



LAW SCHOOL BOARD ROOM STUDY COLLEGE OF WILLIAM & MARY

Project Narrative

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Architect

Glavé & Holmes Architecture

2101 East Main Street

Richmond, VA 23223

(804) 649-9303

(804) 343-3378 fax

www.glaveandholmes.com

Colonial Engineered Solutions

MEP & FP Engineer

223 Bulifants Blvd Suite E

Williamsburg, VA 23188

T: 757.634.3653

www.cesolutions-inc.com

Lynch Mykins Structural Engineers

Structural Engineer

1503 Santa Rosa Road, Suite 210

Richmond, VA 23229

T: 804.346.3935

www.stroudpence.com

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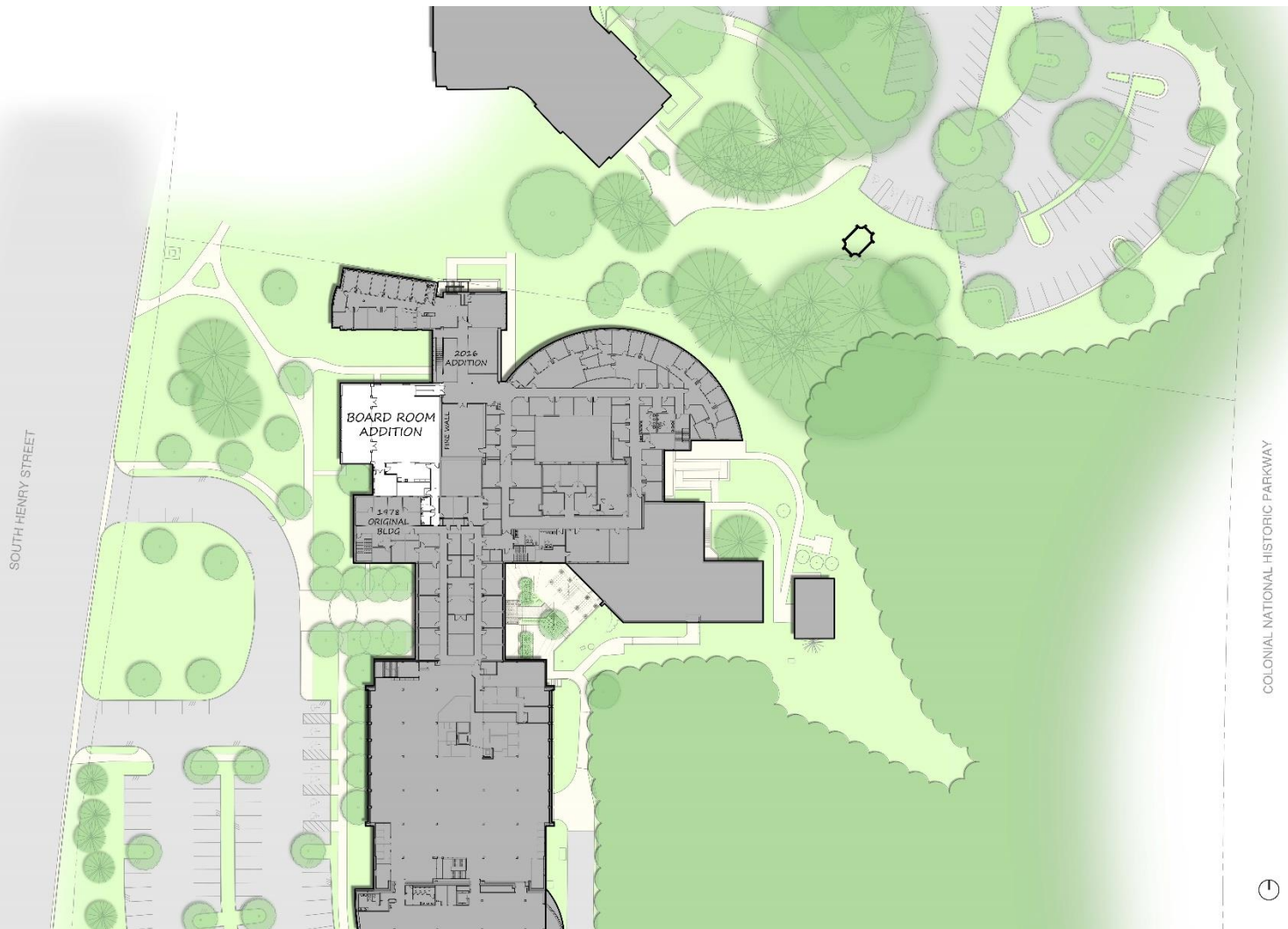
01 Summary

Description

The project consists of a second story addition to the existing law school. The addition will include a boardroom accommodating approximately 50 people, catering kitchen, roof balcony, and associated support spaces (Mechanical/Electrical, Storage, Restrooms).

Location

The addition is located above the existing single story Moot Courtroom that is part of the original 1978 portion of the Law School. Directly adjacent to the Moot Courtroom to the south is a 2-story mass (also part of the 1978 original building) and to the northeast is a 2-story addition (built in 2016). The board room addition will infill between these two existing 2-story masses at the second level.

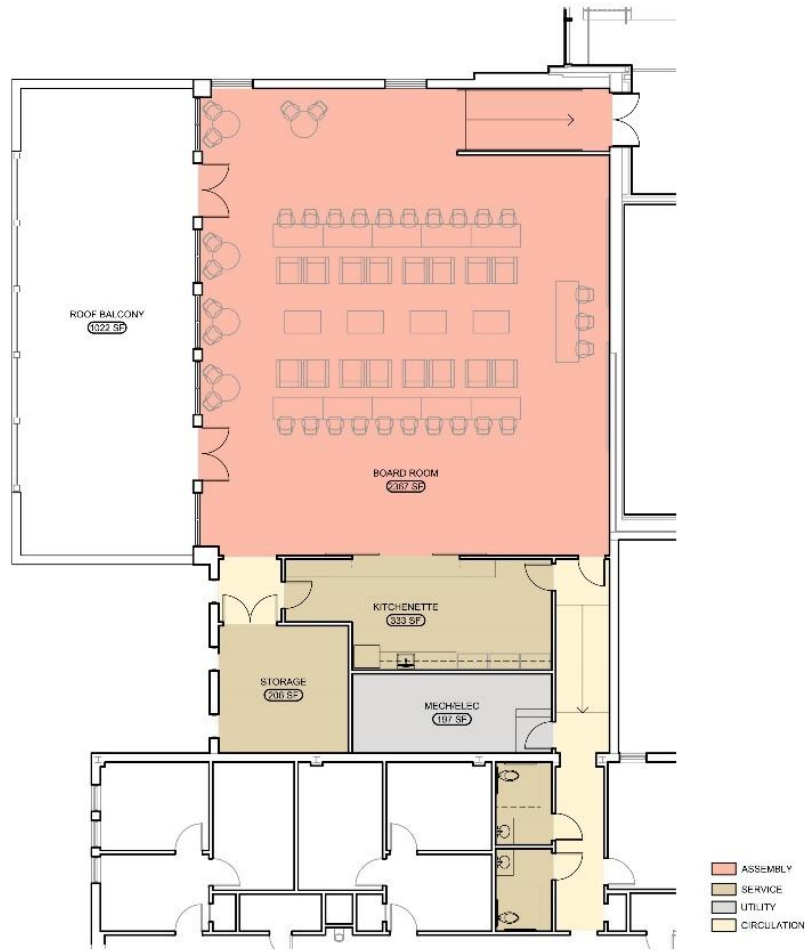


Site Plan

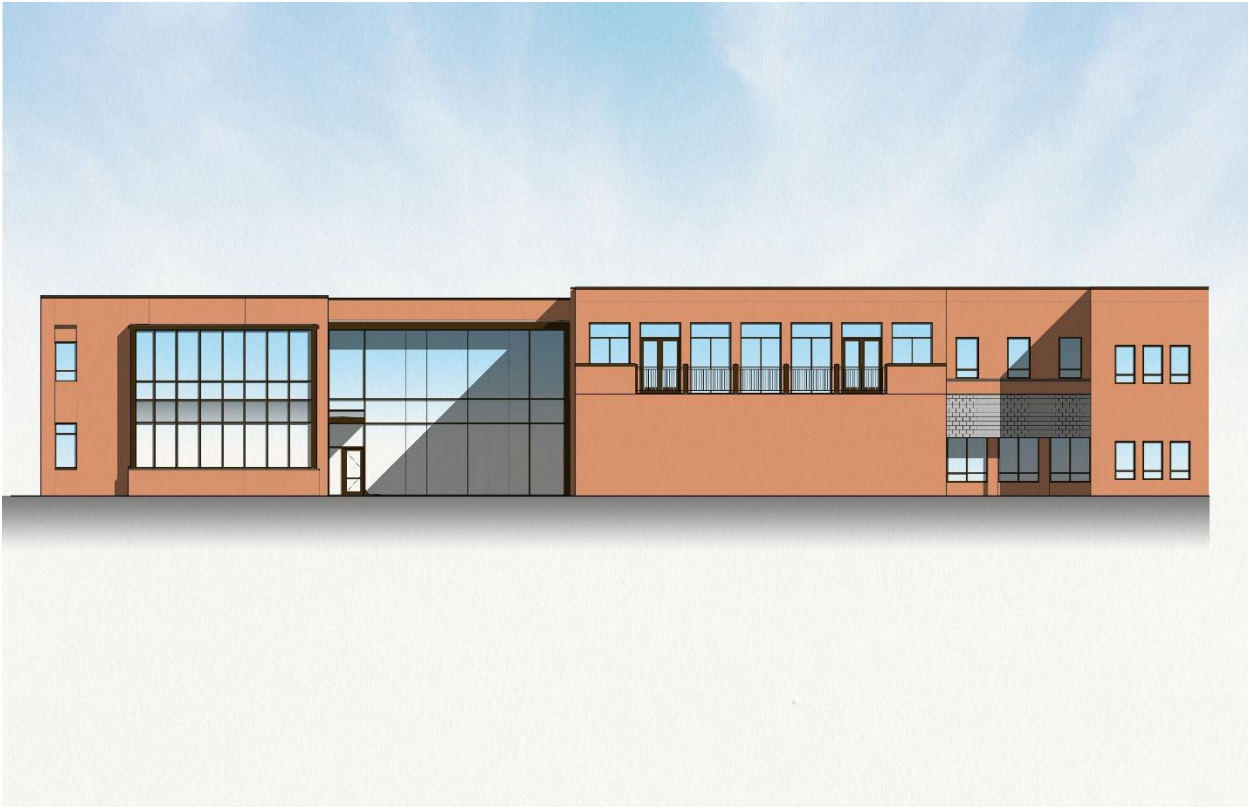
Addition

The existing roof over the Moot Courtroom and support structure will require removal and new structure will be erected to support the addition. Demolition of existing ceilings below the addition and limited demolition to walls and floor slabs will be required for the removal, replacement, and enhancement of structure and structural footings. The Moot Courtroom and adjacent spaces under the addition will require protection from weather until the floor slab of the addition is installed above. The existing fire wall (2 wythes of 8” CMU) separating the 1978 original building and the 2016 addition will be extended another story to maintain code required separation. The existing exterior brick/CMU masonry walls will also be extended another story to enclose the addition.

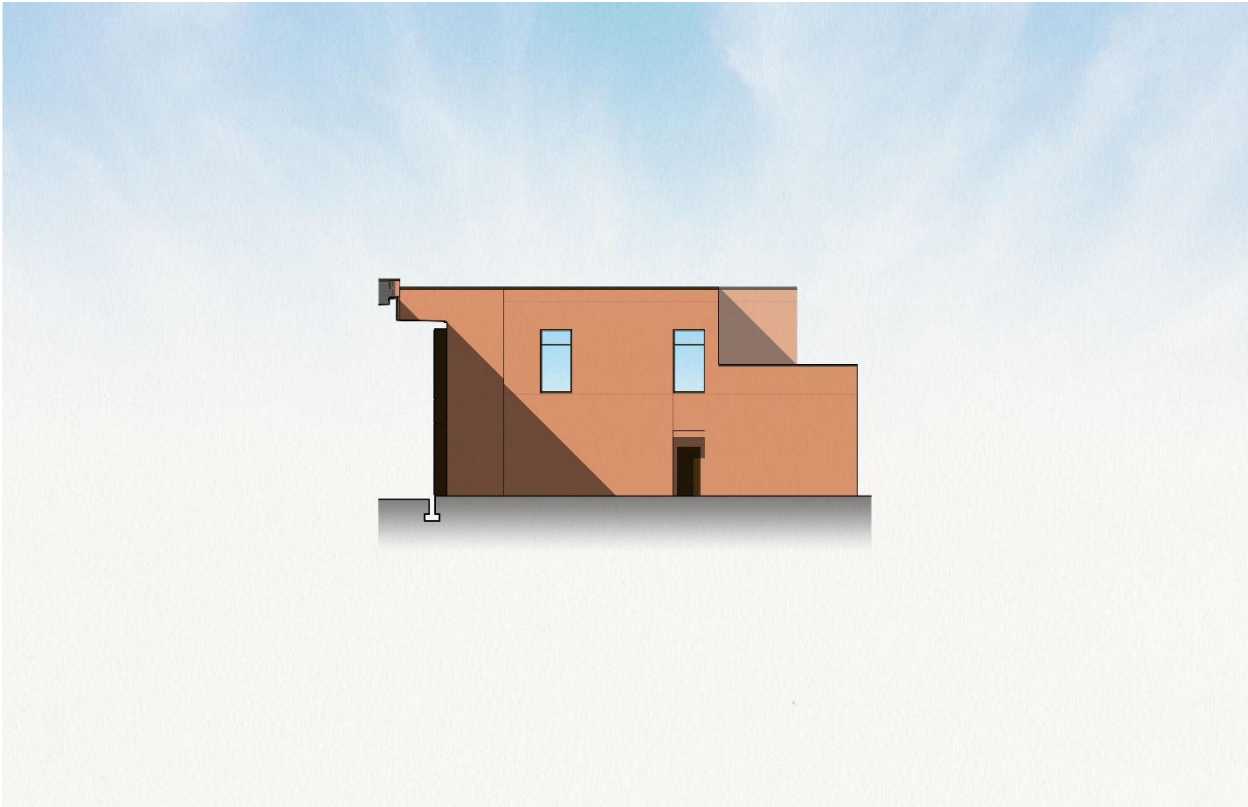
The main entry to the board room will be through a 2-hour fire rated double door from the 2016 addition. A ramp from the existing 2nd floor level will lead up the floor slab of the addition. This new floor slab will be approximately on foot above the existing second level to preserve the interstitial ceiling space for the existing courtroom and rooms below. A decorative screen partition will separate the entry ramp from the board room. The west exterior wall of the board room clad mostly with glazing is located on an existing column line and additional structure along this column line will be required to support the wall. A roof balcony will be located to west of the board room. At the balcony perimeter the existing parapet walls will get extended higher to achieve required guard rail height and a portion of the parapet will get removed and replaced with a 36” tall decorative metal guard rail. A kitchenette, storage room, and mechanical/electrical room will be located to the south of board room. An operable sliding double door will open on the south wall of the board room to the kitchenette counter. Another ramp will connect to the existing 1978 original building to the south of the addition. Two existing offices of the original building will get repurposed as restrooms.



Floor Plan



West Elevation



North Elevation

02 Architectural (Divisions 02 – 14) [Glavé & Holmes Architecture]

Applicable Building Codes

Virginia Uniform Statewide Building Code
Virginia Construction Code 2018 (USBC, Part I)
Virginia Mechanical Code 2018
Virginia Plumbing Code 2018
Virginia Fuel Gas Code 2018
Virginia Energy Conservation Code 2018
Virginia Statewide Fire Prevention Code 2018
National Electric Code (NFPA 70) 2014
National Fire Alarm and Signaling Code (NFPA 72) 2013
Installation of Sprinkler System (NFPA 13) 2013
Construction and Professional Services Manual 2020 Rev. 0

Accessibility Standards

Virginia Construction Code 2018 (USBC, Part I)
ICC A117.1, 2009
2010 ADA Standards for Accessible Design

Use and Occupancy Classification

Existing 1978 Original Building: Business Group B (Primary Occupancy Classification)
Assembly Group A-3

Addition: Assembly Group A-3

Construction Type Classification

Existing: Type II-B Non-combustible
Addition: Type II-B Non-combustible

Addition Area

Addition: 3,440 sf

Roof Balcony: 1,088 sf

Total: 4,528 sf

Architectural Materials and Systems Description

A Substructure

A10 Foundations

A1010 Standard Foundations

1. Refer to Structural Section.

A40 Slabs-on-Grade

A4010 Standard Slabs-on-Grade

1. Refer to Structural Section.

B Shell

B10 Superstructure

B1010 Floor Construction

1. Refer to Structural Section.

B1020 Roof Construction

1. Refer to Structural Section.

B20 Exterior Enclosure

B2010 Exterior Walls

1. Typical above grade exterior wall system includes brick, 2" air space, 1 1/2" rigid insulation, air barrier over 5/8" exterior gypsum sheathing on 6" light gauge metal stud framing @ 16" o.c. with 6" mineral wool batt insulation and 5/8" gypsum wall board on the interior side.
 - a. Brick Veneer (Woodmold) – Match Existing Brick on Law School
 - b. Soldier Accent Brick (Wire Cut) at top of wall and window/door headers– Match Existing Brick on Law School
 - c. R-13 batt + R-7.5 rigid (continuous insulation)
 - d. Copper flashings, cavity vents and weep holes
2. Slate stone window sills.
3. Parapets - stacked bond soldier course with aluminum coping – Match Existing Law School

B2020 Exterior Windows

1. Stationary Windows
 - a. Aluminum storefront
 - a) Factory fluoropolymer painted finish – custom color (bronze) to match existing Law School
 - b) Fixed (Non-operable)
2. Glazing

- a. Insulated units with tempered clear glass and low-e coating on the second surface.

B2050 Exterior Doors and Grilles

1. Exterior doors and frame – Aluminum Storefront
 - a. Glazed full panel aluminum doors
 - b. Factory fluoropolymer painted finish - custom color (bronze) to match existing Law School

B30 Exterior Horizontal Enclosures

B3010 Roofing

1. Low slope roofs to have fully-adhered 60-mil EPDM membrane roofing over R-30 Polyisocyanurate insulation with adhered coverboard. Tapered insulation to be utilized for surface slope to roof drains. Self-adhered air/water barrier and stainless or copper flashings.
2. Parapet conditions will be detailed to include coping and flashing.
3. Balcony - Concrete pedestal pavers over fully-adhered 60-mil EPDM membrane roofing over R-30 Polyisocyanurate insulation. Tapered insulation to be utilized for surface slope to roof drains. Self-adhered air/water barrier and stainless or copper flashings.

B3020 Roof Appurtenances

1. Roof Drains (low profile roof drains under pedestal pavers)

C Interiors

C10 Interior Construction

C1010 Interior Partitions

1. Metal stud partitions
 - a. Non-bearing walls:
 - i. Type 1 - 3 5/8" metal studs @ 16" o.c. with 3.5" mineral wool batt insulation, 1 layer of 5/8" GWB on each side. Based on UL U419. (Standard interior walltype)
 - ii. Type 2 - 3 5/8" metal studs @ 16" o.c. with 3.5 mineral wool batt insulation and 2 layers of 5/8" drywall on one side and 1 layer on the other side. Based on UL U419 with 52 STC laboratory rating. (For the following areas: Restrooms and Board room.)
 - iii. Provide stained wood stile and rail wood paneling at board room.
 - iv. Type 3 – 2 1/2" metal furring @ 16" o.c. with and 1 layer of 5/8" GWB on finish face. (Over existing masonry walls)

- i. Provide stained wood stile and rail wood paneling at board room.
2. CMU partitions
 - a. Double wythe 8” CMU 2-hour rated fire wall

C1030 Interior Doors

1. Interior non-rated doors
 - a. Board Room -Stained stile and rail solid core wood doors with gaskets (25-30) STC
 - b. Kitchenette, Mech/Elec, an Restrooms - Stained flush solid core wood doors (20 – 25 STC)
 - c. Operable sliding, stained stile and rail wood doors between board room and kitchenette.
2. Interior fire-rated doors (northeast double door entry to board room)
 - a. Stained stile and rail wood doors
 - b. 2 HR rated
3. Door frames
 - a. Stained wood
 - b. Labeled hollow metal frames where required by fire-ratings – Painted to match wood stain
 - c. Applied wood trim, stained
4. Hardware
 - a. Mortise locks
 - b. Hinges - 5 knuckle, 3 minimum per door
 - c. Finish – Oil-rubbed bronze (US 10b)
 - d. Basis of Design - Corbin Russwin.
 - e. In accordance with ICC/ANSI A117.1.

C1070 Suspended Ceiling Construction

1. Suspended sound attenuating gypsum board ceilings

C1090 Interior Specialties

1. Interior signage

C20 Interior Finishes

C2010 Wall Finishes

1. Interior partitions shall be sheathed with 5/8" gypsum wall board (GWB) and Level 4 finish typical.
2. GWB to be high-abuse resistant in corridors.
3. Moisture and mold resistant GWB to be used in bathrooms.
4. Stained wood paneling in board room.
5. Refer to Interior Finishes Section for additional information.

C2030 Flooring

1. Refer Interior Finishes Section

C2040 Ramp Finishes

1. Handrails
 - a. Bronze railings at ramps
 - b. Carpet

C2050 Ceiling Finishes

1. Acoustical Ceiling Tile
 - a. 2'-0" x 2'-0" with tegular edge
 - b. GWB soffits
2. Painted suspended GWB.
3. Refer Interior Finishes Section for additional information.

D Services

D20 Plumbing

1. Refer to Fire Plumbing Section

D30 Heating, Ventilation and Air Conditioning

2. Refer to Mechanical Section

D40 Fire Protection

3. Refer to Fire Protection Section

D50 Electrical

1. Recessed linear LED cove Lighting
 - a. Location: Board Room
2. Recessed 4" LED Downlights

- a. Location: Board Room
- 3. Lay-in 2'x2' Fixture
 - a. Kitchenette, Storage, Mechanical/Electrical, Restrooms
- 4. Decorative Exterior Wall Sconces
 - a. Location: Roof Balcony

E Equipment and Furnishings

E10 Equipment

E1040 Institutional Equipment

- 1. Kitchenette
 - a. Refrigerator
 - b. Icemaker
 - c. Coffee machine
 - d. Dishwasher
 - e. Microwave
 - f. Undercounter Wine Cooler

E20 Furnishings

E2010 Fixed Furnishings

- 1. General
 - a. AWI Custom Grade Quality
- 2. Boardroom
 - a. Wood veneer casework for housing A/V equipment
- 5. Kitchenette
 - a. Solid surface countertop
 - b. Plastic Laminate Cabinets
- 6. Window treatments
 - a. Roller shades
- 7. Toilet Accessories
- 8. Solid surface vanity tops in restrooms
- 9. Refer Interior Finish section below for additional information

F Special Construction and Demolition

F30 Demolition

F3030 Selective Building Demolition

1. Roofing and substrate
2. Roof structure
3. Ceiling and associated ceiling fixtures below addition. Salvage fixtures for reinstallation.
4. Partial removal of first floor slab and interior walls as required for replacement of structure and new structural footings
5. Brick parapet and coping

G Sitework

G10 Site Preparation

1. Tree protection will be required between the work zone and 2016 addition to the north and between the work zone and South Henry Street to the West. An 8” Holly tree will require removal as it impedes into the work zone.

03 Structural (Divisions 03 – 05) [Lynch Mykins Structural Engineers, PC.]

Structural Design Live Loads, Wind Loads and Seismic Criteria:

2018 Virginia Uniform Statewide Building Code

Design Loads:

| | |
|------------------------------------|---------|
| Risk Category | III |
| Roof | 20 psf |
| Ground Snow, Pg | 15 psf |
| 2nd Floor | 100psf |
| Snow Importance Factor, I | 1.025 |
| Wind, V (ultimate – 3 second gust) | 125 mph |
| Exposure Category | B |
| Seismic Design Category | B |
| SS = .114 | |
| S1 = .043 | |
| Site Class D (Assumed) | |
| Seismic Importance Factor, I | 1.25 |
| Slab-on-grade | 150 psf |

Structural Materials:

| | |
|------------------------|--|
| Foundation Concrete | 3000 psi, normal weight concrete |
| Slab-on-grade Concrete | 3500 psi, normal weight concrete |
| Concrete Masonry Units | |
| Reinforcing Steel | F _y = 1,500 psi |
| Steel Beams | ASTM A615 Grade 60 W-Shapes – ASTM A992 Pipe – ASTM A53 Grade B HSS – ASTM A500 Grade B Channel, Angle, Plate – ASTM A36 |

General Structural Description:

The intent is to provide a new board room space over the existing one-story space. Preliminary analysis shows that the existing roof structure is not adequate to support the new floor and roof loads. In addition, because of the proposed changes, the existing lateral load system will no longer be adequate for the wind and seismic loads required by the building code. The existing roof structure and columns under the addition will be removed and replaced with new steel roof framing. In addition column footings, and some wall footings, will be enlarged or replaced. In the new sections, a new lateral load resisting system will be provided. In the existing areas to remain, some new lateral load resisting elements will be required or strengthening of the existing system required to meet the current building code.

System Selection:

1. Floor Construction:
 - a. The new second floor/mezzanine will consist of 3.5 inches of lightweight concrete over 2 inch composite deck (5.5 inches total). The slab will be supported on steel beams. The beams will be supported on steel beams, on new masonry, and/or on steel columns.
2. Roof Construction:
 - a. New roofs will generally be 1.5-inch-deep type B roof deck on steel joists or beams on new steel framing or on Concrete Masonry Unit (CMU) walls.
 - b. Roof framing over the meeting area will span up to 67 feet
3. Exterior and Interior Walls:
 - a. The exterior walls will be load bearing masonry or non-load bearing cold formed metal framing.
 - b. Interior walls will be non-bearing cold formed metal framing
4. Lateral Loads:

- a. In the new framing areas the lateral load resisting system will consist of the roof and floor diaphragms that will transfer the horizontal wind and seismic loads to braced frames of steel in the vertical direction
- b. In the existing areas to remain the existing masonry shear wall will need to be reinforced and new shear wall provided.

Foundation System:

5. Slab-on-grade:
 - a. The new slabs on grade will consist of a 4” thick slab on grade reinforced with Welded Wire Reinforcing on vapor retarder and porous fill. This must be verified with the site-specific geotechnical report.
6. Foundations:
 - a. New footings are assumed to be shallow spread footings to match the adjacent existing structures. This must be verified by a site-specific geotechnical report.

04 Acoustical Design (Divisions 03 – 13) [Glavé & Holmes Architecture]

Criteria

Acoustic Design Criteria:

1. Board Room: NC 30 with a relatively low reverberation time and a reasonably balanced, but traditional spectrum.

Isolation

Partitions:

1. Board Room and Restrooms: 50 STC - 3 5/8" light gauge stud with 2 layers of 5/8" drywall on one side and 1 layer on the other side with insulation in the cavity.
2. Other Areas: 45 STC - 3 5/8" light gauge stud with a single layer of 5/8" drywall on each side and insulation in the cavity.

Doors:

1. Board Room: Gasketed Solid Core Doors
2. Other Areas: Ungasketed Solid Core Doors

Ceilings:

1. Board Room: 55-60 STC range - Mixture of acoustical tile (minimum 0.65 NRC rating with a minimum 35-39 CAC rating) and plaster/drywall

Floor Finish:

1. Board room – Carpet (to limit impact noise transfer)

Mechanical System Noise Control

Main air handler unit should be selected for quiet operation which normally includes plenum or plug-type fans and ideally FanWall technology. Units should also include VFD drives. Where practical, the VAV boxes should be located in non-sensitive corridor or support areas and not located directly over sensitive space.

In general, air handling systems will likely require a minimum 20' of 2" sound-lined duct on the unit intake and discharge (or a 7' low-pressure attenuator) in addition to selection of a quiet unit as noted above. For most areas, large VAV boxes (over 1200 CFM) should incorporate a minimum 12' of 1" sound-lined duct on the discharge (or a 5' low-pressure attenuator) and will likely require an attenuator on the inlet of any fan-powered boxes. Smaller VAV boxes (1200 CFM or less) should incorporate a minimum 8' of 1" sound-lined duct on the box discharge (or a 3' low-pressure attenuator and inlet attenuator). For the board room, these guidelines should be upgraded with large VAV boxes (over 1200 CFM) incorporating a minimum 10' of 2" sound-lined duct on the discharge (or a 5' low-pressure attenuator) and will likely require an attenuator on the inlet of any fan-powered boxes. Smaller VAV boxes (1200 CFM or less) should incorporate a minimum 10' of 1" sound-lined duct on the box discharge (or a 3' low-pressure attenuator and inlet attenuator). As noted above, boxes over any sensitive space would benefit from field upgrades to control radiated noise.

Diffusers should be selected for at least 5 NC points lower than the design goal at normal operating conditions (less than NC 25 for the board room). Dampers should be remote from diffusers with lined duct or lined flex between the damper and the diffuser. The system should be air-balanced to minimize noise. This normally requires a rebalance after the initial balance. During the rebalance, the contractor should further address fan RPM to minimize system static and adjust individual diffusers for the lowest noise possible within the practical tolerance allowed between diffusers.

All major vibrating equipment should be isolated from the building structure.

05 Interior Finishes (Division 09) [Glavé & Holmes Architecture]

Board Room

Floors: Broadloom Carpet
Base: Stained Wood
Walls: Stained Wood Paneling
Ceiling: 24"x24" APC (Tegular with Fine Grid) / Painted GWB Soffits

Remarks:

Restrooms

Floors: Porcelain Tile
Base: Porcelain Tile
Walls: Tile Wainscot / Painted GWB
Ceiling: Painted GWB
Remarks:

Kitchenette

Floors: Resilient Sheet Good
Base: Rubber Base
Walls: Painted GWB
Ceiling: 24"x24" APC (Tegular with Fine Grid)

Remarks:

Storage

Floors: VCT
Base: Vinyl Base
Walls: Painted GWB
Ceiling: 24"x24" APC (Tegular with Fine Grid)

Mechanical/Electrical

Floors: Sealed/Painted Concrete
Base: None
Walls: Painted CMU
Ceiling: Painted Exposed Ceiling
Remarks:

Existing Interior Spaces Below Addition

Floors: Existing to remain
Base: Existing to remain
Walls: Existing to remain, Painted GWB
Ceiling: 24"x24" APC (Tegular with Fine Grid)/ Painted GWB Soffits

06 Fire Suppression (Division 21) [Colonial Engineered Solutions]

No fire suppression work is anticipated at this time.

07 Plumbing (Division 22) [Colonial Engineered Solutions]

Plumbing Systems – General Summary

The plumbing systems required for the board room addition will serve two new restrooms, and a kitchenette. The restrooms include a floor mounted water-closet and a wall or vanity mounted lavatory. The kitchenette will include icemaker, refrigerator, coffee machine, dishwasher, microwave, and an undercounter refrigerator.

There is a 2" cold water line in the area below the new addition. It is anticipated a 1-1/2" cold water line will be required. The existing 2" water line size will be sufficient to serve the existing and new fixtures.

22 0500 - Common Work Results for Plumbing

Work will be performed in accordance with the Virginia Uniform Statewide Building Code 2015 (IBC/IPC/IFGC 2015).

22 0553 - Identification for Plumbing Piping and Equipment

Plastic laminate or brass tags for all valves. Plastic markers for pipes. Ceiling tacks for valves and equipment located above suspended acoustical ceiling tiles.

22 0719 - Plumbing Piping Insulation

Rigid fiberglass pipe insulation with all-service jacket will be used for interior domestic cold / hot water and storm drain piping. PVC fitting covers.

22 1005 - Plumbing Piping

Sanitary waste / vent piping will be Schedule 40 PVC or cast-iron no-hub below grade and cast-iron no-hub above grade, as the existing building utilizes an above ceiling plenum return for the HVAC system.

Below-grade domestic cold / hot water piping will be Type M copper. Above grade domestic cold / hot water piping will be Type L copper. Interior storm drain piping will be cast iron in all above-grade locations, and cast iron or Schedule 40 PVC underground.

22 1006 - Plumbing Piping Specialties

Roof drains will be cast iron body with sump and polyethylene dome. Secondary roof drainage shall be provided by internal drains and routed to discharge 24" above grade. Downspout nozzles (overflow drain outlets) will be nickel bronze, round with curved outlet

Floor drains will be lacquered cast iron two piece body with double drainage flange, weep holes, reversible clamping collar, and round, adjustable nickel-bronze strainer. Floor drains (cast brass, round strainers) will be provided in mechanical rooms, janitors' closets, all holding areas, and public restrooms. Trap guard will prevent evaporation in floor drains. Cleanouts will be round cast nickel bronze access frame and non-skid cover.

Recessed galvanized box and quarter-turn valves will be provided for ice machine and refrigerator ice maker supplies. Water hammer arrestors will be provided in water supply branch piping to flush valve fixtures.

22 3000 - Plumbing Equipment

An existing hot water recirculation line is available to temperature maintenance of domestic hot water supply piping. This will be extended up to within 5 ft of each low flow fixture requiring hot or tempered water – i.e. lavatories in the restrooms. Balance valves will be required at each connection point.

22 4000 - Plumbing Fixtures

Plumbing fixtures will be water-conserving type. Kohler, Sloan, Zurn, Moen, Elkay used as basis for design in most cases.

- Water closets will be floor mounted, vitreous china, with flush tanks and open front seat without cover.
- Lavatories will be vitreous china, counter mounted, with grid strainers and automatic sensor faucets. Lavatory faucets will be equipped with 0.5 GPM low-flow aerators.
- Sinks in the kitchenette will be stainless steel with gooseneck swing spout.

08 Mechanical (Division 23) [Colonial Engineered Solutions]

HVAC System - General Summary

The building heating, ventilating and air conditioning (HVAC) system is generally described as 4-pipe heating water / chilled water (HW/CHW) with air distribution via air handler units with HW/CHW coils

and air terminal units with HW coils. Preliminary load calculations indicate 12-tons of cooling and 100 MBH are needed for the new space.

Two air distribution systems will serve the addition – one single zone variable air volume (VAV) AHU will serve the board room, while a smaller VAV central air handling system with HW air terminal units will serve the remaining spaces. The intake and exhaust for the air handling system shall be provided by intake and exhaust hoods located on the mechanical room roof.

The Board Room AHU will be a 2,000 cfm nominal unit with economizer, filtration section, supply fan, and HW / CHW coils.

The ancillary spaces will utilize a 1,000 cfm blower coil system with economizer, filtration section, supply fan, and HW / CHW coils. VAV's will be single duct, shut-off type with hot water heating coil.

The perimeter of the board room will require hot water radiant heating due to the large quantity of windows. Baseboard fin-tube with a small circulator pump will be utilized for this service.

The HVAC systems will be controlled by an existing building automation system (BAS), with full capabilities of scheduling, controlling, monitoring and alarming for the system. The existing BAS system for the Law School is through Siemens. The existing system will be extended to provide a new expansion panel and controller for the new equipment.

Chilled and hot water will be provided from an expanded chilled and hot water plant within the building, which is currently under design. 1-1/2" chilled and hot water pipes are expected to be required.

23 0500 - Common Work Results for HVAC

Work will be performed in accordance with the Virginia Uniform Statewide Building Code 2015 (IBC/IMC 2015).

23 0513 - Common Motor Requirements for HVAC Equipment

Motors for HVAC equipment will be premium efficiency.

23 0519 - Meters and Gauges for HVAC Piping

Pressure gauges (4.5-inch diameter) at inlet / outlet of all AHU coils.

23 0548 - Vibration and Seismic Controls for HVAC Piping and Equipment

Spring-and-neoprene hangers for suspended equipment. Braided flexible piping connectors for pumps and air moving equipment.

Threaded rods for suspended equipment and piping. Trapeze hangers for grouped piping. Concrete pads for all equipment located in mechanical rooms. Insulated roof curbs for all roof mounted equipment.

23 0553 - Identification for HVAC Piping and Equipment

Plastic laminate nameplates for all HVAC equipment. Plastic laminate or brass tags for all valves. Plastic markers for pipes. Stenciled identification for all ducts. Plastic underground warning tape for underground piping. Ceiling tacks for equipment located above suspended acoustical ceiling tiles.

23 0593 - Testing, Adjusting and Balancing for HVAC

Provide complete testing, adjusting and balancing (TAB) of HVAC systems. The TAB team shall consist of the air and water testing sub-contractor, BAS Contractor, equipment manufacturers' representatives, and the Owner's representative. Provide pre-TAB checklist and complete air / water balancing reports.

23 0713 - Duct Insulation

Flexible fiberglass blanket insulation, 2" thickness, 3/4# density, will be used for supply and outdoor air intake ducts, and ducts located in unconditioned spaces.

23 0719 - HVAC Piping Insulation

Rigid fiberglass pipe insulation with all-service jacket will be used for interior building distribution piping. Elastomeric cellular foam insulation for condensate drain piping.

23 0923 - Direct Digital Control System for HVAC

The building HVAC systems will be controlled by a DDC building automation system (BAS) with the main panel located in the mechanical room, and with full capabilities of scheduling, controlling, monitoring and alarming for the system.

Thermostats, humidistats, temperature sensors, pressure sensors, current sensors, control valves, and automatic dampers with operators shall interface and be compatible with the BAS. Electronic controls will be programmable and provide for temperature control, humidity control, occupied / unoccupied scheduling, etc. Control valves at terminal units will be 2-way, electric.

Line voltage thermostats will control propeller exhaust fans and unit heaters.

23 0993 – Sequence of Operations for HVAC Controls

Sequences of control will be included on the drawings.

23 2113 - Hydronic Piping

Interior CHW/HW distribution piping will be Schedule 40 welded black steel (diameters greater than 2-inches), and Schedule 40 threaded black steel or soldered copper (2-inch diameter and smaller). Type L copper for equipment drains and overflows. Provide flanges or unions and isolation valves at all connections to equipment.

23 2114 - Hydronic Specialties

Expansion tanks will be diaphragm type. Air vents will be manual type. Air separators will be in-line type.

Piping packages at each air handler, blower coil, fan coil, and air terminal unit will include automatic factory-preset flow setting valve, strainer, unions, P/T ports and ball isolation valves.

23 2500 - HVAC Water Treatment

Chemical cleaning agents and pot feeder for interior piping.

23 3100 - HVAC Ducts and Casings

In general, supply, return, intake and exhaust ducts will be galvanized steel rated for 2-inch pressure class. Flexible ducts with helical wire support, fiberglass insulation and outer vapor barrier will be used for connections to supply diffusers (5-ft maximum length).

23 3300 - Air Duct Accessories

Turning vanes in all rectangular elbows. Manual volume dampers at all branch duct take-offs from mains.

23 3423 - HVAC Power Ventilators

Inline or roof mounted fans will be used for mechanical room and equipment room exhaust. Ceiling and roof fans will be used for consolidated bathroom exhaust.

23 3600 – Air Terminal Units

Single duct variable volume terminal units, complete with HW coil, will provide for regulation and control of conditioned air to occupied spaces. Unit control shall be integrated with BAS and wall or ceiling occupancy / vacancy sensors.

23 3700 - Air Outlets and Inlets

Supply air devices will have integral volume dampers. Ceiling diffusers will be extruded aluminum. Sidewall supply grilles will be double deflection type. Slot diffusers will be linear type. Return grilles will be stationary blades, 3/4-inch deep on 3/4-inch spacing. Louvers will be extruded aluminum, stormproof and drainable, and have painted factory finish. Titus or Kreiger will be used as Basis of Design.

23 4000 - Air Cleaning Devices

Combination 2-inch & 4” pleated media filters in all air handling units (MERV 8 / MERV 14).

23 7413 – Air Handling Units

Units designed for indoor or outdoor installation, as needed. Draw-thru type air handling units with fans, CHW/HW coils, filter and mixing sections. Factory assembled, internally wired, and 100% run tested to check operation, fan and blower rotation and control sequence before leaving the factory. Wiring internal to the unit shall be numbered for simplified identification. Units shall be ETL listed and labeled.

23 8100 – Terminal Heating and Cooling Units

Terminal heating and cooling units will have CHW/HW coils as appropriate. Direct-driven blower coil units, nominal ratings of 1 to 10 tons. Horizontal concealed type fan coils.

Hydronic unit heaters for tempering stairwells and mechanical rooms.

23 8126 – Small Split System Heating and Cooling

Ductless chilled water fan coil systems shall serve main AV room.

09 Electrical (Division 26) [Colonial Engineered Solutions]

Electrical Power Distribution System Extension– Summary of Approach to Extension of Power (Normal and Emergency) for Boardroom Addition

The location of the new Boardroom addition on the second floor places it directly adjacent to the Courtroom and Mezzanine that was constructed as part of the 2016 Experiential Learning Center addition on the north end of the building. Electric power was brought to the 2016 addition via a 277/480V, 3-phase, 300 amp feeder run from the main building switchboard. This feeder connects to a 400 amp panelboard (Panel HB) in the basement of the addition that serves all of the 277V lighting in the basement and first floor of the Experiential Learning Center addition as well as the HVAC equipment. It also supplies a 100 amp panelboard on the second floor (Panel H2) that power second floor lighting for the 2016 addition. And it supplies a 75 kVA transformer that provides all of the 120/208V power for the addition. The secondary of the transformer connects to a 225 amp panel (Panel LB) which powers receptacles and other 120/208V loads in the basement and first floor, and also supplies a 100 amp sub-panel (Panel L2) that does the same for the second floor.

Panel H2 is shown on existing drawings to only have a connected load of 2.3 kVA (3 amps) and has plenty of spare circuits. It can be used to serve the lighting and HVAC loads for the new board room. Panel L2 is shown to have a connected load of approximately 22.5 kVA (63 amps) and is limited on spare circuits. However, Panel LB is only shown to have a load of 42.2 kVA (117 amps) and appears to have just enough spare breaker space available if a couple of circuits are rearranged within the board to be able to add a 100 amp branch breaker that can be used to supply a new sub-panel to serve the 120/208V load for the new Boardroom addition. The sub-panel will be installed in the mech/elec room being created as part of this work.

The projected load for the Boardroom addition is in the range of 25-30 kVA with approximately 10 kVA being 277/480V lighting and HVAC load that would be added to Panel H2, and the remaining 15-20 kVA being for receptacles, appliances, and other such 120/208V loads that would be connected to the new 120/208V sub-panel in the mech/elec room. It appears that Panel H2 can easily handle the added load and likewise, Panel LB and the existing 75 kVA transformer have the necessary spare capacity. The total connected load on Panel HB and the 300 amp feeder supplying it is as indicated on existing drawings for the 2016 addition is 177.4 kVA (213 amps), which means after completion of the Boardroom addition, the new maximum connected load on Panel HB is estimated to be approximately 207 kVA (249 amps). As part of the 2016 addition, Owner sub-metering was installed on Panel HB. When the project moves into preliminary design, the intent is to obtain the peak demand information from the metering which should likely show even less load as well as less voltage drop on the 300 amp feeder than what was anticipated and shown on the 2016 drawings.

In regard to emergency power, the William & Mary Law School is currently provided with an emergency generator and automatic transfer switch to supply life safety loads including emergency lighting. As part of the 2016 addition, an emergency lighting circuit was extended from an existing generator-connected panelboard on the east side of the building to serve the emergency lighting on the second floor of the addition. According to load information provided on the 2016 drawings, the load on that emergency lighting

circuit is only around 1.6 kVA (6 amps), so it appears the circuit has the spare capacity necessary to use it to serve the designated emergency lighting in the Boardroom addition.

26 0500 - Common Work Results for Electrical

The electrical systems shall comply with the 2018 Virginia Uniform Statewide Building Code, the Virginia Energy Conservation Code 2018 (VECC), the National Electrical Code 2017 (NEC), the Americans with Disabilities Act Accessibility Guidelines (ADAAG), and William and Mary (W&M) Facilities Management Design and Construction Manual as well as W&M Technical Standards.

26 0519 - Low-Voltage Electrical Power Conductors and Cables

Branch circuit wiring shall be Type THHN/THWN copper wire installed in conduit.

26 0526 - Grounding and Bonding for Electrical Systems

Provide separate, insulated grounding conductor within each feeder and branch circuit raceway.

26 0533 – Raceway and Boxes for Electrical Systems

All conduit shall be either rigid metal heavywall (RGS), intermediate metal conduit (IMC), or electric metallic tubing (EMT). Flexible metal conduit shall be used for all flexible connections, plus all short motor connections, transformer connections, and all equipment subject to movement or vibration. Liquidtight flexible metal conduit shall be used in all interior wet or damp locations. Flexible metal conduit shall be permitted for use as the connection to recessed lighting fixtures, maximum length of 6', and installed in accordance with all NEC requirements. All boxes including outlet boxes and floor boxes shall be sheradized or galvanized sheet steel code gauge boxes. As the Boardroom is on the second floor, any floor boxes that are required would be poke-thru type.

26 0534 – Pathways for Communications Systems

Provide infrastructure to support the installation of Division 27 low voltage communications systems such as data/telephone, television signal distribution, audio-video distribution, etc. Infrastructure shall consist of the installation of empty boxes for outlets or devices with empty conduit with pull strings stubbed from each box to above an accessible ceiling or directly. The work shall include any conduit sleeves above inaccessible ceilings to create a complete pathway for cabling back to the I.T. room. Infrastructure shall also include 120V circuitry needed for systems equipment, as well as all associated grounding, bonding, etc. Minimum conduit size for data outlets shall be 1". It is anticipated that all new data cabling would be run back to the existing second floor I.T. room 282 located in the 2016 addition.

26 0535 – Pathways for Electronic Safety and Security Systems

Provide infrastructure to support the installation of Division 28 electronic safety and security systems such as fire alarm, access control, and other required safety and security systems. Infrastructure shall consist of the installation of empty boxes for outlets or devices with empty conduit with pull strings stubbed from each box to above an accessible ceiling. It shall include any conduit sleeves above inaccessible ceilings to create a complete pathway for cabling back to the I.T. room. Infrastructure shall also include 120V circuitry needed for systems equipment such as access control system door control boxes located above accessible ceilings, as well as all associated grounding, bonding, etc. Minimum conduit size for security shall be 3/4" with larger

conduits where required or directed by the particular safety or security system designer/installer. A complete conduit system shall be provided for all fire alarm system wiring.

26 0553 - Identification for Electrical Systems

Provide plastic laminate nameplates for all disconnect switches, starters, panelboards, and similar equipment. Provide typed directories in panelboards. Circuits shall be identified on the cover plates of all junction and outlet boxes.

26 0923 – Lighting Control Devices

Provide switches, dimmers, faceplates, occupancy and vacancy sensors, and other manual and automated lighting controls in spaces as required to meet VECC. Most spaces shall have a combination of manual and automated controls. Switches shall be heavy duty specification grade, 120/277V, single-pole, 3-way, 4-way, etc. as required. Wall dimmers shall be slide type. Occupancy and vacancy sensors shall be dual-technology type with adjustable time delay. Occupancy sensors shall generally be used in corridors and along paths of egress and vacancy sensors shall be provided in most other spaces per VECC. Wallplates and device finishes shall match existing devices or shall be as directed by the Architect. The Boardroom will be provided with multiple zones of lighting with separate controls.

26 2416 - Panelboards

Panelboards shall have copper plated bus including neutral and ground bus, shall be housed in code gauge steel cabinets with hinged trim, and shall be supplied with thermal magnetic molded case circuit breakers. Panelboards shall be fully rated or shall be series rated with the upstream circuit breaker supplying them in order to maintain the interrupting rating of the existing system. Square D shall be used as the Basis of Design.

26 2726 - Receptacles

Receptacles for general use will be heavy-duty specification grade 3-wire grounding type, 20A at 125 volts, NEMA 5-20R, with other NEMA types, ground-fault circuit interrupter (GFCI) types, etc. provided where required by the application. Finish of receptacles and wallplates shall match existing or shall be as directed by the Architect.

26 2813 - Fuses

Provide fuses in all fused disconnect switches and combination starters. Fuses to be rejection type C, class RK1, dual element, time delay, current limiting.

26 2816 - Enclosed Switches

Enclosed switches shall be heavy duty in NEMA 1 or 3R enclosures as required, fusible for rejection type fuses, with solid neutral assembly and equipment grounding kit. Square D shall be used as Basis of Design.

26 2900 – Low-Voltage Controllers

Manual motor starters and magnetic combination starters shall be provided for mechanical and plumbing equipment where required. Starters shall be provided with thermal overloads, L.E.D. indicating lights, start-

stop buttons, hand-off-auto switches, phase-protection relays, etc. as required by control diagrams. Starters shall have oversized enclosures. Square D shall be used as Basis of Design.

26 5000 - Lighting

Lighting shall be LED to the extent possible. Individual lighting fixtures shall be selected in collaboration with the Architect and will be appropriate for both the function and character of each space. Potential styles of lighting fixtures anticipated to be used are recessed 2'x2' high efficiency troffers, downlights, pendants, wall sconces, vanity lights in toilet rooms, and other types of decorative or specialty fixtures as dictated by the type of space and type of ceiling. LED drivers shall be electronic and meet the requirements of NEMA-410. Associated lighting controls shall be coordinated with the dimming protocol of the driver in each type of fixture. Exit signs and emergency lighting will be provided where required. Exit signs will be LED type and shall match the appearance of other emergency lights used at the Law School. Emergency lighting will be via designated normal lighting fixtures serving the space connected to an emergency circuit. Similar to the approach taken in the 2016 project, relays will be used to bypass the normal lighting controls and turn the designated emergency fixtures on to full brightness on loss of the normal lighting circuit serving the space.

Lighting levels shall be in accordance with or greater than recommended levels by IES:

| <u>Space</u> | <u>Footcandles</u> |
|--------------|--------------------|
| Boardroom | 40-50 |
| Corridors | 15-20 |
| Toilets | 15-20 |
| Mech/Elec | 20-30 |
| Storage | 15-20 |
| Roof Balcony | 5-10 |

10 Audio-Visual (Division 27) [Glavé & Holmes Architecture]

Board Room

1. Video System
 - a. The main video display for board room will consist of two ceiling recessed, electric projection screens (tensioned, with gray projection surface for high contrast images) and an associated ceiling-lift mounted video projectors. The projection screen will be located in a ceiling soffit on the east side of the board room. The video projector lift will conceal the projector above the ceiling when not in use.
 - b. The video input location on the east wall and will be provided with a compact interface including HDMI input (which is compatible with the DVI, Display Port, and Thunderbolt digital video formats), VGA analog video input, and analog audio input.
2. Audio System
 - a. Ceiling speakers.
 - b. 24"x24" Multi-directional ceiling mounted microphones

3. Control System

- a. A central control system, with touch panel controllers, will be provided for simplified and centralized control of the audiovisual system.
- b. A equipment rack located in a base cabinet on the south side of the room will be provided to house all of the AV switching, control, and signal distribution equipment.

11 Electronic Safety and Security (Division 28) [Colonial Engineered Solutions]

28 3100 – Fire Detection and Alarm

The existing fire alarm system shall be extended to the Boardroom addition. The existing system is a Simplex 4100ES system with main panel located just outside the main mechanical/electrical room for the entire facility. However, as part of the 2016 Experiential Learning Center addition, a new panel/transponder was installed and connect to the existing Simplex fire alarm system. All devices added during the 2016 project was connected to this new panel. With the Boardroom addition no larger than it is and the quantity of new devices required expected to be fairly low, it is anticipated that the SLC and NAC circuits that were installed to connect to the second floor fire alarm devices put in as part of the 2016 addition would be extended to serve the new devices installed as part of this project. Fire alarm devices including initiating devices (pull stations, smoke detectors, duct detectors, etc.), and notification devices (horn-strobes and strobe only) will be provided in the Boardroom area as required.