

Department of Defense

**REPORT TO CONGRESS
ON
AIR TRAFFIC CONTROL FACILITIES**



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REPORT TO CONGRESS ON AIR TRAFFIC CONTROL FACILITIES

This report responds to the request in House Report 115-188, page 24, accompanying H.R. 2998, the Military Construction, Veterans Affairs, and Related Agencies Appropriations Bill, 2018 that requests the Secretary of Defense conduct a risk assessment on Air Traffic Control Facilities and develop a plan to update these facilities. Specifically, the report states:

“Air traffic control facilities.—The Committee is concerned that many Department of Defense Air Traffic Control facilities are unsafe, antiquated, and do not provide adequate control, communications or observation abilities for the current air traffic levels at certain locations. For example, the current facility located at Fort Benning will become wholly inadequate at the current pace of operations, and a replacement facility is necessary to ensure Air Traffic Services are available to support mission readiness and deployment platforms and the military flying community. The Committee is concerned that this could be a problem throughout the DOD enterprise with the recent reductions to the Department of Defense’s Construction accounts. Therefore, the Secretary of Defense is directed to conduct a risk assessment on Air Traffic Control Facilities throughout the Defense enterprise and develop a plan to update these facilities. This assessment shall be submitted to the congressional defense committees not later than 60 days after enactment of this Act.”

The Department shares the Committee’s concern over the conditions of its real property and the ability of the Department of Defense (DoD) built environment to safely and adequately support warfighter needs. Of the 212 Air Traffic Control Facilities reported by the Military Departments, 49 are considered to be in poor or failing condition.

The DoD has over 585,000 facilities in its inventory with a backlog of deferred maintenance and repair of over \$100 billion. Air Traffic Control Facilities compete with the needs of all real property assets. Military Department facility managers prioritize investments based largely on (1) life, health and safety concerns, (2) mission requirements (3) the need to mitigate critical deficiencies, and (4) “Quality of Life” improvements; and must do so within budgets that continually fall short of the industry standards for proper sustainment and recapitalization.

The Office of the Assistant Secretary of Defense (Sustainment) (OASD(S) asked the Departments of the Army, Navy and Air Force to provide their respective assessments of Air Traffic Control Facilities condition and mission risk, and explain how these requirements will be addressed within each of their budget planning processes. For the purposes of this report, the Military Departments focused their assessments on Air Traffic Control Towers (Facility Analysis Category 1413) based on the Committee’s language that references the Air Traffic Control Tower at Fort Benning as an example for its concerns. This report does not include condition assessments on aviation operations buildings or aircraft navigation facilities.

Military Department Assessments:

Department of the Army

The Army plan to improve quality of Air Traffic Control facilities is part of the Army Facility Investment Strategy (FIS). The FIS balances resource requirements across the infrastructure portfolio in support of installation readiness through the optimization of investments. The Department of Defense goal is to have a steady and predictable level of funding that is optimized and commensurate to the mission to maintain the Army's Real Property Inventory. Current and projected funding falls significantly short of requirements and will result in sustained risk to installation readiness as reflected in the current condition of the Air Traffic Control facilities.

As of the time of this report, funding levels and projections fall short of air traffic control tower upgrade or replacement requirements, resulting in sustained significant risk to installation readiness.

Air Traffic Control Towers at Army Air Fields (AAFs) and Army Helicopter Ports (AHPs)

There are 56 Army Airfields (AAFs) and 25 Army Helicopter Ports (AHPs) on the official list of Army Airfields and Helicopter Ports. US Army Aeronautical Systems Agency (USAASA) reports 69 Air Traffic Control Towers under active management at these 81 airfields and helicopter ports. This report is based on data available in June of 2018.

a. Air Traffic Control Tower Age

The inventory of Air Traffic Control Towers range from facilities built in the 1930s through World War II (WWII), the Korean and Vietnam Wars, and up to the present period. The average age of Air Traffic Control Towers is 33 years. Figure 1 shows the age range of the aviation Air Traffic Control Tower facility real property inventory.

Figure 1: Age of Air Traffic Control Tower Infrastructure

From	To	Era	Quantity
1930s	1949	World War II	6
1950	1954	Korean War	1
1955	1979	Vietnam War	18
1980s	1990s	Cold War	13
2000s		Global War on Terror	31

b. Air Traffic Control Tower Quality (Condition) Rating

The Army evaluates facilities by Facility Condition Index (FCI) within the Army Installation Status Report (ISR) system. The Army's goal is to have 80% of all facilities at an adequate rating, Q2 or better, by 2025, to include Air Traffic Control Towers. Overall, 68 percent of Air Traffic Control Facilities have an FCI rating of > 80%. Approximately 26 percent of the

overall Army infrastructure is rated with an FCI < 80%. The table, figure 2, depicts the ISR FCI quality and color rating, definition, number of towers by FCI condition and percentage by category.

Figure 2: Quality (Q-Level) Condition of Air Traffic Control Tower Inventory

ISR Quality (Q-Level) Condition of Air Traffic Control Tower Inventory				
Quality Rating	ISR Rating Color	ISR Quality Definition	# Towers*	Percent
Q1		Good. The condition meets or exceeds Army standards for most or all rated components. The cost to improve will be no more than 10% of the replacement value.	38	55%
Q2	Amber	Adequate. The condition meets the minimum level of Army standards for most or all rated components. The cost to improve will be no more than 20% of the replacement value.	9	13%
Q3	Red	Poor. The condition fails to meet the minimum level of Army standards for at least one major rated component. The cost to improve will be no more than 40% of the replacement value.	13	19%
Q4	Black	Failing. The condition fails to meet the minimum level of Army standards for multiple rated components. The cost to improve will exceed 40% of the replacement value.	5	7%

* Four towers (6%) have not yet been rated in 2018.

c. Description Real Property Inventory Status, Installation Status Report (ISR) Quality, Q-Rating and Mission Support Functional Capability F-Rating

USAASA classified each airfield with an operational mission assessment, based on the missions and the importance of airfield risk to overall Army Aviation Operations. These airfield mission assignments, organized into: High, Medium and Low categories, are depicted with each military construction and restoration and modernization project to assist in the project funding process.



Air Traffic Control Tower, Lawson Army Airfield, Fort Benning, Georgia

In April 2016, the Department of Defense updated the Unified Facility Criteria (UFC) for Air Traffic Control and Air Operations Facilities (UFC 4-133-01), providing the standards for designing Air Traffic Control (ATC) and Air Operations Facilities. This UFC contains guidance for DoD planners, engineers, and architects on the planning, engineering, and design of Air Traffic Control Towers (ATCT), Radar Approach Control Facilities and Air Operations Buildings (AOB). The Army will reflect the increased standards mandated in the UFC 4-133-01, Air Traffic Control and Air Operations Facilities in the Real Property Planning and Analysis System (RPLANS) working with Garrison staffs to ensure accurate reporting of the Installation Real Property and requirements data.

Figure 3 depicts the prioritization of Air Traffic Control Towers with FCI rating < 80% by Airfield Mission Status; location; Installation Status Report (Q3/Q4), and functional mission inspection ratings.

Figure 3. Installation Status Report (ISR) Quality, Q-Rating and Mission Support Functional Capability F-Rating (Data: Q2FY18)

Airfield Mission	Base	Building Number	Quality Rating	Functional Rating
High	Fort Hood AAF, TX	7001	Q4	F2
High	Fort Riley, KS	731	Q4	F1
Medium	Redstone Arsenal, AL	4808	Q4	F2
Medium	Camp Grayling, MI	1197	Q4	F1
Medium	Fort Bragg (Camp Mackall), NC	T2767	Q4	F4
High	Fort Campbell, KY	7212	Q3	F4
High	Fort Benning, GA	302	Q3	F4
High	Fort Indiantown Gap, PA	19101	Q3	F3
High	Fort Pickett, VA	T0051	Q3	F4
Medium	USAG Kwajalein Atoll	901	Q3	F4
Medium	Fort Polk, LA	4258	Q3	F2
High	USAG HAWAII	363	Q3	F3
Medium	USAG HAWAII	800	Q3	F3
Medium	Fort Huachuca, AZ	91249	Q3	F3
Low	USAG Wiesbaden	1036	Q3	F3

d. Real Property Planning and Analysis System Reporting ATC Standards

The Army’s Real Property Planning and Analysis System (RPLANS) C-ratings measures the available, on-hand, permanent Real Property Inventory (RPI) assets compared to the operational validated facilities requirements, and tabulated at the Installation level.

RPLANS C-Level, Installation Shortages in Air Traffic Control Tower Inventory			
Facility Quality Rating	Color in ISR	ISR Quality Definition	Percent in this Category
C1		Good. Permanent + Semi-Permanent + New Construction Assets / Validated Requirement	$\geq 95\%$
C2	Amber	Adequate. Permanent + Semi-Permanent + New Construction Assets / Validated Requirement	$\geq 80\% < 95\%$
C3	Red	Poor. Permanent + Semi-Permanent + New Construction Assets / Validated Requirement	$\geq 60\% < 80\%$
C4	Black	Failing. Permanent + Semi-Permanent + New Construction Assets / Validated Requirement	$< 60\%$

Simply explained, if an Army airfield is operating in 50-60 percent of authorized Air Traffic Control Tower Space (C4), to the current Army Standard, there is an operational trigger addressed in future Planning and Programming for military construction (MilCon) requirements. By Department of Defense policy, Form 1391 project documents are developed and validated through the Director of Public Works (DPW) Master Planning Process to the Army's MilCon Integrated Programming Team (IPT) to address validated mission requirement shortfalls.

Figure 4 depicts Air Traffic Control Towers by base and installation, depicting the size and space deficit for these installations with less than 60 percent (C4), using DoD and Army Standards.

Figure 4. RPLANS, Square Footage, Shortage, C- Ratings (Square Foot Shortages) (Ver. 48, Jun 2018)

Base Name	Category Code	Category Code Description	UM	Perm Asset (SF)	Army Standard Requirement (SF)	C- Rating
CAMP GUERNSEY	13310	FLT CONT TOWER	SF	0	7,446	C4
SCHOFIELD BARRACKS MILITARY RESERVATION	13310	FLT CONT TOWER	SF	1,723	6,900	C4
US ARMY KWAJALEIN ATOLL	13310	FLT CONT TOWER	SF	531	1,619	C4
FORT POLK	13310	FLT CONT TOWER	SF	1,610	5,040	C4
FORT RILEY	13310	FLT CONT TOWER	SF	2,000	5,770	C4
REDSTONE ARSENAL	13310	FLT CONT TOWER	SF	2,383	10,373	C4
FORT BENNING	13310	FLT CONT TOWER	SF	3,600	7,600	C4

Air Traffic Control Risk Assessment

Department of the Army – Aviation (DAMO-AV) and the Office of the Assistant Chief of Staff for Installation Management (OACSIM) assess the overall risk as significant. While it is accurate that the majority of Army Air Traffic Control Towers are adequate and meeting mission requirements, high priority airfield locations and specific facility shortfalls to Army standards will need to be addressed as soon as programming funds can be provided. To assess and monitor Army risk, the Chief of Staff of the Army has instituted the Army Strategic Readiness Assessment (ASRA) process under AR 525-30, Army Strategic Readiness and Department of the Army Pamphlet 525-30. The intent is to carefully monitor areas of the Army that contribute to overall Army readiness and provide senior leaders strategic levers to address areas of concern, especially in areas that include Army core competencies, such as Army Aviation.

Two types of risk exist within the Army installation tenant programs in Air Traffic Control: Military risk to Army Aviation Readiness with aviation unit's ability to train and meet required deployment timelines, and facility degradation risk maintaining the Real Property Inventory. ACSIM and the Installation Management Command (IMCOM) work within the Planning, Programming and Budget Execution (PPBE) processes that develop, validate and prioritize Restoration and Modernization and Military Construction projects. The Army will address facility shortfalls in accordance with the Facility Investment Strategy and Facility Investment Guidance.

Modernization and Recapitalization Plan

The Army has a stated goal to achieve an overall FCI > 80% (Q2) for all facilities not later than 2025. This requires a recapitalization program to replace the aging inventory with modern facilities that meet Army standards. Army leaders establish investment priorities in the appropriate venues (Military Construction and Restoration and Modernization) targeted to provide the greatest impact to improve total Army readiness.

Consistent with available funding and priorities, the Army will modernize Air Traffic Control Towers, which compete with all other facility modernization programs. The current facility investment strategy is to modernize the Air Traffic Control inventory through operation and maintenance-funded restoration and modernization projects, Military Construction funded projects, and demolition of excess airfield operations facilities.

Many of these facility upgrades are competing for limited restoration and modernization funding. The Installation's Directorate of Public Works develops all facility upgrade projects, including Air Traffic Control Towers. Each installation senior commander prioritizes and approves projects based on the FIS and the competing requirements of the installation.

Military Construction (MilCon) Overview

The Military Construction Integrated Programming Team (MilCon IPT) is the principal forum responsible for providing Army leadership with detailed analysis and strategic program recommendations for MilCon needs, capabilities, and priorities spanning the Active Army, Army National Guard, and U.S. Army Reserve in order to support major Army initiatives, force

readiness, development of future capabilities, and Soldier quality of life. The MilCon IPT membership includes broad representation among Army functional proponents and Army Reserve Components to provide Army leadership recommendations to best optimize MilCon investments, within given fiscal constraints. Figure 5 provides a list of Army command ATCT MilCon project submissions competing for limited future year MilCon funding.

Figure 5. MILCON Projects evaluated by the MILCON IPT

Air Traffic Control Tower MILCON Projects with associated HQDA Operational Mission Assessment*							
Airfield Mission	FY	Description	Location	ST	PA	Project Number	Command
High	2018	Construct Flight Control Tower	Fort Benning	GA	\$10.8M	55112	IMCOM
High	N/A	Construct Flight Control Tower	Fort Campbell	KY	\$5.2M	77122	IMCOM
Medium	2022	Construct Airfield Operations Building, Air Traffic Control Tower and Passenger Terminal Facility	Kwajalein Island	NA	\$40M	64063	IMCOM
Medium	N/A	Construct Polk Army Airfield Control Tower	Fort Polk	LA	\$6M	62420	IMCOM
Medium	2023	Construct Air Traffic Control Tower	Redstone Arsenal	AL	\$7.9M	71154	IMCOM

Two of the five projects are programmed in the FY19 President’s Budget (PB) Fiscal Year Defense Program (FYDP) for FY19-23. Unprogrammed projects (FY listed as N/A) represent projects submitted to HQDA for funding consideration.

This project list does not represent a complete list of all MilCon Air Traffic Control Tower project requirements as Military Construction and OMA-funded projects are at various stages of development and validation. For example, the National Guard Bureau reports its developing Air Traffic Control Tower projects at these National Guard locations:

- Grayling AAF Tower, Camp Grayling MI (Est. \$3.0M),
- Blackstone AAF Tower, Fort Picket, VA (Est. \$4.0M),
- Himsel AAF Tower, Camp Atterbury, IN (Est. \$4.2M),
- Camp Ripley, MN, (Est. \$4.0M)
- Muir AAF Tower, Fort Indiantown Gap, PA, (Est. \$4.0M)

Air Traffic Control Tower Summary

The goal for the Department of Defense is to have a steady and predictable level of funding that is optimized and commensurate to the requirement to maintain the Army’s Real Property Inventory to Army Standards. Improved funding levels will support Real Property improvements and are being considered as Readiness “buy-backs” by DoD leadership. With a

focused effort, HQDA staff will improve the condition of the Air Traffic Control facilities working with all Army stakeholders executing a disciplined and long-term plan worked actively as a team over the next several years.

Department of the Navy

Air Traffic Control Tower Inventory and Assessment

The Department of the Navy (DON) has 40 air traffic control towers in its real property inventory. The Navy has 30 air traffic controls towers and the Marine Corps has 10 air traffic control towers in their respective real property inventories. The Navy's aggregate condition assessment of air traffic control towers is "Fair".

- a. 5 facilities are in Good condition.
- b. 13 facilities are in Fair condition.
- c. 8 facilities are in Poor condition.
- d. 4 facilities are in Failing condition.

Similarly, the Marine Corps' aggregate condition assessment of air traffic control towers is Fair.

- a. 3 facilities are in Good condition.
- b. 6 are in Fair condition.
- c. 1 is in Failing condition.

BUILDER™ Sustainment Management System (SMS) is the SMS module for buildings that calculates backlog based on results of building component inspections, and generates maintenance requirements associated with each component system. BUILDER™ algorithms use current condition index (CI) and component replacement costs to determine requirement costs. The backlog is a summation of maintenance requirements generated in a building. Poor and failing air traffic control towers comprise part of the DON's facilities backlog.

Over the last decade, the DON has deliberately taken substantial risk by underfunding infrastructure capital investments and installation operations. Difficult decisions were required to afford other warfighting, readiness and modernization requirements. The under-investment has increased and deferred the maintenance and repair requirements, reduced facility effectiveness, and in some cases led to significant infrastructure failures that impacted Naval missions.

Air Traffic Control Facilities Risk Assessment

The DON measures the risk of air traffic control facilities related to mission readiness and safety using the assigned Mission Dependency Index for the facility and evaluates Condition Index, or rating, via periodic facilities assessments. In addition to facilities assessments, each

airfield and air traffic control system is regularly evaluated for compliance with Naval Air Training and Operating Procedures Standardization (NATOPS). These evaluations may also identify air traffic control facilities-related issues impacting flight operations.

Air Traffic Control Facilities Mitigation

Military Construction projects are an essential enabler of Navy and Marine Corps warfighting capability. The Navy uses a deliberative, capabilities-based, comprehensive assessment via the Shore Mission Integration Group (SMIG) process to ensure military construction investments are evaluated, integrated and prioritized to provide the most readiness and capability within fiscal constraints. Construction projects are evaluated based on support to global posture, basing decisions, Fleet readiness, and corrections required for documented life, safety, and health deficiencies.

The Marine Corps utilizes a standing board that meets annually to review and prioritize projects in support of: (a) New platform or weapons introduction, (b) Adjusted force structure requirements and/or relocating forces, (c) Meeting a force protection or safety standard, (d) Eliminating unacceptable conditions in the workplace or living facilities, (e) Meeting new and improved training standards and improving training areas to include aerial/ground ranges, (f) Modernizing critical facilities, (g) Improving utilities reliability to support readiness, (h) Meeting environmental compliance regulations, and (i) acquiring land as necessary to support the OPFOR.

Air Traffic Control Facility Projects

The DON has three MilCon projects planned for the near term to address deficiencies with ATC towers onboard our installations. Project P253, North Field Air Traffic Control Tower at NAS Whiting Field, Florida (\$10M) was recently authorized and appropriated in FY19 as an Unfunded Priority List project. Additionally, two projects are programmed across the FYDP, including Project P152, Air Traffic Control Tower at NAS Pax River, Maryland (\$8.7) and Project P228, ATC Tower and Airfield Ops, MCAS Cherry Point, North Carolina (\$61.3M).

DON Summary

The DON's PB19 budget acknowledges and begins to address the installation investment challenges, recapitalizing critical enabling infrastructure where possible. With support from Congress, the DON is utilizing military construction and restoration and modernization funding towards projects that have been rigorously evaluated and prioritized based on several factors including mission alignment, severity, urgency, and current condition. The Navy and Marine Corps will utilize available funds to resource the top unfunded projects from their priority list, including but not limited to, repair and modernization of air traffic control facilities.

Department of the Air Force

The Air Force has 103 Air Traffic Control Towers (ATCTs) on Active Duty Air Force bases. These towers can be stand-alone towers or towers attached to an existing facility (such as an Airfield Operations Building). ATCTs consist of an elevated control cab that houses equipment and personnel for control of aircraft and vehicular movement on the runways, taxiways, and associated areas to ensure safe and successful airfield operations.

As of June 2018, the overall average condition of active duty ATCTs rated as “Fair” per the Building Condition Index Rating (BCI) generated by the Air Force Facility Condition Assessment program. The Average BCI for Active Duty Air Force Air Traffic Control Towers is 76 on a 100 scale (100 being the best facility condition).

The Air Force defines category conditions “Good” for a BCI range of 86 to 100, “Fair” for a BCI range of 70-85 and “Poor” for a BCI range of 0-69. There are 30 ATCT facilities rated as Good, 42 as Fair, and 19 are rated as Poor. Twelve ATCTs do not have an assessment listed.

The Air Force Facility Condition Assessment program uses the BUILDER™ SMS to determine facility condition. BUILDER™ SMS uses assessments to generate a condition index for the facility, assists in predicting future condition and forecasts (out year) sustainment requirements. BUILDER™ SMS was developed and launched by the U.S. Army Corps of Engineer’s Construction Engineering Research Laboratory and is mandated by OSD for facility condition assessments of DoD Facilities.

Projects to repair, modernize, or replace towers are generated by installations and processed through the Facility Sustainment, Repair and Maintenance Program (FSRM) or the Military Construction Program (MilCon). Installations use outputs of BUILDER™ SMS to create FSRM repair projects to submit into an Air Force wide, risk-based, Integrated Priority List (IPL) of all built infrastructure projects within available funding. This IPL is coordinated with installation Civil Engineers and MAJCOM staffs. The Air Force approves and authorizes projects to pursue contract execution. The Air Force utilizes MilCon for ATCT projects that require re-capitalization (total replacement) and a prioritization process similar to FSRM requirements.

SMS condition data for ATCTs includes the building envelope, electrical and mechanical systems, and elevators. ATCT condition data does not include consoles, communication equipment, and radar processing equipment located inside the control cab (these items are non-real property items and are maintained by the using organization).

The Headquarters Air Force A3 organization measures Air Traffic Control (ATC) mission readiness risk in terms of personnel readiness and deployable systems/facilities. The Air Force tracks and documents these reportable items in the Defense Readiness Reporting System. Airfield Operations personnel do not measure risk to the physical structure of in-garrison ATC facilities.

Installation Civil Engineers provide risk assessments of in-garrison ATC facilities and assign Risk Assessment Codes as necessary. Airfield Operations facility managers report facility outages, environmental problems, and safety hazards in accordance with Air Force regulations.

Additionally, they monitor issues assessed by Civil Engineers and follow guidance to ensure the safety of personnel using the facility.

Projects to repair, modernize, or replace towers are generated by installations and processed through FSRM or MilCon programs. Installations use outputs of BUILDER™ SMS to create FSRM repair projects and submit into an Air Force wide, risk-based IPL of all built infrastructure projects within available funding. This IPL is coordinated with installation Civil Engineers and Major Command staffs. The Air Force approves and authorizes projects to pursue contract execution. The Air Force pursues ATCT projects that require recapitalization (total replacement) through the MilCon program, which uses a prioritization process similar to FSRM requirements.

BUILDER™ SMS leverages actual asset condition data, collected by engineers and craftsmen in the field. The data is then processed through lifecycle analysis software to inform the right scope, time, and level of investment to sustain our assets at the lowest possible lifecycle cost. Working with mission owners, the Air Force also evaluates the *direct impact* of every facility on operational employment of air, space, and cyber capabilities. For example, the Tanker Airlift Control Center at Scott Air Force Base has a greater *direct* mission impact than other mission support facilities such as the base library. This data driven approach, backed by innovative analytics and technical experts, ensure the Air Force invests in the right mission critical facilities, at the right time, at the right scope.

Report Summary

The Military Departments are working to comply with DoD policy to inspect their real property assets for condition and risk to mission performance. Information produced from such inspections provide mission operators and facility maintainers with the necessary data to identify deficiencies and to plan, prioritize, budget, and execute facility maintenance and repair or replacement needs.

The Air Traffic Control Facility at Fort Benning that's mentioned in the Committees' language is scheduled for replacement. The FY 2018 project to replace that facility, estimated at \$10.8M, was advertised by the U.S. Army Corps of Engineer, Savannah District, in August with contractor bids due on September 17, 2018.

Air Traffic Control Facility requirements compete for funding with all other real property asset needs and the facility programs such as FSRM and MilCon compete for funding with the military training and equipping needs within each Military Department.

Glossary

- **Building Condition Index (BCI)** - BUILDER™ uses BCI as its primary physical condition measure. Building components or systems are assessed along a 0-to-100 point scale, with 100 being perfect or like new condition. The condition index for each building component or section is computed from inspection data that records the type, severity, and density of each distress found. The condition index for all building components is rolled up to the system level and then to the building level to produce an overall Building Condition Index. It's important to note that the BCI is only a measure of physical condition and does not introduce the cost of the repairs.
- **Facility Condition Index (FCI)** – FCI is another metric produced by BUILDER™. The FCI introduces the financial aspect of condition. Once a building component, system, or asset has deteriorated to the point where repairs are required and the cost for the repairs are estimated, a FCI can be computed. At the building level, the FCI is a ratio of the cost of all required maintenance and repairs to the plant replacement cost of the asset as expressed in the formula:

$$FCI = 1 - (\text{cost of needed maintenance \& repairs} / \text{Plant Replacement Value}) \times 100$$

In BUILDER™, the total cost of necessary repairs at the building level is estimated by summing the individual building section repair costs. FCI results are expressed on a scale of 0% to 100% with a 100% representing a building that requires no immediate maintenance or repair beyond the normal, annual, minor recurring attention. DoD bands FCIs for program management purposes such that FCI from 100% to 90% represents assets in “Good” condition, 89% to 80% are “Fair,” 79% to 60% are “Poor,” and assets with an FCI below 60% are considered to be in “Failing” condition.

- **Quality Ratings or “Q-Ratings”**- A Q-Rating is essentially the same as the FCI. Prior to the Federal Real Property Council making the FCI a federal standard metric, DoD used the term Q-Ratings to express asset condition. Some DoD Components still use the Q-Rating term and the bands of Q1 through Q4, which track with the same FCI bands as discussed above.