

Office of University Building Official (OUBO)

Building Safety Month Training Series

Session 3: Chapter 8 & Related Appendices – Part 1: Schematic Design

Stakeholders: GMU Facilities, Contractors, & Registered Design Professionals

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Agenda

HECO Chapter 8 & Related Appendices:

- Appendix W: HECO Manual Revision History
- Chapter 8: Project Design Standards and Requirements
- Appendix L: Art & Architectural Review Board (AARB)...
- Appendix D: Basis of Design Narratives
- Appendix E: Cost Estimates



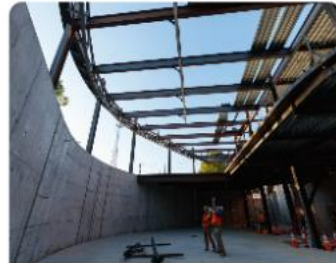
Office of University Building Official



Permits



Plan Review



Inspections



Resources

University Resources

- [OUBO e-Builder Processes](#)
- [GMU Design Standards Manual](#)
- [GMU HECO/DGS Forms](#)
- [GMU e-Builder](#)
- [GMU Facilities Planning, Design and Construction](#)
- [GMU Senior Vice President of Administration & Finance](#)
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- [GMU Board of Visitors](#)
- [GMU Campus Maps and Directions](#)
- [GMU Capital Strategy and Planning](#)
- [Tier III Management Agreement](#)

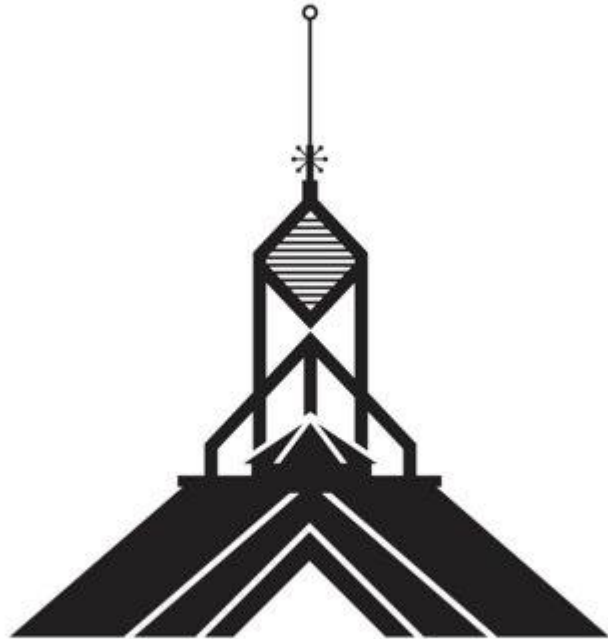


HECO/DGS Forms

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GEORGE MASON UNIVERSITY
Higher Education Capital Outlay Manual
2023



Vice President of Facilities

References: The Commonwealth of Virginia "Construction and Professional Services Manual" (CPSM) and the "Design & Construction Guidelines" are referenced extensively and should be readily available when using this Manual.

The most current version of these two documents are on the following websites:
<https://facilities.gmu.edu/> and www.dgs.virginia.gov

Page | 1

APPENDIX W HECO MANUAL REVISION HISTORY

2016 – Original Publication
2023-Version 2.0

**Revision Package – Dated February 02.03.2023
Summary of Revisions for HECO Manual Version 2.0**

*** Major Revisions are notated in Red below.**

Minor formatting, editing, grammar changes or updates to Personnel Titles or Agency names are not individually notated in this Revision Package.

Section 8.6 Schematic Design Project Criteria

8.6.1 General Requirements

8.6.1.1 Verification of Existing Conditions

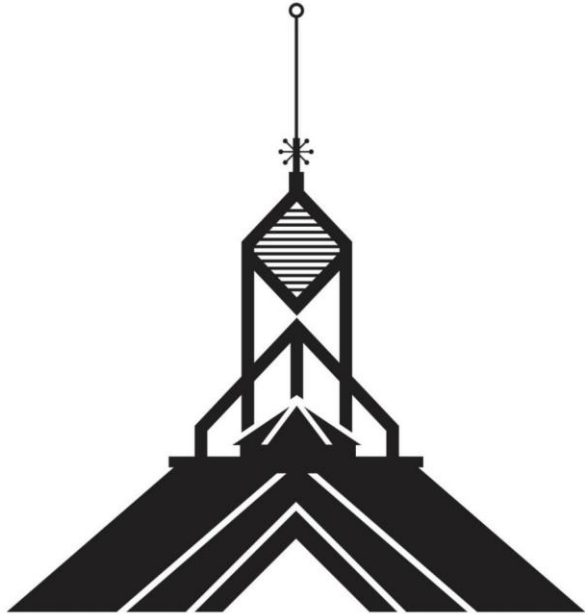
8.6.2 Basis of Design Narrative

8.6.3 Schematic Drawings

- **Content revised and edited to reflect new requirements for "Title Sheet & Code Compliance Plans (G), Architectural Drawings (A), and Life Safety Drawings (G).**



GEORGE MASON UNIVERSITY
Higher Education Capital Outlay Manual
2023



Vice President of Facilities

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Page | 1

Table of Contents

Chapter 1: Introduction

Chapter 2: Terms And Definitions

Chapter 3: General Terms and Conditions For Professional Services

Chapter 4: Procurement Procedures For Professional Services

Chapter 5: Basic Services and Responsibilities

Chapter 6: Fees and Payment For A/E Services

Chapter 7: Engineering and Technical Criteria

Chapter 8: Project Design Standards and Requirements



CHAPTER 8: PROJECT DESIGN STANDARDS AND REQUIREMENTS

Section 8.1 General

Section 8.2 Drawing Standards

Section 8.3 Specification Standards

Section 8.4 Cost Estimate Standards

Section 8.5 Design Initiation /Pre-design Conference

Section 8.6 Schematic Design Project Criteria

Section 8.7 Preliminary Design

Section 8.8 Working Drawing

Section 8.9 Bid Forms & Procedures

Section 8.10 Additive Bid Items

Section 8.11 Project Submission Requirements

Section 8.12 Authority Having Jurisdiction Reviews and Approvals

Section 8.13 Quality Control/Quality Assurance

Section 8.14 Value Engineering (VE)

Section 8.15 Structural and Special Inspections, & Structural Observations

Section 8.16 Structural Observations

Section 8.17 Commissioning of HVAC Systems

Section 8.18 Electrical Coordination Analyses (Shop Drawings) Review

Section 8.19 Fire Protection Shop Drawings

CHAPTER 8: PROJECT DESIGN STANDARDS AND REQUIREMENTS

Section 8.1 General

Section 8.2 Drawing Standards

Section 8.5 Design Initiation/Pre-design Conference

Section 8.6 Schematic Design Project Criteria

CHAPTER 8: PROJECT DESIGN STANDARDS AND REQUIREMENTS

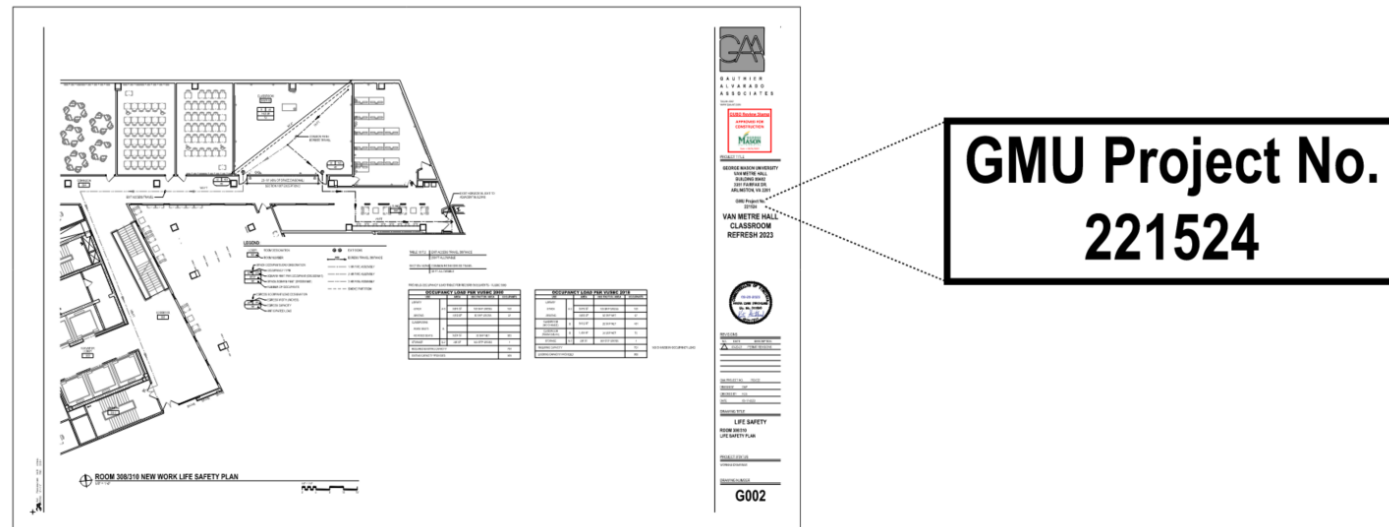
Note: Entire Section has been revised to reflect the policies/procedures of the George Mason University Office of University Building Official (OUBO) and most references to DEB have been replaced with OUBO where they are acting as the Building Official under Mason's University Management Agreement with the Commonwealth. Some Content from Chapter 7 has been moved to Chapter 8.



8.1.3 Project Identification on Documents:

The University and the A/E shall show the **Project Code** on all plans, specifications, contracts, correspondence, sketches, invoices, memoranda, addenda and other documents related to the project. Where the project has been subdivided, also show the two-digit subproject identification code number. Documents without the required identification are not complete. The University will assign a **project number** for each project.

Each page/sheet/sketch/drawing of any addenda shall show the **project code**, addendum, and page or sequence number to clearly indicate that the material is a part of the contract documents. The A/E shall require the Contractor to show the **PC#** and University Work Order on all submittals including invoices, schedules, shop drawings, change order proposals, correspondence and other project documentation.



8.1.4 Capital Project Initiation:

The University will be authorized to initiate the design of a Capital construction project upon completion of an approved CO-2/HECO-2 Form. Depending on the project documentation previously submitted and the action wording on the CO-2/HECO-2, one or more of the following design progress phases for review by the Building Official may be required:

1. Schematic Design/Project Criteria
2. Preliminary Design
3. Working Drawings/Contract Documents
4. Revised Working Drawings
5. Clouded Documents

Minimum requirements for data, drawings, specifications, and cost estimates to be included in the submittal for the indicated phases are described in this chapter and the referenced Appendices.

8.1.5 Non-Capital Projects:

This applies to all General funded, Non-general funded, and Maintenance Reserve projects. Construction or improvement projects undertaken on University property that are not classified as Capital Outlay projects are not required to follow the capital outlay procedures. **However, they are subject to review by the Building Official or designee for conformance to the USBC including its referenced standards, for the technical and procurement requirements of the Manual, and Mason Design Manual.** “Changes in Use Group Classification” of existing University owned buildings require the submittal of information for the review and approval, and issuance of a new Certificate of Use and Occupancy by OUBO. Non-Capital Projects shall follow the guidelines established by the OUBO.

❖ Note: Non-Capital projects may initiate with Working Drawings

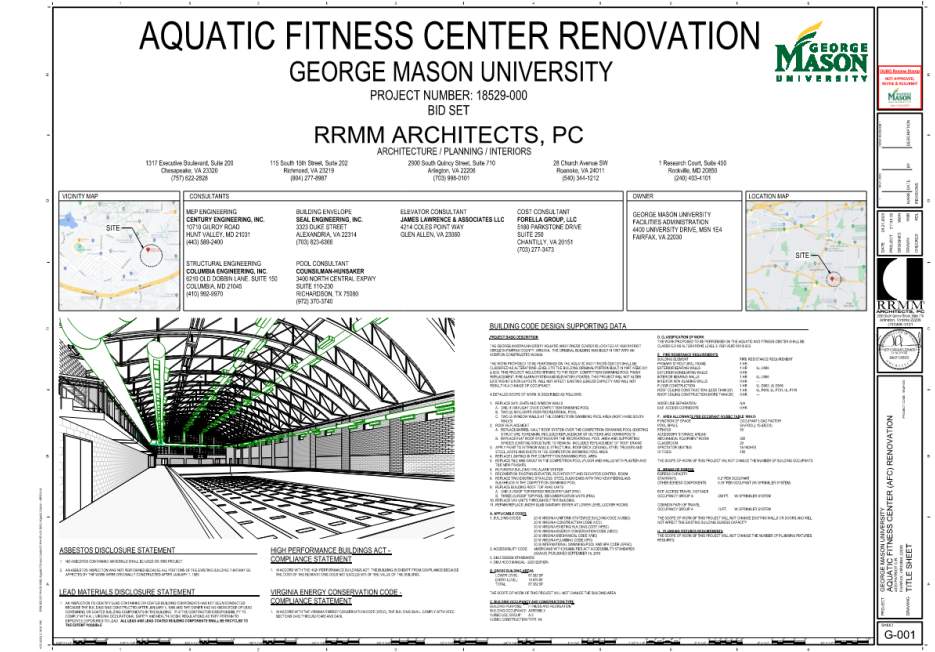


SECTION 8.2 DRAWING STANDARDS [Note: Standard for Schematic, Preliminary, & Working Drawings.]

The following clarifies the requirements, standards, and expectations applicable to drawings prepared for bidding and construction on state projects:

8.2.1 General Requirements: The **Title sheet(s)** shall clearly indicate the following:

1. Project Title and **project code**.
2. Activity or function(s) to be performed in the facility.
3. Version (date) of USBC on which the design is based.
4. Other major code used as a basis for design.
5. Use Group classification(s).
6. Maximum USBC occupancy for each level and total for building.
7. USBC classification of construction type.



8.2.1 General Requirements continued...

8. Area for each floor and entire building; volume of building.

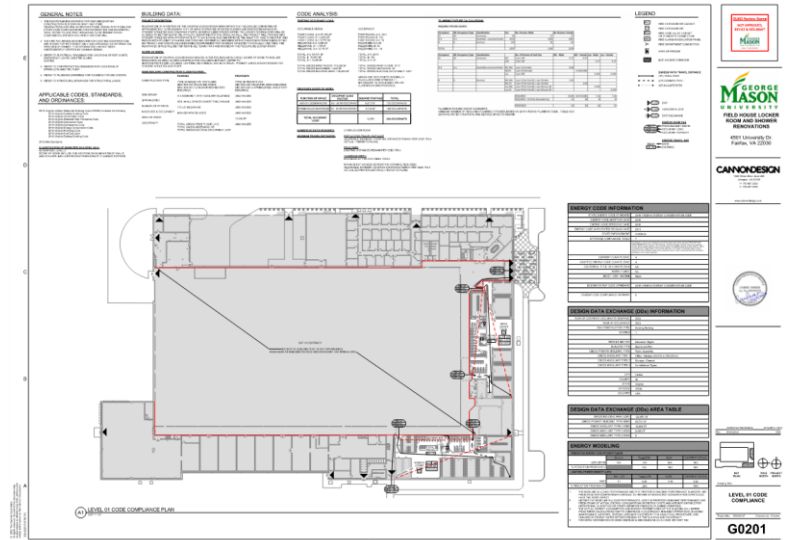
9. Location and Vicinity Maps.

10. Seals of the responsible Architect and Engineers, signed and dated.

11. Indicate the number of beds (dormitory or hospital), fixed seats (auditorium) or parking spaces (parking deck), and other information relating to capacity of the facility as applicable.

12. Provide a master listing of all applicable abbreviations and symbols used in the set of drawings or provide a listing of all common abbreviations and symbols at the beginning of the drawings and provide a listing of the discipline specific abbreviations and symbols at the beginning of each discipline.

13. Building floor plans and drawings for all disciplines shall be oriented the same to avoid confusion and to facilitate overlaying of drawings.



8.2.2 Drawing Requirements & Specifications: [Note: **BOLD** indicates drawings required for Schematic Design]

8.2.2.1 Arrangement of Drawings: Drawings shall be arranged in the following order with the discipline identifying character shown:

G - Title Sheet, Index, Code Compliance, and Life Safety Drawings [Previously T-Title Sheet and Index]

C - Plot and/or Site plans

C - Sanitary and Civil

B - Boring logs

L - Landscaping

D - Demolition

A - Architectural

S - Structural

FA – Fire Alarm [Previously FP-Fire Protection Information]

FX – Fire Suppression, Standpipes, and Accessories [Previously SP-Sprinkler Systems, Standpipes, and Accessories]

P - Plumbing

M - Mechanical (heating, cooling, ventilation, etc.)

E - Electrical

R - Asbestos Abatement

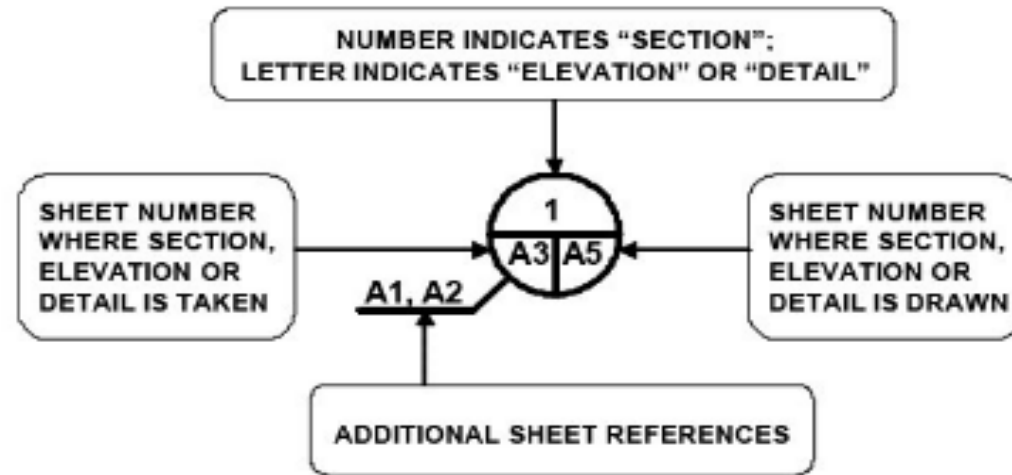
T–Telecom/AV

AC – Access Controls (Access Controls, Cameras, and Alarm Systems) [New]



8.2.2.6 Section and Detail Designation:

The standard section symbol ([*Added]Figure 8.2-2) will be shown both where the section or detail is cut and where the section or detail is drawn. When practicable, the AE should batch and hyperlink the detail and drawing callouts throughout the documents prior to submission to the OUBO.



STANDARD SECTION, ELEVATION OR DETAIL SYMBOL

NOTE: SYMBOL SHOULD ALWAYS APPEAR AS PART OF TITLE, PLACED UNDER THE VIEW

Figure 8.2-2

SECTION 8.6 SCHEMATIC DESIGN/PROJECT CRITERIA

8.6.1 General Requirements:

...A schematic “On Board” review meeting with the Building Official may be requested by the University, A/E, or University Project Manager to assist in verifying the design and program approach, the systems proposed for the project and/or to resolve issues raised by the review of the Schematic submittal.

A Schematic Design presentation to the State Art and Architectural Review Board and the University Architectural Review Committee is required. (See **Appendix L**) Reviews by the University Steering Committee are also required. Also, see the Mason Design & Construction Guidelines. All review issues must be resolved before the A/E is authorized to proceed with the preliminary design.

APPENDIX L ART AND ARCHITECTURAL REVIEW BOARD AND MASON BOARD OF VISITORS

1. ART & ARCHITECTURAL REVIEW BOARD (AARB)

PURPOSE OF THE AARB

The AARB consists of six members appointed by the Governor, plus a representative of the Department of Historic Resources, to advise him on the "artistic character" of buildings and works of art which are to be paid for by the state, or to be located on or over state property. In practice, the AARB recommends approval or disapproval to the Director of General Services, to whom the Governor has delegated this authority...

VIRGINIA ART AND ARCHITECTURAL REVIEW BOARD (AARB)



Art and Architectural Review Board
Agenda
November 4, 2022 at 10:00am
James Monroe Building, Rooms D and E
101 North 14th Street, Richmond, VA 23219

2.0 CONSENT AGENDA

2.2 George Mason University – Johnson Center Entrance Vestibule Addition

(Final Approval)

This project consists of adding a new ground level entrance vestibule on the north side of the Johnson Center with a pair of storefront doors to serve as a secondary entrance to the bookstore from the recently renovated Wilkins Plaza area. The entrance addition is a single story, 377 square feet, with white composite metal panels, white aluminum frame storefront, and granite stone base to match adjacent entrance finishes.

2.3 George Mason University – Rivanna Module Demolition

(Final Approval)

This project consists of the demolition of a prefabricated fiberglass modular structure originally constructed in 1996. The existing structure is in fair to poor condition so is designated for demolition/removal. The area will be regraded and restored with vegetation. No new structure is scheduled to replace it.

[AARB \(virginia.gov\)](http://AARB.virginia.gov)

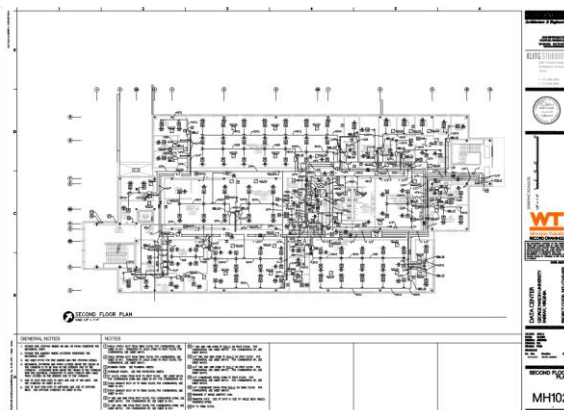


SECTION 8.6 SCHEMATIC DESIGN/PROJECT CRITERIA

8.6.1.1 Verification of Existing Conditions:

The A/E shall visit the site and ascertain pertinent local conditions that must be addressed in the design. As part of the required services, it is the A/E's responsibility to verify, by on-site observations of applicable existing buildings, the configurations, locations, dimensions, sizes and conditions accessible for verification. Certain assumptions are made regarding existing conditions in the remodeling and or rehabilitation of an existing building. Some of these assumptions may not be verifiable without additional exploration or investigation of the building or site. To minimize the risk during construction of uncovering conditions that are not as shown on the documents and delaying project progress, the Agency should consider and evaluate the advice of the A/E to conduct additional investigation, verifications or checks to verify.

❖ **Note: Verification of Existing Conditions required for Schematic, Preliminary, and Working Drawings**



8.6.2 Basis of Design Narrative:

The Schematic Design shall include a Basis of Design Narrative which provides the following information:

See **Appendix D** for Narrative requirements.

APPENDIX D

BASIS OF DESIGN NARRATIVES INTRODUCTION

The basis of design is a narrative description of the project and should be a bound presentation of facts sufficiently complete in accordance with the following format to expedite review of the Schematic and the Preliminary submittals. The Schematic Basis of Design narrative presents the basic information, criteria, logic, evaluations and considerations developed in each category to prepare the Schematic submittal. The Preliminary Basis of Design narrative expands upon the Schematic submittal to reflect the further analyses, evaluations and selections/decisions made to arrive at the Preliminary level of design.

Design computations, sizing of members or conductors, details of connections, etc., are not required to be submitted with the Schematic Basis of Design, but general computations supporting system selection, member depths, floor to floor heights, mechanical and electrical loads should have been made.



SCHEMATIC BASIS OF DESIGN INFORMATION

The Schematic submittal shall include a Basis of Design Narrative which as a minimum provides the following information in narrative or tabular format:

1. Type of occupancy/USBC Use Group
2. Estimated occupancy capacity and method or factor used for estimate
3. Functions to be housed in the building
4. Proposed building location on the site
5. Exterior Circulation (i.e. how this project may interface with other area facilities)
6. Areas and/or capacity required for various activities proposed for building and how this compares with the initial program requirements
7. Type of Construction proposed: i.e. fire resistive, protected or unprotected noncombustible, etc. and USBC Type #



SCHEMATIC BASIS OF DESIGN INFORMATION continued...

8. Indicate the proposed Virginia Energy Conservation Code compliance path
9. Outline description of basic materials
10. Future construction or expansion to be accommodated, if any
11. Style and character of building desired
12. Structural Design Live Loads, Wind and Seismic Design Criteria
13. Types of structural framing evaluated and recommendation
14. General description of any proposed fire suppression systems (clean agent, chemical, etc.)
15. Provide a general description of any proposed fire sprinkler systems.



SCHEMATIC BASIS OF DESIGN INFORMATION continued...

16. Identify applicable NFPA Standard (cited by the USBC) which provides the minimum requirements for the design, installation, testing, inspection, approval, operation, and maintenance of the proposed fire sprinkler or fire suppression system. Indicate the water supply to the proposed building and whether or not a fire pump will be required. (Calculations to support this position are desirable at this phase but are not required.)

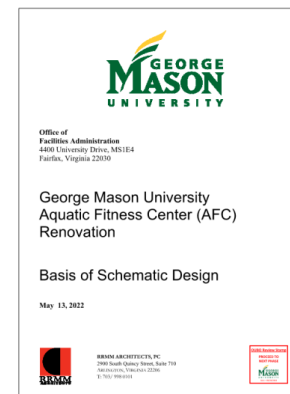
17. Description of the types of HVAC systems being evaluated, estimated heating and cooling loads, fuels evaluated and fuel selected to be used

18. Description of all energy conservation and peak energy reduction methods being evaluated

19. Description of types of electrical systems evaluated, voltages, possible transformer locations and need for generator

20. Total square foot area per floor and per building

21. Total cubic foot volume



SCHEMATIC BASIS OF DESIGN INFORMATION continued...

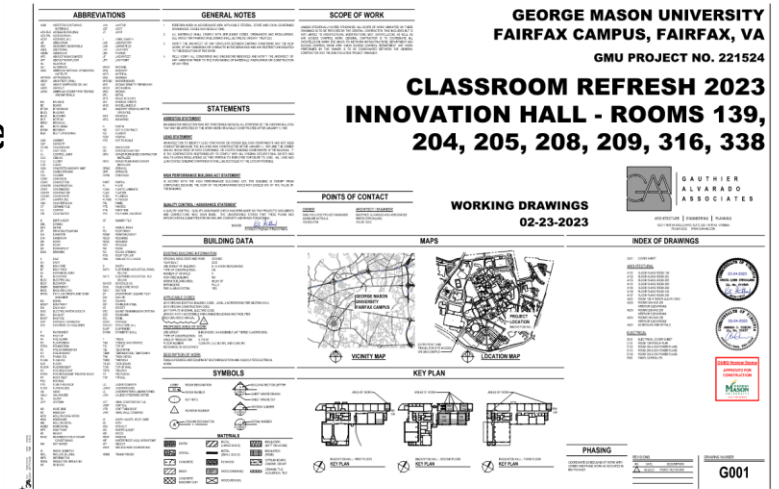
22. Number of beds, seats or parking spaces, where applicable
23. Total estimated construction cost based on the schematic documents
24. Total proposed project budget
25. Geotechnical report criteria
26. Describe Site Work issues such as site survey, geotechnical, utilities, parking, roads, sidewalks and grading
27. Provide description of Electrical Coordination Analyses process, installation and testing requirements.
28. Document requirement of In-Building Emergency Communications System.



8.6.3 Schematic Drawings: The following drawings shall be included as a minimum:

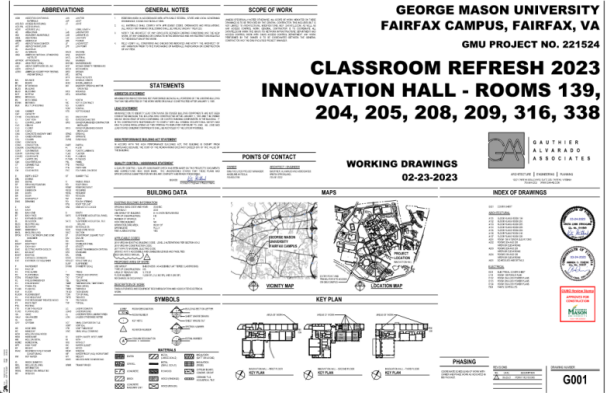
Title Sheet & Code Compliance Plans (G)

1. Project Identification: Agency, **Project Code Number**, Appropriation Act Title
2. Activity or function(s) to be performed in the facility
3. Edition (year) of the USBC on which the design is based.
4. Applicable accessibility standards.
5. VCC Construction Type.
6. (Use) Group(s) per VCC. For mixed-use occupancies, indicate which Groups are separated and non-separated.
7. Other major code(s) used as a basis for design.
8. Indicate if High Performance Buildings Act is applicable.



Title Sheet & Code Compliance Plans (G) Plans continued...

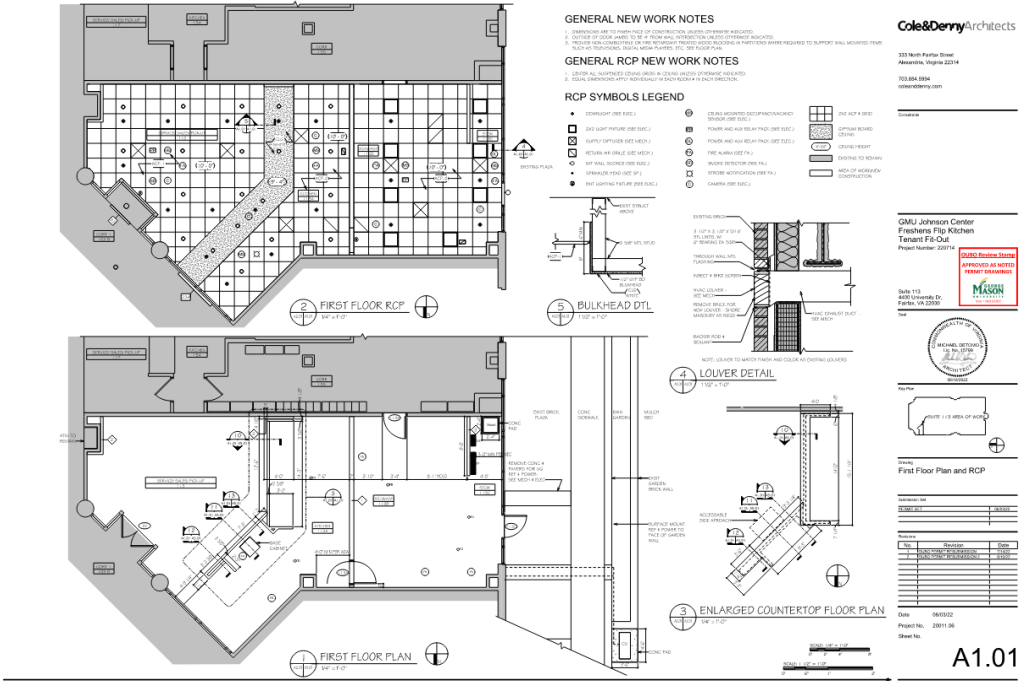
- 9. Identify the applicable Virginia Energy Conservation Code Compliance Statement (Refer to Section 7.2.7).
- 10. Location and vicinity maps noted to show project location.
- 11. Tabulation of GSF per floor (new and renovated), total GSF (all floors - new and renovated), total building volume.
- 12. Tabulation of "Building Area" per VCC definition (per story).
- 13. Tabulation of units: Number of parking spaces, auditorium seats, bedrooms etc.
- 14. Design occupant load for each level and total for the building.
- 15. Index of drawings.
- 16. The uniform date of the completed schematic design documents.
- 17. Statement documenting whether the local emergency public safety personnel utilizes public safety wireless communications.



Architectural Drawings (A)

The following drawings shall be included as a minimum:

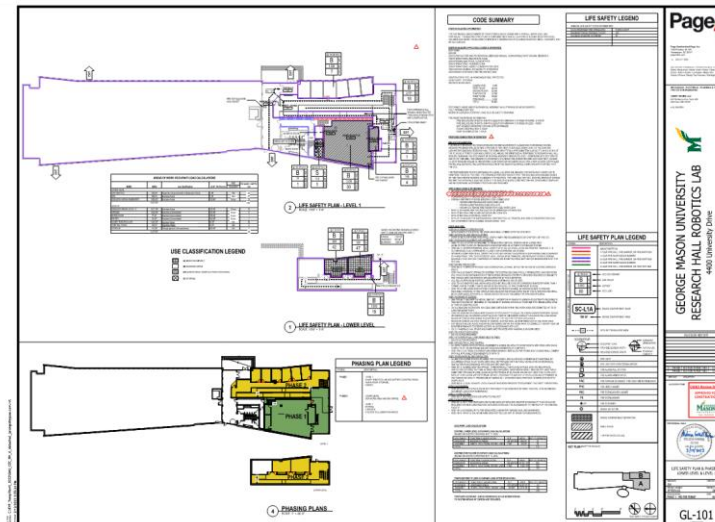
1. Architectural Floor plans of each floor showing space names, nominal room sizes, and circulation paths.
2. Architectural Roof plan showing roof slopes and drainage.
3. Longitudinal building section with floor to floor and floor to ceiling dimensions
4. Transverse building section
5. Exterior elevations
6. Structural plan of a typical supported floor framing scheme and a typical section showing the proposed components of the floor system
7. Orientation and approximate location of proposed roads, walks and parking on a site plan
8. The rooms and spaces to be protected by any proposed fire suppression system (including clean agent) and the proposed locations of the major fire suppression system components.
9. Any other information that is of value to the Agency and the Architect/ Engineer reviewing the project.



Life Safety (G) Drawings

Provide the following as a minimum:

1. Indicate whether or not the building will be equipped with fire protection sprinkler system and/or fire detection/fire alarm systems.
2. Design occupant load(s), including the number of occupants to be accommodated in each space. The determination for the occupants is based on the use and function of the spaces.
3. Indicate paths for means of egress, paths of exit access, travel distances to exits and common paths of travel.
4. Indicate specific locations where access controls or security locking systems will be provided within means of egress paths.
5. Identify projects that will have partial or phased occupancy.
6. Indicate fire-resistance rating(s) of all proposed assemblies. Completely show the continuity of the rated assemblies using reference symbols.



8.6.4 Cost Estimate: See **Appendix E** for Schematic Cost Estimate requirements.

Appendix E Cost Estimates

SCHEMATIC DESIGN/PROJECT CRITERIA PHASE ESTIMATE

The Schematic Design Construction Cost Estimate shall be developed in the "Systems" format. Each system shall include a description or listing of the components or items included in that unit cost. To the extent possible, major systems or commodities should be quantified. Where quantification is not reasonable, the assumptions and logic for the cost shall be shown...



Office of University Building Official

Training

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- [Fire Protection Part II](#)
- [OUBO HECO Training Session 1 OUBO Charter, HECO Chapter 11, OUBO Website Introduction & e-Builder](#)
- [HECO Chapter 7 & Related Appendices](#)

[Training – Office of University Building Official \(gmu.edu\)](#)



MAY 2023 BUILDING SAFETY MONTH

Building Safety Month is an international campaign celebrated in May to raise awareness about building safety.

For more than 42 years, Building Safety Month has reinforced the need for the adoption of modern, regularly-updated building codes, and helps individuals, families and businesses understand what it takes to create safe and sustainable structures.

Mason's Office of University Building Official is hosting the following online training from 11:30 a.m. to 12:15 p.m. :

- May 10, 2023 OUBO Charter, HECO Chapter 11, OUBO Website Introduction & e-Builder
- May 16, 2023 HECO Chapter 7 & Related Appendices
- May 18, 2023 HECO Chapter 8 & Related Appendices - Part 1
- May 23, 2023 HECO Chapter 8 & Related Appendices - Part 2
- May 25, 2023 HECO Chapter 8 & Related Appendices - Part 3
- May 31, 2023 Additional Q&A, Follow-up Session

RSVP BY EMAILING [OUBO@GMU.EDU](mailto:oubo@gmu.edu)

OUBO CONTACT INFORMATION

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oubo.gmu.edu





QUESTIONS?

Learn More at [OUBO.GMU.EDU](https://oubo.gmu.edu)