

Facilities Engineering (FE) Workforce Competency Assessment Report

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Executive Summary

The Director of Human Capital Initiatives (HCI) for the Department of Defense's (DoD) Acquisition, Technology, and Logistics (AT&L) workforce supports the development of acquisition personnel and leaders, enabling them to make important business decisions that provide the best dollar value while supporting DoD agencies' missions. HCI initiatives include programs such as competency development and assessment. HCI's goals include improving acquisition workforce performance, making necessary investments in training, conducting trend analysis, and emphasizing the criticality of the acquisition workforce to DoD mission success.

HCI works in conjunction with the Defense Acquisition University (DAU), which supports DoD and other federal agencies in the certification, training, and development of the acquisition workforce. This focus has become the impetus for a competency-based approach to optimize workforce effectiveness. In response to HCI's request, CNA is working with HCI and workforce representatives to develop competency models for each of the major career fields within the AT&L workforce. This report focuses on the competencies identified for the Facilities Engineering (FE) career field, which include respondents in the Departments of Navy and Army with a few from the Air Force and Fourth Estate agencies.

Together, HCI, FE leadership, and subject matter experts (SMEs), with guidance from CNA, developed and validated a model of performance consisting of competencies determined to be necessary to meet FE's mission goals (presented in Appendix A). We used the model to create a competency assessment, in which we invited all FE employees (and their supervisors) to participate. Respondents reported on their (the employees') proficiency on each competency element. They also indicated how critical each competency element was to their job.

Employees (not supervisors) indicated how frequently they perform each competency element and responded to 20 demographic and intentions questions.

The analyses in this report use data collected via the competency assessment to address the following research goals: (1) to assess the current Facilities Engineering capability of the workforce, (2) to describe how those capabilities are distributed across DoD organizations and communities, (3) to determine the potential of the current FE workforce to boost the DoD's Facilities Engineering capability, and (4) to validate the competency model for the FE workforce.

Participation rates

The FE population consists of approximately 7,000 employees. Of those 7,000, 1,745 employees participated in the competency assessment across all workforce segments (services and Fourth Estate agencies), which represent 24 percent of the FE population. Seven percent of supervisors assessed employees, but only four percent of those assessments were of employees who also participated in the assessment. As a result, we use employee responses for the analysis presented in this report.

Workforce demographics

We present the responses to demographic questions for the workforce segments relative to the FE workforce as a whole. We found that the data we collected is representative of the FE workforce. Our results match demographic data in the DAU Datamart.

- We found the military/civilian percentage (which is overwhelmingly civilian) to be the same as in the population numbers (99%).
- We found that the participation rates by major components were similar to the population numbers (21% Army and 79% Navy) while skewed a little higher (6%) toward Navy.

- We found that the Certification Level numbers were generally consistent (within 8%) with the population numbers. Both showed most of the workforce at Level II.

The 24 percent of the workforce that responded was not necessarily a random sample. A random sample would help us to extrapolate to the workforce as a whole. From our examination of the demographic dimensions that we were able to explore, we found no major evidence that the sample is not random. However, caution should still be exercised in extrapolating these results to represent the entire workforce. These results **do** represent the 24 percent of the workforce who responded to the assessment.

Competency analyses

In previous reports, we averaged employee and supervisor ratings and performed the competency analyses using the composite ratings. However, because of the low percentage of paired employee-supervisor responses, we only analyzed employee responses in this report.

Analysis of employee responses suggests that the FE competency model captures the competencies most pertinent to the Construction, Design, Environment, and Facilities Sustainment workforce communities. These communities combined represent 75 percent of the FE workforce. Hence, our importance and proficiency analyses focus on these communities.

Findings

We found that the relative importance of competencies is highly dependent on the workforce community. We found that employees at Senior career levels are not necessarily at Level III certification.

The Workforce Communities generally do not find consensus on the competencies that are most important to their success on the job; competencies identified as high importance to one

community are different from those considered high importance to another.

Professional competencies seem to be the most highly important competencies to all workforce communities and components. A large percentage of respondents report *advanced to expert* proficiency at all levels of certification for the professional competencies. Mean proficiency values increase with increasing certification level and are highest for professional competencies.

Facilities Engineering respondents at Journey and Senior levels generally report at least *intermediate to advanced* proficiency in the competencies of high importance to their respective communities; but a fraction of respondents report *basic to intermediate* proficiency or only an *awareness to basic proficiency* of some competencies.

Facilities Engineering respondents expressed relatively more intent to boost their proficiency in many of the high importance competencies. Our intentions analyses also indicate that respondents are willing to mentor others. Despite a general enthusiasm for professional growth, most respondents do not have a strong desire to attend graduate school. Respondents are undecided about going to the next certification level in the next six months.

Recommendations

We recommend that Facilities Engineering management consider using our analysis results to do the following:

- Develop proficiency standards
- Develop gap-closure strategies for high importance competencies that have lower proficiency ratings
- Consider developing mentoring programs
- Develop and increase awareness of the community of practice resources available on the DAU website.

Finally, we recommend that a strong emphasis be placed on the development of professional competencies. Responses to the assessment indicate that professional competencies captured in the FE model are universally important to the entire FE workforce. The high importance competencies may need to be boosted as the workforce ages and leadership experiences are lost to retirement.

In presenting our extensive analysis of competency data we did not explicitly identify proficiency gaps based on a standard. We present and discuss the data in ways intended to help leadership think about the current state of the FE workforce. Given that no proficiency standards currently exist, we strongly encourage FE leadership to set proficiency standards based on this baseline for future investments in gap-closure strategies. Once standards have been set, results such as these can be used to discover existing or potential gaps at an individual and organizational level.

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Section 1: Background and model overview

Personnel challenges within the AT&L community must be addressed in order for the DoD to effectively perform its mission. As part of the AT&L workforce, the FE career field is about integrating functions from planning, design, construction, sustainment, recapitalization, and disposal to deliver a capability.

*Facilities Engineering — The Facilities Engineering career field encompasses a variety of professional individuals with diverse skills focused on the design, construction, and life cycle maintenance of military installations, facilities, civil works projects, airfields, roadways, and ocean facilities. It involves all facets of life cycle management from planning through disposal, including design, construction, environmental protection, base operations and support, housing, real estate, and real property maintenance. Additional duties include advising or assisting commanders and acting as, or advising, program managers and other officials as necessary in executing all aspects of their responsibilities for facility management and the mitigation/elimination of environmental impact in direct support of the defense acquisition process.*¹

Rapid changes in the acquisition environment, retirement eligibility of baby boomers, and potential talent shortages threaten the strength and stability of AT&L to meet its mission goals. Acquisition personnel are a key focus of government-wide initiatives to enhance recruiting, training, and retention.²

¹ <https://dap.dau.mil/career/fe/Pages/Default.aspx>

² Department of Defense, Acquisition, Technology & Logistics, *AT&L Human Capital Strategic Plan v3.0*, 2007.

This report presents the most recent assessment of the competencies of the AT&L FE career field.

The Office of Personnel Management (OPM) describes a competency as “an observable, measurable pattern of skills, knowledge, abilities, behaviors and other characteristics that an individual needs to perform work roles or occupational functions successfully.” OPM’s definition of a competency is the foundation on which AT&L workforce competency models are built. The FE workforce competency-based assessment described here aligns with the AT&L Human Capital Strategic Plan and is one element of an approach by the Human Capital Initiatives (HCI) Office to prepare the AT&L workforce for the future.³

The FE workforce assessment is part of a larger competency assessment program addressing all career fields within the AT&L community.

Research objectives

The research goals for the overall AT&L Competency Program are the following:⁴

- AT&L Goal-1: Define the competencies required to deliver (needed) capabilities.
- AT&L Goal-2: Assess the workforce to identify current and future gaps.

The competency model used for this assessment satisfies the first AT&L goal. The assessment results shared in this report will help achieve the second goal.

³ Ken Krieg, Under Secretary of Defense for Acquisition, Technology & Logistics, *AT&L Human Capital Strategic Plan v3.0*, 2007.

⁴ Department of Defense, Acquisition, Technology & Logistics, *AT&L Human Capital Strategic Plan v3.0*, 2007.

Model components

AT&L competency models have both a technical and a professional component. Technical competencies are functional-specific competencies associated with a career field (e.g., Design Engineering and Architecture). Professional competencies are leadership, relational, cognitive, and management-focused and can be applied to all career fields (e.g., Communication). Competency models contain high-level units of competence that hold more descriptive competencies with concise descriptions of behaviors and the associated goal of the behavior needed to demonstrate the competency (referred to as competency elements). In addition, competencies often include short statements about the knowledge required to perform the behaviors (referred to as knowledge items).

Model development

The FE competency model was developed and validated in four phases. In **Phase I**, the competency assessment model development phase, career field leadership served as an expert panel (EP). Those leaders identified the behaviors, skills, characteristics, and knowledge they believe are required to be a successful FE employee. Through successive discussions between FE leadership and CNA, this information was developed into a competency model framework, which was then used to solicit more detailed competency information from a larger group of subject matter experts (SMEs).

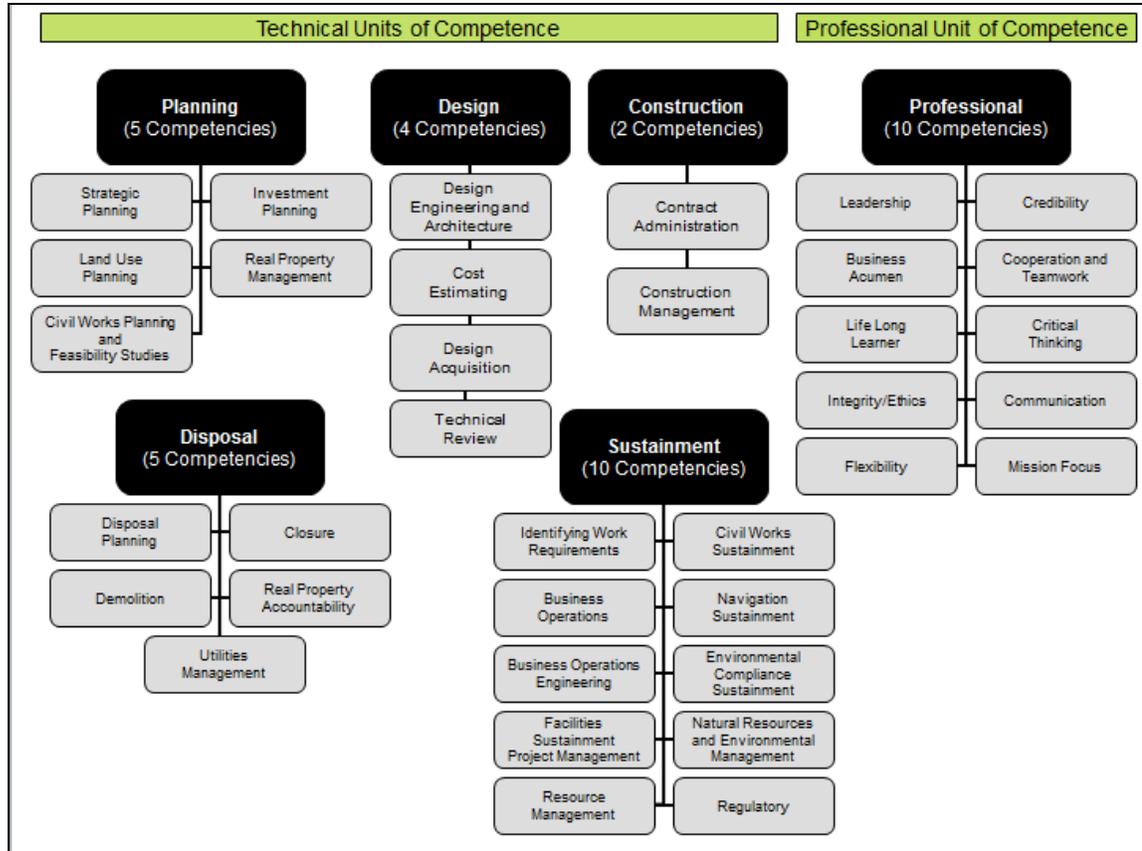
At the end of Phase I, expert panel members identified successful FE employees from all representative DoD services and agencies to serve as SMEs and to support development of a model from the framework. Criteria to serve as an SME ensured that participants represented the entire FE workforce population and that they were experienced, superior employees. This in turn ensured that the final competency model would accurately reflect successful performance criteria.

In **Phase II**, SMEs were asked to provide data about what makes them successful in their jobs. The CNA research team devised a multifaceted approach to collecting the data. Use of CNA's online data collection tool facilitated collection of demographic information, framework validation, and descriptions of key situations. FE SMEs were first asked to provide demographic information. SMEs were also asked to add or suggest removal of competencies, elements, and knowledge items. Finally, a structured set of questions asked SMEs to compare their job responsibilities with the framework of competencies and provide examples from their own experiences of successful job performance. This process allowed CNA to collect both qualitative and quantitative data needed to validate competencies required for superior performance.

In **Phase III**, CNA worked with FE leadership and workforce experts to decide how to use the information provided by the SMEs to refine the FE competency framework developed by the expert panel. CNA used this resulting competency model to build a web-based assessment tool to capture workforce-wide assessment data.

The FE competency model consists of 74 elements with 26 technical and 10 professional competencies, all organized into six units of competence. Figure 1 shows the final FE competency model, and the detailed elements are listed in Appendix A. The Phase IV assessment of the FE workforce used this competency model.

Figure 1. Facilities Engineering Competency Model



Phase IV of the FE competency assessment process began in June 1, 2011. At that time, CNA administered the assessment to the FE workforce. Employees had four weeks to complete the assessment before the assessment closed July 1, 2011. The analyses of employee-provided proficiency, criticality, and frequency ratings are described in this report.

Survey approval

The Director of Human Capital Initiatives submitted the assessment survey to the Defense Manpower Data Center (DMDC) and Washington Headquarters Services (WHS) for survey approval in late 2009. We received survey approval in July 2010, under WHS survey license number DD-AT&L (AR) 2431.

Section summary

We developed the Competency Model for the FE workforce using the same process used for each of the other DoD Acquisition workforces. This process starts with a small group of Expert Panel members who develop a framework for the model. The process then expands the audience to a larger group of SMEs from across the workforce, who validate the content in the framework to produce the recommended model. Finally, we assess the still broader workforce population against this model. This final assessment provides further validation of the model, as well as demographic, proficiency, and importance ratings. The assessment survey was approved, prior to the launch of the assessment, by both DMDC and WHS.

Section 2: Rating and analysis methodology

The intent for this assessment of FE employees was to conduct an assessment of a large convenience sample of FE employees. We received 1,734 employee assessment responses. The response rate was evaluated against population statistics, in order to understand the degree to which the participants are reflective of the population. Therefore, our discussion of methodology starts with a discussion of the observed participation rates.

Participation rates

Overall, 24 percent of the FE workforce contributed in some way to the assessment. Across all services and agencies, employees completed 1,745 self-assessments and supervisors assessed 493 employees, not all of whom participated in the assessment. The FE workforce has employees in all three service departments, as well as Fourth Estate agencies. FE was most represented in the Navy and Army. Participation rates for the overall FE workforce and for each of the four segments of the workforce –Air Force, Army, Navy, and Fourth Estate –are shown in Table 1.

As we previously mentioned, the 24 percent of the workforce that responded was not necessarily a random sample, which is needed in order to statistically extrapolate to the workforce as a whole. However, in the few demographic dimensions (MIL/CIV, career level and component) that we were able to explore, we found no major evidence that our sample is not random. Nevertheless, caution should still be exercised in extrapolating these results to represent the entire workforce. These results **do** represent the 24 percent of the workforce who responded to the survey.

Table 1. Participation rates by FE workforce segment

Final Assessment Status	FE-All		Air Force		Army		Navy		4 th Estate	
	Participant Count	%	Participant Count	%	Participant Count	%	Participant Count	%	Participant Count	%
Number of people invited	7,343	100	46	100	1,563	100	5,721	78	13	100
Completed or partially completed Employee Assessments	1,745	24	5	11	237	15	1,499	26	4	31
Completed or partially completed Supervisory Assessments	493	7	4	9	38	2	451	8	0	0
Completed or partially completed Employee and Supervisory Assessments	297	4	2	4	17	1	278	5	0	0

Methodology changes driven by participation rates

Changes in the data used for analysis

We have used a multi-rater approach for prior DoD Acquisition workforce assessments, by capturing criticality and proficiency ratings for each employee from both the employee and his or her supervisor. The response rate for paired FE employee-supervisor assessments was, however, too low to provide sufficient data for analysis. Therefore, we modified our methodology to use only employee responses. This approach provides the largest consistent set of responses for our analysis. The number of employee responses is representative of the overall FE workforce population. The results are, however, less verifiable than employee-supervisor paired responses, because the employee proficiency and criticality responses have not been validated against supervisor responses. See the section on *Data used for analysis* for a further discussion of this topic.

Changes to how data is aggregated and reported

In this report, we provide results at the overall FE workforce level. We include separate breakdowns at the component and community levels where the findings may be unique from what are in the overall FE findings. This methodology for data aggregation and reporting eliminates most of the problems associated with low response analysis, which requires masking of responses due to privacy and confidentiality issues.

Competency ratings

Employees rated their own proficiency for each element of the competency model, how critical they believed the competency element to be in performing their current job, and how frequently they use that competency element. Each employee's supervisor was also asked to rate the proficiency of the employee for each element in the competency model and the criticality of the element to the employee's job. Behavioral descriptions for each competency element assisted the participant in selecting the most appropriate rating for each element. Each rating scale contained five usable ratings, enumerated one through five, and one rating of zero, which indicated that the employee or supervisor could not respond for this element and for this rating category (criticality, proficiency, or frequency). We excluded all zero ratings in calculating average response rates. The rating scales used are below:

Criticality: How critical is this activity in your job? (Employee) /
How critical is this behavior to the employee whom you are rating? (Supervisor)

- 0. N/A: Not needed in my job
- 1. Not Critical
- 2. Somewhat Critical
- 3. Fairly Critical
- 4. Very Critical
- 5. Extremely Critical

Proficiency: How proficient are you at the competency element behaviors? (Employee) / How proficient is the employee whom you are rating? (Supervisor)

0. No exposure to or awareness of this competency
1. Awareness: Applies the competency in the simplest situations
2. Basic: Applies the competency in *somewhat complex* situations
3. Intermediate: Applies the competency in *complex* situations
4. Advanced: Applies the competency in *considerably complex* situations
5. Expert: Applies the competency in *exceptionally complex* situations

Frequency: How often do you do this activity in your job?
(Employee only)

0. Never: Not needed in my job
1. Almost Never
2. Rarely
3. Occasionally
4. Frequently
5. Very Frequently

Career level

We used the employees' responses to identify what career level they are at currently (Entry, Journeyman, Senior) as opposed to their certification level.

Analysis of importance

We asked employees to rate the criticality and frequency of use of each competency element against a standard five-point scale. We computed the mean of both ratings by competency, in order to assign relative importance. We categorized competencies as high, medium, or low, based on their mean criticality and frequency values. We also computed mean criticality and frequency ratings by career level and grouped them according to relative importance.

In order to determine how many competencies lie within each importance category (high, medium, or low) by workforce community, we plotted mean criticality against mean frequency

ratings for the four workforce communities of interest. Comparing high importance competencies across the four workforce communities allowed us to identify similarities and differences between them. Comparing mean criticality and frequency ratings across career levels within each workforce community revealed the relative importance of competencies to each career level grouping.

Prior to analyzing importance data, we eliminated any responses that did not include a value of one through five for both criticality and frequency of use and calculated the sample sizes for importance of each competency by counting respondents who provided reliable frequency and criticality responses at the competency element level. Eliminating responses using our validation criteria (outlined separately) changed the sample sizes for each question in the assessment.

Analysis of proficiency

We analyzed proficiency data received from respondents in the FE workforce communities. First, we computed mean proficiency values for each competency by workforce community and career level. Next, we plotted these values in order to get a sense of the proficiency status for each grouping of respondents.

We compared mean proficiency levels across career levels to determine the reported proficiency status for each. We used the same process to remove incomplete/invalid data from our proficiency data set as we did for our importance analysis.

Data used for analysis

We obtained only 297 sets of paired responses from an employee and his or her supervisor, across the entire FE workforce. If we were to perform our analysis using the multi-rater approach, this low level of response would be insufficient for the level and types of analysis needed by workforce management. Therefore, we use data from the employee responses alone.

To ensure that the data set contained reliable data for analysis, we validated the data set and excluded the following scenarios from the analysis:

- *If the employee selected 0: (Not needed in my job) in the frequency or criticality rating for an element.*
- *If the employee selected 0: (No exposure to or awareness of this competency) in the proficiency rating for an element.*
- *If the criticality, proficiency, or frequency ratings were blank for an element.*
- *If the responding employee was identified as a contractor by “.ctr” in his or her email address.*
- *If a systematic response pattern was identified (i.e., AAA, ABA, ABB, etc.).*

Section summary

Overall, 24 percent of the FE workforce contributed to the assessment, completing 1,745 self-assessments. The lower-than-expected response rates, especially from supervisors, required us to use only employee responses for analysis. We will use career level to examine the differences between competencies at various levels of performance in the FE career field.

The methodologies for analysis of importance and proficiency are consistent with the other DoD Acquisition workforce analyses, and the rating scales used are identical.

Section 3: Workforce demographics

Respondents were asked 20 demographic and intentions questions. Supervisors were presented the same demographic questions when they responded as an employee, but provided no demographic input in their supervisory responses.

What follows helps create a profile of the FE workforce obtained from the demographic responses.

Experience

Most FE respondents have less than 10 years of FE experience.

Results presented in Table 2 are derived from the following demographic question: *How many years of experience have you had as a Facilities Engineer?*

The majority of the FE respondents have less than 10 years of Facilities Engineering (55 percent). The Navy segment has more people with less than 10 years of experience (56 percent) than the Army (47 percent). Approximately 17 percent of FE respondents have more than 25 years of Facilities Engineering experience. Generally, the Army has more years of FE experience as a segment than the Navy. Although shown in the table, the number of participants from Air Force and 4th Estate is so low as to not be meaningful in terms of identifying demographic trends.

Table 2. Facilities Engineering experience responses by FE segment

Years of Experience	FE-All		Air Force		Army		Navy		4 th Estate	
	Participant Count	%	Participant Count	%						
Less than 5	699	40	1	20	83	35	613	41	2	50
5 to 10	261	15	3	60	29	12	229	15		0
11 to 15	178	10		0	31	13	147	10		0
16 to 25	291	17	1	20	44	19	246	16		0
More than 25	293	17		0	49	21	242	16	2	50
Unknown	23	1		0	1	0	22	1		0
All Respondents	1,745	100	5	100	237	100	1,499	100	4	100

Most FE respondents have less than 10 years` experience as a scientist or other type of engineer.

Results presented in Table 3 are derived from the following demographic question: *How many years of experience have you had as an engineer or scientist other than as a Facilities Engineer?*

As was found with Facilities Engineering experience, the majority of FE respondents have less than 10 years of other science or engineering experience (59 percent). The Navy segment has the largest percentage of respondents in this category (61 percent), driving the results.

Table 3. Other experience as a scientist or engineer responses by FE segment

Years of Experience	FE-All		Air Force		Army		Navy		4 th Estate	
	Participant Count	%	Participant Count	%						
Less than 5	744	43	3	60	76	32	663	44	2	50
5 to 10	287	16		0	35	15	252	17		0
11 to 15	194	11		0	31	13	162	2	1	25
16 to 25	243	14	1	20	38	16	204	14		0
More than 25	252	14	1	20	56	24	194	13	1	25
Unknown	25	1		0	1	0	24	2		0
All Respondents	1,745	100	5	100	237	100	1,499	100	4	100

Military vs. civilian status

Most FE respondents are federal civilians with no prior military experience.

Results presented in Table 4 are derived from the following demographic question: *What is your current status?*

Most of the FE respondents consist of federal civilians (99 percent), and most civilian respondents have no prior military experience (68 percent), which is consistent across the Army and Navy.

About one-third (31 percent) of the FE respondents have military experience. Most respondents with military experience are civilians, while the remaining respondents are active duty military (primarily from the Navy).

Table 4. Military versus civilian responses by FE segment

Military/ Civilian Status	FE-All		Air Force		Army		Navy		4 th Estate	
	Participant Count	%	Participant Count	%	Participant Count	%	Participant Count	%	Participant Count	%
Active Duty Military	20	1	2	40	0	0	18	1	0	0
Federal Civilian - No Prior Military Service	1180	68	1	20	170	72	1009	67	0	0
Federal Civilian - Prior Military Service	544	31	2	40	67	28	471	31	4	100
Unknown	1	0	0	0	0	0	1	0	0	0
All Respondents	1,745	100	5	100	237	100	1,499	1	4	100

Most FE participants are paid according to the GS-level pay scale and reside in the GS-11 to GS-13 grade level range.

Results presented in Table 5 are derived from the following demographic question: *If you are in the civil service (or NSPS) system, what is your current grade level (or pay-band)?*

Almost all FE civilian respondents are paid according to the GS-Level pay scale. Within the GS-Level pay scale system, most civilian respondents fall in the GS-11 to GS-13 range (1,330 respondents which is 76 percent of the civilian workforce).

Table 5. Civilian grade level/pay band responses by FE segment

Grade Level/ Pay Band	FE-All		Air Force		Army		Navy		4 th Estate	
	Participant Count	%	Participant Count	%	Participant Count	%	Participant Count	%	Participant Count	%
GS-10 or below	115	7	0	0	6	3	109	7	0	0
GS-11 to GS- 13	1330	76	3	60	133	56	1,193	80	1	25
GS-14 or higher	197	11	0	0	83	35	114	8	0	0
N/A: Not civil service (or NSPS)	81	5	2	40	6	3	73	5	0	0
NSPS Pay Band 1	2	0	0	0	0	0	2	0	0	0
NSPS Pay Band 2	4	0	0	0	2	1	2	0	0	0
NSPS Pay Band 3	2	0	0	0	0	0	0	0	2	50
Other Pay Plan	11	1	0	0	6	3	4	0	1	25
Unknown	3	0	0	0	1	0	2	0	0	0
All Civilian Respondents	1745	100	5	100	237	100	1,499	100	4	100

Career level and certification level

About half of FE participants indicate that they are at the Senior career level.

Results presented in Table 6 are derived from the following demographic question: *What is your current career level?*

About half of the FE participants indicate “Senior” as their career level (53 percent). However, the Army indicates that almost three-quarters (74 percent) of their workforce is at a Senior career level. That is contrasted with the Navy workforce’s 49 percent at the Senior level.

Table 6. Career level responses by FE segment

Career Level	FE-All		Air Force		Army		Navy		4 th Estate	
	Partici- pant Count	%	Participant Count	%	Partici- pant Count	%	Partici- pant Count	%	Partici- pant Count	%
Entry	273	16	1	20	26	11	245	16	1	25
Journey	535	31	1	20	30	13	504	34		0
Senior	918	53	3	60	176	74	736	49	3	75
Unknown	19	1		0	5	2	14	1		0
All Respon- dents	1,745	100	5	100	237	100	1,499	100	4	100

The analyses in this report will be described by career level in order to examine differences in competency importance and proficiency. This is juxtaposed against the certification level, which is restricted to their DAWIA level. Human capital initiatives should take into account both; however, the competency analysis does not presume that certification level is equivalent to career level.

FE respondents are primarily at Level 2 Certification level.

Results presented in Table 7 are derived from the following demographic question: *What is your current certification level?*

Most of the FE respondents indicated they are at least Level 2 certified (53 percent) or have completed FE-201, are GS 9-13, and completed 24 hours of online course-work in addition to the requirements at Level 1. There is a difference between the Army and the Navy at 37 percent and 56 percent, respectively. Of note, 39 percent of respondents in the Army indicated that they did not know their certification level.

Table 7. Certification level responses by FE segment

Level	FE-All		Air Force		Army		Navy		4 th Estate	
	Participant Count	%	Participant Count	%						
One	261	15	0	0	29	12	232	15	0	0
Two	922	53	0	0	88	37	833	56	1	25
Three	199	11	0	0	28	12	168	11	3	75
Unknown	363	21	5	100	92	39	266	18	0	0
All Respondents	1,745	100	5	100	237	100	1,499	100	4	100

This is in contrast to the career level (Table 6) where most respondents indicate they are at the Senior level. Our analysis will focus on career level to examine at what point in a FE employee’s career competencies become most important.

Education

About four-fifths of FE respondents have achieved a bachelor’s degree or higher.

Results presented in Table 8 are derived from the following demographic questions: *What is your highest level of educational attainment?*

The highest level of educational achievement by most of FE respondents is either bachelor’s degree (50 percent) or master’s

degree (30 percent). The Navy and Army have the same percentage of respondents with a bachelor’s degree (both 51 percent).

Table 8. Education levels and focus responses by FE segment

Highest Level of Educational Achievement	FE-All		Air Force		Army		Navy		4 th Estate	
	Participant Count	%	Participant Count	%						
High School	172	10	0	0	10	4	162	11	0	0
Associate Degree	107	6	1	20	4	2	102	7	0	0
Bachelor's Degree	880	50	1	20	120	51	758	51	1	25
Master's Degree	525	30	3	60	96	41	423	28	3	75
Doctoral Degree	22	1	0	0	5	2	17	1	0	0
Other	38	2	0	0	2	1	36	2	0	0
Unknown	1	0	0	0		0	1	0	0	0
All Respondents	1,745	100	5	100	237	100	1,499	100	4	100

Workforce community

Most respondents identify themselves with the Construction, Design, and Environmental workforce communities.

Results presented in Table 9 are derived from the following demographic statement: *Please identify the workforce community with which you are most closely associated.*

As one might expect from Facilities Engineering, 44 percent are working in Construction and Design; 19 percent are working in Environmental; and 12 percent are in Facility Sustainment. Construction and Design are fairly equally distributed across Army (47 percent) and Navy (43 percent). However, Environmental is a community much more represented in Navy (21 percent) than Army (6 percent).

The remaining respondents (25 percent) classified themselves as one of “Other” workforce communities. Of note, Education and Training and to a lesser extent, Safety and Occupational

Health are very small communities in FE, at least as measured by survey response.

Table 9. Workforce community responses by FE segment

Workforce Community	FE-All		Air Force		Army		Navy		4 th Estate	
	Participant Count	%	Participant Count	%						
Civil Works	48	3	0	0	23	10	25	2	0	0
Construction	381	22	1	20	49	21	331	22	0	0
Design	376	22	0	0	61	26	315	21	0	0
Education and Training	1	0	0	0	0	0	1	0	0	0
Environmental	337	19	0	0	15	6	322	21	0	0
Facility Sustainment/ Management	211	12	2	40	35	15	172	11	2	50
Other Facilities Engineering	159	9	0	0	20	9	138	9	1	25
Other/None	50	3	1	20	13	6	35	2	1	25
Planning	105	6	1	20	11	5	93	6	0	0
Real Estate	50	3	0	0	9	4	41	3	0	0
Safety and Occupational Health	25	1	0	0	1	0	24	2	0	0
Unknown	2	0	0	0	0	0	2	0	0	0
All Respondents	1,745	100	5	100	235	100	1,499	100	4	100

Respondents were asked to identify themselves with one of the FE workforce communities.

Other demographic and intentions data

Additional data were collected about assessment respondents. Some of these were used to inform our retirement and intentions analyses and will be discussed later.

Section summary

The responses we received to the demographic portion of the competency assessment provide insight into the composition of the FE workforce.

Results indicate that most FE respondents have less than 10 years of FE experience and less than 10 years of experience as a scientist or other type of engineer. FE respondents are mostly federal civilians with no prior military experience and are primarily GS-11 to GS-13 grade level range.

About half of FE participants indicate that they are at the Senior career level, but only at Level II Certification. About four-fifths of FE respondents have achieved a bachelor's degree or higher.

FE respondents mostly identified themselves with the Construction, Design, and Environmental workforce communities.

The number of survey participants from Air Force and 4th Estate is too low to be useful for meaningful analysis. Therefore, based on the demographics of the workforce, we will evaluate the relative importance and proficiency of the competencies by career level across Army and Navy only.

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Section 4: Relative importance of competencies

Each assessment participant ranked the criticality and frequency of use for each of the 74 competency elements. We computed the mean criticality and the mean frequency of each competency, which we then used to assign relative importance. We categorize competencies in terms of importance as follows:

- Competencies that have **both a mean criticality rating AND a mean frequency rating of 3.0 or above** have *high importance*.
- Competencies that have **either a mean criticality rating OR a mean frequency rating of 3.0 or above** have *medium importance*.
- Competencies that have **both a mean criticality rating AND a mean frequency rating below 3.0** have *lower importance*.

In this section we discuss the relative importance of competencies for Army and Navy, which have the greatest number of FE employees. Next, we discuss the relative importance of the competencies by community. All analysis is considered by the relative importance of competencies by career level, highlighting the high and medium importance competencies.

Relative importance of competencies across FE

To get a baseline understanding of which competencies are important across all of Facilities Engineering, we compared the frequency and criticality of each competency to identify which competencies have high importance, medium importance, and low importance.

Professional competencies are highly important across all Facilities Engineering participants.

All of the professional competencies were important across all career levels, all communities, and all components. The competencies include the following:

- Leadership
- Business Acumen
- Life Long Learner
- Integrity/Ethics
- Flexibility
- Credibility
- Cooperation and Teamwork
- Critical Thinking
- Communication
- Mission Focus.

Integrity/Ethics leads all other competencies as the highest in frequency and criticality across all career levels. These findings emphasize the importance of blending professional competencies into the development and planning for the Facilities Engineering workforce.

Design competencies increase in importance with increasing career level.

In addition to the Professional competencies, “Design” competencies tend to grow in importance as career levels advance. For example, Technical Review is medium importance at Entry and gains high importance at Journey and Senior career levels. Cost Estimating gains high importance at Journey and is maintained at Senior. Design Acquisition becomes highly important at Senior.

Outside specific contexts of work, most competencies are low importance.

Most competencies were found to have lower importance. This finding motivated us to understand whether the competencies were important when examined in the context in which they are performed, within the components of Army and Navy and the workforce communities (Table 10).

Table 10. Importance ratings for the FE Career Field, by career level

Unit	Competency	Entry			Journey			Senior		
		Frequency	Criticality	Importance	Frequency	Criticality	Importance	Frequency	Criticality	Importance
Planning	1 Strategic Planning	2.07	2.10		2.28	2.21		2.55	2.57	
	2 Land Use Planning	2.22	2.27		2.26	2.27		2.31	2.40	
	3 Civil Works Planning / Feasibility Studies	2.03	2.10		1.99	2.07		2.11	2.28	
	4 Investment Planning	2.62	2.64		2.67	2.72		2.82	2.95	
	5 Real Property Management	2.13	2.13		2.30	2.31		2.31	2.42	
Design	6 Design Engineering and Architecture	2.48	2.73		2.69	2.80		2.83	3.02	●
	7 Cost Estimating	2.94	2.98		3.03	3.02	●	3.10	3.25	●
	8 Design Acquisition	2.65	2.91		2.78	2.93		3.03	3.22	●
	9 Technical Review	2.93	3.08	●	3.07	3.10	●	3.14	3.34	●
Construction	10 Contract Administration	2.52	2.85		2.69	2.89		2.89	3.15	●
	11 Construction Management	2.77	2.18		2.93	2.63		2.83	2.93	
Disposal	12 Disposal Planning	2.16	2.43		2.15	2.37		2.33	2.59	
	13 Demolition	2.12	2.52		2.21	2.41		2.21	2.46	
	14 Closure	2.27	2.82		2.13	2.51		2.22	2.80	
	15 Real Property Accountability	1.94	2.15		2.01	2.27		2.17	2.42	
	16 Utilities Management	1.80	1.95		1.58	2.09		1.62	2.25	
Sustainment	17 Identifying Work Requirements	2.57	2.78		2.43	2.78		2.38	2.87	
	18 Business Operations	2.36	2.51		2.27	2.57		2.61	2.68	
	19 Business Operations Engineering	2.49	2.63		2.57	2.52		2.56	2.84	
	20 Facilities Sustainment PM	2.78	2.85		2.81	2.85		2.95	3.05	●
	21 Resource Management	2.37	2.50		2.29	2.56		2.47	2.73	
	22 Civil Works Sustainment	2.04	2.51		1.99	2.37		2.06	2.64	
	23 Navigation Sustainment	2.06	2.20		1.98	2.16		2.09	2.51	
	24 Enviro Compliance Sustainment	2.64	2.96		2.76	2.86		2.75	2.99	
	25 Natural Resources / Enviro Mgmt	2.39	2.59		2.27	2.55		2.33	2.76	
	26 Regulatory	2.09	2.57		1.99	2.45		2.03	2.62	
Professional	27 Leadership	3.37	3.45	●	3.58	3.50	●	4.08	3.96	●
	28 Business Acumen	3.32	3.45	●	3.51	3.48	●	3.98	3.97	●
	29 Life Long Learner	3.40	3.41	●	3.42	3.45	●	3.71	3.72	●
	30 Integrity/Ethics	4.50	4.37	●	4.56	4.37	●	4.68	4.53	●
	31 Flexibility	4.05	3.99	●	4.08	4.02	●	4.25	4.18	●
	32 Credibility	3.41	3.43	●	3.54	3.63	●	3.83	3.95	●
	33 Cooperation and Teamwork	4.21	4.16	●	4.34	4.20	●	4.44	4.37	●
	34 Critical Thinking	3.77	3.81	●	3.87	3.82	●	4.08	4.10	●
	35 Communication	3.89	4.03	●	4.10	4.05	●	4.32	4.27	●
	36 Mission Focus	3.71	3.80	●	4.01	4.00	●	4.27	4.23	●

The dots indicate relative importance of each competency according to respondents: green = high importance; yellow = medium importance; no dot = lower importance.

Relative importance of competencies by Army and Navy

In this section we discuss the relative importance of competencies within the Navy and Army components, which make up the very large majority of FE employees.

Professional competencies are important across components.

As found with the FE workforce as a total, the Professional competencies were important across all career levels in the Army and Navy components.

The Design Unit of Competence is an important set of competencies across Army and Navy.

The competencies within the Design Unit of Competence are important across both the Army and Navy. At the Senior level, Cost Estimating, Design Acquisition, and Technical Review are all highly important competencies. For the Army, Cost Estimating is highly important at the Entry level.

Construction and Sustainment competencies are important for the Army at the Journey career level.

The Unit of Competence, Construction, is an important set of competencies for the Army at the Journey career level. These competencies include Contract Administration and Construction Management. Contract Administration remains highly important at the Senior level for the Army.

In addition, the Sustainment set of competencies are important for the Army at the Journey career level. The competencies Identifying Work Requirements, Business Operations, Business Operations Engineering, Facilities Sustainment Project Management, Resource Management, Civil Works Sustainment, Navigation Sustainment are all highly important at the Journey level (Table 11).

Table 11. Important competencies for the FE Career Field, by component and career level

Unit	Competency	Army			Navy		
		Entry	Journey	Senior	Entry	Journey	Senior
Planning	1 Strategic Planning						
	2 Land Use Planning						
	3 Civil Works Planning / Feasibility Studies						
	4 Investment Planning						
	5 Real Property Management						
Design	6 Design Engineering and Architecture						
	7 Cost Estimating	●		●		●	●
	8 Design Acquisition	●	●	●		●	●
	9 Technical Review		●	●	●	●	●
Construction	10 Contract Administration		●	●			
	11 Construction Management		●				●
Disposal	12 Disposal Planning						
	13 Demolition		●				
	14 Closure		●				
	15 Real Property Accountability						
	16 Utilities Management		●				
Sustainment	17 Identifying Work Requirements		●				
	18 Business Operations		●				
	19 Business Operations Engineering		●				
	20 Facilities Sustainment PM		●				●
	21 Resource Management						
	22 Civil Works Sustainment		●				
	23 Navigation Sustainment		●	●			
	24 Enviro Compliance Sustainment						
	25 Natural Resources / Enviro Mgmt						
	26 Regulatory						
Professional	27 Leadership	●	●	●	●	●	●
	28 Business Acumen	●	●	●	●	●	●
	29 Life Long Learner	●	●	●	●	●	●
	30 Integrity/Ethics	●	●	●	●	●	●
	31 Flexibility	●	●	●	●	●	●
	32 Credibility	●	●	●	●	●	●
	33 Cooperation and Teamwork	●	●	●	●	●	●
	34 Critical Thinking	●	●	●	●	●	●
	35 Communication	●	●	●	●	●	●
	36 Mission Focus	●	●	●	●	●	●

The dots indicate relative importance of each competency according to respondents: green = high importance; yellow = medium importance; no dot = lower importance. *The frequency and critical ratings that were used to calculate high, medium, and lower importance are found in the Appendices C (Army) and D (Navy).*

Relative importance of competencies by workforce community

In this section we discuss the important competencies within the Construction, Design, Environment, and Facilities Sustainment communities. Participants in the workforce assessment most frequently selected these communities.

Professional competencies are important across all career levels.

As found with the FE workforce as a total and by component, the Professional competencies were universally important across all career levels.

Workforce community strongly dictates the competencies that are important.

As a result of finding few competencies important across all communities, we chose to evaluate the competencies relative to the workforce community. We found that the workforce community strongly dictates the competencies that are reflected as important by the FE respondents. The importance of competencies varies widely across workforce communities. This could suggest that the communities are operating independently of each other. This independence could cause difficulty in developing a singular FE career field development plan.

The Design community is a homogenous workforce community across all career levels.

The Design community found all the design competencies, Design Engineering and Architecture, Cost Estimating, Design Acquisition, and Technical Review important across all career levels. Other than the professional competencies, they found few other competencies important to their work. This suggests that the Design community is fairly homogenous and could be siloed from the other part of the FE workforce. However, they share their design work with the Construction and Facilities Sustainment communities.

Construction is a specialized workforce community.

The Construction community specializes in Contract Administration and Construction Management, which are highly important across almost all career levels. They share the Technical Review competency with the Design community as also being important across all career levels.

Environment is a specialized workforce community.

The Environment community specializes in Environmental Compliance and Sustainment, which is important across all career levels. In addition, it is the only community that highlights (at the Senior level) Disposal Planning as highly important.

Facilities Sustainment is a cross-functional community.

The Facilities Sustainment community found that competencies were moderately or highly important across all Units of Competence except for Disposal.

This community found Facilities Sustainment Project Management and Business Operations Engineering as highly important across all career levels. In addition, they share highly important competencies like Cost Estimating and Technical Review across multiple career levels with the Construction and Design communities.

Investment Planning is important at Entry and Senior levels.

Investment Planning is moderately or highly important at the Entry and Senior levels for Construction and Facilities Sustainment. Planning competencies don't show up in any other workforce communities as important (Table 12).

Table 12. Important competencies for the FE Career Field, by community and career level

Unit	Competency	Construction			Design			Environment			Facilities Sustainment		
		Entry	Journey	Senior	Entry	Journey	Senior	Entry	Journey	Senior	Entry	Journey	Senior
Planning	1 Strategic Planning												
	2 Land Use Planning												
	3 Civil Works Planning / Feasibility Studies												
	4 Investment Planning	●									●		
	5 Real Property Management			●								●	
Design	6 Design Engineering and Architecture				●	●	●						
	7 Cost Estimating	●		●	●	●	●		●		●		●
	8 Design Acquisition			●	●	●	●			●		●	
	9 Technical Review	●	●	●	●	●	●				●		●
Construction	10 Contract Administration	●	●	●		●					●		●
	11 Construction Management	●	●	●									●
Disposal	12 Disposal Planning									●			
	13 Demolition												
	14 Closure								●		●		
	15 Real Property Accountability												
	16 Utilities Management												
Sustainment	17 Identifying Work Requirements	●									●	●	●
	18 Business Operations										●	●	●
	19 Business Operations Engineering										●	●	●
	20 Facilities Sustainment PM					●	●			●	●	●	●
	21 Resource Management												●
	22 Civil Works Sustainment					●							●
	23 Navigation Sustainment												●
	24 Enviro Compliance Sustainment								●	●	●		●
	25 Natural Resources / Enviro Mgmt										●		
	26 Regulatory												
Professional	27 Leadership	●	●	●	●	●	●	●	●	●	●	●	●
	28 Business Acumen	●	●	●	●	●	●	●	●	●	●	●	●
	29 Life Long Learner	●	●	●	●	●	●	●	●	●	●	●	●
	30 Integrity/Ethics	●	●	●	●	●	●	●	●	●	●	●	●
	31 Flexibility	●	●	●	●	●	●	●	●	●	●	●	●
	32 Credibility	●	●	●	●	●	●	●	●	●	●	●	●
	33 Cooperation and Teamwork	●	●	●	●	●	●	●	●	●	●	●	●
	34 Critical Thinking	●	●	●	●	●	●	●	●	●	●	●	●
	35 Communication	●	●	●	●	●	●	●	●	●	●	●	●
	36 Mission Focus	●	●	●	●	●	●	●	●	●	●	●	●

The dots indicate relative importance of each competency according to respondents: green = high importance; yellow = medium importance; no dot = lower importance. The frequency and critical ratings that were used to calculate high, medium, and lower importance are found in the Appendices E (Construction), F (Design), G (Environment), and H (Facilities Sustainment).

Section summary

We examined the relative importance of competencies by career level across all Facilities Engineering respondents and in relation to the major FE components, Navy and Army. In addition, we examined the relative importance of competencies by the largest workforce communities: Design, Construction, Environment, and Facilities Sustainment.

We found the professional competencies to be highly important across all Facilities Engineering participants, regardless of career level. In addition, Design competencies were found to increase in importance with increasing career level. However, outside specific contexts of work, most competencies were of lower importance in the FE workforce as a whole.

Therefore, we examined the competencies by component. We found that the professional competencies are important across all career levels in Army and Navy. The Design Unit of Competence is an important set of competencies across Army and Navy. In addition, Construction and Sustainment competencies are important for the Army at the Journey level.

Lastly, we examined the competencies by workforce community. The Professional competencies were found important across all career levels in each of the workforce communities. This strong finding across the various workforce segments suggests that professional competencies are a ubiquitous part of the FE job experience.

We found that the workforce community with which individuals are associated strongly dictates the competencies that are important. We found that the Design community is a homogenous workforce community across levels that focus on design competencies. The Construction community is a specialized workforce community with some overlap with Design. Environment is a specialized workforce community that finds only a few competencies highly important. Facilities

Sustainment is a cross-functional community with important competencies across most major Units of Competence.

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Section 5: Proficiency ratings

In this section, we present the average proficiency ratings provided by assessment participants for all competencies in the FE Competency Model. We display our results by workforce community and career level at the competency level. We finish our discussion by highlighting the proficiency of the highly important competencies.

Proficiency ratings of Facilities Engineering respondents

Proficiency trends tend to move similarly across career levels.

The peaks and valleys in the proficiency of the workforce as a whole tend to move similarly across career levels. That suggests that while Entry level employees score themselves lower, Journey level score in the middle, and Senior level score the highest, they tend to evaluate Proficiency in a similar direction (Figure 2).

Responses indicate that, on average, Entry level respondents apply the following competencies in *complex* situations (proficiency scale rating of 3):

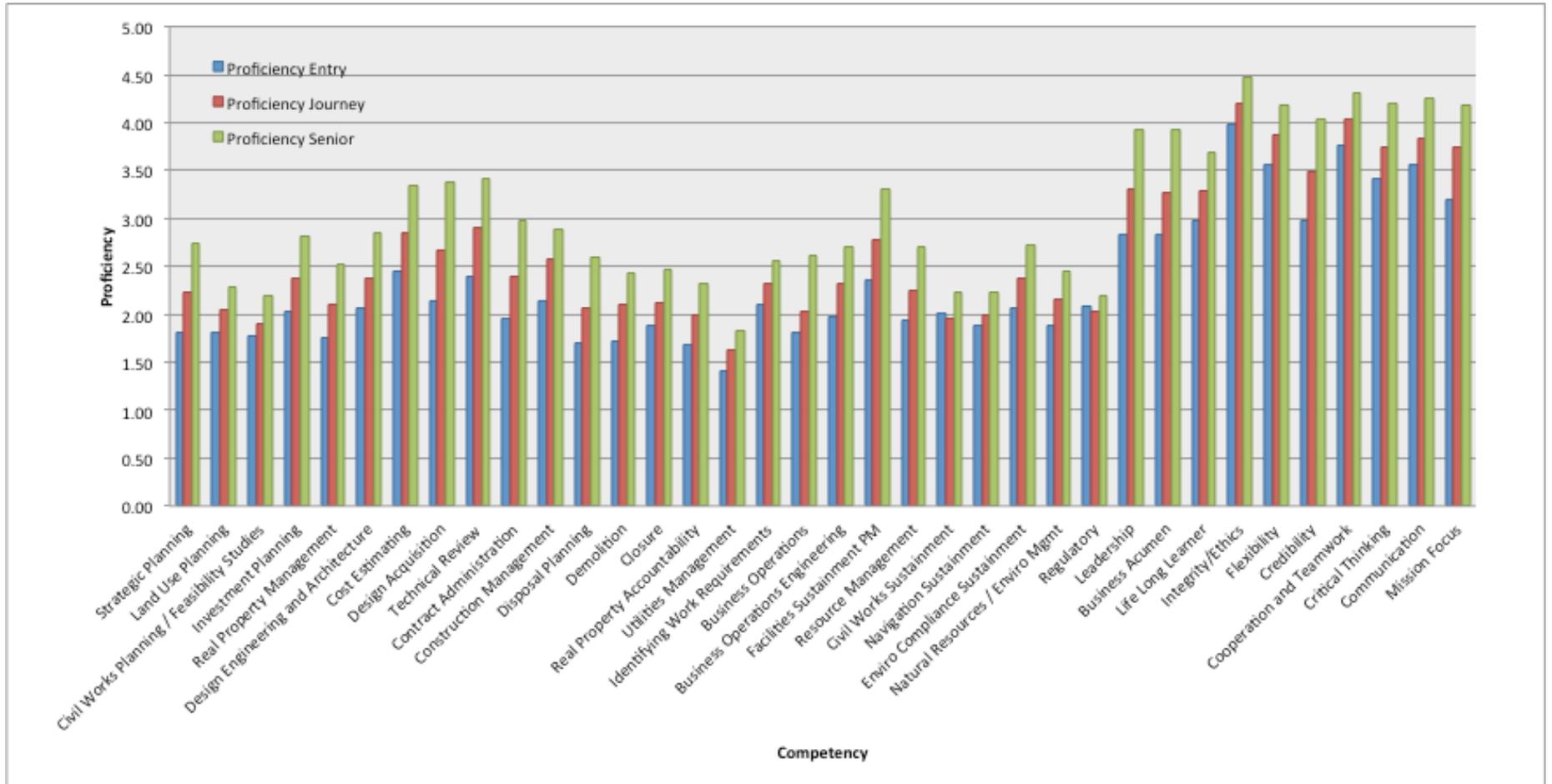
- Integrity and Ethics
- Flexibility
- Cooperation and Teamwork
- Critical Thinking
- Communication
- Mission Focus

The Journey and Senior level employees apply all the professional competencies in, at least, *complex* situations. Senior level employees also rate some Design competencies and Sustainment competencies as proficient in complex situations.

Journey level employees have a potential gap in Design competencies rated highly important.

Cost Estimating and Technical Review are two high importance competencies that Journey level employees rate themselves on average below intermediate proficiency (Table 13).

Figure 2. Average proficiency level by career level for the FE workforce



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Table 13. Mean proficiency ratings for the FE community, by level

Unit	Comp #	Competency	Proficiency		
			Entry	Journey	Senior
Planning	1	Strategic Planning	1.81	2.23	2.75
	2	Land Use Planning	1.81	2.05	2.28
	3	Civil Works Planning / Feasibility Studies	1.78	1.91	2.19
	4	Investment Planning	2.03	2.37	2.82
	5	Real Property Management	1.76	2.11	2.52
Design	6	Design Engineering and Architecture	2.07	2.38	2.85
	7	Cost Estimating	2.45	2.84	3.34
	8	Design Acquisition	2.14	2.68	3.37
	9	Technical Review	2.39	2.91	3.42
Construction	10	Contract Administration	1.95	2.40	2.97
	11	Construction Management	2.14	2.58	2.89
Disposal	12	Disposal Planning	1.71	2.08	2.60
	13	Demolition	1.73	2.11	2.43
	14	Closure	1.89	2.13	2.46
	15	Real Property Accountability	1.69	2.00	2.32
	16	Utilities Management	1.41	1.62	1.84
Sustainment	17	Identifying Work Requirements	2.11	2.32	2.56
	18	Business Operations	1.81	2.03	2.62
	19	Business Operations Engineering	1.97	2.33	2.71
	20	Facilities Sustainment PM	2.35	2.78	3.31
	21	Resource Management	1.94	2.25	2.70
	22	Civil Works Sustainment	2.02	1.96	2.23
	23	Navigation Sustainment	1.88	1.99	2.23
	24	Enviro Compliance Sustainment	2.07	2.38	2.73
	25	Natural Resources / Enviro Mgmt	1.89	2.16	2.45
	26	Regulatory	2.09	2.04	2.19
Professional	27	Leadership	2.84	3.30	3.92
	28	Business Acumen	2.84	3.28	3.93
	29	Life Long Learner	2.99	3.29	3.68
	30	Integrity/Ethics	3.99	4.20	4.48
	31	Flexibility	3.56	3.88	4.18
	32	Credibility	2.98	3.50	4.04
	33	Cooperation and Teamwork	3.77	4.03	4.32
	34	Critical Thinking	3.42	3.74	4.20
	35	Communication	3.56	3.84	4.25
	36	Mission Focus	3.19	3.74	4.19

The dots indicate relative importance of each competency according to respondents: green = high importance; yellow = medium importance; no dot = lower importance. The shading indicates relative proficiency of each competency: light green = advanced to expert proficiency (4 or above), green = intermediate to advanced proficiency (3 to 4), yellow = basic to intermediate proficiency (2 to 3).

Proficiency ratings of Facilities Engineering respondents by workforce community

Construction community

The Construction community has potential proficiency gaps on important competencies at the Entry level.

In examining the Construction community by itself, we found that three technical competencies were rated high importance, but had *basic to intermediate* proficiency ratings:

- Investment Planning
- Technical Review
- Contract Administration.

This was also found in the Leadership, Business Acumen, Life Long Learner, and Credibility professional competencies, but to a lesser extent.

The high importance competencies at the Journey and Senior levels also had intermediate (*complex*), advanced (*considerably complex*), or expert (*exceptionally complex*) proficiency.

For the most part, high importance competencies at the Journey and Senior level also have at least *intermediate to advanced* proficiency ratings. One exception, however, is Contract Administration, which had a *basic to intermediate* proficiency rating at the Journey level. All the professional competencies have at least *intermediate to advanced* level proficiency ratings and some have *advanced to expert* (Table 14).

Table 14. Mean proficiency ratings for the Construction community, by level

Unit	Comp #	Competency	Proficiency		
			Entry	Journey	Senior
Planning	1	Strategic Planning	1.98	2.27	2.80
	2	Land Use Planning	1.80	1.93	2.19
	3	Civil Works Planning and Feasibility Studies	1.54	1.67	1.89
	4	Investment Planning	● 2.31	2.55	● 2.95
	5	Real Property Management	1.65	2.10	2.58
Design	6	Design Engineering and Architecture	1.89	2.26	2.76
	7	Cost Estimating	● 2.58	2.88	● 3.38
	8	Design Acquisition	2.07	2.82	● 3.43
	9	Technical Review	● 2.39	● 3.22	● 3.77
Construction	10	Contract Administration	● 2.35	● 2.97	● 3.80
	11	Construction Management	● 2.68	● 3.38	● 3.91
Disposal	12	Disposal Planning	1.95	1.80	2.35
	13	Demolition	1.86	2.04	2.40
	14	Closure	1.90	2.09	2.45
	15	Real Property Accountability	1.89	2.16	2.41
	16	Utilities Management	1.88	1.67	1.70
Sustainment	17	Identifying Work Requirements	● 2.21	2.43	2.48
	18	Business Operations	1.95	2.00	2.48
	19	Business Operations Engineering	1.82	2.31	2.79
	20	Facilities Sustainment Project Management	2.40	2.81	3.27
	21	Resource Management	1.90	2.30	2.49
	22	Civil Works Sustainment	2.33	1.82	2.18
	23	Navigation Sustainment	1.85	2.06	2.11
	24	Environmental Compliance Sustainment	1.97	2.12	2.50
	25	Natural Resources and Environmental Manag	1.72	1.99	2.25
	26	Regulatory	2.50	1.84	2.01
Professional	27	Leadership	● 2.76	● 3.38	● 3.97
	28	Business Acumen	● 2.71	● 3.24	● 3.97
	29	Life Long Learner	● 2.83	● 3.30	● 3.65
	30	Integrity/Ethics	● 3.89	● 4.18	● 4.43
	31	Flexibility	● 3.50	● 3.92	● 4.14
	32	Credibility	● 2.79	● 3.46	● 4.05
	33	Cooperation and Teamwork	● 3.70	● 4.08	● 4.28
	34	Critical Thinking	● 3.23	● 3.66	● 4.11
	35	Communication	● 3.48	● 3.89	● 4.18
	36	Mission Focus	● 3.11	● 3.80	● 4.19

The dots indicate relative importance of each competency according to respondents: green = high importance; yellow = medium importance; no dot = lower importance. The shading indicates relative proficiency of each competency: light green = advanced to expert proficiency (4 or above), green = intermediate to advanced proficiency (3 to 4), yellow = basic to intermediate proficiency (2 to 3).

Design Community

The Design community has potential proficiency gaps on important competencies at the Entry and Journey levels.

In examining the Design community by itself, we found that four technical competencies were rated high importance, but had *basic to intermediate* proficiency ratings at the Entry level (Table 15). Those competencies include the four competencies in the Unit of Competence, “Design”.

- Design Engineering and Architecture
- Cost Estimating
- Design Acquisition
- Technical Review.

While higher than Entry employees, the Journey level also had only *basic to intermediate* proficiency on Design Engineering and Architecture and Cost Estimating.

Senior level employees are proficient at the high importance competencies.

The Senior level employees were found to have at least *intermediate to advanced* proficiency among the high importance competencies. They have *advanced to expert* proficiency for six high importance professional competencies.

Table 15. Mean proficiency ratings for the Design community, by level

Unit	Comp #	Competency	Proficiency		
			Entry	Journey	Senior
Planning	1	Strategic Planning	1.80	1.96	2.47
	2	Land Use Planning	1.64	2.04	2.02
	3	Civil Works Planning and Feasibility Studies	1.83	1.75	2.05
	4	Investment Planning	2.00	2.20	2.54
	5	Real Property Management	1.80	2.02	2.22
Design	6	Design Engineering and Architecture	● 2.63	● 2.96	● 3.26
	7	Cost Estimating	● 2.88	● 2.97	● 3.39
	8	Design Acquisition	● 2.41	● 3.13	● 3.83
	9	Technical Review	● 2.85	● 3.29	● 3.66
Construction	10	Contract Administration	1.90	2.36	● 2.76
	11	Construction Management	1.89	2.28	2.57
Disposal	12	Disposal Planning	1.48	1.86	2.22
	13	Demolition	1.62	1.91	2.24
	14	Closure	1.38	1.83	1.83
	15	Real Property Accountability	1.36	1.64	1.99
	16	Utilities Management	1.11	1.42	1.55
Sustainment	17	Identifying Work Requirements	2.00	2.09	2.33
	18	Business Operations	1.79	1.93	2.40
	19	Business Operations Engineering	1.72	2.14	2.43
	20	Facilities Sustainment Project Management	● 2.49	2.74	● 3.23
	21	Resource Management	1.85	2.24	2.54
	22	Civil Works Sustainment	● 2.00	1.69	2.12
	23	Navigation Sustainment	2.60	1.89	2.50
	24	Environmental Compliance Sustainment	1.74	1.99	2.09
	25	Natural Resources and Environmental Manag	1.55	1.84	1.93
	26	Regulatory	1.85	1.50	1.84
Professional	27	Leadership	● 3.00	● 3.20	● 3.82
	28	Business Acumen	● 3.00	● 3.48	● 3.93
	29	Life Long Learner	● 3.31	● 3.53	● 3.79
	30	Integrity/Ethics	● 4.45	● 4.18	● 4.50
	31	Flexibility	● 3.84	● 3.89	● 4.19
	32	Credibility	● 3.22	● 3.67	● 4.00
	33	Cooperation and Teamwork	● 4.00	● 4.06	● 4.33
	34	Critical Thinking	● 3.68	● 3.85	● 4.20
	35	Communication	● 3.64	● 3.81	● 4.25
	36	Mission Focus	● 3.16	● 3.74	● 4.18

The dots indicate relative importance of each competency according to respondents: green = high importance; yellow = medium importance; no dot = lower importance. The shading indicates relative proficiency of each competency: light green = advanced to expert proficiency (4 or above), green = intermediate to advanced proficiency (3 to 4), yellow = basic to intermediate proficiency (2 to 3).

Environment Community

The Environment community has a potential proficiency gap on an important competency at the Entry level.

In examining the Environment community by itself, we found that one technical competency was rated high importance but had only a *basic to intermediate* proficiency rating at the Entry level (Table 16). That competency is Environmental Compliance Sustainment.

This was also found in the Leadership, Business Acumen, Life Long Learner, and Credibility professional competencies, but to a lesser extent.

Journey and Senior level employees are proficient at the high importance competencies.

The Journey and Senior level employees were found to have at least *intermediate to advanced* proficiency at the high and medium importance competencies.

Table 16. Mean proficiency ratings for the Environment community, by level

Unit	Comp #	Competency	Proficiency		
			Entry	Journey	Senior
Planning	1	Strategic Planning	1.97	2.24	2.83
	2	Land Use Planning	2.02	2.16	2.46
	3	Civil Works Planning and Feasibility Studies	1.89	2.10	2.39
	4	Investment Planning	1.80	2.21	2.66
	5	Real Property Management	1.55	1.70	1.93
Design	6	Design Engineering and Architecture	2.19	2.35	2.83
	7	Cost Estimating	2.30	2.80	3.24
	8	Design Acquisition	1.92	2.27	3.02
	9	Technical Review	2.20	2.55	2.97
Construction	10	Contract Administration	1.55	1.98	2.43
	11	Construction Management	1.79	2.00	2.45
Disposal	12	Disposal Planning	2.00	2.42	3.26
	13	Demolition	1.87	2.43	2.75
	14	Closure	2.59	2.69	3.53
	15	Real Property Accountability	1.75	1.85	2.23
	16	Utilities Management	1.42	1.56	1.76
Sustainment	17	Identifying Work Requirements	1.76	1.85	2.16
	18	Business Operations	1.60	1.66	2.26
	19	Business Operations Engineering	1.69	2.13	2.43
	20	Facilities Sustainment Project Management	2.16	2.73	3.32
	21	Resource Management	1.67	1.87	2.44
	22	Civil Works Sustainment	2.18	1.75	1.84
	23	Navigation Sustainment	1.81	1.89	2.11
	24	Environmental Compliance Sustainment	2.93	3.22	3.82
	25	Natural Resources and Environmental Manag	2.45	2.67	3.22
	26	Regulatory	2.70	2.58	3.01
Professional	27	Leadership	2.67	3.29	3.97
	28	Business Acumen	2.81	3.09	3.92
	29	Life Long Learner	2.81	3.24	3.61
	30	Integrity/Ethics	3.70	4.17	4.49
	31	Flexibility	3.25	3.84	4.12
	32	Credibility	2.87	3.47	4.06
	33	Cooperation and Teamwork	3.34	3.96	4.33
	34	Critical Thinking	3.35	3.75	4.23
	35	Communication	3.34	3.82	4.27
	36	Mission Focus	3.00	3.63	4.14

The dots indicate relative importance of each competency according to respondents: green = high importance; yellow = medium importance; no dot = lower importance. The shading indicates relative proficiency of each competency: light green = advanced to expert proficiency (4 or above), green = intermediate to advanced proficiency (3 to 4), yellow = basic to intermediate proficiency (2 to 3).

Facilities Sustainment Community

The Facilities Sustainment community has potential proficiency gaps on important competencies at the Entry and Journey levels.

In examining the Facilities community by itself, we found that high importance competencies at Entry and Journey levels had only *basic to intermediate* proficiency ratings (Table 17). For Entry level, these are:

- Cost Estimating
- Business Operations Engineering
- Facilities Sustainment Project Management.

For Journey level, these are:

- Facilities Sustainment Project Management
- Life Long Learner.

For the most part, the professional competencies were rated with at least *intermediate to advanced* proficiency.

Senior level employees are proficient at the high importance competencies.

The Senior level employees were found to have at least *intermediate to advanced* proficiency at the high importance competencies. In seven professional competencies, they were found to have *advanced to expert* proficiency.

Table 17. Mean proficiency ratings for the Facilities Sustainment community, by level

Unit	Comp #	Competency	Proficiency		
			Entry	Journey	Senior
Planning	1	Strategic Planning	1.92	2.43	2.94
	2	Land Use Planning	1.63	1.58	2.29
	3	Civil Works Planning and Feasibility Studies	1.36	1.71	2.22
	4	Investment Planning	● 2.21	2.39	● 3.03
	5	Real Property Management	2.11	2.56	2.80
Design	6	Design Engineering and Architecture	1.78	2.01	2.74
	7	Cost Estimating	● 2.48	2.72	● 3.48
	8	Design Acquisition	● 2.20	2.26	● 3.20
	9	Technical Review	● 2.40	2.46	● 3.49
Construction	10	Contract Administration	● 1.97	2.14	● 2.97
	11	Construction Management	2.23	2.55	● 2.97
Disposal	12	Disposal Planning	1.50	2.29	2.76
	13	Demolition	1.65	1.94	2.52
	14	Closure	1.33	1.85	2.31
	15	Real Property Accountability	1.72	2.32	2.48
	16	Utilities Management	1.25	1.54	2.30
Sustainment	17	Identifying Work Requirements	● 2.21	● 2.83	● 3.11
	18	Business Operations	● 2.01	2.46	● 3.27
	19	Business Operations Engineering	● 2.81	● 2.85	● 3.31
	20	Facilities Sustainment Project Management	● 2.86	● 3.19	● 3.66
	21	Resource Management	2.34	2.67	● 3.25
	22	Civil Works Sustainment	2.07	2.14	● 2.71
	23	Navigation Sustainment	1.54	2.23	1.92
	24	Environmental Compliance Sustainment	1.79	2.13	● 2.91
	25	Natural Resources and Environmental Manag	1.76	1.73	2.51
	26	Regulatory	1.56	1.64	1.98
Professional	27	Leadership	● 3.09	● 3.19	● 4.02
	28	Business Acumen	● 3.09	● 3.24	● 4.04
	29	Life Long Learner	● 3.12	2.98	● 3.70
	30	Integrity/Ethics	● 4.28	● 4.24	● 4.58
	31	Flexibility	● 3.96	● 4.02	● 4.32
	32	Credibility	● 3.35	● 3.50	● 4.08
	33	Cooperation and Teamwork	● 3.96	● 4.07	● 4.35
	34	Critical Thinking	● 3.68	● 3.51	● 4.25
	35	Communication	● 3.88	● 3.91	● 4.32
	36	Mission Focus	● 3.76	● 3.89	● 4.22

The dots indicate relative importance of each competency according to respondents: green = high importance; yellow = medium importance; no dot = lower importance. The shading indicates relative proficiency of each competency: light green = advanced to expert proficiency (4 or above), green = intermediate to advanced proficiency (3 to 4), yellow = basic to intermediate proficiency (2 to 3).

Section summary

In summary, we found that proficiency trends tend to move similarly across career level. As a workforce in total, the Journey level employees have a potential gap in Design competencies rated high importance.

When examining the proficiency of the workforce by community, the Construction community has potential proficiency gaps on important competencies at the Entry level. However, the high importance competencies at the Journey and Senior level largely had an *intermediate to advanced* or *advanced to expert* proficiency.

The Design community has potential proficiency gaps on important competencies at the Entry and Journey level. Senior level employees are proficient at high importance competencies. The Environment community has potential proficiency gaps on important competencies at the Entry level. Journey and Senior level employees are proficient at high importance competencies. The Facilities Sustainment community has potential proficiency gaps on important competencies at the Entry and Journey levels. Senior level employees are proficient at high importance competencies.

Therefore, FE leadership should consider using the proficiency analyses in this report as the impetus for developing proficiency standards. Once standards are set, results such as these can be used to discover whether and where deficiencies exist in the FE workforce.

Section 6: Intentions predictors

In this section we present the results of our analysis of respondent-provided intentions data. Our discussion focuses on how respondent intentions relate to continued professional development in the FE career field.

Retirement and Leaving Intentions

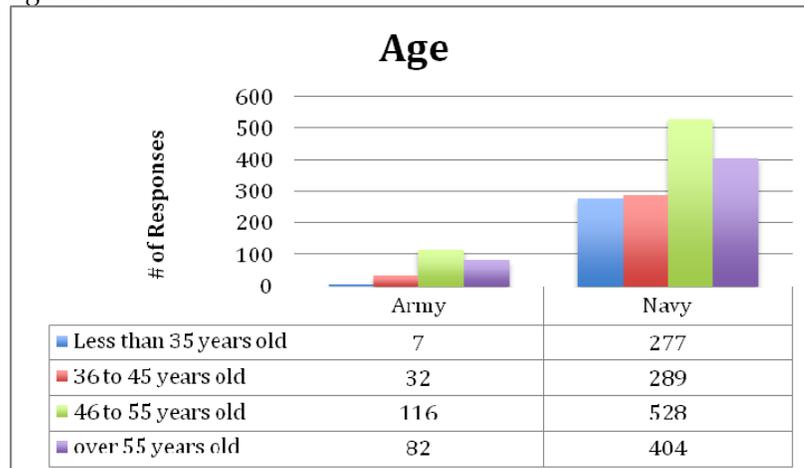
Leaving

First we asked each participant, *Do you intend to leave the FE career-field within the next 6 months?* This question was asked to get a better understanding of the short-term stability of the workforce. Only 3 percent of the respondents indicated that they plan to leave the FE career-field within the next 6 months.

Age

The largest age range category among FE respondents is between 46 and 55 years old. Many in the FE workforce are over 55 years old (Figure 3).

Figure 3 Age range of FE workforce



Retirement

Although most FE respondents indicate that they have more than 10 years until retirement, the Army and Navy could expect from respondents' answers that 26 percent and 16 percent, respectively, could retire in less than 4 years (Figure 4).

Figure 4: Years until retirement in the FE workforce



Competency boost

Results presented in Table 18 are derived from the following intentions question: *Select the top three competencies in which you plan to boost your proficiency during the next 12-month period.* The results are the tabulated responses for the Facilities Engineering community ranked according to how frequently they were chosen.

Design Engineering and Architecture, Technical Review, Leadership, Cost Estimating, Construction Management, and Contract Administration were the most frequently selected competencies in which Facilities Engineering respondents cited an intention to boost their proficiency in the next year. Most of these were also deemed as high importance competencies.

Among the lowest chosen competencies in which they intend to boost their proficiency, we found Closure, Navigation Sustainment, Integrity/Ethics, Disposal Planning, Credibility, Flexibility, and Demolition. The technical competencies that were rated lowest importance were those in the Disposal Unit of Competence. Interestingly, Integrity/Ethics, which is rated with the highest importance of all competencies, was not selected as something that respondents plan to boost over the next 12 months.

Table 18. Competencies in which FE respondents intend to boost their proficiency during the next 12 months

Competency	Number of Times Selected
Design Engineering and Architecture	433
Technical Review	391
Leadership	365
Cost Estimating	327
Construction Management	321
Contract Administration	279
Environmental Compliance Sustainment	211
Facilities Sustainment Project Management	200
Strategic Planning	165
Natural Resources and Environmental Management	155
Communication	154
Cooperation and Teamwork	143
Design Acquisition	138
Utilities Management	115
Critical Thinking	113
Civil Works Planning and Feasibility Studies	94
Business Operations	93
Regulatory	92
Real Property Management	90
Land Use Planning	87
Mission Focus	85
Life Long Learner	71
Identifying Work Requirements	58
Resource Management	55
Business Operations Engineering	54
Civil Works Sustainment	48
Real Property Accountability	47
Business Acumen	43
Investment Planning	38
Demolition	26
Flexibility	21
Credibility	15
Disposal Planning	14
Integrity/Ethics	13
Navigation Sustainment	11
Closure	10

Advancement and mentoring intentions

Responses to advancement and mentoring intentions-related questions are consistent between Army and Navy assessment participants (Figures 5 and 6). Respondents generally seem to be motivated to advance professionally, but are not interested in applying to graduate study courses, as indicated by the high percentage of negative and unsure responses to this intentions question.

Given the number of Unsure responses, respondents were undecided as to whether they intended to qualify for the next highest certification level within the next 6 months. Most respondents are not aware that there is an FE community of practice available on the DAU website. Overwhelmingly, most respondents are willing to mentor others.

Figure 5. Intentions of Army FE respondents

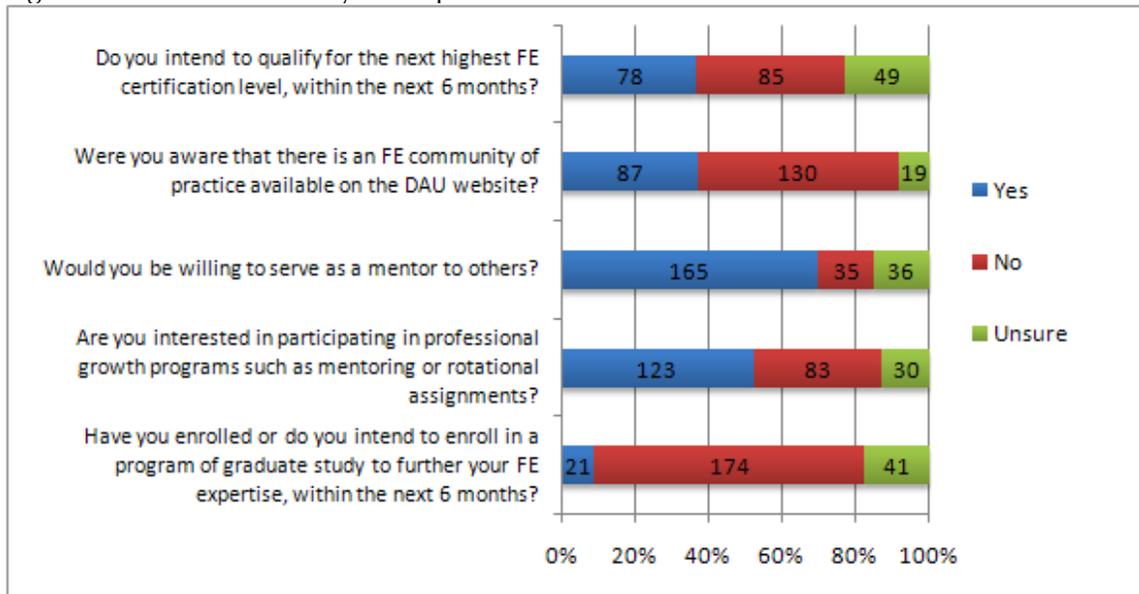
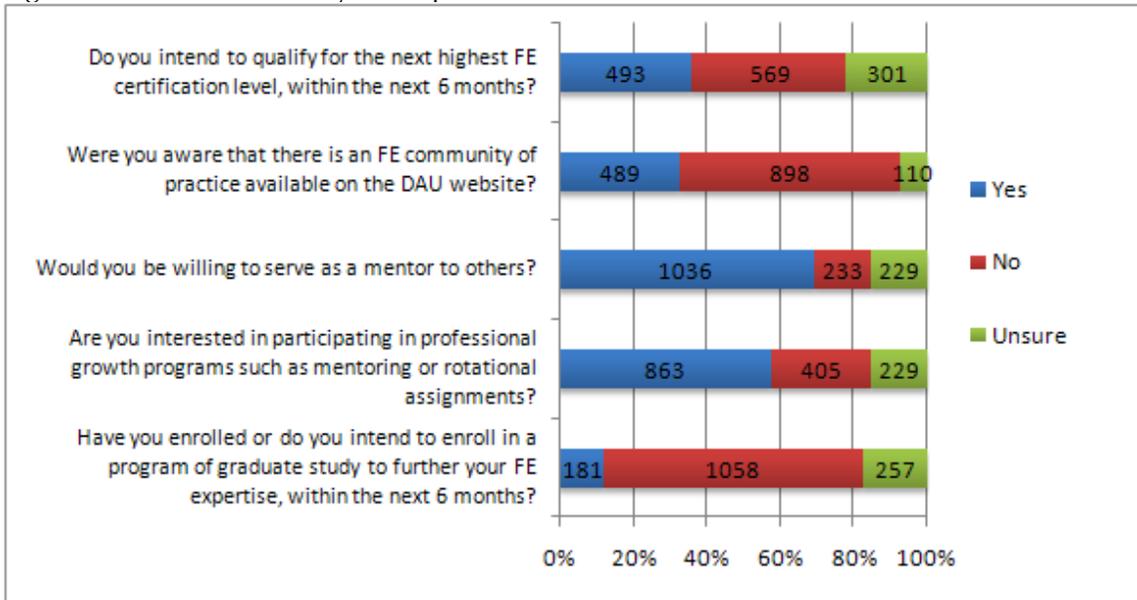


Figure 6. Intentions of Navy FE respondents



Section 7: Conclusion and next steps

Our analysis of employee-provided responses to the FE competency assessment suggests that the FE Competency Model captures technical competencies pertinent to each of the Facilities Engineering workforce communities. However, just as the workforce is divided into communities, so is the Competency Model through the Units of Competence.

The workforce communities generally do not find consensus on the competencies that are most important to their success on the job; competencies identified as high importance to one community are different from those considered to be high importance to another.

Professional competencies seem to be the most highly important competencies to all workforce communities and components. A large percentage of respondents report expert proficiency at all levels of certification for the professional competencies. Mean proficiency values increase with increasing certification level and are highest for professional competencies.

Facilities Engineering respondents at Journey and Senior levels generally report at least *intermediate* to *advanced* proficiency in the competencies of high importance to their respective communities; but a fraction of respondents report *basic to intermediate* proficiency or only an *awareness to basic proficiency* of some competencies.

Facilities Engineering respondents expressed relatively more intent to boost their proficiency in many of the high importance competencies. Our intentions analyses also indicate that respondents are willing to mentor others. Despite a general enthusiasm for professional growth, most respondents do not have a strong desire to attend graduate school. Respondents are

undecided about going to the next certification level in the next six months.

We recommend that FE management consider using our analysis results to do the following:

- Develop proficiency standards
- Develop gap-closure strategies for high importance competencies that may have lower proficiency ratings
- Consider developing mentoring programs
- Develop and increase awareness of the community of practice resources available on the DAU website.

Finally, we recommend that a strong emphasis be placed on the development of professional competencies. Responses to the assessment indicate that professional competencies captured in the FE model are universally important to the entire FE workforce. The high importance competencies may need to be boosted as the workforce ages and leadership experiences are lost to retirement.

Appendix A: FE Workforce Competency Model

Table 19. The Model

Unit of Competence	Competency	Element
Planning	Strategic Planning	Element 1. Identify operation readiness requirements (e.g. ordnance delivery, en route, bid down) across installations to assess capabilities and gaps of infrastructure.
		Element 2. Work with Acquisition Category (ACAT) Program Executive Officers (PEOS) for new platforms and major system upgrades to identify requirements during the weapon acquisition timeline in order to deliver infrastructure concurrently with platform and system upgrade delivery.
		Element 3. Develop alternatives and perform impact analysis for the purpose of making basing decision to include joint basing.
	Land Use Planning	Element 4. Develop and maintain a land use plan in accordance with federal, state, and local land use compatibility laws and DoD policies to guide development or installation infrastructure and analyze potential impact of encroachment on military mission.
		Element 5. Develop Real Estate Land Management plans, and execute acquisition of real estate to ensure the government owns or has the proper rights to properties associated with mission execution.
		Element 6. Perform geospatial analysis to identify land use compatibility, site alternatives, and man-made and environmental constraints.
		Element 7. Use compatibility laws and applicable guidelines to define clear zone, accident potential zones and contour zones to address safety and noise issues.
		Element 8. Use Real Estate acquisition and appraisal regulations and techniques to acquire property and facilities that meet mission requirements to include leasing agreements, enhanced lease usage and other methods.
		Element 9. Incorporate sustainability into land use planning in order to comply with executive orders and other energy sustainability policies.
	Civil Works Planning and Feasibility Studies	Element 10. Conduct feasibility studies or other decision documents for water resource development projects and special projects that communities have submitted through congressional channels to identify potential solutions for water resource items.
		Element 11. Conduct Real Estate Planning, Acquisition, Appraisal, P.L. 91-646 Relocation Benefits studies, Utility/Facility Relocation studies Agency Tech Reviews, and other real estate functions to support execution of civil works projects.
	Investment Planning	Element 12. Develop and maintain installation comprehensive plans (to include master and capital improvement plans, and real estate acquisition plans which identify planned acquisition, sustainment and disposal actions to ensure installations real property is constructed, maintained, and disposed of in accordance with (IAW) mission requirement and applicable regulations.
		Element 13. Identify and analyze investment alternatives to include siting alternatives, fund sources, alternative financing solutions, operational considerations and life cycle cost to determine best investment decision.
		Element 14. Evaluate total ownership cost (TOC) to include economic analysis of investment alternatives in the management of sustainment functions.

		<p>Element 15. Develop programming documents for various typed of government funded projects to include Military or Civil Works Projects, Operation and Maintenance (SRM) projects, special projects, Demolition or Disposal projects, Research and Development (RDT&E) projects etc, to ensure that congressional or other funded can be accurately planned and allocated in a timely manner to acquire real property facilities to meet mission requirements.</p> <p>Element 16. Obtain safety approval for all project sites, designs, and construction activities as required by DoD or service safety regulations.</p>
	Real Property Management	Element 17. Manage building space across installations and/or regions to increase facility utilization and identify facility consolidation and disposal actions.
Design	Design Engineering and Architecture	Element 18. Independently prepare discipline specific scientific, engineering or architectural studies, designs and specifications to meet or exceed criteria codes established for a facility acquisition.
		Element 19. Determine and apply applicable criteria (LEED, Leadership in Energy and Environmental Design, Anti Terrorism Force Protection (ATFP), energy) safety, codes, and standards to acquisition of real property facilities to ensure the highest quality design of products that meets or exceeds customer requirements.
		Element 20. Include Facility Systems Safety (FASS) in design of projects to ensure life cycle safety and sustainability as well as reduced project cost.
		Element 21. Prepare environmental permits (Resource Conservation and Recovery Act (RCRA) and Toxic Substance Control Act (TSCA), water, storm water) to meet state, federal, and local requirements.
		Element 22. Establish criteria and prepare designs for infrastructure protection (physical security, ATFB, electronic security) to meet or exceed current standards and customer requirements.
	Cost Estimating	Element 23. Prepare project cost estimates, economic analyses, benefit cost analyses that are accurate and justify projects or programs.
		Element 24. Prepare construction cost estimates from design documents to ensure projects are within budgeted amounts to ensure facilities can be acquired within programmed costs.
	Design Acquisition	Element 25. Prepare design acquisition strategies and plans, solicit, evaluate and select A-E firms under Brooks Act to develop design documents in accordance with project criteria leading to the design and construction of real property facilities.
		Element 26. Prepare and evaluate scopes of work and proposals for design build contracts for acquisition of facilities that result in projects that meet or exceed criteria, are under budget, and provide ahead of schedule.
	Technical Review	Element 27. Independently review engineering, scientific, or architecture products related to real property acquisition to ensure deliverable meets or exceeds criteria and stakeholder and customer requirements.
		Element 28. Provide technical support during/after construction to ensure the project meets or exceeds criteria budget and schedule.
		Element 29. Obtain/Provide detailed systems safety engineering reviews of design to verify that industrial safety has been considered and included in the design for the project.
Construction	Contract Administration	Element 30. Utilize appropriate Federal Acquisitions Regulations (FARs) and construction contract clauses to ensure the administration of construction contracts that is delivered on-time, on budget and meets mission requirements.
		Element 31. Develop effective change management controls to include the proper use of remedy-granting construction clauses to ensure a construction project that is delivered on-time, on budget and meets mission requirements.
	Construction Management	Element 32. Develop a quality management program to include contractor quality control and government quality assurance to ensure that a construction project that is delivered on-time, on-budget and meets mission requirements.
		Element 33. Develop effective change management controls to include the proper use of remedy-granting construction clauses to ensure a construction project that is delivered on-time, on budget and meets mission requirements.
		Element 34. Verify that requirements from EM 385-1-1 and 29 CFR 1926/1910 are included in contract documents to assure safe working conditions are provided on the project.

		Element 35. Include industrial safety evaluations in implementation of quality control program to assure safe working conditions are provided on the project.
		Element 36. Execute transfer and acceptance documents to ensure timely delivery of the completed construction project to the end user and/or owner.
Disposal	Disposal Planning	Element 37. Develop strategies of disposal with cost environmental historical analysis, etc, considerations and determine best alternative using economic analysis and established criteria.
	Demolition	Element 38. Properly dispose of real property components maximizing green principles and environmental considerations as well as maximizing salvage values to the government.
	Closure	Element 39. Execute environmental closure permits that meet or exceed all local, state, and federal requirements.
	Real Property Accountability	Element 40. Remove property from the real property inventory through exchanging or demolition, to the maximum benefit of the government.
	Utilities Management	Element 41. Manage and negotiate utility rates with utilities provider in order to manage energy costs.
Sustainment	Identifying Work Requirements	Element 42. Effectively and safety operate utility infrastructure or installations to ensure continuity of service and efficiency of operation.
	Business Operations	Element 43. Manage and execute energy program to meet energy mandates in executive orders and laws.
		Element 44. Determine requirements, budgets, priorities, and future uses for facilities to support the war fighters and tenants.
		Element 45. Develop an annual facility repair and modernization program as a plan to fund, design, and execute projects.
	Business Operations Engineering	Element 46. Receive and process customer work requests in accordance with work classification guidance to route work to the appropriate vendor.
	Facilities Sustainment Project Management	Element 47. Develop work descriptions and cost estimates (labor, material and equipment) to accomplish work in most effective and efficient method for work not requiring extensive design.
		Element 48. Accurately track the status of service orders and work requests to ensure effective and timely execution and use of resources.
		Element 49. Develop scope of work and cost estimates for all engineering projects for inclusion in annual execution plan.
		Element 50. Assess facility situation and develop technical solutions in order to classify work and recommended method of execution based on complexity and cost.
	Resource Management	Element 51. Perform condition assessments to identify infrastructure deficiencies which could negatively impact mission safety or quality of life.
		Element 52. Perform physical inventories of all real property assets in accordance with DODI 4165.14 and service its policies.
		Element 53. Update and maintain real property information in the real property inventory and maintenance management systems upon completion of work and surveys/ assessments in accordance with Executive Orders and DOD instruction.
		Element 54. Establish a resource management and budget for money, personnel, and equipment that will accomplish installation operations and maintenance missions at a specified level of service.
		Element 55. Acquire and manage services for operation and maintenance of real property facilities to execute projects or programs within budget and schedule.
	Civil Works Sustainment	Element 56. Provide management, operation, preventative and major maintenance of all electrical, mechanical, and structural features at flood control dams, navigation dams, hydro-power plants, and high voltage switchyards for the purposes of flood control, power production and transmission, navigation channel elevation regulation, recreation, water quality.

	Navigation Sustainment	Element 57. Develop budget information, schedules, and perform channel maintenance activities on commercially navigable waterways to assure navigation routes are available.
		Element 58. Provide specialized technical expertise and engineering service to accomplish major and non-routine maintenance activities at navigation facilities.
	Environmental Compliance Sustainment	Element 59. Ensure facility compliance with air, water, solid waste, hazardous water, and other environmental requirements.
		Element 60. Coordinate implementation of Environmental Management System IAW Executive Order 13423 to integrate environmental sustainment into installation management.
	Natural Resources and Environmental Management	Element 63. Assess environmental impacts (including protecting wetlands, waters, forests, wildlife, and cultural resources) for inclusion in the environmental management system.
		Element 64. Determine availability of project lands and waters for disposal, leases, licenses, or other out grants. Operate, maintain, and renovate recreation areas, roads, trails, grounds, water, and wastewater treatment systems, and related project facilities.
		Element 65. Manage, plan, organize, and operate programs to respond to natural disasters, national emergencies, and hazardous substance spills.
	Regulatory	Element 64. Evaluate permit applications for work in waters of the United States, and take appropriate action in cases of unauthorized activities to assure the protection and preservation of waters of the United States.
Professional	Leadership	Element 65. Inspire and foster team commitment to establish and accomplish goals.
	Business Acumen	Element 66. Use technical knowledge, expertise, innovative technology, and available resources to create a high-performing, mission-oriented organization.
	Life Long Learner	Element 67. Seek continuous learning to integrate or bridge changing standards and technology and infuse new knowledge and skills into the workplace.
	Integrity/Ethics	Element 68. Behave in an honest, fair, and ethical manner; show consistency in words and actions; model high standards of ethics.
	Flexibility	Element 69. Rapidly adapt to new information, changing conditions, or unexpected obstacles.
	Credibility	Element 70. Capable of making official claims and pronouncements; believability is based on technical competence, accountability, recognition of own limitations; dependable; produces consistently high quality results.
	Cooperation and Teamwork	Element 71. Develop and maintain effective working relationships with others and contribute to a positive team atmosphere that fosters cooperation, trust, and group identity.
	Critical Thinking	Element 72. Using analytical or objective methodology to solve complex problems that lead to a conclusion.
	Communication	Element 73. Effectively listen, manage, and disseminate information (written & oral) to achieve a common understanding leading to mission success.
	Mission Focus	Element 74. Anticipates and meets the needs of both internal and external customers and stakeholders.

Appendix B: Frequency, Criticality, and Proficiency for All FE

Table 20. Frequency, Criticality, and Proficiency for all FE

Unit	Competency	Entry			Journey			Senior			Proficiency		
		Frequency	Criticality	Importance	Frequency	Criticality	Importance	Frequency	Criticality	Importance	Entry	Journey	Senior
Planning	1 Strategic Planning	2.07	2.10		2.28	2.21		2.55	2.57		1.81	2.23	2.75
	2 Land Use Planning	2.22	2.27		2.26	2.27		2.31	2.40		1.81	2.05	2.28
	3 Civil Works Planning / Feasibility Studies	2.03	2.10		1.99	2.07		2.11	2.28		1.78	1.91	2.19
	4 Investment Planning	2.62	2.64		2.67	2.72		2.82	2.95		2.03	2.37	2.82
	5 Real Property Management	2.13	2.13		2.30	2.31		2.31	2.42		1.76	2.11	2.52
Design	6 Design Engineering and Architecture	2.48	2.73		2.69	2.80		2.83	3.02	●	2.07	2.38	2.85
	7 Cost Estimating	2.94	2.98		3.03	3.02	●	3.10	3.25	●	2.45	2.84	3.34
	8 Design Acquisition	2.65	2.91		2.78	2.93		3.03	3.22	●	2.14	2.68	3.37
	9 Technical Review	2.93	3.08	●	3.07	3.10	●	3.14	3.34	●	2.39	2.91	3.42
Construction	10 Contract Administration	2.52	2.85		2.69	2.89		2.89	3.15	●	1.95	2.40	2.97
	11 Construction Management	2.77	2.18		2.93	2.63		2.83	2.93		2.14	2.58	2.89
Disposal	12 Disposal Planning	2.16	2.43		2.15	2.37		2.33	2.59		1.71	2.08	2.60
	13 Demolition	2.12	2.52		2.21	2.41		2.21	2.46		1.73	2.11	2.43
	14 Closure	2.27	2.82		2.13	2.51		2.22	2.80		1.89	2.13	2.46
	15 Real Property Accountability	1.94	2.15		2.01	2.27		2.17	2.42		1.69	2.00	2.32
	16 Utilities Management	1.80	1.95		1.58	2.09		1.62	2.25		1.41	1.62	1.84
Sustainment	17 Identifying Work Requirements	2.57	2.78		2.43	2.78		2.38	2.87		2.11	2.32	2.56
	18 Business Operations	2.36	2.51		2.27	2.57		2.61	2.68		1.81	2.03	2.62
	19 Business Operations Engineering	2.49	2.63		2.57	2.52		2.56	2.84		1.97	2.33	2.71
	20 Facilities Sustainment PM	2.78	2.85		2.81	2.85		2.95	3.05	●	2.35	2.78	3.31
	21 Resource Management	2.37	2.50		2.29	2.56		2.47	2.73		1.94	2.25	2.70
	22 Civil Works Sustainment	2.04	2.51		1.99	2.37		2.06	2.64		2.02	1.96	2.23
	23 Navigation Sustainment	2.06	2.20		1.98	2.16		2.09	2.51		1.88	1.99	2.23
	24 Enviro Compliance Sustainment	2.64	2.96		2.76	2.86		2.75	2.99		2.07	2.38	2.73
	25 Natural Resources / Enviro Mgmt	2.39	2.59		2.27	2.55		2.33	2.76		1.89	2.16	2.45
	26 Regulatory	2.09	2.57		1.99	2.45		2.03	2.62		2.09	2.04	2.19
Professional	27 Leadership	3.37	3.45	●	3.58	3.50	●	4.08	3.96	●	2.84	3.30	3.92
	28 Business Acumen	3.32	3.45	●	3.51	3.48	●	3.98	3.97	●	2.84	3.28	3.93
	29 Life Long Learner	3.40	3.41	●	3.42	3.45	●	3.71	3.72	●	2.99	3.29	3.68
	30 Integrity/Ethics	4.50	4.37	●	4.56	4.37	●	4.68	4.53	●	3.99	4.20	4.48
	31 Flexibility	4.05	3.99	●	4.08	4.02	●	4.25	4.18	●	3.56	3.88	4.18
	32 Credibility	3.41	3.43	●	3.54	3.63	●	3.83	3.95	●	2.98	3.50	4.04
	33 Cooperation and Teamwork	4.21	4.16	●	4.34	4.20	●	4.44	4.37	●	3.77	4.03	4.32
	34 Critical Thinking	3.77	3.81	●	3.87	3.82	●	4.08	4.10	●	3.42	3.74	4.20
	35 Communication	3.89	4.03	●	4.10	4.05	●	4.32	4.27	●	3.56	3.84	4.25
	36 Mission Focus	3.71	3.80	●	4.01	4.00	●	4.27	4.23	●	3.19	3.74	4.19

The dots indicate relative importance of each competency according to respondents: green = high importance; yellow = medium importance; no dot = lower importance. The shading indicates relative proficiency of each competency: light green = advanced to expert proficiency (4 or above), green = intermediate to advanced proficiency (3 to 4), yellow = basic to intermediate proficiency (2 to 3).

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Appendix C: Army Frequency, Criticality, and Proficiency

Table 21. Army Frequency, Criticality, and Proficiency

Unit	Comp #	Competency	Entry			Journey			Senior			Proficiency		
			Frequency	Criticality	Importance	Frequency	Criticality	Importance	Frequency	Criticality	Importance	Entry	Journey	Senior
Planning	1	Strategic Planning	1.76	1.74		2.76	2.53		2.46	2.38		1.63	2.68	2.69
	2	Land Use Planning	1.93	1.92		2.01	1.98		2.38	2.44		1.57	1.95	2.30
	3	Civil Works Planning and Feasibility Studies	2.47	2.37		2.46	2.31		2.63	2.65		2.33	2.75	2.49
	4	Investment Planning	2.41	2.38		2.65	2.90		2.70	2.83		1.92	2.47	2.81
	5	Real Property Management	2.50	2.50		2.90	2.54		2.27	2.39		2.10	2.64	2.67
Design	6	Design Engineering and Architecture	2.28	2.42		2.69	2.65		2.79	2.99		2.05	2.40	2.82
	7	Cost Estimating	3.07	3.05		2.72	2.81		3.04	3.25		2.66	2.60	3.23
	8	Design Acquisition	2.77	3.10	●	3.03	3.12	●	3.06	3.30	●	2.68	2.98	3.50
	9	Technical Review	2.74	2.95		3.04	3.01	●	3.12	3.41	●	2.79	3.11	3.50
Construction	10	Contract Administration	2.44	2.53		3.32	3.50	●	3.14	3.46	●	2.15	2.86	3.23
	11	Construction Management	2.84	2.51		3.13	3.07	●	2.69	2.91		2.25	2.92	2.86
Disposal	12	Disposal Planning	1.70	2.30		2.56	2.50		2.14	2.38		1.64	2.67	2.64
	13	Demolition	1.63	1.75		3.08	2.21	●	2.10	2.44		1.50	2.67	2.45
	14	Closure	1.78	2.11		3.00	2.78	●	1.96	2.57		1.50	2.60	2.35
	15	Real Property Accountability	1.20	1.71		2.44	2.10		2.07	2.41		1.60	1.91	2.45
	16	Utilities Management	1.50	1.71		2.20	3.00	●	1.45	2.33		1.30	1.71	1.88
Sustainment	17	Identifying Work Requirements	2.25	2.20		3.11	3.40	●	2.23	2.86		1.92	3.08	2.57
	18	Business Operations	2.82	2.55		3.28	3.05	●	2.46	2.80		2.17	2.54	2.60
	19	Business Operations Engineering	2.14	2.38		3.33	2.91	●	2.67	2.70		1.91	2.83	2.76
	20	Facilities Sustainment Project Management	2.93	2.88		3.06	3.22	●	2.89	2.96		2.59	3.19	3.34
	21	Resource Management	2.70	2.87		2.84	2.87		2.45	2.71		2.20	2.78	2.82
	22	Civil Works Sustainment	2.22	2.40		4.00	3.89	●	2.41	3.06	●	2.36	3.30	2.61
	23	Navigation Sustainment	2.67	2.30		4.08	3.57	●	2.62	3.10	●	2.14	3.00	2.55
	24	Environmental Compliance Sustainment	2.42	2.61		2.89	2.60		2.48	2.91		1.93	2.40	2.57
	25	Natural Resources and Environmental Management	2.62	2.73		2.15	2.35		2.26	2.87		2.17	2.48	2.50
	26	Regulatory	2.11	2.18		2.50	2.63		2.02	2.64		2.14	1.89	2.14
Professional	27	Leadership	3.77	4.00	●	4.15	3.96	●	4.44	4.28	●	3.77	3.77	4.21
	28	Business Acumen	3.52	3.60	●	3.88	3.96	●	4.38	4.28	●	3.52	3.88	4.17
	29	Life Long Learner	3.59	3.59	●	3.67	3.85	●	3.89	3.91	●	3.59	3.63	3.89
	30	Integrity/Ethics	4.50	4.45	●	4.81	4.56	●	4.75	4.69	●	4.18	4.48	4.64
	31	Flexibility	4.14	4.09	●	4.22	4.19	●	4.24	4.27	●	3.82	4.26	4.25
	32	Credibility	3.45	3.48	●	3.77	3.73	●	3.90	4.03	●	3.24	3.73	4.19
	33	Cooperation and Teamwork	4.32	4.09	●	4.37	4.30	●	4.62	4.53	●	4.23	4.33	4.43
	34	Critical Thinking	3.77	3.86	●	4.20	4.08	●	4.13	4.23	●	3.77	4.16	4.26
	35	Communication	4.18	4.23	●	4.33	4.22	●	4.50	4.42	●	3.95	4.19	4.38
	36	Mission Focus	4.00	4.00	●	4.26	4.30	●	4.40	4.38	●	3.77	4.15	4.28

The dots indicate relative importance of each competency according to respondents: green = high importance; yellow = medium importance; no dot = lower importance. The shading indicates relative proficiency of each competency: light green = advanced to expert proficiency (4 or above), green = intermediate to advanced proficiency (3 to 4), yellow = basic to intermediate proficiency (2 to 3).

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Appendix D: Navy Frequency, Criticality, and Proficiency

Table 22. Navy Frequency, Criticality, and Proficiency

Unit	Comp #	Competency	Entry			Journey			Senior			Proficiency		
			Frequency	Criticality	Importance	Frequency	Criticality	Importance	Frequency	Criticality	Importance	Entry	Journey	Senior
Planning	1	Strategic Planning	2.10	2.14		2.26	2.19		2.56	2.60		1.81	2.21	2.75
	2	Land Use Planning	2.26	2.31		2.27	2.29		2.29	2.39		1.83	2.06	2.27
	3	Civil Works Planning and Feasibility Studies	1.98	2.07		1.96	2.07		1.94	2.16		1.72	1.88	2.09
	4	Investment Planning	2.65	2.67		2.67	2.71		2.84	2.97		2.05	2.37	2.82
	5	Real Property Management	2.09	2.11		2.27	2.30		2.31	2.42		1.73	2.09	2.48
Design	6	Design Engineering and Architecture	2.51	2.76		2.69	2.81		2.84	3.02	●	2.07	2.39	2.85
	7	Cost Estimating	2.93	2.97		3.05	3.03	●	3.10	3.25	●	2.42	2.86	3.35
	8	Design Acquisition	2.65	2.88		2.77	2.93		3.02	3.20	●	2.08	2.66	3.34
	9	Technical Review	2.96	3.09	●	3.07	3.11	●	3.14	3.32	●	2.36	2.90	3.40
Construction	10	Contract Administration	2.53	2.90		2.65	2.85		2.82	3.07	●	1.93	2.37	2.90
	11	Construction Management	2.77	2.14		2.92	2.61		2.86	2.93		2.13	2.56	2.90
Disposal	12	Disposal Planning	2.23	2.46		2.13	2.36		2.37	2.64		1.73	2.06	2.58
	13	Demolition	2.18	2.60		2.17	2.42		2.23	2.46		1.76	2.08	2.42
	14	Closure	2.35	2.92		2.10	2.50		2.28	2.86		1.96	2.11	2.49
	15	Real Property Accountability	2.00	2.20		1.99	2.28		2.19	2.42		1.70	2.00	2.29
	16	Utilities Management	1.85	2.00		1.55	2.04		1.67	2.22		1.44	1.62	1.81
Sustainment	17	Identifying Work Requirements	2.63	2.85		2.39	2.75		2.39	2.85		2.15	2.28	2.55
	18	Business Operations	2.31	2.63		2.22	2.49		2.64	2.85		1.78	2.01	2.62
	19	Business Operations Engineering	2.49	2.49		2.53	2.55		2.52	2.67		1.95	2.30	2.70
	20	Facilities Sustainment Project Management	2.76	2.84		2.79	2.83		2.95	3.06		2.32	2.75	3.29
	21	Resource Management	2.34	2.46		2.25	2.54		2.47	2.73		1.92	2.22	2.66
	22	Civil Works Sustainment	2.03	2.57		1.85	2.27		1.96	2.53		1.96	1.88	2.12
	23	Navigation Sustainment	1.93	2.19		1.86	2.07		1.93	2.35		1.81	1.92	2.13
	24	Environmental Compliance Sustainment	2.67	3.00		2.75	2.88		2.80	3.00		2.09	2.38	2.76
	25	Natural Resources and Environmental Management	2.37	2.58		2.27	2.56		2.34	2.73		1.86	2.14	2.43
	26	Regulatory	2.09	2.65		1.97	2.44		2.03	2.62		2.08	2.04	2.21
Professional	27	Leadership	3.31	3.37	●	3.54	3.47	●	4.00	3.89	●	2.71	3.27	3.85
	28	Business Acumen	3.30	3.43	●	3.49	3.45	●	3.88	3.89	●	2.75	3.24	3.87
	29	Life Long Learner	3.38	3.39	●	3.41	3.43	●	3.66	3.67	●	2.91	3.27	3.63
	30	Integrity/Ethics	4.49	4.36	●	4.54	4.36	●	4.66	4.49	●	3.96	4.18	4.45
	31	Flexibility	4.03	3.97	●	4.08	4.01	●	4.25	4.16	●	3.53	3.85	4.17
	32	Credibility	3.40	3.43	●	3.52	3.62	●	3.80	3.93	●	2.95	3.48	4.00
	33	Cooperation and Teamwork	4.19	4.16	●	4.34	4.20	●	4.40	4.33	●	3.71	4.01	4.29
	34	Critical Thinking	3.77	3.80	●	3.85	3.81	●	4.06	4.07	●	3.38	3.71	4.18
	35	Communication	3.86	4.01	●	4.08	4.04	●	4.28	4.23	●	3.51	3.82	4.22
	36	Mission Focus	3.68	3.78	●	3.99	3.98	●	4.23	4.19	●	3.12	3.71	4.17

The dots indicate relative importance of each competency according to respondents: green = high importance; yellow = medium importance; no dot = lower importance. The shading indicates relative proficiency of each competency: light green = advanced to expert proficiency (4 or above), green = intermediate to advanced proficiency (3 to 4), yellow = basic to intermediate proficiency (2 to 3).

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Appendix E: Construction Community Frequency, Criticality, and Proficiency

Table 23. Construction Community Frequency, Criticality, and Proficiency

Unit	Competency	Entry			Journey			Senior			Proficiency		
		Frequency	Criticality	Importance	Frequency	Criticality	Importance	Frequency	Criticality	Importance	Entry	Journey	Senior
Planning	1 Strategic Planning	2.04	1.95		2.36	2.18		2.39	2.57		1.98	2.27	2.80
	2 Land Use Planning	2.23	2.30		2.15	2.21		2.10	2.28		1.80	1.93	2.19
	3 Civil Works Planning and Feasibility Studies	1.68	1.77		1.70	1.91		1.70	1.98		1.54	1.67	1.89
	4 Investment Planning	3.16	3.06	●	2.88	2.90		3.00	3.13	●	2.31	2.55	2.95
	5 Real Property Management	1.78	1.61		2.24	2.33		2.12	2.41		1.65	2.10	2.58
Design	6 Design Engineering and Architecture	2.29	2.64		2.49	2.63		2.75	2.90		1.89	2.26	2.76
	7 Cost Estimating	2.77	3.01	●	2.88	2.90		2.99	3.15	●	2.58	2.88	3.38
	8 Design Acquisition	2.25	2.56		2.83	2.86		3.06	3.27	●	2.07	2.82	3.43
	9 Technical Review	3.17	3.28	●	3.38	3.30	●	3.61	3.68	●	2.39	3.22	3.77
Construction	10 Contract Administration	3.02	3.21	●	3.42	3.39	●	3.79	3.86	●	2.35	2.97	3.80
	11 Construction Management	3.42	2.64	●	3.73	3.24	●	3.85	3.72	●	2.68	3.38	3.91
Disposal	12 Disposal Planning	2.11	2.50		1.76	2.34		2.07	2.25		1.95	1.80	2.35
	13 Demolition	2.15	2.71		2.19	2.45		2.26	2.34		1.86	2.04	2.40
	14 Closure	2.35	2.94		2.08	2.58		2.48	2.77		1.90	2.09	2.45
	15 Real Property Accountability	1.80	2.19		2.18	2.44		2.27	2.39		1.89	2.16	2.41
	16 Utilities Management	1.38	1.88		1.50	2.00		1.39	1.94		1.88	1.67	1.70
	17 Identifying Work Requirements	2.50	3.00	●	2.52	2.97		2.26	2.80		2.21	2.43	2.48
Sustainment	18 Business Operations	2.37	2.89		2.07	2.51		2.27	2.59		1.95	2.00	2.48
	19 Business Operations Engineering	2.27	2.75		2.39	2.63		2.41	2.56		1.82	2.31	2.79
	20 Facilities Sustainment Project Management	2.65	2.98		2.69	2.82		2.75	2.94		2.40	2.81	3.27
	21 Resource Management	2.08	2.60		2.09	2.61		2.15	2.50		1.90	2.30	2.49
	22 Civil Works Sustainment	2.11	2.75		1.81	2.50		1.78	2.44		2.33	1.82	2.18
	23 Navigation Sustainment	1.93	2.06		1.81	2.06		1.81	2.26		1.85	2.06	2.11
	24 Environmental Compliance Sustainment	2.24	2.87		2.32	2.68		2.50	2.77		1.97	2.12	2.50
	25 Natural Resources and Environmental Management	2.06	2.47		1.97	2.43		2.03	2.53		1.72	1.99	2.25
	26 Regulatory	1.63	2.88		1.71	2.31		1.90	2.60		2.50	1.84	2.01
	Professional	27 Leadership	3.38	3.58	●	3.50	3.45	●	4.16	3.97	●	2.76	3.38
28 Business Acumen		3.22	3.57	●	3.37	3.34	●	4.07	4.08	●	2.71	3.24	3.97
29 Life Long Learner		3.31	3.61	●	3.31	3.40	●	3.78	3.67	●	2.83	3.30	3.65
30 Integrity/Ethics		4.50	4.32	●	4.49	4.29	●	4.73	4.54	●	3.89	4.18	4.43
31 Flexibility		3.98	3.93	●	4.02	3.92	●	4.27	4.20	●	3.50	3.92	4.14
32 Credibility		3.05	3.30	●	3.52	3.48	●	3.95	4.09	●	2.79	3.46	4.05
33 Cooperation and Teamwork		4.07	4.09	●	4.31	4.19	●	4.48	4.39	●	3.70	4.08	4.28
34 Critical Thinking		3.43	3.55	●	3.72	3.75	●	4.11	4.11	●	3.23	3.66	4.11
35 Communication		3.80	4.00	●	4.06	3.99	●	4.30	4.27	●	3.48	3.89	4.18
36 Mission Focus		3.55	3.66	●	3.89	4.02	●	4.28	4.27	●	3.11	3.80	4.19

The dots indicate relative importance of each competency according to respondents: green = high importance; yellow = medium importance; no dot = lower importance. The shading indicates relative proficiency of each competency: light green = advanced to expert proficiency (4 or above), green = intermediate to advanced proficiency (3 to 4), yellow = basic to intermediate proficiency (2 to 3).

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Appendix F: Design Community Frequency, Criticality, and Proficiency

Table 24. Design Community Frequency, Criticality, and Proficiency

Unit	Comp #	Competency	Entry			Journey			Senior			Proficiency		
			Frequency	Criticality	Importance	Frequency	Criticality	Importance	Frequency	Criticality	Importance	Entry	Journey	Senior
Planning	1	Strategic Planning	1.96	2.05		1.91	2.01		2.44	2.43		1.80	1.96	2.47
	2	Land Use Planning	1.88	1.94		2.14	2.23		2.20	2.30		1.64	2.04	2.02
	3	Civil Works Planning and Feasibility Studies	1.88	1.86		1.95	2.00		2.13	2.24		1.83	1.75	2.05
	4	Investment Planning	2.26	2.31		2.40	2.61		2.63	2.76		2.00	2.20	2.54
	5	Real Property Management	1.86	2.29		2.02	2.22		2.08	2.12		1.80	2.02	2.22
Design	6	Design Engineering and Architecture	3.27	3.54	●	3.28	3.34	●	3.42	3.48	●	2.63	2.96	3.26
	7	Cost Estimating	3.38	3.59	●	3.25	3.29	●	3.28	3.46	●	2.88	2.97	3.39
	8	Design Acquisition	3.28	3.72	●	3.23	3.55	●	3.50	3.67	●	2.41	3.13	3.83
	9	Technical Review	3.23	3.58	●	3.34	3.54	●	3.44	3.59	●	2.85	3.29	3.66
Construction	10	Contract Administration	2.25	2.89		2.44	2.95		2.79	3.06	●	1.90	2.36	2.76
	11	Construction Management	2.51	1.85		2.49	2.40		2.60	2.58	●	1.89	2.28	2.57
Disposal	12	Disposal Planning	1.77	2.41		1.88	2.10		2.06	2.39		1.48	1.86	2.22
	13	Demolition	2.00	2.48		2.05	2.33		2.17	2.43		1.62	1.91	2.24
	14	Closure	1.67	2.50		1.80	2.24		1.76	2.53		1.38	1.83	1.83
	15	Real Property Accountability	1.25	1.83		1.77	2.16		2.07	2.28		1.36	1.64	1.99
	16	Utilities Management	1.25	1.11		1.32	1.81		1.38	2.12		1.11	1.42	1.55
Sustainment	17	Identifying Work Requirements	1.90	2.46		2.06	2.46		2.10	2.63		2.00	2.09	2.33
	18	Business Operations	2.30	2.63		2.15	2.52		2.49	2.77		1.79	1.93	2.40
	19	Business Operations Engineering	2.23	2.46		2.19	2.35		2.44	2.58		1.72	2.14	2.43
	20	Facilities Sustainment Project Management	2.96	3.09	●	2.65	2.81		2.93	3.07	●	2.49	2.74	3.23
	21	Resource Management	2.16	2.44		2.11	2.58		2.40	2.62		1.85	2.24	2.54
	22	Civil Works Sustainment	1.50	3.00	●	1.38	1.96		1.97	2.52		2.00	1.69	2.12
	23	Navigation Sustainment	2.17	2.95		2.00	2.13		2.50	2.79		2.60	1.89	2.50
	24	Environmental Compliance Sustainment	2.26	2.91		2.30	2.47		2.15	2.49		1.74	1.99	2.09
	25	Natural Resources and Environmental Management	1.76	2.47		1.90	2.18		2.06	2.50		1.55	1.84	1.93
	26	Regulatory	2.29	2.70		1.65	1.77		1.96	2.57		1.85	1.50	1.84
Professional	27	Leadership	3.47	3.77	●	3.63	3.60	●	4.04	3.91	●	3.00	3.20	3.82
	28	Business Acumen	3.47	3.69	●	3.67	3.72	●	3.97	3.91	●	3.00	3.48	3.93
	29	Life Long Learner	3.47	3.42	●	3.69	3.73	●	3.79	3.78	●	3.31	3.53	3.79
	30	Integrity/Ethics	4.74	4.61	●	4.55	4.32	●	4.66	4.55	●	4.45	4.18	4.50
	31	Flexibility	4.08	4.18	●	4.15	4.06	●	4.20	4.13	●	3.84	3.89	4.19
	32	Credibility	3.76	3.66	●	3.76	3.85	●	3.71	3.86	●	3.22	3.67	4.00
	33	Cooperation and Teamwork	4.38	4.41	●	4.39	4.23	●	4.42	4.34	●	4.00	4.06	4.33
	34	Critical Thinking	4.13	4.29	●	4.08	3.96	●	4.05	4.11	●	3.68	3.85	4.20
	35	Communication	3.97	4.26	●	4.15	4.11	●	4.27	4.23	●	3.64	3.81	4.25
	36	Mission Focus	3.78	3.97	●	4.07	4.06	●	4.21	4.18	●	3.16	3.74	4.18

The dots indicate relative importance of each competency according to respondents: green = high importance; yellow = medium importance; no dot = lower importance. The shading indicates relative proficiency of each competency: light green = advanced to expert proficiency (4 or above), green = intermediate to advanced proficiency (3 to 4), yellow = basic to intermediate proficiency (2 to 3).

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Appendix G: Environment Community Frequency, Criticality, and Proficiency

Table 25. Environment Community Frequency, Criticality, and Proficiency

Unit	Comp #	Competency	Entry			Journey			Senior			Proficiency		
			Frequency	Criticality	Importance	Frequency	Criticality	Importance	Frequency	Criticality	Importance	Entry	Journey	Senior
Planning	1	Strategic Planning	2.34	2.22		2.24	2.09		2.65	2.56		1.97	2.24	2.83
	2	Land Use Planning	2.32	2.40		2.37	2.27		2.46	2.44		2.02	2.16	2.46
	3	Civil Works Planning and Feasibility Studies	2.30	2.56		1.95	1.94		2.21	2.35		1.89	2.10	2.39
	4	Investment Planning	2.28	2.46		2.42	2.47		2.65	2.78		1.80	2.21	2.66
	5	Real Property Management	1.60	1.70		1.66	1.53		1.91	2.00		1.55	1.70	1.93
Design	6	Design Engineering and Architecture	2.37	2.57		2.56	2.74		2.77	2.97		2.19	2.35	2.83
	7	Cost Estimating	2.59	2.54		2.92	2.95		2.97	3.05	●	2.30	2.80	3.24
	8	Design Acquisition	2.32	2.55		2.50	2.64		2.80	2.94		1.92	2.27	3.02
	9	Technical Review	2.56	2.63		2.66	2.68		2.71	2.95		2.20	2.55	2.97
Construction	10	Contract Administration	2.02	2.38		2.25	2.40		2.25	2.59		1.55	1.98	2.43
	11	Construction Management	2.26	1.90		2.44	2.10		2.49	2.61		1.79	2.00	2.45
Disposal	12	Disposal Planning	2.73	2.92		2.39	2.46		3.04	3.14	●	2.00	2.42	3.26
	13	Demolition	2.17	2.65		2.26	2.39		2.41	2.65		1.87	2.43	2.75
	14	Closure	2.48	3.04	●	2.37	2.76		2.84	3.39	●	2.59	2.69	3.53
	15	Real Property Accountability	2.00	1.95		1.76	1.92		2.06	2.23		1.75	1.85	2.23
	16	Utilities Management	1.43	1.92		1.14	1.25		1.52	1.91		1.42	1.56	1.76
Sustainment	17	Identifying Work Requirements	2.18	2.44		1.76	1.93		1.98	2.21		1.76	1.85	2.16
	18	Business Operations	2.18	2.35		1.95	2.02		2.13	2.43		1.60	1.66	2.26
	19	Business Operations Engineering	2.18	1.93		2.34	2.22		2.13	2.35		1.69	2.13	2.43
	20	Facilities Sustainment Project Management	2.43	2.50		2.92	2.83		2.99	3.03	●	2.16	2.73	3.32
	21	Resource Management	2.00	2.04		2.04	2.27		2.25	2.52		1.67	1.87	2.44
	22	Civil Works Sustainment	2.00	2.27		1.53	1.95		1.77	2.07		2.18	1.75	1.84
	23	Navigation Sustainment	1.68	1.93		1.70	1.83		1.73	2.07		1.81	1.89	2.11
	24	Environmental Compliance Sustainment	3.54	3.50	●	3.65	3.51	●	3.76	3.76	●	2.93	3.22	3.82
	25	Natural Resources and Environmental Management	2.80	2.90		2.69	2.91		2.95	3.12	●	2.45	2.67	3.22
	26	Regulatory	2.43	2.82		2.40	2.91		2.48	2.94		2.70	2.58	3.01
Professional	27	Leadership	3.21	3.23	●	3.64	3.48	●	4.01	3.91	●	2.67	3.29	3.97
	28	Business Acumen	3.21	3.29	●	3.46	3.36	●	3.88	3.87	●	2.81	3.09	3.92
	29	Life Long Learner	3.17	3.22	●	3.27	3.31	●	3.59	3.66	●	2.81	3.24	3.61
	30	Integrity/Ethics	4.27	4.26	●	4.52	4.28	●	4.67	4.50	●	3.70	4.17	4.49
	31	Flexibility	3.86	3.86	●	4.06	4.01	●	4.20	4.16	●	3.25	3.84	4.12
	32	Credibility	3.31	3.36	●	3.39	3.57	●	3.82	3.91	●	2.87	3.47	4.06
	33	Cooperation and Teamwork	4.02	4.02	●	4.36	4.14	●	4.37	4.37	●	3.34	3.96	4.33
	34	Critical Thinking	3.60	3.74	●	3.88	3.76	●	4.05	4.08	●	3.35	3.75	4.23
	35	Communication	3.77	4.00	●	4.13	4.07	●	4.29	4.25	●	3.34	3.82	4.27
	36	Mission Focus	3.60	3.78	●	4.11	4.00	●	4.22	4.20	●	3.00	3.63	4.14

The dots indicate relative importance of each competency according to respondents: green = high importance; yellow = medium importance; no dot = lower importance. The shading indicates relative proficiency of each competency: light green = advanced to expert proficiency (4 or above), green = intermediate to advanced proficiency (3 to 4), yellow = basic to intermediate proficiency (2 to 3).

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Appendix H: Facilities Sustainment Community Frequency, Criticality, and Proficiency

Table 26. Facilities Sustainment Community Frequency, Criticality, and Proficiency

Unit	Comp #	Competency	Entry			Journey			Senior			Proficiency		
			Frequency	Criticality	Importance	Frequency	Criticality	Importance	Frequency	Criticality	Importance	Entry	Journey	Senior
Planning	1	Strategic Planning	1.90	2.01		2.64	2.57		2.79	2.74		1.92	2.43	2.94
	2	Land Use Planning	2.05	2.10		1.82	1.89		2.34	2.49		1.63	1.58	2.29
	3	Civil Works Planning and Feasibility Studies	1.50	1.63		2.15	2.10		2.10	2.32		1.36	1.71	2.22
	4	Investment Planning	2.86	3.09	●	2.73	2.64		3.00	3.10	●	2.21	2.39	3.03
	5	Real Property Management	2.50	2.33		2.75	2.55		2.72	2.83		2.11	2.56	2.80
Design	6	Design Engineering and Architecture	2.06	2.41		2.55	2.48		2.54	2.87		1.78	2.01	2.74
	7	Cost Estimating	3.06	3.20	●	2.93	2.77		3.24	3.36	●	2.48	2.72	3.48
	8	Design Acquisition	2.66	3.05	●	2.44	2.52		2.84	3.11	●	2.20	2.26	3.20
	9	Technical Review	2.96	3.16	●	2.72	2.59		3.05	3.34	●	2.40	2.46	3.49
Construction	10	Contract Administration	2.80	3.24	●	2.38	2.37		2.96	3.20	●	1.97	2.14	2.97
	11	Construction Management	2.78	2.13		2.89	2.59		2.84	3.03	●	2.23	2.55	2.97
Disposal	12	Disposal Planning	1.77	2.21		2.47	2.26		2.39	2.74		1.50	2.29	2.76
	13	Demolition	2.23	2.64		2.52	2.31		2.15	2.57		1.65	1.94	2.52
	14	Closure	1.91	2.92		2.36	2.29		2.14	2.85		1.33	1.85	2.31
	15	Real Property Accountability	2.14	2.21		2.27	2.39		2.25	2.74		1.72	2.32	2.48
	16	Utilities Management	1.50	2.10		1.53	2.50		2.04	2.83		1.25	1.54	2.30
Sustainment	17	Identifying Work Requirements	2.83	3.11	●	2.92	3.22	●	3.09	3.71	●	2.21	2.83	3.11
	18	Business Operations	2.74	3.02	●	2.67	2.76		3.31	3.55	●	2.01	2.46	3.27
	19	Business Operations Engineering	3.40	3.30	●	3.46	3.15	●	3.18	3.32	●	2.81	2.85	3.31
	20	Facilities Sustainment Project Management	3.44	3.44	●	3.32	3.05	●	3.47	3.49	●	2.86	3.19	3.66
	21	Resource Management	2.77	2.69		2.93	2.69		3.03	3.30	●	2.34	2.67	3.25
	22	Civil Works Sustainment	2.38	2.80		2.20	2.19		2.59	3.25	●	2.07	2.14	2.71
	23	Navigation Sustainment	2.28	2.08		2.78	2.68		1.95	2.54		1.54	2.23	1.92
	24	Environmental Compliance Sustainment	2.44	2.76		2.81	2.52		2.80	3.19	●	1.79	2.13	2.91
	25	Natural Resources and Environmental Management	2.28	2.42		2.17	2.09		2.30	2.87		1.76	1.73	2.51
	26	Regulatory	1.83	2.00		1.13	2.00		1.79	2.55		1.56	1.64	1.98
Professional	27	Leadership	3.59	3.77	●	3.68	3.44	●	4.23	4.05	●	3.09	3.19	4.02
	28	Business Acumen	3.36	3.59	●	3.70	3.53	●	4.17	4.07	●	3.09	3.24	4.04
	29	Life Long Learner	3.48	3.68	●	3.18	3.10	●	3.76	3.81	●	3.12	2.98	3.70
	30	Integrity/Ethics	4.60	4.48	●	4.73	4.42	●	4.73	4.58	●	4.28	4.24	4.58
	31	Flexibility	4.38	4.35	●	4.30	4.07	●	4.36	4.28	●	3.96	4.02	4.32
	32	Credibility	3.43	3.57	●	3.62	3.59	●	4.06	4.03	●	3.35	3.50	4.08
	33	Cooperation and Teamwork	4.38	4.27	●	4.49	4.22	●	4.54	4.39	●	3.96	4.07	4.35
	34	Critical Thinking	4.04	3.88	●	3.78	3.56	●	4.15	4.13	●	3.68	3.51	4.25
	35	Communication	4.04	4.12	●	4.16	4.00	●	4.40	4.31	●	3.88	3.91	4.32
	36	Mission Focus	3.92	3.92	●	4.05	3.93	●	4.32	4.23	●	3.76	3.89	4.22

The dots indicate relative importance of each competency according to respondents: green = high importance; yellow = medium importance; no dot = lower importance. The shading indicates relative proficiency of each competency: light green = advanced to expert proficiency (4 or above), green = intermediate to advanced proficiency (3 to 4), yellow = basic to intermediate proficiency (2 to 3).

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