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

BCOM NEWSLETTER

Issue # 39
March 2018

In this issue:

Applying Professional Seals on State-Owned Building Designs

Occasionally there is confusion about the application of professional seals of licensed architects and professional engineers on the work product prepared for Commonwealth of Virginia design and construction documents. Here is what you need to keep in mind.

Commonwealth of Virginia Policy regarding Responsible Design Professionals:

It is the policy of the Commonwealth of Virginia to contract with a single entity to provide the full range of professional architectural and/or engineering services identified for the project.

The single entity is an Architectural and/or Engineering (A/E) firm that is properly registered and licensed in Virginia. The Board for Architects, Professional Engineers, Land Surveyors, Certified Interior Designers and Landscape Architects (APELSCIDLA) administers the registration and licensing for the Virginia Department of Professional and Occupational Regulation (DPOR).

The contract for professional services is between the A/E firm and the Owner – the Commonwealth of Virginia agency. The A/E firm may have capabilities to provide all professional services in-house, or the A/E may subcontract with consultants for those disciplines not provided in-house.

The person having overall professional responsibility for the project management and coordination of all design disciplines may be either a Virginia-licensed Architect or Professional Engineer. This person is the *Registered Design Professional in Responsible Charge*.

Seals of Professional Design Professionals and Consultants:

When an A/E subcontracts portions of the project design to consultants, such as mechanical engineers, civil engineers, electrical engineers, structural engineers, or other architects, the *Registered Design Professional* for each design discipline shall be licensed in the Commonwealth of Virginia. He or she shall affix his or her professional seal to those documents completed under his or her direct control and personal supervision.

The seal of the *Registered Design Professional in Responsible Charge* who has overall responsibility for the project shall be on the title sheet of the aggregate collection of documents and on the table of contents or title page of the project manual.

The person with overall responsibility may also require the seal and signature of the principal of its consultants to be affixed to the title sheet of the drawings and the title page or table of contents of the project manual.

Document Reviews:

Schematic and Preliminary Phase documents submitted to BCOM for review are not required to display professional seals.

Working Drawings are required to display the professional seals of the individual architects and/or engineers as described above. As part of their review, BCOM will verify the license names and numbers on the professional seals through the "License Lookup" page on the Virginia Department of Professional and Occupational Regulation (DPOR) website. The seals on Working Drawings are not signed and dated.

Professional seals, signed and dated, are required on all construction documents advertised for bid and submitted to BCOM in support of application for a building permit. These documents are the "Final Documents" (drawings and project manual for bid sets and permit sets) and shall be signed and dated to match the uniform date of the documents.

In addition to providing the seal of the *Registered Design Professional in Responsible Charge* on both the title sheet and the project manual, the seal of each design discipline *Registered Design Professional* – in-house or consultant – shall be included on all drawings and specifications for which that professional is responsible.

Seals:

Below are two examples of formats for professional seals, as found on the DPOR website in the *APELSCIDLA Board Regulations*.

Refer to DPOR's website link, http://www.dpor.virginia.gov/Boards/APELS/ , for additional information. (Specifically, refer to the tab entitled "Laws and Regulations.")

In addition to the permit sets, the *Registered Design Professional's* seal, signed and dated, shall be included on all Addenda. This is because Addenda modify the bid documents - "Final documents" as defined by DPOR.

Construction Contract Administration Activities:

During construction contract administration, the *Registered Design Professional's* seal is also required on a formal written statement provided by the professional after review of the fire suppression, fire alarm, and security access-control shop drawings.

Attach this statement to the reviewed shop drawings. Include confirmation that the shop drawings (including working plans, product data and calculations) satisfy the requirements of the project contract documents and the applicable codes and referenced standards. If the sealed statement is not attached to the shop drawings when submitted to BCOM for review, the shop drawings may be rejected as incomplete.

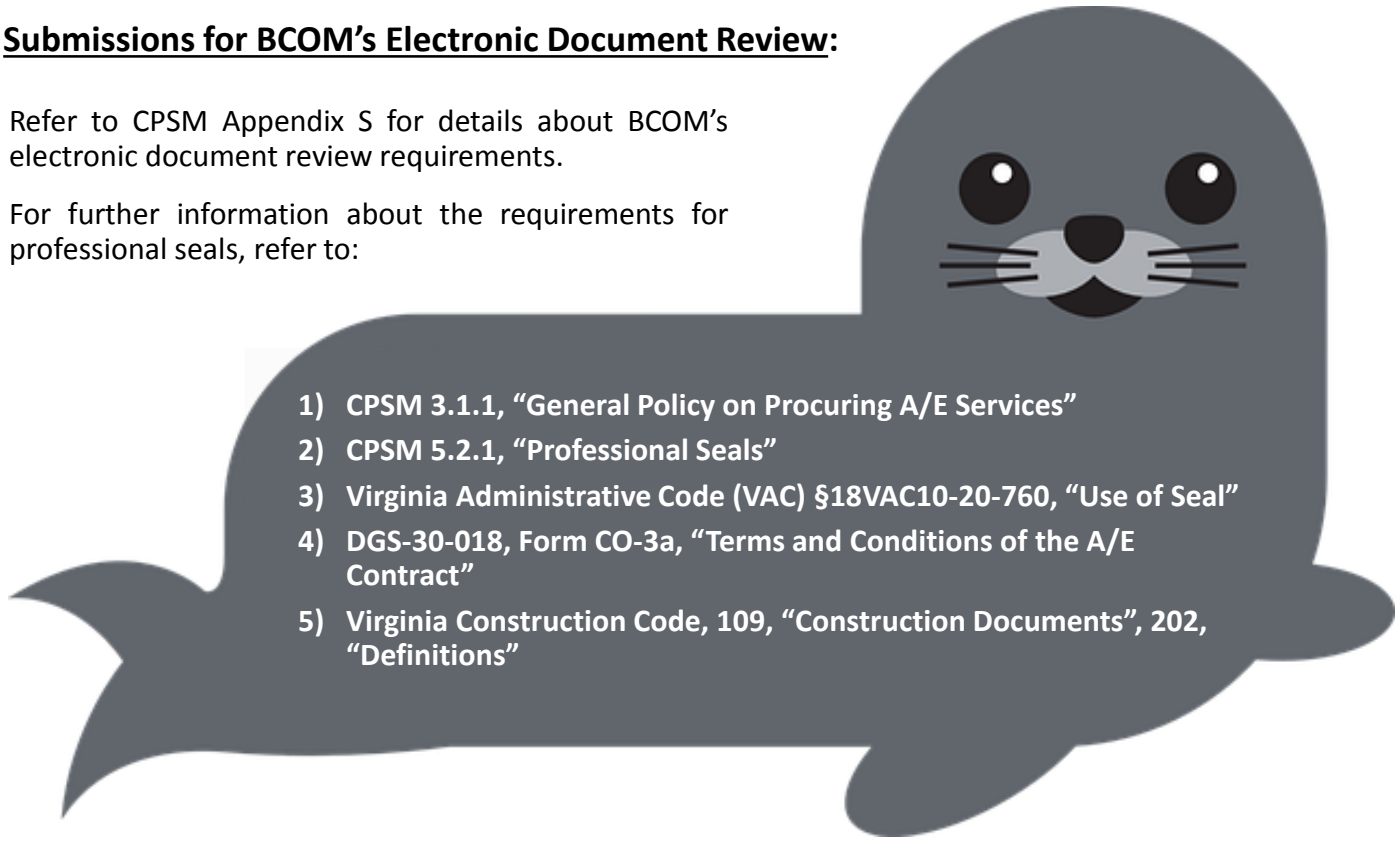
Electronic Seals and Signatures:

When working drawing documents are submitted to BCOM in hard copy or electronically, an electronic seal, signature and date may be used in place of an original seal, signature and date. The electronic seal must have a unique identification of the professional, be verifiable, and its use must be under the *Registered Design Professional's* direct control. The seal shall be 2 inches in diameter with the printed name above the license number. The electronic signature, which may contain digital signature verification, is acceptable if all relevant information is legible.

Submissions for BCOM's Electronic Document Review:

Refer to CPSM Appendix S for details about BCOM's electronic document review requirements.

For further information about the requirements for professional seals, refer to:



1) **CPSM 3.1.1, "General Policy on Procuring A/E Services"**
2) **CPSM 5.2.1, "Professional Seals"**
3) **Virginia Administrative Code (VAC) §18VAC10-20-760, "Use of Seal"**
4) **DGS-30-018, Form CO-3a, "Terms and Conditions of the A/E Contract"**
5) **Virginia Construction Code, 109, "Construction Documents", 202, "Definitions"**

Mechanical Equipment Mounting Requirements on Low Sloped Roofs

This article examines the 2012 Virginia Uniform Statewide Building Code (VUSBC) and 2017 Construction and Professional Services Manual (CPSM) requirements for accessing, mounting, and supporting mechanical, plumbing, and fuel gas fired rooftop equipment and associated piping on low slope roofs. Generally requirements for the installation of rooftop equipment are well documented, but can become burdensome to correct in the field. The building code sections that are applicable to rooftop mounted equipment are scattered throughout the VUSBC in the Virginia Construction Code, Virginia Mechanical Code, Virginia Plumbing Code, and Virginia Fuel Gas Code. In addition, SMACNA (Sheet Metal and Air Conditioning Contractors' National Association) HVAC Duct Construction Standards is an industry standard referenced by the Virginia Mechanical Code. SMACNA Chapter 6 Exterior Components is a building block of this article. Moreover, for capital outlay projects, the BCOM requirements for roofing are found in CPSM APPENDIX A - DEB ROOFING POLICY & TECHNICAL STANDARDS FOR STATE-OWNED BUILDINGS with the focus for this article being the National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual.

Means of Access:

A permanent means of access to the roof is required where an HVAC appliance or equipment requiring service is located more than 16 feet above grade. Specific ladder requirements are outlined in VMC 306.5 where a roof hatch or exterior ladder is selected as the means of access. There are several other approved means of access in the VCC. Access to equipment on roofs shall not require climbing over obstructions greater than 30 inches high on low slope roofs. Where the roof access or any HVAC appliance is located closer than 10 feet to the roof's edge a 42-inch high guard is required. The guard shall be designed to withstand the physical design loads of VCC 1607.8.1 Handrails and guards. In addition, the length of the guard along the roof's edge shall extend not less than 30-inches beyond each end of the appliance. The guard construction shall not permit a 21-inch sphere to pass through, which includes 42-inch minimum height parapets and screen walls. Plumbing roof drainage systems for primary and secondary roof drainage systems are not the focus of this article, however, it is worth noting that scuppers and roof drains do not require a permanent means of access.

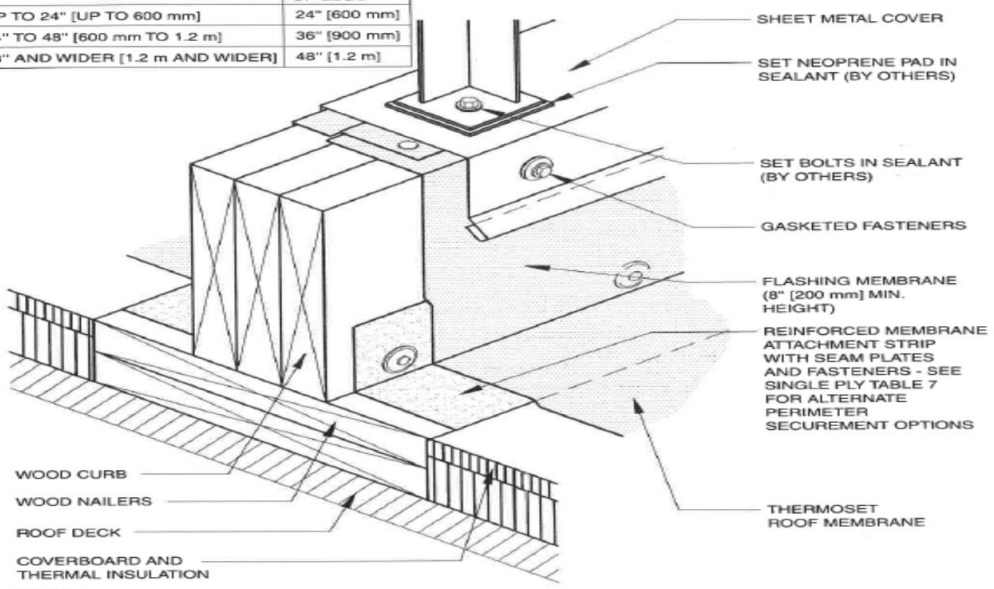
Curbs and Stands:

Rooftop HVAC units and exhaust fans with vertical duct connections directly underneath are straightforward and mounted on the typical box curb without fanfare. Condensing units for split systems and other non-ducted rooftop equipment are more difficult to accommodate. The NRCA Manual has example details for specific types of low slope roofs. The NRCA guidelines are a requirement of the CPSM. These spit system units and other remote air-cooled equipment shall be mounted on rooftop equipment curbs (NRCA Figure TS-9) or stands (NRCA Figure TS-10). The HVAC rooftop equipment is structurally attached to these curbs or stands to resist wind loads and movement from vibration. The selection and design of the equipment curb or stands are fundamental and must be included in the set of required roof details.

Curbs:

The NRCA Roofing and Waterproofing Manual—Fifth Edition

WIDTH OF EQUIPMENT	HEIGHT OF LEGS
UP TO 24" [UP TO 600 mm]	24" [600 mm]
24" TO 48" [600 mm TO 1.2 m]	36" [900 mm]
48" AND WIDER [1.2 m AND WIDER]	48" [1.2 m]



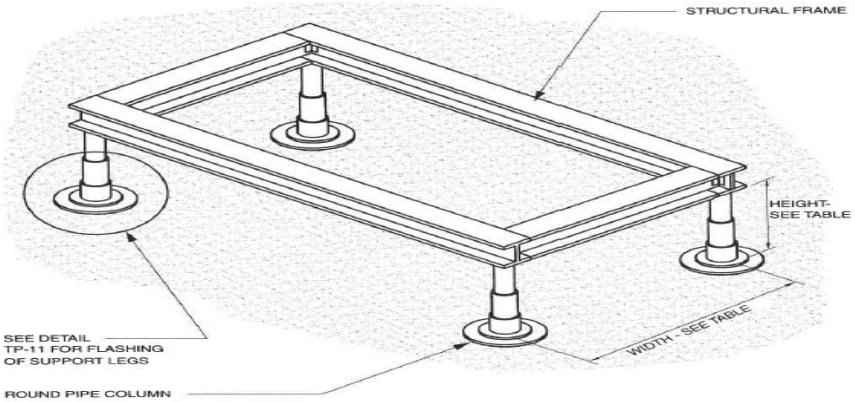
NOTES :
1. THIS DETAIL ALLOWS FOR MEMBRANE MAINTENANCE AROUND THE SUPPORTED EQUIPMENT. THE CONTINUOUS SUPPORT IS PREFERRED IN LIGHTWEIGHT STRUCTURAL SYSTEMS BECAUSE THE EQUIPMENT WEIGHT CAN BE SPREAD ACROSS TWO OR MORE SUPPORTING MEMBERS. WHERE HEAVY STRUCTURAL SYSTEMS ARE USED OR WHERE THE LOAD CAN BE CONCENTRATED OVER A COLUMN, DETAIL TP-10 MAY BE PREFERRED. A MINIMUM OF 2 FEET [600 mm] OF HORIZONTAL CLEARANCE MUST BE PROVIDED FOR REMOVAL AND REPLACEMENT OF ROOFING AND FLASHING BETWEEN PARALLEL SUPPORTS. REFER TO THE TABLE ABOVE FOR RECOMMENDATIONS ON VERTICAL CLEARANCE FROM ROOF SURFACE TO BOTTOM OF SUPPORTED EQUIPMENT.
2. REFER TO THE SHEET METAL SECTION OF THE METAL ROOFING MANUAL FOR JOINERY AND SECUREMENT OPTIONS FOR SHEET METAL.
3. REFER TO THE INTRODUCTION FOR ADDITIONAL INFORMATION.

NATIONAL ROOFING CONTRACTORS ASSOCIATION — **EQUIPMENT SUPPORT CURB** — TS-9
2001 — NOT DRAWN TO SCALE

1206

Stands:

The NRCA Roofing and Waterproofing Manual—Fifth Edition



WIDTH OF EQUIPMENT	HEIGHT OF LEGS
UP TO 24" [UP TO 600 mm]	24" [600 mm]
24" TO 48" [600 mm TO 1.2 m]	36" [900 mm]
48" AND WIDER [1.2 m AND WIDER]	48" [1.2 m]

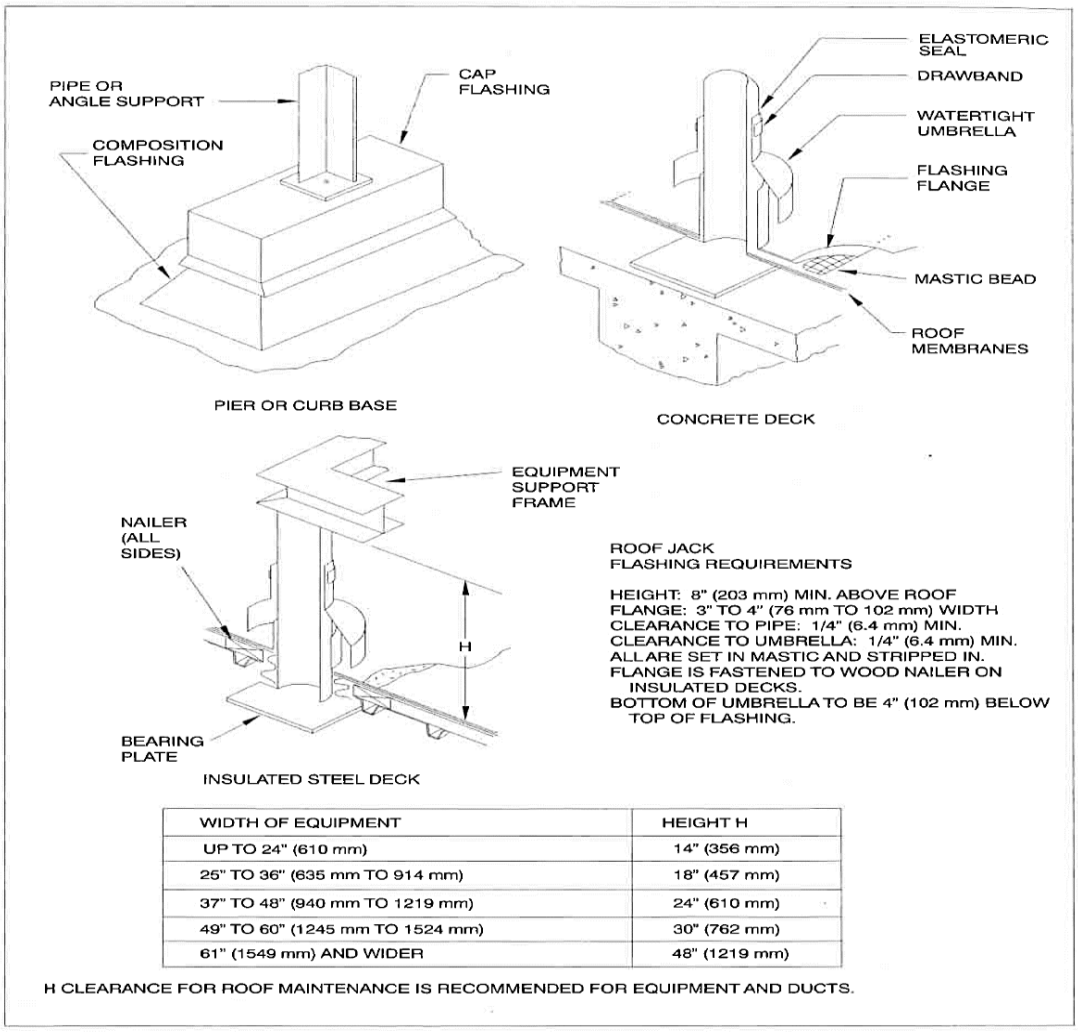
NOTES :
1. THIS DETAIL MAY BE PREFERABLE TO DETAIL TP-9 WHEN THE CONCENTRATED LOADS CAN BE LOCATED DIRECTLY OVER COLUMNS OR HEAVY GIRDERS IN THE STRUCTURE OF THE BUILDING. THIS DETAIL CAN BE ADAPTED FOR OTHER USES, SUCH AS SIGN SUPPORTS.
2. REFER TO THE INTRODUCTION FOR ADDITIONAL INFORMATION.

NATIONAL ROOFING CONTRACTORS ASSOCIATION — **EQUIPMENT SUPPORT STAND** — TS-10
2001 — NOT DRAWN TO SCALE

1208

Supports for Exterior Ductwork:

Ducted rooftop HVAC units and fans with exterior horizontal ductwork presents a more difficult design strategy. Beginning with the basics, exterior ductwork is required by VMC 603.10 to be supported in accord with SMACNA. Furthermore, capital projects require compliance with the DEB ROOFING POLICY, and the NRCA Manual compliance. Together, SMACNA Figure 6-4 and NRCA Figure TS-9 form a solid approach to compliant exterior roof mounted duct support systems. A Table of Values for the code minimum height requirements above the roof of the roof-mounted ductwork and non-ducted HVAC equipment on stands is presented in the SMACNA Figure 6-4.



WIDTH OF EQUIPMENT	HEIGHT H
UP TO 24" (610 mm)	14" (356 mm)
25" TO 36" (635 mm TO 914 mm)	18" (457 mm)
37" TO 48" (940 mm TO 1219 mm)	24" (610 mm)
49" TO 60" (1245 mm TO 1524 mm)	30" (762 mm)
61" (1549 mm) AND WIDER	48" (1219 mm)

H CLEARANCE FOR ROOF MAINTENANCE IS RECOMMENDED FOR EQUIPMENT AND DUCTS.

FIGURE 6–4 EQUIPMENT AND DUCT SUPPORT FLASHING

SMACNA HVAC Duct Construction Standards Metal and Flexible • Third Edition 6.7

A similar and more stringent Table of Values is presented in the NRCA Figure TS-9. Here again, the structural attachment of the ductwork to the roof equipment curb based on the wind load requirements of VCC 1609.1 shall be a consideration. Planning of equipment supports for roof-mounted ductwork is essential to avoid the pitfalls of inferior and non-compliant rooftop ductwork supporting systems.

Piping Supports and Anchorage:

Mechanical hydronic, condensate drain, and refrigeration piping on roofs is often poorly supported. VMC 305.3 states clearly that pipe hangers and supports shall be attached to the building construction. Many times, piping is both shown on the drawings and installed at the site on either treated wood sleepers or manufactured roof blocks of recycled rubber or polyurethane prepolymers. It is known some roofing membrane manufacturers will not permit these types of rooftop products to be adhered to their membranes. Wood sleepers and prefabricated blocks by themselves are not code complaint. A more robust requirement attachment to the building structure is fuel gas pipe codified under VFGC 407.2. This VFGC section requires the gas piping to be anchored to prevent undue strains on connected appliances. A clear direction to contractors for the proper support and anchor attachment to building construction is an essential element of mechanical design.

Other Details:

Other interesting details are the vent through roof, roof scuppers, and electrical outlets. The vent through roof flashing detail is a common detail. The height of the vent where shown on the detail shall be a minimum of 12-inches above the roof. VPC 1108.3 requires scuppers have a clear dimension of 4-inches in both width and height. The roofing details shall show this opening as a minimum dimension free and clear of the roofing membrane and sealants. All too easy to neglect is the required electrical convenience receptacle located at or near the mechanical equipment typically within 25 feet of the appliance and not located closer than 10 feet to the roof's edge without a guard.

Whether it is access, guards, HVAC equipment, duct and pipe supports, or miscellaneous roofing elements, the roofing layout and accompanying details become significant in the overall building design. Many other roofing items such as thermal insulation, air barriers, the influence of roof color, roof requirements in VEES, green roofs, primary and secondary roof drains, and storm water collection are worthy topics for future articles; however, if advice or direction is needed, consult with your agency's assigned BCOM review team.

CPSM Forms Update

The following revised forms are available from the DGS Forms Center:

CPSM Forms Master List (DGS-30-000)

CR-1, Project Planner (DGS-30-199) and completed example

VCCDB Update

An updated summary from the Virginia Construction Cost Database (VCCDB) is now also available on the BCOM website:

Virginia Construction Cost Database