



Sustainment Management System

Army BUILDER™ SMS Inventory and Assessment Guide

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**US Army Corps
of Engineers**
Mobile District

ERDC
Engineer Research & Development Center

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Global (Applicable to All Systems)
Summary of Changes

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Safety The following items should not be interpreted as 1) Safety Plan, 2) OSHA, or base safety requirements. These are recommendations. The contractor should operate in accordance with the SOW and approved safety plan.

Safety is of the utmost concern and should always be at the forefront of any activities taking place in the field. There are many potential safety hazards associated with building assessments. Prior to performing building assessments, the assessing staff/team must ensure that field activities are in accordance with the 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Safety Preparation Activities

Do not perform a task that may harm or endanger the health and safety of oneself or others.

Consult with the installation safety representative to review installation-specific safety requirements.

Conduct a daily “stand-up” safety meeting.

Ensure new assessors have been properly trained.

Review the assessment plan/schedule for the day.

Ensure proper Personal Protective Equipment (PPE) is available. This includes, but is not limited to, a hardhat; hearing protection; eye protection; safety shoes, gloves; and a safety colored vest.

Prior to conducting assessments, the team leader must check with the safety office or building POC to determine if there are any building/site-specific safety rules or hazards. For instance, some manufacturing areas may require steel toe shoes, hearing protection, or eye protection.

Safety Recommendations

Do not walk and write, or talk on a mobile phone, at the same time; this can lead to trips/falls.

Do not review documents or write while walking on steps or stairs.

Do not enter posted or suspected confined spaces such as crawl spaces, tanks, chases, or pits.

Mechanical rooms, attic spaces, or other areas with piping/ductwork may require the use of hard hats to prevent against head bumping hazards. Refer to the project specific safety plan for further clarification.

Do not enter areas with hazardous material signs posted or that appear to contain hazardous materials (asbestos, gases, visible mold, etc.).

Be careful when walking through/across vehicle maintenance or staging areas.

Be aware of loose-fitting clothing and lanyards that may get caught in tight areas or on piping such as in mechanical/electrical rooms, etc.

Be careful of wildlife and insects when walking around a building or opening seldom-entered mechanical/electrical rooms. Assessors may encounter snakes, spiders, stray cats/dogs, rats/mice, etc. in these areas. Do not enter or place hands in spaces that are not completely visible.

If a life safety problem is observed, do not try to fix it. Report it to the proper authority or building manager prior to leaving the building or area.

Before the assessment team leaves a building, ensure all team members are accounted for.

Ladder use should be done in accordance with 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Designate a safety POC to enforce the safety accident prevention plan.

Perform a daily safety briefing before field work. Document the attendees and the topics covered.

Halt outdoor field operations at the sign of lightning or thunder.

Safety Recommendations (continued)

Do not access pitched roofs. They may be assessed from a nearby building or using binoculars.

Use proper techniques to place, secure, and climb ladders. Never climb a ladder while holding anything. Always use the three-point technique for climbing. Equipment should be placed in a backpack or an over-the-shoulder satchel to free hands for climbing.

Do not operate powered equipment, Weight Handling Equipment (WHE)/cranes, or remove access covers from powered equipment to perform assessments.

BUILDER™ assessments are commonly performed without electrical test equipment. Do not use electrical test equipment to test circuits or equipment unless qualified by a local authority. Only open panel box doors or enter electrical/mechanical rooms following proper training. Consult the local safety representative.

Site Preparation

Site Preparation Activities

Coordinate with the base to determine building access requirements, such as: escorts; camera passes; classified/secure area restrictions; or keys.

Locate buildings on a map and develop a schedule. Coordinate with the base to identify the appropriate building manager from the POC list. Notify the building managers of the upcoming assessment as needed.

Obtain a set of mechanical/electrical room master keys from the installation POC.

Extract all BRED™ files from BUILDER™ and have them loaded onto tablets (if using tablets). Verify all tablets are charged.

If multiple buildings are to be assessed by one team, confirm the schedule and plan of action with the team leader. A schedule may have building start times detailed to the hour.

Review the building names for the types/sizes of buildings that will be assessed to determine/confirm the needed tools and safety equipment. For instance, if the facilities are not climate-controlled, prepare accordingly (for cold weather bring hats/gloves).

Recommended Assessor Gear/Tools

Hardhat	Digital Camera with Extra Battery(s)
Hearing Protection	Measuring Tape
Safety Glasses	Laser Measuring Device/Flash Light
Reflective Safety Vest	Measuring Wheel
OSHA Approved Footwear	Backpack
Other Required Personal Protection Equipment (PPE)	Graphite Powder (for stuck locks)
Cell Phone and Team Cell Phone List	Cleaning Pad (to clean/help read nameplates)
Assessment Schedule	Pen/Pencils
Building Floor Plans/Base Map	Clipboard
Small Magnet (for determining door/window type)	Paper/Assessment Forms
Flash Light/Compass	Graph Paper
Sun Screen/Bug Spray	Refillable Water Bottle

Operating efficiently in the field is key to the success of the assessment. The following guidance is detailed by 1) Team Leader and 2) Assessor. **Bold items are drivers for client deliverables.**

Team Leader

Upon arrival, check in with the building manager and QA representative (if present).

Conduct the building manager interview. The entire team should be present for the building manager interview. The following questions should be asked:

Question 1: Are there any mission-related deficiencies in the building?

Question 2: Are there any safety-related deficiencies in the building?

Question 3: Have there been any upgrades or remodels of the building?

Question 4: Are there any building deficiencies (HVAC not working, electrical breakers tripping, maintenance issues, roof leaks, etc.) present?

The team leader (ONLY the team leader!) should populate the building level comment with the following information: 1) Missing systems, 2) Renovation dates, 3) Areas of the building not accessible during the assessment, and 4) If drawings were/were not provided. Below are some examples of building level comments:

Comment 1: No A20, D10, or D40 systems present. 2016: Vault room not accessible. Drawings not provided.

Comment 2: No A20 systems present. Renovated in 2010. 2016: 5% of building not accessible. Drawings provided.

The team leader should review the real property data in BRED™ and compare it to what is found during the assessment. The following should be confirmed: 1) Number of stories, 2) Building square footage, and 3) Building install date and 4) Building number in BRED™ matches the building. Variances between real property data and actual field data should be recorded for inclusion into the client deliverable.

Team Leader and Assessors

Best Practice: Each assessor should first take a photo of the building number to identify the subsequent photos associated with the building when they are downloaded. Take a second picture that captures the overall building view with respect to nearby buildings/streets. This should help refresh/remind the assessor on what the building looks like, while performing data-entry.

A team caucus should occur to discuss the sectioning strategy for the building and confirm which side is facing north.

Each assessor should have a consistent approach to each building. Assessors should move around the building exterior and interior in a clockwise (or counterclockwise) manner making notes and taking photos.

If a safety item is found, notify the team lead. The team lead will notify the building manager. Capture a photo of the safety item for inclusion into the safety log. Follow all other project-specific procedures when a safety item is encountered.

Upon return to the office perform the following steps:

Step 1: Download all photos from the day to a building-specific folder. Review the photos and delete any that are blurry or unreadable.

Step 2: Complete all calculations and counts. Complete all data entry into BRED™.

Data Entry

With the technology that is available today, the need to use forms in the field and do data entry at the office has been mitigated. Tablets can be used to run BRED™ to complete data entry while in the field. It is understood that there are challenges to accomplish this for certain disciplines. It is only mentioned here as a best practice recommendation and is not a requirement to execute the work. There will be instances where electronics will not be allowed in a facility. Assessors should have a paper/pen data collection system ready as a backup.

General

A1010 - Standard Foundations: Includes spread and strip footings that support the building structure.

A1020 - Special Foundations: Includes piers, piles, and buttresses that support the building structure. These are typically found on larger buildings or where soil conditions are not favorable, such as coastal areas.

A1030 - Slab on Grade: The slab on grade (SOG) may also assist in supporting the building structure when designed for foundation support, often with a 'turn down' footing. This condition is typically found in smaller structures. The SOG may also serve as the interior finished floor surface when not covered, such as in a warehouse, or provide substrate for floor finishes (ceramic tile, wood, carpet).

This section presents common Uniformat A10 Foundations Inventory Component Sections found across installations as a guide for entering into the BUILDER™ or BUILDER™ Remote Entry Database (BRED™) software. Inventory items are arranged by BUILDER™ System with Material/Equipment Category, Component Type, Unit of Measure, and Inventory Notes.

Inspection

Foundation component sections are assessed using Direct Condition Rating (DCR) or Age-Based Modeling. Most of the time the foundations are not visible. When foundations component sections are not visible, no assessment is entered. In this case, BUILDER™ will use the inventory year installed and degradation curves built in to the software to establish the Condition Index (CI).

Foundations show slow rates of deterioration.

Rule of thumb: If you can see it, you should inspect it. There are some caveats to this rule. See component catalog for items that must be age-based whether visible or non-visible.

The assessor may observe conditions in the visible foundation major components such as cracking, displacement, or other damage. These conditions may also be visible in interior or exterior walls, and the floor. If observed, the assessor must consider the severity and density of these conditions to determine if the DCR rating should be adjusted.

When foundation component sections are visible, they should be assessed.

Inventory

It is critical to confirm the year installed (default will be from real property records), or estimate the year installed. BUILDER™ uses the install date, degradation curves, and assessment observations to establish a CI for each component section. If the assessor suspects the default install date is not accurate, or an addition or renovation has taken place, check the real property record for year renovated or check local as-built or renovation drawings to help estimate the year installed.

Except where specifically noted in this Guide, do not use 'General' where a more specific item is available as a component type selection.

If a 2-floor, 10,000 SF (real property area) building is assessed and it is deemed to be within +/- 10% calculated, then the assessor should use SF/FLR (10,000/2), which in this case is 5,000 SF as the quantity for the SF of structural slab on grade (SOG).

If construction drawings or as-builts are available, look for date published to assist with determining age of materials. Custodial drawings can also be a good resource.

If the building area is calculated to be between +/- 10% of the building area shown in the BRED™ file, then the building area shown in BRED™ is to be used. If the calculated area is outside of +/- 10% of the building area shown in the BRED™ file, then the calculated area should be used.

In some cases, superstructure sections may be replaced as an individual repair or partial replacement. These areas would have a different age. The real property construction and renovation dates should be confirmed. If they are not appropriate, the superstructure age must be estimated. The building occupants or other facilities staff may be able to provide some information.

When a component is concealed/hidden, the inventory comment box is used to indicate the reason for no inspection taking place. Standard comments should be used.

When foundations are not visible, as-built drawings should be used to identify and quantify the foundation components. If as-built drawings are not available, the assessor may use experience to make an assumption for the foundation types and quantities based on similar construction of nearby buildings, consultation with local staff, and other reputable web based sources.

When performing an assessment, the 'PAINTED' box should only be selected for components that have local or field applied paintings/coatings. DO NOT mark 'PAINTED' for manufacturer- or factory-applied coatings as they tend to age consistently with the components.

Photography

General comment: Photos are captured to document the following: 1) Inventory, 2) Condition (deficiency), 3) Historical record of the asset, 4) QC, and 5) Life safety issues.

All components where an 'Other' component type is selected must have a photo attached at the Inventory/Section level. (Required)

Assessors should take a photo of the building number at the start of the building assessment to delineate the start/stop of the photos between buildings. (Best Practice)

Assessors should take photos to allow for Quality Control confirmation and data backup. It is a good practice to have a photo of every component type encountered in an assessment. (Best Practice)

Components that have a DCR (component rating only) of A+ or worse should have a photo taken that shows the deficiency identified in the inspection comment. The photo should be attached to the record at the Inspection level. (Required)

Life Safety issues should be photographed for documentation of the safety item and used in safety reports. The photo should be sent to the team lead and all required steps outlined in the safety plan are to be completed. (Required)

Paint DCR does not drive the requirement for a photo to be attached at the inspection level. Example: A component has a DCR of 'G-' and a paint DCR of 'A' would result in no photo attached to the inspection.

See Scope Of Work (SOW) for any photo renaming/deliverable requirements.

The Team Leader is required to take one photo of the front elevation, or a representative elevation view, and attach the photo to the building record at the building level. (Required)

Reinspection

All existing quantities for components such as slab quantity and pile counts are to be validated to a +/-15% accuracy. This can be accomplished through random sampling.

Assessors must not delete/edit components and sections that are not within their discipline.

BRED™ functions such as 'Copy Building' and 'Copy Section' should not be used unless their ramifications are fully understood. Copy building: The entire building will be copied. Copy section: All items with the same section name will be copied. For example, if a D50 assessor uses copy section on the section name FL1, the assessor may copy/paste interior doors, mechanical equipment, etc. without knowing it. If there is no existing data, these functions are easily used.

Existing data should be deleted if: 1) The component is no longer present, 2) The correct component type exists, 3) There are duplicate components with the same section name, or 4) The component is correct but has the wrong install date (requires deletion and re-entry with correct date).

If a component type in the existing data is no longer in scope, it must be updated to an in-scope item, or deleted if no longer applicable.

Past inspection comments are not required to be revised to current standards.

Section names, component types, and quantities must be verified and updated.

When performing a reinspection it should be understood that modifications in the inventory guidance may have taken place between the previous assessment date and the current effort. The new assessment should update the inventory to the latest inventory guidance. This may require, but is not limited to, combination of quantities (Ex: removing cardinal direction sectioning when it is no longer needed), modifying component type selections, or removing/adding items. The detailed inventory guidance portion of the manual will often provide direction on what steps need to be taken.

Sectioning

Additions, new wings, or major renovations likely require identifying a separate superstructure sections with a different age. A10 is a long life asset so sectioning should only occur for an addition if the original building is more than 25 years older than the addition.

Do not section foundations by cardinal direction. Exterior foundation components should be sectioned per guidance found on the 'Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components' page.

If a section for an addition is added, it should be named 'ADDITION'.

In the case of superstructures, the assessor must use judgment in sectioning these components. Superstructure components should be sectioned in the manner they are generally managed. If there are no new superstructures, a separate section for a single new superstructure is not necessary. However, if there are two major types or ages of superstructures, then separate sectioning is required.

Once all base sectioning guidelines have been followed, there may be a need to apply a DCR-driven sectioning methodology based on two factors 1) difference in DCR, and 2) quantity of distress. Step 1: Assessors should section a component when there is a 2-step difference in DCR (Ex: G- to A) in accordance with the guidance found in Step 2. If there is only a 1-step difference in DCR, the assessor shall have a single section and the lower of the DCR's should be used. Step 2: When a 2-step difference is found, the assessor should consider the quantity of distress that is present. If the distress is present on 25% or less of the component, a single section with a DCR in-between the high/low DCR shall be added (if G-/A are found then A+ is used). If the distress is present on over 25% of the component, two sections should be added at the high/low DCR. Any component with a 3-step or more difference in DCR should have two sections.

The most critical part to an assessment is having all assessors aligned on how to perform an assessment. To reach an accurate DCR of a component, follow the steps below:

Step 1: Consider the level of degradation and the performance of the component:

OPERATIONAL CAPABILITY	OPERATIONAL CONDITION RATING	DEGRADATION	DCR
Fully Operational	Green	Free of observable or known degradation.	Green (+)
		Normal wear requiring normal preventative maintenance.	Green
		Normal degradation requiring corrective maintenance.	Green (-)
Impaired Operation	Amber	Minor degradation requiring corrective maintenance.	Amber (+)
		Moderate degradation requiring corrective repair.	Amber
		Significant degradation requiring moderate repair.	Amber (-)
Inoperable	Red	Extensive degradation requiring major repair.	Red (+)
		Severe degradation requiring major rehabilitation or partial replacement.	Red
		Complete degradation requiring full replacement.	Red (-)

Step 2: Consider the maintenance requirements of the component:

Type	Green (G+/G/G-)	Amber (A+/A/A-)	Red (R+/R/R-)
Dynamic (Equipment)	<p>Distresses present are of no impact to the components operation.</p> <p>Example: The fan component is fully operational.</p>	<p>Distresses present are of impact to the components operation. A repair is needed to bring the component back to proper operating condition</p> <p>Example: A fan has corrosion on the housing. A sand and paint would remove the distress.</p>	<p>Distresses present are of impact to the components operation. The component needs to be replaced.</p> <p>Example: A fan motor has overheated and no longer functions. Replacement of the component is required.</p>
Non-Dynamic	<p>The architecture component is in good condition requiring no maintenance outside of normal operations.</p> <p>Example: The carpet component is fully operational.</p>	<p>The architecture component has a distress that requires an extra level of maintenance outside of normal operations. This extra maintenance (or repair) would be an action such as a cleaning or a painting of a surface.</p> <p>Example: A carpet component has stains. A cleaning would remove the distress.</p>	<p>The architecture component has a distress where a maintenance operation will not fix the problem at hand. A replacement of the component is required.</p> <p>Example: A carpet component is damaged (ripped). The component needs to be replaced to fix the distress.</p>

Dynamic: Refers to equipment in the D10, D20, D30, D40, D50, and E10 systems.

Non-Dynamic: Refers to architectural components in the A10, A20, B10, B20, B30, C10, C20, and C30 systems.

Note: There are some Non-Dynamic components (for instance, toilets under D20) in the Dynamic systems.

Step 3: Adhere to the following requirements:

Requirements
Maintainability and obsolescence should not be the driving factor when conducting a condition assessment unless it has led to actual deterioration of condition that can be observed or reasonably inferred.
G+ ratings should only be given to inventory that is in pristine condition and is free of any observable defects.
Do not downgrade an assessment rating simply because an item is dirty.
Do not downgrade an assessment rating because the item does not meet current code compliance standards
Do not downgrade an assessment rating because the item is not deemed energy efficient.
Do not downgrade an assessment rating because the item is deemed to be a safety violation/hazard unless otherwise directed.
Do not downgrade an assessment rating because of a code violation.
Ratings should not be anticipated based on planned repairs or replacement.
Assessors should not expend field time and effort to determine the cause of a deficiency. If the cause is easily identified it should be included in the inspection comment.
Ratings shall be based upon the observable and documentable condition of the component.
A component should be downgraded if its operational capability, performance, reliability, etc. is compromised according to the direct rating definitions.
Incorporate user interviews, work order histories, or other information sources when determining the condition of the component. Include this information in the inspection comment.

The assessor should calibrate their mindset on what the expected DCR should be based on condition.
The assessor should consider the maintenance requirements of the component in the current condition.
The assessor should factor in the requirements/business rules for completing an inspection.

One factor that can play into an assessment is if the assessor receives information from a POC that results in a lower rating. For instance, an assessment takes place in July and there is a heating water pump that looks brand new, but has a blown motor. The assessor would assume the pump is supposed to be off due to being off season, but if the POC informs the assessor about the blown motor, this can be factored into the assessment (and indicated in the inspection comment).

One factor that should not play into an assessment is pending replacements of components. Assessors should rate components in the condition they are at the time of assessment. If the carpet is being replaced next month, that should not factor into a rating. Now, if the carpet contractor is on site (the work is currently taking place), this could be factored into the rating and a G+ rating provided with the current date of inspection chosen as the install date.

Service Life: No distresses present and component is nearing (or past) its service life.

The following comment can be used as an inspection comment for components that have no signs of distresses, are rated either Amber (A) or Amber Plus (A+), and are over 75% through their service life. This negates the need to have 4 parts of an inspection comment. Also, an inspection photo is no longer required.

[First Last-AE-Date] - The component is in proper working condition and is showing no signs of distress. The DCR was based on estimated remaining service life.

Step 1: Understand the 5 parts of the inspection comment:

Part #	Part Type	Type Description
1	Front End	[First Last-AE-Date] OR [First Last-DPW-Date] (ex: [John Doe-AE-7/4/2017])
2	Distress	Identifies the distress of the component
3	Severity	Identifies the amount of the distress.
4	Location	Identifies the location of the distress
5	Quantity	Identifies the quantity of the distress

Step 2: Use the DCR of the component as the basis for the severity.

DCR	Severity
Amber (+)	Minor/Mild
Amber	Moderate
Amber (-)	Significant/Major
Red (+)	Extensive
Red	Severe
Red (-)	Complete/Total

To aid in the inspection comments reading correctly the severity can be modified slightly. For instance, 'moderately' can be used for an 'A' DCR comment. This approach also applies to the distresses where one of the 23 MUST be selected. If 'Cracked' is selected as the distress, the wording 'cracks' may be used.

Step 3: Identify the distress of the component:

23 Distresses			
Blistered	Displaced	Overheated	Capability/Capacity Deficient
Broken	Efflorescent	Patched	Animal/Insect Damaged
Clogged	Holes	Rotten	Moisture/Debris Contaminated
Corroded	Leaks	Stained/Dirty	Noise/Vibration Excessive
Damaged	Loose	Cracked	Operationally Impaired
Deteriorated	Missing		Electrical Ground Inadequate or Unintentional

Step 4: Location and Quantity

Location on non-dynamic assets - 'lobby area' or 'northwest corner'.

Quantity on a SF UOM will typically be a %. On an EA UOM will typically be a count.

Step 5: Put all 5 components together to form an inspection comment (colors correspond to part):

A+	Front End	CRACKED.	The	walls have	minor	cracks	present on	10% of the	gym.
A	Front End	DETERIORATION.	The	carpet has	moderate	deterioration	over	50 %	of the lobby.
A-	Front End	DAMAGED.	The	door has	significant	damage	to the	lower half	of the door.
R+	Front End	CRACKED.	The	windows have	extensive	cracks	present in	4	panes.
R	Front End	LEAKS.	The	roof has	severe	leaking	around the	HVAC	penetrations.
R-	Front End	OPERATIONALLY IMPAIRED.	The	3	north	doors are	completely	operationally impaired.	

Inspection Comments

Rule #	Rule
1	Required on all inspections with a DCR of A+ and below.
2	Paint DCRs do not have an inspection comment requirement. Only the component DCR A+ and below.
3	Should include any component specific information obtained from the base or POC interview.
4	Should be in complete sentences and use industry standard terminology. Comments can be typed into MS Word for spelling/grammar checks and then pasted into the comments box.
5	Do not use all capital letters for the entire comment. The distress should be all capital letters.
6	Do not use abbreviations, jargon, or slang.
7	Should give enough information for a follow-on assessor to locate the problem area/equipment.
8	Should accurately describe the problem/observation that is the basis for the rating. Someone unfamiliar with the particular item should have an accurate picture of the components current condition and the justification for the assigned rating.
9	Should accurately describe the location of the distress if the component is only showing a distress in a single location. For instance, if an office has a stain in the carpet, it would be necessary to call out the room number of the office.
10	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. For instance, assessor John Doe at firm AE: [John Doe-AE-7/4/2017].
11	After #10 front end information in the brackets one of the 23 distresses should be provided in capitalized form. Building on #10 for an example if stained carpet: [John Doe-AE-7/4/2017] - STAINED.
12	After #10 and #11 a sentence should be provided that provides the distress, severity, location, and quantity. Quantity/Location refers to the amount/location of the distress present.

Inventory Comments

Rule #	Rule
1	Used to identify components that were not visible for inspection. See standard comments.
2	Used as a bread crumb for follow-on inspections. Can provide useful additional information such as location or type to help the next assessor understand what was being inventoried. Ex: This component is the stone wall located behind the receptionist in the lobby area.
3	Should describe the component inventoried where 'OTHER' is used to allow follow-on assessments to understand what was inventoried in the previous assessment.
4	Used to provide the location of the component (especially used for architecture components where there are no Section Details provided that have a location): Roof, NW Corner, Room Number
5	Do not use all capital letters, abbreviations, jargon, or slang.
6	Used to further describe an asset if it is not adequately described in the component type selection.
7	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Section Detail Comments

Rule #	Rule
1	Used to identify data that was not able to be populated in the Details fields. See standard comments.
2	Used to provide information that is specific to just that component section detail field. This can be a location of the specific section or something that the section services.
4	Do not use all capital letters, abbreviations, jargon, or slang.
5	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Standard Inventory Comments

When	Use Standard Comment
Assets are not visible for inspection.	Component was not visible for inspection. The component condition will be age-based by BUILDER program degradation curves.
Assets are not visible for inspection that also require Section Details to be populated.	The component is not visible for inspection or population of Section Details. The component condition will be age-based by BUILDER program degradation curves and no nameplate data or inventory photo will be provided.
Assets are not visible for inspection that require quantities to be assumed. Hidden mechanical equipment, ductwork, and # of control points are common occurrences.	The component is not visible for inspection and the quantity was estimated based on architect/engineering judgment. The component condition will be age-based by BUILDER program degradation curves.
Assets are located in an area where no electronics area allowed. This prevents an assessor from taking inventory/inspection photos.	The component is located in a secure area of the facility that did not allow electronic devices to be used. Photos were not obtainable.
Assets are visible for inspection but are a system that is not tested (HVAC controls, security system, etc.) so an age-based BUILDER™ CI is desired.	The component condition will be age-based by BUILDER program degradation curves.

Standard Section Detail Comments

When	Use Standard Comment
Nameplate is not found on the component.	Nameplate not found on the component. All fields with "NA" represent data not found.
Nameplate is found on the component but it is partial/completely unreadable.	Nameplate on the component was dirty/corroded/damaged/sunwashed. Section Detail fields with "NA" represent data that was not found.
Nameplate is found on the component that is readable but is missing certain Section Details fields.	Nameplate on the component was missing certain Section Detail fields. Section Detail fields have been populated and fields with "NA" represent data not found.

Comment Front-End Clarification

A front end refers to the bracketed information at the start of an inspection/inventory/section detail comment. The front end must have to following 3 pieces of information: 1) assessor name, 2) assessor company or affiliation, and the date. The BRED™ stamp may also provide the time of inspection which is acceptable.

BRED™/BUILDER™ Clarification

The terms BRED™ and BUILDER™ are used interchangeably throughout this document.

Rule #	Rule
1	Components are divided into sections when a significant variation exists in material/equipment category, age, or construction history, which impacts the life cycle characteristics of the component. Example 1 - If a wing or addition was added to a much older building, the two areas of the building should be sectioned differently because the age and construction history is different. Example 2 – If the building roof has multiple levels of similar materials in different conditions, these levels should be sectioned differently to capture the difference in condition. Example 3 – If the building has more than one of a particular type of component, separate component sections. For example: There is a 5,000 and 10,000 CFM air handler.
2	Multi-wing buildings are always sectioned by wing if the installation date of the wings vary. If a building is an 'E' shape and all wings have the same install date only sectioning by floor is required.
3	Multi-story buildings are always sectioned vertically by floor or level (in the case of a basement or mezzanine).
4	There may be unique instances where sectioning by an area of a building is required. For instance, if a building is split between two companies an installation may request sectioning by company 1 and 2.
5	An on-site discussion must occur at each building among all team members to determine the cardinal direction of the building. All assessors should have North as the same side of the building.
6	An on-site discussion must occur at each building among all team members on how the building should be sectioned. The goal is to avoid one assessor calling it a toilet, one calling it a restroom, and another calling it a bathroom. Standard sectioning naming is important for a consistent data set.
7	The section name should not be repetitive of the component type or material. If the floor is wood, do not have a section name 'WOOD'. Incorporation of the location into the section name is very helpful to be used for follow on assessments. If the wood floor has the section name 'LOBBY', it provides great

Standard Section Names and Format Rules

Use	Standard Section Name
Section by Floor (Business Rule)	FL1 – 1st Floor, FL2 – 2nd Floor, FL3 – 3rd Floor, etc.
Section by Floor (Business Rule)	BASEMENT, MEZZANINE, ATTIC, etc.
Section by Wing (applicable if different construction histories or condition only)	MAIN, WING A, WING B, WING C, ADDITION, etc.
Section by Direction (applicable if different construction histories or condition only)	NORTH, EAST, WEST, SOUTH, etc.
Section by Roof Level (applicable if different construction histories or condition only)	UPPER, LOWER, MAIN, etc.

When an equipment tag is included in the section name it should match exactly what was found in the field. Example: if the boiler ID number is B-1, the section name equipment tag portion should read B-1. If the boiler is tagged B1, the equipment tag portion should read B1. See equipment sectioning for further guidance.

Dashes are not required in the section name other than the instance in regards to equipment ID tags above.

The section name field is always entered in all capital letters.

Sectioning Business Rules - Grouping

The following only applies to each (EA) unit of measure (UOM) components. The 'Complete Component Catalog Breakdown' at the end of the section has a 'Group OK?' column. This has the values of 'Yes', 'No', and 'N/A'.

'Yes' = Grouping is allowed for this component type. A quantity of greater than '1' is acceptable.

'No' = Grouping is not allowed for this component type. The quantity must be '1'.

N/A = Not Applicable. Component type is not an EA UOM or is out of scope.

Group OK? = Yes when Section Details and Inventory Photos are Required.

There are several equipment component types (Unit Heaters, small pumps, etc) that have the following designations in the 'Complete Component Catalog Breakdown': 1) Group OK? = Yes, 2) Section Details? = Yes, and 3) Inventory Photo? = Yes.

In this case, a single section detail and inventory photo representative of the entire section is required. A few more clarifications:

- 1) The location field would be for the entire section (FL1/BAY 1/EXTERIOR) and not specific to a single component.
- 2) A difference in manufacturer does not drive further sectioning. For instance, 2 KW electric unit heaters from multiple manufacturers can be combined into one section. Capacity (2 KW) is the driver for sectioning methodology.
- 3) It is understood that the single section detail field is representative of the entire section. The details should be populated per one component. There is no need to enter multiple details or try to combine multiple manufacturer/model/serial/etc into to a single section detail field.

Group OK? = No

The quantity for these component types must be 1. For equipment (Section Details? = Yes and Inventory Photo? = Yes) the guidance found on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components', 'Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components', and 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components' must be followed.

Sectioning of Components on the Exterior of a Building



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Business Rules

- 1) Components of like type, condition, and install date should be inventoried in a single section. (Ex: B201005, B203001 and B301001 above are all like type, condition, and install date). S/N = 'N/A'
- 2) Components that require multiple sections should indicate cardinal direction for additional sections. (Ex: B201001 - Damage present on south face - S/N = 'SOUTH'. All other 3 sides were same condition - S/N = 'N/A'.
- 3) Components that are only found on a single side of a building should indicate cardinal direction in section name (Ex: B203002 GLAZED DOORS are only found on west face in example above - S/N - 'WEST').

- B20 EXTERIOR ENCLOSURE
 - B2010 EXTERIOR WALLS
 - B201001 EXTERIOR CLOSURE - Pre-Engineered Steel Wall and Panel
 - B201005 EXTERIOR LOUVERS & SCREENS - General
 - SOUTH - B201001 EXTERIOR CLOSURE - Pre-Engineered Steel Wall and Panel
 - B2020 EXTERIOR WINDOWS
 - NORTH-ALUMINUM-4 - B202001 WINDOWS - General
 - SOUTH-ALUMINUM-3 - B202001 WINDOWS - General
 - B2030 EXTERIOR DOORS
 - B203001 SOLID DOORS - Steel
 - WEST - B203002 GLAZED DOORS - General
- B30 ROOFING
 - B3010 ROOF COVERINGS
 - B301001 STEEP SLOPE ROOF SYSTEMS - Formed Metal - Metal Standing Seam
 - B301005 GUTTERS & DOWNSPOUTS - Gutters
 - NORTH - B301005 GUTTERS & DOWNSPOUTS - Downspouts
 - SOUTH - B301005 GUTTERS & DOWNSPOUTS - Downspouts

4) Component types in which there are multiple sections present, and the respective section is only found on a single side of a building, should indicate cardinal direction in the section name (Ex: B301005 GUTTERS DOWNSPOUTS - S/N 'NORTH' and 'SOUTH').

Note: The guidance above is listed in order of application. For example, if the downspouts were all the same condition then #1 would have applied and the section name would have been 'N/A'.

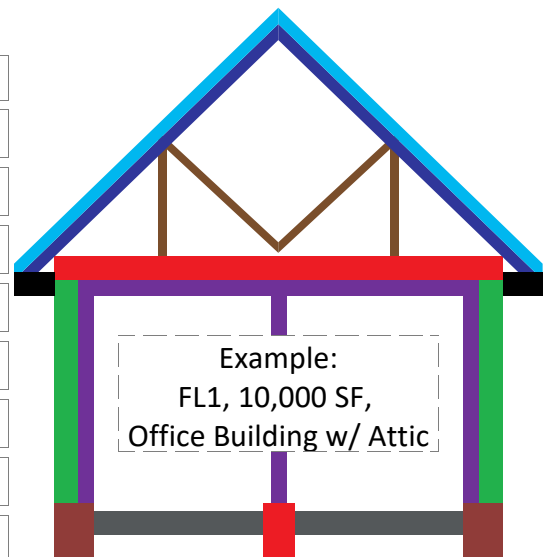
B10 Superstructure is often not visible, which can lead to a variety of different inventory methods. See below for the steps to properly inventory the B10 Superstructure.

Step 1: Consider the size of the building.

Building Square Footage	B1010 Floor Construction	B1020 Roof Construction
1 SF - 1,000 SF	Not Inventoried	Inventory
1,001 SF - 5,000 SF	Assessor Judgment	Inventory
5,000 SF +	Assessor Judgment	Inventory

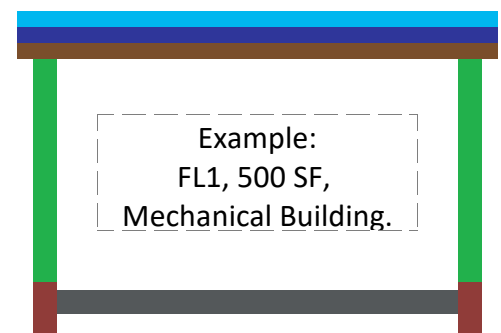
* B1010 captures the structural framing that supports the B1020 (roof) structural framing. B1010 will be present on multiple story buildings and buildings that have a mezzanine or deck area. Note: If there is an attic space, it may be necessary to have a B1010 on a single-story building. While not part of the living area of the building, there is structural support for this area that is not part of the B1020 structural framing.

Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Shingle	N/A
B102003 Roof Decks and Slabs	Wood	N/A
B102001 Roof Construction	General	N/A
B101003 Floor Decks and Slabs	Wood	ATTIC
B201007 Exterior Soffits	General	N/S/E/W
B101001 Floor Construction	General	N/A
B201001 Exterior Enclosure	Siding	N/S/E/W
A103002 Structural SOG	General	N/A
A101001 Wall Foundations	Grade Beams	N/A
A101001 Wall Foundations	Strip Footing	N/A



A10 assets will be hard to inventory as they are not visible. Use drawings or assessor experience on construction type to inventory these assets.

Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Built-Up	N/A
B102003 Roof Decks and Slabs	Concrete	N/A
B102001 Roof Construction	General	N/A
B201001 Exterior Enclosure	Concrete Block	N/S/E/W
A103002 Structural SOG	General	N/A
A101001 Wall Foundations	Strip Footing	N/A

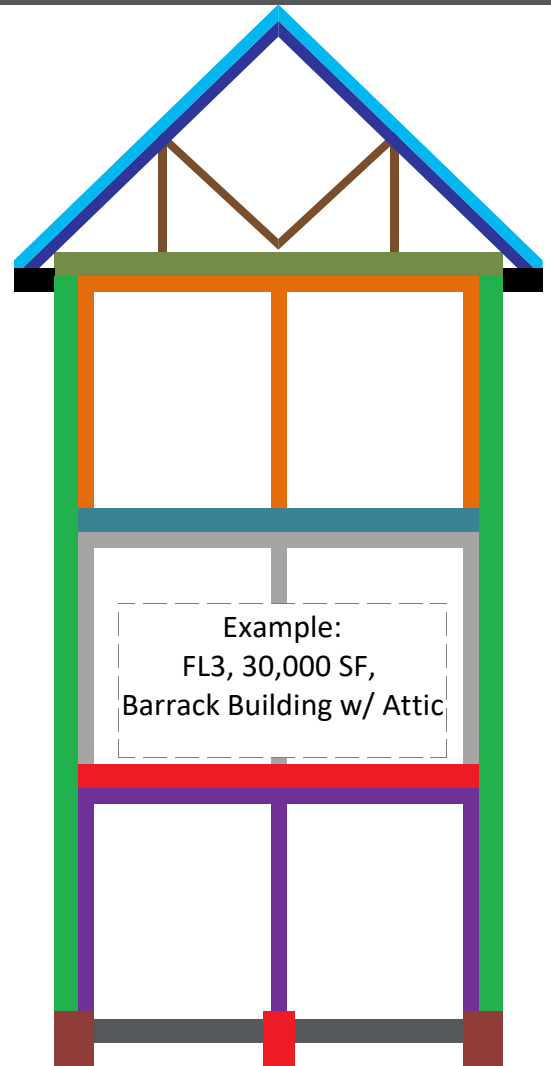


Note: The roof deck overhangs the building. There is no soffit material

Note: B102001 should be included even though structural members are not visible. There is reinforcing (rebar) in the concrete roof deck. A building will always have a B102001 component regardless of size.

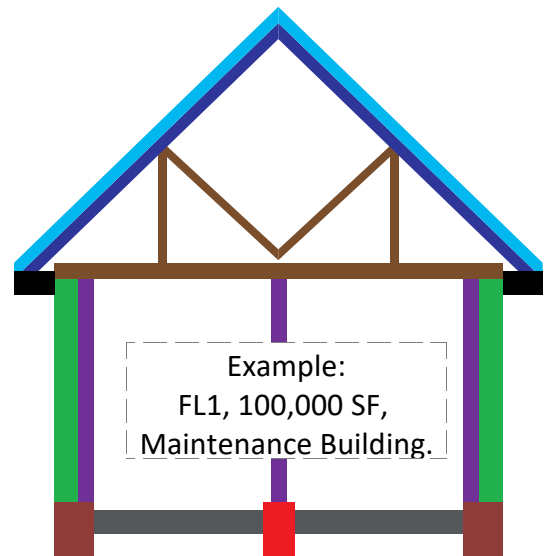
Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Standing Seam	N/A
B102003 Roof Decks and Slabs	Steel	N/A
B102001 Roof Construction	General	N/A
B101003 Floor Decks and Slabs	Concrete	ATTIC
B101001 Floor Construction	General	FL3
B101003 Floor Decks and Slabs	Concrete	FL3
B101001 Floor Construction	General	FL2
B101003 Floor Decks and Slabs	Concrete	FL2
B201007 Exterior Soffits	General	N/S/E/W
B101001 Floor Construction	General	FL1
B201001 Exterior Enclosure	Tilt-Up Panel	N/S/E/W
A103002 Structural SOG	General	N/A
A101001 Wall Foundations	Grade Beams	N/A
A101001 Wall Foundations	Strip Footing	N/A

- 1) B10: Sectioned by floor. B20: Not sectioned by floor.
 2) A10 assets will be hard to inventory as they are not visible. Use drawings or assessor experience on construction type to inventory these assets.



Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Standing Seam	N/A
B102003 Roof Decks and Slabs	Steel	N/A
B102001 Roof Construction	General	N/A
B201007 Exterior Soffits	General	N/A
B101001 Floor Construction	General	N/A
B201001 Exterior Enclosure	Siding	N/S/E/W
A103002 Structural SOG	General	N/A
A101002 Column Foundations	Spread Footing	N/A
A101001 Wall Foundations	Strip Footing	N/A

- 1) Columns will have a column foundation (typically will be found) use 'A101002 - Spread Footing.'



A101001 WALL FOUNDATIONS - Foundation Wall

Typical Application and General Component Guidance:

This component is used to inventory foundation walls.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Foundation walls are used when there are no A20 basement walls and there is an above-grade section of the structural component in which the B10 and B20 components bear.

Lesson Learned

Foundation walls will bear on the strip footings for the buildings.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Foundation Wall	Yes	No	No	No	N/A	No	100 SF

A101001 WALL FOUNDATIONS - Grade Beams

Typical Application and General Component Guidance:

This component is used to inventory the grade beams located on the interior of the building.



Business Rules/General/Lessons Learned/Reinspection

Lesson Learned

The quantity of grade beams is often estimated based on engineering judgment. If the columns can be identified within the space, then column grid lines can be seen to help with this estimation.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Grade Beams	Yes	No	No	No	N/A	Yes	100 LF

A101001 WALL FOUNDATIONS - Strip Footing**Typical Application and General Component Guidance:**

This component is used to inventory the strip footing located on the exterior perimeter of the building.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

For consistency purposes, use strip footing even when there is some indication of the thickened slab or mat foundation unless foundation drawings are available that provide a definitive description of the foundation design.

If there is a notch in the building or a protrusion that is less than 5' in depth, there is no need to include this in the strip footing LF quantity total.

If there is an addition to a building, there will be a strip footing located on an interior (used to be exterior before addition) wall. This quantity of strip footing should be added to the total exterior strip footing LF.

'Strip footing' component type should be used for all buildings unless it can be determined that the structure is on pile supported grade beams.

Strip footings are typically measured as the exterior perimeter of the building. However, they can be measured by the length of the load-bearing masonry/concrete walls as well.

Lesson Learned

In almost all cases, strip footings will be used for the foundation of a building.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Strip Footing	Yes	No	No	No	N/A	No	100	LF

A101002 COLUMN FOUNDATIONS & PILE CAPS - General

Typical Application and General Component Guidance:

This component is used to inventory the concrete foundations and pile caps which are found typically in warehouses and maintenance buildings. An assessor can view the column bearing on the concrete pedestal.



Business Rules/General/Lessons Learned/Reinspection

Lesson Learned

Buildings such as warehouses and maintenance shops will have columns that are bearing on a column foundations (A101002). Assessor can count visible columns to approximate the EA inventory quantity.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

A101002 COLUMN FOUNDATIONS & PILE CAPS - Spread Footing

Typical Application and General Component Guidance:

This component is used to inventory spread footings. There would be a single spread footing under each column.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Column footings are counted only when there is an isolated structural footing.

If a structural part of a column is less than a nominal 4 inches in diameter/width, the column foundation should not be inventoried. These smaller posts typically bear on a SOG or thickened edge slab.

Lesson Learned

A very common use of this component is canopies where one side is supported off the building and the other side is supported by posts. This will commonly be found on the entry way to a building.

When determining the size of a post, do not include any architectural trim or casing.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Spread Footing	Yes	No	No	No	Yes	No	100	EA

A103002 STRUCTURAL SLAB ON GRADE - General**Typical Application and General Component Guidance:**

This component is used to inventory the structural slab on grade (SOG).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

An inventory comment should be provided if the Component Type/Section Name does not accurately/sufficiently describe the material/location of the component.

Buildings such as warehouses or maintenance shops will typically have a visible SOG, and an assessment can be provided.

Buildings that have been placed on a parking lot where it is obvious that the asphalt/concrete predates the construction of the building will not have a SOG. Assessor should capture the LF of strip foundation or EA of column foundations.

Buildings with docks will have two SOGs. One will be sectioned 'N/A' and represent the interior building SOG. One will be sectioned 'DOCK' and represent the dock SOG. The exterior SOG is subject to freeze/thaw and will degrade at a different rate.

Do not inventory sidewalks under A10.

In the case where an exterior transformer is inventoried, the structural slab should also be inventoried. This should be separate from the building slab and section name should have the cardinal direction from the building.

When a SOG exists, it is always entered under A1030 regardless of whether the slab is a foundation element. The SOG should not be entered under B1010, Floor Construction.

General

The material is almost always concrete.

Lesson Learned

Assessor will use 'A103001 Standard Slab on Grade - General,' which is out of scope. The correct component type is 'A103002 Structural Slab on Grade - General.'

If as-builts of the foundation have been provided, the assessor should use those for the quantity takeoffs of 'A10 Foundation' components.

The quantity is the total of all footings for the entire building. Note: An addition to the building requires a separate foundation section.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	100	SF

Complete Component Catalog Breakdown

A10

A10 FOUNDATIONS

A10

A101001 WALL FOUNDATIONS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Foundation Wall	Yes	No	No	No	N/A	No	100	SF
General	No	No	No	No	N/A	No	100	LF
Grade Beams	Yes	No	No	No	N/A	Yes	100	LF
Other	No	No	No	No	N/A	No	100	LF
Strip Footing	Yes	No	No	No	N/A	No	100	LF
Unknown	No	No	No	No	N/A	No	100	LF

A101002 COLUMN FOUNDATIONS & PILE CAPS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Column Pier	No	No	No	No	N/A	No	100	EA
Column Pier - Concrete	Yes	No	No	No	Yes	No	100	EA
Column Pier - Steel	Yes	No	No	No	Yes	No	100	EA
Column Pier - Wood	Yes	No	No	No	Yes	No	60	EA
General	No	No	No	No	N/A	No	100	EA
Other	No	No	No	No	N/A	No	100	EA
Pile Cap	Yes	No	No	No	Yes	No	100	EA
Spread Footing	Yes	No	No	No	Yes	No	100	EA
Unknown	No	No	No	No	N/A	No	100	EA

A101003 DEWATERING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	SF
Other	No	No	No	No	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

A101090 OTHER STANDARD FOUNDATIONS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	EA
Other	No	No	No	No	N/A	No	100	EA
Unknown	No	No	No	No	N/A	No	100	EA

A102001 PILE FOUNDATIONS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
CIP Concrete	Yes	No	No	No	Yes	No	100	EA
General	No	No	No	No	N/A	No	100	SF
Other	No	No	No	No	N/A	No	100	SF
PC Concrete	Yes	No	No	No	Yes	No	100	EA
Steel H Section	Yes	No	No	No	Yes	No	100	EA
Steel Pipe	Yes	No	No	No	Yes	No	100	EA
Treated Wood	Yes	No	No	No	Yes	No	60	EA
Unknown	No	No	No	No	N/A	No	100	SF

A102002 CAISSONS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	LF
Other	No	No	No	No	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

A102003 UNDERPINNING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	LF
Other	No	No	No	No	N/A	No	100	LF
Unknown	No	No	No	No	N/A	No	100	LF

A102004 DEWATERING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	SF
Other	No	No	No	No	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

A102005 RAFT FOUNDATIONS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	SF
Other	No	No	No	No	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

A102006 PRESSURE INJECTED GROUTING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	SF
Other	No	No	No	No	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

A102090 OTHER SPECIAL FOUNDATIONS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	Yes	No	100	EA
Other	No	No	No	No	N/A	No	100	EA
Unknown	No	No	No	No	N/A	No	100	EA

A103001 STANDARD SLAB ON GRADE

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	SF
Other	No	No	No	No	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

A103002 STRUCTURAL SLAB ON GRADE

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	100	SF
Other	Yes	No	Yes	Yes	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

A103003 TRENCHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	LF
Other	No	No	No	No	N/A	No	100	LF
Unknown	No	No	No	No	N/A	No	100	LF

A103004 PITS AND BASES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	EA
Other	No	No	No	No	N/A	No	100	EA
Unknown	No	No	No	No	N/A	No	100	EA

A103005 FOUNDATION DRAINAGE

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	LF
Other	No	No	No	No	N/A	No	100	LF
Unknown	No	No	No	No	N/A	No	100	LF

A103090 OTHER SLAB ON GRADE

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	N/A	No	100	SF
Other	No	No	No	No	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

Details Req? If 'Yes', all required section detail fields are to be populated.

Inventory Pic? If 'Yes', an inventory level photo is to be provided. This is a step back photo showing the component.

Inventory Cmmt? If 'Yes', an inventory comment is to be populated. This should describe the component.

Group OK? Only applicable to each (EA) UOM's that are In Scope? = 'Yes'. If 'No' section must be a quantity of 1. If 'Yes' section may have a quantity greater than 1. If 'N/A' it is not applicable to the component type.

Age Based? If 'Yes', age based (do not provide an inspection) is the desired approach. If 'No' but upon inspection the component is not visible, then an age based approach is acceptable.

Design Life Design life of the component.

UOM Unit of measure. If yellow highlight = new component type in 2019 update.

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Army BUILDER™ SMS Inventory and Assessment Guide

A20 BASEMENT CONSTRUCTION



**US Army Corps
of Engineers**
Mobile District

ERDC
Engineer Research & Development Center

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Summary of Changes

A20

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Safety The following items should not be interpreted as 1) Safety Plan, 2) OSHA, or base safety requirements. These are recommendations. The contractor should operate in accordance with the SOW and approved safety plan.

Safety is of the utmost concern and should always be at the forefront of any activities taking place in the field. There are many potential safety hazards associated with building assessments. Prior to performing building assessments, the assessing staff/team must ensure that field activities are in accordance with the 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Safety Preparation Activities

Do not perform a task that may harm or endanger the health and safety of oneself or others.

Consult with the installation safety representative to review installation-specific safety requirements.

Conduct a daily “stand-up” safety meeting.

Ensure new assessors have been properly trained.

Review the assessment plan/schedule for the day.

Ensure proper Personal Protective Equipment (PPE) is available. This includes, but is not limited to, a hardhat; hearing protection; eye protection; safety shoes, gloves; and a safety colored vest.

Prior to conducting assessments, the team leader must check with the safety office or building POC to determine if there are any building/site-specific safety rules or hazards. For instance, some manufacturing areas may require steel toe shoes, hearing protection, or eye protection.

Safety Recommendations

Do not walk and write, or talk on a mobile phone, at the same time; this can lead to trips/falls.

Do not review documents or write while walking on steps or stairs.

Do not enter posted or suspected confined spaces such as crawl spaces, tanks, chases, or pits.

Mechanical rooms, attic spaces, or other areas with piping/ductwork may require the use of hard hats to prevent against head bumping hazards. Refer to the project specific safety plan for further clarification.

Do not enter areas with hazardous material signs posted or that appear to contain hazardous materials (asbestos, gases, visible mold, etc.).

Be careful when walking through/across vehicle maintenance or staging areas.

Be aware of loose-fitting clothing and lanyards that may get caught in tight areas or on piping such as in mechanical/electrical rooms, etc.

Be careful of wildlife and insects when walking around a building or opening seldom-entered mechanical/electrical rooms. Assessors may encounter snakes, spiders, stray cats/dogs, rats/mice, etc. in these areas. Do not enter or place hands in spaces that are not completely visible.

If a life safety problem is observed, do not try to fix it. Report it to the proper authority or building manager prior to leaving the building or area.

Before the assessment team leaves a building, ensure all team members are accounted for.

Ladder use should be done in accordance with 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Designate a safety POC to enforce the safety accident prevention plan.

Perform a daily safety briefing before field work. Document the attendees and the topics covered.

Halt outdoor field operations at the sign of lightning or thunder.

Safety Recommendations (continued)

Do not access pitched roofs. They may be assessed from a nearby building or using binoculars.

Use proper techniques to place, secure, and climb ladders. Never climb a ladder while holding anything. Always use the three-point technique for climbing. Equipment should be placed in a backpack or an over-the-shoulder satchel to free hands for climbing.

Do not operate powered equipment, Weight Handling Equipment (WHE)/cranes, or remove access covers from powered equipment to perform assessments.

BUILDER™ assessments are commonly performed without electrical test equipment. Do not use electrical test equipment to test circuits or equipment unless qualified by a local authority. Only open panel box doors or enter electrical/mechanical rooms following proper training. Consult the local safety representative.

Site Preparation
Site Preparation Activities

Coordinate with the base to determine building access requirements, such as: escorts; camera passes; classified/secure area restrictions; or keys.

Locate buildings on a map and develop a schedule. Coordinate with the base to identify the appropriate building manager from the POC list. Notify the building managers of the upcoming assessment as needed.

Obtain a set of mechanical/electrical room master keys from the installation POC.

Extract all BRED™ files from BUILDER™ and have them loaded onto tablets (if using tablets). Verify all tablets are charged.

If multiple buildings are to be assessed by one team, confirm the schedule and plan of action with the team leader. A schedule may have building start times detailed to the hour.

Review the building names for the types/sizes of buildings that will be assessed to determine/confirm the needed tools and safety equipment. For instance, if the facilities are not climate-controlled, prepare accordingly (for cold weather bring hats/gloves).

Recommended Assessor Gear/Tools

Hardhat	Digital Camera with Extra Battery(s)
Hearing Protection	Measuring Tape
Safety Glasses	Laser Measuring Device/Flash Light
Reflective Safety Vest	Measuring Wheel
OSHA Approved Footwear	Backpack
Other Required Personal Protection Equipment (PPE)	Graphite Powder (for stuck locks)
Cell Phone and Team Cell Phone List	Cleaning Pad (to clean/help read nameplates)
Assessment Schedule	Pen/Pencils
Building Floor Plans/Base Map	Clipboard
Small Magnet (for determining door/window type)	Paper/Assessment Forms
Flash Light/Compass	Graph Paper
Sun Screen/Bug Spray	Refillable Water Bottle

Operating efficiently in the field is key to the success of the assessment. The following guidance is detailed by 1) Team Leader and 2) Assessor. **Bold items are drivers for client deliverables.**

Team Leader

Upon arrival, check in with the building manager and QA representative (if present).

Conduct the building manager interview. The entire team should be present for the building manager interview. The following questions should be asked:

Question 1: Are there any mission-related deficiencies in the building?

Question 2: Are there any safety-related deficiencies in the building?

Question 3: Have there been any upgrades or remodels of the building?

Question 4: Are there any building deficiencies (HVAC not working, electrical breakers tripping, maintenance issues, roof leaks, etc.) present?

The team leader (ONLY the team leader!) should populate the building level comment with the following information: 1) Missing systems, 2) Renovation dates, 3) Areas of the building not accessible during the assessment, and 4) If drawings were/were not provided. Below are some examples of building level comments:

Comment 1: No A20, D10, or D40 systems present. 2016: Vault room not accessible. Drawings not provided.

Comment 2: No A20 systems present. Renovated in 2010. 2016: 5% of building not accessible. Drawings provided.

The team leader should review the real property data in BRED™ and compare it to what is found during the assessment. The following should be confirmed: 1) Number of stories, 2) Building square footage, and 3) Building install date and 4) Building number in BRED™ matches the building. Variances between real property data and actual field data should be recorded for inclusion into the client deliverable.

Team Leader and Assessors

Best Practice: Each assessor should first take a photo of the building number to identify the subsequent photos associated with the building when they are downloaded. Take a second picture that captures the overall building view with respect to nearby buildings/streets. This should help refresh/remind the assessor on what the building looks like, while performing data-entry.

A team caucus should occur to discuss the sectioning strategy for the building and confirm which side is facing north.

Each assessor should have a consistent approach to each building. Assessors should move around the building exterior and interior in a clockwise (or counterclockwise) manner making notes and taking photos.

If a safety item is found, notify the team lead. The team lead will notify the building manager. Capture a photo of the safety item for inclusion into the safety log. Follow all other project-specific procedures when a safety item is encountered.

Upon return to the office perform the following steps:

Step 1: Download all photos from the day to a building-specific folder. Review the photos and delete any that are blurry or unreadable.

Step 2: Complete all calculations and counts. Complete all data entry into BRED™.

Data Entry

With the technology that is available today, the need to use forms in the field and do data entry at the office has been mitigated. Tablets can be used to run BRED™ to complete data entry while in the field. It is understood that there are challenges to accomplish this for certain disciplines. It is only mentioned here as a best practice recommendation and is not a requirement to execute the work. There will be instances where electronics will not be allowed in a facility. Assessors should have a paper/pen data collection system ready as a backup.

General

This section presents common Unifmat A20 Basement Construction Inventory Component Sections found across installations as a guide for entering into the BUILDER™ or BUILDER™ Remote Entry Database (BRED™) software. Inventory items are arranged by BUILDER™ System with Material/Equipment Category, Component Type, Unit of Measure, and Inventory Notes.

A2010 - Basement Excavation: This element is an activity and is not used.

A2020 - Basement Walls: Includes any basement wall material or construction type, typically concrete or masonry (brick or concrete masonry unit).

Inspection

Basement construction component sections are assessed using Direct Condition Rating (DCR) or Age-Based Modeling. When basement construction component sections are not visible, no assessment is entered. In this case, BUILDER™ will use the inventory year installed and degradation curves built in to the software to establish the Condition Index (CI).

Rule of thumb: If you can see it, you should inspect it. There are some caveats to this rule. See component catalog for items that must be age-based whether visible or non-visible.

The assessor may observe conditions in the visible basement major components such as cracking, displacement, or other damage. If observed, the assessor must consider the severity and density of these conditions to determine the DCR rating.

Inventory

It is critical to confirm the year installed (default will be from real property records), or estimate the year installed. BUILDER™ uses the install date, degradation curves, and assessment observations to establish a CI for each component section. If the assessor suspects the default install date is not accurate, or an addition or renovation has taken place, check the real property record for year renovated or check local as-built or renovation drawings to help estimate the year installed.

Except where specifically noted in this Guide, do not use 'General' where a more specific item is available as a component type selection.

When a component is concealed/hidden, the inventory comment box is used to indicate the reason for no inspection taking place. Standard comments should be used.

When Basement Construction is not visible, as-built drawings should be used to identify and quantify the components. If as-built drawings are not available, the assessor may use experience to make an assumption for the component types and quantities based on similar construction of nearby buildings, consultation with local staff, and other reputable online resources.

When performing an assessment, the 'PAINTED' box should only be selected for components that have local or field applied paintings/coatings. DO NOT mark 'PAINTED' for manufacturer- or factory-applied coatings as they tend to age consistently with the components.

Photography

General comment: Photos are captured to document the following: 1) Inventory, 2) Condition (deficiency), 3) Historical record of the asset, 4) QC, and 5) Life safety issues.

All components where an 'Other' component type is selected must have a photo attached at the Inventory/Section level.

Assessors should take a photo of the building number at the start of the building assessment to delineate the start/stop of the photos between buildings. (Best Practice)

Assessors should take photos to allow for quality control (QC) confirmation and data backup. It is a good practice to have a photo of every component type encountered in an assessment. (Best Practice)

Components that have a DCR (component rating only) of A+ or worse should have a photo taken that shows the deficiency identified in the inspection comment. The photo should be attached to the record at the Inspection level. (Required)

Life Safety issues should be photographed for documentation of the safety item and used in safety reports. The photo should be sent to the team lead and all required steps outlined in the safety plan are to be completed. (Required)

Paint DCR does not drive the requirement for a photo to be attached at the inspection level. Example: A component has a DCR of 'G-' and a paint DCR of 'A' would result in no photo attached to the inspection.

See Scope Of Work (SOW) for any photo renaming/deliverable requirements.

The Team Leader is required to take one photo of the front elevation, or a representative elevation view, and attach the photo to the building record at the building level. (Required)

Reinspection

All existing quantities for components such as basement walls are to be validated to a +/-15% accuracy. This can be accomplished through random sampling.

Assessors must not delete/edit components and sections that are not within their discipline.

BRED™ functions such as 'Copy Building' and 'Copy Section' should not be used unless their ramifications are fully understood. Copy building: The entire building will be copied. Copy section: All items with the same section name will be copied. For example, if a D50 assessor uses copy section on the section name FL1, the assessor may copy/paste interior doors, mechanical equipment, etc. without knowing it. If there is no existing data, these functions are easily used.

Existing data should be deleted if: 1) The component is no longer present, 2) The correct component type exists, 3) There are duplicate components with the same section name, or 4) The component is correct but has the wrong install date (requires deletion and re-entry with correct date).

If a component type in the existing data is no longer in scope, it must be updated to an in-scope item, or deleted if no longer applicable.

Past inspection comments are not required to be revised to current standards.

Section names, component types, and quantities must be verified and updated.

When performing a reinspection it should be understood that modifications in the inventory guidance may have taken place between the previous assessment date and the current effort. The new assessment should update the inventory to the latest inventory guidance. This may require, but is not limited to, combination of quantities (Ex: removing cardinal direction sectioning when it is no longer needed), modifying component type selections, or removing/adding items. The detailed inventory guidance portion of the manual will often provide direction on what steps need to be taken.

Sectioning

Once all base sectioning guidelines have been followed, there may be a need to apply a DCR-driven sectioning methodology based on two factors 1) difference in DCR, and 2) quantity of distress. Step 1: Assessors should section a component when there is a 2-step difference in DCR (Ex: G- to A) in accordance with the guidance found in Step 2. If there is only a 1-step difference in DCR, the assessor shall have a single section and the lower of the DCR's should be used. Step 2: When a 2-step difference is found, the assessor should consider the quantity of distress that is present. If the distress is present on 25% or less of the component, a single section with a DCR in-between the high/low DCR shall be added (if G-/A are found then A+ is used). If the distress is present on over 25% of the component, two sections should be added at the high/low DCR. Any component with a 3-step or more difference in DCR should have two sections.

The most critical part to an assessment is having all assessors aligned on how to perform an assessment. To reach an accurate DCR of a component, follow the steps below:

Step 1: Consider the level of degradation and the performance of the component:

OPERATIONAL CAPABILITY	OPERATIONAL CONDITION RATING	DEGRADATION	DCR
Fully Operational	Green	Free of observable or known degradation.	Green (+)
		Normal wear requiring normal preventative maintenance.	Green
		Normal degradation requiring corrective maintenance.	Green (-)
Impaired Operation	Amber	Minor degradation requiring corrective maintenance.	Amber (+)
		Moderate degradation requiring corrective repair.	Amber
		Significant degradation requiring moderate repair.	Amber (-)
Inoperable	Red	Extensive degradation requiring major repair.	Red (+)
		Severe degradation requiring major rehabilitation or partial replacement.	Red
		Complete degradation requiring full replacement.	Red (-)

Step 2: Consider the maintenance requirements of the component:

Type	Green (G+/G/G-)	Amber (A+/A/A-)	Red (R+/R/R-)
Dynamic (Equipment)	<p>Distresses present are of no impact to the components operation.</p> <p>Example: The fan component is fully operational.</p>	<p>Distresses present are of impact to the components operation. A repair is needed to bring the component back to proper operating condition</p> <p>Example: A fan has corrosion on the housing. A sand and paint would remove the distress.</p>	<p>Distresses present are of impact to the components operation. The component needs to be replaced.</p> <p>Example: A fan motor has overheated and no longer functions. Replacement of the component is required.</p>
Non-Dynamic	<p>The architecture component is in good condition requiring no maintenance outside of normal operations.</p> <p>Example: The carpet component is fully operational.</p>	<p>The architecture component has a distress that requires an extra level of maintenance outside of normal operations. This extra maintenance (or repair) would be an action such as a cleaning or a painting of a surface.</p> <p>Example: A carpet component has stains. A cleaning would remove the distress.</p>	<p>The architecture component has a distress where a maintenance operation will not fix the problem at hand. A replacement of the component is required.</p> <p>Example: A carpet component is damaged (ripped). The component needs to be replaced to fix the distress.</p>

Dynamic: Refers to equipment in the D10, D20, D30, D40, D50, and E10 systems.

Non-Dynamic: Refers to architectural components in the A10, A20, B10, B20, B30, C10, C20, and C30 systems.

Note: There are some Non-Dynamic components (for instance, toilets under D20) in the Dynamic systems.

Step 3: Adhere to the following requirements:

Requirements
Maintainability and obsolescence should not be the driving factor when conducting a condition assessment unless it has led to actual deterioration of condition that can be observed or reasonably inferred.
G+ ratings should only be given to inventory that is in pristine condition and is free of any observable defects.
Do not downgrade an assessment rating simply because an item is dirty.
Do not downgrade an assessment rating because the item does not meet current code compliance standards
Do not downgrade an assessment rating because the item is not deemed energy efficient.
Do not downgrade an assessment rating because the item is deemed to be a safety violation/hazard unless otherwise directed.
Do not downgrade an assessment rating because of a code violation.
Ratings should not be anticipated based on planned repairs or replacement.
Assessors should not expend field time and effort to determine the cause of a deficiency. If the cause is easily identified it should be included in the inspection comment.
Ratings shall be based upon the observable and documentable condition of the component.
A component should be downgraded if its operational capability, performance, reliability, etc. is compromised according to the direct rating definitions.
Incorporate user interviews, work order histories, or other information sources when determining the condition of the component. Include this information in the inspection comment.

The assessor should calibrate their mindset on what the expected DCR should be based on condition.
 The assessor should consider the maintenance requirements of the component in the current condition.
 The assessor should factor in the requirements/business rules for completing an inspection.

One factor that can play into an assessment is if the assessor receives information from a POC that results in a lower rating. For instance, an assessment takes place in July and there is a heating water pump that looks brand new, but has a blown motor. The assessor would assume the pump is supposed to be off due to being off season, but if the POC informs the assessor about the blown motor, this can be factored into the assessment (and indicated in the inspection comment).

One factor that should not play into an assessment is pending replacements of components. Assessors should rate components in the condition they are at the time of assessment. If the carpet is being replaced next month, that should not factor into a rating. Now, if the carpet contractor is on site (the work is currently taking place), this could be factored into the rating and a G+ rating provided with the current date of inspection chosen as the install date.

Service Life: No distresses present and component is nearing (or past) its service life.

The following comment can be used as an inspection comment for components that have no signs of distresses, are rated either Amber (A) or Amber Plus (A+), and are over 75% through their service life. This negates the need to have 4 parts of an inspection comment. Also, an inspection photo is no longer required.

[First Last-AE-Date] - The component is in proper working condition and is showing no signs of distress. The DCR was based on estimated remaining service life.

Step 1: Understand the 5 parts of the inspection comment:

Part #	Part Type	Type Description
1	Front End	[First Last-AE-Date] OR [First Last-DPW-Date] (ex: [John Doe-AE-7/4/2017])
2	Distress	Identifies the distress of the component
3	Severity	Identifies the amount of the distress.
4	Location	Identifies the location of the distress
5	Quantity	Identifies the quantity of the distress

Step 2: Use the DCR of the component as the basis for the severity.

DCR	Severity
Amber (+)	Minor/Mild
Amber	Moderate
Amber (-)	Significant/Major
Red (+)	Extensive
Red	Severe
Red (-)	Complete/Total

To aid in the inspection comments reading correctly the severity can be modified slightly. For instance, 'moderately' can be used for an 'A' DCR comment. This approach also applies to the distresses where one of the 23 MUST be selected. If 'Cracked' is selected as the distress, the wording 'cracks' may be used.

Step 3: Identify the distress of the component:

23 Distresses			
Blistered	Displaced	Overheated	Capability/Capacity Deficient
Broken	Efflorescent	Patched	Animal/Insect Damaged
Clogged	Holes	Rotten	Moisture/Debris Contaminated
Corroded	Leaks	Stained/Dirty	Noise/Vibration Excessive
Damaged	Loose	Cracked	Operationally Impaired
Deteriorated	Missing		Electrical Ground Inadequate or Unintentional

Step 4: Location and Quantity

Location on non-dynamic assets - 'lobby area' or 'northwest corner'.

Quantity on a SF UOM will typically be a %. On an EA UOM will typically be a count.

Step 5: Put all 5 components together to form an inspection comment (colors correspond to part):

A+	Front End	CRACKED.	The	walls have	minor	cracks	present on	10% of the	gym.
A	Front End	DETERIORATION.	The	carpet has	moderate	deterioration	over	50 %	of the lobby.
A-	Front End	DAMAGED.	The	door has	significant	damage	to the	lower half	of the door.
R+	Front End	CRACKED.	The	windows have	extensive	cracks	present in	4	panes.
R	Front End	LEAKS.	The	roof has	severe	leaking	around the	HVAC	penetrations.
R-	Front End	OPERATIONALLY IMPAIRED.	The	3	north	doors are	completely	operationally impaired.	

Inspection Comments

Rule #	Rule
1	Required on all inspections with a DCR of A+ and below.
2	Paint DCRs do not have an inspection comment requirement. Only the component DCR A+ and below.
3	Should include any component specific information obtained from the base or POC interview.
4	Should be in complete sentences and use industry standard terminology. Comments can be typed into MS Word for spelling/grammar checks and then pasted into the comments box.
5	Do not use all capital letters for the entire comment. The distress should be all capital letters.
6	Do not use abbreviations, jargon, or slang.
7	Should give enough information for a follow-on assessor to locate the problem area/equipment.
8	Should accurately describe the problem/observation that is the basis for the rating. Someone unfamiliar with the particular item should have an accurate picture of the components current condition and the justification for the assigned rating.
9	Should accurately describe the location of the distress if the component is only showing a distress in a single location. For instance, if an office has a stain in the carpet, it would be necessary to call out the room number of the office.
10	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. For instance, assessor John Doe at firm AE: [John Doe-AE-7/4/2017].
11	After #10 front end information in the brackets one of the 23 distresses should be provided in capitalized form. Building on #10 for an example if stained carpet: [John Doe-AE-7/4/2017] - STAINED.
12	After #10 and #11 a sentence should be provided that provides the distress, severity, location, and quantity. Quantity/Location refers to the amount/location of the distress present.

Inventory Comments

Rule #	Rule
1	Used to identify components that were not visible for inspection. See standard comments.
2	Used as a bread crumb for follow-on inspections. Can provide useful additional information such as location or type to help the next assessor understand what was being inventoried. Ex: This component is the stone wall located behind the receptionist in the lobby area.
3	Should describe the component inventoried where 'OTHER' is used to allow follow-on assessments to understand what was inventoried in the previous assessment.
4	Used to provide the location of the component (especially used for architecture components where there are no Section Details provided that have a location): Roof, NW Corner, Room Number
5	Do not use all capital letters, abbreviations, jargon, or slang.
6	Used to further describe an asset if it is not adequately described in the component type selection.
7	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Section Detail Comments

Rule #	Rule
1	Used to identify data that was not able to be populated in the Details fields. See standard comments.
2	Used to provide information that is specific to just that component section detail field. This can be a location of the specific section or something that the section services.
4	Do not use all capital letters, abbreviations, jargon, or slang.
5	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Standard Inventory Comments

When	Use Standard Comment
Assets are not visible for inspection.	Component was not visible for inspection. The component condition will be age-based by BUILDER program degradation curves.
Assets are not visible for inspection that also require Section Details to be populated.	The component is not visible for inspection or population of Section Details. The component condition will be age-based by BUILDER program degradation curves and no nameplate data or inventory photo will be provided.
Assets are not visible for inspection that require quantities to be assumed. Hidden mechanical equipment, ductwork, and # of control points are common occurrences.	The component is not visible for inspection and the quantity was estimated based on architect/engineering judgment. The component condition will be age-based by BUILDER program degradation curves.
Assets are located in an area where no electronics area allowed. This prevents an assessor from taking inventory/inspection photos.	The component is located in a secure area of the facility that did not allow electronic devices to be used. Photos were not obtainable.
Assets are visible for inspection but are a system that is not tested (HVAC controls, security system, etc.) so an age-based BUILDER™ CI is desired.	The component condition will be age-based by BUILDER program degradation curves.

Standard Section Detail Comments

When	Use Standard Comment
Nameplate is not found on the component.	Nameplate not found on the component. All fields with "NA" represent data not found.
Nameplate is found on the component but it is partial/completely unreadable.	Nameplate on the component was dirty/corroded/damaged/sunwashed. Section Detail fields with "NA" represent data that was not found.
Nameplate is found on the component that is readable but is missing certain Section Details fields.	Nameplate on the component was missing certain Section Detail fields. Section Detail fields have been populated and fields with "NA" represent data not found.

Comment Front-End Clarification

A front end refers to the bracketed information at the start of an inspection/inventory/section detail comment. The front end must have to following 3 pieces of information: 1) assessor name, 2) assessor company or affiliation, and the date. The BRED™ stamp may also provide the time of inspection which is acceptable.

BRED™/BUILDER™ Clarification

The terms BRED™ and BUILDER™ are used interchangeably throughout this document.

Rule #	Rule
1	Components are divided into sections when a significant variation exists in material/equipment category, age, or construction history, which impacts the life cycle characteristics of the component. Example 1 - If a wing or addition was added to a much older building, the two areas of the building should be sectioned differently because the age and construction history is different. Example 2 – If the building roof has multiple levels of similar materials in different conditions, these levels should be sectioned differently to capture the difference in condition. Example 3 – If the building has more than one of a particular type of component, separate component sections. For example: There is a 5,000 and 10,000 CFM air handler.
2	Multi-wing buildings are always sectioned by wing if the installation date of the wings vary. If a building is an 'E' shape and all wings have the same install date only sectioning by floor is required.
3	Multi-story buildings are always sectioned vertically by floor or level (in the case of a basement or mezzanine).
4	There may be unique instances where sectioning by an area of a building is required. For instance, if a building is split between two companies an installation may request sectioning by company 1 and 2.
5	An on-site discussion must occur at each building among all team members to determine the cardinal direction of the building. All assessors should have North as the same side of the building.
6	An on-site discussion must occur at each building among all team members on how the building should be sectioned. The goal is to avoid one assessor calling it a toilet, one calling it a restroom, and another calling it a bathroom. Standard sectioning naming is important for a consistent data set.
7	The section name should not be repetitive of the component type or material. If the floor is wood, do not have a section name 'WOOD'. Incorporation of the location into the section name is very helpful to be used for follow on assessments. If the wood floor has the section name 'LOBBY', it provides great

Standard Section Names and Format Rules

Use	Standard Section Name
Section by Floor (Business Rule)	FL1 – 1st Floor, FL2 – 2nd Floor, FL3 – 3rd Floor, etc.
Section by Floor (Business Rule)	BASEMENT, MEZZANINE, ATTIC, etc.
Section by Wing (applicable if different construction histories or condition only)	MAIN, WING A, WING B, WING C, ADDITION, etc.
Section by Direction (applicable if different construction histories or condition only)	NORTH, EAST, WEST, SOUTH, etc.
Section by Roof Level (applicable if different construction histories or condition only)	UPPER, LOWER, MAIN, etc.

When an equipment tag is included in the section name it should match exactly what was found in the field. Example: if the boiler ID number is B-1, the section name equipment tag portion should read B-1. If the boiler is tagged B1, the equipment tag portion should read B1. See equipment sectioning for further guidance.

Dashes are not required in the section name other than the instance in regards to equipment ID tags above.

The section name field is always entered in all capital letters.

Sectioning Business Rules - Grouping

The following only applies to each (EA) unit of measure (UOM) components. The 'Complete Component Catalog Breakdown' at the end of the section has a 'Group OK?' column. This has the values of 'Yes', 'No', and 'N/A'.

'Yes' = Grouping is allowed for this component type. A quantity of greater than '1' is acceptable.

'No' = Grouping is not allowed for this component type. The quantity must be '1'.

N/A = Not Applicable. Component type is not an EA UOM or is out of scope.

Group OK? = Yes when Section Details and Inventory Photos are Required.

There are several equipment component types (Unit Heaters, small pumps, etc) that have the following designations in the 'Complete Component Catalog Breakdown': 1) Group OK? = Yes, 2) Section Details? = Yes, and 3) Inventory Photo? = Yes.

In this case, a single section detail and inventory photo representative of the entire section is required. A few more clarifications:

- 1) The location field would be for the entire section (FL1/BAY 1/EXTERIOR) and not specific to a single component.
- 2) A difference in manufacturer does not drive further sectioning. For instance, 2 KW electric unit heaters from multiple manufacturers can be combined into one section. Capacity (2 KW) is the driver for sectioning methodology.
- 3) It is understood that the single section detail field is representative of the entire section. The details should be populated per one component. There is no need to enter multiple details or try to combine multiple manufacturer/model/serial/etc into to a single section detail field.

Group OK? = No

The quantity for these component types must be 1. For equipment (Section Details? = Yes and Inventory Photo? = Yes) the guidance found on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components', 'Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components', and 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components' must be followed.

Sectioning of Components on the Exterior of a Building

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Business Rules

- 1) Components of like type, condition, and install date should be inventoried in a single section. (Ex: B201005, B203001 and B301001 above are all like type, condition, and install date). S/N = 'N/A'
- 2) Components that require multiple sections should indicate cardinal direction for additional sections. (Ex: B201001 - Damage present on south face - S/N = 'SOUTH'. All other 3 sides were same condition - S/N = 'N/A'.
- 3) Components that are only found on a single side of a building should indicate cardinal direction in section name (Ex: B203002 GLAZED DOORS are only found on west face in example above - S/N - 'WEST').

- B20 EXTERIOR ENCLOSURE
 - B2010 EXTERIOR WALLS
 - B201001 EXTERIOR CLOSURE - Pre-Engineered Steel Wall and Panel
 - B201005 EXTERIOR LOUVERS & SCREENS - General
 - SOUTH - B201001 EXTERIOR CLOSURE - Pre-Engineered Steel Wall and Panel
 - B2020 EXTERIOR WINDOWS
 - NORTH-ALUMINUM-4 - B202001 WINDOWS - General
 - SOUTH-ALUMINUM-3 - B202001 WINDOWS - General
 - B2030 EXTERIOR DOORS
 - B203001 SOLID DOORS - Steel
 - WEST - B203002 GLAZED DOORS - General
- B30 ROOFING
 - B3010 ROOF COVERINGS
 - B301001 STEEP SLOPE ROOF SYSTEMS - Formed Metal - Metal Standing Seam
 - B301005 GUTTERS & DOWNSPOUTS - Gutters
 - NORTH - B301005 GUTTERS & DOWNSPOUTS - Downspouts
 - SOUTH - B301005 GUTTERS & DOWNSPOUTS - Downspouts

4) Component types in which there are multiple sections present, and the respective section is only found on a single side of a building, should indicate cardinal direction in the section name (Ex: B301005 GUTTERS DOWNSPOUTS - S/N 'NORTH' and 'SOUTH').

Note: The guidance above is listed in order of application. For example, if the downspouts were all the same condition then #1 would have applied and the section name would have been 'N/A'.

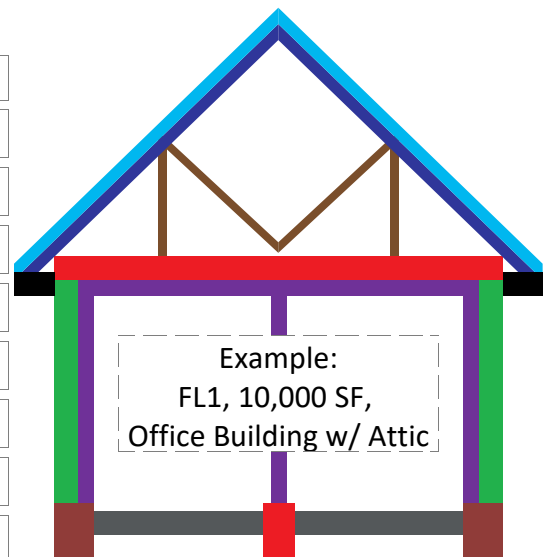
B10 Superstructure is often not visible, which can lead to a variety of different inventory methods. See below for the steps to properly inventory the B10 Superstructure.

Step 1: Consider the size of the building.

Building Square Footage	B1010 Floor Construction	B1020 Roof Construction
1 SF - 1,000 SF	Not Inventoried	Inventory
1,001 SF - 5,000 SF	Assessor Judgment	Inventory
5,000 SF +	Assessor Judgment	Inventory

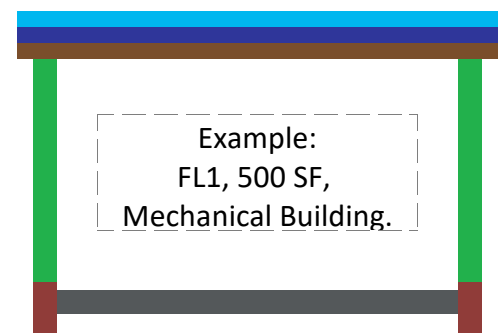
* B1010 captures the structural framing that supports the B1020 (roof) structural framing. B1010 will be present on multiple story buildings and buildings that have a mezzanine or deck area. Note: If there is an attic space, it may be necessary to have a B1010 on a single-story building. While not part of the living area of the building, there is structural support for this area that is not part of the B1020 structural framing.

Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Shingle	N/A
B102003 Roof Decks and Slabs	Wood	N/A
B102001 Roof Construction	General	N/A
B101003 Floor Decks and Slabs	Wood	ATTIC
B201007 Exterior Soffits	General	N/S/E/W
B101001 Floor Construction	General	N/A
B201001 Exterior Enclosure	Siding	N/S/E/W
A103002 Structural SOG	General	N/A
A101001 Wall Foundations	Grade Beams	N/A
A101001 Wall Foundations	Strip Footing	N/A



A10 assets will be hard to inventory as they are not visible. Use drawings or assessor experience on construction type to inventory these assets.

Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Built-Up	N/A
B102003 Roof Decks and Slabs	Concrete	N/A
B102001 Roof Construction	General	N/A
B201001 Exterior Enclosure	Concrete Block	N/S/E/W
A103002 Structural SOG	General	N/A
A101001 Wall Foundations	Strip Footing	N/A

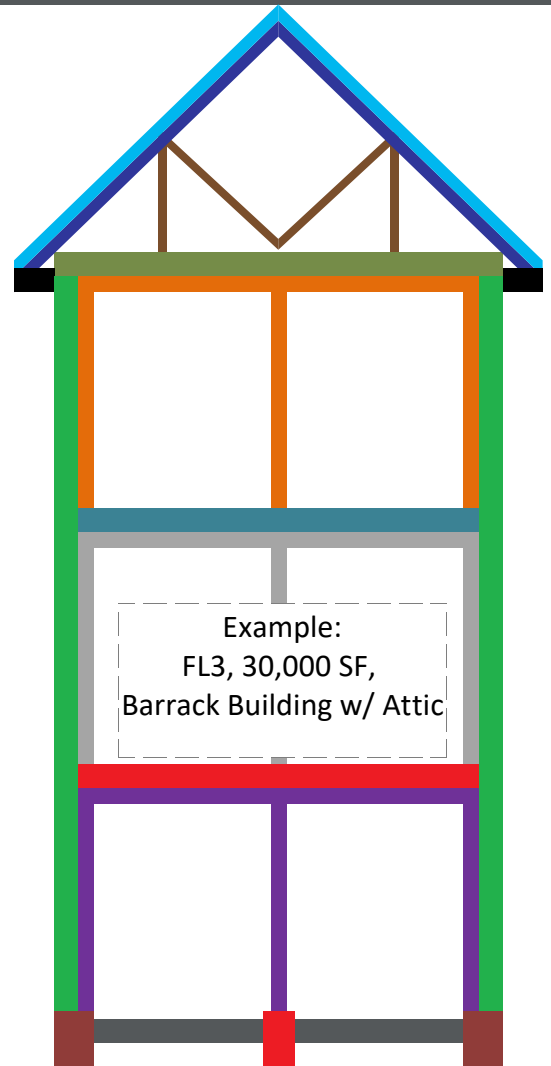


Note: The roof deck overhangs the building. There is no soffit material

Note: B102001 should be included even though structural members are not visible. There is reinforcing (rebar) in the concrete roof deck. A building will always have a B102001 component regardless of size.

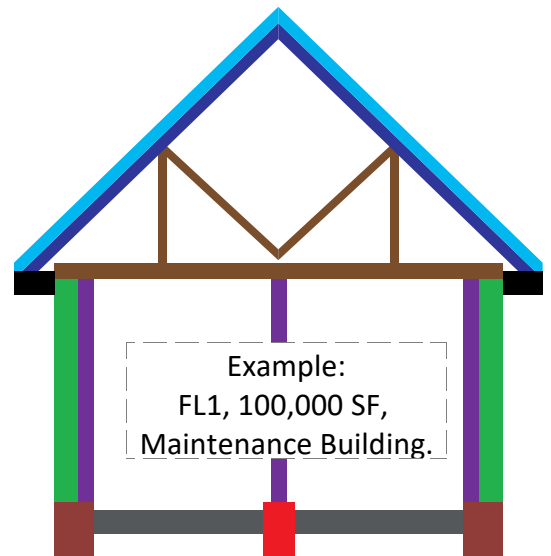
Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Standing Seam	N/A
B102003 Roof Decks and Slabs	Steel	N/A
B102001 Roof Construction	General	N/A
B101003 Floor Decks and Slabs	Concrete	ATTIC
B101001 Floor Construction	General	FL3
B101003 Floor Decks and Slabs	Concrete	FL3
B101001 Floor Construction	General	FL2
B101003 Floor Decks and Slabs	Concrete	FL2
B201007 Exterior Soffits	General	N/S/E/W
B101001 Floor Construction	General	FL1
B201001 Exterior Enclosure	Tilt-Up Panel	N/S/E/W
A103002 Structural SOG	General	N/A
A101001 Wall Foundations	Grade Beams	N/A
A101001 Wall Foundations	Strip Footing	N/A

- 1) B10: Sectioned by floor. B20: Not sectioned by floor.
 2) A10 assets will be hard to inventory as they are not visible. Use drawings or assessor experience on construction type to inventory these assets.



Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Standing Seam	N/A
B102003 Roof Decks and Slabs	Steel	N/A
B102001 Roof Construction	General	N/A
B201007 Exterior Soffits	General	N/A
B101001 Floor Construction	General	N/A
B201001 Exterior Enclosure	Siding	N/S/E/W
A103002 Structural SOG	General	N/A
A101002 Column Foundations	Spread Footing	N/A
A101001 Wall Foundations	Strip Footing	N/A

- 1) Columns will have a column foundation (typically will be found) use 'A101002 - Spread Footing.'



A202001 BASEMENT WALL CONSTRUCTION - General**Typical Application and General Component Guidance:**

This component is used to inventory walls that are below grade.



A20

Business Rules/General/Lessons Learned/Reinspection**Business Rule**

Do not use BASEMENT for a section name in this case because inventory is entered as part of A2020 Basement Walls.

Arch barrel structures typical of Quonset huts and earth-covered magazines are covered under B1020 Roof Construction. End walls are covered under B2010 Exterior Walls. Do not use A2020 even though walls/roof can be below grade.

Basement walls that are partially (> 4 feet) above grade are counted as the appropriate Exterior Enclosure for the full height of the wall. Do not inventory these under A20 Basement.

General

Material is almost always brick, concrete block, or cast-in-place concrete.

Lesson Learned

Do not use an A10 or B20 wall construction component type to inventory basement walls. A20 should be used.

'General' component type is always used. This allows the assessor to inventory the wall in a SF UOM similar to all other wall types.

In certain areas of the country, there may be a steam distribution system. These will typically have wells below grade for the pipes to enter the building. These well/pit walls should be captured as an A20 component.

Maintenance garages will have pits where a vehicle can be driven over the pit and serviced from below. The walls of these maintenance pits should be captured as an A20 Basement Foundation component.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	100	SF

Complete Component Catalog Breakdown

A20

A20 BASEMENT CONSTRUCTION

A201001 EXCAVATION FOR BASEMENTS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	SY
Other	No	No	No	No	N/A	No	100	SY
Unknown	No	No	No	No	N/A	No	100	SY

A201002 STRUCTURE BACKFILL & COMPACTION

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	SY
Other	No	No	No	No	N/A	No	100	SY
Unknown	No	No	No	No	N/A	No	100	SY

A201003 SHORING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	SF
Other	No	No	No	No	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

A201090 OTHER BASEMENT EXCAVATION

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	EA
Other	No	No	No	No	N/A	No	100	EA
Unknown	No	No	No	No	N/A	No	100	EA

A202001 BASEMENT WALL CONSTRUCTION

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
CIP Concrete	No	No	No	No	N/A	No	100	LF
Concrete Block	No	No	No	No	N/A	No	100	LF
General	Yes	No	No	No	N/A	No	100	SF
Other	No	No	No	No	N/A	No	100	LF
Unknown	No	No	No	No	N/A	No	100	SF
Wood	No	No	No	No	N/A	No	100	LF

A202002 MOISTURE PROTECTION

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	SF
Other	No	No	No	No	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

A202003 BASEMENT WALL INSULATION

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	SF
Other	No	No	No	No	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

A202090 OTHER BASEMENT WALLS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	SF
Other	No	No	No	No	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

Details Req?	If 'Yes', all required section detail fields are to be populated.
Inventory Pic?	If 'Yes', an inventory level photo is to be provided. This is a step back photo showing the component.
Inventory Cmmt?	If 'Yes', an inventory comment is to be populated. This should describe the component.
Group OK?	Only applicable to each (EA) UOM's that are In Scope? = 'Yes'. If 'No' section must be a quantity of 1. If 'Yes' section may have a quantity greater than 1. If 'N/A' it is not applicable to the component type.
Age Based?	If 'Yes', age based (do not provide an inspection) is the desired approach. If 'No' but upon inspection the component is not visible, then an age based approach is acceptable.
Design Life	Design life of the component.
UOM	Unit of measure. If yellow highlight = new component type in 2019 update.

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Army BUILDER™ SMS Inventory and Assessment Guide

B10 SUPERSTRUCTURE



US Army Corps
of Engineers
Mobile District

ERDC
Engineer Research & Development Center

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Summary of Changes

Date	Record of Revisions/Additions to SMS Inventory and Assessment Methodology
06/01/2019	Added page "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" to clarify sectioning guidance for exterior components.
06/01/2019	Removed BR "If a building has floor balconies or stairwell slabs, the area of these components should be added to the floor deck and slab quantity." from B101003.
06/01/2019	Added BR "If a building has floor balconies or stairwell slabs, they should be inventoried under 'B101005 BALCONY CONSTRUCTION' and not included in the 'B101003 FLOOR DECKS AND SLABS' quantity."

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Safety The following items should not be interpreted as 1) Safety Plan, 2) OSHA, or base safety requirements. These are recommendations. The contractor should operate in accordance with the SOW and approved safety plan.

Safety is of the utmost concern and should always be at the forefront of any activities taking place in the field. There are many potential safety hazards associated with building assessments. Prior to performing building assessments, the assessing staff/team must ensure that field activities are in accordance with the 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Safety Preparation Activities

Do not perform a task that may harm or endanger the health and safety of oneself or others.

Consult with the installation safety representative to review installation-specific safety requirements.

Conduct a daily “stand-up” safety meeting.

Ensure new assessors have been properly trained.

Review the assessment plan/schedule for the day.

Ensure proper Personal Protective Equipment (PPE) is available. This includes, but is not limited to, a hardhat; hearing protection; eye protection; safety shoes, gloves; and a safety colored vest.

Prior to conducting assessments, the team leader must check with the safety office or building POC to determine if there are any building/site-specific safety rules or hazards. For instance, some manufacturing areas may require steel toe shoes, hearing protection, or eye protection.

Safety Recommendations

Do not walk and write, or talk on a mobile phone, at the same time; this can lead to trips/falls.

Do not review documents or write while walking on steps or stairs.

Do not enter posted or suspected confined spaces such as crawl spaces, tanks, chases, or pits.

Mechanical rooms, attic spaces, or other areas with piping/ductwork may require the use of hard hats to prevent against head bumping hazards. Refer to the project specific safety plan for further clarification.

Do not enter areas with hazardous material signs posted or that appear to contain hazardous materials (asbestos, gases, visible mold, etc.).

Be careful when walking through/across vehicle maintenance or staging areas.

Be aware of loose-fitting clothing and lanyards that may get caught in tight areas or on piping such as in mechanical/electrical rooms, etc.

Be careful of wildlife and insects when walking around a building or opening seldom-entered mechanical/electrical rooms. Assessors may encounter snakes, spiders, stray cats/dogs, rats/mice, etc. in these areas. Do not enter or place hands in spaces that are not completely visible.

If a life safety problem is observed, do not try to fix it. Report it to the proper authority or building manager prior to leaving the building or area.

Before the assessment team leaves a building, ensure all team members are accounted for.

Ladder use should be done in accordance with 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Designate a safety POC to enforce the safety accident prevention plan.

Perform a daily safety briefing before field work. Document the attendees and the topics covered.

Halt outdoor field operations at the sign of lightning or thunder.

Safety Recommendations (continued)

Do not access pitched roofs. They may be assessed from a nearby building or using binoculars.

Use proper techniques to place, secure, and climb ladders. Never climb a ladder while holding anything. Always use the three-point technique for climbing. Equipment should be placed in a backpack or an over-the-shoulder satchel to free hands for climbing.

Do not operate powered equipment, Weight Handling Equipment (WHE)/cranes, or remove access covers from powered equipment to perform assessments.

BUILDER™ assessments are commonly performed without electrical test equipment. Do not use electrical test equipment to test circuits or equipment unless qualified by a local authority. Only open panel box doors or enter electrical/mechanical rooms following proper training. Consult the local safety representative.

Site Preparation

Site Preparation Activities

Coordinate with the base to determine building access requirements, such as: escorts; camera passes; classified/secure area restrictions; or keys.

Locate buildings on a map and develop a schedule. Coordinate with the base to identify the appropriate building manager from the POC list. Notify the building managers of the upcoming assessment as needed.

Obtain a set of mechanical/electrical room master keys from the installation POC.

Extract all BRED™ files from BUILDER™ and have them loaded onto tablets (if using tablets). Verify all tablets are charged.

If multiple buildings are to be assessed by one team, confirm the schedule and plan of action with the team leader. A schedule may have building start times detailed to the hour.

Review the building names for the types/sizes of buildings that will be assessed to determine/confirm the needed tools and safety equipment. For instance, if the facilities are not climate-controlled, prepare accordingly (for cold weather bring hats/gloves).

Recommended Assessor Gear/Tools

Hardhat	Digital Camera with Extra Battery(s)
Hearing Protection	Measuring Tape
Safety Glasses	Laser Measuring Device/Flash Light
Reflective Safety Vest	Measuring Wheel
OSHA Approved Footwear	Backpack
Other Required Personal Protection Equipment (PPE)	Graphite Powder (for stuck locks)
Cell Phone and Team Cell Phone List	Cleaning Pad (to clean/help read nameplates)
Assessment Schedule	Pen/Pencils
Building Floor Plans/Base Map	Clipboard
Small Magnet (for determining door/window type)	Paper/Assessment Forms
Flash Light/Compass	Graph Paper
Sun Screen/Bug Spray	Refillable Water Bottle

Operating efficiently in the field is key to the success of the assessment. The following guidance is detailed by 1) Team Leader and 2) Assessor. **Bold items are drivers for client deliverables.**

Team Leader

Upon arrival, check in with the building manager and QA representative (if present).

Conduct the building manager interview. The entire team should be present for the building manager interview. The following questions should be asked:

Question 1: Are there any mission-related deficiencies in the building?

Question 2: Are there any safety-related deficiencies in the building?

Question 3: Have there been any upgrades or remodels of the building?

Question 4: Are there any building deficiencies (HVAC not working, electrical breakers tripping, maintenance issues, roof leaks, etc.) present?

The team leader (ONLY the team leader!) should populate the building level comment with the following information: 1) Missing systems, 2) Renovation dates, 3) Areas of the building not accessible during the assessment, and 4) If drawings were/were not provided. Below are some examples of building level comments:

Comment 1: No A20, D10, or D40 systems present. 2016: Vault room not accessible. Drawings not provided.

Comment 2: No A20 systems present. Renovated in 2010. 2016: 5% of building not accessible. Drawings provided.

The team leader should review the real property data in BRED™ and compare it to what is found during the assessment. The following should be confirmed: 1) Number of stories, 2) Building square footage, and 3) Building install date and 4) Building number in BRED™ matches the building. Variances between real property data and actual field data should be recorded for inclusion into the client deliverable.

Team Leader and Assessors

Best Practice: Each assessor should first take a photo of the building number to identify the subsequent photos associated with the building when they are downloaded. Take a second picture that captures the overall building view with respect to nearby buildings/streets. This should help refresh/remind the assessor on what the building looks like, while performing data-entry.

A team caucus should occur to discuss the sectioning strategy for the building and confirm which side is facing north.

Each assessor should have a consistent approach to each building. Assessors should move around the building exterior and interior in a clockwise (or counterclockwise) manner making notes and taking photos.

If a safety item is found, notify the team lead. The team lead will notify the building manager. Capture a photo of the safety item for inclusion into the safety log. Follow all other project-specific procedures when a safety item is encountered.

Upon return to the office perform the following steps:

Step 1: Download all photos from the day to a building-specific folder. Review the photos and delete any that are blurry or unreadable.

Step 2: Complete all calculations and counts. Complete all data entry into BRED™.

Data Entry

With the technology that is available today, the need to use forms in the field and do data entry at the office has been mitigated. Tablets can be used to run BRED™ to complete data entry while in the field. It is understood that there are challenges to accomplish this for certain disciplines. It is only mentioned here as a best practice recommendation and is not a requirement to execute the work. There will be instances where electronics will not be allowed in a facility. Assessors should have a paper/pen data collection system ready as a backup.

General

This section presents common Unifomat B10 Superstructure Inventory Component Sections found across installations as a guide for entering into the BUILDER™ or BUILDER™ Remote Entry Database (BRED™) software. Inventory items are arranged by BUILDER™ System with Material/Equipment Category, Component Type, Unit of Measure, and Inventory Notes.

B1010 - Floor Construction: Includes balconies, ramps, columns/pillars, elevated floors, beams/girders, joists, and slabs at intermediate floors.

B1020 - Roof Construction: Includes awnings, beams/girders, joist, rafters, trusses, purlins, and decking that support the roof coverings and rooftop equipment.

Building superstructures are above ground and overhead structural components that support other building systems such as the exterior enclosure, roofing, and interior construction.

Inspection

Roof Construction will normally not be visible unless the building is a warehouse or maintenance-type structure with no finished ceilings. No assessment will normally be entered unless the assessor can observe some portion of the Roof Construction, observe distresses noted, or has access to an engineering report.

Rule of thumb: If you can see it, you should inspect it. There are some caveats to this rule. See component catalog for items that must be age-based whether visible or non-visible.

Superstructure component sections are assessed using Direct Condition Rating (DCR) or Age-Based Modeling. Much of the time, superstructure component sections are not visible. When superstructure component sections are not visible, no assessment is entered. In this case, BUILDER™ will use the inventory year installed and degradation curves built in to the software to establish the Condition Index (CI).

Inventory

It is critical to confirm the year installed (default will be from real property records), or estimate the year installed. BUILDER™ uses the install date, degradation curves, and assessment observations to establish a CI for each component section. If the assessor suspects the default install date is not accurate, or an addition or renovation has taken place, check the real property record for year renovated or check local as-built or renovation drawings to help estimate the year installed.

Except where specifically noted in this Guide, do not use 'General' where a more specific item is available as a component type selection.

If a 2-floor, 10,000 SF (real property area) building is assessed and it is deemed to be within +/- 10% calculated, then the assessor should use SF/FLR (10,000/2), which in this case is 5,000 SF as the quantity for the SF of the superstructure components.

If the building area is calculated to be between +/- 10% of the building area shown in the BRED™ file, then the building area shown in BRED™ is to be used. If the calculated area is outside of +/- 10% of the building area shown in the BRED™ file, then the calculated area should be used.

When a component is concealed/hidden, the inventory comment box is used to indicate the reason for no inspection taking place. Standard comments should be used.

When performing an assessment, the 'PAINTED' box should only be selected for components that have local or field applied paintings/coatings. DO NOT mark 'PAINTED' for manufacturer- or factory-applied coatings as they tend to age consistently with the components.

When superstructures are not visible, as-built drawings should be used to identify and quantify the superstructure components. If as-built drawings are not available, the assessor may use experience to make an assumption for the superstructure types and quantities based on similar construction of nearby buildings, consultation with local staff, and other reputable online resources.

Photography

General comment: Photos are captured to document the following: 1) Inventory, 2) Condition (deficiency), 3) Historical record of the asset, 4) QC, and 5) Life safety issues.

All components where an 'Other' component type is selected must have a photo attached at the Inventory/Section level. (Required)

Assessors should take a photo of the building number at the start of the building assessment to delineate the start/stop of the photos between buildings. (Best Practice)

Assessors should take photos to allow for quality control (QC) confirmation and data backup. It is a good practice to have a photo of every component type encountered in an assessment. (Best Practice)

Components that have a DCR (component rating only) of A+ or worse should have a photo taken that shows the deficiency identified in the inspection comment. The photo should be attached to the record at the Inspection level. (Required)

Life Safety issues should be photographed for documentation of the safety item and used in safety reports. The photo should be sent to the team lead and all required steps outlined in the safety plan are to be completed. (Required)

Paint DCR does not drive the requirement for a photo to be attached at the inspection level. Example: A component has a DCR of 'G-' and a paint DCR of 'A' would result in no photo attached to the inspection.

See Scope Of Work (SOW) for any photo renaming/deliverable requirements.

The Team Leader is required to take one photo of the front elevation, or a representative elevation view, and attach the photo to the building record at the building level. (Required)

Reinspection

All existing quantities for components such as floor deck and structural frame are to be validated to a +/-15% accuracy. This can be accomplished through random sampling.

Assessors must not delete/edit components and sections that are not within their discipline.

BRED™ functions such as 'Copy Building' and 'Copy Section' should not be used unless their ramifications are fully understood. Copy building: The entire building will be copied. Copy section: All items with the same section name will be copied. For example, if a D50 assessor uses copy section on the section name FL1, the assessor may copy/paste interior doors, mechanical equipment, etc. without knowing it. If there is no existing data, these functions are easily used.

Existing data should be deleted if: 1) The component is no longer present, 2) The correct component type exists, 3) There are duplicate components with the same section name, or 4) The component is correct but has the wrong install date (requires deletion and re-entry with correct date).

If a component type in the existing data is no longer in scope, it must be updated to an in-scope item, or deleted if no longer applicable.

Past inspection comments are not required to be revised to current standards.

Section names, component types, and quantities must be verified and updated.

When performing a reinspection it should be understood that modifications in the inventory guidance may have taken place between the previous assessment date and the current effort. The new assessment should update the inventory to the latest inventory guidance. This may require, but is not limited to, combination of quantities (Ex: removing cardinal direction sectioning when it is no longer needed), modifying component type selections, or removing/adding items. The detailed inventory guidance portion of the manual will often provide direction on what steps need to be taken.

Sectioning

Exterior ramps and canopies should be sectioned per guidance found on the 'Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components' page. On maintenance facilities, sometimes a canopy or garage door will be labeled, and the label can be included in the section name.

Floor framing and deck slabs should be sectioned by floor.

Once all base sectioning guidelines have been followed, there may be a need to apply a DCR-driven sectioning methodology based on two factors 1) difference in DCR, and 2) quantity of distress. Step 1: Assessors should section a component when there is a 2-step difference in DCR (Ex: G- to A) in accordance with the guidance found in Step 2. If there is only a 1-step difference in DCR, the assessor shall have a single section and the lower of the DCR's should be used. Step 2: When a 2-step difference is found, the assessor should consider the quantity of distress that is present. If the distress is present on 25% or less of the component, a single section with a DCR in-between the high/low DCR shall be added (if G-/A are found then A+ is used). If the distress is present on over 25% of the component, two sections should be added at the high/low DCR. Any component with a 3-step or more difference in DCR should have two sections.

Roof framing, roof deck, and roof covering components should all be sectioned in similar fashion. For example, if there are 'HIGH' and 'LOW' roof sections for framing, the same sectioning methodology is used for the roof deck and roof covering components.

Sectioning by wing is also required if there is a difference in age between wings. If a building with an East and West wing is assessed, the Section Name for the floor framing, roof framing, and decking would read 'EAST WING' and 'WEST WING'. If the entire building has the same install date, there is no need to section B10 components by wing.

The most critical part to an assessment is having all assessors aligned on how to perform an assessment. To reach an accurate DCR of a component, follow the steps below:

Step 1: Consider the level of degradation and the performance of the component:

OPERATIONAL CAPABILITY	OPERATIONAL CONDITION RATING	DEGRADATION	DCR
Fully Operational	Green	Free of observable or known degradation.	Green (+)
		Normal wear requiring normal preventative maintenance.	Green
		Normal degradation requiring corrective maintenance.	Green (-)
Impaired Operation	Amber	Minor degradation requiring corrective maintenance.	Amber (+)
		Moderate degradation requiring corrective repair.	Amber
		Significant degradation requiring moderate repair.	Amber (-)
Inoperable	Red	Extensive degradation requiring major repair.	Red (+)
		Severe degradation requiring major rehabilitation or partial replacement.	Red
		Complete degradation requiring full replacement.	Red (-)

Step 2: Consider the maintenance requirements of the component:

Type	Green (G+/G/G-)	Amber (A+/A/A-)	Red (R+/R/R-)
Dynamic (Equipment)	<p>Distresses present are of no impact to the components operation.</p> <p>Example: The fan component is fully operational.</p>	<p>Distresses present are of impact to the components operation. A repair is needed to bring the component back to proper operating condition</p> <p>Example: A fan has corrosion on the housing. A sand and paint would remove the distress.</p>	<p>Distresses present are of impact to the components operation. The component needs to be replaced.</p> <p>Example: A fan motor has overheated and no longer functions. Replacement of the component is required.</p>
Non-Dynamic	<p>The architecture component is in good condition requiring no maintenance outside of normal operations.</p> <p>Example: The carpet component is fully operational.</p>	<p>The architecture component has a distress that requires an extra level of maintenance outside of normal operations. This extra maintenance (or repair) would be an action such as a cleaning or a painting of a surface.</p> <p>Example: A carpet component has stains. A cleaning would remove the distress.</p>	<p>The architecture component has a distress where a maintenance operation will not fix the problem at hand. A replacement of the component is required.</p> <p>Example: A carpet component is damaged (ripped). The component needs to be replaced to fix the distress.</p>

Dynamic: Refers to equipment in the D10, D20, D30, D40, D50, and E10 systems.

Non-Dynamic: Refers to architectural components in the A10, A20, B10, B20, B30, C10, C20, and C30 systems.

Note: There are some Non-Dynamic components (for instance, toilets under D20) in the Dynamic systems.

Step 3: Adhere to the following requirements:

Requirements
Maintainability and obsolescence should not be the driving factor when conducting a condition assessment unless it has led to actual deterioration of condition that can be observed or reasonably inferred.
G+ ratings should only be given to inventory that is in pristine condition and is free of any observable defects.
Do not downgrade an assessment rating simply because an item is dirty.
Do not downgrade an assessment rating because the item does not meet current code compliance standards
Do not downgrade an assessment rating because the item is not deemed energy efficient.
Do not downgrade an assessment rating because the item is deemed to be a safety violation/hazard unless otherwise directed.
Do not downgrade an assessment rating because of a code violation.
Ratings should not be anticipated based on planned repairs or replacement.
Assessors should not expend field time and effort to determine the cause of a deficiency. If the cause is easily identified it should be included in the inspection comment.
Ratings shall be based upon the observable and documentable condition of the component.
A component should be downgraded if its operational capability, performance, reliability, etc. is compromised according to the direct rating definitions.
Incorporate user interviews, work order histories, or other information sources when determining the condition of the component. Include this information in the inspection comment.

The assessor should calibrate their mindset on what the expected DCR should be based on condition.

The assessor should consider the maintenance requirements of the component in the current condition.

The assessor should factor in the requirements/business rules for completing an inspection.

One factor that can play into an assessment is if the assessor receives information from a POC that results in a lower rating. For instance, an assessment takes place in July and there is a heating water pump that looks brand new, but has a blown motor. The assessor would assume the pump is supposed to be off due to being off season, but if the POC informs the assessor about the blown motor, this can be factored into the assessment (and indicated in the inspection comment).

One factor that should not play into an assessment is pending replacements of components. Assessors should rate components in the condition they are at the time of assessment. If the carpet is being replaced next month, that should not factor into a rating. Now, if the carpet contractor is on site (the work is currently taking place), this could be factored into the rating and a G+ rating provided with the current date of inspection chosen as the install date.

Service Life: No distresses present and component is nearing (or past) its service life.

The following comment can be used as an inspection comment for components that have no signs of distresses, are rated either Amber (A) or Amber Plus (A+), and are over 75% through their service life. This negates the need to have 4 parts of an inspection comment. Also, an inspection photo is no longer required.

[First Last-AE-Date] - The component is in proper working condition and is showing no signs of distress. The DCR was based on estimated remaining service life.

Step 1: Understand the 5 parts of the inspection comment:

Part #	Part Type	Type Description
1	Front End	[First Last-AE-Date] OR [First Last-DPW-Date] (ex: [John Doe-AE-7/4/2017])
2	Distress	Identifies the distress of the component
3	Severity	Identifies the amount of the distress.
4	Location	Identifies the location of the distress
5	Quantity	Identifies the quantity of the distress

Step 2: Use the DCR of the component as the basis for the severity.

DCR	Severity
Amber (+)	Minor/Mild
Amber	Moderate
Amber (-)	Significant/Major
Red (+)	Extensive
Red	Severe
Red (-)	Complete/Total

To aid in the inspection comments reading correctly the severity can be modified slightly. For instance, 'moderately' can be used for an 'A' DCR comment. This approach also applies to the distresses where one of the 23 MUST be selected. If 'Cracked' is selected as the distress, the wording 'cracks' may be used.

Step 3: Identify the distress of the component:

23 Distresses			
Blistered	Displaced	Overheated	Capability/Capacity Deficient
Broken	Efflorescent	Patched	Animal/Insect Damaged
Clogged	Holes	Rotten	Moisture/Debris Contaminated
Corroded	Leaks	Stained/Dirty	Noise/Vibration Excessive
Damaged	Loose	Cracked	Operationally Impaired
Deteriorated	Missing		Electrical Ground Inadequate or Unintentional

Step 4: Location and Quantity

Location on non-dynamic assets - 'lobby area' or 'northwest corner'.

Quantity on a SF UOM will typically be a %. On an EA UOM will typically be a count.

Step 5: Put all 5 components together to form an inspection comment (colors correspond to part):

A+	Front End	CRACKED.	The	walls have	minor	cracks	present on	10% of the	gym.
A	Front End	DETERIORATION.	The	carpet has	moderate	deterioration	over	50 %	of the lobby.
A-	Front End	DAMAGED.	The	door has	significant	damage	to the	lower half	of the door.
R+	Front End	CRACKED.	The	windows have	extensive	cracks	present in	4	panes.
R	Front End	LEAKS.	The	roof has	severe	leaking	around the	HVAC	penetrations.
R-	Front End	OPERATIONALLY IMPAIRED.	The	3	north	doors are	completely	operationally impaired.	

Inspection Comments

Rule #	Rule
1	Required on all inspections with a DCR of A+ and below.
2	Paint DCRs do not have an inspection comment requirement. Only the component DCR A+ and below.
3	Should include any component specific information obtained from the base or POC interview.
4	Should be in complete sentences and use industry standard terminology. Comments can be typed into MS Word for spelling/grammar checks and then pasted into the comments box.
5	Do not use all capital letters for the entire comment. The distress should be all capital letters.
6	Do not use abbreviations, jargon, or slang.
7	Should give enough information for a follow-on assessor to locate the problem area/equipment.
8	Should accurately describe the problem/observation that is the basis for the rating. Someone unfamiliar with the particular item should have an accurate picture of the components current condition and the justification for the assigned rating.
9	Should accurately describe the location of the distress if the component is only showing a distress in a single location. For instance, if an office has a stain in the carpet, it would be necessary to call out the room number of the office.
10	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. For instance, assessor John Doe at firm AE: [John Doe-AE-7/4/2017].
11	After #10 front end information in the brackets one of the 23 distresses should be provided in capitalized form. Building on #10 for an example if stained carpet: [John Doe-AE-7/4/2017] - STAINED.
12	After #10 and #11 a sentence should be provided that provides the distress, severity, location, and quantity. Quantity/Location refers to the amount/location of the distress present.

Inventory Comments

Rule #	Rule
1	Used to identify components that were not visible for inspection. See standard comments.
2	Used as a bread crumb for follow-on inspections. Can provide useful additional information such as location or type to help the next assessor understand what was being inventoried. Ex: This component is the stone wall located behind the receptionist in the lobby area.
3	Should describe the component inventoried where 'OTHER' is used to allow follow-on assessments to understand what was inventoried in the previous assessment.
4	Used to provide the location of the component (especially used for architecture components where there are no Section Details provided that have a location): Roof, NW Corner, Room Number
5	Do not use all capital letters, abbreviations, jargon, or slang.
6	Used to further describe an asset if it is not adequately described in the component type selection.
7	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Section Detail Comments

Rule #	Rule
1	Used to identify data that was not able to be populated in the Details fields. See standard comments.
2	Used to provide information that is specific to just that component section detail field. This can be a location of the specific section or something that the section services.
4	Do not use all capital letters, abbreviations, jargon, or slang.
5	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Standard Inventory Comments

When	Use Standard Comment
Assets are not visible for inspection.	Component was not visible for inspection. The component condition will be age-based by BUILDER program degradation curves.
Assets are not visible for inspection that also require Section Details to be populated.	The component is not visible for inspection or population of Section Details. The component condition will be age-based by BUILDER program degradation curves and no nameplate data or inventory photo will be provided.
Assets are not visible for inspection that require quantities to be assumed. Hidden mechanical equipment, ductwork, and # of control points are common occurrences.	The component is not visible for inspection and the quantity was estimated based on architect/engineering judgment. The component condition will be age-based by BUILDER program degradation curves.
Assets are located in an area where no electronics area allowed. This prevents an assessor from taking inventory/inspection photos.	The component is located in a secure area of the facility that did not allow electronic devices to be used. Photos were not obtainable.
Assets are visible for inspection but are a system that is not tested (HVAC controls, security system, etc.) so an age-based BUILDER™ CI is desired.	The component condition will be age-based by BUILDER program degradation curves.

Standard Section Detail Comments

When	Use Standard Comment
Nameplate is not found on the component.	Nameplate not found on the component. All fields with "NA" represent data not found.
Nameplate is found on the component but it is partial/completely unreadable.	Nameplate on the component was dirty/corroded/damaged/sunwashed. Section Detail fields with "NA" represent data that was not found.
Nameplate is found on the component that is readable but is missing certain Section Details fields.	Nameplate on the component was missing certain Section Detail fields. Section Detail fields have been populated and fields with "NA" represent data not found.

Comment Front-End Clarification

A front end refers to the bracketed information at the start of an inspection/inventory/section detail comment. The front end must have to following 3 pieces of information: 1) assessor name, 2) assessor company or affiliation, and the date. The BRED™ stamp may also provide the time of inspection which is acceptable.

BRED™/BUILDER™ Clarification

The terms BRED™ and BUILDER™ are used interchangeably throughout this document.

Rule #	Rule
1	Components are divided into sections when a significant variation exists in material/equipment category, age, or construction history, which impacts the life cycle characteristics of the component. Example 1 - If a wing or addition was added to a much older building, the two areas of the building should be sectioned differently because the age and construction history is different. Example 2 – If the building roof has multiple levels of similar materials in different conditions, these levels should be sectioned differently to capture the difference in condition. Example 3 – If the building has more than one of a particular type of component, separate component sections. For example: There is a 5,000 and 10,000 CFM air handler.
2	Multi-wing buildings are always sectioned by wing if the installation date of the wings vary. If a building is an 'E' shape and all wings have the same install date only sectioning by floor is required.
3	Multi-story buildings are always sectioned vertically by floor or level (in the case of a basement or mezzanine).
4	There may be unique instances where sectioning by an area of a building is required. For instance, if a building is split between two companies an installation may request sectioning by company 1 and 2.
5	An on-site discussion must occur at each building among all team members to determine the cardinal direction of the building. All assessors should have North as the same side of the building.
6	An on-site discussion must occur at each building among all team members on how the building should be sectioned. The goal is to avoid one assessor calling it a toilet, one calling it a restroom, and another calling it a bathroom. Standard sectioning naming is important for a consistent data set.
7	The section name should not be repetitive of the component type or material. If the floor is wood, do not have a section name 'WOOD'. Incorporation of the location into the section name is very helpful to be used for follow on assessments. If the wood floor has the section name 'LOBBY', it provides great

Standard Section Names and Format Rules

Use	Standard Section Name
Section by Floor (Business Rule)	FL1 – 1st Floor, FL2 – 2nd Floor, FL3 – 3rd Floor, etc.
Section by Floor (Business Rule)	BASEMENT, MEZZANINE, ATTIC, etc.
Section by Wing (applicable if different construction histories or condition only)	MAIN, WING A, WING B, WING C, ADDITION, etc.
Section by Direction (applicable if different construction histories or condition only)	NORTH, EAST, WEST, SOUTH, etc.
Section by Roof Level (applicable if different construction histories or condition only)	UPPER, LOWER, MAIN, etc.

When an equipment tag is included in the section name it should match exactly what was found in the field. Example: if the boiler ID number is B-1, the section name equipment tag portion should read B-1. If the boiler is tagged B1, the equipment tag portion should read B1. See equipment sectioning for further guidance.

Dashes are not required in the section name other than the instance in regards to equipment ID tags above.

The section name field is always entered in all capital letters.

Sectioning Business Rules - Grouping

The following only applies to each (EA) unit of measure (UOM) components. The 'Complete Component Catalog Breakdown' at the end of the section has a 'Group OK?' column. This has the values of 'Yes', 'No', and 'N/A'.

'Yes' = Grouping is allowed for this component type. A quantity of greater than '1' is acceptable.

'No' = Grouping is not allowed for this component type. The quantity must be '1'.

N/A = Not Applicable. Component type is not an EA UOM or is out of scope.

Group OK? = Yes when Section Details and Inventory Photos are Required.

There are several equipment component types (Unit Heaters, small pumps, etc) that have the following designations in the 'Complete Component Catalog Breakdown': 1) Group OK? = Yes, 2) Section Details? = Yes, and 3) Inventory Photo? = Yes.

In this case, a single section detail and inventory photo representative of the entire section is required. A few more clarifications:

- 1) The location field would be for the entire section (FL1/BAY 1/EXTERIOR) and not specific to a single component.
- 2) A difference in manufacturer does not drive further sectioning. For instance, 2 KW electric unit heaters from multiple manufacturers can be combined into one section. Capacity (2 KW) is the driver for sectioning methodology.
- 3) It is understood that the single section detail field is representative of the entire section. The details should be populated per one component. There is no need to enter multiple details or try to combine multiple manufacturer/model/serial/etc into to a single section detail field.

Group OK? = No

The quantity for these component types must be 1. For equipment (Section Details? = Yes and Inventory Photo? = Yes) the guidance found on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components', 'Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components', and 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components' must be followed.

Sectioning of Components on the Exterior of a Building

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Business Rules

- 1) Components of like type, condition, and install date should be inventoried in a single section. (Ex: B201005, B203001 and B301001 above are all like type, condition, and install date). S/N = 'N/A'
- 2) Components that require multiple sections should indicate cardinal direction for additional sections. (Ex: B201001 - Damage present on south face - S/N = 'SOUTH'. All other 3 sides were same condition - S/N = 'N/A'.
- 3) Components that are only found on a single side of a building should indicate cardinal direction in section name (Ex: B203002 GLAZED DOORS are only found on west face in example above - S/N - 'WEST').

- B20 EXTERIOR ENCLOSURE
 - B2010 EXTERIOR WALLS
 - B201001 EXTERIOR CLOSURE - Pre-Engineered Steel Wall and Panel
 - B201005 EXTERIOR LOUVERS & SCREENS - General
 - SOUTH - B201001 EXTERIOR CLOSURE - Pre-Engineered Steel Wall and Panel
 - B2020 EXTERIOR WINDOWS
 - NORTH-ALUMINUM-4 - B202001 WINDOWS - General
 - SOUTH-ALUMINUM-3 - B202001 WINDOWS - General
 - B2030 EXTERIOR DOORS
 - B203001 SOLID DOORS - Steel
 - WEST - B203002 GLAZED DOORS - General
- B30 ROOFING
 - B3010 ROOF COVERINGS
 - B301001 STEEP SLOPE ROOF SYSTEMS - Formed Metal - Metal Standing Seam
 - B301005 GUTTERS & DOWNSPOUTS - Gutters
 - NORTH - B301005 GUTTERS & DOWNSPOUTS - Downspouts
 - SOUTH - B301005 GUTTERS & DOWNSPOUTS - Downspouts

4) Component types in which there are multiple sections present, and the respective section is only found on a single side of a building, should indicate cardinal direction in the section name (Ex: B301005 GUTTERS DOWNSPOUTS - S/N 'NORTH' and 'SOUTH').

Note: The guidance above is listed in order of application. For example, if the downspouts were all the same condition then #1 would have applied and the section name would have been 'N/A'.

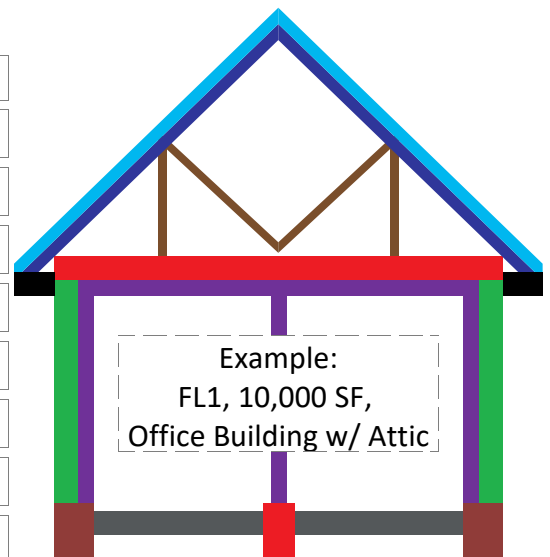
B10 Superstructure is often not visible, which can lead to a variety of different inventory methods. See below for the steps to properly inventory the B10 Superstructure.

Step 1: Consider the size of the building.

Building Square Footage	B1010 Floor Construction	B1020 Roof Construction
1 SF - 1,000 SF	Not Inventoried	Inventory
1,001 SF - 5,000 SF	Assessor Judgment	Inventory
5,000 SF +	Assessor Judgment	Inventory

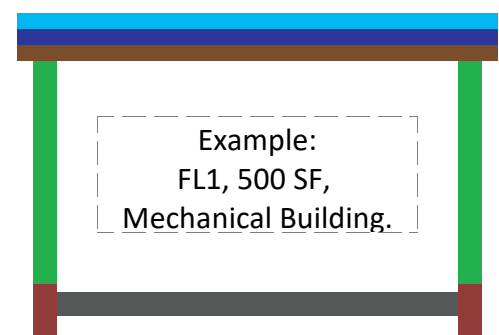
* B1010 captures the structural framing that supports the B1020 (roof) structural framing. B1010 will be present on multiple story buildings and buildings that have a mezzanine or deck area. Note: If there is an attic space, it may be necessary to have a B1010 on a single-story building. While not part of the living area of the building, there is structural support for this area that is not part of the B1020 structural framing.

Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Shingle	N/A
B102003 Roof Decks and Slabs	Wood	N/A
B102001 Roof Construction	General	N/A
B101003 Floor Decks and Slabs	Wood	ATTIC
B201007 Exterior Soffits	General	N/S/E/W
B101001 Floor Construction	General	N/A
B201001 Exterior Enclosure	Siding	N/S/E/W
A103002 Structural SOG	General	N/A
A101001 Wall Foundations	Grade Beams	N/A
A101001 Wall Foundations	Strip Footing	N/A



A10 assets will be hard to inventory as they are not visible. Use drawings or assessor experience on construction type to inventory these assets.

Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Built-Up	N/A
B102003 Roof Decks and Slabs	Concrete	N/A
B102001 Roof Construction	General	N/A
B201001 Exterior Enclosure	Concrete Block	N/S/E/W
A103002 Structural SOG	General	N/A
A101001 Wall Foundations	Strip Footing	N/A

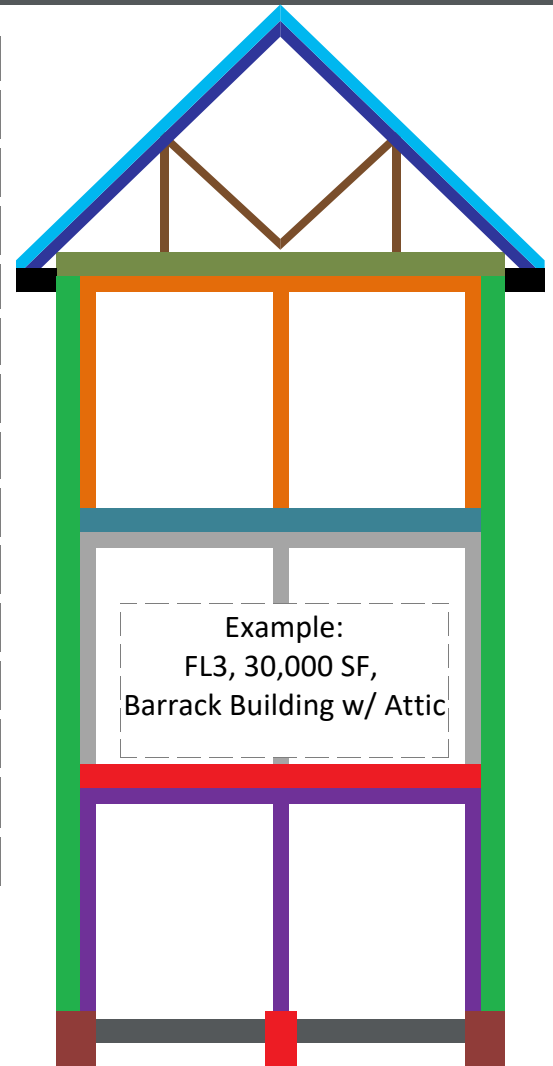


Note: The roof deck overhangs the building. There is no soffit material

Note: B102001 should be included even though structural members are not visible. There is reinforcing (rebar) in the concrete roof deck. A building will always have a B102001 component regardless of size.

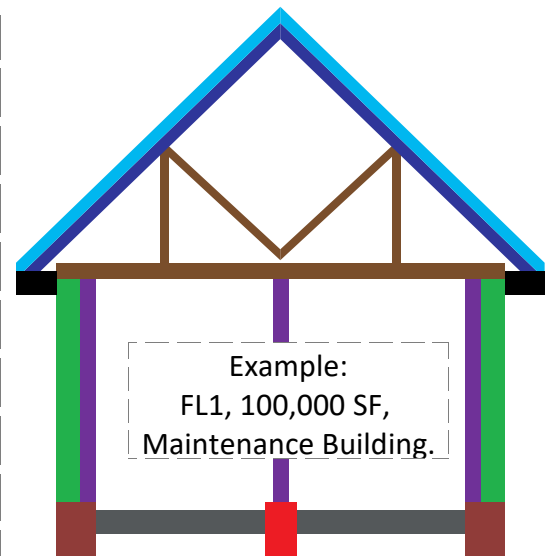
Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Standing Seam	N/A
B102003 Roof Decks and Slabs	Steel	N/A
B102001 Roof Construction	General	N/A
B101003 Floor Decks and Slabs	Concrete	ATTIC
B101001 Floor Construction	General	FL3
B101003 Floor Decks and Slabs	Concrete	FL3
B101001 Floor Construction	General	FL2
B101003 Floor Decks and Slabs	Concrete	FL2
B201007 Exterior Soffits	General	N/S/E/W
B101001 Floor Construction	General	FL1
B201001 Exterior Enclosure	Tilt-Up Panel	N/S/E/W
A103002 Structural SOG	General	N/A
A101001 Wall Foundations	Grade Beams	N/A
A101001 Wall Foundations	Strip Footing	N/A

- 1) B10: Sectioned by floor. B20: Not sectioned by floor.
 2) A10 assets will be hard to inventory as they are not visible. Use drawings or assessor experience on construction type to inventory these assets.



Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Standing Seam	N/A
B102003 Roof Decks and Slabs	Steel	N/A
B102001 Roof Construction	General	N/A
B201007 Exterior Soffits	General	N/A
B101001 Floor Construction	General	N/A
B201001 Exterior Enclosure	Siding	N/S/E/W
A103002 Structural SOG	General	N/A
A101002 Column Foundations	Spread Footing	N/A
A101001 Wall Foundations	Strip Footing	N/A

- 1) Columns will have a column foundation (typically will be found) use 'A101002 - Spread Footing.'



B101001 STRUCTURAL FRAME - General

Typical Application and General Component Guidance:

This component is used to inventory the structural elements of a building that are column/pillars, purlins, beams, and girders that support the roof structure (B102001).



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Floor framing is chosen for multi-story buildings, large decks, mezzanines, or off-grade structures.

If Floor Framing - General is used for a mezzanine, the section name should be 'MEZZANINE'. Do not include the framing for the mezzanine with the framing for the overall building.

It is not necessary to section different types of floor framing unless there is an age or condition difference that requires it. Note: Mezzanines are the exception to this rule; they are sectioned separately.

Lesson Learned

Floor construction above will not be visible in areas with finished ceilings, but may be visible in mechanical/electrical rooms.

Floor framing can be present on a single-story building IF there is no SOG and the building is supported on piles. Also, it can be used for large decks and landings.

Look for crawl or access spaces to view the structural framing. Access these areas per the safety plan.

The ground floor component may be bearing on a structural frame component. An assessor should look for crawlspace vents to indicate the presence of a floor slab on structural framing instead of an A10 slab on grade.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	100	SF

B101002 STRUCTURAL INTERIOR WALLS - General**Typical Application and General Component Guidance:**

This component is included for clarification purposes only.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not inventory interior structural walls under B10. All interior walls should be inventoried under C10 to provide a clear delineation of components for future data usage and assessments.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	100	SF

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

B101003 FLOOR DECKS AND SLABS - Deck - Composite w/Bar Joists**Typical Application and General Component Guidance:**

This component is used to inventory composite with bar joists floor deck and slabs.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Composite w/ Bar Joists should be used to capture concrete on metal pan floor decks and slabs. This should be used regardless of whether joists are present.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Deck - Composite w/Bar Joists	Yes	No	No	No	N/A	100	SF

B101003 FLOOR DECKS AND SLABS - Deck - Composite w/Structural Beam

Typical Application and General Component Guidance:

This component is used to inventory concrete with structural beam floor decks and slabs.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

This is used when there are structural steel beams that are supporting the concrete slab that does NOT have a metal deck.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Deck - Composite w/Structural Beam	Yes	No	No	No	N/A	No	100	SF

B101003 FLOOR DECKS AND SLABS - Deck - Light Gauge Steel

Typical Application and General Component Guidance:

This component is used to inventory metal decks.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

This component is ONLY used when there is not a concrete section above. This is very rarely used for entire floors.

Lesson Learned

This is typically used for grating on mezzanines and maintenance bays. If there is a walkway or area that is grating, then this (and a floor framing) should be added to capture the asset.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Deck - Light Gauge Steel	Yes	No	No	No	N/A	No	100 SF

B101003 FLOOR DECKS AND SLABS - General**Typical Application and General Component Guidance:**

This component is used to inventory the floor decks on multiple-story buildings. Note: The FL1 slab is captured under A10.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

For a concrete slab, the inspector should make a judgment on whether it was CIP or Precast based on visual evidence or building type.

If a building has floor balconies or stairwell slabs, they should be inventoried under 'B101005 BALCONY CONSTRUCTION' and not included in the 'B101003 FLOOR DECKS AND SLABS' quantity.

If a 'MEZZANINE' section for 'Floor Framing - General' is provided, a similar section of 'MEZZANINE' should be provided for B101003 Floor deck and slab.

If the first floor of a building is not SOG and the building is elevated on piles, it should have a 'FL0' B101001 structural framing component and a 'FL1' B101003 floor deck and slab component.

Slab on Grade (SOG) should be inventoried under A1030. DO NOT USE B101003 for SOG.

The assessor should only use 'Other' when none of the other 'in-scope' choices in B101003 are applicable. In this instance, an inventory comment describing the component should be provided.

Lesson Learned

Floor decks will typically match the floor framing quantity.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	SF

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

B101004 INCLINED AND STEPPED FLOORS - Other**Typical Application and General Component Guidance:**

This component is used to inventory the floor construction for theater and auditorium rooms. The photo shows a inclined floor in the front and a stepped floor in the rear.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Used for theater and auditorium type floors.

Lesson Learned

The 'Other' component type should be used, as its UOM is 'SF', which allows for better estimation as opposed to 'General', which has an 'EA' UOM.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Other	Yes	No	Yes	Yes	N/A	No	100	SF

B101005 BALCONY CONSTRUCTION - General**Typical Application and General Component Guidance:**

This component is used to inventory balcony construction. The photograph shows the walkway in front of the door entrances on the 2FL, 3FL, and 4FL floors.

**Business Rules/General/Lessons Learned/Reinspection****General**

This component is primarily used in housing buildings.

This component is to be used to capture structural slabs that are exposed to the elements and that are above grade. Common occurrences of use are balconies located outside of living areas and walkways around barracks.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	100	SF

B101006 RAMPS - General**Typical Application and General Component Guidance:**

This component is used to inventory ramps. This includes American with Disabilities Act (ADA) accessibility ramps as well as vehicle ramps.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Exterior ramps should follow the exterior sectioning methodology. Interior ramps should follow the interior sectioning methodology. All ramps are to be inventoried under 'B101006 RAMPS'.

Ramps follow the sectioning methodology detailed on the "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" page. If there are both interior and exterior ramps they should be sectioned separately.

Ramps should be part of the structural element of a building. For example, if a ramp is connected to the structural SOG that a building sits on, it should be captured. Temporary ramps (not bolted down) should not be captured.

General

This component captures the ramps on the interior and exterior of a building.

This component should be used to capture ADA ramps leading into a building and located within a building. They should be permanently installed.

This component should be used to capture driveway ramps up to loading docks. Any ramp that leads to a building and that is needed for the building to serve its purpose should be captured.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	100	SF

B102001 STRUCTURAL FRAME - General

Typical Application and General Component Guidance:

This component is used to inventory the structural framing that supports the roof deck/covering.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

B1020 ONLY applies to roof construction (some components are similar to B1010.)

Canvas and vinyl window awnings/canopies that typically are attached to buildings for aesthetic or as sunshades are not inventoried. More permanent metal or concrete awnings/canopies are inventoried.

Earthen berms (magazine roofs) are covered under B1020 Roof Construction.

Metal arch barrel structures (Quonset huts) are covered under B1020 Roof Construction. End walls are covered under B2010 Exterior Walls. Note: No B1010 should be inventoried unless there is a column or other structural support member present.

Only large (> 100 SF) overhangs should be added to the inventory. Do not include awnings over windows or doors (< 25 SF).

When inventorying a Quonset hut, do not break the arched portion into part wall and part roof components. It should all be inventoried under B1020, and the quantity should match what is used in B30.

General

An assessor should include overhangs, soffits, and porches in the calculation of the quantity. The quantity is always inventoried in plan view regardless of the pitch of the roof.

Roof construction materials are typically concrete, steel, or wood.

This component captures awnings, beams/girders, joist, rafters, trusses, and purlins that support the roof coverings/decking and roof top equipment.

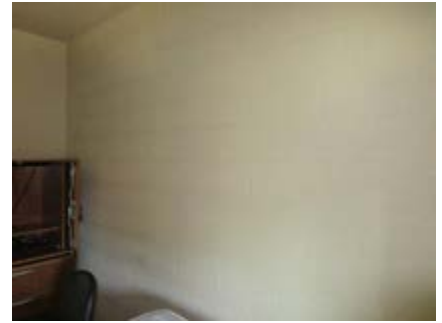
Lesson Learned

Roof construction may be visible in mechanical/electrical rooms where there are no finished ceilings.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	100	SF

B102002 STRUCTURAL INTERIOR WALLS - General**Typical Application and General Component Guidance:**

This component is included for clarification purposes only.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not inventory interior structural walls under B10. All interior walls should be inventoried under C10 to provide a clear delineation of components for future data usage and assessments.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	SF

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

B102003 ROOF DECKS AND SLABS - General**Typical Application and General Component Guidance:**

This component is used to inventory the roof deck. Select the correct type.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not take hips or gables into account when determining the predominate slope of the roof. For complex roofs with multiple slopes, the assessor should make a visual estimate of the average slope.

If a sandwich panel is found, use 'General' component type. This is when the roof, insulation, and decking are one panel. This should be inventoried as both 1) a B102003 roof deck, and 2) B30 roof covering component types. The SF of both should match.

Roof Decks are the only B10 element is inventoried in SLOPE rather than plan.

Square footage adjustment factor %: [(0-2):12] = 0% __ [3:12] = 3% __ [4:12] = 5% __ [5:12] = 8% __ [6:12] = 12% __ [7:12] = 16% __ [8:12] = 20% __ [9:12] = 25% __ [10:12] = 30% __ [11:12] = 36% __ [12:12] = 41%

General

An assessor should include overhangs, soffits, and porches in the calculation of the quantity.

The assessor should only use 'Other' when none of the other 'in-scope' choices in B102003 are applicable.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	SF

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

B102004 CANOPIES - General

Typical Application and General Component Guidance:

This component is used to inventory canopies. A canopy is defined as a roof partially supported by a building that has no exterior walls.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

A typical canopy consists of a structural element (typically column supports A101002), canopies (B102004), roof deck (B1020), and roof covering (B3010). Sectioning these components as 'cardinal direction - canopy' is required.

Canopies follow the sectioning methodology detailed on the "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" page.

If a canopy is connected to two buildings, it should be inventoried under the largest building and have an inventory comment identifying the other building to which it connects.

If a canopy is included with the main building components, an inventory comment should be added to the building components stating how much SF is canopy. This will allow follow-on assessments to understand the approach taken during initial inventory.

General

An assessor should consider whether the canopy has just a roof covering (B3010) or if there is a roof deck (B1020) as well. It is acceptable to include these assets with the main building if they are the same type/age/condition.

This component captures the structural framing of a canopy. This includes the support members above the SOG and the canopy framing.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
General	Yes	No	No	No	N/A	No	20	SF

B101001 STRUCTURAL FRAME

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Beam/Girder	No	No	No	No	N/A	No	100	LF
Beam/Girder - Concrete	No	No	No	No	N/A	No	100	LF
Beam/Girder - Metal	No	No	No	No	N/A	No	100	LF
Beam/Girder - Wood	No	No	No	No	N/A	No	60	LF
Column	No	No	No	No	N/A	No	100	LF
Column - Concrete	No	No	No	No	N/A	No	100	LF
Column - Metal	No	No	No	No	N/A	No	100	LF
Column - Wood	No	No	No	No	N/A	No	60	LF
General	Yes	No	No	No	N/A	No	100	SF
Other	Yes	No	Yes	Yes	N/A	No	100	SF
Truss/Joist	No	No	No	No	N/A	No	100	LF
Truss/Joist - Concrete	No	No	No	No	N/A	No	100	LF
Truss/Joist - Metal	No	No	No	No	N/A	No	100	LF
Truss/Joist - Wood	No	No	No	No	N/A	No	60	LF
Unknown	No	No	No	No	N/A	No	100	SF

B101002 STRUCTURAL INTERIOR WALLS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
CMU	No	No	No	No	N/A	No	100	SF
Concrete	No	No	No	No	N/A	No	100	SF
General	No	No	No	No	N/A	No	100	SF
Other	No	No	No	No	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

B101003 FLOOR DECKS AND SLABS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Deck - Composite w/Bar Joists	Yes	No	No	No	N/A	No	100	SF
Deck - Composite w/Structural Beam	Yes	No	No	No	N/A	No	100	SF
Deck - Light Gauge Steel	Yes	No	No	No	N/A	No	100	SF
Deck - Wood Beam and Joist	Yes	No	No	No	N/A	No	60	SF
General	No	No	No	No	N/A	No	100	SF
Other	Yes	No	Yes	Yes	N/A	No	100	SF
Slab - CIP Concrete	Yes	No	No	No	N/A	No	100	SF
Slab - Precast Concrete	Yes	No	No	No	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

B101004 INCLINED AND STEPPED FLOORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	EA
Other	Yes	No	Yes	Yes	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

B101005 BALCONY CONSTRUCTION

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	100	SF
Other	Yes	No	Yes	Yes	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

B101006 RAMPS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	100	SF
Other	Yes	No	Yes	Yes	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

B10 SUPERSTRUCTURE

B101007 FLOOR RACEWAY SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	100	SF
Other	Yes	No	Yes	Yes	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

B101090 OTHER FLOOR CONSTRUCTION

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	N/A	No	100	SF
Other	No	No	No	No	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

B102001 STRUCTURAL FRAME

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Beam/Girder	No	No	No	No	N/A	No	100	LF
Beam/Girder - Concrete	No	No	No	No	N/A	No	100	LF
Beam/Girder - Metal	No	No	No	No	N/A	No	100	LF
Beam/Girder - Wood	No	No	No	No	N/A	No	60	LF
Column	No	No	No	No	N/A	No	100	LF
Column - Concrete	No	No	No	No	N/A	No	100	LF
Column - Metal	No	No	No	No	N/A	No	100	LF
Column - Wood	No	No	No	No	N/A	No	60	LF
General	Yes	No	No	No	N/A	No	100	SF
Other	Yes	No	Yes	Yes	N/A	No	100	SF
Truss/Joist	No	No	No	No	N/A	No	100	LF
Truss/Joist - Concrete	No	No	No	No	N/A	No	100	LF
Truss/Joist - Metal	No	No	No	No	N/A	No	100	LF
Truss/Joist - Wood	No	No	No	No	N/A	No	60	LF
Unknown	No	No	No	No	N/A	No	100	SF

B102002 STRUCTURAL INTERIOR WALLS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
CMU	No	No	No	No	N/A	No	100	SF
Concrete	No	No	No	No	N/A	No	100	SF
General	No	No	No	No	N/A	No	100	SF
Other	No	No	No	No	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

B102003 ROOF DECKS AND SLABS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
CIP Concrete Beam and Slab	Yes	No	No	No	N/A	No	100	SF
Deck - Fiber Cement	Yes	No	No	No	N/A	No	100	SF
Deck - Fiberglass	Yes	No	No	No	N/A	No	100	SF
Deck - Gypsum	Yes	No	No	No	N/A	No	60	SF
Deck - Other	Yes	No	Yes	Yes	N/A	No	100	SF
Deck - Steel	Yes	No	No	No	N/A	No	100	SF
Deck - Wood	Yes	No	No	No	N/A	No	100	SF
General	No	No	No	No	N/A	No	100	SF
Other	No	No	No	No	N/A	No	100	SF
Slab - CIP Concrete	Yes	No	No	No	N/A	No	100	SF
Slab - PC Concrete	Yes	No	No	No	N/A	No	100	SF
Unknown	No	No	No	No	N/A	No	100	SF

B102004 CANOPIES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF
Other	Yes	No	Yes	Yes	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

B102090 OTHER ROOF CONSTRUCTION

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	N/A	No	60	SF
Other	No	No	No	No	N/A	No	60	SF
Unknown	No	No	No	No	N/A	No	60	SF

Details Req?	If 'Yes', all required section detail fields are to be populated.
Inventory Pic?	If 'Yes', an inventory level photo is to be provided. This is a step back photo showing the component.
Inventory Cmmt?	If 'Yes', an inventory comment is to be populated. This should describe the component.
Group OK?	Only applicable to each (EA) UOM's that are In Scope? = 'Yes'. If 'No' section must be a quantity of 1. If 'Yes' section may have a quantity greater than 1. If 'N/A' it is not applicable to the component type.
Age Based?	If 'Yes', age based (do not provide an inspection) is the desired approach. If 'No' but upon inspection the component is not visible, then an age based approach is acceptable.
Design Life	Design life of the component.
UOM	Unit of measure. If yellow highlight = new component type in 2019 update.



Sustainment Management System

Army BUILDER™ SMS Inventory and Assessment Guide

B20 EXTERIOR ENCLOSURE



**US Army Corps
of Engineers**
Mobile District

ERDC
Engineer Research & Development Center

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B20 EXTERIOR ENCLOSURE

B20

Summary of Changes

Date	Record of Revisions/Additions to SMS Inventory and Assessment Methodology
06/01/2019	Added page "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" to clarify sectioning guidance for exterior components.
06/01/2019	Updated inventory guidance on windows to align with methodology found in "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" page.
06/01/2019	Component type added: 'B202001 WINDOWS - Security Bars/Screen'.
06/01/2019	Added guidance on how to inventory a Stucco exterior finish that has a CMU backup to 'B201001 EXTERIOR CLOSURE - Stucco'.
06/01/2019	Added guidance on how to inventory a EIFS exterior finish that has a CMU backup to 'B201001 EXTERIOR CLOSURE - EIFS'.
06/01/2019	Updated inventory guidance on handrails to clarify when it is assumed that the handrail is part of the C20 stair component.

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Safety The following items should not be interpreted as 1) Safety Plan, 2) OSHA, or base safety requirements. These are recommendations. The contractor should operate in accordance with the SOW and approved safety plan.

Safety is of the utmost concern and should always be at the forefront of any activities taking place in the field. There are many potential safety hazards associated with building assessments. Prior to performing building assessments, the assessing staff/team must ensure that field activities are in accordance with the 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Safety Preparation Activities

Do not perform a task that may harm or endanger the health and safety of oneself or others.

Consult with the installation safety representative to review installation-specific safety requirements.

Conduct a daily “stand-up” safety meeting.

Ensure new assessors have been properly trained.

Review the assessment plan/schedule for the day.

Ensure proper Personal Protective Equipment (PPE) is available. This includes, but is not limited to, a hardhat; hearing protection; eye protection; safety shoes, gloves; and a safety colored vest.

Prior to conducting assessments, the team leader must check with the safety office or building POC to determine if there are any building/site-specific safety rules or hazards. For instance, some manufacturing areas may require steel toe shoes, hearing protection, or eye protection.

Safety Recommendations

Do not walk and write, or talk on a mobile phone, at the same time; this can lead to trips/falls.

Do not review documents or write while walking on steps or stairs.

Do not enter posted or suspected confined spaces such as crawl spaces, tanks, chases, or pits.

Mechanical rooms, attic spaces, or other areas with piping/ductwork may require the use of hard hats to prevent against head bumping hazards. Refer to the project specific safety plan for further clarification.

Do not enter areas with hazardous material signs posted or that appear to contain hazardous materials (asbestos, gases, visible mold, etc.).

Be careful when walking through/across vehicle maintenance or staging areas.

Be aware of loose-fitting clothing and lanyards that may get caught in tight areas or on piping such as in mechanical/electrical rooms, etc.

Be careful of wildlife and insects when walking around a building or opening seldom-entered mechanical/electrical rooms. Assessors may encounter snakes, spiders, stray cats/dogs, rats/mice, etc. in these areas. Do not enter or place hands in spaces that are not completely visible.

If a life safety problem is observed, do not try to fix it. Report it to the proper authority or building manager prior to leaving the building or area.

Before the assessment team leaves a building, ensure all team members are accounted for.

Ladder use should be done in accordance with 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Designate a safety POC to enforce the safety accident prevention plan.

Perform a daily safety briefing before field work. Document the attendees and the topics covered.

Halt outdoor field operations at the sign of lightning or thunder.

Safety Recommendations (continued)

Do not access pitched roofs. They may be assessed from a nearby building or using binoculars.

Use proper techniques to place, secure, and climb ladders. Never climb a ladder while holding anything. Always use the three-point technique for climbing. Equipment should be placed in a backpack or an over-the-shoulder satchel to free hands for climbing.

Do not operate powered equipment, Weight Handling Equipment (WHE)/cranes, or remove access covers from powered equipment to perform assessments.

BUILDER™ assessments are commonly performed without electrical test equipment. Do not use electrical test equipment to test circuits or equipment unless qualified by a local authority. Only open panel box doors or enter electrical/mechanical rooms following proper training. Consult the local safety representative.

Site Preparation

Site Preparation Activities

Coordinate with the base to determine building access requirements, such as: escorts; camera passes; classified/secure area restrictions; or keys.

Locate buildings on a map and develop a schedule. Coordinate with the base to identify the appropriate building manager from the POC list. Notify the building managers of the upcoming assessment as needed.

Obtain a set of mechanical/electrical room master keys from the installation POC.

Extract all BRED™ files from BUILDER™ and have them loaded onto tablets (if using tablets). Verify all tablets are charged.

If multiple buildings are to be assessed by one team, confirm the schedule and plan of action with the team leader. A schedule may have building start times detailed to the hour.

Review the building names for the types/sizes of buildings that will be assessed to determine/confirm the needed tools and safety equipment. For instance, if the facilities are not climate-controlled, prepare accordingly (for cold weather bring hats/gloves).

Recommended Assessor Gear/Tools

Hardhat	Digital Camera with Extra Battery(s)
Hearing Protection	Measuring Tape
Safety Glasses	Laser Measuring Device/Flash Light
Reflective Safety Vest	Measuring Wheel
OSHA Approved Footwear	Backpack
Other Required Personal Protection Equipment (PPE)	Graphite Powder (for stuck locks)
Cell Phone and Team Cell Phone List	Cleaning Pad (to clean/help read nameplates)
Assessment Schedule	Pen/Pencils
Building Floor Plans/Base Map	Clipboard
Small Magnet (for determining door/window type)	Paper/Assessment Forms
Flash Light/Compass	Graph Paper
Sun Screen/Bug Spray	Refillable Water Bottle

Operating efficiently in the field is key to the success of the assessment. The following guidance is detailed by 1) Team Leader and 2) Assessor. **Bold items are drivers for client deliverables.**

Team Leader

Upon arrival, check in with the building manager and QA representative (if present).

Conduct the building manager interview. The entire team should be present for the building manager interview. The following questions should be asked:

Question 1: Are there any mission-related deficiencies in the building?

Question 2: Are there any safety-related deficiencies in the building?

Question 3: Have there been any upgrades or remodels of the building?

Question 4: Are there any building deficiencies (HVAC not working, electrical breakers tripping, maintenance issues, roof leaks, etc.) present?

The team leader (ONLY the team leader!) should populate the building level comment with the following information: 1) Missing systems, 2) Renovation dates, 3) Areas of the building not accessible during the assessment, and 4) If drawings were/were not provided. Below are some examples of building level comments:

Comment 1: No A20, D10, or D40 systems present. 2016: Vault room not accessible. Drawings not provided.

Comment 2: No A20 systems present. Renovated in 2010. 2016: 5% of building not accessible. Drawings provided.

The team leader should review the real property data in BRED™ and compare it to what is found during the assessment. The following should be confirmed: 1) Number of stories, 2) Building square footage, and 3) Building install date and 4) Building number in BRED™ matches the building. Variances between real property data and actual field data should be recorded for inclusion into the client deliverable.

Team Leader and Assessors

Best Practice: Each assessor should first take a photo of the building number to identify the subsequent photos associated with the building when they are downloaded. Take a second picture that captures the overall building view with respect to nearby buildings/streets. This should help refresh/remind the assessor on what the building looks like, while performing data-entry.

A team caucus should occur to discuss the sectioning strategy for the building and confirm which side is facing north.

Each assessor should have a consistent approach to each building. Assessors should move around the building exterior and interior in a clockwise (or counterclockwise) manner making notes and taking photos.

If a safety item is found, notify the team lead. The team lead will notify the building manager. Capture a photo of the safety item for inclusion into the safety log. Follow all other project-specific procedures when a safety item is encountered.

Upon return to the office perform the following steps:

Step 1: Download all photos from the day to a building-specific folder. Review the photos and delete any that are blurry or unreadable.

Step 2: Complete all calculations and counts. Complete all data entry into BRED™.

Data Entry

With the technology that is available today, the need to use forms in the field and do data entry at the office has been mitigated. Tablets can be used to run BRED™ to complete data entry while in the field. It is understood that there are challenges to accomplish this for certain disciplines. It is only mentioned here as a best practice recommendation and is not a requirement to execute the work. There will be instances where electronics will not be allowed in a facility. Assessors should have a paper/pen data collection system ready as a backup.

General

This section presents common Unifomat B20 Exterior Enclosure Inventory Component Sections found across installations as a guide for entering into the BUILDER™ or BRED™ software. Inventory items are arranged by BUILDER™ System with Material/Equipment Category, Component Type, Unit of Measure, and Inventory Notes.

B2010 - Exterior Wall Assembly: Besides providing protection from the environment, an exterior wall may also provide bearing support, shear support, or fire resistance. Structural elements can operate separate from the exterior façade material, or be integrated into the wall assembly. An example of an integrated wall assembly is a load bearing masonry wall.

B2020 - Exterior Windows: Allows daylight, air movement, security, and exterior vision.

B2030 - Exterior Door: Allows for the passage of people or vehicles, and may also serve many of the same purposes as exterior windows.

The exterior enclosure system separates the building interior from the external environment. It keeps environmental elements such as sunlight, moisture, wind, heat/cold, and sound out of the living or work space. The exterior enclosure is supported by the building structural system and may be separate or integrated with the structural system. Exterior Enclosure does not include roofing systems.

Inspection

Exterior enclosure component sections are assessed using Direct Condition Rating (DCR) or Age-Based Modeling. Usually exterior enclosure components will be visible and accessible. When component sections are not visible no assessment is entered. In this case, BUILDER™ will use the inventory year installed and degradation curves built in to the software to establish the Condition Index (CI).

Exterior wall components show slow rates of deterioration initially, but can accelerate with age.

Only assess the exterior skin component. For instance, if the exterior wall has an exterior insulation and finishing system (EIFS), the EIFS is the basis of the DCR inspection on the exterior wall and not the backup system.

Rule of thumb: If you can see it, you should inspect it. There are some caveats to this rule. See component catalog for items that must be age-based whether visible or non-visible.

The following conditions or events can accelerate exterior enclosure component deterioration and should be considered by the assessor: 1) Improper construction or installation, 2) Neglected maintenance, 3) Moisture infiltration, 4) Surface damage, 5) Environmental factors damage such as wind-driven rain and solar (ultraviolet [UV] deterioration).

Inventory

It is critical to confirm the year installed (default will be from real property records), or estimate the year installed. BUILDER™ uses the install date, degradation curves, and assessment observations to establish a CI for each component section. If the assessor suspects the default install date is not accurate, or an addition or renovation has taken place, check the real property record for year renovated or check local as-built or renovation drawings to help estimate the year installed.

Except where specifically noted in this Guide, do not use 'General' where a more specific item is available as a component type selection.

Exterior enclosure components inventoried for buildings are usually visible. When exterior enclosure components are not visible, as-built drawings should be used to identify and quantify the components. If as-built drawings are not available, the assessor may use experience to make an assumption for the exterior enclosure types and quantities based on similar construction, consultation with local staff, and other reputable online resources.

Exterior enclosure components that are integral to the building are typically the same age as building.

If construction drawings or as-builts are available, look for date published to assist with determining age of materials. Custodial drawings can also be a good resource.

Some exterior enclosure components may have been replaced as an individual repair or partial replacement. These areas would have a different age. The real property construction and renovation dates should be confirmed, if they are not appropriate, the age must be estimated. The building occupants or other facilities staff may be able to provide some information.

When a component is concealed/hidden, the inventory comment box is used to indicate the reason for no inspection taking place. Standard comments should be used.

When performing an assessment, the 'PAINTED' box should only be selected for components that have local or field applied paintings/coatings. DO NOT mark 'PAINTED' for manufacturer- or factory-applied coatings as they tend to age consistently with the components.

Photography

General comment: Photos are captured to document the following: 1) Inventory, 2) Condition (deficiency), 3) Historical record of the asset, 4) QC, and 5) Life safety issues.

All components where an 'Other' component type is selected must have a photo attached at the Inventory/Section level. (Required)

Assessors should take a photo of the building number at the start of the building assessment to delineate the start/stop of the photos between buildings. (Best Practice)

Assessors should take photos to allow for quality control (QC) confirmation and data backup. It is a good practice to have a photo of every component type encountered in an assessment. (Best Practice)

Components that have a DCR (component rating only) of A+ or worse should have a photo taken that shows the deficiency identified in the inspection comment. The photo should be attached to the record at the Inspection level. (Required)

Life Safety issues should be photographed for documentation of the safety item and used in safety reports. The photo should be sent to the team lead and all required steps outlined in the safety plan are to be completed. (Required)

Paint DCR does not drive the requirement for a photo to be attached at the inspection level. Example: A component has a DCR of 'G-' and a paint DCR of 'A' would result in no photo attached to the inspection.

See Scope Of Work (SOW) for any photo renaming/deliverable requirements.

The Team Leader is required to take one photo of the front elevation, or a representative elevation view, and attach the photo the building record at the building level. (Required)

Reinspection

All existing quantities for components such as exterior enclosure components and window counts are to be validated to a +/-15% accuracy. This can be accomplished through random sampling.

Assessors must not delete/edit components and sections that are not within their discipline.

BRED™ functions such as 'Copy Building' and 'Copy Section' should not be used unless their ramifications are fully understood. Copy building: The entire building will be copied. Copy section: All items with the same section name will be copied. For example, if a D50 assessor uses copy section on the section name FL1, the assessor may copy/paste interior doors, mechanical equipment, etc. without knowing it. If there is no existing data, these functions are easily used.

Existing data should be deleted if: 1) The component is no longer present, 2) The correct component type exists, 3) There are duplicate components with the same section name, or 4) The component is correct but has the wrong install date (requires deletion and re-entry with correct date).

If a component type in the existing data is no longer in scope, it must be updated to an in-scope item, or deleted if no longer applicable.

Past inspection comments are not required to be revised to current standards.

Section names, component types, and quantities must be verified and updated.

When performing a reinspection it should be understood that modifications in the inventory guidance may have taken place between the previous assessment date and the current effort. The new assessment should update the inventory to the latest inventory guidance. This may require, but is not limited to, combination of quantities (Ex: removing cardinal direction sectioning when it is no longer needed), modifying component type selections, or removing/adding items. The detailed inventory guidance portion of the manual will often provide direction on what steps need to be taken.

Sectioning

The section name for a window component consists of two parts (in this order): 1) Material type (Wood, Steel, Aluminum, Vinyl) and 2) Window opening count. Example: 'ALUMINUM-20'. If there are multiple install dates of the same window type, the section name would include the install year and read such as: 'ALUMINUM-20-1970' and 'ALUMINUM-20-2015'. If there is only one section, there is no need for the date as it is already found in the record.

Additions, new wings, or major renovations require identifying separate exterior enclosure sections with a different age identified in the section name. For instance, two metal panel sections would have the names 'NORTH - 1970' and 'NORTH - 2015'.

All exterior B20 components (enclosure, windows, doors, etc.) are required to be sectioned per guidance found on the 'Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components' page.

Do not section by floor.

It is desired that N/S/E/W be used as the predominate sections even though a building may not sit squarely pointed in one direction. If a team decides to use NE/NW/SE/SW, it is ok as long as all team members follow suit. Verifying cardinal direction should be the first step a team takes when approaching a building.

Once all base sectioning guidelines have been followed, there may be a need to apply a DCR-driven sectioning methodology based on two factors 1) difference in DCR, and 2) quantity of distress. Step 1: Assessors should section a component when there is a 2-step difference in DCR (Ex: G- to A) in accordance with the guidance found in Step 2. If there is only a 1-step difference in DCR, the assessor shall have a single section and the lower of the DCR's should be used. Step 2: When a 2-step difference is found, the assessor should consider the quantity of distress that is present. If the distress is present on 25% or less of the component, a single section with a DCR in-between the high/low DCR shall be added (if G-/A are found then A+ is used). If the distress is present on over 25% of the component, two sections should be added at the high/low DCR. Any component with a 3-step or more difference in DCR should have two sections.

Typical section names include: WING 'X,' NORTH, SOUTH, EAST, WEST, etc.

When sectioning by cardinal direction include all components on the predominant side in the section. For example, if on the north face of the building there is a indent in the building that has a window that is technically facing east it should be included in the north facing quantity. Sectioning by cardinal direction is not as prevalent after the 2019 update.

The most critical part to an assessment is having all assessors aligned on how to perform an assessment. To reach an accurate DCR of a component, follow the steps below:

Step 1: Consider the level of degradation and the performance of the component:

OPERATIONAL CAPABILITY	OPERATIONAL CONDITION RATING	DEGRADATION	DCR
Fully Operational	Green	Free of observable or known degradation.	Green (+)
		Normal wear requiring normal preventative maintenance.	Green
		Normal degradation requiring corrective maintenance.	Green (-)
Impaired Operation	Amber	Minor degradation requiring corrective maintenance.	Amber (+)
		Moderate degradation requiring corrective repair.	Amber
		Significant degradation requiring moderate repair.	Amber (-)
Inoperable	Red	Extensive degradation requiring major repair.	Red (+)
		Severe degradation requiring major rehabilitation or partial replacement.	Red
		Complete degradation requiring full replacement.	Red (-)

Step 2: Consider the maintenance requirements of the component:

Type	Green (G+/G/G-)	Amber (A+/A/A-)	Red (R+/R/R-)
Dynamic (Equipment)	<p>Distresses present are of no impact to the components operation.</p> <p>Example: The fan component is fully operational.</p>	<p>Distresses present are of impact to the components operation. A repair is needed to bring the component back to proper operating condition</p> <p>Example: A fan has corrosion on the housing. A sand and paint would remove the distress.</p>	<p>Distresses present are of impact to the components operation. The component needs to be replaced.</p> <p>Example: A fan motor has overheated and no longer functions. Replacement of the component is required.</p>
Non-Dynamic	<p>The architecture component is in good condition requiring no maintenance outside of normal operations.</p> <p>Example: The carpet component is fully operational.</p>	<p>The architecture component has a distress that requires an extra level of maintenance outside of normal operations. This extra maintenance (or repair) would be an action such as a cleaning or a painting of a surface.</p> <p>Example: A carpet component has stains. A cleaning would remove the distress.</p>	<p>The architecture component has a distress where a maintenance operation will not fix the problem at hand. A replacement of the component is required.</p> <p>Example: A carpet component is damaged (ripped). The component needs to be replaced to fix the distress.</p>

Dynamic: Refers to equipment in the D10, D20, D30, D40, D50, and E10 systems.

Non-Dynamic: Refers to architectural components in the A10, A20, B10, B20, B30, C10, C20, and C30 systems.

Note: There are some Non-Dynamic components (for instance, toilets under D20) in the Dynamic systems.

Step 3: Adhere to the following requirements:

Requirements
Maintainability and obsolescence should not be the driving factor when conducting a condition assessment unless it has led to actual deterioration of condition that can be observed or reasonably inferred.
G+ ratings should only be given to inventory that is in pristine condition and is free of any observable defects.
Do not downgrade an assessment rating simply because an item is dirty.
Do not downgrade an assessment rating because the item does not meet current code compliance standards
Do not downgrade an assessment rating because the item is not deemed energy efficient.
Do not downgrade an assessment rating because the item is deemed to be a safety violation/hazard unless otherwise directed.
Do not downgrade an assessment rating because of a code violation.
Ratings should not be anticipated based on planned repairs or replacement.
Assessors should not expend field time and effort to determine the cause of a deficiency. If the cause is easily identified it should be included in the inspection comment.
Ratings shall be based upon the observable and documentable condition of the component.
A component should be downgraded if its operational capability, performance, reliability, etc. is compromised according to the direct rating definitions.
Incorporate user interviews, work order histories, or other information sources when determining the condition of the component. Include this information in the inspection comment.

The assessor should calibrate their mindset on what the expected DCR should be based on condition.
 The assessor should consider the maintenance requirements of the component in the current condition.
 The assessor should factor in the requirements/business rules for completing an inspection.

One factor that can play into an assessment is if the assessor receives information from a POC that results in a lower rating. For instance, an assessment takes place in July and there is a heating water pump that looks brand new, but has a blown motor. The assessor would assume the pump is supposed to be off due to being off season, but if the POC informs the assessor about the blown motor, this can be factored into the assessment (and indicated in the inspection comment).

One factor that should not play into an assessment is pending replacements of components. Assessors should rate components in the condition they are at the time of assessment. If the carpet is being replaced next month, that should not factor into a rating. Now, if the carpet contractor is on site (the work is currently taking place), this could be factored into the rating and a G+ rating provided with the current date of inspection chosen as the install date.

Service Life: No distresses present and component is nearing (or past) its service life.

The following comment can be used as an inspection comment for components that have no signs of distresses, are rated either Amber (A) or Amber Plus (A+), and are over 75% through their service life. This negates the need to have 4 parts of an inspection comment. Also, an inspection photo is no longer required.

[First Last-AE-Date] - The component is in proper working condition and is showing no signs of distress. The DCR was based on estimated remaining service life.

Step 1: Understand the 5 parts of the inspection comment:

Part #	Part Type	Type Description
1	Front End	[First Last-AE-Date] OR [First Last-DPW-Date] (ex: [John Doe-AE-7/4/2017])
2	Distress	Identifies the distress of the component
3	Severity	Identifies the amount of the distress.
4	Location	Identifies the location of the distress
5	Quantity	Identifies the quantity of the distress

Step 2: Use the DCR of the component as the basis for the severity.

DCR	Severity
Amber (+)	Minor/Mild
Amber	Moderate
Amber (-)	Significant/Major
Red (+)	Extensive
Red	Severe
Red (-)	Complete/Total

To aid in the inspection comments reading correctly the severity can be modified slightly. For instance, 'moderately' can be used for an 'A' DCR comment. This approach also applies to the distresses where one of the 23 MUST be selected. If 'Cracked' is selected as the distress, the wording 'cracks' may be used.

Step 3: Identify the distress of the component:

23 Distresses			
Blistered	Displaced	Overheated	Capability/Capacity Deficient
Broken	Efflorescent	Patched	Animal/Insect Damaged
Clogged	Holes	Rotten	Moisture/Debris Contaminated
Corroded	Leaks	Stained/Dirty	Noise/Vibration Excessive
Damaged	Loose	Cracked	Operationally Impaired
Deteriorated	Missing		Electrical Ground Inadequate or Unintentional

Step 4: Location and Quantity

Location on non-dynamic assets - 'lobby area' or 'northwest corner'.

Quantity on a SF UOM will typically be a %. On an EA UOM will typically be a count.

Step 5: Put all 5 components together to form an inspection comment (colors correspond to part):

A+	Front End	CRACKED.	The	walls have	minor	cracks	present on	10% of the	gym.
A	Front End	DETERIORATION.	The	carpet has	moderate	deterioration	over	50 %	of the lobby.
A-	Front End	DAMAGED.	The	door has	significant	damage	to the	lower half	of the door.
R+	Front End	CRACKED.	The	windows have	extensive	cracks	present in	4	panes.
R	Front End	LEAKS.	The	roof has	severe	leaking	around the	HVAC	penetrations.
R-	Front End	OPERATIONALLY IMPAIRED.	The	3	north	doors are	completely	operationally impaired.	

Inspection Comments

Rule #	Rule
1	Required on all inspections with a DCR of A+ and below.
2	Paint DCRs do not have an inspection comment requirement. Only the component DCR A+ and below.
3	Should include any component specific information obtained from the base or POC interview.
4	Should be in complete sentences and use industry standard terminology. Comments can be typed into MS Word for spelling/grammar checks and then pasted into the comments box.
5	Do not use all capital letters for the entire comment. The distress should be all capital letters.
6	Do not use abbreviations, jargon, or slang.
7	Should give enough information for a follow-on assessor to locate the problem area/equipment.
8	Should accurately describe the problem/observation that is the basis for the rating. Someone unfamiliar with the particular item should have an accurate picture of the components current condition and the justification for the assigned rating.
9	Should accurately describe the location of the distress if the component is only showing a distress in a single location. For instance, if an office has a stain in the carpet, it would be necessary to call out the room number of the office.
10	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. For instance, assessor John Doe at firm AE: [John Doe-AE-7/4/2017].
11	After #10 front end information in the brackets one of the 23 distresses should be provided in capitalized form. Building on #10 for an example if stained carpet: [John Doe-AE-7/4/2017] - STAINED.
12	After #10 and #11 a sentence should be provided that provides the distress, severity, location, and quantity. Quantity/Location refers to the amount/location of the distress present.

Inventory Comments

Rule #	Rule
1	Used to identify components that were not visible for inspection. See standard comments.
2	Used as a bread crumb for follow-on inspections. Can provide useful additional information such as location or type to help the next assessor understand what was being inventoried. Ex: This component is the stone wall located behind the receptionist in the lobby area.
3	Should describe the component inventoried where 'OTHER' is used to allow follow-on assessments to understand what was inventoried in the previous assessment.
4	Used to provide the location of the component (especially used for architecture components where there are no Section Details provided that have a location): Roof, NW Corner, Room Number
5	Do not use all capital letters, abbreviations, jargon, or slang.
6	Used to further describe an asset if it is not adequately described in the component type selection.
7	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Section Detail Comments

Rule #	Rule
1	Used to identify data that was not able to be populated in the Details fields. See standard comments.
2	Used to provide information that is specific to just that component section detail field. This can be a location of the specific section or something that the section services.
4	Do not use all capital letters, abbreviations, jargon, or slang.
5	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Standard Inventory Comments

When	Use Standard Comment
Assets are not visible for inspection.	Component was not visible for inspection. The component condition will be age-based by BUILDER program degradation curves.
Assets are not visible for inspection that also require Section Details to be populated.	The component is not visible for inspection or population of Section Details. The component condition will be age-based by BUILDER program degradation curves and no nameplate data or inventory photo will be provided.
Assets are not visible for inspection that require quantities to be assumed. Hidden mechanical equipment, ductwork, and # of control points are common occurrences.	The component is not visible for inspection and the quantity was estimated based on architect/engineering judgment. The component condition will be age-based by BUILDER program degradation curves.
Assets are located in an area where no electronics area allowed. This prevents an assessor from taking inventory/inspection photos.	The component is located in a secure area of the facility that did not allow electronic devices to be used. Photos were not obtainable.
Assets are visible for inspection but are a system that is not tested (HVAC controls, security system, etc.) so an age-based BUILDER™ CI is desired.	The component condition will be age-based by BUILDER program degradation curves.

Standard Section Detail Comments

When	Use Standard Comment
Nameplate is not found on the component.	Nameplate not found on the component. All fields with "NA" represent data not found.
Nameplate is found on the component but it is partial/completely unreadable.	Nameplate on the component was dirty/corroded/damaged/sunwashed. Section Detail fields with "NA" represent data that was not found.
Nameplate is found on the component that is readable but is missing certain Section Details fields.	Nameplate on the component was missing certain Section Detail fields. Section Detail fields have been populated and fields with "NA" represent data not found.

Comment Front-End Clarification

A front end refers to the bracketed information at the start of an inspection/inventory/section detail comment. The front end must have to following 3 pieces of information: 1) assessor name, 2) assessor company or affiliation, and the date. The BRED™ stamp may also provide the time of inspection which is acceptable.

BRED™/BUILDER™ Clarification

The terms BRED™ and BUILDER™ are used interchangeably throughout this document.

Rule #	Rule
1	Components are divided into sections when a significant variation exists in material/equipment category, age, or construction history, which impacts the life cycle characteristics of the component. Example 1 - If a wing or addition was added to a much older building, the two areas of the building should be sectioned differently because the age and construction history is different. Example 2 – If the building roof has multiple levels of similar materials in different conditions, these levels should be sectioned differently to capture the difference in condition. Example 3 – If the building has more than one of a particular type of component, separate component sections. For example: There is a 5,000 and 10,000 CFM air handler.
2	Multi-wing buildings are always sectioned by wing if the installation date of the wings vary. If a building is an 'E' shape and all wings have the same install date only sectioning by floor is required.
3	Multi-story buildings are always sectioned vertically by floor or level (in the case of a basement or mezzanine).
4	There may be unique instances where sectioning by an area of a building is required. For instance, if a building is split between two companies an installation may request sectioning by company 1 and 2.
5	An on-site discussion must occur at each building among all team members to determine the cardinal direction of the building. All assessors should have North as the same side of the building.
6	An on-site discussion must occur at each building among all team members on how the building should be sectioned. The goal is to avoid one assessor calling it a toilet, one calling it a restroom, and another calling it a bathroom. Standard sectioning naming is important for a consistent data set.
7	The section name should not be repetitive of the component type or material. If the floor is wood, do not have a section name 'WOOD'. Incorporation of the location into the section name is very helpful to be used for follow on assessments. If the wood floor has the section name 'LOBBY', it provides great

Standard Section Names and Format Rules

Use	Standard Section Name
Section by Floor (Business Rule)	FL1 – 1st Floor, FL2 – 2nd Floor, FL3 – 3rd Floor, etc.
Section by Floor (Business Rule)	BASEMENT, MEZZANINE, ATTIC, etc.
Section by Wing (applicable if different construction histories or condition only)	MAIN, WING A, WING B, WING C, ADDITION, etc.
Section by Direction (applicable if different construction histories or condition only)	NORTH, EAST, WEST, SOUTH, etc.
Section by Roof Level (applicable if different construction histories or condition only)	UPPER, LOWER, MAIN, etc.

When an equipment tag is included in the section name it should match exactly what was found in the field. Example: if the boiler ID number is B-1, the section name equipment tag portion should read B-1. If the boiler is tagged B1, the equipment tag portion should read B1. See equipment sectioning for further guidance.

Dashes are not required in the section name other than the instance in regards to equipment ID tags above.

The section name field is always entered in all capital letters.

Sectioning Business Rules - Grouping

The following only applies to each (EA) unit of measure (UOM) components. The 'Complete Component Catalog Breakdown' at the end of the section has a 'Group OK?' column. This has the values of 'Yes', 'No', and 'N/A'.

'Yes' = Grouping is allowed for this component type. A quantity of greater than '1' is acceptable.

'No' = Grouping is not allowed for this component type. The quantity must be '1'.

N/A = Not Applicable. Component type is not an EA UOM or is out of scope.

Group OK? = Yes when Section Details and Inventory Photos are Required.

There are several equipment component types (Unit Heaters, small pumps, etc) that have the following designations in the 'Complete Component Catalog Breakdown': 1) Group OK? = Yes, 2) Section Details? = Yes, and 3) Inventory Photo? = Yes.

In this case, a single section detail and inventory photo representative of the entire section is required. A few more clarifications:

- 1) The location field would be for the entire section (FL1/BAY 1/EXTERIOR) and not specific to a single component.
- 2) A difference in manufacturer does not drive further sectioning. For instance, 2 KW electric unit heaters from multiple manufacturers can be combined into one section. Capacity (2 KW) is the driver for sectioning methodology.
- 3) It is understood that the single section detail field is representative of the entire section. The details should be populated per one component. There is no need to enter multiple details or try to combine multiple manufacturer/model/serial/etc into to a single section detail field.

Group OK? = No

The quantity for these component types must be 1. For equipment (Section Details? = Yes and Inventory Photo? = Yes) the guidance found on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components', 'Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components', and 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components' must be followed.

Sectioning of Components on the Exterior of a Building



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Business Rules

- 1) Components of like type, condition, and install date should be inventoried in a single section. (Ex: B201005, B203001 and B301001 above are all like type, condition, and install date). S/N = 'N/A'
- 2) Components that require multiple sections should indicate cardinal direction for additional sections. (Ex: B201001 - Damage present on south face - S/N = 'SOUTH'. All other 3 sides were same condition - S/N = 'N/A'.
- 3) Components that are only found on a single side of a building should indicate cardinal direction in section name (Ex: B203002 GLAZED DOORS are only found on west face in example above - S/N - 'WEST').

- B20 EXTERIOR ENCLOSURE
 - B2010 EXTERIOR WALLS
 - B201001 EXTERIOR CLOSURE - Pre-Engineered Steel Wall and Panel
 - B201005 EXTERIOR LOUVERS & SCREENS - General
 - SOUTH - B201001 EXTERIOR CLOSURE - Pre-Engineered Steel Wall and Panel
 - B2020 EXTERIOR WINDOWS
 - NORTH-ALUMINUM-4 - B202001 WINDOWS - General
 - SOUTH-ALUMINUM-3 - B202001 WINDOWS - General
 - B2030 EXTERIOR DOORS
 - B203001 SOLID DOORS - Steel
 - WEST - B203002 GLAZED DOORS - General
- B30 ROOFING
 - B3010 ROOF COVERINGS
 - B301001 STEEP SLOPE ROOF SYSTEMS - Formed Metal - Metal Standing Seam
 - B301005 GUTTERS & DOWNSPOUTS - Gutters
 - NORTH - B301005 GUTTERS & DOWNSPOUTS - Downspouts
 - SOUTH - B301005 GUTTERS & DOWNSPOUTS - Downspouts

4) Component types in which there are multiple sections present, and the respective section is only found on a single side of a building, should indicate cardinal direction in the section name (Ex: B301005 GUTTERS DOWNSPOUTS - S/N 'NORTH' and 'SOUTH').

Note: The guidance above is listed in order of application. For example, if the downspouts were all the same condition then #1 would have applied and the section name would have been 'N/A'.

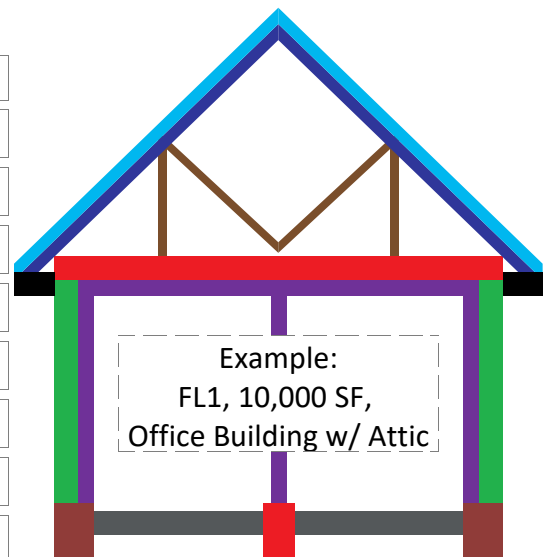
B10 Superstructure is often not visible, which can lead to a variety of different inventory methods. See below for the steps to properly inventory the B10 Superstructure.

Step 1: Consider the size of the building.

Building Square Footage	B1010 Floor Construction	B1020 Roof Construction
1 SF - 1,000 SF	Not Inventoried	Inventory
1,001 SF - 5,000 SF	Assessor Judgment	Inventory
5,000 SF +	Assessor Judgment	Inventory

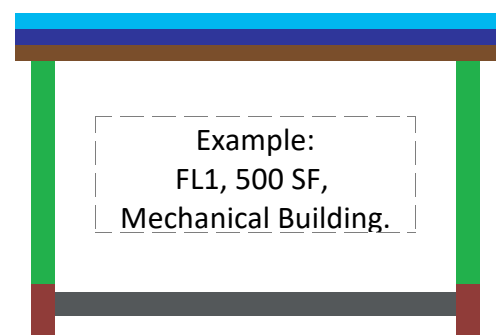
* B1010 captures the structural framing that supports the B1020 (roof) structural framing. B1010 will be present on multiple story buildings and buildings that have a mezzanine or deck area. Note: If there is an attic space, it may be necessary to have a B1010 on a single-story building. While not part of the living area of the building, there is structural support for this area that is not part of the B1020 structural framing.

Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Shingle	N/A
B102003 Roof Decks and Slabs	Wood	N/A
B102001 Roof Construction	General	N/A
B101003 Floor Decks and Slabs	Wood	ATTIC
B201007 Exterior Soffits	General	N/S/E/W
B101001 Floor Construction	General	N/A
B201001 Exterior Enclosure	Siding	N/S/E/W
A103002 Structural SOG	General	N/A
A101001 Wall Foundations	Grade Beams	N/A
A101001 Wall Foundations	Strip Footing	N/A



A10 assets will be hard to inventory as they are not visible. Use drawings or assessor experience on construction type to inventory these assets.

Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Built-Up	N/A
B102003 Roof Decks and Slabs	Concrete	N/A
B102001 Roof Construction	General	N/A
B201001 Exterior Enclosure	Concrete Block	N/S/E/W
A103002 Structural SOG	General	N/A
A101001 Wall Foundations	Strip Footing	N/A

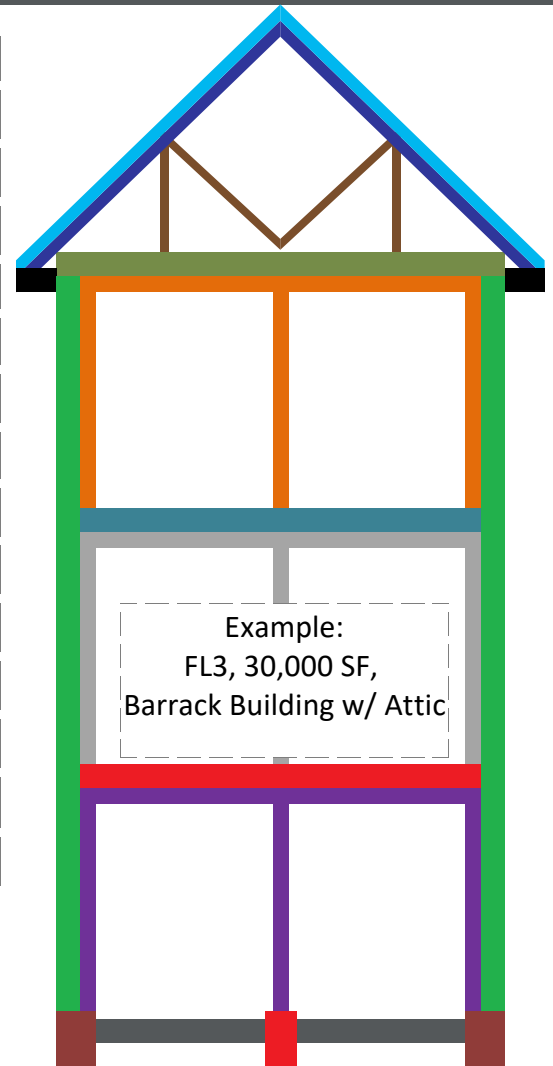


Note: The roof deck overhangs the building. There is no soffit material

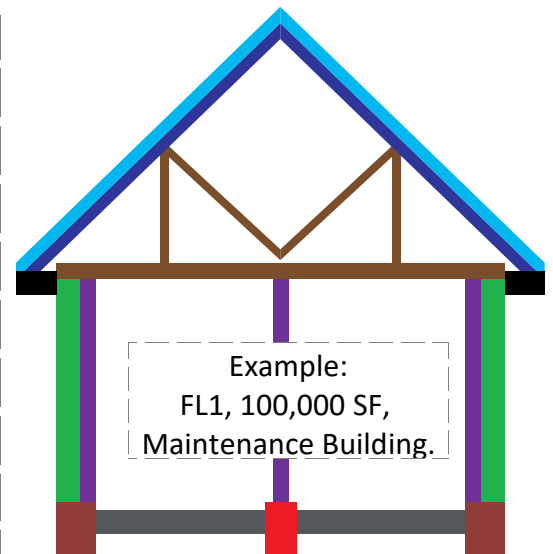
Note: B102001 should be included even though structural members are not visible. There is reinforcing (rebar) in the concrete roof deck. A building will always have a B102001 component regardless of size.

Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Standing Seam	N/A
B102003 Roof Decks and Slabs	Steel	N/A
B102001 Roof Construction	General	N/A
B101003 Floor Decks and Slabs	Concrete	ATTIC
B101001 Floor Construction	General	FL3
B101003 Floor Decks and Slabs	Concrete	FL3
B101001 Floor Construction	General	FL2
B101003 Floor Decks and Slabs	Concrete	FL2
B201007 Exterior Soffits	General	N/S/E/W
B101001 Floor Construction	General	FL1
B201001 Exterior Enclosure	Tilt-Up Panel	N/S/E/W
A103002 Structural SOG	General	N/A
A101001 Wall Foundations	Grade Beams	N/A
A101001 Wall Foundations	Strip Footing	N/A

- 1) B10: Sectioned by floor. B20: Not sectioned by floor.
 2) A10 assets will be hard to inventory as they are not visible. Use drawings or assessor experience on construction type to inventory these assets.



Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Standing Seam	N/A
B102003 Roof Decks and Slabs	Steel	N/A
B102001 Roof Construction	General	N/A
B201007 Exterior Soffits	General	N/A
B101001 Floor Construction	General	N/A
B201001 Exterior Enclosure	Siding	N/S/E/W
A103002 Structural SOG	General	N/A
A101002 Column Foundations	Spread Footing	N/A
A101001 Wall Foundations	Strip Footing	N/A



- 1) Columns will have a column foundation (typically will be found) use 'A101002 - Spread Footing.'

B20 EXTERIOR ENCLOSURE - B2010 EXTERIOR WALLS

B201001 EXTERIOR CLOSURE - Brick Veneer w/CMU Backup**Typical Application and General Component Guidance:**

This component is used to inventory brick veneer exterior walls that have a Concrete Masonry Unit (CMU) backup.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Brick Veneer w/CMU Backup	Yes	No	No	No	N/A	No	75	SF

B201001 EXTERIOR CLOSURE - CIP Concrete**Typical Application and General Component Guidance:**

This component is used to inventory Cast-In-Place (CIP) concrete walls.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
CIP Concrete	Yes	No	No	No	N/A	No	75	SF

B201001 EXTERIOR CLOSURE - Concrete Block**Typical Application and General Component Guidance:**

This component is used to inventory concrete block/CMU exterior walls.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Concrete Block	Yes	No	No	No	N/A	No	75	SF

B201001 EXTERIOR CLOSURE - E.I.F.S.**Typical Application and General Component Guidance:**

This component is used to inventory Exterior Insulation Finish System (EIFS) walls.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

When a CMU backup is found the assessor should add 'B201001 EXTERIOR CLOSURE - Concrete Block' with a quantity to match that of the EIFS component. Section name should be 'INTERIOR BACKING'

General

EIFS is often found with CMU backup on older facilities. In this case the replacement cost of the CMU backup is not included in the Stucco component type (the cost is for Stucco with stud backup).

Lesson Learned

Further clarification: EIFS will usually make a hollow sound as it is typically a 2-inch-thick foam-backed sandwich panel. Stucco will usually make a more solid sound as it is typically applied to a solid substrate/wall or lath.

There can often be confusion between EIFS and Stucco wall systems since they can look the same.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
E.I.F.S.	Yes	No	No	No	N/A	No	50	SF

B20 EXTERIOR ENCLOSURE - B2010 EXTERIOR WALLS

B201001 EXTERIOR CLOSURE - General**Typical Application and General Component Guidance:**

This component is used to inventory the exterior enclosure of a building. Select the correct component type.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Exterior walls of a multi-story building with the same construction history are inventoried/assessed as one section. There are exceptions when inventorying exterior walls where both the exterior fascia and interior backup are inventoried separately. This is limited to EIFS and Stucco finishes that have CMU backup.

Lesson Learned

Assessors should pay close attention to the condition of the caulking when performing their assessment. It may be necessary to degrade the asset to an A+ or lower and note that the failure of the caulk material is the driving factor for the DCR.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	30	SF

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

B201001 EXTERIOR CLOSURE - Glass Block**Typical Application and General Component Guidance:**

This component is used to inventory exterior glass block walls.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Glass Block	Yes	No	No	No	N/A	No	50	SF

B20 EXTERIOR ENCLOSURE - B2010 EXTERIOR WALLS

B201001 EXTERIOR CLOSURE - Masonite**Typical Application and General Component Guidance:**

This component is used to inventory masonite exterior walls.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Masonite	Yes	No	No	No	N/A	No	75	SF

B201001 EXTERIOR CLOSURE - Metal Panel**Typical Application and General Component Guidance:**

This component is used to inventory metal panel exterior walls.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

This component is a metal exterior finish that is not part of a pre-engineered system.

Lesson Learned

If the building is a pre-engineered structure, then use 'Pre-Engineered Steel Wall and Panel' instead of 'Metal Panel'.

'Metal Panel' should not be confused with 'Metal Siding' or 'Pre-Engineered Steel Wall and Panel.' Different types include flat panel, corrugated panel, and formed panel. This component will be affixed to the exterior enclosure as a veneer finish.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Metal Panel	Yes	No	No	No	N/A	No	30	SF

B201001 EXTERIOR CLOSURE - Metal Siding

Typical Application and General Component Guidance:

This component is used to inventory metal siding.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

This is used for horizontal housing-type exterior finish. This will commonly be aluminum.

Lesson Learned

'Pre-Engineered Steel Wall and Panel' should not be confused with 'Metal Siding' or 'Metal Panel.'

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Metal Siding	Yes	No	No	No	N/A	No	30	SF

B201001 EXTERIOR CLOSURE - Precast Concrete Panel (Ribbed)

Typical Application and General Component Guidance:

This component is used to inventory precast ribbed concrete panels.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Precast Concrete Panel (Ribbed)	Yes	No	No	No	N/A	No	75	SF

B201001 EXTERIOR CLOSURE - Precast Concrete Panel (Tilt Up)

Typical Application and General Component Guidance:

This component is used to inventory tilt up concrete precast panels.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Precast Concrete Panel (Tilt Up)	Yes	No	No	No	N/A	No	75	SF

B201001 EXTERIOR CLOSURE - Pre-Engineered Steel Wall and Panel

Typical Application and General Component Guidance:

This component is used to inventory pre-engineered steel walls and exterior panels on pre-engineered metal buildings.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Used to capture exterior walls on pre-engineered metal buildings. This component is limited to just this application. There are 'Metal Siding' and 'Metal Panel' components available for other metal panel enclosure types.

Lesson Learned

'Pre-Engineered Steel Wall and Panel' should not be confused with 'Metal Siding' or 'Metal Panel.'

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Pre-Engineered Steel Wall and Panel	Yes	No	No	No	N/A	60	SF

B201001 EXTERIOR CLOSURE - Solid Brick - Double Wythe

Typical Application and General Component Guidance:

This component is used to inventory double wythe brick walls.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Many historic buildings are solid brick built up to triple wythe. Some buildings have brick veneer over brick. In both cases they should be inventoried as solid brick - double wythe.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Solid Brick - Double Wythe	Yes	No	No	No	N/A	75	SF

B201001 EXTERIOR CLOSURE - Stone

Typical Application and General Component Guidance:

This component is used to inventory solid stone exterior walls. Note: There is also 'Stone Veneer w/CMU Backup' and 'Stone Veneer w/Stud Backup.' Use the correct component type.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Stone	Yes	No	No	No	N/A	No	75	SF

B201001 EXTERIOR CLOSURE - Stone Veneer w/CMU Backup

Typical Application and General Component Guidance:

This component is used to inventory stone veneer exterior walls that have a CMU backup.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Stone Veneer w/CMU Backup	Yes	No	No	No	N/A	No	75	SF

B201001 EXTERIOR CLOSURE - Stucco

Typical Application and General Component Guidance:

This component is used to inventory stucco exterior walls.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

When a CMU backup is found, the assessor should add 'B201001 EXTERIOR CLOSURE - Concrete Block' with a quantity to match that of the Stucco component. Section name should be 'INTERIOR BACKING'.

Lesson Learned

Stucco is often found with CMU backup on older facilities. In this case the replacement cost of the CMU backup is not included in the Stucco component type (the cost is for Stucco with stud backup).

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Stucco	Yes	No	No	No	N/A	No	40	SF

B201001 EXTERIOR CLOSURE - Wall Louver

Typical Application and General Component Guidance:

This component is included for clarification purposes only.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

'B201005 EXTERIOR LOUVERS & SCREENS' is the correct component type to inventory louvers. Do not use B102001 Exterior Closure - Wall Louver.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Wall Louver	No	No	No	No	N/A	No	30	SF

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

B201001 EXTERIOR CLOSURE - Wood Cladding w/Stud Backup

Typical Application and General Component Guidance:

This component is used to inventory wood clad exterior walls with stud backup.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Wood Cladding w/Stud Backup	Yes	No	No	No	N/A	No	40	SF

B201004 PARAPETS - General**Typical Application and General Component Guidance:**

This component is included for clarification purposes only.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Parapets should not be used. The quantity of the parapet component should be included in the B201001 exterior enclosure component quantity.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	LF

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

B201005 EXTERIOR LOUVERS & SCREENS - General**Typical Application and General Component Guidance:**

This component is used to inventory wall louvers.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

'B201005 EXTERIOR LOUVERS & SCREENS' is the correct component type to inventory louvers. Do not use B102001 Exterior Closure - Wall Louver.

Do not inventory small brick vents and pipe penetrations.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF

B201006 BALCONY WALLS & HANDRAILS - Handrailing

Typical Application and General Component Guidance:

This component is used to inventory exterior handrail and guardrail components.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Handrails and guardrails follow the sectioning methodology detailed on the "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" page.

Handrails that are of different material and affixed to a stair component should be inventoried. The most common application of this rule is concrete stairs that have metal handrails. The metal handrails will often be in worse condition than the steps.

Handrails that are of like-kind material and affixed to a stair component should not be inventoried. The most common application of this rule is metal stairs in which the handrails are also metal and are integral to the component.

Only inventory if the LF value of handrails for the section is greater than 10'.

Only inventory if the railing is a stand-alone component that is not integrated into another component. Example: A balcony with a 4' handrail to protect against falls would be inventoried. A single rail on top of a half wall would not be inventoried.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Handrailing	Yes	No	No	No	N/A	No	15	LF

B201006 BALCONY WALLS & HANDRAILS - Ladder

Typical Application and General Component Guidance:

This component is used to inventory exterior ladders.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Ladders follow the sectioning methodology detailed on the "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" page.

General

There is an interior ladder component type, so interior ladders should not be captured in this quantity.

Lesson Learned

Exterior ladders should be tested for structural integrity before being used. If the ladder is loose, do not use and report the safety deficiency to the building manager.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Ladder	Yes	No	No	No	N/A	No	15	LF

B201007 EXTERIOR SOFFITS - General

Typical Application and General Component Guidance:

This component is used to inventory soffits. A general description of a soffit is a ceiling-type application that is used on the exterior of a building.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

In facilities where multiple material types are used for soffits, they should be sectioned by material type such as 'WOOD', 'METAL', or 'CONCRETE.'

Soffits follow the sectioning methodology detailed on the "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" page.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF

B20 EXTERIOR ENCLOSURE - B2010 EXTERIOR WALLS

B201011 SUN CONTROL DEVICES - General**Typical Application and General Component Guidance:**

This component is used to inventory sun-control devices.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not inventory if the sum of the SF of all of the shade devices is less than 100 SF.

The sunshade device must be attached to the building. If it is a surface-mounted type canopy, do not inventory.

Lesson Learned

Will be typically found on barracks and dining facility type buildings.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF

B201090 OTHER EXTERIOR WALLS - General**Typical Application and General Component Guidance:**

This component is used to inventory other types of exterior walls. The most common type is fencing that is part of the building structure. The photo shows a mechanical yard enclosure.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Components inventoried under this component type follow the sectioning methodology detailed on the "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" page.

If fencing is permanently attached to the building, it should be captured. The most common occurrence is mechanical yards. The section name 'FENCING' should be used.

If the fencing is installed as the ceiling of a mechanical enclosure, capture it with the wall section. There is no component type for exterior ceilings, and the walls/ceiling fencing will degrade at the same rate.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	N/A	No	40	SF

B202001 WINDOWS - Aluminum Windows

Typical Application and General Component Guidance:

This component is included for clarification purposes only.



Business Rules/General/Lessons Learned/Reinspection

General

Included for reference purposes only. Out of scope. All business rules stated in B202001 WINDOWS - General are to be followed.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Aluminum Windows	No	No	No	No	N/A	35	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

B202001 WINDOWS - Exterior Glazing

Typical Application and General Component Guidance:

This component is included for clarification purposes only.



Business Rules/General/Lessons Learned/Reinspection

General

Included for reference purposes only. Out of scope. All business rules stated in B202001 WINDOWS - General are to be followed.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Exterior Glazing	No	No	No	No	N/A	50	SF

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

B202001 WINDOWS - General**Typical Application and General Component Guidance:**

This component is used to inventory the exterior windows.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

The section name for a window component consists of two parts (in this order): 1) Material type (Wood, Steel, Aluminum, Vinyl), and 2) Window opening count.

All windows are to be inventoried under 'General' which is a SF (UOM).

If a window (or group of windows) is to be sectioned out due to difference of install date/condition, then cardinal direction should be included. Example: 'NORTH-ALUMINUM-20'.

If a window is constructed out of storefront material (common on newer buildings), it should NOT be inventoried under 'B202002 Storefronts.' Only windows that extend to the ground are considered a storefront. All other glazing is considered a window.

If there are identical section names, the 'year installed' should be added to the name. For instance, there could be 'ALUMINUM-20-2014' and 'ALUMINUM-20-1975.'

The material type should be entered into the section name.

The operability (operable or non-operable) of windows does not impact how the windows are inventoried. Do not section windows out by 'SLIDING', 'FIXED', 'AWNING' or any other functionality type.

The window count for a section is obtained by viewing a glazed area wall penetration separated by items (not mullions) such as CMU, stucco, etc. to be counted as 1 window. Note: The section name includes this number.

Window screen condition or missing a screen does not factor into the window DCR inspection.

Window sectioning drivers: material type (included in section name) and condition.

General

Creating an inordinate amount of sections for windows does not increase quality. Assessors should strive to have an accurate inventory of windows at the minimum amount of sections while still meeting the requirements above.

Windows that extend to the ground are to be inventoried under 'B202002 Storefronts.'

Lesson Learned

It is helpful to calculate the quantity of windows and deduct that total from the B201001 wall component type quantity.

On certain windows the construction date can be viewed in small font on a sticker somewhere on the window frame. This can be used by an assessor to estimate the install date of the window.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	50	SF

B202001 WINDOWS - Other**Typical Application and General Component Guidance:**

This component is used to inventory other types of windows.

**Business Rules/General/Lessons Learned/Reinspection****Reinspection**

'B202001 WINDOWS - Other' was used to inventory security bars/screens prior to the 2019 update. When performing a reinspection, the assessor should select the correct component type.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Other	Yes	No	No	No	N/A	No	50 SF

B202001 WINDOWS - Security Bars/Screen**Typical Application and General Component Guidance:**

This component is used to inventory security bars and screens affixed to windows.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Follows the same section naming and inventory requirements as 'B202001 WINDOWS - General'.

Used to capture security bars/screens. These are commonly found on armories and other secure buildings.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Security Bars/Screen	Yes	No	No	No	N/A	No	50	SF

B202001 WINDOWS - Steel Windows

Typical Application and General Component Guidance:

This component is included for clarification purposes only.



Business Rules/General/Lessons Learned/Reinspection

General

Included for reference purposes only. Out of scope. All business rules stated in B202001 WINDOWS - General are to be followed.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Steel Windows	No	No	No	No	N/A	50	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

B202001 WINDOWS - Wood Windows

Typical Application and General Component Guidance:

This component is included for clarification purposes only.



Business Rules/General/Lessons Learned/Reinspection

General

Included for reference purposes only. Out of scope. All business rules stated in B202001 WINDOWS - General are to be followed.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Wood Windows	No	No	No	No	N/A	25	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

B202002 STOREFRONTS - General**Typical Application and General Component Guidance:**

This component is used to inventory storefronts.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

A glazed door that is part of a storefront should still be inventoried as a separate glazed door component type.

All business rules stated in B202001 WINDOWS - General in regards to sectioning are to be followed. 1) Cardinal direction, 2) Material type (Wood, Steel, Aluminum, Vinyl), and 3) Storefront opening count. Example: 'NORTH-ALUMINUM-2'.

If the component is over one story in height, it should be captured as a 'B202003 GLAZED CURTAIN WALL'.

On newer buildings the use of storefront material for windows is becoming more popular. Do not capture windows under this storefront component type. Use 'B202001 WINDOWS'.

General

Any glazing that extends to the ground is considered a storefront. This is commonly found on entrances into buildings. The entire assembly SF should be captured as a storefront (minus the glazed doors SF).

Lesson Learned

An assessor should calculate the SF of the opening and then subtract the SF of the doors in an entryway application.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF

B202003 CURTAIN WALLS - General**Typical Application and General Component Guidance:**

This component is used to inventory curtain walls.

**Business Rules/General/Lessons Learned/Reinspection****General**

A curtain wall will typically be over one story in height.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	75	SF

B203001 SOLID DOORS - Steel

Typical Application and General Component Guidance:

This component is used to inventory steel doors.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

A pair of steel doors are to be captured as a quantity of 2.

Doors follow the sectioning methodology detailed on the "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" page.

Doors that are primarily wood with a thin metal covering shall be inventoried as wood doors, as their costs and service lives are more consistent with wood doors.

Screen doors or other covering doors over exterior doors are not inventoried.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Steel	Yes	No	No	No	Yes	No	20	EA

B203001 SOLID DOORS - Wood

Typical Application and General Component Guidance:

This component is used to inventory exterior wood doors.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

A pair of wood doors are to be captured as a quantity of 2.

Doors follow the sectioning methodology detailed on the "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" page.

Screen doors or other covering doors over exterior doors are not inventoried.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Wood	Yes	No	No	No	Yes	No	20	EA

B203002 GLAZED DOORS - General**Typical Application and General Component Guidance:**

This component is used to inventory glazed doors. The pair of doors shown in the photo would be inventoried as a quantity of 2.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

A pair of glazed doors are to be captured as a quantity of 2.

Doors follow the sectioning methodology detailed on the "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" page.

If a door has a window, it is not considered to be a glazed door. Glazed doors consist primarily of full height glass panes with or without a frame/stile on the perimeter of the door.

Lesson Learned

If the glazed doors are installed in a 'B202002 Storefront,' capture the SF of the doors so it can be deducted from the Storefront opening quantity.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	40	EA

B203004 OVERHEAD AND ROLL-UP DOORS - General**Typical Application and General Component Guidance:**

This component is used to inventory overhead and roll-up doors. Select the correct type and size (round up to the nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Doors follow the sectioning methodology detailed on the "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" page.

It is understood that while several sizes are available in BUILDER™, there will be other size doors found in the field. The assessor is to use judgment on selecting the component type. The component type should be rounded up to the next available size.

Lesson Learned

If there are multiple doors where the sizes do not align, it is helpful to add an inventory comment with the actual size and cardinal direction. This will leave a bread crumb for the next assessor to understand the previous sectioning.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	20	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

B203007 GATES - General**Typical Application and General Component Guidance:**

This component is used to inventory gates.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Gates follow the sectioning methodology detailed on the "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" page.

Lesson Learned

Door component types are quantified as an EA UOM whereas 'B203007 GATES - General' is a SF UOM. This UOM change is sometimes missed and a quantity for 2 gates is entered as '2' when it should be the total SF of the gates.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	20	SF

B203090 OTHER EXTERIOR SPECIALTY DOORS - Emergency Egress Door**Typical Application and General Component Guidance:**

This component is used to inventory exterior doors that have emergency egress (fire alarm bar) installed.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Doors follow the sectioning methodology detailed on the "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" page.

The door must have a fire alarm bar installed.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Emergency Egress Door	Yes	No	No	No	Yes	No	20	EA

B203090 OTHER EXTERIOR SPECIALTY DOORS - General**Typical Application and General Component Guidance:**

This component is used to inventory specialty doors that do not have a component type in BUILDER™. The photo shows a weapons issue door at an armory.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Assessor to add a section name to adequately identify the door. 'ARMORY ISSUE' is one example. If enough detail is not provided in the section name for easy identification, an inventory comment should be provided.

Doors follow the sectioning methodology detailed on the "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" page.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	Yes	No	20	EA

Complete Component Catalog Breakdown

B20

B20 EXTERIOR ENCLOSURE

B201001 EXTERIOR CLOSURE

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Adobe	Yes	No	No	No	N/A	No	75	SF
Brick Veneer w/CMU Backup	Yes	No	No	No	N/A	No	75	SF
Brick Veneer w/Stud Backup	Yes	No	No	No	N/A	No	75	SF
Cement Boards / Panels	Yes	No	No	No	N/A	No	30	SF
CIP Concrete	Yes	No	No	No	N/A	No	75	SF
Concrete Block	Yes	No	No	No	N/A	No	75	SF
E.I.F.S.	Yes	No	No	No	N/A	No	50	SF
Fiber Cement Siding	Yes	No	No	No	N/A	No	75	SF
General	No	No	No	No	N/A	No	30	SF
Glass Block	Yes	No	No	No	N/A	No	50	SF
Gypsum	Yes	No	No	No	N/A	No	50	SF
Masonite	Yes	No	No	No	N/A	No	75	SF
Masonry Cavity	Yes	No	No	No	N/A	No	75	SF
Masonry Composite	Yes	No	No	No	N/A	No	75	SF
Metal Panel	Yes	No	No	No	N/A	No	30	SF
Metal Siding	Yes	No	No	No	N/A	No	30	SF
Other	Yes	No	Yes	Yes	N/A	No	30	SF
Precast Concrete Panel (Ribbed)	Yes	No	No	No	N/A	No	75	SF
Precast Concrete Panel (Tilt Up)	Yes	No	No	No	N/A	No	75	SF
Pre-Engineered Steel Wall and Panel	Yes	No	No	No	N/A	No	60	SF
Solid Brick - Double Wythe	Yes	No	No	No	N/A	No	75	SF
Solid Brick - Single Wythe	Yes	No	No	No	N/A	No	75	SF
Stone	Yes	No	No	No	N/A	No	75	SF
Stone Veneer w/CMU Backup	Yes	No	No	No	N/A	No	75	SF
Stone Veneer w/Stud Backup	Yes	No	No	No	N/A	No	30	SF
Stucco	Yes	No	No	No	N/A	No	40	SF
Tile Veneer w/CMU Backup	Yes	No	No	No	N/A	No	75	SF
Unknown	No	No	No	No	N/A	No	30	SF
Vinyl/Fiberglass Siding	Yes	No	No	No	N/A	No	30	SF
Wall Louver	No	No	No	No	N/A	No	30	SF

Complete Component Catalog Breakdown

B20

B20 EXTERIOR ENCLOSURE

Wood Cladding w/Stud Backup	Yes	No	No	No	N/A	No	40	SF
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B201002 EXTERIOR WALL BACKUP CONSTRUCTION

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

B201003 INSULATION & VAPOR RETARDER

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Fiberglass Batts	No	No	No	No	N/A	No	20	SF
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

B201004 PARAPETS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	LF
Other	No	No	No	No	N/A	No	20	LF
Unknown	No	No	No	No	N/A	No	20	LF

B201005 EXTERIOR LOUVERS & SCREENS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF
Other	Yes	No	Yes	Yes	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

B201006 BALCONY WALLS & HANDRAILS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	15	LF
Handrailing	Yes	No	No	No	N/A	No	15	LF
Ladder	Yes	No	No	No	N/A	No	15	LF
Other	No	No	No	No	N/A	No	15	LF
Unknown	No	No	No	No	N/A	No	15	LF

Complete Component Catalog Breakdown

B20 EXTERIOR ENCLOSURE

B20

B201007 EXTERIOR SOFFITS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF
Other	Yes	No	Yes	Yes	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

B201008 FLASHING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

B201009 EXTERIOR PAINTING AND SPECIAL COATINGS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

B201010 EXTERIOR JOINT SEALANT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	LF
Other	No	No	No	No	N/A	No	20	LF
Unknown	No	No	No	No	N/A	No	20	LF

B201011 SUN CONTROL DEVICES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

Complete Component Catalog Breakdown

B20

B20 EXTERIOR ENCLOSURE

B201012 SCREEN WALLS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	LF
Other	No	No	No	No	N/A	No	20	LF
Unknown	No	No	No	No	N/A	No	20	LF

B201090 OTHER EXTERIOR WALLS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	N/A	No	40	SF
Other	No	No	No	No	N/A	No	40	SF
Unknown	No	No	No	No	N/A	No	40	SF

B202001 WINDOWS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Aluminum Windows	No	No	No	No	N/A	No	35	EA
Exterior Glazing	No	No	No	No	N/A	No	50	SF
General	Yes	No	No	No	N/A	No	50	SF
Other	Yes	No	No	No	N/A	No	50	SF
Security Bars/Screen	Yes	No	No	No	N/A	No	50	SF
Steel Windows	No	No	No	No	N/A	No	50	EA
Unknown	No	No	No	No	N/A	No	50	SF
Vinyl Clad Windows	No	No	No	No	N/A	No	40	EA
Wood Windows	No	No	No	No	N/A	No	25	EA

B202002 STOREFRONTS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF
Other	Yes	No	Yes	Yes	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

Complete Component Catalog Breakdown

B20

B20 EXTERIOR ENCLOSURE

B202003 CURTAIN WALLS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	75	SF
Other	Yes	No	Yes	Yes	N/A	No	75	SF
Unknown	No	No	No	No	N/A	No	75	SF

B202090 OTHER EXTERIOR WINDOWS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	Yes	No	65	EA
Other	No	No	No	No	N/A	No	65	EA
Unknown	No	No	No	No	N/A	No	65	EA

B203001 SOLID DOORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Aluminum	Yes	No	No	No	Yes	No	20	EA
General	No	No	No	No	N/A	No	20	EA
Other	Yes	No	Yes	Yes	Yes	No	20	EA
Steel	Yes	No	No	No	Yes	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA
Wood	Yes	No	No	No	Yes	No	20	EA

B203002 GLAZED DOORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	40	EA
Other	Yes	No	Yes	Yes	Yes	No	40	EA
Unknown	No	No	No	No	N/A	No	40	EA

B203003 REVOLVING DOORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Electric	Yes	No	No	No	Yes	No	20	EA
General	No	No	No	No	N/A	No	20	EA
Manual	Yes	No	No	No	Yes	No	20	EA
Other	Yes	No	Yes	Yes	Yes	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

Complete Component Catalog Breakdown

B20

B20 EXTERIOR ENCLOSURE

B203004 OVERHEAD AND ROLL-UP DOORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Aluminum/Fiberglass, Electric, 12'x12'	Yes	No	No	No	Yes	No	20	EA
Aluminum/Fiberglass, Manual, 12'x12'	Yes	No	No	No	Yes	No	20	EA
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	SF
Shutter, Rollup	Yes	No	No	No	Yes	No	20	EA
Steel Rolling	No	No	No	No	N/A	No	25	EA
Steel Rolling, Electric, 10'x10'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Electric, 12'x12'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Electric, 14'x14'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Electric, 20'x12'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Electric, 20'x16'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Electric, 8'x8'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Fire Rated, 10'x10'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Manual, 10'x10'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Manual, 12'x12'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Manual, 14'x14'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Manual, 20'x12'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Manual, 20'x16'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Manual, 8'x8'	Yes	No	No	No	Yes	No	20	EA
Steel Sectional	No	No	No	No	N/A	No	25	EA
Steel Sectional, Electric, 10'x10'	Yes	No	No	No	Yes	No	20	EA
Steel Sectional, Electric, 12'x12'	Yes	No	No	No	Yes	No	20	EA
Steel Sectional, Electric, 20'x14'	Yes	No	No	No	Yes	No	20	EA
Steel Sectional, Electric, 8'x8'	Yes	No	No	No	Yes	No	20	EA
Steel Sectional, Manual, 10'x10'	Yes	No	No	No	Yes	No	20	EA
Steel Sectional, Manual, 12'x12'	Yes	No	No	No	Yes	No	20	EA
Steel Sectional, Manual, 20'x14'	Yes	No	No	No	Yes	No	20	EA
Steel Sectional, Manual, 8'x8'	Yes	No	No	No	Yes	No	20	EA
Steel Vertical Lift, Electric, 16'x16'	Yes	No	No	No	Yes	No	20	EA
Steel Vertical Lift, Electric, 32'x24'	Yes	No	No	No	Yes	No	20	EA

Complete Component Catalog Breakdown

B20

B20 EXTERIOR ENCLOSURE

Unknown	No	No	No	No	N/A	No	20	SF
Wood, Electric, 10'x10'	Yes	No	No	No	Yes	No	20	EA
Wood, Electric, 12'x12'	Yes	No	No	No	Yes	No	20	EA
Wood, Electric, 14'x14'	Yes	No	No	No	Yes	No	20	EA
Wood, Electric, 20'x16'	Yes	No	No	No	Yes	No	20	EA
Wood, Electric, 8'x8'	Yes	No	No	No	Yes	No	20	EA
Wood, Manual, 10'x10'	Yes	No	No	No	Yes	No	20	EA
Wood, Manual, 12'x12'	Yes	No	No	No	Yes	No	20	EA
Wood, Manual, 14'x14'	Yes	No	No	No	Yes	No	20	EA
Wood, Manual, 20'x16'	Yes	No	No	No	Yes	No	20	EA
Wood, Manual, 8'x8'	Yes	No	No	No	Yes	No	20	EA

B203005 HANGAR DOORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	35	SF
Other	No	No	No	No	N/A	No	35	SF
Steel	No	No	No	No	N/A	No	35	SF
Steel Bi-Fold	Yes	No	No	No	N/A	No	35	SF
Steel Sliding	Yes	No	No	No	N/A	No	35	SF
Steel Vertical	Yes	No	No	No	N/A	No	35	SF
Unknown	No	No	No	No	N/A	No	35	SF
Wood	No	No	No	No	N/A	No	35	SF
Wood Bi-Fold	Yes	No	No	No	N/A	No	35	SF
Wood Sliding	Yes	No	No	No	N/A	No	35	SF
Wood Vertical	Yes	No	No	No	N/A	No	35	SF

B203006 BLAST RESISTANT DOORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF
Other	Yes	No	Yes	Yes	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

Complete Component Catalog Breakdown

B20

B20 EXTERIOR ENCLOSURE

B203007 GATES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF
Other	Yes	No	Yes	Yes	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

B203008 EXTERIOR DOOR HARDWARE

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

B203090 OTHER EXTERIOR SPECIALTY DOORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Emergency Egress Door	Yes	No	No	No	Yes	No	20	EA
General	Yes	No	Yes	Yes	Yes	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Storm Door	Yes	No	No	No	Yes	No	25	EA
Unknown	No	No	No	No	N/A	No	20	EA

B203091 OTHER EXTERIOR PERSONNEL DOORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	Yes	No	20	EA
Other	No	No	No	No	N/A	No	30	EA
Unknown	No	No	No	No	N/A	No	30	EA

Details Req?	If 'Yes', all required section detail fields are to be populated.
Inventory Pic?	If 'Yes', an inventory level photo is to be provided. This is a step back photo showing the component.
Inventory Cmnt?	If 'Yes', an inventory comment is to be populated. This should describe the component.
Group OK?	Only applicable to each (EA) UOM's that are In Scope? = 'Yes'. If 'No' section must be a quantity of 1. If 'Yes' section may have a quantity greater than 1. If 'N/A' it is not applicable to the component type.
Age Based?	If 'Yes', age based (do not provide an inspection) is the desired approach. If 'No' but upon inspection the component is not visible, then an age based approach is acceptable.
Design Life	Design life of the component.
UOM	Unit of measure. If yellow highlight = new component type in 2019 update.



Sustainment Management System

Army BUILDER™ SMS Inventory and Assessment Guide

B30 ROOFING



**US Army Corps
of Engineers**
Mobile District

ERDC
Engineer Research & Development Center

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B30

Record of Revisions/Additions to SMS Inventory and Assessment Methodology

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Safety The following items should not be interpreted as 1) Safety Plan, 2) OSHA, or base safety requirements. These are recommendations. The contractor should operate in accordance with the SOW and approved safety plan.

Safety is of the utmost concern and should always be at the forefront of any activities taking place in the field. There are many potential safety hazards associated with building assessments. Prior to performing building assessments, the assessing staff/team must ensure that field activities are in accordance with the 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Safety Preparation Activities

Do not perform a task that may harm or endanger the health and safety of oneself or others.

Consult with the installation safety representative to review installation-specific safety requirements.

Conduct a daily “stand-up” safety meeting.

Ensure new assessors have been properly trained.

Review the assessment plan/schedule for the day.

Ensure proper Personal Protective Equipment (PPE) is available. This includes, but is not limited to, a hardhat; hearing protection; eye protection; safety shoes, gloves; and a safety colored vest.

Prior to conducting assessments, the team leader must check with the safety office or building POC to determine if there are any building/site-specific safety rules or hazards. For instance, some manufacturing areas may require steel toe shoes, hearing protection, or eye protection.

Safety Recommendations

Do not walk and write, or talk on a mobile phone, at the same time; this can lead to trips/falls.

Do not review documents or write while walking on steps or stairs.

Do not enter posted or suspected confined spaces such as crawl spaces, tanks, chases, or pits.

Mechanical rooms, attic spaces, or other areas with piping/ductwork may require the use of hard hats to prevent against head bumping hazards. Refer to the project specific safety plan for further clarification.

Do not enter areas with hazardous material signs posted or that appear to contain hazardous materials (asbestos, gases, visible mold, etc.).

Be careful when walking through/across vehicle maintenance or staging areas.

Be aware of loose-fitting clothing and lanyards that may get caught in tight areas or on piping such as in mechanical/electrical rooms, etc.

Be careful of wildlife and insects when walking around a building or opening seldom-entered mechanical/electrical rooms. Assessors may encounter snakes, spiders, stray cats/dogs, rats/mice, etc. in these areas. Do not enter or place hands in spaces that are not completely visible.

If a life safety problem is observed, do not try to fix it. Report it to the proper authority or building manager prior to leaving the building or area.

Before the assessment team leaves a building, ensure all team members are accounted for.

Ladder use should be done in accordance with 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Designate a safety POC to enforce the safety accident prevention plan.

Perform a daily safety briefing before field work. Document the attendees and the topics covered.

Halt outdoor field operations at the sign of lightning or thunder.

Safety Recommendations (continued)

Do not access pitched roofs. They may be assessed from a nearby building or using binoculars.

Use proper techniques to place, secure, and climb ladders. Never climb a ladder while holding anything. Always use the three-point technique for climbing. Equipment should be placed in a backpack or an over-the-shoulder satchel to free hands for climbing.

Do not operate powered equipment, Weight Handling Equipment (WHE)/cranes, or remove access covers from powered equipment to perform assessments.

BUILDER™ assessments are commonly performed without electrical test equipment. Do not use electrical test equipment to test circuits or equipment unless qualified by a local authority. Only open panel box doors or enter electrical/mechanical rooms following proper training. Consult the local safety representative.

Site Preparation

Site Preparation Activities

Coordinate with the base to determine building access requirements, such as: escorts; camera passes; classified/secure area restrictions; or keys.

Locate buildings on a map and develop a schedule. Coordinate with the base to identify the appropriate building manager from the POC list. Notify the building managers of the upcoming assessment as needed.

Obtain a set of mechanical/electrical room master keys from the installation POC.

Extract all BRED™ files from BUILDER™ and have them loaded onto tablets (if using tablets). Verify all tablets are charged.

If multiple buildings are to be assessed by one team, confirm the schedule and plan of action with the team leader. A schedule may have building start times detailed to the hour.

Review the building names for the types/sizes of buildings that will be assessed to determine/confirm the needed tools and safety equipment. For instance, if the facilities are not climate-controlled, prepare accordingly (for cold weather bring hats/gloves).

Recommended Assessor Gear/Tools

Hardhat	Digital Camera with Extra Battery(s)
Hearing Protection	Measuring Tape
Safety Glasses	Laser Measuring Device/Flash Light
Reflective Safety Vest	Measuring Wheel
OSHA Approved Footwear	Backpack
Other Required Personal Protection Equipment (PPE)	Graphite Powder (for stuck locks)
Cell Phone and Team Cell Phone List	Cleaning Pad (to clean/help read nameplates)
Assessment Schedule	Pen/Pencils
Building Floor Plans/Base Map	Clipboard
Small Magnet (for determining door/window type)	Paper/Assessment Forms
Flash Light/Compass	Graph Paper
Sun Screen/Bug Spray	Refillable Water Bottle

Operating efficiently in the field is key to the success of the assessment. The following guidance is detailed by 1) Team Leader and 2) Assessor. **Bold items are drivers for client deliverables.**

Team Leader

Upon arrival, check in with the building manager and QA representative (if present).

Conduct the building manager interview. The entire team should be present for the building manager interview. The following questions should be asked:

Question 1: Are there any mission-related deficiencies in the building?

Question 2: Are there any safety-related deficiencies in the building?

Question 3: Have there been any upgrades or remodels of the building?

Question 4: Are there any building deficiencies (HVAC not working, electrical breakers tripping, maintenance issues, roof leaks, etc.) present?

The team leader (ONLY the team leader!) should populate the building level comment with the following information: 1) Missing systems, 2) Renovation dates, 3) Areas of the building not accessible during the assessment, and 4) If drawings were/were not provided. Below are some examples of building level comments:

Comment 1: No A20, D10, or D40 systems present. 2016: Vault room not accessible. Drawings not provided.

Comment 2: No A20 systems present. Renovated in 2010. 2016: 5% of building not accessible. Drawings provided.

The team leader should review the real property data in BRED™ and compare it to what is found during the assessment. The following should be confirmed: 1) Number of stories, 2) Building square footage, and 3) Building install date and 4) Building number in BRED™ matches the building. Variances between real property data and actual field data should be recorded for inclusion into the client deliverable.

Team Leader and Assessors

Best Practice: Each assessor should first take a photo of the building number to identify the subsequent photos associated with the building when they are downloaded. Take a second picture that captures the overall building view with respect to nearby buildings/streets. This should help refresh/remind the assessor on what the building looks like, while performing data-entry.

A team caucus should occur to discuss the sectioning strategy for the building and confirm which side is facing north.

Each assessor should have a consistent approach to each building. Assessors should move around the building exterior and interior in a clockwise (or counterclockwise) manner making notes and taking photos.

If a safety item is found, notify the team lead. The team lead will notify the building manager. Capture a photo of the safety item for inclusion into the safety log. Follow all other project-specific procedures when a safety item is encountered.

Upon return to the office perform the following steps:

Step 1: Download all photos from the day to a building-specific folder. Review the photos and delete any that are blurry or unreadable.

Step 2: Complete all calculations and counts. Complete all data entry into BRED™.

Data Entry

With the technology that is available today, the need to use forms in the field and do data entry at the office has been mitigated. Tablets can be used to run BRED™ to complete data entry while in the field. It is understood that there are challenges to accomplish this for certain disciplines. It is only mentioned here as a best practice recommendation and is not a requirement to execute the work. There will be instances where electronics will not be allowed in a facility. Assessors should have a paper/pen data collection system ready as a backup.

General

This section presents common Unifomat B30 Roofing Inventory component sections found across installations as a guide for entering into the BUILDER™ or BUILDER™ Remote Entry Database (BRED™) software. Inventory items are arranged by BUILDER™ System with Material/Equipment Category, Component Type, Unit of Measure, and Inventory Notes.

B3010 - Roof Coverings: Provide the primary weather protection and insulation for the top of the building. In BUILDER™, roof covering refers to the complete roof system composed of the exposed covering and any underlayment such as insulation, asphaltic/bitumen layers, membranes, etc. Typical roof covering or system types found on bases include Built-up, Modified-Bitumen, Membrane, Metal, Shingle, and Tile. The roof coverings component also includes exterior rain drainage (gutters and downspouts). When the roof structure also serves as a weatherproofing component (e.g. A single sheet of metal, or a concrete deck, coated or uncoated), it is inventoried and assessed under B1020. If the roof construction includes a structural substrate under the roof cover, that component is inventoried and assessed by the architectural assessor under B1020 Roof Construction. It is incumbent upon the roofing assessor to ensure roof structures that also serve as weatherproofing components are properly inventoried and assessed, i.e. ensure the weatherproofing function of the roof is considered in the assessment.

B3020 - Roof Openings: Provide physical access and daylight passage through the roof system. These openings can be fixed or operable and be made of different materials.

Roof covering component sections are inventoried by roof covering system (component type). Because the inventory is by roof covering system, the assessor will not inventory underlayment materials, roof insulation, or accessory items (e.g. edge metal, flashing, insulation, fascia, pitch pans, ridge vents, walk pads, etc.). The roof covering inventory includes the roof system material typically rubber, plastic, asphalt, metal, shingle, tile, etc. and the component type such as single-ply, built-up, modified-bitumen, shingle, tile, etc.

The roofing system of a building separates the building interior from the external environment. It provides weather protection and insulation. It may also serve other functions such as supporting equipment, providing fire separation, or allowing daylight to enter the building. The roof is supported by the building structural system.

Inspection

Roof systems and coverings have advanced over the years and typically have a design life of 25–50 years. When properly installed, these components show slow rates of deterioration, but can accelerate with age if common problems such as wind damage, debris build up, minor leaks, etc. are not addressed in a timely manner.

Roofing component sections are assessed using Direct Condition Rating (DCR) or Age-Based Modeling. Usually roofing components will be visible. When component sections are not visible inventory should still be entered, but no assessment is provided. In this case, BUILDER™ will use the inventory year installed and degradation curves built in to the software to establish the Condition Index (CI).

Rule of thumb: If you can see it, you should inspect it. There are some caveats to this rule. See component catalog for items that must be age-based whether visible or non-visible.

The assessor should consider the condition of roof accessories in rating the roof covering, even though roof accessories are not inventoried. A roof covering in excellent condition, could be rated amber '+' or below if a significant quantity or severity of conditions exist related to roof flashing, edge metal, pitch pockets, curbs, etc. Problems noted with accessories should be included in assessment comments.

Inventory

It is critical to confirm the year installed (default will be from real property records), or estimate the year installed. BUILDER™ uses the install date, degradation curves, and assessment observations to establish a CI for each component section. If the assessor suspects the default install date is not accurate, or an addition or renovation has taken place, check the real property record for year renovated or check local as-built or renovation drawings to help estimate the year installed.

In some cases, roof sections may be replaced as an individual repair or partial replacement. These areas would have a different age. The real property construction and renovation dates should be confirmed; if they are not appropriate, the roof age must be estimated. The building occupants or other facilities staff may be able to provide some information.

Some buildings may have a roof warranty document posted near roof access to assist in determining age.

Except where specifically noted in this Guide, do not use 'General' where a more specific item is available as a component type selection.

If a 2-floor, 10,000 SF (real property area) building is assessed and it is deemed to be within +/- 10% calculated, then the assessor should use SF/FLR (10,000/2), which in this case is 5,000 SF as the quantity for the SF of roofing components (Note: many roofing components also require the slope factor to be applied).

If the building area is calculated to be between +/- 10% of the building area shown in the BRED™ file, then the building area shown in BRED™ is to be used. If the calculated area is outside of +/- 10% of the building area shown in the BRED™ file, then the calculated area should be used.

Roofing components inventoried for buildings are usually visible. When roofing components are not visible (or the roof is not accessible), as-built drawings should be used to identify and quantify the roofing components. If as-built drawings are not available, the assessor may use experience to make an assumption for the roofing types and quantities based on similar construction, consultation with local staff, other reputable online resources.

When a component is concealed/hidden, the inventory comment box is used to indicate the reason for no inspection taking place. Standard comments should be used.

When performing an assessment, the 'PAINTED' box should only be selected for components that have local or field applied paintings/coatings. DO NOT mark 'PAINTED' for manufacturer- or factory-applied coatings as they tend to age consistently with the components.

Photography

General comment: Photos are captured to document the following: 1) Inventory, 2) Condition (deficiency), 3) Historical record of the asset, 4) QC, and 5) Life safety issues.

All components where an 'Other' component type is selected must have a photo attached at the Inventory/Section level. (Required)

Assessors should take a photo of the building number at the start of the building assessment to delineate the start/stop of the photos between buildings. (Best Practice)

Assessors should take photos to allow for quality control (QC) confirmation and data backup. It is a good practice to have a photo of every component type encountered in an assessment. (Best Practice)

Components that are required to have section details populated should also have a single photo attached at the Inventory/Component Section level. This photo should be a step back photo showing the component in relation to its surroundings. Follow on assessments and base operations can use this to see what was inventoried in the case where there is any confusion on the section name or location field in the section details. If the component is hidden, no photo is necessary. (Required)

Components that have a DCR (component rating only) of A+ or worse should have a photo taken that shows the deficiency identified in the inspection comment. The photo should be attached to the record at the Inspection level. (Required)

Life Safety issues should be photographed for documentation of the safety item and used in safety reports. The photo should be sent to the team lead and all required steps outlined in the safety plan are to be completed. (Required)

Paint DCR does not drive the requirement for a photo to be attached at the inspection level. Example: A component has a DCR of 'G-' and a paint DCR of 'A' would result in no photo attached to the inspection.

See Scope Of Work (SOW) for any photo renaming/deliverable requirements.

The Team Leader is required to take one photo of the front elevation, or a representative elevation view, and attach the photo the building record at the building level. (Required)

Reinspection

All existing quantities for components such as roof coverings and hatches are to be validated to a +/-15% accuracy. This can be accomplished through random sampling.

Assessors must not delete/edit components and sections that are not within their discipline.

BRED™ functions such as 'Copy Building' and 'Copy Section' should not be used unless their ramifications are fully understood. Copy building: The entire building will be copied. Copy section: All items with the same section name will be copied. For example, if a D50 assessor uses copy section on the section name FL1, the assessor may copy/paste interior doors, mechanical equipment, etc. without knowing it. If there is no existing data, these functions are easily used.

Existing data should be deleted if: 1) The component is no longer present, 2) The correct component type exists, 3) There are duplicate components with the same section name, or 4) The component is correct but has the wrong install date (requires deletion and re-entry with correct date).

If a component type in the existing data is no longer in scope, it must be updated to an in-scope item, or deleted if no longer applicable.

Past inspection comments are not required to be revised to current standards.

Section names, component types, and quantities must be verified and updated.

When performing a reinspection it should be understood that modifications in the inventory guidance may have taken place between the previous assessment date and the current effort. The new assessment should update the inventory to the latest inventory guidance. This may require, but is not limited to, combination of quantities (Ex: removing cardinal direction sectioning when it is no longer needed), modifying component type selections, or removing/adding items. The detailed inventory guidance portion of the manual will often provide direction on what steps need to be taken.

Sectioning

Additions, new wings, or major renovations likely require identifying a separate roof section with a different age.

Typical section names used for B30 include MAIN, UPPER, LOWER, WING 'X,' EAST, WEST, FLAT, SLOPED, etc.

For roofing, do not section by floor.

If a building east and west wings is assessed and the roofs have different install dates, the Section Name for the roof covering would read 'EAST WING' and 'WEST WING'. If there is an instance where a single wing has multiple roofs with different install dates the names 'WEST WING - 1970' and 'WEST WING - 2015' would be used.

Once all base sectioning guidelines have been followed, there may be a need to apply a DCR-driven sectioning methodology based on two factors 1) difference in DCR, and 2) quantity of distress. Step 1: Assessors should section a component when there is a 2-step difference in DCR (Ex: G- to A) in accordance with the guidance found in Step 2. If there is only a 1-step difference in DCR, the assessor shall have a single section and the lower of the DCR's should be used. Step 2: When a 2-step difference is found, the assessor should consider the quantity of distress that is present. If the distress is present on 25% or less of the component, a single section with a DCR in-between the high/low DCR shall be added (if G-/A are found then A+ is used). If the distress is present on over 25% of the component, two sections should be added at the high/low DCR. Any component with a 3-step or more difference in DCR should have two sections.

Roof framing, roof deck, and roof covering components should all be sectioned in similar fashion using the exact same section names. For example, if there are 'HIGH' and 'LOW' roof sections for framing the same sectioning methodology is used for the roof deck and roof covering components.

The most critical part to an assessment is having all assessors aligned on how to perform an assessment. To reach an accurate DCR of a component, follow the steps below:

Step 1: Consider the level of degradation and the performance of the component:

OPERATIONAL CAPABILITY	OPERATIONAL CONDITION RATING	DEGRADATION	DCR
Fully Operational	Green	Free of observable or known degradation.	Green (+)
		Normal wear requiring normal preventative maintenance.	Green
		Normal degradation requiring corrective maintenance.	Green (-)
Impaired Operation	Amber	Minor degradation requiring corrective maintenance.	Amber (+)
		Moderate degradation requiring corrective repair.	Amber
		Significant degradation requiring moderate repair.	Amber (-)
Inoperable	Red	Extensive degradation requiring major repair.	Red (+)
		Severe degradation requiring major rehabilitation or partial replacement.	Red
		Complete degradation requiring full replacement.	Red (-)

Step 2: Consider the maintenance requirements of the component:

Type	Green (G+/G/G-)	Amber (A+/A/A-)	Red (R+/R/R-)
Dynamic (Equipment)	<p>Distresses present are of no impact to the components operation.</p> <p>Example: The fan component is fully operational.</p>	<p>Distresses present are of impact to the components operation. A repair is needed to bring the component back to proper operating condition</p> <p>Example: A fan has corrosion on the housing. A sand and paint would remove the distress.</p>	<p>Distresses present are of impact to the components operation. The component needs to be replaced.</p> <p>Example: A fan motor has overheated and no longer functions. Replacement of the component is required.</p>
Non-Dynamic	<p>The architecture component is in good condition requiring no maintenance outside of normal operations.</p> <p>Example: The carpet component is fully operational.</p>	<p>The architecture component has a distress that requires an extra level of maintenance outside of normal operations. This extra maintenance (or repair) would be an action such as a cleaning or a painting of a surface.</p> <p>Example: A carpet component has stains. A cleaning would remove the distress.</p>	<p>The architecture component has a distress where a maintenance operation will not fix the problem at hand. A replacement of the component is required.</p> <p>Example: A carpet component is damaged (ripped). The component needs to be replaced to fix the distress.</p>

Dynamic: Refers to equipment in the D10, D20, D30, D40, D50, and E10 systems.

Non-Dynamic: Refers to architectural components in the A10, A20, B10, B20, B30, C10, C20, and C30 systems.

Note: There are some Non-Dynamic components (for instance, toilets under D20) in the Dynamic systems.

Step 3: Adhere to the following requirements:

Requirements
Maintainability and obsolescence should not be the driving factor when conducting a condition assessment unless it has led to actual deterioration of condition that can be observed or reasonably inferred.
G+ ratings should only be given to inventory that is in pristine condition and is free of any observable defects.
Do not downgrade an assessment rating simply because an item is dirty.
Do not downgrade an assessment rating because the item does not meet current code compliance standards
Do not downgrade an assessment rating because the item is not deemed energy efficient.
Do not downgrade an assessment rating because the item is deemed to be a safety violation/hazard unless otherwise directed.
Do not downgrade an assessment rating because of a code violation.
Ratings should not be anticipated based on planned repairs or replacement.
Assessors should not expend field time and effort to determine the cause of a deficiency. If the cause is easily identified it should be included in the inspection comment.
Ratings shall be based upon the observable and documentable condition of the component.
A component should be downgraded if its operational capability, performance, reliability, etc. is compromised according to the direct rating definitions.
Incorporate user interviews, work order histories, or other information sources when determining the condition of the component. Include this information in the inspection comment.

The assessor should calibrate their mindset on what the expected DCR should be based on condition.
 The assessor should consider the maintenance requirements of the component in the current condition.
 The assessor should factor in the requirements/business rules for completing an inspection.

One factor that can play into an assessment is if the assessor receives information from a POC that results in a lower rating. For instance, an assessment takes place in July and there is a heating water pump that looks brand new, but has a blown motor. The assessor would assume the pump is supposed to be off due to being off season, but if the POC informs the assessor about the blown motor, this can be factored into the assessment (and indicated in the inspection comment).

One factor that should not play into an assessment is pending replacements of components. Assessors should rate components in the condition they are at the time of assessment. If the carpet is being replaced next month, that should not factor into a rating. Now, if the carpet contractor is on site (the work is currently taking place), this could be factored into the rating and a G+ rating provided with the current date of inspection chosen as the install date.

Service Life: No distresses present and component is nearing (or past) its service life.

The following comment can be used as an inspection comment for components that have no signs of distresses, are rated either Amber (A) or Amber Plus (A+), and are over 75% through their service life. This negates the need to have 4 parts of an inspection comment. Also, an inspection photo is no longer required.

[First Last-AE-Date] - The component is in proper working condition and is showing no signs of distress. The DCR was based on estimated remaining service life.

Step 1: Understand the 5 parts of the inspection comment:

Part #	Part Type	Type Description
1	Front End	[First Last-AE-Date] OR [First Last-DPW-Date] (ex: [John Doe-AE-7/4/2017])
2	Distress	Identifies the distress of the component
3	Severity	Identifies the amount of the distress.
4	Location	Identifies the location of the distress
5	Quantity	Identifies the quantity of the distress

Step 2: Use the DCR of the component as the basis for the severity.

DCR	Severity
Amber (+)	Minor/Mild
Amber	Moderate
Amber (-)	Significant/Major
Red (+)	Extensive
Red	Severe
Red (-)	Complete/Total

To aid in the inspection comments reading correctly the severity can be modified slightly. For instance, 'moderately' can be used for an 'A' DCR comment. This approach also applies to the distresses where one of the 23 MUST be selected. If 'Cracked' is selected as the distress, the wording 'cracks' may be used.

Step 3: Identify the distress of the component:

23 Distresses			
Blistered	Displaced	Overheated	Capability/Capacity Deficient
Broken	Efflorescent	Patched	Animal/Insect Damaged
Clogged	Holes	Rotten	Moisture/Debris Contaminated
Corroded	Leaks	Stained/Dirty	Noise/Vibration Excessive
Damaged	Loose	Cracked	Operationally Impaired
Deteriorated	Missing		Electrical Ground Inadequate or Unintentional

Step 4: Location and Quantity

Location on non-dynamic assets - 'lobby area' or 'northwest corner'.

Quantity on a SF UOM will typically be a %. On an EA UOM will typically be a count.

Step 5: Put all 5 components together to form an inspection comment (colors correspond to part):

A+	Front End	CRACKED.	The	walls have	minor	cracks	present on	10% of the	gym.
A	Front End	DETERIORATION.	The	carpet has	moderate	deterioration	over	50 %	of the lobby.
A-	Front End	DAMAGED.	The	door has	significant	damage	to the	lower half	of the door.
R+	Front End	CRACKED.	The	windows have	extensive	cracks	present in	4	panes.
R	Front End	LEAKS.	The	roof has	severe	leaking	around the	HVAC	penetrations.
R-	Front End	OPERATIONALLY IMPAIRED.	The	3	north	doors are	completely	operationally impaired.	

Inspection Comments

Rule #	Rule
1	Required on all inspections with a DCR of A+ and below.
2	Paint DCRs do not have an inspection comment requirement. Only the component DCR A+ and below.
3	Should include any component specific information obtained from the base or POC interview.
4	Should be in complete sentences and use industry standard terminology. Comments can be typed into MS Word for spelling/grammar checks and then pasted into the comments box.
5	Do not use all capital letters for the entire comment. The distress should be all capital letters.
6	Do not use abbreviations, jargon, or slang.
7	Should give enough information for a follow-on assessor to locate the problem area/equipment.
8	Should accurately describe the problem/observation that is the basis for the rating. Someone unfamiliar with the particular item should have an accurate picture of the components current condition and the justification for the assigned rating.
9	Should accurately describe the location of the distress if the component is only showing a distress in a single location. For instance, if an office has a stain in the carpet, it would be necessary to call out the room number of the office.
10	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. For instance, assessor John Doe at firm AE: [John Doe-AE-7/4/2017].
11	After #10 front end information in the brackets one of the 23 distresses should be provided in capitalized form. Building on #10 for an example if stained carpet: [John Doe-AE-7/4/2017] - STAINED.
12	After #10 and #11 a sentence should be provided that provides the distress, severity, location, and quantity. Quantity/Location refers to the amount/location of the distress present.

Inventory Comments

Rule #	Rule
1	Used to identify components that were not visible for inspection. See standard comments.
2	Used as a bread crumb for follow-on inspections. Can provide useful additional information such as location or type to help the next assessor understand what was being inventoried. Ex: This component is the stone wall located behind the receptionist in the lobby area.
3	Should describe the component inventoried where 'OTHER' is used to allow follow-on assessments to understand what was inventoried in the previous assessment.
4	Used to provide the location of the component (especially used for architecture components where there are no Section Details provided that have a location): Roof, NW Corner, Room Number
5	Do not use all capital letters, abbreviations, jargon, or slang.
6	Used to further describe an asset if it is not adequately described in the component type selection.
7	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Section Detail Comments

Rule #	Rule
1	Used to identify data that was not able to be populated in the Details fields. See standard comments.
2	Used to provide information that is specific to just that component section detail field. This can be a location of the specific section or something that the section services.
4	Do not use all capital letters, abbreviations, jargon, or slang.
5	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Standard Inventory Comments

When	Use Standard Comment
Assets are not visible for inspection.	Component was not visible for inspection. The component condition will be age-based by BUILDER program degradation curves.
Assets are not visible for inspection that also require Section Details to be populated.	The component is not visible for inspection or population of Section Details. The component condition will be age-based by BUILDER program degradation curves and no nameplate data or inventory photo will be provided.
Assets are not visible for inspection that require quantities to be assumed. Hidden mechanical equipment, ductwork, and # of control points are common occurrences.	The component is not visible for inspection and the quantity was estimated based on architect/engineering judgment. The component condition will be age-based by BUILDER program degradation curves.
Assets are located in an area where no electronics area allowed. This prevents an assessor from taking inventory/inspection photos.	The component is located in a secure area of the facility that did not allow electronic devices to be used. Photos were not obtainable.
Assets are visible for inspection but are a system that is not tested (HVAC controls, security system, etc.) so an age-based BUILDER™ CI is desired.	The component condition will be age-based by BUILDER program degradation curves.

Standard Section Detail Comments

When	Use Standard Comment
Nameplate is not found on the component.	Nameplate not found on the component. All fields with "NA" represent data not found.
Nameplate is found on the component but it is partial/completely unreadable.	Nameplate on the component was dirty/corroded/damaged/sunwashed. Section Detail fields with "NA" represent data that was not found.
Nameplate is found on the component that is readable but is missing certain Section Details fields.	Nameplate on the component was missing certain Section Detail fields. Section Detail fields have been populated and fields with "NA" represent data not found.

Comment Front-End Clarification

A front end refers to the bracketed information at the start of an inspection/inventory/section detail comment. The front end must have to following 3 pieces of information: 1) assessor name, 2) assessor company or affiliation, and the date. The BRED™ stamp may also provide the time of inspection which is acceptable.

BRED™/BUILDER™ Clarification

The terms BRED™ and BUILDER™ are used interchangeably throughout this document.

Rule #	Rule
1	Components are divided into sections when a significant variation exists in material/equipment category, age, or construction history, which impacts the life cycle characteristics of the component. Example 1 - If a wing or addition was added to a much older building, the two areas of the building should be sectioned differently because the age and construction history is different. Example 2 – If the building roof has multiple levels of similar materials in different conditions, these levels should be sectioned differently to capture the difference in condition. Example 3 – If the building has more than one of a particular type of component, separate component sections. For example: There is a 5,000 and 10,000 CFM air handler.
2	Multi-wing buildings are always sectioned by wing if the installation date of the wings vary. If a building is an 'E' shape and all wings have the same install date only sectioning by floor is required.
3	Multi-story buildings are always sectioned vertically by floor or level (in the case of a basement or mezzanine).
4	There may be unique instances where sectioning by an area of a building is required. For instance, if a building is split between two companies an installation may request sectioning by company 1 and 2.
5	An on-site discussion must occur at each building among all team members to determine the cardinal direction of the building. All assessors should have North as the same side of the building.
6	An on-site discussion must occur at each building among all team members on how the building should be sectioned. The goal is to avoid one assessor calling it a toilet, one calling it a restroom, and another calling it a bathroom. Standard sectioning naming is important for a consistent data set.
7	The section name should not be repetitive of the component type or material. If the floor is wood, do not have a section name 'WOOD'. Incorporation of the location into the section name is very helpful to be used for follow on assessments. If the wood floor has the section name 'LOBBY', it provides great

Standard Section Names and Format Rules

Use	Standard Section Name
Section by Floor (Business Rule)	FL1 – 1st Floor, FL2 – 2nd Floor, FL3 – 3rd Floor, etc.
Section by Floor (Business Rule)	BASEMENT, MEZZANINE, ATTIC, etc.
Section by Wing (applicable if different construction histories or condition only)	MAIN, WING A, WING B, WING C, ADDITION, etc.
Section by Direction (applicable if different construction histories or condition only)	NORTH, EAST, WEST, SOUTH, etc.
Section by Roof Level (applicable if different construction histories or condition only)	UPPER, LOWER, MAIN, etc.

When an equipment tag is included in the section name it should match exactly what was found in the field. Example: if the boiler ID number is B-1, the section name equipment tag portion should read B-1. If the boiler is tagged B1, the equipment tag portion should read B1. See equipment sectioning for further guidance.

Dashes are not required in the section name other than the instance in regards to equipment ID tags above.

The section name field is always entered in all capital letters.

Sectioning Business Rules - Grouping

The following only applies to each (EA) unit of measure (UOM) components. The 'Complete Component Catalog Breakdown' at the end of the section has a 'Group OK?' column. This has the values of 'Yes', 'No', and 'N/A'.

'Yes' = Grouping is allowed for this component type. A quantity of greater than '1' is acceptable.

'No' = Grouping is not allowed for this component type. The quantity must be '1'.

N/A = Not Applicable. Component type is not an EA UOM or is out of scope.

Group OK? = Yes when Section Details and Inventory Photos are Required.

There are several equipment component types (Unit Heaters, small pumps, etc) that have the following designations in the 'Complete Component Catalog Breakdown': 1) Group OK? = Yes, 2) Section Details? = Yes, and 3) Inventory Photo? = Yes.

In this case, a single section detail and inventory photo representative of the entire section is required. A few more clarifications:

- 1) The location field would be for the entire section (FL1/BAY 1/EXTERIOR) and not specific to a single component.
- 2) A difference in manufacturer does not drive further sectioning. For instance, 2 KW electric unit heaters from multiple manufacturers can be combined into one section. Capacity (2 KW) is the driver for sectioning methodology.
- 3) It is understood that the single section detail field is representative of the entire section. The details should be populated per one component. There is no need to enter multiple details or try to combine multiple manufacturer/model/serial/etc into to a single section detail field.

Group OK? = No

The quantity for these component types must be 1. For equipment (Section Details? = Yes and Inventory Photo? = Yes) the guidance found on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components', 'Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components', and 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components' must be followed.

Sectioning of Components on the Exterior of a Building

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Business Rules

- 1) Components of like type, condition, and install date should be inventoried in a single section. (Ex: B201005, B203001 and B301001 above are all like type, condition, and install date). S/N = 'N/A'
- 2) Components that require multiple sections should indicate cardinal direction for additional sections. (Ex: B201001 - Damage present on south face - S/N = 'SOUTH'. All other 3 sides were same condition - S/N = 'N/A'.
- 3) Components that are only found on a single side of a building should indicate cardinal direction in section name (Ex: B203002 GLAZED DOORS are only found on west face in example above - S/N - 'WEST').

- B20 EXTERIOR ENCLOSURE
 - B2010 EXTERIOR WALLS
 - B201001 EXTERIOR CLOSURE - Pre-Engineered Steel Wall and Panel
 - B201005 EXTERIOR LOUVERS & SCREENS - General
 - SOUTH - B201001 EXTERIOR CLOSURE - Pre-Engineered Steel Wall and Panel
 - B2020 EXTERIOR WINDOWS
 - NORTH-ALUMINUM-4 - B202001 WINDOWS - General
 - SOUTH-ALUMINUM-3 - B202001 WINDOWS - General
 - B2030 EXTERIOR DOORS
 - B203001 SOLID DOORS - Steel
 - WEST - B203002 GLAZED DOORS - General
- B30 ROOFING
 - B3010 ROOF COVERINGS
 - B301001 STEEP SLOPE ROOF SYSTEMS - Formed Metal - Metal Standing Seam
 - B301005 GUTTERS & DOWNSPOUTS - Gutters
 - NORTH - B301005 GUTTERS & DOWNSPOUTS - Downspouts
 - SOUTH - B301005 GUTTERS & DOWNSPOUTS - Downspouts

4) Component types in which there are multiple sections present, and the respective section is only found on a single side of a building, should indicate cardinal direction in the section name (Ex: B301005 GUTTERS DOWNSPOUTS - S/N 'NORTH' and 'SOUTH').

Note: The guidance above is listed in order of application. For example, if the downspouts were all the same condition then #1 would have applied and the section name would have been 'N/A'.

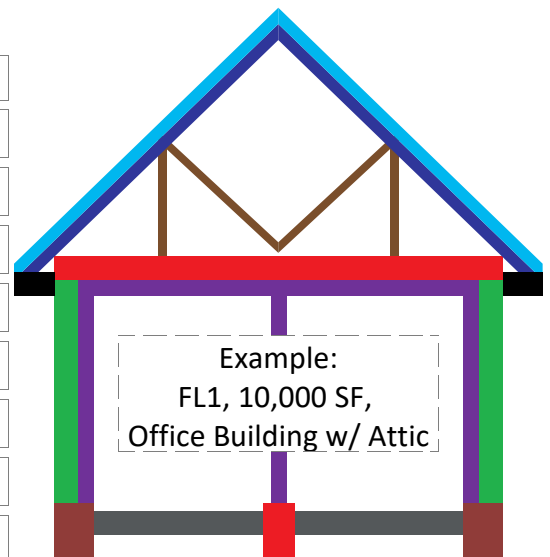
B10 Superstructure is often not visible, which can lead to a variety of different inventory methods. See below for the steps to properly inventory the B10 Superstructure.

Step 1: Consider the size of the building.

Building Square Footage	B1010 Floor Construction	B1020 Roof Construction
1 SF - 1,000 SF	Not Inventoried	Inventory
1,001 SF - 5,000 SF	Assessor Judgment	Inventory
5,000 SF +	Assessor Judgment	Inventory

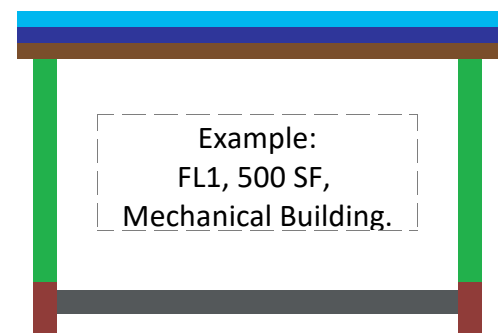
* B1010 captures the structural framing that supports the B1020 (roof) structural framing. B1010 will be present on multiple story buildings and buildings that have a mezzanine or deck area. Note: If there is an attic space, it may be necessary to have a B1010 on a single-story building. While not part of the living area of the building, there is structural support for this area that is not part of the B1020 structural framing.

Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Shingle	N/A
B102003 Roof Decks and Slabs	Wood	N/A
B102001 Roof Construction	General	N/A
B101003 Floor Decks and Slabs	Wood	ATTIC
B201007 Exterior Soffits	General	N/S/E/W
B101001 Floor Construction	General	N/A
B201001 Exterior Enclosure	Siding	N/S/E/W
A103002 Structural SOG	General	N/A
A101001 Wall Foundations	Grade Beams	N/A
A101001 Wall Foundations	Strip Footing	N/A



A10 assets will be hard to inventory as they are not visible. Use drawings or assessor experience on construction type to inventory these assets.

Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Built-Up	N/A
B102003 Roof Decks and Slabs	Concrete	N/A
B102001 Roof Construction	General	N/A
B201001 Exterior Enclosure	Concrete Block	N/S/E/W
A103002 Structural SOG	General	N/A
A101001 Wall Foundations	Strip Footing	N/A



Note: The roof deck overhangs the building. There is no soffit material

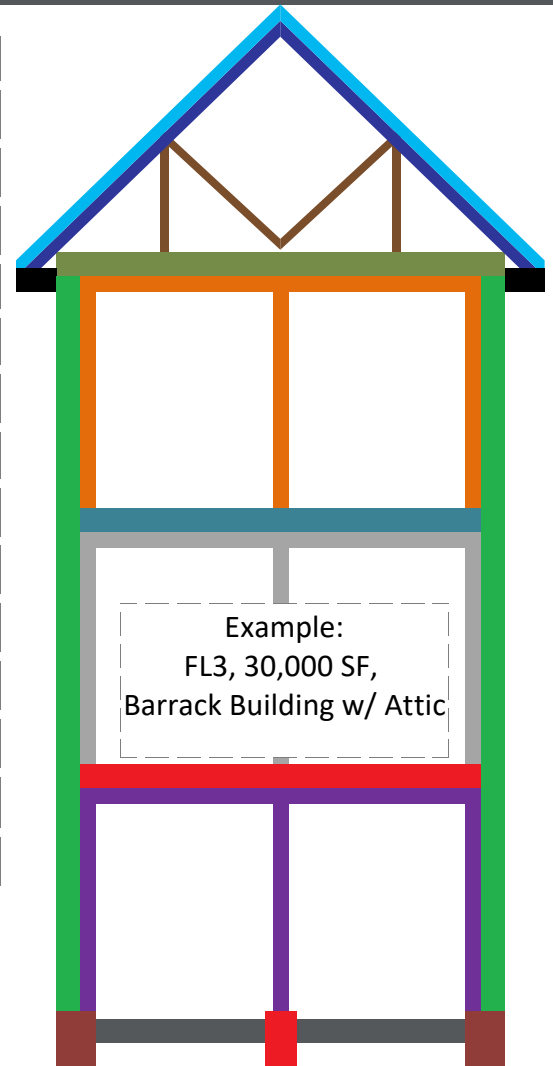
Note: B102001 should be included even though structural members are not visible. There is reinforcing (rebar) in the concrete roof deck. A building will always have a B102001 component regardless of size.

Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Standing Seam	N/A
B102003 Roof Decks and Slabs	Steel	N/A
B102001 Roof Construction	General	N/A
B101003 Floor Decks and Slabs	Concrete	ATTIC
B101001 Floor Construction	General	FL3
B101003 Floor Decks and Slabs	Concrete	FL3
B101001 Floor Construction	General	FL2
B101003 Floor Decks and Slabs	Concrete	FL2
B201007 Exterior Soffits	General	N/S/E/W
B101001 Floor Construction	General	FL1
B201001 Exterior Enclosure	Tilt-Up Panel	N/S/E/W
A103002 Structural SOG	General	N/A
A101001 Wall Foundations	Grade Beams	N/A
A101001 Wall Foundations	Strip Footing	N/A

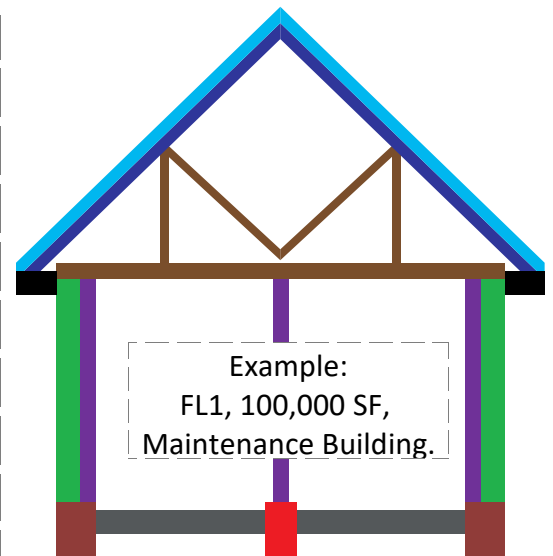
- 1) B10: Sectioned by floor. B20: Not sectioned by floor.
 2) A10 assets will be hard to inventory as they are not visible. Use drawings or assessor experience on construction type to inventory these assets.

Material/Equipment Category	Component Type	Section Name
B301001 Roof Coverings	Standing Seam	N/A
B102003 Roof Decks and Slabs	Steel	N/A
B102001 Roof Construction	General	N/A
B201007 Exterior Soffits	General	N/A
B101001 Floor Construction	General	N/A
B201001 Exterior Enclosure	Siding	N/S/E/W
A103002 Structural SOG	General	N/A
A101002 Column Foundations	Spread Footing	N/A
A101001 Wall Foundations	Strip Footing	N/A

- 1) Columns will have a column foundation (typically will be found) use 'A101002 - Spread Footing.'



B30



B301001 STEEP SLOPE ROOF SYSTEMS - Fiberglass Shingles

Typical Application and General Component Guidance:

This component is used to inventory residential-style shingle roof coverings.



Business Rules/General/Lessons Learned/Reinspection

General

Design life varies from 30-50 years. 3-tabs (see photo) typically 30 years. "Dimensional" shingles typically last 40-50 years.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Fiberglass Shingles	Yes	No	No	No	N/A	20	SF

B301001 STEEP SLOPE ROOF SYSTEMS - Formed Metal - Metal Standing Seam

Typical Application and General Component Guidance:

This component is used to inventory standing seam metal roofs.



Business Rules/General/Lessons Learned/Reinspection

General

Panel system consists of a factory or field formed panel with a raised interlocking standing seam.

Typically factory finished or painted. Insulation, if present, is below the roof deck.

Lesson Learned

There are instances where a standing seam metal roof has been added on top of a previous 'B301002 LOW SLOPE ROOF SYSTEMS' component. In this case, the flat roof becomes a 'B101003 FLOOR DECKS AND SLABS' floor deck with the section name 'ATTIC'.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Formed Metal - Metal Standing Seam	Yes	No	No	No	N/A	40	SF

B301001 STEEP SLOPE ROOF SYSTEMS - General**Typical Application and General Component Guidance:**

This component is used to inventory translucent panels that are integrated into roofing systems.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

DO NOT inventory as a skylight. If a skylight is found, inventory under 'B301006 ROOF OPENINGS AND SUPPORTS - Skylight.'

If a sandwich panel is found, use 'General' component type. This is when the roof, insulation, and decking are one panel. This should be inventoried as both 1) a B102003 roof deck and 2) B30 roof covering component types. The SF of both should match.

Square footage adjustment factor %: [(0-2):12] = 0% __ [3:12] = 3% __ [4:12] = 5% __ [5:12] = 8% __ [6:12] = 12% __ [7:12] = 16% __ [8:12] = 20% __ [9:12] = 25% __ [10:12] = 30% __ [11:12] = 36% __ [12:12] = 41%

The section name 'TRANSLUCENT PANEL' should be used when capturing translucent panels that are integrated into the roofing system.

There may be instances where fiberglass panels have been used. The section name 'FIBERGLASS PANELS' should be used.

Lesson Learned

The quantity (and sectioning) of the steep slope roof system should match that of the roof decking.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF

B301001 STEEP SLOPE ROOF SYSTEMS - Preformed Metal - Metal Panel**Typical Application and General Component Guidance:**

This component is used to inventory preformed metal panel roof coverings.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Most metal roofs of small storage buildings consist of only one layer. This metal layer should be captured as this component. This will primarily be used for pre-manufactured and small metal buildings.

General

May be galvanized or painted.

Stamped or formed panels and "corrugated" metal sheets are included in this component

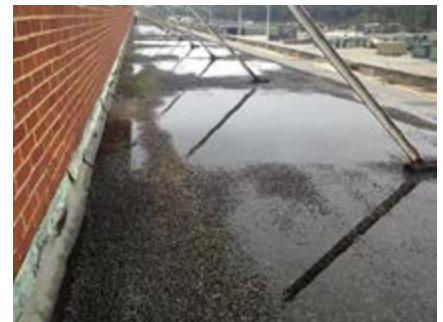
Lesson Learned

There are several other options for metal roofs available. Make sure you are selecting the correct one!

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Preformed Metal - Metal Panel	Yes	No	No	No	N/A	40	SF

B301002 LOW SLOPE ROOF SYSTEMS - Built-Up**Typical Application and General Component Guidance:**

This component is used to inventory low slope, built-up roof coverings.

**Business Rules/General/Lessons Learned/Reinspection****General**

Developed in the 1850s for flat, low slope covering. Felts embedded in hot asphalt 'plies' usually total 4.

Gravel embedded in asphalt flood coat. Sometimes referred to as "Tar and Gravel." Typically applied in a hot top coat with an edge band metal stop.

There will frequently be little or no insulation.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Built-Up	Yes	No	No	No	N/A	20	SF

B301002 LOW SLOPE ROOF SYSTEMS - Liquid Elastomers

Typical Application and General Component Guidance:

This component is used to inventory liquid elastomer roof coverings.



Business Rules/General/Lessons Learned/Reinspection

General

Consists of a rubber-like sprayed-on top coat over an existing roof surface.

Often used as “recover” to extend life or provide impact protection.

Spray is applied, and then it expands to form a seamless cover.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Liquid Elastomers	Yes	No	No	No	N/A	20	SF

B301002 LOW SLOPE ROOF SYSTEMS - Polyurethane Foam

Typical Application and General Component Guidance:

This component is used to inventory polyurethane foam roof coverings.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

If a structural base is visible from below (which is typical), it should be captured under 'B102003 ROOF DECKS AND SLABS' with the appropriate component type selected.

General

Often used as “recover” to extend life, provide insulation, or provide impact protection.

Spray is applied, and then it expands to form a seamless cover.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Polyurethane Foam	Yes	No	No	No	N/A	20	SF

B301002 LOW SLOPE ROOF SYSTEMS - Single Ply Membrane**Typical Application and General Component Guidance:**

This component is used to inventory single ply membrane roof coverings.

**Business Rules/General/Lessons Learned/Reinspection****General**

A typical single ply roof section.

Insulation is located below the membrane. Plate and pin fasteners or adhesives hold down the insulation. The sheets are then glued to the plate fasteners.

Sheets will have glued or heat welded seams

The membrane is either fully adhered, mechanically fastened, or loose laid with a ballast.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Single Ply Membrane	Yes	No	No	No	N/A	No	20	SF

B301005 GUTTERS & DOWNSPOUTS - Downspouts**Typical Application and General Component Guidance:**

This component is used to inventory rainwater downspouts.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

All vertical exterior rainwater piping is inventoried under 'B301005 GUTTERS & DOWNSPOUTS - Downspouts'. All interior rainwater piping is inventoried under 'D204002 ROOF DRAINS - General'.

Downspouts follow the sectioning methodology detailed on the "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" page.

If there are multiple material types of downspouts, they should be sectioned separately. For example, on older buildings you may have both copper and galvanized downspouts. Section names of 'COPPER' and 'GALVANIZED' should be used.

This component is used to inventory all vertical rainwater-conveying piping found on the exterior of a building. All rainwater-conveying piping found on the interior should be inventoried under "D204002 ROOF DRAINS - General".

Lesson Learned

An assessor should pay close attention to the bottom of the downspout when providing a DCR. Often these are damaged by forklifts, maintenance operations, lawn mowers, etc.

Reinspection

Prior to the 2019 update there were business rules that stated all piping (typical schedule 40) that conveyed rainwater should be captured under 'D204002 ROOF DRAINS - General'. This included interior and exterior piping.

When performing a reassessment on data captured prior to the 2019 update, the assessor should assume that if exterior piping is present, this value will need to be recalculated.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Downspouts	Yes	No	No	No	N/A	No	20	LF

B301005 GUTTERS & DOWNSPOUTS - Gutters

Typical Application and General Component Guidance:

This component is used to inventory gutters.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Gutters follow the sectioning methodology detailed on the "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" page.

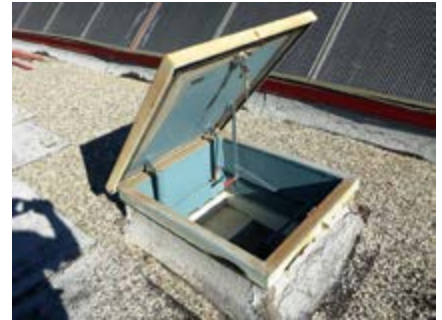
If there are multiple types of gutters, they should be sectioned separately. For example, on older buildings you may have both copper and galvanized gutters. Section names of 'COPPER' and 'GALVANIZED' should be used.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Gutters	Yes	No	No	No	N/A	No	20	LF

B301006 ROOF OPENINGS AND SUPPORTS - Hatches

Typical Application and General Component Guidance:

This component is used to inventory roof hatches.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

There are a variety of roof hatches that have two leaves to the door opening. In this case the quantity should be 1. DO NOT capture as a quantity of 2, which is typical for other double door applications.

General

Roof hatches are typically and allow for personnel or equipment access to the roof.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Hatches	Yes	No	No	No	Yes	No	75	EA

B301006 ROOF OPENINGS AND SUPPORTS - Skylights**Typical Application and General Component Guidance:**

This component is used to inventory skylights.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Large glass atrium roofs should be included in B1020 Other Roof Construction.

Lesson Learned

Take note of the UOM. An assessor needs to capture the SF of glazing.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Skylights	Yes	No	No	No	N/A	No	75	SF

Complete Component Catalog Breakdown

B30

B30 ROOFING

B301001 STEEP SLOPE ROOF SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Asbestos Cement Shingles	Yes	No	No	No	N/A	No	70	SF
Asphalt Shingles	Yes	No	No	No	N/A	No	25	SF
Clay Tile	Yes	No	No	No	N/A	No	70	SF
Concrete Shingles	Yes	No	No	No	N/A	No	70	SF
Concrete Tile	Yes	No	No	No	N/A	No	70	SF
Fiberglass Shingles	Yes	No	No	No	N/A	No	20	SF
Formed Metal	Yes	No	No	No	N/A	No	30	SF
Formed Metal - Metal Standing Seam	Yes	No	No	No	N/A	No	40	SF
General	Yes	No	No	No	N/A	No	20	SF
Metal Shingles	Yes	No	No	No	N/A	No	40	SF
Other	Yes	No	Yes	Yes	N/A	No	20	SF
Preformed Metal	No	No	No	No	N/A	No	40	SF
Preformed Metal - Metal Panel	Yes	No	No	No	N/A	No	40	SF
Shingle & Tile	Yes	No	No	No	N/A	No	20	SF
Slate Shingles	Yes	No	No	No	N/A	No	70	SF
Unknown	No	No	No	No	N/A	No	20	SF
Wood Shakes	Yes	No	No	No	N/A	No	30	SF
Wood Shingles	Yes	No	No	No	N/A	No	30	SF

B301002 LOW SLOPE ROOF SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Built-Up	Yes	No	No	No	N/A	No	20	SF
General	Yes	No	No	No	N/A	No	20	SF
Liquid Elastomers	Yes	No	No	No	N/A	No	20	SF
Modified Bitumen	Yes	No	No	No	N/A	No	20	SF
Other	Yes	No	Yes	Yes	N/A	No	20	SF
Polyurethane Foam	Yes	No	No	No	N/A	No	20	SF
Single Ply Membrane	Yes	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

B30 ROOFING

B301003 ROOF INSULATION & FILL

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Cellular Fill	No	No	No	No	N/A	No	20	SF
Fiberglass Batts	No	No	No	No	N/A	No	20	SF
General	No	No	No	No	N/A	No	20	SF
Gypsum Fill	No	No	No	No	N/A	No	20	SF
Lightweight Concrete Fill	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Perlite Fill	No	No	No	No	N/A	No	20	SF
Rigid Cork	No	No	No	No	N/A	No	20	SF
Rigid Expanded Polystyrene	No	No	No	No	N/A	No	20	SF
Rigid Extruded Polystyrene	No	No	No	No	N/A	No	20	SF
Rigid Foamed-In-Place/PUF	No	No	No	No	N/A	No	20	SF
Rigid Foamglass	No	No	No	No	N/A	No	20	SF
Rigid Glass Fiber	No	No	No	No	N/A	No	20	SF
Rigid Multiple Types	No	No	No	No	N/A	No	20	SF
Rigid Perlite	No	No	No	No	N/A	No	20	SF
Rigid Phenolic	No	No	No	No	N/A	No	20	SF
Rigid Polyisocyanurate	No	No	No	No	N/A	No	20	SF
Rigid Polyurethane/Board	No	No	No	No	N/A	No	20	SF
Rigid Unknown	No	No	No	No	N/A	No	20	SF
Rigid Wood Fiberboard	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF
Vermiculite Fill	No	No	No	No	N/A	No	20	SF

Complete Component Catalog Breakdown

B30

B30 ROOFING

B301004 FLASHINGS & TRIM

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Chimney Cap/Squirrel/Bird Screen	No	No	No	No	N/A	No	25	LF
Flashings - Apron	No	No	No	No	N/A	No	25	LF
Flashings - Base	No	No	No	No	N/A	No	25	LF
Flashings - Cap	No	No	No	No	N/A	No	25	LF
Flashings - Embedded Edge Metal	No	No	No	No	N/A	No	25	LF
Flashings - Flashing Penetrations	No	No	No	No	N/A	No	25	EA
Flashings - Pitch Pans	No	No	No	No	N/A	No	25	EA
Flashings - Step	No	No	No	No	N/A	No	25	LF
Flashings - Valley	No	No	No	No	N/A	No	25	LF
General	No	No	No	No	N/A	No	25	LF
Other	No	No	No	No	N/A	No	25	SF
Unknown	No	No	No	No	N/A	No	25	SF

B301005 GUTTERS & DOWNSPOUTS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Downspouts	Yes	No	No	No	N/A	No	20	LF
General	No	No	No	No	N/A	No	20	LF
Gutters	Yes	No	No	No	N/A	No	20	LF
Other	No	No	No	No	N/A	No	20	LF
Unknown	No	No	No	No	N/A	No	20	LF

B30

Complete Component Catalog Breakdown

B30

B30 ROOFING

B301006 ROOF OPENINGS AND SUPPORTS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	75	SF
Gravity Ventilator	No	No	No	No	N/A	No	20	EA
Gravity Ventilator - 12" Diameter	No	No	No	No	N/A	No	20	EA
Gravity Ventilator - 12" x 12"	No	No	No	No	N/A	No	20	EA
Gravity Ventilator - 12" x 24"	No	No	No	No	N/A	No	20	EA
Gravity Ventilator - 12" x 36"	No	No	No	No	N/A	No	20	EA
Gravity Ventilator - 18" Diameter	No	No	No	No	N/A	No	20	EA
Gravity Ventilator - 20" x 72"	No	No	No	No	N/A	No	20	EA
Gravity Ventilator - 24" Diameter	No	No	No	No	N/A	No	20	EA
Gravity Ventilator - 24" x 72"	No	No	No	No	N/A	No	20	EA
Gravity Ventilator - 30" Diameter	No	No	No	No	N/A	No	20	EA
Gravity Ventilator - 36" Diameter	No	No	No	No	N/A	No	20	EA
Gravity Ventilator - 42" Diameter	No	No	No	No	N/A	No	20	EA
Gravity Ventilator - 48" x 60"	No	No	No	No	N/A	No	20	EA
Gravity Ventilator - 48" x 72"	No	No	No	No	N/A	No	20	EA
Gravity Ventilator - 6" Diameter	No	No	No	No	N/A	No	20	EA
Gravity Ventilator - 60" x 72"	No	No	No	No	N/A	No	20	EA
Gravity Ventilator - 72" x 72"	No	No	No	No	N/A	No	20	EA
Hatches	Yes	No	No	No	Yes	No	75	EA
Other	No	No	No	No	N/A	No	75	EA
Skylights	Yes	No	No	No	N/A	No	75	SF
Unknown	No	No	No	No	N/A	No	75	SF

B301090 OTHER ROOFING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	N/A	No	10	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	10	SF
Walkway Protection	No	No	No	No	N/A	No	10	SF

Details Req?	If 'Yes', all required section detail fields are to be populated.
Inventory Pic?	If 'Yes', an inventory level photo is to be provided. This is a step back photo showing the component.
Inventory Cmnt?	If 'Yes', an inventory comment is to be populated. This should describe the component.
Group OK?	Only applicable to each (EA) UOM's that are In Scope? = 'Yes'. If 'No' section must be a quantity of 1. if 'Yes' section may have a quantity greater than 1. If 'N/A' it is not applicable to the component type.
Age Based?	If 'Yes', age based (do not provide an inspection) is the desired approach. If 'No' but upon inspection the component is not visible, then an age based approach is acceptable.
Design Life	Design life of the component.
UOM	Unit of measure. If yellow highlight = new component type in 2019 update.



Sustainment Management System

Army BUILDER™ SMS Inventory and Assessment Guide

C10 INTERIOR CONSTRUCTION



**US Army Corps
of Engineers**
Mobile District

ERDC
Engineer Research & Development Center

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Summary of Changes

Date

Record of Revisions/Additions to SMS Inventory and Assessment Methodology

06/01/2019	Added component types under 'C102005 INTERIOR OVERHEAD DOORS'. The inventory guidance was also updated.
06/01/2019	Updated inventory guidance for 'C102091 OTHER INTERIOR PERSONNEL DOORS - Cipher Lock' to alleviate confusion on when this component type should be used.
06/01/2019	Updated inventory guidance for 'C102004 SLIDING & FOLDING DOORS' to alleviate confusion with the introduction of the 'C102005 INTERIOR OVERHEAD DOORS' component types.
06/01/2019	Updated inventory guidance on handrails to clarify when it is assumed that the handrail is part of the C20 stair component.

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Safety The following items should not be interpreted as 1) Safety Plan, 2) OSHA, or base safety requirements. These are recommendations. The contractor should operate in accordance with the SOW and approved safety plan.

Safety is of the utmost concern and should always be at the forefront of any activities taking place in the field. There are many potential safety hazards associated with building assessments. Prior to performing building assessments, the assessing staff/team must ensure that field activities are in accordance with the 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Safety Preparation Activities

Do not perform a task that may harm or endanger the health and safety of oneself or others.

Consult with the installation safety representative to review installation-specific safety requirements.

Conduct a daily “stand-up” safety meeting.

Ensure new assessors have been properly trained.

Review the assessment plan/schedule for the day.

Ensure proper Personal Protective Equipment (PPE) is available. This includes, but is not limited to, a hardhat; hearing protection; eye protection; safety shoes, gloves; and a safety colored vest.

Prior to conducting assessments, the team leader must check with the safety office or building POC to determine if there are any building/site-specific safety rules or hazards. For instance, some manufacturing areas may require steel toe shoes, hearing protection, or eye protection.

Safety Recommendations

Do not walk and write, or talk on a mobile phone, at the same time; this can lead to trips/falls.

Do not review documents or write while walking on steps or stairs.

Do not enter posted or suspected confined spaces such as crawl spaces, tanks, chases, or pits.

Mechanical rooms, attic spaces, or other areas with piping/ductwork may require the use of hard hats to prevent against head bumping hazards. Refer to the project specific safety plan for further clarification.

Do not enter areas with hazardous material signs posted or that appear to contain hazardous materials (asbestos, gases, visible mold, etc.).

Be careful when walking through/across vehicle maintenance or staging areas.

Be aware of loose-fitting clothing and lanyards that may get caught in tight areas or on piping such as in mechanical/electrical rooms, etc.

Be careful of wildlife and insects when walking around a building or opening seldom-entered mechanical/electrical rooms. Assessors may encounter snakes, spiders, stray cats/dogs, rats/mice, etc. in these areas. Do not enter or place hands in spaces that are not completely visible.

If a life safety problem is observed, do not try to fix it. Report it to the proper authority or building manager prior to leaving the building or area.

Before the assessment team leaves a building, ensure all team members are accounted for.

Ladder use should be done in accordance with 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Designate a safety POC to enforce the safety accident prevention plan.

Perform a daily safety briefing before field work. Document the attendees and the topics covered.

Halt outdoor field operations at the sign of lightning or thunder.

Safety Recommendations (continued)

Do not access pitched roofs. They may be assessed from a nearby building or using binoculars.

Use proper techniques to place, secure, and climb ladders. Never climb a ladder while holding anything. Always use the three-point technique for climbing. Equipment should be placed in a backpack or an over-the-shoulder satchel to free hands for climbing.

Do not operate powered equipment, Weight Handling Equipment (WHE)/cranes, or remove access covers from powered equipment to perform assessments.

BUILDER™ assessments are commonly performed without electrical test equipment. Do not use electrical test equipment to test circuits or equipment unless qualified by a local authority. Only open panel box doors or enter electrical/mechanical rooms following proper training. Consult the local safety representative.

Site Preparation

Site Preparation Activities

Coordinate with the base to determine building access requirements, such as: escorts; camera passes; classified/secure area restrictions; or keys.

Locate buildings on a map and develop a schedule. Coordinate with the base to identify the appropriate building manager from the POC list. Notify the building managers of the upcoming assessment as needed.

Obtain a set of mechanical/electrical room master keys from the installation POC.

Extract all BRED™ files from BUILDER™ and have them loaded onto tablets (if using tablets). Verify all tablets are charged.

If multiple buildings are to be assessed by one team, confirm the schedule and plan of action with the team leader. A schedule may have building start times detailed to the hour.

Review the building names for the types/sizes of buildings that will be assessed to determine/confirm the needed tools and safety equipment. For instance, if the facilities are not climate-controlled, prepare accordingly (for cold weather bring hats/gloves).

Recommended Assessor Gear/Tools

Hardhat	Digital Camera with Extra Battery(s)
Hearing Protection	Measuring Tape
Safety Glasses	Laser Measuring Device/Flash Light
Reflective Safety Vest	Measuring Wheel
OSHA Approved Footwear	Backpack
Other Required Personal Protection Equipment (PPE)	Graphite Powder (for stuck locks)
Cell Phone and Team Cell Phone List	Cleaning Pad (to clean/help read nameplates)
Assessment Schedule	Pen/Pencils
Building Floor Plans/Base Map	Clipboard
Small Magnet (for determining door/window type)	Paper/Assessment Forms
Flash Light/Compass	Graph Paper
Sun Screen/Bug Spray	Refillable Water Bottle

Operating efficiently in the field is key to the success of the assessment. The following guidance is detailed by 1) Team Leader and 2) Assessor. **Bold items are drivers for client deliverables.**

Team Leader

Upon arrival, check in with the building manager and QA representative (if present).

Conduct the building manager interview. The entire team should be present for the building manager interview. The following questions should be asked:

Question 1: Are there any mission-related deficiencies in the building?

Question 2: Are there any safety-related deficiencies in the building?

Question 3: Have there been any upgrades or remodels of the building?

Question 4: Are there any building deficiencies (HVAC not working, electrical breakers tripping, maintenance issues, roof leaks, etc.) present?

The team leader (ONLY the team leader!) should populate the building level comment with the following information: 1) Missing systems, 2) Renovation dates, 3) Areas of the building not accessible during the assessment, and 4) If drawings were/were not provided. Below are some examples of building level comments:

Comment 1: No A20, D10, or D40 systems present. 2016: Vault room not accessible. Drawings not provided.

Comment 2: No A20 systems present. Renovated in 2010. 2016: 5% of building not accessible. Drawings provided.

The team leader should review the real property data in BRED™ and compare it to what is found during the assessment. The following should be confirmed: 1) Number of stories, 2) Building square footage, and 3) Building install date and 4) Building number in BRED™ matches the building. Variances between real property data and actual field data should be recorded for inclusion into the client deliverable.

Team Leader and Assessors

Best Practice: Each assessor should first take a photo of the building number to identify the subsequent photos associated with the building when they are downloaded. Take a second picture that captures the overall building view with respect to nearby buildings/streets. This should help refresh/remind the assessor on what the building looks like, while performing data-entry.

A team caucus should occur to discuss the sectioning strategy for the building and confirm which side is facing north.

Each assessor should have a consistent approach to each building. Assessors should move around the building exterior and interior in a clockwise (or counterclockwise) manner making notes and taking photos.

If a safety item is found, notify the team lead. The team lead will notify the building manager. Capture a photo of the safety item for inclusion into the safety log. Follow all other project-specific procedures when a safety item is encountered.

Upon return to the office perform the following steps:

Step 1: Download all photos from the day to a building-specific folder. Review the photos and delete any that are blurry or unreadable.

Step 2: Complete all calculations and counts. Complete all data entry into BRED™.

Data Entry

With the technology that is available today, the need to use forms in the field and do data entry at the office has been mitigated. Tablets can be used to run BRED™ to complete data entry while in the field. It is understood that there are challenges to accomplish this for certain disciplines. It is only mentioned here as a best practice recommendation and is not a requirement to execute the work. There will be instances where electronics will not be allowed in a facility. Assessors should have a paper/pen data collection system ready as a backup.

General

This section presents common Unifmat C10 Interior Construction inventory component sections found across installations as a guide for entering into the BUILDER™ or BUILDER™ Remote Entry Database (BRED™) software. Inventory items are arranged by BUILDER™ System with Material/Equipment Category, Component Type, Unit of Measure, and Inventory Notes.

C1010 - Partitions: Partitions include interior walls constructed from different types of materials (typically drywall, masonry, wood, or plaster) and windows used to divide the interior space to meet the needs of the occupants.

C1020 - Interior Doors: Interior doors allow access, environmental control, and security for both personnel and non-personnel needs.

C1030 - Specialties: Fittings are a collection of interior components including shower compartments, cubicles, toilet partitions, counters, lockers, ladders, display boards, etc.

The interior construction system of a building facilitates space definition, separation, security, observation, functionality, and environmental control within the building. The system is designed to support the function/mission of the building and for the comfort and safety of the occupants.

Inspection

Do not provide inspection comments directed at/identifying only problems with the paint/paint coating. If another distress is present, an assessor may comment on the paint coating in their inspection comment.

Interior construction component sections are assessed using Direct Condition Rating (DCR) or Age-Based Modeling. Usually interior construction components will be visible. When component sections are not visible inventory should still be entered, but no assessment is provided. In this case, BUILDER™ will use the inventory year installed and degradation curves built in to the software to establish the Condition Index (CI).

Rule of thumb: If you can see it, you should inspect it. There are some caveats to this rule. See component catalog for items that must be age-based whether visible or non-visible.

The component should be rated based on its condition, NOT the condition of the paint coating. An assessor can have a DCR for the component and then select the 'PAINTED' box and provide a DCR for the paint coating.

The following conditions or events can accelerate interior construction deterioration and should be considered by the assessor: 1) Moisture damage due to roof or pipe leaks, 2) Damage due to personnel or 3) equipment, 4) Improper construction or installation, and 5) Neglected maintenance.

The life cycle for Interior Construction varies based on material type/quality, amount of use, and care over the lifecycle. Typically finish materials are short-lived components and the lifecycle is based on the manufacturers' standard life of the product.

When performing an assessment, the 'PAINTED' box should only be selected for components that have local or field applied paintings/coatings. DO NOT mark 'PAINTED' for manufacturer- or factory-applied coatings as they tend to age consistently with the components.

Inventory

It is critical to confirm the year installed (default will be from real property records), or estimate the year installed. BUILDER™ uses the install date, degradation curves, and assessment observations to establish a CI for each component section. If the assessor suspects the default install date is not accurate, or an addition or renovation has taken place, check the real property record for year renovated or check local as-built or renovation drawings to help estimate the year installed.

A sliding glazed door will often have a fixed glazed component as part of the assembly. This should be counted as 1 EA and not inventoried as one part door and one part window since it is one assembly.

As a general rule, all double doors are inventoried as 2 EA.

Except where specifically noted in this Guide, do not use 'General' where a more specific item is available as a component type selection.

If construction drawings or as-builts are available, look for date published to assist with determining age of materials. Custodial drawings can also be a good resource.

If the interior (C10) and exterior (B20) master systems are divided between two assessors, extra coordination needs to take place to avoid duplication/missing of components. If B20 captures the exterior block, it should not be included in C10 as well. If that same block wall is furred out with a 'Wall - Drywall w/Stud Framing,' then there is a C10 component that needs to be captured.

In some cases, interior construction sections may be replaced as an individual repair or partial replacement. These areas would have a different age. The real property construction and renovation dates should be confirmed; if they are not appropriate, the interior construction age must be estimated. The building occupants or other facilities staff may be able to provide some information

Interior construction components inventoried for buildings are usually visible. When interior construction components are not visible, as-built drawings should be used to identify and quantify the interior construction components. If as-built drawings are not available, the assessor may use experience to make an assumption for the interior construction types and quantities based on similar construction, consultation with local staff, and other reputable online resources.

Interior windows are assessed separately from the interior partition walls. The UOM to be used is SF.

The year or date manufactured for interior doors may be visible on a label on the door edge (hinge side) in determining age.

Transoms and sidelights on doors are inventoried as windows. If the sidelight extends to the ground it should be inventoried as an interior storefront.

When a component is concealed/hidden, the inventory comment box is used to indicate the reason for no inspection taking place. Standard comments should be used.

Photography

General comment: Photos are captured to document the following: 1) Inventory, 2) Condition (deficiency), 3) Historical record of the asset, 4) QC, and 5) Life safety issues.

All components where an 'Other' component type is selected must have a photo attached at the Inventory/Section level. (Required)

Assessors should take a photo of the building number at the start of the building assessment to delineate the start/stop of the photos between buildings. (Best Practice)

Assessors should take photos to allow for quality control (QC) confirmation and data backup. It is a good practice to have a photo of every component type encountered in an assessment. (Best Practice)

Components that have a DCR (component rating only) of A+ or worse should have a photo taken that shows the deficiency identified in the inspection comment. The photo should be attached to the record at the Inspection level. (Required)

Life Safety issues should be photographed for documentation of the safety item and used in safety reports. The photo should be sent to the team lead and all required steps outlined in the safety plan are to be completed. (Required)

Paint DCR does not drive the requirement for a photo to be attached at the inspection level. Example: A component has a DCR of 'G-' and a paint DCR of 'A' would result in no photo attached to the inspection.

See Scope Of Work (SOW) for any photo renaming/deliverable requirements.

The Team Leader is required to take one photo of the front elevation, or a representative elevation view, and attach the photo to the building record at the building level. (Required)

Reinspection

All existing quantities for components such as floor finishes and window counts are to be validated to a +/-15% accuracy. This can be accomplished through random sampling.

Assessors must not delete/edit components and sections that are not within their discipline.

BRED™ functions such as 'Copy Building' and 'Copy Section' should not be used unless their ramifications are fully understood. Copy building: The entire building will be copied. Copy section: All items with the same section name will be copied. For example, if a D50 assessor uses copy section on the section name FL1, the assessor may copy/paste interior doors, mechanical equipment, etc. without knowing it. If there is no existing data, these functions are easily used.

Existing data should be deleted if: 1) The component is no longer present, 2) The correct component type exists, 3) There are duplicate components with the same section name, or 4) The component is correct but has the wrong install date (requires deletion and re-entry with correct date).

If a component type in the existing data is no longer in scope, it must be updated to an in-scope item, or deleted if no longer applicable.

Past inspection comments are not required to be revised to current standards.

Section names, component types, and quantities must be verified and updated.

When performing a reinspection it should be understood that modifications in the inventory guidance may have taken place between the previous assessment date and the current effort. The new assessment should update the inventory to the latest inventory guidance. This may require, but is not limited to, combination of quantities (Ex: removing cardinal direction sectioning when it is no longer needed), modifying component type selections, or removing/adding items. The detailed inventory guidance portion of the manual will often provide direction on what steps need to be taken.

Sectioning

Additions, new wings, or major renovations likely require identifying separate Interior Partitions or Interior Doors sections with different ages.

In the case of interior construction, the assessor must use judgment in sectioning interior partitions or doors. In large buildings with many interior partitions or doors, these components should be sectioned in the manner they are generally managed. If there are two major types or ages of interior partitions or doors, then separate sectioning is a good idea. If sectioning out a single door inclusion of the room number (if available) in the section name is required.

In the case where age/condition/material type is different for a single component type it is required that the functional area be included in the section name such as 'FL1 - LOBBY' and 'FL2 - KITCHEN'.

Interior construction is always sectioned by floor. If there are multiple easily definable wings of a building with different install dates, then sectioning by floor AND by wing is required. For example, if there is an east and west wing on a 2-floor building, you would have 'FL2 EAST' and 'FL2 WEST'.

Once all base sectioning guidelines have been followed, there may be a need to apply a DCR-driven sectioning methodology based on two factors 1) difference in DCR, and 2) quantity of distress. Step 1: Assessors should section a component when there is a 2-step difference in DCR (Ex: G- to A) in accordance with the guidance found in Step 2. If there is only a 1-step difference in DCR, the assessor shall have a single section and the lower of the DCR's should be used. Step 2: When a 2-step difference is found, the assessor should consider the quantity of distress that is present. If the distress is present on 25% or less of the component, a single section with a DCR in-between the high/low DCR shall be added (if G-/A are found then A+ is used). If the distress is present on over 25% of the component, two sections should be added at the high/low DCR. Any component with a 3-step or more difference in DCR should have two sections.

The most critical part to an assessment is having all assessors aligned on how to perform an assessment. To reach an accurate DCR of a component, follow the steps below:

Step 1: Consider the level of degradation and the performance of the component:

OPERATIONAL CAPABILITY	OPERATIONAL CONDITION RATING	DEGRADATION	DCR
Fully Operational	Green	Free of observable or known degradation.	Green (+)
		Normal wear requiring normal preventative maintenance.	Green
		Normal degradation requiring corrective maintenance.	Green (-)
Impaired Operation	Amber	Minor degradation requiring corrective maintenance.	Amber (+)
		Moderate degradation requiring corrective repair.	Amber
		Significant degradation requiring moderate repair.	Amber (-)
Inoperable	Red	Extensive degradation requiring major repair.	Red (+)
		Severe degradation requiring major rehabilitation or partial replacement.	Red
		Complete degradation requiring full replacement.	Red (-)

Step 2: Consider the maintenance requirements of the component:

Type	Green (G+/G/G-)	Amber (A+/A/A-)	Red (R+/R/R-)
Dynamic (Equipment)	<p>Distresses present are of no impact to the components operation.</p> <p>Example: The fan component is fully operational.</p>	<p>Distresses present are of impact to the components operation. A repair is needed to bring the component back to proper operating condition</p> <p>Example: A fan has corrosion on the housing. A sand and paint would remove the distress.</p>	<p>Distresses present are of impact to the components operation. The component needs to be replaced.</p> <p>Example: A fan motor has overheated and no longer functions. Replacement of the component is required.</p>
Non-Dynamic	<p>The architecture component is in good condition requiring no maintenance outside of normal operations.</p> <p>Example: The carpet component is fully operational.</p>	<p>The architecture component has a distress that requires an extra level of maintenance outside of normal operations. This extra maintenance (or repair) would be an action such as a cleaning or a painting of a surface.</p> <p>Example: A carpet component has stains. A cleaning would remove the distress.</p>	<p>The architecture component has a distress where a maintenance operation will not fix the problem at hand. A replacement of the component is required.</p> <p>Example: A carpet component is damaged (ripped). The component needs to be replaced to fix the distress.</p>

Dynamic: Refers to equipment in the D10, D20, D30, D40, D50, and E10 systems.

Non-Dynamic: Refers to architectural components in the A10, A20, B10, B20, B30, C10, C20, and C30 systems.

Note: There are some Non-Dynamic components (for instance, toilets under D20) in the Dynamic systems.

Step 3: Adhere to the following requirements:

Requirements
Maintainability and obsolescence should not be the driving factor when conducting a condition assessment unless it has led to actual deterioration of condition that can be observed or reasonably inferred.
G+ ratings should only be given to inventory that is in pristine condition and is free of any observable defects.
Do not downgrade an assessment rating simply because an item is dirty.
Do not downgrade an assessment rating because the item does not meet current code compliance standards
Do not downgrade an assessment rating because the item is not deemed energy efficient.
Do not downgrade an assessment rating because the item is deemed to be a safety violation/hazard unless otherwise directed.
Do not downgrade an assessment rating because of a code violation.
Ratings should not be anticipated based on planned repairs or replacement.
Assessors should not expend field time and effort to determine the cause of a deficiency. If the cause is easily identified it should be included in the inspection comment.
Ratings shall be based upon the observable and documentable condition of the component.
A component should be downgraded if its operational capability, performance, reliability, etc. is compromised according to the direct rating definitions.
Incorporate user interviews, work order histories, or other information sources when determining the condition of the component. Include this information in the inspection comment.

The assessor should calibrate their mindset on what the expected DCR should be based on condition.

The assessor should consider the maintenance requirements of the component in the current condition.

The assessor should factor in the requirements/business rules for completing an inspection.

One factor that can play into an assessment is if the assessor receives information from a POC that results in a lower rating. For instance, an assessment takes place in July and there is a heating water pump that looks brand new, but has a blown motor. The assessor would assume the pump is supposed to be off due to being off season, but if the POC informs the assessor about the blown motor, this can be factored into the assessment (and indicated in the inspection comment).

One factor that should not play into an assessment is pending replacements of components. Assessors should rate components in the condition they are at the time of assessment. If the carpet is being replaced next month, that should not factor into a rating. Now, if the carpet contractor is on site (the work is currently taking place), this could be factored into the rating and a G+ rating provided with the current date of inspection chosen as the install date.

Service Life: No distresses present and component is nearing (or past) its service life.

The following comment can be used as an inspection comment for components that have no signs of distresses, are rated either Amber (A) or Amber Plus (A+), and are over 75% through their service life. This negates the need to have 4 parts of an inspection comment. Also, an inspection photo is no longer required.

[First Last-AE-Date] - The component is in proper working condition and is showing no signs of distress. The DCR was based on estimated remaining service life.

Step 1: Understand the 5 parts of the inspection comment:

Part #	Part Type	Type Description
1	Front End	[First Last-AE-Date] OR [First Last-DPW-Date] (ex: [John Doe-AE-7/4/2017])
2	Distress	Identifies the distress of the component
3	Severity	Identifies the amount of the distress.
4	Location	Identifies the location of the distress
5	Quantity	Identifies the quantity of the distress

Step 2: Use the DCR of the component as the basis for the severity.

DCR	Severity
Amber (+)	Minor/Mild
Amber	Moderate
Amber (-)	Significant/Major
Red (+)	Extensive
Red	Severe
Red (-)	Complete/Total

To aid in the inspection comments reading correctly the severity can be modified slightly. For instance, 'moderately' can be used for an 'A' DCR comment. This approach also applies to the distresses where one of the 23 MUST be selected. If 'Cracked' is selected as the distress, the wording 'cracks' may be used.

Step 3: Identify the distress of the component:

23 Distresses			
Blistered	Displaced	Overheated	Capability/Capacity Deficient
Broken	Efflorescent	Patched	Animal/Insect Damaged
Clogged	Holes	Rotten	Moisture/Debris Contaminated
Corroded	Leaks	Stained/Dirty	Noise/Vibration Excessive
Damaged	Loose	Cracked	Operationally Impaired
Deteriorated	Missing		Electrical Ground Inadequate or Unintentional

Step 4: Location and Quantity

Location on non-dynamic assets - 'lobby area' or 'northwest corner'.

Quantity on a SF UOM will typically be a %. On an EA UOM will typically be a count.

Step 5: Put all 5 components together to form an inspection comment (colors correspond to part):

A+	Front End	CRACKED.	The	walls have	minor	cracks	present on	10% of the	gym.
A	Front End	DETERIORATION.	The	carpet has	moderate	deterioration	over	50 %	of the lobby.
A-	Front End	DAMAGED.	The	door has	significant	damage	to the	lower half	of the door.
R+	Front End	CRACKED.	The	windows have	extensive	cracks	present in	4	panes.
R	Front End	LEAKS.	The	roof has	severe	leaking	around the	HVAC	penetrations.
R-	Front End	OPERATIONALLY IMPAIRED.	The	3	north	doors are	completely	operationally impaired.	

Inspection Comments

Rule #	Rule
1	Required on all inspections with a DCR of A+ and below.
2	Paint DCRs do not have an inspection comment requirement. Only the component DCR A+ and below.
3	Should include any component specific information obtained from the base or POC interview.
4	Should be in complete sentences and use industry standard terminology. Comments can be typed into MS Word for spelling/grammar checks and then pasted into the comments box.
5	Do not use all capital letters for the entire comment. The distress should be all capital letters.
6	Do not use abbreviations, jargon, or slang.
7	Should give enough information for a follow-on assessor to locate the problem area/equipment.
8	Should accurately describe the problem/observation that is the basis for the rating. Someone unfamiliar with the particular item should have an accurate picture of the components current condition and the justification for the assigned rating.
9	Should accurately describe the location of the distress if the component is only showing a distress in a single location. For instance, if an office has a stain in the carpet, it would be necessary to call out the room number of the office.
10	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. For instance, assessor John Doe at firm AE: [John Doe-AE-7/4/2017].
11	After #10 front end information in the brackets one of the 23 distresses should be provided in capitalized form. Building on #10 for an example if stained carpet: [John Doe-AE-7/4/2017] - STAINED.
12	After #10 and #11 a sentence should be provided that provides the distress, severity, location, and quantity. Quantity/Location refers to the amount/location of the distress present.

Inventory Comments

Rule #	Rule
1	Used to identify components that were not visible for inspection. See standard comments.
2	Used as a bread crumb for follow-on inspections. Can provide useful additional information such as location or type to help the next assessor understand what was being inventoried. Ex: This component is the stone wall located behind the receptionist in the lobby area.
3	Should describe the component inventoried where 'OTHER' is used to allow follow-on assessments to understand what was inventoried in the previous assessment.
4	Used to provide the location of the component (especially used for architecture components where there are no Section Details provided that have a location): Roof, NW Corner, Room Number
5	Do not use all capital letters, abbreviations, jargon, or slang.
6	Used to further describe an asset if it is not adequately described in the component type selection.
7	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Section Detail Comments

Rule #	Rule
1	Used to identify data that was not able to be populated in the Details fields. See standard comments.
2	Used to provide information that is specific to just that component section detail field. This can be a location of the specific section or something that the section services.
4	Do not use all capital letters, abbreviations, jargon, or slang.
5	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Standard Inventory Comments

When	Use Standard Comment
Assets are not visible for inspection.	Component was not visible for inspection. The component condition will be age-based by BUILDER program degradation curves.
Assets are not visible for inspection that also require Section Details to be populated.	The component is not visible for inspection or population of Section Details. The component condition will be age-based by BUILDER program degradation curves and no nameplate data or inventory photo will be provided.
Assets are not visible for inspection that require quantities to be assumed. Hidden mechanical equipment, ductwork, and # of control points are common occurrences.	The component is not visible for inspection and the quantity was estimated based on architect/engineering judgment. The component condition will be age-based by BUILDER program degradation curves.
Assets are located in an area where no electronics area allowed. This prevents an assessor from taking inventory/inspection photos.	The component is located in a secure area of the facility that did not allow electronic devices to be used. Photos were not obtainable.
Assets are visible for inspection but are a system that is not tested (HVAC controls, security system, etc.) so an age-based BUILDER™ CI is desired.	The component condition will be age-based by BUILDER program degradation curves.

Standard Section Detail Comments

When	Use Standard Comment
Nameplate is not found on the component.	Nameplate not found on the component. All fields with "NA" represent data not found.
Nameplate is found on the component but it is partial/completely unreadable.	Nameplate on the component was dirty/corroded/damaged/sunwashed. Section Detail fields with "NA" represent data that was not found.
Nameplate is found on the component that is readable but is missing certain Section Details fields.	Nameplate on the component was missing certain Section Detail fields. Section Detail fields have been populated and fields with "NA" represent data not found.

Comment Front-End Clarification

A front end refers to the bracketed information at the start of an inspection/inventory/section detail comment. The front end must have to following 3 pieces of information: 1) assessor name, 2) assessor company or affiliation, and the date. The BRED™ stamp may also provide the time of inspection which is acceptable.

BRED™/BUILDER™ Clarification

The terms BRED™ and BUILDER™ are used interchangeably throughout this document.

Rule #	Rule
1	Components are divided into sections when a significant variation exists in material/equipment category, age, or construction history, which impacts the life cycle characteristics of the component. Example 1 - If a wing or addition was added to a much older building, the two areas of the building should be sectioned differently because the age and construction history is different. Example 2 – If the building roof has multiple levels of similar materials in different conditions, these levels should be sectioned differently to capture the difference in condition. Example 3 – If the building has more than one of a particular type of component, separate component sections. For example: There is a 5,000 and 10,000 CFM air handler.
2	Multi-wing buildings are always sectioned by wing if the installation date of the wings vary. If a building is an 'E' shape and all wings have the same install date only sectioning by floor is required.
3	Multi-story buildings are always sectioned vertically by floor or level (in the case of a basement or mezzanine).
4	There may be unique instances where sectioning by an area of a building is required. For instance, if a building is split between two companies an installation may request sectioning by company 1 and 2.
5	An on-site discussion must occur at each building among all team members to determine the cardinal direction of the building. All assessors should have North as the same side of the building.
6	An on-site discussion must occur at each building among all team members on how the building should be sectioned. The goal is to avoid one assessor calling it a toilet, one calling it a restroom, and another calling it a bathroom. Standard sectioning naming is important for a consistent data set.
7	The section name should not be repetitive of the component type or material. If the floor is wood, do not have a section name 'WOOD'. Incorporation of the location into the section name is very helpful to be used for follow on assessments. If the wood floor has the section name 'LOBBY', it provides great

Standard Section Names and Format Rules

Use	Standard Section Name
Section by Floor (Business Rule)	FL1 – 1st Floor, FL2 – 2nd Floor, FL3 – 3rd Floor, etc.
Section by Floor (Business Rule)	BASEMENT, MEZZANINE, ATTIC, etc.
Section by Wing (applicable if different construction histories or condition only)	MAIN, WING A, WING B, WING C, ADDITION, etc.
Section by Direction (applicable if different construction histories or condition only)	NORTH, EAST, WEST, SOUTH, etc.
Section by Roof Level (applicable if different construction histories or condition only)	UPPER, LOWER, MAIN, etc.

When an equipment tag is included in the section name it should match exactly what was found in the field. Example: if the boiler ID number is B-1, the section name equipment tag portion should read B-1. If the boiler is tagged B1, the equipment tag portion should read B1. See equipment sectioning for further guidance.

Dashes are not required in the section name other than the instance in regards to equipment ID tags above.

The section name field is always entered in all capital letters.

Sectioning Business Rules - Grouping

The following only applies to each (EA) unit of measure (UOM) components. The 'Complete Component Catalog Breakdown' at the end of the section has a 'Group OK?' column. This has the values of 'Yes', 'No', and 'N/A'.

'Yes' = Grouping is allowed for this component type. A quantity of greater than '1' is acceptable.

'No' = Grouping is not allowed for this component type. The quantity must be '1'.

N/A = Not Applicable. Component type is not an EA UOM or is out of scope.

Group OK? = Yes when Section Details and Inventory Photos are Required.

There are several equipment component types (Unit Heaters, small pumps, etc) that have the following designations in the 'Complete Component Catalog Breakdown': 1) Group OK? = Yes, 2) Section Details? = Yes, and 3) Inventory Photo? = Yes.

In this case, a single section detail and inventory photo representative of the entire section is required. A few more clarifications:

- 1) The location field would be for the entire section (FL1/BAY 1/EXTERIOR) and not specific to a single component.
- 2) A difference in manufacturer does not drive further sectioning. For instance, 2 KW electric unit heaters from multiple manufacturers can be combined into one section. Capacity (2 KW) is the driver for sectioning methodology.
- 3) It is understood that the single section detail field is representative of the entire section. The details should be populated per one component. There is no need to enter multiple details or try to combine multiple manufacturer/model/serial/etc into to a single section detail field.

Group OK? = No

The quantity for these component types must be 1. For equipment (Section Details? = Yes and Inventory Photo? = Yes) the guidance found on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components', 'Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components', and 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components' must be followed.

C101001 FIXED PARTITIONS - Other

Typical Application and General Component Guidance:

This component is used to inventory other type of wall construction.



Business Rules/General/Lessons Learned/Reinspection

Lesson Learned

There are many types of walls that are not present in the catalog that are inventoried under 'C101001 FIXED PARTITIONS -Other'. One of the most common is metal panel with stud backup (see photo).

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Other	Yes	No	Yes	Yes	N/A	No	14	SF

C101001 FIXED PARTITIONS - Security Cage/Wire Mesh

Typical Application and General Component Guidance:

The component is used to inventory fencing/mesh that is used as a partition.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

The security cage/wire mesh should be permanently affixed to the facility. A bolted-down installation meets this requirement.

Lesson Learned

Assessor to also capture a quantity of the gates for inclusion in 'C102006 INTERIOR GATES.'

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Security Cage/Wire Mesh	Yes	No	No	No	N/A	No	20	SF

C10 INTERIOR CONSTRUCTION - C1010 PARTITIONS

C101001 FIXED PARTITIONS - Wall - Concrete Block**Typical Application and General Component Guidance:**

The component is used to inventory interior concrete block/CMU walls.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

When calculating the height for use in area calculations, use the distance between the floor and ceiling. Do not account for the unseen portion of the wall above the ceiling. Measuring to the nearest foot is acceptable.

Typical Distress

Damaged concrete block/CMU.

Mortar joint deterioration due to exposure to moisture.

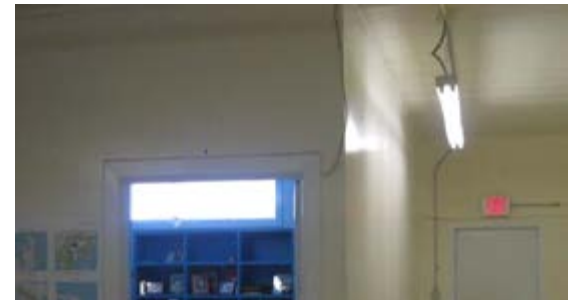
Paint deterioration due to exposure to moisture.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Wall - Concrete Block	Yes	No	No	No	N/A	No	75	SF

C10

C101001 FIXED PARTITIONS - Wall - Drywall w/Stud Framing**Typical Application and General Component Guidance:**

This component is used to inventory the drywall interior partition walls.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

In the rare case where one side of the wall does not have drywall, it should be inventoried in a regular fashion in which both sides had drywall. Add an inventory comment stating the % of wall not covered on the other side.

This assembly includes the studs and BOTH sides of the drywall. Do not double count when in different rooms that share the same wall. Do not add C301003 Gypsum Wallboard Finish to the other side of the wall.

When calculating the height for use in area calculations, use the distance between the floor and ceiling. Do not account for the unseen portion of the wall above the ceiling. Measuring to the nearest foot is acceptable.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Wall - Drywall w/Stud Framing	Yes	No	No	No	N/A	No	50	SF

C10 INTERIOR CONSTRUCTION - C1010 PARTITIONS

C101002 DEMOUNTABLE PARTITIONS - General**Typical Application and General Component Guidance:**

This component is used to inventory demountable partitions.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Demountable partitions are very common on installations, and even though they can be viewed as temporary construction, they should be inventoried as part of the assessment.

Demountable partitions will often have interior doors and windows integrated into the assembly. Do not capture these items separately, as it is assumed that the C101002 component cost includes these items. The DCR is for the entire assembly.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF

C101003 RETRACTABLE PARTITIONS - General**Typical Application and General Component Guidance:**

This component is used to inventory retractable wall partitions. This will be commonly found in office buildings and large meeting rooms.

**Business Rules/General/Lessons Learned/Reinspection****Lesson Learned**

These are very common in large offices or halls and are used to divide the space as needed. They will often tuck away in a concealed area and can be easily missed. Look for a rail along the ceiling that the door will travel on when opened.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF

C10 INTERIOR CONSTRUCTION - C1010 PARTITIONS

C101004 INTERIOR GUARDRAILS & SCREENS - Guardrail**Typical Application and General Component Guidance:**

This component is used to inventory guardrails. The photo shows a glazed guardrail.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Handrails that are of different material and affixed to a stair component should be inventoried. The most common application of this rule is concrete stairs that have metal handrails. The metal handrails will often be in worse condition than the steps.

Handrails that are of like-kind material and affixed to a stair component should not be inventoried. The most common application of this rule is metal stairs in which the handrails are also metal and are integral to the component.

There are times where mezzanine or balcony has a wall component (such as concrete block) that provides the majority of fall protection but will still have a single rail along the top of the wall. Do not inventory as a guardrail in this instance.

General

Used to capture a crash rail along a wall (typically in a healthcare facility) or a railing acting as a fall prevention device on a balcony or mezzanine.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Guardrail	Yes	No	No	No	N/A	No	20	LF

C101005 INTERIOR WINDOWS - General**Typical Application and General Component Guidance:**

This component is used to inventory interior windows.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Interior windows should be inventoried using a 'SF' UOM similar to all other wall construction component types. Use 'C101005 INTERIOR WINDOWS - General'.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF

C10 INTERIOR CONSTRUCTION - C1010 PARTITIONS

C101005 INTERIOR WINDOWS - Interior Windows**Typical Application and General Component Guidance:**

This component is included for clarification purposes only.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not use as this is an 'EA' UOM. Use 'C101005 INTERIOR WINDOWS - General', which is a 'SF' UOM.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Interior Windows	No	No	No	No	N/A	No	50	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

C10

C101005 INTERIOR WINDOWS - Metal Rollup/Coiling Grille**Typical Application and General Component Guidance:**

The component is used to inventory metal rollup/coiling grilles.

**Business Rules/General/Lessons Learned/Reinspection****General**

These are commonly found in food service buildings such as the base commissary or dining facility.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Metal Rollup/Coiling Grille	Yes	No	No	No	N/A	No	20	SF

C10 INTERIOR CONSTRUCTION - C1010 PARTITIONS

C101006 GLAZED PARTITIONS & STOREFRONTS - General**Typical Application and General Component Guidance:**

This component is used to inventory interior storefronts. Storefronts are defined as windows that extend to the floor and are commonly found on the interior walls of vestibules.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Only used to capture interior storefronts. If there is an interior glass wall, 'C101007 INTERIOR GLAZING' should be used.

Lesson Learned

If a door has a sidelite that goes to the floor it should be counted as an interior storefront.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF

C101007 INTERIOR GLAZING - General**Typical Application and General Component Guidance:**

This component is used to inventory interior glass walls.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Only used for glass walls. If there is an interior storefront, 'C101006 GLAZES PARTITIONS AND STOREFRONTS' should be used.

General

Commonly found in buildings with offices that have an interior glass wall to the rest of the space or in gyms that have racquetball courts.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF

C102001 STANDARD INTERIOR DOORS - General**Typical Application and General Component Guidance:**

This component is not used very often, as there are more appropriate component types in 'C102001.'

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

All double doors or pairs of doors are to be inventoried as 2 EA.

Dutch doors should be sectioned as 'DUTCH.' While Dutch doors are '2' sections, they are inventoried as a quantity of 1.

Interior doors that have windows in them DO NOT count toward the 'C101005 INTERIOR WINDOWS' quantity value.

There can be plastic doors (think swinging doors in/out of a kitchen or the back of a warehouse area) found in a building. Inventory under 'General' with the section name 'PLASTIC'.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	40	EA

C102001 STANDARD INTERIOR DOORS - Metal Door**Typical Application and General Component Guidance:**

This component is used to inventory interior metal doors.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

All double doors or pairs of doors are inventoried as 2 EA.

Typical Distress

Corrosion or damaged.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Metal Door	Yes	No	No	No	Yes	No	50	EA

C102001 STANDARD INTERIOR DOORS - Wood Door/Metal Frame**Typical Application and General Component Guidance:**

This component is used to inventory interior wood door/metal frame doors.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

All double doors or pairs of doors are inventoried as 2 EA.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Wood Door/Metal Frame	Yes	No	No	No	Yes	No	40	EA

C102001 STANDARD INTERIOR DOORS - Wood Door/Wood Frame**Typical Application and General Component Guidance:**

This component is used to inventory wood door/wood frame interior doors.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

All double doors or pairs of doors are inventoried as 2 EA.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Wood Door/Wood Frame	Yes	No	No	No	Yes	No	40	EA

C102002 GLAZED INTERIOR DOORS - General

Typical Application and General Component Guidance:

This component is used to inventory interior glazed doors.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

All double doors or pairs of doors are inventoried as 2 EA.

If a door has a window, it is not considered to be a glazed door. Glazed doors consist primarily of full height glass panes with or without a frame/stile on the perimeter of the door.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
General	Yes	No	No	No	Yes	No	40	EA

C102003 FIRE DOORS - General

Typical Application and General Component Guidance:

This component is used to inventory fire doors.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

All double doors or pairs of doors are inventoried as 2 EA.

Only inventory under 'C102003 FIRE DOORS' when there is a magnetic 'mechanical closure' device that keeps the door open. All other doors should be inventoried under 'C102001 STANDARD INTERIOR DOORS.'

General

It is understood that fire doors are often located throughout a facility. Due to the maintenance requirements of mechanical closure doors that are controlled by the fire protection system, it is desired that these be inventoried separately.

Lesson Learned

There may be a fire-rated label on the inside edge that can be helpful in determining if a door is fire rated.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
General	Yes	No	No	No	Yes	No	40	EA

C102004 SLIDING & FOLDING DOORS - General

Typical Application and General Component Guidance:

This component is used to inventory sliding/folding doors.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Folding doors will typically have multiple leafs. DO NOT inventory by leaf. Inventory by the opening as the EA quantity, NOT by how many doors are present. If two folding doors make up one closet opening, that is a quantity of 1.

If there are multiple types of these doors, section them separately for ease of reassessment. It helps to also include a location, if possible. For example, you could have both 'BIFOLD - CLOSET' and 'SLIDING - PANTRY' sections in a housing unit.

The component type 'General' is used for folding doors. The other component types are used for sliding/rolling doors (as shown in the photo).

There are rolling doors component types in both 'C102004 SLIDING & FOLDING DOORS; and 'C102005 INTERIOR OVERHEAD DOORS'. The former would be used for a door that slides. The latter would be used for a coiling overhead door.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	30	EA

C102005 INTERIOR OVERHEAD DOORS - Steel Rolling, Electric, 12'x12'**Typical Application and General Component Guidance:**

This component is used to inventory interior overhead doors.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Interior overhead doors may be abandoned in place if the building mission has changed. If it is apparent that this is the case, do not inventory the door.

There are rolling doors component types in both 'C102004 SLIDING & FOLDING DOORS; and 'C102005 INTERIOR OVERHEAD DOORS'. The former would be used for a door that slides. The latter would be used for a coiling overhead door.

Lesson Learned

Overhead doors are often found in warehouses separating the different bays.

Reinspection

Prior to the 2019 update the component types available were 'Metal', 'Wood', and 'General'. Due to a lack of component types, it should be assumed that during a reinspection a new inventory of overhead doors will be required.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Steel Rolling, Electric, 12'x12'	Yes	No	No	No	Yes	No	20	EA

C102006 INTERIOR GATES - General**Typical Application and General Component Guidance:**

This component is used to inventory interior gates.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

The security cage/wire mesh should be permanently affixed to the facility. A bolted-down installation meets this requirement. The gate associated with this installation should be captured under 'C102006 INTERIOR GATES.'

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	20	EA

C102090 OTHER INTERIOR SPECIALTY DOORS - Cold Storage**Typical Application and General Component Guidance:**

This component is used to inventory doors to built-in freezers. DO NOT use for stand-alone freezers.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If a freezer/cooler is integral to the building construction, the door should be inventoried.

If the freezer/cooler is a stand-alone unit that is not part of the building construction, there is no need to inventory the door. It is viewed as a stand-alone piece of equipment.

General

This is commonly found on large buildings where the freezer/cooler is an entire room in a building. The interior/exterior walls are captured in B20/C10, and the doors should be captured here in 'C102090 - Cold Storage.'

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Cold Storage	Yes	No	No	No	Yes	No	20	EA

C102091 OTHER INTERIOR PERSONNEL DOORS - Cipher Lock**Typical Application and General Component Guidance:**

This component is used to inventory security doors.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

This component is used to capture interior blast doors. A door into an armory would fall under this component type. Note: If the door is on the exterior, the component type 'B203006 BLAST RESISTANT DOORS - General' should be used.

This component is used to capture vault type doors. Do not use to capture regular metal doors that have an electronic lock installed (these should be inventoried under metal doors).

General

The lock-type is not a driver for service life of a door. Typical doors found in a facility should be inventoried under 'C102001 STANDARD INTERIOR DOORS'.

Lesson Learned

These doors are typically found in either secure buildings or secure rooms within a building.

Reinspection

Prior to the 2019 update assessments may have incorrectly captured typical doors with generic electronic locks under this component type. Assessors should update door counts if this inventory method was used.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Cipher Lock	Yes	No	No	No	Yes	No	40	EA

C102091 OTHER INTERIOR PERSONNEL DOORS - General**Typical Application and General Component Guidance:**

This component is used to inventory other material/type doors that do not fall into any other component types available. The photo shows a swinging decorative door.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

The section name should be populated with type/location to allow future assessments to understand what was being inventoried. For example, if it is a swinging kitchen door, it should be 'KITCHEN DOOR - SWINGING'

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	Yes	No	40	EA

C103001 COMPARTMENTS, CUBICLES & TOILET PARTITIONS - Shower Compartment

Typical Application and General Component Guidance:

This component is used to inventory shower compartments.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

This component captures manufactured shower compartments. If a shower is constructed entirely out of wall tile/floor tile/and gypsum ceiling, then there is no need to inventory a shower compartment. All the components are inventoried elsewhere.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Shower Compartment	Yes	No	No	No	Yes	No	20	EA

C103001 COMPARTMENTS, CUBICLES & TOILET PARTITIONS - Toilet Partitions

Typical Application and General Component Guidance:

This component is used to inventory toilet partitions.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Each stall should be counted as 1 EA 'toilet unit.'

Typical Distress

Broken wall and/or floor anchors.

Corroded anchors due to wet floors.

Rust and corrosion due to exposure to moisture and a concentrated source of Hydrogen Sulfide (H₂S) generation.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Toilet Partitions	Yes	No	No	No	Yes	No	20	EA

C103001 COMPARTMENTS, CUBICLES & TOILET PARTITIONS - Urinal Screen**Typical Application and General Component Guidance:**

This component is used to inventory the urinal screens. In the photo there is a quantity of 5.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Urinal Screen	Yes	No	No	No	Yes	No	20	EA

C103005 LOCKERS - General**Typical Application and General Component Guidance:**

This component is used to inventory lockers.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Lockers must be of large enough size that personal items (backpack/purse) can be stored. The intent of this component type is not to inventory small lockboxes outside of a secure room that are used to store cell phones.

Lockers must be permanently affixed to the building.

General

Commonly found in gyms and training facilities.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	30	EA

C103010 CASEWORK - General**Typical Application and General Component Guidance:**

This component is used to inventory cabinets.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If there is an installation with a top/lower cabinet (typical of a kitchen), the LF should be multiplied by 2 when calculating the quantity.

The 'C103010 CASEWORK' component includes the countertop and all other hardware. Rate the component as the condition of the entire assembly.

This component is used to capture permanently installed cabinets.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	LF

C103090 OTHER INTERIOR SPECIALTIES - Chandelier**Typical Application and General Component Guidance:**

This component is used to inventory chandeliers.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

The quantity value is per chandelier assembly. Do not count individual light bulbs.

Lesson Learned

There is often a division of labor between the C10 and D50 assessors. Verify that the D50 assessor did not include the chandelier in his/her light count.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Chandelier	Yes	No	No	No	Yes	No	20	EA

C103090 OTHER INTERIOR SPECIALTIES - Ladder**Typical Application and General Component Guidance:**

This component is used to inventory interior ladders.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Ladders that are a pull down type (similar to a house application to access an attic) should be inventoried under 'C103090 OTHER INTERIOR SPECIALTIES'.

The unit of measure is LF, and it should include ladder and platform in the estimate of total length.

Lesson Learned

If there is a division of labor between the B30 and C10 systems, assessors should coordinate to make sure that the interior ladder and roof hatch are both inventoried (if the ladder is leading to a roof hatch).

If there is a division of labor between the C10 and C20 systems, assessors should coordinate to on the inventory of ship ladders. Ship ladders should be inventoried under C20 as a metal stair.

Typical Distress

Damage to safety rail or cage.

Damaged rungs or vertical supports from vehicle traffic (in shops).

Loose or broken bolt connections.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Ladder	Yes	No	No	No	N/A	No	100	LF

C101001 FIXED PARTITIONS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	50	SF
Other	Yes	No	Yes	Yes	N/A	No	14	SF
Security Cage/Wire Mesh	Yes	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	50	SF
Wall - Brick	Yes	No	No	No	N/A	No	75	SF
Wall - Concrete Block	Yes	No	No	No	N/A	No	75	SF
Wall - Drywall w/Stud Framing	Yes	No	No	No	N/A	No	50	SF
Wall - Glass Block	Yes	No	No	No	N/A	No	125	SF
Wall - Glass Curtain Wall	Yes	No	No	No	N/A	No	125	SF
Wall - Glazed Tile	Yes	No	No	No	N/A	No	75	SF
Wall - Plaster w/Stud Framing	Yes	No	No	No	N/A	No	125	SF

C101002 DEMOUNTABLE PARTITIONS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF
Other	Yes	No	Yes	Yes	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C101003 RETRACTABLE PARTITIONS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF
Other	Yes	No	Yes	Yes	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C101004 INTERIOR GUARDRAILS & SCREENS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	LF
Guardrail	Yes	No	No	No	N/A	No	20	LF
Other	No	No	No	No	N/A	No	20	LF
Unknown	No	No	No	No	N/A	No	20	LF
Wall Screen	Yes	No	No	No	N/A	No	20	SF

C10 INTERIOR CONSTRUCTION

C101005 INTERIOR WINDOWS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF
Interior Windows	No	No	No	No	N/A	No	50	EA
Metal Rollup/Coiling Grille	Yes	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C101006 GLAZED PARTITIONS & STOREFRONTS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF
Other	Yes	No	Yes	Yes	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C101007 INTERIOR GLAZING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF
Other	Yes	No	Yes	Yes	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C101008 INTERIOR JOINT SEALANT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	LF
Other	No	No	No	No	N/A	No	20	LF
Unknown	No	No	No	No	N/A	No	20	LF

C101090 OTHER PARTITIONS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C102001 STANDARD INTERIOR DOORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	40	EA
Metal Door	Yes	No	No	No	Yes	No	50	EA
Other	Yes	No	Yes	Yes	Yes	No	40	EA
Unknown	No	No	No	No	N/A	No	40	EA
Wood Door/Metal Frame	Yes	No	No	No	Yes	No	40	EA
Wood Door/Wood Frame	Yes	No	No	No	Yes	No	40	EA

C102002 GLAZED INTERIOR DOORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	40	EA
Other	Yes	No	Yes	Yes	Yes	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

C102003 FIRE DOORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Fire Door - Rollup	No	No	No	No	N/A	No	40	EA
Fire Door - Sliding	No	No	No	No	N/A	No	40	EA
Fire Door - Sliding, Metal	No	No	No	No	N/A	No	30	EA
Fire Door - Sliding, Wood	No	No	No	No	N/A	No	30	EA
Fire Door - Swinging	No	No	No	No	N/A	No	40	EA
Fire Door - Swinging, Metal	No	No	No	No	N/A	No	30	EA
Fire Door - Swinging, Wood	No	No	No	No	N/A	No	30	EA
General	Yes	No	No	No	Yes	No	40	EA
Other	Yes	No	Yes	Yes	Yes	No	40	EA
Unknown	No	No	No	No	N/A	No	40	EA

C102004 SLIDING & FOLDING DOORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	30	EA
Other	No	No	No	No	N/A	No	30	SF
Rolling, Steel, Electric, 10' x 10'	Yes	No	No	No	Yes	No	30	EA
Rolling, Steel, Electric, 12' x 12'	Yes	No	No	No	Yes	No	30	EA
Rolling, Steel, Electric, 20' x 10'	Yes	No	No	No	Yes	No	30	EA
Rolling, Steel, Electric, 8' x 8'	Yes	No	No	No	Yes	No	30	EA
Rolling, Steel, Manual, 10' x 10'	Yes	No	No	No	Yes	No	30	EA
Rolling, Steel, Manual, 12' x 12'	Yes	No	No	No	Yes	No	30	EA
Rolling, Steel, Manual, 20' x 10'	Yes	No	No	No	Yes	No	30	EA
Rolling, Steel, Manual, 8' x 8'	Yes	No	No	No	Yes	No	30	EA
Sliding, 16' x 9', black finish	Yes	No	No	No	Yes	No	30	EA
Sliding, 16' x 9', bronze finish	Yes	No	No	No	Yes	No	30	EA
Sliding, 16' x 9', mill finish	Yes	No	No	No	Yes	No	72	EA
Sliding, 24' x 9', black finish	Yes	No	No	No	Yes	No	30	EA
Sliding, 24' x 9', bronze finish	Yes	No	No	No	Yes	No	30	EA
Sliding, 24' x 9', mill finish	Yes	No	No	No	Yes	No	30	EA
Sliding, 48' x 9', black finish	Yes	No	No	No	Yes	No	30	EA
Sliding, 48' x 9', bronze finish	Yes	No	No	No	Yes	No	30	EA
Sliding, 48' x 9', mill finish	Yes	No	No	No	Yes	No	30	EA
Unknown	No	No	No	No	N/A	No	30	SF

C102005 INTERIOR OVERHEAD DOORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	16	EA
Metal	Yes	No	No	No	Yes	No	35	EA
Other	No	No	No	No	N/A	No	16	SF
Steel Rolling	Yes	No	No	No	Yes	No	25	EA
Steel Rolling, Electric, 10'x10'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Electric, 12'x12'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Electric, 14'x14'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Electric, 20'x12'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Electric, 20'x16'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Electric, 8'x8'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Fire Rated, 10'x10'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Manual, 10'x10'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Manual, 12'x12'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Manual, 14'x14'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Manual, 20'x12'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Manual, 20'x16'	Yes	No	No	No	Yes	No	20	EA
Steel Rolling, Manual, 8'x8'	Yes	No	No	No	Yes	No	20	EA
Steel Sectional	Yes	No	No	No	Yes	No	25	EA
Steel Sectional, Electric, 10'x10'	Yes	No	No	No	Yes	No	20	EA
Steel Sectional, Electric, 12'x12'	Yes	No	No	No	Yes	No	20	EA
Steel Sectional, Electric, 20'x14'	Yes	No	No	No	Yes	No	20	EA
Steel Sectional, Electric, 8'x8'	Yes	No	No	No	Yes	No	20	EA
Steel Sectional, Manual, 10'x10'	Yes	No	No	No	Yes	No	20	EA
Steel Sectional, Manual, 12'x12'	Yes	No	No	No	Yes	No	20	EA
Steel Sectional, Manual, 20'x14'	Yes	No	No	No	Yes	No	20	EA
Steel Sectional, Manual, 8'x8'	Yes	No	No	No	Yes	No	20	EA
Steel Vertical Lift, Electric, 16'x16'	Yes	No	No	No	Yes	No	20	EA
Steel Vertical Lift, Electric, 32'x24'	Yes	No	No	No	Yes	No	20	EA
Unknown	No	No	No	No	N/A	No	16	SF
Wood	Yes	No	No	No	Yes	No	16	EA

Complete Component Catalog Breakdown

C10

C10 INTERIOR CONSTRUCTION

Wood, Electric, 10'x10'	Yes	No	No	No	Yes	No	20	EA
Wood, Electric, 12'x12'	Yes	No	No	No	Yes	No	20	EA
Wood, Electric, 14'x14'	Yes	No	No	No	Yes	No	20	EA
Wood, Electric, 20'x16'	Yes	No	No	No	Yes	No	20	EA
Wood, Electric, 8'x8'	Yes	No	No	No	Yes	No	20	EA
Wood, Manual, 10'x10'	Yes	No	No	No	Yes	No	20	EA
Wood, Manual, 12'x12'	Yes	No	No	No	Yes	No	20	EA
Wood, Manual, 14'x14'	Yes	No	No	No	Yes	No	20	EA
Wood, Manual, 20'x16'	Yes	No	No	No	Yes	No	20	EA
Wood, Manual, 8'x8'	Yes	No	No	No	Yes	No	20	EA

C102006 INTERIOR GATES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	20	EA
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C102007 INTERIOR DOOR HARDWARE

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

C10

C102090 OTHER INTERIOR SPECIALTY DOORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Cold Storage	Yes	No	No	No	Yes	No	20	EA
General	Yes	No	Yes	Yes	Yes	No	50	EA
Other	No	No	No	No	N/A	No	24	EA
Rollup Grille, Aluminum, Electric, 10' x 10', bronze anodized	Yes	No	No	No	Yes	No	24	EA
Rollup Grille, Aluminum, Electric, 10' x 10', mill finish	Yes	No	No	No	Yes	No	24	EA
Rollup Grille, Aluminum, Manual, 10' x 10', bronze anodized	Yes	No	No	No	Yes	No	24	EA
Rollup Grille, Aluminum, Manual, 10' x 10', mill finish	Yes	No	No	No	Yes	No	24	EA
Rollup Grille, Steel, Electric, 10' x 10'	Yes	No	No	No	Yes	No	25	EA
Rollup Grille, Steel, Electric, 15' x 8'	Yes	No	No	No	Yes	No	24	EA
Rollup Grille, Steel, Manual, 10' x 10'	Yes	No	No	No	Yes	No	25	EA
Rollup Grille, Steel, Manual, 15' x 8'	Yes	No	No	No	Yes	No	24	EA
Unknown	No	No	No	No	N/A	No	24	EA

C102091 OTHER INTERIOR PERSONNEL DOORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Cipher Lock	Yes	No	No	No	Yes	No	40	EA
General	Yes	No	Yes	Yes	Yes	No	40	EA
Other	No	No	No	No	No	No	40	EA
Unknown	No	No	No	No	N/A	No	40	EA

C103001 COMPARTMENTS, CUBICLES & TOILET PARTITIONS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	Yes	No	Yes	Yes	Yes	No	20	EA
Shower Compartment	Yes	No	No	No	Yes	No	20	EA
Shower Compartment - Coated Steel	No	No	No	No	N/A	No	20	EA
Shower Compartment - Fiberglass	No	No	No	No	N/A	No	20	EA
Shower Compartment - Glass	No	No	No	No	N/A	No	20	EA
Shower Compartment - Plastic	No	No	No	No	N/A	No	20	EA
Shower Compartment - Stainless Steel	No	No	No	No	N/A	No	20	EA
Toilet Partitions	Yes	No	No	No	Yes	No	20	EA
Toilet Partitions - Coated Steel	No	No	No	No	N/A	No	40	EA
Toilet Partitions - Plastic	No	No	No	No	N/A	No	40	EA
Toilet Partitions - Stainless Steel	No	No	No	No	N/A	No	20	EA
Toilet Partitions - Stone	No	No	No	No	N/A	No	50	EA
Unknown	No	No	No	No	N/A	No	20	EA
Urinal Screen	Yes	No	No	No	Yes	No	20	EA

C103002 TOILET & BATH ACCESSORIES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

C103003 MARKER BOARDS & TACK BOARDS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

C103004 IDENTIFYING DEVICES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

C103005 LOCKERS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	30	EA
Other	Yes	No	Yes	Yes	Yes	No	30	EA
Unknown	No	No	No	No	N/A	No	30	EA

C103006 SHELVING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	50	LF
Other	No	No	No	No	N/A	No	50	LF
Unknown	No	No	No	No	N/A	No	50	LF

C103007 FIRE EXTINGUISHER CABINETS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

C103008 COUNTERS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Concrete	No	No	No	No	N/A	No	30	LF
Corian	No	No	No	No	N/A	No	30	LF
General	No	No	No	No	N/A	No	30	LF
Granite	No	No	No	No	N/A	No	30	LF
Laminated Plastic	No	No	No	No	N/A	No	30	LF
Metal	No	No	No	No	N/A	No	30	LF
Other	No	No	No	No	N/A	No	30	LF
Stone	No	No	No	No	N/A	No	30	LF
Tile	No	No	No	No	N/A	No	30	LF
Unknown	No	No	No	No	N/A	No	30	LF
Wood	No	No	No	No	N/A	No	30	LF

C103009 CABINETS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	50	LF
Other	No	No	No	No	N/A	No	20	LF
Unknown	No	No	No	No	N/A	No	20	LF

C103010 CASEWORK

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	LF
Other	Yes	No	Yes	Yes	N/A	No	20	LF
Unknown	No	No	No	No	N/A	No	20	LF

C103011 CLOSETS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	LF
Other	No	No	No	No	N/A	No	20	LF
Unknown	No	No	No	No	N/A	No	20	LF

C10 INTERIOR CONSTRUCTION

C103012 FIRESTOPPING PENETRATIONS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

C103013 SPRAYED FIRE-RESISTIVE MATERIALS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C103014 ENTRANCE FLOOR GRILLES AND MATS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Fiberglass Grate System	No	No	No	No	N/A	No	28	SF
General	No	No	No	No	N/A	No	28	SF
Other	No	No	No	No	N/A	No	28	SF
Unknown	No	No	No	No	N/A	No	28	SF

C103015 ORNAMENTAL METALWORK

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

C103090 OTHER INTERIOR SPECIALTIES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Built-In Fireplace	Yes	No	No	No	Yes	No	40	EA
Chandelier	Yes	No	No	No	Yes	No	20	EA
Fireplace Accessories	No	No	No	No	N/A	No	25	EA
General	Yes	No	Yes	Yes	Yes	No	15	EA
Ladder	Yes	No	No	No	N/A	No	100	LF
Other	No	No	No	No	N/A	No	15	EA
Unknown	No	No	No	No	N/A	No	15	EA

Details Req?	If 'Yes', all required section detail fields are to be populated.
Inventory Pic?	If 'Yes', an inventory level photo is to be provided. This is a step back photo showing the component.
Inventory Cmnt?	If 'Yes', an inventory comment is to be populated. This should describe the component.
Group OK?	Only applicable to each (EA) UOM's that are In Scope? = 'Yes'. If 'No' section must be a quantity of 1. If 'Yes' section may have a quantity greater than 1. If 'N/A' it is not applicable to the component type.
Age Based?	If 'Yes', age based (do not provide an inspection) is the desired approach. If 'No' but upon inspection the component is not visible, then an age based approach is acceptable.
Design Life	Design life of the component.
UOM	Unit of measure. If yellow highlight = new component type in 2019 update.

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Sustainment Management System

Army BUILDER™ SMS Inventory and Assessment Guide C20 STAIRS



**US Army Corps
of Engineers**
Mobile District

ERDC
Engineer Research & Development Center

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C20 STAIRS
Summary of Changes

C20

Date

Record of Revisions/Additions to SMS Inventory and Assessment Methodology

06/01/2019

Added page "Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components" to clarify sectioning guidance for exterior components.

C20

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Safety The following items should not be interpreted as 1) Safety Plan, 2) OSHA, or base safety requirements. These are recommendations. The contractor should operate in accordance with the SOW and approved safety plan.

Safety is of the utmost concern and should always be at the forefront of any activities taking place in the field. There are many potential safety hazards associated with building assessments. Prior to performing building assessments, the assessing staff/team must ensure that field activities are in accordance with the 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Safety Preparation Activities

Do not perform a task that may harm or endanger the health and safety of oneself or others.

Consult with the installation safety representative to review installation-specific safety requirements.

Conduct a daily “stand-up” safety meeting.

Ensure new assessors have been properly trained.

Review the assessment plan/schedule for the day.

Ensure proper Personal Protective Equipment (PPE) is available. This includes, but is not limited to, a hardhat; hearing protection; eye protection; safety shoes, gloves; and a safety colored vest.

Prior to conducting assessments, the team leader must check with the safety office or building POC to determine if there are any building/site-specific safety rules or hazards. For instance, some manufacturing areas may require steel toe shoes, hearing protection, or eye protection.

Safety Recommendations

Do not walk and write, or talk on a mobile phone, at the same time; this can lead to trips/falls.

Do not review documents or write while walking on steps or stairs.

Do not enter posted or suspected confined spaces such as crawl spaces, tanks, chases, or pits.

Mechanical rooms, attic spaces, or other areas with piping/ductwork may require the use of hard hats to prevent against head bumping hazards. Refer to the project specific safety plan for further clarification.

Do not enter areas with hazardous material signs posted or that appear to contain hazardous materials (asbestos, gases, visible mold, etc.).

Be careful when walking through/across vehicle maintenance or staging areas.

Be aware of loose-fitting clothing and lanyards that may get caught in tight areas or on piping such as in mechanical/electrical rooms, etc.

Be careful of wildlife and insects when walking around a building or opening seldom-entered mechanical/electrical rooms. Assessors may encounter snakes, spiders, stray cats/dogs, rats/mice, etc. in these areas. Do not enter or place hands in spaces that are not completely visible.

If a life safety problem is observed, do not try to fix it. Report it to the proper authority or building manager prior to leaving the building or area.

Before the assessment team leaves a building, ensure all team members are accounted for.

Ladder use should be done in accordance with 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Designate a safety POC to enforce the safety accident prevention plan.

Perform a daily safety briefing before field work. Document the attendees and the topics covered.

Halt outdoor field operations at the sign of lightning or thunder.

Safety Recommendations (continued)

Do not access pitched roofs. They may be assessed from a nearby building or using binoculars.

Use proper techniques to place, secure, and climb ladders. Never climb a ladder while holding anything. Always use the three-point technique for climbing. Equipment should be placed in a backpack or an over-the-shoulder satchel to free hands for climbing.

Do not operate powered equipment, Weight Handling Equipment (WHE)/cranes, or remove access covers from powered equipment to perform assessments.

BUILDER™ assessments are commonly performed without electrical test equipment. Do not use electrical test equipment to test circuits or equipment unless qualified by a local authority. Only open panel box doors or enter electrical/mechanical rooms following proper training. Consult the local safety representative.

Site Preparation

Site Preparation Activities

Coordinate with the base to determine building access requirements, such as: escorts; camera passes; classified/secure area restrictions; or keys.

Locate buildings on a map and develop a schedule. Coordinate with the base to identify the appropriate building manager from the POC list. Notify the building managers of the upcoming assessment as needed.

Obtain a set of mechanical/electrical room master keys from the installation POC.

Extract all BRED™ files from BUILDER™ and have them loaded onto tablets (if using tablets). Verify all tablets are charged.

If multiple buildings are to be assessed by one team, confirm the schedule and plan of action with the team leader. A schedule may have building start times detailed to the hour.

Review the building names for the types/sizes of buildings that will be assessed to determine/confirm the needed tools and safety equipment. For instance, if the facilities are not climate-controlled, prepare accordingly (for cold weather bring hats/gloves).

Recommended Assessor Gear/Tools

Hardhat	Digital Camera with Extra Battery(s)
Hearing Protection	Measuring Tape
Safety Glasses	Laser Measuring Device/Flash Light
Reflective Safety Vest	Measuring Wheel
OSHA Approved Footwear	Backpack
Other Required Personal Protection Equipment (PPE)	Graphite Powder (for stuck locks)
Cell Phone and Team Cell Phone List	Cleaning Pad (to clean/help read nameplates)
Assessment Schedule	Pen/Pencils
Building Floor Plans/Base Map	Clipboard
Small Magnet (for determining door/window type)	Paper/Assessment Forms
Flash Light/Compass	Graph Paper
Sun Screen/Bug Spray	Refillable Water Bottle

Operating efficiently in the field is key to the success of the assessment. The following guidance is detailed by 1) Team Leader and 2) Assessor. **Bold items are drivers for client deliverables.**

Team Leader

Upon arrival, check in with the building manager and QA representative (if present).

Conduct the building manager interview. The entire team should be present for the building manager interview. The following questions should be asked:

Question 1: Are there any mission-related deficiencies in the building?

Question 2: Are there any safety-related deficiencies in the building?

Question 3: Have there been any upgrades or remodels of the building?

Question 4: Are there any building deficiencies (HVAC not working, electrical breakers tripping, maintenance issues, roof leaks, etc.) present?

The team leader (ONLY the team leader!) should populate the building level comment with the following information: 1) Missing systems, 2) Renovation dates, 3) Areas of the building not accessible during the assessment, and 4) If drawings were/were not provided. Below are some examples of building level comments:

Comment 1: No A20, D10, or D40 systems present. 2016: Vault room not accessible. Drawings not provided.

Comment 2: No A20 systems present. Renovated in 2010. 2016: 5% of building not accessible. Drawings provided.

The team leader should review the real property data in BRED™ and compare it to what is found during the assessment. The following should be confirmed: 1) Number of stories, 2) Building square footage, and 3) Building install date and 4) Building number in BRED™ matches the building. Variances between real property data and actual field data should be recorded for inclusion into the client deliverable.

Team Leader and Assessors

Best Practice: Each assessor should first take a photo of the building number to identify the subsequent photos associated with the building when they are downloaded. Take a second picture that captures the overall building view with respect to nearby buildings/streets. This should help refresh/remind the assessor on what the building looks like, while performing data-entry.

A team caucus should occur to discuss the sectioning strategy for the building and confirm which side is facing north.

Each assessor should have a consistent approach to each building. Assessors should move around the building exterior and interior in a clockwise (or counterclockwise) manner making notes and taking photos.

If a safety item is found, notify the team lead. The team lead will notify the building manager. Capture a photo of the safety item for inclusion into the safety log. Follow all other project-specific procedures when a safety item is encountered.

Upon return to the office perform the following steps:

Step 1: Download all photos from the day to a building-specific folder. Review the photos and delete any that are blurry or unreadable.

Step 2: Complete all calculations and counts. Complete all data entry into BRED™.

Data Entry

With the technology that is available today, the need to use forms in the field and do data entry at the office has been mitigated. Tablets can be used to run BRED™ to complete data entry while in the field. It is understood that there are challenges to accomplish this for certain disciplines. It is only mentioned here as a best practice recommendation and is not a requirement to execute the work. There will be instances where electronics will not be allowed in a facility. Assessors should have a paper/pen data collection system ready as a backup.

General

This section presents common Uniformat C20 Stairs inventory component sections found across installations as a guide for entering into the BUILDER™ or BUILDER™ Remote Entry Database (BRED™) software. Inventory items are arranged by BUILDER™ System with Material/Equipment Category, Component Type, Unit of Measure, and Inventory Notes.

C2010 - Stair Construction: Allows access and egress to/from multi-level facilities including from the ground level down to a basement or up to the 1st floor level. Materials primarily include concrete, masonry, metal, and wood. Component types include Full-Set, Half-Set, and Steps. The C20 system includes both interior and exterior stairs.

Stairs allow access and egress to/from multi-level facilities including from the ground level down to a basement or up to the 1st floor level. Full functionality of stairs is important to minimize potential of accidents and injuries. This is especially important for stairs providing emergency egress from the building.

Inspection

Rule of thumb: If you can see it, you should inspect it. There are some caveats to this rule. See component catalog for items that must be age-based whether visible or non-visible.

Staircase component sections are assessed using Direct Condition Rating (DCR) or Age-Based Modeling. Usually staircase components will be visible and accessible. When component sections are not visible or accessible, inventory should still be entered, but no assessment is provided. In this case, BUILDER™ will use the inventory year installed and degradation curves built in to the software to establish the Condition Index (CI).

The assessment of C20 components is based on the structural component of the stair (supports, treads, handrails) not the stair finishes. The C30 assessor will capture the finishes and rate them as a separate component.

The assessor should consider handrail condition in the overall staircase assessment. A comment should be added pertaining to poor stair handrail conditions if they are encountered.

Inventory

It is critical to confirm the year installed (default will be from real property records), or estimate the year installed. BUILDER™ uses the install date, degradation curves, and assessment observations to establish a CI for each component section. If the assessor suspects the default install date is not accurate, or an addition or renovation has taken place, check the real property record for year renovated or check local as-built or renovation drawings to help estimate the year installed.

Do not break up a 24 step riser into two, 12 step risers due to a landing being present. This should be one 24 step riser component.

Except where specifically noted in this Guide, do not use 'General' where a more specific item is available as a component type selection.

Full sets (24 riser flights) extend from one floor to another and may have an intermediate landing.

Half sets (12 riser flights) may be on exterior of building at the entrance or dock areas or may go to a mezzanine or other intermediate location between floors.

If a staircase is between 3 and 14 steps, it should be inventoried as a '12 riser flight.' If a staircase is between 15 and 30 steps, it should be inventoried as a '24 riser flight.'

If the component section appears to have been installed when the building was constructed, check available as-built drawings to determine the original construction date.

If this is an initial assessment and no staircase inventory has previously been entered into BUILDER™, an inventory is required. Staircase components inventoried for buildings are usually accessible and visible. When staircase components are not, as-built drawings should be used to identify and quantify the staircase components. If as-built drawings are not available, the assessor may use experience to make an assumption for the staircase types and quantities based on similar construction, consultation with local staff, and other reputable online resources.

Portable or wheeled steps commonly used in warehouses are not assessed. The stairs must be structurally attached to the building or loading dock.

Some staircases may be replaced as an individual repair or partial replacement. These areas would have a different age. The real property construction and renovation dates should be confirmed, if they are not appropriate, the age must be estimated. The building occupants or other facilities staff may be able to provide some information.

Staircase finishes (carpet, tile, vinyl composite tile [VCT]) are captured under C3020 Floor Finishes.

Staircase should be captured by the staircase frame materials, not the step or tread materials. If a structural steel stair with concrete tread is encountered, it should fall under a 'steel' component type.

Staircases that are integral to building are typically the same age as building.

When a component is concealed/hidden, the inventory comment box is used to indicate the reason for no inspection taking place. Standard comments should be used.

Photography

General comment: Photos are captured to document the following: 1) Inventory, 2) Condition (deficiency), 3) Historical record of the asset, 4) QC, and 5) Life safety issues.

All components where an 'Other' component type is selected must have a photo attached at the Inventory/Section level. (Required)

Assessors should take a photo of the building number at the start of the building assessment to delineate the start/stop of the photos between buildings. (Best Practice)

Assessors should take photos to allow for quality control (QC) confirmation and data backup. It is a good practice to have a photo of every component type encountered in an assessment. (Best Practice)

Components that are required to have section details populated should also have a single photo attached at the Inventory/Component Section level. This photo should be a step back photo showing the component in relation to its surroundings. Follow on assessments and base operations can use this to see what was inventoried in the case where there is any confusion on the section name or location field in the section details. If the component is hidden, no photo is necessary. (Required)

Components that have a DCR (component rating only) of A+ or worse should have a photo taken that shows the deficiency identified in the inspection comment. The photo should be attached to the record at the Inspection level. (Required)

Life Safety issues should be photographed for documentation of the safety item and used in safety reports. The photo should be sent to the team lead and all required steps outlined in the safety plan are to be completed. (Required)

Paint DCR does not drive the requirement for a photo to be attached at the inspection level. Example: A component has a DCR of 'G-' and a paint DCR of 'A' would result in no photo attached to the inspection.

See Scope Of Work (SOW) for any photo renaming/deliverable requirements.

The Team Leader is required to take one photo of the front elevation, or a representative elevation view, and attach the photo the building record at the building level. (Required)

Reinspection

All existing quantities for components such as stairs should be validated to a +/-15% accuracy. This can be accomplished through random sampling.

Assessors must not delete/edit components and sections that are not within their discipline.

BRED™ functions such as 'Copy Building' and 'Copy Section' should not be used unless their ramifications are fully understood. Copy building: The entire building will be copied. Copy section: All items with the same section name will be copied. For example, if a D50 assessor uses copy section on the section name FL1, the assessor may copy/paste interior doors, mechanical equipment, etc. without knowing it. If there is no existing data, these functions are easily used.

Existing data should be deleted if: 1) The component is no longer present, 2) The correct component type exists, 3) There are duplicate components with the same section name, or 4) The component is correct but has the wrong install date (requires deletion and re-entry with correct date).

If a component type in the existing data is no longer in scope, it must be updated to an in-scope item, or deleted if no longer applicable.

Past inspection comments are not required to be revised to current standards.

Section names, component types, and quantities must be verified and updated.

When performing a reinspection it should be understood that modifications in the inventory guidance may have taken place between the previous assessment date and the current effort. The new assessment should update the inventory to the latest inventory guidance. This may require, but is not limited to, combination of quantities (Ex: removing cardinal direction sectioning when it is no longer needed), modifying component type selections, or removing/adding items. The detailed inventory guidance portion of the manual will often provide direction on what steps need to be taken.

Sectioning

Additions, new wings, or major renovations likely require identifying a separate staircase section with a different age.

Do not section stairs by floor (FL1, FL2, etc.).

For exterior stairs, section per guidance found on the 'Exterior Sectioning: A10, A20, B10, B20, B30, and C20 components' page.

Once all base sectioning guidelines have been followed, there may be a need to apply a DCR-driven sectioning methodology based on two factors 1) difference in DCR, and 2) quantity of distress. Step 1: Assessors should section a component when there is a 2-step difference in DCR (Ex: G- to A) in accordance with the guidance found in Step 2. If there is only a 1-step difference in DCR, the assessor shall have a single section and the lower of the DCR's should be used. Step 2: When a 2-step difference is found, the assessor should consider the quantity of distress that is present. If the distress is present on 25% or less of the component, a single section with a DCR in-between the high/low DCR shall be added (if G-/A are found then A+ is used). If the distress is present on over 25% of the component, two sections should be added at the high/low DCR. Any component with a 3-step or more difference in DCR should have two sections.

Typical section names used for C20 include: N. WING, S. WING, etc.

The most critical part to an assessment is having all assessors aligned on how to perform an assessment. To reach an accurate DCR of a component, follow the steps below:

Step 1: Consider the level of degradation and the performance of the component:

OPERATIONAL CAPABILITY	OPERATIONAL CONDITION RATING	DEGRADATION	DCR
Fully Operational	Green	Free of observable or known degradation.	Green (+)
		Normal wear requiring normal preventative maintenance.	Green
		Normal degradation requiring corrective maintenance.	Green (-)
Impaired Operation	Amber	Minor degradation requiring corrective maintenance.	Amber (+)
		Moderate degradation requiring corrective repair.	Amber
		Significant degradation requiring moderate repair.	Amber (-)
Inoperable	Red	Extensive degradation requiring major repair.	Red (+)
		Severe degradation requiring major rehabilitation or partial replacement.	Red
		Complete degradation requiring full replacement.	Red (-)

Step 2: Consider the maintenance requirements of the component:

Type	Green (G+/G/G-)	Amber (A+/A/A-)	Red (R+/R/R-)
Dynamic (Equipment)	<p>Distresses present are of no impact to the components operation.</p> <p>Example: The fan component is fully operational.</p>	<p>Distresses present are of impact to the components operation. A repair is needed to bring the component back to proper operating condition</p> <p>Example: A fan has corrosion on the housing. A sand and paint would remove the distress.</p>	<p>Distresses present are of impact to the components operation. The component needs to be replaced.</p> <p>Example: A fan motor has overheated and no longer functions. Replacement of the component is required.</p>
Non-Dynamic	<p>The architecture component is in good condition requiring no maintenance outside of normal operations.</p> <p>Example: The carpet component is fully operational.</p>	<p>The architecture component has a distress that requires an extra level of maintenance outside of normal operations. This extra maintenance (or repair) would be an action such as a cleaning or a painting of a surface.</p> <p>Example: A carpet component has stains. A cleaning would remove the distress.</p>	<p>The architecture component has a distress where a maintenance operation will not fix the problem at hand. A replacement of the component is required.</p> <p>Example: A carpet component is damaged (ripped). The component needs to be replaced to fix the distress.</p>

Dynamic: Refers to equipment in the D10, D20, D30, D40, D50, and E10 systems.

Non-Dynamic: Refers to architectural components in the A10, A20, B10, B20, B30, C10, C20, and C30 systems.

Note: There are some Non-Dynamic components (for instance, toilets under D20) in the Dynamic systems.

Step 3: Adhere to the following requirements:

Requirements
Maintainability and obsolescence should not be the driving factor when conducting a condition assessment unless it has led to actual deterioration of condition that can be observed or reasonably inferred.
G+ ratings should only be given to inventory that is in pristine condition and is free of any observable defects.
Do not downgrade an assessment rating simply because an item is dirty.
Do not downgrade an assessment rating because the item does not meet current code compliance standards
Do not downgrade an assessment rating because the item is not deemed energy efficient.
Do not downgrade an assessment rating because the item is deemed to be a safety violation/hazard unless otherwise directed.
Do not downgrade an assessment rating because of a code violation.
Ratings should not be anticipated based on planned repairs or replacement.
Assessors should not expend field time and effort to determine the cause of a deficiency. If the cause is easily identified it should be included in the inspection comment.
Ratings shall be based upon the observable and documentable condition of the component.
A component should be downgraded if its operational capability, performance, reliability, etc. is compromised according to the direct rating definitions.
Incorporate user interviews, work order histories, or other information sources when determining the condition of the component. Include this information in the inspection comment.

The assessor should calibrate their mindset on what the expected DCR should be based on condition.
The assessor should consider the maintenance requirements of the component in the current condition.
The assessor should factor in the requirements/business rules for completing an inspection.

One factor that can play into an assessment is if the assessor receives information from a POC that results in a lower rating. For instance, an assessment takes place in July and there is a heating water pump that looks brand new, but has a blown motor. The assessor would assume the pump is supposed to be off due to being off season, but if the POC informs the assessor about the blown motor, this can be factored into the assessment (and indicated in the inspection comment).

One factor that should not play into an assessment is pending replacements of components. Assessors should rate components in the condition they are at the time of assessment. If the carpet is being replaced next month, that should not factor into a rating. Now, if the carpet contractor is on site (the work is currently taking place), this could be factored into the rating and a G+ rating provided with the current date of inspection chosen as the install date.

Service Life: No distresses present and component is nearing (or past) its service life.

The following comment can be used as an inspection comment for components that have no signs of distresses, are rated either Amber (A) or Amber Plus (A+), and are over 75% through their service life. This negates the need to have 4 parts of an inspection comment. Also, an inspection photo is no longer required.

[First Last-AE-Date] - The component is in proper working condition and is showing no signs of distress. The DCR was based on estimated remaining service life.

Step 1: Understand the 5 parts of the inspection comment:

Part #	Part Type	Type Description
1	Front End	[First Last-AE-Date] OR [First Last-DPW-Date] (ex: [John Doe-AE-7/4/2017])
2	Distress	Identifies the distress of the component
3	Severity	Identifies the amount of the distress.
4	Location	Identifies the location of the distress
5	Quantity	Identifies the quantity of the distress

Step 2: Use the DCR of the component as the basis for the severity.

DCR	Severity
Amber (+)	Minor/Mild
Amber	Moderate
Amber (-)	Significant/Major
Red (+)	Extensive
Red	Severe
Red (-)	Complete/Total

To aid in the inspection comments reading correctly the severity can be modified slightly. For instance, 'moderately' can be used for an 'A' DCR comment. This approach also applies to the distresses where one of the 23 MUST be selected. If 'Cracked' is selected as the distress, the wording 'cracks' may be used.

Step 3: Identify the distress of the component:

23 Distresses			
Blistered	Displaced	Overheated	Capability/Capacity Deficient
Broken	Efflorescent	Patched	Animal/Insect Damaged
Clogged	Holes	Rotten	Moisture/Debris Contaminated
Corroded	Leaks	Stained/Dirty	Noise/Vibration Excessive
Damaged	Loose	Cracked	Operationally Impaired
Deteriorated	Missing		Electrical Ground Inadequate or Unintentional

Step 4: Location and Quantity

Location on non-dynamic assets - 'lobby area' or 'northwest corner'.

Quantity on a SF UOM will typically be a %. On an EA UOM will typically be a count.

Step 5: Put all 5 components together to form an inspection comment (colors correspond to part):

A+	Front End	CRACKED.	The	walls have	minor	cracks	present on	10% of the	gym.
A	Front End	DETERIORATION.	The	carpet has	moderate	deterioration	over	50 %	of the lobby.
A-	Front End	DAMAGED.	The	door has	significant	damage	to the	lower half	of the door.
R+	Front End	CRACKED.	The	windows have	extensive	cracks	present in	4	panes.
R	Front End	LEAKS.	The	roof has	severe	leaking	around the	HVAC	penetrations.
R-	Front End	OPERATIONALLY IMPAIRED.	The	3	north	doors are	completely	operationally impaired.	

Inspection Comments

Rule #	Rule
1	Required on all inspections with a DCR of A+ and below.
2	Paint DCRs do not have an inspection comment requirement. Only the component DCR A+ and below.
3	Should include any component specific information obtained from the base or POC interview.
4	Should be in complete sentences and use industry standard terminology. Comments can be typed into MS Word for spelling/grammar checks and then pasted into the comments box.
5	Do not use all capital letters for the entire comment. The distress should be all capital letters.
6	Do not use abbreviations, jargon, or slang.
7	Should give enough information for a follow-on assessor to locate the problem area/equipment.
8	Should accurately describe the problem/observation that is the basis for the rating. Someone unfamiliar with the particular item should have an accurate picture of the components current condition and the justification for the assigned rating.
9	Should accurately describe the location of the distress if the component is only showing a distress in a single location. For instance, if an office has a stain in the carpet, it would be necessary to call out the room number of the office.
10	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. For instance, assessor John Doe at firm AE: [John Doe-AE-7/4/2017].
11	After #10 front end information in the brackets one of the 23 distresses should be provided in capitalized form. Building on #10 for an example if stained carpet: [John Doe-AE-7/4/2017] - STAINED.
12	After #10 and #11 a sentence should be provided that provides the distress, severity, location, and quantity. Quantity/Location refers to the amount/location of the distress present.

Inventory Comments

Rule #	Rule
1	Used to identify components that were not visible for inspection. See standard comments.
2	Used as a bread crumb for follow-on inspections. Can provide useful additional information such as location or type to help the next assessor understand what was being inventoried. Ex: This component is the stone wall located behind the receptionist in the lobby area.
3	Should describe the component inventoried where 'OTHER' is used to allow follow-on assessments to understand what was inventoried in the previous assessment.
4	Used to provide the location of the component (especially used for architecture components where there are no Section Details provided that have a location): Roof, NW Corner, Room Number
5	Do not use all capital letters, abbreviations, jargon, or slang.
6	Used to further describe an asset if it is not adequately described in the component type selection.
7	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Section Detail Comments

Rule #	Rule
1	Used to identify data that was not able to be populated in the Details fields. See standard comments.
2	Used to provide information that is specific to just that component section detail field. This can be a location of the specific section or something that the section services.
4	Do not use all capital letters, abbreviations, jargon, or slang.
5	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Standard Inventory Comments

When	Use Standard Comment
Assets are not visible for inspection.	Component was not visible for inspection. The component condition will be age-based by BUILDER program degradation curves.
Assets are not visible for inspection that also require Section Details to be populated.	The component is not visible for inspection or population of Section Details. The component condition will be age-based by BUILDER program degradation curves and no nameplate data or inventory photo will be provided.
Assets are not visible for inspection that require quantities to be assumed. Hidden mechanical equipment, ductwork, and # of control points are common occurrences.	The component is not visible for inspection and the quantity was estimated based on architect/engineering judgment. The component condition will be age-based by BUILDER program degradation curves.
Assets are located in an area where no electronics area allowed. This prevents an assessor from taking inventory/inspection photos.	The component is located in a secure area of the facility that did not allow electronic devices to be used. Photos were not obtainable.
Assets are visible for inspection but are a system that is not tested (HVAC controls, security system, etc.) so an age-based BUILDER™ CI is desired.	The component condition will be age-based by BUILDER program degradation curves.

Standard Section Detail Comments

When	Use Standard Comment
Nameplate is not found on the component.	Nameplate not found on the component. All fields with "NA" represent data not found.
Nameplate is found on the component but it is partial/completely unreadable.	Nameplate on the component was dirty/corroded/damaged/sunwashed. Section Detail fields with "NA" represent data that was not found.
Nameplate is found on the component that is readable but is missing certain Section Details fields.	Nameplate on the component was missing certain Section Detail fields. Section Detail fields have been populated and fields with "NA" represent data not found.

Comment Front-End Clarification

A front end refers to the bracketed information at the start of an inspection/inventory/section detail comment. The front end must have to following 3 pieces of information: 1) assessor name, 2) assessor company or affiliation, and the date. The BRED™ stamp may also provide the time of inspection which is acceptable.

BRED™/BUILDER™ Clarification

The terms BRED™ and BUILDER™ are used interchangeably throughout this document.

Rule #	Rule
1	Components are divided into sections when a significant variation exists in material/equipment category, age, or construction history, which impacts the life cycle characteristics of the component. Example 1 - If a wing or addition was added to a much older building, the two areas of the building should be sectioned differently because the age and construction history is different. Example 2 – If the building roof has multiple levels of similar materials in different conditions, these levels should be sectioned differently to capture the difference in condition. Example 3 – If the building has more than one of a particular type of component, separate component sections. For example: There is a 5,000 and 10,000 CFM air handler.
2	Multi-wing buildings are always sectioned by wing if the installation date of the wings vary. If a building is an 'E' shape and all wings have the same install date only sectioning by floor is required.
3	Multi-story buildings are always sectioned vertically by floor or level (in the case of a basement or mezzanine).
4	There may be unique instances where sectioning by an area of a building is required. For instance, if a building is split between two companies an installation may request sectioning by company 1 and 2.
5	An on-site discussion must occur at each building among all team members to determine the cardinal direction of the building. All assessors should have North as the same side of the building.
6	An on-site discussion must occur at each building among all team members on how the building should be sectioned. The goal is to avoid one assessor calling it a toilet, one calling it a restroom, and another calling it a bathroom. Standard sectioning naming is important for a consistent data set.
7	The section name should not be repetitive of the component type or material. If the floor is wood, do not have a section name 'WOOD'. Incorporation of the location into the section name is very helpful to be used for follow on assessments. If the wood floor has the section name 'LOBBY', it provides great

Standard Section Names and Format Rules

Use	Standard Section Name
Section by Floor (Business Rule)	FL1 – 1st Floor, FL2 – 2nd Floor, FL3 – 3rd Floor, etc.
Section by Floor (Business Rule)	BASEMENT, MEZZANINE, ATTIC, etc.
Section by Wing (applicable if different construction histories or condition only)	MAIN, WING A, WING B, WING C, ADDITION, etc.
Section by Direction (applicable if different construction histories or condition only)	NORTH, EAST, WEST, SOUTH, etc.
Section by Roof Level (applicable if different construction histories or condition only)	UPPER, LOWER, MAIN, etc.

When an equipment tag is included in the section name it should match exactly what was found in the field. Example: if the boiler ID number is B-1, the section name equipment tag portion should read B-1. If the boiler is tagged B1, the equipment tag portion should read B1. See equipment sectioning for further guidance.

Dashes are not required in the section name other than the instance in regards to equipment ID tags above.

The section name field is always entered in all capital letters.

Sectioning Business Rules - Grouping

The following only applies to each (EA) unit of measure (UOM) components. The 'Complete Component Catalog Breakdown' at the end of the section has a 'Group OK?' column. This has the values of 'Yes', 'No', and 'N/A'.

'Yes' = Grouping is allowed for this component type. A quantity of greater than '1' is acceptable.

'No' = Grouping is not allowed for this component type. The quantity must be '1'.

N/A = Not Applicable. Component type is not an EA UOM or is out of scope.

Group OK? = Yes when Section Details and Inventory Photos are Required.

There are several equipment component types (Unit Heaters, small pumps, etc) that have the following designations in the 'Complete Component Catalog Breakdown': 1) Group OK? = Yes, 2) Section Details? = Yes, and 3) Inventory Photo? = Yes.

In this case, a single section detail and inventory photo representative of the entire section is required. A few more clarifications:

- 1) The location field would be for the entire section (FL1/BAY 1/EXTERIOR) and not specific to a single component.
- 2) A difference in manufacturer does not drive further sectioning. For instance, 2 KW electric unit heaters from multiple manufacturers can be combined into one section. Capacity (2 KW) is the driver for sectioning methodology.
- 3) It is understood that the single section detail field is representative of the entire section. The details should be populated per one component. There is no need to enter multiple details or try to combine multiple manufacturer/model/serial/etc into to a single section detail field.

Group OK? = No

The quantity for these component types must be 1. For equipment (Section Details? = Yes and Inventory Photo? = Yes) the guidance found on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components', 'Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components', and 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components' must be followed.

Sectioning of Components on the Exterior of a Building

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Business Rules

- 1) Components of like type, condition, and install date should be inventoried in a single section. (Ex: B201005, B203001 and B301001 above are all like type, condition, and install date). S/N = 'N/A'
- 2) Components that require multiple sections should indicate cardinal direction for additional sections. (Ex: B201001 - Damage present on south face - S/N = 'SOUTH'. All other 3 sides were same condition - S/N = 'N/A'.
- 3) Components that are only found on a single side of a building should indicate cardinal direction in section name (Ex: B203002 GLAZED DOORS are only found on west face in example above - S/N - 'WEST').

- B20 EXTERIOR ENCLOSURE
 - B2010 EXTERIOR WALLS
 - B201001 EXTERIOR CLOSURE - Pre-Engineered Steel Wall and Panel
 - B201005 EXTERIOR LOUVERS & SCREENS - General
 - SOUTH - B201001 EXTERIOR CLOSURE - Pre-Engineered Steel Wall and Panel
 - B2020 EXTERIOR WINDOWS
 - NORTH-ALUMINUM-4 - B202001 WINDOWS - General
 - SOUTH-ALUMINUM-3 - B202001 WINDOWS - General
 - B2030 EXTERIOR DOORS
 - B203001 SOLID DOORS - Steel
 - WEST - B203002 GLAZED DOORS - General
- B30 ROOFING
 - B3010 ROOF COVERINGS
 - B301001 STEEP SLOPE ROOF SYSTEMS - Formed Metal - Metal Standing Seam
 - B301005 GUTTERS & DOWNSPOUTS - Gutters
 - NORTH - B301005 GUTTERS & DOWNSPOUTS - Downspouts
 - SOUTH - B301005 GUTTERS & DOWNSPOUTS - Downspouts

4) Component types in which there are multiple sections present, and the respective section is only found on a single side of a building, should indicate cardinal direction in the section name (Ex: B301005 GUTTERS DOWNSPOUTS - S/N 'NORTH' and 'SOUTH').

Note: The guidance above is listed in order of application. For example, if the downspouts were all the same condition then #1 would have applied and the section name would have been 'N/A'.

C201001 INTERIOR AND EXTERIOR STAIRS - Exterior Stairs - Concrete (12 Riser Flight)

Typical Application and General Component Guidance:

This component is used to inventory exterior stairs in which the riser is 12 steps.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Exterior Stairs - Concrete (12 Riser Flight)	Yes	No	No	No	Yes	No	125	EA

C201001 INTERIOR AND EXTERIOR STAIRS - Exterior Stairs - Concrete (24 Riser Flight)

Typical Application and General Component Guidance:

This component is used to inventory exterior stairs in which the riser is 24 steps.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

A "full set" is 24 steps that start at one floor level and lead to another floor level. There may be an intermediate landing breaking up the riser, but it should be inventoried as 1 EA. DO NOT inventory as 2 '12-step' risers.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Exterior Stairs - Concrete (24 Riser Flight)	Yes	No	No	No	Yes	No	125	EA

**C201001 INTERIOR AND EXTERIOR STAIRS - Exterior Stairs - Metal
(12 Riser Flight)****Typical Application and General Component Guidance:**

This component is used to inventory exterior metal stairs in which the riser is 12 steps.

**Business Rules/General/Lessons Learned/Reinspection****Lesson Learned**

Metal stairs/steps may have different step inserts such as concrete or metal grates. Make sure you are looking at the stair construction and not just the tread.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Exterior Stairs - Metal (12 Riser Flight)	Yes	No	No	No	Yes	No	65 EA

**C201001 INTERIOR AND EXTERIOR STAIRS - Exterior Stairs - Metal
(24 Riser Flight)****Typical Application and General Component Guidance:**

This component is used to inventory exterior metal stairs in which the riser is 24 steps.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

A "full set" is 24 steps that start at one floor level and lead to another floor level. There may be an intermediate landing breaking up the riser, but it should be inventoried as 1 EA. DO NOT inventory as 2 '12-step' risers.

General

Includes all metal, open grate, and steel stairs with concrete-filled steps.

Lesson Learned

Metal stairs/steps may have different step inserts such as concrete or metal grates. Make sure you are looking at the stair construction and not just the tread.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Exterior Stairs - Metal (24 Riser Flight)	Yes	No	No	No	Yes	No	65	EA

C201001 INTERIOR AND EXTERIOR STAIRS - Exterior Stairs - Wood (12 Riser Flight)

Typical Application and General Component Guidance:

This component is used to inventory exterior wood stairs in which the riser is 12 steps.



Business Rules/General/Lessons Learned/Reinspection

General

Stair treads may be concrete, wood, or metal.

The finish is normally clear varnish or paint.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Exterior Stairs - Wood (12 Riser Flight)	Yes	No	No	No	Yes	No	65	EA

C201001 INTERIOR AND EXTERIOR STAIRS - Exterior Stairs - Wood (24 Riser Flight)

Typical Application and General Component Guidance:

This component is used to inventory exterior wood stairs in which the riser is 24 steps.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

A "full set" is 24 steps that start at one floor level and lead to another floor level. There may be an intermediate landing breaking up the riser, but it should be inventoried as 1 EA. DO NOT inventory as 2 '12-step' risers.

General

Stair treads may be concrete, wood, or metal.

The finish is normally clear varnish or paint.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Exterior Stairs - Wood (24 Riser Flight)	Yes	No	No	No	Yes	No	65 EA

C20 STAIRS - C2010 STAIR CONSTRUCTION

C201001 INTERIOR AND EXTERIOR STAIRS - Exterior Steps - Concrete**Typical Application and General Component Guidance:**

This component is included for clarification purposes only.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not use the 'Exterior Steps' component type. If the stair riser is one or two steps, it can be ignored. If three or more steps, it should be categorized as a 12-step riser flight with correct material type selected.

Lesson Learned

The stoop shown in the photo above would be inventoried as a 'C201001 INTERIOR AND EXTERIOR STAIRS - Exterior Stairs - Concrete (12 Riser Flight)' component type. This shows the smallest stair to be inventoried.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Exterior Steps - Concrete	No	No	No	No	N/A	20	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

C20

C201001 INTERIOR AND EXTERIOR STAIRS - Interior Stairs - Concrete (24 Riser Flight)**Typical Application and General Component Guidance:**

This component is used to inventory interior concrete stairs in which the riser is 24 steps.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

A "full set" is 24 steps that start at one floor level and lead to another floor level. There may be an intermediate landing breaking up the riser, but it should be inventoried as 1 EA. DO NOT inventory as 2 '12-step' risers.

General

Concrete Stair/Steps may be finished with carpet, epoxy or rubber.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Interior Stairs - Concrete (24 Riser Flight)	Yes	No	No	No	Yes	125	EA

C201001 INTERIOR AND EXTERIOR STAIRS - Interior Stairs - Metal (24 Riser Flight)

Typical Application and General Component Guidance:

This component is used to inventory interior metal stairs in which the riser is 24 steps.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

A "full set" is 24 steps that start at one floor level and lead to another floor level. There may be an intermediate landing breaking up the riser, but it should be inventoried as 1 EA. DO NOT inventory as 2 '12-step' risers.

Ship ladders should be inventoried under C20.

Lesson Learned

Metal Stair/Steps may have different step inserts such as concrete or metal grates. Make sure you are looking at the stair construction and not just the tread.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Interior Stairs - Metal (24 Riser Flight)	Yes	No	No	No	Yes	No	125 EA

C201001 INTERIOR AND EXTERIOR STAIRS - Interior Stairs - Wood (24 Riser Flight)

Typical Application and General Component Guidance:

This component is used to inventory interior wood stairs in which the riser is 24 steps.



Business Rules/General/Lessons Learned/Reinspection

Lesson Learned

A "full set" is 24 steps that start at one floor level and lead to another floor level. There may be an intermediate landing breaking up the riser, but it should be inventoried as 1 EA. DO NOT inventory as 2 '12-step' risers.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Interior Stairs - Wood (24 Riser Flight)	Yes	No	No	No	Yes	No	100 EA

C201001 INTERIOR AND EXTERIOR STAIRS - Interior Steps - Concrete**Typical Application and General Component Guidance:**

This component is included for clarification purposes only.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not use the 'Interior Steps' component type. If the stair riser is one or two steps, it can be ignored. If three or more steps, it should be categorized as a 12-step riser flight with correct material type selected.

Lesson Learned

The stoop shown in the photo above would be inventoried as a 'C201001 INTERIOR AND EXTERIOR STAIRS - Interior Stairs - Concrete (12 Riser Flight)' component type. This shows the smallest stair to be inventoried.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Interior Steps - Concrete	No	No	No	No	N/A	No	20	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

Complete Component Catalog Breakdown

C20

C20 STAIRS

C201001 INTERIOR AND EXTERIOR STAIRS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Concrete Stoop	No	No	No	No	N/A	No	100	FLT
Exterior Stairs	No	No	No	No	N/A	No	65	EA
Exterior Stairs - Concrete (12 Riser Flight)	Yes	No	No	No	Yes	No	125	EA
Exterior Stairs - Concrete (24 Riser Flight)	Yes	No	No	No	Yes	No	125	EA
Exterior Stairs - Metal (12 Riser Flight)	Yes	No	No	No	Yes	No	65	EA
Exterior Stairs - Metal (24 Riser Flight)	Yes	No	No	No	Yes	No	65	EA
Exterior Stairs - Wood (12 Riser Flight)	Yes	No	No	No	Yes	No	65	EA
Exterior Stairs - Wood (24 Riser Flight)	Yes	No	No	No	Yes	No	65	EA
Exterior Steps	No	No	No	No	N/A	No	20	EA
Exterior Steps - Concrete	No	No	No	No	N/A	No	20	EA
Exterior Steps - Wood	No	No	No	No	N/A	No	20	EA
General	No	No	No	No	N/A	No	20	FLT
Interior Stairs	No	No	No	No	N/A	No	100	EA
Interior Stairs - Concrete (12 Riser Flight)	Yes	No	No	No	Yes	No	125	EA
Interior Stairs - Concrete (24 Riser Flight)	Yes	No	No	No	Yes	No	125	EA
Interior Stairs - Metal (12 Riser Flight)	Yes	No	No	No	Yes	No	125	EA
Interior Stairs - Metal (24 Riser Flight)	Yes	No	No	No	Yes	No	125	EA
Interior Stairs - Wood (12 Riser Flight)	Yes	No	No	No	Yes	No	100	EA
Interior Stairs - Wood (24 Riser Flight)	Yes	No	No	No	Yes	No	100	EA
Interior Steps	No	No	No	No	N/A	No	20	EA
Interior Steps - Concrete	No	No	No	No	N/A	No	20	EA
Interior Steps - Wood	No	No	No	No	N/A	No	20	EA
Other	Yes	No	Yes	Yes	Yes	No	65	EA
Unknown	No	No	No	No	N/A	No	65	FLT

C201002 FIRE ESCAPE STAIRS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	FLT
Other	No	No	No	No	N/A	No	20	FLT
Unknown	No	No	No	No	N/A	No	20	FLT

C201090 STAIR HANDRAILS, GUARDRAILS AND ACCESSORIES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	LF
Other	No	No	No	No	N/A	No	20	LF
Unknown	No	No	No	No	N/A	No	20	LF

Details Req?	If 'Yes', all required section detail fields are to be populated.
Inventory Pic?	If 'Yes', an inventory level photo is to be provided. This is a step back photo showing the component.
Inventory Cmmt?	If 'Yes', an inventory comment is to be populated. This should describe the component.
Group OK?	Only applicable to each (EA) UOM's that are In Scope? = 'Yes'. If 'No' section must be a quantity of 1. if 'Yes' section may have a quantity greater than 1. If 'N/A' it is not applicable to the component type.
Age Based?	If 'Yes', age based (do not provide an inspection) is the desired approach. If 'No' but upon inspection the component is not visible, then an age based approach is acceptable.
Design Life	Design life of the component.
UOM	Unit of measure. If yellow highlight = new component type in 2019 update.

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Sustainment Management System

Army BUILDER™ SMS Inventory and Assessment Guide

C30 INTERIOR FINISHES



**US Army Corps
of Engineers**
Mobile District

ERDC
Engineer Research & Development Center

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Summary of Changes

C30

Record of Revisions/Additions to SMS Inventory and Assessment Methodology

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Safety The following items should not be interpreted as 1) Safety Plan, 2) OSHA, or base safety requirements. These are recommendations. The contractor should operate in accordance with the SOW and approved safety plan.

Safety is of the utmost concern and should always be at the forefront of any activities taking place in the field. There are many potential safety hazards associated with building assessments. Prior to performing building assessments, the assessing staff/team must ensure that field activities are in accordance with the 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Safety Preparation Activities

Do not perform a task that may harm or endanger the health and safety of oneself or others.

Consult with the installation safety representative to review installation-specific safety requirements.

Conduct a daily “stand-up” safety meeting.

Ensure new assessors have been properly trained.

Review the assessment plan/schedule for the day.

Ensure proper Personal Protective Equipment (PPE) is available. This includes, but is not limited to, a hardhat; hearing protection; eye protection; safety shoes, gloves; and a safety colored vest.

Prior to conducting assessments, the team leader must check with the safety office or building POC to determine if there are any building/site-specific safety rules or hazards. For instance, some manufacturing areas may require steel toe shoes, hearing protection, or eye protection.

Safety Recommendations

Do not walk and write, or talk on a mobile phone, at the same time; this can lead to trips/falls.

Do not review documents or write while walking on steps or stairs.

Do not enter posted or suspected confined spaces such as crawl spaces, tanks, chases, or pits.

Mechanical rooms, attic spaces, or other areas with piping/ductwork may require the use of hard hats to prevent against head bumping hazards. Refer to the project specific safety plan for further clarification.

Do not enter areas with hazardous material signs posted or that appear to contain hazardous materials (asbestos, gases, visible mold, etc.).

Be careful when walking through/across vehicle maintenance or staging areas.

Be aware of loose-fitting clothing and lanyards that may get caught in tight areas or on piping such as in mechanical/electrical rooms, etc.

Be careful of wildlife and insects when walking around a building or opening seldom-entered mechanical/electrical rooms. Assessors may encounter snakes, spiders, stray cats/dogs, rats/mice, etc. in these areas. Do not enter or place hands in spaces that are not completely visible.

If a life safety problem is observed, do not try to fix it. Report it to the proper authority or building manager prior to leaving the building or area.

Before the assessment team leaves a building, ensure all team members are accounted for.

Ladder use should be done in accordance with 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Designate a safety POC to enforce the safety accident prevention plan.

Perform a daily safety briefing before field work. Document the attendees and the topics covered.

Halt outdoor field operations at the sign of lightning or thunder.

Safety Recommendations (continued)

Do not access pitched roofs. They may be assessed from a nearby building or using binoculars.

Use proper techniques to place, secure, and climb ladders. Never climb a ladder while holding anything. Always use the three-point technique for climbing. Equipment should be placed in a backpack or an over-the-shoulder satchel to free hands for climbing.

Do not operate powered equipment, Weight Handling Equipment (WHE)/cranes, or remove access covers from powered equipment to perform assessments.

BUILDER™ assessments are commonly performed without electrical test equipment. Do not use electrical test equipment to test circuits or equipment unless qualified by a local authority. Only open panel box doors or enter electrical/mechanical rooms following proper training. Consult the local safety representative.

Site Preparation

Site Preparation Activities

Coordinate with the base to determine building access requirements, such as: escorts; camera passes; classified/secure area restrictions; or keys.

Locate buildings on a map and develop a schedule. Coordinate with the base to identify the appropriate building manager from the POC list. Notify the building managers of the upcoming assessment as needed.

Obtain a set of mechanical/electrical room master keys from the installation POC.

Extract all BRED™ files from BUILDER™ and have them loaded onto tablets (if using tablets). Verify all tablets are charged.

If multiple buildings are to be assessed by one team, confirm the schedule and plan of action with the team leader. A schedule may have building start times detailed to the hour.

Review the building names for the types/sizes of buildings that will be assessed to determine/confirm the needed tools and safety equipment. For instance, if the facilities are not climate-controlled, prepare accordingly (for cold weather bring hats/gloves).

Recommended Assessor Gear/Tools

Hardhat	Digital Camera with Extra Battery(s)
Hearing Protection	Measuring Tape
Safety Glasses	Laser Measuring Device/Flash Light
Reflective Safety Vest	Measuring Wheel
OSHA Approved Footwear	Backpack
Other Required Personal Protection Equipment (PPE)	Graphite Powder (for stuck locks)
Cell Phone and Team Cell Phone List	Cleaning Pad (to clean/help read nameplates)
Assessment Schedule	Pen/Pencils
Building Floor Plans/Base Map	Clipboard
Small Magnet (for determining door/window type)	Paper/Assessment Forms
Flash Light/Compass	Graph Paper
Sun Screen/Bug Spray	Refillable Water Bottle

Operating efficiently in the field is key to the success of the assessment. The following guidance is detailed by 1) Team Leader and 2) Assessor. **Bold items are drivers for client deliverables.**

Team Leader

Upon arrival, check in with the building manager and QA representative (if present).

Conduct the building manager interview. The entire team should be present for the building manager interview. The following questions should be asked:

Question 1: Are there any mission-related deficiencies in the building?

Question 2: Are there any safety-related deficiencies in the building?

Question 3: Have there been any upgrades or remodels of the building?

Question 4: Are there any building deficiencies (HVAC not working, electrical breakers tripping, maintenance issues, roof leaks, etc.) present?

The team leader (ONLY the team leader!) should populate the building level comment with the following information: 1) Missing systems, 2) Renovation dates, 3) Areas of the building not accessible during the assessment, and 4) If drawings were/were not provided. Below are some examples of building level comments:

Comment 1: No A20, D10, or D40 systems present. 2016: Vault room not accessible. Drawings not provided.

Comment 2: No A20 systems present. Renovated in 2010. 2016: 5% of building not accessible. Drawings provided.

The team leader should review the real property data in BRED™ and compare it to what is found during the assessment. The following should be confirmed: 1) Number of stories, 2) Building square footage, and 3) Building install date and 4) Building number in BRED™ matches the building. Variances between real property data and actual field data should be recorded for inclusion into the client deliverable.

Team Leader and Assessors

Best Practice: Each assessor should first take a photo of the building number to identify the subsequent photos associated with the building when they are downloaded. Take a second picture that captures the overall building view with respect to nearby buildings/streets. This should help refresh/remind the assessor on what the building looks like, while performing data-entry.

A team caucus should occur to discuss the sectioning strategy for the building and confirm which side is facing north.

Each assessor should have a consistent approach to each building. Assessors should move around the building exterior and interior in a clockwise (or counterclockwise) manner making notes and taking photos.

If a safety item is found, notify the team lead. The team lead will notify the building manager. Capture a photo of the safety item for inclusion into the safety log. Follow all other project-specific procedures when a safety item is encountered.

Upon return to the office perform the following steps:

Step 1: Download all photos from the day to a building-specific folder. Review the photos and delete any that are blurry or unreadable.

Step 2: Complete all calculations and counts. Complete all data entry into BRED™.

Data Entry

With the technology that is available today, the need to use forms in the field and do data entry at the office has been mitigated. Tablets can be used to run BRED™ to complete data entry while in the field. It is understood that there are challenges to accomplish this for certain disciplines. It is only mentioned here as a best practice recommendation and is not a requirement to execute the work. There will be instances where electronics will not be allowed in a facility. Assessors should have a paper/pen data collection system ready as a backup.

General

This section presents common Unifomat C30 Interior Finishes inventory component sections found across installations as a guide for entering into the BUILDER™ or BUILDER™ Remote Entry Database (BRED™) software. Inventory items are arranged by BUILDER™ System with Material/Equipment Category, Component Type, Unit of Measure, and Inventory Notes.

C3010 - Wall Finishes: Finishes for interior walls to meet the intended space use and provide durability. Note: Partition walls are captured under C1010.

C3020 - Floor Finishes: Finishes for interior floor substrate to meet the intended space use and provide durability.

C3030 - Ceiling Finishes: Finishes for interior ceilings to meet the interior space use and provide climate control, security and/or durability.

C3040 - Interior Coatings / Special Finishes: Special finishes and coatings applied to interior spaces.

The interior finishes provide required durable finishes for interior construction materials to support the interior space use and occupancy. Additionally, C3030 Ceiling Finishes allow the spaces to be enclosed where required for security and/or interior climate control as needed by the users.

Inspection

Do not provide inspection comments directed at/identifying only problems with the paint/paint coating.

Interior finish component sections are assessed using Direct Condition Rating (DCR) or Age-Based Modeling. Usually interior finishes components will be visible and accessible. When component sections are not visible or accessible, inventory should still be entered, but no assessment is provided. In this case, BUILDER™ will use the inventory year installed and degradation curves built in to the software to establish the Condition Index (CI).

Rule of thumb: If you can see it, you should inspect it. There are some caveats to this rule. See component catalog for items that must be age-based whether visible or non-visible.

The component should be rated based on its condition, NOT the condition of the paint coating. An assessor can have a DCR for the component and then select the 'PAINTED' box and provide a DCR for the paint coating.

The DCR inspection reflects observed deterioration and impact on functionality based on the assessor's professional judgment.

The following conditions or events can accelerate interior finishes deterioration and should be considered by the assessor: 1) Surface damage due to personnel or equipment, 2) Neglected maintenance, 3) Improper construction or installation, 4) Moisture infiltration resulting from roof or pipe leaks, and 5) Improper finish for current facility use.

When performing an assessment, the 'PAINTED' box should only be selected for components that have local or field applied paintings/coatings. DO NOT mark 'PAINTED' for manufacturer- or factory-applied coatings as they tend to age consistently with the components.

Inventory

It is critical to confirm the year installed (default will be from real property records), or estimate the year installed. BUILDER™ uses the install date, degradation curves, and assessment observations to establish a CI for each component section. If the assessor suspects the default install date is not accurate, or an addition or renovation has taken place, check the real property record for year renovated or check local as-built or renovation drawings to help estimate the year installed.

Additions, new wings, or major renovations likely require identifying a separate interior finishes sections with a different age.

Cubicle partitions are not captured.

Due to some overlap in the BUILDER™, interior partitions (walls) are captured under C1010 Partitions. It is very important for the CRV to capture walls under C1010 Partitions and ONLY finishes under C30.

Except where specifically noted in this Guide, do not use 'General' where a more specific item is available as a component type selection.

Exposed metal decking supporting concrete for the floor above is not considered a ceiling finish for the floor below.

If construction drawings or as-builts are available, look for date published to assist with determining age of materials. Custodial drawings can also be a good resource.

If there is a PAINTED CMU, brick, or wood interior wall, there would not be a finish to capture. The wall component is captured under C1010 with the 'PAINTED' box selected and a paint DCR provided. The most common occurrence of a 'PAINT' interior finish for a wall would be a 'B2010 EXTERIOR WALLS' component that is painted on the interior face.

In some cases, interior finishes sections may be replaced as an individual repair or partial replacement. These areas would have a different age. The real property construction and renovation dates should be confirmed; if they are not appropriate, the interior finishes age must be estimated. The building occupants or other facilities staff may be able to provide some information.

Interior finishes components inventoried for buildings are usually visible. When interior finishes components are not visible or accessible, as-built drawings should be used to identify and quantify the interior finishes components. If as-built drawings are not available, the assessor may use experience to make an assumption for the interior finishes types and quantities based on similar construction, consultation with local staff, and other reputable online resources.

When a component is concealed/hidden, the inventory comment box is used to indicate the reason for no inspection taking place. Standard comments should be used.

Photography

General comment: Photos are captured to document the following: 1) Inventory, 2) Condition (deficiency), 3) Historical record of the asset, 4) QC, and 5) Life safety issues.

All components where an 'Other' component type is selected must have a photo attached at the Inventory/Section level. (Required)

Assessors should take a photo of the building number at the start of the building assessment to delineate the start/stop of the photos between buildings. (Best Practice)

Assessors should take photos to allow for quality control (QC) confirmation and data backup. It is a good practice to have a photo of every component type encountered in an assessment. (Best Practice)

Components that are required to have section details populated should also have a single photo attached at the Inventory/Component Section level. This photo should be a step back photo showing the component in relation to its surroundings. Follow on assessments and base operations can use this to see what was inventoried in the case where there is any confusion on the section name or location field in the section details. If the component is hidden, no photo is necessary. (Required)

Components that have a DCR (component rating only) of A+ or worse should have a photo taken that shows the deficiency identified in the inspection comment. The photo should be attached to the record at the Inspection level. (Required)

Life Safety issues should be photographed for documentation of the safety item and used in safety reports. The photo should be sent to the team lead and all required steps outlined in the safety plan are to be completed. (Required)

Paint DCR does not drive the requirement for a photo to be attached at the inspection level. Example: A component has a DCR of 'G-' and a paint DCR of 'A' would result in no photo attached to the inspection.

See Scope Of Work (SOW) for any photo renaming/deliverable requirements.

The Team Leader is required to take one photo of the front elevation, or a representative elevation view, and attach the photo the building record at the building level. (Required)

Reinspection

All existing quantities for components such as wall, floor, and ceiling finishes are to be validated to a +/-15% accuracy. This can be accomplished through random sampling.

Assessors must not delete/edit components and sections that are not within their discipline.

BRED™ functions such as 'Copy Building' and 'Copy Section' should not be used unless their ramifications are fully understood. Copy building: The entire building will be copied. Copy section: All items with the same section name will be copied. For example, if a D50 assessor uses copy section on the section name FL1, the assessor may copy/paste interior doors, mechanical equipment, etc. without knowing it. If there is no existing data, these functions are easily used.

Existing data should be deleted if: 1) The component is no longer present, 2) The correct component type exists, 3) There are duplicate components with the same section name, or 4) The component is correct but has the wrong install date (requires deletion and re-entry with correct date).

If a component type in the existing data is no longer in scope, it must be updated to an in-scope item, or deleted if no longer applicable.

Past inspection comments are not required to be revised to current standards.

Section names, component types, and quantities must be verified and updated.

When performing a reinspection it should be understood that modifications in the inventory guidance may have taken place between the previous assessment date and the current effort. The new assessment should update the inventory to the latest inventory guidance. This may require, but is not limited to, combination of quantities (Ex: removing cardinal direction sectioning when it is no longer needed), modifying component type selections, or removing/adding items. The detailed inventory guidance portion of the manual will often provide direction on what steps need to be taken.

Sectioning

Barracks are to be sectioned by floor then by 1) commons and 2) quarters. Commons refers to the common areas (halls, utility rooms, lobby, etc). Quarters refers to the individual living area (dorms). A common section name would be 'FL1 - COMMONS' and 'FL1 - QUARTERS.' Barracks refers to all multi-level housing units for permanent and transient residents. This methodology is applicable to all interior finishes.

Do not section by the type of the component type. For instance, if there are two carpet designs installed and the condition/age of the carpet is similar for both types, they are to be one 'carpet' section.

In the case of interior finishes, the assessor must use judgment in sectioning interior finishes. In large buildings with many interior finishes, these components should be sectioned in the manner they are generally managed.

In the case where age/condition/material type is different for a single component type, it is required that the functional area be included in the section name such as 'FL1 - LOBBY' and 'FL1 - KITCHEN'.

Interior finishes are always sectioned by floor. If there are multiple easily definable wings of a building with different install dates then sectioning by floor AND by wing is required. For example, if there is an east and west wing on a 2-floor building you would have 'FL2 EAST' and 'FL2 - WEST'.

Once all base sectioning guidelines have been followed, there may be a need to apply a DCR-driven sectioning methodology based on two factors 1) difference in DCR, and 2) quantity of distress. Step 1: Assessors should section a component when there is a 2-step difference in DCR (Ex: G- to A) in accordance with the guidance found in Step 2. If there is only a 1-step difference in DCR, the assessor shall have a single section and the lower of the DCR's should be used. Step 2: When a 2-step difference is found, the assessor should consider the quantity of distress that is present. If the distress is present on 25% or less of the component, a single section with a DCR in-between the high/low DCR shall be added (if G-/A are found then A+ is used). If the distress is present on over 25% of the component, two sections should be added at the high/low DCR. Any component with a 3-step or more difference in DCR should have two sections.

Stair finishes need to be inventoried as a single component section for the entire stairwell with the section name 'STAIR'. Do not include as part of the floor finish total. If there are multiple stairwells, it is acceptable to combine into one section if they are the same condition.

The most critical part to an assessment is having all assessors aligned on how to perform an assessment. To reach an accurate DCR of a component, follow the steps below:

Step 1: Consider the level of degradation and the performance of the component:

OPERATIONAL CAPABILITY	OPERATIONAL CONDITION RATING	DEGRADATION	DCR
Fully Operational	Green	Free of observable or known degradation.	Green (+)
		Normal wear requiring normal preventative maintenance.	Green
		Normal degradation requiring corrective maintenance.	Green (-)
Impaired Operation	Amber	Minor degradation requiring corrective maintenance.	Amber (+)
		Moderate degradation requiring corrective repair.	Amber
		Significant degradation requiring moderate repair.	Amber (-)
Inoperable	Red	Extensive degradation requiring major repair.	Red (+)
		Severe degradation requiring major rehabilitation or partial replacement.	Red
		Complete degradation requiring full replacement.	Red (-)

Step 2: Consider the maintenance requirements of the component:

Type	Green (G+/G/G-)	Amber (A+/A/A-)	Red (R+/R/R-)
Dynamic (Equipment)	<p>Distresses present are of no impact to the components operation.</p> <p>Example: The fan component is fully operational.</p>	<p>Distresses present are of impact to the components operation. A repair is needed to bring the component back to proper operating condition</p> <p>Example: A fan has corrosion on the housing. A sand and paint would remove the distress.</p>	<p>Distresses present are of impact to the components operation. The component needs to be replaced.</p> <p>Example: A fan motor has overheated and no longer functions. Replacement of the component is required.</p>
Non-Dynamic	<p>The architecture component is in good condition requiring no maintenance outside of normal operations.</p> <p>Example: The carpet component is fully operational.</p>	<p>The architecture component has a distress that requires an extra level of maintenance outside of normal operations. This extra maintenance (or repair) would be an action such as a cleaning or a painting of a surface.</p> <p>Example: A carpet component has stains. A cleaning would remove the distress.</p>	<p>The architecture component has a distress where a maintenance operation will not fix the problem at hand. A replacement of the component is required.</p> <p>Example: A carpet component is damaged (ripped). The component needs to be replaced to fix the distress.</p>

Dynamic: Refers to equipment in the D10, D20, D30, D40, D50, and E10 systems.

Non-Dynamic: Refers to architectural components in the A10, A20, B10, B20, B30, C10, C20, and C30 systems.

Note: There are some Non-Dynamic components (for instance, toilets under D20) in the Dynamic systems.

Step 3: Adhere to the following requirements:

Requirements
Maintainability and obsolescence should not be the driving factor when conducting a condition assessment unless it has led to actual deterioration of condition that can be observed or reasonably inferred.
G+ ratings should only be given to inventory that is in pristine condition and is free of any observable defects.
Do not downgrade an assessment rating simply because an item is dirty.
Do not downgrade an assessment rating because the item does not meet current code compliance standards
Do not downgrade an assessment rating because the item is not deemed energy efficient.
Do not downgrade an assessment rating because the item is deemed to be a safety violation/hazard unless otherwise directed.
Do not downgrade an assessment rating because of a code violation.
Ratings should not be anticipated based on planned repairs or replacement.
Assessors should not expend field time and effort to determine the cause of a deficiency. If the cause is easily identified it should be included in the inspection comment.
Ratings shall be based upon the observable and documentable condition of the component.
A component should be downgraded if its operational capability, performance, reliability, etc. is compromised according to the direct rating definitions.
Incorporate user interviews, work order histories, or other information sources when determining the condition of the component. Include this information in the inspection comment.

The assessor should calibrate their mindset on what the expected DCR should be based on condition.
The assessor should consider the maintenance requirements of the component in the current condition.
The assessor should factor in the requirements/business rules for completing an inspection.

One factor that can play into an assessment is if the assessor receives information from a POC that results in a lower rating. For instance, an assessment takes place in July and there is a heating water pump that looks brand new, but has a blown motor. The assessor would assume the pump is supposed to be off due to being off season, but if the POC informs the assessor about the blown motor, this can be factored into the assessment (and indicated in the inspection comment).

One factor that should not play into an assessment is pending replacements of components. Assessors should rate components in the condition they are at the time of assessment. If the carpet is being replaced next month, that should not factor into a rating. Now, if the carpet contractor is on site (the work is currently taking place), this could be factored into the rating and a G+ rating provided with the current date of inspection chosen as the install date.

Service Life: No distresses present and component is nearing (or past) its service life.

The following comment can be used as an inspection comment for components that have no signs of distresses, are rated either Amber (A) or Amber Plus (A+), and are over 75% through their service life. This negates the need to have 4 parts of an inspection comment. Also, an inspection photo is no longer required.

[First Last-AE-Date] - The component is in proper working condition and is showing no signs of distress. The DCR was based on estimated remaining service life.

Step 1: Understand the 5 parts of the inspection comment:

Part #	Part Type	Type Description
1	Front End	[First Last-AE-Date] OR [First Last-DPW-Date] (ex: [John Doe-AE-7/4/2017])
2	Distress	Identifies the distress of the component
3	Severity	Identifies the amount of the distress.
4	Location	Identifies the location of the distress
5	Quantity	Identifies the quantity of the distress

Step 2: Use the DCR of the component as the basis for the severity.

DCR	Severity
Amber (+)	Minor/Mild
Amber	Moderate
Amber (-)	Significant/Major
Red (+)	Extensive
Red	Severe
Red (-)	Complete/Total

To aid in the inspection comments reading correctly the severity can be modified slightly. For instance, 'moderately' can be used for an 'A' DCR comment. This approach also applies to the distresses where one of the 23 MUST be selected. If 'Cracked' is selected as the distress, the wording 'cracks' may be used.

Step 3: Identify the distress of the component:

23 Distresses			
Blistered	Displaced	Overheated	Capability/Capacity Deficient
Broken	Efflorescent	Patched	Animal/Insect Damaged
Clogged	Holes	Rotten	Moisture/Debris Contaminated
Corroded	Leaks	Stained/Dirty	Noise/Vibration Excessive
Damaged	Loose	Cracked	Operationally Impaired
Deteriorated	Missing		Electrical Ground Inadequate or Unintentional

Step 4: Location and Quantity

Location on non-dynamic assets - 'lobby area' or 'northwest corner'.

Quantity on a SF UOM will typically be a %. On an EA UOM will typically be a count.

Step 5: Put all 5 components together to form an inspection comment (colors correspond to part):

A+	Front End	CRACKED.	The	walls have	minor	cracks	present on	10% of the	gym.
A	Front End	DETERIORATION.	The	carpet has	moderate	deterioration	over	50 %	of the lobby.
A-	Front End	DAMAGED.	The	door has	significant	damage	to the	lower half	of the door.
R+	Front End	CRACKED.	The	windows have	extensive	cracks	present in	4	panes.
R	Front End	LEAKS.	The	roof has	severe	leaking	around the	HVAC	penetrations.
R-	Front End	OPERATIONALLY IMPAIRED.	The	3	north	doors are	completely	operationally impaired.	

Inspection Comments

Rule #	Rule
1	Required on all inspections with a DCR of A+ and below.
2	Paint DCRs do not have an inspection comment requirement. Only the component DCR A+ and below.
3	Should include any component specific information obtained from the base or POC interview.
4	Should be in complete sentences and use industry standard terminology. Comments can be typed into MS Word for spelling/grammar checks and then pasted into the comments box.
5	Do not use all capital letters for the entire comment. The distress should be all capital letters.
6	Do not use abbreviations, jargon, or slang.
7	Should give enough information for a follow-on assessor to locate the problem area/equipment.
8	Should accurately describe the problem/observation that is the basis for the rating. Someone unfamiliar with the particular item should have an accurate picture of the components current condition and the justification for the assigned rating.
9	Should accurately describe the location of the distress if the component is only showing a distress in a single location. For instance, if an office has a stain in the carpet, it would be necessary to call out the room number of the office.
10	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. For instance, assessor John Doe at firm AE: [John Doe-AE-7/4/2017].
11	After #10 front end information in the brackets one of the 23 distresses should be provided in capitalized form. Building on #10 for an example if stained carpet: [John Doe-AE-7/4/2017] - STAINED.
12	After #10 and #11 a sentence should be provided that provides the distress, severity, location, and quantity. Quantity/Location refers to the amount/location of the distress present.

Inventory Comments

Rule #	Rule
1	Used to identify components that were not visible for inspection. See standard comments.
2	Used as a bread crumb for follow-on inspections. Can provide useful additional information such as location or type to help the next assessor understand what was being inventoried. Ex: This component is the stone wall located behind the receptionist in the lobby area.
3	Should describe the component inventoried where 'OTHER' is used to allow follow-on assessments to understand what was inventoried in the previous assessment.
4	Used to provide the location of the component (especially used for architecture components where there are no Section Details provided that have a location): Roof, NW Corner, Room Number
5	Do not use all capital letters, abbreviations, jargon, or slang.
6	Used to further describe an asset if it is not adequately described in the component type selection.
7	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Section Detail Comments

Rule #	Rule
1	Used to identify data that was not able to be populated in the Details fields. See standard comments.
2	Used to provide information that is specific to just that component section detail field. This can be a location of the specific section or something that the section services.
4	Do not use all capital letters, abbreviations, jargon, or slang.
5	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Standard Inventory Comments

When	Use Standard Comment
Assets are not visible for inspection.	Component was not visible for inspection. The component condition will be age-based by BUILDER program degradation curves.
Assets are not visible for inspection that also require Section Details to be populated.	The component is not visible for inspection or population of Section Details. The component condition will be age-based by BUILDER program degradation curves and no nameplate data or inventory photo will be provided.
Assets are not visible for inspection that require quantities to be assumed. Hidden mechanical equipment, ductwork, and # of control points are common occurrences.	The component is not visible for inspection and the quantity was estimated based on architect/engineering judgment. The component condition will be age-based by BUILDER program degradation curves.
Assets are located in an area where no electronics area allowed. This prevents an assessor from taking inventory/inspection photos.	The component is located in a secure area of the facility that did not allow electronic devices to be used. Photos were not obtainable.
Assets are visible for inspection but are a system that is not tested (HVAC controls, security system, etc.) so an age-based BUILDER™ CI is desired.	The component condition will be age-based by BUILDER program degradation curves.

Standard Section Detail Comments

When	Use Standard Comment
Nameplate is not found on the component.	Nameplate not found on the component. All fields with "NA" represent data not found.
Nameplate is found on the component but it is partial/completely unreadable.	Nameplate on the component was dirty/corroded/damaged/sunwashed. Section Detail fields with "NA" represent data that was not found.
Nameplate is found on the component that is readable but is missing certain Section Details fields.	Nameplate on the component was missing certain Section Detail fields. Section Detail fields have been populated and fields with "NA" represent data not found.

Comment Front-End Clarification

A front end refers to the bracketed information at the start of an inspection/inventory/section detail comment. The front end must have to following 3 pieces of information: 1) assessor name, 2) assessor company or affiliation, and the date. The BRED™ stamp may also provide the time of inspection which is acceptable.

BRED™/BUILDER™ Clarification

The terms BRED™ and BUILDER™ are used interchangeably throughout this document.

Rule #	Rule
1	Components are divided into sections when a significant variation exists in material/equipment category, age, or construction history, which impacts the life cycle characteristics of the component. Example 1 - If a wing or addition was added to a much older building, the two areas of the building should be sectioned differently because the age and construction history is different. Example 2 – If the building roof has multiple levels of similar materials in different conditions, these levels should be sectioned differently to capture the difference in condition. Example 3 – If the building has more than one of a particular type of component, separate component sections. For example: There is a 5,000 and 10,000 CFM air handler.
2	Multi-wing buildings are always sectioned by wing if the installation date of the wings vary. If a building is an 'E' shape and all wings have the same install date only sectioning by floor is required.
3	Multi-story buildings are always sectioned vertically by floor or level (in the case of a basement or mezzanine).
4	There may be unique instances where sectioning by an area of a building is required. For instance, if a building is split between two companies an installation may request sectioning by company 1 and 2.
5	An on-site discussion must occur at each building among all team members to determine the cardinal direction of the building. All assessors should have North as the same side of the building.
6	An on-site discussion must occur at each building among all team members on how the building should be sectioned. The goal is to avoid one assessor calling it a toilet, one calling it a restroom, and another calling it a bathroom. Standard sectioning naming is important for a consistent data set.
7	The section name should not be repetitive of the component type or material. If the floor is wood, do not have a section name 'WOOD'. Incorporation of the location into the section name is very helpful to be used for follow on assessments. If the wood floor has the section name 'LOBBY', it provides great

Standard Section Names and Format Rules

Use	Standard Section Name
Section by Floor (Business Rule)	FL1 – 1st Floor, FL2 – 2nd Floor, FL3 – 3rd Floor, etc.
Section by Floor (Business Rule)	BASEMENT, MEZZANINE, ATTIC, etc.
Section by Wing (applicable if different construction histories or condition only)	MAIN, WING A, WING B, WING C, ADDITION, etc.
Section by Direction (applicable if different construction histories or condition only)	NORTH, EAST, WEST, SOUTH, etc.
Section by Roof Level (applicable if different construction histories or condition only)	UPPER, LOWER, MAIN, etc.

When an equipment tag is included in the section name it should match exactly what was found in the field. Example: if the boiler ID number is B-1, the section name equipment tag portion should read B-1. If the boiler is tagged B1, the equipment tag portion should read B1. See equipment sectioning for further guidance.

Dashes are not required in the section name other than the instance in regards to equipment ID tags above.

The section name field is always entered in all capital letters.

Sectioning Business Rules - Grouping

The following only applies to each (EA) unit of measure (UOM) components. The 'Complete Component Catalog Breakdown' at the end of the section has a 'Group OK?' column. This has the values of 'Yes', 'No', and 'N/A'.

'Yes' = Grouping is allowed for this component type. A quantity of greater than '1' is acceptable.

'No' = Grouping is not allowed for this component type. The quantity must be '1'.

N/A = Not Applicable. Component type is not an EA UOM or is out of scope.

Group OK? = Yes when Section Details and Inventory Photos are Required.

There are several equipment component types (Unit Heaters, small pumps, etc) that have the following designations in the 'Complete Component Catalog Breakdown': 1) Group OK? = Yes, 2) Section Details? = Yes, and 3) Inventory Photo? = Yes.

In this case, a single section detail and inventory photo representative of the entire section is required. A few more clarifications:

- 1) The location field would be for the entire section (FL1/BAY 1/EXTERIOR) and not specific to a single component.
- 2) A difference in manufacturer does not drive further sectioning. For instance, 2 KW electric unit heaters from multiple manufacturers can be combined into one section. Capacity (2 KW) is the driver for sectioning methodology.
- 3) It is understood that the single section detail field is representative of the entire section. The details should be populated per one component. There is no need to enter multiple details or try to combine multiple manufacturer/model/serial/etc into to a single section detail field.

Group OK? = No

The quantity for these component types must be 1. For equipment (Section Details? = Yes and Inventory Photo? = Yes) the guidance found on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components', 'Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components', and 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components' must be followed.

C30 INTERIOR FINISHES - C3010 WALL FINISHES

C301001 CONCRETE WALL FINISHES - General

Typical Application and General Component Guidance:

This component is used to inventory decorative concrete wall finishes.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

This is only used for an interior skim coat on a block wall or other concrete wall hanging affixed to a block wall. Do not use this to inventory a concrete wall, as that should be inventoried under C10.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF

C301002 PLASTER WALL FINISHES - General

Typical Application and General Component Guidance:

This component is used to inventory plaster wall finishes.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

This finish is typically applied to an interior face of an exterior wall. If the plaster wall has a stud backup, it should be captured under 'C1010 PARTITIONS.'

Typical Distress

Damage from personnel or maintenance operations. Water damage from piping behind wall or HVAC components above. Cracks from settling of building after construction.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	125	SF

C301003 GYPSUM WALLBOARD FINISHES - General

Typical Application and General Component Guidance:

This component is used to inventory gypsum wall finishes.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

This finish is typically attached to an interior face of an exterior wall. If the gypsum wall has a stud backup, it should be captured under 'C1010 PARTITIONS'.

Lesson Learned

The wall component 'C101001 FIXED PARTITIONS - Wall - Drywall w/Stud Framing' includes drywall. Do not double count and add drywall under 'C301003 GYPSUM WALLBOARD FINISHES.'

Typical Distress

Damage from personnel or maintenance operations. Water damage from piping behind wall or HVAC components above. Cracks from settling of building after construction.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	125	SF

C301004 TILE & TERRAZZO WALL FINISHES - Tile

Typical Application and General Component Guidance:

This component is used to inventory tile wall coverings.



Business Rules/General/Lessons Learned/Reinspection

General

Commonly found in bathrooms or kitchen areas.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Tile	Yes	No	No	No	N/A	No	75	SF

C301005 WALL COVERINGS - Laminated Plastic

Typical Application and General Component Guidance:

This component is used to inventory laminated plastic wall coverings.



Business Rules/General/Lessons Learned/Reinspection

General

May be referred to as FRP (fiber-reinforced plastic).
FRP will typically have protruding seam covers and is washable.

Lesson Learned

Commonly found in food service areas and occasionally in bathrooms.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Laminated Plastic	Yes	No	No	No	N/A	No	10	SF

C301005 WALL COVERINGS - Metal Panel

Typical Application and General Component Guidance:

This component is used to inventory metal panel wall finishes. The photo has diamond plate metal as the finish adhered to the drywall with stud backup.



Business Rules/General/Lessons Learned/Reinspection

Lesson Learned

Lab and research facilities may have metal panels that have been painted. These can easily be missed if a close examination of wall material is not performed.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Metal Panel	Yes	No	No	No	N/A	No	40	SF

C30 INTERIOR FINISHES - C3010 WALL FINISHES

C301005 WALL COVERINGS - Paint

Typical Application and General Component Guidance:

This component is used to inventory paint wall finishes.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

If an interior wall has been painted, DO NOT inventory the quantity under a paint finish. The assessor should have selected 'PAINTED' and provided a 'PAINT DCR' under C1010.

If there is an exterior wall where the interior has been painted, then only the paint is captured as an interior finish.

Unpainted brick, concrete, and masonry walls are not captured under C3010. C1010 should be used.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Paint	Yes	No	No	No	N/A	No	20	SF

C301005 WALL COVERINGS - Wallpaper

Typical Application and General Component Guidance:

This component is used to inventory wallpaper wall finishes.



Business Rules/General/Lessons Learned/Reinspection

General

Commonly found as a wainscot or in full wall application.

Types include vinyl coated paper, coated fabric, textile, and foil-faced.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Wallpaper	Yes	No	No	No	N/A	No	15	SF

C301005 WALL COVERINGS - Wood

Typical Application and General Component Guidance:

This component is used to inventory wood wall finishes.



Business Rules/General/Lessons Learned/Reinspection

General

Includes interior wood such as tongue and groove.

Types include shiplap, tongue and groove, reclaimed wood, board and batten, beadboard, and flat panel.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Wood	Yes	No	No	No	N/A	No	10	SF

C301006 ACOUSTICAL PANELS ADHERED TO WALLS - General

Typical Application and General Component Guidance:

This component is used to inventory acoustic panels that are adhered to walls. Will typically be found in gyms and auditoriums.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

There is no ceiling component for these type of acoustical panels. If, for example, in an auditorium there are panels on the walls and ceilings, the assessor should combine them into one section and inventory under 'C301006-General.'

Lesson Learned

This component may also be found along the tops of loud rooms such as engine generator rooms to prevent noise from reaching the main areas of the building.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
General	Yes	No	No	No	N/A	No	90	SF

C30 INTERIOR FINISHES - C3010 WALL FINISHES

C301090 OTHER WALL FINISHES - General**Typical Application and General Component Guidance:**

This component is used to inventory other wall finishes such as the carpet shown in the photo.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Always provide an inventory comment stating what the asset is and where it is located. This will give future assessments the ability to find and reassess the component.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	N/A	No	14	SF

C301090 OTHER WALL FINISHES - Plastic Covered Insulated Batts**Typical Application and General Component Guidance:**

This component is used to inventory plastic covered insulated batt.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

It is common for a building to have batt insulation installed on both walls and ceiling in metal buildings. Use 'C303090 OTHER CEILING & CEILING FINISHES - Plastic Covered Insulated Batts' to capture the ceiling.

Lesson Learned

The wall finish will often have more distresses present than the ceiling due to building operations.

Reinspection

Prior to the 2019 update 'C301090 OTHER WALL FINISHES - Other' was used to capture this wall finish. When performing a reinspection, the component type should be updated.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Plastic Covered Insulated Batts	Yes	No	No	No	N/A	No	20	SF

C30 INTERIOR FINISHES - C3020 FLOOR FINISHES

C302001 TILE FLOOR FINISHES - Ceramic Tile**Typical Application and General Component Guidance:**

This component is used to inventory ceramic tile floor coverings.

**Business Rules/General/Lessons Learned/Reinspection****General**

Commonly found in bathrooms or kitchen areas.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Ceramic Tile	Yes	No	No	No	N/A	No	75	SF

C302002 TERRAZZO FLOOR FINISHES - General**Typical Application and General Component Guidance:**

This component is used to inventory terrazzo floor finishes.

**Business Rules/General/Lessons Learned/Reinspection****General**

Commonly found in dining areas, lobbies, labs, and main corridors of older and somewhat more costly buildings.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	75	SF

C30 INTERIOR FINISHES - C3020 FLOOR FINISHES

C302003 WOOD FLOORING - General**Typical Application and General Component Guidance:**

This component is used to inventory wood floor finishes.

**Business Rules/General/Lessons Learned/Reinspection****General**

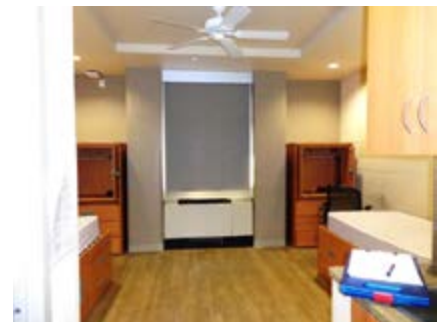
Most commonly found in gyms.

Types include solid and engineered.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	40	SF

C302004 RESILIENT FLOOR FINISHES - Composition Sheet**Typical Application and General Component Guidance:**

This component is used to inventory composition sheet resilient floor finishes.

**Business Rules/General/Lessons Learned/Reinspection****General**

Often found in kitchen, galleys, and Morale, Welfare, and Recreation (MWR) facilities.

Types include linoleum and sheet vinyl.

Usually installed in sheets 4' to 6' wide.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Composition Sheet	Yes	No	No	No	N/A	18	SF

C30 INTERIOR FINISHES - C3020 FLOOR FINISHES

C302004 RESILIENT FLOOR FINISHES - Resilient Tile**Typical Application and General Component Guidance:**

This component is used to inventory resilient tile floor finishes.

**Business Rules/General/Lessons Learned/Reinspection****General**

Types can include cork, rubber, PVC, and solid vinyl.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Resilient Tile	Yes	No	No	No	N/A	No	50	SF

C302004 RESILIENT FLOOR FINISHES - Rubber Sheet**Typical Application and General Component Guidance:**

This component is used to inventory rubber sheet resilient floor finishes.

**Business Rules/General/Lessons Learned/Reinspection****General**

Commonly found in fitness facilities, at entries, and on stair landings/treads.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Rubber Sheet	Yes	No	No	No	N/A	No	40	SF

C302004 RESILIENT FLOOR FINISHES - Vinyl Tile

Typical Application and General Component Guidance:

This component is used to inventory vinyl composition tile (VCT) resilient floor finishes.



Business Rules/General/Lessons Learned/Reinspection

General

Commonly found in office areas and hallways, referred to as "VCT".

VCT is made with PVC chips and limestone as a filler material. The original VCT flooring was made with asphalt or asbestos (predominantly used from the 1920s to the 1980s).

Lesson Learned

Asbestos-based floor tiles are usually 9"x9" and can be found in older facilities.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Vinyl Tile	Yes	No	No	No	N/A	No	18	SF

C302005 CARPETING - Carpet Tile

Typical Application and General Component Guidance:

This component is used to inventory carpet tile floor finishes.



Business Rules/General/Lessons Learned/Reinspection

General

Commonly found in office areas and over raised access flooring.

Typical Distress

Staining, wear, and curled edges.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Carpet Tile	Yes	No	No	No	N/A	No	10	SF

C302005 CARPETING - General**Typical Application and General Component Guidance:**

This component is used to inventory carpet floor finishes.

**Business Rules/General/Lessons Learned/Reinspection****Typical Distress**

Staining, wear, and frayed seams.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	7	SF

C302006 MASONRY & STONE FLOORING - Quarry Tile**Typical Application and General Component Guidance:**

This component is used to inventory quarry tile floor finishes.

**Business Rules/General/Lessons Learned/Reinspection****General**

Often found in kitchens, galleys, and MWR facilities.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Quarry Tile	Yes	No	No	No	N/A	No	50	SF

C302009 FLOOR TOPPINGS AND TRAFFIC MEMBRANES - Paint**Typical Application and General Component Guidance:**

This component is used to inventory painted floor finishes. This is a 'roll on' type application. If a concrete topping was used, then inventory under 'C302010 HARDENERS AND SEALERS'.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not inventory if the paint is just for striping purposes. For instance, in the photo, if just the yellow line was present, there would be no component inventoried.

This captures 'rolled/brushed-on' painted floors. If a floor has a more substantial finish applied, then 'C302010 HARDENERS AND SEALERS - Concrete Topping' should be used.

Lesson Learned

For consistency purposes, architect assessors should coordinate on which components are being inventoried under 'C302009 - Paint', 'C302010 - Concrete Topping', and 'C302010 - Epoxy.'

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Paint	Yes	No	No	No	N/A	No	20	SF

C302010 HARDENERS AND SEALERS - Concrete Topping

Typical Application and General Component Guidance:

This component is used to inventory finishes that are a concrete sealer.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

If a floor only has a paint coating applied, then 'C302009 FLOOR TOPPINGS AND TRAFFIC MEMBRANES - Paint' should be used.

If the concrete has a polished, more decorative finish it should be inventoried under 'C302010 HARDENERS AND SEALERS - Epoxy.'

Lesson Learned

Architect assessors should be coordinated on what components are being inventoried under 'C302009 - Paint', 'C302010 - Concrete Topping', and 'C302010 - Epoxy.' This is an area for confusion.

The most common application of concrete topping is in warehouses. The concrete will have a shiny/polished appearance but still be a natural concrete color.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Concrete Topping	Yes	No	No	No	N/A	No	40	SF

C302010 HARDENERS AND SEALERS - Epoxy

Typical Application and General Component Guidance:

This component is used to inventory decorative concrete floor finishes.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

If the concrete has a polished, more decorative finish it should be inventoried under 'C302010 HARDENERS AND SEALERS - Epoxy.'

Lesson Learned

It is understood that paint will often be an epoxy, which causes confusion between 'C302009 - Paint' and 'C302010 - Epoxy.' The general rule is if it was applied with a brush it should be inventoried under 'C302009 - Paint'.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Epoxy	Yes	No	No	No	N/A	No	20	SF

C302011 RAISED ACCESS FLOORING - General**Typical Application and General Component Guidance:**

This component is used to inventory raised access flooring.

**Business Rules/General/Lessons Learned/Reinspection****General**

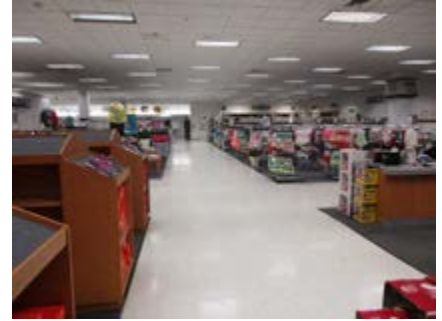
Commonly found in newer office buildings, data centers, and server rooms.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	30	SF

C303001 ACOUSTICAL CEILING TILES & PANELS - General

Typical Application and General Component Guidance:

This component is used to inventory acoustical ceiling tile (ACT).



Business Rules/General/Lessons Learned/Reinspection

General

Includes adhered tile and lay-in suspended grid/tile. Will be commonly found in office buildings.

Typical Distress

Blistering from exposure to water or heat.

Damage from being removed for maintenance operations.

Moisture damage/staining from leaking roof or HVAC components.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	70	SF

C303002 GYPSUM WALLBOARD CEILING FINISHES - General

Typical Application and General Component Guidance:

This component is used to inventory gypsum ceiling finishes.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	60	SF

C303003 PLASTER CEILING FINISHES - General**Typical Application and General Component Guidance:**

This component is used to inventory plaster ceiling finishes.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	125	SF

C303004 WOOD CEILINGS - General**Typical Application and General Component Guidance:**

This component is used to inventory wood ceilings.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	60	SF

C303006 METAL STRIP CEILINGS - General**Typical Application and General Component Guidance:**

This component is used to inventory metal strip and metal panel ceilings.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	40	SF

C303090 OTHER CEILING & CEILING FINISHES - Exposed Concrete Finish

Typical Application and General Component Guidance:

This component is used to inventory ceiling finishes of concrete structural members that are exposed to the occupant area.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

There is no component type to inventory ceiling paint finish on the underside of a structure. If the component is not concrete (e.g. a metal deck) this can still be used to capture this paint finish.

This is not used to inventory factory-applied coatings.

Lesson Learned

This component type is often used to capture the paint finish on the underside of a floor deck and slab component. This is often found in spaces where the space is open to the roof/floor deck above.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Exposed Concrete Finish	Yes	No	No	No	N/A	125	SF

C303090 OTHER CEILING & CEILING FINISHES - Plastic Covered Insulated Batts

Typical Application and General Component Guidance:

This component is used to inventory plastic-covered or foil-backed insulation that is commonly found in maintenance buildings and mechanical rooms.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

It is common for a building to have batt insulation installed on both walls and ceilings in metal buildings. Use 'C301090 OTHER WALL FINISHES - Plastic Covered Insulated Batts' to capture the walls.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Plastic Covered Insulated Batts	Yes	No	No	No	N/A	20	SF

C30 INTERIOR FINISHES

C301001 CONCRETE WALL FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF
Other	Yes	No	Yes	Yes	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C301002 PLASTER WALL FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	125	SF
Other	Yes	No	Yes	Yes	N/A	No	125	SF
Unknown	No	No	No	No	N/A	No	125	SF

C301003 GYPSUM WALLBOARD FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	125	SF
Other	Yes	No	Yes	Yes	N/A	No	125	SF
Unknown	No	No	No	No	N/A	No	125	SF

C301004 TILE & TERRAZZO WALL FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	75	SF
Other	Yes	No	Yes	Yes	N/A	No	75	SF
Tile	Yes	No	No	No	N/A	No	75	SF
Unknown	No	No	No	No	N/A	No	75	SF

C30 INTERIOR FINISHES

C301005 WALL COVERINGS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	10	SF
Laminated Plastic	Yes	No	No	No	N/A	No	10	SF
Metal Panel	Yes	No	No	No	N/A	No	40	SF
Other	Yes	No	Yes	Yes	N/A	No	10	SF
Paint	Yes	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	10	SF
Wallpaper	Yes	No	No	No	N/A	No	15	SF
Wood	Yes	No	No	No	N/A	No	10	SF

C301006 ACOUSTICAL PANELS ADHERED TO WALLS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	90	SF
Other	Yes	No	Yes	Yes	N/A	No	90	SF
Unknown	No	No	No	No	N/A	No	90	SF

C301090 OTHER WALL FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	N/A	No	14	SF
Other	No	No	No	No	N/A	No	14	SF
Plastic Covered Insulated Batts	Yes	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	14	SF

C302001 TILE FLOOR FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Ceramic Tile	Yes	No	No	No	N/A	No	75	SF
General	No	No	No	No	N/A	No	75	SF
Marble Tile	Yes	No	No	No	N/A	No	75	SF
Other	Yes	No	Yes	Yes	N/A	No	75	SF
Porcelain Tile	Yes	No	No	No	N/A	No	75	SF
Unknown	No	No	No	No	N/A	No	75	SF

C30 INTERIOR FINISHES

C302002 TERRAZZO FLOOR FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	75	SF
Other	Yes	No	Yes	Yes	N/A	No	75	SF
Unknown	No	No	No	No	N/A	No	75	SF

C302003 WOOD FLOORING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	40	SF
Other	Yes	No	Yes	Yes	N/A	No	40	SF
Unknown	No	No	No	No	N/A	No	40	SF

C302004 RESILIENT FLOOR FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Composition Sheet	Yes	No	No	No	N/A	No	18	SF
Cork Tile	Yes	No	No	No	N/A	No	40	SF
General	No	No	No	No	N/A	No	18	SF
Other	Yes	No	Yes	Yes	N/A	No	18	SF
Resilient Tile	Yes	No	No	No	N/A	No	50	SF
Rubber Sheet	Yes	No	No	No	N/A	No	40	SF
Unknown	No	No	No	No	N/A	No	18	SF
Vinyl Tile	Yes	No	No	No	N/A	No	18	SF

C302005 CARPETING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Carpet Tile	Yes	No	No	No	N/A	No	10	SF
General	Yes	No	No	No	N/A	No	7	SF
Other	Yes	No	Yes	Yes	N/A	No	7	SF
Unknown	No	No	No	No	N/A	No	7	SF

C30 INTERIOR FINISHES

C302006 MASONRY & STONE FLOORING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	50	SF
Other	Yes	No	Yes	Yes	N/A	No	50	SF
Quarry Tile	Yes	No	No	No	N/A	No	50	SF
Unknown	No	No	No	No	N/A	No	50	SF

C302007 WALL BASE FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	LF
Other	No	No	No	No	N/A	No	20	LF
Unknown	No	No	No	No	N/A	No	20	LF

C302008 STAIR FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C302009 FLOOR TOPPINGS AND TRAFFIC MEMBRANES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Paint	Yes	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C302010 HARDENERS AND SEALERS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Concrete Topping	Yes	No	No	No	N/A	No	40	SF
Epoxy	Yes	No	No	No	N/A	No	20	SF
General	No	No	No	No	N/A	No	40	SF
Other	No	No	No	No	N/A	No	40	SF
Unknown	No	No	No	No	N/A	No	40	SF

C30 INTERIOR FINISHES

C302011 RAISED ACCESS FLOORING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	30	SF
Other	Yes	No	Yes	Yes	N/A	No	30	SF
Unknown	No	No	No	No	N/A	No	30	SF

C302090 OTHER FLOORING & FLOOR FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	N/A	No	50	SF
Other	No	No	No	No	N/A	No	50	SF
Unknown	No	No	No	No	N/A	No	50	SF

C303001 ACOUSTICAL CEILING TILES & PANELS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	70	SF
Other	Yes	No	Yes	Yes	N/A	No	70	SF
Unknown	No	No	No	No	N/A	No	70	SF

C303002 GYPSUM WALLBOARD CEILING FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	60	SF
Other	Yes	No	Yes	Yes	N/A	No	125	SF
Unknown	No	No	No	No	N/A	No	125	SF

C303003 PLASTER CEILING FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	125	SF
Other	Yes	No	Yes	Yes	N/A	No	125	SF
Unknown	No	No	No	No	N/A	No	125	SF

C30 INTERIOR FINISHES

C303004 WOOD CEILINGS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	60	SF
Other	Yes	No	Yes	Yes	N/A	No	60	SF
Unknown	No	No	No	No	N/A	No	60	SF

C303005 SUSPENSION SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	20	SF
Other	Yes	No	Yes	Yes	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C303006 METAL STRIP CEILINGS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	40	SF
Other	Yes	No	Yes	Yes	N/A	No	40	SF
Unknown	No	No	No	No	N/A	No	40	SF

C303090 OTHER CEILING & CEILING FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Exposed Concrete Finish	Yes	No	No	No	N/A	No	125	SF
General	Yes	No	Yes	Yes	N/A	No	40	SF
Other	No	No	No	No	N/A	No	40	SF
Plastic Covered Insulated Batts	Yes	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	40	SF

C304001 GENERAL REQUIREMENTS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C30 INTERIOR FINISHES

C304002 CONCRETE FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C304003 CONCRETE MASONRY FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C304004 METAL FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C304005 INTERIOR WOOD FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C304006 GYPSUM WALLBOARD FINISHES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

C304007 SPECIAL COATINGS ON WALLS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

Details Req?	If 'Yes', all required section detail fields are to be populated.
Inventory Pic?	If 'Yes', an inventory level photo is to be provided. This is a step back photo showing the component.
Inventory Cmmt?	If 'Yes', an inventory comment is to be populated. This should describe the component.
Group OK?	Only applicable to each (EA) UOM's that are In Scope? = 'Yes'. If 'No' section must be a quantity of 1. if 'Yes' section may have a quantity greater than 1. If 'N/A' it is not applicable to the component type.
Age Based?	If 'Yes', age based (do not provide an inspection) is the desired approach. If 'No' but upon inspection the component is not visible, then an age based approach is acceptable.
Design Life	Design life of the component.
UOM	Unit of measure. If yellow highlight = new component type in 2019 update.



Sustainment Management System

Army BUILDER™ SMS Inventory and Assessment Guide

D10 CONVEYING



**US Army Corps
of Engineers**
Mobile District

ERDC
Engineer Research & Development Center

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Safety The following items should not be interpreted as 1) Safety Plan, 2) OSHA, or base safety requirements. These are recommendations. The contractor should operate in accordance with the SOW and approved safety plan.

Safety is of the utmost concern and should always be at the forefront of any activities taking place in the field. There are many potential safety hazards associated with building assessments. Prior to performing building assessments, the assessing staff/team must ensure that field activities are in accordance with the 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Safety Preparation Activities

Do not perform a task that may harm or endanger the health and safety of oneself or others.

Consult with the installation safety representative to review installation-specific safety requirements.

Conduct a daily “stand-up” safety meeting.

Ensure new assessors have been properly trained.

Review the assessment plan/schedule for the day.

Ensure proper Personal Protective Equipment (PPE) is available. This includes, but is not limited to, a hardhat; hearing protection; eye protection; safety shoes, gloves; and a safety colored vest.

Prior to conducting assessments, the team leader must check with the safety office or building POC to determine if there are any building/site-specific safety rules or hazards. For instance, some manufacturing areas may require steel toe shoes, hearing protection, or eye protection.

Safety Recommendations

Do not walk and write, or talk on a mobile phone, at the same time; this can lead to trips/falls.

Do not review documents or write while walking on steps or stairs.

Do not enter posted or suspected confined spaces such as crawl spaces, tanks, chases, or pits.

Mechanical rooms, attic spaces, or other areas with piping/ductwork may require the use of hard hats to prevent against head bumping hazards. Refer to the project specific safety plan for further clarification.

Do not enter areas with hazardous material signs posted or that appear to contain hazardous materials (asbestos, gases, visible mold, etc.).

Be careful when walking through/across vehicle maintenance or staging areas.

Be aware of loose-fitting clothing and lanyards that may get caught in tight areas or on piping such as in mechanical/electrical rooms, etc.

Be careful of wildlife and insects when walking around a building or opening seldom-entered mechanical/electrical rooms. Assessors may encounter snakes, spiders, stray cats/dogs, rats/mice, etc. in these areas. Do not enter or place hands in spaces that are not completely visible.

If a life safety problem is observed, do not try to fix it. Report it to the proper authority or building manager prior to leaving the building or area.

Before the assessment team leaves a building, ensure all team members are accounted for.

Ladder use should be done in accordance with 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Designate a safety POC to enforce the safety accident prevention plan.

Perform a daily safety briefing before field work. Document the attendees and the topics covered.

Halt outdoor field operations at the sign of lightning or thunder.

Safety Recommendations (continued)

Do not access pitched roofs. They may be assessed from a nearby building or using binoculars.

Use proper techniques to place, secure, and climb ladders. Never climb a ladder while holding anything. Always use the three-point technique for climbing. Equipment should be placed in a backpack or an over-the-shoulder satchel to free hands for climbing.

Do not operate powered equipment, Weight Handling Equipment (WHE)/cranes, or remove access covers from powered equipment to perform assessments.

BUILDER™ assessments are commonly performed without electrical test equipment. Do not use electrical test equipment to test circuits or equipment unless qualified by a local authority. Only open panel box doors or enter electrical/mechanical rooms following proper training. Consult the local safety representative.

Site Preparation

Site Preparation Activities

Coordinate with the base to determine building access requirements, such as: escorts; camera passes; classified/secure area restrictions; or keys.

Locate buildings on a map and develop a schedule. Coordinate with the base to identify the appropriate building manager from the POC list. Notify the building managers of the upcoming assessment as needed.

Obtain a set of mechanical/electrical room master keys from the installation POC.

Extract all BRED™ files from BUILDER™ and have them loaded onto tablets (if using tablets). Verify all tablets are charged.

If multiple buildings are to be assessed by one team, confirm the schedule and plan of action with the team leader. A schedule may have building start times detailed to the hour.

Review the building names for the types/sizes of buildings that will be assessed to determine/confirm the needed tools and safety equipment. For instance, if the facilities are not climate-controlled, prepare accordingly (for cold weather bring hats/gloves).

Recommended Assessor Gear/Tools

Hardhat	Digital Camera with Extra Battery(s)
Hearing Protection	Measuring Tape
Safety Glasses	Laser Measuring Device/Flash Light
Reflective Safety Vest	Measuring Wheel
OSHA Approved Footwear	Backpack
Other Required Personal Protection Equipment (PPE)	Graphite Powder (for stuck locks)
Cell Phone and Team Cell Phone List	Cleaning Pad (to clean/help read nameplates)
Assessment Schedule	Pen/Pencils
Building Floor Plans/Base Map	Clipboard
Small Magnet (for determining door/window type)	Paper/Assessment Forms
Flash Light/Compass	Graph Paper
Sun Screen/Bug Spray	Refillable Water Bottle

Operating efficiently in the field is key to the success of the assessment. The following guidance is detailed by 1) Team Leader and 2) Assessor. **Bold items are drivers for client deliverables.**

Team Leader

Upon arrival, check in with the building manager and QA representative (if present).

Conduct the building manager interview. The entire team should be present for the building manager interview. The following questions should be asked:

Question 1: Are there any mission-related deficiencies in the building?

Question 2: Are there any safety-related deficiencies in the building?

Question 3: Have there been any upgrades or remodels of the building?

Question 4: Are there any building deficiencies (HVAC not working, electrical breakers tripping, maintenance issues, roof leaks, etc.) present?

The team leader (ONLY the team leader!) should populate the building level comment with the following information: 1) Missing systems, 2) Renovation dates, 3) Areas of the building not accessible during the assessment, and 4) If drawings were/were not provided. Below are some examples of building level comments:

Comment 1: No A20, D10, or D40 systems present. 2016: Vault room not accessible. Drawings not provided.

Comment 2: No A20 systems present. Renovated in 2010. 2016: 5% of building not accessible. Drawings provided.

The team leader should review the real property data in BRED™ and compare it to what is found during the assessment. The following should be confirmed: 1) Number of stories, 2) Building square footage, and 3) Building install date and 4) Building number in BRED™ matches the building. Variances between real property data and actual field data should be recorded for inclusion into the client deliverable.

Team Leader and Assessors

Best Practice: Each assessor should first take a photo of the building number to identify the subsequent photos associated with the building when they are downloaded. Take a second picture that captures the overall building view with respect to nearby buildings/streets. This should help refresh/remind the assessor on what the building looks like, while performing data-entry.

A team caucus should occur to discuss the sectioning strategy for the building and confirm which side is facing north.

Each assessor should have a consistent approach to each building. Assessors should move around the building exterior and interior in a clockwise (or counterclockwise) manner making notes and taking photos.

If a safety item is found, notify the team lead. The team lead will notify the building manager. Capture a photo of the safety item for inclusion into the safety log. Follow all other project-specific procedures when a safety item is encountered.

Upon return to the office perform the following steps:

Step 1: Download all photos from the day to a building-specific folder. Review the photos and delete any that are blurry or unreadable.

Step 2: Complete all calculations and counts. Complete all data entry into BRED™.

Data Entry

With the technology that is available today, the need to use forms in the field and do data entry at the office has been mitigated. Tablets can be used to run BRED™ to complete data entry while in the field. It is understood that there are challenges to accomplish this for certain disciplines. It is only mentioned here as a best practice recommendation and is not a requirement to execute the work. There will be instances where electronics will not be allowed in a facility. Assessors should have a paper/pen data collection system ready as a backup.

General

This section presents common Unifomat D10 Conveying Systems Inventory Component Sections, found across installations, as a guide for entering into the BUILDER™ or BUILDER™ Remote Entry Database (BRED™) software. Inventory items are arranged by BUILDER™ System with Material/Equipment Category, Component Type, Unit of Measure, and Inventory Notes.

Inspection

Conveying component sections are assessed using Direct Condition Rating (DCR) or Age-Based Modeling. Usually conveying components will be visible. When component sections are not visible, no assessment is entered. In this case, BUILDER™ will use the inventory year installed and degradation curves built in to the software to establish the Condition Index (CI).

Elevators and building weight handling equipment (WHE) require an independent inspection/annual certification. These certifications are normally performed by assigned base staff or through a service contractor. The assessor should rely heavily on this information to assist in determining the inspection rating.

Rule of thumb: If you can see it, you should inspect it. There are some caveats to this rule. See component catalog for items that must be age-based whether visible or non-visible.

Some thought may be required regarding deterioration and functionality loss, along with level of repair. Total functionality loss may occur due to some minor reason (e.g. failed switch, hydraulic leak, etc.). In these cases, the overall component section condition may be 'Green' when only a minor fix will correct the problem.

The following conditions or events can accelerate deterioration: 1) Improper construction or installation, 2) Improper maintenance or service, 3) Improper loading, and 4) Equipment damage.

When equipment is found that has been abandoned and is no longer functional it should not be inventoried. If the equipment is abandoned, but is still able to be put back in service, it should be inventoried and assessed.

Inventory

It is critical to confirm the year installed (default will be from real property records), or estimate the year installed. BUILDER™ uses the install date, degradation curves, and assessment observations to establish a CI for each component section. If the assessor suspects the default install date is not accurate, or an addition or renovation has taken place, check the real property record for year renovated or check local as-built or renovation drawings to help estimate the year installed.

Accessibility lifts may be retrofitted on older administrative, recreation, or base service buildings.

Certain items such as loading dock levelers and automotive equipment lifts are inventoried under 'E1030 VEHICULAR EQUIPMENT'. If E10 is part of the scope, they should be inventoried in that system.

Except where specifically noted in this Guide, do not use 'General' where a more specific item is available as a component type selection.

Hydraulic elevators have a large hydraulic oil tank in the elevator control room near the elevator on the lowest floor and will typically be 3 stops or less.

If as-builts can be located, they should indicate conveying system type, material, and quantity.

If the elevator capacity information is not available, the assessor should use professional judgment to estimate capacity. Small passenger elevators are typically < 2,500 pounds (LBS) capacity. Freight elevators are typically > 4,000 LBS capacity.

If the elevator control room is not accessible, the make and capacity is typically included on the control panel in the cab.

Older buildings may have retrofitted elevators. Do not automatically assume the elevator dates to the year the building was built.

The annual elevator inspection certificate may be posted in the elevator or on file with the building point of contact (POC) or base Public Works. The certificate may provide specific information. The certificate may provide specific information.

When a component is concealed/hidden, the inventory comment box is used to indicate the reason for no inspection taking place. Standard comments should be used.

When conveying systems are not fully visible (such as chutes), as-built drawings should be used to identify and quantify the conveying components. If as-built drawings are not available, the assessor may use experience to make an assumption for the conveying system type and quantities based on similar systems, consultation with local staff, and other reputable online resources.

When performing an assessment, the 'PAINTED' box should only be selected for components that have local or field applied paintings/coatings. DO NOT mark 'PAINTED' for manufacturer- or factory-applied coatings as they tend to age consistently with the components.

When selecting an equipment component type, assessors should always select the correct size. If the correct size is not available, assessors should round up to the next available size and note the actual size in the Section Details. If the size exceeds the largest selection, assessors should select the largest available size and note the actual size in the Section Details.

Photography

General comment: Photos are captured to document the following: 1) Inventory, 2) Condition (deficiency), 3) Historical record of the asset, 4) QC, and 5) Life safety issues.

All components where an 'Other' component type is selected must have a photo attached at the Inventory/Section level. (Required)

Assessors should take a photo of the building number at the start of the building assessment to delineate the start/stop of the photos between buildings. (Best Practice)

Assessors should take photos to allow for quality control (QC) confirmation and data backup. It is a good practice to have a photo of every component type encountered in an assessment. (Best Practice)

Components that are required to have section details populated should also have a single photo attached at the Inventory/Component Section level. No photos should be attached at the Section Detail level. This photo should be a step back photo showing the component in relation to its surroundings. Follow on assessments and base operations can use this to see what was inventoried in the case where there is any confusion on the section name or location field in the section details. If the component is hidden, no photo is necessary. (Required)

Components that have a DCR (component rating only) of A+ or worse should have a photo taken that shows the deficiency identified in the inspection comment. The photo should be attached to the record at the Inspection level. (Required)

Life Safety issues should be photographed for documentation of the safety item and used in safety reports. The photo should be sent to the team lead and all required steps outlined in the safety plan are to be completed. (Required)

Paint DCR does not drive the requirement for a photo to be attached at the inspection level. Example: A component has a DCR of 'G-' and a paint DCR of 'A' would result in no photo attached to the inspection.

See Scope Of Work (SOW) for any photo renaming/deliverable requirements.

The Team Leader is required to take one photo of the front elevation, or a representative elevation view, and attach the photo the building record at the building level. (Required)

Reinspection

All existing quantities for components such wall, floor, and ceiling finishes are to be validated to a +/-15% accuracy. This can be accomplished through random sampling. Large equipment (lifts, cranes, etc.) should be validated to 100% accuracy level.

Assessors must not delete/edit components and sections that are not within their discipline.

BRED™ functions such as 'Copy Building' and 'Copy Section' should not be used unless their ramifications are fully understood. Copy building: The entire building will be copied. Copy section: All items with the same section name will be copied. For example, if a D50 assessor uses copy section on the section name FL1, the assessor may copy/paste interior doors, mechanical equipment, etc. without knowing it. If there is no existing data, these functions are easily used.

Existing data should be deleted if: 1) The component is no longer present, 2) The correct component type exists, 3) There are duplicate components with the same section name, or 4) The component is correct but has the wrong install date (requires deletion and re-entry with correct date).

If a component type in the existing data is no longer in scope, it must be updated to an in-scope item, or deleted if no longer applicable.

Past inspection comments are not required to be revised to current standards.

Section names, component types, and quantities must be verified and updated.

When performing a reinspection it should be understood that modifications in the inventory guidance may have taken place between the previous assessment date and the current effort. The new assessment should update the inventory to the latest inventory guidance. This may require, but is not limited to, combination of quantities (Ex: removing cardinal direction sectioning when it is no longer needed), modifying component type selections, or removing/adding items. The detailed inventory guidance portion of the manual will often provide direction on what steps need to be taken.

Section Details

Collect nameplate/component data for the following fields: ID, Model, Serial Number, Manufacturer, Location, Equipment Type, Capacity, Manufacturer Date, Year Installed, and Control Type for population into section details fields. If information is not available, place 'NA' in the section detail field to indicate it was not available.

If a capacity is estimated, the capacity field should include 'ESTIMATED' to delineate that an estimation took place. For example, if an elevator with no tag is found, it may read '3500 LB ESTIMATED'. Truncating 'estimated' to 'EST' so the example would read '3500 LB EST' is acceptable.

If the component has an RPIE ID tag, that exact value (and ONLY that value) should be used in the Section Details 'ID Number' field. If there is no RPIE ID tag present, the regular tag number (ELEV-1) should be used. Verify how the ID Number field should be used before performing the assessment. See guidance on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components' page.

Section detail fields should be capitalized. It is understood that if existing data has been entered in lowercase, BRED™ limitations can prevent new data from being capitalized.

The Section Details comment box is used to identify specific characteristics on the component that are not captured in the Section Details fields. This can be extra information on location or material type for example. Also, any reasons why Section Detail fields could not be populated should be highlighted (not found/damaged nameplate/sun washed tag/etc.) and should be noted by using the standard comments.

The 'Year Installed' field in the Section Details should match the 'Year Installed' field at the Inventory/Section level. Populate the 'Manufacturer Date' field in the Section Details with data found on the component OR default to 1/1/'Year Installed' as the assumed value.

Sectioning

Additions, new wings, or major renovations likely require identifying separate sections with a different age.

Do not section elevators by floor. It can simply be 'ELEV-1'.

Once all base sectioning guidelines have been followed, there may be a need to apply a DCR-driven sectioning methodology based on two factors 1) difference in DCR, and 2) quantity of distress. Step 1: Assessors should section a component when there is a 2-step difference in DCR (Ex: G- to A) in accordance with the guidance found in Step 2. If there is only a 1-step difference in DCR, the assessor shall have a single section and the lower of the DCR's should be used. Step 2: When a 2-step difference is found, the assessor should consider the quantity of distress that is present. If the distress is present on 25% or less of the component, a single section with a DCR in-between the high/low DCR shall be added (if G-/A are found then A+ is used). If the distress is present on over 25% of the component, two sections should be added at the high/low DCR. Any component with a 3-step or more difference in DCR should have two sections.

Refer to the 'Sectioning: D20,D30,D40,D50 and E10 Equipment Components' part of the manual for section name guidance for equipment.

Section each elevator, crane, lift, and monorail out separately.

The most critical part to an assessment is having all assessors aligned on how to perform an assessment. To reach an accurate DCR of a component, follow the steps below:

Step 1: Consider the level of degradation and the performance of the component:

OPERATIONAL CAPABILITY	OPERATIONAL CONDITION RATING	DEGRADATION	DCR
Fully Operational	Green	Free of observable or known degradation.	Green (+)
		Normal wear requiring normal preventative maintenance.	Green
		Normal degradation requiring corrective maintenance.	Green (-)
Impaired Operation	Amber	Minor degradation requiring corrective maintenance.	Amber (+)
		Moderate degradation requiring corrective repair.	Amber
		Significant degradation requiring moderate repair.	Amber (-)
Inoperable	Red	Extensive degradation requiring major repair.	Red (+)
		Severe degradation requiring major rehabilitation or partial replacement.	Red
		Complete degradation requiring full replacement.	Red (-)

Step 2: Consider the maintenance requirements of the component:

Type	Green (G+/G/G-)	Amber (A+/A/A-)	Red (R+/R/R-)
Dynamic (Equipment)	<p>Distresses present are of no impact to the components operation.</p> <p>Example: The fan component is fully operational.</p>	<p>Distresses present are of impact to the components operation. A repair is needed to bring the component back to proper operating condition</p> <p>Example: A fan has corrosion on the housing. A sand and paint would remove the distress.</p>	<p>Distresses present are of impact to the components operation. The component needs to be replaced.</p> <p>Example: A fan motor has overheated and no longer functions. Replacement of the component is required.</p>
Non-Dynamic	<p>The architecture component is in good condition requiring no maintenance outside of normal operations.</p> <p>Example: The carpet component is fully operational.</p>	<p>The architecture component has a distress that requires an extra level of maintenance outside of normal operations. This extra maintenance (or repair) would be an action such as a cleaning or a painting of a surface.</p> <p>Example: A carpet component has stains. A cleaning would remove the distress.</p>	<p>The architecture component has a distress where a maintenance operation will not fix the problem at hand. A replacement of the component is required.</p> <p>Example: A carpet component is damaged (ripped). The component needs to be replaced to fix the distress.</p>

Dynamic: Refers to equipment in the D10, D20, D30, D40, D50, and E10 systems.

Non-Dynamic: Refers to architectural components in the A10, A20, B10, B20, B30, C10, C20, and C30 systems.

Note: There are some Non-Dynamic components (for instance, toilets under D20) in the Dynamic systems.

Step 3: Adhere to the following requirements:

Requirements
Maintainability and obsolescence should not be the driving factor when conducting a condition assessment unless it has led to actual deterioration of condition that can be observed or reasonably inferred.
G+ ratings should only be given to inventory that is in pristine condition and is free of any observable defects.
Do not downgrade an assessment rating simply because an item is dirty.
Do not downgrade an assessment rating because the item does not meet current code compliance standards
Do not downgrade an assessment rating because the item is not deemed energy efficient.
Do not downgrade an assessment rating because the item is deemed to be a safety violation/hazard unless otherwise directed.
Do not downgrade an assessment rating because of a code violation.
Ratings should not be anticipated based on planned repairs or replacement.
Assessors should not expend field time and effort to determine the cause of a deficiency. If the cause is easily identified it should be included in the inspection comment.
Ratings shall be based upon the observable and documentable condition of the component.
A component should be downgraded if its operational capability, performance, reliability, etc. is compromised according to the direct rating definitions.
Incorporate user interviews, work order histories, or other information sources when determining the condition of the component. Include this information in the inspection comment.

The assessor should calibrate their mindset on what the expected DCR should be based on condition.

The assessor should consider the maintenance requirements of the component in the current condition.

The assessor should factor in the requirements/business rules for completing an inspection.

One factor that can play into an assessment is if the assessor receives information from a POC that results in a lower rating. For instance, an assessment takes place in July and there is a heating water pump that looks brand new, but has a blown motor. The assessor would assume the pump is supposed to be off due to being off season, but if the POC informs the assessor about the blown motor, this can be factored into the assessment (and indicated in the inspection comment).

One factor that should not play into an assessment is pending replacements of components. Assessors should rate components in the condition they are at the time of assessment. If the carpet is being replaced next month, that should not factor into a rating. Now, if the carpet contractor is on site (the work is currently taking place), this could be factored into the rating and a G+ rating provided with the current date of inspection chosen as the install date.

Service Life: No distresses present and component is nearing (or past) its service life.

The following comment can be used as an inspection comment for components that have no signs of distresses, are rated either Amber (A) or Amber Plus (A+), and are over 75% through their service life. This negates the need to have 4 parts of an inspection comment. Also, an inspection photo is no longer required.

[First Last-AE-Date] - The component is in proper working condition and is showing no signs of distress. The DCR was based on estimated remaining service life.

Step 1: Understand the 5 parts of the inspection comment:

Part #	Part Type	Type Description
1	Front End	[First Last-AE-Date] OR [First Last-DPW-Date] (ex: [John Doe-AE-7/4/2017])
2	Distress	Identifies the distress of the component
3	Severity	Identifies the amount of the distress.
4	Location	Identifies the location of the distress
5	Quantity	Identifies the quantity of the distress

Step 2: Use the DCR of the component as the basis for the severity.

DCR	Severity
Amber (+)	Minor/Mild
Amber	Moderate
Amber (-)	Significant/Major
Red (+)	Extensive
Red	Severe
Red (-)	Complete/Total

To aid in the inspection comments reading correctly the severity can be modified slightly. For instance, 'moderately' can be used for an 'A' DCR comment. This approach also applies to the distresses where one of the 23 MUST be selected. If 'Cracked' is selected as the distress, the wording 'cracks' may be used.

Step 3: Identify the distress of the component:

23 Distresses			
Blistered	Displaced	Overheated	Capability/Capacity Deficient
Broken	Efflorescent	Patched	Animal/Insect Damaged
Clogged	Holes	Rotten	Moisture/Debris Contaminated
Corroded	Leaks	Stained/Dirty	Noise/Vibration Excessive
Damaged	Loose	Cracked	Operationally Impaired
Deteriorated	Missing		Electrical Ground Inadequate or Unintentional

Step 4: Location and Quantity

Location on non-dynamic assets - 'lobby area'. On dynamic assets - 'housing' or 'base'.

Quantity on a SF UOM will typically be a %. On an EA UOM will typically be a count.

Step 5: Put all 5 components together to form an inspection comment (colors correspond to part):

A+	Front End	CRACKED.	The pump has	minor	cracks	present on	10% of the	housing.
A	Front End	DETERIORATION.	The tank has	moderate	deterioration	over	50 %	of the base.
A-	Front End	DAMAGED.	The exhaust has	significant	damage	to	all	the vehicle connectors.
R+	Front End	CRACKED.	The crane has	extensive	cracks	present on	2	pedestals.
R	Front End	LEAKS.	The piping has	severe	leaking	around the	HVAC	penetrations.
R-	Front End	OPERATIONALLY IMPAIRED.	The	3	CW	pumps are	completely	operationally impaired.

Inspection Comments

Rule #	Rule
1	Required on all inspections with a DCR of A+ and below.
2	Paint DCRs do not have an inspection comment requirement. Only the component DCR A+ and below.
3	Should include any component specific information obtained from the base or POC interview.
4	Should be in complete sentences and use industry standard terminology. Comments can be typed into MS Word for spelling/grammar checks and then pasted into the comments box.
5	Do not use all capital letters for the entire comment. The distress should be all capital letters.
6	Do not use abbreviations, jargon, or slang.
7	Should give enough information for a follow-on assessor to locate the problem area/equipment.
8	Should accurately describe the problem/observation that is the basis for the rating. Someone unfamiliar with the particular item should have an accurate picture of the components current condition and the justification for the assigned rating.
9	Should accurately describe the location of the distress if the component is only showing a distress in a single location. For instance, if an office has a stain in the carpet, it would be necessary to call out the room number of the office.
10	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. For instance, assessor John Doe at firm AE: [John Doe-AE-7/4/2017].
11	After #10 front end information in the brackets one of the 23 distresses should be provided in capitalized form. Building on #10 for an example if stained carpet: [John Doe-AE-7/4/2017] - STAINED.
12	After #10 and #11 a sentence should be provided that provides the distress, severity, location, and quantity. Quantity/Location refers to the amount/location of the distress present.

Inventory Comments

Rule #	Rule
1	Used to identify components that were not visible for inspection. See standard comments.
2	Used as a bread crumb for follow-on inspections. Can provide useful additional information such as location or type to help the next assessor understand what was being inventoried. Ex: This component is the stone wall located behind the receptionist in the lobby area.
3	Should describe the component inventoried where 'OTHER' is used to allow follow-on assessments to understand what was inventoried in the previous assessment.
4	Used to provide the location of the component (especially used for architecture components where there are no Section Details provided that have a location): Roof, NW Corner, Room Number
5	Do not use all capital letters, abbreviations, jargon, or slang.
6	Used to further describe an asset if it is not adequately described in the component type selection.
7	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Section Detail Comments

Rule #	Rule
1	Used to identify data that was not able to be populated in the Details fields. See standard comments.
2	Used to provide information that is specific to just that component section detail field. This can be a location of the specific section or something that the section services.
4	Do not use all capital letters, abbreviations, jargon, or slang.
5	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Standard Inventory Comments

When	Use Standard Comment
Assets are not visible for inspection.	Component was not visible for inspection. The component condition will be age-based by BUILDER program degradation curves.
Assets are not visible for inspection that also require Section Details to be populated.	The component is not visible for inspection or population of Section Details. The component condition will be age-based by BUILDER program degradation curves and no nameplate data or inventory photo will be provided.
Assets are not visible for inspection that require quantities to be assumed. Hidden mechanical equipment, ductwork, and # of control points are common occurrences.	The component is not visible for inspection and the quantity was estimated based on architect/engineering judgment. The component condition will be age-based by BUILDER program degradation curves.
Assets are located in an area where no electronics area allowed. This prevents an assessor from taking inventory/inspection photos.	The component is located in a secure area of the facility that did not allow electronic devices to be used. Photos were not obtainable.
Assets are visible for inspection but are a system that is not tested (HVAC controls, security system, etc.) so an age-based BUILDER™ CI is desired.	The component condition will be age-based by BUILDER program degradation curves.

Standard Section Detail Comments

When	Use Standard Comment
Nameplate is not found on the component.	Nameplate not found on the component. All fields with "NA" represent data not found.
Nameplate is found on the component but it is partial/completely unreadable.	Nameplate on the component was dirty/corroded/damaged/sunwashed. Section Detail fields with "NA" represent data that was not found.
Nameplate is found on the component that is readable but is missing certain Section Details fields.	Nameplate on the component was missing certain Section Detail fields. Section Detail fields have been populated and fields with "NA" represent data not found.

Comment Front-End Clarification

A front end refers to the bracketed information at the start of an inspection/inventory/section detail comment. The front end must have to following 3 pieces of information: 1) assessor name, 2) assessor company or affiliation, and the date. The BRED™ stamp may also provide the time of inspection which is acceptable.

BRED™/BUILDER™ Clarification

The terms BRED™ and BUILDER™ are used interchangeably throughout this document.

Rule #	Rule
1	Components are divided into sections when a significant variation exists in material/equipment category, age, or construction history, which impacts the life cycle characteristics of the component. Example 1 - If a wing or addition was added to a much older building, the two areas of the building should be sectioned differently because the age and construction history is different. Example 2 – If the building roof has multiple levels of similar materials in different conditions, these levels should be sectioned differently to capture the difference in condition. Example 3 – If the building has more than one of a particular type of component, separate component sections. For example: There is a 5,000 and 10,000 CFM air handler.
2	Multi-wing buildings are always sectioned by wing if the installation date of the wings vary. If a building is an 'E' shape and all wings have the same install date only sectioning by floor is required.
3	Multi-story buildings are always sectioned vertically by floor or level (in the case of a basement or mezzanine).
4	There may be unique instances where sectioning by an area of a building is required. For instance, if a building is split between two companies an installation may request sectioning by company 1 and 2.
5	An on-site discussion must occur at each building among all team members to determine the cardinal direction of the building. All assessors should have North as the same side of the building.
6	An on-site discussion must occur at each building among all team members on how the building should be sectioned. The goal is to avoid one assessor calling it a toilet, one calling it a restroom, and another calling it a bathroom. Standard sectioning naming is important for a consistent data set.
7	The section name should not be repetitive of the component type or material. If the floor is wood, do not have a section name 'WOOD'. Incorporation of the location into the section name is very helpful to be used for follow on assessments. If the wood floor has the section name 'LOBBY', it provides great

Standard Section Names and Format Rules

Use	Standard Section Name
Section by Floor (Business Rule)	FL1 – 1st Floor, FL2 – 2nd Floor, FL3 – 3rd Floor, etc.
Section by Floor (Business Rule)	BASEMENT, MEZZANINE, ATTIC, etc.
Section by Wing (applicable if different construction histories or condition only)	MAIN, WING A, WING B, WING C, ADDITION, etc.
Section by Direction (applicable if different construction histories or condition only)	NORTH, EAST, WEST, SOUTH, etc.
Section by Roof Level (applicable if different construction histories or condition only)	UPPER, LOWER, MAIN, etc.

When an equipment tag is included in the section name it should match exactly what was found in the field. Example: if the boiler ID number is B-1, the section name equipment tag portion should read B-1. If the boiler is tagged B1, the equipment tag portion should read B1. See equipment sectioning for further guidance.

Dashes are not required in the section name other than the instance in regards to equipment ID tags above.

The section name field is always entered in all capital letters.

Sectioning Business Rules - Grouping

The following only applies to each (EA) unit of measure (UOM) components. The 'Complete Component Catalog Breakdown' at the end of the section has a 'Group OK?' column. This has the values of 'Yes', 'No', and 'N/A'.

'Yes' = Grouping is allowed for this component type. A quantity of greater than '1' is acceptable.

'No' = Grouping is not allowed for this component type. The quantity must be '1'.

N/A = Not Applicable. Component type is not an EA UOM or is out of scope.

Group OK? = Yes when Section Details and Inventory Photos are Required.

There are several equipment component types (Unit Heaters, small pumps, etc) that have the following designations in the 'Complete Component Catalog Breakdown': 1) Group OK? = Yes, 2) Section Details? = Yes, and 3) Inventory Photo? = Yes.

In this case, a single section detail and inventory photo representative of the entire section is required. A few more clarifications:

- 1) The location field would be for the entire section (FL1/BAY 1/EXTERIOR) and not specific to a single component.
- 2) A difference in manufacturer does not drive further sectioning. For instance, 2 KW electric unit heaters from multiple manufacturers can be combined into one section. Capacity (2 KW) is the driver for sectioning methodology.
- 3) It is understood that the single section detail field is representative of the entire section. The details should be populated per one component. There is no need to enter multiple details or try to combine multiple manufacturer/model/serial/etc into to a single section detail field.

Group OK? = No

The quantity for these component types must be 1. For equipment (Section Details? = Yes and Inventory Photo? = Yes) the guidance found on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components', 'Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components', and 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components' must be followed.

Sectioning of Equipment Components

The business rules stated below are applicable components that have a 'Group OK? = No' designation.

Sectioning of equipment components is of critical importance to provide a data set that is usable by the installation, is able to have Quality Assurance reviews, and is able to be reassessed. To achieve this goal it is required that equipment be sectioned by 1) floor, 2) area/room, and 3) have the ID number included.

Case Study: Below is a drawing of a large building that has several electrical rooms. If one section of 125 AMP panels is provided with section name 'N/A', the usability of the data is greatly reduced. If the equipment is sectioned by room (FL1 - RM 109, FL1 - RM 141, FL1 - RM 104, FL1 - RM 153, FL1 - RM 149), follow-on assessments, QA, and the installation can easily identify/reassess components.

If equipment is located in a concealed space (such as VAV's) this sectioning guidance is not applicable. A single section can be added per floor with the estimated quantity provided. There are other exceptions (such as panels under 100A) that are noted within the component breakdown part of the manual.

This sectioning provides the benefit that if a remodel/addition takes place between assessments, it will be apparent what has been added/deleted in a specific room without the assessor having to do a complete walk-through of the building and the deduce what changed (which is a very difficult, if not impossible, task).

The Section Name should include the equipment ID number. For example, the panel LP1 can have the Section Name: FL1 - RM 109 - LP1.



5 - EXAMPLE

D50 ELECTRICAL

D5010 ELECTRICAL SERVICE & DISTRIBUTION

- FL1 - RM 104 - LP1 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 109 - LP2 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 109 - MP1 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 109 - SG1 - D501004 PANELBOARDS - Switchgear - 2000 Amp
- FL1 - RM 141 - LP3 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 141 - MP2 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 141 - T1 - D501003 INTERIOR DISTRIBUTION TRANSFORMERS - dry-type, 15 kV
- FL1 - RM 149 - LP4 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 149 - MP3 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 153 - LP5 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 153 - MP4 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB

Example BRED Tree Structure

Example Section Names

FL1 - RM 109
FL1 - RM 141
FL1 - RM 104
FL1 - RM 153
FL1 - RM 149

The inclusion of the room/area into the section name DOES NOT negate the need to fill in the 'location' field in the Section Details. All general detail population rules must still be followed.

The use of dashes and underscores is not standardized but should be uniform throughout the BRED tree so data aligns/sorts cleanly. In the example to the left all future users of data can easily find the components inventoried.

Electrical shown as example data set. Applies to all equipment.



Sectioning of Components on the Exterior of a Building

The component catalog has a column called 'GROUP' that indicates for all each (EA) UOM component types whether they are to be a single section (Quantity = 1, NO) or can be "grouped" into a single section (Quantity >= 1, YES). When inventorying a single section (NO) component type the assessor must include cardinal direction (roof is included). When inventorying a grouped (YES) component type 'EXTERIOR' should be used.

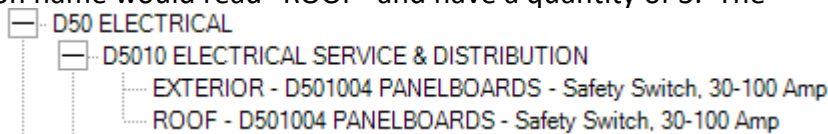
The inclusion of the cardinal direction into the section name DOES NOT negate the need to fill in the 'location' field in the Section Details.



S/N starts with one of the following for Group OK? = No items.

NORTH
SOUTH
EAST
WEST
ROOF

- 1) Locations should be uniform throughout the data set. For instance, all equipment in the mechanical yard example above would have section names starting with 'WEST_MECH YARD' (followed by ID Number).
- 2) If inventorying a component where grouping is allowed (such as the 'Safety Switch, 30-100 AMP' component type above) and there is a difference in condition/install date that requires another section, the assessor should include cardinal direction in section name. For instance, if the switches serving the roof exhaust fans were to be sectioned out the section name would read "ROOF" and have a quantity of 3. The 'EXTERIOR' would remain with a quantity of 2.



Section Details

The component catalog indicates which component types need section details. If 'YES' a single section detail should be added to the section.

No photos are required at the section detail level. All 'step-back' photos are placed at the inventory (component section) level.

In the case where Section Details? = 'Yes' and Grouping? = 'Yes' a single section detail representative of the section should be added.

Section Detail fields:

ID Number: Captures the unique number associated with the equipment. The order of importance is 1) RPIE (barcode Ex: 12345), 2) Tag (phenolic/plastic Ex: EF-1), and 3) Felt tip pen markings. Assessment should follow guidance from installation on use of this field to provide the most value. This is also found in the Section Name. If both barcode and tag are to be captured the ID Number field reads Tag/RPIE (EF-1/12345).

Model: Captures the model number of the equipment.

Serial Number: Captures the serial number of the equipment.

Manufacturer: Captures the manufacturer of the equipment. Assessors should use the same spelling for all components from that manufacturer. Once a standard is set for the installation it should be followed.

Location: Captures the location of the equipment. It should be detailed enough for someone to easily locate the component. This is also found in the Section Name.

Equipment Type: Captures the type of the equipment. This can be found in the component type field.

Equipment Make: Captures the make of the equipment. Manufacturers will have a certain model identified by a name. This field captures that name.

Capacity: Captures the capacity of the equipment. In some cases the component type is a selection based on a round-up to the larger size. This field captures the actual capacity found in the field.

Date Manufactured: Captures the date manufactured. if not found, it can be set to 1/1/Year Installed.

Year Installed: Captures the year the component was installed.

Control Type/Make: Captures the control type. Common entries are: 1) Manual, 2) Thermostat, 3) DDC, 4) VFD. Many other control types can be used.

D101002 PASSENGER ELEVATORS - Hydraulic Elevators - 2500 lb, 2 floors

Typical Application and General Component Guidance:

This component is used to inventory passenger elevators. Assessor to select the most correct component type (rounding up to nearest available size).



Business Rules/General/Lessons Learned/Reinspection

Business Rule

If the elevator capacity information is not available, the assessor should use professional judgment to estimate capacity. Small passenger elevators are typically < 2,500 LBS capacity. Freight elevators are typically > 4,000 LBS capacity.

Section each elevator separately.

General

Electric traction elevators will be more than 4 stops.

Hydraulic elevators have a large hydraulic oil tank in the elevator control room near the elevator on the lowest floor and will typically be 3 stops or less.

If the building has an elevator, be sure to enter the elevator control room for a thorough assessment. Observing the pumps or motors is preferred over just observing the inside of the cab.

The annual elevator inspection certificate may be posted in the elevator or kept on file with the building Point of Contact (POC) or base Public Works. The certificate may provide specific information such as the install date.

Lesson Learned

Elevators will typically have a G or G- inspection. It is understood that other more in-depth inspections take place on these components. Accurate inventory is very important due to elevators being an expensive item for a facility.

If the elevator control room is not accessible, the make and capacity is typically included on the control panel in the cab.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Hydraulic Elevators - 2500 lb, 2 floors	Yes	Yes	Yes	No	No	25	EA

D101004 WHEELCHAIR LIFT - Vertical**Typical Application and General Component Guidance:**

This component is used to inventory vertical wheelchair lifts.

**Business Rules/General/Lessons Learned/Reinspection****Lesson Learned**

Accessibility lifts may be retrofitted on older administrative, recreation, or base service buildings.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Vertical	Yes	Yes	Yes	No	No	No	20	EA

D101005 DUMBWAITERS - Hydraulic**Typical Application and General Component Guidance:**

This component is used to inventory dumbwaiters.

**Business Rules/General/Lessons Learned/Reinspection****Lesson Learned**

Dumbwaiters are typically found in restaurants, schools, hospitals, or private homes.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Hydraulic	Yes	Yes	Yes	No	No	No	35	EA

D102002 OVERHEAD CRANES - Cranes, Bridge girder, 10 ton, 40' span

Typical Application and General Component Guidance:

This component is used to inventory bridge cranes.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

If the size of the crane is in the middle of the component types available, the assessor should round up to the next available size and indicate the correct size in the section details.

Section each bridge crane separately. There will often be a unique identifier on the bridge crane that can be included in the section name.

General

Do not operate the Weight Handling Equipment (WHE)/Crane to perform the assessment. Coordinate with the building POC or authorized operator if there is a question.

Lesson Learned

The annual WHE/Crane inspection certificate may be located near the lift controls or kept on file with the building POC or base Public Works. The certificate may provide specific information.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Cranes, Bridge girder, 10 ton, 40' span	Yes	Yes	Yes	No	No	20	EA

D102002 OVERHEAD CRANES - Hoists, 15' lift, 3 ton**Typical Application and General Component Guidance:**

This component is used to inventory jib cranes and other miscellaneous lifts.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not inventory portable jib-booms, A-frames, or lifts if they are not permanently affixed components. Some lifts will be on rollers, so they can be moved around as needed. These are not to be inventoried.

If the size of the crane is in the middle of the component types available, the assessor should round up to the next available size and indicate the correct size in the section details.

Section each lift separately. There will often be a unique identifier on the lifts that can be included in the section name.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Hoists, 15' lift, 3 ton	Yes	Yes	Yes	No	No	No	20	EA

D102003 MONORAILS - General**Typical Application and General Component Guidance:**

This component is used to inventory monorails.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Monorails are inventoried by the number of hooks present as an 'EA' UOM. The lifting mechanism and rail are viewed as an assembly and should be rated as such.

Section each monorail assembly separately. If there are two lifting mechanisms on one rail, a quantity of 2 should be used. 'Group OK? - No' applies to the monorail not the number of lifting mechanisms.

General

Do not operate the WHE/Crane to perform the assessment. Coordinate with the building POC or authorized operator if there is a question.

Lesson Learned

Monorails can often be an entire system across a maintenance bay. In this case, a single section with the number of lifts is an acceptable inventory method. If monorails are separate they would be inventoried separately.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
General	Yes	Yes	Yes	No	No	20	EA

D103001 ESCALATORS - General**Typical Application and General Component Guidance:**

This component is used to inventory escalators. Note the UOM.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	40	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

D109001 PNEUMATIC TUBE SYSTEMS - Other

Typical Application and General Component Guidance:

This component is used to inventory pneumatic tube systems.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

This component is inventoried as an entire system using the 'Other' component type, which is an 'EA' UOM. Assessor should enter one component for each system that is found.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Other	Yes	Yes	Yes	Yes	Yes	No	35	EA

D109002 CONVEYORS - General

Typical Application and General Component Guidance:

This component is used to inventory industrial type conveyors.



Business Rules/General/Lessons Learned/Reinspection

General

The component is used to capture industrial type conveyors (not the type you use at the grocery store) with rollers and belts. A 'LF' UOM should be used.

Lesson Learned

There are times when the conveyor system belongs to a tenant and does not need to be inventoried. The assessor should contact the building manager and installation POC to verify if the conveyor should be inventoried.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	Yes	Yes	No	N/A	No	35	LF

D101001 GENERAL CONSTRUCTION ITEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D101002 PASSENGER ELEVATORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	25	STP
Hydraulic Elevators - 1500 lb, 2 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - 1500 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - 2000 lb, 2 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - 2000 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - 2500 lb, 2 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - 2500 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - 3000 lb, 2 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - 3000 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - 3500 lb, 2 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - 3500 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - 4000 lb, 2 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - 4000 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - 4500 lb, 2 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - 4500 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - Hospital, 3500 lb, 2 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - Hospital, 3500 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - Hospital, 4000 lb, 2 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - Hospital, 4000 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - Hospital, 4500 lb, 2 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - Hospital, 4500 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - Hospital, 5000 lb, 2 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - Hospital, 5000 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Other	No	No	No	No	N/A	No	25	STP
Traction Geared Elevators - 2000 lb, 15 floors, 350 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - 2000 lb, 5 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - 2500 lb, 15 floors, 350 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - 2500 lb., 5 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - 3000 lb, 15 floors, 350 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - 3000 lb, 5 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA

Complete Component Catalog Breakdown

D10

D10 CONVEYING

Traction Geared Elevators - 3500 lb, 15 floors, 350 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - 3500 lb, 5 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - 4000 lb, 15 floors, 350 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - 4000 lb, 5 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - 4500 lb, 15 floors, 350 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - 4500 lb, 5 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - 5000 lb, 15 floors, 350 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - 5000 lb, 5 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - Hospital, 3500 lb, 15 floors, 350 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - Hospital, 3500 lb, 5 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - Hospital, 4000 lb, 15 floors, 350 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - Hospital, 4000 lb, 5 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - Hospital, 4500 lb, 15 floors, 350 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - Hospital, 4500 lb, 5 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - Hospital, 5000 lb, 15 floors, 350 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - Hospital, 5000 lb, 5 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - 3000 lb, 30 floors, 600 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - 2500 lb, 10 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - 2500 lb, 30 floors, 600 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - 3000 lb, 10 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - 3500 lb, 10 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - 3500 lb, 30 floors, 600 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - 3500 lb, 50 floors, 800 FPM	Yes	Yes	Yes	No	No	No	25	EA

D10

Complete Component Catalog Breakdown

D10

D10 CONVEYING

Traction Gearless Elevators - 4000 lb, 10 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - 4000 lb, 30 floors, 600 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - 4000 lb, 50 floors, 800 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - 4500 lb, 10 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - 4500 lb, 30 floors, 600 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - 4500 lb, 50 floors, 800 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - 5000 lb, 10 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - 5000 lb, 30 floors, 600 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - 5000 lb, 50 floors, 800 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - Hospital, 3500 lb, 10 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - Hospital, 3500 lb, 30 floors, 600 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - Hospital, 4000 lb, 10 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - Hospital, 4000 lb, 30 floors, 600 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - Hospital, 4500 lb, 10 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - Hospital, 4500 lb, 30 floors, 600 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - Hospital, 5000 lb, 10 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Gearless Elevators - Hospital, 5000 lb, 30 floors, 600 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction MRL Elevator - 2000 lb, 15 floors	Yes	Yes	Yes	No	No	No	25	EA
Traction MRL Elevator - 2000 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Traction MRL Elevator - 2500 lb, 15 floors	Yes	Yes	Yes	No	No	No	25	EA
Traction MRL Elevator - 2500 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Traction MRL Elevator - 3000 lb, 15 floors	Yes	Yes	Yes	No	No	No	25	EA

D10

Complete Component Catalog Breakdown

D10

D10 CONVEYING

Traction MRL Elevator - 3000 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Traction MRL Elevator - 3500 lb, 15 floors	Yes	Yes	Yes	No	No	No	25	EA
Traction MRL Elevator - 3500 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Traction MRL Elevator - 4000 lb, 15 floors	Yes	Yes	Yes	No	No	No	25	EA
Traction MRL Elevator - 4000 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Traction MRL Elevator - 4500 lb, 15 floors	Yes	Yes	Yes	No	No	No	25	EA
Traction MRL Elevator - 4500 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Traction MRL Elevator - 5000 lb, 15 floors	Yes	Yes	Yes	No	No	No	25	EA
Traction MRL Elevator - 5000 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Unknown	No	No	No	No	N/A	No	25	STP

D10

D101003 FREIGHT ELEVATORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	25	STP
Hydraulic Elevators - (class"B"), 10,000 lb, 2 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - (class"B"), 10,000 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - (class"B"), 20,000 lb, 2 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - (class"B"), 20,000 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - (class"B"), 3000 lb, 2 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - (class"B"), 3000 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - (class"B"), 4000 lb, 2 floors	Yes	Yes	Yes	No	No	No	25	EA
Hydraulic Elevators - (class"B"), 4000 lb, 5 floors	Yes	Yes	Yes	No	No	No	25	EA
Other	No	No	No	No	N/A	No	25	STP
Traction Geared Elevators - (class"B"), 10,000 lb, 15 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - (class"B"), 10,000 lb, 5 floors, 50 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - (class"B"), 20,000 lb, 15 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - (class"B"), 20,000 lb, 5 floors, 50 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - (class"B"), 4000 lb, 15 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - (class"B"), 4000 lb, 5 floors, 50 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - (class"B"), 8000 lb, 15 floors, 200 FPM	Yes	Yes	Yes	No	No	No	25	EA
Traction Geared Elevators - (class"B"), 8000 lb, 5 floors, 50 FPM	Yes	Yes	Yes	No	No	No	25	EA
Unknown	No	No	No	No	N/A	No	25	STP

D10 CONVEYING

D101004 WHEELCHAIR LIFT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Inclined, stair climber	Yes	Yes	Yes	No	No	No	20	EA
Inclined, stair lift	Yes	Yes	Yes	No	No	No	20	EA
Other	Yes	Yes	Yes	Yes	No	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA
Vertical	Yes	Yes	Yes	No	No	No	20	EA

D101005 DUMBWAITERS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Automatic	No	No	No	No	N/A	No	35	EA
Electric	Yes	Yes	Yes	No	No	No	35	EA
General	No	No	No	No	N/A	No	35	EA
Hydraulic	Yes	Yes	Yes	No	No	No	35	EA
Manual	Yes	Yes	Yes	No	No	No	35	EA
Other	No	No	No	No	N/A	No	35	STP
Unknown	No	No	No	No	N/A	No	35	STP

D101090 OTHER VERTICAL TRANSPORTATION EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Correspondence lifts, elec	No	No	No	No	N/A	No	25	EA
Correspondence lifts, hand	No	No	No	No	N/A	No	25	EA
General	No	No	No	No	N/A	No	25	EA
Lifts	No	No	No	No	N/A	No	35	EA
Other	No	No	No	No	N/A	No	25	EA
Other Hydraulic Elevators	No	No	No	No	N/A	No	25	EA
Other Traction Geared Elevators	No	No	No	No	N/A	No	25	EA
Other Traction Gearless Elevators	No	No	No	No	N/A	No	25	EA
Parcel lifts, elec	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D102001 BASIC REQUIREMENTS OF CRANES AND MONORAILS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

Complete Component Catalog Breakdown

D10

D10 CONVEYING

D102002 OVERHEAD CRANES

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Cranes, Bridge girder, 10 ton, 20' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 10 ton, 30' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 10 ton, 40' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 10 ton, 50' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 15 ton, 20' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 15 ton, 30' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 15 ton, 40' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 15 ton, 50' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 25 ton, 40' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 25 ton, 50' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 3 ton, 20' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 3 ton, 30' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 3 ton, 40' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 3 ton, 50' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 5 ton, 20' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 5 ton, 30' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 5 ton, 40' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 5 ton, 50' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 7.5 ton, 20' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 7.5 ton, 30' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 7.5 ton, 40' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Bridge girder, 7.5 ton, 50' span	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Movable gantry, 2,000 lb, 12' to 15' range	Yes	Yes	Yes	No	No	No	20	EA
Cranes, Movable gantry, 6,000 lb, 12' to 15' range	Yes	Yes	Yes	No	No	No	20	EA
General	No	No	No	No	N/A	No	20	EA
Hoists, 15' lift, 1 ton	Yes	Yes	Yes	No	No	No	20	EA
Hoists, 15' lift, 3 ton	Yes	Yes	Yes	No	No	No	20	EA
Hoists, 15' lift, 5 ton	Yes	Yes	Yes	No	No	No	20	EA
Other	Yes	Yes	Yes	Yes	No	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D10

D10 CONVEYING

D102003 MONORAILS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	Yes	Yes	No	No	No	20	EA
Other	Yes	Yes	Yes	Yes	No	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D103001 ESCALATORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
10' height, 32" width	No	No	No	No	N/A	No	40	EA
10' height, 48" width	No	No	No	No	N/A	No	40	EA
15' height, 32" width	No	No	No	No	N/A	No	40	EA
15' height, 48" width	No	No	No	No	N/A	No	40	EA
20' height, 32" width	No	No	No	No	N/A	No	40	EA
20' height, 48" width	No	No	No	No	N/A	No	40	EA
25' height, 32" width	No	No	No	No	N/A	No	40	EA
25' height, 48" width	No	No	No	No	N/A	No	40	EA
General	No	No	No	No	N/A	No	40	EA
Other	Yes	Yes	Yes	Yes	N/A	No	40	LF
Unknown	No	No	No	No	N/A	No	40	LF

D103002 MOVING WALKS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Flat, 2'-0" width	Yes	Yes	Yes	No	N/A	No	40	LF
Flat, 3'-4" width	Yes	Yes	Yes	No	N/A	No	40	LF
General	Yes	Yes	Yes	No	N/A	No	40	LF
Other	Yes	Yes	Yes	Yes	N/A	No	40	LF
Ramp, 3'4" width	Yes	Yes	Yes	No	N/A	No	40	LF
Unknown	No	No	No	No	N/A	No	40	LF

Complete Component Catalog Breakdown

D10

D10 CONVEYING

D103090 OTHER MOVING STAIRS & WALKS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	Yes	Yes	No	No	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D109001 PNEUMATIC TUBE SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	35	LF
Other	Yes	Yes	Yes	Yes	Yes	No	35	EA
Unknown	No	No	No	No	N/A	No	35	EA

D109002 CONVEYORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	Yes	Yes	No	N/A	No	35	LF
Horizontal belt, 27' length	No	No	No	No	N/A	No	35	EA
Horizontal belt, 42' length	No	No	No	No	N/A	No	35	EA
Horizontal belt, 62' length	No	No	No	No	N/A	No	35	EA
Inclined belt, 28' length	No	No	No	No	N/A	No	35	EA
Other	No	No	No	No	N/A	No	35	EA
Unknown	No	No	No	No	N/A	No	35	EA

D109003 LINEN, TRASH, AND MAIL CHUTES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Chute - Linen / Refuse	No	No	No	No	N/A	No	20	LF
Chute - Personnel	No	No	No	No	N/A	No	20	LF
Chutes	No	No	No	No	N/A	No	20	LF
General	Yes	No	No	No	N/A	No	20	LF
Other	No	No	No	No	N/A	No	20	LF
Unknown	No	No	No	No	N/A	No	20	LF

D10

D10 CONVEYING

D109004 TURNTABLES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D109005 OPERABLE SCAFFOLDING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

D109006 TRANSPORTATION SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D109090 OTHER MATERIAL HANDLING SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	Yes	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

Details Req?	If 'Yes', all required section detail fields are to be populated.
Inventory Pic?	If 'Yes', an inventory level photo is to be provided. This is a step back photo showing the component.
Inventory Cmmt?	If 'Yes', an inventory comment is to be populated. This should describe the component.
Group OK?	Only applicable to each (EA) UOM's that are In Scope? = 'Yes'. If 'No' section must be a quantity of 1. If 'Yes' section may have a quantity greater than 1. If 'N/A' it is not applicable to the component type.
Age Based?	If 'Yes', age based (do not provide an inspection) is the desired approach. If 'No' but upon inspection the component is not visible, then an age based approach is acceptable.
Design Life	Design life of the component.
UOM	Unit of measure. If yellow highlight = new component type in 2019 update.

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Sustainment Management System

Army BUILDER™ SMS Inventory and Assessment Guide

D20 PLUMBING



**US Army Corps
of Engineers**
Mobile District

ERDC
Engineer Research & Development Center

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Summary of Changes

Date	Record of Revisions/Additions to SMS Inventory and Assessment Methodology
06/01/2019	Updated page "Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components" to clarify sectioning guidance for equipment components.
06/01/2019	Added page "Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components" to clarify sectioning guidance for exterior components.
06/01/2019	Added 'D201004 SINKS - Mop Sink' component type. Updated/added inventory guidance for both mop sinks and service sinks to align with this addition.
06/01/2019	Added 'D203003 FLOOR DRAINS - Trench Drain' component type and inventory guidance.
06/01/2019	Updated inventory guidance for 'D202003 DOMESTIC WATER EQUIPMENT - Water Heaters' to include an 80 gallon rule between commercial and residential water heater component types.
06/01/2019	Added photo and inventory guidance for 'D202003 DOMESTIC WATER EQUIPMENT - Water Treatment Equipment - Deionization Station' component type.
06/01/2019	Added 'D202003 DOMESTIC WATER EQUIPMENT - Booster Pump - <1 HP' component type and inventory guidance.
06/01/2019	Updated inventory guidance for 'D202003 DOMESTIC WATER EQUIPMENT - Tankless Heater - Gas' component type.
06/01/2019	Updated inventory guidance for 'D204002 ROOF DRAINS - General' component type.
06/01/2019	Added page "Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components" to clarify sectioning guidance for exterior components.
06/01/2019	Updated inventory guidance on 'D209001 SPECIAL PIPING SYSTEMS' to require an inventory photo and inventory comment.
06/01/2019	Updated inventory guidance on sump pumps to be inventoried under 'D204003 RAINWATER DRAINAGE EQUIPMENT'.
06/01/2019	Updated inventory guidance on tankless water heaters under 'D202003 DOMESTIC WATER EQUIPMENT'.
06/01/2019	Updated inventory guidance on storage tanks under 'D202003 DOMESTIC WATER EQUIPMENT'.

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Safety The following items should not be interpreted as 1) Safety Plan, 2) OSHA, or base safety requirements. These are recommendations. The contractor should operate in accordance with the SOW and approved safety plan.

Safety is of the utmost concern and should always be at the forefront of any activities taking place in the field. There are many potential safety hazards associated with building assessments. Prior to performing building assessments, the assessing staff/team must ensure that field activities are in accordance with the 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Safety Preparation Activities

Do not perform a task that may harm or endanger the health and safety of oneself or others.

Consult with the installation safety representative to review installation-specific safety requirements.

Conduct a daily “stand-up” safety meeting.

Ensure new assessors have been properly trained.

Review the assessment plan/schedule for the day.

Ensure proper Personal Protective Equipment (PPE) is available. This includes, but is not limited to, a hardhat; hearing protection; eye protection; safety shoes, gloves; and a safety colored vest.

Prior to conducting assessments, the team leader must check with the safety office or building POC to determine if there are any building/site-specific safety rules or hazards. For instance, some manufacturing areas may require steel toe shoes, hearing protection, or eye protection.

Safety Recommendations

Do not walk and write, or talk on a mobile phone, at the same time; this can lead to trips/falls.

Do not review documents or write while walking on steps or stairs.

Do not enter posted or suspected confined spaces such as crawl spaces, tanks, chases, or pits.

Mechanical rooms, attic spaces, or other areas with piping/ductwork may require the use of hard hats to prevent against head bumping hazards. Refer to the project specific safety plan for further clarification.

Do not enter areas with hazardous material signs posted or that appear to contain hazardous materials (asbestos, gases, visible mold, etc.).

Be careful when walking through/across vehicle maintenance or staging areas.

Be aware of loose-fitting clothing and lanyards that may get caught in tight areas or on piping such as in mechanical/electrical rooms, etc.

Be careful of wildlife and insects when walking around a building or opening seldom-entered mechanical/electrical rooms. Assessors may encounter snakes, spiders, stray cats/dogs, rats/mice, etc. in these areas. Do not enter or place hands in spaces that are not completely visible.

If a life safety problem is observed, do not try to fix it. Report it to the proper authority or building manager prior to leaving the building or area.

Before the assessment team leaves a building, ensure all team members are accounted for.

Ladder use should be done in accordance with 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Designate a safety POC to enforce the safety accident prevention plan.

Perform a daily safety briefing before field work. Document the attendees and the topics covered.

Halt outdoor field operations at the sign of lightning or thunder.

Safety Recommendations (continued)

Do not access pitched roofs. They may be assessed from a nearby building or using binoculars.

Use proper techniques to place, secure, and climb ladders. Never climb a ladder while holding anything. Always use the three-point technique for climbing. Equipment should be placed in a backpack or an over-the-shoulder satchel to free hands for climbing.

Do not operate powered equipment, Weight Handling Equipment (WHE)/cranes, or remove access covers from powered equipment to perform assessments.

BUILDER™ assessments are commonly performed without electrical test equipment. Do not use electrical test equipment to test circuits or equipment unless qualified by a local authority. Only open panel box doors or enter electrical/mechanical rooms following proper training. Consult the local safety representative.

Site Preparation

Site Preparation Activities

Coordinate with the base to determine building access requirements, such as: escorts; camera passes; classified/secure area restrictions; or keys.

Locate buildings on a map and develop a schedule. Coordinate with the base to identify the appropriate building manager from the POC list. Notify the building managers of the upcoming assessment as needed.

Obtain a set of mechanical/electrical room master keys from the installation POC.

Extract all BRED™ files from BUILDER™ and have them loaded onto tablets (if using tablets). Verify all tablets are charged.

If multiple buildings are to be assessed by one team, confirm the schedule and plan of action with the team leader. A schedule may have building start times detailed to the hour.

Review the building names for the types/sizes of buildings that will be assessed to determine/confirm the needed tools and safety equipment. For instance, if the facilities are not climate-controlled, prepare accordingly (for cold weather bring hats/gloves).

Recommended Assessor Gear/Tools

Hardhat	Digital Camera with Extra Battery(s)
Hearing Protection	Measuring Tape
Safety Glasses	Laser Measuring Device/Flash Light
Reflective Safety Vest	Measuring Wheel
OSHA Approved Footwear	Backpack
Other Required Personal Protection Equipment (PPE)	Graphite Powder (for stuck locks)
Cell Phone and Team Cell Phone List	Cleaning Pad (to clean/help read nameplates)
Assessment Schedule	Pen/Pencils
Building Floor Plans/Base Map	Clipboard
Small Magnet (for determining door/window type)	Paper/Assessment Forms
Flash Light/Compass	Graph Paper
Sun Screen/Bug Spray	Refillable Water Bottle

Operating efficiently in the field is key to the success of the assessment. The following guidance is detailed by 1) Team Leader and 2) Assessor. **Bold items are drivers for client deliverables.**

Team Leader

Upon arrival, check in with the building manager and QA representative (if present).

Conduct the building manager interview. The entire team should be present for the building manager interview. The following questions should be asked:

Question 1: Are there any mission-related deficiencies in the building?

Question 2: Are there any safety-related deficiencies in the building?

Question 3: Have there been any upgrades or remodels of the building?

Question 4: Are there any building deficiencies (HVAC not working, electrical breakers tripping, maintenance issues, roof leaks, etc.) present?

The team leader (ONLY the team leader!) should populate the building level comment with the following information: 1) Missing systems, 2) Renovation dates, 3) Areas of the building not accessible during the assessment, and 4) If drawings were/were not provided. Below are some examples of building level comments:

Comment 1: No A20, D10, or D40 systems present. 2016: Vault room not accessible. Drawings not provided.

Comment 2: No A20 systems present. Renovated in 2010. 2016: 5% of building not accessible. Drawings provided.

The team leader should review the real property data in BRED™ and compare it to what is found during the assessment. The following should be confirmed: 1) Number of stories, 2) Building square footage, and 3) Building install date and 4) Building number in BRED™ matches the building. Variances between real property data and actual field data should be recorded for inclusion into the client deliverable.

Team Leader and Assessors

Best Practice: Each assessor should first take a photo of the building number to identify the subsequent photos associated with the building when they are downloaded. Take a second picture that captures the overall building view with respect to nearby buildings/streets. This should help refresh/remind the assessor on what the building looks like, while performing data-entry.

A team caucus should occur to discuss the sectioning strategy for the building and confirm which side is facing north.

Each assessor should have a consistent approach to each building. Assessors should move around the building exterior and interior in a clockwise (or counterclockwise) manner making notes and taking photos.

If a safety item is found, notify the team lead. The team lead will notify the building manager. Capture a photo of the safety item for inclusion into the safety log. Follow all other project-specific procedures when a safety item is encountered.

Upon return to the office perform the following steps:

Step 1: Download all photos from the day to a building-specific folder. Review the photos and delete any that are blurry or unreadable.

Step 2: Complete all calculations and counts. Complete all data entry into BRED™.

Data Entry

With the technology that is available today, the need to use forms in the field and do data entry at the office has been mitigated. Tablets can be used to run BRED™ to complete data entry while in the field. It is understood that there are challenges to accomplish this for certain disciplines. It is only mentioned here as a best practice recommendation and is not a requirement to execute the work. There will be instances where electronics will not be allowed in a facility. Assessors should have a paper/pen data collection system ready as a backup.

General

This section presents common Uniformat D20 plumbing inventory component sections found across installations as a guide for entering into the BUILDER™ or BUILDER™ Remote Entry Database (BRED™) software. Inventory items are arranged by BUILDER™ System with Material/Equipment Category, Component Type, Unit of Measure, and Inventory Notes.

D2010 - Plumbing Fixtures: A receptor or device that has both a water supply connection and a discharge to the drainage system such as toilets, lavatories, showers, and sinks.

D2020 - Domestic Water Distribution: The system of pipes, tanks, pumps, filters, and water conditioning appliances used for the supply, distribution, heating, and filtering of potable water within a building.

D2030 - Sanitary Waste: The system of drain, waste, and vent pipes that remove sanitary waste and gray water from a building and vents the gases produced by the waste.

D2040 - Rain Water Drainage: The piping system within a building (interior) for the removal of rain water collected on the roof.

D2090 - Other Plumbing Systems: Specialty pipe, equipment or appliances that are not part of the potable water distribution system or the drain-waste-vent system.

One of the most common problems with plumbing systems is that over time building mission, equipment, and occupancy change. These changes often require plumbing system alterations, additional piping, and new fixtures that can result in an overloaded building sanitary waste system, code issues, and plumbing as-built drawings.

The plumbing system of a building provides the supply and distribution of potable water and the removal of waterborne/sanitary wastes and roof rainwater (interior piping). The system includes piping and fixtures for safe distribution and waste removal, and may include energized equipment for heat transfer, water heating, washing, or pumping. The system may also contain control valves, relief valves, filters, and conditioners. The system is designed to support the function/mission of the building, and for comfort and safety of the occupants.

Inspection

A large building will have a significant number of plumbing fixtures; the assessor should use judgment in assigning the rating based on the overall condition of fixtures of a specific component section. Do not assign a low rating based on a single old or damaged fixture. This fixture should be sectioned separately.

It is very common for piping to be insulated. In this case, the assessor should look for signs of leaking or degradation on connection points to equipment. If totally concealed by the insulation, the assessor should provide no assessment and let the component be degraded by BUILDER™ degradation curves.

Rule of thumb: If you can see it, you should inspect it. There are some caveats to this rule. See component catalog for items that must be age-based whether visible or non-visible.

Some thought may be required regarding deterioration and functionality loss, along with level of repair. Total functionality loss may occur due to some minor reason (e.g. failed switch, failed pump motor, etc.). In these cases, the overall component section condition may be 'Green' when only a minor fix will correct the problem.

When equipment is found that has been abandoned and is no longer functional it should not be inventoried. If the equipment is abandoned, but is still able to be put back in service, it should be inventoried and assessed.

Inventory

It is critical to confirm the year installed (default will be from real property records), or estimate the year installed. BUILDER™ uses the install date, degradation curves, and assessment observations to establish a CI for each component section. If the assessor suspects the default install date is not accurate, or an addition or renovation has taken place, check the real property record for year renovated or check local as-built or renovation drawings to help estimate the year installed.

Assessors for 'D20 Plumbing' and 'D30 HVAC' need to work closely together. These systems have some similar components.

Do not inventory water heaters under 20 gallons, point of use water heaters, expansion tanks under 5 gallons, and equipment (washer, refrigerator, etc.) hookups (they are included in piping estimate),

Except where specifically noted in this Guide, do not use 'General' where a more specific item is available as a component type selection.

If the building area is calculated to be between +/- 10% of the building area shown in the BRED™ file, then the building area shown in BRED™ is to be used. If the calculated area is outside of +/- 10% of the building area shown in the BRED™ file, then the calculated area should be used.

In some cases, plumbing sections may be replaced as an individual repair or partial replacement. These areas would have a different age. The real property construction and renovation dates should be confirmed, if they are not appropriate, the component age must be estimated. The building occupants or other facilities staff may be able to provide some information.

Most plumbing components inventoried for buildings are visible with exception of piping. When plumbing components are not visible (or an area of the building is not accessible), as-built drawings should be used to identify and quantify the plumbing components. If as-built drawings are not available, the assessor may use experience to make an estimate for the plumbing component types and quantities based on similar construction, consultation with local staff, and other reputable online resources.

When a component is concealed/hidden, the inventory comment box is used to indicate the reason for no inspection taking place. Standard comments should be used.

When performing an assessment, the 'PAINTED' box should only be selected for components that have local or field applied paintings/coatings. DO NOT mark 'PAINTED' for manufacturer- or factory-applied coatings as they tend to age consistently with the components.

When selecting an equipment component type, assessors should always select the correct size. If the correct size is not available, assessors should round up to the next available size and note the actual size in the Section Details. If the size exceeds the largest selection, assessors should select the largest available size and note the actual size in the Section Details.

Photography

General comment: Photos are captured to document the following: 1) Inventory, 2) Condition (deficiency), 3) Historical record of the asset, 4) QC, and 5) Life safety issues.

All components where an 'Other' component type is selected must have a photo attached at the Inventory/Section level. (Required)

Assessors should take a photo of the building number at the start of the building assessment to delineate the start/stop of the photos between buildings. (Best Practice)

Assessors should take photos to allow for quality control (QC) confirmation and data backup. It is a good practice to have a photo of every component type encountered in an assessment. (Best Practice)

Components that are required to have section details populated should also have a single photo attached at the Inventory/Component Section level. No photos should be attached at the Section Detail level. This photo should be a step back photo showing the component in relation to its surroundings. Follow on assessments and base operations can use this to see what was inventoried in the case where there is any confusion on the section name or location field in the section details. If the component is hidden, no photo is necessary. (Required)

Components that have a DCR (component rating only) of A+ or worse should have a photo taken that shows the deficiency identified in the inspection comment. The photo should be attached to the record at the Inspection level. (Required)

Life Safety issues should be photographed for documentation of the safety item and used in safety reports. The photo should be sent to the team lead and all required steps outlined in the safety plan are to be completed. (Required)

Paint DCR does not drive the requirement for a photo to be attached at the inspection level. Example: A component has a DCR of 'G-' and a paint DCR of 'A' would result in no photo attached to the inspection.

See Scope Of Work (SOW) for any photo renaming/deliverable requirements.

The Team Leader is required to take one photo of the front elevation, or a representative elevation view, and attach the photo the building record at the building level. (Required)

Reinspection

All existing quantities for components such as fixture counts and pipe quantities are to be validated to a +/-15% accuracy. This can be accomplished through random sampling. Large equipment (water heaters, pumps, etc.) should be validated to 100% accuracy level.

Assessors must not delete/edit components and sections that are not within their discipline.

BRED™ functions such as 'Copy Building' and 'Copy Section' should not be used unless their ramifications are fully understood. Copy building: The entire building will be copied. Copy section: All items with the same section name will be copied. For example, if a D50 assessor uses copy section on the section name FL1, the assessor may copy/paste interior doors, mechanical equipment, etc. without knowing it. If there is no existing data, these functions are easily used.

Existing data should be deleted if: 1) The component is no longer present, 2) The correct component type exists, 3) There are duplicate components with the same section name, or 4) The component is correct but has the wrong install date (requires deletion and re-entry with correct date).

If a component type in the existing data is no longer in scope, it must be updated to an in-scope item, or deleted if no longer applicable.

Past inspection comments are not required to be revised to current standards.

Section names, component types, and quantities must be verified and updated.

When performing a reinspection it should be understood that modifications in the inventory guidance may have taken place between the previous assessment date and the current effort. The new assessment should update the inventory to the latest inventory guidance. This may require, but is not limited to, combination of quantities (Ex: removing cardinal direction sectioning when it is no longer needed), modifying component type selections, or removing/adding items. The detailed inventory guidance portion of the manual will often provide direction on what steps need to be taken.

Section Details

Collect nameplate/component data for the following fields: ID, Model, Serial Number, Manufacturer, Location, Equipment Type, Capacity, Manufacturer Date, Year Installed, and Control Type for population into section details fields. If information is not available, place 'NA' in the section detail field to indicate it was not available.

If a capacity is estimated, the capacity field should include 'ESTIMATED' to delineate that an estimation took place. For example, if a pump with no tag is found, it may read '100 GPM ESTIMATED'. Truncating 'estimated' to 'EST' so the example would read '100 GPM EST' is acceptable.

If the component has an RPIE ID tag, that exact value (and ONLY that value) should be used in the Section Details 'ID Number' field. If there is no RPIE ID tag present, the regular tag number (PUMP-1) should be used. Verify how the ID Number field should be used before performing the assessment. See guidance on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components' page.

Section detail fields should be capitalized. It is understood that if previous data has been entered in lowercase, BRED™ limitations can prevent new data from being capitalized.

The Section Details comment box is used to identify specific characteristics on the component that are not captured in the Section Details fields. This can be extra information on location or material type for example. Also, any reasons why Section Detail fields could not be populated should be highlighted (not found/damaged nameplate/sun washed tag/etc.) and should be noted by using the standard comments.

The 'Year Installed' field in the Section Details should match the 'Year Installed' field at the Inventory/Section level. Populate the 'Manufacturer Date' field in the Section Details with data found on the component OR default to 1/1/'Year Installed' as the assumed value.

Sectioning

Additions, new wings, or major renovations likely require identifying a separate plumbing section with a different age.

Barracks are to be sectioned by floor then by 1) commons and 2) quarters. Commons refers to the common areas (halls, utility rooms, lobby, etc). Quarters refers to the individual living area (dorms). A common section name would be 'FL1 - COMMONS' and 'FL1 - QUARTERS.' Barracks refers to all multi-level housing units for permanent and transient residents. This methodology is applicable only to plumbing fixtures.

For 'D2010 PLUMBING FIXTURES' barracks are to be sectioned by floor then by 1) commons and 2) quarters. Commons refers to the common areas (halls, utility rooms, lobby, etc.). Quarters refers to the individual living areas (dorms). A common section name would be 'FL1 - COMMONS.' Barracks refers to all multi-level housing units for permanent or transient residents.

Once all base sectioning guidelines have been followed, there may be a need to apply a DCR-driven sectioning methodology based on two factors 1) difference in DCR, and 2) quantity of distress. Step 1: Assessors should section a component when there is a 2-step difference in DCR (Ex: G- to A) in accordance with the guidance found in Step 2. If there is only a 1-step difference in DCR, the assessor shall have a single section and the lower of the DCR's should be used. Step 2: When a 2-step difference is found, the assessor should consider the quantity of distress that is present. If the distress is present on 25% or less of the component, a single section with a DCR in-between the high/low DCR shall be added (if G-/A are found then A+ is used). If the distress is present on over 25% of the component, two sections should be added at the high/low DCR. Any component with a 3-step or more difference in DCR should have two sections.

Plumbing components such as water closets and urinals can be grouped in a section. For instance, if there are 5 urinals they can be grouped in a single component section with a quantity of 5. Do not section fixtures by men's/women's restrooms unless there is a difference in condition.

Plumbing fixtures and equipment are always sectioned by floor. If there are multiple easily definable wings of a building with different install dates then sectioning by floor AND by wing is required. For example, if there is an east and west wing on a 2-floor building you would have 'FL2 EAST' and 'FL2 - WEST'.

Refer to the 'Sectioning: D20,D30,D40,D50 and E10 Equipment Components' part of the manual for section name guidance for equipment.

Rule of Thumb: All plumbing components that require Section Details should be sectioned separately. There are exceptions to this rule, review the 'Group OK?' column.

Typical section names used to describe the major areas of the building include: FL1, FL2, BASEMENT, MEZZANINE, ROOF, WING 'X,' etc.

The most critical part to an assessment is having all assessors aligned on how to perform an assessment. To reach an accurate DCR of a component, follow the steps below:

Step 1: Consider the level of degradation and the performance of the component:

OPERATIONAL CAPABILITY	OPERATIONAL CONDITION RATING	DEGRADATION	DCR
Fully Operational	Green	Free of observable or known degradation.	Green (+)
		Normal wear requiring normal preventative maintenance.	Green
		Normal degradation requiring corrective maintenance.	Green (-)
Impaired Operation	Amber	Minor degradation requiring corrective maintenance.	Amber (+)
		Moderate degradation requiring corrective repair.	Amber
		Significant degradation requiring moderate repair.	Amber (-)
Inoperable	Red	Extensive degradation requiring major repair.	Red (+)
		Severe degradation requiring major rehabilitation or partial replacement.	Red
		Complete degradation requiring full replacement.	Red (-)

Step 2: Consider the maintenance requirements of the component:

Type	Green (G+/G/G-)	Amber (A+/A/A-)	Red (R+/R/R-)
Dynamic (Equipment)	<p>Distresses present are of no impact to the components operation.</p> <p>Example: The fan component is fully operational.</p>	<p>Distresses present are of impact to the components operation. A repair is needed to bring the component back to proper operating condition</p> <p>Example: A fan has corrosion on the housing. A sand and paint would remove the distress.</p>	<p>Distresses present are of impact to the components operation. The component needs to be replaced.</p> <p>Example: A fan motor has overheated and no longer functions. Replacement of the component is required.</p>
Non-Dynamic	<p>The architecture component is in good condition requiring no maintenance outside of normal operations.</p> <p>Example: The carpet component is fully operational.</p>	<p>The architecture component has a distress that requires an extra level of maintenance outside of normal operations. This extra maintenance (or repair) would be an action such as a cleaning or a painting of a surface.</p> <p>Example: A carpet component has stains. A cleaning would remove the distress.</p>	<p>The architecture component has a distress where a maintenance operation will not fix the problem at hand. A replacement of the component is required.</p> <p>Example: A carpet component is damaged (ripped). The component needs to be replaced to fix the distress.</p>

Dynamic: Refers to equipment in the D10, D20, D30, D40, D50, and E10 systems.

Non-Dynamic: Refers to architectural components in the A10, A20, B10, B20, B30, C10, C20, and C30 systems.

Note: There are some Non-Dynamic components (for instance, toilets under D20) in the Dynamic systems.

Step 3: Adhere to the following requirements:

Requirements
Maintainability and obsolescence should not be the driving factor when conducting a condition assessment unless it has led to actual deterioration of condition that can be observed or reasonably inferred.
G+ ratings should only be given to inventory that is in pristine condition and is free of any observable defects.
Do not downgrade an assessment rating simply because an item is dirty.
Do not downgrade an assessment rating because the item does not meet current code compliance standards
Do not downgrade an assessment rating because the item is not deemed energy efficient.
Do not downgrade an assessment rating because the item is deemed to be a safety violation/hazard unless otherwise directed.
Do not downgrade an assessment rating because of a code violation.
Ratings should not be anticipated based on planned repairs or replacement.
Assessors should not expend field time and effort to determine the cause of a deficiency. If the cause is easily identified it should be included in the inspection comment.
Ratings shall be based upon the observable and documentable condition of the component.
A component should be downgraded if its operational capability, performance, reliability, etc. is compromised according to the direct rating definitions.
Incorporate user interviews, work order histories, or other information sources when determining the condition of the component. Include this information in the inspection comment.

The assessor should calibrate their mindset on what the expected DCR should be based on condition.

The assessor should consider the maintenance requirements of the component in the current condition.

The assessor should factor in the requirements/business rules for completing an inspection.

One factor that can play into an assessment is if the assessor receives information from a POC that results in a lower rating. For instance, an assessment takes place in July and there is a heating water pump that looks brand new, but has a blown motor. The assessor would assume the pump is supposed to be off due to being off season, but if the POC informs the assessor about the blown motor, this can be factored into the assessment (and indicated in the inspection comment).

One factor that should not play into an assessment is pending replacements of components. Assessors should rate components in the condition they are at the time of assessment. If the carpet is being replaced next month, that should not factor into a rating. Now, if the carpet contractor is on site (the work is currently taking place), this could be factored into the rating and a G+ rating provided with the current date of inspection chosen as the install date.

Service Life: No distresses present and component is nearing (or past) its service life.

The following comment can be used as an inspection comment for components that have no signs of distresses, are rated either Amber (A) or Amber Plus (A+), and are over 75% through their service life. This negates the need to have 4 parts of an inspection comment. Also, an inspection photo is no longer required.

[First Last-AE-Date] - The component is in proper working condition and is showing no signs of distress. The DCR was based on estimated remaining service life.

Step 1: Understand the 5 parts of the inspection comment:

Part #	Part Type	Type Description
1	Front End	[First Last-AE-Date] OR [First Last-DPW-Date] (ex: [John Doe-AE-7/4/2017])
2	Distress	Identifies the distress of the component
3	Severity	Identifies the amount of the distress.
4	Location	Identifies the location of the distress
5	Quantity	Identifies the quantity of the distress

Step 2: Use the DCR of the component as the basis for the severity.

DCR	Severity
Amber (+)	Minor/Mild
Amber	Moderate
Amber (-)	Significant/Major
Red (+)	Extensive
Red	Severe
Red (-)	Complete/Total

To aid in the inspection comments reading correctly the severity can be modified slightly. For instance, 'moderately' can be used for an 'A' DCR comment. This approach also applies to the distresses where one of the 23 MUST be selected. If 'Cracked' is selected as the distress, the wording 'cracks' may be used.

Step 3: Identify the distress of the component:

23 Distresses			
Blistered	Displaced	Overheated	Capability/Capacity Deficient
Broken	Efflorescent	Patched	Animal/Insect Damaged
Clogged	Holes	Rotten	Moisture/Debris Contaminated
Corroded	Leaks	Stained/Dirty	Noise/Vibration Excessive
Damaged	Loose	Cracked	Operationally Impaired
Deteriorated	Missing		Electrical Ground Inadequate or Unintentional

Step 4: Location and Quantity

Location on non-dynamic assets - 'lobby area'. On dynamic assets - 'housing' or 'base'.

Quantity on a SF UOM will typically be a %. On an EA UOM will typically be a count.

Step 5: Put all 5 components together to form an inspection comment (colors correspond to part):

A+	Front End	CRACKED.	The pump has	minor	cracks	present on	10% of the	housing.
A	Front End	DETERIORATION.	The tank has	moderate	deterioration	over	50 %	of the base.
A-	Front End	DAMAGED.	The exhaust has	significant	damage	to	all	the vehicle connectors.
R+	Front End	CRACKED.	The crane has	extensive	cracks	present on	2	pedestals.
R	Front End	LEAKS.	The piping has	severe	leaking	around the	HVAC	penetrations.
R-	Front End	OPERATIONALLY IMPAIRED.	The	3	CW	pumps are	completely	operationally impaired.

Inspection Comments

Rule #	Rule
1	Required on all inspections with a DCR of A+ and below.
2	Paint DCRs do not have an inspection comment requirement. Only the component DCR A+ and below.
3	Should include any component specific information obtained from the base or POC interview.
4	Should be in complete sentences and use industry standard terminology. Comments can be typed into MS Word for spelling/grammar checks and then pasted into the comments box.
5	Do not use all capital letters for the entire comment. The distress should be all capital letters.
6	Do not use abbreviations, jargon, or slang.
7	Should give enough information for a follow-on assessor to locate the problem area/equipment.
8	Should accurately describe the problem/observation that is the basis for the rating. Someone unfamiliar with the particular item should have an accurate picture of the components current condition and the justification for the assigned rating.
9	Should accurately describe the location of the distress if the component is only showing a distress in a single location. For instance, if an office has a stain in the carpet, it would be necessary to call out the room number of the office.
10	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. For instance, assessor John Doe at firm AE: [John Doe-AE-7/4/2017].
11	After #10 front end information in the brackets one of the 23 distresses should be provided in capitalized form. Building on #10 for an example if stained carpet: [John Doe-AE-7/4/2017] - STAINED.
12	After #10 and #11 a sentence should be provided that provides the distress, severity, location, and quantity. Quantity/Location refers to the amount/location of the distress present.

Inventory Comments

Rule #	Rule
1	Used to identify components that were not visible for inspection. See standard comments.
2	Used as a bread crumb for follow-on inspections. Can provide useful additional information such as location or type to help the next assessor understand what was being inventoried. Ex: This component is the stone wall located behind the receptionist in the lobby area.
3	Should describe the component inventoried where 'OTHER' is used to allow follow-on assessments to understand what was inventoried in the previous assessment.
4	Used to provide the location of the component (especially used for architecture components where there are no Section Details provided that have a location): Roof, NW Corner, Room Number
5	Do not use all capital letters, abbreviations, jargon, or slang.
6	Used to further describe an asset if it is not adequately described in the component type selection.
7	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Section Detail Comments

Rule #	Rule
1	Used to identify data that was not able to be populated in the Details fields. See standard comments.
2	Used to provide information that is specific to just that component section detail field. This can be a location of the specific section or something that the section services.
4	Do not use all capital letters, abbreviations, jargon, or slang.
5	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Standard Inventory Comments

When	Use Standard Comment
Assets are not visible for inspection.	Component was not visible for inspection. The component condition will be age-based by BUILDER program degradation curves.
Assets are not visible for inspection that also require Section Details to be populated.	The component is not visible for inspection or population of Section Details. The component condition will be age-based by BUILDER program degradation curves and no nameplate data or inventory photo will be provided.
Assets are not visible for inspection that require quantities to be assumed. Hidden mechanical equipment, ductwork, and # of control points are common occurrences.	The component is not visible for inspection and the quantity was estimated based on architect/engineering judgment. The component condition will be age-based by BUILDER program degradation curves.
Assets are located in an area where no electronics area allowed. This prevents an assessor from taking inventory/inspection photos.	The component is located in a secure area of the facility that did not allow electronic devices to be used. Photos were not obtainable.
Assets are visible for inspection but are a system that is not tested (HVAC controls, security system, etc.) so an age-based BUILDER™ CI is desired.	The component condition will be age-based by BUILDER program degradation curves.

Standard Section Detail Comments

When	Use Standard Comment
Nameplate is not found on the component.	Nameplate not found on the component. All fields with "NA" represent data not found.
Nameplate is found on the component but it is partial/completely unreadable.	Nameplate on the component was dirty/corroded/damaged/sunwashed. Section Detail fields with "NA" represent data that was not found.
Nameplate is found on the component that is readable but is missing certain Section Details fields.	Nameplate on the component was missing certain Section Detail fields. Section Detail fields have been populated and fields with "NA" represent data not found.

Comment Front-End Clarification

A front end refers to the bracketed information at the start of an inspection/inventory/section detail comment. The front end must have to following 3 pieces of information: 1) assessor name, 2) assessor company or affiliation, and the date. The BRED™ stamp may also provide the time of inspection which is acceptable.

BRED™/BUILDER™ Clarification

The terms BRED™ and BUILDER™ are used interchangeably throughout this document.

Rule #	Rule
1	Components are divided into sections when a significant variation exists in material/equipment category, age, or construction history, which impacts the life cycle characteristics of the component.
	Example 1 - If a wing or addition was added to a much older building, the two areas of the building should be sectioned differently because the age and construction history is different.
	Example 2 – If the building roof has multiple levels of similar materials in different conditions, these levels should be sectioned differently to capture the difference in condition.
	Example 3 – If the building has more than one of a particular type of component, separate component sections. For example: There is a 5,000 and 10,000 CFM air handler.
2	Multi-wing buildings are always sectioned by wing if the installation date of the wings vary. If a building is an 'E' shape and all wings have the same install date only sectioning by floor is required.
3	Multi-story buildings are always sectioned vertically by floor or level (in the case of a basement or mezzanine).
4	There may be unique instances where sectioning by an area of a building is required. For instance, if a building is split between two companies an installation may request sectioning by company 1 and 2.
5	An on-site discussion must occur at each building among all team members to determine the cardinal direction of the building. All assessors should have North as the same side of the building.
6	An on-site discussion must occur at each building among all team members on how the building should be sectioned. The goal is to avoid one assessor calling it a toilet, one calling it a restroom, and another calling it a bathroom. Standard sectioning naming is important for a consistent data set.
7	The section name should not be repetitive of the component type or material. If the floor is wood, do not have a section name 'WOOD'. Incorporation of the location into the section name is very helpful to be used for follow on assessments. If the wood floor has the section name 'LOBBY', it provides great

Standard Section Names and Format Rules

Use	Standard Section Name
Section by Floor (Business Rule)	FL1 – 1st Floor, FL2 – 2nd Floor, FL3 – 3rd Floor, etc.
Section by Floor (Business Rule)	BASEMENT, MEZZANINE, ATTIC, etc.
Section by Wing (applicable if different construction histories or condition only)	MAIN, WING A, WING B, WING C, ADDITION, etc.
Section by Direction (applicable if different construction histories or condition only)	NORTH, EAST, WEST, SOUTH, etc.
Section by Roof Level (applicable if different construction histories or condition only)	UPPER, LOWER, MAIN, etc.

When an equipment tag is included in the section name it should match exactly what was found in the field. Example: if the boiler ID number is B-1, the section name equipment tag portion should read B-1. If the boiler is tagged B1, the equipment tag portion should read B1. See equipment sectioning for further guidance.

Dashes are not required in the section name other than the instance in regards to equipment ID tags above.

The section name field is always entered in all capital letters.

Sectioning Business Rules - Grouping

The following only applies to each (EA) unit of measure (UOM) components. The 'Complete Component Catalog Breakdown' at the end of the section has a 'Group OK?' column. This has the values of 'Yes', 'No', and 'N/A'.

'Yes' = Grouping is allowed for this component type. A quantity of greater than '1' is acceptable.

'No' = Grouping is not allowed for this component type. The quantity must be '1'.

N/A = Not Applicable. Component type is not an EA UOM or is out of scope.

Group OK? = Yes when Section Details and Inventory Photos are Required.

There are several equipment component types (Unit Heaters, small pumps, etc) that have the following designations in the 'Complete Component Catalog Breakdown': 1) Group OK? = Yes, 2) Section Details? = Yes, and 3) Inventory Photo? = Yes.

In this case, a single section detail and inventory photo representative of the entire section is required. A few more clarifications:

- 1) The location field would be for the entire section (FL1/BAY 1/EXTERIOR) and not specific to a single component.
- 2) A difference in manufacturer does not drive further sectioning. For instance, 2 KW electric unit heaters from multiple manufacturers can be combined into one section. Capacity (2 KW) is the driver for sectioning methodology.
- 3) It is understood that the single section detail field is representative of the entire section. The details should be populated per one component. There is no need to enter multiple details or try to combine multiple manufacturer/model/serial/etc into to a single section detail field.

Group OK? = No

The quantity for these component types must be 1. For equipment (Section Details? = Yes and Inventory Photo? = Yes) the guidance found on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components', 'Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components', and 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components' must be followed.

Sectioning of Equipment Components

The business rules stated below are applicable components that have a 'Group OK? = No' designation.

Sectioning of equipment components is of critical importance to provide a data set that is usable by the installation, is able to have Quality Assurance reviews, and is able to be reassessed. To achieve this goal it is required that equipment be sectioned by 1) floor, 2) area/room, and 3) have the ID number included.

Case Study: Below is a drawing of a large building that has several electrical rooms. If one section of 125 AMP panels is provided with section name 'N/A', the usability of the data is greatly reduced. If the equipment is sectioned by room (FL1 - RM 109, FL1 - RM 141, FL1 - RM 104, FL1 - RM 153, FL1 - RM 149), follow-on assessments, QA, and the installation can easily identify/reassess components.

If equipment is located in a concealed space (such as VAV's) this sectioning guidance is not applicable. A single section can be added per floor with the estimated quantity provided. There are other exceptions (such as panels under 100A) that are noted within the component breakdown part of the manual.

This sectioning provides the benefit that if a remodel/addition takes place between assessments, it will be apparent what has been added/deleted in a specific room without the assessor having to do a complete walk-through of the building and the deduce what changed (which is a very difficult, if not impossible, task).

The Section Name should include the equipment ID number. For example, the panel LP1 can have the Section Name: FL1 - RM 109 - LP1.



**Example
Section
Names**

FL1 - RM 109
FL1 - RM 141
FL1 - RM 104
FL1 - RM 153
FL1 - RM 149

5 - EXAMPLE

D50 ELECTRICAL

D5010 ELECTRICAL SERVICE & DISTRIBUTION

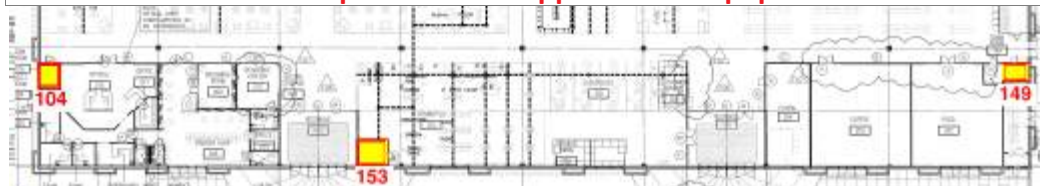
- FL1 - RM 104 - LP1 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 109 - LP2 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 109 - MP1 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 109 - SG1 - D501004 PANELBOARDS - Switchgear - 2000 Amp
- FL1 - RM 141 - LP3 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 141 - MP2 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 141 - T1 - D501003 INTERIOR DISTRIBUTION TRANSFORMERS - dry-type, 15 kV
- FL1 - RM 149 - LP4 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 149 - MP3 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 153 - LP5 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 153 - MP4 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB

Example BRED Tree Structure

The inclusion of the room/area into the section name DOES NOT negate the need to fill in the 'location' field in the Section Details. All general detail population rules must still be followed.

The use of dashes and underscores is not standardized but should be uniform throughout the BRED tree so data aligns/sorts cleanly. In the example to the left all future users of data can easily find the components inventoried.

Electrical shown as example data set. Applies to all equipment.



Sectioning of Components on the Exterior of a Building

The component catalog has a column called 'GROUP' that indicates for all each (EA) UOM component types whether they are to be a single section (Quantity = 1, NO) or can be "grouped" into a single section (Quantity >= 1, YES). When inventorying a single section (NO) component type the assessor must include cardinal direction (roof is included). When inventorying a grouped (YES) component type 'EXTERIOR' should be used.

The inclusion of the cardinal direction into the section name DOES NOT negate the need to fill in the 'location' field in the Section Details.



S/N starts with one of the following for Group OK?
= No items.

NORTH

SOUTH

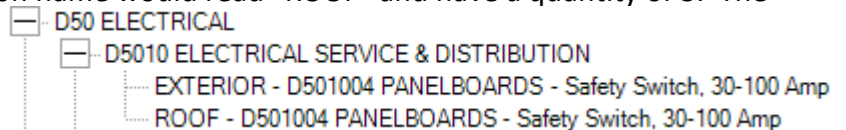
EAST

WEST

ROOF

1) Locations should be uniform throughout the data set. For instance, all equipment in the mechanical yard example above would have section names starting with 'WEST_MECH YARD' (followed by ID Number).

2) If inventorying a component where grouping is allowed (such as the 'Safety Switch, 30-100 AMP' component type above) and there is a difference in condition/install date that requires another section, the assessor should include cardinal direction in section name. For instance, if the switches serving the roof exhaust fans were to be sectioned out the section name would read "ROOF" and have a quantity of 3. The 'EXTERIOR' would remain with a quantity of 2.



Section Details

The component catalog indicates which component types need section details. If 'YES' a single section detail should be added to the section.

No photos are required at the section detail level. All 'step-back' photos are placed at the inventory (component section) level.

In the case where Section Details? = 'Yes' and Grouping? = 'Yes' a single section detail representative of the section should be added.

Section Detail fields:

ID Number: Captures the unique number associated with the equipment. The order of importance is 1) RPIE (barcode Ex: 12345), 2) Tag (phenolic/plastic Ex: EF-1), and 3) Felt tip pen markings. Assessment should follow guidance from installation on use of this field to provide the most value. This is also found in the Section Name. If both barcode and tag are to be captured the ID Number field reads Tag/RPIE (EF-1/12345).

Model: Captures the model number of the equipment.

Serial Number: Captures the serial number of the equipment.

Manufacturer: Captures the manufacturer of the equipment. Assessors should use the same spelling for all components from that manufacturer. Once a standard is set for the installation it should be followed.

Location: Captures the location of the equipment. It should be detailed enough for someone to easily locate the component. This is also found in the Section Name.

Equipment Type: Captures the type of the equipment. This can be found in the component type field.

Equipment Make: Captures the make of the equipment. Manufacturers will have a certain model identified by a name. This field captures that name.

Capacity: Captures the capacity of the equipment. In some cases the component type is a selection based on a round-up to the larger size. This field captures the actual capacity found in the field.

Date Manufactured: Captures the date manufactured. if not found, it can be set to 1/1/Year Installed.

Year Installed: Captures the year the component was installed.

Control Type/Make: Captures the control type. Common entries are: 1) Manual, 2) Thermostat, 3) DDC, 4) VFD. Many other control types can be used.

D201001 WATERCLOSETS - General**Typical Application and General Component Guidance:**

This component is used to pick up the waterclosets.

**Business Rules/General/Lessons Learned/Reinspection****General**

Includes floor-mounted, wall-hung, or tankless.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA

D201002 URINALS - General**Typical Application and General Component Guidance:**

This component is used to inventory urinals.

**Business Rules/General/Lessons Learned/Reinspection****General**

Includes waterless urinals and floor mounted urinals.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA

D20 PLUMBING - D2010 PLUMBING FIXTURES

D201003 LAVATORIES - General**Typical Application and General Component Guidance:**

This component is used to inventory lavatories. The photo has a quantity of 3.

**Business Rules/General/Lessons Learned/Reinspection****Typical Distress**

Typical distresses include: chipped corners, attachment to wall is failing, the lavatory is separating from wall, and/or leaking faucet.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
General	Yes	No	No	No	Yes	No	25	EA

D201004 SINKS - General**Typical Application and General Component Guidance:**

This component is hardly ever used, as there are more specific component types available.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not capture sinks that are free standing that serve the mission and not the building. A good way to think of this is if the mission of the building were to change, what sinks would remain?

Do not inventory multi-basin sinks, galley steam kettles, scullery dishwashers, clothes washers, etc. Only inventory sinks that are permanently mounted to the facility.

Lesson Learned

Buildings that are operated by a tenant (ex: a fast food restaurant chain) always have gray areas on what sinks are part of the building and what sinks are tenant owned. If in doubt, the assessor should err on the side of inventorying the asset.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	25	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

D201004 SINKS - Group Wash Fountain**Typical Application and General Component Guidance:**

This component is used to inventory group wash fountains.

**Business Rules/General/Lessons Learned/Reinspection****General**

May be circular or semi-circular.

May be stainless steel, concrete, or fiberglass.

Lesson Learned

Typically found in gyms.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Group Wash Fountain	Yes	No	No	No	Yes	No	10	EA

D201004 SINKS - Kitchen Sink**Typical Application and General Component Guidance:**

This component is used to inventory kitchen sinks.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

To be entered as Kitchen Sink irrespective of material type; may include ceramic, enameled cast iron, or metal.

Lesson Learned

A kitchen sink will often be made of stainless steel, and since there is a 'Stainless' component type, this can lead to confusion. If the sink is located in a kitchen or break room, use the 'Kitchen Sink' component type.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Kitchen Sink	Yes	No	No	No	Yes	No	35	EA

D20 PLUMBING - D2010 PLUMBING FIXTURES

D201004 SINKS - Laundry Sink**Typical Application and General Component Guidance:**

This component is used to inventory laundry (plastic) sinks. These may be located in other rooms other than a laundry room.

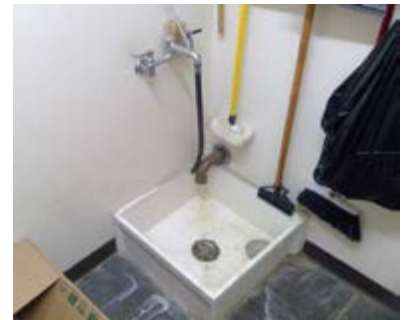
**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

All plastic sinks should be inventoried under the laundry sink component type regardless of whether they are located in a laundry room or not.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Laundry Sink	Yes	No	No	No	Yes	No	35	EA

D201004 SINKS - Mop Sink**Typical Application and General Component Guidance:**

This component is used to inventory mop sinks.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

A mop sink will have a drain in the middle of the basin. This is part of the fixture and is not counted in the floor drain total.

Use 'Mop Sink' for mop sinks of all material types.

Reinspection

Prior to the 2019 update mop sinks were included in the 'Service Sink' component type. It can be assumed that when performing a reinspection, a new inventory of these sinks will need to be completed.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Mop Sink	Yes	No	No	No	Yes	No	20	EA

D20 PLUMBING - D2010 PLUMBING FIXTURES

D201004 SINKS - Service Sink**Typical Application and General Component Guidance:**

This component is used to inventory service sinks.

**Business Rules/General/Lessons Learned/Reinspection****General**

Use 'Service Sink' for all wall-hung service sinks irrespective of material; typically ceramic, enameled cast iron, metal, or plastic.

Reinspection

Prior to the 2019 update mop sinks were included in the 'Service Sink' component type. It can be assumed that when performing a reinspection, a new inventory of these sinks will need to be completed.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Service Sink	Yes	No	No	No	Yes	No	25	EA

D201004 SINKS - Stainless**Typical Application and General Component Guidance:**

This component is used to inventory stainless steel sinks.

**Business Rules/General/Lessons Learned/Reinspection****Lesson Learned**

A kitchen sink will often be made of stainless steel, and since there is a 'Stainless' component type, this can lead to confusion. If the stainless sink is NOT located in a kitchen, use the 'Stainless' component type.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Stainless	Yes	No	No	No	Yes	No	25	EA

D201005 SHOWERS/TUBS - Bathtub**Typical Application and General Component Guidance:**

This component is used to inventory bathtubs. Note: If it is a shower/tub combo, there is another component type that should be used.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Bathtub	Yes	No	No	No	Yes	No	25	EA

D201005 SHOWERS/TUBS - Combo Unit (Shower / Tub)**Typical Application and General Component Guidance:**

This component is used to inventory shower and tub combo units.

**Business Rules/General/Lessons Learned/Reinspection****General**

Combo Units have both a tub and a shower head.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Combo Unit (Shower / Tub)	Yes	No	No	No	Yes	No	25	EA

D201005 SHOWERS/TUBS - Shower**Typical Application and General Component Guidance:**

This component is used to inventory showers. The photos shows a quantity of 3.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

In a gang-type shower installation, the assessor should count the number of shower heads to derive the quantity of showers.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Shower	Yes	No	No	No	Yes	No	25	EA

D201006 DRINKING FOUNTAINS AND COOLERS - Drinking Fountain**Typical Application and General Component Guidance:**

This component is used to inventory drinking fountains. Note: If there is a cooling unit integrated, use the water cooler component type.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

For double units, count the quantity as 2.

Stand-alone bottle-fill stations are becoming more popular and should be inventoried as part of this component type. If the bottle-fill station is integral to the drinking fountain, do not count as a separate component.

General

Includes interior, exterior, flush, and surface mount.

Lesson Learned

If the fountain has a compressor to cool water, it should be inventoried under the 'Water Cooler' component type.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Drinking Fountain	Yes	No	No	No	Yes	No	25	EA

D201006 DRINKING FOUNTAINS AND COOLERS - Water Cooler**Typical Application and General Component Guidance:**

This component is used to inventory water coolers. The photo shows a 'side by side' ADA install that is counted as a quantity of 2.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

For double units, count the quantity as 2.

Lesson Learned

This unit will include a compressor that cools the water.

Typical Distress

Loud compressor noises. Missing panels. Corrosion on the exterior. Low water-flow hints at internal problems and prevents ease of use.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Water Cooler	Yes	No	No	No	Yes	No	25	EA

D201006 DRINKING FOUNTAINS AND COOLERS - Water Fountain With Bottle Filler**Typical Application and General Component Guidance:**

This component is used to inventory drinking fountains that have an integral bottle filler.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Water Fountain With Bottle Filler	Yes	No	No	No	Yes	No	40	EA

D201090 OTHER PLUMBING FIXTURES - Combo (Eye Wash and Shower)

Typical Application and General Component Guidance:

This component is used to inventory combination eye wash/showers (ESEW).



Business Rules/General/Lessons Learned/Reinspection

Business Rule

If a combination ESEW is found, it should be inventoried under this component type. DO NOT inventory the emergency shower and emergency eyewash as separate components.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Combo (Eye Wash and Shower)	Yes	No	No	No	Yes	No	20	EA

D201090 OTHER PLUMBING FIXTURES - Emergency Eye Wash

Typical Application and General Component Guidance:

This component is used to inventory emergency eye washes.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Do not count portable, un-piped plastic units.

General

The emergency eyewash must be a stand-alone shower and not be integral to a combination unit. If the unit is a combination unit, the component type 'Combo (Eye Wash and Shower)' should be used.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Emergency Eye Wash	Yes	No	No	No	Yes	No	25	EA

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D201090 OTHER PLUMBING FIXTURES - Emergency Shower**Typical Application and General Component Guidance:**

This component is used to inventory emergency showers.

**Business Rules/General/Lessons Learned/Reinspection****General**

The emergency shower must be a stand-alone shower and not be integral to a combination unit. If the unit is a combination unit, the component type 'Combo (Eye Wash and Shower)' should be used.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Emergency Shower	Yes	No	No	No	Yes	No	25	EA

D201090 OTHER PLUMBING FIXTURES - Stainless Steel Combo Unit (WC/Sink)**Typical Application and General Component Guidance:**

This component is used to inventory fixtures where the water closet and sink are integrated into one component. This is a rare component that would typically be found in hospital/jail applications.

**Business Rules/General/Lessons Learned/Reinspection****Lesson Learned**

Will typically be found in prisons or hospitals.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Stainless Steel Combo Unit (WC/Sink)	Yes	No	No	No	Yes	No	25	EA

D201090 OTHER PLUMBING FIXTURES - Sump**Typical Application and General Component Guidance:**

This component is used to inventory sump and floor fixtures. The photo shows an above grade sump fixture.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

This is used to capture sump fixtures. This is not used to capture sump pumps. A sump fixture is typically the plastic lining of the sump well in which the sump pump is placed.

Lesson Learned

This component type can also be used to capture floor sinks. These are commonly found in dining facilities.

Reinspection

Prior to the 2019 update sump pumps may have been inventoried under 'D201090 OTHER PLUMBING FIXTURES - Sump'. Upon reinspection a new inventory may be required under 'D204003 RAINWATER DRAINAGE EQUIPMENT'.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Sump	Yes	No	No	No	Yes	No	100	EA

D202001 PIPES & FITTINGS - General**Typical Application and General Component Guidance:**

This component is used to inventory the domestic water piping in a building.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

The average cost of plumbing per SF is estimated at \$6/SF. Assessors should use the following formula to derive the LF value: (Building SF * \$6) / (BUILDER Cost). The current BUILDER cost per LF is \$73/LF. Verify this value at the start of the project.

Lesson Learned

Assessors must use judgment when using the standard formula. A large warehouse will have much less plumbing than a large office building. Assessors can slide the average cost per SF up/down based on their expertise.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
General	Yes	No	No	No	N/A	Yes	75	LF

D202002 VALVES & HYDRANTS - Backflow Preventer - 2" pipe**Typical Application and General Component Guidance:**

This component is used to inventory backflow preventers. Select the correct size.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

There will often be a 3/4" backflow preventer on hot/chilled water systems for make-up water. These should be inventoried under the 'D202002 VALVES & HYDRANTS - Backflow Preventer - 1" pipe' component type.

Use pipe size to determine component type selection. If the backflow preventer is larger than 8", the 8" component type should be selected with the actual size noted in the section detail capacity field.

General

May be brass, stainless steel, or painted steel.

May be located on the exterior of a building, climate permitting, or in a mechanical room.

May be reduced pressure or double check. A reduced pressure will have an air gap attachment and a drain on the bottom of the assembly.

Lesson Learned

There will often be a fire protection backflow preventer in the same vicinity as the potable water backflow preventer. The fire protection backflow preventer should be captured under 'D402001 FIRE PROTECTION WATER PIPING AND EQUIPMENT.'

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Backflow Preventer - 2" pipe	Yes	Yes	Yes	No	No	No	25	EA

D202003 DOMESTIC WATER EQUIPMENT - Booster Pump - <1 HP

Typical Application and General Component Guidance:

This component is used to inventory small booster or circulating pumps.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

'D202003 DOMESTIC WATER EQUIPMENT - Pumps' are only applicable to potable water systems. Do not inventory D30 Hot/Chilled water pumps under D20. The pump component types under D30 should be used for Hot/Chilled water systems.

Do not section small circulation pumps as individual component sections. Combine into one component section for an entire facility unless there is a difference in condition.

The rules here only apply to this component type (pumps under 1 HP).

There are often small circulation pumps throughout a plumbing system. These are to be inventoried and assessed.

Reinspection

Prior to the 2019 update, the component type 'Booster Pump - <1 HP' did not exist and 'Booster Pump' was used to capture fractional HP pumps. In a reinspection, the assessor should update the component type in accordance with the latest guidance.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Booster Pump - <1 HP	Yes	Yes	Yes	No	Yes	No	20	EA

D202003 DOMESTIC WATER EQUIPMENT - Booster Pump - 1 HP**Typical Application and General Component Guidance:**

This component is used to inventory booster pumps found on water systems.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

'D202003 DOMESTIC WATER EQUIPMENT - Pumps' are only applicable to potable water systems. Do not inventory D30 Hot/Chilled water pumps under D20. The pump component types under D30 should be used for Hot/Chilled water systems.

In the instance of a duplex pump assembly, the quantity is 2. Provide details from one pump. Do not inventory the pumps as separate component sections. In the instance of a duplex pump assembly, 'Group OK? = Yes'.

General

Booster pumps are used for increasing domestic water pressure.

Will often be seen as a "package" unit, duplex pump assembly in mechanical rooms serving a barracks or building complex.

Typical Distress

Failed seals are leading to the pump leaking. Louder than usual operation.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Booster Pump - 1 HP	Yes	Yes	Yes	No	No	No	25	EA

**D202003 DOMESTIC WATER EQUIPMENT - Storage Tank -
Galvanized steel, 500 gallon, 36" diameter, 126" L.O.A.**

Typical Application and General Component Guidance:

This component is used to inventory storage tanks. Select the correct size. Some storage tanks (pictured) may have an integral heat exchanger.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

If there is a division of labor between the D20 and D30 systems, the assessors need to coordinate to make sure all tanks in the facility have been captured. Detailed section naming is needed. Ex: A chilled water tank should have 'CW' in the section name.

The tank may have an internal heat exchanger. If this is the case, do not inventory the Heat Exchanger (HX) separately, as the asset is a single assembly and is to be treated as one component.

When there are multiple storage tanks present the system should be included in the section name. For instance, PW = potable water, CW = chilled water, and HW = hot water. Example section name: FL1_Mech RM_CW_TANK 1.

General

May use steam or hot water as the heating source.

Typically used in mechanical rooms where a boiler is being used to make hot water and is connected to the tank. Heat is transferred from boiler loop to domestic hot water loop via an external/internal heat exchanger.

Lesson Learned

For large water heater tanks or storage tanks, the volume can be calculated by measuring the length or height and the radius (1/2 the diameter), and using the following formula: $(3.142) \times \text{Radius}^2 \times \text{Length (or Height)} / 7.48$ (Gal/Ft³).

There are often tanks for the chilled/hot water systems in D30 that are inventoried under D202003 due to there being no component type available in D30 for these to be inventoried.

Typical Distress

Corrosion on the base or where pipes are connected.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Storage Tank - Galvanized steel, 500 gallon, 36" diameter, 126" L.O.A.	Yes	Yes	Yes	No	No	No	30	EA

D202003 DOMESTIC WATER EQUIPMENT - Tankless Heater - Electric**Typical Application and General Component Guidance:**

This component is used to inventory instantaneous electric water heaters.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If there are two or more under-sink, single point of use water heaters, assessors should 'Group OK? - Yes' those into a single section following the grouping methodology.

Point-of-use is defined as a small (usually under sink) water heater serving only one fixture. If the heater is serving two fixtures, it should be inventoried. If the heater is only serving one fixture, it does not need to be inventoried.

Lesson Learned

Gas tankless heaters are typically found in mechanical rooms. Electric tankless heaters can be located in various locations throughout a facility.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Tankless Heater - Electric	Yes	Yes	Yes	No	No	No	12	EA

D202003 DOMESTIC WATER EQUIPMENT - Tankless Heater - Gas**Typical Application and General Component Guidance:**

This component is used to inventory instantaneous tankless gas-fired water heaters.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If there are two or more under-sink, single point of use water heaters, assessors should 'Group OK? - Yes' those into a single section following the grouping methodology.

Point-of-use is defined as a small (usually under sink) water heater serving only one fixture. If the heater is serving two fixtures, it should be inventoried. If the heater is only serving one fixture, it does not need to be inventoried.

Lesson Learned

Gas tankless heaters are typically found in mechanical rooms. Electric tankless heaters can be located in various locations throughout a facility.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Tankless Heater - Gas	Yes	Yes	Yes	No	No	No	12	EA

**D202003 DOMESTIC WATER EQUIPMENT - Water Heaters,
Commercial, Electric - 250 gal, 150 KW, 615 GPH**

Typical Application and General Component Guidance:

This component is used to inventory electric commercial water heaters.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Do not inventory 'point of use' tank type heaters under 20 gallons. Point-of-use is defined as a small heater serving only one fixture.

Water heaters of 80 gallons or less should be inventoried under 'Residential' component types. Water heaters of 81 gallons and above should be inventoried under 'Commercial' component types.

Lesson Learned

For large water heater tanks or storage tanks, the volume can be calculated by measuring the length or height and the radius (1/2 the diameter), and using the following formula: $(3.142) \times \text{Radius}^2 \times \text{Length (or Height)} / 7.48$ (Gal/Ft³).

Reinspection

Prior to the 2019 update there was no business rule stating that 80 gallons and below should be inventoried as residential. Upon reinspection, the assessor should update the component type in accordance with the latest inventory guidance.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Water Heaters, Commercial, Electric - 250 gal, 150 KW, 615 GPH	Yes	Yes	Yes	No	No	No	10	EA

D202003 DOMESTIC WATER EQUIPMENT - Water Heaters, Commercial, Gas - 200 MBH input, 192 GPH

Typical Application and General Component Guidance:

This component is used to inventory commercial water heaters.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Do not inventory under 'D202003 DOMESTIC WATER EQUIPMENT' if the unit supplies heating hot water as these are counted under 'D3020 HEAT GENERATING SYSTEMS'. Water heaters under 'D202003 DOMESTIC WATER EQUIPMENT' only apply to drinking water systems.

Water heaters of 80 gallons or less should be inventoried under 'Residential' component types. Water heaters of 81 gallons and above should be inventoried under 'Commercial' component types.

General

BRED™ D2020 does not have a dropdown for domestic water boilers. Enter as 'Water Heater - Commercial' with correct MBH selected. If MBH exceeds options in 'D202003 DOMESTIC WATER EQUIPMENT', inventory under 'D302001 BOILERS'.

Large vertical-tank-style units often are provided with circulating pump.

Lesson Learned

For large water heater tanks or storage tanks, the volume can be calculated by measuring the length or height and the radius (1/2 the diameter), and using the following formula: $(3.142) \times \text{Radius}^2 \times \text{Length (or Height)} / 7.48$ (Gal/Ft3).

Large barrack buildings will often use a boiler to make hot water (through a heat exchanger). These boilers will quickly exceed the BRED™ size selections, and since they are in fact a boiler, it makes sense to inventory them under 'D302001 BOILERS'.

Reinspection

Prior to the 2019 update there was no business rule stating that 80 gallons and below should be inventoried as residential. Upon reinspection, the assessor should update the component type in accordance with the latest inventory guidance.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Water Heaters, Commercial, Gas - 200 MBH input, 192 GPH	Yes	Yes	Yes	No	No	No	10	EA

D20 PLUMBING - D2020 DOMESTIC WATER DISTRIBUTION

**D202003 DOMESTIC WATER EQUIPMENT - Water Heaters,
Residential, Electric****Typical Application and General Component Guidance:**

This component is used to inventory residential water heaters. Note:
If it is a commercial water heater, do not use this component type.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not inventory 'point of use' heaters. Point-of-use is defined as a small heater serving only one fixture.

Do not inventory water heaters under 20 gallons. Twenty gallons or more are to be inventoried.

Water heaters of 80 gallons or less should be inventoried under 'Residential' component types. Water heaters of 81 gallons and above should be inventoried under 'Commercial' component types.

General

Typically found in small administrative buildings with low occupancy.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Water Heaters, Residential, Electric	Yes	Yes	Yes	No	No	25	EA

**D202003 DOMESTIC WATER EQUIPMENT - Water Treatment
Equipment - Chemical Treatment****Typical Application and General Component Guidance:**

This component is used to inventory commercial chemical water treatment equipment. If a residential type water softener is installed, use the 'Water Softener' component type. In the photo there is a quantity of 2.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

This component is used for commercial water treatment systems. If there is a residential water softener installed, then 'D202003 DOMESTIC WATER EQUIPMENT - Water Softener' should be used.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Water Treatment Equipment - Chemical Treatment	Yes	Yes	Yes	No	No	25	EA

D202003 DOMESTIC WATER EQUIPMENT - Water Treatment Equipment - Deionization Station

Typical Application and General Component Guidance:

This component is used to inventory deionization stations.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

If found in a point-of-use type application, a single section detail and inventory photo can be added and the components grouped into a single section (Group OK? = Yes).

General

The component may be found as a point of use or as part of the water treatment equipment upstream of the building distribution system.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Water Treatment Equipment - Deionization Station	Yes	Yes	Yes	No	No	25	EA

D20 PLUMBING - D2030 SANITARY WASTE

D203001 WASTE PIPE & FITTINGS - General**Typical Application and General Component Guidance:**

This component is used to inventory the sanitary piping in a building.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

The average cost of plumbing per SF is estimated at \$4/SF. Assessors should use the following formula to derive the LF value: (Building SF * 4) / (BUILDER Cost). The current BUILDER cost per SF is \$74/LF. Verify this value at the start of the project.

General

Bell & Spigot cast iron pipe (3" and up) with galvanized pipe branches (1-1/4" to 2") was used through the 1950s. Copper came into use in the 1960s and is still used today.

Lesson Learned

Assessors must use judgment when using the standard formula. A large warehouse will have much less sanitary piping than a large office building. Assessors can slide the average cost per SF up/down based on their expertise.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	Yes	50	LF

D203003 FLOOR DRAINS - General**Typical Application and General Component Guidance:**

This component is used to inventory floor drains.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Floor drains are to be counted and inventoried as a single component for the entire facility. These are viewed as part of the plumbing distribution system so there is no need to section by floor.

If a floor drain in a restroom or a mechanical room is of a significantly worse condition, it should be sectioned out and a standard section name 'FL1 - MECH RM' should be used.

The component is meant to inventory standard floor drains. If the drain is part of a plastic shower or another type of fixture, it does not count towards the quantity.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA

D203003 FLOOR DRAINS - Trench Drain**Typical Application and General Component Guidance:**

This component is used to inventory trench drains.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

There are instances where a trench is installed that is identical to a trench drain but is used as a conduit for piping. In this case there is still a drain present in the trench, and it should be included in the overall inventory of the trench drains.

Trench drains are inventoried in a LF UOM. The assessment is often based on the condition of the gratings.

Lesson Learned

These type of drains are very common in maintenance bays.

Reinspection

Prior to the 2019 update, there was no 'Trench Drain' component type. Drains were often inventoried under 'General' with regular floor drains. It can be assumed that, during a reinspection, this component type will require a new inventory.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Trench Drain	Yes	No	No	No	N/A	No	20	LF

D204002 ROOF DRAINS - General**Typical Application and General Component Guidance:**

This component is used to inventory roof drains. Note: 'General' is a LF UOM, which is the correct one to use. Other is an EA, which should not be used.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

All interior rainwater piping is inventoried under 'D204002 ROOF DRAINS - General'. All vertical exterior rainwater piping is inventoried under 'B301005 GUTTERS & DOWNSPOUTS - Downspouts'.

Assessors count the number of drains (main and overflows) on the roof and use the following formula to derive the LF value: $(\# \text{ Drains} * (\text{building width}/2)) + (2 * (\text{building length} + \text{building height})) = \text{LF quantity}$.

The 'Roof Drain' component type includes both the basket on the roof, the drain, and the interior piping. Capture the component in LF from the drain to the discharge including all laterals and mains.

This component is used to inventory all rainwater-conveying piping found on the interior of a building. All rain-water conveying piping/downspouts/etc. should be inventoried under "B301005 GUTTERS & DOWNSPOUTS".

General

The component UOM is 'LF', which requires the assessor to make a calculation to arrive at the quantity.

Lesson Learned

Typically cast iron, bell & spigot in older buildings, and no-hub band in newer buildings. May be plastic in some applications.

Typically only found on flat roofs.

Reinspection

Prior to the 2019 update there were business rules that stated all piping (typical schedule 40) that conveyed rainwater should be captured under this component type. This included interior and exterior.

When performing a reassessment on data captured prior to the 2019 update, the assessor should assume that if exterior piping is present, this value will need to be recalculated.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	25	LF

D204003 RAINWATER DRAINAGE EQUIPMENT - Sump Pump - Duplex**Typical Application and General Component Guidance:**

This component is used to inventory single/duplex sump pump systems.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Sump pumps that are not the submersible type (such as the photo above) should be inventoried under the 'D204003 RAINWATER DRAINAGE EQUIPMENT - Sump Pump - Duplex' component type.

General

Sump pumps are commonly found in mechanical rooms.

Lesson Learned

Sump pumps can be located in confined spaces that are typically deemed inaccessible. Consult the approved safety plan.

Reinspection

Prior to the 2019 update sump pumps may have been inventoried under 'D201090 OTHER PLUMBING FIXTURES - Sump'. Upon reinspection a new inventory may be required under 'D204003 RAINWATER DRAINAGE EQUIPMENT'.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Sump Pump - Duplex	Yes	Yes	Yes	No	No	No	25	EA

D204003 RAINWATER DRAINAGE EQUIPMENT - Sump Pump - Submersible**Typical Application and General Component Guidance:**

This component is used to inventory submersible sump pumps.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Sump pumps that are not visible (such as the photo above) should be inventoried under the 'D204003 RAINWATER DRAINAGE EQUIPMENT - Sump Pump - Submersible' component type.

General

Sump pumps are commonly found in mechanical rooms.

Lesson Learned

Sump pumps can be located in confined spaces that are typically deemed inaccessible. Consult the approved safety plan.

Reinspection

Prior to the 2019 update sump pumps may have been inventoried under 'D201090 OTHER PLUMBING FIXTURES - Sump'. Upon reinspection a new inventory may be required under 'D204003 RAINWATER DRAINAGE EQUIPMENT'.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Sump Pump - Submersible	Yes	Yes	Yes	No	No	No	25	EA

D204090 OTHER RAIN WATER DRAINAGE SYSTEM - General**Typical Application and General Component Guidance:**

This component is used to inventory rainwater collection systems.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

In newer buildings, there may be rain-water collection systems installed. The component is an 'EA' UOM that captures the rainwater piping system from the roof to the tank. A quantity of '1' should be entered.

Lesson Learned

Assessors will still have to add a gray water piping distribution system (D202001), tanks, pumps, and other applicable components that complete the system.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA

D20 PLUMBING - D2090 OTHER PLUMBING SYSTEMS

D209001 SPECIAL PIPING SYSTEMS - General**Typical Application and General Component Guidance:**

This component is used to inventory specialty piping in a building.
The photo shows medical gas piping.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

The inventory comment should state which piping system is being inventoried.
The section name should indicate what type of piping system was being inventoried.

General

This component is used to capture other types of piping systems that are made of standard steel or flex piping.
This component is used to capture special piping systems like a stainless fuel system or an oxygen gas system found in a hospital.

Lesson Learned

The most common application of this component type is compressed air, oil, or lubricant piping in maintenance shops. The section name should indicate which type of system is being inventoried.

Reinspection

Prior to the 2019 update the inclusion of a inventory comment and photo detailing the piping system was not required. This was added to remove confusion on buildings that have multiple special piping systems present.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	N/A	No	15	LF

D209002 ACID WASTE SYSTEMS - General**Typical Application and General Component Guidance:**

This component is used to inventory acid waste systems.

**Business Rules/General/Lessons Learned/Reinspection****General**

This component can be found in labs where there is a hazardous environment.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA

D20 PLUMBING - D2090 OTHER PLUMBING SYSTEMS

D209003 INTERCEPTORS - General**Typical Application and General Component Guidance:**

This component is used to inventory grease traps or oil/water separators.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Multiple grease traps should be inventoried as a single component section. Oil/Water separators should be sectioned separately, as they are typically serving different areas of a facility and will have different maintenance schedules.

General

This component is used to inventory oil/water separators (commonly found in maintenance garages) and grease traps (commonly found in kitchens).

Lesson Learned

The oil/water separator will often be located outside of the building. Put the cardinal direction in the section name to align with the other exterior component sectioning methodology.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA

D209004 POOL PIPING AND EQUIPMENT - General**Typical Application and General Component Guidance:**

This component is used to inventory pool equipment.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If there are multiple pools/hot tub systems, section them separately with the pool they are serving indicated in the section name.

It is not desired to inventory all aspects of a pool system. This component represents the entire system including pumps, chemicals, piping, and all other appurtenances. Use a quantity of 1 EA.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA

D20 PLUMBING

D201001 WATERCLOSETS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA
Other	Yes	No	Yes	Yes	Yes	No	25	EA
Stainless	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D201002 URINALS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA
Other	Yes	No	Yes	Yes	Yes	No	25	EA
Stainless	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D201003 LAVATORIES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA
Other	Yes	No	Yes	Yes	Yes	No	25	EA
Stainless	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D201004 SINKS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	25	EA
Group Wash Fountain	Yes	No	No	No	Yes	No	10	EA
Kitchen Sink	Yes	No	No	No	Yes	No	35	EA
Laboratory Sink	Yes	No	No	No	Yes	No	25	EA
Laundry Sink	Yes	No	No	No	Yes	No	35	EA
Mop Sink	Yes	No	No	No	Yes	No	20	EA
Other	Yes	No	Yes	Yes	Yes	No	25	EA
Service Sink	Yes	No	No	No	Yes	No	25	EA
Stainless	Yes	No	No	No	Yes	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D20 PLUMBING

D201005 SHOWERS/TUBS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Bathtub	Yes	No	No	No	Yes	No	25	EA
Combo Unit (Shower / Tub)	Yes	No	No	No	Yes	No	25	EA
General	No	No	No	No	N/A	No	25	EA
Other	No	No	No	No	N/A	No	25	EA
Shower	Yes	No	No	No	Yes	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D201006 DRINKING FOUNTAINS AND COOLERS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Drinking Fountain	Yes	No	No	No	Yes	No	25	EA
General	No	No	No	No	N/A	No	10	EA
Other	No	No	No	No	N/A	No	10	EA
Unknown	No	No	No	No	N/A	No	10	EA
Water Cooler	Yes	No	No	No	Yes	No	25	EA
Water Fountain With Bottle Filler	Yes	No	No	No	Yes	No	40	EA

D201007 BIDETS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA
Other	Yes	No	Yes	Yes	Yes	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D201090 OTHER PLUMBING FIXTURES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Combo (Eye Wash and Shower)	Yes	No	No	No	Yes	No	20	EA
Emergency Eye Wash	Yes	No	No	No	Yes	No	25	EA
Emergency Shower	Yes	No	No	No	Yes	No	25	EA
General	Yes	No	Yes	Yes	Yes	No	15	EA
Other	No	No	No	No	N/A	No	15	EA
Stainless Steel Combo Unit (WC/Sink)	Yes	No	No	No	Yes	No	25	EA
Sump	Yes	No	No	No	Yes	No	100	EA
Unknown	No	No	No	No	N/A	No	15	EA
Washer / Dryer Hookup	No	No	No	No	N/A	No	15	EA

D20 PLUMBING

D202001 PIPES & FITTINGS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Black / Galvanized Steel <1" Pipe	No	No	No	No	N/A	No	75	LF
Black / Galvanized Steel 1"-2" Pipe	No	No	No	No	N/A	No	75	LF
Black / Galvanized Steel 2"-4" Pipe	No	No	No	No	N/A	No	75	LF
Black / Galvanized Steel 4"-6" Pipe	No	No	No	No	N/A	No	75	LF
Black / Galvanized Steel >6" Pipe	No	No	No	No	N/A	No	75	LF
Copper <1" Pipe	No	No	No	No	N/A	No	75	LF
Copper 1"-2" Pipe	No	No	No	No	N/A	No	75	LF
Copper 2"-4" Pipe	No	No	No	No	N/A	No	75	LF
Copper 4"-6" Pipe	No	No	No	No	N/A	No	75	LF
Copper >6" Pipe	No	No	No	No	N/A	No	75	LF
CPVC <1" Pipe	No	No	No	No	N/A	No	75	LF
CPVC 1"-2" Pipe	No	No	No	No	N/A	No	75	LF
CPVC 2"-4" Pipe	No	No	No	No	N/A	No	75	LF
CPVC >6" Pipe	No	No	No	No	N/A	No	75	LF
CPVC 4" - 6" Pipe	No	No	No	No	N/A	No	50	LF
Ductile Iron 4" Pipe	No	No	No	No	N/A	No	75	LF
Ductile Iron 6" Pipe	No	No	No	No	N/A	No	75	LF
General	Yes	No	No	No	N/A	Yes	75	LF
HDPE 4" Pipe	No	No	No	No	N/A	No	75	LF
HDPE 6" Pipe	No	No	No	No	N/A	No	75	LF
Other	No	No	No	No	N/A	No	75	EA
PVC 2"-4" Pipe	No	No	No	No	N/A	No	75	LF
PVC 4"-6" Pipe	No	No	No	No	N/A	No	75	LF
PVC < 2" Pipe	No	No	No	No	N/A	No	75	LF
PVC >6" Pipe	No	No	No	No	N/A	No	75	LF
Unknown	No	No	No	No	N/A	No	75	EA

D202002 VALVES & HYDRANTS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Backflow Preventer	No	No	No	No	N/A	No	25	EA
Backflow Preventer - 1" pipe	Yes	Yes	Yes	No	No	No	25	EA
Backflow Preventer - 1.5" pipe	Yes	Yes	Yes	No	No	No	25	EA
Backflow Preventer - 2" pipe	Yes	Yes	Yes	No	No	No	25	EA
Backflow Preventer - 3" pipe	Yes	Yes	Yes	No	No	No	25	EA
Backflow Preventer - 4" pipe	Yes	Yes	Yes	No	No	No	25	EA
Backflow Preventer - 6" pipe	Yes	Yes	Yes	No	No	No	25	EA
Backflow Preventer - 8" pipe	Yes	Yes	Yes	No	No	No	25	EA
General	No	No	No	No	N/A	No	25	EA
Hose Bib	No	No	No	No	N/A	No	25	EA
Kitchen Faucets	No	No	No	No	N/A	No	10	EA
Other	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA
Washer/Dryer Faucets	No	No	No	No	N/A	No	10	EA

D202003 DOMESTIC WATER EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Booster Pump	No	No	No	No	N/A	No	25	EA
Booster Pump - <1 HP	Yes	Yes	Yes	No	Yes	No	20	EA
Booster Pump - 1 HP	Yes	Yes	Yes	No	No	No	25	EA
Booster Pump - 1.5 HP	Yes	Yes	Yes	No	No	No	25	EA
Booster Pump - 10 HP	Yes	Yes	Yes	No	No	No	25	EA
Booster Pump - 2 HP	Yes	Yes	Yes	No	No	No	25	EA
Booster Pump - 3 HP	Yes	Yes	Yes	No	No	No	25	EA
Booster Pump - 5 HP	Yes	Yes	Yes	No	No	No	25	EA
Booster Pump - 7.5 HP	Yes	Yes	Yes	No	No	No	25	EA
Booster Pump - Variable speed, 15 HP, 6" discharge, 1000 GPM	Yes	Yes	Yes	No	No	No	25	EA
Booster Pump - Variable speed, 30 HP, 6" discharge, 1700 GPM	Yes	Yes	Yes	No	No	No	25	EA
Booster Pump - Variable speed, 7.5 HP, 4" discharge, 400 GPM	Yes	Yes	Yes	No	No	No	25	EA
General	No	No	No	No	N/A	No	25	EA
Heat Transfer Package	No	No	No	No	N/A	No	25	EA
Heat Transfer Package - One pump system, 28 GPM	Yes	Yes	Yes	No	No	No	25	EA
Heat Transfer Package - One pump system, 35 GPM	Yes	Yes	Yes	No	No	No	25	EA
Heat Transfer Package - One pump system, 55 GPM	Yes	Yes	Yes	No	No	No	25	EA
Heat Transfer Package - One pump system, 130 GPM	Yes	Yes	Yes	No	No	No	25	EA
Heat Transfer Package - One pump system, 255 GPM	Yes	Yes	Yes	No	No	No	25	EA
Heat Transfer Package - One pump system, 550 GPM	Yes	Yes	Yes	No	No	No	25	EA
Heat Transfer Package - One pump system, 800 GPM	Yes	Yes	Yes	No	No	No	25	EA
Heat Transfer Package - Two pump system, 130 GPM	Yes	Yes	Yes	No	No	No	25	EA
Heat Transfer Package - Two pump system, 255 GPM	Yes	Yes	Yes	No	No	No	25	EA
Heat Transfer Package - Two pump system, 28 GPM	Yes	Yes	Yes	No	No	No	25	EA
Heat Transfer Package - Two pump system, 35 GPM	Yes	Yes	Yes	No	No	No	25	EA
Heat Transfer Package - Two pump system, 55 GPM	Yes	Yes	Yes	No	No	No	25	EA
Heat Transfer Package - Two pump system, 550 GPM	Yes	Yes	Yes	No	No	No	25	EA
Heat Transfer Package - Two pump system, 800 GPM	Yes	Yes	Yes	No	No	No	25	EA

Complete Component Catalog Breakdown

D20

D20 PLUMBING

Other	Yes	Yes	Yes	Yes	No	No	25	EA
Storage Tank	No	No	No	No	N/A	No	30	EA
Storage Tank - Galvanized steel, 135 gallon, 24" diameter, 75" L.O.A.	Yes	Yes	Yes	No	No	No	30	EA
Storage Tank - Galvanized steel, 15 gallon, 14" diameter, 26" L.O.A.	Yes	Yes	Yes	No	No	No	50	EA
Storage Tank - Galvanized steel, 240 gallon, 30" diameter, 86" L.O.A.	Yes	Yes	Yes	No	No	No	50	EA
Storage Tank - Galvanized steel, 30 gallon, 14" diameter, 49" L.O.A.	Yes	Yes	Yes	No	No	No	50	EA
Storage Tank - Galvanized steel, 300 gallon, 36" diameter, 76" L.O.A.	Yes	Yes	Yes	No	No	No	50	EA
Storage Tank - Galvanized steel, 400 gallon, 36" diameter, 100" L.O.A.	Yes	Yes	Yes	No	No	No	30	EA
Storage Tank - Galvanized steel, 500 gallon, 36" diameter, 126" L.O.A.	Yes	Yes	Yes	No	No	No	30	EA
Storage Tank - Galvanized steel, 80 gallon, 20" diameter, 64" L.O.A.	Yes	Yes	Yes	No	No	No	30	EA
Storage Tank - Glass lined, PE, 1330 gallon, 66" diameter, 107" L.O.A.	Yes	Yes	Yes	No	No	No	50	EA
Storage Tank - Glass lined, PE, 140 gallon, 24" diameter, 80" L.O.A.	Yes	Yes	Yes	No	No	No	30	EA
Storage Tank - Glass lined, PE, 1615 gallon, 72" diameter, 110" L.O.A.	Yes	Yes	Yes	No	No	No	50	EA
Storage Tank - Glass lined, PE, 225 gallon, 30" diameter, 78" L.O.A.	Yes	Yes	Yes	No	No	No	30	EA
Storage Tank - Glass lined, PE, 2285 gallon, 84" diameter, 128" L.O.A.	Yes	Yes	Yes	No	No	No	50	EA
Storage Tank - Glass lined, PE, 325 gallon, 36" diameter, 81" L.O.A.	Yes	Yes	Yes	No	No	No	30	EA
Storage Tank - Glass lined, PE, 3440 gallon, 96" diameter, 157" L.O.A.	Yes	Yes	Yes	No	No	No	50	EA
Storage Tank - Glass lined, PE, 460 gallon, 42" diameter, 84" L.O.A.	Yes	Yes	Yes	No	No	No	30	EA
Storage Tank - Glass lined, PE, 605 gallon, 48" diameter, 87" L.O.A.	Yes	Yes	Yes	No	No	No	30	EA
Storage Tank - Glass lined, PE, 740 gallon, 54" diameter, 91" L.O.A.	Yes	Yes	Yes	No	No	No	50	EA
Storage Tank - Glass lined, PE, 80 gallon, 20" diameter, 64" L.O.A.	Yes	Yes	Yes	No	No	No	30	EA

D20

Complete Component Catalog Breakdown

D20

D20 PLUMBING

Storage Tank - Glass lined, PE, 940 gallon, 60" diameter, 93" L.O.A.	Yes	Yes	Yes	No	No	No	50	EA
Tankless Heater - Electric	Yes	Yes	Yes	No	No	No	12	EA
Tankless Heater - Gas	Yes	Yes	Yes	No	No	No	12	EA
Unknown	No	No	No	No	N/A	No	10	EA
Water Heaters, Commercial, Electric	No	No	No	No	N/A	No	10	EA
Water Heaters, Commercial, Electric - 50 gal, 9 KW, 37 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Electric - 80 gal, 12 KW, 49 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Electric - 80 gal, 36 KW, 147 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Electric - 120 gal, 36 KW, 147 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Electric - 150 gal, 120 KW, 490 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Electric - 200 gal, 120 KW, 490 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Electric - 250 gal, 150 KW, 615 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Electric - 300 gal, 180 KW, 738 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Electric - 350 gal, 30 KW, 123 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Electric - 350 gal, 180 KW, 738 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Electric - 500 gal, 30 KW, 123 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Electric - 500 gal, 240 KW, 984 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Electric - 700 gal, 30 KW, 123 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Electric - 700 gal, 300 KW, 1230 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Electric - 1000 gal, 60 KW, 245 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Electric - 1000 gal, 480 KW, 1970 GPH	Yes	Yes	Yes	No	No	No	10	EA

D20

Complete Component Catalog Breakdown

D20

D20 PLUMBING

Water Heaters, Commercial, Electric - 1500 gal, 60 KW, 245 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Electric - 1500 gal, 480 KW, 1970 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Gas	No	No	No	No	N/A	No	10	EA
Water Heaters, Commercial, Gas - 75 MBH input, 63 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Gas - 95 MBH input, 86 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Gas - 100 MBH input, 91 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Gas - 115 MBH input, 110 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Gas - 155 MBH input, 150 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Gas - 175 MBH input, 168 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Gas - 200 MBH input, 192 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Gas - 240 MBH input, 230 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Gas - 300 MBH input, 278 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Gas - 390 MBH input, 374 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Gas - 500 MBH input, 480 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Gas - 600 MBH input, 576 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Oil	No	No	No	No	N/A	No	10	EA
Water Heaters, Commercial, Oil - 140 gal, 140 MBH input, 134 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Oil - 140 gal, 255 MBH input, 247 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Oil - 140 gal, 270 MBH input, 259 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Oil - 140 gal, 400 MBH input, 384 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Oil - 140 gal, 720 MBH input, 691 GPH	Yes	Yes	Yes	No	No	No	10	EA

D20

Complete Component Catalog Breakdown

D20

D20 PLUMBING

Water Heaters, Commercial, Oil - 201 gal, 1000 MBH input, 960 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Oil - 201 gal, 1250 MBH input, 1200 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Oil - 201 gal, 1500 MBH input, 1441 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Oil - 221 gal, 300 MBH input, 288 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Oil - 221 gal, 600 MBH input, 576 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Oil - 221 gal, 800 MBH input, 768 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Oil - 397 gal, 1500 MBH input, 1441 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Oil - 397 gal, 1750 MBH input, 1681 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Oil - 411 gal, 600 MBH input, 576 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Oil - 411 gal, 800 MBH input, 768 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Oil - 411 gal, 1000 MBH input, 960 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Commercial, Oil - 411 gal, 1250 MBH input, 1200 GPH	Yes	Yes	Yes	No	No	No	10	EA
Water Heaters, Residential, Electric	Yes	Yes	Yes	No	No	No	25	EA
Water Heaters, Residential, Gas	Yes	Yes	Yes	No	No	No	25	EA
Water Heaters, Residential, Oil	Yes	Yes	Yes	No	No	No	25	EA
Water Softener	Yes	Yes	Yes	No	No	No	15	EA
Water Treatment Equipment	No	No	No	No	N/A	No	25	EA
Water Treatment Equipment - Chemical Treatment	Yes	Yes	Yes	No	No	No	25	EA
Water Treatment Equipment - Deionization Station	Yes	Yes	Yes	No	No	No	25	EA
Water Treatment Equipment - Ultraviolet Treatment	Yes	Yes	Yes	No	No	No	30	EA
Water Treatment Equipment - Wastewater Filtration for WashRack Equipment	Yes	Yes	Yes	No	No	No	25	EA

D20

D20 PLUMBING

D202004 INSULATION & IDENTIFICATION

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	25	EA
Other	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D202005 SPECIALTIES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	25	EA
Other	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D202090 OTHER DOMESTIC WATER SUPPLY

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	8	EA
Other	No	No	No	No	N/A	No	8	EA
Unknown	No	No	No	No	N/A	No	8	EA

D203001 WASTE PIPE & FITTINGS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	Yes	50	LF
Other	No	No	No	No	N/A	No	50	EA
Unknown	No	No	No	No	N/A	No	75	EA

D203002 VENT PIPE & FITTINGS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	75	EA
Other	No	No	No	No	N/A	No	75	EA
Unknown	No	No	No	No	N/A	No	75	EA

Complete Component Catalog Breakdown

D20

D20 PLUMBING

D203003 FLOOR DRAINS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA
Other	No	No	No	No	N/A	No	25	EA
Trench Drain	Yes	No	No	No	N/A	No	20	LF
Unknown	No	No	No	No	N/A	No	25	EA

D203004 SANITARY AND VENT EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Backflow Preventer	No	No	No	No	N/A	No	40	EA
Backflow Preventer - > 6" Pipe	Yes	Yes	Yes	No	No	No	40	EA
Backflow Preventer - 2" Pipe	Yes	Yes	Yes	No	No	No	40	EA
Backflow Preventer - 3" Pipe	Yes	Yes	Yes	No	No	No	40	EA
Backflow Preventer - 4" Pipe	Yes	Yes	Yes	No	No	No	40	EA
Backflow Preventer - 6" Pipe	Yes	Yes	Yes	No	No	No	40	EA
General	No	No	No	No	N/A	No	25	EA
Other	Yes	No	Yes	Yes	Yes	No	25	EA
Sanitary Waste Separator	No	No	No	No	N/A	No	25	EA
Sanitary Waste Separator - 1" size	No	No	No	No	N/A	No	25	EA
Sanitary Waste Separator - 10" size	No	No	No	No	N/A	No	25	EA
Sanitary Waste Separator - 2" size	No	No	No	No	N/A	No	25	EA
Sanitary Waste Separator - 3" size	No	No	No	No	N/A	No	25	EA
Sanitary Waste Separator - 4" size	No	No	No	No	N/A	No	25	EA
Sanitary Waste Separator - 5" size	No	No	No	No	N/A	No	25	EA
Sanitary Waste Separator - 6" size	No	No	No	No	N/A	No	25	EA
Sanitary Waste Separator - 8" size	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D203005 INSULATION & IDENTIFICATION

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	25	EA
Other	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D20 PLUMBING

D203090 OTHER SANITARY WASTE

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	100	EA
Other	No	No	No	No	N/A	No	100	EA
Unknown	No	No	No	No	N/A	No	100	EA

D204001 PIPE & FITTINGS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	25	LF
Other	No	No	No	No	N/A	No	25	LF
Unknown	No	No	No	No	N/A	No	25	LF

D204002 ROOF DRAINS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	No	25	LF
Other	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D204003 RAINWATER DRAINAGE EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	25	EA
Other	No	No	No	No	N/A	No	25	EA
Sump Pump - Duplex	Yes	Yes	Yes	No	No	No	25	EA
Sump Pump - Submersible	Yes	Yes	Yes	No	No	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D204004 INSULATION & IDENTIFICATION

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	25	LF
Other	No	No	No	No	N/A	No	25	LF
Unknown	No	No	No	No	N/A	No	25	LF

D20 PLUMBING

D204090 OTHER RAIN WATER DRAINAGE SYSTEM

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA
Other	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D209001 SPECIAL PIPING SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	N/A	No	15	LF
Other	No	No	No	No	N/A	No	15	EA
Unknown	No	No	No	No	N/A	No	15	EA

D209002 ACID WASTE SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA
Other	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D209003 INTERCEPTORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA
Other	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D209004 POOL PIPING AND EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA
Other	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D20 PLUMBING

D209005 COMPRESSED AIR SYSTEM (NON-BREATHING)

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	25	EA
Other	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D209090 OTHER SPECIAL PLUMBING SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	Yes	No	25	EA
Other	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

Details Req?	If 'Yes', all required section detail fields are to be populated.
Inventory Pic?	If 'Yes', an inventory level photo is to be provided. This is a step back photo showing the component.
Inventory Cmmt?	If 'Yes', an inventory comment is to be populated. This should describe the component.
Group OK?	Only applicable to each (EA) UOM's that are In Scope? = 'Yes'. If 'No' section must be a quantity of 1. if 'Yes' section may have a quantity greater than 1. If 'N/A' it is not applicable to the component type.
Age Based?	If 'Yes', age based (do not provide an inspection) is the desired approach. If 'No' but upon inspection the component is not visible, then an age based approach is acceptable.
Design Life	Design life of the component.
UOM	Unit of measure. If yellow highlight = new component type in 2019 update.



Sustainment Management System

Army BUILDER™ SMS Inventory and Assessment Guide

D30 HVAC



**US Army Corps
of Engineers**
Mobile District

ERDC
Engineer Research & Development Center

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D30 HVAC

Summary of Changes

D30

Date	Record of Revisions/Additions to SMS Inventory and Assessment Methodology
06/01/2019	Updated page "Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components" to clarify sectioning guidance for equipment components.
06/01/2019	Added page "Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components" to clarify sectioning guidance for exterior components.
06/01/2019	Added air separator component types under 'D302004 AUXILIARY EQUIPMENT'. Hot/Chilled water auxiliary components are now correctly split between D3020/D3030.
06/01/2019	Added centrifugal and scroll of chiller component types under 'D303001 CHILLED WATER SYSTEMS'.
06/01/2019	Added air separator, chemical feed, and expansion tank component types under 'D303004 AUXILIARY EQUIPMENT'. Hot/Chilled water auxiliary components are now correctly split between D3020/D3030.
06/01/2019	Added condensate pumping systems (powered and steam powered), steam generators, and steam-powered traps under 'D304002 STEAM DISTRIBUTION SYSTEMS'.
06/01/2019	Added small circulating pumps and a 10-HP pump to both 'D304003 HOT WATER DISTRIBUTION SYSTEMS' and 'D304006 CHILLED WATER DISTRIBUTION SYSTEMS'.
06/01/2019	Added glycol additive system 'Glycol Additive System (Includes Pumps/Tanks/Meters/Controls)' to 'D304005 GLYCOL DISTRIBUTION SYSTEMS'.
06/01/2019	Added 'Condenser Water Pump' component types of various sizes to 'D304006 CHILLED WATER DISTRIBUTION SYSTEMS'.
06/01/2019	Added wall exhaust, utility set, and industrial exhaust fan component types to 'D304007 EXHAUST SYSTEMS' and updated inventory guidance.
06/01/2019	Added axial fan and large blade destratification fan component types to 'D305001 UNIT VENTILATORS' and updated inventory guidance.
06/01/2019	Added 2-KW electric unit heater component type to 'D305005 ELECTRIC HEATING' and updated inventory guidance.
06/01/2019	Added various-size VFD component types to 'D306001 HVAC CONTROLS' and updated inventory guidance.
06/01/2019	Added DDC control panel component type to 'D306002 ELECTRONIC CONTROLS'.
06/01/2019	Added various-size CFM component types to 'D309090 OTHER SPECIAL MECHANICAL SYSTEMS' for inventory of HVAC energy recovery systems.
06/01/2019	Updated inventory guidance on split systems (see D303002 DIRECT EXPANSION SYSTEMS and 'D305006 PACKAGE UNITS - A/C Unit, Split Systems w/ Air Cooled Condenser').
06/01/2019	Updated inventory guidance on 'D305006 PACKAGE UNITS - A/C Unit, Computer Room - Air Cooled' to align with new split system guidance.
06/01/2019	Updated inventory guidance for 'D304007 EXHAUST SYSTEMS' and 'D305001 UNIT VENTILATORS' to align with the new component types.
06/01/2019	Updated inventory guidance for 'D305006 PACKAGE UNITS - Packaged DX Refrigerant System - Air Cooled'.
06/01/2019	Added page "Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components" to clarify sectioning guidance for exterior components.
06/01/2019	Updated inventory guidance on 'D305006 PACKAGE UNITS - A/C Unit, Computer Room' to clarify inventory method when it is a split system.

Record of Revisions/Additions to SMS Inventory and Assessment Methodology

[illegible]

Safety The following items should not be interpreted as 1) Safety Plan, 2) OSHA, or base safety requirements. These are recommendations. The contractor should operate in accordance with the SOW and approved safety plan.

Safety is of the utmost concern and should always be at the forefront of any activities taking place in the field. There are many potential safety hazards associated with building assessments. Prior to performing building assessments, the assessing staff/team must ensure that field activities are in accordance with the 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Safety Preparation Activities

Do not perform a task that may harm or endanger the health and safety of oneself or others.

Consult with the installation safety representative to review installation-specific safety requirements.

Conduct a daily “stand-up” safety meeting.

Ensure new assessors have been properly trained.

Review the assessment plan/schedule for the day.

Ensure proper Personal Protective Equipment (PPE) is available. This includes, but is not limited to, a hardhat; hearing protection; eye protection; safety shoes, gloves; and a safety colored vest.

Prior to conducting assessments, the team leader must check with the safety office or building POC to determine if there are any building/site-specific safety rules or hazards. For instance, some manufacturing areas may require steel toe shoes, hearing protection, or eye protection.

Safety Recommendations

Do not walk and write, or talk on a mobile phone, at the same time; this can lead to trips/falls.

Do not review documents or write while walking on steps or stairs.

Do not enter posted or suspected confined spaces such as crawl spaces, tanks, chases, or pits.

Mechanical rooms, attic spaces, or other areas with piping/ductwork may require the use of hard hats to prevent against head bumping hazards. Refer to the project specific safety plan for further clarification.

Do not enter areas with hazardous material signs posted or that appear to contain hazardous materials (asbestos, gases, visible mold, etc.).

Be careful when walking through/across vehicle maintenance or staging areas.

Be aware of loose-fitting clothing and lanyards that may get caught in tight areas or on piping such as in mechanical/electrical rooms, etc.

Be careful of wildlife and insects when walking around a building or opening seldom-entered mechanical/electrical rooms. Assessors may encounter snakes, spiders, stray cats/dogs, rats/mice, etc. in these areas. Do not enter or place hands in spaces that are not completely visible.

If a life safety problem is observed, do not try to fix it. Report it to the proper authority or building manager prior to leaving the building or area.

Before the assessment team leaves a building, ensure all team members are accounted for.

Ladder use should be done in accordance with 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Designate a safety POC to enforce the safety accident prevention plan.

Perform a daily safety briefing before field work. Document the attendees and the topics covered.

Halt outdoor field operations at the sign of lightning or thunder.

Safety Recommendations (continued)

Do not access pitched roofs. They may be assessed from a nearby building or using binoculars.

Use proper techniques to place, secure, and climb ladders. Never climb a ladder while holding anything. Always use the three-point technique for climbing. Equipment should be placed in a backpack or an over-the-shoulder satchel to free hands for climbing.

Do not operate powered equipment, Weight Handling Equipment (WHE)/cranes, or remove access covers from powered equipment to perform assessments.

BUILDER™ assessments are commonly performed without electrical test equipment. Do not use electrical test equipment to test circuits or equipment unless qualified by a local authority. Only open panel box doors or enter electrical/mechanical rooms following proper training. Consult the local safety representative.

Site Preparation

Site Preparation Activities

Coordinate with the base to determine building access requirements, such as: escorts; camera passes; classified/secure area restrictions; or keys.

Locate buildings on a map and develop a schedule. Coordinate with the base to identify the appropriate building manager from the POC list. Notify the building managers of the upcoming assessment as needed.

Obtain a set of mechanical/electrical room master keys from the installation POC.

Extract all BRED™ files from BUILDER™ and have them loaded onto tablets (if using tablets). Verify all tablets are charged.

If multiple buildings are to be assessed by one team, confirm the schedule and plan of action with the team leader. A schedule may have building start times detailed to the hour.

Review the building names for the types/sizes of buildings that will be assessed to determine/confirm the needed tools and safety equipment. For instance, if the facilities are not climate-controlled, prepare accordingly (for cold weather bring hats/gloves).

Recommended Assessor Gear/Tools

Hardhat	Digital Camera with Extra Battery(s)
Hearing Protection	Measuring Tape
Safety Glasses	Laser Measuring Device/Flash Light
Reflective Safety Vest	Measuring Wheel
OSHA Approved Footwear	Backpack
Other Required Personal Protection Equipment (PPE)	Graphite Powder (for stuck locks)
Cell Phone and Team Cell Phone List	Cleaning Pad (to clean/help read nameplates)
Assessment Schedule	Pen/Pencils
Building Floor Plans/Base Map	Clipboard
Small Magnet (for determining door/window type)	Paper/Assessment Forms
Flash Light/Compass	Graph Paper
Sun Screen/Bug Spray	Refillable Water Bottle

Operating efficiently in the field is key to the success of the assessment. The following guidance is detailed by 1) Team Leader and 2) Assessor. **Bold items are drivers for client deliverables.**

Team Leader

Upon arrival, check in with the building manager and QA representative (if present).

Conduct the building manager interview. The entire team should be present for the building manager interview. The following questions should be asked:

Question 1: Are there any mission-related deficiencies in the building?

Question 2: Are there any safety-related deficiencies in the building?

Question 3: Have there been any upgrades or remodels of the building?

Question 4: Are there any building deficiencies (HVAC not working, electrical breakers tripping, maintenance issues, roof leaks, etc.) present?

The team leader (ONLY the team leader!) should populate the building level comment with the following information: 1) Missing systems, 2) Renovation dates, 3) Areas of the building not accessible during the assessment, and 4) If drawings were/were not provided. Below are some examples of building level comments:

Comment 1: No A20, D10, or D40 systems present. 2016: Vault room not accessible. Drawings not provided.

Comment 2: No A20 systems present. Renovated in 2010. 2016: 5% of building not accessible. Drawings provided.

The team leader should review the real property data in BRED™ and compare it to what is found during the assessment. The following should be confirmed: 1) Number of stories, 2) Building square footage, and 3) Building install date and 4) Building number in BRED™ matches the building. Variances between real property data and actual field data should be recorded for inclusion into the client deliverable.

Team Leader and Assessors

Best Practice: Each assessor should first take a photo of the building number to identify the subsequent photos associated with the building when they are downloaded. Take a second picture that captures the overall building view with respect to nearby buildings/streets. This should help refresh/remind the assessor on what the building looks like, while performing data-entry.

A team caucus should occur to discuss the sectioning strategy for the building and confirm which side is facing north.

Each assessor should have a consistent approach to each building. Assessors should move around the building exterior and interior in a clockwise (or counterclockwise) manner making notes and taking photos.

If a safety item is found, notify the team lead. The team lead will notify the building manager. Capture a photo of the safety item for inclusion into the safety log. Follow all other project-specific procedures when a safety item is encountered.

Upon return to the office perform the following steps:

Step 1: Download all photos from the day to a building-specific folder. Review the photos and delete any that are blurry or unreadable.

Step 2: Complete all calculations and counts. Complete all data entry into BRED™.

Data Entry

With the technology that is available today, the need to use forms in the field and do data entry at the office has been mitigated. Tablets can be used to run BRED™ to complete data entry while in the field. It is understood that there are challenges to accomplish this for certain disciplines. It is only mentioned here as a best practice recommendation and is not a requirement to execute the work. There will be instances where electronics will not be allowed in a facility. Assessors should have a paper/pen data collection system ready as a backup.

General

This section presents common Unifomat D30 HVAC inventory component sections found across installations as a guide for entering into the BUILDER™ or BUILDER Remote Entry Database (BRED™) software. Inventory items are arranged by BUILDER™ System with Material/Equipment Category, Component Type, Unit of Measure, and Inventory Notes.

D3010 - Energy Supply: This subsystem provides a source of fuel/energy (other than electrical) for the heating and cooling systems in the building. The inventory components are those not owned and operated by a utility provider such as the local gas company or through a lease with a propane tank provider.

D3020 - Heat Generating Systems: This subsystem provides the heating for the building and may include boilers, furnaces, and duct furnace heaters.

D3030 - Cooling Generating Systems: This subsystem provides the cooling for the building and may include chillers, cooling towers, and condensing units.

D3040 - Distribution Systems: This subsystem distributes heated and cooled air in the building. Components include piping, fans, air handling equipment, and pumps.

D3050 - Terminal & Package Units: This subsystem provides self-contained heating and cooling units and includes unit heaters, package units, and heat pumps.

D3060 - Controls and Instrumentation: This subsystem includes equipment and devices to monitor and control the HVAC system, such as thermostats, timers, sensors, and control valves.

D3090 - Other HVAC Systems & Equipment: This grouping captures additional unique or specialized HVAC equipment including humidifiers, dehumidifiers, burner assemblies, and water treatment.

One of the most common problems with HVAC systems is that over time building, mission, equipment and occupancy change. These changes often require HVAC system alterations, additional loads, new or changed services, mechanical/HVAC code/safety issues, damaged components, and outdated HVAC as-built drawings. Another common problem is that HVAC components are subject to corrosion/deterioration due to their circulation of steam, water, and air through the systems. Also, installations that are located in a coastal environment, which accelerates the deterioration of components and subcomponents exposed to the weather.

The HVAC system of a building generates, distributes, and controls energy, fluids, and air to associated equipment in order to maintain environmental conditions (humidity, temperature, air exchanges, etc.) within the building. The HVAC system may serve the entire building or a part of the building. The system is designed to support the function/mission of the building, and for comfort and safety of the occupants.

Inspection

HVAC component sections are assessed using Direct Condition Rating (DCR) or Age-Based Modeling. Most HVAC component sections will be visible. When component sections are not visible, inventory should be entered, but no assessment is entered. In this case, BUILDER™ will use the inventory, year installed, and degradation curves built in to the software to establish the CI.

All HVAC equipment using R-22 refrigerant should be rated A+ or below.

Rule of thumb: If you can see it, you should inspect it. There are some caveats to this rule. See component catalog for items that must be age-based.

The following conditions or events can accelerate HVAC component deterioration and should be considered by the assessor: 1) Improper construction or installation, 2) Improper maintenance or service, 3) Weather exposure and/or coastal environment, 4) Damage or misuse, 5) Overloading, 6) Water or chemical treatment issues, and 7) Corrosion.

When equipment is found that has been abandoned and is no longer functional it should not be inventoried. If the equipment is abandoned, but is still able to be put back in service, it should be inventoried and assessed.

When HVAC component sections are visible, they should be assessed. When determining the rating, the assessor should consider the quantity and severity of conditions or distresses observed.

Inventory

It is critical to confirm the year installed (default will be from real property records), or estimate the year installed. BUILDER™ uses the install date, degradation curves, and assessment observations to establish a CI for each component section. If the assessor suspects the default install date is not accurate, or an addition or renovation has taken place, check the real property record for year renovated or check local as-built or renovation drawings to help estimate the year installed.

Do not inventory: 1) Common valves, 2) Kitchen exhaust units (think residential-type kitchen hood), 3) Filters, 4) Small bathroom exhaust fans, 5) Residential-style ceiling fans, 6) Window A/C units (window mounted), and 7) Ceiling or floor vents, grilles, registers, diffusers, or fire dampers.

Except where specifically noted in this Guide, do not use 'General' where a more specific item is available as a component type selection.

If the building area is calculated to be between +/- 10% of the building area shown in the BRED™ file, then the building area shown in BRED™ is to be used. If the calculated area is outside of +/- 10% of the building area shown in the BRED™ file, then the calculated area should be used.

In some cases, HVAC sections may be replaced as an individual repair or partial replacement. These areas would have a different age. The real property construction and renovation dates should be confirmed, if they are not appropriate, the component age must be estimated. The building occupants or other facilities staff may be able to provide some information.

Information to determine age and capacity is often available online. A web search question can be used to find informational websites (e.g. How to read boiler model numbers?).

Most HVAC components inventoried for buildings are visible with exception of piping and ductwork components. When HVAC components are not visible (or an area of the building is not accessible), as-built drawings should be used to identify and quantify the HVAC components. If as-built drawings are not available, the assessor may use experience to make an assumption for the HVAC component types and quantities based on similar construction, consultation with local staff, and other reputable online resources. Often manufacturer websites will have extensive product information available that can help the assessor determine age, equipment type, capacity, and/model.

Reading the model number of a piece of equipment can help determine the size. Many manufacturers use a factor of 12 (12 = 1 ton, 24 = 2 ton), For example, in the following model number 2TWB0060A1000AA, the '060' indicates 60000 BTU or 5 Ton cooling).

To assist in determining capacity: 1 Ton of cooling = 12000 BTUH and 1000 BTUH = 1 MBH

When a component is concealed/hidden, the inventory comment box is used to indicate the reason for no inspection taking place. Standard comments should be used.

When performing an assessment, the 'PAINTED' box should only be selected for components that have local or field applied paintings/coatings. DO NOT mark 'PAINTED' for manufacturer- or factory-applied coatings as they tend to age consistently with the components.

When selecting an equipment component type, assessors should always select the correct size. If the correct size is not available, assessors should round up to the next available size and note the actual size in the Section Details. If the size exceeds the largest selection, assessors should select the largest available size and note the actual size in the Section Details.

Photography

General comment: Photos are captured to document the following: 1) Inventory, 2) Condition (deficiency), 3) Historical record of the asset, 4) QC, and 5) Life safety issues.

All components where an 'Other' component type is selected must have a photo attached at the Inventory/Section level. (Required)

Assessors should take a photo of the building number at the start of the building assessment to delineate the start/stop of the photos between buildings. (Best Practice)

Assessors should take photos to allow for quality control (QC) confirmation and data backup. It is a good practice to have a photo of every component type encountered in an assessment. (Best Practice)

Components that are required to have section details populated should also have a single photo attached at the Inventory/Component Section level. No photos should be attached at the Section Detail level. This photo should be a step back photo showing the component in relation to its surroundings. Follow on assessments and base operations can use this to see what was inventoried in the case where there is any confusion on the section name or location field in the section details. If the component is hidden, no photo is necessary. (Required)

Components that have a DCR (component rating only) of A+ or worse should have a photo taken that shows the deficiency identified in the inspection comment. The photo should be attached to the record at the Inspection level. (Required)

Life Safety issues should be photographed for documentation of the safety item and used in safety reports. The photo should be sent to the team lead and all required steps outlined in the safety plan are to be completed. (Required)

Paint DCR does not drive the requirement for a photo to be attached at the inspection level. Example: A component has a DCR of 'G-' and a paint DCR of 'A' would result in no photo attached to the inspection.

See Scope Of Work (SOW) for any photo renaming/deliverable requirements.

The Team Leader is required to take one photo of the front elevation, or a representative elevation view, and attach the photo the building record at the building level. (Required)

Reinspection

All existing quantities for components such as VAV boxes, HVAC controls, and fan coils are to be validated to a +/-15% accuracy. This can be accomplished through random sampling. Large equipment (air handlers, boilers, pumps, chillers, etc.) should be validated to 100% accuracy level.

Assessors must not delete/edit components and sections that are not within their discipline.

BRED™ functions such as 'Copy Building' and 'Copy Section' should not be used unless their ramifications are fully understood. Copy building: The entire building will be copied. Copy section: All items with the same section name will be copied. For example, if a D50 assessor uses copy section on the section name FL1, the assessor may copy/paste interior doors, mechanical equipment, etc. without knowing it. If there is no existing data, these functions are easily used.

Existing data should be deleted if: 1) The component is no longer present, 2) The correct component type exists, 3) There are duplicate components with the same section name, or 4) The component is correct but has the wrong install date (requires deletion and re-entry with correct date).

If a component type in the existing data is no longer in scope, it must be updated to an in-scope item, or deleted if no longer applicable.

Past inspection comments are not required to be revised to current standards.

Section names, component types, and quantities must be verified and updated.

When performing a reinspection it should be understood that modifications in the inventory guidance may have taken place between the previous assessment date and the current effort. The new assessment should update the inventory to the latest inventory guidance. This may require, but is not limited to, combination of quantities (Ex: removing cardinal direction sectioning when it is no longer needed), modifying component type selections, or removing/adding items. The detailed inventory guidance portion of the manual will often provide direction on what steps need to be taken.

Section Details

Collect nameplate/component data for the following fields: ID, Model, Serial Number, Manufacturer, Location, Equipment Type, Capacity, Manufacturer Date, Year Installed, and Control Type for population into section details fields. If information is not available, place 'NA' in the section detail field to indicate it was not available.

For all HVAC equipment that has R-22 refrigerant the designation 'R-22' should be included in the section details 'equipment type' field. This will allow the installation to query 'R-22' and identify all equipment still using class II controlled compounds.

If a capacity is estimated, the capacity field should include 'ESTIMATED' to delineate that an estimation took place. For example, if a pump with no tag is found, it may read '100 GPM ESTIMATED'. Truncating 'estimated' to 'EST' so the example would read '100 GPM EST' is acceptable.

If the component has an RPIE ID tag, that exact value (and ONLY that value) should be used in the Section Details 'ID Number' field. If there is no RPIE ID tag present, the regular tag number (PUMP-1) should be used. Verify how the ID Number field should be used before performing the assessment. See guidance on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components' page.

Manufacturer's data tags for HVAC equipment will normally be in the back near the piping connections or service panel.

Section detail fields should be capitalized. It is understood that if previous data has been entered in lowercase, BRED™ limitations can prevent new data from being capitalized.

The Section Details comment box is used to identify specific characteristics on the component that are not captured in the Section Details fields. This can be extra information on location or material type for example. Also, any reasons why Section Detail fields could not be populated should be highlighted (not found/damaged nameplate/sun washed tag/etc.) and should be noted by using the standard comments.

The 'Year Installed' field in the Section Details should match the 'Year Installed' field at the Inventory/Section level. Populate the 'Manufacturer Date' field in the Section Details with data found on the component OR default to 1/1/'Year Installed' as the assumed value.

Sectioning

Additions, new wings, or major renovations likely require identifying a separate HVAC section with a different age.

HVAC components such as VAVs can be grouped in a section. For instance, if there are 5 VAVs a single component section can be provided with a quantity of 5. This sectioning methodology for equipment is limited to components that are like kind throughout a facility and are part of a single system.

HVAC equipment is always sectioned by floor. If there are multiple easily definable wings of a building with different install dates, then sectioning by floor AND by wing is required. For example, if there is an east and west wing on a 2-floor building you would have 'FL2 EAST' and 'FL2 - WEST'.

It is required to have all equipment on the roof to have the section name 'ROOF - XXX' so future assessments can easily differentiate equipment located roof from equipment on the ground level, mechanical room, etc. Refer to the 'Sectioning: D20,D30,D40,D50 and E10 Equipment Components' part of the manual for section name guidance for equipment.

Once all base sectioning guidelines have been followed, there may be a need to apply a DCR-driven sectioning methodology based on two factors 1) difference in DCR, and 2) quantity of distress. Step 1: Assessors should section a component when there is a 2-step difference in DCR (Ex: G- to A) in accordance with the guidance found in Step 2. If there is only a 1-step difference in DCR, the assessor shall have a single section and the lower of the DCR's should be used. Step 2: When a 2-step difference is found, the assessor should consider the quantity of distress that is present. If the distress is present on 25% or less of the component, a single section with a DCR in-between the high/low DCR shall be added (if G-/A are found then A+ is used). If the distress is present on over 25% of the component, two sections should be added at the high/low DCR. Any component with a 3-step or more difference in DCR should have two sections.

Refer to the 'Sectioning: D20,D30,D40,D50 and E10 Equipment Components' part of the manual for section name guidance for equipment.

Rule of Thumb: All HVAC components that require Section Details should be sectioned separately. There are exceptions to this rule, review the 'Group OK?' column.

Typical section names are used to describe equipment designations such as AHU-1, RTU-1, MU-1, EF-1, CWP-1, etc.

Typical section names used to describe the major areas of the building include: FL1, FL2, BASEMENT, MEZZANINE, ROOF, WING 'X,' etc.

The most critical part to an assessment is having all assessors aligned on how to perform an assessment. To reach an accurate DCR of a component, follow the steps below:

Step 1: Consider the level of degradation and the performance of the component:

OPERATIONAL CAPABILITY	OPERATIONAL CONDITION RATING	DEGRADATION	DCR
Fully Operational	Green	Free of observable or known degradation.	Green (+)
		Normal wear requiring normal preventative maintenance.	Green
		Normal degradation requiring corrective maintenance.	Green (-)
Impaired Operation	Amber	Minor degradation requiring corrective maintenance.	Amber (+)
		Moderate degradation requiring corrective repair.	Amber
		Significant degradation requiring moderate repair.	Amber (-)
Inoperable	Red	Extensive degradation requiring major repair.	Red (+)
		Severe degradation requiring major rehabilitation or partial replacement.	Red
		Complete degradation requiring full replacement.	Red (-)

Step 2: Consider the maintenance requirements of the component:

Type	Green (G+/G/G-)	Amber (A+/A/A-)	Red (R+/R/R-)
Dynamic (Equipment)	<p>Distresses present are of no impact to the components operation.</p> <p>Example: The fan component is fully operational.</p>	<p>Distresses present are of impact to the components operation. A repair is needed to bring the component back to proper operating condition</p> <p>Example: A fan has corrosion on the housing. A sand and paint would remove the distress.</p>	<p>Distresses present are of impact to the components operation. The component needs to be replaced.</p> <p>Example: A fan motor has overheated and no longer functions. Replacement of the component is required.</p>
Non-Dynamic	<p>The architecture component is in good condition requiring no maintenance outside of normal operations.</p> <p>Example: The carpet component is fully operational.</p>	<p>The architecture component has a distress that requires an extra level of maintenance outside of normal operations. This extra maintenance (or repair) would be an action such as a cleaning or a painting of a surface.</p> <p>Example: A carpet component has stains. A cleaning would remove the distress.</p>	<p>The architecture component has a distress where a maintenance operation will not fix the problem at hand. A replacement of the component is required.</p> <p>Example: A carpet component is damaged (ripped). The component needs to be replaced to fix the distress.</p>

Dynamic: Refers to equipment in the D10, D20, D30, D40, D50, and E10 systems.

Non-Dynamic: Refers to architectural components in the A10, A20, B10, B20, B30, C10, C20, and C30 systems.

Note: There are some Non-Dynamic components (for instance, toilets under D20) in the Dynamic systems.

Step 3: Adhere to the following requirements:

Requirements
Maintainability and obsolescence should not be the driving factor when conducting a condition assessment unless it has led to actual deterioration of condition that can be observed or reasonably inferred.
G+ ratings should only be given to inventory that is in pristine condition and is free of any observable defects.
Do not downgrade an assessment rating simply because an item is dirty.
Do not downgrade an assessment rating because the item does not meet current code compliance standards
Do not downgrade an assessment rating because the item is not deemed energy efficient.
Do not downgrade an assessment rating because the item is deemed to be a safety violation/hazard unless otherwise directed.
Do not downgrade an assessment rating because of a code violation.
Ratings should not be anticipated based on planned repairs or replacement.
Assessors should not expend field time and effort to determine the cause of a deficiency. If the cause is easily identified it should be included in the inspection comment.
Ratings shall be based upon the observable and documentable condition of the component.
A component should be downgraded if its operational capability, performance, reliability, etc. is compromised according to the direct rating definitions.
Incorporate user interviews, work order histories, or other information sources when determining the condition of the component. Include this information in the inspection comment.

The assessor should calibrate their mindset on what the expected DCR should be based on condition.

The assessor should consider the maintenance requirements of the component in the current condition.

The assessor should factor in the requirements/business rules for completing an inspection.

One factor that can play into an assessment is if the assessor receives information from a POC that results in a lower rating. For instance, an assessment takes place in July and there is a heating water pump that looks brand new, but has a blown motor. The assessor would assume the pump is supposed to be off due to being off season, but if the POC informs the assessor about the blown motor, this can be factored into the assessment (and indicated in the inspection comment).

One factor that should not play into an assessment is pending replacements of components. Assessors should rate components in the condition they are at the time of assessment. If the carpet is being replaced next month, that should not factor into a rating. Now, if the carpet contractor is on site (the work is currently taking place), this could be factored into the rating and a G+ rating provided with the current date of inspection chosen as the install date.

Service Life: No distresses present and component is nearing (or past) its service life.

The following comment can be used as an inspection comment for components that have no signs of distresses, are rated either Amber (A) or Amber Plus (A+), and are over 75% through their service life. This negates the need to have 4 parts of an inspection comment. Also, an inspection photo is no longer required.

[First Last-AE-Date] - The component is in proper working condition and is showing no signs of distress. The DCR was based on estimated remaining service life.

Step 1: Understand the 5 parts of the inspection comment:

Part #	Part Type	Type Description
1	Front End	[First Last-AE-Date] OR [First Last-DPW-Date] (ex: [John Doe-AE-7/4/2017])
2	Distress	Identifies the distress of the component
3	Severity	Identifies the amount of the distress.
4	Location	Identifies the location of the distress
5	Quantity	Identifies the quantity of the distress

Step 2: Use the DCR of the component as the basis for the severity.

DCR	Severity
Amber (+)	Minor/Mild
Amber	Moderate
Amber (-)	Significant/Major
Red (+)	Extensive
Red	Severe
Red (-)	Complete/Total

To aid in the inspection comments reading correctly the severity can be modified slightly. For instance, 'moderately' can be used for an 'A' DCR comment. This approach also applies to the distresses where one of the 23 MUST be selected. If 'Cracked' is selected as the distress, the wording 'cracks' may be used.

Step 3: Identify the distress of the component:

23 Distresses			
Blistered	Displaced	Overheated	Capability/Capacity Deficient
Broken	Efflorescent	Patched	Animal/Insect Damaged
Clogged	Holes	Rotten	Moisture/Debris Contaminated
Corroded	Leaks	Stained/Dirty	Noise/Vibration Excessive
Damaged	Loose	Cracked	Operationally Impaired
Deteriorated	Missing		Electrical Ground Inadequate or Unintentional

Step 4: Location and Quantity

Location on non-dynamic assets - 'lobby area'. On dynamic assets - 'housing' or 'base'.

Quantity on a SF UOM will typically be a %. On an EA UOM will typically be a count.

Step 5: Put all 5 components together to form an inspection comment (colors correspond to part):

A+	Front End	CRACKED.	The pump has	minor	cracks	present on	10% of the	housing.
A	Front End	DETERIORATION.	The tank has	moderate	deterioration	over	50 %	of the base.
A-	Front End	DAMAGED.	The exhaust has	significant	damage	to	all	the vehicle connectors.
R+	Front End	CRACKED.	The crane has	extensive	cracks	present on	2	pedestals.
R	Front End	LEAKS.	The piping has	severe	leaking	around the	HVAC	penetrations.
R-	Front End	OPERATIONALLY IMPAIRED.	The	3	CW	pumps are	completely	operationally impaired.

Inspection Comments

Rule #	Rule
1	Required on all inspections with a DCR of A+ and below.
2	Paint DCRs do not have an inspection comment requirement. Only the component DCR A+ and below.
3	Should include any component specific information obtained from the base or POC interview.
4	Should be in complete sentences and use industry standard terminology. Comments can be typed into MS Word for spelling/grammar checks and then pasted into the comments box.
5	Do not use all capital letters for the entire comment. The distress should be all capital letters.
6	Do not use abbreviations, jargon, or slang.
7	Should give enough information for a follow-on assessor to locate the problem area/equipment.
8	Should accurately describe the problem/observation that is the basis for the rating. Someone unfamiliar with the particular item should have an accurate picture of the components current condition and the justification for the assigned rating.
9	Should accurately describe the location of the distress if the component is only showing a distress in a single location. For instance, if an office has a stain in the carpet, it would be necessary to call out the room number of the office.
10	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. For instance, assessor John Doe at firm AE: [John Doe-AE-7/4/2017].
11	After #10 front end information in the brackets one of the 23 distresses should be provided in capitalized form. Building on #10 for an example if stained carpet: [John Doe-AE-7/4/2017] - STAINED.
12	After #10 and #11 a sentence should be provided that provides the distress, severity, location, and quantity. Quantity/Location refers to the amount/location of the distress present.

Inventory Comments

Rule #	Rule
1	Used to identify components that were not visible for inspection. See standard comments.
2	Used as a bread crumb for follow-on inspections. Can provide useful additional information such as location or type to help the next assessor understand what was being inventoried. Ex: This component is the stone wall located behind the receptionist in the lobby area.
3	Should describe the component inventoried where 'OTHER' is used to allow follow-on assessments to understand what was inventoried in the previous assessment.
4	Used to provide the location of the component (especially used for architecture components where there are no Section Details provided that have a location): Roof, NW Corner, Room Number
5	Do not use all capital letters, abbreviations, jargon, or slang.
6	Used to further describe an asset if it is not adequately described in the component type selection.
7	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Section Detail Comments

Rule #	Rule
1	Used to identify data that was not able to be populated in the Details fields. See standard comments.
2	Used to provide information that is specific to just that component section detail field. This can be a location of the specific section or something that the section services.
4	Do not use all capital letters, abbreviations, jargon, or slang.
5	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Standard Inventory Comments

When	Use Standard Comment
Assets are not visible for inspection.	Component was not visible for inspection. The component condition will be age-based by BUILDER program degradation curves.
Assets are not visible for inspection that also require Section Details to be populated.	The component is not visible for inspection or population of Section Details. The component condition will be age-based by BUILDER program degradation curves and no nameplate data or inventory photo will be provided.
Assets are not visible for inspection that require quantities to be assumed. Hidden mechanical equipment, ductwork, and # of control points are common occurrences.	The component is not visible for inspection and the quantity was estimated based on architect/engineering judgment. The component condition will be age-based by BUILDER program degradation curves.
Assets are located in an area where no electronics area allowed. This prevents an assessor from taking inventory/inspection photos.	The component is located in a secure area of the facility that did not allow electronic devices to be used. Photos were not obtainable.
Assets are visible for inspection but are a system that is not tested (HVAC controls, security system, etc.) so an age-based BUILDER™ CI is desired.	The component condition will be age-based by BUILDER program degradation curves.

Standard Section Detail Comments

When	Use Standard Comment
Nameplate is not found on the component.	Nameplate not found on the component. All fields with "NA" represent data not found.
Nameplate is found on the component but it is partial/completely unreadable.	Nameplate on the component was dirty/corroded/damaged/sunwashed. Section Detail fields with "NA" represent data that was not found.
Nameplate is found on the component that is readable but is missing certain Section Details fields.	Nameplate on the component was missing certain Section Detail fields. Section Detail fields have been populated and fields with "NA" represent data not found.

Comment Front-End Clarification

A front end refers to the bracketed information at the start of an inspection/inventory/section detail comment. The front end must have to following 3 pieces of information: 1) assessor name, 2) assessor company or affiliation, and the date. The BRED™ stamp may also provide the time of inspection which is acceptable.

BRED™/BUILDER™ Clarification

The terms BRED™ and BUILDER™ are used interchangeably throughout this document.

Rule #	Rule
1	Components are divided into sections when a significant variation exists in material/equipment category, age, or construction history, which impacts the life cycle characteristics of the component.
	Example 1 - If a wing or addition was added to a much older building, the two areas of the building should be sectioned differently because the age and construction history is different.
	Example 2 – If the building roof has multiple levels of similar materials in different conditions, these levels should be sectioned differently to capture the difference in condition.
	Example 3 – If the building has more than one of a particular type of component, separate component sections. For example: There is a 5,000 and 10,000 CFM air handler.
2	Multi-wing buildings are always sectioned by wing if the installation date of the wings vary. If a building is an 'E' shape and all wings have the same install date only sectioning by floor is required.
3	Multi-story buildings are always sectioned vertically by floor or level (in the case of a basement or mezzanine).
4	There may be unique instances where sectioning by an area of a building is required. For instance, if a building is split between two companies an installation may request sectioning by company 1 and 2.
5	An on-site discussion must occur at each building among all team members to determine the cardinal direction of the building. All assessors should have North as the same side of the building.
6	An on-site discussion must occur at each building among all team members on how the building should be sectioned. The goal is to avoid one assessor calling it a toilet, one calling it a restroom, and another calling it a bathroom. Standard sectioning naming is important for a consistent data set.
7	The section name should not be repetitive of the component type or material. If the floor is wood, do not have a section name 'WOOD'. Incorporation of the location into the section name is very helpful to be used for follow on assessments. If the wood floor has the section name 'LOBBY', it provides great

Standard Section Names and Format Rules

Use	Standard Section Name
Section by Floor (Business Rule)	FL1 – 1st Floor, FL2 – 2nd Floor, FL3 – 3rd Floor, etc.
Section by Floor (Business Rule)	BASEMENT, MEZZANINE, ATTIC, etc.
Section by Wing (applicable if different construction histories or condition only)	MAIN, WING A, WING B, WING C, ADDITION, etc.
Section by Direction (applicable if different construction histories or condition only)	NORTH, EAST, WEST, SOUTH, etc.
Section by Roof Level (applicable if different construction histories or condition only)	UPPER, LOWER, MAIN, etc.

When an equipment tag is included in the section name it should match exactly what was found in the field. Example: if the boiler ID number is B-1, the section name equipment tag portion should read B-1. If the boiler is tagged B1, the equipment tag portion should read B1. See equipment sectioning for further guidance.

Dashes are not required in the section name other than the instance in regards to equipment ID tags above.

The section name field is always entered in all capital letters.

Sectioning Business Rules - Grouping

The following only applies to each (EA) unit of measure (UOM) components. The 'Complete Component Catalog Breakdown' at the end of the section has a 'Group OK?' column. This has the values of 'Yes', 'No', and 'N/A'.

'Yes' = Grouping is allowed for this component type. A quantity of greater than '1' is acceptable.

'No' = Grouping is not allowed for this component type. The quantity must be '1'.

N/A = Not Applicable. Component type is not an EA UOM or is out of scope.

Group OK? = Yes when Section Details and Inventory Photos are Required.

There are several equipment component types (Unit Heaters, small pumps, etc) that have the following designations in the 'Complete Component Catalog Breakdown': 1) Group OK? = Yes, 2) Section Details? = Yes, and 3) Inventory Photo? = Yes.

In this case, a single section detail and inventory photo representative of the entire section is required. A few more clarifications:

- 1) The location field would be for the entire section (FL1/BAY 1/EXTERIOR) and not specific to a single component.
- 2) A difference in manufacturer does not drive further sectioning. For instance, 2 KW electric unit heaters from multiple manufacturers can be combined into one section. Capacity (2 KW) is the driver for sectioning methodology.
- 3) It is understood that the single section detail field is representative of the entire section. The details should be populated per one component. There is no need to enter multiple details or try to combine multiple manufacturer/model/serial/etc into to a single section detail field.

Group OK? = No

The quantity for these component types must be 1. For equipment (Section Details? = Yes and Inventory Photo? = Yes) the guidance found on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components', 'Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components', and 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components' must be followed.

Sectioning of Equipment Components

The business rules stated below are applicable components that have a 'Group OK? = No' designation.

Sectioning of equipment components is of critical importance to provide a data set that is usable by the installation, is able to have Quality Assurance reviews, and is able to be reassessed. To achieve this goal it is required that equipment be sectioned by 1) floor, 2) area/room, and 3) have the ID number included.

Case Study: Below is a drawing of a large building that has several electrical rooms. If one section of 125 AMP panels is provided with section name 'N/A', the usability of the data is greatly reduced. If the equipment is sectioned by room (FL1 - RM 109, FL1 - RM 141, FL1 - RM 104, FL1 - RM 153, FL1 - RM 149), follow-on assessments, QA, and the installation can easily identify/reassess components.

If equipment is located in a concealed space (such as VAV's) this sectioning guidance is not applicable. A single section can be added per floor with the estimated quantity provided. There are other exceptions (such as panels under 100A) that are noted within the component breakdown part of the manual.

This sectioning provides the benefit that if a remodel/addition takes place between assessments, it will be apparent what has been added/deleted in a specific room without the assessor having to do a complete walk-through of the building and the deduce what changed (which is a very difficult, if not impossible, task).

The Section Name should include the equipment ID number. For example, the panel LP1 can have the Section Name: FL1 - RM 109 - LP1.



5 - EXAMPLE

D50 ELECTRICAL

D5010 ELECTRICAL SERVICE & DISTRIBUTION

- FL1 - RM 104 - LP1 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 109 - LP2 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 109 - MP1 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 109 - SG1 - D501004 PANELBOARDS - Switchgear - 2000 Amp
- FL1 - RM 141 - LP3 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 141 - MP2 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 141 - T1 - D501003 INTERIOR DISTRIBUTION TRANSFORMERS - dry-type, 15 kV
- FL1 - RM 149 - LP4 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 149 - MP3 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 153 - LP5 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 153 - MP4 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB

Example BRED Tree Structure

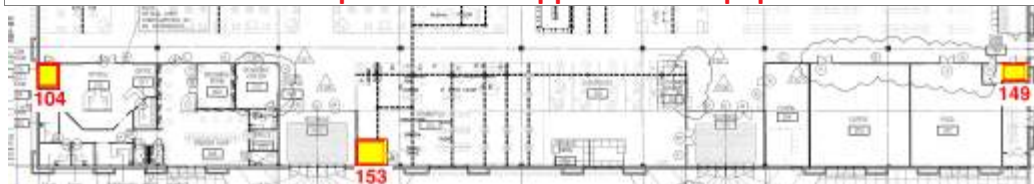
Example Section Names

FL1 - RM 109
FL1 - RM 141
FL1 - RM 104
FL1 - RM 153
FL1 - RM 149

The inclusion of the room/area into the section name DOES NOT negate the need to fill in the 'location' field in the Section Details. All general detail population rules must still be followed.

The use of dashes and underscores is not standardized but should be uniform throughout the BRED tree so data aligns/sorts cleanly. In the example to the left all future users of data can easily find the components inventoried.

Electrical shown as example data set. Applies to all equipment.



Sectioning of Components on the Exterior of a Building

The component catalog has a column called 'GROUP' that indicates for all each (EA) UOM component types whether they are to be a single section (Quantity = 1, NO) or can be "grouped" into a single section (Quantity >= 1, YES). When inventorying a single section (NO) component type the assessor must include cardinal direction (roof is included). When inventorying a grouped (YES) component type 'EXTERIOR' should be used.

The inclusion of the cardinal direction into the section name DOES NOT negate the need to fill in the 'location' field in the Section Details.



BRED tree below with components added:

- D30 HVAC
 - D3030 COOLING GENERATING SYSTEMS
 - EAST_CU-1 - D303002 DIRECT EXPANSION SYSTEMS - Condenser, DX, Air Cooled - Direct Drive, 5 ton,
 - WEST_MECH YARD_CT-1 - D303001 CHILLED WATER SYSTEMS - Cooling Tower, Fiberglass - 125 TN
 - D3040 DISTRIBUTION SYSTEMS
 - ROOF_EF-1 - D304007 EXHAUST SYSTEMS - Fan System, Roof Exhaust - 1500 CFM
 - ROOF_EF-2 - D304007 EXHAUST SYSTEMS - Fan System, Roof Exhaust - 800 CFM
 - ROOF_EF-3 - D304007 EXHAUST SYSTEMS - Fan System, Roof Exhaust - 800 CFM
- + D40 FIRE PROTECTION
- D50 ELECTRICAL
 - D5010 ELECTRICAL SERVICE & DISTRIBUTION
 - EXTERIOR - D501004 PANELBOARDS - Safety Switch, 30-100 Amp

S/N starts with one of the following for Group OK? = No items.
NORTH
SOUTH
EAST
WEST
ROOF

- 1) Locations should be uniform throughout the data set. For instance, all equipment in the mechanical yard example above would have section names starting with 'WEST_MECH YARD' (followed by ID Number).
- 2) If inventorying a component where grouping is allowed (such as the 'Safety Switch, 30-100 AMP' component type above) and there is a difference in condition/install date that requires another section, the assessor should include cardinal direction in section name. For instance, if the switches serving the roof exhaust fans were to be sectioned out the section name would read "ROOF" and have a quantity of 3. The 'EXTERIOR' would remain with a quantity of 2.

- D50 ELECTRICAL
 - D5010 ELECTRICAL SERVICE & DISTRIBUTION
 - EXTERIOR - D501004 PANELBOARDS - Safety Switch, 30-100 Amp
 - ROOF - D501004 PANELBOARDS - Safety Switch, 30-100 Amp

Section Details

The component catalog indicates which component types need section details. If 'YES' a single section detail should be added to the section.

No photos are required at the section detail level. All 'step-back' photos are placed at the inventory (component section) level.

In the case where Section Details? = 'Yes' and Grouping? = 'Yes' a single section detail representative of the section should be added.

Section Detail fields:

ID Number: Captures the unique number associated with the equipment. The order of importance is 1) RPIE (barcode Ex: 12345), 2) Tag (phenolic/plastic Ex: EF-1), and 3) Felt tip pen markings. Assessment should follow guidance from installation on use of this field to provide the most value. This is also found in the Section Name. If both barcode and tag are to be captured the ID Number field reads Tag/RPIE (EF-1/12345).

Model: Captures the model number of the equipment.

Serial Number: Captures the serial number of the equipment.

Manufacturer: Captures the manufacturer of the equipment. Assessors should use the same spelling for all components from that manufacturer. Once a standard is set for the installation it should be followed.

Location: Captures the location of the equipment. It should be detailed enough for someone to easily locate the component. This is also found in the Section Name.

Equipment Type: Captures the type of the equipment. This can be found in the component type field.

Equipment Make: Captures the make of the equipment. Manufacturers will have a certain model identified by a name. This field captures that name.

Capacity: Captures the capacity of the equipment. In some cases the component type is a selection based on a round-up to the larger size. This field captures the actual capacity found in the field.

Date Manufactured: Captures the date manufactured. if not found, it can be set to 1/1/Year Installed.

Year Installed: Captures the year the component was installed.

Control Type/Make: Captures the control type. Common entries are: 1) Manual, 2) Thermostat, 3) DDC, 4) VFD. Many other control types can be used.

D301002 GAS SUPPLY SYSTEM - Fuel Storage Tank - Fuel Storage Tank, 2500 GAL

Typical Application and General Component Guidance:

This component is used to inventory diesel, natural gas, oil, etc. type of tanks.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Use tank size to determine component type selection. If the tank is larger than 5,000 gallons, the 5,000 gallon component type should be selected, with the actual size noted in the section detail capacity field.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Fuel Storage Tank - Fuel Storage Tank, 2500 GAL	Yes	Yes	Yes	No	No	50	EA

D301005 SOLAR ENERGY SYSTEMS - Closed Loop, Space/Hot Water Systems

Typical Application and General Component Guidance:

This component is used to inventory solar heating systems. Quantity is determined by the number of solar panels located on the roof. The photo shows a QTY of 8.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

The assessor should count the number of solar water heating panels and use that as the EA value to populate the quantity field.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Closed Loop, Space/Hot Water Systems	Yes	No	No	No	Yes	25	EA

D301005 SOLAR ENERGY SYSTEMS - Solar Inverter**Typical Application and General Component Guidance:**

This component is used to inventory the solar inverter.

**Business Rules/General/Lessons Learned/Reinspection****Lesson Learned**

The inverter may be located in a weather proof enclosure on the exterior of the building or in the electrical room. If it is not found, coordinate with the D50 Electrical assessor as it may have been seen elsewhere in the building.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Solar Inverter	Yes	Yes	Yes	No	No	No	10	EA

D301005 SOLAR ENERGY SYSTEMS - Solar Panel - Aluminum Monocrystalline Silicon**Typical Application and General Component Guidance:**

This component is used to inventory solar panels.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If the assessor is unsure about what type of panel is installed (very common if located on a sloped roof and is being viewed from the ground), then the component type 'Aluminum Monocrystalline Silicon' should be used.

The quantity value should be the square foot sum of the entire PV array. Do not section by individual panels.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Solar Panel - Aluminum Monocrystalline Silicon	Yes	No	No	No	N/A	No	25	SF

D301005 SOLAR ENERGY SYSTEMS - Solar Panel Battery - Lead Acid**Typical Application and General Component Guidance:**

This component is used to inventory the batteries associated with the solar panel system.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Section details are required for the entire assembly. Do not add a section detail for each individual battery.
The quantity value is the number of batteries present.

Lesson Learned

As a safety precaution, assessors should maintain a safe distance from the batteries when performing their inspection.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Solar Panel Battery - Lead Acid	Yes	Yes	Yes	No	No	4	EA

D301005 SOLAR ENERGY SYSTEMS - Solar Panel System**Typical Application and General Component Guidance:**

This component is used to inventory the solar panel system wiring, supports, and other appurtenances.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If there is a PV system present, this component type should be added. An age-based approach is required, with no section details to be populated.

General

This component is used to inventory the miscellaneous items (wiring, conduits, supports) for the PV system.

Lesson Learned

The KW can often be obtained by looking at the equipment tag of the inverter.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Solar Panel System	Yes	No	No	No	N/A	25	KW

D301090 OTHER ENERGY SUPPLY - Thermal Storage Tank**Typical Application and General Component Guidance:**

This component is used to inventory thermal storage tanks.

**Business Rules/General/Lessons Learned/Reinspection****General**

Typically an ice storage system used to store cooling capacity to be used at peak loads.

Component Type	In Scope?	Details Req?	Inventory Pic? Cmmt?	Group OK?	Age Based?	Design Life	UOM
Thermal Storage Tank	Yes	Yes	Yes	No	No	25	EA

D30 HVAC - D3020 HEAT GENERATING SYSTEMS

D302001 BOILERS - Electric, Hot Water - 135-180 KW, 460-613**Typical Application and General Component Guidance:**

This component is used to inventory electric boilers. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****General**

Typically smaller than gas-fired boilers, these can be identified by having no gas lines serving the unit. These types are typically only used when gas service is not available.

Lesson Learned

An assessor will need to convert the boiler KW to MBH for the sizing of the 'D304003 HOT WATER DISTRIBUTION SYSTEMS - General' hot water distribution piping system which has a UOM of MBH.

Multiplying the KW by 3.41 will produce the MBH used for the 'D304003 HOT WATER DISTRIBUTION SYSTEMS - General' piping component type.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Electric, Hot Water - 135-180 KW, 460-613 MBH	Yes	Yes	Yes	No	No	30	EA

D302001 BOILERS - Gas, Hot Water - 400-500 MBH**Typical Application and General Component Guidance:**

This component is used to inventory smaller gas-fired boilers. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****General**

The most common type of boiler found on installations. Look for the gas flue through the roof or exterior wall of the mechanical room as an indicator. There will also be gas lines serving the boiler.

Lesson Learned

The burner assembly may show capacity information.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Gas, Hot Water - 400-500 MBH	Yes	Yes	Yes	No	No	30	EA

D302001 BOILERS - Gas/Oil, Fire Tube - Fire Tube 7,500-12,500

Typical Application and General Component Guidance:

This component is used to inventory larger gas-fired boilers. Select the correct type and size (round up to nearest size if required).



Business Rules/General/Lessons Learned/Reinspection

General

Typically used for larger facilities or will be found in a mechanical building that is serving a large building or campus distribution system.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Gas/Oil, Fire Tube - Fire Tube 7,500-12,500	Yes	Yes	Yes	No	No	30	EA

D302001 BOILERS - General

Typical Application and General Component Guidance:

This component type is in the manual to provide general guidance to all like-kind component types. Review the catalog to see the 'In Scope - Yes' options available.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

If a boiler is inventoried, it is required that the assessor also add a component section for the hot water distribution piping. The component type used for this is 'D304003 HOT WATER DISTRIBUTION SYSTEMS - General.'

General

There are many types of boilers in the catalog, and the assessor needs to be familiar with each component type. Also, there may be domestic hot water heating boilers that exceeded the sizes of D202003 captured here as well.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	30	MBH

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

D30 HVAC - D3020 HEAT GENERATING SYSTEMS

D302002 FURNACES - Electric, 34.1 MBH**Typical Application and General Component Guidance:**

This component is used to inventory electric furnaces. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If there is no heating element (electric coil) in the unit, then only the DX coil exists. In this case, do not inventory as a furnace. The component type 'D305003 FAN COIL UNITS - DX' should be used.

General

Will look like a standard residential-type furnace. Note: There may be an integrated cooling coil as well, but that is not captured separately, as the furnace is viewed as a single assembly.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Electric, 34.1 MBH	Yes	Yes	Yes	No	No	15	EA

D302002 FURNACES - Gas, 150 MBH**Typical Application and General Component Guidance:**

This component is used to inventory gas-fired furnaces. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If there is no heating element (burner) in the unit, then only the DX coil exists. In this case, do not inventory as a furnace. The component type 'D305003 FAN COIL UNITS - DX' should be used.

Note in the Section Details field 'Equipment Type' if the unit is of a different fuel source than natural gas (LPG or oil-fired).

General

Will look like a standard residential-type furnace. Note: There may be an integrated cooling coil as well, but that is not captured separately, as the furnace is viewed as a single assembly.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Gas, 150 MBH	Yes	Yes	Yes	No	No	15	EA

D302003 FUEL-FIRED UNIT HEATERS - Gas - 160 MBH**Typical Application and General Component Guidance:**

This component is used to inventory fuel-fired unit heaters. Select the correct type and size (round up to nearest size if required). Note: There are also unit heaters under D305002. See business rules for clarification.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Radiant heaters will often have a vacuum pump at the end of the tube to expel the exhaust gases. This is considered to be a part of the heater component and should not be inventoried separately.

To eliminate confusion within this component type, if both 'forced air' and 'tube-type infrared' heaters are present, the section name of the radiant heater shall be 'RADIANT', which will differentiate the two. Do not combine into one section.

General

One of the most common types of unit heaters found on installations. This is a gas-fired unit heater component type and captures two separate types of heaters: 1) Forced air and 2) tube-type radiant heaters (photographed above).

Lesson Learned

Often confused with 'D305002 UNIT HEATERS - Infrared'. If the heater is a cassette type (square) infrared heater, it should be captured under D305002. If it is forced air or a long tube type, it should be captured under D302003.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Gas - 160 MBH	Yes	Yes	Yes	No	Yes	No	25	EA

D302003 FUEL-FIRED UNIT HEATERS - Gas - 60 MBH

Typical Application and General Component Guidance:

This component is used to inventory fuel-fired unit heaters. Select the correct type and size (round up to nearest size if required). Note: There are also unit heaters under D305002. See business rules for clarification.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

To eliminate confusion within this component type, if both 'forced air' and 'tube-type infrared' heaters are present, the section name of the radiant heater shall be 'RADIANT', which will differentiate the two. Do not combine into one section.

General

One of the most common types of unit heaters found on installations. This is a gas-fired unit heater component type and captures two separate types of heaters: 1) Forced air (photographed above) and 2) tube-type radiant heaters.

Lesson Learned

Often confused with 'D305002 UNIT HEATERS - Infrared'. If the heater is a cassette type (square) infrared heater, it should be captured under D305002. If it is forced air or a long tube type, it should be captured under D302003.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Gas - 60 MBH	Yes	Yes	Yes	No	Yes	No	30	EA

D302004 AUXILIARY EQUIPMENT - Air Separator - Air control, air separator, 3" diameter, includes strainer**Typical Application and General Component Guidance:**

This component is used to inventory air separators that are part of the hot water system.

**Business Rules/General/Lessons Learned/Reinspection****Lesson Learned**

If there is a hot water hydronic system, there will typically be an air separator.

Reinspection

If correcting the inventory location, the air separator under 'D304001 AIR DISTRIBUTION, HEATING & COOLING' should be deleted.

Prior to the 2019 update, air separators were inventoried under 'D304001 AIR DISTRIBUTION, HEATING & COOLING'. Upon reinspection of data collected before this update, it can be assumed that air separators will require a new inventory.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Air Separator - Air control, air separator, 3" diameter, includes strainer	Yes	Yes	Yes	No	No	35	EA

D302004 AUXILIARY EQUIPMENT - Chemical Feedwater - 150 lb., 5 gallon, ASME**Typical Application and General Component Guidance:**

This component is used to inventory chemical feeders that are part of the hot water hydronic system.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

In the Section Details 'Equipment Type' field it should also be noted which loop the chemical feeder is serving.

General

Chemical feeder is typically located by pumps and is a 5-gallon type with a 3-leg pedestal. If the system is small, they may be mounted/supported off the piping system.

Reinspection

Prior to the 2019 update, only 'D302004 AUXILIARY EQUIPMENT' was available for the inventory of chemical feeders. This meant that many chilled water chemical feeders were inventoried under 'D3020 HEAT GENERATING SYSTEMS'.

When performing a reinspection of data collected before the 2019 update, it can be assumed that all chilled water chemical feeders will require a new inventory.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Chemical Feedwater - 150 lb., 5 gallon, ASME	Yes	Yes	Yes	No	No	No	20	EA

D302004 AUXILIARY EQUIPMENT - Expansion Tank - 100 gal**Typical Application and General Component Guidance:**

This component is used to inventory expansion tanks. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not inventory small expansion tanks connected to the domestic water system. Do not inventory any expansion tanks under five gallons in size.

General

Will be typically ground-mounted on newer hydronic systems. However, on older systems they were often mounted on the ceiling to save floor space. A good rule of thumb is if you have a hydronic system you probably have an expansion tank.

Reinspection

Prior to the 2019 update, only 'D302004 AUXILIARY EQUIPMENT' was available for the inventory of expansion tanks. This meant that many chilled water expansion tanks were inventoried under 'D3020 HEAT GENERATING SYSTEMS'.

When performing a reinspection of data collected before the 2019 update, it can be assumed that all chilled water expansion tanks will require a new inventory.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Expansion Tank - 100 gal	Yes	Yes	Yes	No	No	No	30	EA

D303001 CHILLED WATER SYSTEMS - Chiller, Absorption, Gas, Water Cooled - 1000 TN**Typical Application and General Component Guidance:**

This component is used to capture absorption chillers.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Chiller, Absorption, Gas, Water Cooled - 1000 TN	Yes	Yes	Yes	No	No	No	20	EA

D303001 CHILLED WATER SYSTEMS - Chiller, Centrifugal, Water Cooled - 200 TN**Typical Application and General Component Guidance:**

This component is used to inventory centrifugal chillers.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Chiller, Centrifugal, Water Cooled - 200 TN	Yes	Yes	Yes	No	No	No	20	EA

D303001 CHILLED WATER SYSTEMS - Chiller, Reciprocating, Air Cooled - 80 TN**Typical Application and General Component Guidance:**

This component is used to inventory air-cooled reciprocating chillers. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****General**

Reciprocating compressors have bolts at cylinder heads; smaller units may have hermetic (tin can) compressors. Scroll compressors are typically mounted vertically.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Chiller, Reciprocating, Air Cooled - 80 TN	Yes	Yes	Yes	No	No	No	20	EA

D303001 CHILLED WATER SYSTEMS - Chiller, Rotary Screw - 150 TN, Water Cooled Screw Liquid Chiller, Dual Compressors

Typical Application and General Component Guidance:

This component is used to inventory water-cooled screw chillers.
Select the correct type and size (round up to nearest size if required).



Business Rules/General/Lessons Learned/Reinspection

General

Compressors have "flat oval" appearance.
Normal operational sound is a "whine" or gear noise.

Lesson Learned

A building will typically have a cooling tower if this component type is present.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Chiller, Rotary Screw - 150 TN, Water Cooled Screw Liquid Chiller, Dual Compressors	Yes	Yes	Yes	No	No	20	EA

D303001 CHILLED WATER SYSTEMS - Chiller, Scroll - 50 TN

Typical Application and General Component Guidance:

This component is used to inventory scroll chillers.



Business Rules/General/Lessons Learned/Reinspection

Lesson Learned

Due to the lack of a tonnage breakout before the 2019 update, component types that included a size such as 'Chiller, Reciprocating, Air Cooled' may have been chosen.

Reinspection

Prior to the 2019 update, only 'Chiller, Scroll' was available for selection. It can be assumed that when performing a reinspection, the correct component type will need to be selected.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Chiller, Scroll - 50 TN	Yes	Yes	Yes	No	No	20	EA

D303001 CHILLED WATER SYSTEMS - Cooling Tower, Fiberglass - 125 TN**Typical Application and General Component Guidance:**

This component is used to inventory fiberglass cooling towers. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****General**

A cooling tower may be mounted on the ground in an equipment yard or on the roof of large buildings.

Cooling towers will have a fan on top pulling air over the coils.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Cooling Tower, Fiberglass - 125 TN	Yes	Yes	Yes	No	No	15	EA

D303002 DIRECT EXPANSION SYSTEMS - Condenser, DX, Air Cooled - Direct Drive, 5 ton

Typical Application and General Component Guidance:

This component is used to inventory air-cooled DX condensers/heat pumps. Select the correct type and size (round up to nearest size if required). Ignore the R-22 designation.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

If the system is a ductless DX split system, it should be inventoried under 'D305006 PACKAGE UNITS - A/C Unit, Split Systems w/ Air Cooled Condenser.'

In the Section Details 'Equipment Type' field indicate if the refrigerant is R-22.

The component type 'Condenser, DX, Air Cooled' is used to inventory both condensing units and heat pumps.

VRF systems are becoming more popular and use this component type. The exterior unit is inventoried under 'D303002 DIRECT EXPANSION SYSTEMS - Condenser, DX, Air Cooled', and the indoor units under 'D305003 FAN COIL UNITS - DX.'

When capturing a split system, if the indoor component has a heating element (gas/electric) it should be inventoried under 'D302002 FURNACES.'

General

This component type is used to inventory the heat rejection (outdoor) side of a split system.

Lesson Learned

Variable Refrigerant Volume (VRV) systems are becoming increasingly popular. Use this component type to capture the outdoor unit and use 'D305003 FAN COIL UNITS' to capture the multiple indoor units.

Reinspection

Prior to the 2019 update there were rules on inventorying split systems by tonnage and by the type of interior unit. If followed correctly, these rules led most condensing units to be inventoried under 'D303002 DIRECT EXPANSION SYSTEMS'.

When performing a reassessment on data captured prior to the 2019 update, the assessor should assume that there may be a need to inventory a portion of condensing units to the current inventory guidance.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Condenser, DX, Air Cooled - Direct Drive, 5 ton	Yes	Yes	Yes	No	No	15	EA

D303002 DIRECT EXPANSION SYSTEMS - Rooftop Air Conditioning Unit - multizone, electric cool, gas heat, 20 ton cooling

Typical Application and General Component Guidance:

This component is included for clarification purposes only.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

'D305006 PACKAGE UNITS' has much better selections for rooftop units and should be used for all rooftop air handlers. This is out of scope and is only included as a reference to eliminate any confusion when seen in the catalog.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Rooftop Air Conditioning Unit - multizone, electric cool, gas heat, 20 ton cooling	No	No	No	No	N/A	20	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

D303004 AUXILIARY EQUIPMENT - Air Separator - Air control, air separator, 3" diameter, includes strainer

Typical Application and General Component Guidance:

This component is used to inventory air separators that are part of the chilled water system.



Business Rules/General/Lessons Learned/Reinspection

Lesson Learned

If there is a chilled water hydronic system, there will typically be an air separator.

Reinspection

If correcting the inventory location from a previous assessment, the air separator under 'D304001 AIR DISTRIBUTION, HEATING & COOLING' should be deleted.

Prior to the 2019 update, air separators were inventoried under 'D304001 AIR DISTRIBUTION, HEATING & COOLING'. Upon reinspection of data collected before this update, it can be assumed that air separators will require a new inventory.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Air Separator - Air control, air separator, 3" diameter, includes strainer	Yes	Yes	Yes	No	No	35	EA

**D303004 AUXILIARY EQUIPMENT - Chemical Feedwater - 125 PSIG,
1.7 gallon****Typical Application and General Component Guidance:**

This component is used to inventory chemical feeders that are part of the chilled water hydronic system.

**Business Rules/General/Lessons Learned/Reinspection****Reinspection**

Prior to the 2019 update, only 'D302004 AUXILIARY EQUIPMENT' was available for the inventory of chemical feeders. This meant that many chilled water chemical feeders were inventoried under 'D3020 HEAT GENERATING SYSTEMS'.

When performing a reinspection of data collected before the 2019 update, it can be assumed that all chilled water chemical feeders will require a new inventory (the incorrect inventory should be deleted).

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Chemical Feedwater - 125 PSIG, 1.7 gallon	Yes	Yes	Yes	No	No	No	20	EA

D303004 AUXILIARY EQUIPMENT - Expansion Tank - 30 gal**Typical Application and General Component Guidance:**

This component is used to inventory expansion tanks that are a part of a chilled water hydronic systems.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not inventory small expansion tanks connected to the domestic water system. Do not inventory any expansion tanks under five gallons in size.

Lesson Learned

Will be typically ground-mounted on newer hydronic systems. However, on older systems they were often mounted on the ceiling to save floor space. A good rule of thumb is if you have a hydronic system you probably have an expansion tank.

Reinspection

Prior to the 2019 update, only 'D302004 AUXILIARY EQUIPMENT' was available for the inventory of expansion tanks. This meant that many chilled water expansion tanks were inventoried under 'D3020 HEAT GENERATING SYSTEMS'.

When performing a reinspection of data collected before the 2019 update, it can be assumed that all chilled water expansion tanks will require a new inventory (the incorrect inventory should be deleted).

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Expansion Tank - 30 gal	Yes	Yes	Yes	No	No	No	19	EA

D304001 AIR DISTRIBUTION, HEATING & COOLING - Air Separator - Air control, air separator, 4" diameter, includes strainer

Typical Application and General Component Guidance:

This component is included for clarification purposes only.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Chilled water air separators are to be inventoried under 'D303004 AUXILIARY EQUIPMENT- Air Separator'. Hot water air separators are to be inventoried under 'D302004 AUXILIARY EQUIPMENT- Air Separator'

Reinspection

Prior to the 2019 update, air separators were inventoried under 'D304001 AIR DISTRIBUTION, HEATING & COOLING'. Upon reinspection of data collected before this update, it can be assumed that air separators will require a new inventory.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Air Separator - Air control, air separator, 4" diameter, includes strainer	No	No	No	No	N/A	No	35	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

D304001 AIR DISTRIBUTION, HEATING & COOLING - Dehumidifier - 16 to 20 lb./Hr., 600 CFM

Typical Application and General Component Guidance:

This component is used to inventory dehumidifiers. Select the correct type and size (round up to nearest size if required).



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Do not inventory plug-in dehumidifiers. Do not inventory if the dehumidifier section is integrated into the air handler. The unit must be a permanently installed stand-alone assembly.

General

Typically will be installed in ductwork and will have refrigerant lines connected to the unit with a drain line for the water.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Dehumidifier - 16 to 20 lb./Hr., 600 CFM	Yes	Yes	Yes	No	No	No	10	EA

D304001 AIR DISTRIBUTION, HEATING & COOLING - Ductwork**Typical Application and General Component Guidance:**

This component is used to inventory ductwork.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

A ductwork calculator can be used in the cases where the majority of the ductwork is not readily visible.

The average cost of ductwork per SF is estimated at \$8/SF. Assessors should use the formula to derive the LF value: (Building SF * \$8) / (BUILDER Cost). The current BUILDER cost value per LF is 27 \$/LF. Verify this value at the start of the project.

Lesson Learned

Assessors must use judgment when using the standard formula. A large warehouse will have much less ductwork than a large office building. Assessors can slide the average cost per SF up/down based on their expertise.

The assessor can use the length of the building as the value for the main trunk. The amount of horizontal distribution legs off the main should be estimated and multiplied by the width of the building. The sum of these two values is the LF quantity.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Ductwork	Yes	No	No	No	N/A	No	40	LF

D304001 AIR DISTRIBUTION, HEATING & COOLING - Humidifier - 22 lb. per hour**Typical Application and General Component Guidance:**

This component is used to inventory humidifiers. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not inventory plug-in humidifiers. Do not inventory if the humidifier section is integrated into the air handler.

Lesson Learned

Do not inventory swamp coolers under this component type (you may find existing data with inventory under this type). Use 'D305006 PACKAGE UNITS - Evaporative Cooler' to inventory swamp coolers.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Humidifier - 22 lb. per hour	Yes	Yes	Yes	No	No	No	10	EA

D304001 AIR DISTRIBUTION, HEATING & COOLING - VAV Terminal, Fan Powered - 1000 CFM, Hot Water Reheat

Typical Application and General Component Guidance:

This component is used to inventory Variable Air Volume (VAV) boxes. Select the correct type and size (round up to nearest size if required).



Business Rules/General/Lessons Learned/Reinspection

Business Rule

VAVs are typically hidden from view. To accurately arrive at a CRV, the number of VAV's can be estimated (see lesson learned for acceptable methods).

General

There are 2-pipe and 4-pipe VAVs available. It can also be determined from the mechanical room piping if it is a true 4-pipe or a 2-pipe with a CW/HW switchover.

VAV's can be fan powered or unpowered. If a VAV is exposed in a mechanical room, the type can be determined.

Lesson Learned

It is not required to remove ceiling tiles during the assessment.

Last resort: An assessor can assume 1 CFM/SF as the total airflow and use the formula Bldg SF/400 to arrive at the number of boxes. Building SF would only be the area served by the VAV system. The boxes would be inventoried as 'VAV Terminal - 400 CFM.'

There are several ways to estimate the number of VAVs: 1) Count the T-stats, 2) View the digital display in the Mechanical Room that shows a one-line of the HVAC system, 3) Drawings, 4) Engineering judgment, 5) Last resort.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
VAV Terminal, Fan Powered - 1000 CFM, Hot Water Reheat	Yes	No	No	No	Yes	No	30	EA

D304002 STEAM DISTRIBUTION SYSTEMS - Condensate Pumping System - Steam Powered

Typical Application and General Component Guidance:

This component is used to inventory steam powered condensate pumping systems.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Condensate Pumping System - Steam Powered	Yes	Yes	Yes	No	No	No	30	EA

D304002 STEAM DISTRIBUTION SYSTEMS - Condensate Pumping System 1 - 5 HP (Single and Duplex)

Typical Application and General Component Guidance:

This component is used to inventory condensate pumping systems.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

If the pumps are under 1 HP, the component type 'Condensate Pumping System 1 - 5 HP (Single and Duplex)' should be used. All condensate pumping systems should be inventoried.

General

This component is used to capture condensate pumping systems. This captures the vessel, pump(s), and controls.

Reinspection

Prior to the 2019 update, there was no component type for condensate pumps. They should have been inventoried under 'D304090 OTHER DISTRIBUTION SYSTEMS - General'.

Upon reassessment of data captured prior to the 2019 update, the assessor should assume that, at a minimum, an update to the component type will be required. The component may have been missed in its entirety and would require a new inventory.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Condensate Pumping System 1 - 5 HP (Single and Duplex)	Yes	Yes	Yes	No	No	No	30	EA

D304002 STEAM DISTRIBUTION SYSTEMS - General

Typical Application and General Component Guidance:

This component is used to inventory the steam distribution system. Note the UOM is LF.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Use General, which is a LF UOM, to capture the steam piping. The piping from 5' outside the building to the heat exchanger (supply and return) should be totaled and used for the quantity value.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	Yes	30	LF

D304002 STEAM DISTRIBUTION SYSTEMS - Steam Generator**Typical Application and General Component Guidance:**

This component is used to inventory steam generators.

**Business Rules/General/Lessons Learned/Reinspection****General**

Steam generators are found as part of a steam distribution system.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Steam Generator	Yes	Yes	Yes	No	No	30	EA

D304002 STEAM DISTRIBUTION SYSTEMS - Steam Powered Trap**Typical Application and General Component Guidance:**

This component is used to inventory steam powered traps.

**Business Rules/General/Lessons Learned/Reinspection****General**

Steam powered traps are found as part of a steam distribution system. These will have a glass tube on the side that will show the condensate level. Once full, steam is released into the vessel and the water is discharged.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Steam Powered Trap	Yes	Yes	Yes	No	No	30	EA

D30 HVAC - D3040 DISTRIBUTION SYSTEMS

D304003 HOT WATER DISTRIBUTION SYSTEMS - Circulating Pump - 1/2 HP**Typical Application and General Component Guidance:**

This component is used to inventory small pumps associated with the HW distribution system.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

All hot water distribution pumps should have section details populated.

Pumps sized 1/2 HP to 1 HP (not including 1 HP) should be inventoried under the 1/2 HP component type.

Reinspection

Prior to the 2019 update, component types for pump sizes 1 HP and 1 1/2 HP did not exist. Assessor may have to update the component type selection upon a reinspection.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Circulating Pump - 1/2 HP	Yes	Yes	Yes	No	Yes	No	30	EA

D304003 HOT WATER DISTRIBUTION SYSTEMS - Circulating Pump, End Suction - 4" size, 7-1/2 HP, to 350 GPM**Typical Application and General Component Guidance:**

This component is used to inventory hot water circulating pumps. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not inventory hot water distribution pumps under 'D202003 DOMESTIC WATER EQUIPMENT - Booster Pump'. All hot water distribution pumps should be under 'D304003 HOT WATER DISTRIBUTION SYSTEMS'.

Reinspection

Previous inspections may have omitted smaller pumps. All pumps 1/4 HP and above should be inventoried.

Prior to the 2019 update, component types for pump sizes 1 HP, 1 1/2 HP, and 10 HP did not exist. Assessors may have to update the component type selection upon a reinspection.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Circulating Pump, End Suction - 4" size, 7-1/2 HP, to 350 GPM	Yes	Yes	Yes	No	No	20	EA

D304003 HOT WATER DISTRIBUTION SYSTEMS - General**Typical Application and General Component Guidance:**

This component is used to inventory hot/steam water distribution piping systems. Note the UOM is MBH.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If there are multiple boilers present, the summation of their MBH should be used as the quantity for this component type.

The UOM is MBH. When sizing the hot water hydronic system, one can view the size of the boiler for the total MBH. If the boiler is electric, a conversion from KW to MBH is required.

Lesson Learned

Assessors will commonly collect all the hydronic components and forget the piping distribution system, which is a significant portion of CRV for the building.

The hot water distribution system will typically not be visible, as it will be fully insulated. It is preferred to inventory with correct MBH and install date and let BUILDER™ degrade the asset. If a large portion is visible, provide an assessment.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	Yes	20 MBH

D304003 HOT WATER DISTRIBUTION SYSTEMS - Heat Exchanger, Plate Type - 400 GPM**Typical Application and General Component Guidance:**

This component is used to inventory hot/chilled water plate and frame heat exchangers. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Include in the Section Name field if the unit is part of the 'CW' or 'HW' loop, as both distribution system heat exchangers are captured under this component type. Ex: 'FL1 - MECH RM 109 - CW'

The smallest component type is 400 GPM. Plate and frame HX below 400 GPM shall be inventoried under the 400 GPM component type and the correct size placed in the Section Details field 'Capacity'.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Heat Exchanger, Plate Type - 400 GPM	Yes	Yes	Yes	No	No	20	EA

D304003 HOT WATER DISTRIBUTION SYSTEMS - Heat Exchanger, Shell & Tube - 96 GPM**Typical Application and General Component Guidance:**

This component is used to inventory hot/chilled water shell and tube heat exchangers. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Include in the Section Name field if the unit is part of the 'CW' or 'HW' loop, as both distribution system heat exchangers are captured under this component type. Ex: 'FL1 - MECH RM 109 - HW'

General

Commonly used on steam distribution to hot water applications.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Heat Exchanger, Shell & Tube - 96 GPM	Yes	Yes	Yes	No	No	20	EA

D304005 GLYCOL DISTRIBUTION SYSTEMS - Glycol Additive System (Includes Pumps/Tanks/Meters/Controls)**Typical Application and General Component Guidance:**

This component is used to inventory glycol feed systems.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

This component type captures the entire glycol system. Section details should be populated from the nameplate found on the tank.

General

This component is commonly found when a chilled water system is present in a cold climate. There is typically a large plastic tank with associated controls to monitor the glycol level.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Glycol Additive System (Includes Pumps/Tanks/Meters/Controls)	Yes	Yes	Yes	No	No	20	EA

D304006 CHILLED WATER DISTRIBUTION SYSTEMS - Circulating Pump, End Suction - 4" size, 7-1/2 HP, to 350 GPM**Typical Application and General Component Guidance:**

This component is used to inventory chilled water circulating pumps. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not inventory chilled water distribution pumps under 'D202003 DOMESTIC WATER EQUIPMENT - Booster Pump'. All chilled water distribution pumps should be under 'D304006 CHILLED WATER DISTRIBUTION SYSTEMS'.

Previous inspections may have omitted smaller pumps. All pumps 1/4 HP and above should be inventoried.

Reinspection

Prior to the 2019 update, component types for pump sizes 1/4 HP, 1/2 HP, 1 HP, 1 1/2 HP, and 10 HP did not exist. Assessor may have to update the component type selection upon a reinspection.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Circulating Pump, End Suction - 4" size, 7-1/2 HP, to 350 GPM	Yes	Yes	Yes	No	No	20	EA

D304006 CHILLED WATER DISTRIBUTION SYSTEMS - Condenser Water Pump, End Suction – 10 HP**Typical Application and General Component Guidance:**

This component is used to capture condenser water pumps.

**Business Rules/General/Lessons Learned/Reinspection****Lesson Learned**

These are commonly found in facilities that have a cooling tower.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Condenser Water Pump, End Suction – 10 HP	Yes	Yes	Yes	No	No	20	EA

D304006 CHILLED WATER DISTRIBUTION SYSTEMS - General**Typical Application and General Component Guidance:**

This component is used to inventory chilled water distribution piping systems. Note the UOM is ton.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

The average cost for piping per SF is estimated at \$8/SF. Assessors should use the formula to derive the tonnage value: (Building SF * \$8) / (BUILDER Cost). The current BUILDER cost value per ton is 5,863 \$/LF.

Verify the BUILDER cost value at the start of the project.

General

The chilled water distribution system will typically not be visible (it will be fully insulated). It is preferred to inventory with correct tonnage and install date and let BUILDER degrade the asset. If a large portion is visible, provide an assessment.

The UOM is TON. When sizing the chilled water hydronic system, one should use the formula indicated above.

Lesson Learned

Assessors must use judgment when using the standard formula. A large warehouse will have much less piping than a large office building with VAV's. Assessors can slide the average cost per SF up/down based on their expertise.

Assessors will commonly collect all the hydronic components and forget the piping distribution system, which is a significant portion of CRV for the building.

Reinspection

Prior to the 2019 update, assessors used the sum of the chillers as the quantity. It can be assumed that this value will need to be updated when performing a reinspection.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	Yes	20	TON

D304007 EXHAUST SYSTEMS - Commercial/Industrial Vacuum Dust Collection - 5000 CFM**Typical Application and General Component Guidance:**

This component is used to inventory commercial/industrial dust collection systems. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****General**

Typically found on paint booths or woodshop-type buildings.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Commercial/Industrial Vacuum Dust Collection - 5000 CFM	Yes	Yes	Yes	No	No	10	EA

D304007 EXHAUST SYSTEMS - Fan System, Residential Exhaust**Typical Application and General Component Guidance:**

This component is included for clarification purposes only.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not inventory small, plastic, single-room bathroom fans.

If the bathroom exhaust consists of an inline fan, it should be inventoried. These will often serve multiple bathrooms and should be inventoried under 'D305001 UNIT VENTILATORS - Fan System, Centrifugal In-Line'.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Fan System, Residential Exhaust	No	No	No	No	N/A	40	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

D304007 EXHAUST SYSTEMS - Fan System, Roof Exhaust - 800 CFM**Typical Application and General Component Guidance:**

This component is used to inventory roof-/wall-mounted 'mushroom' or 'bulls-eye' fans. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Lesson Learned**

If there are multiple fans of like size an assessor can indicate 'UPBLAST' or 'DOWNBLAST' in the section name for the spun aluminum type fans.

Reinspection

Prior to the 2019 update, many mushroom/bull's-eye fans located on walls were inventoried under 'Fan System, Roof Exhaust' to have more appropriate CFM. Upon reinspection, the assessor should update the component type. With the additions to 'D304007 EXHAUST SYSTEMS' in the 2019 update, many component types can be updated when performing a reinspection. The assessor should update the component types to the latest inventory guidance.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Fan System, Roof Exhaust - 800 CFM	Yes	Yes	Yes	No	No	No	20	EA

D304007 EXHAUST SYSTEMS - Fan System, Utility Set - 10,000 CFM**Typical Application and General Component Guidance:**

This component is used to inventory utility set fans that are operating as an exhaust system.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Assessors need to be aware there is a 'D305001 UNIT VENTILATORS - Fan System, Utility Set' in the catalog that is used for general HVAC ventilation, NOT exhaust fans. A utility set used in an exhaust application should be captured under D304007.

'Double width - double inlet' and 'Single width - single inlet' are both inventoried with this material/equipment category. Note in the Section Details field 'Equipment Type' if the unit is 'SWSI' or 'DWDI'.

In an instance where a garage exhaust system has the nozzles daisy chained and connected to one utility set, that exhaust fan should be a separate section under this component type.

General

Utility set type exhaust fans that are connected to an industrial process, whether that be a garage exhaust system or a building-specific process, should be captured under this component type.

Reinspection

With the additions to 'D304007 EXHAUST SYSTEMS' in the 2019 update, many component types can be updated when performing a reinspection. The assessor should update the component types to the latest inventory guidance.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Fan System, Utility Set - 10,000 CFM	Yes	Yes	Yes	No	No	No	20	EA

D304007 EXHAUST SYSTEMS - Fan System, Wall Exhaust - 2750 CFM**Typical Application and General Component Guidance:**

This component is used to inventory wall-mounted exhaust fans.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

The section name for wall mounted fans should start with the cardinal direction (see guidance on the 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components' page.

General

Mushroom fans that are located on the walls are also referred to as bull's-eye.

Reinspection

Prior to the 2019 update, many wall-mounted exhaust fans were inventoried under 'Fan System, Roof Exhaust' due to lack of CFM selections. Assessor should assume that all wall exhaust fans will require a new component type selection.

With the additions to 'D304007 EXHAUST SYSTEMS' in the 2019 update, many component types can be updated when performing a reinspection. The assessor should update the component types to the latest inventory guidance.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Fan System, Wall Exhaust - 2750 CFM	Yes	Yes	Yes	No	No	No	20	EA

D304007 EXHAUST SYSTEMS - Fan System, Wall Exhaust - 500 CFM**Typical Application and General Component Guidance:**

This component is used to capture wall-mounted exhaust fans.

**Business Rules/General/Lessons Learned/Reinspection****Lesson Learned**

This component type is often used for small prop fans found on the walls in mechanical rooms.

Reinspection

Prior to the 2019 update, small prop exhaust fans may have been inventoried under 'D304007 EXHAUST SYSTEMS- Industrial Exhaust System - 2000 CFM, 3 H.P.' Upon reinspection, the assessor should assume an update in the component type will be required.

With the additions to 'D304007 EXHAUST SYSTEMS' in the 2019 update, many component types can be updated when performing a reinspection. The assessor should update the component types to the latest inventory guidance.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Fan System, Wall Exhaust - 500 CFM	Yes	Yes	Yes	No	No	20	EA

D304007 EXHAUST SYSTEMS - Fan System, Wall Exhaust - 6175 CFM**Typical Application and General Component Guidance:**

This component can be used to inventory wall prop fans. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****General**

Typically this will be a large prop exhaust fan located in a maintenance bay or supply storage to provide general ventilation.

Reinspection

With the additions to 'D304007 EXHAUST SYSTEMS' in the 2019 update, many component types can be updated when performing a reinspection. The assessor should update the component types to the latest inventory guidance.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Fan System, Wall Exhaust - 6175 CFM	Yes	Yes	Yes	No	No	10	EA

D304007 EXHAUST SYSTEMS - Fume Hood Exhaust System - 4', 2000 CFM**Typical Application and General Component Guidance:**

This component is used to inventory fume hoods.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

This component type captures the fume hood, integrated exhaust appurtenances, and associated controls. If there is a separate exhaust fan located on the roof, that would be inventoried separately.

Lesson Learned

These are commonly found in labs.

Reinspection

Prior to the 2019 update, this was not indicated as in scope. When performing a reinspection, it can be assumed that a new inventory of fume hoods will be required.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Fume Hood Exhaust System - 4', 2000 CFM	Yes	No	No	No	Yes	No	10 EA

D304007 EXHAUST SYSTEMS - Garage Exhaust Systems - Single exhaust, 3" outlet, 1 bay**Typical Application and General Component Guidance:**

This component is used to inventory garage exhaust systems. Count the quantity of connections.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If a garage exhaust system is a system with an integral fan, this component captures the exhaust nozzle, fan system, and the controls as a single component section.

If the exhaust system is of the daisy chained variety, the quantity of nozzles can be inventoried as a single section. A 'Group OK? - Yes' approach can be used.

If the garage exhaust system nozzles are daisy chained to one large utility set exhaust fan, count the number of nozzles for the quantity and capture the exhaust fan as a separate 'D304007 - Industrial Exhaust System - 8000 CFM, 15 H.P.' component section.

Lesson Learned

If the function of the building has changed and the garage exhaust is no longer needed, do not inventory or assess the component. It can be assumed it has been abandoned in place.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Garage Exhaust Systems - Single exhaust, 3" outlet, 1 bay	Yes	Yes	Yes	No	No	10	EA

D304007 EXHAUST SYSTEMS - Industrial Exhaust System - 8000 CFM, 15 H.P.**Typical Application and General Component Guidance:**

This component is used to inventory industrial type fans. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

This component type was widely used for various types of fans before the 2019 update. Now, it is primarily limited to high velocity plume fans that are found in laboratory/manufacturing buildings.

Reinspection

This component type was widely used before the 2019 update to inventory utility sets and small wall prop exhaust fans. When performing a reinspection, many component types will need to be modified.

With the additions to 'D304007 EXHAUST SYSTEMS' in the 2019 update, many component types can be updated when performing a reinspection. The assessor should update the component types to the latest inventory guidance.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Industrial Exhaust System - 8000 CFM, 15 H.P.	Yes	Yes	Yes	No	No	35	EA

D304007 EXHAUST SYSTEMS - Kitchen Exhaust/Make-Up Air - 8000 CFM**Typical Application and General Component Guidance:**

This component is used to inventory ONE unit package kitchen exhaust and make-up air systems.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If the make-up air unit and exhaust fan are separate assets, they should not be inventoried under this component type. Both assets should be captured under the correct respective component type. Only use this for packaged systems.

General

This component captures packaged systems that come on a skid with both the kitchen exhaust piece and make-up air piece installed.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Kitchen Exhaust/Make-Up Air - 8000 CFM	Yes	Yes	Yes	No	No	30	EA

D30 HVAC - D3040 DISTRIBUTION SYSTEMS

D304008 AIR HANDLING UNITS - Central Station - 5000 CFM, VAV**Typical Application and General Component Guidance:**

This component is used to inventory central station air handlers located indoors. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****General**

The 'D304008 AIR HANDLING UNITS - Central Station' component type should be used for air handlers found indoors in mechanical rooms or mezzanines. Note there are VAV and non-VAV selections available.

This component type is typically located indoors and will have hydronic piping supplying the heat/chilled water to the coils.

Lesson Learned

Assessor should be aware of selections in 'D305006 PACKAGE UNITS' that are very similar and which are used for outdoor packaged units. This often leads to confusion.

Items inventoried under 'D304008 AIR HANDLING UNITS' will typically just have a hot water (HW) and chilled water (CW) coil present.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Central Station - 5000 CFM, VAV	Yes	Yes	Yes	No	No	25	EA

D304008 AIR HANDLING UNITS - Field Fabricated - 150000 CFM, VAV**Typical Application and General Component Guidance:**

This component is used to inventory field-fabricated air handlers. Note the size. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****General**

Typically used on very large buildings that need an extreme amount of airflow. A good rule of thumb is to use this for air handlers that have doors and that are large enough to walk into. If not, there are other component types that are better.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Field Fabricated - 150000 CFM, VAV	Yes	Yes	Yes	No	No	15	EA

D304008 AIR HANDLING UNITS - Indoor Modular - 3200 CFM, 8 TN Central AHU**Typical Application and General Component Guidance:**

This component is used to inventory indoor modular air handlers. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****General**

Typically used in a single zone indoor application. Example: a gym with a single AHU in the corner, a long run of ductwork down the middle, and airflow returning to the unit. If it is a VAV system, use the 'Central Station' component type.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Indoor Modular - 3200 CFM, 8 TN Central AHU	Yes	Yes	Yes	No	No	15	EA

D304008 AIR HANDLING UNITS - Rooftop - 15000 CFM, VAV**Typical Application and General Component Guidance:**

This component is used to inventory central station air handlers located on the rooftop. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****General**

Air handling units will typically be located in mechanical rooms.

Roof-mounted units are usually a packaged unit and would be inventoried under 'D305006 PACKAGE UNITS'. Large AHU's will sometimes be located on the roof. Assessors should look for hydronic piping to/from the unit in this case.

Lesson Learned

There are several options for rooftop units, so this one is only for air handling units. In 'D305006 PACKAGE UNITS', the best selections are available.

There are three rooftop component types in the catalog: 1) 'D303002 DIRECT EXPANSION SYSTEMS' - Not used, 2) 'D304008 AIR HANDLING UNITS' - Used infrequently, and 3) 'D305006 PACKAGE UNITS' - Used frequently.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Rooftop - 15000 CFM, VAV	Yes	Yes	Yes	No	No	15	EA

D304090 OTHER DISTRIBUTION SYSTEMS - 2-Pipe Heating/Cooling Distribution Steel Piping - 1 IN

Typical Application and General Component Guidance:

This component is used to inventory steel 2-pipe refrigerant piping.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Do not use it to inventory individual line sets connecting split system components.

Do not use this component type to inventory chilled water distribution system piping. 'D304006 CHILLED WATER DISTRIBUTION SYSTEMS' should be used.

Do not use this component type to inventory hot water distribution system piping. 'D304003 HOT WATER DISTRIBUTION SYSTEMS - General' should be used.

The average cost of piping per SF is estimated at \$2/SF. Assessors should use the following formula to derive the LF value: $(\text{Building SF} * \$2) / (\text{BUILDER Cost})$. The current BUILDER cost per LF is \$62/LF. Verify this value at the start of the project.

There will typically be several sizes of pipes as part of the system. Select the 1 IN component type and have a single record that captures the entire distribution system. Do not section by size, floor, etc.

This is used to inventory building-wide refrigerant distribution systems and all associated appurtenances between the exterior and interior units. If this is a 3-pipe VRV assessors should adjust the \$/SF in the calculation accordingly.

General

This component is often found in buildings that have a variable refrigerant volume (VRV) HVAC system.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
2-Pipe Heating/Cooling Distribution Steel Piping - 1 IN	Yes	No	No	No	N/A	Yes	30	LF

D304090 OTHER DISTRIBUTION SYSTEMS - General**Typical Application and General Component Guidance:**

This component is used to inventory significant hydronic equipment not listed in BUILDER™. Items such as steam headers, vacuum pumps (in photo), and other large value hydronic items fall under this component type.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If a hydronic or steam component is captured, the Section Name should accurately describe the component. An inventory comment is required to aid the next assessment in finding and identifying the component.

General

Significant pieces of hydronic equipment that do not have a component type in BUILDER™ still need to be inventoried under 'D304090 OTHER DISTRIBUTION SYSTEMS.'

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	Yes	Yes	Yes	No	No	30	EA

D305001 UNIT VENTILATORS - Air Curtain**Typical Application and General Component Guidance:**

This component is used to inventory air curtains. Note the UOM is LF.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Note that the UOM is LF. Provide a component section for each individual air curtain with the Section Details field 'Capacity' populated with the LF of the unit.

General

Typically found on the entrance to stores or backdoors into kitchens. The ventilator provides a velocity of air across the face of the opening to prevent bugs from flying in and helps keep the inside area conditioned.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Air Curtain	Yes	Yes	Yes	No	Yes	No	20	LF

D305001 UNIT VENTILATORS - Fan System, Axial - 2500 CFM**Typical Application and General Component Guidance:**

This component is used to inventory axial fans.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

All axial fans should be inventoried under this component type and the correct size selected.

Lesson Learned

As a general lesson learned, an axial fan will be cylindrical and a centrifugal fan will be square. An assessor can research the model number for confirmation if unknown, as this rule is not 100% accurate.

Reinspection

Prior to the 2019 update, there was no CFM breakout for 'Fan System, Axial', so many components were inventoried under 'Fan System, Centrifugal In-Line to align with an estimated size.

When performing a reassessment on data captured prior to the 2019 update, the assessor should assume that a component type update will be required for all axial fans.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Fan System, Axial - 2500 CFM	Yes	Yes	Yes	No	No	20	EA

D305001 UNIT VENTILATORS - Fan System, Centrifugal In-Line - 2500 CFM**Typical Application and General Component Guidance:**

This component is used to inventory centrifugal in-line exhaust fans.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

All centrifugal in-line fans should be inventoried under this component type and the correct size selected.

General

This is a very common type of fan. It will be found on the interior of a building, ducted to a louver in an exhaust fan application. It can be found on HVAC systems as a return air fan. There are many applications.

Lesson Learned

As a general lesson learned, an axial fan will be cylindrical and a centrifugal fan will be square. An assessor can research the model number for confirmation if unknown, as this rule is not 100% accurate.

Very common in electrical rooms that need just a small amount of ventilation.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Fan System, Centrifugal In-Line - 2500 CFM	Yes	Yes	Yes	No	No	No	20	EA

D305001 UNIT VENTILATORS - Fan System, Large Blade Destratification Fan

Typical Application and General Component Guidance:

This component is used to inventory large industrial circulating fans.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Large blade is defined as a fan that is excess of 10' in diameter.

General

These fans are common in warehouses.

Lesson Learned

There will often be a VFD used to control the RPM of the fan. This should be inventoried under 'D306001 HVAC CONTROLS'.

Reinspection

Prior to the 2019 update, these fans were inventoried under 'D305001 UNIT VENTILATORS - Axial fan'. Assessor should assume that an update of the component type selection is required when performing a reinspection.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Fan System, Large Blade Destratification Fan	Yes	Yes	Yes	No	Yes	No	20	EA

D305001 UNIT VENTILATORS - Fan System, Utility Set - 3500 CFM**Typical Application and General Component Guidance:**

This component is used to inventory utility set fans. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If the fan is operating in an exhaust fashion, it should be inventoried under 'D304007 EXHAUST SYSTEMS - Utility Set.'

General

Typically located indoors and used for applications such as an HVAC supply fan.

Lesson Learned

Often confused with 'D304007 EXHAUST SYSTEMS - Utility Set'. If the utility set is used in an exhaust application, capture it under that component type.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Fan System, Utility Set - 3500 CFM	Yes	Yes	Yes	No	No	20	EA

D305001 UNIT VENTILATORS - Make-Up Air Unit - 3000 CFM, 252 MBH, includes standard controls**Typical Application and General Component Guidance:**

This component is used to inventory make-up air units. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****General**

Typically used in kitchens or gyms that have a large amount of outside air requirements to meet.

Lesson Learned

Often confused with 'D305006 PACKAGE UNITS', 'D304008 AIR HANDLING UNITS', and 'D303002 DIRECT EXPANSION SYSTEMS' that have air handler component types available.

Previous inspections may have captured this equipment under 'D302002 FURNACES'. If the air is solely used for make-up air, it should be inventoried under this component type.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Make-Up Air Unit - 3000 CFM, 252 MBH, includes standard controls	Yes	Yes	Yes	No	No	30	EA

D305002 UNIT HEATERS - Hydronic - 60 MBH**Typical Application and General Component Guidance:**

This component is used to inventory hydronic unit heaters. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****General**

This is a very common piece of equipment across installations. It will have two pipes (supply/return) going to the unit heater and be fed from the hot water distribution system.

Lesson Learned

Note that there is no option for electric unit heaters under 'D305002 UNIT HEATERS'. They are captured under 'D305005 ELECTRIC HEATING'.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Hydronic - 60 MBH	Yes	Yes	Yes	No	Yes	No	30	EA

D305002 UNIT HEATERS - Infrared - 45 MBH**Typical Application and General Component Guidance:**

This component is used to inventory infrared unit heaters. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Lesson Learned**

Note that there is no option for electric unit heaters under 'D305002 UNIT HEATERS'. They are captured under 'D305005 ELECTRIC HEATING'.

Often confused with 'D302003 FUEL-FIRED UNIT HEATERS'. This is for cassette-type infrared unit heaters. If the asset is a gas-fired radiant tube heater, it should be inventoried under 'D302003 FUEL-FIRED UNIT HEATERS', not under 'D305002 UNIT HEATERS'.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Infrared - 45 MBH	Yes	Yes	Yes	No	Yes	No	25	EA

D305003 FAN COIL UNITS - Cab Mount, Four Pipe - 2 ton

Typical Application and General Component Guidance:

This component is used to inventory cab-mount hydronic 4-pipe fan coil units. Select the correct type and size (round up to nearest size if required).



Business Rules/General/Lessons Learned/Reinspection

General

This component type is used for hydronic systems. They will typically be found on barracks type buildings.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Cab Mount, Four Pipe - 2 ton	Yes	Yes	Yes	No	Yes	No	15	EA

D305003 FAN COIL UNITS - Cab Mount, Two Pipe - 2 ton

Typical Application and General Component Guidance:

This component is used to inventory cab-mount hydronic 2-pipe fan coil units. Select the correct type and size (round up to nearest size if required).



Business Rules/General/Lessons Learned/Reinspection

General

This component type is used for hydronic systems. They will typically be found on barracks type buildings.

Lesson Learned

Do not confuse two-pipe hydronic systems with DX systems. There is a component type under 'D305003 FAN COIL UNITS' for DX fan coils.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Cab Mount, Two Pipe - 2 ton	Yes	Yes	Yes	No	Yes	No	15	EA

D305003 FAN COIL UNITS - Duct Mount, 2 Pipe - 2 ton, Elec. Heat**Typical Application and General Component Guidance:**

This component is used to inventory hydronic duct-mount fan coils that have electric backup heat.

**Business Rules/General/Lessons Learned/Reinspection****Lesson Learned**

Do not confuse two-pipe hydronic systems with DX systems. There is a component type under 'D305003 FAN COIL UNITS' for DX fan coils.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Duct Mount, 2 Pipe - 2 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA

D305003 FAN COIL UNITS - Duct Mount, 4 Pipe - 2 ton**Typical Application and General Component Guidance:**

This component is used to inventory duct-mount hydronic 4-pipe fan coil units. Select the correct type and size (round up to nearest size if required).



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Duct Mount, 4 Pipe - 2 ton	Yes	Yes	Yes	No	Yes	No	15	EA

D305003 FAN COIL UNITS - DX - 3 ton**Typical Application and General Component Guidance:**

This component is used to inventory DX fan coil units. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

VRF/VRV systems are becoming more popular and use this component type. The exterior unit is inventoried under 'D303002 DIRECT EXPANSION SYSTEMS - Condenser, DX, Air-Cooled' and the indoor units under 'D305003 FAN COIL UNITS - DX.'

When a DX unit is inventoried the first thing to look for is if a heating element (Electric/Gas) is present. If so, then 'D302002 FURNACES'. The DX component type is used when there is only a DX coil present.

Lesson Learned

If the hydronic distribution system (hot/chilled water) serves the unit then it is not a DX fan coil. The component types 'D305003 FAN COIL UNITS - Cab Mount' and 'D305003 FAN COIL UNITS - Duct Mount' should be used.

Typically used to capture indoor DX fan coils. As Variable Refrigerant Volume (VRV) systems become more popular, this component type is being used more often.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
DX - 3 ton	Yes	Yes	Yes	No	Yes	No	15	EA

D305004 FIN TUBE RADIATION - Baseboard Heating - 2' long

Typical Application and General Component Guidance:

This component is used to inventory baseboard heaters. Select the correct type and size (round up to nearest size if required).



Business Rules/General/Lessons Learned/Reinspection

Business Rule

For hydronic baseboard heaters, the UOM options of 'LF' should be used. For electric baseboard heaters, the UOM of 'EA' should be used, with the average size (length) component selected for the facility/floor.

The goal is to inventory the baseboard heaters in a manner that captures them but does not result in a significant amount of sections. They are typically maintained as a single system. One section per floor/building is desired.

General

Typically found in vestibules, at the bottom of stairwells, or on the linear perimeter of a building.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Baseboard Heating - 2' long	Yes	No	No	No	Yes	No	30	EA

D305005 ELECTRIC HEATING - 208-240 volt, 2 kW

Typical Application and General Component Guidance:

This component is used to inventory electric heaters (typically unit heaters). Select the correct type and size (round up to nearest size if required).



Business Rules/General/Lessons Learned/Reinspection

General

Electric unit heaters are very common, and there is no place in BUILDER™ under 'D305002 UNIT HEATERS' to inventory these items. This component type is where electric unit heaters are to be inventoried.

Reinspection

Prior to the 2019 update, the smallest unit heater was 5 KW. When performing a reinspection, it can be assumed that many unit heaters will require a component type update to the latest inventory standards.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
208-240 volt, 2 kW	Yes	Yes	Yes	No	Yes	No	30	EA

D305006 PACKAGE UNITS - A/C Unit, Computer Room - Air Cooled, 8 ton

Typical Application and General Component Guidance:

This component is used to inventory computer room air conditioners (CRAC) units.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Do not capture BARD or Liebert units under this component type. This is only to be used for HVAC systems that are cooling computer/server/IT rooms.

If the system is a split system, the exterior units should be inventoried under 'D303002 DIRECT EXPANSION SYSTEMS - Condenser, DX, Air Cooled'.

This component type captures the interior part of the computer room A/C system (if installed in a split system fashion). Populate section details based on the interior data nameplate.

General

These systems are industrial cooling systems that are located in computer/server/IT rooms. This component will typically be in the form of a split system.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
A/C Unit, Computer Room - Air Cooled, 8 ton	Yes	Yes	Yes	No	No	20	EA

D305006 PACKAGE UNITS - A/C Unit, Package Terminal - Packaged Terminal AC, 48,000 BTUH, 10 kw

Typical Application and General Component Guidance:

This component is used to inventory packaged A/C terminal units (PTAC).



Business Rules/General/Lessons Learned/Reinspection

Business Rule

If a unit is greater than 48,000 BTUH of cooling (4 tons), select the 48,000 BTUH component type and indicate the correct size in the capacity field in the section details.

General

These are commonly referred to as BARD or Liebert units after the most common manufacturers.

These units are very common and are used in a variety of applications from trailers to utility buildings.

Lesson Learned

Often these units will not have heating (dependent on climate). The component types all have a KW listed that can be ignored if this is a cooling/heat pump-only application.

Select the most correct component type. The catalog shows a BTUH and a KW value. The unit in the field may not exactly match. Use the BTUH value as the driving factor when selecting the component type.

The component types in the catalog show the cooling capacity in BTUH. Dividing by 12,000 will arrive at the tonnage of the unit. Often, the units in the field will only show the tonnage.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
A/C Unit, Package Terminal - Packaged Terminal AC, 48,000 BTUH, 10 kw	Yes	Yes	Yes	No	No	20	EA

D305006 PACKAGE UNITS - A/C Unit, Split Systems w/ Air Cooled Condenser - 2 TN**Typical Application and General Component Guidance:**

This component is used to inventory A/C and Heat Pump Mini split systems. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If the ductless split system is under 2 tons, the '2 ton' component type should be selected and the correct capacity should be populated in the Section Details 'Capacity' field.

This component type can be used for Heat Pump (HP) or Air Cooled Condensing Unit (ACCU) ductless HVAC systems.

This component type is used for small ductless DX split systems that serve a single IT/electrical/elevator closet/room. The methodology is that these components (inside/outside) have the same degradation curve and will be replaced upon failure of either.

This component type is used to inventory ductless split systems only. Section Details should be populated from the exterior unit only.

VRV/VRF systems do not use this component type. The exterior unit is inventoried under 'D303002 DIRECT EXPANSION SYSTEMS - Condenser, DX, Air Cooled' and the indoor units under 'D305003 FAN COIL UNITS - DX.'

General

One of the biggest areas of confusion in the BRED™ catalog is caused by this component type. It looks at the split system as a 'packaged system'. This only applies to ductless HVAC systems.

Lesson Learned

The inside fan coil will either be wall mounted or ceiling mounted. If there are multiple inside fan coils, the system would be inventoried per the VRV/VRF inventory guidance.

When capturing a split system with a heating source (like a furnace), the outdoor side will be a 'D303002 DIRECT EXPANSION SYSTEMS - Condenser, DX, Air Cooled'. Do not use this component type.

Reinspection

Prior to the 2019 update, there were rules on inventorying split systems by tonnage and by the type of interior unit. If followed correctly, these rules led most ductless systems to be inventoried under this component type.

When performing a reassessment on data captured prior to the 2019 update, the assessor should assume that there may be a need to inventory a portion of ductless HVAC split systems per the current inventory guidance.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
A/C Unit, Split Systems w/ Air Cooled Condenser - 2 TN	Yes	Yes	Yes	No	No	No	20	EA

D305006 PACKAGE UNITS - A/C Unit, Thru-Wall - 1 ton**Typical Application and General Component Guidance:**

This component is used to inventory thru-wall A/C units. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If a window-style A/C unit is installed in a permanent fashion through a wall, it is to be captured as this component type.

If the window unit is located within a window frame, it is considered temporary and is not to be captured.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
A/C Unit, Thru-Wall - 1 ton	Yes	Yes	Yes	No	Yes	No	20	EA

D305006 PACKAGE UNITS - Evaporative Cooler - 4215 CFM**Typical Application and General Component Guidance:**

This component is used to inventory evaporative coolers. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not inventory portable swamp coolers that can be wheeled into a room for spot cooling. The unit must be permanently affixed to the building.

General

Typically found in dry climates and often referred to as a swamp cooler.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Evaporative Cooler - 4215 CFM	Yes	Yes	Yes	No	No	20	EA

D305006 PACKAGE UNITS - Heat Pump Package Condenser/Evaporator/Air Handler - 3 TN

Typical Application and General Component Guidance:

This component is used to inventory packaged heat-pump HVAC systems.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

As a general rule, if the packaged unit is a heat pump and is under 10 tons, then 'Heat Pump Package Condenser/Evaporator/Air Handler - X TN' should be used. For larger units there are other component types available.

Lesson Learned

There is often confusion between the 'Heat Pump Package Condenser/Evaporator/Air Handler' and the other component types available under 'D305006 PACKAGE UNITS.'

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Heat Pump Package Condenser/Evaporator/Air Handler - 3 TN	Yes	Yes	Yes	No	No	15	EA

D305006 PACKAGE UNITS - Heat Pump Water Source Single Package - 3 TN

Typical Application and General Component Guidance:

This component is used to inventory water source heat pumps.



Business Rules/General/Lessons Learned/Reinspection

General

This component type is commonly associated with geothermal systems.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Heat Pump Water Source Single Package - 3 TN	Yes	Yes	Yes	No	No	15	EA

D305006 PACKAGE UNITS - Heat Pump, Thru-Wall - 1 ton**Typical Application and General Component Guidance:**

This component is used to inventory thru-wall heat pump units.
Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If a window heat pump unit is installed in a permanent fashion through a wall, it is to be captured as this component type.

If the window unit is located within a window frame, it is considered temporary and is not to be captured.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Heat Pump, Thru-Wall - 1 ton	Yes	Yes	Yes	No	Yes	No	20	EA

D305006 PACKAGE UNITS - Packaged A/C, Air Cooled, Elec Heat - 5 ton**Typical Application and General Component Guidance:**

This component is used to inventory packaged air handlers. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Due to the number of areas in the catalog where air handlers can be captured, it is very important for accurate section details to be populated. Accurate 'ID Number' and 'Location' will allow future assessments to locate the component.

There are many packaged selections available under 'D305006 PACKAGE UNITS'. Assessor should select the most correct component type. Note in Section Details the location (ground/roof-mounted).

Lesson Learned

The catalog often causes confusion because of other air handler unit selections in 'D304008 AIR HANDLING UNITS'. A good rule of thumb is to use 'D304008 AIR HANDLING UNITS' for indoor units and 'D305006 PACKAGED UNITS' for outdoor units.

There is confusion in the D305006 material type because 'Packaged A/C' units are often located on the roof and there is a 'Rooftop' Component type as well. The 'Packaged A/C' often has more accurate selections. Use the most accurate selection available.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Packaged A/C, Air Cooled, Elec Heat - 5 ton	Yes	Yes	Yes	No	No	No	20	EA

D305006 PACKAGE UNITS - Packaged DX Refrigerant System - Air Cooled, 5 Ton

Typical Application and General Component Guidance:

This component is used to inventory DX systems associated with freezers/refrigerators.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

The section details should be populated from the exterior unit.

This component type is viewed as a packaged system that includes both the interior and exterior unit. The exterior unit is to be used for the component type size selection.

General

This component type is commonly found in buildings that have a food serving function and is used to capture the DX cooling systems that serve the freezers and refrigerators.

Reinspection

Prior to the 2019 update, the component type 'Packaged DX Refrigerant System - Air Cooled,' was in the catalog but not detailed in the manual as to its intended use. These components may have been missed or inventoried incorrectly.

When performing a reassessment on data captured prior to the 2019 update, the assessor should assume that many of these components will need a new inventory.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Age OK?	Design Based?	Life	UOM
Packaged DX Refrigerant System - Air Cooled, 5 Ton	Yes	Yes	Yes	No	No	No	15	EA

D305006 PACKAGE UNITS - Rooftop Unit - 12-1/2 ton**Typical Application and General Component Guidance:**

This component is used to inventory rooftop packaged units.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

There are many packaged selections available under 'D305006 PACKAGE UNITS' in addition to 'Rooftop Unit'. Assessor should select the most correct component type.

Lesson Learned

The catalog often causes confusion because of other rooftop unit selections in: 1) 'D303002 DIRECT EXPANSION SYSTEMS - Rooftop Air Conditioning Unit' (out of scope) and 2) 'D304008 AIR HANDLING UNITS - Rooftop' (hardly ever used).

This is the best component type available for packaged units that are gas-fired.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Rooftop Unit - 12-1/2 ton	Yes	Yes	Yes	No	No	20	EA

D305006 PACKAGE UNITS - Rooftop Unit - 5 ton**Typical Application and General Component Guidance:**

This component is used to inventory rooftop packaged units. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

A rooftop unit can be selected even if the unit is not located on the roof. Sometimes these units are ground mounted and are ducted into a space. The photo above shows this type of installation.

Lesson Learned

This is the best component type available for packaged units that are gas-fired.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Rooftop Unit - 5 ton	Yes	Yes	Yes	No	No	20	EA

D30 HVAC - D3060 CONTROLS & INSTRUMENTATION

D306001 HVAC CONTROLS - VFD, 10 HP**Typical Application and General Component Guidance:**

This component is used to inventory variable frequency drives (VFDs).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Indicate size (if found) on the capacity field in the section details. If not listed, the HP size of the motor the VFD is controlling can be used as this value.

This component type is only used to inventory VFDs. For Direct Digital Controls (DDC) systems use 'D306002 ELECTRONIC CONTROLS - General'.

Reinspection

Prior to the 2019 update, there were no size selections for VFD's, and 'General' was used. Upon reinspection of data captured before the 2019 update, it can be assumed that the component type for all VFD's will need to be updated.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
VFD, 10 HP	Yes	Yes	Yes	No	No	19	EA

D306002 ELECTRONIC CONTROLS - D.D.C. Control Panel**Typical Application and General Component Guidance:**

This component is used to inventory the main DDC (Direct Digital Control) panel.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Only the main DDC panel is to be inventoried.

General

This component type is used to inventory DDC control panels.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
D.D.C. Control Panel	Yes	Yes	Yes	No	No	20	EA

D30 HVAC - D3060 CONTROLS & INSTRUMENTATION

D306002 ELECTRONIC CONTROLS - General

Typical Application and General Component Guidance:

This component is used to inventory digital HVAC control points.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

The average cost of controls per SF is estimated at \$3/SF. Assessors should use the following formula to derive the EA value: (Building SF * 3) / (BUILDER Cost). The current BUILDER cost is \$1435/EA. Verify this value at the start of the project.

General

Buildings with Direct Digital Control (DDC) electronic controls are hard to inventory because the number of points is hardly ever known. An assessor may find a control drawing in the mechanical room.

Lesson Learned

Assessors must use judgment when using the standard formula. A large warehouse will have much less electronic controls than a large office building. Assessors can slide the average cost per SF up/down based on their expertise.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	Yes	10	EA

D306003 PNEUMATIC CONTROLS - General

Typical Application and General Component Guidance:

This component is used to inventory pneumatic controls. The photo shows a pneumatic thermostat.



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	Yes	10	EA

D306004 INSTRUMENT AIR COMPRESSORS - General**Typical Application and General Component Guidance:**

This component is used to inventory air compressors dedicated to HVAC controls.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

This component type is NOT used to capture air compressors in other applications other than HVAC systems such as 1) Maintenance garages, 2) Gas stations, and 3) Dry-type fire suppression system charge.

General

In older buildings, pneumatic controls may be present, and this is where this component type should be used. Often, this is used to capture items that should be captured elsewhere in the catalog due to having 'air compressor' in the title.

Lesson Learned

Large air compressors used to power pneumatic devices are very common in maintenance shops. If 'E103004 AUTOMOTIVE SHOP EQUIPMENT' is in scope, that is where these compressors would be captured. Do not use D306004.

Note that if a dry pipe D40 system is present, there is often an air compressor to charge the system. Use 'D402001 FIRE PROTECTION WATER PIPING AND EQUIPMENT - Air compressor' to capture this item.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	Yes	Yes	No	No	No	25	EA

D309090 OTHER SPECIAL MECHANICAL SYSTEMS - Ventilation/Heat Recovery System - 1000 CFM**Typical Application and General Component Guidance:**

This component is used to inventory heat recovery systems.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

This is used to inventory all types of energy recovery devices such as enthalpy wheels, fixed plate, and heat pipe. Assessor should indicate the appropriate type in the 'equipment type' section detail field.

Lesson Learned

The photo shows a small residential style heat recovery system. These systems can range a great deal in size. Assessors should look for four ducts heading to one unit as an indicator that a heat recovery system may be present.

Reinspection

Prior to the 2019 update, there was no CFM breakdown for this component type. Assessor can assume that when performing a reinspection on data collected before the 2019 update, an update of the component type will be required.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Ventilation/Heat Recovery System - 1000 CFM	Yes	Yes	Yes	No	No	No	20	EA

D30 HVAC

D301001 OIL SUPPLY SYSTEM

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	MBH
Other	No	No	No	No	N/A	No	20	MBH
Unknown	No	No	No	No	N/A	No	20	MBH

D301002 GAS SUPPLY SYSTEM

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Fuel Storage Tank	No	No	No	No	N/A	No	75	EA
Fuel Storage Tank - Fuel Storage Tank, 1000 GAL	Yes	Yes	Yes	No	No	No	50	EA
Fuel Storage Tank - Fuel Storage Tank, 2500 GAL	Yes	Yes	Yes	No	No	No	50	EA
Fuel Storage Tank - Fuel Storage Tank, 5000 GAL	Yes	Yes	Yes	No	No	No	50	EA
Gas Meter	No	No	No	No	N/A	No	50	EA
General	No	No	No	No	N/A	No	50	MBH
Other	No	No	No	No	N/A	No	50	MBH
Unknown	No	No	No	No	N/A	No	50	MBH

D301003 STEAM SUPPLY SYSTEM (FROM CENTRAL PLANT)

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	MBH
Other	No	No	No	No	N/A	No	20	MBH
Unknown	No	No	No	No	N/A	No	20	MBH

D301004 HOT WATER SUPPLY SYSTEM (FROM CENTRAL PLANT)

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	MBH
Other	No	No	No	No	N/A	No	20	MBH
Unknown	No	No	No	No	N/A	No	20	MBH

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D301005 SOLAR ENERGY SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Charge Controller	Yes	Yes	Yes	No	No	No	5	EA
Closed Loop, Space/Hot Water Systems	Yes	No	No	No	Yes	No	25	EA
General	No	No	No	No	N/A	No	25	EA
Other	Yes	No	Yes	Yes	Yes	No	25	EA
PV Module	Yes	No	No	No	Yes	No	10	EA
Solar Inverter	Yes	Yes	Yes	No	No	No	10	EA
Solar Panel - Aluminum Monocrystalline Silicon	Yes	No	No	No	N/A	No	25	SF
Solar Panel - Aluminum Polycrystalline Silicon	Yes	No	No	No	N/A	No	25	SF
Solar Panel - Thin Film AMORPHOUS	Yes	No	No	No	N/A	No	25	SF
Solar Panel - Thin Film Cadmium Telluride	Yes	No	No	No	N/A	No	25	SF
Solar Panel - Thin Film Monocrystalline	Yes	No	No	No	N/A	No	25	SF
Solar Panel Battery - Gel Acid	Yes	Yes	Yes	No	No	No	4	EA
Solar Panel Battery - Lead Acid	Yes	Yes	Yes	No	No	No	4	EA
Solar Panel System	Yes	No	No	No	N/A	No	25	KW
Unknown	No	No	No	No	N/A	No	25	EA

D301006 WIND ENERGY SUPPLY SYSTEM

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	Yes	No	Yes	Yes	Yes	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D301007 COAL SUPPLY SYSTEM

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	MBH
Other	No	No	No	No	N/A	No	20	MBH
Unknown	No	No	No	No	N/A	No	20	MBH

D301090 OTHER ENERGY SUPPLY

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	Yes	Yes	Yes	No	No	25	EA
Ice Bank	Yes	Yes	Yes	No	No	No	25	EA
Other	No	No	No	No	N/A	No	25	EA
Thermal Storage Tank	Yes	Yes	Yes	No	No	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

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D302001 BOILERS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Electric, Hot Water	No	No	No	No	N/A	No	30	EA
Electric, Hot Water - <22 KW, <78 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Hot Water - 22-45 KW, 78-154 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Hot Water - 45-90 KW, 154-308 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Hot Water - 90-135 KW, 308-460 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Hot Water - 135-180 KW, 460-613 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Hot Water - 180-253 KW, 613-863 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Hot Water - 253-370 KW, 863-1263 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Hot Water - 370-555 KW, 1263-1894 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Hot Water - 555-783 KW, 1894-2672 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Hot Water - 783-1110 KW, 2672-3788 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Hot Water - 1110-1710 KW, 3788-5836 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Hot Water - 1710-2355 KW, 5836-8036 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Hot Water - 2355-3105 KW, 8036-10594 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Hot Water - >3105 KW, >10594 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Steam	No	No	No	No	N/A	No	30	EA
Electric, Steam - 25-48 KW, 92-164 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Steam - 48-90 KW, 164-307 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Steam - 90-135 KW, 307-461 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Steam - <25 KW, <92 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Steam - 135-180 KW, 461-614 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Steam - 180-255 KW, 614-870 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Steam - 255-405 KW, 870-1382 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Steam - 405-615 KW, 1382-2098 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Steam - 615-900 KW, 2098-3071 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Steam - 900-1170 KW, 3071-3993 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Steam - 1170-1440 KW, 3993-4914 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Steam - 1440-1845 KW, 4914-6295 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Steam - 1845-2205 KW, 6295-7524 MBH	Yes	Yes	Yes	No	No	No	30	EA
Electric, Steam - >2205 KW, >7524 MBH	Yes	Yes	Yes	No	No	No	30	EA

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Gas, Hot Water	No	No	No	No	N/A	No	30	EA
Gas, Hot Water - <150 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Hot Water - 150-250 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Hot Water - 250-400 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Hot Water - 400-500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Hot Water - 500-650 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Hot Water - 650-900 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Hot Water - 900-1200 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Hot Water - 1200-1800 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Hot Water - 1800-2500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Hot Water - 2500-3500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Hot Water - 3500-4500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Hot Water - 4500-5500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Hot Water - 5500-6500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Hot Water - >6500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Pulse	No	No	No	No	N/A	No	30	EA
Gas, Pulse - Pulse <100,000 BTU	Yes	Yes	Yes	No	No	No	30	EA
Gas, Pulse - Pulse >100,000 BTU	Yes	Yes	Yes	No	No	No	30	EA
Gas, Steam	No	No	No	No	N/A	No	30	EA
Gas, Steam - <150 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Steam - 150-250 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Steam - 250-400 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Steam - 400-650 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Steam - 650-1000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Steam - 1000-2000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Steam - 2000-3000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Steam - 3000-4000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Steam - 4000-5000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Steam - 5000-6500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Steam - >6500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Water Tube	No	No	No	No	N/A	No	30	EA
Gas, Water Tube - Water Tube <1500 MBH	Yes	Yes	Yes	No	No	No	30	EA

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Gas, Water Tube - Water Tube 1500-2000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Water Tube - Water Tube 2000-2700 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Water Tube - Water Tube 2700-4000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas, Water Tube - Water Tube >4000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Fire Tube	No	No	No	No	N/A	No	30	EA
Gas/Oil, Fire Tube - Fire Tube <5,000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Fire Tube - Fire Tube 5,000-7,500	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Fire Tube - Fire Tube 7,500-12,500	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Fire Tube - Fire Tube 12,500-20,000	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Fire Tube - Fire Tube >20,000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Hot Water	No	No	No	No	N/A	No	30	EA
Gas/Oil, Hot Water - <750 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Hot Water - 750-1,000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Hot Water - 1,000-1,250 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Hot Water - 1,250-1,750 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Hot Water - 1,750-2,250 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Hot Water - 2,250-2,750 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Hot Water - 2,750-3,500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Hot Water - 3,500-4,250 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Hot Water - 4,250-5,000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Hot Water - 5,000-5,750 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Hot Water - 5,750-7,500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Hot Water - 7,500-10,000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Hot Water - 10,000-12,500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Hot Water - >12,500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Steam	No	No	No	No	N/A	No	30	EA
Gas/Oil, Steam - <1000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Steam - 1000-1500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Steam - 1500-2250 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Steam - 2250-3000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Steam - 3000-3500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Steam - 3500-4250 MBH	Yes	Yes	Yes	No	No	No	30	EA

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Gas/Oil, Steam - 4250-5000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Steam - 5000-5750 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Steam - 5750-6500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Gas/Oil, Steam - >6500 MBH	Yes	Yes	Yes	No	No	No	30	EA
General	No	No	No	No	N/A	No	30	MBH
Oil, Fire Tube	No	No	No	No	N/A	No	30	EA
Oil, Fire Tube - <5000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, Fire Tube - 5000-7500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, Fire Tube - 7500-12500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, Fire Tube - 12500-20000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, Fire Tube - >20000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, HW	No	No	No	No	N/A	No	30	EA
Oil, HW - <150 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, HW - 150-200 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, HW - 200-700 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, HW - 700-1300 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, HW - 1300-2000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, HW - 2000-3000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, HW - >3000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, Steam	No	No	No	No	N/A	No	30	EA
Oil, Steam - <150 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, Steam - 150-200 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, Steam - 200-700 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, Steam - 700-1300 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, Steam - 1300-2000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, Steam - 2000-3000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, Steam - >3000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, Water Tube	No	No	No	No	N/A	No	30	EA
Oil, Water Tube - <1500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, Water Tube - 1500-2000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, Water Tube - 2000-2700 MBH	Yes	Yes	Yes	No	No	No	30	EA
Oil, Water Tube - 2700-4000 MBH	Yes	Yes	Yes	No	No	No	30	EA

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Oil, Water Tube - >4000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Other	No	No	No	No	N/A	No	30	MBH
Solid Fuel	No	No	No	No	N/A	No	30	EA
Solid Fuel - Natural Draft, <1500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Natural Draft, 1500-1700 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Natural Draft, 1700-2000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Natural Draft, 2000-2400 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Natural Draft, 2400-2800 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Natural Draft, 2800-3300 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Natural Draft, 3300-4000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Natural Draft, 4000-5000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Natural Draft, 5000-6000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Natural Draft, 6000-7000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Natural Draft, 7000-8000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Natural Draft, 8000-10000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Natural Draft, 10000-12000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Natural Draft, 12000-14000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Natural Draft, 14000-16000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Natural Draft, 16000-17500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Natural Draft, >17500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 148 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 175-225 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 225-275 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 275-350 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 350-450 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 450-550 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 550-1000 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 1000-1350 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 1350-1600 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 1600-1800 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 1800-1900 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 1900-2200 MBH	Yes	Yes	Yes	No	No	No	30	EA

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Solid Fuel - Stoker Fired, 2200-2500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 2500-2800 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 2800-3100 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 3100-3400 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 3400-3700 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 3700-3900 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 3900-4100 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 4100-4300 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, 4300-4500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Solid Fuel - Stoker Fired, >4500 MBH	Yes	Yes	Yes	No	No	No	30	EA
Unknown	No	No	No	No	N/A	No	30	MBH

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D302002 FURNACES

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Electric, 10.2 MBH	Yes	Yes	Yes	No	No	No	15	EA
Electric, 17.1 MBH	Yes	Yes	Yes	No	No	No	15	EA
Electric, 27.3 MBH	Yes	Yes	Yes	No	No	No	15	EA
Electric, 34.1 MBH	Yes	Yes	Yes	No	No	No	15	EA
Electric, 51.6 MBH	Yes	Yes	Yes	No	No	No	15	EA
Electric, 68.3 MBH	Yes	Yes	Yes	No	No	No	15	EA
Electric, 85.3 MBH	Yes	Yes	Yes	No	No	No	15	EA
Gas, 100 MBH	Yes	Yes	Yes	No	No	No	15	EA
Gas, 125 MBH	Yes	Yes	Yes	No	No	No	15	EA
Gas, 150 MBH	Yes	Yes	Yes	No	No	No	15	EA
Gas, 200 MBH	Yes	Yes	Yes	No	No	No	15	EA
Gas, 300 MBH	Yes	Yes	Yes	No	No	No	15	EA
Gas, 400 MBH	Yes	Yes	Yes	No	No	No	15	EA
Gas, 45 MBH	Yes	Yes	Yes	No	No	No	15	EA
Gas, 60 MBH	Yes	Yes	Yes	No	No	No	15	EA
Gas, 75 MBH	Yes	Yes	Yes	No	No	No	15	EA
General	No	No	No	No	N/A	No	15	EA
Oil, 134 MBH	Yes	Yes	Yes	No	No	No	15	EA
Oil, 151 MBH	Yes	Yes	Yes	No	No	No	15	EA
Oil, 200 MBH	Yes	Yes	Yes	No	No	No	15	EA
Oil, 300 MBH	Yes	Yes	Yes	No	No	No	15	EA
Oil, 400 MBH	Yes	Yes	Yes	No	No	No	15	EA
Oil, 56 MBH	Yes	Yes	Yes	No	No	No	15	EA
Oil, 84 MBH	Yes	Yes	Yes	No	No	No	15	EA
Oil, 95 MBH	Yes	Yes	Yes	No	No	No	15	EA
Other	No	No	No	No	N/A	No	15	MBH
Solid Fuel	Yes	Yes	Yes	No	No	No	15	EA
Unknown	No	No	No	No	N/A	No	15	MBH

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D302003 FUEL-FIRED UNIT HEATERS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Gas	No	No	No	No	N/A	No	25	EA
Gas - 100 MBH	Yes	Yes	Yes	No	Yes	No	25	EA
Gas - 160 MBH	Yes	Yes	Yes	No	Yes	No	25	EA
Gas - 20 MBH	Yes	Yes	Yes	No	Yes	No	25	EA
Gas - 200 MBH	Yes	Yes	Yes	No	Yes	No	30	EA
Gas - 280 MBH	Yes	Yes	Yes	No	Yes	No	30	EA
Gas - 320 MBH	Yes	Yes	Yes	No	Yes	No	30	EA
Gas - 60 MBH	Yes	Yes	Yes	No	Yes	No	30	EA
General	No	No	No	No	N/A	No	25	MBH
Other	No	No	No	No	N/A	No	25	MBH
Unknown	No	No	No	No	N/A	No	25	MBH

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D302004 AUXILIARY EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Air Separator	Yes	Yes	Yes	No	No	No	35	EA
Air Separator - Air control, air separator, 10" diameter, includes strainer	Yes	Yes	Yes	No	No	No	35	EA
Air Separator - Air control, air separator, 12" diameter, includes strainer	Yes	Yes	Yes	No	No	No	35	EA
Air Separator - Air control, air separator, 2" diameter, includes strainer	Yes	Yes	Yes	No	No	No	35	EA
Air Separator - Air control, air separator, 2-1/2" diameter, includes strainer	Yes	Yes	Yes	No	No	No	35	EA
Air Separator - Air control, air separator, 3" diameter, includes strainer	Yes	Yes	Yes	No	No	No	35	EA
Air Separator - Air control, air separator, 4" diameter, includes strainer	Yes	Yes	Yes	No	No	No	35	EA
Air Separator - Air control, air separator, 5" diameter, includes strainer	Yes	Yes	Yes	No	No	No	35	EA
Air Separator - Air control, air separator, 6" diameter, includes strainer	Yes	Yes	Yes	No	No	No	35	EA
Air Separator - Air control, air separator, 8" diameter, includes strainer	Yes	Yes	Yes	No	No	No	10	EA
Boiler Feedwater Tank	No	No	No	No	N/A	No	20	EA
Boiler Feedwater Tank - Shot chemical feeder, by pass, floor mount, 10 gal	Yes	Yes	Yes	No	No	No	20	EA
Boiler Feedwater Tank - Shot chemical feeder, by pass, floor mount, 5 gal	Yes	Yes	Yes	No	No	No	20	EA
Boiler Feedwater Tank - Shot chemical feeder, by pass, in-line mount, 1.7 gal	Yes	Yes	Yes	No	No	No	20	EA
Chemical Feedwater	No	No	No	No	N/A	No	20	EA
Chemical Feedwater - 125 PSIG, 1.7 gallon	Yes	Yes	Yes	No	No	No	20	EA
Chemical Feedwater - 150 lb., 10 gallon, ASME	Yes	Yes	Yes	No	No	No	20	EA
Chemical Feedwater - 150 lb., 5 gallon, ASME	Yes	Yes	Yes	No	No	No	20	EA
Chemical Feedwater - 175 PSIG, 12 gallon	Yes	Yes	Yes	No	No	No	20	EA
Chemical Feedwater - 175 PSIG, 5 gallon	Yes	Yes	Yes	No	No	No	20	EA
Chemical Feedwater - 300 lb., 10 gallon, ASME	Yes	Yes	Yes	No	No	No	20	EA
Chemical Feedwater - 300 lb., 5 gallon, ASME	Yes	Yes	Yes	No	No	No	20	EA

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Expansion Tank	No	No	No	No	N/A	No	30	EA
Expansion Tank - 1,200 gal	Yes	Yes	Yes	No	No	No	30	EA
Expansion Tank - 100 gal	Yes	Yes	Yes	No	No	No	30	EA
Expansion Tank - 120 gal	Yes	Yes	Yes	No	No	No	30	EA
Expansion Tank - 135 gal	Yes	Yes	Yes	No	No	No	30	EA
Expansion Tank - 15 gal	Yes	Yes	Yes	No	No	No	30	EA
Expansion Tank - 175 gal	Yes	Yes	Yes	No	No	No	30	EA
Expansion Tank - 2,500 gal	Yes	Yes	Yes	No	No	No	30	EA
Expansion Tank - 220 gal	Yes	Yes	Yes	No	No	No	30	EA
Expansion Tank - 24 gal	Yes	Yes	Yes	No	No	No	30	EA
Expansion Tank - 240 gal	Yes	Yes	Yes	No	No	No	30	EA
Expansion Tank - 30 gal	Yes	Yes	Yes	No	No	No	30	EA
Expansion Tank - 305 gal	Yes	Yes	Yes	No	No	No	30	EA
Expansion Tank - 40 gal	Yes	Yes	Yes	No	No	No	30	EA
Expansion Tank - 400 gal	Yes	Yes	Yes	No	No	No	30	EA
Expansion Tank - 528 gal	Yes	Yes	Yes	No	No	No	30	EA
Expansion Tank - 60 gal	Yes	Yes	Yes	No	No	No	30	EA
Expansion Tank - 80 gal	Yes	Yes	Yes	No	No	No	30	EA
General	No	No	No	No	N/A	No	20	MBH
Other	No	No	No	No	N/A	No	20	MBH
Unknown	No	No	No	No	N/A	No	20	MBH

D302005 EQUIPMENT THERMAL INSULATION

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

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D302090 OTHER HEAT GENERATING SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	Yes	Yes	Yes	No	No	30	EA
Other	No	No	No	No	N/A	No	30	EA
Steel Pipe Steam Distribution Service Lateral	No	No	No	No	N/A	No	30	LF
Unknown	No	No	No	No	N/A	No	30	EA

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D303001 CHILLED WATER SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Chiller, Absorption, Gas, Water Cooled	No	No	No	No	N/A	No	20	EA
Chiller, Absorption, Gas, Water Cooled - 800 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Absorption, Gas, Water Cooled - 10 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Absorption, Gas, Water Cooled - 100 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Absorption, Gas, Water Cooled - 1000 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Absorption, Gas, Water Cooled - 200 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Absorption, Gas, Water Cooled - 400 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Absorption, Gas, Water Cooled - 5 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Absorption, Gas, Water Cooled - 600 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Absorption, Steam, Water Cooled	No	No	No	No	N/A	No	20	EA
Chiller, Absorption, Steam, Water Cooled - 750 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Absorption, Steam, Water Cooled - 955 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Absorption, Steam, Water Cooled - 100 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Absorption, Steam, Water Cooled - 1465 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Absorption, Steam, Water Cooled - 1660 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Absorption, Steam, Water Cooled - 200 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Absorption, Steam, Water Cooled - 420 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Centrifugal, Water Cooled	No	No	No	No	N/A	No	20	EA
Chiller, Centrifugal, Water Cooled - 1250 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Centrifugal, Water Cooled - 200 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Centrifugal, Water Cooled - 400 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Centrifugal, Water Cooled - 600 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Centrifugal, Water Cooled - 800 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Centrifugal, Water Cooled - 1000 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Centrifugal, Water Cooled - 1500 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Reciprocating, Air Cooled	No	No	No	No	N/A	No	20	EA
Chiller, Reciprocating, Air Cooled - 20 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Reciprocating, Air Cooled - 30 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Reciprocating, Air Cooled - 40 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Reciprocating, Air Cooled - 50 TN	Yes	Yes	Yes	No	No	No	20	EA

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Chiller, Reciprocating, Air Cooled - 60 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Reciprocating, Air Cooled - 70 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Reciprocating, Air Cooled - 80 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Reciprocating, Air Cooled - 90 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Reciprocating, Air Cooled - 100 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Reciprocating, Air Cooled - 110 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Reciprocating, Air Cooled - 130 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Reciprocating, Air Cooled - 175 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Reciprocating, Air Cooled - 210 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Reciprocating, Water Cooled	No	No	No	No	N/A	No	20	EA
Chiller, Reciprocating, Water Cooled - 60 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Reciprocating, Water Cooled - 100 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Reciprocating, Water Cooled - 150 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Reciprocating, Water Cooled - 200 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Rotary Screw	No	No	No	No	N/A	No	20	EA
Chiller, Rotary Screw - 130 TN, Air Cooled Screw Liquid Chiller	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Rotary Screw - 150 TN, Water Cooled Screw Liquid Chiller, Dual Compressors	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Rotary Screw - 160 TN, Air Cooled Screw Liquid Chiller	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Rotary Screw - 180 TN, Air Cooled Screw Liquid Chiller	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Rotary Screw - 200 TN, Water Cooled Screw Liquid Chiller	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Rotary Screw - 200 TN, Water Cooled Screw Liquid Chiller, Dual Compressors	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Rotary Screw - 210 TN, Air Cooled Screw Liquid Chiller	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Rotary Screw - 270 TN, Air Cooled Screw Liquid Chiller	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Rotary Screw - 291 TN, Water Cooled Screw Liquid Chiller, Dual Compressors	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Rotary Screw - 320 TN, Air Cooled Screw Liquid Chiller	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Rotary Screw - 350 TN, Water Cooled Screw Liquid Chiller	Yes	Yes	Yes	No	No	No	20	EA

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Chiller, Rotary Screw - 80 TN, Water Cooled Screw Liquid Chiller	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Scroll	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Scroll - 100 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Scroll - 125 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Scroll - 150 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Scroll - 165 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Scroll - 180 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Scroll - 200 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Scroll - 225 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Scroll - 25 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Scroll - 250 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Scroll - 275 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Scroll - 300 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Scroll - 50 TN	Yes	Yes	Yes	No	No	No	20	EA
Chiller, Scroll - 75 TN	Yes	Yes	Yes	No	No	No	20	EA
Cooling Tower, Fiberglass	No	No	No	No	N/A	No	15	EA
Cooling Tower, Fiberglass - 60 TN	Yes	Yes	Yes	No	No	No	15	EA
Cooling Tower, Fiberglass - 125 TN	Yes	Yes	Yes	No	No	No	15	EA
Cooling Tower, Fiberglass - 300 TN	Yes	Yes	Yes	No	No	No	15	EA
Cooling Tower, Fiberglass - 600 TN	Yes	Yes	Yes	No	No	No	15	EA
Cooling Tower, Fiberglass - 1000 TN	Yes	Yes	Yes	No	No	No	15	EA
Cooling Tower, Fluid Cooler	Yes	Yes	Yes	No	No	No	15	EA
Cooling Tower, Galvanized	No	No	No	No	N/A	No	15	EA
Cooling Tower, Galvanized - 60 TN	Yes	Yes	Yes	No	No	No	15	EA
Cooling Tower, Galvanized - 110 TN	Yes	Yes	Yes	No	No	No	15	EA
Cooling Tower, Galvanized - 300 TN	Yes	Yes	Yes	No	No	No	15	EA
Cooling Tower, Galvanized - 600 TN	Yes	Yes	Yes	No	No	No	15	EA
Cooling Tower, Galvanized - 1000 TN	Yes	Yes	Yes	No	No	No	15	EA
Cooling Tower, Stainless Steel	No	No	No	No	N/A	No	15	EA
Cooling Tower, Stainless Steel - 60 TN	Yes	Yes	Yes	No	No	No	15	EA
Cooling Tower, Stainless Steel - 110 TN	Yes	Yes	Yes	No	No	No	15	EA
Cooling Tower, Stainless Steel - 300 TN	Yes	Yes	Yes	No	No	No	15	EA

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Cooling Tower, Stainless Steel - 600 TN	Yes	Yes	Yes	No	No	No	15	EA
Cooling Tower, Stainless Steel - 1000 TN	Yes	Yes	Yes	No	No	No	15	EA
General	No	No	No	No	N/A	No	20	TON
Other	No	No	No	No	N/A	No	20	TON
Unknown	No	No	No	No	N/A	No	20	TON

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D303002 DIRECT EXPANSION SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Condenser, DX, Air Cooled	No	No	No	No	N/A	No	15	EA
Condenser, DX, Air Cooled - Belt Drive, 101 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Belt Drive, 159 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Belt Drive, 228 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Belt Drive, 314 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Belt Drive, 45 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Belt Drive, 471 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Belt Drive, 50 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Belt Drive, 54 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Belt Drive, 59 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Belt Drive, 65 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Belt Drive, 73 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Belt Drive, 81 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Belt Drive, 86 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Belt Drive, 88 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 1 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 10 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 105 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 1-1/2 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 118 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 12 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 126 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 136 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 14 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 142 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 16 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 2 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 21 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 26 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 3 ton	Yes	Yes	Yes	No	No	No	15	EA

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Condenser, DX, Air Cooled - Direct Drive, 30 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 41 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 5 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 52 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 63 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 76 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 8 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 86 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Air Cooled - Direct Drive, 97 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Evaporative	No	No	No	No	N/A	No	15	EA
Condenser, DX, Evaporative - 10 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Evaporative - 100 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Evaporative - 110 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Evaporative - 125 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Evaporative - 135 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Evaporative - 15 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Evaporative - 150 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Evaporative - 165 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Evaporative - 185 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Evaporative - 20 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Evaporative - 25 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Evaporative - 30 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Evaporative - 40 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Evaporative - 50 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Evaporative - 65 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Evaporative - 80 ton	Yes	Yes	Yes	No	No	No	15	EA
Condenser, DX, Evaporative - 90 ton	Yes	Yes	Yes	No	No	No	15	EA
General	No	No	No	No	N/A	No	20	TON
Other	No	No	No	No	N/A	No	20	TON
Rooftop Air Conditioning Unit	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - multizone, electric cool, gas heat	No	No	No	No	N/A	No	20	EA

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Rooftop Air Conditioning Unit - multizone, electric cool, gas heat, 105 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - multizone, electric cool, gas heat, 15 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - multizone, electric cool, gas heat, 20 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - multizone, electric cool, gas heat, 25 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - multizone, electric cool, gas heat, 28 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - multizone, electric cool, gas heat, 30 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - multizone, electric cool, gas heat, 40 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - multizone, electric cool, gas heat, 50 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - multizone, electric cool, gas heat, 70 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - multizone, electric cool, gas heat, 80 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - multizone, electric cool, gas heat, 90 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - single zone, electric cool, gas heat	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - single zone, electric cool, gas heat, 10 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - single zone, electric cool, gas heat, 12.5 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - single zone, electric cool, gas heat, 15 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - single zone, electric cool, gas heat, 18 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - single zone, electric cool, gas heat, 2 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - single zone, electric cool, gas heat, 20 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - single zone, electric cool, gas heat, 25 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - single zone, electric cool, gas heat, 3 ton cooling	No	No	No	No	N/A	No	20	EA

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Rooftop Air Conditioning Unit - single zone, electric cool, gas heat, 30 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - single zone, electric cool, gas heat, 4 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - single zone, electric cool, gas heat, 40 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - single zone, electric cool, gas heat, 5 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - single zone, electric cool, gas heat, 6 ton cooling	No	No	No	No	N/A	No	20	EA
Rooftop Air Conditioning Unit - single zone, electric cool, gas heat, 7.5 ton cooling	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	TON

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D303004 AUXILIARY EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Air Separator	No	No	No	No	N/A	No	35	EA
Air Separator - Air control, air separator, 10" diameter, includes strainer	Yes	Yes	Yes	No	No	No	35	EA
Air Separator - Air control, air separator, 12" diameter, includes strainer	Yes	Yes	Yes	No	No	No	35	EA
Air Separator - Air control, air separator, 2" diameter, includes strainer	Yes	Yes	Yes	No	No	No	35	EA
Air Separator - Air control, air separator, 2-1/2" diameter, includes strainer	Yes	Yes	Yes	No	No	No	35	EA
Air Separator - Air control, air separator, 3" diameter, includes strainer	Yes	Yes	Yes	No	No	No	35	EA
Air Separator - Air control, air separator, 4" diameter, includes strainer	Yes	Yes	Yes	No	No	No	35	EA
Air Separator - Air control, air separator, 5" diameter, includes strainer	Yes	Yes	Yes	No	No	No	35	EA
Air Separator - Air control, air separator, 6" diameter, includes strainer	Yes	Yes	Yes	No	No	No	35	EA
Air Separator - Air control, air separator, 8" diameter, includes strainer	Yes	Yes	Yes	No	No	No	35	EA
Chemical Feedwater	No	No	No	No	N/A	No	20	EA
Chemical Feedwater - 125 PSIG, 1.7 gallon	Yes	Yes	Yes	No	No	No	20	EA
Chemical Feedwater - 150 lb., 10 gallon, ASME	Yes	Yes	Yes	No	No	No	20	EA
Chemical Feedwater - 150 lb., 5 gallon, ASME	Yes	Yes	Yes	No	No	No	20	EA
Chemical Feedwater - 175 PSIG, 12 gallon	Yes	Yes	Yes	No	No	No	20	EA
Chemical Feedwater - 175 PSIG, 5 gallon	Yes	Yes	Yes	No	No	No	20	EA
Chemical Feedwater - 300 lb., 10 gallon, ASME	Yes	Yes	Yes	No	No	No	20	EA
Chemical Feedwater - 300 lb., 5 gallon, ASME	Yes	Yes	Yes	No	No	No	20	EA
Expansion Tank	No	No	No	No	N/A	No	19	EA
Expansion Tank - 100 gal	Yes	Yes	Yes	No	No	No	19	EA
Expansion Tank - 120 gal	Yes	Yes	Yes	No	No	No	19	EA
Expansion Tank - 135 gal	Yes	Yes	Yes	No	No	No	19	EA
Expansion Tank - 15 gal	Yes	Yes	Yes	No	No	No	19	EA
Expansion Tank - 175 gal	Yes	Yes	Yes	No	No	No	19	EA

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Expansion Tank - 220 gal	Yes	Yes	Yes	No	No	No	19	EA
Expansion Tank - 24 gal	Yes	Yes	Yes	No	No	No	19	EA
Expansion Tank - 240 gal	Yes	Yes	Yes	No	No	No	19	EA
Expansion Tank - 30 gal	Yes	Yes	Yes	No	No	No	19	EA
Expansion Tank - 305 gal	Yes	Yes	Yes	No	No	No	19	EA
Expansion Tank - 40 gal	Yes	Yes	Yes	No	No	No	19	EA
Expansion Tank - 400 gal	Yes	Yes	Yes	No	No	No	19	EA
Expansion Tank - 60 gal	Yes	Yes	Yes	No	No	No	19	EA
Expansion Tank - 80 gal	Yes	Yes	Yes	No	No	No	19	EA

D303090 OTHER COOLING GENERATING SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	Yes	Yes	Yes	No	No	15	EA
Other	No	No	No	No	N/A	No	15	EA
Refrigeration Compressor	No	No	No	No	N/A	No	15	EA
Unknown	No	No	No	No	N/A	No	15	EA

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D304001 AIR DISTRIBUTION, HEATING & COOLING

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Air Separator	No	No	No	No	N/A	No	35	EA
Air Separator - Air control, air separator, 10" diameter, includes strainer	No	No	No	No	N/A	No	35	EA
Air Separator - Air control, air separator, 12" diameter, includes strainer	No	No	No	No	N/A	No	35	EA
Air Separator - Air control, air separator, 2" diameter, includes strainer	No	No	No	No	N/A	No	35	EA
Air Separator - Air control, air separator, 2-1/2" diameter, includes strainer	No	No	No	No	N/A	No	35	EA
Air Separator - Air control, air separator, 3" diameter, includes strainer	No	No	No	No	N/A	No	35	EA
Air Separator - Air control, air separator, 4" diameter, includes strainer	No	No	No	No	N/A	No	35	EA
Air Separator - Air control, air separator, 5" diameter, includes strainer	No	No	No	No	N/A	No	35	EA
Air Separator - Air control, air separator, 6" diameter, includes strainer	No	No	No	No	N/A	No	35	EA
Air Separator - Air control, air separator, 8" diameter, includes strainer	No	No	No	No	N/A	No	35	EA
Dehumidifier	No	No	No	No	N/A	No	10	EA
Dehumidifier - 1.5 lb./Hr., 50 CFM	Yes	Yes	Yes	No	No	No	10	EA
Dehumidifier - 1060 to 1375 lb./Hr., 40,000 CFM	Yes	Yes	Yes	No	No	No	10	EA
Dehumidifier - 120 to 155 lb./Hr., 4500 CFM	Yes	Yes	Yes	No	No	No	10	EA
Dehumidifier - 16 to 20 lb./Hr., 600 CFM	Yes	Yes	Yes	No	No	No	10	EA
Dehumidifier - 240 to 310 lb./Hr., 9000 CFM	Yes	Yes	Yes	No	No	No	10	EA
Dehumidifier - 3 lb./Hr., 150 CFM	Yes	Yes	Yes	No	No	No	10	EA
Dehumidifier - 30 to 40 lb./Hr., 1125 CFM	Yes	Yes	Yes	No	No	No	10	EA
Dehumidifier - 400 to 515 lb./Hr., 15,000 CFM	Yes	Yes	Yes	No	No	No	10	EA
Dehumidifier - 530 to 690 lb./Hr., 20,000 CFM	Yes	Yes	Yes	No	No	No	10	EA
Dehumidifier - 6 lb./Hr., 150 CFM	Yes	Yes	Yes	No	No	No	10	EA
Dehumidifier - 60 to 75 lb./Hr., 2250 CFM	Yes	Yes	Yes	No	No	No	10	EA
Dehumidifier - 800 to 1030 lb./Hr., 30,000 CFM	Yes	Yes	Yes	No	No	No	10	EA
Ductwork	Yes	No	No	No	N/A	No	40	LF

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Ductwork - Metal Ductwork, 10" Diameter (80 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Metal Ductwork, 12" Diameter (120 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Metal Ductwork, 14" Diameter (160 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Metal Ductwork, 16" Diameter (210 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Metal Ductwork, 18" Diameter (260 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Metal Ductwork, 20" Diameter (320 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Metal Ductwork, 22" Diameter (390 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Metal Ductwork, 24" Diameter (460 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Metal Ductwork, 30" Diameter (710 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Metal Ductwork, 36" Diameter (1020 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Metal Ductwork, 4" Diameter (15 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Metal Ductwork, 5" Diameter (20 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Metal Ductwork, 6" Diameter (30 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Metal Ductwork, 7" Diameter (40 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Metal Ductwork, 8" Diameter (60 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Non-Metal Ductwork, 10" Diameter (80 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Non-Metal Ductwork, 12" Diameter (120 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Non-Metal Ductwork, 18" Diameter (260 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Non-Metal Ductwork, 24" Diameter (460 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Non-Metal Ductwork, 4" Diameter (15 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Non-Metal Ductwork, 6" Diameter (30 SQ IN)	No	No	No	No	N/A	No	40	LF
Ductwork - Non-Metal Ductwork, 8" Diameter (60 SQ IN)	No	No	No	No	N/A	No	40	LF
Fire Dampers	No	No	No	No	N/A	No	20	EA
General	No	No	No	No	N/A	No	20	EA
Humidifier	No	No	No	No	N/A	No	10	EA
Humidifier - 100 lb. per hour	Yes	Yes	Yes	No	No	No	10	EA
Humidifier - 11 lb. per hour	Yes	Yes	Yes	No	No	No	10	EA

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Humidifier - 150 lb. per hour	Yes	Yes	Yes	No	No	No	10	EA
Humidifier - 200 lb. per hour	Yes	Yes	Yes	No	No	No	10	EA
Humidifier - 22 lb. per hour	Yes	Yes	Yes	No	No	No	10	EA
Humidifier - 33 lb. per hour	Yes	Yes	Yes	No	No	No	10	EA
Humidifier - 50 lb. per hour	Yes	Yes	Yes	No	No	No	10	EA
Other	No	No	No	No	N/A	No	20	EA
Smoke Vents	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA
VAV Terminal	No	No	No	No	N/A	No	30	EA
VAV Terminal - 1000 CFM, Cooling Only	Yes	No	No	No	Yes	No	30	EA
VAV Terminal - 1000 CFM, Hot Water Reheat	Yes	No	No	No	Yes	No	30	EA
VAV Terminal - 1250 CFM, Cooling Only	No	No	No	No	N/A	No	30	EA
VAV Terminal - 1250 CFM, Hot Water Reheat	No	No	No	No	N/A	No	30	EA
VAV Terminal - 1500 CFM, Cooling Only	Yes	No	No	No	Yes	No	30	EA
VAV Terminal - 1500 CFM, Hot Water Reheat	Yes	No	No	No	Yes	No	30	EA
VAV Terminal - 200 CFM, Cooling Only	No	No	No	No	N/A	No	30	EA
VAV Terminal - 200 CFM, Hot Water Reheat	No	No	No	No	N/A	No	30	EA
VAV Terminal - 2000 CFM, Cooling Only	Yes	No	No	No	Yes	No	30	EA
VAV Terminal - 2000 CFM, Hot Water Reheat	Yes	No	No	No	Yes	No	30	EA
VAV Terminal - 400 CFM, Cooling Only	Yes	No	No	No	Yes	No	30	EA
VAV Terminal - 400 CFM, Hot Water Reheat	Yes	No	No	No	Yes	No	30	EA
VAV Terminal - 600 CFM, Cooling Only	No	No	No	No	N/A	No	30	EA
VAV Terminal - 600 CFM, Hot Water Reheat	No	No	No	No	N/A	No	30	EA
VAV Terminal - 800 CFM, Cooling Only	No	No	No	No	N/A	No	30	EA
VAV Terminal - 800 CFM, Hot Water Reheat	No	No	No	No	N/A	No	30	EA
VAV Terminal, Fan Powered	No	No	No	No	N/A	No	30	EA
VAV Terminal, Fan Powered - 1000 CFM, Cooling Only	Yes	No	No	No	Yes	No	30	EA
VAV Terminal, Fan Powered - 1000 CFM, Hot Water Reheat	Yes	No	No	No	Yes	No	30	EA
VAV Terminal, Fan Powered - 1250 CFM, Cooling Only	No	No	No	No	N/A	No	30	EA
VAV Terminal, Fan Powered - 1250 CFM, Hot Water Reheat	No	No	No	No	N/A	No	30	EA
VAV Terminal, Fan Powered - 1500 CFM, Cooling Only	Yes	No	No	No	Yes	No	30	EA

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VAV Terminal, Fan Powered - 1500 CFM, Hot Water Reheat	Yes	No	No	No	Yes	No	30	EA
VAV Terminal, Fan Powered - 200 CFM, Cooling Only	No	No	No	No	N/A	No	30	EA
VAV Terminal, Fan Powered - 200 CFM, Hot Water Reheat	No	No	No	No	N/A	No	30	EA
VAV Terminal, Fan Powered - 2000 CFM, Cooling Only	Yes	No	No	No	Yes	No	30	EA
VAV Terminal, Fan Powered - 2000 CFM, Hot Water Reheat	Yes	No	No	No	Yes	No	30	EA
VAV Terminal, Fan Powered - 400 CFM, Cooling Only	Yes	No	No	No	Yes	No	30	EA
VAV Terminal, Fan Powered - 400 CFM, Hot Water Reheat	Yes	No	No	No	Yes	No	30	EA
VAV Terminal, Fan Powered - 600 CFM, Cooling Only	No	No	No	No	N/A	No	30	EA
VAV Terminal, Fan Powered - 600 CFM, Hot Water Reheat	No	No	No	No	N/A	No	30	EA
VAV Terminal, Fan Powered - 800 CFM, Cooling Only	No	No	No	No	N/A	No	30	EA
VAV Terminal, Fan Powered - 800 CFM, Hot Water Reheat	No	No	No	No	N/A	No	30	EA

D304002 STEAM DISTRIBUTION SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Condensate Pumping System - Steam Powered	Yes	Yes	Yes	No	No	No	30	EA
Condensate Pumping System > 25 HP (Single and Duplex)	Yes	Yes	Yes	No	No	No	30	EA
Condensate Pumping System 1 - 5 HP (Single and Duplex)	Yes	Yes	Yes	No	No	No	30	EA
Condensate Pumping System 5 - 25 HP (Single and Duplex)	Yes	Yes	Yes	No	No	No	30	EA
General	Yes	No	No	No	N/A	Yes	30	LF
Other	No	No	No	No	N/A	No	30	MBH
Steam Generator	Yes	Yes	Yes	No	No	No	30	EA
Steam Powered Trap	Yes	Yes	Yes	No	No	No	30	EA
Unknown	No	No	No	No	N/A	No	30	MBH

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D304003 HOT WATER DISTRIBUTION SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Circulating Pump - 1 1/2 HP	Yes	Yes	Yes	No	Yes	No	20	EA
Circulating Pump - 1 HP	Yes	Yes	Yes	No	Yes	No	20	EA
Circulating Pump - 1/2 HP	Yes	Yes	Yes	No	Yes	No	30	EA
Circulating Pump - 1/4 HP	Yes	Yes	Yes	No	Yes	No	30	EA
Circulating Pump, Double Suction	No	No	No	No	N/A	No	20	EA
Circulating Pump, Double Suction - 10" size, 150 HP, to 4000 GPM	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, Double Suction - 6" size, 50 HP, to 1200 GPM	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, Double Suction - 8" size, 100 HP, to 3000 GPM	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, Double Suction - 8" size, 75 HP, to 2500 GPM	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, End Suction	No	No	No	No	N/A	No	20	EA
Circulating Pump, End Suction - 2-1/2" size, 3 HP, to 150 GPM	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, End Suction - 3" size, 5 HP, to 225 GPM	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, End Suction - 4" size, 10 HP	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, End Suction - 4" size, 7-1/2 HP, to 350 GPM	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, End Suction - 5" size, 15 HP, to 1000 GPM	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, End Suction - 6" size, 25 HP, to 1550 GPM	Yes	Yes	Yes	No	No	No	20	EA
General	Yes	No	No	No	N/A	Yes	20	MBH
Heat Exchanger, Plate Type	No	No	No	No	N/A	No	20	EA
Heat Exchanger, Plate Type - 1200 GPM	Yes	Yes	Yes	No	No	No	20	EA
Heat Exchanger, Plate Type - 1800 GPM	Yes	Yes	Yes	No	No	No	20	EA
Heat Exchanger, Plate Type - 400 GPM	Yes	Yes	Yes	No	No	No	20	EA
Heat Exchanger, Plate Type - 800 GPM	Yes	Yes	Yes	No	No	No	20	EA
Heat Exchanger, Shell & Tube	No	No	No	No	N/A	No	20	EA
Heat Exchanger, Shell & Tube - 240 GPM	Yes	Yes	Yes	No	No	No	20	EA

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Heat Exchanger, Shell & Tube - 40 GPM	Yes	Yes	Yes	No	No	No	20	EA
Heat Exchanger, Shell & Tube - 600 GPM	Yes	Yes	Yes	No	No	No	20	EA
Heat Exchanger, Shell & Tube - 96 GPM	Yes	Yes	Yes	No	No	No	20	EA
Other	No	No	No	No	N/A	No	20	MBH
Unknown	No	No	No	No	N/A	No	20	MBH

D304004 CHANGE OVER DISTRIBUTION SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	MBH
Other	No	No	No	No	N/A	No	20	MBH
Unknown	No	No	No	No	N/A	No	20	MBH

D304005 GLYCOL DISTRIBUTION SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	30	LF
Glycol Additive System (Includes Pumps/Tanks/Meters/Controls)	Yes	Yes	Yes	No	No	No	20	EA
Other	No	No	No	No	N/A	No	30	MBH
Unknown	No	No	No	No	N/A	No	30	MBH

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D304006 CHILLED WATER DISTRIBUTION SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Circulating Pump - 1 1/2 HP	Yes	Yes	Yes	No	Yes	No	20	EA
Circulating Pump - 1 HP	Yes	Yes	Yes	No	Yes	No	20	EA
Circulating Pump - 1/2 HP	Yes	Yes	Yes	No	Yes	No	30	EA
Circulating Pump - 1/4 HP	Yes	Yes	Yes	No	Yes	No	20	EA
Circulating Pump, Double Suction	No	No	No	No	N/A	No	20	EA
Circulating Pump, Double Suction - 10" size, 150 HP, to 4000 GPM	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, Double Suction - 6" size, 50 HP, to 1200 GPM	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, Double Suction - 8" size, 100 HP, to 3000 GPM	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, Double Suction - 8" size, 75 HP, to 2500 GPM	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, End Suction	No	No	No	No	N/A	No	20	EA
Circulating Pump, End Suction - 2-1/2" size, 3 HP, to 150 GPM	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, End Suction - 3" size, 5 HP, to 225 GPM	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, End Suction - 4" size, 10 HP	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, End Suction - 4" size, 7-1/2 HP, to 350 GPM	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, End Suction - 5" size, 15 HP, to 1000 GPM	Yes	Yes	Yes	No	No	No	20	EA
Circulating Pump, End Suction - 6" size, 25 HP, to 1550 GPM	Yes	Yes	Yes	No	No	No	20	EA
Condenser Water Pump, Double Suction – 100 HP	Yes	Yes	Yes	No	No	No	20	EA
Condenser Water Pump, Double Suction – 150 HP	Yes	Yes	Yes	No	No	No	20	EA
Condenser Water Pump, Double Suction – 200 HP	Yes	Yes	Yes	No	No	No	20	EA
Condenser Water Pump, Double Suction – 250 HP	Yes	Yes	Yes	No	No	No	20	EA
Condenser Water Pump, Double Suction – 300 HP	Yes	Yes	Yes	No	No	No	20	EA
Condenser Water Pump, Double Suction – 50 HP	Yes	Yes	Yes	No	No	No	20	EA
Condenser Water Pump, Double Suction – 75 HP	Yes	Yes	Yes	No	No	No	20	EA
Condenser Water Pump, End Suction – 10 HP	Yes	Yes	Yes	No	No	No	20	EA

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Condenser Water Pump, End Suction – 15 HP	Yes	Yes	Yes	No	No	No	20	EA
Condenser Water Pump, End Suction – 25 HP	Yes	Yes	Yes	No	No	No	20	EA
Condenser Water Pump, End Suction – 3 HP	Yes	Yes	Yes	No	No	No	20	EA
Condenser Water Pump, End Suction – 5 HP	Yes	Yes	Yes	No	No	No	20	EA
Condenser Water Pump, End Suction – 7-1/2 HP	Yes	Yes	Yes	No	No	No	20	EA
General	Yes	No	No	No	N/A	Yes	20	TON
Other	No	No	No	No	N/A	No	20	TON
Unknown	No	No	No	No	N/A	No	20	TON

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D304007 EXHAUST SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Ceiling Vents, Passive	No	No	No	No	N/A	No	20	EA
Ceiling Vents, Passive - Passive < 50 CFM	No	No	No	No	N/A	No	20	EA
Ceiling Vents, Passive - Passive > 300 CFM	No	No	No	No	N/A	No	20	EA
Ceiling Vents, Passive - Passive 110-180 CFM	No	No	No	No	N/A	No	20	EA
Ceiling Vents, Passive - Passive 200-300 CFM	No	No	No	No	N/A	No	20	EA
Ceiling Vents, Passive - Passive 50-110 CFM	No	No	No	No	N/A	No	20	EA
Commercial/Industrial Vacuum Dust Collection	No	No	No	No	N/A	No	10	EA
Commercial/Industrial Vacuum Dust Collection - 1000 CFM	Yes	Yes	Yes	No	No	No	10	EA
Commercial/Industrial Vacuum Dust Collection - 1500 CFM	Yes	Yes	Yes	No	No	No	10	EA
Commercial/Industrial Vacuum Dust Collection - 3000 CFM	Yes	Yes	Yes	No	No	No	10	EA
Commercial/Industrial Vacuum Dust Collection - 500 CFM	Yes	Yes	Yes	No	No	No	10	EA
Commercial/Industrial Vacuum Dust Collection - 5000 CFM	Yes	Yes	Yes	No	No	No	10	EA
Fan System, Residential Exhaust	No	No	No	No	N/A	No	40	EA
Fan System, Roof Exhaust	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Roof Exhaust - 13,800 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Roof Exhaust - 1500 CFM	Yes	Yes	Yes	No	No	No	10	EA
Fan System, Roof Exhaust - 2750 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Roof Exhaust - 3500 CFM	Yes	Yes	Yes	No	No	No	10	EA
Fan System, Roof Exhaust - 500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Roof Exhaust - 5000 CFM	Yes	Yes	Yes	No	No	No	10	EA
Fan System, Roof Exhaust - 800 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Roof Exhaust - 8500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Utility Set	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Utility Set - 10,000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Utility Set - 15,000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Utility Set - 20,000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Utility Set - 2000 CFM	Yes	Yes	Yes	No	No	No	20	EA

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Fan System, Utility Set - 3500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Utility Set - 5000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Utility Set - 7500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Wall Exhaust	No	No	No	No	N/A	No	10	EA
Fan System, Wall Exhaust - 10,100 CFM	Yes	Yes	Yes	No	No	No	10	EA
Fan System, Wall Exhaust - 13,800 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Wall Exhaust - 14,300 CFM	Yes	Yes	Yes	No	No	No	10	EA
Fan System, Wall Exhaust - 1500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Wall Exhaust - 19,800 CFM	Yes	Yes	Yes	No	No	No	10	EA
Fan System, Wall Exhaust - 26,250 CFM	Yes	Yes	Yes	No	No	No	10	EA
Fan System, Wall Exhaust - 2750 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Wall Exhaust - 3500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Wall Exhaust - 38,500 CFM	Yes	Yes	Yes	No	No	No	10	EA
Fan System, Wall Exhaust - 46,000 CFM	Yes	Yes	Yes	No	No	No	10	EA
Fan System, Wall Exhaust - 500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Wall Exhaust - 5000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Wall Exhaust - 51,500 CFM	Yes	Yes	Yes	No	No	No	10	EA
Fan System, Wall Exhaust - 6175 CFM	Yes	Yes	Yes	No	No	No	10	EA
Fan System, Wall Exhaust - 7500 CFM	Yes	Yes	Yes	No	No	No	10	EA
Fan System, Wall Exhaust - 800 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Wall Exhaust - 8500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fume Hood Exhaust System	No	No	No	No	N/A	No	10	EA
Fume Hood Exhaust System - 10', 8000 CFM	Yes	No	No	No	Yes	No	10	EA
Fume Hood Exhaust System - 3', 1000 CFM	Yes	No	No	No	Yes	No	10	EA
Fume Hood Exhaust System - 4', 2000 CFM	Yes	No	No	No	Yes	No	10	EA
Fume Hood Exhaust System - 6', 3500 CFM	Yes	No	No	No	Yes	No	10	EA
Fume Hood Exhaust System - 6', 5000 CFM	Yes	No	No	No	Yes	No	10	EA
Garage Exhaust Systems	No	No	No	No	N/A	No	10	EA
Garage Exhaust Systems - Dual exhaust, 3" outlets, pair of adjoining bays	Yes	Yes	Yes	No	No	No	10	EA
Garage Exhaust Systems - Single exhaust, 3" outlet, 1 bay	Yes	Yes	Yes	No	No	No	10	EA
General	No	No	No	No	N/A	No	10	EA

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Industrial Exhaust System	No	No	No	No	N/A	No	25	EA
Industrial Exhaust System - 1000 CFM, 1-1/2 H.P.	Yes	Yes	Yes	No	No	No	35	EA
Industrial Exhaust System - 12,000 CFM, 30 H.P.	Yes	Yes	Yes	No	No	No	35	EA
Industrial Exhaust System - 15,000 CFM, 50 H.P.	Yes	Yes	Yes	No	No	No	35	EA
Industrial Exhaust System - 2000 CFM, 3 H.P.	Yes	Yes	Yes	No	No	No	35	EA
Industrial Exhaust System - 25,000 CFM, 75 H.P.	Yes	Yes	Yes	No	No	No	35	EA
Industrial Exhaust System - 4000 CFM, 7-1/2 H.P.	Yes	Yes	Yes	No	No	No	35	EA
Industrial Exhaust System - 50,000 CFM, 100 H.P.	Yes	Yes	Yes	No	No	No	35	EA
Industrial Exhaust System - 8000 CFM, 15 H.P.	Yes	Yes	Yes	No	No	No	35	EA
Kitchen Exhaust/Make-Up Air	No	No	No	No	N/A	No	20	EA
Kitchen Exhaust/Make-Up Air - 12,000 CFM	Yes	Yes	Yes	No	No	No	30	EA
Kitchen Exhaust/Make-Up Air - 16,000 CFM	Yes	Yes	Yes	No	No	No	30	EA
Kitchen Exhaust/Make-Up Air - 2000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Kitchen Exhaust/Make-Up Air - 3000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Kitchen Exhaust/Make-Up Air - 5000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Kitchen Exhaust/Make-Up Air - 8000 CFM	Yes	Yes	Yes	No	No	No	30	EA
Other	Yes	Yes	Yes	Yes	No	No	25	EA
Unknown	No	No	No	No	N/A	No	10	EA

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D304008 AIR HANDLING UNITS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Central Station	No	No	No	No	N/A	No	25	EA
Central Station - 2000 CFM	Yes	Yes	Yes	No	No	No	25	EA
Central Station - 5000 CFM	Yes	Yes	Yes	No	No	No	25	EA
Central Station - 5000 CFM, VAV	Yes	Yes	Yes	No	No	No	25	EA
Central Station - 10000 CFM	Yes	Yes	Yes	No	No	No	25	EA
Central Station - 10000 CFM, VAV	Yes	Yes	Yes	No	No	No	25	EA
Central Station - 15000 CFM	Yes	Yes	Yes	No	No	No	25	EA
Central Station - 15000 CFM, VAV	Yes	Yes	Yes	No	No	No	25	EA
Central Station - 20000 CFM	Yes	Yes	Yes	No	No	No	25	EA
Central Station - 20000 CFM, VAV	Yes	Yes	Yes	No	No	No	25	EA
Central Station - 30000 CFM, VAV	Yes	Yes	Yes	No	No	No	35	EA
Field Fabricated	No	No	No	No	N/A	No	15	EA
Field Fabricated - 75000 CFM, VAV	Yes	Yes	Yes	No	No	No	15	EA
Field Fabricated - 100000 CFM, VAV	Yes	Yes	Yes	No	No	No	15	EA
Field Fabricated - 150000 CFM, VAV	Yes	Yes	Yes	No	No	No	15	EA
Field Fabricated - 40000 CFM	Yes	Yes	Yes	No	No	No	15	EA
Field Fabricated - 60000 CFM	Yes	Yes	Yes	No	No	No	15	EA
Field Fabricated - 75000 CFM	Yes	Yes	Yes	No	No	No	15	EA
General	No	No	No	No	N/A	No	15	EA
Indoor Modular	No	No	No	No	N/A	No	15	EA
Indoor Modular - 10,000 CFM, 25 TN Central AHU	Yes	Yes	Yes	No	No	No	15	EA
Indoor Modular - 12,000 CFM, 30 TN Central AHU	Yes	Yes	Yes	No	No	No	15	EA
Indoor Modular - 3000 CFM, 7.5 TN Central AHU	Yes	Yes	Yes	No	No	No	15	EA
Indoor Modular - 3200 CFM, 8 TN Central AHU	Yes	Yes	Yes	No	No	No	15	EA
Indoor Modular - 4000 CFM, 10 TN Central AHU	Yes	Yes	Yes	No	No	No	15	EA
Indoor Modular - 4400 CFM, 11 TN Central AHU	Yes	Yes	Yes	No	No	No	15	EA
Indoor Modular - 6000 CFM, 15 TN Central AHU	Yes	Yes	Yes	No	No	No	15	EA
Indoor Modular - 7000 CFM, 17.5 TN Central AHU	Yes	Yes	Yes	No	No	No	15	EA
Other	Yes	Yes	Yes	Yes	No	No	15	EA
Rooftop	No	No	No	No	N/A	No	15	EA

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Rooftop - 2000 CFM	Yes	Yes	Yes	No	No	No	15	EA
Rooftop - 5000 CFM	Yes	Yes	Yes	No	No	No	15	EA
Rooftop - 5000 CFM, VAV	Yes	Yes	Yes	No	No	No	15	EA
Rooftop - 10000 CFM	Yes	Yes	Yes	No	No	No	15	EA
Rooftop - 10000 CFM, VAV	Yes	Yes	Yes	No	No	No	15	EA
Rooftop - 15000 CFM	Yes	Yes	Yes	No	No	No	15	EA
Rooftop - 15000 CFM, VAV	Yes	Yes	Yes	No	No	No	15	EA
Rooftop - 20000 CFM	Yes	Yes	Yes	No	No	No	15	EA
Rooftop - 20000 CFM, VAV	Yes	Yes	Yes	No	No	No	15	EA
Rooftop - 30000 CFM, VAV	Yes	Yes	Yes	No	No	No	15	EA
Unknown	No	No	No	No	N/A	No	15	EA

D304090 OTHER DISTRIBUTION SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
2-Pipe Heating/Cooling Distribution Steel Piping - 1 IN	Yes	No	No	No	N/A	Yes	30	LF
2-Pipe Heating/Cooling Distribution Steel Piping - 3 IN	Yes	No	No	No	N/A	Yes	30	LF
General	Yes	Yes	Yes	Yes	No	No	30	EA
Heating/Cooling Distribution Copper Piping - 1 IN	Yes	No	No	No	N/A	Yes	30	LF
Heating/Cooling Distribution Copper Piping - 3 IN	Yes	No	No	No	N/A	Yes	30	LF
Other	No	No	No	No	N/A	No	30	EA
Unknown	No	No	No	No	N/A	No	30	EA

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D305001 UNIT VENTILATORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Air Curtain	Yes	Yes	Yes	No	Yes	No	20	LF
Fan System, Axial	No	No	No	No	No	No	20	EA
Fan System, Axial - 1300 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Axial - 1500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Axial - 2500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Axial - 500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Axial - 5000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Axial - 7500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Axial - 10,000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Axial - 3500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Centrifugal In-Line	No	No	No	No	No	No	20	EA
Fan System, Centrifugal In-Line - 10,000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Centrifugal In-Line - 1300 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Centrifugal In-Line - 1500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Centrifugal In-Line - 2500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Centrifugal In-Line - 3500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Centrifugal In-Line - 500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Centrifugal In-Line - 5000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Centrifugal In-Line - 7500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Large Blade Destratification Fan	Yes	Yes	Yes	No	Yes	No	20	EA
Fan System, Utility Set	No	No	No	No	N/A	No	20	EA
Fan System, Utility Set - 10,000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Utility Set - 15,000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Utility Set - 20,000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Utility Set - 2000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Utility Set - 3500 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Utility Set - 5000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Fan System, Utility Set - 7500 CFM	Yes	Yes	Yes	No	No	No	20	EA
General	No	No	No	No	N/A	No	20	EA
Make-Up Air Unit	No	No	No	No	N/A	No	30	EA

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Make-Up Air Unit - 10,000 CFM, 838 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 12,000 CFM, 1005 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 14,000 CFM, 1180 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 18,000 CFM, 1340 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 20,000 CFM, 1675 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 2000 CFM, 168 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 24,000 CFM, 2007 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 30,000 CFM, 2510 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 3000 CFM, 252 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 35,000 CFM, 2930 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 40,000 CFM, 3350 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 4000 CFM, 336 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 45,000 CFM, 3770 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 50,000 CFM, 4180 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 55,000 CFM, 4600 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 60,000 CFM, 5020 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 6000 CFM, 502 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 65,000 CFM, 5435 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 75,000 CFM, 6275 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA
Make-Up Air Unit - 8000 CFM, 670 MBH, includes standard controls	Yes	Yes	Yes	No	No	No	30	EA

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Other	Yes	Yes	Yes	Yes	No	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D305002 UNIT HEATERS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	25	EA
Hydronic	No	No	No	No	N/A	No	25	EA
Hydronic - 100 MBH	Yes	Yes	Yes	No	Yes	No	30	EA
Hydronic - 150 MBH	Yes	Yes	Yes	No	Yes	No	30	EA
Hydronic - 20 MBH	Yes	Yes	Yes	No	Yes	No	30	EA
Hydronic - 200 MBH	Yes	Yes	Yes	No	Yes	No	30	EA
Hydronic - 300 MBH	Yes	Yes	Yes	No	Yes	No	30	EA
Hydronic - 60 MBH	Yes	Yes	Yes	No	Yes	No	30	EA
Infrared	No	No	No	No	N/A	No	25	EA
Infrared - 105 MBH	Yes	Yes	Yes	No	Yes	No	25	EA
Infrared - 105,000 BTU	Yes	Yes	Yes	No	Yes	No	25	EA
Infrared - 119,000 BTU	Yes	Yes	Yes	No	Yes	No	25	EA
Infrared - 120 MBH	Yes	Yes	Yes	No	Yes	No	25	EA
Infrared - 13.5 kW, 40,956 BTU	Yes	Yes	Yes	No	Yes	No	25	EA
Infrared - 15 MBH	Yes	Yes	Yes	No	Yes	No	25	EA
Infrared - 24 kW, 81,912 BTU	Yes	Yes	Yes	No	Yes	No	25	EA
Infrared - 30 MBH	Yes	Yes	Yes	No	Yes	No	25	EA
Infrared - 45 MBH	Yes	Yes	Yes	No	Yes	No	25	EA
Infrared - 50 MBH	Yes	Yes	Yes	No	Yes	No	25	EA
Infrared - 6 kW, 20,478 BTU	Yes	Yes	Yes	No	Yes	No	25	EA
Infrared - 60 MBH	Yes	Yes	Yes	No	Yes	No	25	EA
Infrared - 75 MBH	Yes	Yes	Yes	No	Yes	No	25	EA
Infrared - 90 MBH	Yes	Yes	Yes	No	Yes	No	25	EA
Infrared - 91,000 BTU	Yes	Yes	Yes	No	Yes	No	25	EA
Other	Yes	Yes	Yes	Yes	Yes	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

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D305003 FAN COIL UNITS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Cab Mount, Four Pipe	No	No	No	No	N/A	No	15	EA
Cab Mount, Four Pipe - 1 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Cab Mount, Four Pipe - 1/2 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Cab Mount, Four Pipe - 1-1/2 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Cab Mount, Four Pipe - 2 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Cab Mount, Four Pipe - 3 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Cab Mount, Two Pipe	No	No	No	No	N/A	No	15	EA
Cab Mount, Two Pipe - 1 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Cab Mount, Two Pipe - 1 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA
Cab Mount, Two Pipe - 1/2 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Cab Mount, Two Pipe - 1/2 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA
Cab Mount, Two Pipe - 1-1/2 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Cab Mount, Two Pipe - 1-1/2 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA
Cab Mount, Two Pipe - 2 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Cab Mount, Two Pipe - 2 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA
Cab Mount, Two Pipe - 3 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Cab Mount, Two Pipe - 3 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe	No	No	No	No	N/A	No	15	EA
Duct Mount, 2 Pipe - 1 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 1 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 1/2 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 1/2 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 10 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 10 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 1-1/2 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 1-1/2 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 2 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 2 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 3 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 3 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA

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Duct Mount, 2 Pipe - 3-1/2 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 3-1/2 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 4 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 4 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 5 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 5 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 6 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 6 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 7 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 7 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 8 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 2 Pipe - 8 ton, Elec. Heat	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 4 Pipe	No	No	No	No	N/A	No	15	EA
Duct Mount, 4 Pipe - 1 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 4 Pipe - 1/2 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 4 Pipe - 10 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 4 Pipe - 1-1/2 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 4 Pipe - 2 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 4 Pipe - 3 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 4 Pipe - 3.5 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 4 Pipe - 4 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 4 Pipe - 5 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 4 Pipe - 6 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 4 Pipe - 7 ton	Yes	Yes	Yes	No	Yes	No	15	EA
Duct Mount, 4 Pipe - 8 ton	Yes	Yes	Yes	No	Yes	No	15	EA
DX	No	No	No	No	N/A	No	15	EA
DX - 1.5 ton	Yes	Yes	Yes	No	Yes	No	15	EA
DX - 10 ton	Yes	Yes	Yes	No	Yes	No	15	EA
DX - 11 ton	Yes	Yes	Yes	No	Yes	No	15	EA
DX - 15 ton	Yes	Yes	Yes	No	Yes	No	15	EA
DX - 2 ton	Yes	Yes	Yes	No	Yes	No	15	EA
DX - 2.5 ton	Yes	Yes	Yes	No	Yes	No	15	EA

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DX - 20 ton	Yes	Yes	Yes	No	Yes	No	15	EA
DX - 25 ton	Yes	Yes	Yes	No	Yes	No	15	EA
DX - 3 ton	Yes	Yes	Yes	No	Yes	No	15	EA
DX - 3.5 ton	Yes	Yes	Yes	No	Yes	No	15	EA
DX - 30 ton	Yes	Yes	Yes	No	Yes	No	15	EA
DX - 4 ton	Yes	Yes	Yes	No	Yes	No	15	EA
DX - 5 ton	Yes	Yes	Yes	No	Yes	No	15	EA
DX - 7.5 ton	Yes	Yes	Yes	No	Yes	No	15	EA
General	No	No	No	No	N/A	No	15	EA
Other	Yes	Yes	Yes	Yes	Yes	No	15	EA
Unknown	No	No	No	No	N/A	No	15	EA

D305004 FIN TUBE RADIATION

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Baseboard Heating	No	No	No	No	N/A	No	30	EA
Baseboard Heating - 1" Copper Tube	Yes	No	No	No	N/A	No	30	LF
Baseboard Heating - 1/2" Copper Tube	Yes	No	No	No	N/A	No	30	LF
Baseboard Heating - 10' long	Yes	No	No	No	Yes	No	30	EA
Baseboard Heating - 1-1/4" Copper Tube	Yes	No	No	No	N/A	No	30	LF
Baseboard Heating - 2' long	Yes	No	No	No	Yes	No	30	EA
Baseboard Heating - 3/4" Copper Tube	Yes	No	No	No	N/A	No	30	LF
Baseboard Heating - 6' long	Yes	No	No	No	Yes	No	30	EA
Baseboard Heating - 8' long	Yes	No	No	No	Yes	No	30	EA
General	No	No	No	No	N/A	No	30	LF
Other	No	No	No	No	N/A	No	30	EA
Unknown	No	No	No	No	N/A	No	30	EA

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D305005 ELECTRIC HEATING

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
208-240 volt, 10 kW	Yes	Yes	Yes	No	Yes	No	25	EA
208-240 volt, 15 kW	Yes	Yes	Yes	No	Yes	No	25	EA
208-240 volt, 2 kW	Yes	Yes	Yes	No	Yes	No	30	EA
208-240 volt, 20 kW	Yes	Yes	Yes	No	Yes	No	25	EA
208-240 volt, 25 kW	Yes	Yes	Yes	No	Yes	No	25	EA
208-240 volt, 5 kW	Yes	Yes	Yes	No	Yes	No	25	EA
208-240 volt, 7 kW	Yes	Yes	Yes	No	Yes	No	25	EA
480 volt, 10 kW	Yes	Yes	Yes	No	Yes	No	30	EA
480 volt, 13 kW	Yes	Yes	Yes	No	Yes	No	30	EA
480 volt, 15 kW	Yes	Yes	Yes	No	Yes	No	30	EA
480 volt, 2 kW	Yes	Yes	Yes	No	Yes	No	30	EA
480 volt, 20 kW	Yes	Yes	Yes	No	Yes	No	30	EA
480 volt, 25 kW	Yes	Yes	Yes	No	Yes	No	30	EA
480 volt, 30 kW	Yes	Yes	Yes	No	Yes	No	30	EA
480 volt, 40 kW	Yes	Yes	Yes	No	Yes	No	30	EA
480 volt, 5 kW	Yes	Yes	Yes	No	Yes	No	30	EA
480 volt, 50 kW	Yes	Yes	Yes	No	Yes	No	30	EA
480 volt, 7 kW	Yes	Yes	Yes	No	Yes	No	30	EA
General	No	No	No	No	N/A	No	25	EA
Other	Yes	Yes	Yes	Yes	No	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

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D305006 PACKAGE UNITS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
A/C Unit, Computer Room	No	No	No	No	N/A	No	20	EA
A/C Unit, Computer Room - Air Cooled, 10 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Air Cooled, 15 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Air Cooled, 20 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Air Cooled, 23 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Air Cooled, 3 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Air Cooled, 5 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Air Cooled, 8 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Chilled Water, 10 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Chilled Water, 15 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Chilled Water, 20 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Chilled Water, 23 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Chilled Water, 5 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Chilled Water, 8 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Glycol System, 10 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Glycol System, 15 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Glycol System, 20 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Glycol System, 23 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Glycol System, 3 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Glycol System, 5 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Glycol System, 8 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Water Cooled, 15 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Water Cooled, 20 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Water Cooled, 23 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Water Cooled, 3 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Water Cooled, 5 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Computer Room - Water Cooled, 8 ton	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Package Terminal	No	No	No	No	N/A	No	20	EA
A/C Unit, Package Terminal - Fan Coil Air Conditioning Cabinet Mounted filter controls, DX, 1.5 TN	Yes	Yes	Yes	No	No	No	20	EA

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A/C Unit, Package Terminal - Fan Coil Air Conditioning Cabinet Mounted filter controls, DX, 10 TN	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Package Terminal - Fan Coil Air Conditioning Cabinet Mounted filter controls, DX, 20 TN	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Package Terminal - Fan Coil Air Conditioning Cabinet Mounted filter controls, DX, 5 TN	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Package Terminal - Packaged Terminal AC, 12,000 BTUH cooling, 13,900 BTUH heat	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Package Terminal - Packaged Terminal AC, 15,000 BTUH cooling, 13,900 BTUH heat	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Package Terminal - Packaged Terminal AC, 18,000 BTUH, 10 kw	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Package Terminal - Packaged Terminal AC, 24,000 BTUH, 10 kw	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Package Terminal - Packaged Terminal AC, 30,000 BTUH, 10 kw	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Package Terminal - Packaged Terminal AC, 36,000 BTUH, 10 kw	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Package Terminal - Packaged Terminal AC, 42,000 BTUH, 10 kw	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Package Terminal - Packaged Terminal AC, 48,000 BTUH, 10 kw	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Package Terminal - Packaged Terminal AC, 6,000 BTUH cooling, 8,800 BTUH heat	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Package Terminal - Packaged Terminal AC, 9,000 BTUH cooling, 13,900 BTUH heat	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Split Systems w/ Air Cooled Condenser	No	No	No	No	No	No	20	EA
A/C Unit, Split Systems w/ Air Cooled Condenser - 10 TN	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Split Systems w/ Air Cooled Condenser - 100 TN	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Split Systems w/ Air Cooled Condenser - 2 TN	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Split Systems w/ Air Cooled Condenser - 3 TN	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Split Systems w/ Air Cooled Condenser - 35 TN	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Split Systems w/ Air Cooled Condenser - 4 TN	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Split Systems w/ Air Cooled Condenser - 45 TN	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Split Systems w/ Air Cooled Condenser - 5 TN	Yes	Yes	Yes	No	No	No	20	EA

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A/C Unit, Split Systems w/ Air Cooled Condenser - 60 TN	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Split Systems w/ Air Cooled Condenser - 75 TN	Yes	Yes	Yes	No	No	No	20	EA
A/C Unit, Thru-Wall	No	No	No	No	N/A	No	20	EA
A/C Unit, Thru-Wall - 1 ton	Yes	Yes	Yes	No	Yes	No	20	EA
A/C Unit, Thru-Wall - 1/2 ton	Yes	Yes	Yes	No	Yes	No	20	EA
A/C Unit, Thru-Wall - 1-1/2 ton	Yes	Yes	Yes	No	Yes	No	20	EA
A/C Unit, Thru-Wall - 2 ton	Yes	Yes	Yes	No	Yes	No	20	EA
A/C Unit, Thru-Wall - 3/4 ton	Yes	Yes	Yes	No	Yes	No	20	EA
A/C Unit, Window	No	No	No	No	N/A	No	20	EA
Evaporative Cooler	No	No	No	No	N/A	No	20	EA
Evaporative Cooler - 1785 CFM	Yes	Yes	Yes	No	No	No	20	EA
Evaporative Cooler - 2740 CFM	Yes	Yes	Yes	No	No	No	20	EA
Evaporative Cooler - 3235 CFM	Yes	Yes	Yes	No	No	No	20	EA
Evaporative Cooler - 3625 CFM	Yes	Yes	Yes	No	No	No	20	EA
Evaporative Cooler - 4215 CFM	Yes	Yes	Yes	No	No	No	20	EA
Evaporative Cooler - 5255 CFM	Yes	Yes	Yes	No	No	No	20	EA
Evaporative Cooler - 6090 CFM	Yes	Yes	Yes	No	No	No	20	EA
Evaporative Cooler - 8300 CFM	Yes	Yes	Yes	No	No	No	20	EA
Evaporative Cooler - 8360 CFM	Yes	Yes	Yes	No	No	No	20	EA
Evaporative Cooler - 9725 CFM	Yes	Yes	Yes	No	No	No	20	EA
Evaporative Cooler - 11715 CFM	Yes	Yes	Yes	No	No	No	20	EA
Evaporative Cooler - 14410 CFM	Yes	Yes	Yes	No	No	No	20	EA
General	No	No	No	No	N/A	No	20	EA
Heat Pump Package Condenser/Evaporator/Air Handler - 1.5 TN	Yes	Yes	Yes	No	No	No	15	EA
Heat Pump Package Condenser/Evaporator/Air Handler - 2 TN	Yes	Yes	Yes	No	No	No	15	EA
Heat Pump Package Condenser/Evaporator/Air Handler - 2.5 TN	Yes	Yes	Yes	No	No	No	15	EA
Heat Pump Package Condenser/Evaporator/Air Handler - 3 TN	Yes	Yes	Yes	No	No	No	15	EA
Heat Pump Package Condenser/Evaporator/Air Handler - 5 TN	Yes	Yes	Yes	No	No	No	15	EA

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Heat Pump Package Condenser/Evaporator/Air Handler - 7.5 TN	Yes	Yes	Yes	No	No	No	15	EA
Heat Pump Package Condenser/Evaporator/Air Handler -3.5 TN	Yes	Yes	Yes	No	No	No	15	EA
Heat Pump Water Source Single Package - 1 TN	Yes	Yes	Yes	No	No	No	15	EA
Heat Pump Water Source Single Package - 2 TN	Yes	Yes	Yes	No	No	No	15	EA
Heat Pump Water Source Single Package - 3 TN	Yes	Yes	Yes	No	No	No	15	EA
Heat Pump Water Source Single Package - 5 TN	Yes	Yes	Yes	No	No	No	15	EA
Heat Pump Water Source Single Package - 7.5 TN	Yes	Yes	Yes	No	No	No	15	EA
Heat Pump, Air Source, Roof Top	No	No	No	No	N/A	No	20	EA
Heat Pump, Air Source, Roof Top - 10 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Air Source, Roof Top - 20 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Air Source, Roof Top - 30 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Air Source, Roof Top - 40 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Air Source, Roof Top - 50 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Air Source, Roof Top - 60 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Duct Mounted, Horizontal	No	No	No	No	N/A	No	20	EA
Heat Pump, Duct Mounted, Horizontal - 1 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Duct Mounted, Horizontal - 1-1/2 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Duct Mounted, Horizontal - 2 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Duct Mounted, Horizontal - 3 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Duct Mounted, Horizontal - 3-1/2 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Thru-Wall	No	No	No	No	N/A	No	20	EA
Heat Pump, Thru-Wall - 1 ton	Yes	Yes	Yes	No	Yes	No	20	EA
Heat Pump, Thru-Wall - 1/2 ton	Yes	Yes	Yes	No	Yes	No	20	EA
Heat Pump, Thru-Wall - 1-1/2 ton	Yes	Yes	Yes	No	Yes	No	20	EA
Heat Pump, Thru-Wall - 2 ton	Yes	Yes	Yes	No	Yes	No	20	EA
Heat Pump, Thru-Wall - 3/4 ton	Yes	Yes	Yes	No	Yes	No	20	EA
Heat Pump, Water Source, Central Station	No	No	No	No	N/A	No	20	EA
Heat Pump, Water Source, Central Station - 10 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Water Source, Central Station - 20 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Water Source, Central Station - 30 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Water Source, Central Station - 40 ton	Yes	Yes	Yes	No	No	No	20	EA

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Heat Pump, Water Source, Central Station - 5 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Water Source, Central Station - 50 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Water Source, Console	No	No	No	No	N/A	No	20	EA
Heat Pump, Water Source, Console - 1 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Water Source, Console - 1-1/2 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Water Source, Console - 2 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Water Source, Console - 3 ton	Yes	Yes	Yes	No	No	No	20	EA
Heat Pump, Water Source, Console - 3-1/2 ton	Yes	Yes	Yes	No	No	No	20	EA
Other	Yes	Yes	Yes	Yes	No	No	20	EA
Packaged A/C, Air Cooled, Elec Heat	No	No	No	No	N/A	No	20	EA
Packaged A/C, Air Cooled, Elec Heat - 10 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, Elec Heat - 10 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, Elec Heat - 20 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, Elec Heat - 20 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, Elec Heat - 30 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, Elec Heat - 30 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, Elec Heat - 40 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, Elec Heat - 40 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, Elec Heat - 5 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, Elec Heat - 50 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, Elec Heat - 50 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, Elec Heat - 60 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, HW Heat	No	No	No	No	N/A	No	20	EA
Packaged A/C, Air Cooled, HW Heat - 10 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, HW Heat - 10 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, HW Heat - 20 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, HW Heat - 20 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, HW Heat - 30 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, HW Heat - 30 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, HW Heat - 40 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, HW Heat - 40 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, HW Heat - 5 ton	Yes	Yes	Yes	No	No	No	20	EA

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Packaged A/C, Air Cooled, HW Heat - 50 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, HW Heat - 50 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Air Cooled, HW Heat - 60 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, Elec Heat	No	No	No	No	N/A	No	20	EA
Packaged A/C, Water Cooled, Elec Heat - 10 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, Elec Heat - 10 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, Elec Heat - 20 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, Elec Heat - 20 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, Elec Heat - 30 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, Elec Heat - 30 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, Elec Heat - 40 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, Elec Heat - 40 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, Elec Heat - 5 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, Elec Heat - 50 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, Elec Heat - 50 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, Elec Heat - 60 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, HW Heat	No	No	No	No	N/A	No	20	EA
Packaged A/C, Water Cooled, HW Heat - 10 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, HW Heat - 10 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, HW Heat - 20 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, HW Heat - 20 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, HW Heat - 30 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, HW Heat - 30 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, HW Heat - 40 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, HW Heat - 40 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, HW Heat - 5 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, HW Heat - 50 ton	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, HW Heat - 50 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged A/C, Water Cooled, HW Heat - 60 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Packaged DX Refrigerant System	No	No	No	No	N/A	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 1.5 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 10 ton	Yes	Yes	Yes	No	No	No	15	EA

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Packaged DX Refrigerant System - Air Cooled, 100 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 11 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 15 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 2 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 2.5 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 20 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 25 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 3 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 3.5 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 30 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 4 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 40 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 5 Ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 50 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 60 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 7.5 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 75 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 8.5 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Air Cooled, 80 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Water Cooled, 10 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Water Cooled, 100 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Water Cooled, 120 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Water Cooled, 15 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Water Cooled, 20 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Water Cooled, 30 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Water Cooled, 40 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Water Cooled, 5 Ton	Yes	Yes	Yes	No	No	No	15	EA

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Complete Component Catalog Breakdown

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D30 HVAC

Packaged DX Refrigerant System - Water Cooled, 60 ton	Yes	Yes	Yes	No	No	No	15	EA
Packaged DX Refrigerant System - Water Cooled, 80 ton	Yes	Yes	Yes	No	No	No	15	EA
Rooftop Unit	No	No	No	No	N/A	No	20	EA
Rooftop Unit - 12-1/2 ton	Yes	Yes	Yes	No	No	No	20	EA
Rooftop Unit - 12-1/2 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Rooftop Unit - 18 ton	Yes	Yes	Yes	No	No	No	20	EA
Rooftop Unit - 18 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Rooftop Unit - 25 ton	Yes	Yes	Yes	No	No	No	20	EA
Rooftop Unit - 25 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Rooftop Unit - 40 ton	Yes	Yes	Yes	No	No	No	20	EA
Rooftop Unit - 40 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Rooftop Unit - 5 ton	Yes	Yes	Yes	No	No	No	20	EA
Rooftop Unit - 60 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Rooftop Unit - 7-1/2 ton	Yes	Yes	Yes	No	No	No	20	EA
Rooftop Unit - 80 ton, VAV	Yes	Yes	Yes	No	No	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA
Window Unit Air Conditioner - 1 TN	No	No	No	No	N/A	No	10	EA

D305090 OTHER TERMINAL & PACKAGE UNITS

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	Yes	Yes	Yes	No	No	25	EA
Other	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D30

D306001 HVAC CONTROLS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA
VFD, 10 HP	Yes	Yes	Yes	No	No	No	19	EA
VFD, 100 HP	Yes	Yes	Yes	No	No	No	19	EA
VFD, 125 HP	Yes	Yes	Yes	No	No	No	19	EA
VFD, 15 HP	Yes	Yes	Yes	No	No	No	19	EA
VFD, 150 HP	Yes	Yes	Yes	No	No	No	19	EA
VFD, 20 HP	Yes	Yes	Yes	No	No	No	19	EA
VFD, 200 HP	Yes	Yes	Yes	No	No	No	19	EA
VFD, 25 HP	Yes	Yes	Yes	No	No	No	19	EA
VFD, 30 HP	Yes	Yes	Yes	No	No	No	19	EA
VFD, 40 HP	Yes	Yes	Yes	No	No	No	19	EA
VFD, 5 HP	Yes	Yes	Yes	No	No	No	19	EA
VFD, 50 HP	Yes	Yes	Yes	No	No	No	19	EA
VFD, 60 HP	Yes	Yes	Yes	No	No	No	19	EA
VFD, 7.5 HP	Yes	Yes	Yes	No	No	No	19	EA
VFD, 75 HP	Yes	Yes	Yes	No	No	No	19	EA

D306002 ELECTRONIC CONTROLS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Analog inputs, sensors, CFM/transducer	No	No	No	No	N/A	No	10	EA
Analog inputs, sensors, duct humidity, +/- 3%	No	No	No	No	N/A	No	10	EA
Analog inputs, sensors, duct static pressure	No	No	No	No	N/A	No	10	EA
Analog inputs, sensors, duct temperature	No	No	No	No	N/A	No	10	EA
Analog inputs, sensors, KW/transducer	No	No	No	No	N/A	No	10	EA
Analog inputs, sensors, KWH totalization	No	No	No	No	N/A	No	10	EA
Analog inputs, sensors, space humidity, +/- 2%	No	No	No	No	N/A	No	10	EA
Analog inputs, sensors, space static pressure	No	No	No	No	N/A	No	10	EA
Analog inputs, sensors, space temperature	No	No	No	No	N/A	No	10	EA
Analog inputs, sensors, steam flow	No	No	No	No	N/A	No	10	EA
Analog inputs, sensors, steam pressure	No	No	No	No	N/A	No	10	EA
Analog inputs, sensors, water flow	No	No	No	No	N/A	No	10	EA
Analog inputs, sensors, water pressure different	No	No	No	No	N/A	No	10	EA
Analog inputs, sensors, water temperature	No	No	No	No	N/A	No	10	EA
Analog outputs, electric, excl. control device	No	No	No	No	N/A	No	10	EA
Analog outputs, material in MUX	No	No	No	No	N/A	No	10	EA
Analog outputs, P/I transducer	No	No	No	No	N/A	No	10	EA
Analog outputs, pneumatic, excl. control device	No	No	No	No	N/A	No	10	EA
controller MUX panel, 128 point, incl. function boards	No	No	No	No	N/A	No	10	EA
controller MUX panel, 48 point, incl. function boards	No	No	No	No	N/A	No	10	EA
D.D.C controller, mechanical room, 16 point	No	No	No	No	N/A	No	10	EA
D.D.C controller, mechanical room, 32 point	No	No	No	No	N/A	No	10	EA
D.D.C controller, space, V.A.V terminal box, incl	No	No	No	No	N/A	No	10	EA
D.D.C. Control Panel	Yes	Yes	Yes	No	No	No	20	EA
Digital inputs, Status (alarms), current sensor	No	No	No	No	N/A	No	10	EA
Digital inputs, Status (alarms), differential pressure	No	No	No	No	N/A	No	10	EA
Digital inputs, Status (alarms), duct high temperature	No	No	No	No	N/A	No	10	EA
Digital inputs, Status (alarms), duct smoke detector	No	No	No	No	N/A	No	10	EA
Digital inputs, Status (alarms), fire	No	No	No	No	N/A	No	10	EA
Digital inputs, Status (alarms), freeze	No	No	No	No	N/A	No	10	EA

Complete Component Catalog Breakdown

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D30 HVAC

Digital output, Status (alarms), on/off	No	No	No	No	N/A	No	10	EA
Digital output, Status (alarms), start/stop	No	No	No	No	N/A	No	10	EA
General	Yes	No	No	No	Yes	Yes	10	EA
Other	No	No	No	No	N/A	No	10	EA
Status alarms, digital inputs, differential pressure	No	No	No	No	N/A	No	10	EA
Unknown	No	No	No	No	N/A	No	10	EA

D30

D306003 PNEUMATIC CONTROLS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Air supply for pneumatic, tank mounted duplex compressor	No	No	No	No	N/A	No	10	EA
boiler room combustion air, damper to 5 SF, controls	No	No	No	No	N/A	No	10	EA
Compensated hot water from boiler, valve control, readout & reset at panel, 120 GPM	No	No	No	No	N/A	No	10	EA
Compensated hot water from boiler, valve control, readout & reset at panel, 240 GPM	No	No	No	No	N/A	No	10	EA
Compensated hot water from valve control, readout & reset at panel	No	No	No	No	N/A	No	10	EA
fan coil, heating & cooling valves, 4 pipe control system	No	No	No	No	N/A	No	10	EA
General	Yes	No	No	No	Yes	Yes	10	EA
heat & vent, split, mixed air control, economizer cycle, over 20 tons	No	No	No	No	N/A	No	10	EA
heat & vent, split, mixed air control, enthalpy cycle, 10 to 20 tons	No	No	No	No	N/A	No	10	EA
heat & vent, split, mixed air control, enthalpy cycle, up to 10 tons	No	No	No	No	N/A	No	10	EA
heat exchanger system controls	No	No	No	No	N/A	No	10	EA
Heating & ventilating, split system, cooling coil, chilled water	No	No	No	No	N/A	No	10	EA
Heating & ventilating, split system, cooling tower, fan cycle	No	No	No	No	N/A	No	10	EA
Heating & ventilating, split system, heating coil, hot water, 3 way valve	No	No	No	No	N/A	No	10	EA
Heating & ventilating, split system, mixed air control, economizer cycle	No	No	No	No	N/A	No	10	EA
Heating & ventilating, split system, mixed air control, enthalpy cycle	No	No	No	No	N/A	No	10	EA
Multizone control (1 per zone)	No	No	No	No	N/A	No	10	EA
Other	No	No	No	No	N/A	No	10	EA
pneumatic air supply, tank mount duplex compressor, 1 HP	No	No	No	No	N/A	No	10	EA
pneumatic air supply, tank mount duplex compressor, 1.5 HP	No	No	No	No	N/A	No	10	EA

Complete Component Catalog Breakdown

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D30 HVAC

pneumatic air supply, tank mount duplex compressor, 1/2 HP	No	No	No	No	N/A	No	10	EA
pneumatic air supply, tank mount duplex compressor, 3 HP	No	No	No	No	N/A	No	10	EA
pneumatic air supply, tank mount duplex compressor, 5 HP	No	No	No	No	N/A	No	10	EA
Pneumatic thermostat	No	No	No	No	N/A	No	10	EA
program energy saving optimizer	No	No	No	No	N/A	No	10	EA
pump control system	No	No	No	No	N/A	No	10	EA
reheat coil control system, excl. coil	No	No	No	No	N/A	No	10	EA
Static pressure control for air handling unit	No	No	No	No	N/A	No	10	EA
Unit ventilator	No	No	No	No	N/A	No	10	EA
Unknown	No	No	No	No	N/A	No	10	EA
VAV boxes	No	No	No	No	N/A	No	10	EA

D306004 INSTRUMENT AIR COMPRESSORS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	Yes	Yes	No	No	No	25	EA
Other	No	No	No	No	N/A	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D306005 GAS PURGING SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D306090 OTHER CONTROLS INSTRUMENTATION

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	Yes	No	10	EA
Other	No	No	No	No	N/A	No	10	EA
Unknown	No	No	No	No	N/A	No	10	EA

D30

Complete Component Catalog Breakdown

D30

D30 HVAC

D307001 WATER SIDE TESTING & BALANCING - HEATING & COOLING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D307002 AIR SIDE TESTING & BALANCING - HEATING, COOLING & EXHAUST

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D307003 HVAC COMMISSIONING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D307090 OTHER SYSTEMS TESTING & BALANCING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D309001 GENERAL CONSTRUCTION ITEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

D30

D309002 REFRIGERATION SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	TON
Other	No	No	No	No	N/A	No	20	TON
Unknown	No	No	No	No	N/A	No	20	TON

D309090 OTHER SPECIAL MECHANICAL SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	Yes	Yes	Yes	No	No	10	EA
Other	No	No	No	No	N/A	No	10	EA
Radon Management System	Yes	Yes	Yes	No	No	No	10	EA
Unknown	No	No	No	No	N/A	No	10	EA
Ventilation/Heat Recovery System	Yes	Yes	Yes	No	No	No	20	EA
Ventilation/Heat Recovery System - 1000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Ventilation/Heat Recovery System - 10000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Ventilation/Heat Recovery System - 2000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Ventilation/Heat Recovery System - 4000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Ventilation/Heat Recovery System - 6000 CFM	Yes	Yes	Yes	No	No	No	20	EA
Ventilation/Heat Recovery System - 8000 CFM	Yes	Yes	Yes	No	No	No	20	EA

Details Req? If 'Yes', all required section detail fields are to be populated.

Inventory Pic? If 'Yes', an inventory level photo is to be provided. This is a step back photo showing the component.

Inventory Cmmt? If 'Yes', an inventory comment is to be populated. This should describe the component.

Group OK? Only applicable to each (EA) UOM's that are In Scope? = 'Yes'. If 'No' section must be a quantity of 1. If 'Yes' section may have a quantity greater than 1. If 'N/A' it is not applicable to the component type.

Age Based? If 'Yes', age based (do not provide an inspection) is the desired approach. If 'No' but upon inspection the component is not visible, then an age based approach is acceptable.

Design Life Design life of the component.

UOM Unit of measure. If yellow highlight = new component type in 2019 update.

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Sustainment Management System

Army BUILDER™ SMS Inventory and Assessment Guide

D40 FIRE PROTECTION



**US Army Corps
of Engineers**
Mobile District

ERDC
Engineer Research & Development Center

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Summary of Changes

Date	Record of Revisions/Additions to SMS Inventory and Assessment Methodology
06/01/2019	Updated page "Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components" to clarify sectioning guidance for equipment components.
06/01/2019	Added page "Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components" to clarify sectioning guidance for exterior components.
06/01/2019	Added page "Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components" to clarify sectioning guidance for exterior components.
06/01/2019	Updated inventory guidance on 'D401001 FIRE ALARM DISTRIBUTION - Fire Alarm Control Panel' to clarify that mass notification panels should be collected.
06/01/2019	Updated inventory guidance on 'D401001 FIRE ALARM DISTRIBUTION - Control equipment - fire alarm' to clarify the use of the SF UOM component types.
06/01/2019	Updated inventory guidance on 'D401001 FIRE ALARM DISTRIBUTION - General' to clarify that mass notification devices should be included in the quantity.

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Safety The following items should not be interpreted as 1) Safety Plan, 2) OSHA, or base safety requirements. These are recommendations. The contractor should operate in accordance with the SOW and approved safety plan.

Safety is of the utmost concern and should always be at the forefront of any activities taking place in the field. There are many potential safety hazards associated with building assessments. Prior to performing building assessments, the assessing staff/team must ensure that field activities are in accordance with the 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Safety Preparation Activities

Do not perform a task that may harm or endanger the health and safety of oneself or others.

Consult with the installation safety representative to review installation-specific safety requirements.

Conduct a daily “stand-up” safety meeting.

Ensure new assessors have been properly trained.

Review the assessment plan/schedule for the day.

Ensure proper Personal Protective Equipment (PPE) is available. This includes, but is not limited to, a hardhat; hearing protection; eye protection; safety shoes, gloves; and a safety colored vest.

Prior to conducting assessments, the team leader must check with the safety office or building POC to determine if there are any building/site-specific safety rules or hazards. For instance, some manufacturing areas may require steel toe shoes, hearing protection, or eye protection.

Safety Recommendations

Do not walk and write, or talk on a mobile phone, at the same time; this can lead to trips/falls.

Do not review documents or write while walking on steps or stairs.

Do not enter posted or suspected confined spaces such as crawl spaces, tanks, chases, or pits.

Mechanical rooms, attic spaces, or other areas with piping/ductwork may require the use of hard hats to prevent against head bumping hazards. Refer to the project specific safety plan for further clarification.

Do not enter areas with hazardous material signs posted or that appear to contain hazardous materials (asbestos, gases, visible mold, etc.).

Be careful when walking through/across vehicle maintenance or staging areas.

Be aware of loose-fitting clothing and lanyards that may get caught in tight areas or on piping such as in mechanical/electrical rooms, etc.

Be careful of wildlife and insects when walking around a building or opening seldom-entered mechanical/electrical rooms. Assessors may encounter snakes, spiders, stray cats/dogs, rats/mice, etc. in these areas. Do not enter or place hands in spaces that are not completely visible.

If a life safety problem is observed, do not try to fix it. Report it to the proper authority or building manager prior to leaving the building or area.

Before the assessment team leaves a building, ensure all team members are accounted for.

Ladder use should be done in accordance with 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Designate a safety POC to enforce the safety accident prevention plan.

Perform a daily safety briefing before field work. Document the attendees and the topics covered.

Halt outdoor field operations at the sign of lightning or thunder.

Safety Recommendations (continued)

Do not access pitched roofs. They may be assessed from a nearby building or using binoculars.

Use proper techniques to place, secure, and climb ladders. Never climb a ladder while holding anything. Always use the three-point technique for climbing. Equipment should be placed in a backpack or an over-the-shoulder satchel to free hands for climbing.

Do not operate powered equipment, Weight Handling Equipment (WHE)/cranes, or remove access covers from powered equipment to perform assessments.

BUILDER™ assessments are commonly performed without electrical test equipment. Do not use electrical test equipment to test circuits or equipment unless qualified by a local authority. Only open panel box doors or enter electrical/mechanical rooms following proper training. Consult the local safety representative.

Site Preparation

Site Preparation Activities

Coordinate with the base to determine building access requirements, such as: escorts; camera passes; classified/secure area restrictions; or keys.

Locate buildings on a map and develop a schedule. Coordinate with the base to identify the appropriate building manager from the POC list. Notify the building managers of the upcoming assessment as needed.

Obtain a set of mechanical/electrical room master keys from the installation POC.

Extract all BRED™ files from BUILDER™ and have them loaded onto tablets (if using tablets). Verify all tablets are charged.

If multiple buildings are to be assessed by one team, confirm the schedule and plan of action with the team leader. A schedule may have building start times detailed to the hour.

Review the building names for the types/sizes of buildings that will be assessed to determine/confirm the needed tools and safety equipment. For instance, if the facilities are not climate-controlled, prepare accordingly (for cold weather bring hats/gloves).

Recommended Assessor Gear/Tools

Hardhat	Digital Camera with Extra Battery(s)
Hearing Protection	Measuring Tape
Safety Glasses	Laser Measuring Device/Flash Light
Reflective Safety Vest	Measuring Wheel
OSHA Approved Footwear	Backpack
Other Required Personal Protection Equipment (PPE)	Graphite Powder (for stuck locks)
Cell Phone and Team Cell Phone List	Cleaning Pad (to clean/help read nameplates)
Assessment Schedule	Pen/Pencils
Building Floor Plans/Base Map	Clipboard
Small Magnet (for determining door/window type)	Paper/Assessment Forms
Flash Light/Compass	Graph Paper
Sun Screen/Bug Spray	Refillable Water Bottle

Operating efficiently in the field is key to the success of the assessment. The following guidance is detailed by 1) Team Leader and 2) Assessor. **Bold items are drivers for client deliverables.**

Team Leader

Upon arrival, check in with the building manager and QA representative (if present).

Conduct the building manager interview. The entire team should be present for the building manager interview. The following questions should be asked:

Question 1: Are there any mission-related deficiencies in the building?

Question 2: Are there any safety-related deficiencies in the building?

Question 3: Have there been any upgrades or remodels of the building?

Question 4: Are there any building deficiencies (HVAC not working, electrical breakers tripping, maintenance issues, roof leaks, etc.) present?

The team leader (ONLY the team leader!) should populate the building level comment with the following information: 1) Missing systems, 2) Renovation dates, 3) Areas of the building not accessible during the assessment, and 4) If drawings were/were not provided. Below are some examples of building level comments:

Comment 1: No A20, D10, or D40 systems present. 2016: Vault room not accessible. Drawings not provided.

Comment 2: No A20 systems present. Renovated in 2010. 2016: 5% of building not accessible. Drawings provided.

The team leader should review the real property data in BRED™ and compare it to what is found during the assessment. The following should be confirmed: 1) Number of stories, 2) Building square footage, and 3) Building install date and 4) Building number in BRED™ matches the building. Variances between real property data and actual field data should be recorded for inclusion into the client deliverable.

Team Leader and Assessors

Best Practice: Each assessor should first take a photo of the building number to identify the subsequent photos associated with the building when they are downloaded. Take a second picture that captures the overall building view with respect to nearby buildings/streets. This should help refresh/remind the assessor on what the building looks like, while performing data-entry.

A team caucus should occur to discuss the sectioning strategy for the building and confirm which side is facing north.

Each assessor should have a consistent approach to each building. Assessors should move around the building exterior and interior in a clockwise (or counterclockwise) manner making notes and taking photos.

If a safety item is found, notify the team lead. The team lead will notify the building manager. Capture a photo of the safety item for inclusion into the safety log. Follow all other project-specific procedures when a safety item is encountered.

Upon return to the office perform the following steps:

Step 1: Download all photos from the day to a building-specific folder. Review the photos and delete any that are blurry or unreadable.

Step 2: Complete all calculations and counts. Complete all data entry into BRED™.

Data Entry

With the technology that is available today, the need to use forms in the field and do data entry at the office has been mitigated. Tablets can be used to run BRED™ to complete data entry while in the field. It is understood that there are challenges to accomplish this for certain disciplines. It is only mentioned here as a best practice recommendation and is not a requirement to execute the work. There will be instances where electronics will not be allowed in a facility. Assessors should have a paper/pen data collection system ready as a backup.

General

This section presents common Unifomat D40 Fire Protection Systems Inventory Component Sections found across installations as a guide for entering into the BUILDER™ or BUILDER™ Remote Entry Database (BRED™) software. Inventory items are arranged by BUILDER System with Material/Equipment Category, Component Type, Unit of Measure, and Inventory Notes.

D4010 - Fire Alarm & Detection Systems: Includes fire alarm control panels, fire alarm distribution (SF or EA of a system with a defined number of detectors), strobes, and annunciators.

D4020 - Fire Suppression Water Supply / Equipment: Includes air compressors, backflow preventers, and fire pumps.

D4030 - Standpipes Systems: Includes risers associated with fire sprinkler or suppression systems.

D4040 - Sprinklers: Includes sprinkler piping and various sprinkler system types such as deluge, dry, and preaction.

D4090 - Other Fire Protection Systems: Includes carbon dioxide systems, foam generating equipment, clean agent systems, and hood and duct fire protection.

Fire Protection System components are generally built-in items with static piping and operating or moveable parts that require routine inspection, preventive maintenance, and service. Other than the piping, fire protection system components are typically short-lived components that can show accelerated deterioration if not properly inspected or maintained.

Fire Protection systems include fire alarm and automated or manual systems that release water or other agents to extinguish or suppress the spread of fires and protect the building and contents.

Inspection

Fire protection component sections are assessed using Direct Condition Rating (DCR) or Age-Based Modeling. When component sections are not visible, no assessment is entered. In this case, BUILDER™ will use the inventory year installed and degradation curves built into the software to establish the CI.

Rule of thumb: If you can see it, you should inspect it. There are some caveats to this rule. See component catalog for items that must be age-based whether visible or non-visible.

The following conditions or events can accelerate deterioration: 1) Improper construction or installation, 2) Improper maintenance or service, 3) Corrosion, 4) Obstructions to the system devices, and 5) Equipment damage.

When equipment is found that has been abandoned and is no longer functional it should not be inventoried. If the equipment is abandoned but is still able to be put back in service it should be inventoried and assessed.

When fire protection component sections are visible, they should be assessed.

Inventory

It is critical to confirm the year installed (default will be from real property records), or estimate the year installed. BUILDER™ uses the install date, degradation curves, and assessment observations to establish a CI for each component section. If the assessor suspects the default install date is not accurate, or an addition or renovation has taken place, check the real property record for year renovated or check local as-built or renovation drawings to help estimate the year installed.

As-built drawings can be used to identify and quantify components when fire protection systems (such as piping) are not fully visible. If as-built drawings are not available, the assessor may use experience to make an assumption for the piping system and estimate quantities based on similar systems, consultation with local staff, and other reputable online resources.

Except where specifically noted in this Guide, do not use 'General' where a more specific item is available as a component type selection.

Fire Protection is viewed as a single system and does not require sectioning by floor. If there are multiple systems in a single building then sectioning by install date would be required.

If as-builts can be located, they should indicate fire protection systems type, material, and quantity.

If the building area is calculated to be between +/- 10% of the building area shown in the BRED™ file, then the building area shown in BRED™ is to be used. If the calculated area is outside of +/- 10% of the building area shown in the BRED™ file, then the calculated area should be used.

Older buildings may have retrofitted fire protection systems. Do not automatically assume the sprinkler system dates to the year the building was built.

When a component is concealed/hidden, the inventory comment box is used to indicate the reason for no inspection taking place. Standard comments should be used.

When performing an assessment, the 'PAINTED' box should only be selected for components that have local or field applied paintings/coatings. DO NOT mark 'PAINTED' for manufacturer- or factory-applied coatings as they tend to age consistently with the components.

When selecting an equipment component type, assessors should always select the correct size. If the correct size is not available, assessors should round up to the next available size and note the actual size in the Section Details. If the size exceeds the largest selection, assessors should select the largest available size and note the actual size in the Section Details.

Photography

General comment: Photos are captured to document the following: 1) Inventory, 2) Condition (deficiency), 3) Historical record of the asset, 4) QC, and 5) Life safety issues.

All components where an 'Other' component type is selected must have a photo attached at the Inventory/Section level. (Required)

Assessors should take a photo of the building number at the start of the building assessment to delineate the start/stop of the photos between buildings. (Best Practice)

Assessors should take photos to allow for quality control (QC) confirmation and data backup. It is a good practice to have a photo of every component type encountered in an assessment. (Best Practice)

Components that are required to have section details populated should also have a single photo attached at the Inventory/Component Section level. No photos should be attached at the Section Detail level. This photo should be a step back photo showing the component in relation to its surroundings. Follow on assessments and base operations can use this to see what was inventoried in the case where there is any confusion on the section name or location field in the section details. If the component is hidden, no photo is necessary. (Required)

Components that have a DCR (component rating only) of A+ or worse should have a photo taken that shows the deficiency identified in the inspection comment. The photo should be attached to the record at the Inspection level. (Required)

Life Safety issues should be photographed for documentation of the safety item and used in safety reports. The photo should be sent to the team lead and all required steps outlined in the safety plan are to be completed. (Required)

Paint DCR does not drive the requirement for a photo to be attached at the inspection level. Example: A component has a DCR of 'G-' and a paint DCR of 'A' would result in no photo attached to the inspection.

See Scope Of Work (SOW) for any photo renaming/deliverable requirements.

The Team Leader is required to take one photo of the front elevation, or a representative elevation view, and attach the photo the building record at the building level. (Required)

Reinspection

All existing quantities for components such as device and detector counts are to be validated to a +/-15% accuracy. This can be accomplished through random sampling. Large equipment (fire pumps, risers, backflow preventers) should be validated to 100% accuracy level.

Assessors must not delete/edit components and sections that are not within their discipline.

BRED™ functions such as 'Copy Building' and 'Copy Section' should not be used unless their ramifications are fully understood. Copy building: The entire building will be copied. Copy section: All items with the same section name will be copied. For example, if a D50 assessor uses copy section on the section name FL1, the assessor may copy/paste interior doors, mechanical equipment, etc. without knowing it. If there is no existing data, these functions are easily used.

Existing data should be deleted if: 1) The component is no longer present, 2) The correct component type exists, 3) There are duplicate components with the same section name, or 4) The component is correct but has the wrong install date (requires deletion and re-entry with correct date).

If a component type in the existing data is no longer in scope, it must be updated to an in-scope item, or deleted if no longer applicable.

Past inspection comments are not required to be revised to current standards.

Section names, component types, and quantities must be verified and updated.

When performing a reinspection it should be understood that modifications in the inventory guidance may have taken place between the previous assessment date and the current effort. The new assessment should update the inventory to the latest inventory guidance. This may require, but is not limited to, combination of quantities (Ex: removing cardinal direction sectioning when it is no longer needed), modifying component type selections, or removing/adding items. The detailed inventory guidance portion of the manual will often provide direction on what steps need to be taken.

Section Details

Collect nameplate/component data for the following fields: ID, Model, Serial Number, Manufacturer, Location, Equipment Type, Capacity, Manufacturer Date, Year Installed, and Control Type for population into section details fields. If information is not available, place 'NA' in the section detail field to indicate it was not available.

If a capacity is estimated, the capacity field should include 'ESTIMATED' to delineate that an estimation took place. For example, if a pump with no tag is found, it may read '100 GPM ESTIMATED'. Truncating 'estimated' to 'EST' so the example would read '100 GPM EST' is acceptable.

If the component has an RPIE ID tag, that exact value (and ONLY that value) should be used in the Section Details 'ID Number' field. If there is no RPIE ID tag present, the regular tag number (PUMP-1) should be used. Verify how the ID Number field should be used before performing the assessment. See guidance on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components' page.

Section detail fields should be capitalized. It is understood that if previous data has been entered in lowercase, BRED™ limitations can prevent new data from being capitalized.

The Section Details comment box is used to identify specific characteristics on the component that are not captured in the Section Details fields. This can be extra information on location or material type for example. Also, any reasons why Section Detail fields could not be populated should be highlighted (not found/damaged nameplate/sun washed tag/etc.) and should be noted by using the standard comments.

The 'Year Installed' field in the Section Details should match the 'Year Installed' field at the Inventory/Section level. Populate the 'Manufacturer Date' field in the Section Details with data found on the component OR default to 1/1/'Year Installed' as the assumed value.

Sectioning

Additions, new wings, or major renovations likely require identifying separate sections with a different age.

If the FP system is serving an entire building there is no need to section by floor. The system will be installed, maintained, and degrade at the same rate. All equipment should follow the standard equipment sectioning rules.

Once all base sectioning guidelines have been followed, there may be a need to apply a DCR-driven sectioning methodology based on two factors 1) difference in DCR, and 2) quantity of distress. Step 1: Assessors should section a component when there is a 2-step difference in DCR (Ex: G- to A) in accordance with the guidance found in Step 2. If there is only a 1-step difference in DCR, the assessor shall have a single section and the lower of the DCR's should be used. Step 2: When a 2-step difference is found, the assessor should consider the quantity of distress that is present. If the distress is present on 25% or less of the component, a single section with a DCR in-between the high/low DCR shall be added (if G-/A are found then A+ is used). If the distress is present on over 25% of the component, two sections should be added at the high/low DCR. Any component with a 3-step or more difference in DCR should have two sections.

Refer to the 'Sectioning: D20,D30,D40,D50 and E10 Equipment Components' part of the manual for section name guidance for equipment. This is only applicable to 'D4020 FIRE SUPP WATER SUPPLY / EQUIP' and 'D4030 STANDPIPE SYSTEMS' components.

Rule of Thumb: All fire protection components that require Section Details should be sectioned separately. There are exceptions to this rule, review the 'Group OK?' column.

Typical section names used to describe the major areas of the building include: FL1, FL2, BASEMENT, MEZZANINE, ROOF, WING 'X,' etc.

The most critical part to an assessment is having all assessors aligned on how to perform an assessment. To reach an accurate DCR of a component, follow the steps below:

Step 1: Consider the level of degradation and the performance of the component:

OPERATIONAL CAPABILITY	OPERATIONAL CONDITION RATING	DEGRADATION	DCR
Fully Operational	Green	Free of observable or known degradation.	Green (+)
		Normal wear requiring normal preventative maintenance.	Green
		Normal degradation requiring corrective maintenance.	Green (-)
Impaired Operation	Amber	Minor degradation requiring corrective maintenance.	Amber (+)
		Moderate degradation requiring corrective repair.	Amber
		Significant degradation requiring moderate repair.	Amber (-)
Inoperable	Red	Extensive degradation requiring major repair.	Red (+)
		Severe degradation requiring major rehabilitation or partial replacement.	Red
		Complete degradation requiring full replacement.	Red (-)

Step 2: Consider the maintenance requirements of the component:

Type	Green (G+/G/G-)	Amber (A+/A/A-)	Red (R+/R/R-)
Dynamic (Equipment)	<p>Distresses present are of no impact to the components operation.</p> <p>Example: The fan component is fully operational.</p>	<p>Distresses present are of impact to the components operation. A repair is needed to bring the component back to proper operating condition</p> <p>Example: A fan has corrosion on the housing. A sand and paint would remove the distress.</p>	<p>Distresses present are of impact to the components operation. The component needs to be replaced.</p> <p>Example: A fan motor has overheated and no longer functions. Replacement of the component is required.</p>
Non-Dynamic	<p>The architecture component is in good condition requiring no maintenance outside of normal operations.</p> <p>Example: The carpet component is fully operational.</p>	<p>The architecture component has a distress that requires an extra level of maintenance outside of normal operations. This extra maintenance (or repair) would be an action such as a cleaning or a painting of a surface.</p> <p>Example: A carpet component has stains. A cleaning would remove the distress.</p>	<p>The architecture component has a distress where a maintenance operation will not fix the problem at hand. A replacement of the component is required.</p> <p>Example: A carpet component is damaged (ripped). The component needs to be replaced to fix the distress.</p>

Dynamic: Refers to equipment in the D10, D20, D30, D40, D50, and E10 systems.

Non-Dynamic: Refers to architectural components in the A10, A20, B10, B20, B30, C10, C20, and C30 systems.

Note: There are some Non-Dynamic components (for instance, toilets under D20) in the Dynamic systems.

Step 3: Adhere to the following requirements:

Requirements
Maintainability and obsolescence should not be the driving factor when conducting a condition assessment unless it has led to actual deterioration of condition that can be observed or reasonably inferred.
G+ ratings should only be given to inventory that is in pristine condition and is free of any observable defects.
Do not downgrade an assessment rating simply because an item is dirty.
Do not downgrade an assessment rating because the item does not meet current code compliance standards
Do not downgrade an assessment rating because the item is not deemed energy efficient.
Do not downgrade an assessment rating because the item is deemed to be a safety violation/hazard unless otherwise directed.
Do not downgrade an assessment rating because of a code violation.
Ratings should not be anticipated based on planned repairs or replacement.
Assessors should not expend field time and effort to determine the cause of a deficiency. If the cause is easily identified it should be included in the inspection comment.
Ratings shall be based upon the observable and documentable condition of the component.
A component should be downgraded if its operational capability, performance, reliability, etc. is compromised according to the direct rating definitions.
Incorporate user interviews, work order histories, or other information sources when determining the condition of the component. Include this information in the inspection comment.

The assessor should calibrate their mindset on what the expected DCR should be based on condition.

The assessor should consider the maintenance requirements of the component in the current condition.

The assessor should factor in the requirements/business rules for completing an inspection.

One factor that can play into an assessment is if the assessor receives information from a POC that results in a lower rating. For instance, an assessment takes place in July and there is a heating water pump that looks brand new, but has a blown motor. The assessor would assume the pump is supposed to be off due to being off season, but if the POC informs the assessor about the blown motor, this can be factored into the assessment (and indicated in the inspection comment).

One factor that should not play into an assessment is pending replacements of components. Assessors should rate components in the condition they are at the time of assessment. If the carpet is being replaced next month, that should not factor into a rating. Now, if the carpet contractor is on site (the work is currently taking place), this could be factored into the rating and a G+ rating provided with the current date of inspection chosen as the install date.

Service Life: No distresses present and component is nearing (or past) its service life.

The following comment can be used as an inspection comment for components that have no signs of distresses, are rated either Amber (A) or Amber Plus (A+), and are over 75% through their service life. This negates the need to have 4 parts of an inspection comment. Also, an inspection photo is no longer required.

[First Last-AE-Date] - The component is in proper working condition and is showing no signs of distress. The DCR was based on estimated remaining service life.

Step 1: Understand the 5 parts of the inspection comment:

Part #	Part Type	Type Description
1	Front End	[First Last-AE-Date] OR [First Last-DPW-Date] (ex: [John Doe-AE-7/4/2017])
2	Distress	Identifies the distress of the component
3	Severity	Identifies the amount of the distress.
4	Location	Identifies the location of the distress
5	Quantity	Identifies the quantity of the distress

Step 2: Use the DCR of the component as the basis for the severity.

DCR	Severity
Amber (+)	Minor/Mild
Amber	Moderate
Amber (-)	Significant/Major
Red (+)	Extensive
Red	Severe
Red (-)	Complete/Total

To aid in the inspection comments reading correctly the severity can be modified slightly. For instance, 'moderately' can be used for an 'A' DCR comment. This approach also applies to the distresses where one of the 23 MUST be selected. If 'Cracked' is selected as the distress, the wording 'cracks' may be used.

Step 3: Identify the distress of the component:

23 Distresses			
Blistered	Displaced	Overheated	Capability/Capacity Deficient
Broken	Efflorescent	Patched	Animal/Insect Damaged
Clogged	Holes	Rotten	Moisture/Debris Contaminated
Corroded	Leaks	Stained/Dirty	Noise/Vibration Excessive
Damaged	Loose	Cracked	Operationally Impaired
Deteriorated	Missing		Electrical Ground Inadequate or Unintentional

Step 4: Location and Quantity

Location on non-dynamic assets - 'lobby area'. On dynamic assets - 'housing' or 'base'.

Quantity on a SF UOM will typically be a %. On an EA UOM will typically be a count.

Step 5: Put all 5 components together to form a inspection comment (colors correspond to part):

A+	Front End	CRACKED.	The	lights have	minor	cracks	present on	10% of the	lenses.
A	Front End	DETERIORATION.	The	FP pump has	moderate	deterioration	over	50 %	of the housing.
A-	Front End	DAMAGED.	The	panel has	significant	damage	to the	lower half	of the door.
R+	Front End	CRACKED.	The	fixtures have	extensive	cracks	present on	4	north facing lenses.
R	Front End	LEAKS.	The	oil transformer has	severe	leaking	around the	electrical	penetrations.
R-	Front End	OPERATIONALLY IMPAIRED.	The	3	north	lights are	completely	operationally impaired.	

Inspection Comments

Rule #	Rule
1	Required on all inspections with a DCR of A+ and below.
2	Paint DCRs do not have an inspection comment requirement. Only the component DCR A+ and below.
3	Should include any component specific information obtained from the base or POC interview.
4	Should be in complete sentences and use industry standard terminology. Comments can be typed into MS Word for spelling/grammar checks and then pasted into the comments box.
5	Do not use all capital letters for the entire comment. The distress should be all capital letters.
6	Do not use abbreviations, jargon, or slang.
7	Should give enough information for a follow-on assessor to locate the problem area/equipment.
8	Should accurately describe the problem/observation that is the basis for the rating. Someone unfamiliar with the particular item should have an accurate picture of the components current condition and the justification for the assigned rating.
9	Should accurately describe the location of the distress if the component is only showing a distress in a single location. For instance, if an office has a stain in the carpet, it would be necessary to call out the room number of the office.
10	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. For instance, assessor John Doe at firm AE: [John Doe-AE-7/4/2017].
11	After #10 front end information in the brackets one of the 23 distresses should be provided in capitalized form. Building on #10 for an example if stained carpet: [John Doe-AE-7/4/2017] - STAINED.
12	After #10 and #11 a sentence should be provided that provides the distress, severity, location, and quantity. Quantity/Location refers to the amount/location of the distress present.

Inventory Comments

Rule #	Rule
1	Used to identify components that were not visible for inspection. See standard comments.
2	Used as a bread crumb for follow-on inspections. Can provide useful additional information such as location or type to help the next assessor understand what was being inventoried. Ex: This component is the stone wall located behind the receptionist in the lobby area.
3	Should describe the component inventoried where 'OTHER' is used to allow follow-on assessments to understand what was inventoried in the previous assessment.
4	Used to provide the location of the component (especially used for architecture components where there are no Section Details provided that have a location): Roof, NW Corner, Room Number
5	Do not use all capital letters, abbreviations, jargon, or slang.
6	Used to further describe an asset if it is not adequately described in the component type selection.
7	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Section Detail Comments

Rule #	Rule
1	Used to identify data that was not able to be populated in the Details fields. See standard comments.
2	Used to provide information that is specific to just that component section detail field. This can be a location of the specific section or something that the section services.
4	Do not use all capital letters, abbreviations, jargon, or slang.
5	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Standard Inventory Comments

When	Use Standard Comment
Assets are not visible for inspection.	Component was not visible for inspection. The component condition will be age-based by BUILDER program degradation curves.
Assets are not visible for inspection that also require Section Details to be populated.	The component is not visible for inspection or population of Section Details. The component condition will be age-based by BUILDER program degradation curves and no nameplate data or inventory photo will be provided.
Assets are not visible for inspection that require quantities to be assumed. Hidden mechanical equipment, ductwork, and # of control points are common occurrences.	The component is not visible for inspection and the quantity was estimated based on architect/engineering judgment. The component condition will be age-based by BUILDER program degradation curves.
Assets are located in an area where no electronics area allowed. This prevents an assessor from taking inventory/inspection photos.	The component is located in a secure area of the facility that did not allow electronic devices to be used. Photos were not obtainable.
Assets are visible for inspection but are a system that is not tested (HVAC controls, security system, etc.) so an age-based BUILDER™ CI is desired.	The component condition will be age-based by BUILDER program degradation curves.

Standard Section Detail Comments

When	Use Standard Comment
Nameplate is not found on the component.	Nameplate not found on the component. All fields with "NA" represent data not found.
Nameplate is found on the component but it is partial/completely unreadable.	Nameplate on the component was dirty/corroded/damaged/sunwashed. Section Detail fields with "NA" represent data that was not found.
Nameplate is found on the component that is readable but is missing certain Section Details fields.	Nameplate on the component was missing certain Section Detail fields. Section Detail fields have been populated and fields with "NA" represent data not found.

Comment Front-End Clarification

A front end refers to the bracketed information at the start of an inspection/inventory/section detail comment. The front end must have to following 3 pieces of information: 1) assessor name, 2) assessor company or affiliation, and the date. The BRED™ stamp may also provide the time of inspection which is acceptable.

BRED™/BUILDER™ Clarification

The terms BRED™ and BUILDER™ are used interchangeably throughout this document.

Rule #	Rule
1	Components are divided into sections when a significant variation exists in material/equipment category, age, or construction history, which impacts the life cycle characteristics of the component. Example 1 - If a wing or addition was added to a much older building, the two areas of the building should be sectioned differently because the age and construction history is different. Example 2 – If the building roof has multiple levels of similar materials in different conditions, these levels should be sectioned differently to capture the difference in condition. Example 3 – If the building has more than one of a particular type of component, separate component sections. For example: There is a 5,000 and 10,000 CFM air handler.
2	Multi-wing buildings are always sectioned by wing if the installation date of the wings vary. If a building is an 'E' shape and all wings have the same install date only sectioning by floor is required.
3	Multi-story buildings are always sectioned vertically by floor or level (in the case of a basement or mezzanine).
4	There may be unique instances where sectioning by an area of a building is required. For instance, if a building is split between two companies an installation may request sectioning by company 1 and 2.
5	An on-site discussion must occur at each building among all team members to determine the cardinal direction of the building. All assessors should have North as the same side of the building.
6	An on-site discussion must occur at each building among all team members on how the building should be sectioned. The goal is to avoid one assessor calling it a toilet, one calling it a restroom, and another calling it a bathroom. Standard sectioning naming is important for a consistent data set.
7	The section name should not be repetitive of the component type or material. If the floor is wood, do not have a section name 'WOOD'. Incorporation of the location into the section name is very helpful to be used for follow on assessments. If the wood floor has the section name 'LOBBY', it provides great

Standard Section Names and Format Rules

Use	Standard Section Name
Section by Floor (Business Rule)	FL1 – 1st Floor, FL2 – 2nd Floor, FL3 – 3rd Floor, etc.
Section by Floor (Business Rule)	BASEMENT, MEZZANINE, ATTIC, etc.
Section by Wing (applicable if different construction histories or condition only)	MAIN, WING A, WING B, WING C, ADDITION, etc.
Section by Direction (applicable if different construction histories or condition only)	NORTH, EAST, WEST, SOUTH, etc.
Section by Roof Level (applicable if different construction histories or condition only)	UPPER, LOWER, MAIN, etc.

When an equipment tag is included in the section name it should match exactly what was found in the field. Example: if the boiler ID number is B-1, the section name equipment tag portion should read B-1. If the boiler is tagged B1, the equipment tag portion should read B1. See equipment sectioning for further guidance.

Dashes are not required in the section name other than the instance in regards to equipment ID tags above.

The section name field is always entered in all capital letters.

Sectioning Business Rules - Grouping

The following only applies to each (EA) unit of measure (UOM) components. The 'Complete Component Catalog Breakdown' at the end of the section has a 'Group OK?' column. This has the values of 'Yes', 'No', and 'N/A'.

'Yes' = Grouping is allowed for this component type. A quantity of greater than '1' is acceptable.

'No' = Grouping is not allowed for this component type. The quantity must be '1'.

N/A = Not Applicable. Component type is not an EA UOM or is out of scope.

Group OK? = Yes when Section Details and Inventory Photos are Required.

There are several equipment component types (Unit Heaters, small pumps, etc) that have the following designations in the 'Complete Component Catalog Breakdown': 1) Group OK? = Yes, 2) Section Details? = Yes, and 3) Inventory Photo? = Yes.

In this case, a single section detail and inventory photo representative of the entire section is required. A few more clarifications:

- 1) The location field would be for the entire section (FL1/BAY 1/EXTERIOR) and not specific to a single component.
- 2) A difference in manufacturer does not drive further sectioning. For instance, 2 KW electric unit heaters from multiple manufacturers can be combined into one section. Capacity (2 KW) is the driver for sectioning methodology.
- 3) It is understood that the single section detail field is representative of the entire section. The details should be populated per one component. There is no need to enter multiple details or try to combine multiple manufacturer/model/serial/etc into to a single section detail field.

Group OK? = No

The quantity for these component types must be 1. For equipment (Section Details? = Yes and Inventory Photo? = Yes) the guidance found on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components', 'Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components', and 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components' must be followed.

Sectioning of Equipment Components

The business rules stated below are applicable components that have a 'Group OK? = No' designation.

Sectioning of equipment components is of critical importance to provide a data set that is usable by the installation, is able to have Quality Assurance reviews, and is able to be reassessed. To achieve this goal it is required that equipment be sectioned by 1) floor, 2) area/room, and 3) have the ID number included.

Case Study: Below is a drawing of a large building that has several electrical rooms. If one section of 125 AMP panels is provided with section name 'N/A', the usability of the data is greatly reduced. If the equipment is sectioned by room (FL1 - RM 109, FL1 - RM 141, FL1 - RM 104, FL1 - RM 153, FL1 - RM 149), follow-on assessments, QA, and the installation can easily identify/reassess components.

If equipment is located in a concealed space (such as VAV's) this sectioning guidance is not applicable. A single section can be added per floor with the estimated quantity provided. There are other exceptions (such as panels under 100A) that are noted within the component breakdown part of the manual.

This sectioning provides the benefit that if a remodel/addition takes place between assessments, it will be apparent what has been added/deleted in a specific room without the assessor having to do a complete walk-through of the building and the deduce what changed (which is a very difficult, if not impossible, task).

The Section Name should include the equipment ID number. For example, the panel LP1 can have the Section Name: FL1 - RM 109 - LP1.



**Example
Section
Names**

FL1 - RM 109
FL1 - RM 141
FL1 - RM 104
FL1 - RM 153
FL1 - RM 149

5 - EXAMPLE

D50 ELECTRICAL

D5010 ELECTRICAL SERVICE & DISTRIBUTION

- FL1 - RM 104 - LP1 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 109 - LP2 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 109 - MP1 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 109 - SG1 - D501004 PANELBOARDS - Switchgear - 2000 Amp
- FL1 - RM 141 - LP3 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 141 - MP2 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 141 - T1 - D501003 INTERIOR DISTRIBUTION TRANSFORMERS - dry-type, 15 kV
- FL1 - RM 149 - LP4 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 149 - MP3 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 153 - LP5 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 153 - MP4 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB

Example BRED Tree Structure

The inclusion of the room/area into the section name DOES NOT negate the need to fill in the 'location' field in the Section Details. All general detail population rules must still be followed.

The use of dashes and underscores is not standardized but should be uniform throughout the BRED tree so data aligns/sorts cleanly. In the example to the left all future users of data can easily find the components inventoried.

Electrical shown as example data set. Applies to all equipment.



Sectioning of Components on the Exterior of a Building

The component catalog has a column called 'GROUP' that indicates for all each (EA) UOM component types whether they are to be a single section (Quantity = 1, NO) or can be "grouped" into a single section (Quantity >= 1, YES). When inventorying a single section (NO) component type the assessor must include cardinal direction (roof is included). When inventorying a grouped (YES) component type 'EXTERIOR' should be used.

The inclusion of the cardinal direction into the section name DOES NOT negate the need to fill in the 'location' field in the Section Details.



S/N starts with one of the following for Group OK?
= No items.

NORTH

SOUTH

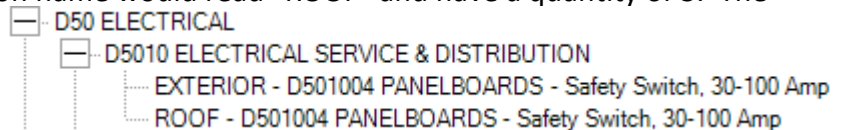
EAST

WEST

ROOF

1) Locations should be uniform throughout the data set. For instance, all equipment in the mechanical yard example above would have section names starting with 'WEST_MECH YARD' (followed by ID Number).

2) If inventorying a component where grouping is allowed (such as the 'Safety Switch, 30-100 AMP' component type above) and there is a difference in condition/install date that requires another section, the assessor should include cardinal direction in section name. For instance, if the switches serving the roof exhaust fans were to be sectioned out the section name would read "ROOF" and have a quantity of 3. The 'EXTERIOR' would remain with a quantity of 2.



Section Details

The component catalog indicates which component types need section details. If 'YES' a single section detail should be added to the section.

No photos are required at the section detail level. All 'step-back' photos are placed at the inventory (component section) level.

In the case where Section Details? = 'Yes' and Grouping? = 'Yes' a single section detail representative of the section should be added.

Section Detail fields:

ID Number: Captures the unique number associated with the equipment. The order of importance is 1) RPIE (barcode Ex: 12345), 2) Tag (phenolic/plastic Ex: EF-1), and 3) Felt tip pen markings. Assessment should follow guidance from installation on use of this field to provide the most value. This is also found in the Section Name. If both barcode and tag are to be captured the ID Number field reads Tag/RPIE (EF-1/12345).

Model: Captures the model number of the equipment.

Serial Number: Captures the serial number of the equipment.

Manufacturer: Captures the manufacturer of the equipment. Assessors should use the same spelling for all components from that manufacturer. Once a standard is set for the installation it should be followed.

Location: Captures the location of the equipment. It should be detailed enough for someone to easily locate the component. This is also found in the Section Name.

Equipment Type: Captures the type of the equipment. This can be found in the component type field.

Equipment Make: Captures the make of the equipment. Manufacturers will have a certain model identified by a name. This field captures that name.

Capacity: Captures the capacity of the equipment. In some cases the component type is a selection based on a round-up to the larger size. This field captures the actual capacity found in the field.

Date Manufactured: Captures the date manufactured. if not found, it can be set to 1/1/Year Installed.

Year Installed: Captures the year the component was installed.

Control Type/Make: Captures the control type. Common entries are: 1) Manual, 2) Thermostat, 3) DDC, 4) VFD. Many other control types can be used.

D401001 FIRE ALARM DISTRIBUTION - Control equipment - fire alarm**Typical Application and General Component Guidance:**

This component is used to inventory the fire alarm distribution system.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not provide an inspection. The functionality of the system is verified through other inspections. BUILDER™ will use the inventory year installed and degradation curves built into the software to establish the condition.

Do not section by floor. The total area of the building served by the fire protection system should be used as the quantity. This is viewed as a single system.

Install date may be found on the fire protection control panel.

There are 3 component types that can be used for the SF UOM distribution system: 1) 'Control equipment - fire alarm', 2) 'Control equipment - mass notification', and 3) 'Control equipment - combination fire alarm and mass notification'

General

This component captures all the control wiring, subpanels, and other appurtenances downstream of the main fire panel.

Lesson Learned

A typical fire alarm system will have the following component sections: 1) D401001 FIRE ALARM DISTRIBUTION (SF), 2) D401001 FIRE ALARM DISTRIBUTION - Fire Alarm Control Panel (EA), and 3) D401002 FIRE ALARM DEVICES - General (EA).

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Control equipment - fire alarm	Yes	No	No	No	N/A	Yes	20	SF

D401001 FIRE ALARM DISTRIBUTION - Fire Alarm Control Panel**Typical Application and General Component Guidance:**

This component is used to inventory fire alarm and mass notification control panels.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not provide an inspection. The functionality of the system is verified through other inspections. BUILDER™ will use the inventory year installed and degradation curves built into the software to establish the CI.

Only the main fire alarm control panel requires inventory. In large buildings there may be more than one main control panel if there are multiple zones. In this case, there will be multiple control panels inventoried.

Populate section details from the data nameplate information located on the fire control panel.

There may be two main fire panels in a building. The first one is for the fire (red in the photo above) and the second one is for the mass notification system (black in the photo above). Both should be inventoried.

General

This component captures the main fire alarm control panel. All subpanels and other appurtenances are captured under the 'D401001 FIRE ALARM DISTRIBUTION - General' component type which is a SF (UOM).

Lesson Learned

A typical fire alarm system will have the following component sections: 1) D401001 FIRE ALARM DISTRIBUTION (SF), 2) D401001 FIRE ALARM DISTRIBUTION - Fire Alarm Control Panel (EA), and 3) D401002 FIRE ALARM DEVICES - General (EA).

The fire alarm control panel will often be located near the main entrance to the building or in the mechanical room.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Fire Alarm Control Panel	Yes	Yes	Yes	No	No	Yes	20	EA

D401002 FIRE ALARM DEVICES - Annunciator**Typical Application and General Component Guidance:**

This component is included for clarification purposes only.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Annunciators are to be counted and added to the sum of the total devices inventoried under 'D401002 FIRE ALARM DEVICES - General.'

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Annunciator	No	No	No	No	N/A	No	20	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

D401002 FIRE ALARM DEVICES - Bell signaling device**Typical Application and General Component Guidance:**

This component is included for clarification purposes only.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Bells are to be counted and added to the sum of the total devices inventoried under 'D401002 FIRE ALARM DEVICES - General.'

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Bell signaling device	No	No	No	No	N/A	No	20	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

D401002 FIRE ALARM DEVICES - Detectors with brackets, ion detector (smoke) detector**Typical Application and General Component Guidance:**

This component is included for clarification purposes only.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Smoke detectors are to be counted and added to the sum of the total devices inventoried under 'D401002 FIRE ALARM DEVICES - General.'

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Detectors with brackets, ion detector (smoke) detector	No	No	No	No	N/A	No	20	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

D401002 FIRE ALARM DEVICES - Detectors with brackets, rate of temperature rise detector**Typical Application and General Component Guidance:**

This component is included for clarification purposes only.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Temperature detectors are to be counted and added to the sum of the total devices inventoried under 'D401002 FIRE ALARM DEVICES - General.'

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Detectors with brackets, rate of temperature rise detector	No	No	No	No	N/A	No	20	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

D401002 FIRE ALARM DEVICES - Electric mechanical release**Typical Application and General Component Guidance:**

This component is included for clarification purposes only.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Electric mechanical releases are to be counted and added to the sum of the total devices inventoried under 'D401002 FIRE ALARM DEVICES - General.'

If there is a double door and each door has a mechanical release, then that should be inventoried as a quantity of 2. Coordinate with C10 assessor as the quantity of releases will drive the quantity for 'C102003 FIRE DOORS'.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Electric mechanical release	No	No	No	No	N/A	No	20	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

D401002 FIRE ALARM DEVICES - General**Typical Application and General Component Guidance:**

This component is used to inventory fire alarm devices.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

All mass notification devices should be included in this quantity.

Do not section by floor. The number of devices served by the fire protection system should be used as the quantity. If there are multiple fire alarm panels/systems (driven by different install dates) then multiple device sections would be used.

The following should be inventoried: 1) Annunciators, 2) Bell signaling devices, 3) Detectors (smoke and temperature detectors), 4) Manual pull stations, 5) Strobes, 6) Strobe/Annunciator Combos, and 7) Electric mechanical releases.

Lesson Learned

A typical fire alarm system will have the following component sections: 1) D401001 FIRE ALARM DISTRIBUTION (SF), 2) D401001 FIRE ALARM DISTRIBUTION - Fire Alarm Control Panel (EA), and 3) D401002 FIRE ALARM DEVICES - General (EA).

One section should be used for all the items inventoried unless there is a difference in age or condition. Do not section out by device type (items 1 through 7 above).

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	20	EA

D401002 FIRE ALARM DEVICES - Manual pull station**Typical Application and General Component Guidance:**

This component is included for clarification purposes only.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Pull stations are to be counted and added to the sum of the total devices inventoried under 'D401002 FIRE ALARM DEVICES - General.'

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Manual pull station	No	No	No	No	N/A	No	20	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

D401002 FIRE ALARM DEVICES - Strobe**Typical Application and General Component Guidance:**

This component is included for clarification purposes only.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Strobes are to be counted and added to the sum of the total devices inventoried under 'D401002 FIRE ALARM DEVICES - General.'

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Strobe	No	No	No	No	N/A	No	20	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

D401002 FIRE ALARM DEVICES - Strobe/Annunciator Combo**Typical Application and General Component Guidance:**

This component is included for clarification purposes only.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Strobe/Annunciator combos are to be counted and added to the sum of the total devices inventoried under 'D401002 FIRE ALARM DEVICES - General.'

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Age OK?	Design Based?	Life	UOM
Strobe/Annunciator Combo	No	No	No	No	N/A	No	20	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

D402001 FIRE PROTECTION WATER PIPING AND EQUIPMENT - Air Compressor

Typical Application and General Component Guidance:

This component is used to inventory the air compressor that charges the dry pipe system.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

This is commonly found on dry-pipe systems. These can be very small and mounted on the fire riser assembly (as shown in photo above).

Lesson Learned

Only air compressors directly associated with the fire protection system should be inventoried under this component type. DO NOT inventory HVAC or maintenance air compressors with this component type.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Air Compressor	Yes	Yes	Yes	No	No	20	EA

D402001 FIRE PROTECTION WATER PIPING AND EQUIPMENT - Backflow Preventer - 6"

Typical Application and General Component Guidance:

This component is used to inventory the backflow preventer associated with the fire protection system.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

If the backflow preventer is integrated into the fire riser, BOTH the backflow preventer (D402001) and fire riser (D403001) should be inventoried and assessed.

Use pipe size to determine component type selection. If the backflow preventer is larger than 8", the 8" component type should be selected with the actual size noted in the section detail capacity field.

General

May be located on the exterior of a building, climate permitting, or in a mechanical/fire riser room.

Lesson Learned

A typical fire suppression system will have the following component sections: 1) D402001 FIRE PROTECTION WATER PIPING AND EQUIPMENT - Backflow, 2) D403001 STANDPIPE EQUIPMENT & PIPING - Riser, and 3) D404001 SPRINKLERS AND RELEASING DEVICES - type.

There will often be a potable water backflow preventer in the same vicinity as the fire protection backflow preventer. The potable water backflow preventer should be captured under 'D202002 VALVES & HYDRANTS.'

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Backflow Preventer - 6"	Yes	Yes	Yes	No	No	No	40	EA

**D403001 STANDPIPE EQUIPMENT & PIPING - Fire Hose Equipment -
Fire pump, diesel, with controller, 6" pump, 140 HP, 1500 GPM,
100 psi**

Typical Application and General Component Guidance:

This component is used to inventory diesel-driven fire protection pumps.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

If the diesel tank is separate from the fire pump skid, it should be inventoried under 'D301002 GAS SUPPLY SYSTEM - Fuel Storage Tank.' If the tank is a belly tank, it is considered part of the fire pump assembly and does not need to be inventoried.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Fire Hose Equipment - Fire pump, diesel, with controller, 6" pump, 140 HP, 1500 GPM, 100 psi	Yes	Yes	Yes	No	No	20	EA

**D403001 STANDPIPE EQUIPMENT & PIPING - Fire Hose Equipment -
Fire pump, electric, with controller, 10" pump, 300 HP, 3500 GPM,
1770 RPM**

Typical Application and General Component Guidance:

This component is used to inventory the fire pump and other connected appurtenances. Select the correct size (round up to nearest size if required).



Business Rules/General/Lessons Learned/Reinspection

General

This includes the fire pump, controller, electrical supply, and all other appurtenances associated with the fire pump system.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Fire Hose Equipment - Fire pump, electric, with controller, 10" pump, 300 HP, 3500 GPM, 1770 RPM	Yes	Yes	Yes	No	No	20	EA

D403001 STANDPIPE EQUIPMENT & PIPING - Riser - 4" diam**Typical Application and General Component Guidance:**

This component is used to inventory the fire riser. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If there is both a dry pipe and wet pipe system present, then two risers should be added for each assembly. The dry pipe riser should be sized based on the size of the dry valve found on the riser.

Standpipes are often found in the stairwells of multiple story facilities. These allow for a fire department connection at each story. These are part of the 'SF' wet pipe distribution system and do not require inventory.

The wet pipe riser should be sized by the predominant size present through the riser. If an 8" water line comes into the facility and is reduced to 6", which is what the valves, backflow, and other appurtenances are sized at, then the riser type is 6".

Use pipe size to determine component type selection. If the riser is larger than 8", the 8" component type should be selected with the actual size noted in an inventory comment.

General

The fire riser will typically have its own room or may be located within the mechanical room. On retrofits, it may be in a closet within the building.

Lesson Learned

A typical fire suppression system will have the following component sections: 1) D402001 FIRE PROTECTION WATER PIPING AND EQUIPMENT - Backflow, 2) D403001 STANDPIPE EQUIPMENT & PIPING - Riser, and 3) D404001 SPRINKLERS AND RELEASING DEVICES - type.

The assessor should do a walk around the building to count the Siamese connections, as they indicate a riser. If a riser is hidden, this is a good way to find it.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Riser - 4" diam	Yes	No	No	No	Yes	No	20	EA

D404001 SPRINKLERS AND RELEASING DEVICES - Wet Pipe Systems - ordinary hazard

Typical Application and General Component Guidance:

This component is used to inventory the fire protection distribution system.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Do not provide an inspection. The functionality of the system is verified through other inspections. BUILDER™ will use the inventory year installed and degradation curves built into the software to establish the CI.

If there is a single sprinkler head attached to a domestic water line (commonly found in janitors closets), do not inventory this under D40 Fire Protection. This can be ignored.

Lesson Learned

A typical fire suppression system will have the following component sections: 1) D402001 FIRE PROTECTION WATER PIPING AND EQUIPMENT - Backflow, 2) D403001 STANDPIPE EQUIPMENT & PIPING - Riser, and 3) D404001 SPRINKLERS AND RELEASING DEVICES - type.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Wet Pipe Systems - ordinary hazard	Yes	No	No	No	N/A	Yes	75	SF

D409001 CARBON DIOXIDE SYSTEMS - General**Typical Application and General Component Guidance:**

This component is used to inventory carbon monoxide (CO), carbon dioxide (CO₂), nitrogen dioxide (NO₂), and combustible gas detection systems.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

This is an EA UOM. Count the number of detectors and use that total as the quantity.

General

Typically found in vehicle maintenance shops.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA

D409002 FOAM GENERATING EQUIPMENT - General**Typical Application and General Component Guidance:**

This component is used to inventory foam fire suppression systems. This includes the tank (pictured), valves (pictured), piping, and other appurtenances. Pumps are to be captured under D403001.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

A foam generating system consists of many types of components including tanks, pumps, diffusers, valves, etc. This equipment should not be inventoried under other areas in BUILDER™. This component type covers all appurtenances.

The average cost per SF is estimated at \$30/SF. Assessors should use the following formula to derive the EA value: (Building SF * 30) / (BUILDER Cost). The current BUILDER cost per SF is \$171/EA. Verify this value at the start of the project.

General

Typically found in aircraft hangars.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	20	EA

D409003 CLEAN AGENT SYSTEMS - General**Typical Application and General Component Guidance:**

This component is used to inventory clean agent fire suppression systems.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Use 'General' which is a SF UOM. Use the SF of the room served and use that total as the quantity.

General

FM-200, shown in the photo, is a common clean agent.

Typically found in electrical rooms or data centers.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	Yes	Yes	Yes	N/A	No	20	SF

D409004 HOOD & DUCT FIRE PROTECTION - Carbon Dioxide CO2 (includes agent containers, distribution piping and controls)**Typical Application and General Component Guidance:**

This component is used to inventory hood and duct fire suppression systems.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

This is an EA UOM. Count the number of systems and use that total as the quantity. There will typically be a chrome box on the wall that will serve two hoods (four-six nozzles). If they are not visible, the assessor can estimate quantity.

General

Typically found in kitchens.

Lesson Learned

Typically, a system will cover an entire bank (two-three hoods) in a kitchen. If there are 'back-to-back' hoods, that will typically be two separate systems. Tracing the lines to the control boxes can identify the total number of systems present.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Carbon Dioxide CO2 (includes agent containers, distribution piping and controls)	Yes	No	No	No	Yes	No	20	EA

D401001 FIRE ALARM DISTRIBUTION

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Control equipment - combination fire alarm and mass notification	Yes	No	No	No	N/A	Yes	20	SF
Control equipment - fire alarm	Yes	No	No	No	N/A	Yes	20	SF
Control equipment - mass notification	Yes	No	No	No	N/A	Yes	20	SF
Fire Alarm Control Panel	Yes	Yes	Yes	No	No	Yes	20	EA
Fire Alarm Control Panel, multizone (4)	No	No	No	No	N/A	No	20	EA
Fire Alarm Control Panel, single zone	No	No	No	No	N/A	No	20	EA
Fire detection systems, 12 detectors	No	No	No	No	N/A	No	20	EA
Fire detection systems, 25 detectors	No	No	No	No	N/A	No	20	EA
Fire detection systems, 50 detectors	No	No	No	No	N/A	No	20	EA
Fire detection systems, 100 detectors	No	No	No	No	N/A	No	20	EA
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

D401002 FIRE ALARM DEVICES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Annunciator	No	No	No	No	N/A	No	20	EA
Battery standby power 10" x 10" x 17"	No	No	No	No	N/A	No	20	EA
Bell signaling device	No	No	No	No	N/A	No	20	EA
Detectors with brackets, fixed temperature heat detector	No	No	No	No	N/A	No	20	EA
Detectors with brackets, ion detector (smoke) detector	No	No	No	No	N/A	No	20	EA
Detectors with brackets, rate of temperature rise detector	No	No	No	No	N/A	No	20	EA
Electric mechanical release	No	No	No	No	N/A	No	20	EA
General	Yes	No	No	No	Yes	No	20	EA
Manual pull station	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Strobe	No	No	No	No	N/A	No	20	EA
Strobe/Annunciator Combo	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D402001 FIRE PROTECTION WATER PIPING AND EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Air Compressor	Yes	Yes	Yes	No	No	No	20	EA
Air Dryer	Yes	Yes	Yes	No	No	No	20	EA
Backflow Preventer	No	No	No	No	N/A	No	40	EA
Backflow Preventer - 1"	Yes	Yes	Yes	No	No	No	40	EA
Backflow Preventer - 1-1/2"	Yes	Yes	Yes	No	No	No	40	EA
Backflow Preventer - 2"	Yes	Yes	Yes	No	No	No	40	EA
Backflow Preventer - 3"	Yes	Yes	Yes	No	No	No	40	EA
Backflow Preventer - 4"	Yes	Yes	Yes	No	No	No	40	EA
Backflow Preventer - 6"	Yes	Yes	Yes	No	No	No	40	EA
Backflow Preventer - 8"	Yes	Yes	Yes	No	No	No	40	EA
General	No	No	No	No	N/A	No	20	LF
Other	No	No	No	No	N/A	No	20	LF
Underground non-potable distribution main - fire service approved pipe	No	No	No	No	N/A	No	20	LF
Unknown	No	No	No	No	N/A	No	20	LF

D402002 FIRE PUMP

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
100 to 499 GPM includes controller and relief devices	Yes	Yes	Yes	No	No	No	20	EA
1000 to 1499 GPM includes controller and relief devices	Yes	Yes	Yes	No	No	No	20	EA
1500 to 1999 GPM includes controller and relief devices	Yes	Yes	Yes	No	No	No	20	EA
2000 to 2499 GPM includes controller and relief devices	Yes	Yes	Yes	No	No	No	20	EA
2500 to 2999 GPM includes controller and relief devices	Yes	Yes	Yes	No	No	No	20	EA
3000 and greater GPM includes controller and relief devices	Yes	Yes	Yes	No	No	No	20	EA
4" pump, 30 HP, 500 GPM	Yes	Yes	Yes	No	No	No	20	EA
5" pump, 100 HP, 1000 GPM	Yes	Yes	Yes	No	No	No	20	EA
5" pump, 40 HP, 1000 GPM	Yes	Yes	Yes	No	No	No	20	EA
500 to 999 GPM includes controller and relief devices	Yes	Yes	Yes	No	No	No	20	EA
General	No	No	No	No	N/A	No	20	EA
Hydraulic transit controls (surge arrestors)	No	No	No	No	N/A	No	20	EA
Jockey Pump includes controller and disconnects	Yes	Yes	Yes	No	No	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Test header, flow meters, recirculation system	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D403001 STANDPIPE EQUIPMENT & PIPING

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Class I Riser	No	No	No	No	N/A	No	20	EA
Class II Riser	No	No	No	No	N/A	No	20	EA
Class III Riser	No	No	No	No	N/A	No	20	EA
Fire Hose Equipment	No	No	No	No	N/A	No	75	LF
Fire Hose Equipment - Fire pump, diesel, with controller, 10" pump, 300 HP, 3500 GPM, 100 psi	Yes	Yes	Yes	No	No	No	20	EA
Fire Hose Equipment - Fire pump, diesel, with controller, 6" pump, 140 HP, 1500 GPM, 100 psi	Yes	Yes	Yes	No	No	No	20	EA
Fire Hose Equipment - Fire pump, electric, for jockey pump system, add	Yes	Yes	Yes	No	No	No	20	EA
Fire Hose Equipment - Fire pump, electric, w/controller, fittings, relief valve	Yes	Yes	Yes	No	No	No	20	EA
Fire Hose Equipment - Fire pump, electric, with controller, 10" pump, 300 HP, 3500 GPM, 1770 RPM	Yes	Yes	Yes	No	No	No	20	EA
Fire Hose Equipment - Fire pump, electric, with controller, 4" pump, 30 HP, 500 GPM	Yes	Yes	Yes	No	No	No	20	EA
Fire Hose Equipment - Fire pump, electric, with controller, 5" pump, 100 HP, 1000 GPM	Yes	Yes	Yes	No	No	No	20	EA
Fire Hose Equipment - Fire pump, electric, with controller, 5" pump, 40 HP, 1000 GPM	Yes	Yes	Yes	No	No	No	20	EA
Fire Hose Equipment - Fire pump, electric, with controller, 6" pump, 139 HP, 1500 GPM, 1770 RPM	Yes	Yes	Yes	No	No	No	20	EA
General	Yes	No	No	No	Yes	No	20	EA
Other	Yes	No	Yes	Yes	Yes	No	20	EA
Riser	No	No	No	No	N/A	No	20	EA
Riser - 2" diam	Yes	No	No	No	Yes	No	20	EA
Riser - 2-1/2" diam	Yes	No	No	No	Yes	No	20	EA
Riser - 4" diam	Yes	No	No	No	Yes	No	20	EA
Riser - 6" diam	Yes	No	No	No	Yes	No	20	EA
Riser - 8" diam	Yes	No	No	No	Yes	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D404001 SPRINKLERS AND RELEASING DEVICES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Deluge Systems	No	No	No	No	N/A	No	75	SF
Deluge Systems - extra hazard	Yes	No	No	No	N/A	Yes	75	SF
Deluge Systems - light hazard	Yes	No	No	No	N/A	Yes	75	SF
Deluge Systems - ordinary hazard	Yes	No	No	No	N/A	Yes	75	SF
Dry Pipe Systems	No	No	No	No	N/A	No	75	SF
Dry Pipe Systems - extra hazard	Yes	No	No	No	N/A	Yes	75	SF
Dry Pipe Systems - light hazard	Yes	No	No	No	N/A	Yes	75	SF
Dry Pipe Systems - ordinary hazard	Yes	No	No	No	N/A	Yes	75	SF
Firecycle Systems	No	No	No	No	N/A	No	75	SF
Firecycle Systems - extra hazard	Yes	No	No	No	N/A	Yes	75	SF
Firecycle Systems - light hazard	Yes	No	No	No	N/A	Yes	75	SF
Firecycle Systems - ordinary hazard	Yes	No	No	No	N/A	Yes	75	SF
General	No	No	No	No	N/A	No	50	EA
Other	No	No	No	No	N/A	No	50	EA
Preaction Systems	No	No	No	No	N/A	No	75	SF
Preaction Systems - extra hazard	Yes	No	No	No	N/A	Yes	75	SF
Preaction Systems - light hazard	Yes	No	No	No	N/A	Yes	75	SF
Preaction Systems - ordinary hazard	Yes	No	No	No	N/A	Yes	75	SF
Sprinkler Piping	No	No	No	No	N/A	No	50	LF
Unknown	No	No	No	No	N/A	No	50	EA
Wet Pipe Systems	No	No	No	No	N/A	No	75	SF
Wet Pipe Systems - extra hazard	Yes	No	No	No	N/A	Yes	75	SF
Wet Pipe Systems - light hazard	Yes	No	No	No	N/A	Yes	75	SF
Wet Pipe Systems - ordinary hazard	Yes	No	No	No	N/A	Yes	75	SF

D404002 SPRINKLER WATER SUPPLY EQUIPMENT AND PIPING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	23	EA
Other	No	No	No	No	N/A	No	23	SF
Unknown	No	No	No	No	N/A	No	23	EA

D405001 PORTABLE EXTINGUISHERS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Dispersion nozzle	No	No	No	No	N/A	No	20	EA
Dispersion nozzle, carbon dioxide 3" x 5" dispersion nozzle	No	No	No	No	N/A	No	20	EA
Dispersion nozzle, FM200 1-1/2" dispersion nozzle	No	No	No	No	N/A	No	20	EA
Extinguisher agent	No	No	No	No	N/A	No	20	EA
Extinguisher agent, 200 lb FM200, container	No	No	No	No	N/A	No	20	EA
Extinguisher agent, 75 lb carbon dioxide cylinder	No	No	No	No	N/A	No	20	EA
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D409001 CARBON DIOXIDE SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	25	EA
High Pressure Carbon Dioxide CO2 (includes agent containers, distribution piping and controls)	Yes	No	No	No	N/A	No	20	SF
Low Pressure Carbon Dioxide CO2 (includes agent containers, distribution piping and controls)	Yes	No	No	No	Yes	No	20	EA
Other	Yes	No	Yes	Yes	Yes	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA

D40 FIRE PROTECTION

D409002 FOAM GENERATING EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Control Equipment - Fire Suppression System Releasing, addressable	Yes	Yes	Yes	No	No	No	20	EA
Foam-water closed head sprinklers system includes concentrate proportioning system	Yes	No	No	No	N/A	No	20	SF
Foam-water deluge sprinkler system includes concentrate proportioning system	Yes	No	No	No	N/A	No	20	SF
General	Yes	No	No	No	Yes	No	20	EA
Low-level (in trench) grate nozzle system includes concentrate proportioning system	Yes	No	No	No	N/A	No	20	SF
Low-level high-expansion system includes concentrate proportioning system	Yes	No	No	No	N/A	No	20	SF
Other	Yes	No	Yes	Yes	Yes	No	20	EA
Supplemental (under-aircraft) fixed nozzle system includes concentrate proportioning system	Yes	No	No	No	N/A	No	20	SF
Supplemental (under-aircraft) oscillating nozzle system includes concentrate proportioning system	Yes	No	No	No	N/A	No	20	SF
Supplemental high-expansion system includes concentrate proportioning system	Yes	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	EA

D409003 CLEAN AGENT SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
FM 200, HFC-227ea, CF3CHFCF3 (includes agent containers, distribution piping)	Yes	Yes	Yes	No	N/A	No	20	SF
General	Yes	Yes	Yes	Yes	N/A	No	20	SF
HALON 1301, CBR2F2 (includes agent containers, distribution piping)	Yes	Yes	Yes	No	N/A	No	20	SF
Inergen, IG-541, N2, Ar, CO2 (includes agent containers, distribution piping)	Yes	Yes	Yes	No	N/A	No	20	SF
Nitrogen, IG 100, N2 (includes agent containers, distribution piping)	Yes	Yes	Yes	No	N/A	No	20	SF
NOVEC 1230, FK-5-1-12mmy2, CF3CF2C(O)CF(CF3)2 (includes agent containers, distribution piping)	Yes	Yes	Yes	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D40 FIRE PROTECTION

D409004 HOOD & DUCT FIRE PROTECTION

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Carbon Dioxide CO2 (includes agent containers, distribution piping and controls)	Yes	No	No	No	Yes	No	20	EA
Dry Chemical (includes agent containers, distribution piping and controls)	Yes	No	No	No	Yes	No	20	EA
General	No	No	No	No	N/A	No	25	EA
Other	Yes	No	Yes	Yes	Yes	No	25	EA
Unknown	No	No	No	No	N/A	No	25	EA
Water (includes agent containers, distribution piping and controls)	Yes	No	No	No	Yes	No	20	EA
Wet Chemical (includes agent containers, distribution piping and controls)	Yes	No	No	No	Yes	No	20	EA

D409090 OTHER SPECIAL FIRE PROTECTION SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	Yes	No	20	EA
High sensitivity smoke detection systems - air sampling / air aspirating	Yes	Yes	Yes	No	N/A	No	20	SF
Optical detection system - UV/IR (includes detectors, interconnecting circuits and controls)	Yes	Yes	Yes	No	N/A	No	20	SF
Optical detection system-triple IR (IR3) (includes detectors, interconnecting circuits and controls)	Yes	Yes	Yes	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

Details Req? If 'Yes', all required section detail fields are to be populated.

Inventory Pic? If 'Yes', an inventory level photo is to be provided. This is a step back photo showing the component.

Inventory Cmmt? If 'Yes', an inventory comment is to be populated. This should describe the component.

Group OK? Only applicable to each (EA) UOM's that are In Scope? = 'Yes'. If 'No' section must be a quantity of 1. If 'Yes' section may have a quantity greater than 1. If 'N/A' it is not applicable to the component type.

Age Based? If 'Yes', age based (do not provide an inspection) is the desired approach. If 'No' but upon inspection the component is not visible, then an age based approach is acceptable.

Design Life Design life of the component.

UOM Unit of measure. If yellow highlight = new component type in 2019 update.



Sustainment Management System

Army BUILDER™ SMS Inventory and Assessment Guide

D50 ELECTRICAL



**US Army Corps
of Engineers**
Mobile District

ERDC
Engineer Research & Development Center

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Summary of Changes

Date	Record of Revisions/Additions to SMS Inventory and Assessment Methodology
06/01/2019	Updated page "Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components" to clarify sectioning guidance for equipment components.
06/01/2019	Added page "Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components" to clarify sectioning guidance for exterior components.
06/01/2019	Added several component types under 'D501002 SERVICE ENTRANCE EQUIPMENT'. Several sections added to manual with associated inventory guidance.
06/01/2019	Updated inventory guidance to 'D501003 INTERIOR DISTRIBUTION TRANSFORMERS' clarifying there may be instances where large transformers upstream of switchgear should be inventoried.
06/01/2019	Updated inventory guidance to 'D501004 PANELBOARDS' to say that over 800 amp panelboards should be inventoried as switchgear (change from 600 amp).
06/01/2019	Updated inventory guidance to 'D501004 PANELBOARDS' to align with new component types added. MCB panels are now inventoried under 'D501004 PANELBOARDS'.
06/01/2019	Updated inventory guidance to 'D501004 PANELBOARDS' to provide more direction on the population of section detail fields.
06/01/2019	Updated inventory guidance for 'D501004 PANELBOARDS - Safety Switches' to clarify that all safety switches should be inventoried.
06/01/2019	Updated inventory guidance for 'D501005 ENCLOSED CIRCUIT BREAKERS' to align with the new component types available.
06/01/2019	Added panelboards, safety switches, bypass isolation switches, and switchgear component types to 'D501004 PANELBOARDS'.
06/01/2019	Added 'Exterior Fluorescent Lighting' component type to 'D502002 LIGHTING EQUIPMENT'.
06/01/2019	Added component types for LED lighting to 'D502002 LIGHTING EQUIPMENT'.
06/01/2019	Added component types 'Bugeye' and 'Exit/Emergency Lighting (EME Combo Fixture)' to 'D509002 EMERGENCY LIGHTING & POWER'.
06/01/2019	Added several different size component types for generators to 'D509002 EMERGENCY LIGHTING & POWER'.
06/01/2019	Added several different size component types for 'Uninterruptible Power Supply' to 'D509002 EMERGENCY LIGHTING & POWER'.
06/01/2019	Moved 'D503005 SECURITY SYSTEMS' from being 'In Scope? - Yes' to 'In Scope? - No'.
06/01/2019	Updated inventory guidance on 'D503090 OTHER COMMUNICATIONS & ALARM SYSTEMS'.
06/01/2019	Modified details required to 'Yes' for 'D503002 PUBLIC ADDRESS SYSTEMS'.
06/01/2019	Added page "Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components" to clarify sectioning guidance for exterior components.
06/01/2019	Updated inventory guidance on 'D501003 INTERIOR DISTRIBUTION TRANSFORMERS' to clarify when exterior transformers should be inventoried.

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Safety The following items should not be interpreted as 1) Safety Plan, 2) OSHA, or base safety requirements. These are recommendations. The contractor should operate in accordance with the SOW and approved safety plan.

Safety is of the utmost concern and should always be at the forefront of any activities taking place in the field. There are many potential safety hazards associated with building assessments. Prior to performing building assessments, the assessing staff/team must ensure that field activities are in accordance with the 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Safety Preparation Activities

Do not perform a task that may harm or endanger the health and safety of oneself or others.

Consult with the installation safety representative to review installation-specific safety requirements.

Conduct a daily “stand-up” safety meeting.

Ensure new assessors have been properly trained.

Review the assessment plan/schedule for the day.

Ensure proper Personal Protective Equipment (PPE) is available. This includes, but is not limited to, a hardhat; hearing protection; eye protection; safety shoes, gloves; and a safety colored vest.

Prior to conducting assessments, the team leader must check with the safety office or building POC to determine if there are any building/site-specific safety rules or hazards. For instance, some manufacturing areas may require steel toe shoes, hearing protection, or eye protection.

Safety Recommendations

Do not walk and write, or talk on a mobile phone, at the same time; this can lead to trips/falls.

Do not review documents or write while walking on steps or stairs.

Do not enter posted or suspected confined spaces such as crawl spaces, tanks, chases, or pits.

Mechanical rooms, attic spaces, or other areas with piping/ductwork may require the use of hard hats to prevent against head bumping hazards. Refer to the project specific safety plan for further clarification.

Do not enter areas with hazardous material signs posted or that appear to contain hazardous materials (asbestos, gases, visible mold, etc.).

Be careful when walking through/across vehicle maintenance or staging areas.

Be aware of loose-fitting clothing and lanyards that may get caught in tight areas or on piping such as in mechanical/electrical rooms, etc.

Be careful of wildlife and insects when walking around a building or opening seldom-entered mechanical/electrical rooms. Assessors may encounter snakes, spiders, stray cats/dogs, rats/mice, etc. in these areas. Do not enter or place hands in spaces that are not completely visible.

If a life safety problem is observed, do not try to fix it. Report it to the proper authority or building manager prior to leaving the building or area.

Before the assessment team leaves a building, ensure all team members are accounted for.

Ladder use should be done in accordance with 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Designate a safety POC to enforce the safety accident prevention plan.

Perform a daily safety briefing before field work. Document the attendees and the topics covered.

Halt outdoor field operations at the sign of lightning or thunder.

Safety Recommendations (continued)

Do not access pitched roofs. They may be assessed from a nearby building or using binoculars.

Use proper techniques to place, secure, and climb ladders. Never climb a ladder while holding anything. Always use the three-point technique for climbing. Equipment should be placed in a backpack or an over-the-shoulder satchel to free hands for climbing.

Do not operate powered equipment, Weight Handling Equipment (WHE)/cranes, or remove access covers from powered equipment to perform assessments.

BUILDER™ assessments are commonly performed without electrical test equipment. Do not use electrical test equipment to test circuits or equipment unless qualified by a local authority. Only open panel box doors or enter electrical/mechanical rooms following proper training. Consult the local safety representative.

Site Preparation

Site Preparation Activities

Coordinate with the base to determine building access requirements, such as: escorts; camera passes; classified/secure area restrictions; or keys.

Locate buildings on a map and develop a schedule. Coordinate with the base to identify the appropriate building manager from the POC list. Notify the building managers of the upcoming assessment as needed.

Obtain a set of mechanical/electrical room master keys from the installation POC.

Extract all BRED™ files from BUILDER™ and have them loaded onto tablets (if using tablets). Verify all tablets are charged.

If multiple buildings are to be assessed by one team, confirm the schedule and plan of action with the team leader. A schedule may have building start times detailed to the hour.

Review the building names for the types/sizes of buildings that will be assessed to determine/confirm the needed tools and safety equipment. For instance, if the facilities are not climate-controlled, prepare accordingly (for cold weather bring hats/gloves).

Recommended Assessor Gear/Tools

Hardhat	Digital Camera with Extra Battery(s)
Hearing Protection	Measuring Tape
Safety Glasses	Laser Measuring Device/Flash Light
Reflective Safety Vest	Measuring Wheel
OSHA Approved Footwear	Backpack
Other Required Personal Protection Equipment (PPE)	Graphite Powder (for stuck locks)
Cell Phone and Team Cell Phone List	Cleaning Pad (to clean/help read nameplates)
Assessment Schedule	Pen/Pencils
Building Floor Plans/Base Map	Clipboard
Small Magnet (for determining door/window type)	Paper/Assessment Forms
Flash Light/Compass	Graph Paper
Sun Screen/Bug Spray	Refillable Water Bottle

Operating efficiently in the field is key to the success of the assessment. The following guidance is detailed by 1) Team Leader and 2) Assessor. **Bold items are drivers for client deliverables.**

Team Leader

Upon arrival, check in with the building manager and QA representative (if present).

Conduct the building manager interview. The entire team should be present for the building manager interview. The following questions should be asked:

Question 1: Are there any mission-related deficiencies in the building?

Question 2: Are there any safety-related deficiencies in the building?

Question 3: Have there been any upgrades or remodels of the building?

Question 4: Are there any building deficiencies (HVAC not working, electrical breakers tripping, maintenance issues, roof leaks, etc.) present?

The team leader (ONLY the team leader!) should populate the building level comment with the following information: 1) Missing systems, 2) Renovation dates, 3) Areas of the building not accessible during the assessment, and 4) If drawings were/were not provided. Below are some examples of building level comments:

Comment 1: No A20, D10, or D40 systems present. 2016: Vault room not accessible. Drawings not provided.

Comment 2: No A20 systems present. Renovated in 2010. 2016: 5% of building not accessible. Drawings provided.

The team leader should review the real property data in BRED™ and compare it to what is found during the assessment. The following should be confirmed: 1) Number of stories, 2) Building square footage, and 3) Building install date and 4) Building number in BRED™ matches the building. Variances between real property data and actual field data should be recorded for inclusion into the client deliverable.

Team Leader and Assessors

Best Practice: Each assessor should first take a photo of the building number to identify the subsequent photos associated with the building when they are downloaded. Take a second picture that captures the overall building view with respect to nearby buildings/streets. This should help refresh/remind the assessor on what the building looks like, while performing data-entry.

A team caucus should occur to discuss the sectioning strategy for the building and confirm which side is facing north.

Each assessor should have a consistent approach to each building. Assessors should move around the building exterior and interior in a clockwise (or counterclockwise) manner making notes and taking photos.

If a safety item is found, notify the team lead. The team lead will notify the building manager. Capture a photo of the safety item for inclusion into the safety log. Follow all other project-specific procedures when a safety item is encountered.

Upon return to the office perform the following steps:

Step 1: Download all photos from the day to a building-specific folder. Review the photos and delete any that are blurry or unreadable.

Step 2: Complete all calculations and counts. Complete all data entry into BRED™.

Data Entry

With the technology that is available today, the need to use forms in the field and do data entry at the office has been mitigated. Tablets can be used to run BRED™ to complete data entry while in the field. It is understood that there are challenges to accomplish this for certain disciplines. It is only mentioned here as a best practice recommendation and is not a requirement to execute the work. There will be instances where electronics will not be allowed in a facility. Assessors should have a paper/pen data collection system ready as a backup.

General

This section presents common Unifomat D50 Electrical Inventory component sections found across installations as a guide for entering into the BUILDER™ or BRED™ software. Inventory items are arranged by BUILDER™ System with Material/Equipment Category, Component Type, Unit of Measure, and Inventory Notes.

D5010 - Electrical Service & Distribution: This subsystem provides for electrical equipment that are required to deliver power from the primary service and distribute to power distribution electrical equipment systems. These components include building-service transformers, interior distribution transformers, panelboards, safety switches, transfer switches, switchgear, enclosed circuit breakers, and motor control centers.

D5020 - Lighting & Branch Wiring: This subsystem provides for conduit and wiring to circuit panels, lighting and convenience outlets, as well as exit, explosion-proof, interior, exterior and other lighting systems.

D5030 - Communications & Security: This subsystem includes telecommunications, public address, intercom, TV, and security systems. Note: Fire alarm systems formerly included in D5030 are now included in Fire Alarm and Detection Systems (D4010).

D5090 - Other Electrical Systems: This subsystem includes emergency lighting, emergency generators, and uninterruptible power supplies (UPS).

One of the most common problems with electrical systems is that over time building mission, equipment and occupancy change. These changes often require electrical system alterations, additional loads, new or changed circuits, and equipment additions, that can result in overloaded/unbalanced circuits, electrical code/safety issues, damaged components, and outdated electrical as-built drawings. Another common problem is that electrical components such as switchboxes and lighting, installed outdoors in a coastal environment, can deteriorate quickly.

The electrical system of a building distributes and safely energizes building component sections or installed equipment from the primary transformer to the building support functions and systems.

Inspection

Electrical component sections are assessed using Direct Condition Rating (DCR) or Age-Based Modeling. Most electrical component sections will be visible. When component sections are not visible inventory may be entered, but no assessment is entered. In this case, BUILDER™ will use the inventory, year installed, and degradation curves built in to the software to establish the CI.

Rule of thumb: If you can see it, you should inspect it. There are some caveats to this rule. See component catalog for items that must be age-based whether visible or non-visible.

The following conditions or events can accelerate electrical component deterioration and should be considered by the assessor: 1) Advanced age, 2) Improper construction or installation, 3) Damage or misuse, 4) Improper additional circuits or alterations, 5) Corrosion, 6) Lack of preventative maintenance, and 7) Overloading or power surges.

When electrical component sections are visible, they should be assessed.

When equipment is found that has been abandoned and is no longer functional it should not be inventoried. If the equipment is abandoned, but is still able to be put back in service, it should be inventoried and assessed.

Inventory

It is critical to confirm the year installed (default will be from real property records), or estimate the year installed. BUILDER™ uses the install date, degradation curves, and assessment observations to establish a CI for each component section. If the assessor suspects the default install date is not accurate, or an addition or renovation has taken place, check the real property record for year renovated or check local as-built or renovation drawings to help estimate the year installed.

Chandeliers are a component type under 'C103090 OTHER INTERIOR SPECIALTIES' and are often double counted by both the C10 and D50 assessors. Verify that the C10 assessor inventoried the chandelier and do not include it in the lighting count.

Do not inventory individual disconnects associated with building mission or process equipment (e.g. food service equipment, etc.)

Do not inventory portable lights or lamps.

Do not inventory specialty power equipment such as converters, regulators, etc., associated with the building mission or process.

Except where specifically noted in this Guide, do not use 'General' where a more specific item is available as a component type selection.

If the building area is calculated to be between +/- 10% of the building area shown in the BRED™ file, then the building area shown in BRED™ is to be used. If the calculated area is outside of +/- 10% of the building area shown in the BRED™ file, then the calculated area should be used.

In some cases, electrical sections may be replaced as an individual repair or partial replacement. These areas would have a different age. The real property construction and renovation dates should be confirmed, if they are not appropriate, the component age must be estimated. The building occupants or other facilities staff may be able to provide some information.

Most electrical components inventoried for buildings are visible. When electrical components are not visible (or an area of the building is not accessible), as-built drawings should be used to identify and quantify the electrical components. If as-built drawings are not available, the assessor may use experience to make an assumption for the electrical component types and quantities based on similar construction, consultation with local staff, and other reputable online resources.

Unit of measure for lighting fixtures refers to number of fixtures, not lamps. In cases where lights are installed in a strip-type fashion (typical in warehouses), the fixtures are still counted individually.

When a component is concealed/hidden, the inventory comment box is used to indicate the reason for no inspection taking place. Standard comments should be used.

When performing an assessment, the 'PAINTED' box should only be selected for components that have local or field applied paintings/coatings. DO NOT mark 'PAINTED' for manufacturer- or factory-applied coatings as they tend to age consistently with the components.

When selecting an equipment component type, assessors should always select the correct size. If the correct size is not available, assessors should round up to the next available size and note the actual size in the Section Details. If the size exceeds the largest selection, assessors should select the largest available size and note the actual size in the Section Details.

Photography

General comment: Photos are captured to document the following: 1) Inventory, 2) Condition (deficiency), 3) Historical record of the asset, 4) QC, and 5) Life safety issues.

All components where an 'Other' component type is selected must have a photo attached at the Inventory/Section level. (Required)

Assessors should take a photo of the building number at the start of the building assessment to delineate the start/stop of the photos between buildings. (Best Practice)

Assessors should take photos to allow for quality control (QC) confirmation and data backup. It is a good practice to have a photo of every component type encountered in an assessment. (Best Practice)

Common safety issues that require a photograph are missing breaker blanks, exposed wiring in lighting, or boxes missing junction covers. These should be notified to the team lead and the safety procedures followed for reporting the finding.

Components that are required to have section details populated should also have a single photo attached at the Inventory/Component Section level. No photos should be attached at the Section Detail level. This photo should be a step back photo showing the component in relation to its surroundings. Follow on assessments and base operations can use this to see what was inventoried in the case where there is any confusion on the section name or location field in the section details. If the component is hidden, no photo is necessary. (Required)

Components that have a DCR (component rating only) of A+ or worse should have a photo taken that shows the deficiency identified in the inspection comment. The photo should be attached to the record at the Inspection level. (Required)

Life Safety issues should be photographed for documentation of the safety item and used in safety reports. The photo should be sent to the team lead and all required steps outlined in the safety plan are to be completed. (Required)

Paint DCR does not drive the requirement for a photo to be attached at the inspection level. Example: A component has a DCR of 'G-' and a paint DCR of 'A' would result in no photo attached to the inspection.

See Scope Of Work (SOW) for any photo renaming/deliverable requirements.

The Team Leader is required to take one photo of the front elevation, or a representative elevation view, and attach the photo the building record at the building level. (Required)

Reinspection

All existing quantities for components such as panels, lights, and exist signs are to be validated to a +/-15% accuracy. This can be accomplished through random sampling. Large equipment (generators, switchgear, transformers, etc.) should be validated to 100% accuracy level.

Assessors must not delete/edit components and sections that are not within their discipline.

BRED™ functions such as 'Copy Building' and 'Copy Section' should not be used unless their ramifications are fully understood. Copy building: The entire building will be copied. Copy section: All items with the same section name will be copied. For example, if a D50 assessor uses copy section on the section name FL1, the assessor may copy/paste interior doors, mechanical equipment, etc. without knowing it. If there is no existing data, these functions are easily used.

Existing data should be deleted if: 1) The component is no longer present, 2) The correct component type exists, 3) There are duplicate components with the same section name, or 4) The component is correct but has the wrong install date (requires deletion and re-entry with correct date).

If a component type in the existing data is no longer in scope, it must be updated to an in-scope item, or deleted if no longer applicable.

Past inspection comments are not required to be revised to current standards.

Section names, component types, and quantities must be verified and updated.

When performing a reinspection it should be understood that modifications in the inventory guidance may have taken place between the previous assessment date and the current effort. The new assessment should update the inventory to the latest inventory guidance. This may require, but is not limited to, combination of quantities (Ex: removing cardinal direction sectioning when it is no longer needed), modifying component type selections, or removing/adding items. The detailed inventory guidance portion of the manual will often provide direction on what steps need to be taken.

Section Details

Collect nameplate/component data for the following fields: ID, Model, Serial Number, Manufacturer, Location, Equipment Type, Capacity, Manufacturer Date, Year Installed, and Control Type for population into section details fields. If information is not available, place 'NA' in the section detail field to indicate it was not available.

If a capacity is estimated, the capacity field should include 'ESTIMATED' to delineate that an estimation took place. For example, a generator with no tag is found, it may read '500 KW ESTIMATED'. Truncating 'estimated' to 'EST' so the example would read '500 KW EST' is acceptable.

If the component has an RPIE ID tag, that exact value (and ONLY that value) should be used in the Section Details 'ID Number' field. If there is no RPIE ID tag present, the regular tag number (PNL-1) should be used. Verify how the ID Number field should be used before performing the assessment. See guidance on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components' page.

Section detail fields should be capitalized. It is understood that if previous data has been entered in lowercase, BRED™ limitations can prevent new data from being capitalized.

The Section Details comment box is used to identify specific characteristics on the component that are not captured in the Section Details fields. This can be extra information on location or material type for example. Also, any reasons why Section Detail fields could not be populated should be highlighted (not found/damaged nameplate/sun washed tag/etc.) and should be noted by using the standard comments.

The 'Year Installed' field in the Section Details should match the 'Year Installed' field at the Inventory/Section level. Populate the 'Manufacturer Date' field in the Section Details with data found on the component OR default to 1/1/'Year Installed' as the assumed value.

Sectioning

Additions, new wings, or major renovations likely require identifying a separate section with a different age.

Barracks are to be sectioned by floor then by 1) commons and 2) quarters. Commons refers to the common areas (halls, utility rooms, lobby, etc). Quarters refers to the individual living area (dorms). A common section name would be 'FL1 - COMMONS' and 'FL1 - QUARTERS.' Barracks refers to all multi-level housing units for permanent and transient residents. This methodology is applicable only to light fixtures.

Electrical components are always sectioned by floor. If there are multiple easily definable wings of a building with different install dates then sectioning by floor AND by wing is required. For example, if there is an east and west wing on a 2-floor building you would have 'FL2 EAST' and 'FL2 - WEST'.

For 'D502002 LIGHTING EQUIPMENT' barracks are to be sectioned by floor then by 1) commons and 2) quarters. Commons refers to the common areas (halls, utility rooms, lobby, etc.). Quarters refers to the individual living areas (dorms). A common section name would be 'FL1 - COMMONS.' Barracks refers to all multi-level housing units for permanent or transient residents.

It is required that lights are sectioned by stairwells. The section name 'STAIR' should be used. It is not required to section each stairwell out individually.

Once all base sectioning guidelines have been followed, there may be a need to apply a DCR-driven sectioning methodology based on two factors 1) difference in DCR, and 2) quantity of distress. Step 1: Assessors should section a component when there is a 2-step difference in DCR (Ex: G- to A) in accordance with the guidance found in Step 2. If there is only a 1-step difference in DCR, the assessor shall have a single section and the lower of the DCR's should be used. Step 2: When a 2-step difference is found, the assessor should consider the quantity of distress that is present. If the distress is present on 25% or less of the component, a single section with a DCR in-between the high/low DCR shall be added (if G-/A are found then A+ is used). If the distress is present on over 25% of the component, two sections should be added at the high/low DCR. Any component with a 3-step or more difference in DCR should have two sections.

Refer to the 'Sectioning: D20,D30,D40,D50 and E10 Equipment Components' part of the manual for section name guidance for equipment.

Rule of Thumb: All electrical components that require Section Details should be sectioned separately. There are exceptions to this rule, review the 'Group OK?' column.

Stair lights need to be inventoried as a single component section for the entire stairwell. Do not include as part of the floor light total. If there are multiple stairwells, it is acceptable to combine into one section if they are the same condition

Typical section names used to describe the major areas of the building include: FL1, FL2, BASEMENT, MEZZANINE, ROOF, WING 'X,' etc.

The most critical part to an assessment is having all assessors aligned on how to perform an assessment. To reach an accurate DCR of a component, follow the steps below:

Step 1: Consider the level of degradation and the performance of the component:

OPERATIONAL CAPABILITY	OPERATIONAL CONDITION RATING	DEGRADATION	DCR
Fully Operational	Green	Free of observable or known degradation.	Green (+)
		Normal wear requiring normal preventative maintenance.	Green
		Normal degradation requiring corrective maintenance.	Green (-)
Impaired Operation	Amber	Minor degradation requiring corrective maintenance.	Amber (+)
		Moderate degradation requiring corrective repair.	Amber
		Significant degradation requiring moderate repair.	Amber (-)
Inoperable	Red	Extensive degradation requiring major repair.	Red (+)
		Severe degradation requiring major rehabilitation or partial replacement.	Red
		Complete degradation requiring full replacement.	Red (-)

Step 2: Consider the maintenance requirements of the component:

Type	Green (G+/G/G-)	Amber (A+/A/A-)	Red (R+/R/R-)
Dynamic (Equipment)	<p>Distresses present are of no impact to the components operation.</p> <p>Example: The fan component is fully operational.</p>	<p>Distresses present are of impact to the components operation. A repair is needed to bring the component back to proper operating condition</p> <p>Example: A fan has corrosion on the housing. A sand and paint would remove the distress.</p>	<p>Distresses present are of impact to the components operation. The component needs to be replaced.</p> <p>Example: A fan motor has overheated and no longer functions. Replacement of the component is required.</p>
Non-Dynamic	<p>The architecture component is in good condition requiring no maintenance outside of normal operations.</p> <p>Example: The carpet component is fully operational.</p>	<p>The architecture component has a distress that requires an extra level of maintenance outside of normal operations. This extra maintenance (or repair) would be an action such as a cleaning or a painting of a surface.</p> <p>Example: A carpet component has stains. A cleaning would remove the distress.</p>	<p>The architecture component has a distress where a maintenance operation will not fix the problem at hand. A replacement of the component is required.</p> <p>Example: A carpet component is damaged (ripped). The component needs to be replaced to fix the distress.</p>

Dynamic: Refers to equipment in the D10, D20, D30, D40, D50, and E10 systems.

Non-Dynamic: Refers to architectural components in the A10, A20, B10, B20, B30, C10, C20, and C30 systems.

Note: There are some Non-Dynamic components (for instance, toilets under D20) in the Dynamic systems.

Step 3: Adhere to the following requirements:

Requirements
Maintainability and obsolescence should not be the driving factor when conducting a condition assessment unless it has led to actual deterioration of condition that can be observed or reasonably inferred.
G+ ratings should only be given to inventory that is in pristine condition and is free of any observable defects.
Do not downgrade an assessment rating simply because an item is dirty.
Do not downgrade an assessment rating because the item does not meet current code compliance standards
Do not downgrade an assessment rating because the item is not deemed energy efficient.
Do not downgrade an assessment rating because the item is deemed to be a safety violation/hazard unless otherwise directed.
Do not downgrade an assessment rating because of a code violation.
Ratings should not be anticipated based on planned repairs or replacement.
Assessors should not expend field time and effort to determine the cause of a deficiency. If the cause is easily identified it should be included in the inspection comment.
Ratings shall be based upon the observable and documentable condition of the component.
A component should be downgraded if its operational capability, performance, reliability, etc. is compromised according to the direct rating definitions.
Incorporate user interviews, work order histories, or other information sources when determining the condition of the component. Include this information in the inspection comment.

The assessor should calibrate their mindset on what the expected DCR should be based on condition.

The assessor should consider the maintenance requirements of the component in the current condition.

The assessor should factor in the requirements/business rules for completing an inspection.

One factor that can play into an assessment is if the assessor receives information from a POC that results in a lower rating. For instance, an assessment takes place in July and there is a heating water pump that looks brand new, but has a blown motor. The assessor would assume the pump is supposed to be off due to being off season, but if the POC informs the assessor about the blown motor, this can be factored into the assessment (and indicated in the inspection comment).

One factor that should not play into an assessment is pending replacements of components. Assessors should rate components in the condition they are at the time of assessment. If the carpet is being replaced next month, that should not factor into a rating. Now, if the carpet contractor is on site (the work is currently taking place), this could be factored into the rating and a G+ rating provided with the current date of inspection chosen as the install date.

Service Life: No distresses present and component is nearing (or past) its service life.

The following comment can be used as an inspection comment for components that have no signs of distresses, are rated either Amber (A) or Amber Plus (A+), and are over 75% through their service life. This negates the need to have 4 parts of an inspection comment. Also, an inspection photo is no longer required.

[First Last-AE-Date] - The component is in proper working condition and is showing no signs of distress. The DCR was based on estimated remaining service life.

Step 1: Understand the 5 parts of the inspection comment:

Part #	Part Type	Type Description
1	Front End	[First Last-AE-Date] OR [First Last-DPW-Date] (ex: [John Doe-AE-7/4/2017])
2	Distress	Identifies the distress of the component
3	Severity	Identifies the amount of the distress.
4	Location	Identifies the location of the distress
5	Quantity	Identifies the quantity of the distress

Step 2: Use the DCR of the component as the basis for the severity.

DCR	Severity
Amber (+)	Minor/Mild
Amber	Moderate
Amber (-)	Significant/Major
Red (+)	Extensive
Red	Severe
Red (-)	Complete/Total

To aid in the inspection comments reading correctly the severity can be modified slightly. For instance, 'moderately' can be used for an 'A' DCR comment. This approach also applies to the distresses where one of the 23 MUST be selected. If 'Cracked' is selected as the distress, the wording 'cracks' may be used.

Step 3: Identify the distress of the component:

23 Distresses			
Blistered	Displaced	Overheated	Capability/Capacity Deficient
Broken	Efflorescent	Patched	Animal/Insect Damaged
Clogged	Holes	Rotten	Moisture/Debris Contaminated
Corroded	Leaks	Stained/Dirty	Noise/Vibration Excessive
Damaged	Loose	Cracked	Operationally Impaired
Deteriorated	Missing		Electrical Ground Inadequate or Unintentional

Step 4: Location and Quantity

Location on non-dynamic assets - 'lobby area'. On dynamic assets - 'housing' or 'base'.

Quantity on a SF UOM will typically be a %. On an EA UOM will typically be a count.

Step 5: Put all 5 components together to form a inspection comment (colors correspond to part):

A+	Front End	CRACKED.	The	lights have	minor	cracks	present on	10% of the	lenses.
A	Front End	DETERIORATION.	The	FP pump has	moderate	deterioration	over	50 %	of the housing.
A-	Front End	DAMAGED.	The	panel has	significant	damage	to the	lower half	of the door.
R+	Front End	CRACKED.	The	fixtures have	extensive	cracks	present on	4	north facing lenses.
R	Front End	LEAKS.	The	oil transformer has	severe	leaking	around the	electrical	penetrations.
R-	Front End	OPERATIONALLY IMPAIRED.	The	3	north	lights are	completely	operationally impaired.	

Inspection Comments

Rule #	Rule
1	Required on all inspections with a DCR of A+ and below.
2	Paint DCRs do not have an inspection comment requirement. Only the component DCR A+ and below.
3	Should include any component specific information obtained from the base or POC interview.
4	Should be in complete sentences and use industry standard terminology. Comments can be typed into MS Word for spelling/grammar checks and then pasted into the comments box.
5	Do not use all capital letters for the entire comment. The distress should be all capital letters.
6	Do not use abbreviations, jargon, or slang.
7	Should give enough information for a follow-on assessor to locate the problem area/equipment.
8	Should accurately describe the problem/observation that is the basis for the rating. Someone unfamiliar with the particular item should have an accurate picture of the components current condition and the justification for the assigned rating.
9	Should accurately describe the location of the distress if the component is only showing a distress in a single location. For instance, if an office has a stain in the carpet, it would be necessary to call out the room number of the office.
10	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. For instance, assessor John Doe at firm AE: [John Doe-AE-7/4/2017].
11	After #10 front end information in the brackets one of the 23 distresses should be provided in capitalized form. Building on #10 for an example if stained carpet: [John Doe-AE-7/4/2017] - STAINED.
12	After #10 and #11 a sentence should be provided that provides the distress, severity, location, and quantity. Quantity/Location refers to the amount/location of the distress present.

Inventory Comments

Rule #	Rule
1	Used to identify components that were not visible for inspection. See standard comments.
2	Used as a bread crumb for follow-on inspections. Can provide useful additional information such as location or type to help the next assessor understand what was being inventoried. Ex: This component is the stone wall located behind the receptionist in the lobby area.
3	Should describe the component inventoried where 'OTHER' is used to allow follow-on assessments to understand what was inventoried in the previous assessment.
4	Used to provide the location of the component (especially used for architecture components where there are no Section Details provided that have a location): Roof, NW Corner, Room Number
5	Do not use all capital letters, abbreviations, jargon, or slang.
6	Used to further describe an asset if it is not adequately described in the component type selection.
7	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Section Detail Comments

Rule #	Rule
1	Used to identify data that was not able to be populated in the Details fields. See standard comments.
2	Used to provide information that is specific to just that component section detail field. This can be a location of the specific section or something that the section services.
4	Do not use all capital letters, abbreviations, jargon, or slang.
5	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Standard Inventory Comments

When	Use Standard Comment
Assets are not visible for inspection.	Component was not visible for inspection. The component condition will be age-based by BUILDER program degradation curves.
Assets are not visible for inspection that also require Section Details to be populated.	The component is not visible for inspection or population of Section Details. The component condition will be age-based by BUILDER program degradation curves and no nameplate data or inventory photo will be provided.
Assets are not visible for inspection that require quantities to be assumed. Hidden mechanical equipment, ductwork, and # of control points are common occurrences.	The component is not visible for inspection and the quantity was estimated based on architect/engineering judgment. The component condition will be age-based by BUILDER program degradation curves.
Assets are located in an area where no electronics area allowed. This prevents an assessor from taking inventory/inspection photos.	The component is located in a secure area of the facility that did not allow electronic devices to be used. Photos were not obtainable.
Assets are visible for inspection but are a system that is not tested (HVAC controls, security system, etc.) so an age-based BUILDER™ CI is desired.	The component condition will be age-based by BUILDER program degradation curves.

Standard Section Detail Comments

When	Use Standard Comment
Nameplate is not found on the component.	Nameplate not found on the component. All fields with "NA" represent data not found.
Nameplate is found on the component but it is partial/completely unreadable.	Nameplate on the component was dirty/corroded/damaged/sunwashed. Section Detail fields with "NA" represent data that was not found.
Nameplate is found on the component that is readable but is missing certain Section Details fields.	Nameplate on the component was missing certain Section Detail fields. Section Detail fields have been populated and fields with "NA" represent data not found.

Comment Front-End Clarification

A front end refers to the bracketed information at the start of an inspection/inventory/section detail comment. The front end must have to following 3 pieces of information: 1) assessor name, 2) assessor company or affiliation, and the date. The BRED™ stamp may also provide the time of inspection which is acceptable.

BRED™/BUILDER™ Clarification

The terms BRED™ and BUILDER™ are used interchangeably throughout this document.

Rule #	Rule
1	Components are divided into sections when a significant variation exists in material/equipment category, age, or construction history, which impacts the life cycle characteristics of the component. Example 1 - If a wing or addition was added to a much older building, the two areas of the building should be sectioned differently because the age and construction history is different. Example 2 – If the building roof has multiple levels of similar materials in different conditions, these levels should be sectioned differently to capture the difference in condition. Example 3 – If the building has more than one of a particular type of component, separate component sections. For example: There is a 5,000 and 10,000 CFM air handler.
2	Multi-wing buildings are always sectioned by wing if the installation date of the wings vary. If a building is an 'E' shape and all wings have the same install date only sectioning by floor is required.
3	Multi-story buildings are always sectioned vertically by floor or level (in the case of a basement or mezzanine).
4	There may be unique instances where sectioning by an area of a building is required. For instance, if a building is split between two companies an installation may request sectioning by company 1 and 2.
5	An on-site discussion must occur at each building among all team members to determine the cardinal direction of the building. All assessors should have North as the same side of the building.
6	An on-site discussion must occur at each building among all team members on how the building should be sectioned. The goal is to avoid one assessor calling it a toilet, one calling it a restroom, and another calling it a bathroom. Standard sectioning naming is important for a consistent data set.
7	The section name should not be repetitive of the component type or material. If the floor is wood, do not have a section name 'WOOD'. Incorporation of the location into the section name is very helpful to be used for follow on assessments. If the wood floor has the section name 'LOBBY', it provides great

Standard Section Names and Format Rules

Use	Standard Section Name
Section by Floor (Business Rule)	FL1 – 1st Floor, FL2 – 2nd Floor, FL3 – 3rd Floor, etc.
Section by Floor (Business Rule)	BASEMENT, MEZZANINE, ATTIC, etc.
Section by Wing (applicable if different construction histories or condition only)	MAIN, WING A, WING B, WING C, ADDITION, etc.
Section by Direction (applicable if different construction histories or condition only)	NORTH, EAST, WEST, SOUTH, etc.
Section by Roof Level (applicable if different construction histories or condition only)	UPPER, LOWER, MAIN, etc.

When an equipment tag is included in the section name it should match exactly what was found in the field. Example: if the boiler ID number is B-1, the section name equipment tag portion should read B-1. If the boiler is tagged B1, the equipment tag portion should read B1. See equipment sectioning for further guidance.

Dashes are not required in the section name other than the instance in regards to equipment ID tags above.

The section name field is always entered in all capital letters.

Sectioning Business Rules - Grouping

The following only applies to each (EA) unit of measure (UOM) components. The 'Complete Component Catalog Breakdown' at the end of the section has a 'Group OK?' column. This has the values of 'Yes', 'No', and 'N/A'.

'Yes' = Grouping is allowed for this component type. A quantity of greater than '1' is acceptable.

'No' = Grouping is not allowed for this component type. The quantity must be '1'.

N/A = Not Applicable. Component type is not an EA UOM or is out of scope.

Group OK? = Yes when Section Details and Inventory Photos are Required.

There are several equipment component types (Unit Heaters, small pumps, etc) that have the following designations in the 'Complete Component Catalog Breakdown': 1) Group OK? = Yes, 2) Section Details? = Yes, and 3) Inventory Photo? = Yes.

In this case, a single section detail and inventory photo representative of the entire section is required. A few more clarifications:

- 1) The location field would be for the entire section (FL1/BAY 1/EXTERIOR) and not specific to a single component.
- 2) A difference in manufacturer does not drive further sectioning. For instance, 2 KW electric unit heaters from multiple manufacturers can be combined into one section. Capacity (2 KW) is the driver for sectioning methodology.
- 3) It is understood that the single section detail field is representative of the entire section. The details should be populated per one component. There is no need to enter multiple details or try to combine multiple manufacturer/model/serial/etc into to a single section detail field.

Group OK? = No

The quantity for these component types must be 1. For equipment (Section Details? = Yes and Inventory Photo? = Yes) the guidance found on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components', 'Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components', and 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components' must be followed.

Sectioning of Equipment Components

The business rules stated below are applicable components that have a 'Group OK? = No' designation.

Sectioning of equipment components is of critical importance to provide a data set that is usable by the installation, is able to have Quality Assurance reviews, and is able to be reassessed. To achieve this goal it is required that equipment be sectioned by 1) floor, 2) area/room, and 3) have the ID number included.

Case Study: Below is a drawing of a large building that has several electrical rooms. If one section of 125 AMP panels is provided with section name 'N/A', the usability of the data is greatly reduced. If the equipment is sectioned by room (FL1 - RM 109, FL1 - RM 141, FL1 - RM 104, FL1 - RM 153, FL1 - RM 149), follow-on assessments, QA, and the installation can easily identify/reassess components.

If equipment is located in a concealed space (such as VAV's) this sectioning guidance is not applicable. A single section can be added per floor with the estimated quantity provided. There are other exceptions (such as panels under 100A) that are noted within the component breakdown part of the manual.

This sectioning provides the benefit that if a remodel/addition takes place between assessments, it will be apparent what has been added/deleted in a specific room without the assessor having to do a complete walk-through of the building and the deduce what changed (which is a very difficult, if not impossible, task).

The Section Name should include the equipment ID number. For example, the panel LP1 can have the Section Name: FL1 - RM 109 - LP1.



**Example
Section
Names**

FL1 - RM 109
FL1 - RM 141
FL1 - RM 104
FL1 - RM 153
FL1 - RM 149

5 - EXAMPLE

D50 ELECTRICAL

D5010 ELECTRICAL SERVICE & DISTRIBUTION

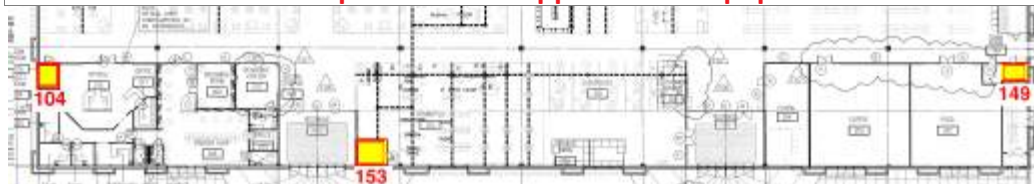
- FL1 - RM 104 - LP1 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 109 - LP2 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 109 - MP1 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 109 - SG1 - D501004 PANELBOARDS - Switchgear - 2000 Amp
- FL1 - RM 141 - LP3 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 141 - MP2 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 141 - T1 - D501003 INTERIOR DISTRIBUTION TRANSFORMERS - dry-type, 15 kV
- FL1 - RM 149 - LP4 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 149 - MP3 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 153 - LP5 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 153 - MP4 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB

Example BRED Tree Structure

The inclusion of the room/area into the section name DOES NOT negate the need to fill in the 'location' field in the Section Details. All general detail population rules must still be followed.

The use of dashes and underscores is not standardized but should be uniform throughout the BRED tree so data aligns/sorts cleanly. In the example to the left all future users of data can easily find the components inventoried.

Electrical shown as example data set. Applies to all equipment.



Sectioning of Components on the Exterior of a Building

The component catalog has a column called 'GROUP' that indicates for all each (EA) UOM component types whether they are to be a single section (Quantity = 1, NO) or can be "grouped" into a single section (Quantity >= 1, YES). When inventorying a single section (NO) component type the assessor must include cardinal direction (roof is included). When inventorying a grouped (YES) component type 'EXTERIOR' should be used.

The inclusion of the cardinal direction into the section name DOES NOT negate the need to fill in the 'location' field in the Section Details.



S/N starts with one of the following for Group OK?
= No items.

NORTH

SOUTH

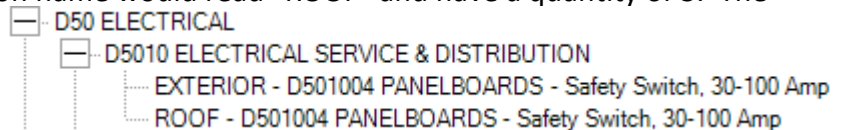
EAST

WEST

ROOF

1) Locations should be uniform throughout the data set. For instance, all equipment in the mechanical yard example above would have section names starting with 'WEST_MECH YARD' (followed by ID Number).

2) If inventorying a component where grouping is allowed (such as the 'Safety Switch, 30-100 AMP' component type above) and there is a difference in condition/install date that requires another section, the assessor should include cardinal direction in section name. For instance, if the switches serving the roof exhaust fans were to be sectioned out the section name would read "ROOF" and have a quantity of 3. The 'EXTERIOR' would remain with a quantity of 2.



Section Details

The component catalog indicates which component types need section details. If 'YES' a single section detail should be added to the section.

No photos are required at the section detail level. All 'step-back' photos are placed at the inventory (component section) level.

In the case where Section Details? = 'Yes' and Grouping? = 'Yes' a single section detail representative of the section should be added.

Section Detail fields:

ID Number: Captures the unique number associated with the equipment. The order of importance is 1) RPIE (barcode Ex: 12345), 2) Tag (phenolic/plastic Ex: EF-1), and 3) Felt tip pen markings. Assessment should follow guidance from installation on use of this field to provide the most value. This is also found in the Section Name. If both barcode and tag are to be captured the ID Number field reads Tag/RPIE (EF-1/12345).

Model: Captures the model number of the equipment.

Serial Number: Captures the serial number of the equipment.

Manufacturer: Captures the manufacturer of the equipment. Assessors should use the same spelling for all components from that manufacturer. Once a standard is set for the installation it should be followed.

Location: Captures the location of the equipment. It should be detailed enough for someone to easily locate the component. This is also found in the Section Name.

Equipment Type: Captures the type of the equipment. This can be found in the component type field.

Equipment Make: Captures the make of the equipment. Manufacturers will have a certain model identified by a name. This field captures that name.

Capacity: Captures the capacity of the equipment. In some cases the component type is a selection based on a round-up to the larger size. This field captures the actual capacity found in the field.

Date Manufactured: Captures the date manufactured. if not found, it can be set to 1/1/Year Installed.

Year Installed: Captures the year the component was installed.

Control Type/Make: Captures the control type. Common entries are: 1) Manual, 2) Thermostat, 3) DDC, 4) VFD. Many other control types can be used.

D501002 SERVICE ENTRANCE EQUIPMENT - Electrical Service - 3 Phase, 480 V, 1200 A

Typical Application and General Component Guidance:

This component is used to inventory exterior service entrance equipment.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

If the component is serving two buildings, inventory under the largest building and provide an inventory comment stating the two buildings it is serving. Consult with government POC on preferred inventory method.

The addition of the 15 kV and 5 kV switchgear component types will allow for a more accurate inventory. It is understood that there are 12,470, 13,200, and 13,800 voltages that may be encountered. In all three instances, 15 kV would be used.

This is often the first piece of electrical gear in a substation lineup in larger facilities. Do not confuse with switchgear. For interior switchgear use 'D501004 PANELBOARDS - Switchgear - XXX Amp'.

General

This component is used to capture service entrance equipment.

This equipment will typically be located in large maintenance buildings where there is a lot of power consumption.

Lesson Learned

If equipment is located in a weather proof enclosure and no nameplate is visible on the outside, the assessor should use judgment in selecting the component type size.

Use the amperage as the basis for the component type selection.

Reinspection

Prior to the 2019 update, only the '120/208 V' selection was available. It can be assumed that when performing a reinspection a modification of the component type will often be required.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Electrical Service - 3 Phase, 480 V, 1200 A	Yes	Yes	Yes	No	No	No	20	EA

D501002 SERVICE ENTRANCE EQUIPMENT - Electrical Service - Distribution Circuit Breaker - For MV/HV Transformer

Typical Application and General Component Guidance:

This component is used to inventory distribution circuit breaker switches.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

An electrical gear lineup will typically have a name, and it should be included as part of the ID Number. The name of the photographed lineup is 'NORTHEAST SUBSTATION_NO. 6'. All other section name guidance still applies (Floor, location, ID number).

This is used to capture large circuit breaker switches. These are defined as switches that are the full height of the gear lineup.

Lesson Learned

If as-built drawings are available they will often show an elevation of the electrical gear and can be very helpful in reaching an accurate inventory for the gear line-up.

In the photo above, three switches would be inventoried as individual sections. The switch on the far right is the Main-Tie-Main and would be inventoried under a different component type.

Reinspection

Prior to the 2019 update, this component type did not exist. These components were either inventoried under 'D501090 OTHER SERVICE AND DISTRIBUTION' or were missed. It can be assumed that when performing a reinspection, a new inventory is required.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Electrical Service - Distribution Circuit Breaker - For MV/HV Transformer	Yes	Yes	Yes	No	No	20	EA

D501002 SERVICE ENTRANCE EQUIPMENT - Electrical Service - Distribution Circuit Breaker - General

Typical Application and General Component Guidance:

This component is used to inventory distribution circuit breakers.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

An electrical gear lineup will typically have a name, and it should be included as part of the ID Number. The name of the photographed lineup is 'NORTHEAST SUBSTATION_NO. 6'. All other section name guidance still applies (Floor, location, ID number).

To the left of the red box is the transformer. To the right is the Main-Tie-Main switch. To the right of the Main-Tie-Main is the other substation gear. Do not combine multiple substations under one component type.

Lesson Learned

As part of the gear lineup there will often be many smaller distribution circuit breakers present. In the photo above, that quantity used would be '5'.

Reinspection

Prior to the 2019 update, this component type did not exist. These components were either inventoried under 'D501090 OTHER SERVICE AND DISTRIBUTION' or were missed. It can be assumed that when performing a reinspection, a new inventory is required.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Electrical Service - Distribution Circuit Breaker - General	Yes	Yes	Yes	No	Yes	No	20	EA

D501002 SERVICE ENTRANCE EQUIPMENT - Electrical Service - Main-Tie-Main Switch 5 KV**Typical Application and General Component Guidance:**

This component is used to inventory Main-Tie-Main switches.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

An electrical gear lineup will typically have a name, and it should be included as part of the ID Number. The name of the photographed lineup is 'NORTHEAST SUBSTATION_NO. 6-7'. All other section name guidance still applies (FLX, location, ID number).

The addition of the 15 kV and 5 kV switchgear component types will allow for a more accurate inventory. It is understood that there are 12,470, 13,200, and 13,800 voltages that may be encountered. In all three instances, 15 kV would be used.

General

A 'Single Line-Up Main-Tie-Main Configuration' is the most common application. There will often be two lineups of gear for each power feed, and the Main-Tie-Main connects the two.

Main-Tie-Main switches will be found in large facilities that have multiple power feeds for reliable power application.

Lesson Learned

In the section name for the component photographed, 'NORTHEAST SUBSTATION_NO. 6-7' was used, as this was the tie between substations No. 6 and No. 7.

There will typically be two transformers on either side of the 'Tie' circuit breaker. The 'Tie' circuit breaker is usually 'Normal Open' to disconnect the two mains. When power failure occurs the 'Tie' circuit breaker is closed allowing power to flow.

Reinspection

Prior to the 2019 update, this component type did not exist. These components were either inventoried under 'D501090 OTHER SERVICE AND DISTRIBUTION' or were missed. It can be assumed that when performing a reinspection, a new inventory is required.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Electrical Service - Main-Tie-Main Switch 5 KV	Yes	Yes	Yes	No	No	20	EA

D501003 INTERIOR DISTRIBUTION TRANSFORMERS - dry-type, 480 V primary 120/208 V secondary, 30 kVA, K-13 rated

Typical Application and General Component Guidance:

This component is used to inventory K-Rated transformers.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Exterior transformers should be inventoried under 'D501003 INTERIOR DISTRIBUTION TRANSFORMERS'. The transformer would follow section naming guidance found on the 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components' page.

If transformers are K-Rated, use the K-13 component type unless the actual K-Rating is known. Typical K-factor ratings are K-4, K-13, and K-20.

The transformer must be directly associated with the building for it to be inventoried. Site/Installation/Utility distribution transformers should not be inventoried.

General

Typically used for transformers that are downstream of the main service entrance. Large maintenance shops might be an exception to the rule, as they can have large transformers mounted on the exterior.

Lesson Learned

An assessor can view the panelboard being served by the transformer as a means to estimate the size. The main circuit breaker size correlates to the transformer as follows: 60A-15kVA, 100A-30kVA, 150A or 175A - 45kVA, 250A-75kVA, 400A-112.5kVA.

If an interior transformer is high on a wall or concealed to the point where the nameplate is not accessible, the assessor can estimate the capacity and populate Section Detail fields based on their judgment.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
dry-type, 480 V primary 120/208 V secondary, 30 kVA, K-13 rated	Yes	Yes	Yes	No	No	No	50	EA

D501003 INTERIOR DISTRIBUTION TRANSFORMERS - dry-type, 480 V primary 120/208 V secondary, 75 kVA

Typical Application and General Component Guidance:

This component is used to inventory interior distribution transformers. Select the correct type and size (round up to nearest size if required).



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Inventory all interior transformers serving emergency panels. Do not inventory transformers enclosed inside electric panels.

Typically used for transformers that are downstream of the main service entrance. Large maintenance shops might be an exception to the rule, as they can have large transformers mounted on the exterior.

General

Interior transformers are typically found in larger buildings. They are used to reduce the incoming voltage to a lower voltage to serve the facilities needs.

Lesson Learned

If an interior transformer is high on a wall or concealed to the point where the nameplate is not accessible, the assessor can estimate the capacity and populate Section Detail fields based on their judgment.

Nameplate is typically on front of the transformer.

The assessor can also use the panelboard being served by the transformer as a means to estimate the transformer size. For example: a 30Kva 480-208/120V, 3 phase transformer would be used to serve a 100A 208/120V, 3 phase panelboard.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
dry-type, 480 V primary 120/208 V secondary, 75 kVA	Yes	Yes	Yes	No	No	No	50	EA

**D501003 INTERIOR DISTRIBUTION TRANSFORMERS - dry-type, 5 kV
primary 277/480 volt secondary, 2000 kVA**

Typical Application and General Component Guidance:

This component is used to capture 5-kV transformers.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

An electrical gear lineup will typically have a name, and it should be included as part of the ID Number. The name of the photographed lineup is 'NORTHEAST SUBSTATION_NO. 6'. All other section name guidance still applies (Floor, location, ID number).

Lesson Learned

This component will often be found in a substation lineup.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
dry-type, 5 kV primary 277/480 volt secondary, 2000 kVA	Yes	Yes	Yes	No	No	No	50	EA

D501003 INTERIOR DISTRIBUTION TRANSFORMERS - oil-filled, 15 kV primary, 277/480 V secondary, 300 kVA

Typical Application and General Component Guidance:

This component is used to inventory exterior pad mounted transformers.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Do not inventory pole-mounted transformers. Only pad-mounted are applicable to the inventory methodology below.

Step 1: If the site utility transformers are owned by a power utility (installation has no responsibility/maintenance component), they should not be inventoried.

Step 2: If the site utility transformers are the responsibility of the installation to maintain/replace, they should be inventoried as follows:

Step 2-1: If the transformer has its own real property ID (maintained as a separate entity), the transformer should be inventoried using that location in BUILDER. Do not include in an adjacent building.

Step 2-2: If the transformer does not have its own real property ID, it should be inventoried within the largest adjacent building.

The category 'D501003 INTERIOR DISTRIBUTION TRANSFORMERS' is used to inventory exterior transformers. When used in this fashion, the section name should indicate the cardinal direction from building.

Lesson Learned

In the case where an exterior transformer is inventoried, the structural slab, should also be inventoried. This should be separate from the building slab and the section name should have the cardinal direction from the building.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
oil-filled, 15 kV primary, 277/480 V secondary, 300 kVA	Yes	Yes	Yes	No	No	30	EA

D501004 PANELBOARDS - Main Circuit Breaker, 120/208 V, 100 amp**Typical Application and General Component Guidance:**

This component is used to inventory panelboards that have a main circuit breaker.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

All panelboards OVER 250 amp (this does NOT include 250 amp as they have their own component type) should be rounded up to the 400 amp component types. The panel amperage should be used for the Section Details 'Capacity' field value.

If a panel is over 800 amp, it should be inventoried under Switchgear.

If the panel has a rated amperage on the main circuit breaker but the panelboard amperage is not found then the amperage on the main circuit breaker should be used for both the component type selection and for the Section Details 'Capacity' field value.

If the panel has a rated amperage on the panelboard but the main circuit breaker amperage is not found then the amperage on the panelboard should be used for both the component type selection and for the Section Details 'Capacity' field value.

MCB panels have a rated capacity on the nameplate. There will also be a main breaker that has an amperage. Use the rated capacity on the nameplate for component type selection and use the main breaker size as Section Details 'Capacity' field value.

Panelboards may have a main breaker that is separate from the distribution breakers (as shown in photo) OR the main breaker may be located in the breaker lineup. The latter situation is easy to miss and can lead to an incorrect component type selection.

Section by floor and equipment sectioning guidelines. Always select the most specific component type based on the panel amperage as the first factor and voltage as the second factor.

Lesson Learned

MCB panelboards will often have a wrong component type chosen because it is selected based on the breaker size. The component type should be selected based on the panel rated amperage on the nameplate.

There are instances where the amperage of the circuit breaker is not located on the front of the breaker. The assessor should look on both sides of the breaker as the amperage will sometimes be written on the side.

Reinspection

Prior to the 2019 update, panelboards with a main breaker were inventoried under 'D501005 ENCLOSED CIRCUIT BREAKERS'. When performing a reinspection on data inventoried before 2019, it can be assumed that all MCB panels will require a new component type.

Prior to the 2019 update, the 800 amp component types did not exist. It can be assumed that all 800 amp panelboards will require an update to the component type when performing a reinspection.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Main Circuit Breaker, 120/208 V, 100 amp	Yes	Yes	Yes	No	No	No	50	EA

D501004 PANELBOARDS - Main Circuit Breaker, 120/208 V, 225 amp**Typical Application and General Component Guidance:**

This component is used to inventory panelboards with main circuit breakers.

**Business Rules/General/Lessons Learned/Reinspection****Lesson Learned**

This was added to the manual to show a unique instance where multiple components are attached. The transformer is on the top, with the MCB panel on the bottom. These are inventoried as two separate items.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Main Circuit Breaker, 120/208 V, 225 amp	Yes	Yes	Yes	No	No	No	50	EA

D501004 PANELBOARDS - Main lugs, 50 amp**Typical Application and General Component Guidance:**

This component is used to inventory all panels that are under 100 amps.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Section by 'EXTERIOR' for outside panels and by floor (FL1, FL2, FL3, etc.) for interior panels.

Section Details and inventory photos are not required for this component type. Lump all the panels into one section.

This is the component type to inventory panels between 30 amp and 99 amp.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Main lugs, 50 amp	Yes	No	No	No	Yes	No	20	EA

D501004 PANELBOARDS - Main lugs, 125 amp**Typical Application and General Component Guidance:**

This component is used to inventory main lug panels that are typically downstream of the main distribution panel.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

All panelboards OVER 250 amp (this does NOT include 250 amp as they have their own component type) should be rounded up to the 400 amp component types. The panel amperage should be used for the Section Details 'Capacity' field value.

If a panel is over 800 amp, and not found as a 'D501004 PANELBOARDS' component type, it should be inventoried under Switchgear.

If the panel is 30 amp to 99 amp, it should be inventoried under the component type 'Main lugs, 50 amp.'

Inventory as a separate component section if above or equal to 100 amps.

MLO panels have a rated capacity on the nameplate. Use the rated capacity on the nameplate for component type selection and for the Section Details 'Capacity' field value.

Often on a small building there will be a single panel under 100 amps. In that case the assessor should inventory the panel and provide section details.

Section by floor and equipment sectioning guidelines. Always select the most specific component type based on the panel amperage as the first factor and voltage as the second factor.

General

A panelboard is typically a wall-mounted electrical cabinet containing a bus bar and circuit breakers for the control and protection of branch circuits from lighting, to HVAC, to plug loads.

Lesson Learned

Assessors should use caution when opening panels as there can be missing breaker covers that expose the connectors/bus bar. This should be brought up as a safety item when found.

If the panel is locked, assessor can use judgment in assuming the size. Often if the panel is downstream of the service entrance panel, the size can be viewed on the service entrance panel breaker as well.

Reinspection

Prior to the 2019, update the 800 amp and above component types did not exist. It can be assumed that some panelboards will require an update to the component type when performing a reinspection.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Main lugs, 125 amp	Yes	Yes	Yes	No	No	20	EA

D501004 PANELBOARDS - Main lugs, 200 amp**Typical Application and General Component Guidance:**

This was included to clarify the section detail fields for panelboards.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Capacity should be populated in accordance with the MCB/MLO business rules. Location should be populated in accordance with all sectioning guidance.

ID Number should always be exactly what is found on the tag on the panel. Serial number, Equipment Make, and Control Type is almost always 'NA'.

The section details for the photo above, Manufacturer = Eaton, Equipment Make = Pow-R-Line, and Model = PRL2A. Category type is used as the model number.

The 'Year Installed' in the section details should match the 'Year Installed' on the Section pane. If not known, the 'Date Manufactured' should be set to January 1st of the year installed.

General

This was added to clarify the section detail fields for panelboards. This applies to all panelboards (MCB and MLO).

Reinspection

Prior to the 2019 update there was not clear definition on section detail fields for panelboards. It can be assumed that when performing a reinspection there may be some modifications needed.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Main lugs, 200 amp	Yes	Yes	Yes	No	No	No	20	EA

D501004 PANELBOARDS - Motor Starter/Disconnect**Typical Application and General Component Guidance:**

This component type is used to inventory combination motor starters/disconnects.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Section Details and inventory photos are not required for this component type. Group all the switches into one section. All sectioning guidance on 'Sectioning: The Rules' pages still apply.

Reinspection

Prior to the 2019 update, this component type was not in scope. It can be assumed that a new inventory will be required when performing a reinspection.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Motor Starter/Disconnect	Yes	No	No	No	Yes	No	30	EA

D501004 PANELBOARDS - Safety Switch, >100 Amp

Typical Application and General Component Guidance:

This component is used to inventory overhead bus safety switches.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

All safety switches located on the bus bar should be counted (even if they are less than 100A).

The safety switches will vary in amperage and will be located in an inaccessible location. The inventory method 'Group OK? - Yes' can be used. The safety switches (only the ones on the bus bar) should be counted and inventoried under a single section.

This component type is only used for this application. This component type and the 'Safety Switch, 30-100 Amp' component type should remain separate. This is only used for bus bar mounted safety switches.

General

Overhead bus bars are commonly found in manufacturing and maintenance facilities. They will often have many safety switches mounted on them. The photo above shows a total of 6 safety switches.

Lesson Learned

Maintenance and manufacturing facilities often have renovations and new electrical gear will be installed. It may be necessary to add sections based on the area of the building if this has occurred.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Safety Switch, >100 Amp	Yes	No	No	No	Yes	No	30	EA

D501004 PANELBOARDS - Safety Switch, 200 Amp**Typical Application and General Component Guidance:**

This component is used to inventory safety switches. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

All safety switches over 30 amp should be inventoried regardless of their function.

If a safety switch is encountered with a live front, the assessor should not approach it.

If a safety switch needs to be sectioned out separately and it does not have an Equipment ID number, use the Equipment ID for the equipment it is serving in the section name so it can be easily located for repair or replacement.

If the safety switch is 30 amp to 99 amp, it should be inventoried under the component type 'Safety Switch, 30-100 Amp.'

Industry standards for non-fused switches are 30A, 60A, 100A, 200A, 400A, 600A, 800A.

Lesson Learned

Safety switches can serve HVAC equipment (air handlers, exhaust fans, etc.), process equipment (air compressors, cranes, welders, etc.), and other miscellaneous items.

There is no need to open the safety switch as the capacity can be found on the front label.

Reinspection

Prior to the 2019 update, 100 amp safety switches were inventoried under 'Safety Switch, > 100 Amp'. Now, the component type 'Safety Switch, 100 Amp' should be used. Upon reinspection, an update of the component type is required.

Prior to the 2019 update, there was a business rule that was often interpreted incorrectly, and this led to many safety switches not being inventoried. When performing a reinspection, it may be found that a new inventory of safety switches is required.

Prior to the 2019 update, there was no 600 amp or 800 amp selection available. 400 amp was used as the component type, so it can be assumed that when performing a reinspection, large safety switches will require a modification of the component type.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Safety Switch, 200 Amp	Yes	Yes	Yes	No	No	No	20	EA

D501004 PANELBOARDS - Safety Switch, 30-100 Amp

Typical Application and General Component Guidance:

This component is used to inventory small safety switches and disconnects. The photo shows two 60-amp safety switches on either side of a 100-amp enclosed circuit breaker.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

30-amp safety switches are to be inventoried. Switches under 30 amps can be ignored.

Safety switches that are between 30 amp and 99 amp should be combined into one component section to be inventoried and assessed.

The exterior safety switches follow section naming guidance found on the 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components' page.

The interior safety switches follow section naming guidance on the 'Sectioning: The Rules' pages.

Lesson Learned

If a safety switch needs to be sectioned out separately and it does not have an Equipment ID number, use the Equipment ID for the equipment it is serving in the section name so it can be easily located for repair or replacement.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Safety Switch, 30-100 Amp	Yes	No	No	No	Yes	No	30	EA

D501004 PANELBOARDS - Switchgear - 1200 Amp**Typical Application and General Component Guidance:**

This component is used to inventory switchgear and switchboards.
Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not open. Capacity can be found on nameplate on exterior of unit. If no nameplate is available, the assessor should use judgment based on experience to select component type.

If there are multiple, stand-alone switchgear assemblies, each one is a separate component section.

The component type should be selected based on the main breaker size. The quantity should be the number of sections that make up the switchgear. Only one section detail is required for the entire assembly.

General

Normally associated with large buildings and will be typically located in the main electrical room.

Switchgear is usually a floor-mounted electrical cabinet or assembly of cabinets containing circuit breakers, switches, and other devices for the protection and control of large electrical loads.

Lesson Learned

The photo would be inventoried as a separate component section with a quantity of 7.

This component type is used to capture both switchgear and switchboards.

Reinspection

Prior to the 2019 update, the 'Switchgear - 3000 Amp' component type did not exist. When this is found when performing a reinspection, it can be assumed that an update to the component type will be required.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Switchgear - 1200 Amp	Yes	Yes	Yes	No	No	No	50	EA

D501004 PANELBOARDS - Transfer Switch - Automatic, 400 amp

Typical Application and General Component Guidance:

This component is used to inventory transfer switches. Select the correct type and size (round up to nearest size if required).



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Do not open transfer switches. They typically will have no model numbers or capacity listed on the inside. The assessor may have to estimate the capacity based on other electrical gear present.

General

Switches may be located inside or outside. If located inside, they will typically be in the main electrical room. If located outside, they will typically be by the generator or secondary power source.

Lesson Learned

If you have a generator present, you will most likely have a transfer switch. Buildings may have a connection for a portable generator to be placed on site and connected to the building. In this case, you have a transfer switch present but no generator.

Switches come in both manual and automatic varieties. Manual will typically have a lever that needs to be actuated. Automatic will have more electronic controls and a possible digital readout on the front panel.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Transfer Switch - Automatic, 400 amp	Yes	Yes	Yes	No	No	30	EA

D501004 PANELBOARDS - Transfer Switch - Bypass Isolation, 400 amp**Typical Application and General Component Guidance:**

This component type is used to capture bypass isolation transfer switches.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

A bypass isolation switch will include an automatic transfer switch. This component type captures both components if they are packaged in a single unit.

A bypass isolation transfer switch will allow for maintenance of the ATS or bypass of the ATS (if disabled). These transfer switches will often have a manual bypass switch on the front of the switch.

General

The equipment has isolation bypass switch in front for ATS isolation for maintenance while downstream equipment is still being energized.

Lesson Learned

Bypass isolation switches are commonly found in situations dealing with a reliable or redundancy power application.

Reinspection

Prior to the 2019 update, bypass isolation transfer switches were inventoried as a regular isolation switch. When one of these are found when performing a reinspection, it can be assumed that a modification to the component type will be required

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Transfer Switch - Bypass Isolation, 400 amp	Yes	Yes	Yes	No	No	No	20	EA

D501005 ENCLOSED CIRCUIT BREAKERS - Enclosed Circuit Breaker, 100 Amp**Typical Application and General Component Guidance:**

This component is used to inventory enclosed circuit breakers.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

100 amp and above should be an individual section.

30 amp enclosed circuit breakers are to be inventoried. Enclosed circuit breakers under 30 amps can be ignored.

All business rules for the 'Safety Switch, 30-100 Amp' component type are applicable to 'Enclosed Circuit Breaker, 30-100 Amp' component type.

Enclosed circuit breakers that are between 30 amp and 99 amp should be combined into one section using the component type 'Enclosed Circuit Breaker, 30-100 Amp' to be inventoried and assessed.

General

This component type is only used to captured enclosed circuit breakers. These will be a panel-type enclosure (often without a door) with a single circuit breaker switch.

Lesson Learned

There are instances where the amperage of the circuit breaker is not located on the front of the breaker. The assessor should look on both sides of the breaker as the amperage will sometimes be written on the side.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Enclosed Circuit Breaker, 100 Amp	Yes	Yes	Yes	No	No	No	20	EA

**D501005 ENCLOSED CIRCUIT BREAKERS - Main circuit breaker,
120/208 V, 225 amp, NQOD****Typical Application and General Component Guidance:**

This component is included for clarification purposes only.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not use the panel component types under 'D501005 ENCLOSED CIRCUIT BREAKERS'. They were left in the catalog due to the amount of data inventoried under these component types when they were the only option.

The panelboard component types under 'D501005 ENCLOSED CIRCUIT BREAKERS' being marked 'In Scope - No?' does not mean they should not be inventoried. They should be inventoried under 'D501004 PANELBOARDS'.

General

This section was left in the manual for clarification purposes only. All panelboards should be inventoried under 'D501004 PANELBOARDS'.

Reinspection

Prior to the 2019 update, panelboards with a main breaker were inventoried under 'D501005 ENCLOSED CIRCUIT BREAKERS'. When performing a reinspection on data inventoried before 2019, it can be assumed that all MCB panels will require a new component type.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Main circuit breaker, 120/208 V, 225 amp, NQOD	No	No	No	No	N/A	No	50	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

D501006 MOTOR CONTROL CENTERS - Motor Control Center - Size 6, 400 HP, 72" high**Typical Application and General Component Guidance:**

This component is used to inventory motor control centers. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Do not inventory a single wall starter as an MCC. This must be a substantial piece of electrical gear with several buckets.

If there are multiple MCCs each one is a separate component section. It is understood that the quantity will often be greater than 1 for this component type as there are typically several columns as part of the single piece of gear.

MCCs are to be inventoried by number of columns that form the MCC assembly. Only one section detail is required for the entire MCC assembly.

The component type will almost always be the 72" tall type. The quantity should be the number of columns that make up the MCC. The photos would result in a quantity of 9 being entered.

The 'Group OK? - No' status is in reference to the complete MCC assembly. Each assembly should be a separate entry. It is understood that quantity will often be greater than 1.

General

Typically found in process-orientated buildings where pumps/fans have large motors that require starters.

Lesson Learned

It is understood that, from an electrical engineering perspective, the component types are the size of the buckets. For consistent inventory and CRV calculation, MCCs should be inventoried as stated in the business rules.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Motor Control Center - Size 6, 400 HP, 72" high	Yes	Yes	Yes	No	No	No	40	EA

D501090 OTHER SERVICE AND DISTRIBUTION - Other**Typical Application and General Component Guidance:**

This component is used to capture other large electrical components that are not found in the catalog.

**Business Rules/General/Lessons Learned/Reinspection****Lesson Learned**

The most common use for this component type is large surge protectors. These will typically serve an entire system and be of considerable size and value.

Reinspection

Prior to the 2019 update, many large pieces of equipment (Main-Tie-Main switches, distribution circuit breakers, etc.) were captured under this component type, as this was the only possible location for inventory.

When performing a reassessment on data captured prior to the 2019 update, the assessor should assume that many of the components will require a component type update.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Other	Yes	Yes	Yes	Yes	No	25	EA

D502001 BRANCH WIRING - General**Typical Application and General Component Guidance:**

This component is used to inventory the wire distribution system.
Note: UOM is SF.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If occupants highlight problem areas that are directly caused by the branch wiring, an inspection can be provided. Receptacles and switches are not inventoried or assessed. They are part of Branch Wiring. Typically will not be visible for an assessment. The UOM is SF. Inventory the wiring and correctly insert the install date. BUILDER™ will degrade the asset from that point or reach the CI.

General

Quantity = Building SF. This captures all the electric service in the building. Do not section by floor. If there is a difference in install dates, then multiple sections would be required.

Lesson Learned

Section name will typically be 'N/A' unless there are new wings or newer remodels of a building where there would be a difference in install date.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
General	Yes	No	No	No	N/A	Yes	60	SF

D502002 LIGHTING EQUIPMENT - Exit Lighting**Typical Application and General Component Guidance:**

This component is used to inventory exit lights.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Combination emergency (bug eye) and exit lights are very common. These should be inventoried under emergency lights.

Do not inventory cardboard or other types of exit signs that are, in fact, just a sign. The requirement to be inventoried is that there must be an illuminating element to the exit sign.

Exit signs may be one-sided or two-sided. Both instances should be inventoried as a quantity of 1.

Lesson Learned

Assessors should inventory 'EME Combo' fixtures under 'D509002 EMERGENCY LIGHTING & POWER - Emergency Lighting' since half the fixture is an emergency light. Verify that 1) Exit lights, 2) EME Combos, and 3) Emergency lights are fully understood.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Exit Lighting	Yes	No	No	No	Yes	No	20	EA

D502002 LIGHTING EQUIPMENT - Explosion Proof Lighting - Incandescent, ceiling mounted, 200 W

Typical Application and General Component Guidance:

This component is used to inventory explosion-proof lighting. Select the correct type. The photo shows the wall mount lights located on a pedestal.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Incandescent fixtures with screw-in compact fluorescent bulbs are counted as incandescent. Newer fixtures are CFL and have a pin-type connection (not screw-in) that would be counted as a fluorescent. Age is a good indicator to use.

General

Typically found in industrial buildings with explosive gases or munitions. May be located on the inside or exterior of a building.

Lesson Learned

Can be identified by heavy conduit, enclosed fixtures, and switches. Conduit entrance to fixture will be sealed.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Explosion Proof Lighting - Incandescent, ceiling mounted, 200 W	Yes	No	No	No	Yes	No	20	EA

D502002 LIGHTING EQUIPMENT - Exterior LED Lighting**Typical Application and General Component Guidance:**

This component is used to inventory exterior LED lighting.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Exterior lights should be sectioned per direction found on the 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components'.

There is no need to have 'Exterior' in the section name, as it is contained in the component type.

Reinspection

Prior to the 2019 update, exterior lights were sectioned by cardinal direction. Upon a reinspection, the lights should be combined/sectioned per the latest inventory guidance.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Exterior LED Lighting	Yes	No	No	No	Yes	No	10	EA

D502002 LIGHTING EQUIPMENT - Exterior Lighting

Typical Application and General Component Guidance:

This component is used to inventory exterior lighting.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

Exterior lights are not sectioned by floor.

Exterior lights should be sectioned per direction found on the 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components'.

Inventory lights if they are built into stairwells, mounted on banisters, illuminating a ramp, etc. Do not inventory site lighting such as parking light poles or other lighting not associated with the building.

There is no need to have 'Exterior' in the section name as it is contained in the component type.

Lesson Learned

It is helpful to section lights by type on the exterior of the building. For example, section lights in the stair risers as 'STAIR LIGHT', section lights in the soffits as 'SOFFIT LIGHT'. If these are both one section, it makes reassessment much harder.

There is a component type for exterior incandescent fixtures available: 'Exterior Lighting - Incandescent, wall mounted, 100 W'.

Wall packs have more accurate component types available such as 'Exterior Lighting - Metal halide, wall pack, 175 W'.

Reinspection

Prior to the 2019 update, exterior lights were sectioned by cardinal direction. Upon a reinspection, the lights should be combined/sectioned per the latest inventory guidance.

Prior to the 2019 update, there was no component type 'Exterior Fluorescent Lighting', so many of these lights were captured under this component type. Upon reinspection, the component type should be updated for exterior fluorescent lights.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Exterior Lighting	Yes	No	No	No	Yes	No	20	EA

D502002 LIGHTING EQUIPMENT - Exterior Lighting - Metal halide, wall pack, 175 W**Typical Application and General Component Guidance:**

This component is used to inventory exterior lighting. Select the correct type.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

All wall packs should be inventoried under one of the six component types with 'wall pack' in the title. Do not use the 'exterior lighting' component type, as that is used for other types of exterior fixtures.

Exterior lights should be sectioned per direction found on the 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components'.

There is no need to have 'Exterior' in the section name as it is contained in the component type.

Wall packs are provided with a high and low wattage selection. For metal halide, this is 175W/250W. If the fixture is on the first floor, use the lower wattage selection. If it is on the second (or higher) floor, use the higher wattage selection.

Wall packs are some of the most common exterior lights. Often you cannot tell the type unless they are on and there is a blue or yellow hue. If unknown, default to 'Exterior Lighting - Metal halide, wall pack, XXX W'.

Reinspection

Prior to the 2019 update, exterior lights were sectioned by cardinal direction. Upon a reinspection, the lights should be combined/sectioned per the latest inventory guidance.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Exterior Lighting - Metal halide, wall pack, 175 W	Yes	No	No	No	Yes	No	20 EA

D502002 LIGHTING EQUIPMENT - Interior Lighting, FL - 2 Lamp T8**Typical Application and General Component Guidance:**

This component is used to inventory fluorescent 2-lamp T8s and T5s.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If a fixture is higher than 15' above finished floor, it is assumed to be a HO fixture. In that case it should be inventoried under a T5 HO component type.

T5's that are not a HO fixture should be inventoried as T8.

The driver for fluorescent component type selection is the number of lamps. Whether the fixture is a 2'x2' or a 4'x2' has no bearing on the component type selection.

General

A T8 light is a light with a 1-inch diameter lamp.

Lesson Learned

If a fixture is concealed behind a lense, a photo taken with a camera will sometimes show the outline of the number of lamps.

Sectioning methodology: T8 = office/schools (low height), T5 = gyms/warehouses (high bay), T12 = uncommon, as most have been replaced.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Interior Lighting, FL - 2 Lamp T8	Yes	No	No	No	Yes	No	20	EA

D502002 LIGHTING EQUIPMENT - Interior Lighting, FL - 4 Lamp T8**Typical Application and General Component Guidance:**

This component is used to inventory fluorescent 4-lamp T8 fixtures.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Assessors should look for seams where the fixtures were joined together. There are instances where 8' fixtures/lamps are used. Assessors should use judgment to determine the fixture length.

Strip lighting: It can be assumed that there are 4' lamps installed. Determine the number of lamps and the total length of strip fixture. Divide the length by 4 to reach the quantity.

T8s are to be used for all common FL light applications such as in offices/barracks/schools. These are typically mounted 7' to 15' above the finished floor.

The driver for fluorescent component type selection is the number of lamps. Whether the fixture is a 2'x2' or a 4'x2' has no bearing on the component type selection.

Lesson Learned

If a fixture is concealed behind a lense, a photo taken with a camera will sometimes show the outline of the number of lamps.

Sectioning methodology: T8 = office/schools (low height), T5 = gyms/warehouses (high bay), T12 = uncommon, as most have been replaced.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Interior Lighting, FL - 4 Lamp T8	Yes	No	No	No	Yes	No	20	EA

D502002 LIGHTING EQUIPMENT - Interior Lighting, FL - 6 Lamp T5, HO**Typical Application and General Component Guidance:**

This component is used to inventory fluorescent 6-lamp T5 HO fixtures. HO is defined as High-Output.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Fixtures that are over 15' in height can be assumed to be a HO fixture. The most common type of HO fixture is a 6-lamp T5.

T5s are commonly used in high bay applications such as gyms/warehouses.

The driver for fluorescent component type selection is the number of lamps. Whether the fixture is a 2'x2' or a 4'x2' has no bearing on the component type selection.

General

A T5 light is a light with a 5/8" diameter lamp.

Lesson Learned

If a fixture is concealed behind a lense a photo with a camera will sometimes show the outline of the number of lamps.

Sectioning methodology: T8 = office/schools (low height), T5 = gyms/warehouses (high bay), T12 = uncommon, as most have been replaced.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Interior Lighting, FL - 6 Lamp T5, HO	Yes	No	No	No	Yes	No	20	EA

D50 ELECTRICAL - D5020 LIGHTING & BRANCH WIRING

D502002 LIGHTING EQUIPMENT - Interior Lighting, Fluorescent**Typical Application and General Component Guidance:**

This component is used to inventory fluorescent light fixtures.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If a can light cannot be determined to be a compact fluorescent (CFL) or incandescent, the assessor should assume it is an incandescent fixture.

Incandescent fixtures with screw-in compact fluorescent bulbs are counted as incandescent. Newer fixtures that are CFL and have a ballast would be counted as a fluorescent. Age is a good indicator to use.

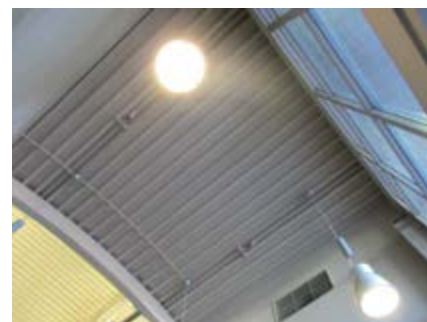
Lesson Learned

Newer can lights that have a pin-type fluorescent connection will be hard to tell from the standard incandescent. Ask the maintenance staff or local personnel if they have changed (or seen) a bulb and remember what it looked like.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Interior Lighting, Fluorescent	Yes	No	No	No	Yes	No	20	EA

D502002 LIGHTING EQUIPMENT - Interior Lighting, High Intensity - Metal Halide 400 W (Type B)**Typical Application and General Component Guidance:**

This component is used to inventory high intensity metal halide fixtures.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

High intensity fluorescent fixtures are becoming more popular on initial installation and retrofits. Use 'Interior Lighting, High Intensity' or the correct 'Interior Lighting, FL - X Lamp T5, HO' component type.

General

Typically found in high bay applications. Maintenance shops and gyms are some of the more common places they are used.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Interior Lighting, High Intensity - Metal Halide 400 W (Type B)	Yes	No	No	No	Yes	No	20	EA

D50 ELECTRICAL - D5020 LIGHTING & BRANCH WIRING

D502002 LIGHTING EQUIPMENT - Interior Lighting, Incandescent**Typical Application and General Component Guidance:**

This component is used to inventory incandescent light fixtures.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

If a can light cannot be determined to be a compact fluorescent or incandescent, the assessor should assume it is an incandescent fixture.

If there is a residential ceiling fan that includes lighting, it should be inventoried as a incandescent fixture. Do not inventory if there is no light present.

Incandescent fixtures with screw-in compact fluorescent bulbs are counted as incandescent. Newer fixtures are CFL and have a pin-type connection (not screw-in) that would be counted as a fluorescent. Age is a good indicator to use.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Interior Lighting, Incandescent	Yes	No	No	No	Yes	No	20	EA

D502002 LIGHTING EQUIPMENT - Interior Lighting, LED**Typical Application and General Component Guidance:**

This component is used to inventory interior LED light fixtures.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

The component type 'Interior Lighting, LED' should be used as little as possible. There are more selections available for LED lights (Canlight, Downlight/Sconce/Pendant, High Bay, Strip, Troffer).

General

LED lamps and fixtures are very common on newer buildings and retrofits.

Reinspection

In the 2019 update, several different types of interior LED light types were added. Prior to this, only 'Interior Lighting, LED' was available. Upon reinspection, it can be assumed that a new inventory of interior LED lights will be required.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Interior Lighting, LED	Yes	No	No	No	Yes	No	20	EA

D502090 OTHER LIGHTING AND BRANCH WIRING - General

Typical Application and General Component Guidance:

This component is used to inventory other types of light fixtures or video display boards.



Business Rules/General/Lessons Learned/Reinspection

General

As a last resort, this can be used to capture any light fixture that does not have a component type elsewhere in the catalog. Provide accurate Section Name and inventory comment to help the next assessor understand what is being inventoried.

The most common use of this component type is display boards that are mounted to a building. These can be scrolling or a larger display type of video board.

Lesson Learned

One use of this was a bug-zapper application where the zapper was located in the vestibule of a building.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	Yes	No	15	EA

D503002 PUBLIC ADDRESS SYSTEMS - 12 outlets**Typical Application and General Component Guidance:**

This component is used to inventory public address (PA) systems.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Assessors should only have one component section per PA system. It is understood that the number of outlets may not add up perfectly to the assessor's value. Section details should provide information on the head unit/system.

Larger buildings will have a PA system with speakers. Note the UOM is the number of outlets (speakers) in the building. Ask the on-site personnel if there is a PA system in the building and if it is functional.

Section details should be populated from the main PA control panel or head unit. Only a single section detail is required.

The system is sized by 6, 12, 25, and 50 outlets. In the event that a building has 75 detectors, a component section of three 25-outlet systems are added.

Lesson Learned

Assessors will sometimes put in the number of speakers. If the component type of 50 is chosen and the quantity entered is 50, the assessor has just added 2,500 speakers to a building when they thought they were adding 50.

There is often confusion between 'D503002 PUBLIC ADDRESS SYSTEMS' and 'D503003 INTERCOMMUNICATIONS SYSTEMS'. D503002 captures PA systems by number of speakers. D503003 captures intercoms by number of stations.

Reinspection

Prior to the 2019 update, section details were not required for PA systems. Upon reinspection, it should be assumed that details will be needed for all PA systems.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
12 outlets	Yes	Yes	No	No	Yes	Yes	20	EA

D503003 INTERCOMMUNICATIONS SYSTEMS - 12 stations**Typical Application and General Component Guidance:**

This component is used to capture intercommunication systems.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Assessors should only have one component section per intercom system. It is understood that the number of intercoms may not add up perfectly to the assessor's value.

General

Larger buildings will have an intercom speaker with stations. Note the UOM is the number of stations in the building. Ask the on-site personnel if there is a intercom system in the building. Intercoms are not as popular as PA systems.

Lesson Learned

Assessors will sometimes put in the number of intercoms. If the component type of 50 is chosen and the quantity entered is 50 the assessor has just added 2,500 intercoms to a building when they thought they were adding 50.

The system is sized by 6, 12, 25, and 50 outlets.

There is often confusion between 'D503002 PUBLIC ADDRESS SYSTEMS' and 'D503003 INTERCOMMUNICATIONS SYSTEMS'. D503002 captures PA systems by number of outlets. D503003 inventories intercoms by number of stations.

Typically located at automatic gates and building entrances.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
12 stations	Yes	No	No	No	Yes	Yes	15	EA

D503005 SECURITY SYSTEMS - General**Typical Application and General Component Guidance:**

This component is used to inventory security systems.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Security systems are out of scope and should not be captured.

Reinspection

Prior to the 2019 update, security systems were 'In Scope? - Yes'. This has since been moved to 'In Scope? - No' and should be removed from the data set upon reinspection.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA

If a component is listed as In Scope? - 'No' it is 1) being included for clarification purposes or 2) providing general guidance for all like-kind component types that are better selections. See complete catalog at the end of the section.

D503006 NURSE CALL SYSTEMS - General**Typical Application and General Component Guidance:**

This component is used to inventory nurse call systems (controls and appurtenances).



Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	Yes	20	EA

D503007 CLOCK & PROGRAM SYSTEMS - General**Typical Application and General Component Guidance:**

This component is used to inventory synchronized clock systems.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Assessors should inventory the system and correctly insert the install date. BUILDER™ will degrade the asset from that point to reach the CI.

When a clock system is found in a building, the component type 'D503007 CLOCK & PROGRAM SYSTEMS - General' with a quantity of 1 should be added.

Lesson Learned

Assessors should look for digital clocks that are synchronized throughout a facility. This system will be commonly found on large/school/medical center/hospital type buildings.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
General	Yes	No	No	No	Yes	No	20	EA

D503090 OTHER COMMUNICATIONS & ALARM SYSTEMS - General**Typical Application and General Component Guidance:**

This component is used to inventory other communication and alarm systems. The photo shows a large speaker that was mounted on the roof.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Provide an accurate Section Name and an inventory comment stating what is being inventoried to allow future assessments to understand what is being inventoried.

Reinspection

Prior to the 2019 update, this component type was used to capture large antennas. Communications equipment such as this has been deemed to be out of scope. Upon reinspection, it should be removed from the inventory.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
General	Yes	Yes	Yes	Yes	Yes	No	15	EA

D509002 EMERGENCY LIGHTING & POWER - Emergency Lighting**Typical Application and General Component Guidance:**

This component is used to inventory emergency light fixtures.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

A standard troffer with a battery backup will commonly have a red or green light visible. These lights are NOT counted as an emergency light. These are inventoried under 'D502002 LIGHTING EQUIPMENT.'

General

The component type 'Emergency Lighting' was widely used prior to the 2019. Now, it is primarily for recessed (troffer type) fixtures that are ONLY an emergency light.

Reinspection

Prior to the 2019 update 'Emergency Lighting' component type was primarily used with section names denoting 'BUGEYE' and 'EME COMBO'. When performing a reinspection, the correct component type should be selected.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Emergency Lighting	Yes	No	No	No	Yes	No	20	EA

D509002 EMERGENCY LIGHTING & POWER - Emergency Lighting - Bugeye**Typical Application and General Component Guidance:**

This component type is used to inventory single/dual beam (bugeye) emergency lights.

**Business Rules/General/Lessons Learned/Reinspection****Reinspection**

Prior to the 2019 update the 'Emergency Lighting' component type was primarily used with section names denoting 'BUGEYE' and 'EME COMBO'. When performing a reinspection, the correct component type should be selected.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM	
Emergency Lighting - Bugeye	Yes	No	No	No	Yes	No	20	EA

D509002 EMERGENCY LIGHTING & POWER - Exit/Emergency Lighting (EME Combo Fixture)**Typical Application and General Component Guidance:**

This component is used to inventory exit/emergency light combos.

**Business Rules/General/Lessons Learned/Reinspection****General**

This component type is used to capture exit/emergency light fixtures that are a combination of the two light types.

Reinspection

Prior to the 2019 update 'Emergency Lighting' component type was primarily used with section names denoting 'BUGEYE' and 'EME COMBO'. When performing a reinspection, the correct component type should be selected.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Exit/Emergency Lighting (EME Combo Fixture)	Yes	No	No	No	Yes	No	20	EA

D509002 EMERGENCY LIGHTING & POWER - Generators - Diesel, 500 kW

Typical Application and General Component Guidance:

This component is used to inventory generators. Select the correct type and size (round up to nearest size if required).



Business Rules/General/Lessons Learned/Reinspection

Business Rule

If the diesel tank is separate from the generator, it should be inventoried under 'D301002 GAS SUPPLY SYSTEM - Fuel Storage Tank.' If the tank is a belly tank, it is considered part of the generator assembly and does not need to be inventoried.

If the generator has a remote radiator, it should be inventoried under 'D303090 OTHER COOLING GENERATING SYSTEMS - General.' If there is a division of labor between D30 and D50, this is a coordination item.

The 'Gas' component type covers both NG- and LPG-fired generators. The 'Diesel' type covers diesel as well as any other liquid fuel types (such as gasoline).

General

Emergency generators are typically found on Mission-Critical and High-Importance Facilities, i.e. headquarters, fire and police, medical, and other emergency support facilities.

Note that the component types provide selections by fuel type and capacity.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmmt?	Group OK?	Age Based?	Design Life	UOM
Generators - Diesel, 500 kW	Yes	Yes	Yes	No	No	No	30	EA

D509002 EMERGENCY LIGHTING & POWER - Uninterruptible Power Supply - 15 kVA**Typical Application and General Component Guidance:**

This component is used to inventory uninterruptible power supply (UPS) systems. Select the correct type and size (round up to nearest size if required).

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Only inventory if the UPS is physically hard-wired to the building. Do not inventory plug-in type systems or systems that are integral to an IT/panel cabinet.

The largest entry of 15 kVA will typically be used. Record the actual or estimated capacity in the Section Details.

General

Typically found in electrical rooms of buildings or data centers, these provide emergency power when the main power fails until a generator or second source of power is brought on-line.

Reinspection

Prior to the 2019 update, the largest UPS was 15 KVa. When performing a reinspection, many UPS components will require the selection of a new component type, as many are larger than 15 KVa.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Uninterruptible Power Supply - 15 kVA	Yes	Yes	Yes	No	No	25	EA

D509003 GROUNDING SYSTEMS - Other**Typical Application and General Component Guidance:**

This component is used to inventory grounding systems.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Assessors should inventory the system and correctly insert the install date. BUILDER™ will degrade the asset from that point to reach the CI.

Per building codes, all buildings must be grounded. Use 'D509003 GROUNDING SYSTEMS - Other' to inventory the system.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Other	Yes	No	No	No	N/A	50	SF

D509004 LIGHTNING PROTECTION - Other**Typical Application and General Component Guidance:**

This component is used to inventory lightning protection systems.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Assessors should inventory the system and correctly insert the install date. BUILDER™ will degrade the asset from that point to reach the CI.

If a building has a lightning protection system, it should be inventoried using 'D509004 LIGHTNING PROTECTION - Other', which is a SF UOM. The SF quantity should match the B30 quantity, which factors in the slope of the roof.

If 'D509004 LIGHTNING PROTECTION - Other' is used, then a component section should also be added for 'D509003 GROUNDING SYSTEMS - Other' as the two are required to complete the lightning protection system.

General

Lightning protection is commonly found on newer buildings.

Lesson Learned

Lightning protection is an optional system. When it is provided, it will be tied to the building grounding system.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group Cmnt?	Group OK?	Age Based?	Design Life	UOM
Other	Yes	No	No	No	N/A	Yes	50	SF

D509006 ENERGY MANAGEMENT CONTROL SYSTEM - Lighting Control Panel**Typical Application and General Component Guidance:**

This component is used to capture lighting control panels.

**Business Rules/General/Lessons Learned/Reinspection****Business Rule**

Only the main lighting control panel needs to be inventoried and assessed.

General

This panel type will often look like regular panelboard but will have different internal components. See photo above for an example.

Lesson Learned

In newer buildings, the lighting control panel (LCP) may have a digital interface.

Reinspection

Prior to the 2019 update, lighting control panels were either captured under 'D501004 PANELBOARDS' or missed entirely. It can be assumed that a new inventory of lighting control panels will be required.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
Lighting Control Panel	Yes	Yes	Yes	No	No	No	20	EA

D501001 MAIN TRANSFORMERS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	KVA
Other	No	No	No	No	N/A	No	20	KVA
Unknown	No	No	No	No	N/A	No	20	KVA

Complete Component Catalog Breakdown

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D50 ELECTRICAL

D501002 SERVICE ENTRANCE EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Electrical Service - 3 Phase, 120/208 V, 100 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 120/208 V, 1000 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 120/208 V, 1200 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 120/208 V, 1600 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 120/208 V, 200 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 120/208 V, 2000 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 120/208 V, 400 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 120/208 V, 60 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 120/208 V, 600 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 120/208 V, 800 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 15 KV, 100 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 15 KV, 1000 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 15 KV, 1200 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 15 KV, 1600 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 15 KV, 200 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 15 KV, 2000 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 15 KV, 400 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 15 KV, 60 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 15 KV, 600 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 15 KV, 800 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 480 V, 100 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 480 V, 1000 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 480 V, 1200 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 480 V, 1600 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 480 V, 200 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 480 V, 2000 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 480 V, 400 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 480 V, 60 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 480 V, 600 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 480 V, 800 A	Yes	Yes	Yes	No	No	No	20	EA

Complete Component Catalog Breakdown

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D50 ELECTRICAL

Electrical Service - 3 Phase, 5 KV, 100 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 5 KV, 1000 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 5 KV, 1200 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 5 KV, 1600 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 5 KV, 200 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 5 KV, 2000 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 5 KV, 400 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 5 KV, 60 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 5 KV, 600 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - 3 Phase, 5 KV, 800 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - Distribution Circuit Breaker - For MV/HV Transformer	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - Distribution Circuit Breaker - General	Yes	Yes	Yes	No	Yes	No	20	EA
Electrical Service - Main-Tie-Main Switch 15 KV	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - Main-Tie-Main Switch 480 V	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - Main-Tie-Main Switch 5 KV	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - Single Phase, 120/240 V, 100 A	Yes	Yes	Yes	No	No	No	20	EA
Electrical Service - Single Phase, 120/240 V, 200 A	Yes	Yes	Yes	No	No	No	20	EA
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	AMP
Unknown	No	No	No	No	N/A	No	20	AMP

D50

D501003 INTERIOR DISTRIBUTION TRANSFORMERS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Buck-boost, 120/240 V primary 12/24 V secondary, 0.10 kVA	Yes	Yes	Yes	No	No	No	30	EA
Buck-boost, 120/240 V primary 12/24 V secondary, 0.25 kVA	Yes	Yes	Yes	No	No	No	30	EA
Buck-boost, 120/240 V primary 12/24 V secondary, 0.50 kVA	Yes	Yes	Yes	No	No	No	30	EA
Buck-boost, 120/240 V primary 12/24 V secondary, 0.75 kVA	Yes	Yes	Yes	No	No	No	30	EA
Buck-boost, 120/240 V primary 12/24 V secondary, 1.0 kVA	Yes	Yes	Yes	No	No	No	30	EA
Buck-boost, 120/240 V primary 12/24 V secondary, 1.5 kVA	Yes	Yes	Yes	No	No	No	30	EA
Buck-boost, 120/240 V primary 12/24 V secondary, 2.0 kVA	Yes	Yes	Yes	No	No	No	30	EA
Buck-boost, 120/240 V primary 12/24 V secondary, 3.0 kVA	Yes	Yes	Yes	No	No	No	30	EA
Buck-boost, 120/240 V primary 12/24 V secondary, 5.0 kVA	Yes	Yes	Yes	No	No	No	30	EA
Buck-boost, 240 V primary 208/120 V secondary, 112.5 kVA	Yes	Yes	Yes	No	No	No	30	EA
Buck-boost, 240 V primary 208/120 V secondary, 15 kVA	Yes	Yes	Yes	No	No	No	30	EA
Buck-boost, 240 V primary 208/120 V secondary, 150 kVA	Yes	Yes	Yes	No	No	No	30	EA
Buck-boost, 240 V primary 208/120 V secondary, 225 kVA	Yes	Yes	Yes	No	No	No	30	EA
Buck-boost, 240 V primary 208/120 V secondary, 30 kVA	Yes	Yes	Yes	No	No	No	30	EA
Buck-boost, 240 V primary 208/120 V secondary, 300 kVA	Yes	Yes	Yes	No	No	No	30	EA
Buck-boost, 240 V primary 208/120 V secondary, 45 kVA	Yes	Yes	Yes	No	No	No	30	EA
Buck-boost, 240 V primary 208/120 V secondary, 75 kVA	Yes	Yes	Yes	No	No	No	30	EA
dry-type, 15 kV primary 277/480 volt secondary, 1000 kVA	Yes	Yes	Yes	No	No	No	30	EA

Complete Component Catalog Breakdown

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D50 ELECTRICAL

dry-type, 15 kV primary 277/480 volt secondary, 112.5 kVA	Yes	Yes	Yes	No	No	No	30	EA
dry-type, 15 kV primary 277/480 volt secondary, 150 kVA	Yes	Yes	Yes	No	No	No	30	EA
dry-type, 15 kV primary 277/480 volt secondary, 1500 kVA	Yes	Yes	Yes	No	No	No	30	EA
dry-type, 15 kV primary 277/480 volt secondary, 2000 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 15 kV primary 277/480 volt secondary, 225 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 15 kV primary 277/480 volt secondary, 2500 kVA	Yes	Yes	Yes	No	No	No	30	EA
dry-type, 15 kV primary 277/480 volt secondary, 300 kVA	Yes	Yes	Yes	No	No	No	30	EA
dry-type, 15 kV primary 277/480 volt secondary, 3000 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 15 kV primary 277/480 volt secondary, 500 kVA	Yes	Yes	Yes	No	No	No	30	EA
dry-type, 15 kV primary 277/480 volt secondary, 750 kVA	Yes	Yes	Yes	No	No	No	30	EA
dry-type, 240/480 V primary 120/240 V secondary, 1 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 240/480 V primary 120/240 V secondary, 10 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 240/480 V primary 120/240 V secondary, 100 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 240/480 V primary 120/240 V secondary, 15 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 240/480 V primary 120/240 V secondary, 167 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 240/480 V primary 120/240 V secondary, 2 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 240/480 V primary 120/240 V secondary, 25 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 240/480 V primary 120/240 V secondary, 3 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 240/480 V primary 120/240 V secondary, 37.5 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 240/480 V primary 120/240 V secondary, 5 kVA	Yes	Yes	Yes	No	No	No	50	EA

Complete Component Catalog Breakdown

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D50 ELECTRICAL

dry-type, 240/480 V primary 120/240 V secondary, 50 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 240/480 V primary 120/240 V secondary, 7.5 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 240/480 V primary 120/240 V secondary, 75 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 1000 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 112.5 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 112.5 kVA, K-13 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 112.5 kVA, K-4 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 112.5 kVA, non-ventilated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 15 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 15 kVA, K-13 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 15 kVA, K-4 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 15 kVA, non-ventilated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 150 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 150 kVA, K-13 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 150 kVA, K-4 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 150 kVA, non-ventilated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 225 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 225 kVA, K-13 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 225 kVA, K-4 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 225 kVA, non-ventilated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 3 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 30 kVA	Yes	Yes	Yes	No	No	No	50	EA

Complete Component Catalog Breakdown

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D50 ELECTRICAL

dry-type, 480 V primary 120/208 V secondary, 30 kVA, K-13 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 30 kVA, K-4 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 30 kVA, non-ventilated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 300 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 300 kVA, K-13 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 300 kVA, K-4 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 300 kVA, non-ventilated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 45 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 45 kVA, K-13 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 45 kVA, K-4 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 45 kVA, non-ventilated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 500 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 500 kVA, K-13 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 500 kVA, K-4 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 6 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 75 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 75 kVA, K-13 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 75 kVA, K-4 rated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 75 kVA, non-ventilated	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 750 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 480 V primary 120/208 V secondary, 9 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 5 kV primary 277/480 volt secondary, 1000 kVA	Yes	Yes	Yes	No	No	No	50	EA

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Complete Component Catalog Breakdown

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D50 ELECTRICAL

dry-type, 5 kV primary 277/480 volt secondary, 112.5 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 5 kV primary 277/480 volt secondary, 150 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 5 kV primary 277/480 volt secondary, 1500 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 5 kV primary 277/480 volt secondary, 2000 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 5 kV primary 277/480 volt secondary, 225 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 5 kV primary 277/480 volt secondary, 2500 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 5 kV primary 277/480 volt secondary, 300 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 5 kV primary 277/480 volt secondary, 3000 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 5 kV primary 277/480 volt secondary, 500 kVA	Yes	Yes	Yes	No	No	No	50	EA
dry-type, 5 kV primary 277/480 volt secondary, 750 kVA	Yes	Yes	Yes	No	No	No	50	EA
General	No	No	No	No	N/A	No	30	EA
Isolation, 120/240 V primary 120/208 V secondary, 112.5 kVA	Yes	Yes	Yes	No	No	No	30	EA
Isolation, 120/240 V primary 120/208 V secondary, 150 kVA	Yes	Yes	Yes	No	No	No	30	EA
Isolation, 120/240 V primary 120/208 V secondary, 225 kVA	Yes	Yes	Yes	No	No	No	30	EA
Isolation, 120/240 V primary 120/208 V secondary, 300 kVA	Yes	Yes	Yes	No	No	No	30	EA
Isolation, 120/240 V primary 120/208 V secondary, 500 kVA	Yes	Yes	Yes	No	No	No	30	EA
Isolation, 120/240 V primary 120/208 V secondary, 750 kVA	Yes	Yes	Yes	No	No	No	30	EA
Isolation, 120/240 V primary 120/240 V secondary, 0.50 kVA	Yes	Yes	Yes	No	No	No	30	EA
Isolation, 120/240 V primary 120/240 V secondary, 1 kVA	Yes	Yes	Yes	No	No	No	30	EA
Isolation, 120/240 V primary 120/240 V secondary, 10 kVA	Yes	Yes	Yes	No	No	No	30	EA

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Complete Component Catalog Breakdown

D50

D50 ELECTRICAL

Isolation, 120/240 V primary 120/240 V secondary, 15 kVA	Yes	Yes	Yes	No	No	No	30	EA
Isolation, 120/240 V primary 120/240 V secondary, 2 kVA	Yes	Yes	Yes	No	No	No	30	EA
Isolation, 120/240 V primary 120/240 V secondary, 25 kVA	Yes	Yes	Yes	No	No	No	30	EA
Isolation, 120/240 V primary 120/240 V secondary, 3 kVA	Yes	Yes	Yes	No	No	No	30	EA
Isolation, 120/240 V primary 120/240 V secondary, 37.5 kVA	Yes	Yes	Yes	No	No	No	30	EA
Isolation, 120/240 V primary 120/240 V secondary, 5 kVA	Yes	Yes	Yes	No	No	No	30	EA
Isolation, 120/240 V primary 120/240 V secondary, 7.5 kVA	Yes	Yes	Yes	No	No	No	30	EA
Isolation, 120/240 V primary 120/240 V secondary, 75 kVA	Yes	Yes	Yes	No	No	No	30	EA
liquid-filled, 5 kV or 15 kV primary, 277/480 V secondary, 1000 kVA	Yes	Yes	Yes	No	No	No	30	EA
liquid-filled, 5 kV or 15 kV primary, 277/480 V secondary, 1500 kVA	Yes	Yes	Yes	No	No	No	30	EA
liquid-filled, 5 kV or 15 kV primary, 277/480 V secondary, 2000 kVA	Yes	Yes	Yes	No	No	No	30	EA
liquid-filled, 5 kV or 15 kV primary, 277/480 V secondary, 225 kVA	Yes	Yes	Yes	No	No	No	30	EA
liquid-filled, 5 kV or 15 kV primary, 277/480 V secondary, 2500 kVA	Yes	Yes	Yes	No	No	No	30	EA
liquid-filled, 5 kV or 15 kV primary, 277/480 V secondary, 300 kVA	Yes	Yes	Yes	No	No	No	30	EA
liquid-filled, 5 kV or 15 kV primary, 277/480 V secondary, 500 kVA	Yes	Yes	Yes	No	No	No	30	EA
liquid-filled, 5 kV or 15 kV primary, 277/480 V secondary, 750 kVA	Yes	Yes	Yes	No	No	No	30	EA
oil-filled, 15 kV primary, 277/480 V secondary, 1000 kVA	Yes	Yes	Yes	No	No	No	30	EA
oil-filled, 15 kV primary, 277/480 V secondary, 150 kVA	Yes	Yes	Yes	No	No	No	30	EA
oil-filled, 15 kV primary, 277/480 V secondary, 1500 kVA	Yes	Yes	Yes	No	No	No	30	EA
oil-filled, 15 kV primary, 277/480 V secondary, 2000 kVA	Yes	Yes	Yes	No	No	No	30	EA
oil-filled, 15 kV primary, 277/480 V secondary, 225 kVA	Yes	Yes	Yes	No	No	No	30	EA

Complete Component Catalog Breakdown

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D50 ELECTRICAL

oil-filled, 15 kV primary, 277/480 V secondary, 2500 kVA	Yes	Yes	Yes	No	No	No	30	EA
oil-filled, 15 kV primary, 277/480 V secondary, 300 kVA	Yes	Yes	Yes	No	No	No	30	EA
oil-filled, 15 kV primary, 277/480 V secondary, 3000 kVA	Yes	Yes	Yes	No	No	No	30	EA
oil-filled, 15 kV primary, 277/480 V secondary, 3750 kVA	Yes	Yes	Yes	No	No	No	30	EA
oil-filled, 15 kV primary, 277/480 V secondary, 500 kVA	Yes	Yes	Yes	No	No	No	30	EA
oil-filled, 15 kV primary, 277/480 V secondary, 750 kVA	Yes	Yes	Yes	No	No	No	30	EA
oil-filled, 2400 V primary, 120/240 V secondary, 10 kVA	Yes	Yes	Yes	No	No	No	30	EA
oil-filled, 2400 V primary, 120/240 V secondary, 100 kVA	Yes	Yes	Yes	No	No	No	30	EA
oil-filled, 2400 V primary, 120/240 V secondary, 15 kVA	Yes	Yes	Yes	No	No	No	30	EA
oil-filled, 2400 V primary, 120/240 V secondary, 25 kVA	Yes	Yes	Yes	No	No	No	30	EA
oil-filled, 2400 V primary, 120/240 V secondary, 37.5 kVA	Yes	Yes	Yes	No	No	No	30	EA
oil-filled, 2400 V primary, 120/240 V secondary, 50 kVA	Yes	Yes	Yes	No	No	No	30	EA
oil-filled, 2400 V primary, 120/240 V secondary, 75 kVA	Yes	Yes	Yes	No	No	No	30	EA
Other	No	No	No	No	N/A	No	30	KVA
Unknown	No	No	No	No	N/A	No	30	KVA

D50

D501004 PANELBOARDS

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	50	EA
Main Circuit Breaker, 120/208 V, 100 amp	Yes	Yes	Yes	No	No	No	50	EA
Main Circuit Breaker, 120/208 V, 125 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 120/208 V, 150 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 120/208 V, 200 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 120/208 V, 225 amp	Yes	Yes	Yes	No	No	No	50	EA
Main Circuit Breaker, 120/208 V, 250 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 120/208 V, 400 amp	Yes	Yes	Yes	No	No	No	50	EA
Main Circuit Breaker, 120/208 V, 600 amp	Yes	Yes	Yes	No	No	No	50	EA
Main Circuit Breaker, 120/208 V, 800 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 120/240 V, 100 amp	Yes	Yes	Yes	No	No	No	50	EA
Main Circuit Breaker, 120/240 V, 125 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 120/240 V, 150 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 120/240 V, 200 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 120/240 V, 225 amp	Yes	Yes	Yes	No	No	No	50	EA
Main Circuit Breaker, 120/240 V, 250 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 120/240 V, 400 amp	Yes	Yes	Yes	No	No	No	50	EA
Main Circuit Breaker, 120/240 V, 600 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 120/240 V, 800 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 277/480 V, 100 amp	Yes	Yes	Yes	No	No	No	50	EA
Main Circuit Breaker, 277/480 V, 1200 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 277/480 V, 125 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 277/480 V, 150 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 277/480 V, 1600 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 277/480 V, 200 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 277/480 V, 2000 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 277/480 V, 225 amp	Yes	Yes	Yes	No	No	No	50	EA
Main Circuit Breaker, 277/480 V, 250 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 277/480 V, 400 amp	Yes	Yes	Yes	No	No	No	50	EA
Main Circuit Breaker, 277/480 V, 600 amp	Yes	Yes	Yes	No	No	No	50	EA

Complete Component Catalog Breakdown

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D50 ELECTRICAL

Main Circuit Breaker, 277/480 V, 800 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 600 V, 1000 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 600 V, 1200 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 600 V, 1600 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 600 V, 200 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 600 V, 2000 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 600 V, 400 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 600 V, 600 amp	Yes	Yes	Yes	No	No	No	20	EA
Main Circuit Breaker, 600 V, 800 amp	Yes	Yes	Yes	No	No	No	20	EA
Main lugs, 50 amp	Yes	No	No	No	Yes	No	20	EA
Main lugs, 120/208 V, 100 amp, NQOD	Yes	Yes	Yes	No	No	No	30	EA
Main lugs, 120/208 V, 225 amp, NQOD	Yes	Yes	Yes	No	No	No	30	EA
Main lugs, 120/208 V, 225 amp, NQOD, NEMA 7	Yes	Yes	Yes	No	No	No	30	EA
Main lugs, 120/240 V, 100 amp, NQOD	Yes	Yes	Yes	No	No	No	30	EA
Main lugs, 120/240 V, 225 amp, NQOD	Yes	Yes	Yes	No	No	No	30	EA
Main lugs, 125 amp	Yes	Yes	Yes	No	No	No	20	EA
Main lugs, 150 amp	Yes	Yes	Yes	No	No	No	20	EA
Main lugs, 200 amp	Yes	Yes	Yes	No	No	No	20	EA
Main lugs, 250 amp	Yes	Yes	Yes	No	No	No	20	EA
Main lugs, 277/480 V, 100 amp, NEHB	Yes	Yes	Yes	No	No	No	30	EA
Main lugs, 277/480 V, 225 amp, NEHB	Yes	Yes	Yes	No	No	No	30	EA
Main lugs, 277/480 V, 225 amp, NEHB, NEMA 7	Yes	Yes	Yes	No	No	No	30	EA
Main lugs, 400 amp	Yes	Yes	Yes	No	No	No	20	EA
Main lugs, 600 amp	Yes	Yes	Yes	No	No	No	20	EA
Main lugs, 800 amp	Yes	Yes	Yes	No	No	No	20	EA
Motor Starter/Disconnect	Yes	No	No	No	Yes	No	30	EA
Other	No	No	No	No	N/A	No	30	AMP
Safety Switch	No	No	No	No	N/A	No	30	EA
Safety Switch, < 30 Amp	No	No	No	No	N/A	No	30	EA
Safety Switch, >100 Amp	Yes	No	No	No	Yes	No	30	EA
Safety Switch, 100 Amp	Yes	Yes	Yes	No	No	No	20	EA
Safety Switch, 200 Amp	Yes	Yes	Yes	No	No	No	20	EA

Complete Component Catalog Breakdown

D50

D50 ELECTRICAL

Safety Switch, 30-100 Amp	Yes	No	No	No	Yes	No	30	EA
Safety Switch, 400 Amp	Yes	Yes	Yes	No	No	No	20	EA
Safety Switch, 600 Amp	Yes	Yes	Yes	No	No	No	20	EA
Safety Switch, 800 Amp	Yes	Yes	Yes	No	No	No	20	EA
Switchgear	No	No	No	No	N/A	No	30	EA
Switchgear - 1200 Amp	Yes	Yes	Yes	No	No	No	50	EA
Switchgear - 1600 Amp	Yes	Yes	Yes	No	No	No	50	EA
Switchgear - 2000 Amp	Yes	Yes	Yes	No	No	No	50	EA
Switchgear - 3000 Amp	Yes	Yes	Yes	No	No	No	50	EA
Switchgear - 400 Amp	Yes	Yes	Yes	No	No	No	50	EA
Switchgear - 600 Amp	Yes	Yes	Yes	No	No	No	50	EA
Switchgear - 800 Amp	Yes	Yes	Yes	No	No	No	50	EA
Transfer Switch	No	No	No	No	N/A	No	30	EA
Transfer Switch - Automatic, 100 amp	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Automatic, 1000 amp	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Automatic, 1200 amp	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Automatic, 150 amp	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Automatic, 1600 amp	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Automatic, 2000 amp	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Automatic, 225 amp	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Automatic, 260 amp	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Automatic, 30 amp	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Automatic, 400 amp	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Automatic, 60 amp	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Automatic, 600 amp	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Automatic, 800 amp	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Bypass Isolation, 100 amp	Yes	Yes	Yes	No	No	No	20	EA
Transfer Switch - Bypass Isolation, 1000 amp	Yes	Yes	Yes	No	No	No	20	EA
Transfer Switch - Bypass Isolation, 1200 amp	Yes	Yes	Yes	No	No	No	20	EA
Transfer Switch - Bypass Isolation, 150 amp	Yes	Yes	Yes	No	No	No	20	EA
Transfer Switch - Bypass Isolation, 1600 amp	Yes	Yes	Yes	No	No	No	20	EA
Transfer Switch - Bypass Isolation, 2000 amp	Yes	Yes	Yes	No	No	No	20	EA

Complete Component Catalog Breakdown

D50

D50 ELECTRICAL

Transfer Switch - Bypass Isolation, 225 amp	Yes	Yes	Yes	No	No	No	20	EA
Transfer Switch - Bypass Isolation, 260 amp	Yes	Yes	Yes	No	No	No	20	EA
Transfer Switch - Bypass Isolation, 30 amp	Yes	Yes	Yes	No	No	No	20	EA
Transfer Switch - Bypass Isolation, 400 amp	Yes	Yes	Yes	No	No	No	20	EA
Transfer Switch - Bypass Isolation, 60 amp	Yes	Yes	Yes	No	No	No	20	EA
Transfer Switch - Bypass Isolation, 600 amp	Yes	Yes	Yes	No	No	No	20	EA
Transfer Switch - Bypass Isolation, 800 amp	Yes	Yes	Yes	No	No	No	20	EA
Transfer Switch - Non-automatic, 100 Amp, Electric	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Non-automatic, 100 Amp, Manual	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Non-automatic, 200 Amp, Electric	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Non-automatic, 200 Amp, Manual	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Non-automatic, 30 Amp, Electric	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Non-automatic, 30 Amp, Manual	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Non-automatic, 400 Amp, Electric	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Non-automatic, 400 Amp, Manual	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Non-automatic, 60 Amp, Electric	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Non-automatic, 60 Amp, Manual	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Non-automatic, 600 Amp, Electric	Yes	Yes	Yes	No	No	No	30	EA
Transfer Switch - Non-automatic, 600 Amp, Manual	Yes	Yes	Yes	No	No	No	30	EA
Unknown	No	No	No	No	N/A	No	30	AMP

D50

D501005 ENCLOSED CIRCUIT BREAKERS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Enclosed Circuit Breaker, 100 Amp	Yes	Yes	Yes	No	No	No	20	EA
Enclosed Circuit Breaker, 200 Amp	Yes	Yes	Yes	No	No	No	20	EA
Enclosed Circuit Breaker, 30-100 Amp	Yes	No	No	No	Yes	No	30	EA
Enclosed Circuit Breaker, 400 Amp	Yes	Yes	Yes	No	No	No	20	EA
Enclosed Circuit Breaker, 600 Amp	Yes	Yes	Yes	No	No	No	20	EA
Enclosed Circuit Breaker, 800 Amp	Yes	Yes	Yes	No	No	No	20	EA
General	No	No	No	No	N/A	No	50	AMP
Main circuit breaker, 120/208 V, 100 amp, NQOD	No	No	No	No	N/A	No	50	EA
Main circuit breaker, 120/208 V, 225 amp, NQOD	No	No	No	No	N/A	No	50	EA
Main circuit breaker, 120/208 V, 400 amp, NQOD	No	No	No	No	N/A	No	50	EA
Main circuit breaker, 120/208 V, 600 amp, NQOD	No	No	No	No	N/A	No	50	EA
Main circuit breaker, 120/240 V, 100 amp, NQOD	No	No	No	No	N/A	No	50	EA
Main circuit breaker, 120/240 V, 225 amp, NQOD	No	No	No	No	N/A	No	50	EA
Main circuit breaker, 120/240 V, 400 amp, NQOD	No	No	No	No	N/A	No	50	EA
Main circuit breaker, 277/480 V, 100 amp, NEHB	No	No	No	No	N/A	No	50	EA
Main circuit breaker, 277/480 V, 225 amp, NEHB	No	No	No	No	N/A	No	50	EA
Main circuit breaker, 277/480 V, 400 amp, NEHB	No	No	No	No	N/A	No	50	EA
Main circuit breaker, 277/480 V, 600 amp, NEHB	No	No	No	No	N/A	No	50	EA
Other	No	No	No	No	N/A	No	50	AMP
Unknown	No	No	No	No	N/A	No	50	AMP

D501006 MOTOR CONTROL CENTERS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	40	EA
Motor Control Center - Size 1, 10 HP, 12" high	Yes	Yes	Yes	No	No	No	40	EA
Motor Control Center - Size 2, 25 HP, 18" high	Yes	Yes	Yes	No	No	No	40	EA
Motor Control Center - Size 3, 50 HP, 24" high	Yes	Yes	Yes	No	No	No	40	EA
Motor Control Center - Size 4, 100 HP, 30" high	Yes	Yes	Yes	No	No	No	40	EA
Motor Control Center - Size 4, 75 HP, 24" high	Yes	Yes	Yes	No	No	No	40	EA
Motor Control Center - Size 5, 200 HP, 48" high	Yes	Yes	Yes	No	No	No	40	EA
Motor Control Center - Size 6, 400 HP, 72" high	Yes	Yes	Yes	No	No	No	40	EA
Other	No	No	No	No	N/A	No	40	AMP
Unknown	No	No	No	No	N/A	No	40	AMP

D501090 OTHER SERVICE AND DISTRIBUTION

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Capacitor Bank	No	No	No	No	N/A	No	25	EA
Capacitor Bank - 240 V, 0.5 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 240 V, 1.0 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 240 V, 10 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 240 V, 15 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 240 V, 2.5 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 240 V, 20 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 240 V, 25 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 240 V, 5.0 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 240 V, 7.5 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 480 V, 1 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 480 V, 10 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 480 V, 15 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 480 V, 2 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 480 V, 20 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 480 V, 30 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 480 V, 40 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 480 V, 5 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 480 V, 50 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 480 V, 7.5 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 600 V, 1 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 600 V, 10 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 600 V, 15 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 600 V, 2 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 600 V, 20 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 600 V, 25 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 600 V, 35 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 600 V, 5 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 600 V, 50 kVAR	Yes	Yes	Yes	No	No	No	25	EA
Capacitor Bank - 600 V, 7.5 kVAR	Yes	Yes	Yes	No	No	No	25	EA

Complete Component Catalog Breakdown

D50

D50 ELECTRICAL

Direct Buried Electrical Service Lateral	No	No	No	No	N/A	No	30	LF
Ducted Electrical Service Lateral	No	No	No	No	N/A	No	30	LF
General	No	No	No	No	N/A	No	25	EA
GFCI Receptacle	No	No	No	No	N/A	No	30	EA
Other	Yes	Yes	Yes	Yes	No	No	25	EA
Overhead Electrical Service Lateral	No	No	No	No	N/A	No	30	LF
Unknown	No	No	No	No	N/A	No	25	EA

D502001 BRANCH WIRING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	Yes	60	SF
Other	No	No	No	No	N/A	No	60	SF
Unknown	No	No	No	No	N/A	No	60	SF

D50

D502002 LIGHTING EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Exit Lighting	Yes	No	No	No	Yes	No	20	EA
Explosion Proof Lighting	No	No	No	No	N/A	No	20	EA
Explosion Proof Lighting - Fluorescent, ceiling mounted, 2-40 W, 4' L	Yes	No	No	No	Yes	No	20	EA
Explosion Proof Lighting - Fluorescent, ceiling mounted, 3-40 W, 4' L	Yes	No	No	No	Yes	No	20	EA
Explosion Proof Lighting - Fluorescent, ceiling mounted, 4-40 W, 4' L	Yes	No	No	No	Yes	No	20	EA
Explosion Proof Lighting - High pressure sodium, ceiling, pendent mounted, 100 W	Yes	No	No	No	Yes	No	20	EA
Explosion Proof Lighting - Incandescent, ceiling mounted, 200 W	Yes	No	No	No	Yes	No	20	EA
Explosion Proof Lighting - Metal halide, ceiling, pendent mounted, 200 W	Yes	No	No	No	Yes	No	20	EA
Exterior Fluorescent Lighting	Yes	No	No	No	Yes	No	20	EA
Exterior LED Lighting	Yes	No	No	No	Yes	No	10	EA
Exterior Lighting	Yes	No	No	No	Yes	No	20	EA
Exterior Lighting - High pressure sodium, wall pack, 150 W	Yes	No	No	No	Yes	No	20	EA
Exterior Lighting - High pressure sodium, wall pack, 70 W	Yes	No	No	No	Yes	No	20	EA
Exterior Lighting - Incandescent, wall mounted, 100 W	Yes	No	No	No	Yes	No	20	EA
Exterior Lighting - Low pressure sodium, wall pack, 35 W	Yes	No	No	No	Yes	No	20	EA
Exterior Lighting - Low pressure sodium, wall pack, 55 W	Yes	No	No	No	Yes	No	20	EA
Exterior Lighting - Metal halide, wall pack, 175 W	Yes	No	No	No	Yes	No	20	EA
Exterior Lighting - Metal halide, wall pack, 250 W	Yes	No	No	No	Yes	No	20	EA
Exterior Lighting - Quartz, wall mounted, 1500 W	Yes	No	No	No	Yes	No	20	EA
Exterior Lighting - Quartz, wall mounted, 500 W	Yes	No	No	No	Yes	No	20	EA
General	No	No	No	No	N/A	No	20	SF
Interior Lighting, FL - 1 Lamp T12	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, FL - 1 Lamp T8	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, FL - 2 Lamp T12	Yes	No	No	No	Yes	No	20	EA

Complete Component Catalog Breakdown

D50

D50 ELECTRICAL

Interior Lighting, FL - 2 Lamp T8	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, FL - 3 Lamp T12	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, FL - 3 Lamp T8	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, FL - 4 Lamp T12	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, FL - 4 Lamp T5, HO	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, FL - 4 Lamp T8	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, FL - 4 Lamp T8, HO	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, FL - 6 Lamp T5, HO	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, FL - 6 Lamp T8, HO	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, Fluorescent	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, Fluorescent - Pendant Mounted (Type D)	No	No	No	No	N/A	No	20	EA
Interior Lighting, Fluorescent - Recessed Fixture (Type C)	No	No	No	No	N/A	No	20	EA
Interior Lighting, Fluorescent - Strip Fixture (Type A)	No	No	No	No	N/A	No	20	EA
Interior Lighting, Fluorescent - Surface Mounted (Type B)	No	No	No	No	N/A	No	20	EA
Interior Lighting, High Intensity	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, High Intensity - High Pressure Sodium 1000 W (Type F)	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, High Intensity - High Pressure Sodium 150 W (Type K)	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, High Intensity - High Pressure Sodium 400 W (Type C)	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, High Intensity - Metal Halide 1000 W (Type G)	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, High Intensity - Metal Halide 250 W (Type J)	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, High Intensity - Metal Halide 400 W (Type B)	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, Incandescent	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, Incandescent - Recessed downlight w/baffles 150 W (Type B)	No	No	No	No	N/A	No	20	EA
Interior Lighting, Incandescent - Recessed PAR-38 flood lamp w/louver 150 W (Type C)	No	No	No	No	N/A	No	20	EA
Interior Lighting, Incandescent - Recessed R-40 flood lamp w/flat reflector 150 W (Type D)	No	No	No	No	N/A	No	20	EA

Complete Component Catalog Breakdown

D50

D50 ELECTRICAL

Interior Lighting, Incandescent - Recessed reflector w/flat glass lens 150 W (Type A)	No	No	No	No	N/A	No	20	EA
Interior Lighting, LED	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, LED - Canlight	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, LED - Downlight/Sconce/Pendant	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, LED - High Bay	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, LED - Strip	Yes	No	No	No	Yes	No	20	EA
Interior Lighting, LED - Troffer	Yes	No	No	No	Yes	No	20	EA
Interior Rope Light	Yes	No	No	No	N/A	No	20	LF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

D502090 OTHER LIGHTING AND BRANCH WIRING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	Yes	Yes	Yes	No	15	EA
Other	No	No	No	No	N/A	No	15	EA
Unknown	No	No	No	No	N/A	No	15	EA

D503001 TELECOMMUNICATIONS SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Direct Buried Telecommunications Service Lateral	No	No	No	No	N/A	No	30	LF
Ducted Telecommunications Service Lateral	No	No	No	No	N/A	No	30	LF
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Overhead Telecommunications Service Lateral	No	No	No	No	N/A	No	30	LF
Unknown	No	No	No	No	N/A	No	20	EA

D50

D50 ELECTRICAL

D503002 PUBLIC ADDRESS SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
100 outlets	Yes	Yes	No	No	Yes	Yes	20	EA
12 outlets	Yes	Yes	No	No	Yes	Yes	20	EA
30 outlets	Yes	Yes	No	No	Yes	Yes	20	EA
6 outlets	Yes	Yes	No	No	Yes	Yes	20	EA
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

D503003 INTERCOMMUNICATIONS SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
100 stations	Yes	No	No	No	Yes	Yes	15	EA
12 stations	Yes	No	No	No	Yes	Yes	15	EA
25 stations	Yes	No	No	No	Yes	Yes	15	EA
50 stations	Yes	No	No	No	Yes	Yes	15	EA
6 stations	Yes	No	No	No	Yes	Yes	15	EA
General	No	No	No	No	N/A	No	15	EA
Other	No	No	No	No	N/A	No	15	EA
Unknown	No	No	No	No	N/A	No	15	EA

D503004 TELEVISION SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Direct Buried Cable Television Service Lateral	No	No	No	No	N/A	No	30	LF
Ducted Cable Television Service Lateral	No	No	No	No	N/A	No	30	LF
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Overhead Cable Television Service Lateral	No	No	No	No	N/A	No	30	LF
Unknown	No	No	No	No	N/A	No	20	EA

D50 ELECTRICAL

D503005 SECURITY SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D503006 NURSE CALL SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	Yes	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D503007 CLOCK & PROGRAM SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	No	No	No	Yes	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

D503090 OTHER COMMUNICATIONS & ALARM SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	Yes	Yes	Yes	Yes	Yes	No	15	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	15	EA

D509001 GENERAL CONSTRUCTION ITEMS (ELECTRICAL)

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

D509002 EMERGENCY LIGHTING & POWER

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Emergency Lighting	Yes	No	No	No	Yes	No	20	EA
Emergency Lighting - Bugeye	Yes	No	No	No	Yes	No	20	EA
Emergency Lighting - Lead battery, twin sealed beam light	No	No	No	No	N/A	No	20	EA
Emergency Lighting - Nickel cadmium battery, twin sealed beam light	No	No	No	No	N/A	No	20	EA
Emergency Lighting - Self-contained, fluorescent lamp pack	No	No	No	No	N/A	No	20	EA
Exit/Emergency Lighting (EME Combo Fixture)	Yes	No	No	No	Yes	No	20	EA
General	No	No	No	No	N/A	No	20	SF
Generators	No	No	No	No	N/A	No	20	EA
Generators - Diesel, 100 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 1000 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 125 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 150 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 1500 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 175 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 200 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 2000 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 250 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 2500 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 275 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 30 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 300 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 3000 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 350 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 400 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 50 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 500 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 60 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 600 kW	Yes	Yes	Yes	No	No	No	30	EA

Complete Component Catalog Breakdown

D50

D50 ELECTRICAL

Generators - Diesel, 650 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 75 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 750 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 800 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Diesel, 900 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Gas, 100 kW	Yes	Yes	Yes	No	No	No	20	EA
Generators - Gas, 1000 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Gas, 11.5 kW	Yes	Yes	Yes	No	No	No	20	EA
Generators - Gas, 125 kW	Yes	Yes	Yes	No	No	No	20	EA
Generators - Gas, 1250 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Gas, 1500 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Gas, 185 kW	Yes	Yes	Yes	No	No	No	20	EA
Generators - Gas, 20 kW	Yes	Yes	Yes	No	No	No	20	EA
Generators - Gas, 200 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Gas, 35 kW	Yes	Yes	Yes	No	No	No	20	EA
Generators - Gas, 500 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Gas, 60 kW	Yes	Yes	Yes	No	No	No	20	EA
Generators - Gas, 7.5 kW	Yes	Yes	Yes	No	No	No	20	EA
Generators - Gas, 750 kW	Yes	Yes	Yes	No	No	No	30	EA
Generators - Gas, 80 kW	Yes	Yes	Yes	No	No	No	20	EA
Other	No	No	No	No	N/A	No	20	SF
Uninterruptible Power Supply	No	No	No	No	N/A	No	15	EA
Uninterruptible Power Supply - 0.35 kVA	Yes	Yes	Yes	No	No	No	25	EA
Uninterruptible Power Supply - 0.5 kVA	Yes	Yes	Yes	No	No	No	25	EA
Uninterruptible Power Supply - 0.75 kVA	Yes	Yes	Yes	No	No	No	25	EA
Uninterruptible Power Supply - 1.0 kVA	Yes	Yes	Yes	No	No	No	25	EA
Uninterruptible Power Supply - 1.5 kVA	Yes	Yes	Yes	No	No	No	25	EA
Uninterruptible Power Supply - 10 kVA	Yes	Yes	Yes	No	No	No	25	EA
Uninterruptible Power Supply - 100 kVA	Yes	Yes	Yes	No	No	No	25	EA
Uninterruptible Power Supply - 15 kVA	Yes	Yes	Yes	No	No	No	25	EA
Uninterruptible Power Supply - 150 kVA	Yes	Yes	Yes	No	No	No	25	EA
Uninterruptible Power Supply - 2 kVA	Yes	Yes	Yes	No	No	No	25	EA

Complete Component Catalog Breakdown

D50

D50 ELECTRICAL

Uninterruptible Power Supply - 200 kVA	Yes	Yes	Yes	No	No	No	25	EA
Uninterruptible Power Supply - 250 kVA	Yes	Yes	Yes	No	No	No	25	EA
Uninterruptible Power Supply - 3 kVA	Yes	Yes	Yes	No	No	No	25	EA
Uninterruptible Power Supply - 30 kVA	Yes	Yes	Yes	No	No	No	25	EA
Uninterruptible Power Supply - 45 kVA	Yes	Yes	Yes	No	No	No	25	EA
Uninterruptible Power Supply - 5 kVA	Yes	Yes	Yes	No	No	No	25	EA
Uninterruptible Power Supply - 60 kVA	Yes	Yes	Yes	No	No	No	25	EA
Uninterruptible Power Supply - 7.5 kVA	Yes	Yes	Yes	No	No	No	25	EA
Uninterruptible Power Supply - 75 kVA	Yes	Yes	Yes	No	No	No	25	EA
Unknown	No	No	No	No	N/A	No	15	SF

D509003 GROUNDING SYSTEMS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	50	EA
Other	Yes	No	No	No	N/A	Yes	50	SF
Unknown	No	No	No	No	N/A	No	50	SF

D509004 LIGHTNING PROTECTION

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	50	EA
Other	Yes	No	No	No	N/A	Yes	50	SF
Unknown	No	No	No	No	N/A	No	50	SF

D509005 ELECTRIC HEATING

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

D50

D50 ELECTRICAL

D509006 ENERGY MANAGEMENT CONTROL SYSTEM

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	No	No	No	N/A	Yes	20	SF
Lighting Control Panel	Yes	Yes	Yes	No	No	No	20	EA
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

D509090 OTHER SPECIAL SYSTEMS AND DEVICES

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group OK?	Age Based?	Design Life	UOM
General	Yes	Yes	Yes	Yes	No	No	18	EA
Other	No	No	No	No	N/A	No	18	EA
Unknown	No	No	No	No	N/A	No	18	EA

Details Req?	If 'Yes', all required section detail fields are to be populated.
Inventory Pic?	If 'Yes', an inventory level photo is to be provided. This is a step back photo showing the component.
Inventory Cmmt?	If 'Yes', an inventory comment is to be populated. This should describe the component.
Group OK?	Only applicable to each (EA) UOM's that are In Scope? = 'Yes'. If 'No' section must be a quantity of 1. If 'Yes' section may have a quantity greater than 1. If 'N/A' it is not applicable to the component type.
Age Based?	If 'Yes', age based (do not provide an inspection) is the desired approach. If 'No' but upon inspection the component is not visible, then an age based approach is acceptable.
Design Life	Design life of the component.
UOM	Unit of measure. If yellow highlight = new component type in 2019 update.



Sustainment Management System

Army BUILDER™ SMS Inventory and Assessment Guide E10 EQUIPMENT



**US Army Corps
of Engineers**
Mobile District

ERDC
Engineer Research & Development Center

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Summary of Changes

E10

E10 EQUIPMENT

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Safety The following items should not be interpreted as 1) Safety Plan, 2) OSHA, or base safety requirements. These are recommendations. The contractor should operate in accordance with the SOW and approved safety plan.

Safety is of the utmost concern and should always be at the forefront of any activities taking place in the field. There are many potential safety hazards associated with building assessments. Prior to performing building assessments, the assessing staff/team must ensure that field activities are in accordance with the 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Safety Preparation Activities

Do not perform a task that may harm or endanger the health and safety of oneself or others.

Consult with the installation safety representative to review installation-specific safety requirements.

Conduct a daily “stand-up” safety meeting.

Ensure new assessors have been properly trained.

Review the assessment plan/schedule for the day.

Ensure proper Personal Protective Equipment (PPE) is available. This includes, but is not limited to, a hardhat; hearing protection; eye protection; safety shoes, gloves; and a safety colored vest.

Prior to conducting assessments, the team leader must check with the safety office or building POC to determine if there are any building/site-specific safety rules or hazards. For instance, some manufacturing areas may require steel toe shoes, hearing protection, or eye protection.

Safety Recommendations

Do not walk and write, or talk on a mobile phone, at the same time; this can lead to trips/falls.

Do not review documents or write while walking on steps or stairs.

Do not enter posted or suspected confined spaces such as crawl spaces, tanks, chases, or pits.

Mechanical rooms, attic spaces, or other areas with piping/ductwork may require the use of hard hats to prevent against head bumping hazards. Refer to the project specific safety plan for further clarification.

Do not enter areas with hazardous material signs posted or that appear to contain hazardous materials (asbestos, gases, visible mold, etc.).

Be careful when walking through/across vehicle maintenance or staging areas.

Be aware of loose-fitting clothing and lanyards that may get caught in tight areas or on piping such as in mechanical/electrical rooms, etc.

Be careful of wildlife and insects when walking around a building or opening seldom-entered mechanical/electrical rooms. Assessors may encounter snakes, spiders, stray cats/dogs, rats/mice, etc. in these areas. Do not enter or place hands in spaces that are not completely visible.

If a life safety problem is observed, do not try to fix it. Report it to the proper authority or building manager prior to leaving the building or area.

Before the assessment team leaves a building, ensure all team members are accounted for.

Ladder use should be done in accordance with 1) Safety Plan, 2) OSHA, and 3) Installation safety guidelines.

Designate a safety POC to enforce the safety accident prevention plan.

Perform a daily safety briefing before field work. Document the attendees and the topics covered.

Halt outdoor field operations at the sign of lightning or thunder.

Safety Recommendations (continued)

Do not access pitched roofs. They may be assessed from a nearby building or using binoculars.

Use proper techniques to place, secure, and climb ladders. Never climb a ladder while holding anything. Always use the three-point technique for climbing. Equipment should be placed in a backpack or an over-the-shoulder satchel to free hands for climbing.

Do not operate powered equipment, Weight Handling Equipment (WHE)/cranes, or remove access covers from powered equipment to perform assessments.

BUILDER™ assessments are commonly performed without electrical test equipment. Do not use electrical test equipment to test circuits or equipment unless qualified by a local authority. Only open panel box doors or enter electrical/mechanical rooms following proper training. Consult the local safety representative.

Site Preparation

Site Preparation Activities

Coordinate with the base to determine building access requirements, such as: escorts; camera passes; classified/secure area restrictions; or keys.

Locate buildings on a map and develop a schedule. Coordinate with the base to identify the appropriate building manager from the POC list. Notify the building managers of the upcoming assessment as needed.

Obtain a set of mechanical/electrical room master keys from the installation POC.

Extract all BRED™ files from BUILDER™ and have them loaded onto tablets (if using tablets). Verify all tablets are charged.

If multiple buildings are to be assessed by one team, confirm the schedule and plan of action with the team leader. A schedule may have building start times detailed to the hour.

Review the building names for the types/sizes of buildings that will be assessed to determine/confirm the needed tools and safety equipment. For instance, if the facilities are not climate-controlled, prepare accordingly (for cold weather bring hats/gloves).

Recommended Assessor Gear/Tools

Hardhat	Digital Camera with Extra Battery(s)
Hearing Protection	Measuring Tape
Safety Glasses	Laser Measuring Device/Flash Light
Reflective Safety Vest	Measuring Wheel
OSHA Approved Footwear	Backpack
Other Required Personal Protection Equipment (PPE)	Graphite Powder (for stuck locks)
Cell Phone and Team Cell Phone List	Cleaning Pad (to clean/help read nameplates)
Assessment Schedule	Pen/Pencils
Building Floor Plans/Base Map	Clipboard
Small Magnet (for determining door/window type)	Paper/Assessment Forms
Flash Light/Compass	Graph Paper
Sun Screen/Bug Spray	Refillable Water Bottle

Operating efficiently in the field is key to the success of the assessment. The following guidance is detailed by 1) Team Leader and 2) Assessor. **Bold items are drivers for client deliverables.**

Team Leader

Upon arrival, check in with the building manager and QA representative (if present).

Conduct the building manager interview. The entire team should be present for the building manager interview. The following questions should be asked:

Question 1: Are there any mission-related deficiencies in the building?

Question 2: Are there any safety-related deficiencies in the building?

Question 3: Have there been any upgrades or remodels of the building?

Question 4: Are there any building deficiencies (HVAC not working, electrical breakers tripping, maintenance issues, roof leaks, etc.) present?

The team leader (ONLY the team leader!) should populate the building level comment with the following information: 1) Missing systems, 2) Renovation dates, 3) Areas of the building not accessible during the assessment, and 4) If drawings were/were not provided. Below are some examples of building level comments:

Comment 1: No A20, D10, or D40 systems present. 2016: Vault room not accessible. Drawings not provided.

Comment 2: No A20 systems present. Renovated in 2010. 2016: 5% of building not accessible. Drawings provided.

The team leader should review the real property data in BRED™ and compare it to what is found during the assessment. The following should be confirmed: 1) Number of stories, 2) Building square footage, and 3) Building install date and 4) Building number in BRED™ matches the building. Variances between real property data and actual field data should be recorded for inclusion into the client deliverable.

Team Leader and Assessors

Best Practice: Each assessor should first take a photo of the building number to identify the subsequent photos associated with the building when they are downloaded. Take a second picture that captures the overall building view with respect to nearby buildings/streets. This should help refresh/remind the assessor on what the building looks like, while performing data-entry.

A team caucus should occur to discuss the sectioning strategy for the building and confirm which side is facing north.

Each assessor should have a consistent approach to each building. Assessors should move around the building exterior and interior in a clockwise (or counterclockwise) manner making notes and taking photos.

If a safety item is found, notify the team lead. The team lead will notify the building manager. Capture a photo of the safety item for inclusion into the safety log. Follow all other project-specific procedures when a safety item is encountered.

Upon return to the office perform the following steps:

Step 1: Download all photos from the day to a building-specific folder. Review the photos and delete any that are blurry or unreadable.

Step 2: Complete all calculations and counts. Complete all data entry into BRED™.

Data Entry

With the technology that is available today, the need to use forms in the field and do data entry at the office has been mitigated. Tablets can be used to run BRED™ to complete data entry while in the field. It is understood that there are challenges to accomplish this for certain disciplines. It is only mentioned here as a best practice recommendation and is not a requirement to execute the work. There will be instances where electronics will not be allowed in a facility. Assessors should have a paper/pen data collection system ready as a backup.

General

This section presents common Unifomat E10 Equipment Inventory Component Sections found across installations as a guide for entering into the BUILDER™ or BUILDER™ Remote Entry Database (BRED™) software. Inventory items are arranged by BUILDER System with Material/Equipment Category, Component Type, Unit of Measure, and Inventory Notes.

Inspection

Equipment component sections are assessed using Direct Condition Rating (DCR) or Age-Based Modeling. When component sections are not visible, no assessment is entered. In this case, BUILDER™ will use the inventory year installed and degradation curves built into the software to establish the CI.

Rule of thumb: If you can see it, you should inspect it. There are some caveats to this rule. See component catalog for items that must be age-based whether visible or non-visible.

When equipment is found that has been abandoned and is no longer functional it should not be inventoried. If the equipment is abandoned, but is still able to be put back in service, it should be inventoried and assessed.

Inventory

It is critical to confirm the year installed (default will be from real property records), or estimate the year installed. BUILDER™ uses the install date, degradation curves, and assessment observations to establish a CI for each component section. If the assessor suspects the default install date is not accurate, or an addition or renovation has taken place, check the real property record for year renovated or check local as-built or renovation drawings to help estimate the year installed.

E10 Equipment is primarily used to inventory "installed building equipment", IBE.

Except where specifically noted in this Guide, do not use 'General' where a more specific item is available as a component type selection.

When a component is concealed/hidden, the inventory comment box is used to indicate the reason for no inspection taking place. Standard comments should be used.

When selecting an equipment component type, assessors should always select the correct size. If the correct size is not available, assessors should round up to the next available size and note the actual size in the Section Details. If the size exceeds the largest selection, assessors should select the largest available size and note the actual size in the Section Details.

Photography

General comment: Photos are captured to document the following: 1) Inventory, 2) Condition (deficiency), 3) Historical record of the asset, 4) QC, and 5) Life safety issues.

All components where an 'Other' component type is selected must have a photo attached at the Inventory/Section level. (Required)

Assessors should take photos to allow for quality control (QC) confirmation and data backup. It is a good practice to have a photo of every component type encountered in an assessment. (Best Practice)

Components that are required to have section details populated should also have a single photo attached at the Inventory/Component Section level. No photos should be attached at the Section Detail level. This photo should be a step back photo showing the component in relation to its surroundings. Follow on assessments and base operations can use this to see what was inventoried in the case where there is any confusion on the section name or location field in the section details. If the component is hidden, no photo is necessary. (Required)

Components that have a DCR (component rating only) of A+ or worse should have a photo taken that shows the deficiency identified in the inspection comment. The photo should be attached to the record at the Inspection level. (Required)

Paint DCR does not drive the requirement for a photo to be attached at the inspection level. Example: A component has a DCR of 'G-' and a paint DCR of 'A' would result in no photo attached to the inspection.

See Scope Of Work (SOW) for any photo renaming/deliverable requirements.

The Team Leader is required to take one photo of the front elevation, or a representative elevation view, and attach the photo to the building record at the building level. (Required)

Reinspection

BRED™ functions such as 'Copy Building' and 'Copy Section' should not be used unless their ramifications are fully understood. Copy building: The entire building will be copied. Copy section: All items with the same section name will be copied. For example, if a D50 assessor uses copy section on the section name FL1, the assessor may copy/paste interior doors, mechanical equipment, etc. without knowing it. If there is no existing data, these functions are easily used.

Equipment should be validated to 100% accuracy level.

Existing data should be deleted if: 1) The component is no longer present, 2) The correct component type exists, 3) There are duplicate components with the same section name, or 4) The component is correct but has the wrong install date (requires deletion and re-entry with correct date).

If a component type in the existing data is no longer in scope, it must be updated to an in-scope item, or deleted if no longer applicable.

Past inspection comments are not required to be revised to current standards.

Section names, component types, and quantities must be verified and updated.

When performing a reinspection it should be understood that modifications in the inventory guidance may have taken place between the previous assessment date and the current effort. The new assessment should update the inventory to the latest inventory guidance. This may require, but is not limited to, combination of quantities (Ex: removing cardinal direction sectioning when it is no longer needed), modifying component type selections, or removing/adding items. The detailed inventory guidance portion of the manual will often provide direction on what steps need to be taken.

Section Details

Collect nameplate/component data for the following fields: ID, Model, Serial Number, Manufacturer, Location, Equipment Type, Capacity, Manufacturer Date, Year Installed, and Control Type for population into section details fields. If information is not available, place 'NA' in the section detail field to indicate it was not available.

If a capacity is estimated, the capacity field should include 'ESTIMATED' to delineate that an estimation took place. For example, if a lift with no tag is found, it may read '10 TON ESTIMATED'. Truncating 'estimated' to 'EST' so the example would read '10 TON EST' is acceptable.

If the component has an RPIE ID tag, that exact value (and ONLY that value) should be used in the Section Details 'ID Number' field. If there is no RPIE ID tag present, the regular tag number (PUMP-1) should be used. Verify how the ID Number field should be used before performing the assessment. See guidance on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components' page.

Section detail fields should be capitalized. It is understood that if previous data has been entered in lowercase, BRED™ limitations can prevent new data from being capitalized.

The Section Details comment box is used to identify specific characteristics on the component that are not captured in the Section Details fields. This can be extra information on location or material type for example. Also, any reasons why Section Detail fields could not be populated should be highlighted (not found/damaged nameplate/sun washed tag/etc.) and should be noted by using the standard comments.

The 'Year Installed' field in the Section Details should match the 'Year Installed' field at the Inventory/Section level. Populate the 'Manufacturer Date' field in the Section Details with data found on the component OR default to 1/1/'Year Installed' as the assumed value.

Sectioning

Additions, new wings, or major renovations likely require identifying separate sections with a different age.

Equipment components are always sectioned by floor. If there are multiple easily definable wings of a building with different install dates then sectioning by floor AND by wing is required. For example, if there is an east and west wing on a 2-floor building you would have 'FL2 EAST' and 'FL2 - WEST'.

Once all base sectioning guidelines have been followed, there may be a need to apply a DCR-driven sectioning methodology based on two factors 1) difference in DCR, and 2) quantity of distress. Step 1: Assessors should section a component when there is a 2-step difference in DCR (Ex: G- to A) in accordance with the guidance found in Step 2. If there is only a 1-step difference in DCR, the assessor shall have a single section and the lower of the DCR's should be used. Step 2: When a 2-step difference is found, the assessor should consider the quantity of distress that is present. If the distress is present on 25% or less of the component, a single section with a DCR in-between the high/low DCR shall be added (if G-/A are found then A+ is used). If the distress is present on over 25% of the component, two sections should be added at the high/low DCR. Any component with a 3-step or more difference in DCR should have two sections.

Refer to the 'Sectioning: D20,D30,D40,D50 and E10 Equipment Components' part of the manual for section name guidance for equipment.

Rule of Thumb: All equipment components that require Section Details should be sectioned separately. There are exceptions to this rule, review the 'Group OK?' column.

Typical section names used to describe the major areas of the building include: FL1, FL2, BASEMENT, MEZZANINE, ROOF, WING 'X,' etc.

The most critical part to an assessment is having all assessors aligned on how to perform an assessment. To reach an accurate DCR of a component, follow the steps below:

Step 1: Consider the level of degradation and the performance of the component:

OPERATIONAL CAPABILITY	OPERATIONAL CONDITION RATING	DEGRADATION	DCR
Fully Operational	Green	Free of observable or known degradation.	Green (+)
		Normal wear requiring normal preventative maintenance.	Green
		Normal degradation requiring corrective maintenance.	Green (-)
Impaired Operation	Amber	Minor degradation requiring corrective maintenance.	Amber (+)
		Moderate degradation requiring corrective repair.	Amber
		Significant degradation requiring moderate repair.	Amber (-)
Inoperable	Red	Extensive degradation requiring major repair.	Red (+)
		Severe degradation requiring major rehabilitation or partial replacement.	Red
		Complete degradation requiring full replacement.	Red (-)

Step 2: Consider the maintenance requirements of the component:

Type	Green (G+/G/G-)	Amber (A+/A/A-)	Red (R+/R/R-)
Dynamic (Equipment)	<p>Distresses present are of no impact to the components operation.</p> <p>Example: The fan component is fully operational.</p>	<p>Distresses present are of impact to the components operation. A repair is needed to bring the component back to proper operating condition</p> <p>Example: A fan has corrosion on the housing. A sand and paint would remove the distress.</p>	<p>Distresses present are of impact to the components operation. The component needs to be replaced.</p> <p>Example: A fan motor has overheated and no longer functions. Replacement of the component is required.</p>
Non-Dynamic	<p>The architecture component is in good condition requiring no maintenance outside of normal operations.</p> <p>Example: The carpet component is fully operational.</p>	<p>The architecture component has a distress that requires an extra level of maintenance outside of normal operations. This extra maintenance (or repair) would be an action such as a cleaning or a painting of a surface.</p> <p>Example: A carpet component has stains. A cleaning would remove the distress.</p>	<p>The architecture component has a distress where a maintenance operation will not fix the problem at hand. A replacement of the component is required.</p> <p>Example: A carpet component is damaged (ripped). The component needs to be replaced to fix the distress.</p>

Dynamic: Refers to equipment in the D10, D20, D30, D40, D50, and E10 systems.

Non-Dynamic: Refers to architectural components in the A10, A20, B10, B20, B30, C10, C20, and C30 systems.

Note: There are some Non-Dynamic components (for instance, toilets under D20) in the Dynamic systems.

Step 3: Adhere to the following requirements:

Requirements
Maintainability and obsolescence should not be the driving factor when conducting a condition assessment unless it has led to actual deterioration of condition that can be observed or reasonably inferred.
G+ ratings should only be given to inventory that is in pristine condition and is free of any observable defects.
Do not downgrade an assessment rating simply because an item is dirty.
Do not downgrade an assessment rating because the item does not meet current code compliance standards
Do not downgrade an assessment rating because the item is not deemed energy efficient.
Do not downgrade an assessment rating because the item is deemed to be a safety violation/hazard unless otherwise directed.
Do not downgrade an assessment rating because of a code violation.
Ratings should not be anticipated based on planned repairs or replacement.
Assessors should not expend field time and effort to determine the cause of a deficiency. If the cause is easily identified it should be included in the inspection comment.
Ratings shall be based upon the observable and documentable condition of the component.
A component should be downgraded if its operational capability, performance, reliability, etc. is compromised according to the direct rating definitions.
Incorporate user interviews, work order histories, or other information sources when determining the condition of the component. Include this information in the inspection comment.

The assessor should calibrate their mindset on what the expected DCR should be based on condition.

The assessor should consider the maintenance requirements of the component in the current condition.

The assessor should factor in the requirements/business rules for completing an inspection.

One factor that can play into an assessment is if the assessor receives information from a POC that results in a lower rating. For instance, an assessment takes place in July and there is a heating water pump that looks brand new, but has a blown motor. The assessor would assume the pump is supposed to be off due to being off season, but if the POC informs the assessor about the blown motor, this can be factored into the assessment (and indicated in the inspection comment).

One factor that should not play into an assessment is pending replacements of components. Assessors should rate components in the condition they are at the time of assessment. If the carpet is being replaced next month, that should not factor into a rating. Now, if the carpet contractor is on site (the work is currently taking place), this could be factored into the rating and a G+ rating provided with the current date of inspection chosen as the install date.

Service Life: No distresses present and component is nearing (or past) its service life.

The following comment can be used as an inspection comment for components that have no signs of distresses, are rated either Amber (A) or Amber Plus (A+), and are over 75% through their service life. This negates the need to have 4 parts of an inspection comment. Also, an inspection photo is no longer required.

[First Last-AE-Date] - The component is in proper working condition and is showing no signs of distress. The DCR was based on estimated remaining service life.

Step 1: Understand the 5 parts of the inspection comment:

Part #	Part Type	Type Description
1	Front End	[First Last-AE-Date] OR [First Last-DPW-Date] (ex: [John Doe-AE-7/4/2017])
2	Distress	Identifies the distress of the component
3	Severity	Identifies the amount of the distress.
4	Location	Identifies the location of the distress
5	Quantity	Identifies the quantity of the distress

Step 2: Use the DCR of the component as the basis for the severity.

DCR	Severity
Amber (+)	Minor/Mild
Amber	Moderate
Amber (-)	Significant/Major
Red (+)	Extensive
Red	Severe
Red (-)	Complete/Total

To aid in the inspection comments reading correctly the severity can be modified slightly. For instance, 'moderately' can be used for an 'A' DCR comment. This approach also applies to the distresses where one of the 23 MUST be selected. If 'Cracked' is selected as the distress, the wording 'cracks' may be used.

Step 3: Identify the distress of the component:

23 Distresses			
Blistered	Displaced	Overheated	Capability/Capacity Deficient
Broken	Efflorescent	Patched	Animal/Insect Damaged
Clogged	Holes	Rotten	Moisture/Debris Contaminated
Corroded	Leaks	Stained/Dirty	Noise/Vibration Excessive
Damaged	Loose	Cracked	Operationally Impaired
Deteriorated	Missing		Electrical Ground Inadequate or Unintentional

Step 4: Location and Quantity

Location on non-dynamic assets - 'lobby area' . On dynamic assets - 'housing' or 'base'.

Quantity on a SF UOM will typically be a %. On an EA UOM will typically be a count.

Step 5: Put all 5 components together to form an inspection comment (colors correspond to part):

A+	Front End	CRACKED.	The pump has	minor	cracks	present on	10% of the	housing.
A	Front End	DETERIORATION.	The tank has	moderate	deterioration	over	50 %	of the base.
A-	Front End	DAMAGED.	The exhaust has	significant	damage	to	all	the vehicle connectors.
R+	Front End	CRACKED.	The crane has	extensive	cracks	present on	2	pedestals.
R	Front End	LEAKS.	The piping has	severe	leaking	around the	HVAC	penetrations.
R-	Front End	OPERATIONALLY IMPAIRED.	The	3	CW	pumps are	completely	operationally impaired.

Inspection Comments

Rule #	Rule
1	Required on all inspections with a DCR of A+ and below.
2	Paint DCRs do not have an inspection comment requirement. Only the component DCR A+ and below.
3	Should include any component specific information obtained from the base or POC interview.
4	Should be in complete sentences and use industry standard terminology. Comments can be typed into MS Word for spelling/grammar checks and then pasted into the comments box.
5	Do not use all capital letters for the entire comment. The distress should be all capital letters.
6	Do not use abbreviations, jargon, or slang.
7	Should give enough information for a follow-on assessor to locate the problem area/equipment.
8	Should accurately describe the problem/observation that is the basis for the rating. Someone unfamiliar with the particular item should have an accurate picture of the components current condition and the justification for the assigned rating.
9	Should accurately describe the location of the distress if the component is only showing a distress in a single location. For instance, if an office has a stain in the carpet, it would be necessary to call out the room number of the office.
10	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. For instance, assessor John Doe at firm AE: [John Doe-AE-7/4/2017].
11	After #10 front end information in the brackets one of the 23 distresses should be provided in capitalized form. Building on #10 for an example if stained carpet: [John Doe-AE-7/4/2017] - STAINED.
12	After #10 and #11 a sentence should be provided that provides the distress, severity, location, and quantity. Quantity/Location refers to the amount/location of the distress present.

Inventory Comments

Rule #	Rule
1	Used to identify components that were not visible for inspection. See standard comments.
2	Used as a bread crumb for follow-on inspections. Can provide useful additional information such as location or type to help the next assessor understand what was being inventoried. Ex: This component is the stone wall located behind the receptionist in the lobby area.
3	Should describe the component inventoried where 'OTHER' is used to allow follow-on assessments to understand what was inventoried in the previous assessment.
4	Used to provide the location of the component (especially used for architecture components where there are no Section Details provided that have a location): Roof, NW Corner, Room Number
5	Do not use all capital letters, abbreviations, jargon, or slang.
6	Used to further describe an asset if it is not adequately described in the component type selection.
7	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Section Detail Comments

Rule #	Rule
1	Used to identify data that was not able to be populated in the Details fields. See standard comments.
2	Used to provide information that is specific to just that component section detail field. This can be a location of the specific section or something that the section services.
4	Do not use all capital letters, abbreviations, jargon, or slang.
5	Each comment should start with the assessor name (First Last), assessor affiliation/company, and date within square brackets. Example: [John Doe-AE-7/4/2017].

Standard Inventory Comments

When	Use Standard Comment
Assets are not visible for inspection.	Component was not visible for inspection. The component condition will be age-based by BUILDER program degradation curves.
Assets are not visible for inspection that also require Section Details to be populated.	The component is not visible for inspection or population of Section Details. The component condition will be age-based by BUILDER program degradation curves and no nameplate data or inventory photo will be provided.
Assets are not visible for inspection that require quantities to be assumed. Hidden mechanical equipment, ductwork, and # of control points are common occurrences.	The component is not visible for inspection and the quantity was estimated based on architect/engineering judgment. The component condition will be age-based by BUILDER program degradation curves.
Assets are located in an area where no electronics area allowed. This prevents an assessor from taking inventory/inspection photos.	The component is located in a secure area of the facility that did not allow electronic devices to be used. Photos were not obtainable.
Assets are visible for inspection but are a system that is not tested (HVAC controls, security system, etc.) so an age-based BUILDER™ CI is desired.	The component condition will be age-based by BUILDER program degradation curves.

Standard Section Detail Comments

When	Use Standard Comment
Nameplate is not found on the component.	Nameplate not found on the component. All fields with "NA" represent data not found.
Nameplate is found on the component but it is partial/completely unreadable.	Nameplate on the component was dirty/corroded/damaged/sunwashed. Section Detail fields with "NA" represent data that was not found.
Nameplate is found on the component that is readable but is missing certain Section Details fields.	Nameplate on the component was missing certain Section Detail fields. Section Detail fields have been populated and fields with "NA" represent data not found.

Comment Front-End Clarification

A front end refers to the bracketed information at the start of an inspection/inventory/section detail comment. The front end must have to following 3 pieces of information: 1) assessor name, 2) assessor company or affiliation, and the date. The BRED™ stamp may also provide the time of inspection which is acceptable.

BRED™/BUILDER™ Clarification

The terms BRED™ and BUILDER™ are used interchangeably throughout this document.

Rule #	Rule
1	Components are divided into sections when a significant variation exists in material/equipment category, age, or construction history, which impacts the life cycle characteristics of the component. Example 1 - If a wing or addition was added to a much older building, the two areas of the building should be sectioned differently because the age and construction history is different. Example 2 – If the building roof has multiple levels of similar materials in different conditions, these levels should be sectioned differently to capture the difference in condition. Example 3 – If the building has more than one of a particular type of component, separate component sections. For example: There is a 5,000 and 10,000 CFM air handler.
2	Multi-wing buildings are always sectioned by wing if the installation date of the wings vary. If a building is an 'E' shape and all wings have the same install date only sectioning by floor is required.
3	Multi-story buildings are always sectioned vertically by floor or level (in the case of a basement or mezzanine).
4	There may be unique instances where sectioning by an area of a building is required. For instance, if a building is split between two companies an installation may request sectioning by company 1 and 2.
5	An on-site discussion must occur at each building among all team members to determine the cardinal direction of the building. All assessors should have North as the same side of the building.
6	An on-site discussion must occur at each building among all team members on how the building should be sectioned. The goal is to avoid one assessor calling it a toilet, one calling it a restroom, and another calling it a bathroom. Standard sectioning naming is important for a consistent data set.
7	The section name should not be repetitive of the component type or material. If the floor is wood, do not have a section name 'WOOD'. Incorporation of the location into the section name is very helpful to be used for follow on assessments. If the wood floor has the section name 'LOBBY', it provides great

Standard Section Names and Format Rules

Use	Standard Section Name
Section by Floor (Business Rule)	FL1 – 1st Floor, FL2 – 2nd Floor, FL3 – 3rd Floor, etc.
Section by Floor (Business Rule)	BASEMENT, MEZZANINE, ATTIC, etc.
Section by Wing (applicable if different construction histories or condition only)	MAIN, WING A, WING B, WING C, ADDITION, etc.
Section by Direction (applicable if different construction histories or condition only)	NORTH, EAST, WEST, SOUTH, etc.
Section by Roof Level (applicable if different construction histories or condition only)	UPPER, LOWER, MAIN, etc.

When an equipment tag is included in the section name it should match exactly what was found in the field. Example: if the boiler ID number is B-1, the section name equipment tag portion should read B-1. If the boiler is tagged B1, the equipment tag portion should read B1. See equipment sectioning for further guidance.

Dashes are not required in the section name other than the instance in regards to equipment ID tags above.

The section name field is always entered in all capital letters.

Sectioning Business Rules - Grouping

The following only applies to each (EA) unit of measure (UOM) components. The 'Complete Component Catalog Breakdown' at the end of the section has a 'Group OK?' column. This has the values of 'Yes', 'No', and 'N/A'.

'Yes' = Grouping is allowed for this component type. A quantity of greater than '1' is acceptable.

'No' = Grouping is not allowed for this component type. The quantity must be '1'.

N/A = Not Applicable. Component type is not an EA UOM or is out of scope.

Group OK? = Yes when Section Details and Inventory Photos are Required.

There are several equipment component types (Unit Heaters, small pumps, etc) that have the following designations in the 'Complete Component Catalog Breakdown': 1) Group OK? = Yes, 2) Section Details? = Yes, and 3) Inventory Photo? = Yes.

In this case, a single section detail and inventory photo representative of the entire section is required. A few more clarifications:

- 1) The location field would be for the entire section (FL1/BAY 1/EXTERIOR) and not specific to a single component.
- 2) A difference in manufacturer does not drive further sectioning. For instance, 2 KW electric unit heaters from multiple manufacturers can be combined into one section. Capacity (2 KW) is the driver for sectioning methodology.
- 3) It is understood that the single section detail field is representative of the entire section. The details should be populated per one component. There is no need to enter multiple details or try to combine multiple manufacturer/model/serial/etc into to a single section detail field.

Group OK? = No

The quantity for these component types must be 1. For equipment (Section Details? = Yes and Inventory Photo? = Yes) the guidance found on the 'Section Details: D10, D20, D30, D40, D50 and E10 Equipment Components', 'Sectioning: D10, D20, D30, D40, D50 and E10 Equipment Components', and 'Exterior Sectioning: D10, D20, D30, D40, D50 and E10 Components' must be followed.

Sectioning of Equipment Components

The business rules stated below are applicable components that have a 'Group OK? = No' designation.

Sectioning of equipment components is of critical importance to provide a data set that is usable by the installation, is able to have Quality Assurance reviews, and is able to be reassessed. To achieve this goal it is required that equipment be sectioned by 1) floor, 2) area/room, and 3) have the ID number included.

Case Study: Below is a drawing of a large building that has several electrical rooms. If one section of 125 AMP panels is provided with section name 'N/A', the usability of the data is greatly reduced. If the equipment is sectioned by room (FL1 - RM 109, FL1 - RM 141, FL1 - RM 104, FL1 - RM 153, FL1 - RM 149), follow-on assessments, QA, and the installation can easily identify/reassess components.

If equipment is located in a concealed space (such as VAV's) this sectioning guidance is not applicable. A single section can be added per floor with the estimated quantity provided. There are other exceptions (such as panels under 100A) that are noted within the component breakdown part of the manual.

This sectioning provides the benefit that if a remodel/addition takes place between assessments, it will be apparent what has been added/deleted in a specific room without the assessor having to do a complete walk-through of the building and the deduce what changed (which is a very difficult, if not impossible, task).

The Section Name should include the equipment ID number. For example, the panel LP1 can have the Section Name: FL1 - RM 109 - LP1.



**Example
Section
Names**

FL1 - RM 109
FL1 - RM 141
FL1 - RM 104
FL1 - RM 153
FL1 - RM 149

5 - EXAMPLE

D50 ELECTRICAL

D5010 ELECTRICAL SERVICE & DISTRIBUTION

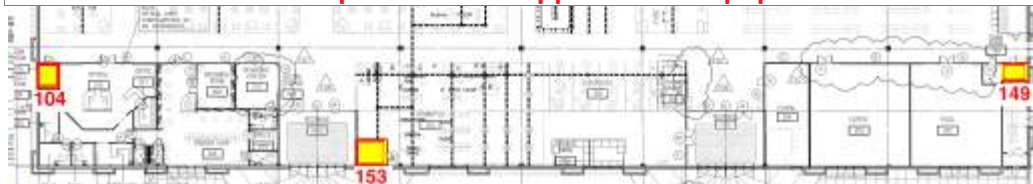
- FL1 - RM 104 - LP1 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 109 - LP2 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 109 - MP1 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 109 - SG1 - D501004 PANELBOARDS - Switchgear - 2000 Amp
- FL1 - RM 141 - LP3 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 141 - MP2 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 141 - T1 - D501003 INTERIOR DISTRIBUTION TRANSFORMERS - dry-type, 15 kV
- FL1 - RM 149 - LP4 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 149 - MP3 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB
- FL1 - RM 153 - LP5 - D501004 PANELBOARDS - Main lugs, 125 amp
- FL1 - RM 153 - MP4 - D501004 PANELBOARDS - Main lugs, 277/480 V, 225 amp, NEHB

Example BRED Tree Structure

The inclusion of the room/area into the section name DOES NOT negate the need to fill in the 'location' field in the Section Details. All general detail population rules must still be followed.

The use of dashes and underscores is not standardized but should be uniform throughout the BRED tree so data aligns/sorts cleanly. In the example to the left all future users of data can easily find the components inventoried.

Electrical shown as example data set. Applies to all equipment.



Sectioning of Components on the Exterior of a Building

The component catalog has a column called 'GROUP' that indicates for all each (EA) UOM component types whether they are to be a single section (Quantity = 1, NO) or can be "grouped" into a single section (Quantity >= 1, YES). When inventorying a single section (NO) component type the assessor must include cardinal direction (roof is included). When inventorying a grouped (YES) component type 'EXTERIOR' should be used.

The inclusion of the cardinal direction into the section name DOES NOT negate the need to fill in the 'location' field in the Section Details.



S/N starts with one of the following for Group OK?
= No items.

NORTH

SOUTH

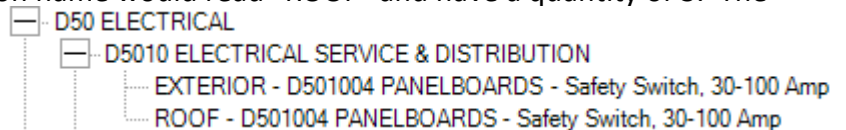
EAST

WEST

ROOF

1) Locations should be uniform throughout the data set. For instance, all equipment in the mechanical yard example above would have section names starting with 'WEST_MECH YARD' (followed by ID Number).

2) If inventorying a component where grouping is allowed (such as the 'Safety Switch, 30-100 AMP' component type above) and there is a difference in condition/install date that requires another section, the assessor should include cardinal direction in section name. For instance, if the switches serving the roof exhaust fans were to be sectioned out the section name would read "ROOF" and have a quantity of 3. The 'EXTERIOR' would remain with a quantity of 2.



Section Details

The component catalog indicates which component types need section details. If 'YES' a single section detail should be added to the section.

No photos are required at the section detail level. All 'step-back' photos are placed at the inventory (component section) level.

In the case where Section Details? = 'Yes' and Grouping? = 'Yes' a single section detail representative of the section should be added.

Section Detail fields:

ID Number: Captures the unique number associated with the equipment. The order of importance is 1) RPIE (barcode Ex: 12345), 2) Tag (phenolic/plastic Ex: EF-1), and 3) Felt tip pen markings. Assessment should follow guidance from installation on use of this field to provide the most value. This is also found in the Section Name. If both barcode and tag are to be captured the ID Number field reads Tag/RPIE (EF-1/12345).

Model: Captures the model number of the equipment.

Serial Number: Captures the serial number of the equipment.

Manufacturer: Captures the manufacturer of the equipment. Assessors should use the same spelling for all components from that manufacturer. Once a standard is set for the installation it should be followed.

Location: Captures the location of the equipment. It should be detailed enough for someone to easily locate the component. This is also found in the Section Name.

Equipment Type: Captures the type of the equipment. This can be found in the component type field.

Equipment Make: Captures the make of the equipment. Manufacturers will have a certain model identified by a name. This field captures that name.

Capacity: Captures the capacity of the equipment. In some cases the component type is a selection based on a round-up to the larger size. This field captures the actual capacity found in the field.

Date Manufactured: Captures the date manufactured. if not found, it can be set to 1/1/Year Installed.

Year Installed: Captures the year the component was installed.

Control Type/Make: Captures the control type. Common entries are: 1) Manual, 2) Thermostat, 3) DDC, 4) VFD. Many other control types can be used.

E103002 LOADING DOCK EQUIPMENT - Loading Dock Equipment - Dock Leveler, hydraulic, 7' x 8', 10 ton

Typical Application and General Component Guidance:

This component is used to inventory hydraulic dock levelers.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

For all hydraulic dock levelers use the 'Loading Dock Equipment - Dock Leveler, hydraulic, 7' x 8', 10 ton' component type regardless of actual size.

For permanently affixed dock levelers, that are not hydraulic, use 'Loading Dock Equipment - Dock Lift, platform type, 6' x 6', portable, 3000 lb. Ignore the 'portable' part of the component type. Portable dock levelers should not be inventoried.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Loading Dock Equipment - Dock Leveler, hydraulic, 7' x 8', 10 ton	Yes	No	No	No	Yes	No	20	EA

E103004 AUTOMOTIVE SHOP EQUIPMENT - Air Dryer, 1-15 CFM

Typical Application and General Component Guidance:

This component is used to inventory air dryers.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

This component type is used to inventory all air dryers minus the ones captured under 'D402001 FIRE PROTECTION WATER PIPING AND EQUIPMENT - Air Dryer'. All air dryers should be inventoried.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Air Dryer, 1-15 CFM	Yes	Yes	Yes	No	No	No	20	EA

E103004 AUTOMOTIVE SHOP EQUIPMENT - Automotive lifts (Hydraulic), clear floor, 2 post, 9000 lb

Typical Application and General Component Guidance:

This component is used to inventory automotive lifts.



Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Automotive lifts (Hydraulic), clear floor, 2 post, 9000 lb	Yes	Yes	Yes	No	No	20	EA

E103004 AUTOMOTIVE SHOP EQUIPMENT - Compressor, Electric, 5 HP, dual controls

Typical Application and General Component Guidance:

This component is used to inventory shop air compressors.



Business Rules/General/Lessons Learned/Reinspection

Reinspection

Prior to the 2019 update, the 5 HP component type was the only one available. When performing a reinspection, an update of the component type will be needed for the larger complexes.

Component Type	In Scope?	Details Req?	Inventory Pic?	Group OK?	Age Based?	Design Life	UOM
Compressor, Electric, 5 HP, dual controls	Yes	Yes	Yes	No	No	20	EA

E109090 OTHER SPECIALIZED FIXED AND MOVEABLE EQUIPMENT - Other

Typical Application and General Component Guidance:

This component is used to inventory equipment that does not have a component type in the catalog. The photo shows a pressure washer.



Business Rules/General/Lessons Learned/Reinspection

Business Rule

This component type is used to inventory any equipment items found in the field that require a component type to be created in BUILDER.

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group OK?	Age Based?	Design Life	UOM
Other	Yes	Yes	Yes	Yes	No	No	20	EA

Complete Component Catalog Breakdown

E10

E10 EQUIPMENT

E101001 CHECKROOM EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E101002 REGISTRATION EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E101003 VENDING EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E101004 LAUNDRY EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E101005 SECURITY & VAULT EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	50	EA
Other	No	No	No	No	N/A	No	50	EA
Security Vault	No	No	No	No	N/A	No	50	EA
Unknown	No	No	No	No	N/A	No	50	EA

Complete Component Catalog Breakdown

E10

E10 EQUIPMENT

E101006 TELLER AND SERVICE EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E101007 MERCANTILE EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E101008 OFFICE EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E102001 MISCELLANEOUS COMMON FIXED & MOVEABLE EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	30	EA
Other	No	No	No	No	N/A	No	30	EA
Unknown	No	No	No	No	N/A	No	30	EA
Vacuum System	No	No	No	No	N/A	No	30	EA

E102002 MEDICAL EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E10 EQUIPMENT

E102003 LABORATORY EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E102004 MORTUARY EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E102005 AUDITORIUM & STAGE EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E102006 LIBRARY EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E102007 ECCLESIASTICAL EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E10 EQUIPMENT

E102008 INSTRUMENTAL EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E102009 AUDIO-VISUAL EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E102010 DETENTION EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E103001 PARKING CONTROL EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E103002 LOADING DOCK EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Loading Dock Equipment - Dock Leveler, hydraulic, 7' x 8', 10 ton	Yes	No	No	No	Yes	No	20	EA
Loading Dock Equipment - Dock Lift, platform type, 6' x 6', portable, 3000 lb	Yes	No	No	No	Yes	No	20	EA
Other	Yes	No	Yes	Yes	Yes	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E103003 WAREHOUSE EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmnt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

Complete Component Catalog Breakdown

E10 EQUIPMENT

E10

E103004 AUTOMOTIVE SHOP EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Cmnt?	Group Ok?	Age Based?	Design Life	UOM
Air Dryer, > 50 CFM	Yes	Yes	Yes	No	No	No	20	EA
Air Dryer, 1-15 CFM	Yes	Yes	Yes	No	No	No	20	EA
Air Dryer, 15-50 CFM	Yes	Yes	Yes	No	No	No	20	EA
Automotive lifts (Hydraulic), clear floor, 2 post, 30,000 lb	Yes	Yes	Yes	No	No	No	20	EA
Automotive lifts (Hydraulic), clear floor, 2 post, 6000 lb	Yes	Yes	Yes	No	No	No	20	EA
Automotive lifts (Hydraulic), clear floor, 2 post, 9000 lb	Yes	Yes	Yes	No	No	No	20	EA
Automotive lifts (Hydraulic), clear floor, 2 post, 15,000 lb	Yes	Yes	Yes	No	No	No	20	EA
Automotive lifts (Hydraulic), ramp style, 4 post, 25,000 lb	Yes	Yes	Yes	No	No	No	20	EA
Automotive lifts (Hydraulic), ramp style, 4 post, 35,000 lb	Yes	Yes	Yes	No	No	No	20	EA
Automotive lifts (Hydraulic), ramp style, 4 post, 50,000 lb	Yes	Yes	Yes	No	No	No	20	EA
Automotive lifts (Hydraulic), ramp style, 4 post, 75,000 lb	Yes	Yes	Yes	No	No	No	20	EA
Compressor, Electric, 10 HP, dual controls	Yes	Yes	Yes	No	No	No	20	EA
Compressor, Electric, 1-1/2 HP, standard controls	Yes	Yes	Yes	No	No	No	20	EA
Compressor, Electric, 25 HP, dual controls	Yes	Yes	Yes	No	No	No	20	EA
Compressor, Electric, 5 HP, dual controls	Yes	Yes	Yes	No	No	No	20	EA
General	No	No	No	No	N/A	No	20	EA
Hoist, 4 post, 3 ton capacity	Yes	Yes	Yes	No	No	No	20	EA
Hoist, 4 post, 5 ton capacity	Yes	Yes	Yes	No	No	No	20	EA
Hoist, dual post, 12 ton capacity, adjustable frame	Yes	Yes	Yes	No	No	No	20	EA
Hoist, single post, 4 ton capacity, swivel arms	Yes	Yes	Yes	No	No	No	20	EA
Lube Equipment, 3 reel type, with pumps	Yes	Yes	Yes	No	No	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Product dispenser, 6 nozzles, with vapor recovery	Yes	Yes	Yes	No	No	No	20	EA
Scales, concrete foundations, 70' x 10'	Yes	Yes	Yes	No	No	No	20	EA
Scales, concrete foundations, 8' x 6'	Yes	Yes	Yes	No	No	No	20	EA
Scales, dial type, built in floor, 10 ton, 9' x 7'	Yes	Yes	Yes	No	No	No	20	EA

Complete Component Catalog Breakdown

E10

E10 EQUIPMENT

Scales, dial type, built in floor, 5 ton, 8' x 6'	Yes	Yes	Yes	No	No	No	20	EA
Scales, dial type, truck (including weigh bridge), 20 ton, 24' x 10'	Yes	Yes	Yes	No	No	No	20	EA
Scales, digital type, truck, 60 ton, 75' x 10'	Yes	Yes	Yes	No	No	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E109001 BUILT-IN MAINTENANCE EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	SF
Other	No	No	No	No	N/A	No	20	SF
Unknown	No	No	No	No	N/A	No	20	SF

E109002 FOOD SERVICE EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Double Oven Commercial Grade	No	No	No	No	N/A	No	10	EA
General	No	No	No	No	N/A	No	20	EA
Ice Maker	No	No	No	No	N/A	No	7	EA
One Compartment Freezer Commercial Grade	No	No	No	No	N/A	No	15	EA
One Compartment Refrigerator Commercial Grade	No	No	No	No	N/A	No	15	EA
Other	No	No	No	No	N/A	No	20	EA
Two Compartment Freezer Commercial Grade	No	No	No	No	N/A	No	15	EA
Two Compartment Refrigerator Commercial Grade	No	No	No	No	N/A	No	15	EA
Unknown	No	No	No	No	N/A	No	20	EA
Warming Drawer	No	No	No	No	N/A	No	10	EA

E109003 WASTE HANDLING EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E10 EQUIPMENT

E109004 RESIDENTIAL EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
Dishwasher Residential Grade	No	No	No	No	N/A	No	9	EA
Double Oven Residential Grade	No	No	No	No	N/A	No	10	EA
Dryer	No	No	No	No	N/A	No	7	EA
Electric Range/Cooktop Residential Grade	No	No	No	No	N/A	No	10	EA
Garbage Disposal Residential Grade	No	No	No	No	N/A	No	7	EA
General	No	No	No	No	N/A	No	20	EA
Microwave Oven	No	No	No	No	N/A	No	8	EA
Other	No	No	No	No	N/A	No	20	EA
Refrigerator Residential Grade	No	No	No	No	N/A	No	15	EA
Stove/Oven Residential Grade	No	No	No	No	N/A	No	10	EA
Trash Compactor Residential grade	No	No	No	No	N/A	No	10	EA
Unknown	No	No	No	No	N/A	No	20	EA
Wall Oven Residential Grade	No	No	No	No	N/A	No	10	EA
Washer	No	No	No	No	N/A	No	7	EA

E109005 UNIT KITCHENS

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E109006 DARKROOM EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E10 EQUIPMENT

E109007 ATHLETIC, RECREATIONAL, & THERAPEUTIC EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E109008 PLANETARIUM EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E109009 OBSERVATORY EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E109010 AGRICULTURAL EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	No	No	No	No	N/A	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

E109090 OTHER SPECIALIZED FIXED AND MOVEABLE EQUIPMENT

Component Type	In Scope?	Details Req?	Inventory Pic?	Inventory Cmmt?	Group Ok?	Age Based?	Design Life	UOM
General	No	No	No	No	N/A	No	20	EA
Other	Yes	Yes	Yes	Yes	No	No	20	EA
Unknown	No	No	No	No	N/A	No	20	EA

Details Req?	If 'Yes', all required section detail fields are to be populated.
Inventory Pic?	If 'Yes', an inventory level photo is to be provided. This is a step back photo showing the component.
Inventory Cmnt?	If 'Yes', an inventory comment is to be populated. This should describe the component.
Group OK?	Only applicable to each (EA) UOM's that are In Scope? = 'Yes'. If 'No' section must be a quantity of 1. if 'Yes' section may have a quantity greater than 1. If 'N/A' it is not applicable to the component type.
Age Based?	If 'Yes', age based (do not provide an inspection) is the desired approach. If 'No' but upon inspection the component is not visible, then an age based approach is acceptable.
Design Life	Design life of the component.
UOM	Unit of measure. If yellow highlight = new component type in 2019 update.