matching the most qualified individuals with the tasks identified for analysis. The support provided by the installation representatives resulted in the success of the task analysis. Additional thanks need to be given to the technical school and course personnel at Sheppard AFB who validated task data collected in the field and advised us of the critical issues to focus on during this study.

During task analysis, questions were tailored to obtain accurate identification of training requirements (i.e., skills and knowledge). These data provided a detailed data base from which to make general recommendations on how to improve career ladder training and will be crucial to the outcome of major career ladder decisions made at the upcoming U&TW. In addition, SME worksheets were used to maintain an audit trail of interviews and to solicit SME views on how to resolve problems in the career field, improve training, and implement future changes.

TRAINING RECOMMENDATIONS

Overview

The purpose of this section is to present optimum training scenarios for the Engineering Assistant career ladder. The recommendations are designed to create the best possible training environment, given realistic resource constraints.

These recommendations were consolidated from field interviews with supervisors on how to provide the highest quality graduate possible. The supervisors felt that the school was doing an excellent job of providing students with the very best of basic information possible. This information provided a solid foundation on which continuous personnel development and growth could be built. However, there was a strong need for graduates to have ample exposure and hands-on training on the most current equipment possible. These recommendations should lead to the replacement of obsolete equipment with up-to-date equipment. The field will then be provided with better qualified individuals to perform required tasks with minimal additional training.

General Recommendations

1. Develop a specialized CDC that encompasses the material from the Engineering Assistant Technician and Contract Construction Inspector courses. All personnel assigned to Construction Contract Management, Service Contract Management, SABER offices, or Red Horse units should be eligible for enrollment in the course.

   RATIONALE: Personnel assigned to Construction and Service Contract Management offices are involved with monitoring materials testing and interpreting materials test reports. They are also required to make decisions concerning construction and service contracts immediately upon assignment to this office. Under current circumstances, it is common for personnel to be assigned to these positions for up to three years before having the opportunity to attend either the Engineering Assistant Technician or Contract Construction Inspector course in residence. With the implementation of the SABER offices, personnel are required to manage a construction project from inception to completion. The material in the above two courses is essential in the performance of these assigned duties. In addition, personnel assigned to Red Horse units are responsible for performing the same functions upon assignment, regardless of rank or skill level. With continuing shortages of TDY funds, this CDC would help qualify these individuals for their duties. Tasks identified as requiring a 7-skill level course and CDC training in the task analysis worksheets encompass material required for development of this course.

2. Change the current MTT course number to a 4AZT number and include it in AFR 50-5 so that more personnel are aware of its availability. Personnel eligible for this course should be in the grades of E-4 through E-9 in the 55XXX career field assigned to Construction Management, Service Contract Management, or SABER offices. Personnel in the grade of E-3 who possess a 5-skill level and are assigned to Red Horse units, should also be eligible to attend this course.

   RATIONALE: Construction Management, Service Contract Management, SABER, and Red Horse personnel are involved with monitoring materials testing, interpreting materials test reports, and making decisions concerning construction and service contracts immediately upon assignment to these positions. The existing course provides excellent hands-on training in these areas. However, during task analysis, it became apparent that since this course is not listed in AFR 50-5, personnel in the field are not aware of its existence. The course material is essential in the performance of these duties.

3. Include more information in the J3AZR55370-001, Engineering Assistant Technician, course on preliminary electrical, plumbing, and mechanical design of proposed construction.

   RATIONALE: Personnel assigned to SABER offices are required to design and manage a construction project from inception to completion. To ensure building code and user requirements are met in a cost effective manner, more in-depth preliminary design requirements information is needed. This should include preconstruction design activities, acceptable plumbing, electrical, and mechanical layouts, and possible unacceptable contractor short-cuts. At present, SABER personnel do not always have SMEs at their disposal to accompany them during construction inspections and preliminary design phases to ensure building code compliance. In addition, personnel assigned to Red Horse units are responsible for performing the same functions upon assignment regardless of rank or skill level.

4. Revise the current STS using the proposed STS in the specific training recommendations section. Based upon review of the OSR, data collected during TRA development, and the current STS, changes are required. Performance tasks should be reflected in the STS with more appropriate codes. The proposed STS and task analysis data will be useful in this review and update. This will also result in an update to the related CDCs to keep pace with career ladder changes and Engineering Assistant technology.

Common Skills and Knowledge Requirements

Common skills and knowledge requirements are prerequisite abilities that support task performance but are not themselves part of the procedures for accomplishing the task. They are behaviors a person must be capable of performing in order to accomplish a task or activity. Many skills and knowledge requirements are not specifically identified in regulations or manuals. On the job they are considered as 'given.' Therefore, to build a successful training program, these common requirements need to be identified and taught as prerequisites to the more difficult job performance tasks. Through task analysis, the following skills and knowledge were identified in three or more tasks and are considered as common for the Engineering Assistant career ladder. These common skills and knowledge should be considered for skill level awarding training and inclusion in the STS. Also, the data provided will be helpful in identifying the major skills or knowledge requirements when rewriting the CDC, writing OJT training plans, and reviewing formal courses.

COMMON SKILLS AND KNOWLEDGE

Knowledge

Annotate AF Form 9
Annotate AF Form 103
Annotate AF Form 327
Annotate AF Form 332
Annotate AF Form 802
Annotate AF Form 1477
Annotate AF Form 3065
Annotate Computerized Forms
Apply Basic Drafting Practices
Apply Drawing Storage Procedures
Apply Equipment Shielding Techniques
Apply Mathematical Formulas
Apply Safety Procedures
Apply Technical Data
Identify Survey Book Data Requirements
Interpret Contract Specifications
Prepare Letters
Recall Contract Specifications
Recall Equipment Requirements

COMMON SKILLS AND KNOWLEDGE (continued)

Skills

Operate Calculator
Operate Computer
Operate Diazo Machine
Operate Kroy Lettering Machine
Operate Laser Plotter
Operate Portable Radio
Operate Theodolite
Operate Total Station (EDM)
Operate Transit
Operate Xerox Engineering Copier
Plot Data
Use Autolevel
Use Ax
Use Basic Drafting Equipment and Supplies
Use CAD Drafting Symbol Templates
Use CAD Software
Use Chain Saw
Use Compass
Use Computer Software
Use Hand Signals
Use Leveling Rod
Use Light Pen
Use Machete
Use Measuring Tape
Use Plane Table
Use Plotter
Use Prisms (Mirrors)
Use Range Pole
Use Rod
Use Safety Equipment
Use Scale
Use Shovel
Use Sledge Hammer
Use Stakes
Use Taping Arrows
Use Templates
Use Total Station Electronic Field Note Book
Use Tripod
Use Vacuum Table

SPECIFIC RECOMMENDATIONS

Purpose

The following proposed STS is provided to assist managers and training developers in revising the STS at the upcoming U&TW.

Content

The content of the current STS has been revised. Specific STS elements have been added and moved to most accurately reflect the essential tasks performed in the career ladder. Also, training codes on many STS elements have been revised to indicate the recommended level of training. These changes are based upon task analysis data, OSR information, and information provided by the supervisors on what is absolutely required knowledge in order to perform in the field.

Format

The format of the proposed STS is identical to the current STS with the exception of a column for the relevant TRA task number. The TRA tasks are cross-referenced to match each appropriate STS element. Each STS element that is not matched to a TRA task should be reviewed at the U&TW to determine its applicability. The task analysis contains the required skills and knowledge to perform the tasks and the relevant OSR task factor data to assist in making STS content decisions at the U&TW.

Training Recommendations

The specific recommendations are indicated by the STS elements included and the training codes assigned to each element. The STS elements represent the task training requirements and the training codes indicate where, when, and to what level training should be provided. The training codes designate the recommended knowledge and performance levels based on the proficiency code key contained in front of the present STS. All changed areas incorporated into the proposed STS are identified with two asterisks (**). Areas identified with a single asterisk (*) are the tasks and knowledge proposed for training in resident wartime courses. Rationale for changes appear at the end of the proposed STS.

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4.	PARTICIPATE IN THE USAF GRADUATE EVALUATION PROGRAM TR: AFR 50-38		-	-
5.	SUPERVISION			
	a. Orient new personnel TR: AFRs 39-1, 50-23, 85-2		-	-
	b. Assign personnel to work crews TR: AFRs 66-1, 85-2		-	-
	c. Plan work assignments/priorities TR: AFRs 66-1, 85-2		-	-
	d. Schedule work assignments TR: AFRs 66-1, 85-2		-	-
	e. Establish TR: AFRs 30-1, 30-30, 40-11, 66-1 85-1; AFPs 35-49, 40-1			
	(1) Work methods		-	-
	(2) Controls		-	-
	(3) Performance standards		-	-
	f. Evaluate work performance of subordinate personnel TR: AFR 39-62; AFP 30-31		-	-
	g. Resolve technical problems for subordinate personnel TR: AFRs 39-62, 66-1, 85-2		-	-
	h. Counsel personnel TR: AFRs 39-6, 211-3		-	-
	i. Initiate action to correct sub-standard performance by personnel TR: AFRs 35-32, 39-30		-	-
6.	TRAINING TR: AFRs 50-2, 50-23; AFP 50-58			
	a. Evaluate personnel to determine need for training		-	-

6.	TRAINING (Continued)			
	b. On The Job Training Supervision			
	(1) Prepare job qualification standards		-	-
	(2) Prepare lesson plans		-	-
	(3) Conduct training		-	-
	(4) Counsel trainees on their progress		-	-
	(5) Monitor effectiveness of training			
	(a) Career knowledge upgrade		-	-
	(b) Job proficiency upgrade		-	-
	(c) Qualification		-	-
	c. Maintain training records		-	-
	d. Evaluate effectiveness of training programs		-	-
	e. Recommend personnel for training TR: AFRs 35-1, 39-1, 50-5, 50-37, 50-39		-	-
7.	CIVIL ENGINEERING MANAGEMENT TR: AFR 85-2			
	a. Work identification/authorization			
	(1) Facility surveys	00280 00290 00320	-	A
	(2) BCE Work Requests	00450	A	B
	(3) Job orders	00450	A	B
	(4) Quality Control	00430	A	B
	(5) Work orders	00450	A	B
	(6) Self-help		-	B
	(7) Recurring work		-	B

7.	CIVIL ENGINEERING MANAGEMENT (Continued)			
	b. In-service work plan		-	A
	c. Scheduling/Time Accounting			
	(1) Daily		-	B
	(2) Weekly		-	B
	d. Warranty and guarantee program	00310 00330 00360	-	A
	e. Property accountability	00280 00290	-	B
	f. Estimate benchstock requirements		-	A
	g. Validate benchstock requirements		-	A
**	**h. Customer Relations TR: AFP 85-17**	**All**	**A**	**-**
**	**i. Use computer to include Work Order Information Management System (WIMS)**	**00280 00290 00310** 00350 00380 00410 00420 00430 00440 00450 00460	**2b/b**	**B**
*8.	AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM TR: AFRs 19-Series, 127-12			
	a. Hazards of AFSC 553X0	All	A	B
	b. AFOSH standards for AFSC 553X0	All	A	B
**	**c. Hazardous and Toxic Waste Management**			
**	**(1) Functions and Responsibilities**	**All**	**A**	**B**

*8. AF OCCUPATIONAL SAFETY AND HEALTH (AFOSH) PROGRAM (Continued)				
**	**(2) Sources and Characteristics**			
**	**(a) Identification**	**All**	**A**	**B**
**	**(b) Disposal**	**All**	**A**	**B**
9. SURVEYING				
*a. Fundamentals TR: TM 5-232				
	(1) Measure horizontal angles	00010 00460	2b	B
	(2) Measure vertical angles	00010 00460	2b	B
	(3) Measure stadia distances	00010 00460	2b	B
	(4) Measure vertical distances	00010 00460	2b	B
	(5) Measure horizontal distances	00010 00460	2b	B
	(6) Maintain surveying equipment TR: TO 33K-1-100	00020 00460	2b	B
**	**(7) Field adjust surveying equipment**	**00010 00020** 00040 thru 00130 00460	**2b**	**B**
	(8) Record field notes TR: FM 5-233	00010 thru 00130 00460	2b	B
*b. Plane surveying				
	(1) Site reconnaissance TR: FM 5-233	00040	-	A
	(2) Reconnaissance reports TR: AFM 89-3; FM 5-233	00040	-	A

9.	SURVEYING (Continued)				
	(3)	Establish horizontal control TR: TM 5-232; FM 5-233	00050	2b	B
	(4)	Establish vertical control TR: TM 5-232 (chap 8)	00050	2b	B
	(5)	Perform topographic surveys TR: TM 5-232 (chaps 7 and 13)	00060 00460	2b	B
	(6)	Establish horizontal alignment such as routes, structures and utilities TR: FM 5-233	00070	2b	B
	(7)	Establish vertical alignment such as routes, structures and utilities TR: FM 5-233	00070	2b	B
	(8)	Set grade stakes TR: FM 5-233 (chap 2)	00080	2b	B
	*c.	Surveying computations TR: TMs 5-232 (app C), 5-237			
	(1)	Compute and adjust traverse data TR: TMs 5-232 (chap 10), 5-237 (chap 8)	00090	2b	B
	(2)	Compute and adjust level circuit data TR: TM 5-232 (chap 8)	00100	2b	B
	(3)	Compute grade stake data TR: FM 5-233 (chap 2)	00080	2b	B
	(4)	Compute earthwork volumes TR: FM 5-233	00110	2b	B
**	**(5)**	**Utilize horizontal curve data** TR: FM 5-233	**00120**	**2b**	**B**
**	**(6)**	**Utilize vertical curve data** TR: FM 5-233	**00120**	**2b**	**B**
	(7)	Compute horizontal distances TR: TM 5-232 (chap 8); FM 5-233	00010	2b	B

9.	SURVEYING (Continued)			
	(8) Compute vertical distances TR: TM 5-232 (chap 8); FM 5-233	00010	2b	B
	(9) Compute azimuths and bearings TR: FM 5-233	00130	2b	B
**	**(10) Use hand-held calculator TR: Manufacturer's Manual**	**00020 00070** 00080 00090 00100 00110 00120 00130 00180 00270 00420 00460	**2b**	**-**
** *d.	**Total Station Instruments/Equipment TR: Surveying Theory and Practice**	**00010 00020** 00030 00040 00050 00060 00070 00080 00090 00130	**2b/b**	**B**
10.	CONSTRUCTION MATERIALS TESTS TR: AFM 89-3; ASTM Manuals 14,15,19			
	a. Perform soils exploration	00140	-	b
	b. Classify soils under field conditions	00140	-	b
**	**c. Classify physical properties of soil**	**00140**	**-**	**-**
**	**d. Test soils**	**00150**	**-**	**-**
**	**e. Test bituminous materials**	**00160**	**-**	**-**
**	**f. Develop preliminary design for bituminous mixes**	**00160**	**-**	**-**

10.	CONSTRUCTION MATERIALS TESTS (Continued)			
**	g. Develop preliminary design for concrete mixes	00170	-	-
**	h. Test concrete materials	00170	-	-
**	i. Interpret material tests reports	00180	-	B
11.	DRAFTING TR: TO 00-25-1-3; TM 5-581E; FM 5-553			
	*a. Perform fundamental drafting practices	00190 00460	2b	c
	*b. Interpret blueprints	00260	2b	c
	*c. Draw			
**	(1) Architectural plans	00200	2b	c
**	(2) Structural plans	00200	2b	c
**	(3) Mechanical plans	00200	2b	c
**	(4) Electrical plans	00200	2b	c
**	(5) Civil plans	00200	2b	c
**	*d. Maintain drawing files	00220 00250 00460	-	A
**	e. Use Computer-Aided Design/Drafting (CAD) to develop drawings	00190 00200 00210 00200 00260 00460	2b/b	B
**	*f. Reproduce drawings	00230 00460	2b	B
	*g. Perform operator maintenance of reproduction machine	00240 00460	a	b

12.	BASE COMPREHENSIVE PLAN (BCP) PROGRAM TR: AFR 86-4			
	a. Contents of BCP	00250 00260	A	B
	b. Submission of BCP	00250 00260	A	B
13. **	**CONSTRUCTION CONTRACT MANAGEMENT**			
	a. Inspector's standards of conduct TR: AFR 30-30; EP 415-1-261	00390 00400	-	A
	b. General provisions of conduct TR: FAR, Volume II	00390 00400	-	A
	c. Constructibility review TR: AFR 89-1	00270 00300 00320	-	A
	d. Documentation of construction activities TR: AFR 89-1; EP 415-1-261	00280 00310 00320 00330 00340 00360 00370 00410	-	A
	e. Construction contract progress schedule TR: FAR, Volume II	00340	-	A
	f. Progress reports TR: FAR, Volume II	00340	-	A
	g. Materials submittals TR: AFR 89-1	00280 00290 00330 00350	-	A
	h. Pre-performance conference TR: AFR 89-1	00320 00350	-	A
	i. Construction permits TR: AFR 85-2	00280 00320 00350	-	A

13.	CONSTRUCTION CONTRACT MANAGEMENT (Continued)			
**	j. Evaluation of military construction program (MCP) projects TR: AFR 89-1	00360 00370	-	A
**	k. Prepare correspondence related to contracts TR: AFRs 70-9, 400-28	00280 00320 00380 00410	-	b
14.	SERVICE CONTRACT MANAGEMENT			
**	TR: AFRs 70-9, 91-30, 400-28			
**	a. Quality assurance evaluator duties			
	(1) Monitor service contracts	00320 00420 00430	-	b
	(2) Prepare Performance Work Statements	00300 00420 00430	-	b
	(3) Prepare surveillance plans	00420 00430	-	b
	(4) Prepare surveillance documents	00420 00430	-	b
**	b. Prepare correspondence related to contracts	00280 00320 00380 00410	-	b
15.	AFSC SPECIFIC CONTINGENCY			
**	RESPONSIBILITIES			
	a. Expedient repair & destruction TR: AFRs 93-2, 93-3; AFM 9-16; AFP 93-12			
**	*(1) Assess base damage	00510	-	b
**	*(2) Report air base damage	00510	-	b

15. AFSC SPECIFIC CONTINGENCY RESPONSIBILITIES (Continued)				
** *(3) Rapid Runway Repair (RRR)				
(a) Perform airfield damage assessment				
** *1 Unexploded ordinance (UXO) identification & location	00510	a	b	
** *2 Crater & runway UXO coordinates	00510	a	b	
** *(b) Identify all minimum operating strip (MOS) candidates	00510	a	b	
(c) Select minimum airfield operating surface (MAOS)				
*1 50' X 5000' MOS	00510	a	b	
*2 Aircraft taxi route(s)	00510	a	b	
(d) Requirements for layout of a MAOS				
*1 MOS configuration	00510	-	b	
*2 Taxi routes, parking ramps, aprons	00510	-	b	
** (4) Command and Control (C2) TR: AFR 360-1				
(a) Command Post relationships				
** *1 Wing Operations Center (WOC)		A	B	
** *2 Survival Recovery Center (SRC)		A	B	

15. **	AFSC SPECIFIC CONTINGENCY RESPONSIBILITIES (Continued)				
	(b) Concept of operations				
**	*1 **SRC**			**A**	**B**
**	*2 **Damage Control Center (DCC)**			**A**	**B**
	(c) Communication Procedures				
**	*1 **SRC**			**A**	**B**
**	*2 **DCC**			**A**	**B**
**	**(5) Base Denial** TR: AFR 93-2; WMP-1, ANNEX S				
	(a) Execute Base Denial Procedures				
	*1 War readiness material (WRM) equipment/vehicles			-	b
	*2 Supplies			-	b
	*3 Critical facilities			-	b
	*(b) Execute evacuation plan			-	a
b.	Expedient field construction TR: AFRs 93-2, 93-3; AFP 93-12				
	(1) Site layout				
	*(a) Establish 1,500 person containment area				
	1 Dispersed layout	00530		-	b
	2 Non-dispersed layout	00530		-	b
	*(b) Select & layout combat support group functional areas	00530		-	b

15. AFSC SPECIFIC CONTINGENCY RESPONSIBILITIES (Continued)				
	*(c) Site & stake out water & elec dist systems for 1,500 personnel	00530	-	b
	(d) Stake out & orient general purpose (GP) shelters in order to minimize			
**	*1 **Shadows**	**00530**	**a**	**b**
**	*2 **Winds**	**00530**	**a**	**b**
**	*3 **Solar radiation**	**00530**	**a**	**b**
**	***(e) Site B-1 revetment for both aircraft and personnel protection**		**a**	**b**
	(f) Mortuary support			
	*1 Prepare temporary internment area burial location record		-	a
	c. Expedient beddown methods TR: AFR 93-2; AFP 93-12			
	(1) Harvest Eagle (HE) assets			
	*(a) Erect GP medium tent	00480 00510 00530	-	b
	*(b) Operate Preway heater	00480 00510 00530	-	b
	*(c) Operate M1950 heater	00480 00510 00530	-	b
	(2) Harvest Falcon (HF) assets			
	*(a) Erect temper tent	00480 00510 00530	-	b

15. **	AFSC SPECIFIC CONTINGENCY RESPONSIBILITIES (Continued)				
**	***(b) Layout 750 person HF deployment**	00480 00510 00530	a	b	
**	***(c) Layout 1,500 person HF deployment**	00480 00510 00530	a	b	
**	***(d) Layout 2,500 person deployment**	00480 00510 00530	a	b	
	d. Special purpose vehicle requirements TR: AFP 93-7; WMP-1, ANNEX S				
	(1) High Mobility Multi-Wheeled Vehicle (HMMWV)	00540	-	-	

****ALL OF THE FOLLOWING SECTION DELETED****			
15. GENERAL CONTINGENCY RESPONSIBILITIES TR: AFP 93-12; War and Mobilization Plan (WMP-1), ANNEX S			
a. First aid techniques TR: Emergency Care and Transportation of the Sick and Injured			
(1) Responsibilities of individuals administering first aid	00470	-	B
(2) Apply first aid procedures			
(a) Lifesaving steps			
1 Assure breathing	00470	-	b
2 Control bleeding	00470	-	b
3 Protect wounds	00470	-	b
4 Prevent shock	00470	-	b
(b) Move and transport injured personnel	00470	-	b
b. Field sanitation and hygiene TR: AFM 161-10; AFP 50-6			
(1) Personal hygiene	00480	-	B
(2) Disease and pestilence countermeasures	00480	-	B
(3) Military field sanitation	00480	-	B
c. Self-protection from extreme weather TR: Emergency Care and Transportation of the Sick and Injured	00480	-	B
d. Work party security TR: AFRs 50-3, 206-2			
(1) Cover and concealment	00500 00540	-	B

15. GENERAL CONTINGENCY RESPONSIBILITIES (Continued)			
(2) Individual movements	00500 00540	-	B
(3) Weapons fire control	00500	-	B
(4) Field Fortifications	00500 00520	-	B
(5) Convoy techniques		-	B
e. Vehicle qualification TR: AFP 93-7	00540	-	-
f. Expedient beddown methods TR: AFR 93-3; AFP 93-7			
(1) Harvest Eagle type assets	00510 00530	-	B
(2) Harvest Bare type assets	00510 00530	-	B
(3) Harvest Falcon type assets	00510 00530	-	B
g. Terrorism TR: AFP 93-12			
(1) Awareness		-	B
(2) Countermeasures		-	B
h. Expedient field construction methods TR: AFR 93-3; AFP 93-7			
(1) Field Latrines	00480	-	B
(2) Berms and dikes	00520	-	B
(3) Field utility systems	00520	-	B
i. Contingency air field surfaces TR: AFR 93-2; AFP 93-12			
*(1) Rapid Runway Repair (RRR) philosophy	00520	A	B

15. GENERAL CONTINGENCY RESPONSIBILITIES (Continued)			
(2) Repair procedures			
*(a) AM-2 matting	00520	A	B
*(b) PFM (Polyurethane Fiberglass Mat)	00520	A	B
*(c) Concrete slab	00520	A	B
(3) Assemble AM-2 matting	00520	-	B
(4) Install			
(a) Polyurethane Impregnated Fiberglass Mat (PFM)	00520	-	B
(b) Concrete slab	00520	-	B

Summary of Proposed Changes

1. 1.d.(4) (Added) - Although Ground Radar Evaluation is a very limited function of the 553X0 career ladder, graduates should be familiar with all functions of their career ladder structure.

2. 3.b. (Changed proficiency code from '-' to 'a' for the 3-skill level course) - During the performance of their everyday duties, personnel are expected to refer to various commercial publications such as drafting standards, manufacturers' manuals, and surveying theories and procedures. Personnel need to be able to locate the information required to perform their duties.

3. 3.c. (Changed proficiency code from '-' to 'a' for the 3-skill level course) - During the performance of their everyday duties, personnel are expected to refer to various Air Force publications such as AFOSH standards and AF 88-series regulations. Personnel need to be able to locate the information required to perform their duties.

4. 7.h. (Added) - Newly trained specialists must interface professionally and effectively with customers of all ranks in a variety of settings. Successful mission accomplishment often requires a sensitive balance between respect for the customer and getting the required information. Students must learn to work with customers who bring them requirements to assure that both parties have the same understanding of the job to be done.

5. 7.i. (Added) - The Work Order Information Management System is used on a daily basis to track work order and project scheduling, status and completion, and for preparing correspondence related to contracts. Field data indicates that many graduates are required to use this system at their first duty assignment.

6. 8.c.(1) and (2) (a) and (b) (Added) - Depending upon the duty position that graduates are assigned to, they may come in contact with hazardous and toxic waste materials. In order to protect the environment and Air Force interests, graduates must be familiar with the identification and disposal of these materials.

7. 9.a.(7) (Changed proficiency code from 'b' to '2b' and deleted TO reference for the 3-skill level course.) - Field data indicates the majority of graduates are assigned to drafting and surveying positions at their first job. When surveying jobs are performed, graduates must be able to adjust the equipment they are using in the field to get an accurate survey. The TO reference is not being used by individuals in the field, but TM 5-232 is, and has been previously stated.

8. 9.c.(5) (Changed the wording from 'Compute horizontal curve data' to 'Utilize horizontal curve data'. Changed proficiency code from '1b' to '2b' for the 3-skill level course.) - During the surveying process, the horizontal curve data is determined by conducting the survey. Once the survey has been completed, the data is then utilized to mathematically compute the horizontal curve. OSR data indicates this task has high Training Emphasis and Task Difficulty indicators.

9. 9.c.(6) (Changed the wording from 'Compute vertical curve data' to 'Utilize vertical curve data'. Changed proficiency code from '1b' to '2b' for the 3-skill level course.) - During the surveying process, the vertical curve data is determined by conducting the survey. Once the survey has been completed, the data is then utilized to mathematically compute the vertical curve. OSR data indicates this task has high Training Emphasis and Task Difficulty indicators.

10. 9.c.(10) (Added) - After performing surveying functions, the majority of the data has to be mathematically calculated before the information is given to the engineer. These calculations involve algebraic and trigonometric computations that are too complicated to be performed by pencil and paper method. Calculators are already being used during Block I of instruction and the operation of the calculator is a unit of instruction. Through possible oversight, it should have been an STS line item previously.

11. 9.d. (Changed proficiency code from 'A/x' to '2b/b' for the 3-skill level course.) - The Total Station/Electronic Distance Measurement (EDM) surveying instrument is a new technological piece of surveying equipment that is entering the Air Force inventory. This piece of equipment is replacing older survey equipment that has been used for many years. Field data indicates that several locations already have the EDM, but some are not using it due to lack of training. In addition, several locations have ordered the equipment, but have not received it yet. The use of the EDM allows for more accurate surveys with a savings in time and manpower. Since surveying positions are one of the first duty assignments, it is imperative that graduates know the basic operation of the EDM upon graduation from the technical school.

12. 10.c. - h. (Changed proficiency code from 'b' to '-' for the 5-skill level CDC) - Field data and OSR data indicate that the majority of 553X0 personnel performing these duties are those assigned to Red Horse units. This equals approximately 33 out of 1,526, or 2 percent of the personnel in the career ladder. Due to this low utilization rate, it is not efficient to provide this training to all personnel. A more efficient way of providing Materials Testing training to those who need it is to either develop an MTT course or a specialized CDC to providetraining to individuals assigned to Red Horse units, Construction Contract Management, Service Contract Management, or SABER offices.

13. 10.i. (Changed 'Prepare materials tests reports' to 'Interpret materials tests reports.' Changed the proficiency code from 'b' to 'B' for the 5-skill level CDC.) - Field interviews indicate that materials testing is contracted out to civilian companies at local Air Force bases due to the expense and lack of materials testing equipment. After completing the testing, the contractor prepares and gives the test report to Construction Management or Service Contract Management or SABER personnel. These personnel are then responsible for reading and interpreting the test report results to ensure the Air Force is getting the quality of materials that it is paying for.

14. 11.c.(1) - (5) (Changed proficiency code from '1b' to '2b' for the 3-skill level course.) - Task analysis interviews and OSR data indicate that surveying and drafting duty positions are one of the primary first duty assignment positions for 553X0 personnel. In this duty position, one of their primary duties is to draft the architectural, structural, mechanical, electrical, and civil plan sketches, made up by the engineers, into final products.

15. 11.d. (Changed proficiency code from '-' to 'A' for the 5-skill level CDC) - While each base has its own local policies and procedures for maintaining drawing files, training analysis interviews indicate that 3- and 5-skill level personnel are performing this task at many locations. Since this is the case, these personnel should at least be familiar with the basic facts and terms related to the task.

16. 11.e. (Changed proficiency code from '2b/x' to '2b/b' for the 3-skill level course.) - Computer Aided Design/Drafting (CAD) is quickly replacing manual drafting practices within the Air Force. Even though the schoolhouse does not currently have the computer hardware and software in place, the step by step knowledge procedures of how to perform this task can be taught now. This way graduates will, at a minimum, be familiar with CAD when they reach the field. Once the schoolhouse receives the hardware and software, they can easily incorporate the hands-on training into the course.

17. 11.f. (Changed proficiency code from '1a' to '2b' for the 3-skill level course and from 'b' to 'B' for the 5-skill level CDC.) - Field data indicates that once drafting personnel finish drawing a plan, copies of it must be reproduced for supervisory and engineer review and appropriate corrections as required. In addition, once the engineer has approved the final drawing, several copies must be reproduced for coordination with and approval from various agencies. In all cases, these reproductions must be of high quality.

18. 13. (Changed 'Contract Management' to 'Construction Contract Management.' Moved Service Contract Management duties into a separate element, number 14.) - Since Construction Contract Management is a separate duty position from Service Contract Management, separating them into their applicable elements more accurately describes the duties performed in each item.

19. 13.j. (Changed 'Surveillance of military construction program (MCP) projects' to 'Evaluation of military construction program (MCP) projects.') - Training analysis interviews indicate that Construction Contract Management personnel perform several evaluations, such as evaluating operational tests of electrical, heating, plumbing, and fire protection systems. 'Surveillance' means to simply observe while 'Evaluation' encompasses the evaluations mentioned above. This change more accurately describes the task being performed.

20. 13.k. (Changed proficiency code from 'B' to 'b' for the 5-skill level CDC.) - The 'B' proficiency code only requires the graduate to identify the relationship between basic facts and general principles about the subject. Since this item is a performance task, it is more appropriately coded as a 'b' so that students learn the step-by-step procedures for doing the task.

21. 14. (Added 'Service Contract Management' and realigned items 13.1. (1) - (4).) - Since Service Contract Management is a separate duty position from Construction Contract Management, this new item groups all of the Service Contract Management tasks together. Also added new item 14.b. since preparing correspondence is an integral part of Service Contract Management.

22. 15. (Renumbered AFSC Specific Contingency Responsibilities, due to new item 14, and incorporated current STS items 14, 15, 16, and 17.) - The majority of this duty section has been rewritten to include specific 553X0 wartime responsibilities IAW the Wartime Task Standard published by AFESC. These items need to be taught in the technical school or CDC since Prime Beef training in the field generally does not address AFSC specific training. General wartime tasks contained in the current STS, items 18.a. - j. have been deleted since these items are trained during Prime Beef training, and may vary greatly depending upon the location and wartime mission of the unit. General local wartime tasks can be identified and trained by using AF Form 797, Job Qualification Continuation Sheet, as needed. Items recommended for deletion, General Contingency Responsibilities, have been separated onto the last two and one-half pages of the proposed STS.