



# **Quality Control/Quality Assurance Plan for Facility Inventory and Condition Assessment Program**

Version 1.0

ERDC-CERL

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## Version history

Version #	Compiled By	Revision Date	Approved By	Approval Date	Reason
1.0	B.B. Mehnert	20 July 2017			Initial Version

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# **1 Introduction**

## **1.1 Background**

BUILDER™ Sustainment Management System (SMS) is a web-based, asset life cycle management, software application developed by the Engineer Research Development Center-Construction Engineering Research Laboratory (ERDC-CERL), which is an element of the U.S. Army Corps of Engineers (USACE). This enterprise-level decision-support system helps an organization to consistently and objectively identify when, where, and how to best invest in its facilities. BUILDER provides investment guidance to objectively assess infrastructure across the enterprise, consistently analyze investment requirements and prioritize scarce resources, track investments to ensure key stakeholder requirements are addressed, and forecast the investment requirements for budget defense and course of action analysis. BUILDER uses the industry-standard UNIFORMAT II hierarchy to populate inventory data from existing building systems. BUILDER SMS, through the direct-rating input of qualified assessors, captures observed degradation of facility components and systems, and then calculates a repair/replacement work item based on (a) life-cycle curves of each component-section and (b) the needs and parameters set by the organization.

The quality control (QC) effort for inventory and assessment focuses on the actions necessary to meet the quality standards set forth by the contractual scope of work (SOW). The quality assurance (QA) effort focuses on auditing or reviewing the data to make sure it is within the limits or ranges expected, and that all data in the contractual SOW was collected to the standards. In order to have consistent and complete data collection (inventory and condition assessment), the QC and QA plans are both needed to provide a quality end product.

## **1.2 Facilities**

Facilities whose systems are being inventoried are located at various Army installations. The Headquarters Installation Information System (HQIIS) real property records are used to pre-populate the general facility information in BUILDER. This information includes the building name, number, catalog code, area, year constructed, number of floors, and replacement cost (plant replacement cost). Facilities imported into BUILDER include all buildings with a

Unit of Measure of Square Feet (SF), a Category Real Property Type Code (CAT\_RPA\_TYPE\_CODE) of B, a Facility Construction Type CD (FCLTY\_CONST\_TYPE\_CD) of Perm, TEMP, or SEMI (Permanent, Temporary, or Semi-Permanent), and a Real Property Operational Status Code (RPA\_OPERNAL\_STAT\_CD) of ACT, NONF, SEMI, or TBA (Active, Non-Functional, Semi-Active, or To Be Acquired).

### **1.3 Systems**

Building systems are inventoried using the Uniformat II hierarchy (ASTM-E1557-09). All systems that the building uses to perform its function (e.g., foundation, roof, heating, cooling, plumbing) are broken down to the smallest component-section (Level 5) and assessed at this smallest component-section using the Direct Rating method.

### **1.4 BUILDER Quality Control/Quality Assurance Plan (QC/QA)**

The purpose of the BUILDER QC/QA Plan is to set up standards and guidelines for the collection of inventory and assessment data. Inventory collection and assessments should be consistent and of high quality to be able to track the life-cycle of each asset and then use BUILDER's internal work planning forecasting capabilities.

### **1.5 Roles and responsibilities**

The quality of the data collected and input into BUILDER is a team effort; however, the Contractor is responsible for management and QC actions necessary to meet the quality standards set forth by the Contractual SOW. The Government-approved QC Plan should be used to guide and to document the implementation of the required management and QC actions to achieve the specified results.

The Quality Assurance Surveillance Plan (QASP) is put in place to provide Government oversight of Contractual SOW QC efforts to assure those efforts are timely and effective, and are delivering the results specified in the SOW. Appendix F has an example of a QASP related to the implementation of BUILDER.

## 2 Inventory Collection Requirements

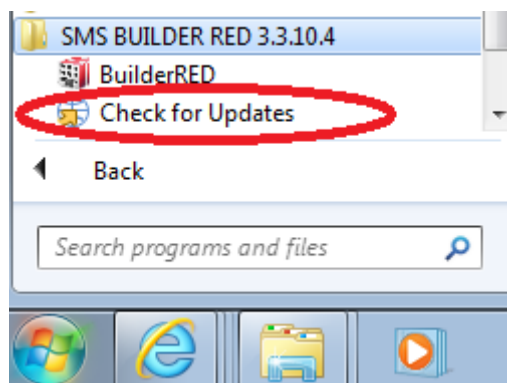
### 2.1 Software requirements

The BUILDER program is a web-based program and currently on Version 3.3.12.22. All references to the web-based application are based on this version. Personnel entering data directly in BUILDER or in the BUILDER Remote Entry Database™ (BRED) program (current version 3.3.10.4) will need to establish a BUILDER user account before entering any data. When a BUILDER account is established, personnel automatically have their name available (assessors) to select from a drop-down menu in the BRED file. For the BRED application, the executable file will need to be downloaded from the SMS website:

<https://www.sms.erdc.dren.mil/Products/BUILDER/Downloads>.

There is a Certificate of Networthiness (CoN) for the BRED application. Please request this CoN from [SMSsupport@erdc.dren.mil](mailto:SMSsupport@erdc.dren.mil) if needed, to present to your information technology (IT) personnel.

From time to time, there will be a new release for both the BUILDER web-based program and the BRED application. For the BUILDER program, the user does not need to do anything. The release should update seamlessly. The releases are usually new features or bug fixes. For the BRED application, please check for updates directly from the BRED installation folder, as shown below:



To establish a BUILDER account, a BUILDER Access Request form needs to be completed and sent to [SMSsupport@erdc.dren.mil](mailto:SMSsupport@erdc.dren.mil). The BUILDER Access Request form can be downloaded from the SMS website:

<https://www.sms.erdc.dren.mil/Products/BUILDER/Downloads>

The Facility Condition Assessment (FCA) team is responsible for the import and export to/from the BUILDER SMS website of all BRED files necessary to execute the project.

The BRED application is meant to be used as a field tool installed on a tablet or field laptop. The BRED application installed on these field tools can be quite fast and efficient for entering field data that has previously been collected on paper, since the device does not have to be connected to the internet. The BRED file is downloaded from BUILDER with the facilities that will be inventoried. When the BRED file is downloaded, the facilities are locked in BUILDER to prevent any changes being made to the facilities that were downloaded.

## **2.2 BUILDER/BRED roles**

The BUILDER program has roles that each user must have in order to enter and edit data in both BUILDER and BRED. Each role has permissions set at the Site (Installation) level. Below is a table with the roles available and the permission descriptions:

<b>BUILDER Roles</b>	<b>BUILDER Role Permission Descriptions</b>
Read-Only	<ul style="list-style-type: none"> <li>• Export Custom and Standard Reports.</li> <li>• CANNOT download or upload BUILDER Remote Entry Database (BRED) files.</li> <li>• Actions that cannot be performed are grayed out.</li> </ul>
Inspection Supervisor (Assessor)	<ul style="list-style-type: none"> <li>• Permission to view and edit the ENTIRE ASSIGNED INSTALLATION inventory and inspection data, and to create Knowledge Base Inspections (KBI) schedules.</li> <li>• Permission to import/export BUILDER RED (BRED) files.</li> <li>• Has the highest level of User privileges. (e.g., create a building, complex.</li> <li>• Actions that cannot be performed are grayed out.</li> <li>• Assessor has 30 days to edit their own data.</li> </ul>
Work Planner	<ul style="list-style-type: none"> <li>• Permission to view and edit the ENTIRE ASSIGNED INSTALLATION inventory and inspection data, create KBI, and edit Inspection Supervisor's inventory and inspection data.</li> <li>• Permission to import/export BRED files.</li> <li>• Permission to create/edit work plans and generate multiyear work plan scenarios.</li> <li>• Permission to create/edit standards, policies, prioritization schemes, and Remaining Service Life (RSL) and cost books.</li> <li>• The Work Planner has the highest level of User privileges. (e.g., create a building, complex, site)</li> </ul>

BUILDER Roles	BUILDER Role Permission Descriptions
	<ul style="list-style-type: none"> <li>• Actions that cannot be performed are grayed out.</li> <li>• Work Planner has 30 days to edit their own data and other Assessor's data.</li> </ul>
Master Planner (Limited to only 1 or 2 people in entire Organization and not provided as a role option)	<ul style="list-style-type: none"> <li>• Permission to view and edit the ENTIRE ASSIGNED INSTALLATION inventory and inspection data, create KBI, and edit Inspection Supervisor and Work Planner inspections.</li> <li>• Master Planner can edit inspections that are past the 30-day period.</li> <li>• Permission to import/export BRED files.</li> <li>• Permission to create or edit work plans and generate multiyear work plan scenarios.</li> <li>• Permission to create/edit and assign standards, policies, prioritization schemes, RSL, and cost books to their selected Site(s) or Organization.</li> <li>• The Master Planner is assigned the highest level of User privileges. (e.g., create a building, complex, site, organization)</li> <li>• Actions that cannot be performed are grayed out.</li> <li>• No time limit for editing data.</li> </ul>

The 30-day window that the Assessor and the Work Planner have to edit the BUILDER and BRED data will have an impact on how quickly the QC and QA data must be performed.

## **2.3 Inventory collection requirements**

The facilities for each installation are preloaded into BUILDER. The facility information comes directly from the HQIIS. If the contractor finds the Real Property square footage for the building is greater than or less than 10 percent of what is expected, the contractor shall submit the correct square footage and inform the Contracting Officer's Representative (COR) in writing regarding the discrepancy.

BUILDER comes with a set of catalog items (over 4,000). The BUILDER Catalog can be obtained from Support ([SMSsupport@erdc.dren.mil](mailto:SMSsupport@erdc.dren.mil)), or it is available to be downloaded as a Custom Report at the organization level. Inventory data will be collected and input in BUILDER in accordance with ASTM E-1557-09 Uniformat-II Level 4 detail with additional Material Sub-type data, (pseudo Uniformat-II Level 5) entered into the Section Details. Building components should be categorized according to the best available Section Subtype in the BUILDER catalog with regard to item type, function, material, and capacity. Building Systems that will be inventoried and assessed are as follows:

A10 Foundations  
A20 Basement Construction  
B10 Superstructure  
B20 Exterior Enclosures  
B30 Roofing  
C10 Interior Construction  
C20 Stairs  
C30 Interior Finishes  
D10 Conveying  
D20 Plumbing  
D30 HVAC  
D40 Fire Protection  
D50 Electrical  
E10 Equipment (optional)

## **2.4 ASTM Uniformat II:**

Inventory data will be captured and input into BUILDER SMS in accordance with the ASTM E-1557-09 Uniformat II Level 4 detail with additional Material Sub-type data (pseudo Uniformat II- level 5) entered into the Section Details.

### **2.4.1 Building components**

Building components should be categorized according to the best-available Section Subtype in the BUILDER catalog in regard to item type, function, material, and capacity.

### **2.4.2 Maintenance and repair**

All maintenance and repair planning decisions are made at the component-section inventory level. This unit is where the life-cycle Sustainment Restoration and Modernization (SRM) requirements are made.

## **2.5 Material quantities**

Quantities shall be counted or measured for all inventories within the SOW. Estimated quantities are only permitted when direct measurement is unavoidably restricted. The quantities should be in the Unit of Measure found in the BUILDER Catalog.

## **2.6 Installation dates**

Each inventory component must have a recorded installation date. If the date is estimated by the Assessor, then it should be identified by checking the “estimated” box in the BUILDER program. If the “estimated” box is checked, then BUILDER will factor that into account when projecting the current condition index of the component-section.

## **2.7 BUILDER comment fields**

All comments shall be placed in the correct data field. The following subsections provide direction for each comment field:

### **2.7.1 Inventory comments:**

Remain with the life of the record and includes information about the items within the section. Access issues preventing an inspection would be added here. The inventory comments provide location information for follow-up inspections.

### **2.7.2 Section detail comments**

These comments remain with the life of the record and includes information about a single item within a section. These comments provide information specific to just that component-section detail field.

### **2.7.3 Inspection comments:**

Inspection comments are generated each time an inspection is conducted, and a comment includes information relating only to that single inspection such as documented condition, rating justification, and location of distress.

## **2.8 Equipment identification information**

For mechanical/electrical equipment where nameplate data exists, Contractor shall collect all available equipment information under the section details of BUILDER/BRED. If the nameplate data is not able to be recorded (e.g., not

accessible, missing, painted over), an Equipment Details Comment shall be added stating why the nameplate data was not collected.

## **2.9 Section naming conventions**

See Appendix C for existing naming conventions that provide guidance to Assessors.

## **2.10 Army BUILDER SMS Inventory and Assessment Guide download**

The new Army BUILDER SMS Inventory and Assessment Guide is available to download from the SMS site.

## **3 Condition Assessment Collection Requirements**

### **3.1 Visual Inspections**

Contractor shall attempt to visually inspect all components identified in the SOW. In cases where items cannot be visually evaluated due to concealment or access issues, that component-section shall not receive an inspection rating. BUILDER will automatically perform an “age-based” inspection rating. The Assessor should add an inventory comment stating that the component was not visible, and BUILDER is being allowed to perform the “age based” rating.

#### **3.1.1 Inspection ratings**

The Contractor shall perform baseline visual inspections of building components utilizing a Direct Rating inspection method in accordance with the BUILDER 9-point rating scale (Green+, Green, Green-, Amber+, Amber, Amber-, Red+, Red, and Red-). The Contractor shall assign ratings according to established BUILDER practices and guidance outlined in the SOW. The rating system is summarized as follows:

Green Category – only minor wear and tear present, routine maintenance

Amber Category – moderate repair and rehabilitation necessary

Red Category – major repair, rehabilitation, or replacement necessary

#### **3.1.2 Rating requirements**

Inspection ratings shall be based upon the observable and documentable condition of the component. Inspection ratings document the inventory’s current condition and shall not be adjusted for anticipated condition.

#### **3.1.3 Inspection comments**

Inspection comments are required for all Amber and Red ratings (i.e., ratings of Amber+, Amber, Amber-, Red+, Red, or Red-). Assessors will use the appropriate, standard BUILDER distress language as needed, to ensure consistency (refer to the “Distress Survey Definitions” section of the BUILDER Condition Assessment Manual). The distress word should be in all capital letters

when describing the distress. The Condition Assessment Manual can be found at the following site: <https://www.sms.erdc.dren.mil/Support/Help-FAQ-News>.

The 23 Distresses are listed below, in alphabetical order (from left to right):

ANIMAL / INSECT DAMAGED	BLISTERED	BROKEN	CAPABILITY/CAPACITY DEFICIENT	CLOGGED
CORRODED	CRACKED	DAMAGED	DETERIORATED	DISPLACED
EFFLORESCENCE	ELECTRICAL GROUND INADEQUATE OR UNINTENTIONAL	HOLES	LEAKS	LOOSE
MISSING	MOISTURE/DEBRIS/ MOLD CONTAMINATED	NOISE/VIBRATION EXCESSIVE	OPERATIONALLY IMPAIRED	OVERHEATED
PATCHED	ROTTEN	STAINED/DIRTY		

#### *3.1.3.1 Inspection comments*

Inspection comments shall use one of the descriptive distresses noting any distresses/deficiencies and the areas affected by those distresses/deficiencies.

#### *3.1.3.2 Inspection comments exception*

A component can have an overall Green Rating and an inspection note that denotes an area of distress. Example would be a small hole or rip in the material. The distress should be in all capital letters.

## **3.2 Non-representative samples vs. maintenance item**

If an atypical deterioration of a component is discovered, the Assessor will evaluate the condition either as a non-representative sample (see 3.2.1) or as a maintenance issue (see 3.2.2).

### **3.2.1 More than two people and greater than 8 hours**

If the Assessor determines that the component's repair will require more than two people and greater than eight hours, the component will be captured in BUILDER as a non-representative sample.

### **3.2.2 Two or fewer people and less than 8 hours**

If the Assessor determines that the component's repairs will require two or less people and less than eight hours to complete, the repair will be viewed as a maintenance issue, and the component's condition should be reflected as part of the direct condition rating.

## **4 Calibration**

### **4.1 Calibration Plan**

The project's architect-engineer (A-E) shall provide a Calibration Plan within 14 calendar days after Government approval for the Project Management Plan (PMP). The Calibration Plan is to be presented for Government review and approval, and it establishes the process and procedures intended for the Task Order Team on the method to conduct inventory and assessment in accordance with the latest version of the BUILDER SMS Inventory and Assessment Guide and the BUILDER Condition Assessment Manual. The Calibration Plan will include the method for conducting QC for validating consistent data collection, assessment, and input. The A-E shall implement the Calibration Plan during a kick-off meeting at the Installation, prior to any on-site validation and assessment activity. Government and QA personnel will participate in the "Field Assessment Team Calibration and Kick-off Meeting" in order to gain an understanding of the process for inventory and assessment and for the QC methods being utilized by the A-E. A maximum of four (4) key Government personnel will be in attendance. There is no need for other "users." The Installation will be responsible for providing space suitable for the Field Assessment Team Calibration, usually about 25 personnel. The A-E shall present by using a Microsoft PowerPoint® presentation and provide suitable materials/handouts to the Team. This Calibration Plan ensures that all Assessors know the method of data collection, review the QASP, review the contract, and calibrate each other on direct ratings for each component-section. Some other items of importance that may be covered in the Calibration Plan training are listed here:

Review purpose of BUILDER and data collection

Safety and site preparation guidance

Personal protective equipment (PPE)

Team Lead and Assessors

Point of Contact at the installation

Sectioning rules

Inventory comments

Inspection comments

Photography requirements

Identification requirements

Daily schedule

Keys to mechanical and electrical room and POC for acquiring the keys

Review typical problem areas (e.g., sectioning, comments, photos, inspection ratings)

Expectations on production rate

Allowing the assessors time to calibrate is essential to having a consistent and reliable BUILDER data collection effort.

#### **4.1.1 Facility Condition Assessment (FCA) procedure**

The A-E will send team leads/subject matter experts to complete FCAs on three (3) separate type of buildings, load the FCA data into BUILDER, and provide, at a minimum, the following BUILDER reports to Government personnel for review:

Final 9 – Facility System Quick View Report

Quality Control 5 (QC5) – Section Detail Report

Quality Control 6 (QC6) – Inspection Details Report

#### **4.1.2 FCA follow-up timeline**

In general, the A-E will allow two (2) weeks for Government review and comment on the FCA. A-E will then make any required corrections prior to returning to the Installation for the actual FCA. The Calibration may be performed a day before the FCA is scheduled to begin. However, if the A-E firm does not have feedback from the QA team, the A-E firm runs the risk of continuing the QA issues.

The buildings where the Calibration is to be performed should be of varied Category Codes that Assessors will encounter at that installation. The inventory and assessment should be completed and reviewed by the QC team lead for the contractor. This is an opportunity for the installation DPW and the QA Team to observe and review the BUILDER data collection effort. The buildings selected for the calibration should have at least 75% of the systems in the contract.

The calibration effort should not take more than one (1) day.

## **4.2 Calibration of assessors at each installation**

The contractor may have performed facility assessments at different installations for different agencies. It is important for the contractor to understand that the SOW may be different and calibration is needed for different Assessor teams, since it may have been some time since the Assessor performed an assessment.

## **5 Quality Control Plan**

The QC review will start no later than the next business day after notification by the Site Coordinator that a facility is “Assessed Complete.” The A-E shall develop and maintain an effective QC program to ensure services are performed in accordance with the SOW. The A-E shall develop and implement procedures to identify, prevent, and ensure non-recurrence of defective services. The A-E’s QC program is the means to assure the work complies with the requirement of the task order. The A-E shall deliver the Draft Quality Control Plan (QCP) to the responsible office as prescribed in the SOW. Upon receipt of comments by the Government or the contractor entity, the A-E shall provide the Final QCP within five (5) working days to the responsible office.

### **5.1 QC review of BUILDER reports**

#### **5.1.1 Critical database information**

The critical information in the BUILDER database is inventory, installation date, sectioning, and Assessor’s rated condition. There should be a logically connected relationship between these items. QA should review these factors to identify features of these elements that appear disconnected. The inventory is the main critical information for both old and new buildings.

#### **5.1.2 Ensure data consistency**

Ensure consistency of BUILDER data is being achieved across the board for all the Assessors at each site and in each facility at the site. Inform the Project Manager (PM) and the FCA Team Lead if significant discrepancies are discovered. The PM is to validate that discrepancy errors are mitigated.

#### **5.1.3 Check for data issues**

Once reports are provided, check for any omissions, inconsistencies, units of measure errors (Final 8 custom report), duplication of data sections, or other issues in the data. Inform ERDC-CERL of any BUILDER software, database, or report issues.

#### **5.1.4 Compare inventory data with FCA data**

Compare the inventory section data collected during the site visit to the same sections in the inventory data collected by the FCA Team. The QA team will determine if there are any significant findings and elevate them to the QA

Manager, Site Coordinators, and the Quality Engineer for any needed Assessor corrections and/or verifications.

#### **5.1.5 Check square footage and floor numbers**

Check the facility area's square feet (SF) and number of floors assessed by the FCA Team, as shown in the BUILDER data reports, is the same number and quantity as what is provided in the BUILDER initial site information.

#### **5.1.6 Utilize BUILDER reports**

Utilize the BUILDER reports by downloading spreadsheets in the Microsoft Excel® format where applicable and then, analyze the data using Excel's sort and filter functions to group similar items together so that the QC/QA team can easily identify and quantify notable areas of concern. Listed below are recommended reports that are available and valuable for this type of analysis including custom reports listed in the next three sections.

### **5.2 BUILDER Final Custom Reports**

**Final 1 – Post Site/Data Review Facility Summary** provides a clear summation or holistic picture of FCA results for all assessed assets at a given installation. First look at some general overall information and work down to more detail. Use the Final 1 report to look at overall information. Compare Plant Replacement Value (PRV) to Component Replacement Value (CRV). Generally numbers should be similar, but with CRV usually larger. Any changes in these values must be accomplished by the Government.

**Final 2 – System Summary** provides a clear summation or holistic picture of building systems within each facility.

**Final 3 – Component Details:** Provides a list distress reports for each component- section collected within each facility. Use the Final 3 report to check quantities. Easy checks include the items measured in SF that should be close to the overall building SF: slab on grade, floor decks and slabs, roof decks and slabs, roofs coverings, floors, ceilings, electrical branch wiring, fire protection (sprinklers), and communications and security systems.

**Final 4 – Equipment Details** provides a list of section details for each piece of equipment collected in order to satisfy Real Property Installed Equipment (RPIE) requirements.

**Final 5 – Inspection Summary** provides a list of inspection ratings for each component-section collected within each facility.

**Final 6 – Distress Details** provides a list of Distress Survey details collected within each facility.

**Final 7 – Work Action Summary** provides a clear summation of recommended work for each facility.

**Final 8 – Work Action Details** provides a detailed breakdown of work item candidates generated from BUILDER, based on component age and condition information. A basic cost estimate is automatically generated for each line item, although that estimate can be overridden by the Contractor with updated cost estimates if necessary. This report can also be used to package individual work items into projects. This report can be used to discover unit of measure problems.

**Final 9 – Facility System Quick View** provides a cross-tab list of color-coded facility and System Condition Index (SCI) on a single line.

### 5.3 BUILDER QC Custom Reports

BUILDER has six (6) Custom Reports available at the Site and Complex level that can be run to check the quality of the data. These reports help to identify, prevent, and ensure non-recurrence of defective services. The available QC reports are listed below:

**QC-1 – Facility Report** provides Building Condition Index (BCI) and Num Sections, but only for those facilities where BCI is not null.

**QC-2 – System Report** provides BCI, SCI, and Num Sections, but only shows systems of those facilities where the BCI is not null.

**QC-3 – Component Report** provides BCI, Building Component Condition Index (BCCI), and Num Sections, but only shows Components for facilities where the BCI is not null.

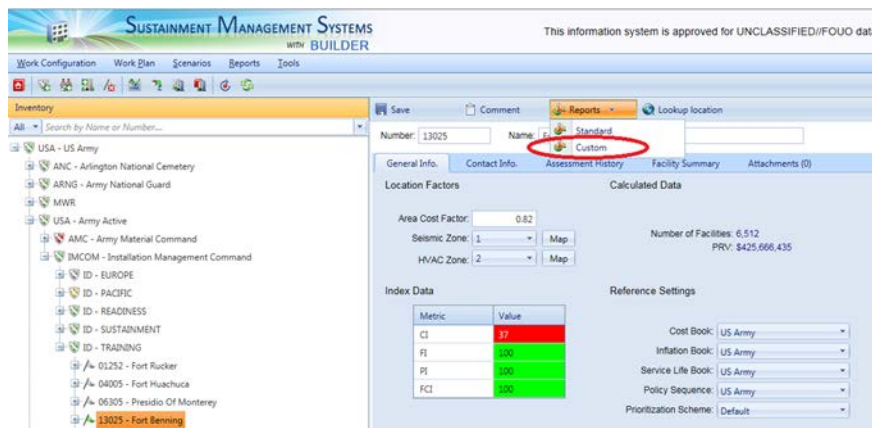
**QC-4 – Component-Sections Report** provides Component Section Condition Index (CSCI), Component Section Coating Condition Index (CSCCI), and Num Inspections. Use this report to check which systems were included. Double check missing items on Final 2 with Final 3 report. Most facilities are 1 floor, so they don't have A20, C20, or D10 systems. If the tenant is only occupying part of a building or the building is owned by others, then it may only have C10, C30, D40, and D50 systems. Most buildings will have A10-20, B10-30, C10, C30, and D20-50 systems. However, lab facilities should have some E10 systems, and facilities with cold storage, vaults, hearing test chambers, and other special rooms should have some F10 systems. Look for blocks that are missing data. If the system is

not available, the FCA Team must add to the inventory comments (at the building level) that the system is not available and delete the system from BUILDER.

**QC-5 – Section Details** provides CSCI, Equipment Make, Model, Serial Number, Capacity, Manufacturer, and Location. This report show all component sections. Use the QC-5 report in BUILDER to ensure the RPIE IDs were properly captured, to include component details and locations.

**QC-6 – Inspection Report** provides CSCI, CSCCI, Comp Rating, and Inspection Comments. This report shows only the inspected Sections.

Appendix A details the information, filtering, and conditional formatting found in each report. Below is an image of the location where the Custom Reports are found in BUILDER:



## 5.4 After BRED files are uploaded to BUILDER

After the FCA Team Lead has completed their detailed field review and all BRED files have been loaded into BUILDER, the FCA Technical Lead will conduct a thorough review of the BUILDER data for each facility utilizing the “Individual Facility Review QC Checklist” included in Attachment 5 of the QASP attached. Once all individual facilities have been reviewed, the FCA Technical Lead will ensure the entire BUILDER dataset is reviewed utilizing the “Overall QC Checklist” included in Attachment 6 of the QASP (not actually attached to this document, but included within Appendix F). The FCA Technical Lead may review all available BUILDER reports although they will focus primarily on the following reports:

BUILDER “Final 1 – Facility Summary Report”

NOTE: If any Building Level data is incorrect, it must be corrected in the customer's Real Property database of record and shall not be changed in BUILDER. A list of Building Level discrepancies will be provided to the customer for internal resolution.

BUILDER "QC 5 – Section Details Report"

BUILDER "QC 6 – Inspection Report"

Direct Rating Data Fields:

- Expected Rating = what BUILDER predicts rating should be
- Comp Rating = Assessor's rating
- Paint Rating = Assessor's paint rating
- Comp Rating = number associations as listed in the grid below:

G+	100	A+	80	R+	50
G	95	A	71	R	25
G-	88	A-	61	R-	10

The FCA Technical Lead will coordinate directly with the FCA Team to ensure that all issues have been resolved and the dataset is free of known errors prior to submitting it for QA Manager to review.

The QA Manager will perform spot checks of all BUILDER data after the FCA Technical Lead has completed a final review to ensure compliance with Army standards, SOW requirements, and BUILDER best practices.

The QA Manager will ensure that all issues have been resolved and the dataset is free of known errors prior to submitting it for customer review.

## **5.5 BRED (BUILDER Remote Entry Database)**

The BUILDER Remote Entry Database is sometimes referred to as B-RED or BRED. This application enables the BUILDER web interface user to download the facility files and do field data collection on a tablet. BRED is the field tool available to import field data into BUILDER. There are currently 8 reports available in the BRED application (BRED version 3.3.10.4). These reports can be exported to a Microsoft Excel format to do QC checks on various data collected.

The Excel worksheet can be filtered for specific quality control issues. This enables the assessor to run their own checks before leaving a facility. The eight reports that follow are found in BRED under the Tools tab (and then select Reports):

Facility Summary

System Summary

Inventory Summary

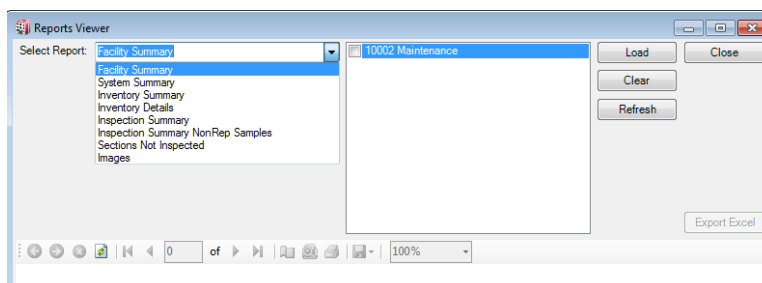
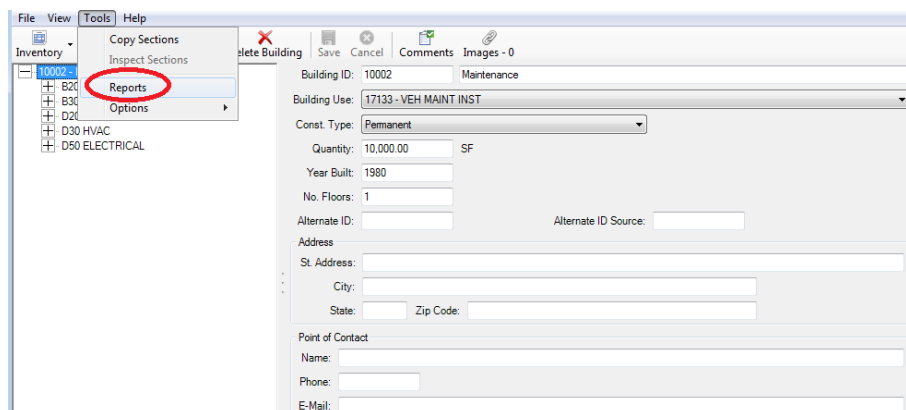
Inventory Details

Inspection Summary

Inspection Summary NonRep Samples

Sections Not Inspected

Images



## **5.6 QC time frame**

The QC should be performed as soon after the data is collected. This will ensure that the Assessor still has access to the site and can check for any discrepancies.

The inventory and inspection data collected should be in BUILDER no later than a week after the contractor returns from the field. Typically, field trips to the sites (installations) have been on a 2-week basis. The Assessors and Work Planner have 30 days to make any edits to their field data. The data should be QC'd daily, if possible.

## **6 Quality Assurance Plan**

### **6.1 Quality Assurance Surveillance Plan (QASP)**

The Government shall evaluate the A-E's performance order through the use of a Quality Assurance Surveillance Plan (QASP). The QASP provides guidance on how the Government will ensure that the A-E has performed in accordance with the performance standards in the SOW. Upon completion of work at the designated location(s), the Government will execute the QASP during review of the A-E work product. Findings from the QASP will be forwarded to the A-E for correction, incorporation, and/or to develop corrective action. A typical QASP can be found in Appendix F.

### **6.2 QA person's attendance**

The QA person should attend the on-site visit when the FCA Team is available and during the calibration, and should also be available to review on-site data collection. The on-site review will require the QA person to perform their independent assessment of a certain number of buildings. The buildings that will be independently assessed by the QA will not be known to the Contractor. Keeping the same QA person for the entirety of the project is essential in maintaining consistent quality.

### **6.3 BUILDER QA Custom Reports**

BUILDER has sixteen (16) Custom Reports available at the Site and Complex level that can be run to check the quality of data collected. These reports help to identify, prevent, and ensure non-recurrence of defective services or of elements that appear disconnected. All QA reports should be run in order to check where there may be issues with the data. If a Custom Report renders any data, the data should be checked for completeness and verified that the data (specifically in "red" or "pink" format) is indeed correct, with a comment provided stating the reason for any "false" positive. If a QA report is run and the report does not render any data, then the data checked within that particular report has no issues with what is being filtered or checked. These reports have built-in conditional formatting, which should simplify the number of filters that need to be performed. Listed in the sections below are recommended reports that are available and valuable for this type of analysis including custom reports. QA Custom Reports descriptions are found in Appendix B and summaries of them are listed below:

**QA-1 – Missing or Low Inventory Report** provides a listing of facilities for which there are fewer than 10 sections. (Low section count.)

**QA-2 – Missing Comments for Component Types** provides a listing of sections for which there is missing or insufficient comments to fully describe the section type. (e.g., Other, General (If the Mat/Equip Type ends in '90'))

**QA-3 – Naming Discrepancies** provides a list of section names that are used infrequently (fewer than 5 times) in the database.

**QA-4 – Suspect Section Inventory** provides a list of sections for which the section quantity or age is suspect or inconsistent with building quantities (e.g., Quantity > 200 or Section Age > Building Age).

**QA-5 – Missing Section Details Report:** A list of sections for which there are no Section Details (i.e., equipment) entered into BUILDER.

**QA-6 – Missing Section Detail Images Report** provides a list of sections for which there are no Section Detail images entered into BUILDER.

**QA-7 – Sections without Inspections** provides a list of sections for which there are no Inspections entered into BUILDER (at the component-section level). Only the Inventory has been entered and the original install date.

**QA-8 – Sections Details without Inspection Report** provides a list of section details that were inventoried, but for which there is no inspection entered into BUILDER.

**QA-9 – Section Detail Discrepancies** provides a list of section details for which the Detail Install Date is suspect or missing. (Examples of suspect dates would be Detail Install Date < Section Install Date OR Detail Install Date > Section Install Date + 2 Yrs.)

**QA-10 – Missing Inspection Comments** provides a list of inspections where a poor rating from the Amber or Red category was given, but no comment or reason was provided for the poor rating.

**QA-11 – Section Condition Analysis Exception** provides a list of sections for which the variance between Age and Design Life exceeds certain constraints (plus or minus 20%). This occurs when the Variance  $[(RSL + Age) / Design Life] < 0.8$  OR  $> 1.4$ .

**QA-12A – Inspection Matrix- By Site, System, Inspector** provides a cross-tab report (pivot table) for each System given any count of Green, Amber, or Red scores by Inspector.

**QA-12B – Inspection Matrix- By Site, System** provides a cross-tab report (pivot table) for each System given any count of Green, Amber, or Red scores.

**QA-12C – Inspection Matrix- By Site, Inspector, System** provides a cross-tab report (pivot table) by Site or System for each Inspector giving a count of Green, Amber, or Red scores.

**QA-12D – By Inspector** provides a cross-tab report (pivot table) for each Inspector giving a count of Green, Amber, or Red scores.

**QA-12E- Inspection Matrix- GRAPH – By Site, System** provides a cross-tab report (pivot table) by Site or System for each Inspector with a count of Green, Amber, Red scores. Bar Graph show breakdown of scores for each system or site.

## 6.4 BRED reports

There are also some reports available in the BRED application which can be downloaded by the Contractor and sent to the QA person. Providing the QA person access to the data without having the Contractor load the BRED file into BUILDER gives the QA person data to check while they are still in the field or, if not in the field, the QA person can still provide timely feedback. This method is sometimes used when the A-E firm is calibrating their team by using 3 buildings. The QA person would then be able to check for some of the same anomalies found in the BUILDER program QA Custom Reports. This method also provides the Contractor with timely feedback before leaving the site.

## 6.5 QA time frame

The QA process can be performed while the Assessors are still at the installation and can verify and rectify the data collected. The QA process may often be after the contractor has left the installation. The QA process shall not exceed ten (10) working days or the number of days that are specified in the SOW after receiving word from the A-E that the BUILDER data is ready for review. QA feedback to the A-E should be provided during the time that the A-E still has access to the installation.

## 6.6 QA-driven changes

The QA person should inform the Contractor, within the time period allowed by the contract, of any discrepancies or anomalies. The Contractor should provide feedback in writing to the QA person on changes or “no changes,” and give reasons for the discrepancies.

## Appendix A: Quality Control Custom Reports

The following QC custom reports are available for BUILDER™ (Version 3.3.12.22)

QC Report Number	Report Name
QC 1	Facility Report
QC 2	System Report
QC 3	Component Report
QC 4	Component-Section
QC 5	Section Details
QC 6	Inspection Report

### QC 1 – Facility Report

The Facility Report has some conditional formatting so that it can check or verify that a building is not missing necessary systems. If the building has less than 10 systems, then it might be a storage building or something similar that does not necessarily need all systems. The Building Condition Index (BCI) is color coded to get a quick view of the condition of the building. BCI values greater than or equal to 85.5 will appear “green,” values greater than or equal to 69.5 are “amber,” and values greater than or equal to “0” will appear “red.”

### QC 2 – System Report

The BCI and the SCI are checked by using “conditional formatting” to visually locate anomalies and applying a color coded rating to them. The BCI and the SCI are color coded per the following: (a) values greater than or equal to 85.5 will appear “green,” (b) values greater than or equal to 69.5 will appear “amber,” and (c) values greater than or equal to “0” will appear “red.” The Number of Sections (Num Sections) should be greater than “0;” if not, the cell will appear “pink.”

### QC 3 – Component Report

The BCI, BCCI, and the Num Sections are checked using conditional formatting to locate anomalies. The BCI and the BCCI are color coded for values greater than or equal to 85.5 to appear “green,” values greater than or equal to 69.5 are “amber,” and values greater than or equal to “0” will appear “red.” The Number

of Sections (NumSections) should be greater than “0;” if not, the cell will appear “pink.”

#### **QC 4 – Component-Section**

The CSCI is color coded, and it provides a quick view of the condition of the component section. Color codes for CSCI and the CSCCI are as follows: (a) values greater than or equal to 85.5 will appear “green,” (b) values greater than or equal to 69.5 will appear “amber,” and (c) values greater than or equal to “0” will appear “red.” The Number of Inspections (NumInspections) should be greater than “0;” if not, the cell will be “pink.”

#### **QC 5 – Section Details**

The section details should be populated for equipment type, equipment make, model, serial number, capacity, manufacturer, warranty. etc.; if not, the report will display in “pink” any items that are missing. The CSCI and the CSCCI are color coded as follows: (a) values greater than or equal to 85.5 will appear “green,” (b) values greater than or equal to 69.5 will appear “amber,” and (c) values greater than or equal to “0” will appear “red.”

#### **QC 6 – Inspection Report**

This report color codes the Computed Rating (CompRating) if it is not within a certain range of the Expected Rating. CSCI and the CSCCI are coded as follows: (a) values greater than or equal to 85.5 will appear “green,” (b) values greater than or equal to 69.5 are “amber,” and (c) values greater than or equal to “0” will appear “red.” The CompRating will appear “pink” if the value is less than or more than 20 points different from the Expected Rating. Inspection Comments (InspComments) also will appear “pink” if the CSCI is amber or below (less than 85.5) and there are no inspection comments.

## Appendix B: Quality Assurance Custom Reports

The following table lists the 16 QA report numbers and names. A description is then given for each report number in the text that follows this table.

QA Report Number	Report Name
QA 01	Missing or Low Inventory
QA 02	Missing Comments
QA 03	Naming Discrepancies
QA 04	Suspect Section Inventory
QA 05	Missing Section Details
QA 06	Missing Section Detail Images
QA 07	Section Without Inspections
QA 08	Section Details without Inspections
QA 09	Section Detail Discrepancies
QA 10	Missing Inspection Comments
QA 11	Section Condition Analysis Exception
QA 12A	Inspector Matrix- ByInstSysInspector
QA 12B	Inspector Matrix- ByInstSys
QA 12C	Inspector Matrix- By InspectorSys
QA 12D	Inspector Matrix - ByInspector
QA 12E	Inspector Matrix – GRAPH- ByInstSys

### QA 01 – Missing or Low Inventory

This report identifies buildings that appear to be missing inventory, based upon a low section record count (i.e., less than 10 sections).

### QA 02 – Missing Comments

This report identifies sections that are poorly or incompletely classified. This process supports identification of inventory catalog items that need to be added (section\_comments). This report will render if Material/Equipment Type ends in “90” (i.e., D502090), and the Comp\_Type is equal to “other,” “general,” or “unknown” and comments are missing. The “comments” field should provide details about the component-section.

### **QA 03 – Naming Discrepancies**

This report identifies user-defined Section names that appear infrequently. This infrequent use may indicate a typographical error, failure to follow naming standards, or data quality issues that need to be corrected. The threshold used for the number of occurrences of discrepancies (Instance Count) is less than 5.

### **QA 04 – Suspect Section Inventory**

This report will provide a list of sections that have exceptionally large quantities (i.e., greater than 200) or potentially exposing transcription errors (usually when assessor puts the year installed in quantity field). The report will also identify where the Section Age (Install Date) is substantially greater than the service life for this classification (Section Age > Building Age). Finally, it will identify sections where the Section Age or Install Date is earlier than the Building Year (BUILDER and BRED do not allow this to occur, but some Assessment Teams are using custom tools to collect field data and generate BRED files).

### **QA 05 – Missing Section Details**

Based upon the Air Force implementation program's requirements, section details for RPIE may or may not be required. This report will identify sections without section details in order to verify and correct missing information if applicable (i.e., if the count is equal to zero or is less than the Section Quantity [each]). This report will render with the lists of Sections that are missing detail entries.

### **QA 06 – Missing Section Detail Images**

This report identifies where Section details exist, but no images (attachments) were found.

### **QA 07 – Sections without Inspections**

This report identifies Sections that are inventoried, but they do not have any inspections listed for each component-section. This may indicate a follow-up is needed due to access issues or situations where a straight age-based deterioration curve is desired (i.e., if the Sections with Inspections equal to zero [0]).

## **QA 08 – Sections Details without Inspections**

This report identifies Section Details that were inventoried, but the parent Section was not inspected. This is similar to Sections with Missing Inspection Report (QA7), but QA8 focuses specifically on situations where RPIE inventory was collected, but no inspection was performed. The report may only be pertinent when the SOW allows RPIE inventory to be performed independently or differently than FCA scope.

## **QA 09 – Section Detail Discrepancies**

Identifies the Section Detail records with year installed records that differ from the parent Section's Year Installed. Indicates Section Details that may be improperly sectioned, or that these records have improper dates. Section Details (RPIE) should be as close to the same age as possible when grouped as one section for life-cycle modeling purposes (i.e., Detail Install Date < Section Install Date or Detail Install Date > Section Install Date + 2 yr).

## **QA 10 – Missing Inspection Comments**

This report identifies inspections in the amber- or red- range that lack an inspection comment to help document the assessor's findings. Provides a list of facilities and the last inspection rating.

## **QA 11 – Section Condition Analysis Exception**

This report leverages the analytical models of BUILDER to identify Sections with assessment results that have caused exceptional values in the calculations. The two (2) identified areas that cause exceptions are described below:

1. Exception for Initial Condition - Identifies sections in which the assessment data indicates a "significant birth defect" was present, due to the rapid deterioration captured early in the section's life.
2. Exception for Adjusted Service Life (too short or too long) - Identifies sections in which the assessment data indicates the adjusted or computed Service Life is significantly different than the normal service life for this classification of section. The report will render when the Variance  $[(RSL + Age) / Design\ Life]$  is < 0.8 or > 1.4.

## **QA 12A – InspectorMatrix-ByInstSysInspector**

This report identifies the Installation, System and Inspector and then analyzes the Num Inspections completed by the Assessor; counts of “green,” “amber,” and “red” scores; and the percentage of each score by System. This report will show any tendencies by the Assessor to overrate or underrate a system.

## **QA 12B – InspectorMatrix-ByInstSys**

This report provides a quick view of the building system’s health based on the number and percentages of green, amber, and red scores a system receives. It identifies the Installation, the Systems, and the total number of inspections performed for the installation and each System. The number of “green,” “amber,” and “red” scores are summarized, along with a summary of the percentages of each color.

## **QA 12C – InspectorMatrix-ByInstInspectorSys**

This report identifies the Assessor, total NumInspections at Site or Complex level, NumInspections by Assessor on System, count of scores (red, amber, green) given by Inspector on each System inspected, and percentages of red, amber, and green ratings given by the Assessor on the Systems.

## **QA 12D – InspectorMatrix-ByInspector**

This report identifies the Site or Complex, the Assessor, the average score given by an Assessor, total NumInspections performed by an Assessor, count of scores (green, amber, and red), and the percentage of green, amber and red scores.

## **QA 12E – InspectorMatrix-GRAPH-ByInstSys**

Identifies the Site, the System Inspected, total number of Inspections, green scores (as a count and as a percentage), amber scores (as a count and as a percentage), and red scores (as a count and as a percentage). Also provides a graph displaying the Systems and the percentage of Inspections with “red,” “amber,” or “green” rating.

## Appendix C: Section Naming Conventions

A description of location or size will help future assessors locate a section. Below are the Section Naming Convention for floors, wings, bays, and equipment type. BUILDER's default is N/A (not applicable).

Section Naming Conventions			
Type	Convention	Example	Notes
Not Applicable	N/A		BUILDER's default entry if nothing is entered
By Floor	FLx	FL1, FL2, FL3	FL1-1 <sup>st</sup> Floor, FL2-2 <sup>nd</sup> Floor, FL3-3 <sup>rd</sup> Floor, etc. BASEMENT, MEZZANINE, ATTIC
By Wing	WINGx	WINGA	WING A, WING B, WING C, ADDITION, etc.
By Bay	BAYx	BAY1, BAY2	
By Cardinal Direction	NORTH	NORTH-EXT-DOORS	North-Exterior-Doors
	SOUTH		
	EAST		
	WEST		
	NE		
	NW		
	SE		
	SW		
By Space	RMx	RM123	
	OFFICE		
	MEZZ		
	WAREHOUSE		
	MECHROOM		
	STORAGE		
	RESTROOM		
	ROOF		
	CORRIDOR		
	STAIRWELL		
By Roof Section	SECx	SECA, SECB	Roof map attached to Section information
By Equipment Type	ACx	AC1	Air Conditioner Unit
	AHUx	AHU1	Air Handling Unit
	WHx	WH1	Water Heater
	VAVx	VAV1	Variable Air Volume Box

Section Naming Conventions			
Type	Convention	Example	Notes
	UHx	UH1	Unit Heater
	CHx	CH1	Chiller
	RTUx	RTU1	Rooftop Unit
	RAFx	RAF1	Return Air Fan
	REFx	REF1	Refrigeration Unit
	SAFx	SAF1	Supply Air Fan
	XFMRx	XFMR1	Transformer
	MAUx	MAU1	Makeup Air Unit
	SBx	SB1	Switchboard
	PANELx	PANEL1	Electrical Panel
	BOILERx	BOILER1	Boiler
	PUMPx	PUMP1	Pump
	HWPx	HWP1	Hot Water Pump
	CWPx	CWP1	Chilled Water Pump
	HPx	HP1	Heat Pump
	HEx	HE1	Heat Exchanger
	FACPx	FACP1	Fire Alarm Control Panel
	FCUx	FCU1	Fan Coil Unit
	EFx	EF1	Exhaust Fan
	ERUx	ERU1	Energy Recovery Unit
	DXx	DX1	Direct Expansion Unit
	CUx	CU1	Condenser Unit
	CTx	CT1	Cooling Tower
	UPSx	UPS1	Uninterruptible Power Supply
	EGx	EG1	Emergency Generator
By Component- Section Size	Size (WxH)	3068	Door 3'-0" wide by 6'-8" tall
		4050	Window 4'-0" wide by 5'-0" tall
By Component- Section Size & Orientation	Dir-Size (WxH)	North-3068	North-facing door 3'-0" wide by 6'-8" tall
		South-4050	South Facing Window 4'-0" wide by 5'-0" tall

## Appendix D: Section Detail Data

The Section Detail data provides further information regarding the equipment.  
Below is the data field where the information is entered and the format required.

Component-Section-Level Information			
<i>One record for each equipment type class/section in a building</i>			
Data Field	Contents	Format	Notes
Section Name	Section descriptor if multiple sections exist for component type	Text	Refer to Section Naming Convention
Section Equipment Type	Uniformat II L4 Identifier	List	
Section Component Type	L5 Identifier that specifies component type	List	
Section Quantity	Number of individual units	Integer	Should usually be the same as the number of section detail records below
Section Year Installed	Representative Year that the component section was installed	Year	

Section Details Information			
<i>One record and one unique barcode for each individual piece of equipment from Equipment List.</i>			
Data Field	Contents	Format	Notes
ID Number	GEFBS Functional Locator Number	Text	From GEFBS where applicable
Equipment Type	Additional Descriptor if different than Section Equip/Component Type	Text	
Equipment Make	From Nameplate Info	Text	
Model	From Nameplate Info	Text	
Serial Number	From Nameplate Info	Text	
Capacity	From Nameplate Info	Text	
Manufacturer	From Nameplate Info	Text	
Date Manufactured	From Nameplate Info	Date	
Year Installed	Date Individual Equipment was placed in service	Date	
Control Type/Make	Enter Part Number here, if applicable	Text	
Warranty Date	Optional	Text	

Section Details Information			
<i>One record and one unique barcode for each individual piece of equipment from Equipment List.</i>			
Data Field	Contents	Format	Notes
Warranty Company	Optional	Date	
Warranty Date2	Optional	Text	
Warranty Company2	Optional	Date	
Location	Location of Equipment in building	Text	Refer to Section Naming Convention
Comments	Section Details Comment	Text	Use to provide specific information pertaining to individual equipment

Section Details Photo Information			
<i>Photo file association to section detail record/barcode to be tracked outside of BRED. One image file per type for each Section Detail Record (Barcoded)</i>			
Data Field	Contents	Format	Notes
Asset Picture	Photo Image of Equipment	.jpg (640x480)	Associate image file name with facility number
Nameplate Picture	Photo Image of Nameplate (if applicable)	.jpg (640x480)	Associate image file name with facility number
Barcode Picture	Photo Image of Barcode (if applicable)	.jpg (640x480)	Associate image file name with facility number

Additional Information that BUILDER Automatically Tracks	
<i>NOTE: Not necessary to collect this data.</i>	
Data Field	Contents
MAJCOM	Parent of Installation Record
Installation	Parent of Facility Record
Facility Number	Parent of System Record
System	Parent of Component Record (Uniformat II L2 Identifier)
Component	Parent of Section Record [above] (Uniformat II L3 Identifier)
Unit of Measure	Populated from the Section Equipment Type Selection
Replacement Cost	Populated from the Section Equipment Type Selection
Design Life	Populated from the Section Equipment Type Selection
Current Year	Tracked by system Date and Time
Equipment Age	Calculated from Current Year - Section Year Installed
Remaining Service Life	Calculated from expected Service Life - Equipment Age

Additional Information that BUILDER Automatically Tracks	
<i>NOTE: Not necessary to collect this data.</i>	
Data Field	Contents
Inspector Last Name	Associated with any inspection record attached to Section
Inspector First Name	Associated with any inspection record attached to Section

## **Appendix E: BUILDER Catalog (in/out SOW)**

The Army BUILDER Catalog can be downloaded from the BUILDER website.  
Please contact [SMSsupport@erdc.dren.mil](mailto:SMSsupport@erdc.dren.mil) if you have any problems downloading this file.

## Appendix F: Example of QASP: Facility Condition Assessment Program

### Purpose

This Quality Assurance Surveillance Plan (QASP) is a document that is developed and applied by the Government to ensure that systematic Quality Assurance (QA) methods are used in the administration of this program. The intent is to ensure that all Facility Condition Assessment (FCA) teams perform in accordance with the requirements specified in the Scope of Work (SOW). This assurance is accomplished by verifying that data gathered in the field by the Assessors is accurate, and correctly entered and represented in BUILDER™, ensuring an accurate and consistent product among all the sites and facilities assessed. The QASP is nevertheless a “living document,” and the Government may review and revise it on a regular basis. The process defined below provides both an outline and the requirements needed to ensure the quality of the FCA products meet BUILDER standards and the [customer] level of expectation.

### Authority

Authority for issuance of this QASP is provided under the contractual SOW, Section XXX, Inspection and Acceptance.

### Scope

To fully understand the roles and responsibilities of the parties within this QASP, it is important to first define the distinction between Quality *Control* Plan (QCP) and the Quality *Assurance Surveillance* Plan (QASP). The FCA Team, and not the Government, is responsible for management and QC actions necessary to meet the quality standards set forth by the contractual SOW. The Government approved the FCA Teams QC Plan (Attachment 7)<sup>1</sup> that they plan to use to guide and document the implementation of the required management and QC actions needed to achieve the specified results.

The QASP on the other hand, is put in place to provide Government oversight of the FCA Teams QC efforts to assure that they are timely, effective and are

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<sup>1</sup> Currently not actually attached to this document or made part of this Appendix, as are Attachments 1–6.

delivering the results specified in the SOW. The following steps explain how the ERDC plans to implement QA for this Program.

## **Government Resources**

The following definitions for Government resources are applicable to this plan:

### **Contracting Officer (KO)**

The KO is a person duly appointed with the authority to enter into contracts and make related determination and findings on behalf of the Government. KOs are designated via a written warrant which sets forth limitations of authority.

### **Contracting Officer Representative (COR)**

The COR is an individual designated in writing by the KO to act as their authorized representative to assist in administering the contract. The COR will be designated in the contract. The limitations of authority are contained in a written letter of designation. It is recommended that the COR have experience in working with the BUILDER program.

### **Quality Assurance Manager (QAM)**

The QAM is an individual designated by the COR and authorized to make sure that systematic QA methods are used in the administration of the contract. The intent is to ensure that the FCA Team performs in accordance with the performance metrics, and the Government receives the quality of services called for in the SOW. The QAM will make QA support field assignments. The QA Chain of Command has the QAM as the leader of the QA team. The QAM should have, at a minimum, 1 year of experience working with the BUILDER program and also have significant design experience.

### **Quality Assurance Evaluators (QAEs)**

QAEs are individuals designated by the QAM and are responsible to provide QA support by utilizing a combination of surveillance methods to adequately assure the Government of the FCA Team's performance in conformance with the SOW, the accepted QCP, and any higher authority's requirements. QA personnel shall be trained as Assessors in BUILDER, have laboratory facility experience or significant design experience, and be available to support the QA efforts for the duration of the project. QAEs are selected based on their qualifications from the

names submitted from various sources to the QAM. The number of QAEs required for each FCA shall be evaluated on a project-by-project basis, and the number required will be adjusted as necessary with input from the customer, the PM, and the QAM. The initial strategic plan is that at least one QAE will attend each site visit to include the kick off meeting, calibration, and attend the out brief when scheduled. Sites with a large amount of square footage may have multiple QAEs present during the facility(s) assessment. Every site will have QAEs reviewing the pre-site and post-site data. QAEs notionally work for and report to the QAM.

## **Responsibilities**

The following Government resources shall have responsibility for the implementation of this QASP:

### **Contracting Officer (KO)**

The KO ensures performance of all necessary actions for effective contracting, ensures compliance with the terms of the contract, and safeguards the interests of the United States in the contractual relationship. It is the KO who assures the Contractor receives impartial, fair, and equitable treatment under the contract. The KO is ultimately responsible for the final determination of the adequacy of the Contractor's performance. The KO is the only one empowered to make any contractual agreements, authorize changes, or otherwise direct the Contractor on the Government's behalf.

### **Contracting Officer Representative (COR)**

The COR is responsible for technical administration of the contract and assures proper Government surveillance of the Contractor's performance. The COR is not empowered to make any contractual commitments or to authorize any changes on the Government's behalf. Any changes that the Contractor deems may affect contract price, terms, and/or conditions shall be referred to the COR for action.

### **Quality Assurance Manager (QAM)**

The QAM is responsible for management and QC actions necessary to meet the quality standards set forth by the SOW through the technical review of both the data and SOW compliance by the FCA Team. The QAM is not empowered to make any contractual commitments or to authorize any changes on the

Government's behalf. Any changes that the FCA Team deems may affect SOW cost, terms and/or conditions shall be referred to the KO for action.

### **Quality Assurance Evaluators (QAEs)**

The QAEs are responsible to utilize a combination of surveillance methods that provide a range of technically acceptable data to adequately assure the Government of the FCA Team's performance in conformance with the SOW, accepted QCP, and any higher authority's requirements. QAE support is to utilize a series of BUILDER™ data input/output checklists and assessment observations. The QASP is keyed to SOW deliverables for type of verification required. QAEs will report to the QAM.

Chain of command (COR-->QAM-->QAE); FCA Team PM is ultimately responsible for program QA.

## **Procedures/Methods of Assessment**

The methods of QA surveillance listed below shall be used by the COR in the technical administration of this QASP.

### **Quality Assurance Manager surveillance schedule**

The QAM will develop a routine surveillance schedule based on the surveillance plan's requirements. The schedule shall be marked "FOR OFFICIAL USE ONLY." In addition, periodic unscheduled surveillance will also be conducted.

### **Inspection methods**

This plan may use a combination of surveillance methods which adequately assures the Government of the Contractor's performance.

### **Periodic inspection**

Periodic inspection is a QA method based on a predetermined plan to evaluate part of the contract outputs by using subjective judgment and an analysis of agency resources to decide what work is to be inspected and how frequently it is to be inspected, as determined by the COR and/or QAM.

### **100% inspection**

100% inspection evaluates all outputs of the SOW requirement. This method requires a total inspection of the FCA Team's performance.

### **Validated customer complaints**

Validated customer complaints is a QA method whereby deficiencies in the outputs of the SOW requirement are identified by a person other than the COR/QAM. These persons (customers) are made aware of SOW requirements and are able to monitor the services provided by the FCA Team. Where there is a case of poor performance or nonperformance, the COR is notified. The COR shall investigate the report and document it if it is found to be valid. Each complaint should be validated to ensure that the service was required, and that the requirement was not fulfilled.

### **Inspection method selection**

The depth and detail of the observations made of the FCA Team's work shall be based on the relative importance of the items of work being evaluated. The principal method of surveillance shall be periodic inspection, with 100% inspection of key requirements; however, any surveillance method can be used at the Government's discretion at any time. Certain tasks may be so important that nonperformance or poor performance may significantly impact the mission, and these tasks will warrant 100% inspection. Joint inspections may be made by the COR/QAM and the FCA Team's PM. Joint inspections are beneficial when routinely performed, but they are vital when any disagreement or misunderstanding occurs.

### **Performing surveillance**

Surveillance results must be able to support action taken by the COR/KO when nonperformance or unacceptable performance occurs.

### **Inspection checklists**

An essential part of any QASP is an Inspection Checklist (Attachments 3-6<sup>2</sup>) for the service that will be evaluated. The Inspection Checklist ensures documented, uniform appraisal of each service occurrence, and that equal weight is given to

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<sup>2</sup> Not actually attached to this document but included as part of this Appendix.

each evaluation. The checklist shall contain such information as: QAE, inspection results, date, time, and other remarks relevant to the inspection. These checklists form the basis for all QA evaluations and constitute the documentation which will be used to substantiate a determination of unsatisfactory performance should one occur.

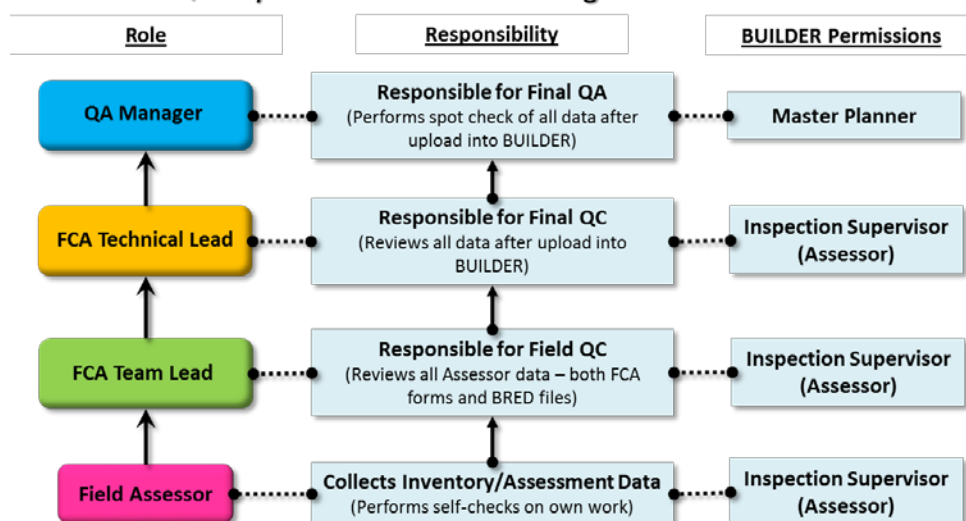
## Documentation

The QAM will maintain a QA file. The file will contain copies of all reports, evaluations, recommendations, and any actions related to the Government's performance of the QA function, including the originals of the QA checklists. All such records will be maintained for the life of the contract.

To achieve the desired level of quality, four (4) types of Quality Reviews shall be completed:

1. The Assessor self-checks their own work (both FCA field forms and BRED files) under the direction of the FCA Team Lead.
2. The FCA Team Lead/ reviews all Assessor work (both FCA field forms and BRED files) before data is uploaded into BUILDER™.
3. The FCA Technical Lead/QC Manager reviews all Assessor data after it has been uploaded into BUILDER™.
4. The QAM spot checks data after it is entered into BUILDER™ to ensure it meets accepted standards.

**Facility Condition Assessment Program**  
Quality Assurance & Control Organizational Chart



## **QC Process**

The process described here and shown above is not prescriptive to the A-E in any way. Rather, this is a checklist to be used by the Government QAM when evaluating the QC program. The QA support services to be provided shall include the following:

### **Pre-Site visit QC requirements and activities:**

1. FCA Team Lead shall be selected by the FCA Technical Lead and will serve as the Field QC Lead.
2. The Field QC Lead shall:
  - a. Participate in site coordination calls with the Site Coordinator, Facility Manager (FM), and FCA Team.
  - b. Verify the FM has received and returned the Pre-site Visit Checklist to the FCA Team prior to the 45-day-out teleconference.
  - c. Verify the FM has been requested to send out notification to each facility that an assessment is forthcoming, to secure a meeting room for the FCA Team, and to provide badges, escorts, and all required documents.
  - d. Verify the FM has uploaded to max.gov the needed installation as-built drawings (including drawings from any recent smaller renovations along with original as-built drawings), service history (service calls, etc.), project lists recently completed, and ongoing and/or planned projects and renovations in the immediate future .
  - e. Ensure the FCA Team has used the information provided so that they can understand the facility issues and concerns ahead of the actual site visit.
  - f. Verify how the FCA Team's sampling and sectioning plans compare to the documentation provided. Ensure that any proposed sectioning and/or sample sizes adequately represent sections and quantities at each facility being assessed no less than 1 week prior to the site visit. Check the site seismic and HVAC zone loaded in the BUILDER™ report "Site Information Summary."
  - g. Request and obtain the FCA Team's plan for assessing the facilities.

3. The FCA Technical Lead and/or FCA Team Lead will support the following activities with the FCA Team to prepare for the site visit:
  - a. Review documentation for each site in advance of the actual site visit.
  - b. Validate that there is enough budget and time planned into the trip schedule to ensure that QC activities can be accomplished during the site visit.
  - c. Ensure that all FCA Team Members are registered on the BUILDER site as Assessors. The BUILDER Access Request form can be downloaded from the following site:  
<https://www.sms.erdc.dren.mil/Products/BUILDER/Downloads>
  - d. Provide Assessors with lessons learned from previous site visits.
  - e. Provide Assessors with SOW requirements to review.
  - f. Provide Assessors with current FCA forms, if they will be using forms to collect the inventory and condition data.
  - g. Ensure that the team has installed the correct version of BRED on their computer.
  - h. Ensure the team is aware of all equipment and PPE requirements.
  - i. Conduct one or two Calibration meetings for the entire team to attend.
  - j. Calibration meetings shall be conducted by using a web meeting, which allows Assessors to log in and view examples of inventory validation, BRED data entry, BRED data QC using BRED report tools, and supplemental documents.

### **Onsite QC Process**

1. Ensure the QA representatives are physically present at each site kick-off, observe the FCA Teams during the site visit, and attend the onsite in- and out-briefs.
2. Kick-Off Meeting onsite will include the following:
  - a. The FCA Team Lead will conduct a review of SOW requirements and QC processes.
  - b. Provide the FCA Team with the “Direct Condition Rating Table” and the “Distress Condition Words Table” (included in

- Attachments 1 and 2)<sup>3</sup> and review the definitions to ensure consistent application among all team members.
- c. Review lessons learned from previous site visits.
  - d. Ensure that Assessors have all the current Field FCA forms.
  - e. Ensure that the team has all required equipment necessary for completing the field inspections and that the equipment is approved for use at the given site.
  - f. Ensure that the FCA Team has the required PPE per site regulations and Army requirements.
  - g. Provide reminders specific to the site assessment covering validation of existing BUILDER inventory, inventory details, and assessment comment requirements.
  - h. Confirm that the FCA Team is supplied with the proper pre-site documents, badges, escorts, etc.
  - i. Confirm the FCA Team assessment plan exists and covers all facilities at that particular site.
3. During the Site Visit
- a. Confirm that the FCA Team is performing the assessments with an awareness that they are in a laboratory, office space, etc. (i.e.; not breaking any regulations for a specific facility nor creating situations that might put anyone at risk, not being loud, touching items, or in any way disrupting/impacting work or research.
  - b. Observe that the visual assessments are being performed in accordance with the contractual SOW, approved FCA Team PMP, QCP, and Safety Plan, ERDC – BUILDER SMS Implementation Resource Guide, BUILDER Condition Assessment Manual V3.3.7, and BRED 3.3.7 User Guide (to include SMS Portfolio downloads found at: <https://www.sms.erdcdren.mil> that are current at the execution of the project). Note that in case of conflict, the contractual SOW overrides other documents.
  - c. Observe that the FCA Team assessed facility SF and number of floors is the same number and quantity as what is provided in the initial site information loaded into BUILDER.
  - d. Provide visual verification that any sampled items (if allowed) in the field follow the FCA Team sample plan.

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<sup>3</sup> Not actually attached to this document but included as part of this Appendix.

- e. Verify components are checked above the ceiling as agreed upon.
- f. During the on-site walk through, collect random inventory data and photograph distressed items for a minimum of 5 sections per building. Data collections will be collectively gathered by the QA Team. These sections should be dispersed evenly between the systems present in that building. This data will be compared against those collected by the FCA Team for those sections. This comparison will occur in the “Post Site/Data Review.”
- g. Ask the FM and facility staff questions about how well the FCA Team is working in their facility; such as disruptions to work, quietness of the FCA Team members, etc.
- h. Ask the FCA Team questions to gauge their process and data collection knowledge.
- i. General Field QC Review – The FCA Team Lead and Assessors will conduct a daily review of the FCA forms and BRED data for each facility by utilizing the “Individual Facility Checklist” included in Attachment 3.<sup>4</sup> Once all individual facilities have been reviewed, the FCA Team Lead will ensure the entire package of FCA forms and BRED files are reviewed by utilizing the “Overall Field QC Checklist” included in Attachment 4.<sup>5</sup>
  - i. Issue Resolution – Each Assessor is expected to correct their own data, as required, however the FCA Technical Lead or QA Manager can make corrections on their behalf if it’s in the best interest of the project and the Assessor is informed of the corrections.
  - ii. If required, the Site Coordinator, FCA Team Lead, and Assessors will revisit the facility to review errors/omissions and discuss corrective actions.
- j. FCA Assessor Re-Calibration – If repetitive issues are noticed, leadership may require team members to participate in additional training mid-project and may remove or substitute team members if additional training fails to work.

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<sup>4</sup> Not actually attached to this document but included as part of this Appendix.

<sup>5</sup> Not actually attached to this document but included as part of this Appendix.

### **Onsite QC Schedule**

1. The QC review will start no later than the next business day after notification by the Site Coordinator that a facility is “Assessed Complete.”
2. The QC review process will be completed before the daily out-brief meeting.
3. During the daily out-brief meeting, the FCA Team Lead is to provide lessons learned to the team.
4. FCA Team Lead will ensure all inventory is verified and any inventory requiring deletion from the database is marked “DELETE” in the section name for easy identification by the QC.
5. FCA Team Lead will ensure equipment details such as make, model, serial number, and location are present on all applicable inventory.
6. Assessors will ensure that all photos are renamed per the photo naming convention and all photos that were uploaded into their BRED data are referenced on their walk sheets by photo number.

### **QC Review of BUILDER Reports**

1. Critical information entries in the BUILDER database are inventory, installation date, sectioning, and Assessor’s rated condition. There should be a logically connected relationship between these items. QA should review these elements to identify features that appear disconnected. The inventory is the main critical item for both old and new buildings.
2. Ensure consistency of BUILDER data is being achieved across the board for all the Assessors at each site and in each facility. Inform the PM and the FCA Team Lead if significant discrepancies are discovered. The PM is to validate that errors are mitigated.
3. Once reports are provided, check for omissions, inconsistencies, unit of measure errors (Final 8 report), duplication of data sections, and other issues in data. Inform CERL of any BUILDER software/database/report issues.
4. Compare the inventory section data collected during the site visit to the same sections in the inventory data collected by the FCA Team. The QA team will determine if there are any significant findings and elevate them to QAM, Site Coordinators, and Quality Engineer for Assessor corrections and/or verification.

5. Check that the facility area (SF) and number of floors the FCA Team assessed, as shown in the BUILDER data reports, is the same number and quantity as what is provided in the BUILDER initial site information.
6. Utilize the BUILDER reports by downloading in the Microsoft Excel format where applicable and analyze the data by using Excel's sort and filter functions to group similar items of interest together so that the QA team can easily identify and quantify notable areas of concern. Listed below are recommended reports that are available and valuable for this type of analysis, including the following standard and custom reports:
  - a. **Final 1 – Post Site/Data Review Facility Summary** provides a clear summation or holistic picture of FCA results for all assessed assets at a given installation.
  - b. **Final 2 – System Summary** provides a clear summation or holistic picture of building systems within each facility.
  - c. **Final 3 – Component Details** provides a list distress reports for each component- section collected within each facility.
  - d. **Final 4 – Equipment Details** provides a list of section details for each piece of equipment collected in order to satisfy RPIE requirements.
  - e. **Final 5 – Inspection Summary** provides a list of inspection ratings for each component-section collected within each facility.
  - f. **Final 6 – Distress Details** provides a list of Distress Survey details collected within each facility.
  - g. **Final 7 – Work Action Summary** provides a clear summation of recommended work for each facility.
  - h. **Final 8 – Work Action Details** provides a detailed breakdown of work item candidates generated from BUILDER, based on component age and condition information. A basic cost estimate is automatically generated for each line item, although the estimate can be overridden by the Contractor with updated cost estimates if necessary. This report can also be used to package individual work items into projects. This report can be used to discover unit of measure problems.
  - i. **Final 9 – Facility System Quick View** provides a cross-tab list of color-coded facility and SCI on a single line.
  - j. **QA-2 – Missing Comments for Component Types:** Other, General (If Mat/Equip Type ends in '90')

- k. **QA-3 – Naming Discrepancies** shows inconsistent section names.
  - l. **QA-4 – Suspect Section Inventory** when the following occur: (Quantity > 200) or (Section Age > Building Age).
  - m. **QA-7 – Sections without Inspections** (inventory only).
  - n. **QA-9 – Section Detail Discrepancies** (Detail Install Date < Section Install Date) OR (Detail Install Date > Section Install Date + 2 Yrs.)
  - o. **QA-10 – Missing Inspection Comments** shows the Inspections with amber or red range of results that lack an inspection comment.
  - p. **QA-11 – Section Condition Analysis Exception** shows when the Variance  $[(RSL + Age) / Design Life]$  is < 0.8 OR > 1.4.
  - q. **QC-1 – Facility Report:** shows BCI and NumSections but only for facilities where BCI is not null.
  - r. **QC-2 – System Report:** shows BCI, SCI, and Num Sections in systems for facilities where the BCI is not null.
  - s. **QC-3 – Component Report** shows BCI, BCCI, and NumSections for facility Components where the BCI is not null.
  - t. **QC-4 – Component-Sections Report** shows CSCI, CSCCI, and NumInspections.
  - u. **QC-5 – Section Details** shows CSCI, Equipment Make, Model, Serial Number, Capacity, Manufacturer, and Location. This report show all component sections.
  - v. **QC-6 – Inspection Report** shows CSCI, CSCCI, Comp Rating, and Inspection Comments. This report shows only the inspected sections.
7. **Inventory.** First look at some general overall information and work down to more detail. Use the Final 1 report to look at overall information. Compare Plant Replacement Value (PRV) to Component Replacement Value (CRV). Generally numbers should be similar, but with CRV usually larger. Any changes in these values must be accomplished by the Government.
8. **Systems.** Use QC-4 to check which systems were included. Double-check missing items on Final 2 with Final 3 custom reports. Most facilities are one floor, so they don't have A20, C20, or D10 systems. If the tenant is only occupying part of a building or the building is owned by others, then it may only have C10, C30, D40, and D50 systems. Most buildings will have A10-20, B10-30, C10, C30, D20-

50 systems. However, lab facilities should have some E10 systems, and facilities with cold storage, vaults, hearing test chambers and other special rooms should have some F10 systems. Look for systems that are missing data. If the data is not available, the FCA Team must have a method of indicating this by populating NA in the data block or adding a comment such as nameplate not attached, accessible, or legible. Facilities such as Outdoor Recreation Pavilions and some storage sheds may only have A10 and B10/30.

9. **Quantities.** Use the Final 3 report to check quantities. Easy checks include the items measured in Square Feet (SF) that should be close to the overall building SF: slab on grade, floor decks and slabs, roof decks and slabs, roofs coverings, floors, ceilings, electrical branch wiring, fire protection (sprinklers), and communications and security systems. HVAC should be .0025 - .005 tons per SF.
10. Use the QC-5 report in BUILDER™ to ensure the RPIE IDs were properly captured, to include component details and locations.
11. After the FCA Team Lead has completed their detailed field review and all BRED files have been loaded into BUILDER, the FCA Technical Lead will conduct a thorough review of the BUILDER data for each facility utilizing the “Individual Facility Review QC Checklist” included in Attachment 5. Once all individual facilities have been reviewed, the FCA Technical Lead will ensure the entire BUILDER dataset is reviewed utilizing the “Overall QC Checklist” included in Attachment 6. The FCA Technical Lead may review all available BUILDER reports although they will focus primarily on the following:
  - a. BUILDER Final 1 – Facility Summary Report  
*NOTE: If any Building Level data is incorrect, it must be corrected in the customer’s Real Property database of record and shall not get changed in BUILDER. A list of Building Level discrepancies will be provided to the customer for internal resolution.*
  - b. BUILDER QC 5 – Section Details Report
  - c. BUILDER QC 6 – Inspection Report
  - d. Direct Rating Data Fields:
    - i. Expected Rating = what BUILDER predicts rating should be
    - ii. Comp Rating = Assessor’s rating
    - iii. Paint Rating = Assessor’s paint rating
    - iv. Comp Rating number associations are listed below:

G+	100	A+	80	R+	50
G	95	A	71	R	25
G-	88	A-	61	R-	10

- e. The FCA Technical Lead will coordinate directly with the FCA Team to ensure all issues have been resolved and the dataset is free of known errors prior to submitting it to the QA Manager for review.
- f. The QA Manager will perform spot checks of all BUILDER data after the FCA Technical Lead has completed their final review to ensure compliance with Army standards, SOW requirements, and BUILDER best practices.
- g. The QA Manager will ensure all issues have been resolved and the dataset is free of known errors prior to submitting it for customer review.

## **QA Process:**

### **QA Site Visit Process**

1. During the Site Visit, the QA Manager will perform random checks to:
  - a. Ensure FCA data is being collected in accordance with the SOW.
  - b. Ensure thorough QC of all field data is being conducted by the FCA Team.
  - c. Gather lessons learned.
  - d. Provide additional training for Assessors in BUILDER, as required.
2. Post Site Visit, the QA Manager will:
  - a. Provide feedback to the FCA Team and Program Office Leadership on performance of the FCA Team in the field.
  - b. Suggest improvements to the QA/QC process.

### **QA Home Office Process**

1. The QA Manager's primary role is to plan, direct, and coordinate QA processes and formulate QC policies to ensure that all products meet Army standards, SOW requirements, and BUILDER best practices.

- a. The QA Manager will regularly review program progress to ensure compliance with established QA/QC standards.
  - b. In the event of discovered noncompliance, the QA Manager will immediately adjust program standards to course correct, and they will notify the FCA Team and Program Office Leadership of any changes. The QA Manager shall arrange for any calibration training as necessary, to ensure the updated standards are communicated and adhered to.
2. The best overall QA tool is the QC-6 report, which can be analyzed to find many potential areas of concern such as the following:
  - a. Amber or red Assessor ratings with no comments and/or photos.
  - b. Improper or inadequate section, equipment, and/or inspection comments
  - c. Installation date
    - i. Ensure equipment install dates are not before the building was constructed. Manufacture dates are possible for reused equipment, but uncommon. Additionally, make sure very few items are defaulting to the original construction date for buildings that are >40 years old, since that defies science and common sense. There are items with extremely long Service Design lives, but these items are rare.
    - ii. There are many ways an installation date may appear to be inaccurate. The date can look suspect if there is a large discrepancy between the expected, completed, and CSCI ratings. It could look in question if it is far beyond its expected service life. It can also be suspect if all similar or related items have a different date, since it is unlikely just a few items would have been left out of a system replacement.
    - iii. One method for checking an install date is to compare to DMLSS. DMLSS has installation dates for many of the items to check against.
3. The Final 4 report lists items by manufacturer, model number, and serial number. Often it is easier to research install dates for critical equipment by the manufacturer's serial number via the internet. A good website for this type of search is <http://www.buildingcenter.org/content/hvac-production-dateage>. All United Technologies Corporation (Carrier, Bryant, Payne, etc.) equipment uses the first 4 digits of the serial number to indicate the

manufactured date, with first 2 numbers representing the week of the year and last 2 numbers representing the year of manufacture. Typically there should be a maximum of 2 years difference between year manufactured and year installed. Some of the items that can be checked in this report are listed below:

- a. Sectioning
- b. Correct material type
- c. Duplicate sections/items
- d. Grammar, punctuation, spelling, or similar errors
- e. Inspection Comments that are really Section/Inventory Comments that should be moved to the Inventory side of BUILDER™
- f. Ratings that are greater than or equal to a 20-point difference between the expected rating and the completed rating; these ratings are highlighted in pink in the Comp Rating column.
  - i. This often occurs because of a lack of visible evidence regarding wear and tear on the item. Based on this, look first for an explanation by the Assessor to validate the rating given, and if a visual inspection of the critical portions of an item cannot be made, challenge the Assessor as to whether it is better to use an age based rating or a direct rating.
  - ii. For many things such as walls, floors, ceilings, doors, windows, toilet fixtures, the condition is more observable and more predictive of failure, so a direct rating that may be higher than usual may be acceptable.
  - iii. On the other hand, for backflow preventers, fire detection and reporting equipment, electrical components, communication and security items, HVAC concealed in cabinets or insulation, and many types of pipes and valves, it is better to rely on BUILDER's age-based degradation curves.
  - iv. Without an objective basis for assigning a higher than expected rating, risk is created for unexpected failure of building systems, potentially creating failure that would impact the mission of the people in the facility and may degrade research.
- g. Assessor's rated condition. The QC-6 report can be used to sort on Assessors to compare the ratings being assigned by the teams and/or the individual Assessors. For example, on the Final 6 report all of the distressed ratings are listed to include the

Assessor. If all of these are done by only two (2) of the typical six (6)-person teams, a check should be performed on the ratings being given by the other Assessors. Individual and team Assessors can be checked for trends.

## **Attachment 1 – Direct Condition Rating Table**

Rating	Operational Status	Observation
Green (+)	Fully Operational	Free of observable or known distress
Green		No reduction of serviceability or reliability. Slight deterioration or minimal wear present. Routine maintenance required.
Green (-)		Slight reduction of serviceability or reliability. Slight deterioration or minimal wear present. Minor repair of non-critical components required.
Amber (+)	Reduced Operation	Moderate reduction of serviceability or reliability though adequate. Very few critical components suffer from moderate deterioration and a few non-critical components suffer from severe deterioration.
Amber		Serviceability or reliability definitely impaired. Some critical components suffer from moderate deterioration and many non-critical components suffer from severe deterioration.
Amber (-)		Significant reduction of serviceability or reliability. Most components suffer from moderate deterioration or a few critical components suffer from severe deterioration.
Red (+)	Loss of Operation	Significant reduction of serviceability or reliability. Majority of components suffer from severe deterioration and others may have varying degrees of deterioration.
Red		Severe reduction of serviceability or reliability such that it barely performs. Most components suffer from severe deterioration.
Red (-)		Complete loss of serviceability or reliability. Few, if any, components are salvageable.

## Attachment 2 – Distress Condition Words Table

**NOTE:** When several descriptors can be used for the same distress, use the more specific distress word.

For example, care must be taken to differentiate between “Broken,” “Cracked,” “Damaged,” “Operationally Impaired,” and “Missing.” The differentiation between “Broken” and “Cracked” are the missing pieces or loss of operability associated with “Broken.” “Broken” provides greater problem specificity and should be used instead of “Damaged,” when applicable. “Operationally Impaired” should be recorded instead of “Broken” if operability is lost, but there is no true separation of pieces or if a separation is unknown. Missing pieces as a result of fracturing denotes “Broken,” whereas missing parts without fracturing denotes “Missing.”

Distress Word	Examples
ANIMAL/INSECT DAMAGED	Gnawed, scratched or likewise damaged. Evidence includes holes, droppings, nests, and sawdust, indicating the presence of animals, birds and/or insects. Termite damage, rodent holes, fecal contamination, animal pathways in insulation, animal hole under fence.
BLISTERED	Round or elongated raised areas on the surface that are generally filled with air. Floor covering with raised area that is “soft” when walked on, wall covering (wallpaper) with air pocket, bubbling of roof membrane
BROKEN	Fractured, shattered, or otherwise separated into two or more pieces, resulting in the loss of operability. Shattered window pane, wire separated from connector preventing lights from working, ceiling tile separated into two pieces
CAPABILITY / CAPACITY DEFICIENT	Serviceability is lacking due to insufficient capacity, technical obsolescence, or lack of compliance to applicable codes. HVAC unit size too small for cooling demand, furnace cannot adequately heat office in winter, poor room lighting, wheelchair ramp too steep
CLOGGED	Obstruction that is disrupting the intended flow of air, gasses, or liquids. Waste water pipe that will not drain or drains slowly, downspout with little flow and water spilling over gutter, reduced airflow from duct due to presence of foreign matter.
CORRODED	Wearing away, disintegrating, flaking or scaling from a chemical, electrochemical, or electrolytic attack. Rust present, brown water from internal pipe corrosion, failure of galvanized coating on steel sheet wall.
CRACKED	Fractured. Separation into pieces may or may not have occurred. No loss of operability. Fractured pipe from frozen water, fractured sidewalk, masonry wall, window, or ceiling tile.

Distress Word	Examples
DAMAGED	Dents, chips, gouges, rips, distortion, rupture, etc., resulting from impact, fire, flood, or other means. Dents in metal column or gutters, gouges in walls from abuse, scratched/chipped/frayed/holed ceiling tile, deformation of roof from hail
DETERIORATED	Natural degradation through normal usage or environment exposure. Involving disintegration erosion, delamination, weathering, checks, warps, bumps, raveling, flaking, pitting, spalling, wear or a change in property Delamination of brick faces, warped flooring, worn or raveled carpeting, spalled concrete
DISPLACED	Moved, shifted, bulged, rotated or settled from intended position. May be due to a specific natural event, plastic deformation, or consolidation over time. Uneven sidewalk, sagging roof truss, dislodged door frame, column out-of-plumb.
EFFLORESCENCE	White powdery coating of salts encrusted on the surface of brick, concrete masonry, or plaster caused by moisture leaching alkalis from mortar or concrete.
ELECTRICAL GROUND INADEQUATE	Improper connection causing a short circuit or resulting in inadequate grounding. Lightning arrestor disconnected or broken, connector insulated by paint, and open or no ground at outlet for interior wiring.
HOLES	Drilling, punching or penetration for an intended purpose (depth may be partial or complete). Pipe penetration that is not sealed, former anchor holes for signs since removed, permanently secured door with lock removed but hole for lock remains.
LEAKS	Unwanted entry, passage, or escape of gas or liquid. Water dripping from rain gutter, leaky faucet, loss of window seal allowing water and air to penetrate interior, and air escaping from compressed air line.
LOOSE	One or more fasteners not secured properly. Loose bolts holding light fixture to wall, roof, or wall panels is flapping in wind, non-secured stair railing, and raised nails or screws in a deck or flooring.
MISSING	Fasteners are required, but absent due to removal, dislodgement, or deterioration. Ceiling tiles removed and never replaced, exhaust fan removed but still needed, and ladder rung was loose and fell out.
MOISTURE / DEBRIS / MOLD /CONTAMINATED	The unintended presence of foreign material, vegetation, mold, mildew, water and/or other liquid. Grass growing in cracks in sidewalk, trash on roof, wet insulation, vines growing up downspout, and presence of leaves in air-handling unit coils.
NOISE / VIBRATION EXCESSIVE	Equipment noise/vibration in excess of normal or acceptable levels. Wobbly or squeaky fan, HVAC compressor motor with unusual whine, and transformer with noisy "hum."

Distress Word	Examples
OPERATIONALLY IMPAIRED	Does not operate properly or at all due to improper installation or construction, misalignment binding, over-tightening, malfunctioning, part failure, or M&R practices. Door difficult to close due to high humidity or improperly hung, window will not stay open, failed AC compressor, no hot water from hot water heater
OVERHEATED	Temperature exceeds normal or acceptable levels. Excessively warm electrical circuit breaker, evidence of heat damage around heater, and discolored flue.
PATCHED	An obvious, localized repair to the subcomponent. Plaster repair of wall with poor workmanship, mastic to repair roof leak, plywood covering over door or window, and substitute of prefabricated wall panel
ROTTEN	Fungal or bacterial decay or decomposition resulting in softness, sponginess, disintegration, loss of strength, and/or distortion. Spongy roof deck, decayed soffit and fascia, and wood column end loss due to water emersion
STAINED/DIRTY	Discoloration resulting from liquids, graffiti, smudges, mildew, mold, moss, algae, soot, dirt, animal waste, or other sources. Graffiti on wall, rust streaks, excessively dirty floors in building that has been vacant for years, and widespread ceiling tile discoloration due to smoke or fumes.

### Attachment 3 – Onsite QC Review (Assessor and FCA Team Lead), Individual Facility Checklist

Installation Name			
Facility Number		Date of QC Review	
Facility Name		QC Reviewer(s)	

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>A. Field FCA Forms</b>						
1.	Are all Assessor notes and forms completed for each discipline? <ul style="list-style-type: none"> <li>All information to be included in BRED is documented appropriately (refer to BRED file checklist below)</li> </ul>					
2.	Does each form have the title block completed for all sheets? <ul style="list-style-type: none"> <li>Installation Name</li> <li>Facility Number</li> <li>Facility Name</li> <li>Date of the Assessment</li> <li>Assessor's full name</li> </ul>					
3.	Are all Assessor notes and forms neat and legible, and do they include pencil/pen marks dark enough for scanning?					
4.	Have all photos been reviewed to ensure they do <u>not</u> depict unauthorized images and that					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>A. Field FCA Forms</b>						
	they <u>do</u> conform to standard naming conventions?					
5.	Have all Assessors completed a review of their work for accuracy and compliance with program standards?					
6.	Has all collected information been entered into BRED?					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>B. BUILDER Remote Entry Database (BRED) File</b>						
1.	Are all systems required by the SOW included? <ul style="list-style-type: none"> <li>• Cross reference the building type - Category Code - to know what systems the building type should have in it.</li> </ul>					
2.	Are all quantities correct?					
3.	Are all records sectioned according to the SOW and best BUILDER practice? Example: Sectioning by floor, type of equipment, etc.					
4.	Is the Section Naming Convention consistently followed?					
5.	Are all UNIFORMAT II Level 5 or Section Subtype selections correct?					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>B. BUILDER Remote Entry Database (BRED) File</b>						
	<ul style="list-style-type: none"> <li>• Ensure the most specific BUILDER catalog item was used and compared for accuracy against the documented equipment capacity. If there is not a specific Subtype available for a given component, the Assessor shall round up to the next available size or choose "Other" if there is nothing close. The Assessor is permitted to use best rounding judgment such as if the delta is very close to the next size down like a 101 GAL tank, it is permissible to select a 100 GAL Subtype. The Assessor should reference and take into careful consideration the Unit Costs in the BUILDER catalog when making subtype selections.</li> <li>• "General" only used when no further detail is required to differentiate the item from other catalog options or it is the only available option. When it's not clear from the UNIFORMAT Level 4 "Section" what the item</li> </ul>					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>B. BUILDER Remote Entry Database (BRED) File</b>						
	<p>truly is, the record must include a detailed Inventory Comment describing the item and its location. For instance, if the “General” subtype is selected under Section “B201005 EXTERIOR LOUVERS &amp; SCREENS,” the Assessor must include an Inventory Comment stating whether the item is a louver or a screen.</p> <ul style="list-style-type: none"> <li>• “Other” only used when there is no catalog option available to accurately describe the item and serves to identify an item for addition to the BUILDER catalog. The record must include a detailed Inventory Comment describing what the item really is and its location.</li> <li>• “Unknown” only used when the item is known to exist though cannot be physically or visually accessed in order to properly identify it. The record must include a detailed Inventory Comment specifying why the item couldn’t be</li> </ul>					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>B. BUILDER Remote Entry Database (BRED) File</b>						
	accessed, noting that the subtype is an estimate, and any other relevant information that will assist the Site with conducting a future investigation to properly classify the item, including its location.					
6.	Are all Units of Measurement (UoM) correct and known mismatches noted in an Inventory Comment? • Example: "AMP = EA"					
7.	Is all required nameplate data included ( <i>Make, Model, Serial Number, etc.</i> ) and "N/A" used for missing or not applicable data fields?					
8.	Are all equipment capacities correct and their UoM noted? • Ensure the correct UoM is recorded according to the BUILDER catalog unless a mismatch is noted in an Inventory Comment • Does all equipment have a clear, documented location listed in the Location data field of the Equipment Details? • Location should be descriptive enough to assist a person unfamiliar with the asset with					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>B. BUILDER Remote Entry Database (BRED) File</b>						
	<p>finding the item with little difficulty. Recommend using room names, room numbers, cardinal direction, etc.</p> <ul style="list-style-type: none"> <li>In situations where nameplate data could not be populated, did the Assessors include Inventory or Equipment Detail Comments stating the reason such as "Nameplate is painted over" or "Missing nameplate"?</li> </ul>					
9.	Are all Equipment Detail Comments appropriate?					
10.	Are all Section Years correct?					
11.	Are all Inspection Dates correct?					
12.	Are all Inspection Types correct (i.e., Direct vs Distress)?					
13.	<p>Do all Inspector data fields include the full given name of the Assessor who performed the field assessment?</p> <ul style="list-style-type: none"> <li>No default CERL names or name of the data entry specialist who entered the data though didn't perform the actual assessment</li> <li>The inspection comments should have the</li> </ul>					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>B. BUILDER Remote Entry Database (BRED) File</b>						
	inspectors name in brackets at the end of the comment after the period. Example: [John Smith]					
14.	Are all required photos included in BRED? <ul style="list-style-type: none"> <li>Photos are required for all A+, A, A-, R+, R, and R- ratings.</li> </ul>					
15.	Do all required inventory records include a new associated inspection rating?					
16.	Are all painted items properly documented and include an associated Paint Rating and Paint Year? <ul style="list-style-type: none"> <li>Ensure Paint Year appropriately corresponds to the inventory Section Year and doesn't default to the Bldg Year unless intended.</li> </ul>					
17.	Are all Inventory Comments appropriate and notated in the correct data field?					
18.	Are all Inspection Comments appropriate and notated in the correct data field?					
19.	Are Inspection Comments included for all A+, A, A-, R+, R, and R- ratings?					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>B. BUILDER Remote Entry Database (BRED) File</b>						
20.	<p>Do all Inspection Comments properly justify their associated rating?</p> <ul style="list-style-type: none"> <li>• Green+ ratings should only be given to inventory that is in pristine condition, free of observable defects.</li> <li>• Maintainability and obsolescence should not be directly considered in the rating unless it has led to actual deterioration of condition that can be observed or reasonably inferred.</li> <li>• Ensure items were not downgraded simply if an item is dirty, due to age or belief that the item is outdated, because the item does not meet current code compliance standards, because the item is not deemed energy efficient, or because the item is deemed to be a safety violation/hazard unless otherwise directed by the SOW. Only downgrade it if an item's functionality, performance, reliability, etc. is compromised</li> </ul>					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>B. BUILDER Remote Entry Database (BRED) File</b>						
	<p>according to the direct rating definitions.</p> <p>Assessor may provide recommendations for repair or replacement. However, this should not be the sole justification provided for an Amber or Red rating.</p>					
21.	<p>Do all Inspection Comments include a Distress word, following the required convention where appropriate?</p> <ul style="list-style-type: none"> <li>Example: "CORRODED – Boiler housing has significant signs of rust damage." [John Smith]</li> </ul>					
22.	Is the dataset free of grammatical, punctuation, and spelling errors?					

## **Attachment 4 – Onsite QC Review (Assessor and FCA Team Lead), Overall Check List**

Installation Name	
Date of QC Review	
QC Reviewer(s)	

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>A. Field FCA Forms and BUILDER Remote Entry Database (BRED) Files</b>						
1.	Have all facilities required by the SOW been inventoried and assessed according to the SOW?					
2.	Have all inventory records been validated and adjusted to correct mistakes, if necessary? <ul style="list-style-type: none"> <li>All required systems included, proper sectioning rules followed, proper Section Naming Convention followed, Subtype selection, Equipment Details data fields</li> </ul>					
3.	Has all inspection data been validated and adjusted to correct mistakes, if necessary? <ul style="list-style-type: none"> <li>All required ratings provided, Inspection Dates, Inspection Type, Inspector Name</li> </ul>					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>A. Field FCA Forms and BUILDER Remote Entry Database (BRED) Files</b>						
4.	Have all inspection ratings been validated and adjusted to correct mistakes, if necessary?					
5.	Have all ratings been reviewed for consistency across individual Assessors and been adjusted, if necessary? <ul style="list-style-type: none"> <li>• Example - If an assessor gives the same rating to all records there might be an issue</li> </ul>					
6.	Are all required photos been uploaded into BRED, reviewed for quality, and properly vetted by the Site POC/Security Office (if required)?					
7.	Have all uploaded photos been reference on the walk sheets with the photo number?					
8.	Has the dataset been reviewed for missing data and all issues resolved?					
9.	Has the dataset been reviewed for missing or insufficient comments and all issues resolved?					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>A. Field FCA Forms and BUILDER Remote Entry Database (BRED) Files</b>						
10.	<p>Has all past inventory been validated and does it include a new inspection?</p> <ul style="list-style-type: none"> <li>If the inventory no longer exists, was it marked for deletion in the section name? Example: MECHANICAL PUMP-DELETE</li> </ul>					

## **Attachment 5 – Final QC Review (FCA Technical Lead), Individual Facility Check List**

Installation Name			
Facility Number		Date of QC Review	
Facility Name		QC Reviewer(s)	

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>A. BUILDER QC 5 – Section Details Report</b>						
1.	Are all systems required by the SOW included?  <ul style="list-style-type: none"> <li>Cross reference the building type - Category Code - to know what systems the building type should have in it</li> </ul>					
2.	Are all quantities correct?					
3.	Are all records sectioned according to the SOW and best BUILDER practice?  <ul style="list-style-type: none"> <li>Example: Sectioning by floor, type of equipment, etc.</li> </ul>					
4.	Is the Section Naming Convention consistently followed?					
5.	Are all UNIFORMAT II Level 5 or Section Subtype selections correct?  <ul style="list-style-type: none"> <li>Ensure the most specific BUILDER catalog item was used and compared for accuracy against the</li> </ul>					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>A. BUILDER QC 5 – Section Details Report</b>						
	<p>documented equipment capacity. If there is not a specific Subtype available for a given component, the Assessor shall round up to the next available size or choose "Other" if there is nothing close. The Assessor is permitted to use best rounding judgment such as if the delta is very close to the next size down like a 101 GAL tank, it is permissible to select a 100 GAL Subtype. The Assessor should reference and take into careful consideration the Unit Costs in the BUILDER catalog when making subtype selections.</p> <ul style="list-style-type: none"> <li>• “General” only used when no further detail is required to differentiate the item from other catalog options or it is the only available option. When it’s not clear from the UNIFORMAT Level 4 “Section” what the item truly is, the record must include a detailed Inventory Comment describing the item and its location. For instance, if the “General” subtype is selected under Section “B201005 EXTERIOR LOUVERS &amp;</li> </ul>					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>A. BUILDER QC 5 – Section Details Report</b>						
	<p>SCREENS,” the Assessor must include an Inventory Comment stating whether the item is a louver or a screen.</p> <ul style="list-style-type: none"> <li>• “Other” only used when there is no catalog option available to accurately describe the item and serves to identify an item for addition to the BUILDER catalog. The record must include a detailed Inventory Comment describing what the item really is and its location.</li> <li>• “Unknown” only used when the item is known to exist though cannot be physically or visually accessed in order to properly identify it. The record must include a detailed Inventory Comment specifying why the item couldn’t be accessed, noting that the subtype is an estimate, and any other relevant information that will assist the Site with conducting a future investigation to properly classify the item, including where it is located.</li> </ul>					
6.	Are all Units of Measurement (UoM) correct and known					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>A. BUILDER QC 5 – Section Details Report</b>						
	mismatches noted in an Inventory Comment? • Example: “AMP = EA”					
7.	Is all required nameplate data included ( <i>Make, Model, Serial Number, etc.</i> ) and “N/A” used for missing or not applicable data fields?					
8.	Does all equipment detail include a location of the equipment if applicable?					
9.	Are all ID Numbers correct? • Should be 4-digit all caps letters followed by 6-digit numbers: XXXX#####)					
10.	Are all equipment capacities correct and their UoM noted? • Ensure the correct UoM is recorded according to the BUILDER catalog unless a mismatch is noted in an Inventory Comment					
11.	Does all equipment have a clear, documented location listed in the Location data field of the Equipment Details? • Location should be descriptive enough to assist a person unfamiliar with the asset with finding the item with little difficulty. Recommend using room names, room numbers, cardinal direction, etc.					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>A. BUILDER QC 5 – Section Details Report</b>						
12.	In situations where nameplate date could not be populated, did the Assessors include Inventory or Equipment Detail Comments stating the reason such as “Nameplate is painted over” or “Missing nameplate”?					
13.	Are all Equipment Detail Comments appropriate?					
14.	Is the dataset free of grammatical, punctuation, or spelling errors?					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>B. BUILDER QC 6 - Inspection Report</b>						
1.	Are all Section Years correct?					
2.	Are all Inspection Dates correct?					
3.	Are all Inspection Types correct (i.e., Direct vs Distress)?					
4.	Do all Inspector data fields include the full given name of the Assessor who performed the field assessment? <ul style="list-style-type: none"> <li>No default CERL names or name of the data entry specialist who entered the data though didn't perform the actual assessment</li> </ul>					
5.	Are all required photos included in BUILDER?					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>B. BUILDER QC 6 - Inspection Report</b>						
	<ul style="list-style-type: none"> <li>Photos are required for all A+, A, A-, R+, R, and R-ratings and documented in the Num Inspection Images data field. The Num Inspection Images data field will show the number of images attached to the Section Inspection Record, e.g. "0," "1," etc.</li> </ul>					
6.	<p>Do all required inventory records include a new associated inspection rating?</p> <ul style="list-style-type: none"> <li>No blanks in the Comp Rating field</li> </ul>					
7.	<p>Are all painted items properly documented (<i>Painted?</i> = "TRUE") and include an associated Paint Rating and Paint Year?</p> <ul style="list-style-type: none"> <li>Ensure Paint Year appropriately corresponds to the inventory Section Year and doesn't default to the Bldg Year unless intended</li> <li>Compare Paint Rating and CSCCI for large discrepancies to ensure Paint Year is accurate</li> <li>If there is a paint rating of 100, verify that the Assessor included an actual rating as BUILDER defaults to 100 when paint inventory is added without a</li> </ul>					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>B. BUILDER QC 6 - Inspection Report</b>						
	corresponding paint rating selection					
8.	Are all Inventory Comments appropriate and notated in the correct data field?					
9.	Do all Inventory Comments include the date added, responsible contractor company, and the Assessor's full given name? <input type="checkbox"/> Example: "[John Doe COMPANY 06/10/2017]"					
10.	Are all Inspection Comments appropriate and notated in the correct data field?					
11.	Are Inspection Comments included for all A+, A, A-, R+, R, and R-ratings?					
12.	Do all Inspection Comments properly justify their associated rating? <ul style="list-style-type: none"> <li>• Green+ ratings should only be given to inventory that is in pristine condition, free of observable defects.</li> <li>• Maintainability and obsolescence should not be directly considered in the rating unless it has led to actual deterioration of condition that can be observed or reasonably inferred.</li> <li>• Ensure items were not downgraded simply if an item is dirty, due to age or belief</li> </ul>					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>B. BUILDER QC 6 - Inspection Report</b>						
	<p>that the item is outdated, because the item does not meet current code compliance standards, because the item is not deemed energy efficient, or because the item is deemed to be a safety violation/hazard unless otherwise directed by the SOW. Only downgrade it if an item's functionality, performance, reliability, etc. is compromised according to the direct rating definitions.</p> <ul style="list-style-type: none"> <li>Assessor may provide recommendations for repair or replacement, however, this should not be the sole justification provided for an Amber or Red rating.</li> </ul>					
13.	<p>Do all Inspection Comments include a Distress word, following the required convention, where appropriate?</p> <ul style="list-style-type: none"> <li>Example: "CORRODED – Boiler housing has significant signs of rust damage. [John Smith]"</li> </ul>					
14.	<p>Have all Comp Ratings been compared with the CSCI and the Expected Rating?</p> <ul style="list-style-type: none"> <li>Typically if there is a point differential of 20+ between the rating and the CSCI, and</li> </ul>					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>B. BUILDER QC 6 - Inspection Report</b>						
	<p>the item has already exceeded its Remaining Service Life (RSL), and the Comp Rating is a Green or Amber, it could indicate that the:</p> <ul style="list-style-type: none"> <li>o Section Year is incorrect (often defaulting to Bldg construction date rather than item install date)</li> <li>o Section Year should be “Estimated” to provide more weight to the Comp Rating if actual install date is unknown (typical for architectural items)</li> <li>o Comp Rating is incorrect (typically inflated)</li> <li>• If large discrepancies exist, verify that the Section Year is correct and that it isn’t defaulting to the Building Year and that it doesn’t need to be noted as “Estimated,” and verify that the Comp Rating is accurate.</li> </ul>					
15.	Is the dataset free of grammatical, punctuation, or spelling errors?					

## **Attachment 6 - Final QC Review (FCA Technical Lead) - Overall QC Check List**

Installation Name	
Date of QC Review	
QC Reviewer(s)	

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>A. All BUILDER Reports</b>						
1.	Have all facilities required by the SOW been inventoried and assessed according to the SOW?					
2.	Have all inventory records been validated and adjusted to correct mistakes, if necessary? <ul style="list-style-type: none"> <li>All required systems included, proper sectioning rules followed, proper Section Naming Convention followed, Subtype selection, Equipment Details data fields</li> </ul>					
3.	Have all inspection data been validated and adjusted to correct mistakes, if necessary? <ul style="list-style-type: none"> <li>All required ratings provided, Inspection Dates, Inspection Type, Inspector Name</li> </ul>					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>A. All BUILDER Reports</b>						
4.	Have all inspection ratings been validated and adjusted to correct mistakes, if necessary?					
5.	Have all ratings been reviewed for consistency across individual Assessors and been adjusted, if necessary? <ul style="list-style-type: none"> <li>• Example - If an Assessor gives the same rating to all records there might be an issue.</li> </ul>					
6.	Are all required photos uploaded into BUILDER, been reviewed for quality, and properly vetted by the Site POC/Security Office (if required)?					
7.	Has the dataset been reviewed for missing data and all issues resolved?					
8.	Has the dataset been reviewed for missing or insufficient comments and all issues resolved?					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>A. All BUILDER Reports</b>						
9.	<p>Has the dataset been reviewed to ensure all Building Condition Indices (BCI) do not appear too high or too low based on their corresponding System Condition Indices (SCI) ratings and any issues brought to the attention of the customer and CERL?</p> <ul style="list-style-type: none"> <li>For each Building, the BCI is computed by taking the average of its system CI's weighted by replacement cost.</li> <li>For each system, the SCI is computed by taking the average of its component CI's weighted by replacement cost.</li> </ul>					

QC Review Questions		Yes	No	N/A	In Progress	Comments
<b>B. BUILDER Final 1 – Facility Summary Report</b>						
1.	Are all facilities required by the SOW included?					
2.	<p>Are all facilities required by the SOW located in the correct BUILDER complex?</p> <ul style="list-style-type: none"> <li>Complex is noted in the “Special Area” column</li> </ul>					

QC Review Questions		Yes	No	N/A	In Progress	Comments
3.	<p>Is all Building Level Information correct and any discrepancies documented and provided to the customer?</p> <ul style="list-style-type: none"> <li>• RPUID</li> <li>• Building Number</li> <li>• Building Name</li> <li>• Construction Type (i.e., Permanent, Semi-Permanent, etc.)</li> <li>• Category Code</li> <li>• Number of Floors</li> <li>• Area (SF)</li> <li>• Construction Year</li> <li>• PRV</li> <li>• MDI</li> </ul>					