DEPARTMENT OF GENERAL SERVICES
BUREAU OF CAPITAL OUTLAY MANAGEMENT
Serving Government. Serving Virginians.

BCOM Newsletter

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In this Issue:

Preparing for Successful Inspections

It's inspection time again! As summer comes to a close and the academic year gears up, the list of substantial completion inspection requests to BCOM grows rapidly. The Bureau is sensitive to the needs of the agencies' construction deadlines. It is greatly appreciated when agencies provide BCOM a minimum of seven to ten days' advance notice of their desired inspection dates. This aids BCOM in scheduling inspections to best accommodate everyone's needs. BCOM's stated performance goal is to complete inspections within seven days of the agencies' requested inspection dates.

The concept of "substantially complete" means that the construction of the building or space is finished and can be used for its intended purpose. When BCOM's inspection teams arrive at project sites, whether brand-new buildings or small renovations, there are a number of deficiencies that occur on a regular basis. Significant deficiencies can mandate the need for revisits and delay the occupancy and use of the facilities.

Inspections are made based on the approved permit drawings, the Virginia Uniform Statewide Building Code (VUSBC), the ADA Standards for Accessible Design (ASAD) and the Construction and Professional Services Manual (CPSM.)

When the agency and their contractor are able to address the items in the following list, before BCOM's arrival, their project is more likely to be on track for a satisfactory inspection and agreement that the agency can move in (aka, take "beneficial occupancy" of the facility).

1) **Incomplete construction and construction debris:** Substantial parts of the work are simply not finished and trash is everywhere. Correcting this condition is especially important in the means of egress and mechanical rooms. Many times the site is a mud pit. Completed construction in the means of egress and to the public way are required for occupancy.

2) **Unapproved changes during construction:** When changes are made to the approved drawings and are not submitted to the Building Official, this may result in code deficiencies. Unapproved changes are often significant and costly to correct.

3) **Incomplete close out documents:** Prior to, or at the time of inspection, make sure to have in-hand the Regional Fire Marshal's Inspection Report, A/E's Certificate of Substantial Completion, Contractor's Certificate of Substantial Completion, Structural and Special Inspections report, Elevator inspection report, Potable water report, preliminary test & balance (TAB) summary.

4) **Inoperable HVAC systems:** Many times BCOM will find, on inspection, fans that are not energized or run backwards. Make sure the HVAC controls are operating properly. Testing and Balancing must be accomplished. Fuel supply must be connected to equipment.

5) **Incorrect handicapped accessibility elements:** Dimensions and fixture installations that are simply wrong, despite the drawings often being correct – especially toilets, showers and protruding objects. Where the ASAD provides a range, such as 16-18 inches or 15-17 inches, build within the range. Another subject is missing or non-compliant stair and ramp handrails as required by ASAD and the VUSBC, and missing or non-compliant guard systems as required by the VUSBC.

6) **Missing MEP equipment identification:** Proper labeling of equipment cutoff switches, electrical panels, boiler pressure vessels, and piping is required.

7) **Incorrect exit signs and exit discharge:** Exit signs that do not lead to an exit or missing exit signs, no walking surface – sometimes a drop-off of a few feet - outside the exit doors, or paths outside of the exit doors that do not lead to the public way or safe dispersal areas are often noted on inspections.

8) **Improperly locked exit doors:** Door locks are added to exit doors in violation of the code at an alarming rate. BCOM is well-versed in special locking systems that are code-compliant. Consult with your BCOM lead reviewer well in advance of inspections to address issues such as this.

9) **Inadequate GFCI protection:** Ground Fault Interrupt must be provided in wet areas to avoid electrical shock. Make sure receptacles are protected within six feet of a sink.

10) **Incorrect indirect waste disposal:** Waste from elevator sump pits, hot water blow off and other non-sewerage sources may not be directly connected to sewer and may not be dumped in hazardous locations.

11) **Incorrect location of plumbing fixtures:** The handicapped accessible fixtures are consistently mounted in improper locations, causing code clearance violations and deviations from the contract drawings. (See number 5 above.)

12) **Roofing deficiencies:** Roofs with insufficient cricket slopes (1/4"/ft.) or cricket valley slopes (1/8"/ft.) create places for ponding water; missing or incorrect secondary roof drainage; and failure to correct roof deficiencies from the roof survey report are issues which must be properly addressed. ❑

Fire Rated Corridor Construction

Achieving code compliant Fire Rated Corridor Construction can be difficult, especially in buildings where a Fire Sprinkler System is not provided. BCOM has encountered various projects where the code requirements for fire rated corridors have been misapplied. This article discusses how compliance can be achieved.

Section 1018.1 of the 2012 Virginia Construction Code (VCC) contains fire-resistance rating requirements for corridor construction. With the exception of 'R' and 'H' occupancy classifications, corridors are typically not required to be fire-resistance rated in buildings equipped throughout with an automatic sprinkler system. However, in buildings that are not sprinklered and have occupant loads greater than the thresholds of VCC Table 1018.1, the minimum corridor fire-resistance rating is one hour. Many buildings fall into this category. In some situations, it may be advantageous to install an automatic sprinkler system even though the code does not require it solely for the purpose of eliminating the fire rated corridors. Where this is infeasible or cost-prohibitive, the designer must understand the various code requirements and system limitations when specifying fire-resistance rated corridor construction.

A **corridor** as defined in VCC Chapter 2 is "an enclosed exit access component that defines and provides a path of egress travel." It can be simply thought of as a six-sided box that includes: an entrance point (exit access doorway), a top (ceiling), a bottom (floor), two sides (walls), and an exit (exterior exit door, exit stairway, exit ramp, etc.). When a corridor is required to be one-hour fire rated, it must be bound on all six sides by fire-resistance rated construction, unless the exit occurs in a non-rated exterior wall. The floor is often a concrete slab-on-grade or an elevated floor (or floor-ceiling) assembly. The walls are clearly specified in VCC 1018.1 to be Fire Partitions as governed by VCC Section 708. Like floor assemblies, a multitude of *listed* and tested wall assemblies are readily available for the designer to specify. Fire Partitions must extend from the top of the slab-on-grade or elevated floor assembly to the underside of the sheathing, slab, deck or floor/roof assembly above. Requirements for the components of these three sides of the corridor "box" are generally well understood and straightforward to apply.

The top surface of the fire rated box – the ceiling – tends to be the component that opens up a myriad of issues for the designer and builder, especially in otherwise non-fire-resistance rated construction. While various options do readily exist for implementing a rated corridor ceiling, each approach has its own set of advantages and distinct limitations which must be understood before being incorporated into the design.

Four of the most common approaches to fire-resistance rated corridor ceiling construction are as follows:

1) *Listed* Floor or Roof Assembly

When a floor or roof assembly above a corridor walking surface is fire-resistance rated as required for the corridor, it can function as the rated ceiling when the fire partitions extend to the underside of the assembly as described in VCC Section 708.4. With this approach, an additional fire-resistance rated ceiling is not required within the corridor space unless an open HVAC plenum is specified or the corridor-side wall membranes do not extend to the underside of the assembly above. Inevitably, items within the corridor such as acoustic tile ceilings, lights, cable trays, ducts, HVAC equipment, etc. will be present and must have structural support. A distinct advantage of utilizing a *listed* floor or roof assembly is that, by definition, it is a loadbearing system. This means that the assembly itself has been tested under a loaded

condition. Superimposed loads can therefore be directly supported from the assembly without the need for supplemental structural framing. It should be noted that, per VCC 711.4, horizontal assemblies "shall be continuous without openings, penetrations or joints except as permitted." In other words, a *listed* horizontal assembly shall apply continuously to at least an entire structural bay within the floor or roof system and cannot be partially applied to isolated areas, such as only those portions of a floor or roof span that occur directly over a corridor. Design considerations with this method include determination of the extent of the rated assembly and associated cost premium, quantity of fire and/or smoke dampers, and potential congestion of penetration firestopping.

2) Horizontal Continuation of the Corridor Wall per VCC 708.4 - Exception 3

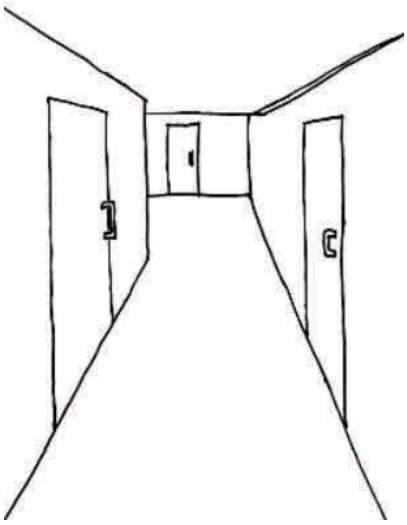
There may be situations where extending the corridor fire partitions to the underside of the sheathing, slab, deck, or ceiling membrane above is especially problematic. For example, large quantities of duct work, conduit, and other MEP items passing through the space all need to be adequately firestopped and dampered as they penetrate the fire partitions, resulting in difficult coordination of various trades. The VCC offers a singular, unique provision found in Section 708.4 Exception 3 which permits the walls to terminate at the upper membrane of the fire-resistance rated corridor ceiling when the ceiling "is constructed as required for the corridor walls." This approach is often referred to as the tunnel method, or the corridor lid method, where the wall assembly turns 90 degrees and spans across the corridor. The horizontal extension of the walls are not horizontal assemblies and cannot be utilized in a loadbearing application. It is merely a code exception. Since the VCC does not place a limit on the span of the ceiling, it is the responsibility of the structural engineer to design the ceiling elements (typically wood or metal studs) to be able to span across the corridor supporting only the assembly self-weight and within acceptable deflection limits. Design considerations with this method include supplemental support for superimposed loads (above or below the rated ceiling assembly), loadbearing vs. non-loadbearing corridor wall classification – and subsequent *listed* assembly selection – as defined in VCC Chapter 2, and lateral stability of the corridor tunnel.

3) Horizontal Shaftwall System

Shaftwall systems are non-loadbearing assemblies traditionally utilized in a vertical orientation due to ease of installation from one side as well as desirable sound attenuation and fire-resistance properties. Numerous UL *Listings* are available for vertically oriented shaftwall assemblies. Due to the lack of available test data on shaftwall systems oriented horizontally, gypsum board manufacturers have produced product-specific literature outlining the horizontal performance of their respective shaftwall assemblies. Evaluation service entities such as UL, ICC ES, and PEI have produced product-specific Evaluation Reports (ER) such as ER-3501-2, ER-3579, AER-09038, NER-258, etc. which govern the usage, performance, and configuration of all components within the completed shaftwall assembly. As long as the designer strictly complies with the associated ER for the specified horizontal shaftwall system, the fire-resistance rating of the assembly can be achieved. Framing details vary from manufacturer to manufacturer, so careful coordination is required to ensure that the desired rating is not compromised due to inconsistent construction methods. A common limitation to all shaftwall systems is that they are not tested in a loadbearing application. Shaftwall manufacturers as well as each corresponding ER are careful to state that these systems are limited to their own self-weight and are not intended to support additional loads. Design considerations with this method are similar to the tunnel method approach with additional attention given to careful adherence to specific construction requirements.

4) *Listed* Non-Loadbearing Horizontal Barrier

UL Designs I501, I502, I503, and I504 are *listed* and tested alternatives to a horizontal shaftwall system and may be preferable in certain scenarios. Similar to the previous two approaches, these *listed* designs are clearly noted to be limited to the self-weight of the assembly. However, contrary to the tunnel method approach, they are prescriptive in the sense that the *listing* provides the minimum size and gauge of studs as well as the maximum horizontal span of the completed assembly. No further structural analysis is required since the *listing* establishes the performance of the system. Detail I503 is often desirable in situations where mechanical ducts must penetrate the corridor ceiling assembly. This particular assembly has been tested with a certain type and size of fire damper framed into the ceiling, which is not a permitted application in other non-loadbearing horizontal assemblies. Design considerations with this method include access to both sides of the assembly for construction purposes (the lack of which often leads to the usage of a shaftwall system), careful adherence to the requirements of the UL *Listing*, HVAC duct requirements (wall penetrations vs ceiling penetrations), and supplemental structural support of all superimposed loads.



When the specific requirements for each of these approaches are understood and carefully implemented into the construction documents, it is likely to facilitate a more expeditious building plan review and can eliminate costly field modifications during construction. It is not the intent of the code to prohibit designers from proposing new or alternate approaches that are based on reliable test and evaluation data. In accordance with VCC 112.2 and 703.3, the designer may propose a variation to any of the code-prescribed approaches discussed above. For instance, applying superimposed loads to any of the non-load bearing methods, while prohibited according to the published assembly data, may be proven to be acceptable if the engineer of record can provide satisfactory evidence demonstrating that the assembly can span a certain distance, under a specified load, and in accordance with the fire exposure and acceptance criteria of ASTM E119 or UL 263. This involves not only the engineering mechanics associated with the structural members but an understanding of their ability to perform under extreme heat exposure for an extended period of time (i.e. one hour).

Regardless of the situation, the importance of discussing the proposed variation with a BCOM Fire Safety Reviewer as early as possible in the design process cannot be overstated. ❑

CPSM Forms Update

The following CPSM forms were recently revised and are available for download:

- **DGS-30-198 CR-2, Cost Review Questionnaire** (Revised 08-16)

Please download Form **DGS-30-000, Capital Outlay Forms Master List** for a complete listing of the latest version of each CPSM form. All current forms may be downloaded from the DGS Forms Center. If a prior version of a form is required, please contact capout@dgs.virginia.gov. ❑

Temporary Structure Permits for Tents, Stages and Amusement Devices

As the outdoor event season is upon us, BCOM would like to remind agencies of the forms and other documents required for events with temporary structures. Temporary Structure Permit applications require the same 14 calendar day minimum turnaround time for processing as other BCOM submittals. Please review the list below so as to be able to provide a complete submittal package to obtain a Temporary Structure Permit. Permit applications submitted with incomplete or missing information or requested at the last minute may require additional time and/or incur additional fees. General requirements include:

- A complete **site plan**, preferably to scale, including the dimensions of the temporary structure and distances to any nearby buildings or structures (including other temporary structures)
- A completed **CO-17TMP form**, submitted using BITS, for each structure being proposed. Include all required data such as occupant load, applicable codes and standards, structure gross area, names of the designers and erectors, method of anchorage, etc.
- A **layout plan** of the interior of the tent or top of stage which indicates means of egress, aisles, exits, furnishings and equipment
- **Certificate of Flame Resistance** for the specific tent being used with a Serial Number or Date of Manufacture

- **Supporting information for amusement devices** including the CO-17TMP Attachment One, Site Plan, Certificate of Liability Insurance and manufacturer information for the device

More detailed submittal requirements are listed in CPSM Section 4.19.3.3. Please direct any questions to BoForms@dgs.virginia.gov or call Heather West, BCOM's Permit Technician, at 804-786-3581. ❑

VCCO Certifications

Congratulations to the following individuals who recently passed the VCCO Certification Exam:

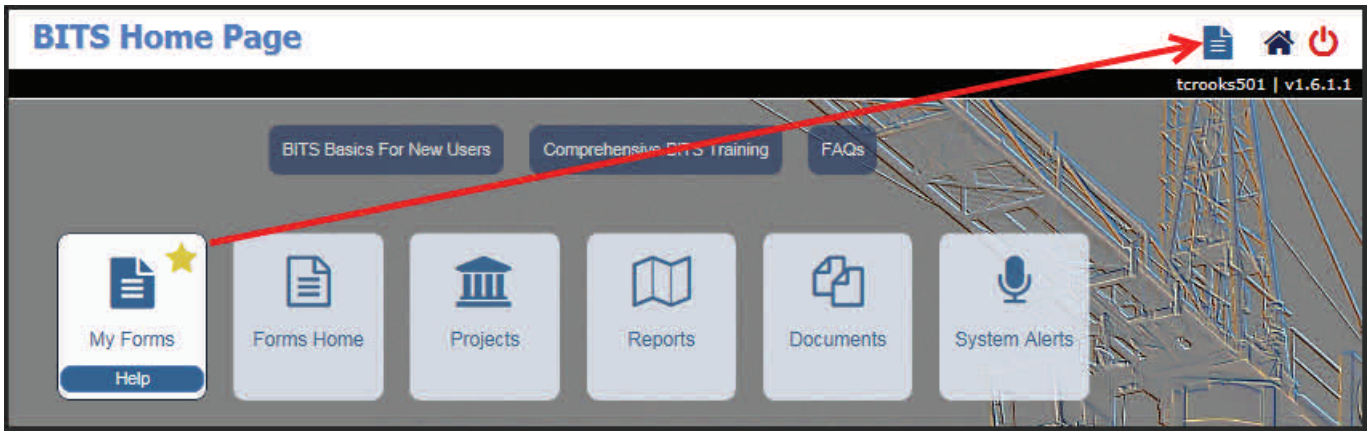
- **Carla Franson, College of William & Mary**
- **Shawn Gore, Department of Corrections**
- **Stephen Howard, James Madison University**
- **Joshua Morgan, Department of Military Affairs**
- **Joe Shields, George Mason University**

Virginia Construction Contracting Officers are state and local government employees who have completed the necessary training and successfully passed a multi-part examination focused on state procurement law, policy and procedures. VCCOs perform several key tasks in delivering projects including the procurement of professional services; the receipt, opening and review of bids; and in some cases the approval of CO-8 forms for recommending the award of construction contracts.

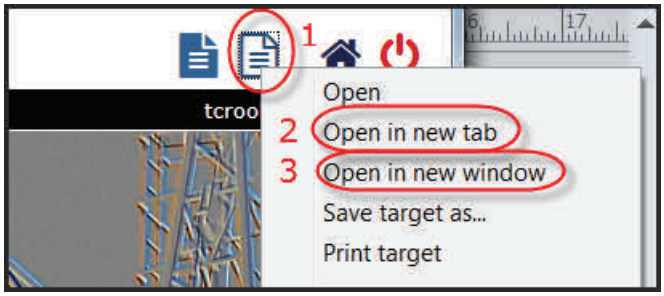
For more information on CPSM & VCCO seminars, visit the Seminars page on the Bureau of Capital Outlay Management's website. ❑

BITS "Favorites"

This is to advise BITS users of a newly added feature. On the BITS Home Page, users may now add "favorites" which are quick links to one or more of their favorite BITS pages. These links are added as icons in the top menu bar, adjacent to the Home and Logoff icons.



To add a "favorite", just click on the star-shaped icon. A gold-colored star indicates the menu item has already been added to the top menu bar. To remove an item from the top menu, just click the star again and it turns blue, indicating the item is no longer a "favorite". The user can add as many favorites as desired to the top menu bar.



1) Once the user's "favorite" icons have been added to the top menu bar, the user can click on them from any other BITS page to quickly access the specific BITS webpages the icons represent.

2) The BITS user can also "right-click" on the icon and then select "Open in new tab". The advantage of this is to allow the user to keep the browser tabs open for both the page they are leaving and the new page they are accessing.

3) Similar to the above, the BITS user can also "right-click" on the icon and then select "Open in new window". This keeps the browser tab open for the page they are leaving, but rather than opening a new tab, a complete new browser instance is opened.

CAUTION: Although Options 2 and 3 above are useful for keeping multiple BITS pages open, once the user signs out of BITS in any one tab or window, it kills their BITS session for all tabs/windows. The other tabs or windows may still be open for viewing, but no data updates can be done. Be cautious and save data frequently when using either of the latter two navigation options. ❑