



**UGA DESIGN & CONSTRUCTION
SUPPLEMENTAL GENERAL REQUIREMENTS & STANDARDS
CHANGES FROM AUGUST 1, 2016 VERSION TO APRIL 30, 2018 VERSION**

00 00 06 – Access to Existing Documents

- Section was updated in its entirety and simplified.

00 00 07—Design Professional Design Process Requirements

- 1.J Added: Design specifications shall adhere to the latest CSI numbering format. Individual equipment items shall have specific sections as defined by CSI and shall not be combined together into large unwieldy sections.

00 00 08 – Design Professional Documentation Requirements & Deliverables

- Table for FMD Project Deliverables Edited: Changed copies needed during 100% Construction Documents stage to the following:
 - Full Size Printed Drawing Set for FMD from 2 to 1.
 - Half Size Printed Drawing Set for FMD from 4 to 0.
 - Printed Project Manual/Specifications for FMD from 6 to 1.

00 00 10 – BIM Requirements

- 4.4.6 Added: “as well as energy performance requirements listed in Section 01 81 00 Facility Performance Requirements.”
- 4.5 Edited: Changed “Procurment” to “Procurement”.

00 00 13—Design Learning Environments

- 4.2 Edited: “Determine the general location, size, and orientation of each screen and the seating area” to “Determine the general location, size, and orientation of each screen based on the seating area.”
- 4.3 Added: The size of the projected image should follow current industry standards. The farthest viewer should be placed no further than five times the height of the screen. Example: if the screen is six feet tall, the farthest viewer should be no further than 30 feet from the screen.
- 4.7 Added: For larger spaces, 48” is a minimum distance from the front wall.

01 31 19.23—Progress Meetings

- 1.A Added: The Design Professional shall provide electronic tools (laptops or thumb-drives) necessary to project plans and specifications onto a UGA provided projector screen. The Design Professional shall coordinate with the Project Manager as necessary.
- 1.B Added: The Contractor shall provide electronic tools (laptops or thumb-drives) necessary to project plans, specifications, change orders, RFIs, photographs, schedules, etc., onto a UGA provided projector screen. The Contractor shall coordinate with the Project Manager as necessary.

01 35 23 – Owner Safety Requirements – Safety Barriers



- 1.A Added: All windscreens utilized shall be black in color and devoid of any company logos or other markers, and must be discussed with the Project Manager prior to installation.

01 41 26.02 – Local Utility Information & Locate

- 1.C Added: The Design Professional shall include the most up-to-date 811 logo on all drawings that call for excavation activity of any kind.

01 41 26.06 – Dining Services

- 1.B Added: Dining Services projects being undertaken as a component of another active project are funded separately, however decisions regarding Design Professional(s) and Contractor selection must be made concurrently with the selections for the main project's contract.
- 1.D Edited: "As soon as a food service operations is identified within a project program, a meeting should be coordinated with the Design Professional(s), Project Manager, ESD, and UGA Dining Services to further discuss the scope." to "As soon as a food service operations is identified within a project program, a meeting should be coordinated with the Design Professional(s), Project Manager, ESD, and UGA Dining Services to further discuss the scope, refine the program, and to identify and coordinate contractual requirements involving third party franchisors."
- 1.E Added: "Design Professional(s) shall coordinate a meeting between Dining Services, Project Manager, and Contractor regarding the sourcing and installation responsibilities regarding equipment on a per project basis."
- 1.F Added: "For renovations and other work in existing facilities, a Pre-TAB report shall be provided by UGA prior to any design work occurring to verify existing operational parameters."
- 1.G Added: "An air balance diagram shall be provided as a component of the mechanical design documents."
- 1.H Added: "Coordinate grease trap placement with outside air intake locations."
- 1.I Added: "Equipment schedules delineating sourcing and installation responsibilities must be reviewed, signed off on, and accepted by both Dining Services and the Project Manager for each project."
- 1.J Added: "Prior to Schematic Design, signage requirements shall be reviewed with Dining Services, OUA, and the Design Professional(s)."
- 1.M Added: "Submission to Health Department for Construction Permit - The OUA Project manager shall coordinate submission of design information (drawings, specifications, equipment lists, etc) to the Athens-Clarke County Health Department for review at the Design Development and 80% Design milestones in order to obtain a construction permit from ACC Health Department."
- 1.N Added: "Operational"
- 1.N.i Edited: "authority having jurisdiction for the project" to Athens-Clarke County Health Department"
- 1.N.v.13.a.i Added: "Design Intent"
- 1.N.v.13.a.v Added: "current capacity and anticipated needed"
- 1.N.v.13.a.vi Added: "current capacity and anticipated needed"
- 2 Added:



“PRODUCTS

A. Plumbing

- i. All above-floor grease interceptors shall be constructed of polyethylene. Alternate materials are not acceptable.
- ii. Acceptable options for above-floor grease interceptors shall be Zurn GT2702-07 or equal.
- iii. Outdoor subgrade grease interceptors shall be constructed of precast concrete, and shall be located with sufficient separation from outside air intakes in order to prevent odors from the interceptor from entering the building.
- iv. Acceptable options for three-compartment sinks at smaller café facilities shall be Advance Tabco K7-CS-21 or equal. For full-size kitchen facilities, the Design Professional shall coordinate specific requirements.
- v. Lever waste drains are required and shall be by T&S (or equal).
- vi. Indirect drains shall be installed at all sinks.
- vii. The domestic water supply serving the Dining Services area shall be sub-metered. The Design Professional shall contact the Project Manager in order to coordinate project-specific metering and sub-metering requirements.
- viii. An EcoLab water filtration shall be provided by Dining Services and coordinated by the Design Professional and Contractor.
- ix. The water filtration system shall be centralized whenever possible and shall serve equipment such as ice machines, coffee makers, tea brewers, etc. Coordinate point of connection and space requirements with Dining Services and Project Manager.
- x. Hand sink faucets shall be by T&S Brass (or equal) and shall be equipped with integrated hands-free sensors and hydrogenerators.
- xi. It is preferred that each Dining Services location is served by its own water heater.

B. Mechanical

- i. No horizontal runs are allowed for grease ducts. Grease ducts are to be light tested, pressure tested, and smoke tested prior to space turnover.
- ii. Kitchen hoods shall be energy efficient and comply with the Standards.
- iii. Make-up air to hoods shall be conditioned.
- iv. All exhausts and other system components shall be accessible.
- v. All HVAC controls shall be compatible with the existing building systems and all equipment provided shall have native BACnet interface.
- vi. Refrigeration condensing units are to be remotely located where the rejected heat will not add load to the HVAC system; coordinate with Project Manager and Dining Services. If remote location of compressors is not possible, provide equipment with bottom-mounted compressors and provide water cooled condensers in buildings with conveniently located recirculating chilled or process chilled water; coordinate with Project Manager.

C. Electrical

- i. The electrical service feeding the food service area shall be metered at the panel or sub-panel feeding the food service area. The Design Professional shall contact the Project Manager in order to coordinate project-specific metering and sub-metering requirements.



- ii. Each piece of hard wired equipment must have a point of disconnect to facilitate maintenance activities.
 - iii. Each piece of equipment requiring nonstandard outlets must be coordinated with equipment requirements and indicated on both the equipment schedule and electrical design documents.
 - iv. GFI breakers shall be provided in lieu of GFI outlets when possible.
 - v. Lighting fixtures shall be LED and comply with the Standards. Refer to Section 26 51 00 Interior Lighting.
 - vi. In general, lights are to be switched; no dimmers or lighting control systems are required. Coordinate project-specific lighting requirements and switch locations with Project Manager and Dining Services.
- D. Finishes
- i. The wall surface material of back-of-house rooms associated with the food service area shall be fiber-reinforced plastic (FRP) panels, which shall extend from floor to ceiling.
 - ii. Flooring at all non-guest areas (food preparation, storage, coolers, freezers, etc.) shall be Titan non-skid, slip-resistant flooring by BMI (or equal). Guest use areas shall receive easily cleanable slip-resistant flooring consistent with the overall design and finish selections. Base in these areas shall also be of Titan material.
 - iii. Base shall be cove base where the top leading edge of the cove shall be flush with the finish surface of the floor material.
 - iv. Grout at all food service areas shall be dark color epoxy grout.
 - v. Ceiling tiles shall be NSF-approved washable tiles at all food preparation and storage areas.
- E. Caulking / Sealants
- i. All joints between dissimilar materials shall be caulked with clear silicone caulk in a manner commensurate with manufacturer instructions.
- F. Furnishings
- i. Food service work tables, cabinets, and casework shall be constructed entirely of stainless steel. Legs and frame shall be square (304-SS) and sheet stainless steel shall be 200- or 300-series. 400-series stainless steel is not acceptable in any case. Decorative cladding is acceptable at aesthetically sensitive areas subject to approval by the Project Manager and Dining Services. When decorative cladding is used, all plywood substrates must be marine grade. Cabinet base may be required to be elevated on a concrete or stainless steel curb; Design Professional to coordinate with Project Manager and Dining Services.
 - ii. Countertops and backsplashes shall be stainless steel or solid surface material as approved by Project Manager and Dining Services.
 - iii. Cabinet backsplashes shall be integral with countertops.
- G. Communications
- i. DSL lines for credit / debit card services are not tied to the campus network and specific needs (entrance location and distribution devices) must be coordinated with the End-User during design.



- ii. Phone and data ports are required at each point-of-sale station. These ports should be run back to the network / communications wall cabinet for the Dining Services area.
- H. Security
- i. Coordinate service entrance access requirements with End-User.
 - ii. Security cameras and any recording device shall be provided by Dining Services, however conduit, backboxes, cabling, and other supporting appurtenances required to accommodate the security system shall be provided and installed by the Contractor. Locations shall be coordinated with Dining Services through the assigned Project Manager. Typical locations to be monitored include (but are not limited to) storage areas and point-of-sale locations.
 - iii. The video recording device should be established within the Dining Service area, such as, for example, in the network / communications wall cabinet typically installed for such areas.

01 58 00 – Campus Signage Standards

- New section added in its entirety.

01 58 13 – Temporary Project Signage

- 1.B Added: “The Contractor shall obtain the templates from the following location under the “01 58 13 – Temporary Project Signage” sub-heading:
<https://www.architects.uga.edu/standards>
The Contractor shall contact the OUA Project Manager if difficulty is encountered while accessing the files.”

01 77 00 – Project Closeout

- 1.G.vi Added: “Site and Utility Plan: Within 30 days of material completion, the Design Professional shall prepare specifically layered site plan drawing per OUA Standards. An Auto CAD Template file can be downloaded here:
<https://www.architects.uga.edu/standards> .
 - a. The submitted site plans shall be an AutoCAD .dwg file 2007 release or later. All survey information shall be included in the drawing as an External Reference and should be submitted as a separate .dwg file. All submitted drawings drawing shall be referenced to NAD 83 State plane coordinates system or to a suitable state plane coordinate system depending on its location. The electronic AutoCAD (.dwg) drawing file shall be submitted via email to the Project Manager. All drawing information (i.e. utilities, site information) shall be placed on the designated layer found in the AutoCAD Template.
 - b. As-built site information shall provide the size and layout of stormwater management appurtenances including, but not limited to, storm and footer drain laterals.”



01 81 00 – Facility Performance Requirements

- 3.A.Facility Performance Requirements Checklist Edited: Changed “The project will achieve energy savings target of 20% or greater.” to “The project will achieve energy savings target as listed in 01 81 00 item 1.E.i.a.”

01 91 13 – General Commissioning Requirements

- 1.B Edited: Changed “insuring” in second line to “ensuring”.
- 1.E.i Edited: Pre-Design Phase: Develop design phase commissioning plan, outline the scope of design requirements and design intent, describe systems to be installed, outline the documentation requirements for each party involved in the commissioning process, define subsequent commissioning procedures and document the process. Interface with the design team to refine the construction phases and ensure that the phasing of MEP systems is logical and appropriate. Develop commissioning specifications and functional testing requirements to be included in the bid documents.
- 1.E.iii.a Edited: Early Construction: Complete commissioning plan at the beginning of the construction phase. Obtain project schedules, work with contractor to incorporate Cx activities into construction schedule. Gather and review subcontractor submittals and operation and maintenance manuals. Work with subcontractors to develop detailed pre-functional check lists and performance test plans for each system and piece of equipment involved in the commissioning process. CxP shall provide pre-functional checklists and functional test procedures to General Contractor, Design Professional and Project Manager for comment a minimum of 6 weeks prior to their execution.

04 00 00 – General Masonry Requirements

- 2.C.iv Added: “Tate Student Center:
Boral Brick - Woodward Blend
Shelby Tan grout by Holcim”
- 2.C.v Added: “Reed Hall:
Cherokee Brick & Tile Company – Old Birmingham
Shelby Tan grout by Holcim”

05 52 00 – Metal Railings

- 2.D.i Edited: Changed part number from 4429 to 4441.
- 2.D.ii Edited: Changed part number from 4429S to 4441-S.
- 2.F.i Edited: Changed part number from 4429 to 4441.
- 3.C Edited: Updated handrail image diagram

08 71 00 – Door Hardware

- 1.B Edited: Changed “For UGA Athens Campus Only” to “For UGA Athens Campus projects (excluding Housing projects)”.
- 1.B Added: For UGA Housing projects, keying is handled directly by the UGA Housing Department. Coordinate specific requirements on a project-by-project basis with the Project Manager.



10 21 13 – Toilet Compartments

- 2.A Added: “or solid phenolic panels”

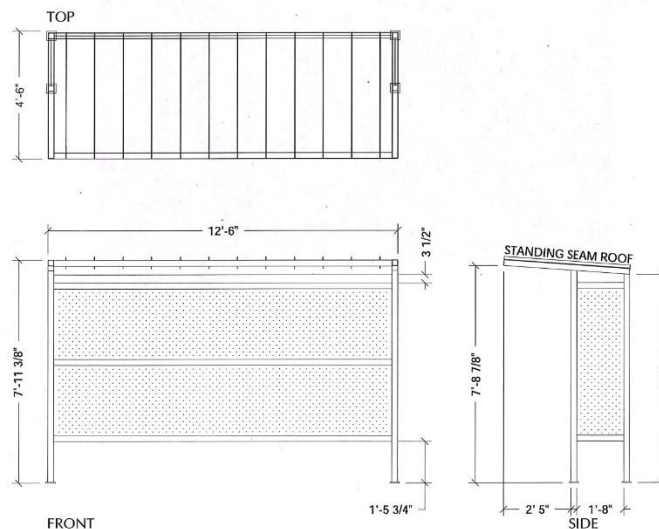
10 28 00 – Toilet, Bath, and Laundry Accessories

- 1.C Edited: Changed “Toilet seat cover dispensers shall not be included in the Project” to “Toilet seat cover dispensers are typically not included in UGA Projects. However, if a certain department wishes to include them, it shall be coordinated between the Design Professional and the Project Manager”.

10 73 43 – Transportation Shelters

- 2.A Edited to: Model: “UOG” Bus Shelter for the University of Georgia
Manufacturer: Lacor Streetscape (602) 371-3110, www.lacorstreetscape.com
The transportation (bus) shelters are fabricated per the information provided in this section. Refer to drawing at end of section.
- 2.A.ii.a Edited: size changed to 12’-6” long x 4’-6” deep x 7’-11-3/8” tall
- Updated the following diagram:

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BUS SHELTER FOR UNIVERSITY OF GEORGIA

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11 52 13 – Projection Screens

- 1.A.ii Added: 00 00 13 – Designing Learning Environments
- 1.B Edited: Removed “Tension project screens are prohibited.”
- Added in entirety:
 - B. The aspect ratio for screens in classrooms is 16:10.
 - C. The Design Professional should follow current audiovisual industry standards for sizing screens. However, the following are minimum guidelines:
 - i. The farthest viewer should be no further than 5 times the height of the screen.
 - ii. The closest viewer should be no closer than one and half times the width of the screen.



- D. Ceiling recessed screens should be utilized where possible.
- E. Non-tensioned screens, up to 10 feet wide, are preferred in classrooms.
- F. Fixed frame screens are preferred in larger classrooms.
- G. Surface material should have a gain of 1.0 or better for classrooms. Preference for surface material is matte white or equivalent.
- H. Motor options should include quiet / silent motor and low voltage control.

11 53 13 – Laboratory Fume Hoods

- 2.A.iv.a.4 Added: “Hood shall be tested to failure in order to identify lowest face velocity at which the hood passes visual local challenge testing.”
- 2.A.iv.b.4 Added: “Hood shall be tested to failure in order to identify lowest face velocity at which the hood passes visual local challenge testing.”
- 2.A.iv.c Added: “The final test report shall include the following at a minimum:
 - a. Test Record Information including:
 - i. Test date
 - ii. Hood Location (Building/Room Number)
 - iii. Hood Asset Number
 - iv. Hood make/model information
 - v. Hood Serial Number
 - b. Airflow Visualization Testing Pass/Fail Results including:
 - i. Local Challenge (pass/fail)
 - ii. Large Volume (pass/fail)
 - iii. Record of testing hood to failure
 - 1. Testing shall identify lowest face velocity at which the hood is capable of passing airflow visualization (local challenge) testing within +/- 2 feet per min. Each face velocity at which the test was performed shall be documented along with the corresponding VFD speed (%) and pass/fail record.
 - c. Face Velocity Measurement Test Results including:
 - i. Record individual face velocity measurements
 - ii. Corresponding VFD Speed (%)
 - iii. Average Face Velocity
 - iv. Pass/Fail Record
 - d. Tracer Gas Containment Test Results including:
 - i. Hood Rating (AI X.XX)
 - ii. Concentration at each mannequin location
 - iii. Background Concentration measured prior to releasing gas
 - iv. Sash Cycling Test results including pass/fail record and gas concentration for each mannequin location tested.”
- 2.F Added: “All utility service piping serving fume hoods shall be provided with shut off valves located external to the fume hood in an accessible location. Service shut off valves shall not be located in hood casework utility chases.”
- 2.S Added: “Fume hood exhaust fans (applies only to non-manifold systems)
 - ii. Fume hood exhaust fans shall be utility set type with vertical discharge.



- iii. Fans shall include options for shaft grounding, phenolic epoxy coating with UV protection, drain plug, flanged inlet, flanged outlet, rub ring and aluminum wheel.”

12 00 00 – General Furnishing Requirements

- 1.G Edited: Changed “insure” to “ensure”

12 93 13 – Bicycle Racks

- 3.B.iii Edited: Changed “deliver” to “delivery”
- 3.B.iv Added: “Wherever possible, locate bicycle racks on level ground.”

22 00 00 – General Plumbing Requirements

- 1.A.xi Added: “23 09 23 – Building Automation and Temperature Control System (BAS)” as new item.
- 1.E Added: “For any domestic water sub-metering applications, controls contractor to provide meter and plumbing contractor to install. Refer to Section 23 09 23 Building Automation and Temperature Control System (BAS) for specification details. Plumbing designer to show meter and associated notes on plumbing drawings.”
- 1.G Added: “Except for UGA Housing projects where trap guards are preferable if they are a viable solution.”
- 1.H Added: “Ball valves shall be used for plumbing services isolation (no gate valves).”
- 1.J.ii Added: “Whenever a project includes work that will penetrate existing concrete slab (elevated and / or on grade), the Design Professional and / or Construction Professional shall review conditions during design with Project Manager to verify if additional investigative work is needed (x-ray, GPR, ferrosan, etc.).”

22 15 13 – Compressed Air Piping

- New section added in its entirety.

22 45 00 – Emergency Plumbing Fixtures

- 2.A Edited: Changed “ANSI Z358.1-2009” to “current edition of ANSI Z358.1”

22 52 00 – Domestic Water Heaters

- New section added in its entirety.

22 52 00.01 – Domestic Water Heaters – Steam-Fired

- New section added in its entirety.

23 00 00 – General Mechanical Requirements (HVAC)

- 1.C.x Removed previous item in its entirety.
- 1.C.xxii Added: “For new projects and projects involving a renovation valued at 50% or more of the building value, all mechanical rooms shall be drawn in 3-D utilizing AutoCAD, Revit or compatible software. Included shall be all piping 2 inches in diameter and over, all valves, fittings, rotating equipment, air-handlers, ductwork, and other mechanical equipment. AutoCAD or Revit compatible files shall be provided to Project Manager as part of final close-out documents.”



- 1.C.xxiii Added: “Mechanical designer shall indicate the total chilled water and hot water system volumes in the design intent.”
- 1.E.vi Added item added in its entirety.
- 1.E.vii Added item added in its entirety.

23 05 14 – Variable Frequency Drive

- 2.A.i Edited: Changed “(basis of design)” to “(Basis of Design for motor HP > 1)”.
- 2.A.ii Added: “ABB ACS 150 (basis of design for motor HP < 1)”.
- 2.J Added: “For VSDs serving fume hood exhaust fans (fan motor HP < 1), VSD shall be located in lab space on wall near fume hood in vented NEMA 1 enclosure with hinged, clear access door.”

23 05 19 – Meters and Gages

- 2.A Edited: Changed “Flexim FLUXUS ADM7x07” to “Flexim FLUXUS 5000 series”
- 2.E Added: “Gauges: i. Gauges shall be 4 ½-inch diameter. ii. Pressure gauges across all chiller heat exchangers shall be equal to Orange Research Delta-P gauges. Install with dirt legs and means of draining.” (moved here from 23 09 23)
- 2.F Added: “Digital temperature indicators across all chiller heat exchangers shall be equal to Weiss Instruments or equal approved. Provide models that can send analog signal to front end. Solar or light powered devices shall not be provided.” (Moved here from 23 09 23).
- 3.D Added: “Thermometers and pressure gauges shall be mounted to be easily readable by observer standing on the floor and adjusting the device concerned.” (Moved here from 23 09 23 – Building Automation and Temperature Control System BAS – 1.J).

23 05 53 – Identification for HVAC Piping and Equipment

- 3.E.i Edited: Changed “Loop High Pressure Returnn” to “Loop High Pressure Return”.
- 3. Notes: 2.iv Added: “All exterior piping exposed to weather or chilled water piping in a ventilated mechanical room, shall be painted with two coats of rust-inhibiting primer, beneath the insulation.”

23 09 23 – Building Automation and Temperate Control System (BAS)

- 1.D.iv Added: “BAS contractor is to provide a temporary network and server setup to allow BAS startup and Commissioning activities to occur if the permanent IT connection provided by EITS is not in place in sufficient time to use during construction. The setup will allow multiple users.”
- 1.H Added: “Designers shall refer to campus standard control sequences of operation and schematics. Campus standard sequences shall be incorporated into each project, all variations from the standard sequences shall be discussed with the UGA project manager.”
- 1.J Moved: “Thermometers and pressure gauges shall be mounted to be easily readable by observer standing on the floor and adjusting the device concerned.” to 23 05 19 as 3.D.
- 2.D & 2.E Moved: D. “Gauges: i. Gauges shall be 4 ½-inch diameter. ii. Pressure gauges across all chiller heat exchangers shall be equal to Orange Research Delta-P gauges. Install with dirt legs and means of draining.” and E. “Digital temperature indicators



across all chiller heat exchangers shall be equal to Weiss Instruments or equal approved. Provide models that can send analog signal to front end. Solar or light powered devices shall not be provided.” (Moved to 23 05 19 as 2.E and 2.F)

- 2.F Edited: Changed “Veris H708” to “Veris H608”, and deleted “On VSDs the CTs shall be self-calibrating equal to Veris H904”.
- 2.H Added: “Wet Differential Pressure: Water system differential pressure use the Veris PW2 series or approved equal. Select the appropriate PW2 range for the given application Select operational range according to maximum gauge pressure, NOT differential pressure.”
- 2.I Added: “Air Differential Pressure / Dry Media Measurement: For dry media differential pressure monitoring (static, building pressure, etc.), use the Veris Industries series PXULX05S or approved equal. For static pressure use the included static tip. For room pressure use the KELE RPS along with the SD-030 Surge Dampener or approved equal. When you need to reference OA pressure, use the KELE A-306 OA static pressure sensor kit or approved equal.”
- 2.L Added: “All water-cooled chillers shall be provided with a dedicated DDC control panel. The control panel shall have a HOA switch and an alarm light indicator. In the manual position, the chiller and all associated auxiliary equipment will be commanded “on” and will modulate normally to maintain chilled water set-point temperature. The rest of the loop chillers will modulate normally.”
- 2.M Added: “Domestic water flow meter used in sub-metering applications shall be shown on the plumbing drawings to be installed under that division. The meter shall be furnished under Section 23 09 23 Building Automation and Temperature Control System BAS, and shall be Badger Recordall Meter, or approved equal, for meters 2 inches or less and Recordall Turbo Meter, or approved equal, for meters greater than 2 inches. Meters to be furnished with a pulsed output for interface to BAS.”
- 2.N Added: “Building main electric meter shall be shown on the electrical drawings but shall be furnished under Section 23 09 23 Building Automation and Temperature Control System BAS and shall be Veris E50H or approved equal. Meter to be installed by electrical contractor. Refer to Section 26 24 13 Switchboards.”
- 3.J Added: “Smoke Damper and Fire Smoke Damper Power / Control: All smoke dampers shall be powered and wired by Division 26 00 00 Electrical. Smoke damper power circuits shall be designated on the electrical panels on the electrical drawings. Control of these dampers shall be by the fire alarm contractor and designated as such on the electrical drawings.”

23 20 00 – Edited: Changed “HVAC Piping & Pumps” to “HVAC Piping Schematics”

- 1.A.ii Removed previous item in its entirety.
- 1.G Added: “Pump and Gauge Manifold Piping Detail SCHEMATIC DRAWINGS FOR GENERAL REFERENCE ONLY” and image detail

23 21 13 – Hydronic Piping

- 2.F Added: “Condensate piping shall be hard-drawn copper and shall be insulated. Condensate piping shall be sloped at 1/4” per foot and shall never be run more than 20 feet horizontally before dropping vertically to a drain.”



- 2.G Added: “Heating hot water pumps shall have a drain pan with drain pipe to floor drain. Route drain piping safely to avoid trip hazards.”
- 3.G Added: “Designer shall provide means to allow for specified flushing procedure. Necessary ports, valves, etc. shall be shown on the plans and labeled for their intended purpose. The designer shall coordinate with the campus treatment vendor.”

23 22 13 – Steam and Condensate Heating Piping

- 2.B Added: “Underground Steam Piping
 - i. High / Medium Pressure Steam Piping (greater than 50 psig)
 - a. The steam pipe shall be a class A, conduit system.
 - b. Carrier piping shall be steel, Schedule 40 seamless steel.
 - c. The carrier pipe shall be insulated with Pyrogel.
 - d. The conduit pipe shall be insulated with polyurethane foam. The insulation shall be blown or injected. If injected, provide third party verification that there are no voids in the foam.
 - e. Provide HDPE outer jacket.
 - f. End seals, gland seals and anchors shall be designed and factory prefabricated to prevent the ingress of moisture into the system. All subassemblies shall be designed to allow for complete draining and drying of the conduit system.
 - g. Basis of design is Thermacor Duo-Therm 505.
 - ii. Steam Condensate
 - a. Steam condensate piping and pumped condensate shall be Schedule 80.
 - b. The foam insulation shall be rated for no less than 250 degrees.
 - c. Foam shall be blown on or injected. If injected, the manufacturer shall provide third party verification that there are no voids in the foam.
 - d. Provide HDPE outer jacket.
 - e. Basis of design is Thermacor HT-406.”
- 3.B.v Edited: Changed “cellularglass” to “aerogel”.

23 31 13 – Metal Ducts

- 1.N Added: “Turning vanes in elbows shall be welded in place, rather than riveted or screwed.”

23 33 13 – Dampers

- 2.I Added: “Manual dampers shall be sized and installed such that the frame does not reduce the free area of the duct in which it is installed.

23 36 01 – VAV Terminal Units

- Edited: Removed Automatic Air Vent Detail from section.
- 3.B Added: “Design Professional to include allowable noise levels, air pressure drop, air flows for cooling max, heating max and minimum in VAV schedules as a minimum.
- Edited: Removed Manual Air Vent Detail from section.
- Edited: Removed Insulation Tie-Down Detail from section.
- Edited: Removed AHU Coil Piping Detail – Single Coil from section.
- Edited: Removed Fan Coil Unit and Terminal Unit Coil Piping Detail from section.



- Edited: Removed AHU Coil Piping Detail – Hot Water Coil with Loop Pump from section.

23 52 00 – Heating Boilers

- 2.B.i. Edited: Changed “Boiler(s) shall be controlled by BAS. Manufacture provided boiler controls shall not be allowed” to “Enabling, disabling, sequencing, and modulation (percentage) shall be controlled through the BAS. Internal boiler operation shall still performed through the manufacturer-provided controls.”

23 64 16.13 – Air-Cooled Water Chillers

- 3.A Added new item in its entirety.

23 64 16.16 – Water Cooled Water Chillers

- 2.G Added: Chillers with VFDs shall provide shaft grounding rings and ceramic back bearings for open drive configurations. Semi-hermetic drives shall provide approved means to protect against and shaft current induced bearing fluting.
- 2.H.i Added: “Whenever a chiller is idle for 24 hours or more and the temperature is above 60 degrees, then the water treatment controls shall be activated, and the condenser water pump shall run for 30 minutes.”
- 2.H.ii Added: “Condenser water pumps shall always be provided with VFDs, and shall start at low speed.”
- 3.E Added: “Chillers will be monitored by a 3rd party remote monitoring system through data obtained from the BAS system.”

23 65 00 – Cooling Towers

- 2.G Edited: Changed “Condenser water/cooling tower shall have a sand filtration system” to “Condenser water filtration shall be accomplished using centrifugal separators and basin sweepers” and combined with 2.H “Cooling tower shall be provided with a 2” drain, minimum, located in the center of the basin well to allow for ease of basin cleaning”.
- 2.K Added: “Fiberglass cooling towers or fiberglass cooling tower fans are not allowed.”
- 2.L Added: “Cooling Tower supply water outlet shall be over-sized as required to ensure that water velocities are low enough to prevent vortexing.”

23 73 00 – Indoor Central-Station Air-Handling Units

- 2.A.iii Added: “The floor shall be insulated with foam and shall be equal to the R-value of the wall panels.”
- 2.A.vii.i Added: “Provide permanent label on filter access door listing filter size(s), quantity of filter types, and specified MERV rating.”
- 2.A.xv Added: “Energy Recovery Wheels: The wheel(s) shall be provided with a 10 year parts and on-site labor warranty. The hub and bearings shall be provided with a manufacturer publicized minimum L-10 life of 1,000,000 hours. The desiccant media shall be provided with a maximum 3 angstrom molecular sieve. The drive shall consist of twin v-belts that ride on a grooved rim. The drive shall be rated for a minimum of 90,000 hours.”



23 74 00 – Packaged Outdoor HVAC Equipment

- 1.C Added: “Provide permanent label on filter access door listing filter size, number and specified MERV rating.”

23 81 29 – Variable Refrigerant Flow (VRF) HVAC Systems

- 2.A Edited: Removed “Basis of Design: Daikin”.
- 2.A.iv Edited: Added “All” before “refrigeration piping,” removed “Mechanical joints may be considered on a case by case basis,” and added “Selector boxes, fan coils, and condensing units shall be connected to system piping with brazed connections. Mechanical joints shall not be allowed.”
- 3.F.ii Edited: Changed to 3.F.ii from 3.G
- 3.F.iii Edited: Changed to 3.F.iii from 3.H
- 3.F.iv Edited: Changed to 3.F.iv from 3.I
- 3.F.v Edited: Changed to 3.F.v from 3.J

26 00 00 – General Electrical Requirements

- 1.A.viii Added: “23 09 23 – BAS”
- 1.A.xvi Added: “Low-Voltage Switchgears”
- 1.A.xvii Added: “Low-Voltage”
- 1.C Added: “Electrical Design Consultant is to locate the IT drops for BAS and Mechanical Equipment on the electrical drawings.”
- 1.D.i Edited: Changed “be provided; 12’ on center placement is recommended as a minimum” to “be provided at 18” above finished floor (AFF) spaced maximum 12’ horizontally” and changed “electrical outlets” to “duplex electrical receptacles”.
- 1.D.ii Edited: Changed “plastic floor outlet covers that break easily and raised floor outlets that present a trip hazard” to “floor receptacle covers shall be rated for pedestrian traffic and shall be mounted flush with the floor surface”.
- 1.E.i Edited: Changed “secondary spaces” to “primary spaces,” removed “and revenue metering equipment including current transformers (CT)s,” and added “On new building projects, the Design Professional will include concrete duct banks for medium voltage primary to the utility transformer in their design documents if new medium voltage primary has to be routed to the new utility transformer” and changed “high” to “medium” in third sentence.
- 1.E.iii Edited: Changed “ductbanks” to “concrete duct banks”, and added “for the primary. The Contractor shall provide and install all secondary service cable in concrete duct banks (to be included in Design Professionals’ design documents), using double-compression lugs, and make the final secondary connections to the utility transformer.”
- 1.E.iv Edited: Changed “generator” to “generator(s)”, added “automatic transfer switches”, changed “When existing one-line diagrams are not available, one shall be created based on existing riser diagram and field survey. This requirement is for the benefit of arc-fault implementation in the future” to “When existing one-line diagrams are not available, an as-built one-line diagram shall be created based on the Design Professional’s field survey. The one-line diagram(s) shall include short-circuit ratings at all nodes in the system, as well as arc-fault ratings. Electrical services (including utility transformer) shall be sized according to the demand load. The Design Professional shall apply industry standard demand factors in conjunction with NEC requirements in their



calculations for the sizing of all electrical services including all electrical distribution equipment (distribution transformers, panelboards, etc.)” and changed “The one-line diagram(s)” to “All one-line diagrams”.

- 1.E.v Removed: “Riser diagrams for single story buildings are optional.”
- 1.E.vi Edited: Added “long-time & short-time trip”, and changed “short circuit calculations” to “circuit breaker coordination study”.
- 1.E.vii Edited: Changed “universal power supplies” to “uninterruptable power supplies (UPS’s)”, and changed “Power plans shall indicate all electrical apparatus including wall receptacles, panelboards, emergency generators, uninterruptable power supplies (UPS’s), MCC’s and HVAC equipment, etc., and all the associated wiring.” to “Power and lighting plans shall indicate all electrical apparatus including switchgears, switchboards, wall receptacles, panelboards, emergency generators, uninterruptable power supplies (UPS’s), MCC’s and HVAC equipment, light fixtures, etc., and all the associated wiring and conduits. The Design Professional shall calculate voltage drop on all circuits per the NEC and size each individual circuit’s conductors accordingly. Notes instructing the Contractor to up-size circuit wiring over a certain distance will not be accepted.”
- 1.E.viii Edited: Changed “detail” to “detailed”, “entail such information as” to “contain”.
- 1.E.viii Edited: Added “Including room number”, “as well as demand load”, and “Panelboard schedules shall also contain mains ratings (225A/14 kAIC, 800A/42 kAIC, etc.) whether the panel is main breaker or main-lug only, operating voltage(s) (208V, 480Y/277V, etc.), number of phases (1 or 3 Phase), number of wires (3W or 4W), and general notes related to service entrance rating (if applicable), NEMA enclosure rating (1, 3R, 4X, etc.), top or bottom feed, and mounting type (flush, surface, etc.)”.
- 1.E.ix Edited: Changed “ductbanks” to “concrete duct banks”, and added “heating” and “UGA” before Project Manager.
- 1.E.xi Edited: Added “disconnect switches, conduit/wiring”, edited “ductbanks” to “concrete duct banks”, added “with 6-inch diameter conduits each with two (2) 200 lb. test nylon pull strings”, added “as required”, and deleted “Contractors shall also install FMD furnished transformers and loop feed switches.”
- 1.E.xii Edited: Changed “its” to “and their”, and added “as well as the routing of all concrete duct banks (both medium voltage primary & low voltage secondary)”.
- 1.E.xiii Edited: Added “per the NEC”.
- 1.E.xiv Edited: Added “Transformer CT Sizing Table provided for general reference below:” and updated following two tables, and changed 450 to 500 in first table, column #4, Row #3.
- 1.E.xv Edited: Added “Prior to completion of Schematic Design, the Design Professional shall confirm with UGA Project Manager if the contractor shall hire 3rd party NETA certified testing agency to perform ANSI/NETA ECS in conjunction with ANSI/NETA MTS for renovations.”

26 05 13 – Medium Voltage Cable

- New section added in its entirety.
- 1.B Added: “approved” before equal.
- 2.A.iv Added “with 133% insulation level” after ICEA S-94-649.
- Removed: Detail “Primary Concrete-Encased Ducts” and all details following this one in this section (3) moved to Section 33 71 19.



26 05 14 – Medium Voltage Cable Installation – Outside Contractor

- New section added in its entirety.

26 05 19 – Low-Voltage Electrical Power Conductors and Cables

- 2.A Edited: Changed “type THWN or XHHW 75 degrees C. For conductors #4/0 or larger, 90°C XHHW may be specified when required” to “type THWN-2, THHN, or XHHW-2 with 90 °C (194 °F) temperature rating for both dry and wet applications”.
- 2.B Edited: Added “the following” before “limited situations”.
- 2.B.ii Edited: Added “at lengths less than or equal to 6’-0””.
- 2.B.iii Edited: Added “prior” and “in writing by the Project Manager”.
- 2.C.i Edited: Added “(AWG)” and “shall be”.
- 2.C.iv Edited: Changed “No. 10” to “#10 AWG”.
- 2.C.v Edited: Changed “#10” to “#10 AWG”.
- 2.D.ii Edited: Changed “208/120V wye system” to “208Y/120V wye system (208V delta system shall have no neutral)”.
- 2.D.iii Edited: Changed “480/277V wye system” to “480Y/277V wye system (480V delta system shall have no neutral)”.

26 05 26 – Grounding and Bonding for Electrical Systems

- 1.B Edited: Changed “208/120V or 480/277V” to “208Y/120V or 480Y/277V”.
- 1.C Edited: Changed “All buildings shall” to “All buildings’ electrical services shall”, changed “Dependent upon project requirements, “grid” may be as simple as three grounding rods or consist of a buried bare copper grounding conductor around the perimeter of the building connecting to the structural steel, re-bars of the foundation etc.” to “Dependent upon project requirements, “grid” may be as simple as a three ground rod triad with each ground rod buried a minimum 2’-0” below finished grade and spaced 10’-0” apart horizontally forming an equilateral triangle, or a ground ring consisting of a buried bare copper grounding conductor connected to ground rods spaced 20’-0” on center around the perimeter of the building, and all vertical structural steel columns, re-bars of the foundation, incoming water service pipe within 5’-0” of its building entrance, etc. A separate grounding triad (as described above) shall be installed for the medium voltage side of a new building service (utility) transformer. It shall be separate from the building service grounding grid. It may be a single ground rod depending on the available space to install underground electrodes. This will be decided by the Design Professional in conjunction with the Project Manager. Typically, a minimum of two separate grounding electrode triads shall be installed. If for any reason the Design Professional needs to specify less than the two separate grounding triads, contact Project Manager.”
- 1.D Edited: Changed “ground shall use exothermic methods” to “ground shall have exothermic welds”.
- 1.E Edited: Added “for each grounding triad”.
- 1.F Edited: Changed “Any grounding resistance test with less than 25 ohms (per NEC) shall not be acceptable” to “It is undesirable to have grounding electrode systems buried under concrete, but if the grounding electrode system must be buried under concrete, a test well for each ground rod buried under concrete shall be provided. In



this case only, the top of ground rods shall be a minimum 18" below finished grade, but the grounding electrode conductors shall still be routed down and away from the ground rods at a minimum of 24" below finished grade. The test well shall have a minimum 12" inside diameter for unobstructed access to ground rods buried 18" below finished grade and a screw down cap. It shall have a length of 24" and slotted up to at least 12" below finished grade on at least two sides for grounding electrode conductor entry/exit. Leave a minimum of 3" of the top of each ground rod exposed (but still 18" below finished grade to top of ground rod) for ease of testing/maintenance access. The test well(s) shall be traffic rated in traffic areas."

- 1.G Added: "Perimeter steel columns in new buildings shall be bonded to its own ground rod with a #4/0 AWG bare, stranded, tinned, copper grounding electrode conductor down lead with the ground rod buried a minimum of 2' below finished grade, and a minimum 3' off the face of the building foundation. If buried under concrete, these ground rods shall have a test well as previously described."
- 1.H Added: "All grounding electrode system underground (buried) bare copper wire shall be tinned."
- 1.I Added: "Any grounding resistance test with less than 25 ohms (per NEC) shall not be acceptable."
- 1.J Edited: Changed "grounding rod(s)" to "grounding electrode", and changed "building ground system" to "building grounding system".
- 1.L Edited: Changed "Electric" to "Electrical".

26 05 33.13 – Conduit for Electrical Systems

- 2.A.i Edited: Changed "3/8" to "1/2", and added "in maximum 6'-0" length".
- 2.B Edited: Changed "Conduit for fire alarm" to "Conduit for all fire alarm systems", and changed "marked red a minimum of every ten feet" to "red or painted red".
- 2.C Added: "All exposed conduit in back of house, work room areas, mechanical rooms, etc. shall be galvanized rigid steel."
- 2.D Added: "All underground low voltage (0V up to 1000V) service secondary and other conduits shall be schedule 40 PVC transitioning to galvanized rigid steel at all elbows to include vertical members penetrating grade, unless otherwise specified. It shall also be encased in minimum 2" (two inches) of 3000 p.s.i. concrete cover around entire circumference of outer conduit(s) with minimum 2" (two inches) concrete separation between the outer circumferences of each conduit."
- 2.E Added: "All underground primary (medium voltage) conduit shall be 6-inch diameter Schedule 40- Type EB PVC transitioning to galvanized rigid steel at turn-up or turn-down elbows to include vertical members penetrating grade encased in minimum 3 inches of 3000 p.s.i. concrete cover around the entire exterior of the outer conduits' circumferences with minimum 3" (three inches) concrete separation between the outer circumferences of each conduit. Steel reinforcing bars for concrete duct bank shall be required in certain circumstances depending on the path of the duct bank itself (beneath roads, railroad tracks, etc.)."
- 2.F Added: "All underground conduits either turning upward or downward shall transition to galvanized rigid steel (galvanized rigid steel elbows) if not in concrete duct bank."



- 2.G Added: “All conduits specified for a project shall be in strict compliance with the NEC.”

26 05 43 – Underground Ducts and Raceways for Electrical Systems

- 1.A.v Added: “33 72 00 – Pad-Mount Utility Transformers”
- 2.A Edited: Changed “All medium voltage duct banks shall be 6 (six) inch diameter schedule 40-Type EB PVC, concrete encased, no exceptions are allowed” to “All medium voltage duct banks shall be 6-inch diameter schedule 40-Type EB PVC transitioning to galvanized rigid steel at turn-up or turn-down elbows to include vertical members penetrating grade, with minimum 3 inches of 3000 p.s.i. or greater concrete encased around the exterior of the duct bank, and 3 inches of concrete between the outer circumference of each conduit. Design for duct bank spacers every five (5) linear feet. No exceptions are allowed.”
- 2.B Edited: Changed “crossing roadways and driveways” to “crossing under roadways, driveways, and railroad tracks”, changed “with re-bars” to “with steel reinforcing bars (re-bar)”.
- 2.C Added: “Provide and install two (2) 200 lb. test nylon pull-strings in each empty conduit leaving a minimum of 4 feet excess for each pull-string at each end.”
- 2.D Added: “All elbows shall be the largest radius available.”

26 09 23 – Lighting Control Devices

- 3.A.ii Edited: Added “satisfactory” before “completion of the Work”.

26 09 36 – Modular Dimming Controls

- 1.B Edited: Changed “presets are required for classrooms” to “presets as listed below”, and changed “addressable controls” to “wireless addressable controls”.

26 22 00 – Low-Voltage Dry Type Transformers

- 1.B Edited: Changed “Transformer 15 kVA” to “Transformers 30 kVA”.
- 1.C Edited: Changed “15 kVA” to “30 kVA”, added “from a “trapeze” type mounting arrangement”, and added “signed and sealed”.
- 2.A Edited: Changed “(Two pluses and two minuses.)” to “(Minimum two pluses and two minuses) +5%; +2.5%; center tap (0%); -2.5%; & -5%.”
- 2.B Edited: Added “Low voltage dry-type transformers shall be high efficiency with copper windings and an 80 °C rise. If approved by Project Manager, a product up to a maximum of 115 °C rise can be selected. Aluminum windings may be specified on a case-by-case basis where weight is a concern with prior written variance approval from FMD engineering via the Project Manager.”
- 2.C Edited: Changed “(such as data centers.)” to “(such as data centers, labs with highly sensitive electronic equipment, etc.). Their “K” rating shall be determined by the Design Professional on the basis of their application.”

26 24 13 – Switchgears and Switchboards

- 1.B Edited: Changed “for incoming services” to “for each incoming electrical service” and changed “and” to “or”
- 2.B Added: “All switchgears/switchboards shall contain a fully-rated neutral bus bar.”



- 2.C Edited: Changed “Fuse” to “Fused.”
- 2.D Edited: Changed “400” to “800” and “insulated type” to “insulated case type”.
- 2.E Edited: Changed “Surge protective devices and metering package shall be standard for all switchgears and switchboards” to “Surge protection devices (transient voltage surge suppressors) and digital metering package shall be standard for all switchgears and switchboards. Automated Logic Controls (ALC) will provide a Veris “E50H5A” or equal power and energy meter with “U018” rope CT’s to be installed by the contractor in or adjacent to (in separate enclosure) the service switchgear/switchboard. It shall be programmed into the BAS by ALC.”
- 2.F Edited: Added “FMD Engineering via the Project Manager”.
- 2.G Added: “All switchgear/switchboard breakers shall be 100% rated, and each breaker shall have ground-fault protection.”
- 2.H Added: “All switchgear/switchgear breakers rated for 400A (four hundred amps) or greater shall have electronic tripping devices.”
- 2.I Added: “All switchgears/switchboards shall have short-circuit ratings greater than it’s short-circuit rating as determined by the Design Professional’s short-circuit analysis of the respective electrical system it is employed in.”
- 2.J Added: “Acceptable manufacturers are Square D, Eaton/Cutler-Hammer, and General Electric (GE). No exceptions.” Changed “Square D,” to “Schneider/Square D,”
- 2.K Added: “A breaker coordination study shall be performed on all new switchgear / switchboard installations to include all breakers downstream of the switchgear / switchboard as well. The instantaneous, long, short, and ground-fault time trip settings of each breaker shall be performed by the contractor and confirmed by the design and/or commissioning engineer prior to owner acceptance.”

26 24 16 – Panelboards

- 1.D Edited: Changed “fuse” to “fused”
- 1.E Edited: Changed “All electrical panels must be protected with shielding if there is a water line of any type located above any part of the electrical panel” to “All electrical panelboard enclosures shall be NEMA rated for the environment they reside in per the NEC”.
- 1.F Added: “All panelboards shall have copper bus bars.”
- 1.G Added: “Acceptable manufacturers are Square D, Eaton/Cutler-Hammer, and General Electric (GE),” and changed “Square D,” to “Schneider/Square D,”
- 1.H Added: “All panelboards shall have a short-circuit rating greater than it’s short-circuit rating as determined by the Design Professional’s short-circuit analysis of the respective electrical system it is employed in.”

26 24 19 – Motor-Control Centers

- 2.E Edited: Added “unless otherwise specified on MCC one-line diagram”.
- 2.F Edited: Changed “65k amps” to “for greater than or equal to RMS short-circuit amperage as specified on MCC one-line diagram by the Design Professional’s short-circuit analysis”.
- 2.G Edited: Added “unless otherwise specified”.
- 2.H Edited: Added “(or VFDs- Variable frequency Drives)”
- 2.I Edited: Changed “continued” to “continuous”, and changed “at” to “across”.



26 32 00 – Packaged Generator Assemblies

- 2.C Edited: Added “(non-switching neutral)”.

26 41 00 – Facility Lightning Protection

- 1.C Edited: Added “lightning protection”.

26 51 00 – Interior Lighting

- 1.B Edited: Added “UGA standards”.
- 1.C Edited: Added “The Lighting Fixture Schedule shall include for each fixture: fixture designation (A, B, A1, B1, X1, X2, OA, OB, etc.); fixture description; manufacturer(s); complete manufacturer(s) part number(s); lamp type/number of lamps (if not LED); lumen output for LED lighting fixtures; operating voltage; operating wattage or volt-amps; mounting type; mounting height; specific remarks or notes for individual fixtures (if required). If all lighting fixtures associated with a project are 4000K LED, a note within the Lighting Fixture Schedule will suffice for the lamp type and color temperature columns.”
- 1.D Edited: Added “manufacturers” before “cut-sheets”.
- 1.E Edited: Added “or area”.
- 1.G Edited: Added “if other than LED. The Lighting Fixture Schedule will suffice for this requirement.”
- 1.H.iii Added: “Light fixtures shall be installed so that all maintainable parts of the fixture are totally accessible.”
- 1.K.i Edited: Added “but this should be confirmed with the project manager on a project-by project basis”.
- 1.K.iv Table Edited: Added “Average” to “Foot Candle (fc) Guidelines” header, added “with 2:1 max.-to-min. ratio” to all cells under “Average Foot Candle (fc) Guidelines” header.
- 1.M Added: “Design Professional is responsible for ensuring control compatibility of lighting fixtures and accessories with the selected lighting control system.”
- 1.N Added: “Wall wash style downlighting on textured (i.e. tiled) walls shall not be permitted.”
- 2.A Edited: Added “when required by other than LED applications”.
- 2.B Edited: Changed “Offices, laboratories, and classrooms are typically furnished with 2 by 4 recessed fixtures. These fixtures shall receive 3 fluorescent lamps, T5 or T8” to “Offices, laboratories, and classrooms are typically furnished with 2’ x 2’ x 2’ x 4’ recessed fixtures (troffers). These fixtures shall be LED. Recessed fixtures shall be Philips “EvoGrid”, “EvoKit”, or approved equals. See manufacturer’s cut-sheets at end of this section for the `EvoGrid` complete fixtures and the `EvoKit` retro-fit kits for existing fluorescent troffers”, added images of manufacturer’s cut-sheets “Philips `EvoGrid` 2’x2’ LED Troffer,” “Philips `EvoGrid` 2’x4’ LED Troffer,” “Philips `EvoKit` 2’x2’ LED Troffer Retro-Fit Kit,” and “Philips `EvoKit` 2’x4’ LED Troffer Retro-Fit Kit” to end of section, and added “All new 2’ x 2’ troffers shall have an efficacy of greater than or equal to 110 lumens/Watt, and 2’ x 4’ troffers shall have an efficacy of greater than or equal to 130 lumens/Watt.”
- 2.D Edited: Removed “fluorescents or dimmable”.



- 2.E Edited: Changed “All interior lamps, except for UGA Housing, shall have a color temperature of approximately 4100K” to “All interior lighting shall have a color temperature of approximately 4000K” and “If the Design Professional has design reasons for 3000K it should be discussed with the Project Manager and a variance submitted for approval. It is imperative that one consistent color temperature is used within any one facility” to “If the Design Professional has design reasons for other than 4000K it should be discussed with the Project Manager and a variance submitted in writing for approval”.
- 2.F Edited: Removed previous item in its entirety.
- 2.H Added: “High-Intensity Discharge lighting is not allowed except in research applications where it is required, and will be requested by the Project Manager.”
- 3.A Edited: Changed “LED warranties: 26 56 00 Exterior Lighting, the section entitled ‘Warranty of LED Fixtures’ applies to interior LED fixtures” to “Warranty of LED Fixtures: UGA will seek written assurances from the manufacturer that the product will perform as claimed in terms of life.
 - i. Provide a written five year on-site replacement of material, fixture finish, and workmanship. On-site replacement includes transportation, removal, and installation of new products. Finish warranty must include warranty against failure or substantial deterioration such as blistering, cracking, peeling, chalking, or fading.
 - ii. Provide a written five year replacement material warranty for defective or non-starting LED source assemblies.
 - iii. Provide a written five-year replacement material warranty on all power supply units (PSUs), which are the LED drivers.
 - iv. Provide a written five year replacement warranty for luminaires producing inadequately-maintained illuminance levels at end of warranty period, as prorated from levels expected at end of useful life. For example, a luminaire expected to produce 70% of initial lumens at 100,000 hours would be expected to last over 11 years (continuous operation), so levels would be expected to be at 87% of initial at end of five-year warranty period. Warranty must cover all light sources (LED package, LED array, or LED module) including, but not limited to the LED die, encapsulate, and phosphor. If the expected useful life of the luminaire system is not maintained, the manufacturer must replace the light source(s) or luminaire(s) as needed at no cost to the University.
 - v. Owner may request an optional ten year replacement warranty for inadequately-maintained illuminance levels, finish of luminaire, power-supply unit (PSU), or defective LED source assemblies. The terms of the extended warranty will be negotiated by the Owner and the luminaire manufacturer for an additional cost.”

26 56 00 – Exterior Lighting

- 1.C.ii Edited: Changed “Design Professional may incur charges” to “Design Professional shall incur charges”.
- 1.C.iii Edited: Changed “and lamp schedules” to “and lighting fixture schedule(s) (see section 26 51 00, 1. General, C. regarding to Lighting Fixture Schedules,” and removed “The Office of University Architects for Facilities Planning recommends that Design



Professionals be Lighting Certified by the National Council for Qualification of Lighting Professionals (NCQLP). The NCQLP has established the LC certification process, by which practitioners in lighting and related fields, through testing, demonstrate their knowledge and experience across the lighting professions.”

- 1.C.iv Added: “The Office of University Architects for Facilities Planning recommends that Design Professionals be Lighting Certified by the National Council for Qualification of Lighting Professionals (NCQLP). The NCQLP has established the LC certification process, by which practitioners in lighting and related fields, through testing, demonstrate their knowledge and experience across the lighting professions.”
- 1.C.vii Added: “in minimum 1” diameter”.
- 1.D.iii Edited: Added “LED”.
- 1.D.iii.a Edited: Changed “White light sources are recommended for campus lighting” to “White LED light sources with a color temperature of 4000K are recommended for campus exterior lighting”, and removed “There have been numerous studies in the past decade, which analyze the effect of light source color in relationship to nighttime vision. Evidence has shown that white light is the most effective source in ambient luminance levels below 3cd/m². This luminance level applies to all exterior lighting on the UGA campuses. Early indications show that white light sources such as metal halide will be more efficient than high pressure sodium when visibility factors are considered. White light is more effective because of nighttime vision sensitivity, which is a combination of two components: cones (focus & day vision) and rods (peripheral and night vision). Our peripheral vision functions poorly when blue/green light is not present in the light source. As white light has all colors present in the spectrum, both rods and cones perform better under this light source. Peripheral vision is enhanced, allowing for faster reaction time, which potentially increases safety”.
- 1.D.iv.a Removed previous item in its entirety.
- 1.D.iv.b Removed previous item in its entirety.
- 1.D.iv.c Removed previous item in its entirety.
- 1.D.iv.a Added: “Do not use LED fixtures with less than 4000K color temperature.”
- 1.D.v.a Edited : Changed “Light fixtures shall be mounted in accessible locations so that the lighting can be maintained regularly. Specify fixtures that have simple mechanisms for lamp changing and captive hardware” to “Light fixtures shall be mounted in accessible locations so that the lighting can be maintained regularly. Specify fixtures that have simple mechanisms for lamp changing and tamper-resistant/captive hardware” and deleted “where parts will not fall out of the fixture and disappear. Use long-life lamps wherever possible and avoid the use of incandescent light sources without written approval of the OUA Project Manager. Specify tamper-resistant and captive screws in any area that may be accessible to the public.”
- 1.D.vi.a Edited: Change “The use of a dimming system or building automation system is not required, but encouraged where appropriate.” to “The use of a dimming system or building automation is allowed in special applications with the approval of the UGA Project Manager.”
- 1.D.vii.a Edited: Changed “(CIR)” to “(>= 70 CRI for exterior fixtures and >= 80 CRI for interior fixtures)”, changed “3000K” to “4000K”, deleted “A color rendering index (CRI) value of 70 or greater is the minimum recommendation for exterior light sources on campus, and 80 or greater for interior fixtures. Any LED products used in exteriors (or



- interiors) will adhere to these standards – refer to appendices regarding LED fixtures and standards”.
- 1.D.ix Edited: Replaced section in its entirety with:
 - a. Safety and security are paramount in an exterior environment. Factors other than horizontal illuminance should be taken into consideration when considering lighting design for safety. Vertical illuminance, glare, color of light, uniformity, contrast, and heat are equally important in lighting design. The ratios of average-to-minimum and maximum-to-minimum illuminance and luminance values shall be as per current edition of the IESNA Handbook’s recommended standards.
 - b. Fixtures should be placed such that they cannot easily or readily be touched by individuals, but are easily accessible to maintenance personnel. No design will be accepted where light fixtures are located so as to not be easily accessible by maintenance personnel.
 - c. At locations with CCTV cameras, special attention must be paid to the illumination levels and distribution because a camera perceives its surrounding very differently from the human visual system. The CCTV manufacturer and security consultant must be consulted for vertical and horizontal illuminance requirements as well as uniformity requirements for the system. There might also be a requirement of using fixtures with specific optical characteristics. The lighting should be specified and designed to adhere to these requirements.
 - 1.E.v.a.3 Edited: Changed “metal halide lamps, LED or fluorescent light sources of 3000K CCT, and 80+ CRI” to “LED light sources of 4000K CCT, and >/+ 70 CRI (>/= 80 CRI for interior fixtures)”.
 - 1.E.vi.a Edited: Added “Point-by-point spacing shall be determined by FMD Engineering via the Project Manager on the basis of the size of the area to be lit, and boundary restrictions such as light pollution, etc.”.
 - 1.F.i.a Edited: Removed “Life of LED lighting is not yet well understood given the relative newness of the technology for this application”.
 - 1.F.ii.a Edited: Changed “LED systems” to “LED lighting systems” and “greater the 200K” to “greater than 200K”.
 - 1.F.ii.b Edited: Changed “70 and above” to “4000K, and a color rendering index (CRI) of 70 or greater (>/=80 CRI for interior fixtures)”.
 - 1.F.iii.c Edited: Added “which are the LED drivers”.
 - 1.F.iv Edited: Replaced section in its entirety with:

The following is a list of requirements for all LED light fixtures:

 - a. UL/ETL listed as a whole assembly;
 - b. Only accept fixtures with LED chips manufactured by Philips, Osram, GE, Nichia, Cree, Hitachi and Xicato;
 - c. Provide LM80 test results from the LED chip manufacturer showing minimum 6000 hours of test time, conducted by the chip manufacturer using bare LED chips;
 - d. Provide LM79 test results for the fixture for total lumen output, electrical characteristics, efficacy and color characteristics, conducted by the manufacturer of the fixture with LEDs installed in it;



- e. Provide L70 test results guaranteeing a minimum 70% of initial lumens at 50,000 hours, at full current and ambient temperature of the room/application that the fixture is designed for;
 - f. Provide binning size of the LED chips. This indicates the amount of consistency and variation in color of the white LEDs. Recommended bin sizes are $\pm 25K$ for premium interior spaces, $\pm 75K$ for standard interior spaces and outdoor signage lighting, and $\pm 150K$ for outdoor area lighting;
 - g. Correlated Color Temperature (CCT) for the fixtures – UGA standard color temperature for interior & exterior lighting is 4000K, except for special applications;
 - h. Color Rendering Index (CRI) of minimum 70 for exterior and 80 for interior lighting fixtures;
 - i. Minimum 5 years warranty – refer to the section on LED warranty).
- 2.C.E3.a Removed previous item in its entirety
 - 2.C.E3.b Edited: Changed “E3.a. and E3.b.” to “E3.ab.”.
 - 2.D.E4.a Removed previous item in its entirety.
 - 2.D.E4.b Edited: Changed “Fixture E4.b” to “Fixture E4.a”
 - 2.E Added:
“E. For Interior Grid Ceiling Recessed Fixtures – E4
See Section 26 56 16 – Interior Lighting.
E4.a. Recessed Grid Lay Fixture (Troffer) – LED
E4.b. LED Retrofit For Fixture E4.a.”

26 56 13 – Lighting Poles & Standards

- 2.B.E1.a. Removed three previous items entirely
- 2.B.E1.b. Removed previous item in its entirety.
- 2.B.E1.c Edited: Changed “Pole for E1.a., E1.b., and E1.c.” to “Pole for E1.a. and E1.b.”

26 56 16 – Parking Lighting

- 1.G Removed previous item in its entirety.
- 1.G Edited: Changed “All new and renovated parking garages that employ fluorescent or LED lighting, the following features and controls shall be incorporated in conjunction with a dedicated lighting relay panel (Wattstopper or similar)” to “All new and renovated parking garages shall employ LED lighting with the following features and controls incorporated in conjunction with a dedicated lighting relay panel (Wattstopper or similar)”.
- 2.B.E3.a Removed previous item in its entirety.
- 2.B.E3.b Edited: Removed “and E3.b”.
- E3.a Removed previous item in its entirety.
- E3.a.A.i Edited: Changed “equal to Lumen Roadstar, 4000K LED with 70 CRI” to “equal to Philips Lumec RoadStar, 4000K CCT with ≥ 70 CR”, and edited “Mounting” specifications cut-sheets.
- E3.a.A.ii Edited: Added “Mountings shall be equal to Philips Lumec DC 6 / DC 8, PSA2.375 / PSA3 / PSA4, or RSAR.”
- E3.b.A.i Edited: Updated cut-sheets images.



- E3.b.A.ii Edited: Added “If using the DC6 / DC8 arm mountings (see E3.a.A.ii specifications), use Philips Lumec ATR85 pole as it does not easily fit with the KIM pole. Project Manager shall be notified of this change.”
- E4.a Removed previous item in its entirety.
- E4.a.A.i Edited: Changed “Equal to KIM Lighting PGL5 fixture, 175W metal halide lamping with HPF magnetic ballast, UV stabilized acrylic refractor lens, tamper resistant latches and integral quartz standby as required, standard white powdercoat finish” to “Equal to KIM Lighting PGL7-LED fixture, 65W or 84W (as required), 4200K CCT with \geq 70 CRI, standard UV stabilized acrylic refractor lens, tamper resistant latches, integral fusing (1 for 1-pole/2 for 2-pole circuits), -20°F to 104°F & IP65/IP66 rated, and standard white powdercoat finish,” and updated cut-sheets.
- E4.b.A.i Edited: Changed “Equal to GUTH Lighting vandal resistant DURASEAL fixture, acrylic lens with smooth outer surface, specular reflector, 2 – 32W T8 lamping with electronic instant start ballast, tamper-resistant and tool free latches, standard finish” to “Equal to Lithonia Lighting wet location, vandal resistant VAP LED fixture, clear polycarbonate lens, 4000K CCT with \geq 70 CRI, integral fusing (1 for 1-pole/2 for 2-pole), tamper-resistant and tool free stainless steel latches, standard white powdercoat finish, -20°F to 104°F & IP65/IP66 rated,” and updated cut-sheets.
- E4.c.A.i Edited: Changed “4000K with 80CRI” to “4000K CCT with \geq 80CRI”.
- E4.d.A.i Edited: Changed “4100K CCT with 70 CRI” to “4100K CCT with \geq 70 CRI”.
- E4.e.A.i Edited: Changed “5000K nominal CCT, CRI 70 minimum” to “5000K nominal CCT with \geq 70 CRI”.

26 56 19 – Roadway Lighting

- 2.A Edited: Added “and Section 26 56 16 Parking Lighting”.

26 56 29 – Site & Building Entry Lighting

- 1.B.iii Edited: Changed “Ninth Edition” to “Tenth Edition”

26 56 33 – Walkway Lighting

- 1.D Added: “UGA does not allow the use of lighted bollards.”

27 00 00 – General Communications Requirements

- 3.B Added note to table: “Refer to electrical and mechanical drawings for locations of Environmental Controls (HVAC) Network Drop location.”

27 05 26 – Grounding & Bonding for Communication Systems

- 1.B.ii Added: The minimum telecommunications bonding backbone (TBB) conductor size shall be a No. 6 American Wire Gauge (AWG). The TBB should be sized at 2 kcmil per linear foot of conductor length up to a maximum size of 750 kcmil. Bonding conductors used for telecommunications should be sized using engineering calculations. See table below.

TBB Conductor Size vs Length	
<i>TBB/GE linear length in meters (ft)</i>	<i>TBB/GE size (AWG)</i>



Less than 4 (13)	6
4 – 6 (14 – 20)	4
6 – 8 (21 – 26)	3
8 – 10 (27 – 33)	2
10 – 13 (34 – 41)	1
13 – 16 (42 – 52)	1/0
16 – 20 (53 – 66)	2/0
20 – 26 (67 – 84)	3/0
26 – 32 (85 – 105)	4/0
32 – 38 (106 – 125)	250 kcmil
38 – 46 (126 – 150)	300 kcmil
46 – 53 (151 – 175)	350 kcmil
53 – 76 (176 – 250)	500 kcmil
76 – 91 (251 – 300)	600 kcmil
Greater than 91 (301)	750 kcmil

27 05 43 – Underground Ducts & Raceways for Communication Systems

- 3.A.xi Edited: Changed “Multiply” to “Multiple”

27 15 00 – Communications Horizontal Cabling

- 1.G Edited: Changed “Two Cat6 Communication cables, capable of delivering either data or voice services are typical per office space receptacle box” to “Two ports served by the Cat6 communication cables capable of delivering either data or voice services are typical per office space receptacle box”
- 1.P Added: “For small projects, the extent of cabling replacement to current standards contained herein shall be determined on a case-by-case basis with the input of EITS, the OUA/FMD project manager, and the departmental point of contact. Factors to be considered shall include a speed test of existing cabling (by EITS), the anticipated speed demands required by end-users, funding availability, and project schedule.”

27 41 00 – General Audio-Video Systems Requirements

- 2.A.i Edited: Removed “or equal”.
- 2.A.ii Edited: Changed “blue jacketed” to “green jacketed”.
- 2.C.ii.c Edited: Changed “Program playback speakers (typically distributed ceiling speakers) and associated amplifier(s)” to “Program playback speakers and associated amplifier(s), which include either a distributed speaker system with a left and right channel mix for small to medium sized rooms or separate left and right channel low impedance speakers for larger spaces.”
- 2.C.ii.f Edited: Changed “For larger spaces, speech reinforcement systems including wired and wireless microphones, digital signal processors (DSPs) and the same speakers and amplifiers required for AV program playback” to “Speech reinforcement systems including wired and wireless microphones, digital signal processors (DSPs) and distributed ceiling speakers.”



27 41 00 01 – Audio-Visual Control System

- 2.A Edited: Removed “(AMX touchpanel filename: egUGA, CR4,Rev2_51_X700_dn.TP4),” added “This example touchpanel file “_UGA,CR5,Rev2_5_X700_dn.TP4” and”.
- 3.D.iv Removed: Projector Closed Caption button feedback will light to follow the status of the closed caption decoder reported by projector.
- 3.N.v.j Removed: Window shades open.
- 3.T.vi Removed: **RESET** button will reset all setting to default (usually provided by resending power on command to document camera).
- 3.U.ii-iv Edited: Removed section in its entirety.
- 3.U.iv Edited: Changed “field 5” to “field address port 5 code 14”.
- 3.Z Edited: Section added in its entirety.
- 3.AA Edited: Changed “Technician page should allow user to enter time of day for daily shutdown of the projector (default 23:59 midnight)” to “By default an automated shutdown will occur every night at 23:59 midnight. In addition automated system shutdown can also occur as scripted by user via RMS”.
- 3.BB Edited: Removed section in its entirety.
- 3.CC Edited: Removed section in its entirety.

32 17 23 – Pavement Marking

- 2.A Edited: Changed “Parking space pavement marking paint for asphalt or porous concrete shall be water-base traffic paint (without glass beads) that meets federal specification TTP 1952-E (TYPE?) (Traffic and Airport Marking) and the Department of Transportation (D)T specification 971-3 (VERIFY SOURCE OF SPECIFICATION)” to “Parking space pavement marking paint for asphalt or porous concrete shall be water-borne traffic paint (without glass beads) that meets applicable sections of the Georgia Department of Transportation (GDOT) specification 870.2.02.”

33 00 00 – General Utilities Requirements

- 1.H Added: “Design Professional shall provide spot elevations for hardscape and landscape elements as required to clearly illustrate storm water flow direction.”
- 1.I Added: “Design Professionals shall route all utilities to avoid the critical root zone of mature trees and landscapes. When absolutely necessary to enter the critical root zone of mature trees a licensed arborist must be consulted to determine the best course of action for attempting to preserve the tree.”
- 1.J Added: “Design Professional shall include pedestrian re-routing plans and traffic control drawings where applicable.”
- 1.K Added: “Underground utilities, to include electrical duct-bank, communications conduit, or any other conduit that can be damaged by high temperatures shall be protected at steam pipe crossings (in the case of steam piping failure or insulation failure) in the immediate vicinity (within 36 inches). The protection shall consist of both thermal and physical barriers utilizing a minimum of 12-inch thick Gilsulate (or equal)



and a physical barrier (3/8-inch thick, 316 grade stainless steel plate). The protection shall extend a minimum 12 inches in every direction beyond the crossing of the steam line.”

33 30 00 – Sanitary Sewerage Utilities – Sanitary Sewer Collection System

- 1.C Added: “Sanitary sewer piping shall be installed in a 6-inch minimum sand bed. Gravel is not acceptable.”
- 1.D Added: “Schedule 40 PVC is acceptable for use under concrete slabs.”

33 60 00 – Hydronic and Steam Energy Utilities

- 2.D Edited: Removed “equal to McGard, LLC FiberShield Manhole with lock”.
- 2.D.i Edited: Changed “Fiber reinforced polymer” with “Cast iron construction with load rating appropriate for location”.
- 2.D.ii Edited: Changed “H-20 and AASHTO HS-25 load rating for 80,000 lb.” to “Molded with “STEAM” inscription”.
- 2.D.iii Removed items in their entirety
- 2.D.iv Removed items in their entirety
- 2.D.v Removed items in their entirety
- 2.D.vi Removed items in their entirety
- 2.E Added: “E. Chilled Water manhole cover equal to Virtual Polymer Compounds, LLC (VPC) manhole cover with penta-socket bolt head lock(s).
 - i. H-20 and AASHTO HS-25 load rating for 80,000 lb.
 - ii. Self-containing locking system that provides cover to frame retention and security from unauthorized entry and uses a penta-socket bolt head.
 - iii. Fiber reinforced polymer
 - iv. Egress handle:
 - a. Provide a manual pull handle for use by individual inside the manhole a means to exit
 - b. All plastic construction to resist corrosion, parts molded in high visibility yellow
 - c. Pulling the handle will latch open one of the cartridge assemblies and allow the person to push the cover out of the frame and then exit.
 - v. Ultraviolet radiation will not affect long term performance of composite manhole cover.
 - vi. Logo Plate: Stainless Steel plate 1/8” thick that as appropriate says “CHILLED WATER”.
 - vii. All metallic hardware shall be 316 stainless steel.”

33 71 19 – Hydronic and Steam Energy Utilities

- 2.A Edited: Removed “equal to McGard, LLC FiberShield Manhole with lock” and added “/handhole cover equal to Virtual Polymer Compounds, LLC (VPC) manhole cover with penta-socket bolt head lock(s).”
- 2.A.ii Edited: Removed “multipurpose T key” and added “penta-socket bolt head”
- 2.A.vii Added: “All metallic hardware shall be 316 stainless steel.”
- 2.B Added: “Manhole/Handhole Cable Racking



- i. Underground Devices Incorporated “BNT Non-Metallic Cable Support” system with 316 stainless steel stanchion hardware, or approved equal.”
- 3 Added: “EXECUTION/INSTALLATION
 - A. All conduits entering/leaving manholes shall be straight for a minimum of 2’-0” (no bends) off of the exterior walls of the manhole/handhole, and there shall be no conduit elbows into or out of manholes/handholes.
 - B. Leave a minimum of 1’-0” of conduit extending into manhole when using cored holes.”