U.S. Air Force Civil Engineer Center
(AFCEC)

U.S. AIR FORCE

Consolidated Communication Squadron Facility

Dynamic Prototypes

FINAL
October 2013

Contract No.: W91278-11-D-0083
Task Order No.: 0010

JACOBS®

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EXECUTIVE SUMMARY

The Air Force Civil Engineer Center (AFCEC) employed Jacobs, under contract, to develop a dynamic prototype and a Standardized Request for Proposal (SDRFP) template for a Consolidated Communications Facility. The project is part of an ongoing effort by the Air Force to provide an available catalog of standard facility types for future project development. To begin the process, Jacobs conducted a concept charrette and prepared a record of the charrette.

During the course of the concept charrette it was determined that personnel present were not the necessary Subject Matter Experts (SMEs) needed to fully develop a dynamic prototype and corresponding RFP template. During interviews it was also apparent that the Communications Division was in a state of organizational flux due to rapidly changing technologies in their field driving a reevaluation of their operations.

Currently there is little design guidance in the development of communications facilities compared to other types of standard facilities. As a result, AFCEC directed Jacobs to collect the information gathered into an interim design document which could be used to provide some guidance for Consolidated Communications facilities currently planned as Sustainment, Renovation, and Modernization (SRM) or Military Construction (MILCON) projects, until such time as this prototype can be revisited and further developed into a full prototype.

Project Overview

“Dynamic prototypes” as described, are 3D models created in commercially available BIM (Building Information Modeling) software. The models are created using a “kit-of-parts” approach where functionally related spaces are grouped together into usable standard modules. The modules can then be combined and arranged/rearranged to create building floor plans that reflect specific site considerations and eventually a complete Consolidated Communications Facility project. This “kit-of-parts” approach has proven to improve design efficiency by incorporating specific design criteria, adjacencies, and specific requirements into the BIM model for future use by the architect or engineer.

Summary

This report documents the priorities, decisions, and direction given to Jacobs during the charrette, subsequent research on program requirements, and development of the Charrette Report with the modified scope. This document contains:

- A general narrative describing facility requirements included as part of the project
- Bubble diagrams to illustrate user group processes and operations

- Conceptual facility diagrams illustrating adjacencies between major functional areas
- Documentation of charrette activities

A. PROJECT OVERVIEW

The project process started with Jacobs conducting a design charrette to collect and analyze requirements for development of a Dynamic Prototypes (DPs) for the Air Force Consolidated Communications facility.

The programming information in this document will be used in the future as a basis to develop a series of dynamic prototype modules and the standard RFP template document. The information was collected in a series of interviews that took place during an on-site charrette work session 18-20 June 2013.

A.1 Jacobs Scope of Services

Jacobs's original scope of services included conducting a charrette for the facility and then creating a draft and final SDRTD incorporating information gathered in the charrette. The primary focus of the charrette was to validate a requirements program, create dynamic prototype modules and develop two facility floor plan concept designs validating the use of the modules, At the conclusion of the charrette, Jacobs conducted an informal Out-Brief to present major findings developed in the charrette and discussed the next steps to be taken.

However, since the correct Subject Matter Experts (SMEs) were unable to be present at the time of the charrette Jacobs was unable to obtain all of the appropriate information necessary to complete the project. This report therefore includes information gathered during a site visit to Randolph Brooks Air Force Base to tour and observe their communications operations facility as well as knowledge from our past experience in developing a program for a consolidated communication projects at Joint Base Elmendorf Richardson.

The report documents the priorities, decisions, and direction given to Jacobs during the charrette and subsequent research on program requirements. Rather than developing a typical SDRTD, Jacobs was directed to document the information gathered and to develop an interim design document which could be used to provide guidance for future Consolidated Communications Facilities along with information from the most current AFAM 32-1084.

The basic communication program requirements would most likely remain constant in the near future thus this product would provide value as a starting point in project development.

A.2 Goals and Expectations

The following goals were determined as significant to a successful charrette and project execution. The following project goals were presented at the charrette.

Charrette Goals

The following goals were presented at the charrette to set the expectations of what to be accomplished during the work sessions.

- Involve all stakeholders in the program definition process
- Set the goals of the project
- Maximize opportunities
- Minimize problems
- Develop data for report content
- Program validation

Function Goals

Function goals imply “what’s going to happen in the building.” They concern activities, relationship of spaces, and people — both their number and characteristics.

- To determine business drivers
- To meet mission requirements
- To optimize operational flow
- To allow for flexibility and expandability
- To develop a concept with potential to achieve LEED silver certification

Form Goals

Form goals related to the site, the physical environment, and the quality of space and construction. Form is what you will see and feel.

- To identify and correctly apply Air Force, and Unified Facility Criteria (UFC) standards
- To develop appropriate facilities sizing

Time Goals

Economy goals concern the initial budget and quality of construction and may also include consideration of operating and life-cycle costs.

- Program for MILCON construction
- Allow for appropriate facility lifespan
- Complete the charrette by 20 June 2013
- Complete the draft document by 23 July 2013
- Complete final draft documents by 11 October 2013

Charrette and Project Expectations

The following expectations were established at the charrette with stakeholders.

- Achieve consensus with all charrette stakeholders
- Fully understand and document the needs
- Lay the foundation for facility design

A.3 Charrette Agenda

AFCEC
Consolidarted Communications Facility

Mobile District Corps of Engineers

Customer Concept Document Charrette Schedule

	Monday 18-Jun-13	Tuesday 19-Jun-13	Wednesday 20-Jun-13	Thursday 21-Jun-13	Friday 22-Jun-13
0700 - 0730					
0700 - 0730					
0730 - 0800					
0800 - 0830	Travel Day	Functional In-Brief by Ms. Harper on Comm	Consolidated Comm Facility Facility Organization & Space Relationship Diagrams	LEED Checklist Review	Travel Day
0830 - 0900					
0900 - 0930		BIM Prototypes Overview and Discussion			
0930 - 1000				Consolidated Comm Facility Facility Organization & Space Relationship Diagrams	
1000 - 1030		Consolidated Comm Discuss pertinent sections that will apply to the new BIM model			
1030 - 1100					
1100 - 1130					
1130 - 1200					
1200 - 1230		Lunch	Lunch	Lunch	
1230 - 1300		Travel to Randolph AFB			
1300 - 1330			Consolidated Comm Facility Facility Organization & Space Relationship Diagrams	Consolidated Comm Facility Facility Organization & Space Relationship Diagrams	
1330 - 1400		Site Visit Building 990 Comm Building Randolph Air Force Base 902 CS Director Mr. Boedigheimer			
1400 - 1430					
1430 - 1500					
1500 - 1530					
1530 - 1600					
1600 - 1630		Optional Work Sessions Review at Jacobs Office	Work Sessions Review		
1630 - 1700					
1700 - 1730					

A.4 Charrette Phase Schedule

The table below outlines the next steps and deadlines of the development process:

Table A-1: Charrette Phase Schedule

Scope	**Date Due**
Charrette Dates	18-20 June 2013
Draft Report Submission	23 July 2013
Final Report Submission	October 2013

B. PROGRAM VALIDATION

B.1 Operations

The process of developing and validating the programmatic requirements of the Consolidated Communications Facility prototype is described in this section. This is critical in order to guide architectural design development and the future creation of corresponding baseline DD Forms 1391 programming documents. The Jacobs Team met with representatives from the Air Force Civil Engineer Center (AFCEC), the US Army Corps of Engineers (USACE) Mobile District, Twenty-fourth Air Force, 38th Cyberspace Engineering & Implementation Group (38th CEIG), and 902nd Communications Squadron (902nd SC).

Currently, there are no space requirements defined for a Communications Squadron Facility within the Air Force Manual (AFMAN) 32-1084, dated 20 April 2012, or any other Air Force or DoD criteria available to the charrette team. In lieu of the typical criteria usually received the team instead prepared a program based on a Consolidated Communication Facility programmed for the 673rd Communications Squadron (Joint Base Elmendorf-Richardson [JBER]) to use as a starting point for discussion.

Instead, the charrette team and available SME's reviewed general information from the JBER program and information gathered during a tour of the 902nd SC facility at Randolph Air Force Base.

The following general programmatic elements were confirmed:

- Squadron Command Section
- SCO Flight
- SCX Flight
- Logistics
- Data Center
- Land Mobile Radio (LMR)
- Post Office

B.2 Personnel Data

Total staffing requirements is critical in determining common-use spaces such as toilets/showers, conference rooms, break rooms, and parking area. The staffing information developed in the tables below was validated using Air Force Unit Manning Documents (UMD) as justification for a large facility as proposed for the JBER facility.

The information illustrates the total personnel requirement reported for the JBER facility used as a basis of design in 2010. Although this is not the conceptual staffing information for an average Consolidated Communications facility, it is shown here to act as the starting point for future Consolidated Communications facility prototype personnel discussions. It was the opinion of those stakeholders present at the charrette that the JBER staffing could be considered representative of a large Air Force Communications Facility. In this example the Air National Guard (ANG) and Air Force Reserve (AFRC) components were also included since they are typically collocated in a combined facility.

For other project types, a prototypical Consolidated Communications facility would need to be specifically programmed to serve a more mid-sized or small squadron, with optional modules to expand as necessary to support a larger operation or other tenant types.

It should be noted that the example program shown in the pages following does not include the local mobile radio (LMR) or a Post Office divisions which are typically standalone operations but come under the jurisdiction of the Communications Squadron.

Table B-1 Reference Personnel Table JBER Joint Consolidated Communication Facility – October 2010

JBER JOINT CONSOLIDATED COMMUNICATIONS FACILITY

PERSONNEL	Ofcr	Sr NCO	Civ Mgmt	Enl	Civ	Contr	Total Staff
	OFFICE			OPEN OFFICE			
COMMAND SECTION							
Commander 3rd Communications Squadron	1						
GS-05					1		
CMSGT		1					
First Sergeant (SMSgt)		1					
GS-06					1		
Deputy Commander	1						
QA's							
TOTAL 3 CS COMMAND PERSONNEL	**2**	**2**	**0**	**0**	**2**	**0**	**6**
SCO OPERATIONS SECTION							
TSgt				1			
CMSgt		1					
GS-05					1		
CPT	2						
GS-12					1		
MAJ	1						
SMSGT		2					
Subotal SCO Flight Command	**3**	**3**	**0**	**1**	**2**	**0**	**9**
SCOA Airfield Systems							
MSGT		2					
SSGT				4			
TSGT				3			
WG-10			1				
SRA				4			
A1C				1			
Subotal SCOA Airfield Systems	**0**	**2**	**1**	**12**	**0**	**0**	**15**

Table B-2 Reference Personnel Table JBER Joint Consolidated Communication Facility – October 2010 (continued)

PERSONNEL	Ofcr	Sr NCO	Civ Mgmt	Enl	Civ	Contr	Total Staff
	OFFICE			OPEN OFFICE			
SCOI Infrastructure							
TSGT				6			
MSGT		1					
SRA				7			
SSGT				9			
A1C				5			
WG-10					1		
Subotal SCOI Infrastructure	**0**	**1**	**0**	**27**	**1**	**0**	**29**
SCXK Knowledge Operations							
GS-07					1		
SRA				2			
MSGT		1					
SSGT				3			
TSGT				1			
A1C				3			
CME						3	
TBD					9		
Subotal SCXK Knowledge Operations	**0**	**1**	**0**	**9**	**10**	**3**	**23**
SCOO Network Operations							
SSGT				10			
SRA				11			
TSGT				2			
A1C				6			
MSGT		1					
CME						10	
CME						3	
TBD					1		
GS-11					1		
Subotal SCOO Network Operations	**0**	**1**	**0**	**29**	**2**	**13**	**45**
SCOS Client Service Center							
MSGT		1					
SRA				9			
A1C				9			
SSGT				9			
TSGT				4			
TBD					9		
CME					2		
Subotal SCOS Infrastructure	**0**	**1**	**0**	**31**	**11**	**0**	**43**
SCOT Transmission Systems							
SSGT				7			
SRA				4			
MSGT		2					
TSGT				2			
A1C				6			
CME						2	
Subotal SCOT Infrastructure	**0**	**2**	**0**	**19**	**0**	**2**	**23**
SCOW Cable and Antenna Systems							
CME						10	
TBD			1		18		
WG-10					14		
WG-11					4		
WL-11					1		
WS-11					1		
WG-08		2					
Subotal SCOW Infrastructure	**0**	**2**	**1**	**0**	**38**	**10**	**51**

Table B-3 Reference Personnel Table JBER Joint Consolidated Communication Facility – October 2010 (continued)

PERSONNEL	Ofcr	Sr NCO	Civ Mgmt	Enl	Civ	Contr	Total Staff
	OFFICE			OPEN OFFICE			
SCQ Policy and Evaluations							
TSGT				2			
SSGT				2			
SMSGT		1					
TBD					1		
Subotal SCQ Infrastructure	**0**	**1**	**0**	**4**	**1**	**0**	**6**
TOTAL SCO PERSONNEL	**3**	**14**	**2**	**132**	**65**	**28**	**244**
SCX PLANS AND RESOURCES							
GS-13					1		
SMSGT		1					
Subotal SCX Flight Command	**0**	**1**	**0**	**0**	**1**	**0**	**2**
SCXP Plans Programs and Resources							
SSGT				2			
CME					1		
TSGT				3			
GS-12					1		
MSGT		1					
TBD					7		
GS-11					2		
Subotal SCXP Plans Programs and Resources	**0**	**1**	**0**	**5**	**11**	**0**	**17**
SCXS Information Assurance							
GS-11					2		
TSGT				3			
MSGT		2					
SRA				7			
SSGT				4			
A1C				2			
Subotal SCXS Information Assurance	**0**	**2**	**0**	**16**	**2**	**0**	**20**
SCXR Resources							
GS-11					1		
Subotal SCXR Resources	**0**	**0**	**0**	**0**	**1**	**0**	**1**
TOTAL SCX PERSONNEL	**0**	**4**	**0**	**21**	**15**	**0**	**40**
TOTAL 3CS PERSONNEL							**290**
AIR NATIONAL GUARD							
Full-Time Command Personnel							
COMMANDER	1						
SMS		2					
TSG				7			
CMS		2					
SSG				0			
MSG		7					
Subtotal Full-Time Command Personnel	**1**	**11**	**0**	**7**	**0**	**0**	**19**
Drill Strength (Weekend Personnel)							
MSG		2					
TSG				6			
SSG				15			
Subtotal Weekend Personnel Personnel	**0**	**2**	**0**	**21**	**0**	**0**	**23**
TOTAL ANG PERSONNEL	**1**	**13**	**0**	**28**	**0**	**0**	**42**
TOTAL OFFICE SPACES			**41**				
TOTAL OPEN OFFICE SPACES							**291**
TOTAL DRILL WEEKEND							**23**
TOTAL FULL-TIME OCCUPANTS							**309**
TOTAL BUILDING OCCUPANTS							**332**

B.3 Parking Requirement

Operational and non-operational vehicle information is based on specific staffing numbers and needs to be collected in order to determine specific baseline parking requirements for a facility in the site plan development. Organizational Vehicles are provided at 100% parking requirement however parking for non-organizational vehicles such as privately-owned vehicles (POVs) is calculated at only 60% of the staff based on the planning guidance in AFMAN 32-1084.

PARKING REQUIREMENTS	NO.	REMARKS
Military Vehicles	0	Excavating and other large equipment assigned to the Comm. Unit are stored off-site at another warehouse
Government Owned (GSA?) Vehicles	38	
Contractor Vehicles	1	close to the Collocate rooms
TOTAL ORG PARKING REQT	**39**	
Personally Owned Vehicles		Five reserved spots for Commander, two Flight Chiefs, 1st SGT, Chief
Total Staff Vehicles	360	5 Command Reserve Spaces
TOTAL NON-ORG PARKING REQT	**216**	**AFH 32-1084 60% of assigned personnel**
Visitor Parking	20	Used for CFP and Training Visitors
Accessible Parking	5	Per code based on building occupancy
TOTAL VISITOR/ACCESSIBLE PARKING REQT	**25**	
TOTAL 3 CS PARKING REQUIREMENT	**280**	
Air National Guard POV Parking @ 75% of 19 FT	15	Per NGR AF 86-2
Air National Guard MV Parking	2	2 pickups (MV) in heated storage, JISCC trailer in heated storage. 2 "Mitzi" mini service vehicle (allowed on Elmo? Low-speed)
TOTAL FACILITY PARKING REQUIREMENT	**297**	

Table B-4 Reference Personnel Table JBER Joint Consolidated Communication Facility – October 2010

B.4 Facility Space Program

As stated earlier in this section, the Facility Program could not be validated at the design charrette due to Communications organizational flux. Because of the lack of documented criteria for a Comm facility, the JBER Consolidated Comm Facility program from a 2010 charrette was used as the starting point for a facility program discussion. That program model is shown below and would be representative of a typical large facility. As is the case with the example staffing table in section B.2, the sample program is shown to start the program validation discussion when SME's are available to participate a programming the Comm facility. Each program area is discussed to better describe functional requirements as a basis for space allocation.

Communications Squadron (CS) Command Section:

The CS Command Section requires primarily office space which includes areas for SCO Ops, SCX Plans and Resources, and the SCQ leadership team. Also included are a 40 person command conference room, a Commander's waiting area, three dedicated 20 person flight conference rooms (one for SCO, one for SCX, and one for SCQ), general warehouse space and a consolidated lab/workbench area shared by all flights. Corresponding file areas, copy rooms, coffee bars are also included in Administrative Support Space allocations.

	USER VALIDATED PROGRAM REQTS		REMARKS
	SF	SM	
3rd COMMUNICATIONS COMMAND SECTION			
Commander's Office Suite	165	15	Command Suite per AFI 32-9010 Attachment 2 P-5 + storage
Commander's Conference Room	800	74	40 person, shared with staff
Office	330	31	1 @ 90 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Open Office	136	13	2 @ 68 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Administrative Support	110	10	Copy, file, printing for 3 @ 40 sf/person per AFH 32-1084 Chapter 12 Table 12.1. Reduced to 110 SF
Commander's Waiting Area	200	19	4-6 people
SCO Operations Flight			
Flight Command Office	108	10	128 SF requirement reduced to 108 SF
Office	450	42	5 @ 90 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Open Office	204	19	3 @ 68 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Administrative Support	320	30	Copy, file, printing for 8 @ 40 sf/person per AFH 32-1084 Chapter 12 Table 12.1.
Flight Conference Room	635	59	20 person
SCX Plans and Resources Flight			
Flight Command Office	108	10	128 SF requirement reduced to 108 SF
Office	90	8	5 @ 90 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Administrative Support	80	7	Copy, file, printing for 2 @ 40 sf/person per AFH 32-1084 Chapter 12 Table 12.1.
Flight Conference Room	635	59	20 person
UCC (Unit Control Center)	0	0	No requirement
SCQ			QA's and Readiness (URO)
Office	90	8	1 @ 90 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Open Office	340	32	5 @ 68 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Administrative Support	240	22	Copy, file, printing for 6 @ 40 sf/person per AFH 32-1084 Chapter 12 Table 12.1Needs additional filing for financial records.
Flight Conference Room	200	19	20 person
Warehouse Space	3,100	288	For all wb/l reqts in bldg
Consolidated Workbench/Lab Area	925	86	For all wb/l reqts in bldg
COMMAND SUBTOTAL	**9,266**	**861**	

Table B-5 Reference Program Area Matrix JBER Joint Consolidated Communication Facility – October 2010

SCO Section

The SCO Section is by far the largest component of a facility program. The breakouts shown in tables below include primarily operations and office space requirements in addition to the command areas above. SCO consists of the following sub-sections:

- Voice Services (SCOW)
- Airfield Maintenance (SCOA)
- Transmission Systems (SCOT)
- Client Service Center (SCOS)
- Infrastructure (SCOI)
- Network Operations (SCOO)

Voice Services (SCOW)

In addition to office and administrative support spaces, SCOW includes allocations for a telephone operator area and associated bullpen area.

	USER VALIDATED PROGRAM REQTS		REMARKS
	SF	SM	
SCO SECTION			
VOICE SERVICES (SCOW)			currently Bldg 10488
Office	90	8	1 office @ 90 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Open Office	2,778	258	40 @ 68 SF/person per AFH 32-1084 Chapter 12 Table 12.1 reduced to 27 @ 50 SF/PERSON + ADMIN, 21 @ 68 SF/PERSON
Administrative Support	960	89	Copy, file, printing 41 @ 40 sf/person per AFH 32-1084 Chapter 12 Table 12.1 reduced to 24 @ 40 SF/PERSON
Telephone/Switch Maintenance			Admin space and terminals for managing equipment
Storage	0	0	2,000 SF reduced to 0 SF. Preferred 500 SF Min
Workbench/Lab Area	0	0	500 SF reduced to 0 SF. Preferred 200 SF Min
Data Center	0	0	Consolidated per concept design
Cable/Antenna Maintenance			Outside Plant
Storage	0	0	1,000 min reduced to 0 SF
Workbench/Lab Area	0	0	1,000 SF reduced to 0 SF. 200 SF min preferred
Operator services	500	46	50 SF/Person @ 10 Telephone operators
Operator Bullpen	680		
Administrative Support	400		Copy, file, printing 10 @ 40 sf/person per AFH 32-1084 Chapter 12 Table 12.1
Subtotal SCOW	***5,408***	***502***	

Table B-6 Reference Program Area Matrix JBER Joint Consolidated Communication Facility – October 2010 (continued)

Airfield Maintenance (SCOA)

SCOA area includes Airfield Systems (ATCALS) office space and administrative support space for field personnel. Showers and lockers should be considered in southern climates due to working conditions.

	USER REQUIREMENTS (REDUCED)		REMARKS
	SF	SM	
SCO SECTION			
AIRFIELD MAINTENANCE (SCOA)			
Office	270		
Open Office	600		12 @ 50 SF/PERSON INCL ADMIN - FIELD PERSONNEL
Administrative Support	600		Copy, file, printing 15 @ 40 sf/person per AFH 32-1084 Chapter 12 Table 12.1
Airfield Systems (ATCALS)			628 Mission Equipment Area; 1,352 Storage (Includes Radar Maintenance)
Workbench/Lab Area	0	0	628 SF reduced to 0 SF. 200 min preferred
Storage Room	0	0	1,352 SF reduced to 0 SF. 500 min preferred
Subtotal SCOA	***1,470***	***137***	

Table B-7 Reference Program Area Matrix JBER Joint Consolidated Communication Facility – October 2010 (continued

Transmission Systems (SCOT)

SCOT includes a crypto vault, secure, non-SCIF storage area in addition to its office space needs.

	USER VALIDATED PROGRAM REQTS		REMARKS
	SF	SM	
TRANSMISSION SYSTEMS (SCOT)			
Office	180	17	2 office @ 90 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Open Office	1,184	110	21 @ 68 SF/person per AFH 32-1084 Chapter 12 Table 12.1 reduced to 13 @ 68 SF/PERSON + 6 @ 50 SF/PERSON (INCL ADMIN)
Administrative Support	680	63	Copy, file, printing for 23 @ 40 sf/person per AFH 32-1084 Chapter 12 Table 12.1. Requirements reduced to 13 @ 40 sf/person
Base Radio	0		2500 Storage Requirement incl in storage
Satellite Systems Maintenance	0		1500 Storage Requirement incl in storage
Cryptovault	1,084	101	
VIIDS Systems Maintenance			Video Imagery and Intrusion Detection Systems 100 Storage Requirement incl in storage room
Workbench/Lab Area	0	0	Requirement for 500 - Base Radio, 100 - Satellite Systems Maintenance, 100 - VIIDS reduced to) SF. 200 SF min preferred
Storage Room	0	0	Consolidated Storage space, Roll-up door for Base Radio equipment. Reduced to 0 SF. Will be accommodated in separate warehouse facility. 800 SF min preferred.
Subtotal SCOT	***3,128***	***291***	

Table B-8 Reference Program Area Matrix JBER Joint Consolidated Communication Facility – October 2010 (continued)

Client Services Center (SCOS)

SCOS has office and administrative support space requirements for large staff which includes a 24 hour help desk.

	USER VALIDATED PROGRAM REQTS		REMARKS
	SF	SM	
CLIENT SERVICE CENTER (SCOS)			
Office	90	8	1 @ 90 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Open Office	2,856	265	42 @ 68 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Administrative Support	1,720	160	Copy, file, printing for 43 @ 40 sf/person per AFH 32-1084 Chapter 12 Table 12.1
Comm Focal Point (CFP/CSA Cell)	380	35	24 hour Helpdesk/Client Support Administrator
Asset Management	743	69	Based on existing operation
Computer Training Room	0	0	30-40 computers (fixed) 20-30 acceptable. Shared with SCSX
Workbench/Lab Area	0	0	500 SF Maintenance work area reduced to 0 SF. 200 SF min preferred
Warehouse Storage Space	0	0	3,200 - Asset Management; 50 - CFP. Need a loading dock with a roll-up door. Reduced to 0 SF. 1,000 SF min preferred
Subtotal SCOS	***5,789***	***538***	

Table B-9 Reference Program Area Matrix JBER Joint Consolidated Communication Facility – October 2010 (continued

Infrastructure (SCOI)

SCOI includes the main Data Center which will house all equipment racks for the SCO and SCX operations. In support of the data center is large open office area with gathering area for group discussions.

	USER VALIDATED PROGRAM REQTS		REMARKS
	SF	SM	
INFRASTRUCTURE (SCOI)			
Office	90	8	1@ 90 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Open Office	1,904	177	28 @ 68 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Administrative Support	1,160	108	Copy, file, printing for 29 @ 40 sf/person per AFH 32-1084 Chapter 12 Table 12.1
Tech Control	0	0	Bldg 10488
DRSN	0	0	
TCF/FCO	0	0	
Storage	0	0	200 SF requirement reduced to 0 SF
Data Center	3,223	299	4,050 SF reduced to 3,225 SF. All bldg requirement for racks of equipment
Infrastructure Maintenance			Bldg 10435
Storage	0	0	1,000 SF reduced to 0 SF. 500 SF min preferred
Subtotal SCOI	***6,377***	***592***	

Table B-10 Reference Program Area Matrix JBER Joint Consolidated Communication Facility – October 2010 (continued)

Network Operations (SCOO)

SCOO requires only open office and administrative support space.

	USER VALIDATED PROGRAM REQTS		REMARKS
	SF	SM	
NETWORK OPS (SCOO)			Collocated with Comm Focal Point
Office	0	0	1@ 90 SF/person per AFH 32-1084 Chapter 12 Table 12.1 90 SF requirement reduced to 0 SF.
Open Office	2,035	189	44 @ 68 SF/person per AFH 32-1084 Chapter 12 Table 12.1Ops workstations - includes administrative support, CAB (cmd), Network Admin, Info Protect Ops, and Config Management space. Reduced to 2,035 SF
Administrative Support	0	0	Copy, file, printing 45 @ 40 sf/person per AFH 32-1084 Chapter 12 Table 12.1. Reduced to 0 SF
Data Center	0	0	For all three spaces; Includes 500 SF of mission space for Network Admin, Info Protect Ops, and Config Management. Reduced from 1,500 SF to 0 SF
Storage	0	0	Reduced from 100 SF to 0 SF
Subtotal SCOO	***2,035***	***189***	

Table B-11 Reference Program Area Matrix JBER Joint Consolidated Communication Facility – October 2010 (continued)

SCO Section Summary

The total net area requirement for all SCO Section and its sub-groups is 24,207 NSF (2,249 NSM) in this example.

	USER VALIDATED PROGRAM REQTS		REMARKS
	SF	SM	
SCO SECTION			
VOICE SERVICES (SCOW)			currently Bldg 10488
Subtotal SCOW	***5,408***	***502***	
AIRFIELD MAINTENANCE (SCOA)			
Subtotal SCOA	***1,470***	***137***	
TRANSMISSION SYSTEMS (SCOT)			
Subtotal SCOT	***3,128***	***291***	
CLIENT SERVICE CENTER (SCOS)			
Subtotal SCOS	***5,789***	***538***	
INFRASTRUCTURE (SCOI)			
Subtotal SCOI	***6,377***	***592***	
NETWORK OPS (SCOO)			Collocated with Comm Focal Point
Subtotal SCOO	***2,035***	***189***	
SCO SECTION SUBTOTAL	**24,207**	**2,249**	

Table B-12 Reference Program Area Matrix JBER Joint Consolidated Communication Facility – October 2010 (continued)

SCX Section

The SCX Section includes the following sub-sections:

- Plans, Resources and Engineering (SCXP)
- Information Assurance (SCXS)
- Knowledge Operations (SCXK)
- Resource Advisor Administrator (SCXR)

Plans, Resources and Engineering (SCXP)

In addition to office space and administrative support space, SCXP includes a 200 SF computer aided drafting room for network drawings.

	USER VALIDATED PROGRAM REQTS		REMARKS
	SF	SM	
SCX SECTION			
PLANS, RESOURCES and ENGINEERING (SCXP)			13 people, unapproved request for 5 additional planners supporting Joint Basing = 18 possible
Office	90	8	1@ 90 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Open Office	1,088	101	16 @ 68 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Administrative Support	680	63	Copy, file, printing for 17 @ 40 sf/person per AFH 32-1084 Chapter 12 Table 12.1
Drafting Room	200	19	Computer equipment and large scale plotter. Four flat files. Archive storage for network drawings.
Warehouse Storage Space	0	0	3,000 SF reduced to 0 SF.
Subtotal SCXP	***2,058***	***191***	

Table B-13 Reference Program Area Matrix JBER Joint Consolidated Communication Facility – October 2010 (continued)

Information Assurance (SCXS)

SCXS includes a multipurpose training room that can be utilized by all units in comm squadron as well as outside groups. Admin support open office space is included as well.

	USER VALIDATED PROGRAM REQTS		REMARKS
	SF	SM	
INFO ASSURANCE (SCXS)			
Office	180	17	2 @ 90 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Open Office	1,224	114	18 @ 68 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Administrative Support	800	74	Copy, file, printing for 20 @ 40 sf/person per AFH 32-1084 Chapter 12 Table 12.1
Information Assurance Office			Bldg 5385
Workbench/Lab Area	0	0	200 Sf requirement reduced to 0 SF. 100 min preferred
COMSEC Management			
Workbench/Lab Area	0	0	This is a COMSEC Vault. 418 SF requirement reduced to 0 sf. 200 SF min preferred
Storage	100	9	
Multipurpose Training Room	1,040	97	50 person room. Shared with other building occupants
Subtotal SCXS	***3,344***	***311***	

Table B-14 Reference Program Area Matrix JBER Joint Consolidated Communication Facility – October 2010 (continued)

Knowledge Operations (SCXK)

SCXK requires three to five years' worth of records storage; therefore, their space requirement includes an area for controlled storage. A large Mail Storage facility is also allocated to SCXK and is specific to the JBER example. It is preferred that the Mail Storage is collocated with the US Postal Service.

	USER REQUIREMENTS (REDUCED)		REMARKS
	SF	SM	
SCX SECTION			
KNOWLEDGE OPS (SCXK)			
Office	90	8	1 @ 90 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Open Office	1,496	139	22 @ 68 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Administrative Support	920	85	Copy, file, printing for 23 @ 40 sf/person per AFH 32-1084 Chapter 12 Table 12.1
Records/File/FOIA	0	0	Bldg 10437
Controlled/Secured Storage	1,865	173	3-5 years worth of records to be stored. 3,500 SF requirement reduced to 1,865 SF. 1,000 min required
Official Mail Center	0	0	Bldg 10437. 800 SF Requirement reduced to 0 SF. 300 SFmin required - not included in this scope
Mail Storage	4,854	451	Collocated with USPS; 9' high door requirement. 300 min
Subtotal SCXK	***9,225***	***857***	

Table B-15 Reference Program Area Matrix JBER Joint Consolidated Communication Facility – October 2010 (continued)

Resource Advisor Administrator (SCXR)

The SCXR requirement is purely an office and administrative support requirement. SCXR consists of a staff office and an additional space allocation for financial records storage.

	USER REQUIREMENTS (REDUCED)		REMARKS
	SF	SM	
SCX SECTION			
RESOURCE ADVISOR ADMINISTRATOR (SCXR)			
Office	90	8	1 @ 90 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Open Office			0 @ 68 SF/person per AFH 32-1084 Chapter 12 Table 12.1
Administrative Support	80	7	Copy, file, printing. Needs 40 SF additional filing for financial records.
Subtotal SCXR	***170***	***16***	

Table B-16 Reference Program Area Matrix JBER Joint Consolidated Communication Facility – October 2010 (continued

SCX Section Summary

The total net area requirement for all SCX Section sub-groups is 14,787 NSF (1,876 NSM).

	USER VALIDATED PROGRAM REQTS		REMARKS
	SF	SM	
SCX SECTION			
PLANS, RESOURCES and ENGINEERING (SCXP)			13 people, unapproved request for 5 additional planners supporting Joint Basing = 18 possible
Subtotal SCXP	***2,058***	***191***	
INFO ASSURANCE (SCXS)			
Subtotal SCXS	***3,344***	***311***	
KNOWLEDGE OPS (SCXK)			
Subtotal SCXK	***9,225***	***857***	
RESOURCE ADVISOR ADMINISTRATOR (SCXR)			
Subtotal SCXR	***170***	***16***	
SCX SECTION SUBTOTAL	**14,797**	**1,375**	

Table B-17 Reference Program Area Matrix JBER Joint Consolidated Communication Facility – October 2010 (continued)

Building Support Spaces:

Building Support spaces include a mechanical room, electrical room, building telecomm rooms, janitor's closets, stairs, shower/locker rooms, restrooms, arctic entryways, and a destruction facility for classified disposal. Because of the large amount of power and data moving through this facility the program also includes a generator room for cold climates (outside location in milder climates), a switch gear room, a main distribution frame room, and a UPS room.

	USER VALIDATED PROGRAM REQTS		REMARKS
	SF	SM	
BUILDING SUPPORT SPACES			
Elevator Equipment Room	132	12	
Mechanical Room	1,130	105	
Electrical Panel Room #1	180	17	
Electrical Panel Room #2	180	17	
Men's Restroom #1	220	20	
Women's Restroom #1	200	19	
Men's Restroom #2	220	20	
Women's Restroom #2	200	19	
Elevator	132	12	
Telecomm Distribution (Comm. Closet)	200	19	
Telecomm Distribution (Comm. Closet)	200	19	
Janitor's Closet #1	96	9	Requirement reduced from 140 SF to 96 SF
Janitor's Closet #2	96	9	Requirement reduced from 140 SF to 96 SF
Stairs #1	280	26	Requirement reduced from 400 SF to 280 SF based on concept design
Stairs #2	280	26	
Fire Pump Room #1	100	9	
Fire Pump Room #2	100	9	
Shower/ Locker Room #1	66	6	Cable Maintenance personnel need this
Shower/ Locker Room #2	66	6	Cable Maintenance personnel need this
Shower/ Locker Room #3	66	6	Cable Maintenance personnel need this
Lobby	100	9	General requirement
Snow Removal Equipment Storage	100	9	120 SF requirement reduced to 100 SF
Facility UPS Room	1,000	93	Includes rectifiers and batteries
Generator Room	960	89	For two generators in parallel; filtrated air. Environmentally regulated. 1,500 SF requirement reduced to 960 SF
Collocate Room	940	87	Commercial vendors, segregated entrance. Four sections, five racks each. Service delivery point. 1,100 SF requirement reduced to 960 SF
Cable Vault	605	56	
Destruction Facility	215	20	250 SF Requirement reduced per concept design
Break Room #1	535	50	
Break Room #2	535	50	
Arctic Entry	325	30	5 total entries
MDF main Distribution Frame	605	56	Demark point - above cable vault
Switch Gear	600	56	
BUILDING SUPPORT SUBTOTAL	**10,664**	**991**	

Table B-18 Reference Program Area Matrix JBER Joint Consolidated Communication Facility – October 2010 (continued

Air Nation Guard

The ANG is shown in the program since it is often part of the communication squadron and includes its own office space, storage, shop space, a small conference room, a large classroom, and vehicle storage for two vehicles and a trailer.

	USER VALIDATED PROGRAM REQTS		REMARKS
	SF	SM	
176th Wing (Air National Guard)			
Commanders Office	175		Per ANG Criteria
Conference Room	225		225
Storage & Supply	100		
Administration	180		
SR 100	200		2 @ 100 SF/person
Chief 125	250		2 @ 125 SF/person
Classroom	890		for 45 persons
MSG 100	900		9 @ 100 SF/person
Vehicle Storage 3 bay	4,086		JISCC requires heated storage 10' min door 32' long trailer. 2 pick up trucks (MV)
Radio Computer Maintenance Shop	875		35x25 workbench area adjacent to vehicle storage bay
ADPE Storage	0		Can combine w/ Computer Staging, with delivery roll-up garage door (FedEx UPS vehicles)
Computer Staging and Storage	600		Includes PPE storage
UTC Storage (Mobility Equip)	400		
COMSEC Vault	0		Share with 3 CS if needed
Mail Room	120		Could be shared with active duty
Lockers (W)	0		Share active duty unless floor too large
Lockers (M)	0		Share active duty unless floor too large
Showers	0		Share active duty
Break Room	0		Share active duty unless floor too large
Restroom (M)	0		Share active duty unless floor too large
Restroom (W)	0		Share active duty unless floor too large
Plans Office (SCPX)	90		1 personnel @ 90 sf ea
Cyber Surety	270		3 personnel @ 90 sf ea
Knowlege Ops (KOM)	540		6 personnel @ 90 sf ea
Cyber Transport	360		4 personnel @ 90 sf ea
Client Support	720		8 personnel @ 90 sf ea wrap around bullpen area (HW)
Infrastructure (Cyber Systems)	270		3 personnel @ 90 sf ea
RF Transmission	180		2 personnel @ 90sf ea
Quality Assurance	90		1 personnel @ 90 sf ea
176th Wing (ANG) SUBTOTAL	**11,521**	**1,070**	
CONSOLIDATED COMMUNICATIONS FACILITY NET FLOOR AREA	**70,455**	**6,545**	
Net to Gross Multiplier (1.25)			
Wall thickness Multiplier (1.1)			
TOTAL CONSOLIDATED COMMUNICATIONS FACILITY	**96,876**	**9,000**	

B.5 Summary

The JBER example illustrates a typical large Consolidated Communications Squadron facility which would require approx. 96,900 sq. ft. (9,000 sm.) of total space for a full time staff of 332. This again is a combination of its Active Duty staff, civilians along with Air Force Reserve and Air National Guard Staff.

B.6 Room Data Sheets

The following section includes the room data sheets for the JBER Facility example detailing the specific requirements for the main building rooms that are within the facility. Once again these are included as a prime example of what a large facility would require and are for discussion purposes only.

Arctic Entry (Where Needed)		
Description / Usage	The Arctic Entry shall provide a protected transition from exterior to interior of building at the primary entry. The Arctic Entry should open into the primary circulation.	
Min. Ceiling Ht.	2.4 m (9 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as egg-shell latex paint on gypsum board.
	Floor:	Provide slip resistant ceramic tile with a 10 ft long (in direction of travel) recessed walk-off grille.
	Ceiling:	Provide gypsum board ceiling with egg-shell latex paint.
Plumbing	None Required	
HVAC	Ventilation and Heating Required.	
Fire Protection	Fire Sprinkler System Required	
Power		
Lighting	10 fc average, provide for emergency and exit lighting. (UFC 3-530-01, Ch. 7, p. 89)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	None Required
	PA / AUDIO:	None Required
	Telephone:	Wall-mounted phone
	Data:	None Required
	Security:	None Required
Casework	None Required	
Furnishings Fixtures & Equipment	None Required	
Special Requirements	None Required	

Entry Vestibule		
Description / Usage	The Entry Vestibule shall provide a protected transition from exterior to interior of building. The entry should open into the circulation.	
Min. Ceiling Ht.	2.4 m (9 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as egg-shell latex paint on gypsum board.
	Floor:	Provide slip resistant ceramic tile with a 10ft long (in direction of travel) walk-off mat.
	Ceiling:	Provide gypsum board ceiling with egg-shell latex paint.
Plumbing	None Required	
HVAC	Ventilation and Heating Required.	
Fire Protection	Fire Sprinkler System Required	
Power		
Lighting	10 fc average, provide for emergency and exit lighting. (UFC 3-530-01, Ch. 7, p. 89)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	None Required
	PA / AUDIO:	None Required
	Telephone:	Wall-mounted phone
	Data:	None Required
	Security:	None Required
Casework	None Required	
Furnishings Fixtures & Equipment	None Required	
Special Requirements	None Required	

Office		
Description / Usage	The Offices in the Consolidated Communications Facility are provided for the government employees in the facility.	
Min. Ceiling Ht.	2.4 m (9 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as egg-shell latex paint on gypsum board/metal stud wall system.
	Floor:	Provide carpet tile flooring (re: ETL 07-4) with rubber base.
	Ceiling:	Provide acoustical ceiling tile and grid.
Plumbing	None Required	
HVAC	Cooling, Heating and Ventilation Required.	
Fire Protection	Fire Sprinkler System Required	
Power	One receptacle on each wall every six feet and one for the computer system	
Lighting	30 fc average ambient, 50 fc average on the task. (UFC 3-530-01, Ch. 7, p. 94)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	Yes
	PA / AUDIO:	Yes
	Telephone:	Yes
	Data:	Yes
	Security:	Yes
Casework	None Required	
Furnishings Fixtures & Equipment	Provide office desk, office chair, file cabinet, bookshelf, desk lamp, and an additional two side chair.	
Special Requirements	None Required	

Open Office		
Description / Usage	The Open Offices in the Consolidated Communications Facility are provided for the government employees in the facility.	
Min. Ceiling Ht.	2.7 m (9 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as egg-shell latex paint on gypsum board/metal stud wall system.
	Floor:	Provide carpet tile flooring (re: ETL 07-4) with rubber base.
	Ceiling:	Provide acoustical ceiling tile and grid.
Plumbing	None Required	
HVAC	Cooling, Heating and Ventilation Required.	
Fire Protection	Fire Sprinkler System Required	
Power	Provide one quad receptacle for each workstation. Provide general purpose outlets along the perimeter walls of the open office every 50 feet minimum.	
Lighting	30 fc average ambient, 50 fc average on the task, provide for emergency egress requirements. (UFC 3-530-01, Ch. 7, p. 97)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	Yes
	PA / AUDIO:	Yes
	Telephone:	Yes
	Data:	Yes, with additional data connections to be provided at SCOS stations to allow updates to multiple computers
	Security:	Yes
Casework	None Required	
Furnishings Fixtures & Equipment	Provide minimum of 6'x8' workstation, office chair, task lighing, and file storage for each personnel.	
Special Requirements	None Required	

Crypto Vault		
Description / Usage	The Crypto Vault in the Consolidated Communications Facility provides a secure space in which the government employees in the facility can access the SIPRNet system.	
Min. Ceiling Ht.	2.4 m (8 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as egg-shell latex paint on gypsum board/metal stud wall system. Walls should extend to the deck.
	Floor:	Provide carpet tile flooring (re: ETL 07-4) with rubber base.
	Ceiling:	Provide acoustical ceiling tile and grid.
Plumbing	None Required	
HVAC	Cooling, Heating and Ventilation Required.	
Fire Protection	Fire Sprinkler System Required	
Power	Provide one quad receptacle for each workstation. Provide general purpose outlets along the perimeter walls of the open office every 50 feet minimum.	
Lighting	30 fc average ambient, 50 fc average on the task, provide for emergency egress requirements. (UFC 3-530-01, Ch. 7, p. 97)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	Yes
	PA / AUDIO:	Yes
	Telephone:	Yes
	Data:	Yes
	Security:	Yes
Casework	None Required	
Furnishings Fixtures & Equipment	Provide minimum of 6'x8' workstation, office chair, task lighing, and file storage for each person.	
Special Requirements	Provide secured entry into Vault.	

Field Personnel Office (Where Needed)		
Description / Usage	The Field Personnel Offices in the Consolidated Communications Facility are provided for the government employees in the facility.	
Min. Ceiling Ht.	2.4 m (8 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as egg-shell latex paint on gypsum board/metal stud wall system.
	Floor:	Provide a low-maintenance, slip/skid-resistant, sheet or tile vinyl flooring with rubber base.
	Ceiling:	Provide acoustical ceiling tile and grid.
Plumbing	None Required	
HVAC	Cooling, Heating and Ventilation Required.	
Fire Protection	Fire Sprinkler System Required	
Power	One receptacle on each wall every six feet and one for the computer system	
Lighting	30 fc average ambient, 50 fc average on the task (UFC 3-530-01, Ch. 7, p.)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	Yes
	PA / AUDIO:	Yes
	Telephone:	Yes
	Data:	Yes
	Security:	Yes
Casework	None Required	
Furnishings Fixtures & Equipment	Provide office desk, office chair, file cabinet, bookshelf, desk lamp, and an additional side chair.	
Special Requirements	None Required	

Field Personnel Open Office (Where Needed)		
Description / Usage	The Field Personnel Open Office provides workstations for Field Personnel.	
Min. Ceiling Ht.	2.7 m (9 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as egg-shell latex paint on gypsum board/metal stud wall system.
	Floor:	Provide a low-maintenance, slip/skid-resistant, sheet or tile vinyl flooring with rubber base.
	Ceiling:	Provide acoustical ceiling tile and grid.
Plumbing	None Required	
HVAC	Cooling, Heating and Ventilation Required.	
Fire Protection	Fire Sprinkler System Required	
Power	Provide one quad receptacle for each workstation. Provide general purpose outlets along the perimeter walls of the open office every 50 feet minimum.	
Lighting	30 fc average ambient, 50 fc average on the task, provide for emergency egress requirements. (UFC 3-530-01, Ch. 7, p. 97)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	Yes
	PA / AUDIO:	Yes
	Telephone:	Yes
	Data:	Yes
	Security:	Yes
Casework	None Required	
Furnishings Fixtures & Equipment	Provide minimum of 6'x8' workstation, office chair, task lighing, and file storage for each personnel.	
Special Requirements	None Required	

Main Telecommunications Room (Main TR)		
Description / Usage	The Main Telecommunications Room provides NIRPNet distribution within the facility and to nearby facilities.	
Min. Ceiling Ht.	None Required	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as industrial egg-shell latex paint on gypsum board/metal stud wall system. Walls should extend to the deck.
	Floor:	Provide a sealed concrete surface.
	Ceiling:	Do not provide (UFC 3-580-01, 2-5.3)
Plumbing	None Required	
HVAC	DX unit per Comm regulation	
Fire Protection	Fire Sprinkler System Required	
Power	Eight receptacles, each on a dedicated circuit.	
Lighting	50 fc (UFC 3-580-01, 2-5.12)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	None Required
	PA / AUDIO:	None Required
	Telephone:	100 pair copper
	Data:	Minimum 36 strands of Single Mode Fiber Optic Cable (SM FOC)
	Security:	None Required
Casework	None Required	
Furnishings Fixtures & Equipment	None Required	
Special Requirements	The Consolidated Communications Facility is an Information Transportation Node (ITN) and as such, its Main TR will connect to at least two other ITNs and will provide distribution to nearby facilities through their End Building Nodes (EBNs). Provide in central location to accommodate distribution run limitations. Maintain a minimum width of 9 feet.	

Telecommunications Room (TR)		
Description / Usage	The Telecommunications Room provides SIPRNet distribution for the facility.	
Min. Ceiling Ht.	None Required	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as industrial egg-shell latex paint on gypsum board/metal stud wall system. Walls should extend to the deck.
	Floor:	Provide a sealed concrete surface.
	Ceiling:	Do not provide (UFC 3-580-01, 2-5.3)
Plumbing	None Required	
HVAC	DX unit per Comm regulation	
Fire Protection	Fire Sprinkler System Required	
Power	Eight receptacles, each on a dedicated circuit.	
Lighting	50 fc (UFC 3-580-01, 2-5.12)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	None Required
	PA / AUDIO:	None Required
	Telephone:	None Required
	Data:	Yes
	Security:	Yes
Casework	None Required	
Furnishings Fixtures & Equipment	None Required	
Special Requirements	Locate near area of SIPRNet usage to reduce distribution runs, which must be exposed or encased in concrete for security. Maintain a minimum width of 9 feet.	

Network Control Center (NCC)		
Description / Usage	The Network Control Center (NCC) provides a secure room for monitoring and remote operation of the network.	
Min. Ceiling Ht.	2.4 m (8 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as egg-shell latex paint on gypsum board/metal stud wall system.
	Floor:	Provide carpet tile flooring (re: ETL 07-4) with rubber base.
	Ceiling:	Provide acoustical ceiling tile and grid.
Plumbing	None Required	
HVAC	Cooling, Heating and Ventilation Required.	
Fire Protection	Fire Sprinkler System Required	
Power	Provide one quad receptacle for each workstation. Provide general purpose outlets along the perimeter walls of the open office every 50 feet minimum.	
Lighting	30 fc average ambient, 50 fc average on the task, provide for emergency egress requirements. (UFC 3-530-01, Ch. 7, p. 97)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	Yes
	PA / AUDIO:	Yes
	Telephone:	Yes
	Data:	Yes
	Security:	Yes
Casework	None Required	
Furnishings Fixtures & Equipment (FF&E)	Provide minimum of 6'x8' workstation, office chair, task lighing, and file storage for each personnel.	
Special Requirements	NCC should be located near Data Center.	

Break Room		
Description / Usage	The Break Room should be centrally located in the facility.	
Min. Ceiling Ht.	2.4 m (8 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as egg-shell latex paint on gypsum board/metal stud wall system.
	Floor:	Provide a low-maintenance, slip/skid-resistant, sheet or tile vinyl flooring with rubber base.
	Ceiling:	Provide acoustical ceiling tile and grid.
Plumbing	Hot and Cold Water Required.	
HVAC	Cooling, Heating and Ventilation Required.	
Fire Protection	Fire Sprinkler System Required	
Power	One receptacle on each wall and one for each appliance or vending machine	
Lighting	10 fc, provide for emergency egress requirements (UFC 3-530-01, Ch. 7, p. 109)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	Yes
	PA / AUDIO:	Yes
	Telephone:	Yes
	Data:	Yes
	Security:	Yes
Casework	Provide casework with sink.	
Furnishings Fixtures & Equipment	Provide tables and chairs and space for a refrigerator.	
Special Requirements	None Required	

Warehouse/Storage Room (Where Needed)		
Description / Usage	The Warehouse/Storage room provides storage for equipment and supplies for field personnel.	
Min. Ceiling Ht.	None Required	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as industrial egg-shell latex paint on gypsum board/metal stud wall system. Walls should extend to the deck.
	Floor:	Provide a sealed concrete surface.
	Ceiling:	None Required
Plumbing	None Required	
HVAC	Heating, and Ventilation Required. Humidity should be maintained at 40% to 55%. Cooling (as needed).	
Fire Protection	Fire Sprinkler System Required	
Power	one receptacle on each wall	
Lighting	5 fc for inactive storage, 30 fc average fo active warehousing (UFC 3-530-01, Ch. 7, p. 149)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	Yes
	PA / AUDIO:	Yes
	Telephone:	Yes
	Data:	Yes
	Security:	Yes
Casework	None Required	
Furnishings Fixtures & Equipment	None Required	
Special Requirements	None Required	

Secured Storage Room		
Description / Usage	The Secured Storage Room provides storage for electronic equipment.	
Min. Ceiling Ht.	None Required	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as industrial egg-shell latex paint on gypsum board/metal stud wall system. Walls should extend to the deck.
	Floor:	Provide a sealed concrete surface.
	Ceiling:	None Required
Plumbing	None Required	
HVAC	Heating, and Ventilation Required. Humidity should be maintained at 40% to 55%. Cooling (as needed).	
Fire Protection	Fire Sprinkler System Required	
Power	One receptacle on each wall	
Lighting	10 fc average (UFC 3-530-01, Ch. 7, p. 112)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	Yes
	PA / AUDIO:	Yes
	Telephone:	Yes
	Data:	Yes
	Security:	Yes
Casework	None Required	
Furnishings Fixtures & Equipment	None Required	
Special Requirements	None Required	

Mechanical Room		
Description / Usage	The Mechanical room shall have direct access to the exterior of the building. The Mechanical room will contain all HVAC equipment for the building.	
Min. Ceiling Ht.	None Required	
Finishes	**Walls:**	CMU. Provide epoxy paints on all wall surfaces.
	Floor:	Provide a sealed concrete surface.
	Ceiling:	None Required
Plumbing	Cold water to hose bib	
HVAC	Ventilation and Heating Required.	
Fire Protection	Fire Sprinkler System Required	
Power	one receptacle with in 25 feet of HVAC equipement	
Lighting	30 fc average (UFC 3-530-01, Ch. 7, p. 114)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	None Required
	PA / AUDIO:	None Required
	Telephone:	Yes
	Data:	Yes
	Security:	None Required
Casework	None Required	
Furnishings Fixtures & Equipment	None Required	
Special Requirements	None Required	

Electrical Room		
Description / Usage	The Electrical room shall have be near the Data Center. This room will house all panelboards and switchboards required for the facility.	
Min. Ceiling Ht.	None Required	
Finishes	**Walls:**	CMU. Provide epoxy paints on all wall surfaces.
	Floor:	Concrete slab to be depressed 30 inches. Provide a raised floor with antistatic tile finish.
	Ceiling:	None Required
Plumbing	None Required	
HVAC	Ventilation and Heating Required.	
Fire Protection	Fire Sprinkler System Required	
Power	one receptacle each wall	
Lighting	30 fc average (UFC 3-530-01, Ch. 7, p. 114)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	None Required
	PA / AUDIO:	None Required
	Telephone:	Yes
	Data:	Yes
	Security:	None Required
Casework	None Required	
Furnishings Fixtures & Equipment	None Required	
Special Requirements	None Required	

UPS Room (Where Needed)		
Description / Usage	The UPS room shall be near the Data Center unless in-line UPS systems are utilzed. This room will house all UPS systems required for the facility.	
Min. Ceiling Ht.	None Required	
Finishes	**Walls:**	CMU. Provide epoxy paints on all wall surfaces.
	Floor:	Concrete slab to be depressed 30 inches. Provide a raised floor with antistatic tile finish.
	Ceiling:	None Required
Plumbing	None Required	
HVAC	Ventilation and Heating Required.	
Fire Protection	Fire Sprinkler System Required	
Power	one receptacle each wall	
Lighting	50 fc (UFC 3-580-01, 2-5.12)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	None Required
	PA / AUDIO:	None Required
	Telephone:	Yes
	Data:	Yes
	Security:	None Required
Casework	None Required	
Furnishings Fixtures & Equipment	None Required	
Special Requirements	None Required	

Men's Toilet Room		
Description / Usage	The Men's Toilet Room includes water closets, urinals, lavatories, and showers for staff.	
Min. Ceiling Ht.	2.4 m (8 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as full-height ceramic tile.
	Floor:	Provide slip resistant ceramic tile.
	Ceiling:	Provide gypsum board ceiling with egg-shell latex paint.
Plumbing	Hot and Cold Water Required	
HVAC	Ventilation and Heating Required.	
Fire Protection	Fire Sprinkler System Required	
Power	one receptacle GFCI on each wall	
Lighting	5 fc (UFC 3-530-01, Ch. 7, p. 117)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	None Required
	PA / AUDIO:	None Required
	Telephone:	Yes
	Data:	None Required
	Security:	None Required
Casework	Provide 610 mm (24 in) minimum depth solid surface materials for any countertops.	
Furnishings Fixtures & Equipment	None Required	
Special Requirements	None Required	

Janitorial Room		
Description / Usage	The Janitorial room provides storage for cleaning supplies. A floor sink and shelves for product storage are included.	
Min. Ceiling Ht.	2.4 m (8 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as industrial semi-gloss latex paint on gypsum board/metal stud wall system.
	Floor:	Provide a low-maintenance, slip/skid-resistant, sheet or tile vinyl flooring with rubber base.
	Ceiling:	Consider providing durable, moisture-resistant ACP or GWB ceiling. Consider semi- gloss latex paint for gypsum board ceiling.
Plumbing	Hot and Cold Water Required	
HVAC	Ventilation Required	
Fire Protection	Fire Sprinkler System Required	
Power	One receptacle GFCI	
Lighting	30 fc average (UFC 3-530-01, Ch. 7, p. 114)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	None Required
	PA / AUDIO:	None Required
	Telephone:	None Required
	Data:	None Required
	Security:	None Required
Casework	None Required	
Furnishings Fixtures & Equipment	None Required	
Special Requirements	None Required	

Women's Toilet Room		
Description / Usage	The Women's Toilet Room includes water closets, lavatories, and showers for staff.	
Min. Ceiling Ht.	2.4 m (8 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as full-height ceramic tile.
	Floor:	Provide slip resistant ceramic tile.
	Ceiling:	Provide gypsum board ceiling with egg-shell latex paint.
Plumbing	Hot and Cold Water Required	
HVAC	Ventilation and Heating Required.	
Fire Protection	Fire Sprinkler System Required	
Power	one receptacle GFCI on each wall	
Lighting	5 fc (UFC 3-530-01, Ch. 7, p. 117)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	None Required
	PA / AUDIO:	None Required
	Telephone:	Yes
	Data:	None Required
	Security:	None Required
Casework	Provide 610 mm (24 in) minimum depth solid surface materials for any countertops.	
Furnishings Fixtures & Equipment	None Required	
Special Requirements	None Required	

Toilet Room / Shower		
Description / Usage	The Toilet Room / Shower includes a water closet, lavatories, and shower for staff. Locate near the Field Personnel Office (if present) and the SCOA area.	
Min. Ceiling Ht.	2.4 m (8 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as full-height ceramic tile.
	Floor:	Provide slip resistant ceramic tile.
	Ceiling:	Provide gypsum board ceiling with egg-shell latex paint.
Plumbing	Hot and Cold Water Required	
HVAC	Ventilation and Heating Required.	
Fire Protection	Fire Sprinkler System Required	
Power	one receptacle gfci on each wall	
Lighting	5 fc (UFC 3-530-01, Ch. 7, p. 117)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	None Required
	PA / AUDIO:	None Required
	Telephone:	Yes
	Data:	None Required
	Security:	None Required
Casework	Provide 610 mm (24 in) minimum solid surface materials for any countertops.	
Furnishings Fixtures & Equipment	None Required	
Special Requirements	None Required	

Corridors		
Description / Usage	The corridor shall connect the entry to all rooms in the facility except the Services (Electrical and Mechanical) rooms which may have exterior access.	
Min. Ceiling Ht.	2.7 m (9 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as egg-shell latex paint on gypsum board/metal stud wall system.
	Floor:	Provide a low-maintenance, slip/skid-resistant, sheet or tile vinyl flooring with rubber base.
	Ceiling:	Provide acoustical ceiling tile and grid.
Plumbing	Cold Water for Electric Water Cooler.	
HVAC	Ventilation and Heating Required.	
Fire Protection	Fire Sprinkler System Required.	
Power	One receptacle on each wall at 25 foot intervals	
Lighting	5 fc average, provide for emergency egress requirements (UFC 3-530-01, Ch. 7, p. 91)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	Yes
	PA / AUDIO:	Yes
	Telephone:	Yes
	Data:	Yes
	Security:	Yes
Casework	None Required	
Furnishings Fixtures & Equipment	None Required	
Special Requirements	None Required	

Data Center		
Description / Usage	The Data Center provides space for server racks and associated CRAC units.	
Min. Ceiling Ht.	2.7 m (9 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as industrial egg-shell latex paint on gypsum board/metal stud wall system. Walls should extend to the deck.
	Floor:	Concrete slab to be depressed 30 inches. Provide a raised floor with antistatic tile finish.
	Ceiling:	Provide acoustical ceiling tile and grid.
Plumbing	None Required	
HVAC	CRAC units per Comm regulation	
Fire Protection	Provide Fire Sprinkler System.	
Power	Provide power for CRAC units and Communications racks.	
Lighting	50 fc (UFC 3-580-01, 2-5.12)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	None Required
	PA / AUDIO:	None Required
	Telephone:	Fiber: 8 each 36 SM 1 each 72 SM 1 each 144 SM 4 each 48 SM 1 each 30 SM 3 each 24 SM 2 each 18 SM

Data Center (continued)		
Communciation	**Data:**	Copper: 3 each 3000 pair 3 each 2400 pair 7 each 1800 pair 1 each 1500 pair 4 each 600 pair 1 each 400 pair
	Security:	Yes, entry control and video monitoring.
Casework	None Required	
Furnishings Fixtures & Equipment (FF&E)	None Required	
Special Requirements	Data Center operations and support systems (NCC, CRAC units, and so on) are to be on emergency generator. Temperature monitoring and reporting to NCC and Fire Department required. Provide a separate secure Equipment Room within the Data Center for SIPRNet equipment.	

Collocate Room		
Description / Usage	The Colloacate room provides space for contractor racks and associated CRAC units with direct access to the exterior.	
Min. Ceiling Ht.	None Required	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as industrial egg-shell latex paint on gypsum board/metal stud wall system. Walls should extend to the deck.
	Floor:	Concrete slab to be depressed 30 inches. Provide a raised floor with antistatic tile finish.
	Ceiling:	None Required
Plumbing	None Required	
HVAC	CRAC unit per Comm regulation	
Fire Protection	Provide Fire Sprinkler System.	
Power	Provide a receptacle on each wall. Provide power for CRAC units and Communications racks.	
Lighting	50 fc (UFC 3-580-01, 2-5.12)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	None Required
	PA / AUDIO:	None Required
	Telephone:	By Contractor
	Data:	By Contractor
	Security:	None Required
Casework	None Required	
Furnishings Fixtures & Equipment (FF&E)	None Required	
Special Requirements	None Required	

Squadron Conference Room		
Description / Usage	The Squadron Conference Room in the Consolidated Communications Facility provides meeting space for government employees with video teleconferencing (VTC) capabilities.	
Min. Ceiling Ht.	2.7 m (9 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as egg-shell latex paint on gypsum board/metal stud wall system.
	Floor:	Provide carpet tile flooring (re: ETL 07-4) with rubber base.
	Ceiling:	Provide acoustical ceiling tile and grid.
Plumbing	None Required	
HVAC	Cooling, Heating and Ventilation Required.	
Fire Protection	Provide Fire Sprinkler System.	
Power	One receptacle on each wall and one for the presentation system.	
Lighting	30-50 fc average, provide for emergency egress requirements (UFC 3-530-01, Ch. 7, p. 105)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	Yes
	PA / AUDIO:	Yes
	Telephone:	Yes
	Data:	Yes
	Security:	Yes
Casework	None Required	
Furnishings Fixtures & Equipment (FF&E)	Provide conference table and chairs, podium, and credenza for equipment.	
Special Requirements	Provide power and data required for VTC equipment. Provide presenters with connections and controls for A/V system and lighting.	

Squadron Training Room		
Description / Usage	The Squadron Training Room provides a shared, computer-based training space for use by the squadron	
Min. Ceiling Ht.	2.4 m (8 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as egg-shell latex paint on gypsum board/metal stud wall system.
	Floor:	Provide carpet tile flooring (re: ETL 07-4) with rubber base.
	Ceiling:	Provide acoustical ceiling tile and grid.
Plumbing	None Required	
HVAC	Cooling, Heating and Ventilation Required.	
Fire Protection	Fire Sprinkler System Required	
Power	Provide one quad receptacle for each desk with two workstations. Provide general purpose outlets along the perimeter walls of the open office every 50 feet minimum.	
Lighting	50 fc average, provide for emercency egress requirements (UFC 3-530-01, Ch. 7, p. 119)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	Yes
	PA / AUDIO:	Yes
	Telephone:	Yes
	Data:	Yes
	Security:	Yes
Casework	None Required	
Furnishings Fixtures & Equipment (FF&E)	Provide a 30" x 60" tables and office chairs as required for the number of trainees and one each for the instructor.	
Special Requirements	Provide blinds for windows. Provide data/power, structural support, and mount for a ceiling mounted projector. Provide a ceiling mounted drop down projection screen. Provide an 8ft long magnetic whiteboard. Provide infrastructure and space for audio/visual presentation equipment.	

Waiting Area		
Description / Usage	The Squadron Command Suites includes a Waiting Area.	
Min. Ceiling Ht.	2.4 m (8 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as egg-shell latex paint on gypsum board/metal stud wall system.
	Floor:	Provide carpet tile flooring (re: ETL 07-4) with rubber base.
	Ceiling:	Provide acoustical ceiling tile and grid.
Plumbing	None Required	
HVAC	Cooling, Heating and Ventilation Required.	
Fire Protection	Fire Sprinkler System Required	
Power	Provide general purpose outlets along the perimeter walls of the every 50 feet minimum.	
Lighting	50 fc average, provide for emercency egress requirements (UFC 3-530-01, Ch. 7, p. 119)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	Yes
	PA / AUDIO:	Yes
	Telephone:	Yes
	Data:	Yes
	Security:	Yes
Casework	None Required	
Furnishings Fixtures & Equipment	Provide seating as required.	
Special Requirements	None Required	

Copy / Print Room		
Description / Usage	Shared Copy / Print Rooms in the Consolidated Communications Facility is provided for the government employees in the facility.	
Min. Ceiling Ht.	2.4 m (9 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as egg-shell latex paint on gypsum board/metal stud wall system.
	Floor:	Provide carpet tile flooring (re: ETL 07-4) with rubber base.
	Ceiling:	Provide acoustical ceiling tile and grid or a gypsum board ceiling with egg-shell latex paint.
Plumbing	None Required	
HVAC	Cooling, Heating and Ventilation Required.	
Fire Protection	Fire Sprinkler System Required	
Power	One general use recep	
Lighting	30 fc average ambient, 50 fc average on the task. (UFC 3-530-01, Ch. 7, p. 94)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	None Required
	PA / AUDIO:	Yes
	Telephone:	Yes
	Data:	Yes
	Security:	None Required
Casework	Provide work surface and storage casework.	
Furnishings Fixtures & Equipment	None Required	
Special Requirements	Copy / Print Rooms should be enclosed with: partitions to structural deck above or a hard-lid ceiling; self-closing door; and exhaust system to maintain negative pressure in accordance with LEED-NC v2009 Indoor Environmental Quality (IEQ) credit 5.	

Breakout Area		
Description / Usage	Breakout Areas provide space for team gatherings within an Open Office space.	
Min. Ceiling Ht.	2.4 m (8 ft.) minimum.	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as egg-shell latex paint on gypsum board/metal stud wall system.
	Floor:	Provide carpet tile flooring (re: ETL 07-4) with rubber base.
	Ceiling:	Provide acoustical ceiling tile and grid.
Plumbing	None Required	
HVAC	Cooling, Heating and Ventilation Required.	
Fire Protection	Fire Sprinkler System Required	
Power	Provide general purpose outlets along the perimeter walls of the every 50 feet minimum.	
Lighting	30 fc average ambient, 50 fc average on the task. (UFC 3-530-01, Ch. 7, p. 111)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	None Required
	PA / AUDIO:	Yes
	Telephone:	Yes
	Data:	Yes
	Security:	None Required
Casework	None Required	
Furnishings Fixtures & Equipment	Provide a table and seating as required.	
Special Requirements	Breakout Areas are located within an Open Office area. This can be centrally located, in a corner of the overall space to accommodate whiteboards.	

Storage Room		
Description / Usage	Storage Rooms are intended to provide general storage of supplies for facility personnel.	
Min. Ceiling Ht.	None Required	
Finishes	**Walls:**	Provide a low-maintenance, durable finish such as industrial egg-shell latex paint on gypsum board/metal stud wall system. Walls should extend to the deck.
	Floor:	Provide a sealed concrete surface.
	Ceiling:	None Required
Plumbing	None Required	
HVAC	Cooling, Heating and Ventilation Required.	
Fire Protection	Fire Sprinkler System Required	
Power	One receptacle on each wall	
Lighting	10 fc average (UFC 3-530-01, Ch. 7, p. 112)	
Communication	**CCTV:**	None Required
	CATV/Internal Video:	Yes
	PA / AUDIO:	Yes
	Telephone:	Yes
	Data:	Yes
	Security:	Yes
Casework	None Required	
Furnishings Fixtures & Equipment	None Required	
Special Requirements	None Required	

C. FACILITY ANALYSIS

C.1 Consolidated Communication Squadron Facility

The objective of a facility analysis is to understand the business drivers, the operational needs, and the facility requirements in order to provide a basis for developing the dynamic prototype modules (BIM models) of the functionally related spaces. When combined together, these modules create a typical Consolidated Communication Squadron Facility.

C.1.1 Components and Organization for Communications Squadron

Employing information that was gathered during the charrette, several functional areas constituting a typical Communications Squadron facility were identified. These areas were then further grouped by function and adjacency requirements to create a series of modules that comprise a typical facility. The modules are:

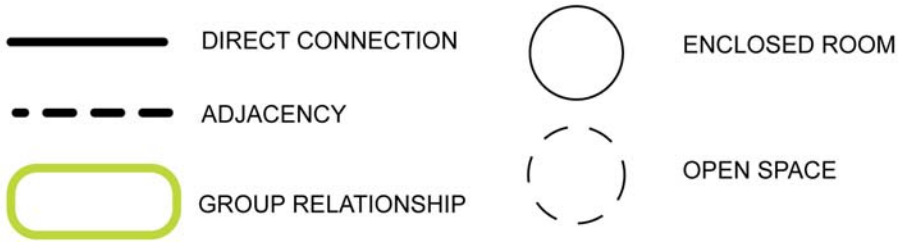
1. Squadron Command
2. SCO Flight Command
3. SCX Flight Command
4. Admin / OPS Module
5. Training
6. Airfield Systems (SCOA)
7. Post Office
8. Land Mobile Radio (LMR)
9. Building Support
10. Data Center
11. Logistics
12. Cryptovault

The following adjacency diagrams illustrate the functional needs and relationships which will influence the organization of the future facility's modules and act as a starting point for future project development.

Figure Legend

The following symbols are used throughout the following figures.

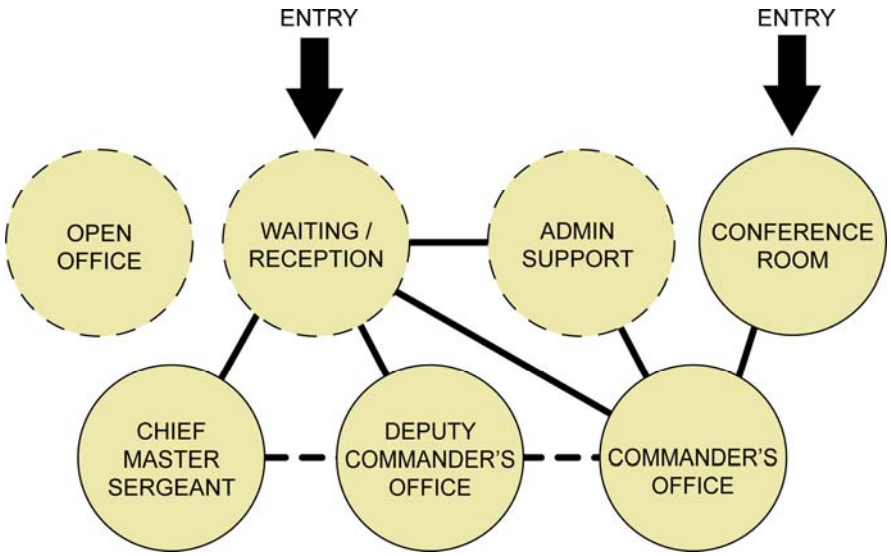
Figure C-1: Figure Legend



1 – Squadron Command Suite

The Squadron Command module is comprised of the private offices of the Squadron Commander, Deputy Commander, Chief Master Sergeant, administrative support position, and open office space. The suite, accessed through a centralized waiting / reception area, will have direct access to the conference room for daily operations and direction adjacent to the main entry. The commander's office should have direct access to the conference room as well.

Figure C-2: Squadron Command Module



2 – SCO Flight Comand

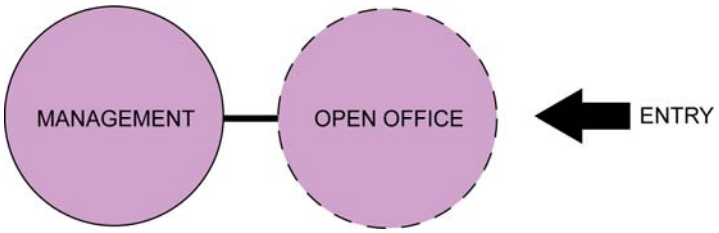
The SCO Flight Command module consists of several management offices, adjacent open office and administrative support as well as a conference room. Access to the module would be off the main circulation spine.

Figure C-3: SCO Flight Command Module

3 – SCX Flight Comand

The SCX Flight Command module consists of a private management office and an adjacent open office area for administrative support. The module would have access off main circulation spine.

Figure C-4: SCX Flight Command Module



4 – Admin / OPS Module

The Admin / OPS Module is comprised of an open office area, two supervisor offices, a breakout area for informal meetings, and a workbench area with adjacent storage.

The Admin / OPS Module will actually apply to all of the following: SCOI, SCOO, SCOS, SCOT, SCOW, and the SCQ section. It is preferable for these spaces to be located within a shared open office environment to allow flexibility in department size, growth and possible future restructuring as well as to encourage collaboration.

SCOI Infrastructure

SCOO Network Operations

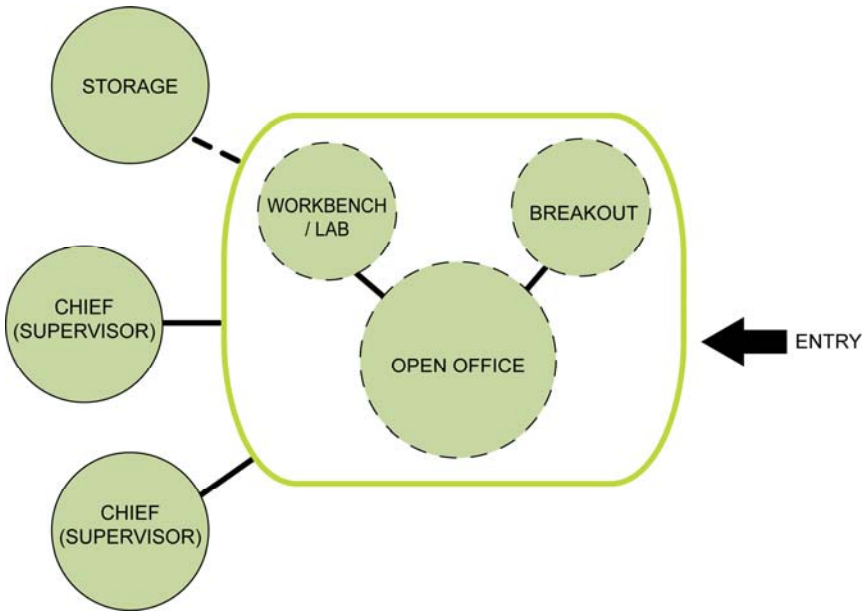
SCOS Service Center

SCOT Transmission Systems

SCOW Wiring Systems (Includes LMR)

SCQ Policy and Evaluations

Figure C-5: Admin/OPS Module

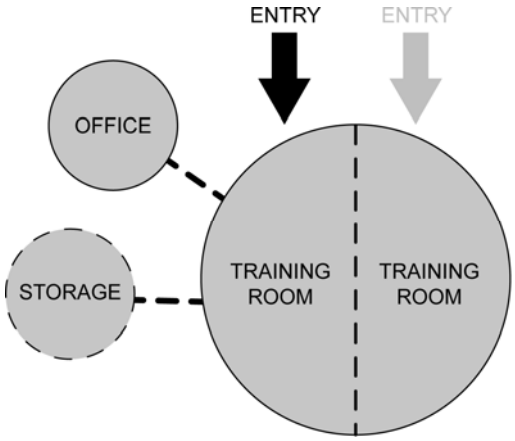


5 – Training

The training module is a multifunctional training space comprised of a large training room, office and storage. The large training room should have the ability to be divided into smaller spaces by means of an operable partition. Training can involve squadron staff as well as general base staff. The training room will be used for specific

computer classes as well as traditional classroom setting courses and have the flexibility to accommodate several different size groups. Access to the space should have direct connection to main building entrance for ease of wayfinding for outside groups.

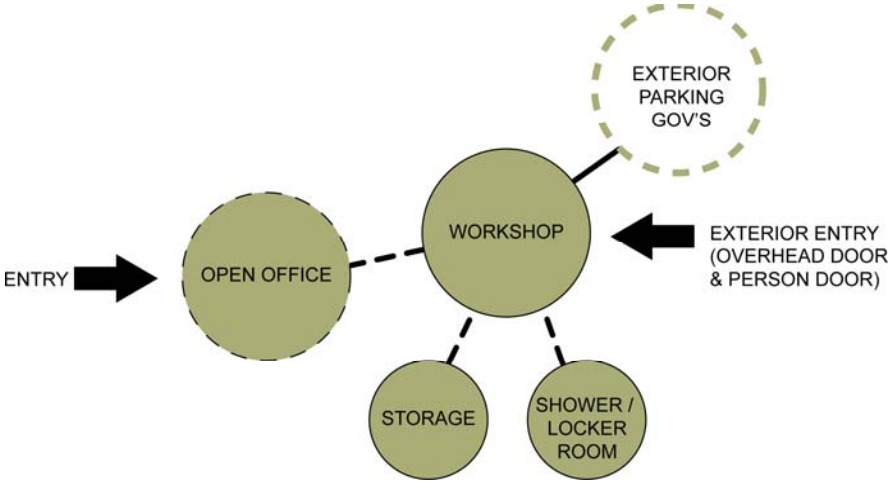
Figure C-6: Training Module



6 – Airfield Systems (SCOA)

The Airfield Systems (SCOA) group is responsible for maintaining the communication systems along the flight line. This module includes an open office for administrative support and a workshop with direct access to the exterior of the building. The workshop should have adjacency or close proximity to storage and a shower / locker room. Adjacent to the exterior should be parking for the government vehicles, typically 3 to 4 pickups or box vans used for field work.

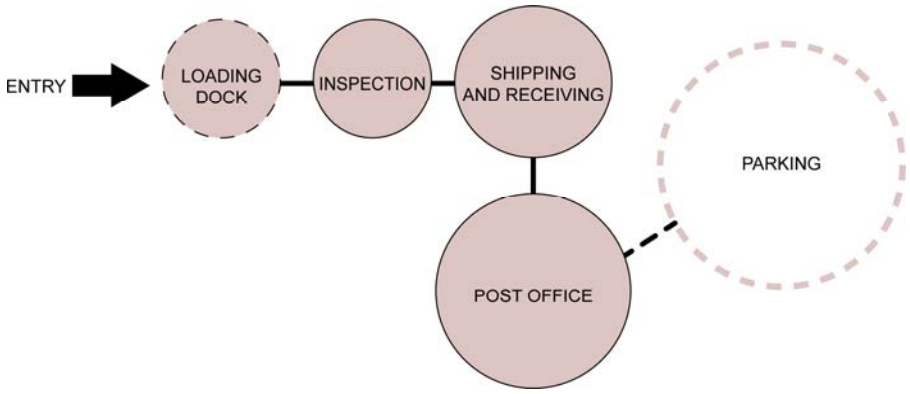
Figure C-7: Airfield Systems (SCOA) Module



7 – Post Office

Although the Post Office falls under the Communications Squadron, most bases already have a facility in place that would likely remain a separate physical structure from other communication activities. This module includes the Post Office with a direct connection to shipping and receiving. The mail arrives at the loading dock and must go through an inspection area prior to shipping and receiving. Provide adequate POV parking with associated ADA spaces adjacent to the post office.

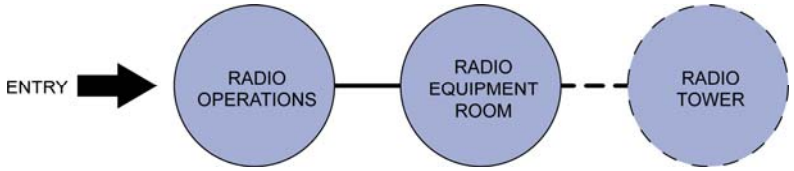
Figure C-8: Post Office Module



8 – Land Mobile Radio (LMR)

This module consists of space for radio operations with an adjacent radio equipment room. An associated radio tower will be located on base, its proximity would be determined by geographical and site specific conditions.

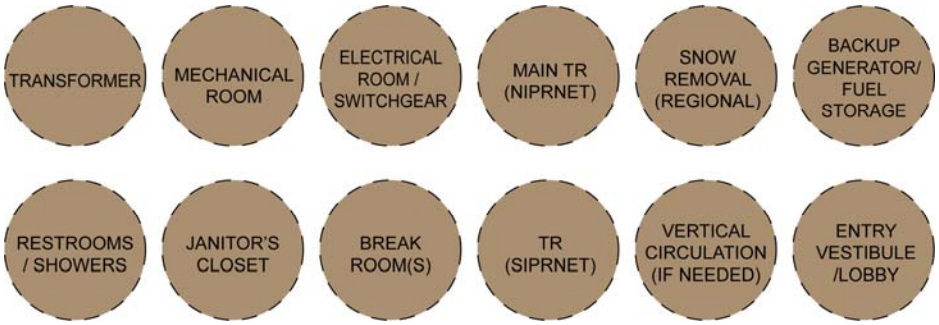
Figure C-9: Land Mobile Radio (LMR) Module



9 – Building Support

This module is comprised of several building components that have no adjacency relationship to each other but rather are required to create a functional building. The size and location of these elements would be determined by the number of personnel within the facility and other site specific conditions.

Figure C-10: Building Support Module

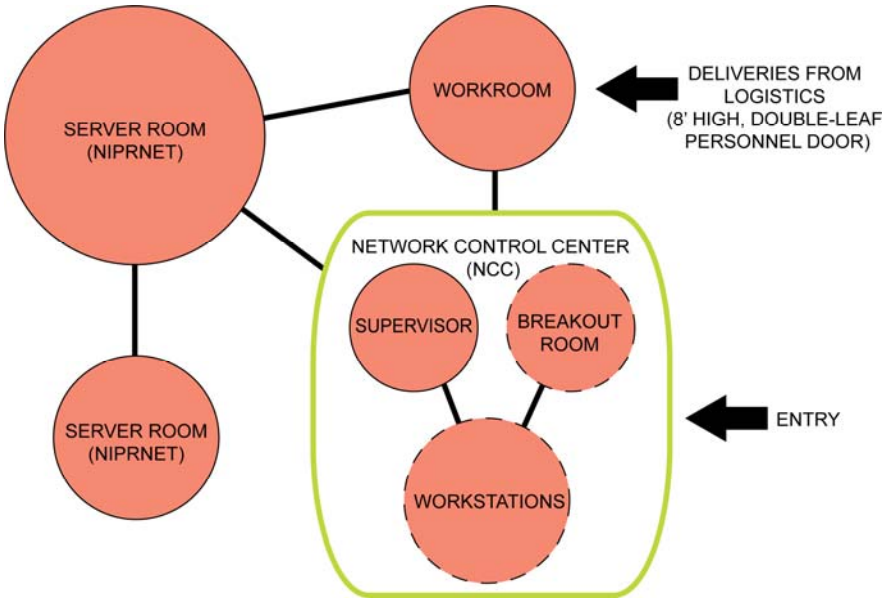


10 – Data Center

With improvements in virtualization and server technology Air Force bases have begun consolidating individual server rooms from different "on base" facilities into one large facility that can address the base's needs from a centralized location.

The data center module includes the server rooms (NIPRNET and SIPERNET) with associated with backup power, raised access floor systems and its own humidity and temperature climate controls. The Network Control Center (NCC) is comprised of open work stations, a supervisor's office and a breakout area for informal meetings. A workroom for maintenance and repairs will be adjacent to the NIPERNET server room and the NCC, a direct connection from both rooms is required. This module should be located within a secure portion of the facility, act as a stand-alone identity, and be scalable to accommodate the changing needs of the base and the rapidly changing technology in that field.

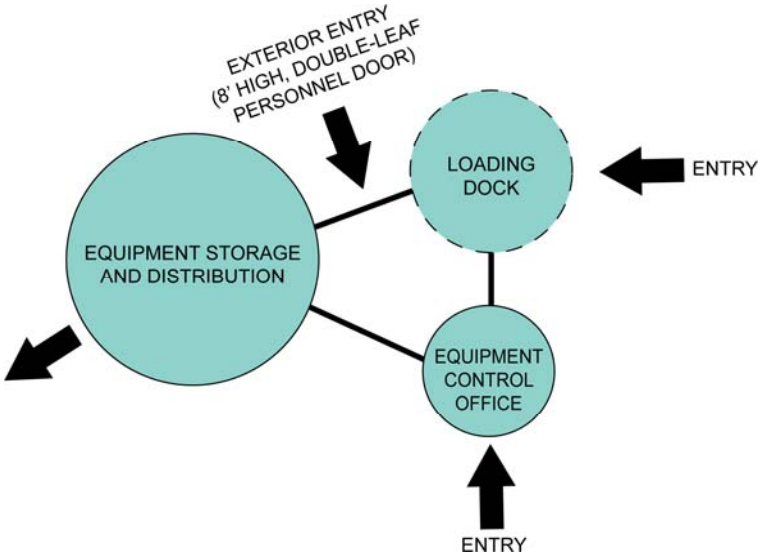
Figure C-11: Data Center Module



11 - Logistics

The logistics module is comprised of an equipment storage and distribution center where equipment shipments are inventoried and stored for distribution. A direct connection to a loading dock is required with sufficient height to move freight between the two spaces and onward to other building components. The equipment control office should be adjacent to both the equipment storage and loading dock areas.

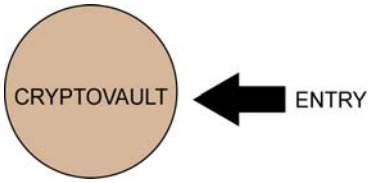
Figure C-12: Logistic Module



12 – Crypto Vault

This module is an individual space with no adjacency relationship to others; however, it should be within a secured area of the building. The Crypto Vault is essential a space within the Comm Facility where multiple people can access the Air Force SIPRNet system (secret data network). In a typical facility, this function should be near the Command Suite for easy access and monitoring. In addition, there should be a Telecommunications Room (TR) nearby which provides the distribution for the SIPRNet system. Because of the security requirements for the SIPRNet distribution lines, shorter fiber runs are preferred over longer runs.

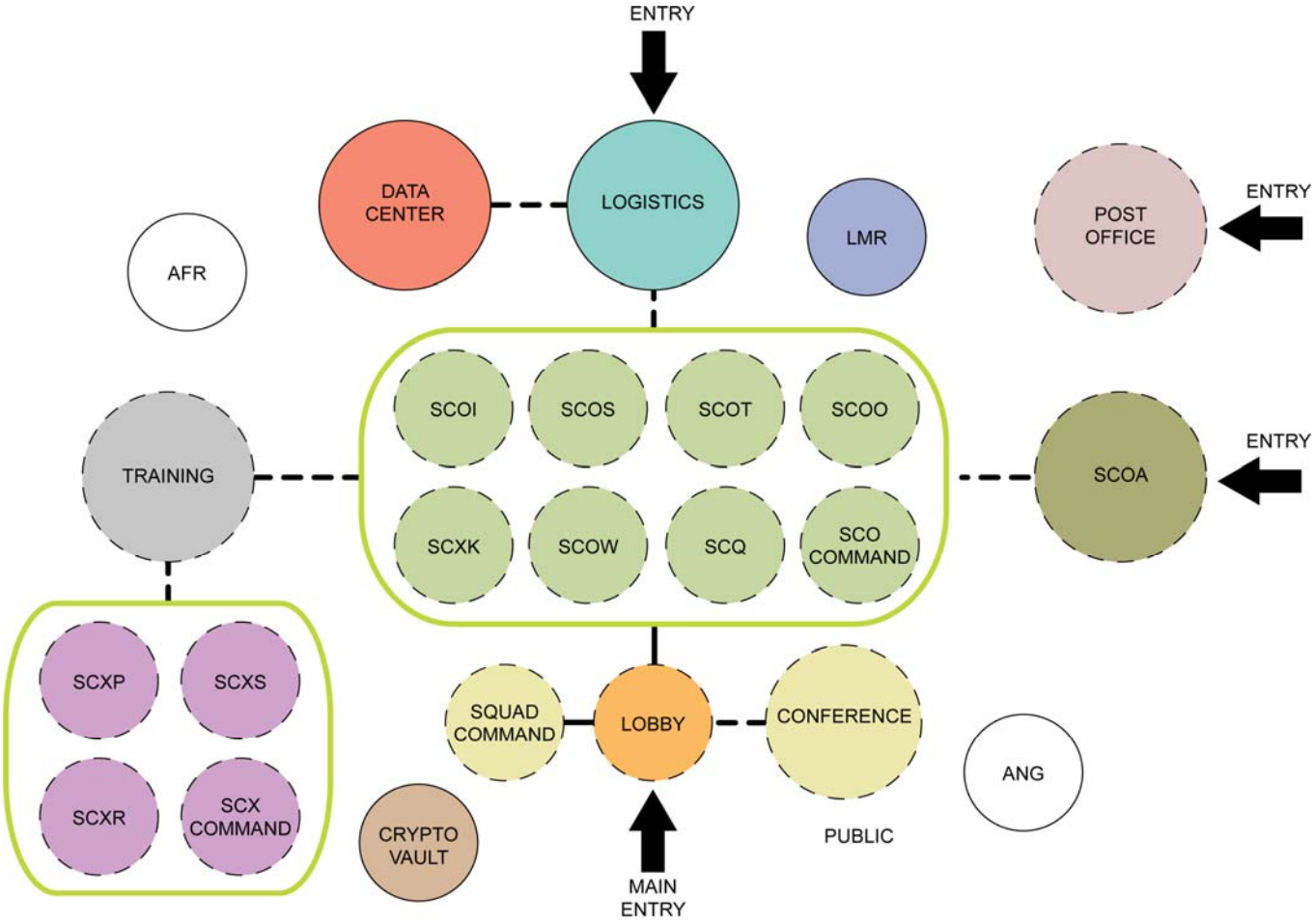
Figure C-13: Cryptovault Module



Composite Relationships

The composite relationship diagram shown below is intended to illustrate the special relationships between previous discussed modules. Due to the inherent flexibility associated with a modular "kit-of-parts," process it is important to understand that these schemes are notional and are not intended to constitute final facility designs but as a starting point for future designs as they are developed. Potential site factors and climatic conditions have yet to be taken into consideration. The Air Force Reserve (AFR) and Air National Guard (ANG) modules can be added or deleted depending on the local requirements.

Figure C-14: Consolidated Communication Composite



Potential Project Facility Concept Design

C.2 Facility Analysis

The prototype Communications facility will be divided into two functionally different sections: Administrative and Field Personnel. The Administrative section will house Client Services, Network Ops, Data Center, Crypto Vault, Open Office areas, and the Command and Division office suites. The Field Personnel area of the facility will house the Field Personnel offices and workstations, Warehouse Storage and Secure Storage, and Workbench/Lab area. Functions within the building should be separated to allow the Administrative area to reflect a more professional corporate environment, while allowing for more durable and wear resistant finishes in the other portion of the facility where personnel will be performing repair and maintenance or entering after working in the field.

A typical conceptual design would utilize a standing seam metal roof with exterior walls composed of a split-faced masonry or brick and incorporate any other base architectural design standards. Interior wall finishes would consist of painted drywall in the administrative areas, ceramic tile in the restrooms, and Painted CMU in the storage and building service areas. Flooring will consist of carpet tile flooring in the administrative areas and conference rooms, vinyl flooring in the field personnel areas, ceramic tile in the bathrooms, raised flooring with under floor AC in the data center and sealed concrete in the building service areas. Generally, administrative areas will have acoustic ceiling tiles while building service areas and the storage areas would not have ceilings.

C.3 Engineering Overview

A Consolidated Communications Facility will include typical engineering systems such as Civil, Structural, Heating Ventilation and Air Conditioning (HVAC), Electrical, Plumbing, Fire Protection, Security, and Telecom. The design of mechanical/plumbing systems will be based on project requirements in accordance with the following:

- UFC 4-610-01, Administration Facilities;
- UFC 3-400-01, Energy Conservation;
- UFC 1-200-02, High Performance and Sustainable Building Requirement;
- AFI 33-104 “Communications Electronics System and Planning Guidance”

And any other governing codes and standards in accordance with UFC’s, International Building Codes, Federal Regulations, Federal Mandates, and local base design criteria.

C.3.1 Civil

Storm drainage design will be designed based upon the specific site location and conditions. Routing of utilities such as electrical feeders (overhead or underground), domestic water, sanitary sewer, fire protection, and telecom will also be determined by site location and base requirements. A key consideration in planning the location of any new Communications facility is its proximity to the existing facility. Due the large number of communications lines, fiber and copper, it is typically cost prohibitive to move that many lines any significant distance. Thus any planning of a new facility must be in extremely close proximity, such as the next block or similar close location.

C.3.2 Structural

Structural systems for the building will vary based upon site location of facilities but must be designed to meet the minimum AT/FP standoff requirements. A mandatory geotechnical survey will determine the exact type of foundation to be used for the new facilities. Where appropriate a pre-engineered structure may be the most cost effective solution.

C.3.3 HVAC

System types for HVAC will vary greatly depending upon the climate zone of the proposed project base. Typically, these facilities will have singularly dedicated heating and cooling plants. All HVAC systems will be controlled by a Building Automation System (BAS) using Direct Digital Controls. The BAS for each facility will be tied into the base Energy Management Control System (EMCS) which is located with the Civil Engineering. Each of the data centers will have their own dedicated systems along with CRAC units or upright vertical air conditioning units that support the data center if the main systems fail. Provide redundant chillers and air handlers

General: Life cycle cost should be evaluated when selection HVAC systems and should be designed to meet the requirements of the most current edition of the following:

- International Mechanical Code (IMC);
- UFC 3-410-01FA,Heating, Ventilating, and Air Conditioning;
- UFC 3-410-02A, Heating, Ventilating, and Air Conditioning (HVAC) Control Systems
- ASHRAE Standard 90.1- 2004 energy conservation and exceed 30% energy efficiency greater than ASHRAE 90.1-2004 Standard.

C.3.4 Electrical

Electrical service for the facilities will be provided through pad mounted transformers in close proximity to building. Secondary service will be 277/480V and 115/208V depending upon the requirements of the facility.

Lighting for these facilities will typically be high efficiency fluorescent or LED fixtures. Design of most spaces will take advantage of daylighting for work areas, where possible use task lighting for desks to minimize usage of overhead lighting. Occupancy sensors will be utilized to minimize power usage.

Exterior Lighting

Provide exterior lighting at building perimeter (consider LED fixtures if permissible), including at personnel doors. Parking lot light fixtures should be full cutoff and controlled with a photo-cell sensor.

Emergency and exit lighting will be provided in accordance with NFPA 101 and National Electrical Code. Exterior lighting will be provided for walkways, entrances/exits, POV and GOV parking areas due to the 24/7 operation of the facility. Lightning protection is mandatory no matter the location.

C.3.5 Stand-by Generator

Parallel 350 KVA stand-by diesel generators with 72-hour fuel supply will be provided for the facility critical telecommunications loads and associated HVAC equipment in the Data Center. A 3-pole, 4-wire 480 volt automatic “make-before-break” transfer switch will be used to transfer power sources. The generator will be provided with vibration isolation springs and weatherproof enclosure with sound dampening.

C.3.6 Uninterrupted Power Supply (UPS)

Two 500 KVA UPS systems each with 15 minute runtime remote batteries, each serving half of the critical loads shall be provided for uninterrupted power during outages and momentary power glitches. Each of the UPS systems shall be capable of serving the entire loads in event one of the UPS undergoes maintenance or goes offline.

C.3.7 Plumbing

General plumbing for the facility will consist of Men's and Women's restrooms sized for the building occupant load with a 70% to 30% ratio of men’s to women’s. Provide automatic flush valves for both urinals and water closets. Waterless urinals are typically not specified due to high long term maintenance costs. The need for a domestic water booster pump will be assessed based upon available site domestic water pressure determined by a fire flow test performed by contractor.

C.3.8 Fire Protection

These facilities will be protected by automatic fire sprinkler systems. The need for an additional fire pump will be determined by future A/E based upon the available domestic water pressure at the site. The entire building will be fully protected throughout by automatic fire sprinkler systems. Light hazard wet-pipe protection will be provided for office areas, training room, storage area, service areas, mechanical room, electrical room, restrooms and locker areas, etc..

An addressable fire protection system with walk-rest capability will be provided for the entire facility. The system will include:

- Manual pull stations, notification appliances (in Alarm Control office, restrooms, training rooms, conference rooms, Break Rooms, (Data Center), horns and strobe lights (indoor only) per base requirements and NFPA 101.
- Smoke Detector shall be installed next to the fire alarm panel.
- Duct smoke detectors will be provided in all air handler return ducts over 2000 cfm.
- Fire alarm and trouble signals will be reported to the base fire department via a roof-mounted radio antenna system, located above the Comm. Room. Building fire alarm system will be provided that is addressable and electronically supervised, match base wide system. The fire alarm system will include a battery backup.

C.3.9 Security

There is a requirement for an electronic security system in this facility. Coordinate the system design and installation with base security forces to ensure compatibility with base wide system.

C.3.10 Telecom

Phone systems will be provided throughout the facilities. LAN system will utilize CAT 6 cable throughout facilities. Intercom system will be provided through the phone system.

C.3.11 Mass Notification (MNS)

Per AT/FP requirements, a MNS will be furnished to provide real-time information to all building occupants or personnel in the immediate vicinity of the facility during emergency situations. The MNS will be designed in accordance with UFC 4-021-01. Design and O & M of the Mass Notification System will be compatible with the Base-wide MNS. The MNS, however, will not serve as the local building Public Address (PA) system.

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APPENDICES

Participant List

In-Brief Presentation

Acronyms

LEED Checklist

Analysis Cards

Charrette Meeting Minutes

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Participants

The following table lists all participants at the Concept Design Charrette. Jacobs would like to thank the participants for their contribution.

AFCEC – Consolidated Communications Facility Charrette: 18-20 June 2013, San Antonio, TX

NAME	TITLE	CONTACT INFORMATION		
		Office Phone	Cell Phone	Email
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Consolidated Communications Facility Dynamic Prototype and Standard RFP Concept Charrette

Air Force Civil Engineering Center

In-Brief

18 June 2013

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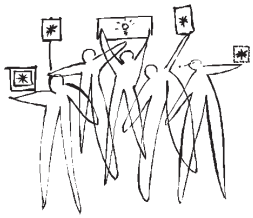
Introductions

- AFCEC
- USACE
- Jacobs
- Others?



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In-Brief Agenda

- Safety Minute
- Charrette Goals, Process and Expectations
- Project Goals and Objectives
- Program Development
- BIM Process Review
- Site Overview (non-site specific)
- Project Schedule
- Discussion

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Safety Minute

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Charrette Goals, Process and Expectations

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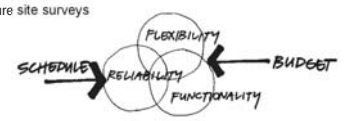
Charrette Goals

Why are we here?

- To create a non-site specific Dynamic Prototype, Standard RFP Document for future Consolidated Communications Facility 35% RFP (Bridging Document) designs, which will lead to more efficient project execution.
  - Involve all stakeholders in the program definition process
  - Set the goals of the project
  - Maximize opportunities
  - Minimize problems
  - Fully understand and document Design-Build processes and requirements
  - Develop data for report content, including;
    - Program validation
    - Two facility concept designs for future site surveys
    - Dynamic Prototype Modules



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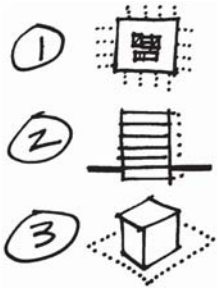
Charrette Process

- **Successful Project Execution**
  - **Early phases** of project design have the **greatest potential** to **affect** the **outcome** of the project, and have the most **significant influence** on **quality, functionality**, and overall project **viability**.



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Charrette Process

- **Interactive work session and the Charrette process**
  - Capture discussions at a macro level
- **What to expect during the work sessions**
  - Review business/mission drivers
  - Develop facility requirements
  - Develop functional relationships
  - Identify building organizational concepts
  - Review Design-Build processes

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Charrette Expectations

- **What are the expectations for this Charrette?**
  - Achieve consensus with all charrette stakeholders
  - Validate the prototype requirements
  - Fully understand and document the needs
  - Lay the foundation for the facility design
  - Develop fully a Dynamic Prototype Model for follow on projects
  - Develop Two Concept Floor Plans using Dynamic Prototypes for future site surveys to develop post charrette
  - Determine structure and outline for Standard RFP Template
  - Others…

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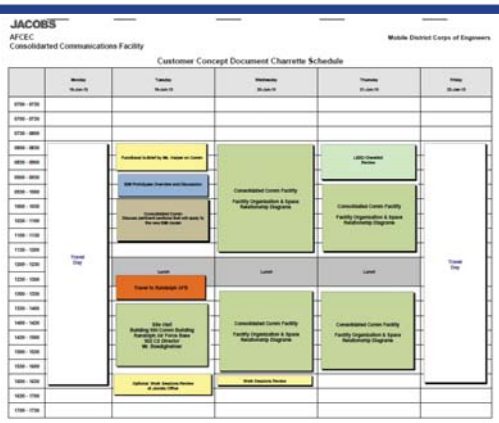
Charrette Schedule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AFCEC
Consolidated Communications Facility
Mobile District Corps of Engineers
Customer Concept Document Charrette Schedule

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Project Goals and Objectives

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Project Goals and Objectives

- **Form**

  Relating to site, physical environment, quality of space and construction.
  - To identify and correctly apply Air Force, and UFC Standards
  - To develop appropriate facilities sizing
  - To develop a viable prototype for Design/Build efforts
- **Function**

  Concerning activities, relationship of spaces, and people – both in number and characteristics.
  - To determine business drivers
  - To meet mission requirements
  - To optimize operational flow
  - To allow for flexibility and expandability
  - To develop a concept with potential to achieve LEED Silver certification

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Project Goals and Objectives

- **Economy**
  Concerning initial budget and quality of construction – may also include operating and life cycle costs.
  - To determine the prototype budget based on authorizations and requirements
- **Time**
  Historical influences and changes from the present, as well as projections into the future.
  - To program for MILCON construction
  - To allow for appropriate facility lifespan
  - To complete the Concept Charrette by……21 June 2013
  - To complete the Concept Charrette final document by….30 July 2013
  - To complete BIM Prototypes and Standard RFP's by……30 Sept 2013
- **Others?**

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BIM Overview

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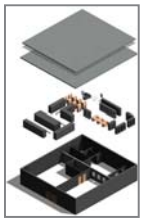
BIM Overview: Program into Practice

Benefits of BIM

- **More effective control over design standards**
- **Better incorporation of best practices**
- **More efficient**
- **More consistency in processes**
- **Products reduce facility acquisition time and costs**
- **Avoid re-inventing the wheel**

3D Representation of Design Guide

- **Jumpstart Design**
- **Incorporate Critical Functional + Technical Criteria**
- **Balancing Flexibility + Standardization**



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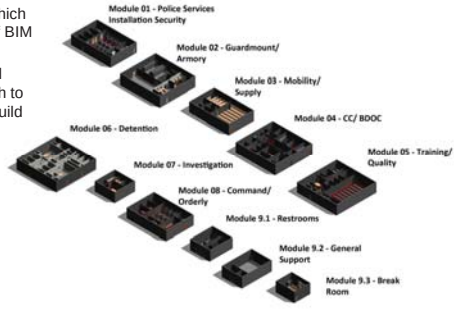
BIM Overview: Dynamic Prototypes

"Dynamic" - Flexible and changeable design model which leverages the advantages of BIM

"Prototype"- A centralized standardized model on which to customize the Design and Build (Design-Build/ Adapt-Build)



Security Forces Operations Dynamic Prototype:

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BIM Overview: Dynamic Prototypes

Security Forces Operations Dynamic Prototype Example

Module Floor Plan

Module Perspective Renderings

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BIM Overview: Dynamic Prototypes

Military Working Dog Kennel Dynamic Prototype

Module Floor Plan

Module 3D View

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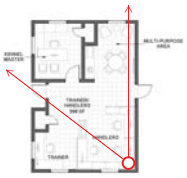
BIM Overview: Dynamic Prototypes

Military Working Dog Kennel Dynamic Prototype



Module Perspective Rendering

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BIM Overview: Dynamic Prototypes

Military Working Dog Kennel Dynamic Prototype

Sample Building Plan

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Program Development

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Program Development

- **Requirement**
  - Develop program to support Dynamic Prototype Modules and Floor Plans for the Consolidated Communications Facility prototype
- **Method**
  - Identify staffing expectations
  - Identify parking quantities/types
  - Review existing standard design elements
  - Identify/quantify SF/SM changes to existing standards
  - Justify changes

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Program Development

- **Requirements:**
  - **Consolidate Communications Operations Facility**
  - **NO existing specific design guidance**
  - **Provide an adequately sized and properly configured facility supporting functional requirements**
  - **Provide modern and appropriate building and building systems to support comm. equipment**
  - **Provide critical functions:**
    - **Command section telephone switch services**
    - **Network control center services**
    - **Communications maintenance work centers**
    - **Photographic elements**
    - **Communications deployment function**
    - **Administrative support areas**

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Program Development

- **Program Issues**
  - **Category Code revised to 131-111 Telecommunications Facility**
  - **US Postal Service and BITC Mail Center Collocation collocated or not?**

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Space Program AFMAN 32-1084

AFMAN32-1084 20 APRIL 2012 65
CATCODE: 131111
OPR: Air Force Network Integration Center (AFNIC)
OCR: N/A

2.3.2.1. **Description.** This facility provides a central location for the common user communications system for intra- and inter-base communications as well as other required communications (exclusive of hardware for navigational aids).

2.3.2.2. **Requirements Determination.** Organizations developing requirements for new facilities should request pre-technical assistance from the supporting engineering and installation Command, Control, Communications, and Computers (C4) organizations in accordance with AFI 33-104. During the technical assistance, communications engineers will identify the special purpose space requirements for the proposed equipment and facility. For new installations, the Base Private Branch Exchange (PBX) Switching Center (commonly referred to as the base telephone switch) may be leased from a telephone company or it may be government owned. HQ USAF or DoD will determine whether leased or government wired telephone equipment/facilities will be used.

2.3.2.3. **Scope Determination.** Size of the telecommunications facilities will vary with the type of operation and equipment used. Space requirements will be defined in accordance with site concurrence procedures defined **in AFI 33-104**. The space required to accommodate telecommunications equipment varies with the design and manufacture of the equipment.

2.3.2.4. **Dimensions.** The wing communications unit, the STEM-B, and/or STEM-C (MAJCOM) will provide assistance to develop the floor plans and engineering drawings for the equipment, to include the telephone switching equipment room; inside and outside plant test, maintenance, repair, and supply rooms; switchboard room; plant-in-place records and publications room; emergency power room; DISN operations area; an operators lounge; and data communications and networking hardware, to include wiring, data routers, computer file servers, and wire and/or fiber optic patch panels, etc., as required on a case-by-case basis.

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General Floor Plan Relationships

2.3.2.5. **Design Considerations.** Various types of cable from the base transmitter and receiver, as well as other base communications systems, are normally fed through this structure. Control of all ground point-to-point contact and air to ground point-to-point contact (such as radio, telephone, teletype, DISNET, etc.) may be exercised from this facility. The building may include space for:

2.3.2.5.1. **Telephone Exchange 1 (PBX Switching Center).** The switching center is composed of switchboard positions, electromechanical and/or electronic switching equipment, emergency power plant, terminal equipment, distributing frames, relay racks, inside cable, wiring, cable vault, Uninterruptible Power Supply (UPS), back-up generator, and other operating appliances.

2.3.2.5.2. **Defense Switched Network (DSN) Equipment.**

2.3.2.5.3. **Administrative Functions.** Includes space for the **communications officer and assistants, intra-base radio management, the base message distribution center, 66 AFMAN32-1084 20 APRIL 2012 crypto storage vault, crypto accounting, commercial communications offices, storage space for record communications, magnetic tape, data cards, message paper, and message tape**. See **Chapter 6** of this Manual for administrative space standards.

2.3.2.5.4. **Maintenance Functions.** Includes space for **Chief of Maintenance/Chief of Systems Flight, training of systems/support flight personnel, training of maintenance and operations personnel, and programming personnel. See Chapter 6 of this Manual for office and training space standards.**

2.3.2.5.5. Weather communications equipment where applicable.

2.3.2.5.6. Additional equipment required in the base Communications/Computer Facility/Base Network Control Center (BNCC); data communications and networking hardware, to include wiring, data routers, computer file servers, wire and/or fiber optic patch panels, etc

.

2.3.2.5.7. Maintenance functions require protected parking for general purpose and specialized government owned vehicles and a cable yard.

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Elmendorf Program Example

PERSONNEL	Ofcr	Sr NCO	Civ Mgmt	Enl	Civ	Contr	Contr	Total Staff
	OFFICE			OPEN				
COMMAND SECTION								
TOTAL 3 CS COMMAND PERSONNEL	2	2	0	0	2	0	0	6
SCO OPERATIONS SECTION								
TOTAL SCO PERSONNEL	3	14	2	132	65	28	28	272
SCX PLANS AND RESOURCES								
TOTAL SCX PERSONNEL	0	4	0	21	15	0	0	40
TOTAL 3CS PERSONNEL								318
AIR NATIONAL GUARD								
TOTAL ANG PERSONNEL	1	13	0	28	0	0	0	42
TOTAL OFFICE SPACES			41					
TOTAL OPEN OFFICE SPACES						319		
TOTAL DRILL WEEKEND								21
TOTAL FULL-TIME OCCUPANTS								339
TOTAL BUILDING OCCUPANTS								360

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Parking

PARKING REQUIREMENTS	No.
Military Vehicles	0
Government Owned (GSA?) Vehicles	38
Contractor Vehicles	1
TOTAL ORG PARKING REQT	39
Personally Owned Vehicles	
Total Staff Vehicles	360
TOTAL NON-ORG PARKING REQT	216
Visitor Parking	20
Accessible Parking	5
TOTAL VISITOR/ACCESSIBLE PARKING REQT	25
TOTAL 3 CS PARKING REQUIREMENT	280
Air National Guard POV Parking @ 75% of 19 FT	15
Air National Guard MV Parking	0
TOTAL FACILITY PARKING REQUIREMENT	295

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Program Summary

	FORMER DD FORM 1391		FULL USER REQUIREMENT		TOTAL REDUCED REQUIREMENT	
	SF	SM	SF	SM	SF	SM
PROGRAM SUMMARY						
SCO SECTION			54,611	5,073	24,207	2,249
SCX SECTION			41,700	3,874	29,594	2,749
3CS COMMAND			6,666	619	9,266	861
BUILDING SUPPORT			11,875	1,103	10,664	991
176TH Wing (ANG)			11,521	1,070	11,521	1,070
Total Facility Area (NSF)	14,553	1,352	126,373	11,740	85,252	7,920
Total Facility Area (GSF)	20,010	1,859	173,763	16,143	117,222	10,890

- **Exist occupied SF (incl ANG) approx. 130,000 SF**

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Program Summary

	PHASE 1 ADMINSTRATION		PHASE 2 FIELD OPS INCL		PHASE 3 MAIL CENTER INCL		PHASE 4 ANG INCL	
	SF	SM	SF	SM	SF	SM	SF	SM
PROGRAM SUMMARY								
SCO SECTION	14,201	1,319	24,207	2,249	24,207	2,249	24,207	2,249
SCX SECTION	19,886	1,847	19,886	1,847	29,594	2,749	29,594	2,749
3CS COMMAND	5,241	487	9,266	861	9,266	861	9,266	861
BUILDING SUPPORT	10,251	952	10,664	991	10,664	991	10,664	991
176TH Wing (ANG)							11,521	1,070
Total Facility Area (NSF)	49,579	4,606	64,023	5,948	73,731	6,850	85,252	7,920
Total Facility Area (GSF)	68,171	6,333	88,032	8,178	101,380	9,418	117,222	10,890

- **Program Proposed Phasing**
  - PH1: Administrative Spaces and Critical Data Center 68,171 GSF
  - PH2: SCO Field Staff, Workbench Labs, Storage, Showers, Destruction Facility included (19,861 GSF)
  - PH3: US Postal Service and Mail Center included (13,348 GSF)
  - PH4: Air National Guard Included (15,842 GSF)

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Building Concept Example

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Facility Concept – Floor 1

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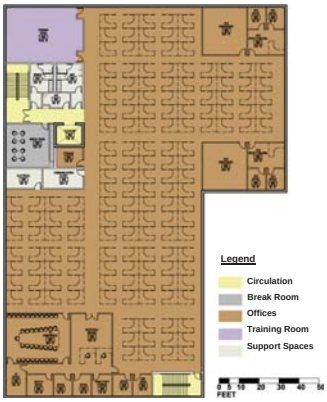
Facility Concept – Floor 2



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Project Site Concept Overview

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General Concept Site Plan Criteria

- **Parking**
  - Driven by staffing quantities
  - Separate GOV and POV
  - Designated spaces
    - Visitors
    - Employees
    - ABA compliant
  - Adequate lighting
  - Landscaping
    - Parking islands
    - Parking lot perimeter

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Conceptual Site Plan

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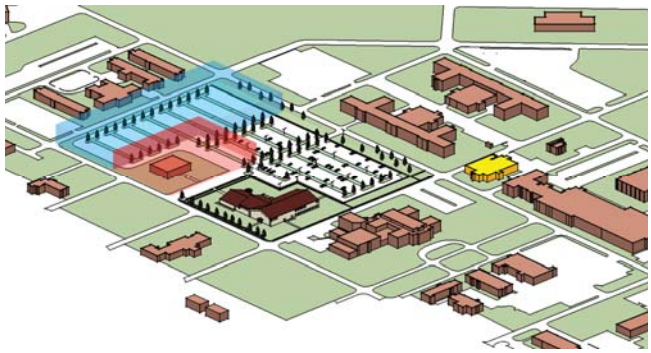
Perspective - 1



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Perspective - 2

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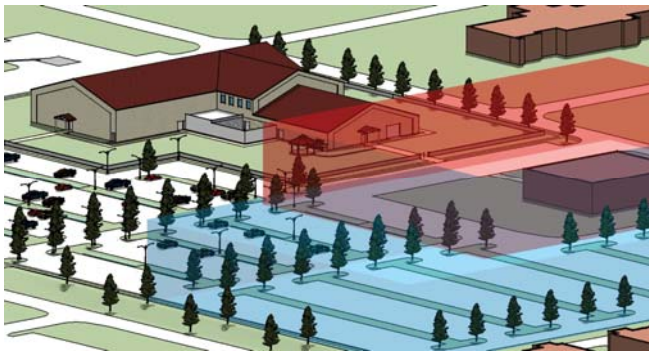
Perspective - 3



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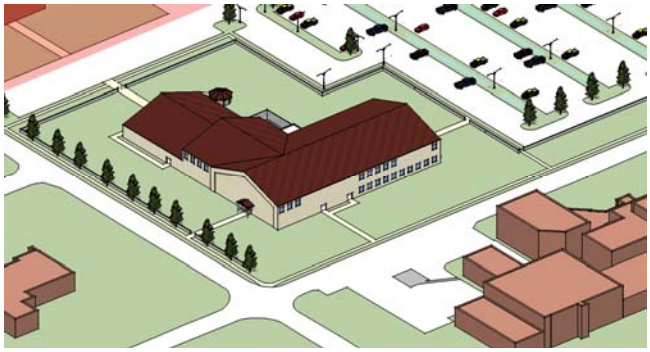
Perspective - 4



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Conceptual Site Plan Expansion

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Charrette Schedule – Major Milestones

- Charrette Date ..... 18 June 13
- Draft Report Submission ..... 19 July 13
- Client Comments ..... 26 July 13

- Final Report Submission ..... 2 Aug 13

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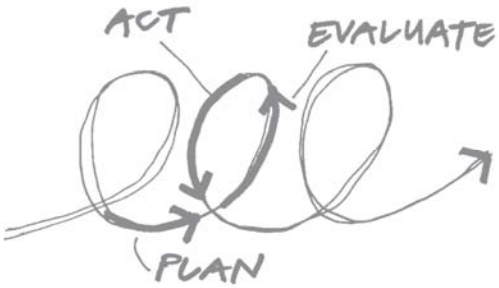
Discussion



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ACRONYMS

AF	Air Force
AFB	Air Force Base
AFCEC	Air Force Civil Engineer Center
AFDIR	Air Force Directory
AETC	Air Education and Training Command
AFH	Air Force Handbook
AFI	Air Force Instruction
AT/FP	Antiterrorism / Force Protection
AFMAN	Air Force Manual
AFPAM	Air Force Pamphlet
AME	Alternate Mission Equipment
ARTS	All-purpose Remote Transport System
CWHF	Controlled Waste Handling Facility
DG	Design Guide
DoD	Department of Defense
EOD	Explosive Ordinance Disposal
GSA	General Services Administration
GSE	Ground Support Equipment
GSF	Gross Square Feet
LEED	Leadership in Energy and Environmental Design
MILCON	Military Construction
MOB	Mobilization
MV	Military Vehicle
NCO	Non-Commissioned Officer
NSF	Net Square Feet
OPR	Office of Primary Responsibility
POV	Privately Owned Vehicle
ROM	Rough Order of Magnitude
SF	Square Feet
TCV	Total Containment Vessel
USGBC	U.S. Green Building Council
USPFO	U.S. Property and Fiscal Office

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LEED CHECKLIST

Based on the Air Force Sustainable Design and Development (SDD) Policy date 02 June 2011 from Maj. Gen Timothy A. Byers, "Beginning with FY12 and *regardless of funding* source, all permanent construction activity on Air Force installations in the United States (including Alaska and Hawaii) and its territories on permanent Active Air Force installations, resulting in Air Force Real Property Assets, shall comply with the requirements of this memorandum. This policy shall also apply to overseas construction activities to the extent practical, considering mission objectives, and Host Nation agreements." "All new vertical construction, and major renovations (Restoration & Modernization), **meeting the USGBC LEED 2009 Minimum Program Requirements (MPRs)**… - All facilities in this category shall fully incorporate Federal requirements for High Performance and Sustainable Buildings (HPSB)…; shall be registered in USGBC LEED-Online; *shall be formally certified and achieve at a minimum LEED Silver certification* (or meet a comparable level of achievement with an overseas third-party green building rating system); and shall achieve not less than 20 points (40 percent of the Silver point threshold) dedicated toward energy efficiency and water conservation."

Achieving LEED Silver certification will require commitment and effort from each member of the project team: the owner, the architect / engineer, the general contractor, and finally the building occupants and staff. Throughout the design, construction, and post-construction phases of the project, the project team will need to identify credits to be pursued, coordinate design requirements with the goals, and collect and submit documentation to the Green Building Certification Institute (GBCI) for certification via LEED Online.

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SOLID WALLS

OPEN OFFICE

SCO ; SCX - PLANS ; R

IRECT ACCESS

DJACENCY

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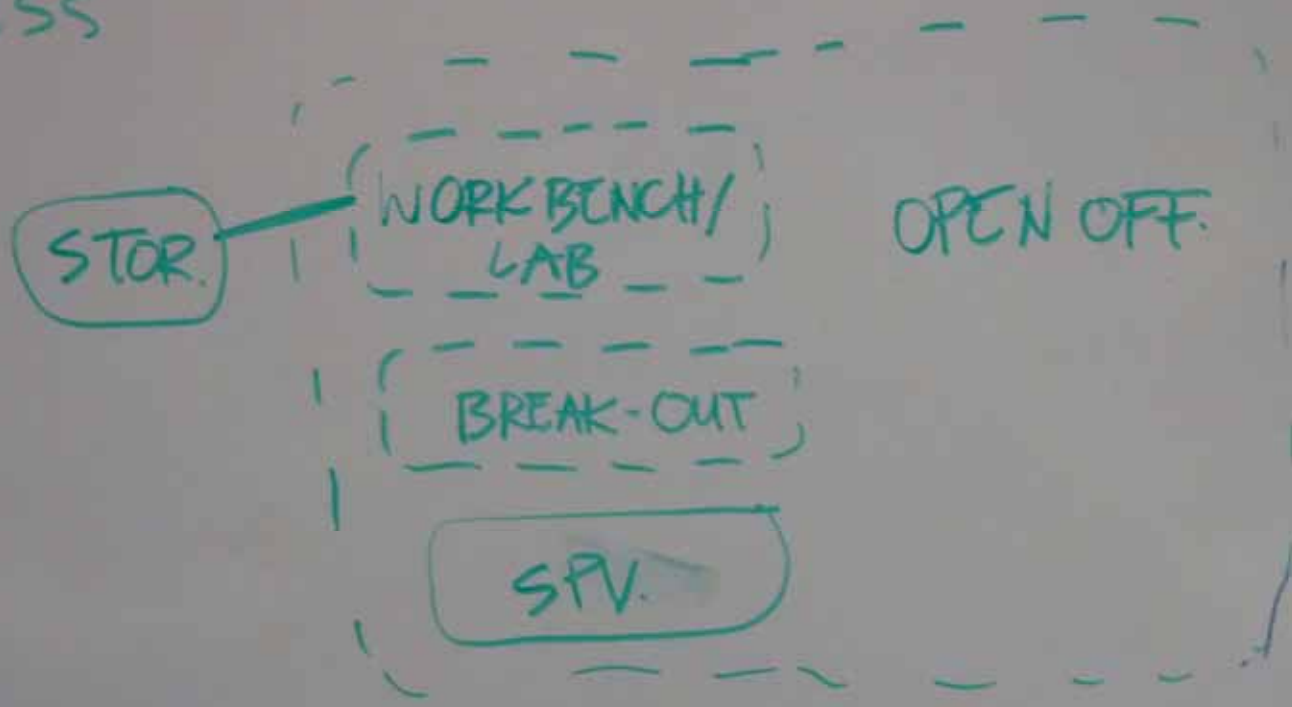

ODULE

MODULE

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MODULE

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ODITIES

CHECKLIST?

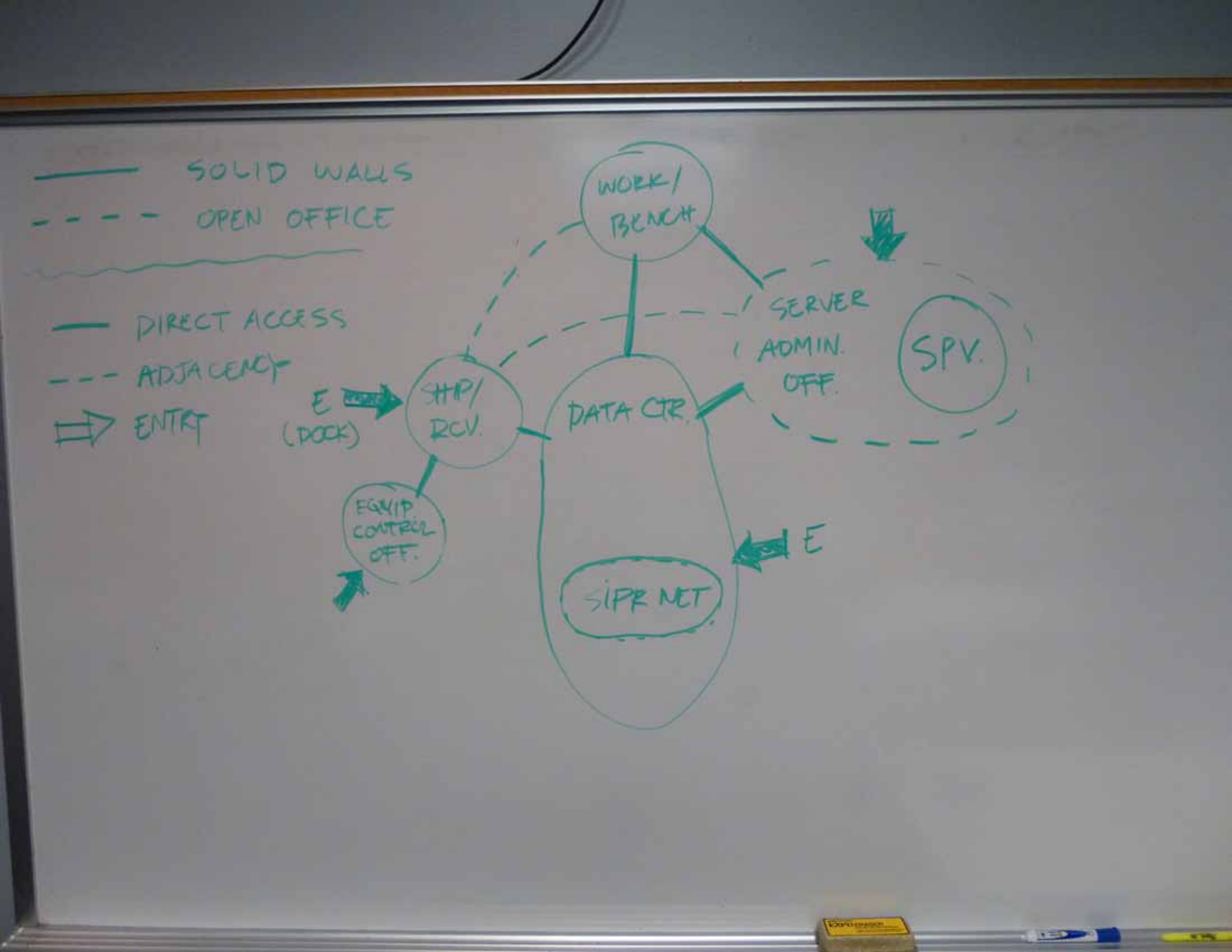
CMR

POST OFFICE

COM (SIPR/NIPR)

ANG (ANGH 38-1084)

AFR (AFRH 38-1001)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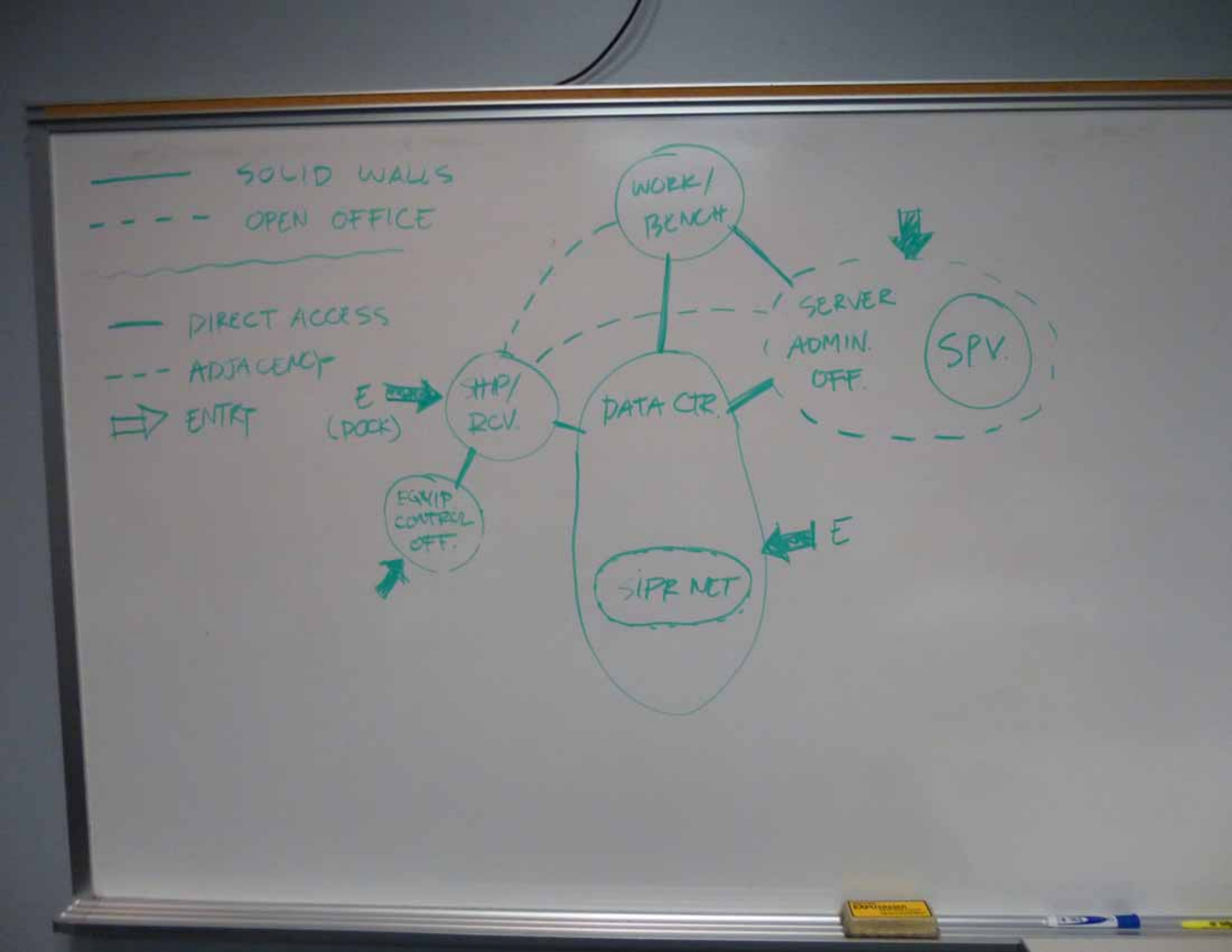
OPEN OFFICE
DIRECT ACCESS
ADJACENCY
ENTRY
WORK/ BENCH
SERVER ADMIN. OFF.
SPV.
E (DOCK)
SHIP/ RCV.
DATA CTR.
EQUIP. CONTROL OFF.
E
SIPR NET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DIRECT ACCESS
ADJACENCY
ENTRY
WORK/ BENCH
SERVER ADMIN. OFF.
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E (DOCK)
SHIP/ RCV.
DATA CTR.
EQMT CONTROL OFF.
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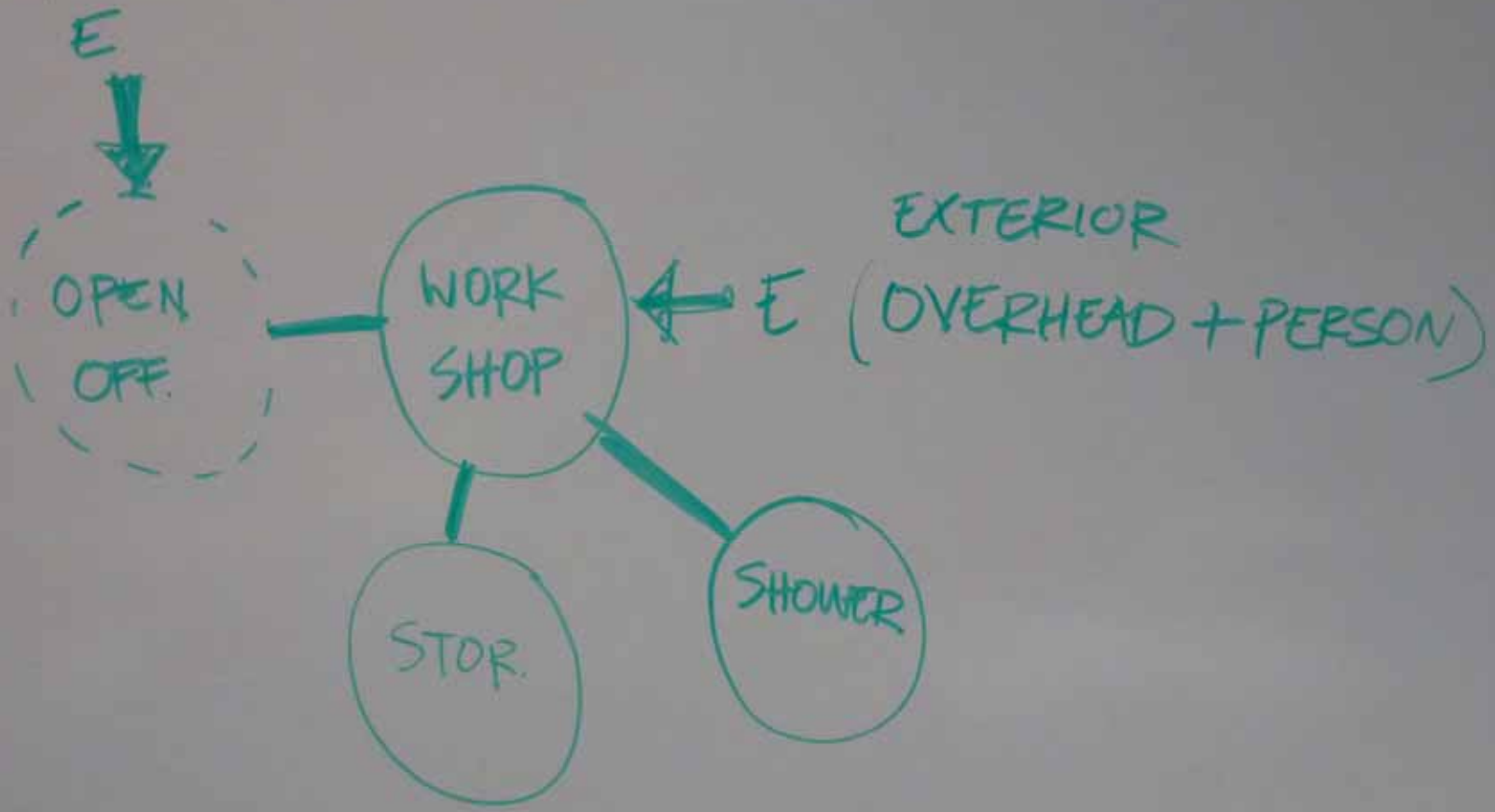
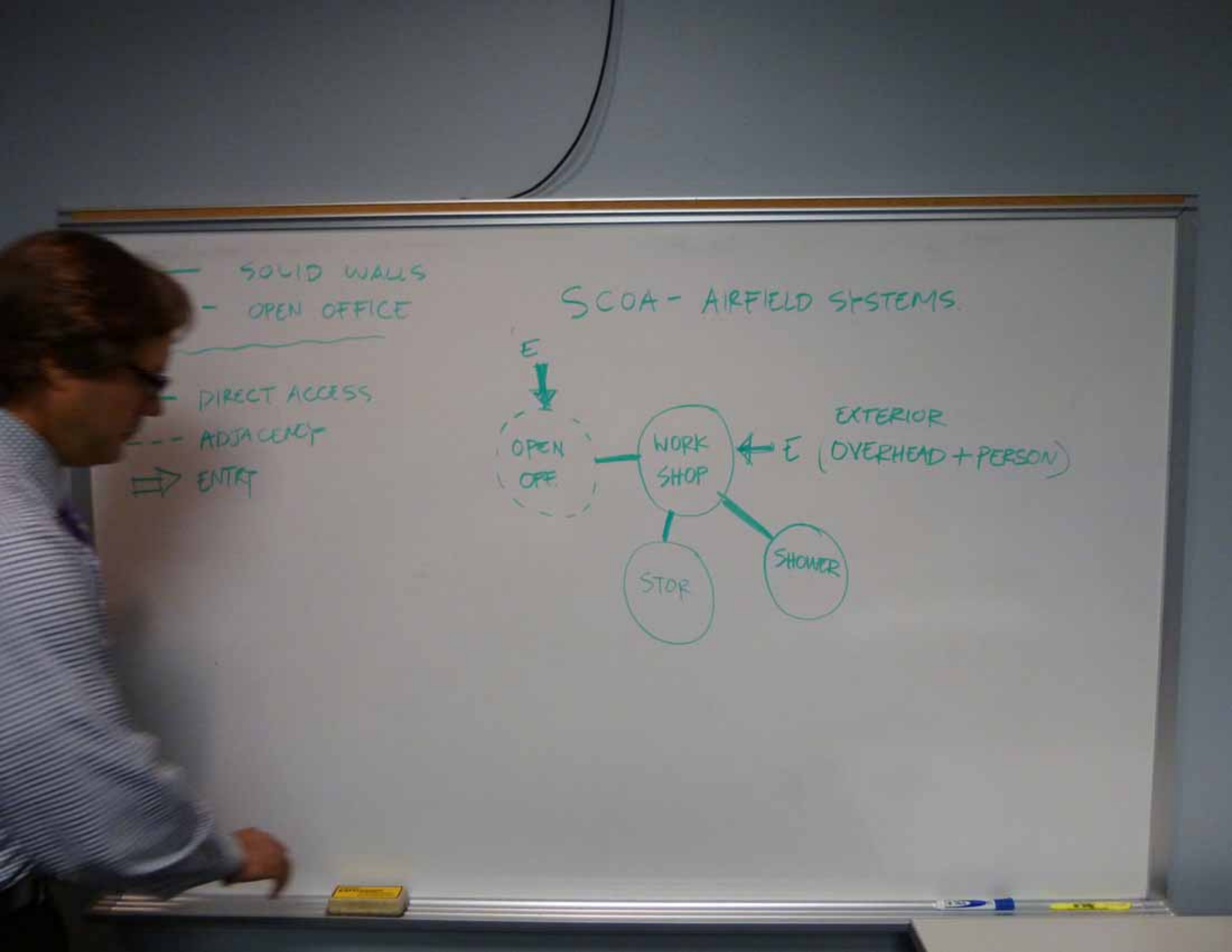
SIPR NET

SCOA - AIRFIELD SYSTEMS.




SOLID WALLS
OPEN OFFICE
DIRECT ACCESS
ADJACENCY
ENTRY
SCOA - AIRFIELD SYSTEMS
E
OPEN OFF
WORK SHOP
E
EXTERIOR
(OVERHEAD + PERSON)
STOR
SHOWER

NALLS

FICE

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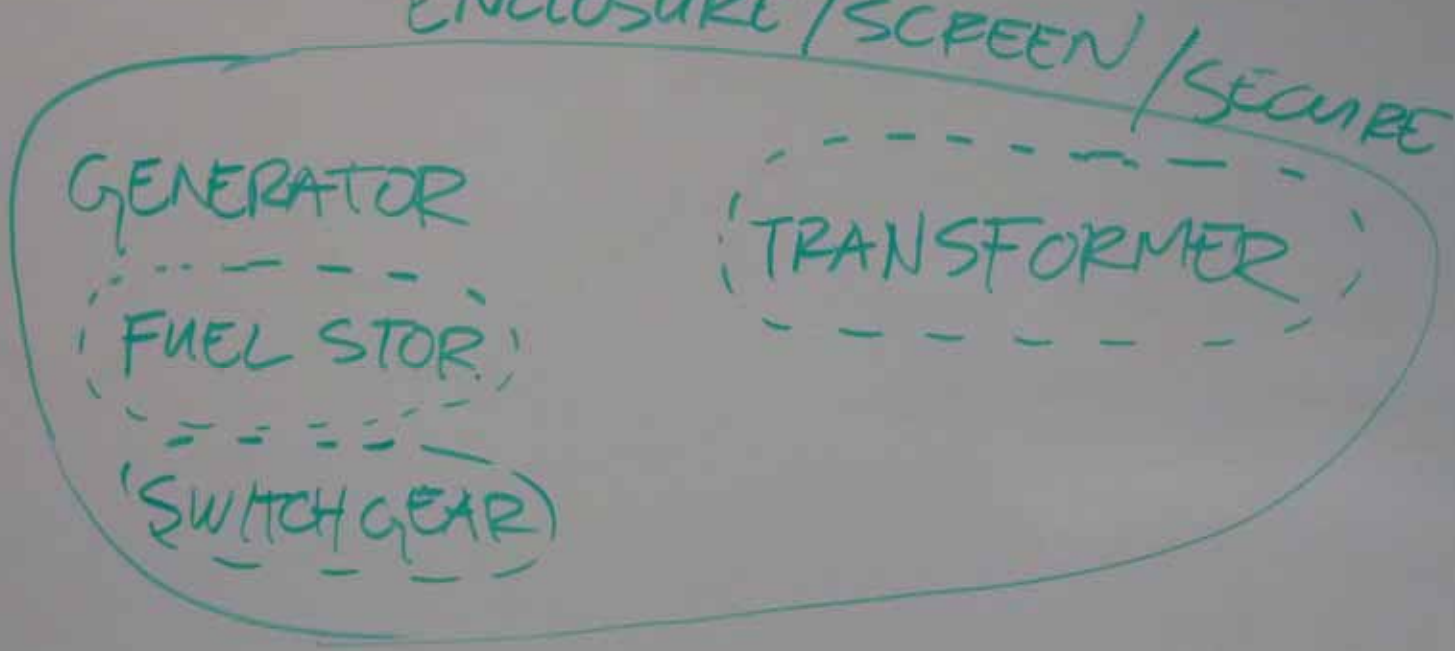
DATA CENTER SUPPORT



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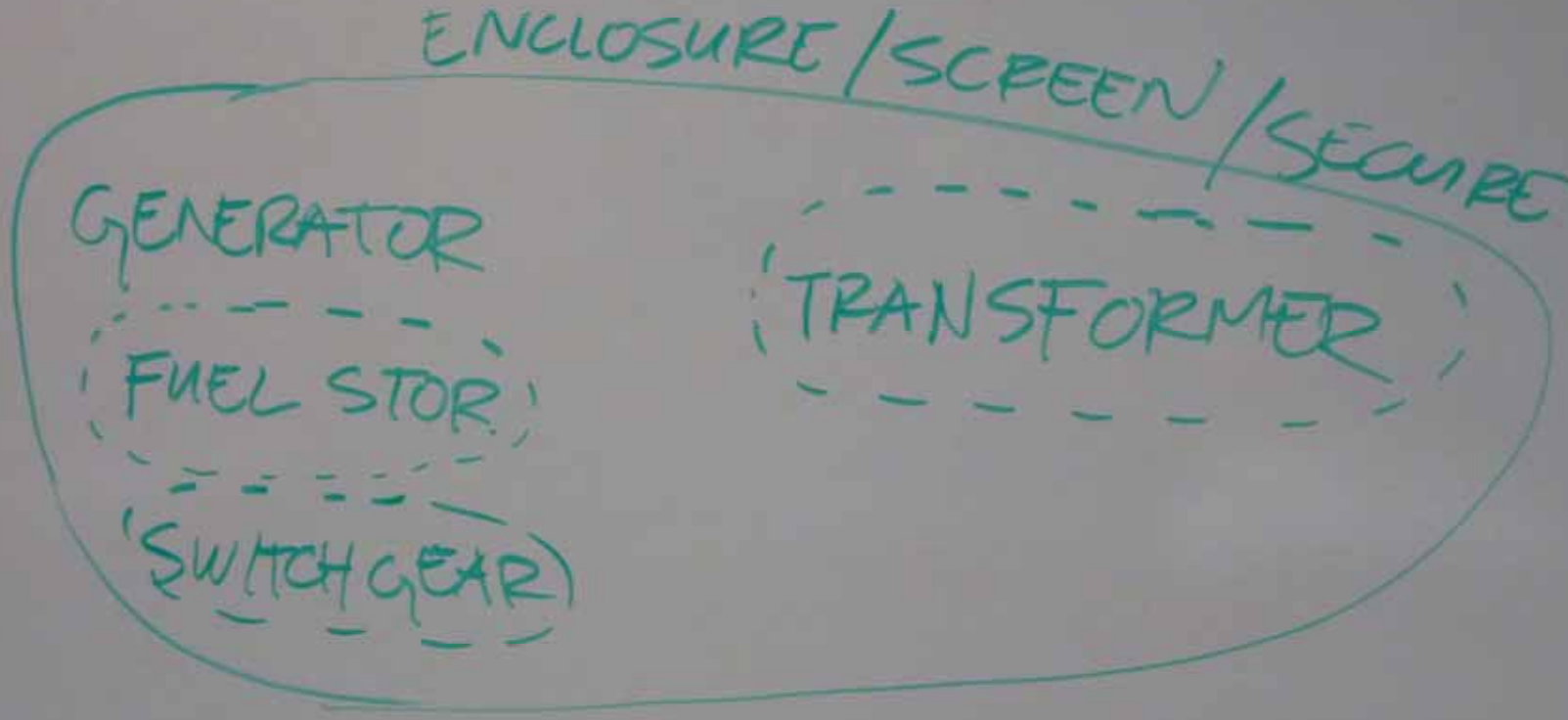
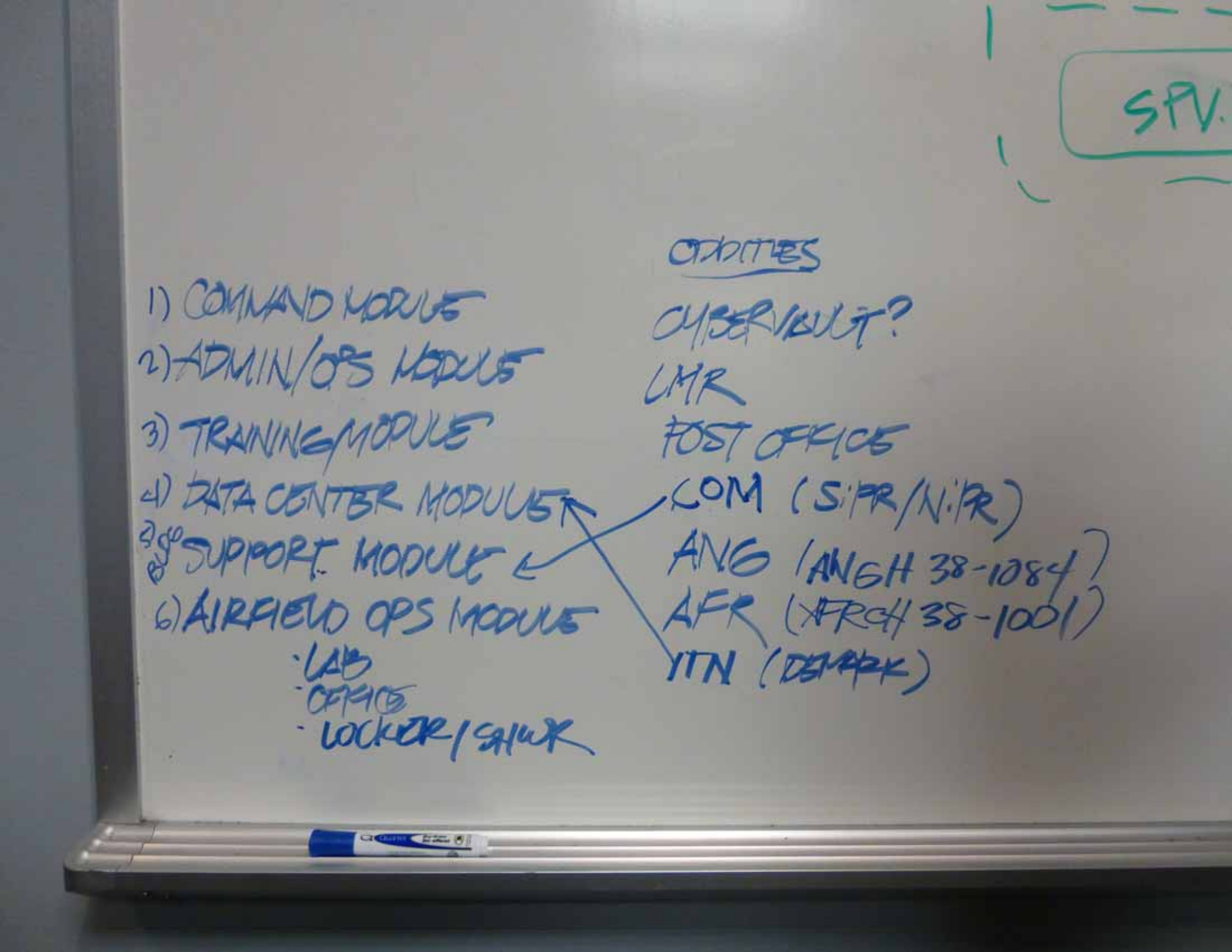
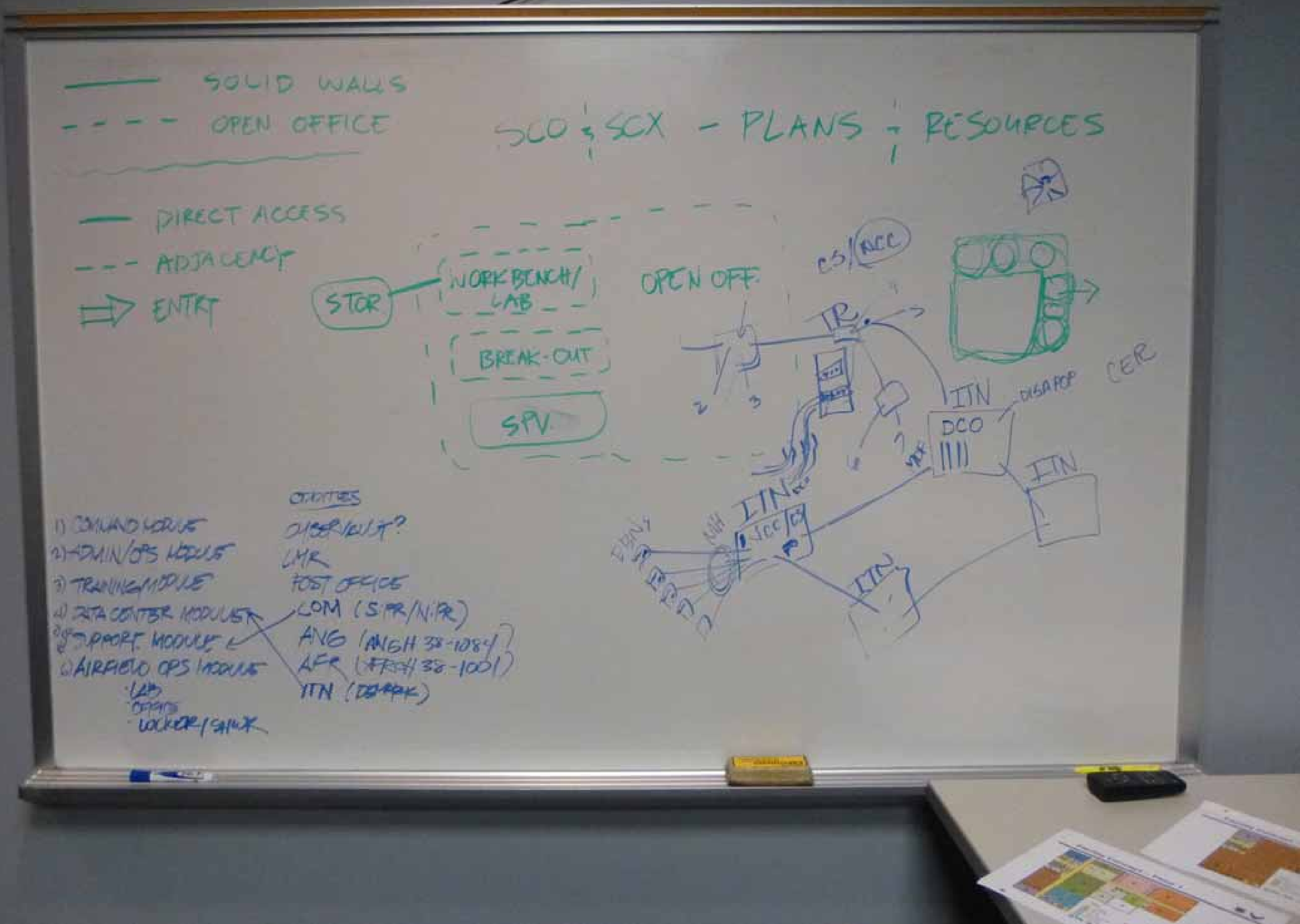
DATA CENTER SUPPORT




SPV.
ODDITIES
CYBERVAULT?
LMR
POST OFFICE
COM (SIPR/NIPR)
ANG (ANGH 38-1084)
AFR (AFRCH 38-1001)
YTN (DEMARK)
1) COMMAND MODULE
2) ADMIN/OPS MODULE
3) TRAINING MODULE
4) DATA CENTER MODULE
5) SUPPORT MODULE
6) AIRFIELD OPS MODULE
- LAB
- OFFICE
- LOCKER/SHWR



SOLID WALLS
OPEN OFFICE
DIRECT ACCESS
ADJACENCY
ENTRY
SCO & SCX - PLANS & RESOURCES
STOR
WORKBENCH/LAB
BREAK-OUT
SPV
OPEN OFF.
CS/NCC
ITN
DCO
DISA POP
CER
ITN
ITN
ITN
NCC
1) COMMAND MODULE
2) ADMIN/OPS MODULE
3) TRAINING MODULE
4) DATA CENTER MODULE
5) SUPPORT MODULE
6) AIRFIELD OPS MODULE
- LAB
- LOCKER/SHWR
LMR
POST OFFICE
COM (SIPR/NIPR)
ANG
AFR
ITN

SOLID WALLS

OPEN OFFICE

SCO ; SCX - PLANS ; RE

CT ACCESS

ACENCY

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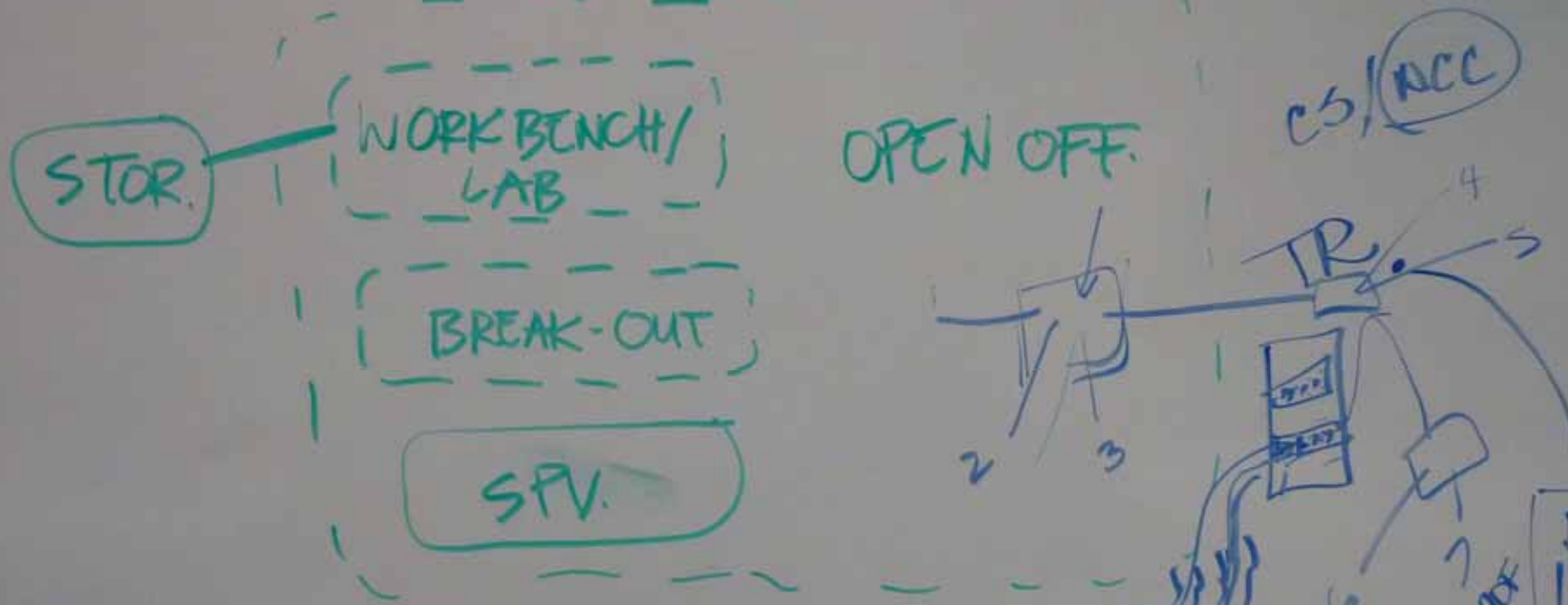


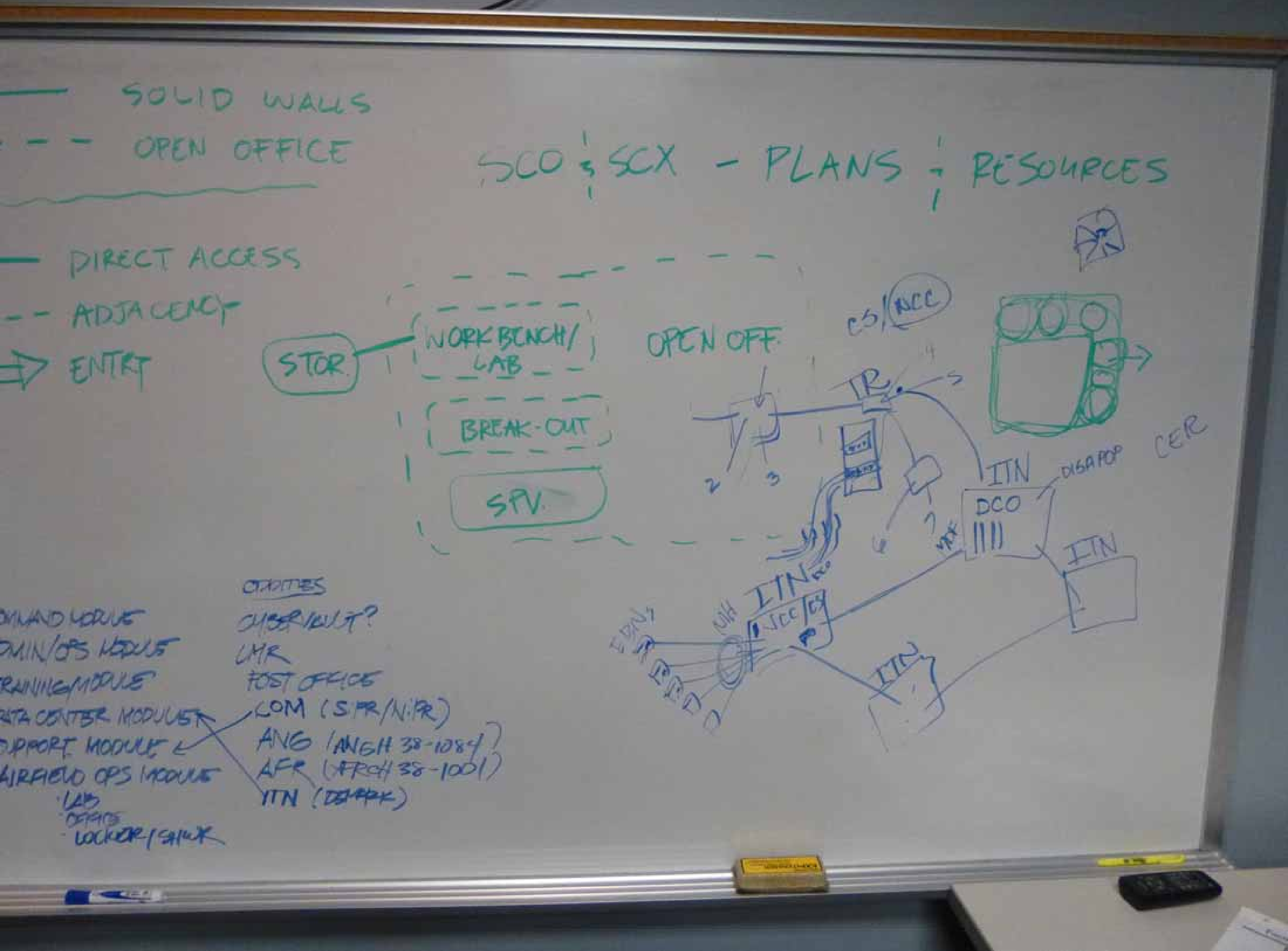
ODDITIES

CYBERVAULT?

LMR

POST OFFICE

COM (S:PR/N:PR)


SOLID WALLS
OPEN OFFICE
DIRECT ACCESS
ADJACENCY
ENTRY
SCO & SCX - PLANS & RESOURCES
STOR
WORK BENCH/ LAB
BREAK-OUT
SPV
OPEN OFF
CS/NCC
CER
ITN
DCO
DISA POP
NCC
LMR
POST OFFICE
COM (SIPR/NIPR)
ANG (ANGH 38-1084)
AFR (AFRCH 38-1001)
ITN (DEMARK)
TRAINING/MODULE
DATA CENTER MODULE
SUPPORT MODULE
AIRFIELD OPS MODULE
LAB
LOCKER/SHWR

SOLID WALLS

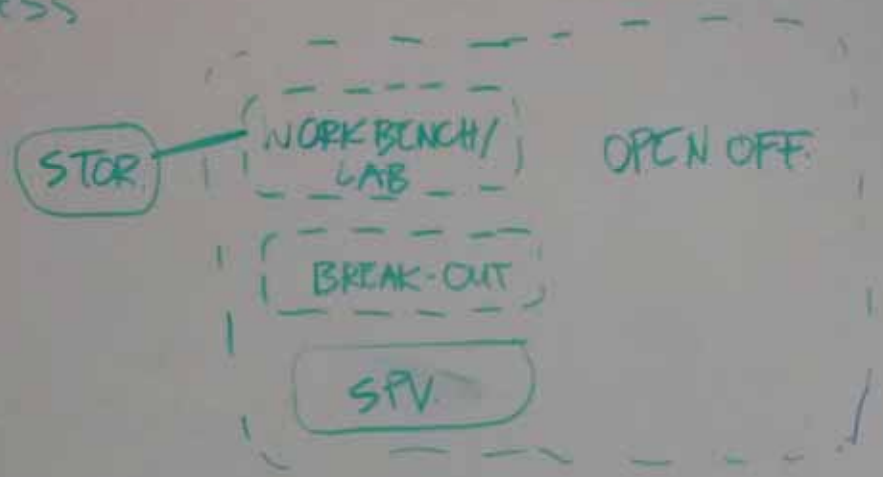
OPEN OFFICE

SCO ; SCX - PLANS ; RESOURCES

DIRECT ACCESS

ADJACENCY

ENTRY



1) COMMAND MODULE
2) ADMIN/OPS MODULE
3) TRAINING MODULE
4) DATA CENTER MODULES
5) SUPPORT MODULE
6) AIRFIELD OPS MODULE
- LAB
- OFFICE
- LOCKER/SHOWER

ENTITIES
OBSERVER?
LMR
POST OFFICE
COM (S/PR/N/PR)
ANG (ANGH 38-1084)
AFR (AFRH 38-1001)
ITN (DEPARK)

JACOBS
911 Central Parkway North
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Meeting Notes

Meeting Location	AFCEC, Port San Antonio	**Client**	AFCEC
Meeting Date/Time	18-20 Jun 2013 Start: 0800	**Project**	Consolidated Communications Squadron Facility Prototype
Subject	Prototype Charrette	**Project No.**	FDYD3110
Participants	Refer to attached Sign-In sheets	**Notes Prepared By**	Robert Bruce

Overview:

This charrette was held over a period of three days, from 18 June through 20 June 2013. The first day consisted of an in-brief by Ji Harper with the 38th Cyberspace Engineering Installation Group (38th CEIG) followed by an overview of the BIM-based prototype process by Jeff White (Jacobs). After lunch, the team was given a tour of the Communications Squadron (Comm. Sqd.) facility at Randolph Air Force Base (AFB). Day two consisted of some discussion regarding special and operational requirements which were used to develop space adjacency diagrams. Ideally, this day would have been used to define some general space allocation rules which could then be used to develop modules. However, the required stakeholders were not available to provide guidance on these criteria. Day three included a brief presentation of the space adjacency diagrams developed by Jacobs and discussion of how the project schedule is to proceed. In general, the Jacobs team was instructed to compile the information gathered into a document which can be used to provide some guidance for future Communications Squadron facilities until such time as the prototype can be developed.

Day 1:

Presentation by Ji Harper (38th CEIG) providing an overview of 38th CEIG responsibilities and some general Comm. Sqd. facility requirements, including design guidance / references (see attached). Following was a presentation by Jeff White (Jacobs) describing the prototype development and implementation processes. After lunch, the participants met at Randolph AFB, Building 990 for a tour of the 902nd Communications Squadron facility. Prior to the tour, the group met with Mr. B_____, _____, and _____ to discuss the goals of the tour, which focused on identifying the components and the functional relationships of the groups in the Randolph facility. During the tour, the following components and criteria were identified:

Server Rooms (NIPRNET and SIPRNET)

- Randolph AFB Comm. Sqd. Is in the process of consolidating multiple servers in different facilities into their Server Rooms.
- Server Rooms make use of through-flow racks (front to back), with 6 feet clear between the fronts of the racks (cold aisle).
- Air supply is via under-floor plenum, through grates into Server Rooms. Return is via above ceiling plenum for primary HVAC or at ceiling when downdraft Computer Room Air Conditioners (CRACs) are operating.

- Access to the Server Rooms allowing equipment delivery needs to be via a route with doors of sufficient height to allow racks to be moved on pallets (approximately 8 feet clear).
- Humidity within Data Center must be kept within an appropriate range.
- Lighting in Data Center needs to be over aisles, and reconfigurable as the racks are reconfigured.
- Anything that can create or collect dust should be excluded from room where possible. This includes fabric wall panels and acoustic ceiling tile (ACT) systems.
- A structural ceiling approximately 2 feet above the racks, from which cable trays could be suspended, would be useful.
- Server Rooms should be connected to emergency power from the facility's emergency generator.
- If CRAC units are secondary cooling system, they need automatically run periodically to circulate chilled water.
- UPS system supporting racks should allow each server to connect to two separate circuits. This is a High-Reliability, Low-Fault system.
- Monitoring of Server Rooms includes: (1) ultra-sensitive smoke detectors in space and under floor; (2) water sensors underfloor; (3) card readers with network connections; (4) video monitoring; and (5) temperature and humidity monitoring. Monitoring systems should report to Network Control Center (NCC).
- Access floor system should include anti-static surface and have sufficient capacity to support equipment (primarily the UPS systems).
- UPS systems should handle server load long enough for emergency generator to start.
- Racks are approximately 6'-6" high. These are delivered on a palette. There needs to be a means of delivering these, by truck, to the loading dock, through the equipment storage and distribution area, into the Data Center work room, and ultimately into the Server Rooms.

Data Center Workroom

- Ideally, there should be an area separate from the Server Room where equipment can be setup, maintained, and repaired without being requiring personnel be within the Server Room.
- There should be access to the Equipment Storage and Distribution area as well as to the Server Rooms that will allow movement of the racks.

Network Control Center (NCC)

- Open office area with workstations, a breakout area, and a large-format printer (plotter).
- This sub-component oversees the operation of the data network. Computers will need to be on emergency power.
- At 902d Comm Sqd facility, this space was also shared with a survey group.

Emergency Generator

- Generator needs to be sized to handle all critical systems.
- Generator should have sufficient fuel capacity to allow for 72 hours of operation at full load.
- Two smaller generators preferred to allow some redundancy.

Squadron Command Suite

- Consists of a small Reception Area, an Administrative Assistant, First Shirt Office, and Squad Commander Office.

Conference Room
- One large, shared conference room was provided for the Squadron.

Loading Dock
- A loading dock was provided for deliveries of telecommunications and computer equipment.
- Loading Dock should be immediately adjacent to Equipment Storage Area.
- Access to storage should be via 8' high (min) doors.
- Loading Dock should have a concrete floor

Equipment Storage Area
- Equipment Storage Area should be adjacent to the Loading Dock and the Equipment Control Office (ECO).
- Equipment Storage Area should be climate controlled.
- Floor should be concrete.

Equipment Control Office
- Office for control of electronic equipment distribution on the base.
- Locate adjacent to the Equipment Storage Area.

Airfield Systems (SCOA) Office Area
- Open office area with workstations
- Locate adjacent to SCOA Workroom

SCOA Workroom
- Area with workbenches and bench stock for the maintenance of airfield electronics
- Locate adjacent to SCOA Office Area
- Provide access to exterior via overhead door to accommodate large or heavy pieces of equipment.

SCOA Locker Area
- SCOA is responsible for some grounds maintenance on the airfield, including mowing. Personnel may need to shower and change when they return to the facility.
- A shower and locker area with access from the exterior is desired. This may be accessed from the entry to the SCOA Workroom.
- Lockers for coveralls and a change of clothes are desired.

Plans, Programs, and Resources (SCXP) Office Area
- Office area including 2 private offices, 7 workstations, and a central breakout area

Resources (SCXR) Office Area
- Office area of 1 private office and 4 workstations

Client Service Center (SCOS) Office Area
- Open office area with workstations and workbench area.
- Responsible for software installation and updates. During large updates, may have 20-50 computers in area being updated. This requires multiple data connections per workstation or workbench
- Exterior access to facilitate moving computers in and out is desirable

Unit Control Center (UCC)
- Not present within 902d Communications Squadron facility, but may be present in others

- Open office area with workstations

Main Telecommunications Room (Main TR) - NIPRNET Distribution

- Primary telecommunications router serving facility. If the facility is an Information Transport Node (ITN), this will connect to a minimum of two other ITNs as well as providing telecommunications connections to multiple End Building Nodes (EBNs), which are the Main TRs for surrounding facilities.

Telecommunications Room (TR) – SIPRNET Distribution

- SIPRNET distribution within facility.
- Typically fed from Dial Central Office (DCO).

Training Room

- A shared computer-based training room with 12 workstations, an instructor's workstation, and an Audio/Video system including a ceiling mounted projector, speakers, and projection screen.

Break Room

- The shared Break Room includes a refrigerator, a microwave, counter space, and a table.

SCO Office Area

- Group handles IT support tickets
- Open office area with workstations and no breakout area.

Day 2:

Claire McCracken (Jacobs) presented the programming matrix, which was based upon that developed for the Communications Squadron Facility at Joint Base Elmendorf-Richardson (JBER). This was to be used as a starting point for the development of space allocation criteria for the Consolidated Communications Squadron Prototype. However, the necessary Subject Matter Experts (SMEs) were not present to allow that level of detail. Instead, a discussion of the organization of the Squadron, functions not included in the Randolph facility, space adjacency, and other general conditions was held. This discussion identified the following Squadron organization as relevant to all Comm Sqds.:

Communications Squadron (SC)

SCO	Operations Flight
SCOA	Airfield Operations
SCOI	Infrastructure
SCOO	Network Operations
SCOS	Service Center
SCOT	Transmission Systems
SCOW	Wiring Systems (Includes LMR)
SCQ	Policy and Evaluations
SCXK	Knowledge Ops (PII – Privacy)
SCX	Plans and Resources Flight
SCXP	Plans, Programs, and Resources
SCXR	Resources
SCXS	Information Assurance

Additional Comm. Sqd. functions identified include:

Post Office

- This is typically a separate facility for security and operational reasons

- Includes a Loading Dock, Inspection Area, Shipping/Receiving/Sorting area, and a lobby.

Land Mobile Radio (LMR)

- Ground-based radio systems
- Consists of a Radio Equipment Room, an Operator Office, and an exterior Tower.
- Towers may be un-guyed (up to 150 ft maximum) or guyed. Type will dictate proximity to Comm facility

Day 3:

Preliminary grouping and adjacency diagrams developed by Jacobs were presented to AFCEC as well as a representative of the Twenty-Fourth Air Force. Following the presentation, the path forward for this project was discussed. Jacobs was directed to document the information gathered and develop an abbreviated version of the charrette report which can be used as guidance for upcoming Communications Squadron facility projects until such time as the direction for Air Force Communications Squadron operations has been defined and the prototypes can be further developed.

JACOBS

Edwards AFB
Consolidated Comm Charrette Sign In Sheet
June 18-20, 2013

NAME	GROUP	Email	PHONE
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