Virginia Tech Design and Construction Standards Manual

UNDERSTANDING AND USING THE STANDARDS

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Design and Construction Standards Manual (DCSM)

Focus on a few topics:

- DCSM history
- Design and Construction Standards Official
- Contributors to the DCSM 2020
- University Design Principles and Master Plans (section 1.2)
  - Accessibility
  - Sustainability
- Design Waiver Process (section 1.3.5)
- DCSM web pages
- Future versions of the DCSM

DCSM History

Virginia Tech was granted the highest level of autonomy from the Commonwealth of Virginia through the Restructured Higher Education Financial and Administrative Operations Act of 2005 and the Management Agreement between the Commonwealth of Virginia and Virginia Tech.

Consequent to this, Virginia Tech was allowed to prepare construction procurement rules and construction design standards that better suited the needs of Virginia Tech, but still maintained the legal restrictions set in place by the Commonwealth.

Design and Construction Standards Official

To revive and establish the fundamental importance of having a DCSM at Virginia Tech, the Design and Construction Standards Official (DCSO) position was created.

The DCSO is the "Keeper of the Standards" and must:

- Develop and maintain an up-to-date and working DCSM
- Maintain communications and updates from Facilities teams on changes to the DCSM
- Work with Virginia Tech Project Managers (VT PM) and Architect/Engineer (A/E) teams on project specific standards
- Evaluate and either approve or reject requests to alter the DCSM in construction projects

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Teams Contributing to the DCSM

Standards, Details, Forms, and comments were contributed by all the teams in Facilities. Input from each team was critical in forming the document.

- University Building Official (UBO)
- Site and Infrastructure Development (SID)
- Engineering & Assessment
- Mechanical Utilities
- Facilities Contracts
- Capital Construction
- Renovations
- VT Office of University Planning (OUP)
- VT Electrical Service (VTES)
- Building Automation Systems
- Buildings and Grounds
- Sustainability
- The Key Shop

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Teams Contributing to the DCSM

Teams outside of the Facilities Department also contributed their standards for new construction and renovation projects.

- Environmental Health and Safety (EHS)
- Student Affairs
- VT Police Department (VT PD)
- Office of Emergency Management (OEM)
- Parking and Transportation
- The Office of Equity and Accessibility
- Division of IT and Data Administration
- Network Infrastructure & Services (NI&S)
- Hokie Passport Services

DCSM 2020

- Uses Chapters to organize the material
- Order of document mimics the steps in the construction process
- Blends contributions from teams across the University and the requirements set in the Virginia Construction and Professional Services Manual (CPSM)
- Ties in the Standards with the Campus Master Plans, the University Policies, and various Details and Forms provided by Facilities teams
- Avoids repeating requirements already found in Code

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DCSM 2020

- The DCSM is available as a searchable PDF document
- The Table of Contents lists the first two levels, but the bookmarks for the PDF version are active down to level six in the outline of the document
- Several separately designed documents are incorporated in the list of Appendices

Accessible Design

- Applies to all new construction and renovation projects.
- DCSM section 1.2.3 includes Virginia Tech requirements that go beyond the ADA Standards.
- Accessibility must be included in initial design plans and cannot be removed or decreased as part of Value Engineering.
- A/Es are encouraged to provide additional accessible design elements.

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Sustainability

DCSM section 1.2.5 addresses sustainability requirements and affirms the desire to maximize sustainability within the affordable limits of the project.

- Virginia Tech Climate Action Commitment (VT CAC) is contained in Presidential Policy Memorandum No. 262

  "Sustainability is the simultaneous pursuit of environmental quality, economic prosperity, and social justice and equity, through action, education, and engagement to address current needs without compromising the capacity and needs of future generations."
- Campus Energy, Water, and Waste Reduction Policy, VT Policy No. 5505
- LEED certification for new construction and major renovations
- A/Es encouraged to consider ParkSmart certification when parking garages are part of the project

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Sustainability

Approved in 2009 and updated in 2013, the VT CAC contains 14 points and set several goals.

- Reduction targets for greenhouse gas emissions
- Monitor and improve electricity and other energy use efficiency (campus heating and cooling, lighting, and transportation)
- Use the campus as a "sustainability laboratory" for student internship and undergraduate research programs
- LEED Silver certification or better for construction projects
- Minimize waste; achieve 50% recycle rate by 2020
- Exceed ASHRAE 90.1 energy performance by 10% for all new buildings and major renovations

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Sustainability

The Campus Energy, Water, and Waste Reduction Policy, VT Policy No. 5505, was approved in 2006 and last revised in 2016.

- Policy fully involves the CPIF Division and the VPCPIF must coordinate efforts with other university departments and outside regulatory agencies to develop and implement procedures.
- Construction of a new building that is greater than 5,000 GSF or the renovation of such a building with a cost that exceeds 50% of the value of the building shall follow the Commonwealth of Virginia (COV) energy conservation requirements (updated in DEB Notice 121510).
- COV requirements in DEB Notice 121510 listed three conservation options and VT is committed to LEED.

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Sustainability

The Campus Energy, Water, and Waste Reduction Policy, VT Policy No. 5505 (continued)

- Design systems based on space use and occupancy to reduce energy costs; educate occupants to participate in energy savings
- Design systems to meet or exceed standards for Federal Energy Policy Act and EPA WaterSense requirements
- Minimize water use and waste by installing low-flow fixtures and landscaping that doesn't require frequent watering
- Recycle construction debris and materials when possible

LEED

- DCSM section 1.2.5.1 addresses the LEED building rating system.

  A/Es shall strive to meet or exceed the minimum number of points needed for LEED certification under the rating system appropriate for the project in accordance with the VT CAC.

- Emphasized from the beginning…

  A/Es are required to state their compliance with the VT CAC and the applicable version of the LEED checklist on the title sheets for the Schematic Drawings (2.5.2).

- …to the end of the construction project.

  Systems based on the LEED goals of the project are commissioned by the university (1.8.3).

LEED

- VT CAC commitment to LEED
  - Achieve LEED Silver certification or better for all eligible and applicable new buildings and major renovations
  - Evaluate the feasibility of LEED certification for existing buildings
- Campus Energy, Water, and Waste Reduction Policy commitment to LEED

  All new buildings greater than 5,000 GSF or the renovation of such a building with a cost that exceeds 50% of the value of the building shall conform to the USGBC LEED Silver standards, consistent with the VT CAC
- VT LEED Program Summary
  - Compilation of construction projects and LEED certification levels attained or in progress
  - Summary is maintained by Capital Construction

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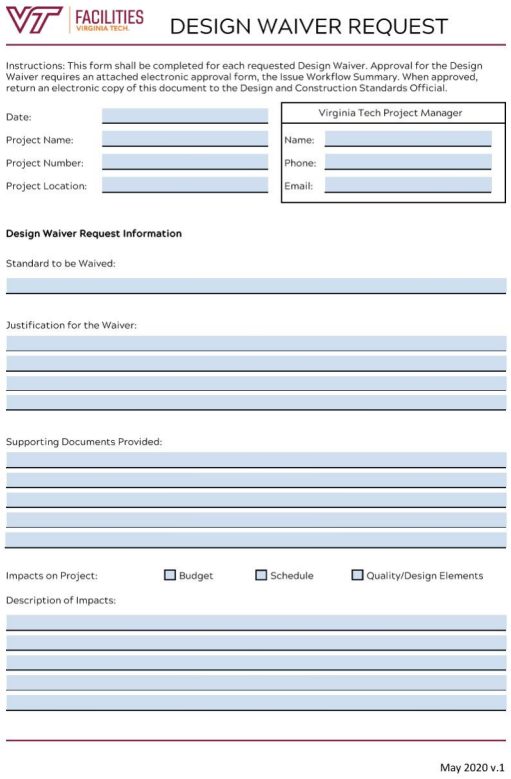
Design Standard Waiver

- The Design Waiver Request form should be used when a standard cannot be realistically met or needs to be changed for a construction project
- Before a form is submitted, the VT PM and the A/E (if applicable) should discuss the problem and potential solutions with the Director of Facilities Engineering and Assessment and other applicable departments that would have input on the standard being waived
- Impacts to the project, both for and against the design waiver, should be considered (for example, loss of some LEED value as compared to delays in construction timeline)

Design Standard Waiver



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DESIGN WAIVER REQUEST

Instructions: This form shall be completed for each requested Design Waiver. Approval for the Design Waiver requires an attached electronic approval form, the Issue Workflow Summary. When approved, return an electronic copy of this document to the Design and Construction Standards Official.

Date:
Project Name:
Project Number:
Project Location:

Virginia Tech Project Manager
Name:
Phone:
Email:

Design Waiver Request Information

Standard to be Waived:

Justification for the Waiver:

Supporting Documents Provided:

Impacts on Project: ☐ Budget ☐ Schedule ☐ Quality/Design Elements

Description of Impacts:

May 2020 v.1

The justification and any documents supporting the change from the original design must be provided. These can include emails from applicable departments supporting the waiver request.

The VT PM or the A/E should also indicate how this change impacts the project.

Be sure to download the most recent version from the website for each use.

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Design Standard Waivers

1.3.5 Design Standard Waiver Request Requirements

The DCSM shall be used on all University projects. Any design standard waiver requests shall come from the VT PM. The VT PM should have preliminary discussions with the Director of Facilities Engineering and Assessment before submitting the design waiver. The design waiver request shall be submitted through the Assistant Vice President for Capital Construction for capital projects or the Assistant Vice President for Facilities Operations for renovation projects, through the Director of Facilities Engineering and Assessment, through the Design and Construction Standards Official, to the Associate Vice President and Chief Facilities Officer (AVP & CFO) for final approval.

The waiver request shall contain the standard for which the applicant is requesting a waiver, the justification for the waiver, and any supporting documentation as attachments. In addition to the signed copy, all design waivers shall be submitted electronically to the Design and Construction Standards Official. See the VT Design Standard Forms Library for the VT Design Standard Waiver Request form.

Approved waiver requests shall be included with 100% drawings for permit requests prior to plan reviews to avoid comments being made on items for which a waiver has been approved. Note that building permits will not be issued for projects with unresolved waiver requests.

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Design Standard Waivers

- Design standard waiver requests come from the VT PM

  The A/E should provide the initial request for the waiver to the VT PM during the design phase

- The VT PM should discuss the issues about the waiver with the Director of Facilities Engineering and Assessment

  VT PMs and A/Es are to consult with and obtain approvals from applicable departments prior to submitting the waiver request. This will aid in receiving final approval in a timely manner

Design Standard Waivers

- Capital projects: submit the waiver to the AVP for Capital Construction
- Renovation projects: submit to the waiver to the AVP for Facilities Operations
- Waivers are then routed to the Director for Facilities Engineering and Assessment, the DCSO, and to the AVP&CFO for final approval

All design waivers AND supporting documents are to be routed through HokieServ

Design Standard Waivers

The waiver request shall contain:

- the standard to be waived
- the justification for the waiver
- supporting documentation for the waiver

Also include a description of the project, impacts to the project, and written acknowledgement of design issue and approvals from applicable departments

The A/E should provide documentation to support the design waiver request to the VT PM. The VT PM should include this with the waiver request

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Design Standard Waivers

- Approved waiver requests shall be included with 100% drawings for permit requests prior to plan reviews

  Submit design waiver requests as soon as the A/E has identified the need for a design waiver, regardless of where that is in the design process

DCSM Website

Manual

Virginia Tech Design and Construction Standards Manual

Appendices

- Appendix A - Campus Design Principles
- Appendix B - Student Experience: VT's Next 20 Years
- Appendix C - University Space Management
- Appendix D - Site Furnishing Guide
- Appendix E - Interior Signage Standards Manual
- Appendix F - Campus Wayfinding Guidelines
- Appendix G - Hokie Stone Masonry Guide Specifications
- Appendix H - Transportation & Parking Review Checklist

Detail Library

Forms

University Plans and Policies

Virginia Tech Construction and Professional Services Manual

The updated DCSM website provides links to the DCSM and associated documents.

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Appendices

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- Appendix A - Campus Design Principles
- Appendix B - Student Experience: VT's Next 20 Years
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- Appendix H - Transportation & Parking Review Checklist

Links to the Appendices will pull up the document or a dedicated website for that document.

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Detail Library

- Door Access Details
- Handrail Detail
- **Landscaping**
  - Groundcover Planting Detail
  - Perennials and Bulbs Planting Detail
  - Shrub Planting Detail
  - Tree Planting Detail
  - Tree Staking Detail
  - Tree Protection Detail
  - Tree Protection - Boring Detail
- Sanitary Sewer Precast Drop Manhole
- **Transportation**
  - Crosswalk Light Standard
  - Asphalt Pavement Repair Detail
  - Transportation Decorative Metal Guardrail
  - Transportation Details
  - Wooden Guardrail
- **Virginia Tech Electrical Service**
  - VTES Construction Details
  - VTES Details

Details provided by Facilities teams are linked on the Detail Library web page.

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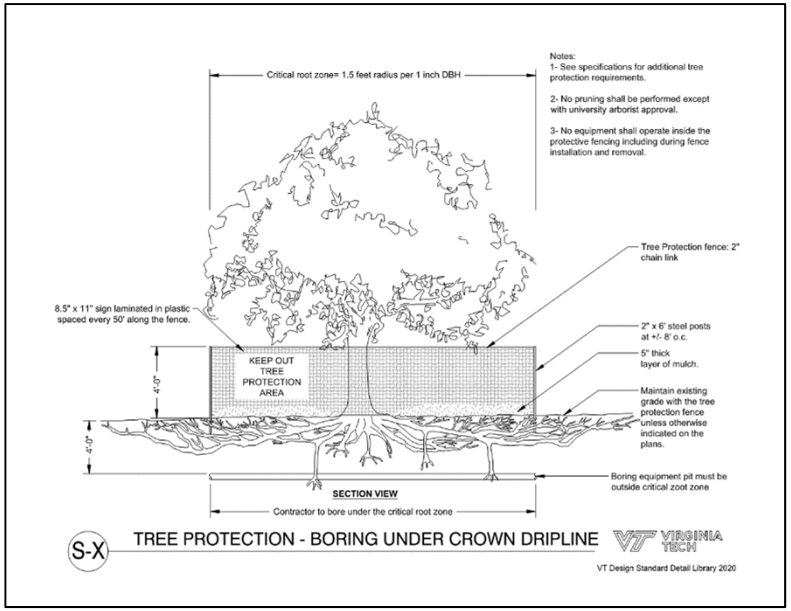
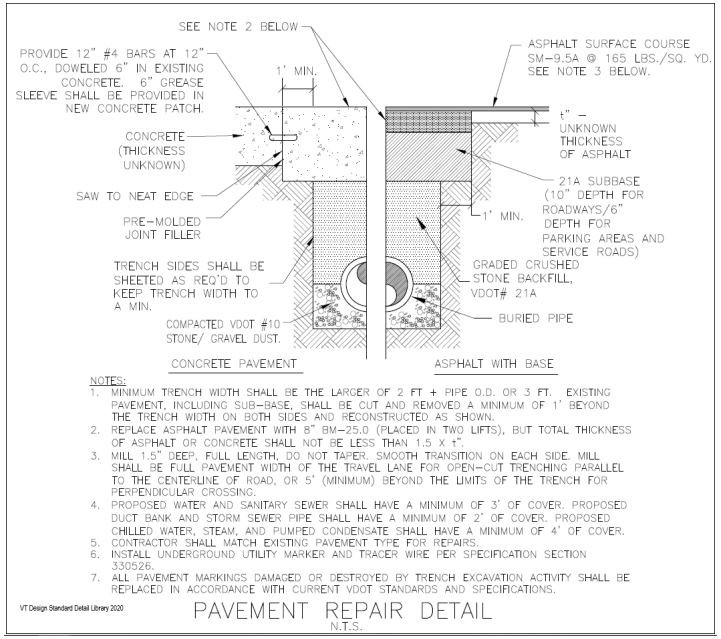
Detail Library





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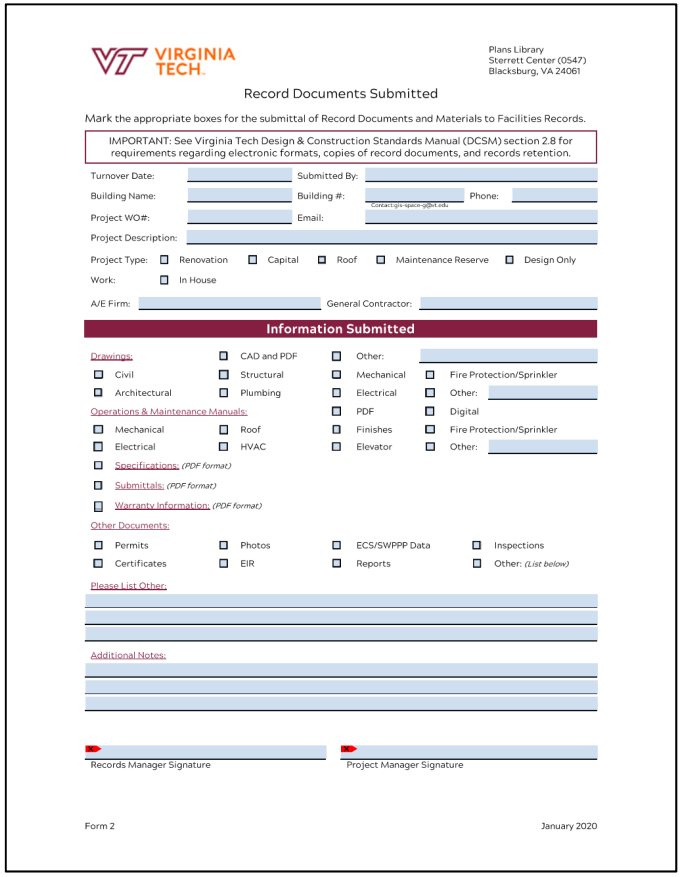
Forms

- **Design Waiver Request** - Required when there is a need to deviate from the current design plan.
- **CAD Quality Assurance Checklist** - Required with the submission of any CAD drawings.
- **CAD Record Documents Submitted** - Required to provide project information and list all records being submitted to Facilities Records.
- **Universal Design Checklist** - Required for each design drawing packet (schematic, preliminary, and working drawings).
- **Variable Frequency Drive Start-Up Checklist** - Required prior to start-up by factory certified technician.

Forms are linked on the Forms web page. They are designed as fillable PDF documents.



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Plans Library
Sterrett Center (0547)
Blacksburg, VA 24061

Record Documents Submitted

Mark the appropriate boxes for the submittal of Record Documents and Materials to Facilities Records.

IMPORTANT: See Virginia Tech Design & Construction Standards Manual (DCSM) section 2.8 for requirements regarding electronic formats, copies of record documents, and records retention.

Turnover Date: | Submitted By:
Building Name: | Building #: | Phone:
Project WO#: | Email:
Project Description:
Project Type: ☐ Renovation ☐ Capital ☐ Roof ☐ Maintenance Reserve ☐ Design Only
Work: ☐ In House
A/E Firm: | General Contractor:

Information Submitted

Drawings: ☐ CAD and PDF ☐ Other:
☐ Civil ☐ Structural ☐ Mechanical ☐ Fire Protection/Sprinkler
☐ Architectural ☐ Plumbing ☐ Electrical ☐ Other:
Operations & Maintenance Manuals: ☐ PDF ☐ Digital
☐ Mechanical ☐ Roof ☐ Finishes ☐ Fire Protection/Sprinkler
☐ Electrical ☐ HVAC ☐ Elevator ☐ Other:
☐ Specifications: *(PDF format)*
☐ Submittals: *(PDF format)*
☐ Warranty Information: *(PDF format)*
Other Documents:
☐ Permits ☐ Photos ☐ ECS/SWPPP Data ☐ Inspections
☐ Certificates ☐ EIR ☐ Reports ☐ Other: *(List below)*
Please List Other:
Additional Notes:

Records Manager Signature | Project Manager Signature

Form 2 | January 2020

Plans and Policies

Master Plans

- Beyond Boundaries Campus Master Plan
- Campus Design Principles
- Parking & Transportation Master Plan
- Bike Parking Master Plan
- Universal Design Principles Checklist
- Virginia Tech Student Experience: Virginia Tech's Next 20 Years

University Policies

- Presidential Policy Memorandum No. 262: The Virginia Tech Climate Action Commitment
- Policy No. 5505: Campus Energy, Water, and Waste Reduction Policy

Links to the Plans and Policies will pull up the document or a dedicated website for that document.

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Future Plans for the DCSM

- Release updated versions of the DCSM annually
- Consolidate repeating information in sections of the DCSM
- Remove items that are already covered by Code, unless there is a specific need to highlight the items
- Replace “basis of design” products and specifications with text that describes the standard needed
- Address questions raised during review that require in-depth discussions with Facilities teams
- Expand the Forms and Details Libraries. Remake the older details for clearer copies of the information

DCSM Team Worksite

- Development under way for a DCSM Team worksite
- DCSM Team worksite will host discussions on changes for the DCSM
  - Members of the Team will include department heads and additional representatives as selected by the department heads
  - Members will be able to post in channels for chapters, forms, checklists, etc.
  - Members will have easy access to discussion points on their own time schedule

Feedback

It is important to receive feedback on what works and what doesn't work in the DCSM.

Indications that a change is needed would include:

- Too many Design Waiver Requests for a particular Standard
- Lessons Learned
- Updates to Industry Standards
- Changes in University Plans and Policies that directly affect new construction and renovation projects

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