PBK, P.O. BOX 880, GRIFFIN, GA 30223

ADDENDUM NUMBER FIVE: DATED: November 2, 2026

To: All prime contract bidders of record.

This addendum forms a part of the Contract Documents and modifies the original Specifications and Drawings dated September 11, 2026, as noted below. **Acknowledge receipt of this Addendum in the space provided on the Bid Form;** failure to do so may subject bidder to disqualification.

BID DATE: November 5, 2026

SPECIFICATIONS

1. Section 087100 – DOOR HARDWARE
   A. 3.7 Hardware Sets
      A. Add the following door to Set #39 – INT SGL – 45H D- AFP
         Door No. J16
      B. Add the following doors to Set #42 – INT SGL – 45H R
         Door No. B58, B60
      C. Add the following door to Set #46 – INT SGL – 45H AT
         Door No. B59

2. Section 113010 – APPLIANCES
   A. Add the following on page 4 as Paragraph 2.5.C:

   "C. Stacked Clothes Washer and Dryer CWD
      1: Residential Stacked Clothes Washer and Dryer:
         Manufacturer: Subject to compliance with requirements, provide selected products by one of the following:
         a. General Electric Corp.
         b. Maytag
         c. Whirlpool Corp.
      2. Type: Freestanding, stacked washer and dryer unit, washer top loading, dryer front loading.
      3. Dimensions:
         a. Width: [27] inches ([685.8] mm).
         b. Depth: [30] inches ([762] mm).
         c. Height: [76] inches ([1930.4] mm).
      4. Washer Drum: Perforated stainless steel.
         a. Capacity: 3.8 cu. ft.

b. Dryer Capacity: 5.90 cu. ft.

5. Controls: Rotary-dial controls for water-fill levels, wash/rinse water temperatures, and variable-speed and fabric selectors.

a.Wash Cycles: 11 wash cycles, including regular, delicate, and permanent press.

b. Dryer Cycles: 4

6. Electrical Power: 120 V, 60 Hz, 1 phase, 30 A.

a.Motor: Manufacturer's standard with built-in overload protector.

7. Washer Features:

a. Agitator: Center spindle.

b. 6 wash/rinse temperatures.

8. Dryer features:

a. Long vent capability”

3. Section 116623 – GYMNASIUM EQUIPMENT

A. Delete Paragraph 2.3 and Replace with the following:

2.3 VOLLEYBALL EQUIPMENT

A. Basis-of-Design Product: Subject to compliance with requirements, provide SportsImports; Volleyball Floorplate and Sleeve – Model KA25-FW or comparable project.

B. General: Provide equipment complying with requirements in NFHS’s “NFHS Volleyball Rules Book.”

C. Floor Insert: Solid-brass floorplate to be a brushed finish of 6 5/8” dimeter with hinged access cover, with a 5” opening. Removable, threaded, or pin swivel covers are unacceptable. Plate shall be .25: thick and shall be designed to be compatible with all floor surfaces. In a wood floor, the plate shall be fastened only to the wood floor so that it can move with any expansion or contraction of the floor. Sleeve shall be tubular steel of .140” thickness, 8 7/8” long and 3 1/16” internal diameter. Seamed tubing or pipe is unacceptable. Sleeve shall have three pre-drilled flanges for attachment to the plate during the installation in accordance with manufacturer’s instructions and shall have a nitrated finish to resist corrosion. The bottom of the sleeve shall be 10” from the floor surface.

4. Section 116833.33 – BASEBALL FIELD EQUIPMENT

A. Delete this section in its entirety and replace with section 116833.33 – BASEBALL FIELD EQUIPMENT included within this addendum.

A. Includes revisions to specified Indoor Batting Tunnel System.

5. Section 133419 – METAL BUILDING SYSTEMS

A. Page 7, Paragraph 2.4.G;

A. Delete Paragraph 2.4.G in its entirety and replace with the following:

“2.4.G. Bracing: Provide adjustable wind bracing as follows:

1. Rigid Portal Frames: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.

2. Pinned-Base Columns: Fabricated from shop-welded, built-up steel plates or structural-steel shapes to match primary framing; of size required to withstand design loads.
3. Diaphragm Action of Metal Panels: Design metal building to resist wind forces through diaphragm action of metal panels."

B. Page 8, Paragraph 2.5 – Metal Roof Panels, Section A, Subsection 1.

A. Delete line 2.5.A.1. – "Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.030-inch (0.76-mm) nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M." **Revise to Read** ""Material: Zinc-coated (galvanized) or aluminum-zinc alloy-coated steel sheet, 0.024-inch (0.61-mm) nominal uncoated steel thickness. Prepainted by the coil-coating process to comply with ASTM A 755/A 755M."

6. Section 260500 – COMMON WORK RESULTS FOR COMMUNICATIONS
   A. On Page 3, add the following as paragraph 1.2.18:

"18. Section 265560 – Auditorium Lighting and Rigging

a. Product Data
b. Shop Drawings
c. Equipment List
d. Qualification Data
e. Warranties"

7. Section 265560 – AUDITORIUM LIGHTING AND RIGGING
   A. Add Section 265560 – AUDITORIUM LIGHTING AND RIGGING included within this addendum.

DRAWINGS

STRUCTURAL

1. SHEET S-201 – BATTING FACILITY FOUNDATION PLAN AND DETAILS

A. Delete Sheet S-201 in its entirety and replace with sheet S-201, included in this addendum.

ARCHITECTURAL

1. SHEET A-101B – FLOOR PLAN – SECTOR B

A. Detail No.1 – LEVEL 1 – AREA B FLOOR PLAN; See revisions to detail on SDA-101B included in this addendum.

1. Revisions include the addition of missing door numbers and tags.

2. SHEET A-101J – FLOOR PLAN – SECTOR J

    A. Space: Jan 506.1

        1. Add door Tag on door opening out from Jan 506.1 to be labeled “J16”

3. SHEET A-405 – ENLARGED TOILET PLANS

    A. Detail No.12 – ENLARGED TOILET PLAN SECTOR J; See revisions to detail on SDA-405 included in this addendum.

    B. Detail No.13 – ENLARGED TOILET PLAN SECTOR J; See revisions to detail on SDA-405 included in this addendum.

4. SHEET A-502AA – BATTING FACILITY EXTERIOR ELEVATIONS & ROOF PLAN

    A. General Elevation Notes; Delete Note No. 14 in its entirety.

5. SHEET A-810 – DOOR SCHEDULE

    A. Door Number J12; Door Type; “HG-1” Revise to Read “FGIR”

    B. Add the Following Doors and Information pertaining to each:

        1. Door No. **B58**; SNGL or PAIR; **SNGL**, Space Name: **STORAGE**, Door Size: **3’-0”x7’-0”,** Door Type: **F**, Door Material: **WD**

        2. Door No. **B59**; SNGL or PAIR: **SNGL**, Space Name: **OFFICE**. Door Size: **3’-0”x7’-0”,** Door Type: **HG-1**, Door Material: **WD**

        3. Door No. **B60**; SNGL or PAIR: **SNGL**, Space Name: **STORAGE**, Door Size: **3’-0”x7’-0”,** Door Type: **F**, Door Material: **WD**

        4. Door No. **J16**; SNGL or PAIR: **SNGL**, Space Name**: JANITOR**, Door Size: **3’-0”x7’-0”,** Door Type **F**, Door Material: **WD**

6. SHEET A-812 – SIGN SCHEDULE AND DETAILS

    A. Add the Following Signs and information pertaining to each:

        1. Door No, **B58**, To Room: **Storage**, To Room Number: **703.3**, Sign Type: **C**, Line Text 2: **STORAGE**

        2. Door No. **B59**, To Room: **Office**, To Room Number:**703.1**, Sign Type **A**, Line Text 2: **OFFICE**

        3. Door No. **B60**, To Room: **Storage**, To Room Number: **703.2**, Sign Type: **C**, Line Text 2: **STORAGE**

        4. Door No. **J16**, To Room: **Cust**, To Room Number: **506.1**, Sign Type: **C**, Line Text 2: **JANITOR**

7. SHEET A-902 – FINISH FLOOR PLAN – ALTERNATE NO.1

    A. Detail No.1 – LEVEL 1 – FINISH FLOOR PLAN

        1. Change the following area to be PC – Polished Concrete

            1. 719.12 – Dish Return

8. SHEET A-931 – INTERIOR ELEVATIONS

    A. Detail No.1 – AUDITORIUM – INTERIOR ELEVATION

        1. Delete Detail Title. **Revise to Read** BAND 513 – INTERIOR ELEVATION]

    B. Detail No.2 – AUDITORIUM – INTERIOR ELEVATION

        1. Delete Detail Title. **Revise to Read** BAND 513 – INTERIOR ELEVATION

    C. Detail No.3 – AUDITORIUM – INTERIOR ELEVATION

        1. Delete Detail Title. **Revise to Read** BAND 513 – INTERIOR ELEVATION

    D. Detail No.4 – AUDITORIUM – INTERIOR ELEVATION

        1. Delete Detail Title. **Revise to Read** BAND 513 – INTERIOR ELEVATION]

ELECTRICAL

9. SHEET ED101 – OVERALL ELECTRICAL DEMOLITION PLAN

    A. Delete Sheet ED101 in its entirety and replace with Sheet ED101, included in this addendum.

10. SHEET E-201J – ELECTRICAL POWER LEVEL 1 – AREA J FLOOR PLAN

    A. Delete Sheet E-201J in its entirety and replace with Sheet E-201J, included in this addendum.

11. SHEET E-502 – ELECTRICAL STAGE LIGHTING RISE DIAGRAM

    A. Delete Sheet E-502 in its entirety and replace with Sheet E-502, included in this addendum.

SECTION 116833.33 - BASEBALL FIELD EQUIPMENT

PART 1 GENERAL

1.1 SUMMARY

A. Provide all equipment and materials, and do all work necessary to furnish and install the athletic equipment, as indicated on the drawings and as specified herein. Athletic equipment shall include, but not be limited to:
   1. BTIPND – Indoor Batting Tunnel; Perimeter Netting with Divider(s)

1.2 RELATED WORK

A. Examine contract documents for requirements that affect work of this section. Other specification divisions and sections that directly relate to the work of this section include, but are not limited to:
   1. 06 16 00 - Sheathing
   2. 13 34 19 - Metal Building Systems
   3. 26 00 00 - Electrical

1.3 SUBMITTALS

A. Manufacturers Product Data
   1. Provide manufacturers product data prior to actual field installation work, for Architect's review.

B. Shop Drawings
   1. Provide drawings of the manufacturers recommended installation requirements prior to actual field installation work, for Architect's review.

1.4 QUALITY ASSURANCE

A. Manufacturer's warranties shall pass to the Owner and certification made that the product materials meet all applicable grade trademarks or conform to industry standards and inspection requirements.

1.5 PRODUCT DELIVERY AND STORAGE

A. Materials delivered to the site shall be examined for damage or defects in shipping. Any defects shall be noted and reported. Replacements, if necessary, shall be immediately re-ordered, so as to minimize any conflict with the construction schedule. Sound materials shall be stored above ground under protective cover or indoors so as to provide proper protection.

PART 2 PRODUCTS

2.1 BTITB – INDOOR TENSION BATTING TUNNEL; BASEBALL

A. Basis-of-Design: Subject to compliance with requirements, provide BTIPND – Indoor Batting Tunnel; Perimeter Netting with Divider(s) as Manufactured and Supplied by:: Sportsfield Specialties, Inc. or comparable product approved by Architect.
   1. Sportsfield Specialties, Inc.
   2. P.O. Box 231
   3. 41155 State Highway 10
   4. Delhi, NY 13753
   5. p. 888-975-3343
   6. www.sportsfield.com

2.2 COMPONENTS:

A. Indoor Batting Tunnel; Perimeter Netting with Divider(s):
   1. Project-Specific Building Connections
      a. Wall Mounts or Ceiling Drop-Down Extension Arms Provided as Required
      b. Super Durable Powder Coated Finish (Various Colors Available)
      c. Note: Main Building Support Structure by Others

2. Tension Cable Support Structure
    a. Galvanized Aircraft Cable and Hardware Assembly Sized as Required
    b. (2) Stacked Cables at Divider Locations Only to Allow for Horizontal Retractability
    c. 3/16” Stainless Steel Spring Clip Attachment every 12” o.c.
3. Batting Tunnel Net
    a. Fixed Perimeter and Ceiling Netting: Size as Required by Drawings
        1) #60 Black Nylon 1-7/8” Square Mesh Net
        2) #60 Twisted Knotted Netting
        3) 100% Nylon Construction
        4) 2.95mm (0.116”) Diameter Twine
        5) 84% Open Mesh Area (See-Through Visibility)
        6) 560 lb. Minimum Breaking Strength
        7) 1-7/8” (48mm) Maximum Square Mesh Size
        8) 0.067 lbs. per Square Foot
        9) Black Multi-Filament Polypropylene Solid Braid Derby Rope Sewn Binding on Perimeter Edges – ¼” Diameter, 530 lb. Minimum Breaking Strength
        10) UV and Weather Treated
    b. Divider Netting Panel(s): Quantity and Size as Required by Drawings
        1) 1’ of Excess Net at Bottom to Reduce Deflection
        2) #36 Black Nylon 1-3/4” Square Mesh Net
        3) #36 Twisted Knotted Netting
        4) 100% Nylon Construction
        5) 2.6mm (0.1023”) Diameter Twine
        6) 87% Open Mesh Area (See-Through Visibility)
        7) 13,363 psi Minimum Breaking Strength
        8) 1-3/4” (44mm) Maximum Square Mesh Size
        9) 0.0425 lbs. per Square Foot
        10) Black Multi-Filament Polypropylene Solid Braid Derby Rope Sewn Binding on Perimeter Edges – ¼” Diameter, 530 lb. Minimum Breaking Strength
        11) UV and Weather Treated
    c. (4) 4’W x Full Height Openings with Curtain Style Exterior Overlap Flaps
4. Accessories:
        1) Weighted Rope Bottom Deadweights
        2) Factory-Sewn / Integrated into Batting Tunnel
        3) Samson Rope Dura Oceanmaster Weighted Rope®
            (a) Flexible / Easy to Handle
            (b) Surface Yarns on Cover Designed to Lash to Netting
            (c) 2,000 lbs. Average Strength
            (d) 250 lbs. per 100 Fathoms Material Weight (0.42 lbs/ft)
        4) 2’ High #60 Black Nylon 1-7/8” Square Mesh Netting Baffles to Prevent Ball Pass-Through

PART 3 EXECUTION

3.1 INSTALLATION OF EQUIPMENT

A. All Indoor Tension Batting Tunnels shall be installed as recommended per manufacturer's written instructions and as indicated on the drawings. Concrete anchoring foundations to be determined by others based on local soil conditions and building codes. Installer should have a minimum of five (5) baseball/softball equipment installations or similar experience in the previous three (3) years.

END OF SECTION

SECTION 265560 - AUDITORIUM LIGHTING AND RIGGING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Work of this Section, as shown or specified, shall be in accordance with the requirements of Division 1 and Division 00 Specifications and the Contract Documents and Owner provided General Conditions. In all cases the most stringent and/or specific requirement shall prevail.

B. Provide labor, materials, and equipment for the installation of networked lighting control system(s) as shown on the drawings and specified herein, including delivery F.O.B. job site.

C. Refer to drawings for dimensions and details. Check and verify dimensions and details on drawings before proceeding with the work. Report any discrepancies at once to the Lighting Designer. Should it appear that the work intended is not sufficiently detailed or explained on the drawings or in the specifications, apply to the Lighting Designer for further drawings or explanations, as may be necessary. Conform to these explanations in the work. If any question arises about the true meaning of the drawings or specifications, refer the matter to the Lighting Designer whose decision is final and conclusive. In no case submit a bid or proceed on any work with uncertainty.

D. The intention of this specification, the related drawings, and schedules is to enable the Contractor to provide a job complete in every respect. However, any risers or schematics which are included are for explanation of system intent only. It is the responsibility of the Contractor to verify the required components and their interconnections. Any engineering questions should be directed to the project's Electrical Engineer of record for resolution. Contractor is responsible for this result and for supplying a complete, integrated, and working system.

E. The installing Electrical Contractor shall be responsible for installation of the equipment furnished under this section and for coordinating its work with the work of the Lighting Systems Integrator. The equipment of this Section shall be furnished by a qualified Lighting Systems Integrator as a direct subcontractor to the installing Electrical Contractor.

1.2 DEFINITIONS

A. In this specification, the term "Lighting Designer" includes the Lighting Designer, Owner's representative and/or the Lighting Consultant, together or individually as they shall decide.

B. The term "Owner" and "Architect" as used herein refer to the organization(s), individuals and their representatives as typically defined.

C. "Lighting Control System" refers to dimming and/ or relay equipment, control panels, control stations, and associated software.

D. The term "Contractor", "Electrical Contractor", or "installing Electrical Contractor" as used variously herein refer to the company, organization, individuals and their representatives who shall:
   1. Install the networked power and lighting control equipment.
   2. Provide the conduit, wire, back boxes and installation labor to complete the Lighting Control System.
      a. For this document low-voltage (control) cable is defined as cable carrying 48VDC or less for the purposes of providing signal level information to devices or fixtures.

E. The term "Lighting Systems Integrator", hereafter referred to as LSI, as used herein refers to the company, organization, individuals, and their representatives who shall:
   1. Furnish the power and lighting control equipment as specified.
   2. Furnish the low voltage control wire for installation by the electrical contractor.
   3. Provide supervision of the system installation, low-voltage (control) cable termination, system startup, and initial system programming as described in the specifications.

4. Employ full time Systems Integrators, Project Managers, and factory authorized Field Service Technicians with experience in completing work of similar or greater size and scope. All fixtures, accessories, and equipment to be installed under the Work of this section shall be purchased from an LSI for installation by the Electrical Contractor providing the Work of this section (the installing Contractor). The LSI shall furnish a complete working system to the Electrical Contractor, meeting the intent of this specification. The LSI shall coordinate delivery schedules and installation of equipment with the Electrical Contractor. Additionally, the LSI shall be responsible for all documentation of the equipment in this section, system record drawings, final testing of the system and training of the Owner's personnel as required by this specification.

F. "Furnish" – To deliver to the project (or other Contractor facility) equipment or materials for installation by others.

G. "Install" – To receive equipment or materials and make them ready for use as part of the finished project by physically mounting or otherwise securing them and electrically connecting them to the appropriate service.

H. "Provide" – To furnish and install equipment or materials.

I. Technical terms peculiar to theatrical and/or architectural lighting and related work shall be construed in the following order, in accordance with:
   1. Captions on related drawings.
   2. General recognized theatrical and/or architectural lighting usage.
   3. Relevant usage and definitions of handbooks, guidebooks, or trade-group recommendations by manufacturer's associations or professional and engineering societies such as UL, ETL, IES, SMPTE, NEC, NEMA, and USITT.

1.3 SCOPE

A. Included in the work of this Section are labor, materials and appurtenances required to complete the work of this Section, as specified herein, as required by job conditions, or as indicated on drawings, including but not limited to general requirements for lighting fixtures including coordination, definitions, quality assurances, submittals, samples, and general responsibility for a complete job.

B. Due to the complexity of this project and the specific combination of equipment and services required for a professional installation, all equipment in this specification shall be purchased from an approved Lighting Systems Integrator.

C. This is a single source specification, one Lighting Control Systems Integrator shall be responsible for furnishing all of the above described equipment, low-voltage (control) cable, termination of low-voltage (control) cable at theatrical fixtures/devices, system startup, and initial system programming system prior to Owner's possession.

D. The Lighting Systems Integrator shall furnish all above described equipment to the Electrical Contractor for installation with the exception of theatrical lighting fixtures which shall be installed by the LSI per plans.

E. The Lighting Systems Integrator shall be responsible for coordinating Ethernet and/ or serial (RS-232) interconnection with AV, security, and/or building operations systems at the location of the main lighting control equipment rack.
   1. System provided shall include one each Ethernet and RS-232 connection point for this purpose.
   2. System provided shall include four each dry contact input and output connection points for this purpose.

F. The Lighting Systems Integrator shall provide technician services to program the system with ten (10) default presets to be determined by the Architect at time of startup.

G. The Lighting Control Systems Integrator shall coordinate the activation/ deactivation of the above presets with base-building lighting and other systems as described above.

H. The Lighting Systems Integrator shall be responsible for supervising the installation of all equipment furnished by the LSI. They shall provide the services of a local, full-time Project Manager to schedule shipments of equipment, coordinate deliveries, answer system inquiries, and generally oversee the installation of the equipment.

I. The Lighting Systems Integrator on behalf of and in conjunction with the Manufacturers whose products are supplied under this specification shall provide the following services which are further described in the remainder of this Section:
   1. Verification of dimensions and conditions in contract documents prior to equipment installation.
   2. Schedule coordination and shipping to job site.
   3. Termination of all low-voltage (control) cable.
   4. Inspection and adjustment of completed installation by Factory Authorized personnel.
   5. Five (5) sets of shop drawings and any required samples for approval by the Architect and Electrical Engineer prior to release for fabrication.
   6. Startup/ Turn-on/ Energization of the lighting control system, initial programming of lighting control system and training on all components furnished under this section.
   7. Installation of dimming/relay modules in racks and lighting control faceplates.
   8. Coordination with installing Electrical Contractor and associated trades in the field.
   9. Submission of record drawings, service and operational data, test certificates and warranties Provide copies of all operations and maintenance manuals as specified in the general conditions.

1.4 COORDINATION

A. Clearly indicate the Work to be performed by other trades contractors, and the materials that are adjacent to or abutting the Work of this Section in any submittals and/or shop drawings. Coordinate as required.

B. Fixture locations as indicated on the electrical drawings are generalized and approximate. Carefully verify locations with the Architect/Engineer plans, reflected ceiling plans and other reference data prior to installation. Check for adequacy of headroom and non-interference with other equipment, such as ducts, pipes or openings. Bring conflicts to the Architect/Engineer attention before proceeding with the work.

C. Although the location of equipment included in the Work of this Section may be shown on the Contract Drawings in a certain place, actual construction may disclose that the location for the Work does not make its position easily and quickly accessible. In such cases, call the Architect/Engineer attention to this situation before installing this Work, and comply with their installation instructions.

D. Give ample notice of special openings required for placing equipment in the building, in order to avoid cutting of completed work.

E. Furnish the materials and labor for Work included under this Section in ample time, and in sufficient quantities so that all of the Work may be installed in proper sequence.

F. Coordinate and schedule the Work of this Section with the Work of other Sections, Utility Companies, etc… so that there shall be no delay in the proper installation and completion of any part of each respective Work. Construction Work shall proceed in its natural sequence without unnecessary delay caused by the Work of this Section.

G. Where Work of this Section is to be flush or concealed, install it to assure that it does not project beyond the finished lines of floors, ceilings or walls.

1.5 LIGHTING SYSTEMS INTEGRATOR QUALIFICATIONS

A. General
1. The LSI shall have experience in the operation and installation of similar equipment associated with the construction and/or renovation of facilities similar in scope to this project.
2. The LSI shall have been in business for a minimum of 20 consecutive years and shall have no history of bankruptcy.
3. The LSI shall be an authorized dealer for the specified equipment in addition to an adequate number of additional manufacturers of system products necessary to provide a complete working system meeting the intent of this specification. System products shall include, but are not limited to, the following:
   a. Dimming Equipment
   b. Control Systems
   c. Theatrical Lighting Fixtures
   d. Power Distribution Equipment
4. The LSI shall be located within 150 miles of the job-site.
5. The LSI shall offer onsite and inhouse maintenance and repair services.
6. The LSI shall have on staff at least two full-time, manufacturer-certified field service technicians for the power and lighting control systems specified. LSI shall have technical support and assistance accessible 24 hours a day, seven days a week either directly or via agreements with principle manufacturers.
7. The LSI shall provide a two-year system manufacturer warranty for the complete system, not including expendable supplies, effective from the date of system acceptance. Within this warranty period, the LSI shall be responsible as the Owner's sole contact for the remedy, repair, or replacement of system deficiencies (through the manufacturer's warranty where applicable).

B. Project Management
1. The LSI shall designate a dedicated Project Manager. The LSI's Project Manager shall be the main contact between the Systems Integrator, Manufacturers, Architects, Engineers, Lighting Designer, installing Electrical Contractor, and any related trade or specialty Contractors from contract award until final sign off. The LSI's Project Manager shall be the same person throughout the entire course of the project, unless otherwise approved by the Architect/Engineer.
2. The LSI's Project Manager shall attend a Kick-Off Meeting at the project site office or a place to be designated. The objectives of the Kick-Off Meeting are:
   a. Introduce the Project Team Members
   b. Review the Project Schedule
   c. Review the Scope of Work and any additional materials and documents not in the Scope of Work

C. Approved Lighting Systems Integration Companies
1. Only qualified contractors shall be used to supply equipment and labor for this section. The work of this section shall be contracted to a single firm, referred to as the Lighting Systems Integrator.
2. The following are qualified Lighting Systems Integrators:
   a. Barbizon Lighting Company - 404/ 681-5124
   b. 4Wall 404/872-0553
   c. Stage Front Presentation Systems 800/736-9242

3. Items (a) thru (e) below shall be included as part of the bid package by all bidders (including those listed as qualified above).
    a. Furnish proof that the Lighting Control Systems Integrator is factory certified to provide warranty service for equipment in this section. Provide names of at least two full-time technicians employed at the local office who are certified to provide service on Electronic Theatre Controls equipment.
    b. Provide proof that each Project Manager assigned to the project has completed an OSHA 30-hour course in Construction Safety and Health and that each on site employee has completed the OSHA 10-hour course. Include a copy of the Project Manager's OSHA 30 card with the bid.
    c. Submit an "evidence only" certificate of insurance indicating all required insurances can be met.
    d. Submit a certified statement from the bidder's bonding company showing proof of bonding ability for this segment of the work (if a bond is required).

D. Contractors seeking qualification shall submit the following to the Architect to be considered as a qualified Lighting Systems Integrator.
1. A listing of 5 equivalent installations including (within a 100-mile radius of this job site):
    a. Name, address, and current telephone number of Owner.
    b. Name, address, and current telephone number of Architect and Engineer/ Consultant associated with the installation.
    c. Total contract value and scope of work of the installation including all sub-contractors and manufacturers.
    d. A brief written description of the contractor's operation, including facilities, key personnel and biographical information of the Project Manager who shall be assigned to this project should the contractor be successful.
2. Provide proof that each Project Manager assigned to the project has completed an OSHA 30-hour course in Construction Safety and Health and that each on site employee has completed the OSHA 10-hour course. Include a copy of the Project Manager's OSHA 30 card with the bid.
3. A statement or binder from the Lighting Control Systems Integrator's Bonding company showing evidence of the ability to bonded for the amount bid as well as aggregate bonding ability, whether a bond is required or not.
4. A list of all sub-contractors who the Lighting Systems Integrator proposes to use, including their qualifications, to perform the work
5. The Lighting Systems Integrator shall submit the names of LSI's factory authorized service technicians (minimum of two), a brief resume of the service department's personnel, a 24-hour service number that is not the manufacturer's service center.

1.6 SUBMITTALS

A. LSI shall submit shop drawings, samples, test data and certificates for approval in accordance with the requirements of the Contract Documents. Devices or other materials shall not be shipped, stored or installed into the work unless prior approval has been received, based upon the submittal of shop drawings, samples, catalogue cuts, test data, certificates or other material submitted for approval. Make modifications to devices in accordance with Lighting Designer's comments concerning submittals, as a part of the work of this Section.

B. LSI shall provide six (6) sets of full system submittals. Submittals shall be 11"x17" for shop drawings and 8.5" x 11" for cut sheets. Submit shop drawings in the form of five (5) hard copy prints and one (1) PDF on CD or DVD as required by size of file. PDF may be one document with bookmarks for each device or equipment type or individual PDFs with the device or equipment type clearly identified in the title in a uniform and consistent format.

C. Submit shop and installation drawings and schedules showing all information necessary to explain fully the design features, appearance, function, fabrication, installation, and use of system components in all phases of operation. They shall be approved by the Architect/Engineer before fabrication, installation, or erection has begun. Such approval does not relieve the LSI of the responsibility of providing equipment in accordance with the specifications. Any deviations from the specifications shall be “starred” and noted in 3/8-inch high letters. Only deviations that are equal or upgrade the quality of the equipment or respond to field conditions will be considered.

D. Indicate on shop drawings, materials, finishes, metal gauges, overall and detail dimensions, sizes, electrical and mechanical connections, fasteners, welds, joints, end conditions, provisions for the work of others, and similar information. Include pertinent mounting details including hung ceiling construction. Indicate complete details of the device, including manufacturer's catalogue numbers.

E. Submittal package shall include:
   1. A list of all drawings, cut sheets, and other documentation supplied; organized by device or equipment type; including a complete list of all deviations from specifications.
   2. Full system riser diagram(s) illustrating interconnection of system components and any special installation considerations.
   3. Catalog cuts or technical data sheets for equipment items. These shall contain full information on dimensions, construction, applications, etc. to permit proper evaluation. In addition, they shall be properly identified as to their intended use. Any options or variations shall be clearly noted.
      a. Manufacturer's catalogue sheets shall indicate input and load electrical characteristics, ambient temperature rating, noise level rating (if applicable), mounting methods and UL listing.
   4. Shop drawings for each type of device, except where specified devices are standard, unmodified, off-the-shelf units, fully described by catalogue cuts. If allowed by Architect/Engineer, such catalogue cuts may be substituted for shop drawings provided that they are marked to indicate all options and accessories included or excluded.

F. Manufacturer shall provide any additional information, including equipment demonstration, as required by the Lighting Designer to verify compliance with specifications.

G. Where samples are required or requested, the LSI shall submit samples without causing delay in work.

H. Submittal Schedule
   1. Within 15 calendar days after award of Contract to LSI, a List of Intended Manufacturers and estimated fabrication lead times shall be submitted to the Architect/Engineer. Lead times shall be measured in weeks, beginning from the manufacturer's receipt of approved shop drawings and release, and ending at shipment. Architect/Engineer shall approve or disapprove each manufacturer.
   2. Within 15 days after Contractor's receipt of Architect/Engineer response to the List of Intended Manufacturers, copies of purchase orders and manufacturers' acknowledgments for all devices and equipment specified, conforming to Architect/Engineer responses, shall be forwarded to Architect/Engineer. The purchase orders and the manufacturer acknowledgments need not list prices, but shall contain a warranted fabrication lead time, in weeks, as defined above. These fabrication times shall be coordinated with the project schedule and any impacts to the project schedule shall immediately be brought to the attention of the Architect/Engineer.
   3. Within 45 days after date of manufacturer's acknowledgment of order, Contractor shall forward to Architect/Engineer complete shop drawings, and/or catalogue cuts for all specified devices and equipment.
   4. Within 15 days after Contractor's receipt of disapproved shop drawings, revised shop drawings shall be resubmitted to Architect/Engineer.

5. Within 15 days after receipt of “approved” or “approved as noted” shop drawings, Contractor shall forward to Architect/Engineer a warranted shipment date for each specified device, as well as forwarding samples, texts, or any outstanding data required for approval.
6. The Contractor shall call to the attention of the Architect/Engineer any submittals that have not been returned in a timely manner and that might affect the timely delivery of devices.

1.7 MOCK-UPS

A. As a part of the work of this Section and at no additional cost to Owner, temporarily install, connect and adjust a reasonable number of devices for mock-ups listed below to verify specified requirements. Place the mock-up devices where and when directed by Architect/Engineer. Removal and storage of mock-up devices, when approved, shall be accomplished by the LSI.

B. Contractor shall coordinate with the Architect, Electrical Contractor, General Contractor, and/ or Construction Manager to provide controls for fixtures being tested which are not part of the Lighting Control scope but required for mock up.

C. Mock-up review required for the following areas: N/A

1.8 QUALITY ASSURANCES

A. Acceptable manufacturers are listed in the device and equipment descriptions. Acceptable manufacturers shall be prepared to provide, upon request, proof of satisfactory production of equal or similar devices for a period of at least five years prior to bidding.

B. Statement of Application: The Contractor, by commencing the Work of this Section, assumes overall responsibility, as a part of the warranty of the Work, to assure that assemblies, components and parts shown or required by the Work of this Section comply with the Contract Documents.

C. Required Warranty
1. For a period of two (2) years after Owner's initial acceptance and establishment of the beginning date of the warranty period, and at no additional cost, the Contractor shall promptly provide and install replacements for devices or components (except for lamps) which, in the opinion of the Owner, are defective in materials or workmanship under normal operating conditions. If approved to do so by the Owner, the Contractor may repair installed equipment at the job site to Owner's satisfaction, provided that the Contractor repairs any damage to adjacent Work. The Contractor also warrants replacement devices or components to be free of defects in workmanship or materials for a period of one year following replacement and shall replace any defective replacements during their warranty period.
2. The Contractor shall not be held responsible for acts of vandalism or for abnormal or accidental abuse of the devices or their components occurring during the warranty period, nor shall the Contractor be held responsible for deleterious effects caused by maintenance procedures performed without the concurrence of the Contractor.

D. Regulatory Agencies: Provide devices and equipment constructed, wired and installed in compliance with the current edition of applicable city, state and national codes. Provide devices and equipment conforming to Underwriters Laboratories (UL) and/or ETL Standards (where such standards exist), and to provisions of applicable codes which exceed those standards. In addition, provide devices and equipment which conform to additional regulations necessary to obtain approval for use of specified devices in locations shown.

E. Recognized Standards
1. Underwriters Laboratories (UL)
2. Electrical Testing Labs (ETL)
3. National Electrical Code (NEC)

4. Certified Ballast Manufacturers Association (CBM)
5. Illuminating Engineering Society (IES)
6. American Society for Testing and Materials (ASTM)
7. American National Standards Institute (ANSI)

1.9 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Electrical contractor shall be responsible for receiving, off-loading and storing all materials and equipment provided by the LSI.

B. Lighting devices and their component elements shall be delivered to the job site factory-assembled and wired to the greatest extent practical, in strict accordance with the approved shop drawings, samples, certificates and catalogue cuts, and shall be handled in a careful manner to avoid damage.

C. Exposed finishes shall be protected during manufacture, transport, storage and handling. Delivered materials shall be identical to the approved samples. Materials which become damaged shall be repaired and/or replaced as directed.

D. Devices shall be stored under cover, above the ground, in clean, dry areas, and shall be tagged and/or marked as to type and location.

1.10 TESTING

A. Provide for final adjustments to systems, the adjustments shall accomplish at least the following:
   1. Provide smooth, continuous light level control from zero percent light output through full light output for both increasing and decreasing light levels. If specified fixtures have limits to their dimming range, demonstrate complete control through Manufacturer's specified dimming range.
   2. Limit dimmer output voltage to incandescent circuits of lighting to between 90 and 95 percent of the rated lamp voltage, as directed.
   3. Patch each sACN and/ or DMX controlled fixtures in the lighting control system and verify operation. Fixture addressing at the fixture/ driver shall be the responsibility of the contractor supplying the fixtures.
   4. Test 0-10V controlled fixtures/ drivers prior to connection to control devices. Report any issues to the installing contractor for correction prior to connection of fixtures/ drivers to control system.
   5. Verify each DMX output device is working to ESTA standards.
   6. During testing and adjustment of the systems it will be necessary to rearrange portable fixtures from circuit to circuit in order to test each dimmer outlet for compliance with operating requirements.

1.11 NOTIFICATION

A. Upon notification of completion of work, the Architect or Architect's Representative will run tests on the Lighting Control System. If any problem arises during the tests, the Lighting Systems Integrator must correct the problem within 5 working days.

1.12 CLOSE OUT

A. Record Drawings
   1. The LSI shall submit two (2) sets of Record Drawings to the Owner for final acceptance. These drawings shall be fully revised and reflect the actual finished installation. The drawing set shall be 100% complete and shall include all schematics, details and Bill of Materials for future maintenance and repair of all systems supplied by the LSI.
      a. Each drawing shall be dated and stamped as a Record Drawing or with the words, "As Built".
      b. Prints shall be full sized, stapled into sets. They shall be fully legible.

c. Any future revisions or modifications during the warranty period shall require that the owner's Record Drawings be updated also.

B. Warranty Statements: A copy of the LSI master warranty statement and any Manufacturer's warranty statements shall be included with the close out documents.

C. Manuals
1. Manuals shall be bound by the LSI in loose-leaf binders and labeled with tabbed dividers for easy reference.
2. The LSI shall provide two (2) sets of printed Instruction and Maintenance manuals to the Owner for quick reference as well as complete PDF versions on CD or DVD as required by size. The manuals shall consist of, but not be limited to:
   a. System Description
   b. User Operating Instructions
   c. User Maintenance Instructions
   d. Catalogue Cut Sheets for all equipment provided
   e. Spare Parts Listing
   f. 11" x 17" reduced drawings of all larger sized manufacturer's drawings needed to perform system maintenance.

PART 2 PRODUCTS

2.1 GENERAL

A. Consult lighting drawings and related device schedules for specific types and quantities of control devices, accessories, power, and control equipment required. Supply equipment only from manufacturers specified in drawings and herein.

B. All power and lighting control devices furnished under this section shall be manufactured by Electronic Theatre Controls, Inc.

C. All control protocol conversion devices shall be manufactured by Electronic Theatre Controls, Inc.; Pathway Connectivity; or Doug Fleenor Designs.

D. All equipment racks shall be manufactured by Middle Atlantic Products, Inc or equal.

E. All networking switches shall be manufactured by Dell, Inc. or Cisco, Inc.

F. All networking patch panels shall be manufactured by Hubbell, Inc. or equal and rated for Cat5e.

G. All control cabling shall be per control system Manufacturer's specifications.

H. Notwithstanding the product designations listed herein, it is the Manufacturer's responsibility to meet or exceed the functional criteria described or implied by the product descriptions.

I. Provide materials, equipment, appurtenances and workmanship for the work of this Section conforming to the highest commercial standards, as specified and indicated on the drawings. Make fixture parts and components not specifically identified or indicated on the drawings, of materials most appropriate to their use or function, and resistant to corrosion and to thermal and mechanical stresses encountered in the normal application and function of the fixtures.

J. Provide fixtures that are constructed to be suitable for and compatible with the surface materials and construction in which they will be installed.

K. All components, consoles, racks and devices shall be complete and functioning units internally wired, complete with numbered terminal strips to facilitate connection to the building wiring system.

L. Where devices and material are mentioned by name and/or model number, it shall be interpreted as referring to that particular item as completely specified in the manufacturer's published data as though that data and literature were printed herein in their entirety.

M. Any cabinets, racks, or other components which must be separated from contiguous parts to enable shipment and/or handling at the site shall be furnished complete with all necessary connecting hardware, buss bars and wire jumpers to provide a complete, functioning system when reassembled in the building.

N. Check actual site conditions, ceiling support positions and openings by accurate field measurements before fabrication; show recorded measurements on final shop drawings.

2.2 MANUFACTURERS

A. Acceptable Manufacturer: ETC Inc, which is located at: 3031 Pleasant View Rd., P. O. Box 620979; Middleton, WI 53562-0979; Phone: 608-831-4116; Web: https://www.etcconnect.com/

B. Requests for substitutions will be considered in accordance with provisions of Section 016000.

2.3 POWER CONTROL ENCLOSURES

A. Product: Sensor IQ Intelligent Breaker System by ETC Inc. Provides 120/208 V, 120/240 V, or 277/480 V mains-fed power distribution for up to 48 branch circuits. Combines high inrush rated overcurrent protection, switched power control, and power usage/breaker status reporting in a single device. Integrated DMX and Ethernet connectivity. Optional 0-10 V dimming, DALI output, contact inputs, and isolated ground bar for audio loads.
   1. IQ48 Enclosure: 48 branch breaker slots, 3-phase 120/208 V mains feed.
   2. Mechanical:
      a. Construction: 16-gauge steel.
      b. Finish: black, fine-textured, scratch-resistant powder coat paint.
      c. Removable outer panel includes integral locking door to limit access to electronics, breakers, and local relay overrides.
      d. Full front access with no side clearance required.
      e. Removable covers for access to Class 1 and Class 2 wiring.
      f. Complies with California building code - seismic zone four.
   3. Electrical:
      a. Mains feed power input to support 120 / 208 V three-phase four-wire or 120 / 240 V bi-phase three-wire plus ground.
      b. Max current input: 100 A at 12 circuits, 200 A at 24 circuits and 400 A at 48 circuits.
      c. Quiescent draw: < 10 W with relays at steady state.
      d. Optional isolation between chassis and equipment grounding.
      e. Short-circuit current rating: 22,000 A or 65,000 A symmetrical.
      f. Overloads occurs at 50 operations of 600 percent of rated current.
      g. Feeder entry supported at top or top side.
         1) Bottom or bottom side entry supported by rotating enclosure during installation.
      h. Load wire entry supported on top, sides, or bottom.
   4. Thermals:
      a. Operating Temperature: 32 to 104 degrees F (0 to 40 degrees C).
      b. Humidity: 5 to 95 percent non-condensing.
   5. Branch breakers:
      a. Trip mechanism: Hydraulic magnetic.
      b. Bus connection type: Stab on.
      c. Inrush-pulse tolerance: 25 times rated current for half-cycle.
      d. Load lugs accept 14-6 AWG load wiring.
      e. Integral current sensing.
      f. Integral trip sensing.
      g. Control and status provided by contact pads directly at bottom of the breaker case. No external wires or connections required for control or feedback.
      h. Visible state indication:
         1) LED On, Handle On: Output active.

2) LED Off, Handle On: Remotely controlled off (Smart breakers only).
3) LED Off, Handle Off: Breaker tipped/Manually off.

i. Remote Feedback for breaker state, breaker type, current draw, and phase voltage.

6. Smart Breakers:
   a. Integral mechanically held air gap relay.
   b. Integrated hall-effect sensors detect contact positions.
   c. Integrated solenoid for remote operation.
   d. Supports manual reset using breaker handle without power.
7. Breaker Operational Ratings:
   a. No load-remote switching (Smart Breakers): 1,000,000 cycles.
   b. Electronic Load: 15 A, 100,000 cycles.
   c. Handle operations: 10,000 cycles.
   d. Duty cycle of 6 full cycles (12 operations) per minute.
   e. Supports voltage isolation of 4000 V RMS.
   f. Utilizes latching state, mechanically held relays (Smart Breakers only).
8. Breaker Models:
   a. Breakers: 120 V Smart.
      1) 1-Pole: 15 A, 20 A, or 30 A.
9. Control:
   a. User interface:
      1) Graphical display with LED backlight.
      2) Button Interface With: 0 to 9 number buttons.
      3) Navigation Buttons: Up, down, back and enter.
      4) "Light bulb" test button for local preset activation, sequence and set level overrides.
      5) USB interface: For upload of setup and software updates.
   b. Control Wiring Terminations:
      1) Control Terminals: Accept 12 AWG wire.
      2) Control Wiring Exiting Panel: Class 2.
      3) Control Terminations: Utilize removable connectors.
   c. Relay Modes: Normal (priority/HTP), latch-lock or last-action.
   d. Configurable DMX on/off threshold.
   e. Status feedback for breaker state, relay state, current drawer circuit, phase voltage and energy usage per circuit.
   f. Presets and sequences:
      1) Sixteen spaces with 64 presets per space configurable via local UI.
      2) One 16 step sequence per space.
   g. UL924 Listed emergency control bypass.
   h. Configurable Data-Loss Behavior: Play preset; Hold last look; Wait and fade.
10. Accessories:
    a. Dimming, 0-10 V: 24 outputs of 0-10 V sink dimming control rated for 100 mA per output.
11. Standards Compliance:
    a. Breakers: Listed to UL 489.
    b. Enclosures: Listed to UL 67, UL 508, UL 924.
    c. Complies with ANSI DMX512-A and ANSI E1.31 streaming ACN standard.
    d. Complies with ESD immunity to IEC standard 1000-4-2.
12. Quantities and configurations of Sensor IQ enclosures, branch circuit breakers, and accessories to be supplied as shown on project drawings.

2.4 CIRCUIT AND DATA DISTRIBUTION

A. Product: 9900 Series Connector Strip by ETC Inc.
   1. Mechanical:
      a. Construction:
         1) Raceway: 18 ga galvanized steel.
         2) End caps and junction brackets: 14 ga galvanized steel.
         3) Covers and faceplates: 16 ga galvanized steel.
      b. Dimensions: (HxD): 6.25 x 3.3 in. (159 x 84 mm); Lengths as specified.
      c. Weight: 6 lb per ft (8.9 kg per m).
      d. Ship wired and folded in 6 ft (1.8 m) lengths with splicing hardware.
   2. Electrical:
      a. Internal Wiring: Sized to circuit ampacity. Rated at 125 degrees C.
      b. Power Output Pigtails and Receptacles:
         1) Pigtails and Receptacles: Mounted on 3 in (76 mm) plates.
         2) Pigtails: Three-wire type "S" jacketed cable sized for the maximum circuit ampacity. Available in 18 in, 24 in., 36 in., or custom length.
      c. Available Data Outlets: Supports the following options per connector strip:
         1) Max total of 6 data inputs, Active Pass-thru chains count as two inputs:
         2) Chain of 5-pin XLR DMX/RDM Active Pass-thru connectors.
            (a) Max of 24 connectors and 32 RDM devices per chain.
         3) Passive 5-pin XLR DMX outputs (1 connector per data input; upstream optosplitter or DMX gateway required for multiple inputs).
         4) RJ45 Ethernet (sACN) ports (1 connector per data input).
         5) Integrated ETC Response 1-port Gateways (1 per data input).
         6) Integrated ETC Response 2-port Gateways (1 per data input).
   3. Standards Compliance: cULus Listed to UL 1573 and CSA C22.2 No. 166.
   4. Connector strips to be supplied as shown on project drawings.

B. Product: Circuit and data distribution as supplied by ETC Inc.
   1. Pigtail and outlet boxes.
   2. Floor pockets and wall pockets.
   3. NEMA wall plates.
   4. Electronic control plug-in boxes (ECPB).
   5. Mechanical:
      a. Construction: Boxes constructed from 18 ga and 14 ga steel. NEMA and ECPB faceplates constructed of aluminum.
      b. Finish: Fine-textured black powder coat.
      c. Include mounting brackets and hardware.
   6. Electrical:
      a. Wire Entry: Conduit knockouts to feed-through terminals individually labeled with corresponding circuit numbers.
      b. Wire Exit: Connectorized receptacles, conduit knockouts, or cable glands.
      c. Low voltage barriers or junction boxes as required.
   7. Standards Compliance: cULus Listed to UL 1573 and CSA C22.2 No. 166.
   8. Power and data distribution equipment to be supplied as shown on project drawings.

2.5 EMERGENCY POWER CONTROL PRODUCTS

A. Product: Emergency Bypass Detection Kit (EBDK) by ETC Inc. Monitors a single- or three-phase normal power feed and a fire alarm contact and automatically triggers the Panic inputs of connected UL 924 Listed ETC Inc. lighting control products in an emergency.
   1. Mechanical:
      a. Construction: 16 gauge (0.08) steel.

b. Finish: fine-textured, scratch resistant epoxy paint.
c. Hinged locking door covers integrated breaker to prevent accidental tripping.

2. Electrical:
   a. Supports input voltage from 100 V up to 277 V.
   b. Phase loss detection circuitry provides a factory-set delay of 0.5 seconds to prevent nuisance tripping.
   c. Integrated circuit breaker for overcurrent protection and simulation of power loss.
   d. Input and output terminals accept #8 AWG to #22 AWG wiring.
3. Functionality:
   a. Compatible with single-phase or three-phase lighting systems from 100 V to 277 V.
   b. Provides dry contact closure output to UL 924 ETC Inc. lighting control products for emergency lighting applications.
      1) Includes three output circuits.
      2) Maximum of eight devices wired to each output.
   c. Automatic sensing of normal power loss and fire alarm contact.
   d. Automatically returns to normal lighting operation when normal power is restored, or fire alarm contact is no longer triggered.
4. Accessories:
   a. Tap Kits: Provide fuse-protected normal loss sense of mains feeds for ETC Sensor, Sensor IQ, or DRd enclosures.
      1) IQ-TAP - Sensor IQ tap kit.
5. Thermals:
   a. Ambient Room Temperature: 32 to 104 degrees F (0 to 40 degrees C).
   b. Ambient Humidity: 10- 90 percent non-condensing.
6. Standards Compliance: Listed: cULus and UL 924 emergency lighting and power equipment.
7. Quantities of Emergency Bypass Detection Kits and related accessories to be supplied as shown on project drawings.

B. Product: SC1008 Branch Circuit ELTS (BCELTS) by ETC Inc. Automatically switches a single 20 A, 120 V or 277 V lighting load from a normal power source to an emergency power source when there is a power failure or other emergency present.
1. Standards Compliance:
   a. ANSI/UL 1008 Listed Branch Circuit Emergency Lighting Transfer Switch (BCELTS) / Automatic Transfer Switch for use in emergency systems.
      1) Category code WPWR.
      2) UL File E157852.
   b. Complies with Standard CSA C22.2 No. 178 Transfer Switch Equipment.
   c. Complies with ANSI/NFPA 110, Standard for Emergency and Standby Power Systems.
   d. Satisfies Requirements of the National Electric Code (NFPA 70):
      1) Article 700 - Emergency Systems.
      2) Article 701 - Legally Required Standby Systems.
      3) Article 702 - Optional Standby Systems.
      4) Section 518.3C - Assembly Occupancies.
      5) Section 520.8 - Theatres and Similar Locations.
      6) Section 540.11C - Motion Picture Projection Rooms.
2. NEMA 1 rated steel enclosure. Finish: Fine-textured, scratch resistant epoxy paint.
3. Mounting: Wall mount with adjustable mounting plate.
4. Front access to wiring space. Terminal Strips: Clearly marked.
5. Conduit Entry: Top, bottom, or right side.

6. Operation:
    a. When Normal Power is Lost with Presence of an Emergency Source: Normal source is disconnected from load and emergency source is connected to load.
    b. When Normal Power is Restored: Emergency source is disconnected from load and normal source is connected to load.
    c. Monitors voltage on normal feed branch circuit.
    d. Emergency State Control Priority:
        1) Power Failure.
        2) Fire Alarm/contact activation.
7. Electrical:
    a. Normal Feed Input:
        1) Single phase 120- 277 VAC circuit, up to 20 Amps.
        2) Additional terminals provided for constant normal power sense feed when circuit is fed by a dimmer or controlled circuit.
        3) Terminals sized for 10 to 18 AWG wire.
        4) Circuit fed from a remote panel.
    b. Emergency Source Feed Input:
        1) Single phase 120 to 277 VAC circuit, up to 20 A.
        2) Circuit fed from a remote breaker panel supplied by others.
    c. Short Circuit Protection:
        1) Class G Short Circuit Current Rating (SCCR) protection rated for 10,000 Amp RMS symmetrical.
        2) Rated for Continuous Load: 2,400 W per circuit at 120 V. 5,440 W per circuit at 277 V.
        3) Fuse Protection: Allows listed use with any circuit breaker brand.
        4) Current Protection: On load side of contactor. Protects normal and emergency source feeds.
    d. Operation: Switches hot (line) and neutral conductors.
        1) Electrically interlocked to ensure normal power is fully disconnected before emergency power is applied.
        2) Mechanically maintained (held) contactor.
    e. Fire Alarm Input: Field configurable normally closed (NC) or normally open (NO) dry contact input.
        1) Input Terminals: Accept 10 to 20 AWG Class 2 connections from alarm panel.
        2) Ten units can be wired in series to a single contact relay.
        3) Maximum total wire length between contact relay and units is 1,000 ft.
    f. User Controls: Front panel local control includes test button, laser test sensor, and 2 LED status indicators for presence of normal and emergency power.
8. Relay Ratings:
    a. Magnetic Ballast (HID): 20 Amp.
    b. Electronic Ballast: 16 Amp.
    c. Tungsten: 20 Amp.
    d. Motor at 120 V: 20 Amp (120 Amp Locked rotor).
    e. Motor at 277 V: 14 Amp (84 Amp Locked rotor).
    f. Relays are mechanically held.
    g. Lifespan:
        1) Full Resistive Load: 100,000 cycles.
        2) Motor, Inductive or Tungsten: 30,000 cycles.
9. Quantities of SC1008 branch circuit transfer switches to be supplied as shown on project drawings.

2.6 ARCHITECTURAL CONTROLS - PARADIGM

A. Touchscreens:
1. Product: Unison Paradigm 7 inches Touchscreen by ETC, Inc.
   a. Model P-TS7-E-X: Paradigm 7 inch Touchscreen.
2. Standards Compliance: UL and cUL LISTED. CE Compliant.
3. Functional:
   a. Built-in setup interface, separate from user configured pages.
   b. Configuration Upload from the Following Sources:
      1) LightDesigner software.
      2) USB Flash Drive, via built in USB port.
      3) SD media.
   c. Ability to store multiple configurations and to select which configuration is active from an on-screen menu.
   d. Allows at least 30 separate control pages.
   e. Control Functions:
      1) Individual zone control.
      2) Preset record and selection.
      3) Room Combine Controls.
      4) Preset, color, sequence, macro, and custom function activation.
      5) Change, initiate, or override timed events.
      6) Multi-level electronic lockout.
   f. Custom controls configured from LightDesigner software.
   g. Custom graphics configured from ControlDesigner software.
   h. Supports Windows 7 and newer HID compliant Touchscreen Displays.
   i. Software controlled lock-out and control visibility using up to 5 unique passcodes.** NOTE TO SPECIFIER ** Applies to Paradigm 7 inch Touchscreen.
4. Mechanical:
   a. Color LCD display with projected capacitive touchscreen interface with LED backlight.
   b. 178 degree horizontal and vertical viewing angle.
   c. Low-profile aluminum bezel finished in a fine-texture powder coat paint.
   d. No visible means of attachment.
   e. Manufacturer provided back boxes for surface and flush mount applications.
   f. Adjustable brightness and contrast for low light conditions.
   g. 7 inch WVGA, display (800x480).
5. Electrical:
   a. Connection to Paradigm Control System utilizes standard Ethernet (CAT5/ 5e).
      1) Powered by Power over Ethernet, PoE Class 2 (6-watts).
      2) Requires ground wire.
6. Operating Temperature Range: 32 to 104 degrees F (0 to 40 degrees C).
7. Relevant Humidity Non-Condensing: 0 to 90 percent.

B. Unison Control Series:
1. Product: Paradigm Architectural Control Processor by ETC, Inc.
   a. Model P-ACP-E Mk2: Enclosure.
   b. Compatible Enclosures: P-ACP-E.
      1) ERn: Unison ERn Mk2 Control Enclosure.
   c. System Accessories:
      1) P-SPM-E Mk2: Paradigm Station Power Module Mk2 - Enclosure.
   d. Standards Compliance: cULus Listed. CE Compliant. UKCA Compliant.
   e. Functional:
      1) Capacity:
         (a) Channels of Control: 2,048.

(b) Stations: 128 per control processor.
(1) Each P-SPM-E can support 63 stations.
(2) Each P-SPS-D can support 63 stations.
(3) Each P-NSPS-D can support 63 stations.
(4) Maximum (1) P-SPM-E or P-SPS-D and (5) P-NSPS-D per control processor for a total of 128 stations per processor.

2) System:
(a) Net3 system interoperability including sACN.
(b) Network Time Protocol for real-time clock synchronization supporting real and astronomical events.
(c) Supports two universes of DMX.
(d) Provides configuration of DRd dimming operations (P-ACP-E only).
(e) Up to 12 control processors per project.
(f) Up to 64 control processors across multiple projects when using a Central Control Server.
(g) Addition of processors to a system proportionately increases the overall capacities.

3) RS-232 Serial Input/Output:
(a) Eight-bit word length, parity selection and one or two stop bits.
(b) Configurable baud rates from 9600 to 115,200 bps.
(c) Fully customizable input and output messages.
(d) Bi-directional.

4) Configuration Data:
(a) Remote upload from a connected PC running LightDesigner or another connected Paradigm Processor or Paradigm Server in the system.
(b) Stored in removable solid-state memory for easy transfer to another Paradigm Processor.

5) Local User Interface:
(a) Front panel color graphic LCD display.
(b) Backlit alpha-numeric direct entry buttons (P-ACP-E only).
(c) Backlit menu navigation buttons (P-ACP-D only).
(d) Front panel status LEDs.
(e) Control functionality for control channels, zones, fixtures, groups, presets, macros, walls, and sequences.
(f) Ability to schedule timed events (edit/delete).
(g) Transfer of configuration using USB removable media.
(h) Transfer of configuration to and from touchscreen stations using removable media.

6) User Access Controls: Two user accounts: Administrator and User. Local to each processor.

7) Web User Interface:
(a) Internal web server accessible via Ethernet port.
(b) Activate and deactivate presets.
(c) Schedule timed events (add/edit/delete).
(d) Displays status information and log files.
(e) Configuration of processor settings.
(f) Supports configurable user login security options.

8) Diagnostics: Standard and Critical Event logging.

9) Stations:
(a) Connected to a Paradigm processor via topology-free LinkPower, or star-topology network connection (Touchscreen Stations only).

(b) Discovery and binding accomplished from the local user interface or LightDesigner Configuration Software.

10) Operation:
(a) Configurable DMX output refresh rate.
(b) Support for 16-bit DMX attributes.
(c) User configurable arbitration for multiple internal and external source data.

f. Mechanical: Common.
1) Microprocessor-based, solid-state technology provides multi-scene lighting and building controls.
2) Fanless.
3) Tool-free installation.
4) Front-panel user interface with backlit 128x160 pixel color graphic display.
5) Front-panel status indicators for Power, DMX, Errors, and Ethernet.
6) RJ-45 Ethernet network and Universal Serial Bus (USB) host port on front panel.
7) Recessed reset button.

g. Mechanical: P-ACP-E Specific.
1) Designed for use in the Unison DRd with a Mk2 CPU2 dimming engine and Unison ERn Mk2 Control Enclosure.
2) Fully contained plug-in module with no discrete wire connections.

h. Electrical:
1) Button stations, button/fader stations, touchscreen stations, sensors, and third party LonMARK compliant products.
2) System configuration and programming information stored in onboard microSD memory card.
3) Support of ESTA BSR E1.17 Advanced Control Networks (ACN) and ESTA BSR E1.31 (sACN) Protocols.
4) Supports EIA-RS232 serial protocol for bi-directional command and communication with third-party equipment.
5) Compliant with IEEE 802.3i for 10/100/1000 BASE-T, Auto-MDI.
6) Two discrete ESTA DMX512A ports, configurable as input or output ports.
(a) When used in a Dimming Enclosure, the second DMX port is always an output.
(b) DMX/RDM termination switches per port (IN= 120 ohm termination, OFF= no termination (the DMX signal passes through), OUT= Paradigm is the source).
7) User Datagram Protocol (UDP) messaging input and output for control of Paradigm or external systems.

i. Electrical: P-ACP-E Specific.
1) No discrete wiring connections required for use in a Mk2 dimming or control enclosure.
2) Hot swapable.
3) Four contact closure inputs capable of 5 V at 50 mA onto the dry contact.
4) Four contact-closure outputs (dry contacts) capable of 1 A at 30 V.
5) Total power draw 16 W.

j. Electrical: P-ACP-E Specific.
1) Compliant with IEEE 802.3at for Power over Ethernet providing network and optionally DC power (PoE+ 25.5 W maximum, Class 4).
2) Removable pluggable connections for the following:
(a) DC Power input on a three position pluggable connector, 48 V, 15 W maximum (+, -, ground). In the presence of both PoE+ and DC Power input, the device will operate from the DC input.

(b) EIA RS-232 serial input on a three position removable pluggable connector (Rx, Tx, Signal Common) serial protocol for bi-directional command and communication with third-party equipment.

(c) Supports two discrete ESTA DMX512-A universes on three position removable pluggable connectors (one input and one output connector available per universes A and B).

3) Total power draw 15 W.

k. Thermal: P-ACP-E.

1) Operating Temperature Range: 32-104 degrees F (0-40 degrees C).

2) Relevant Humidity Non-Condensing: 10 to 90 percent.

2. Product: Unison Paradigm Station Power Module Mk2 by ETC, Inc. For use with Unison DRd and ERn enclosures with Paradigm control. Addition of Station Power Module offers support for button, fader, and touchscreen stations.

a. Model P-SPM-E: Unison Paradigm Station Power Module Mk2.

b. Standards Compliance: cULus Listed. CE Compliant.

c. Functional:

1) Provides LinkConnect for up to 63 stations.

2) Provides 24 V auxiliary power for interface and touchscreen stations.

3) Provides 1,640 ft (500 m) of station bus from the ERn or DRd enclosure.

d. Mechanical:

1) Designed for use in Unison Dimming (DRd) and Control (ERn) Series Enclosures.

2) 18-gauge formed steel construction.

3) Fine-textured, scratch-resistant, epoxy paint.

4) Wall-mount and 19 in rack-mount variants available.

5) Convection cooled.

6) Fully contained plug in module with no discrete wire connections.

7) Tool-free installation.

8) Front-panel status indicators.

e. Electrical:

1) No discrete wiring connections required for use in a DRd dimming or ERn control enclosure.

2) LinkConnect communications with remote devices, including button stations, button/fader stations, touchscreen stations, sensors, and third-party LonMARK-compliant products.

3) 24 V Auxiliary power for interface and touchscreen stations.

f. Operating Temperature Range: 32 to 104 degrees F (0 to 50 degrees C).

g. Relevant Humidity Non-Condensing: 10 to 90 percent.

3. Product: Unison ERn External Control Enclosure by ETC, Inc.

a. Model ERn2-RM-__ Single Processor Control Enclosure-Rack Mount.

b. Standards Compliance: cULus Listed, CE Compliant.

c. General:

1) External Processing Enclosure designed for one or two control processors plus options and accessories.

d. Mechanical:

1) 18-gauge formed steel construction.

2) Fine-texture, scratch-resistant epoxy paint.

3) Wall-mount and 19 in rack-mount variants.

4) Rack-mount enclosure sizes: ERn2: 5U and ERn4: 8U.

5) Rack mount offers connectorized rear panel for all wiring connections.

6) Convection-cooled.

7) Hinged, Locking door with limited access to control processor. Integral electrostatic air filter.
8) Tool-free module removal and installation.
9) 19 in equipment-rack mount offers connectorized rear panel for all wiring connections.
10) Wall-mount offers front access wiring terminations.
11) Top, bottom, and side knockouts for conduit entry.

e. Electrical:
1) External control enclosure rated for 100 V, 120 V, 230 V CE or 240 V UL single phase configurations, 3.5 A maximum draw at 120 V.
(a) AC (single phase).
(b) 24 VDC (2-16 AWG).
(c) LinkConnect.
(d) Two configurable DMX512A ports.
(e) RS232 Bi-directional serial.
(f) Cat5/5e UTP Ethernet.
(g) Contact I/O, 4in/4out (14 to 26 AWG).
(1) Contact output rated 1 A at 30 VDC.
2) Contractor-supplied input and control wiring.
3) Factory-provided connectors for wiring terminations.

f. Operating Temperature Range: 32 to 104 degrees F (0 to 50 degrees C).
g. Relevant Humidity Non-Condensing: 10 to 90 percent.

C. Paradigm Controls Series:
1. Product: Unison Paradigm Inspire Control Stations.
a. Model PI1004: Inspire 4-Button Control Station.
2. Standards Compliance: UL and cUL Listed, CE compliant.
3. Functional:
a. Zone or preset control from any station.
b. RGB button illumination for activity status.
c. Button functions: preset selection, record mode activation, station lockout, raise, lower, macro activation, zone on/off control, timed-event override, and wall open/close or toggle.
d. Custom button functionality programmable via LightDesigner configuration software.
e. Programmable Electronic Lockout Levels:
1) Allows for programming of individual lockout levels.
f. Fader Functions: Zone or group intensity, color control, variable white control.
4. Mechanical:
a. Configurations with 1, 2, 4, 6 and 8 buttons or 4 buttons with rotary fader.
b. Gangable with Inspire stations for custom applications.
c. Enclosed electronics assembly.
d. Cantilevered switch arrays with removable button caps.
e. No visible means of attachment.
f. Flush-mount in industry standard backbox, RACO 690 or equivalent.
g. Surface-mount backboxes available from ETC upon request.
h. Constructed of injection-molded, ABS plastic in four RAL standard colors.
i. Unison Heritage Locking Cover.
5. Electrical:
a. Connect via LinkConnect two-wire control network utilizing low-voltage Class 2 wiring.
1) Topology-free and polarity-independent wiring over Belden 8471 and one No. 14 ESD drain wire.
2) Wiring may be bus, loop, homerun, or any combination of these.

b. All station terminations utilize removable connectors.

6. Operating Temperature Range: 32 to 104 degrees F (0 to 50 degrees C).
7. Relevant Humidity Non-Condensing: 10 to 90 percent.

2.7 ARCHITECTURAL CONTROLS - RESPONSE

A. Gateway Series:

1. Product: Response Mk2 Four-Port Gateway by ETC Inc. Four-Port Gateway provides data distribution using the quality and reliability of ETC's network technology. Built for Net3 using industry-standard sACN, DMX and RDM.
   a. Model: RSN-DMX4-T Response Mk2 4-Port Gateway - 4 Terminal
   b. Standards Compliance: cETLus Listed, CE compliant, EAC certified, RoHS compliant, WEEE.
   c. Functional:
      1) Supports Net3/ACN (ANSI E1.31 and E1.17), RDM (ANSI E1.20), and Supports USITT DMX512-A (ANSI E1.11).
      2) Compliance: USITT DMX512 and ANSI E1.11 DMX512-A.
      3) Flexible Output Patch: Allows a 512-address universe to begin at any output address.
      4) Advanced Input Patch.
      5) Support for per-address- or per-universe-level priority.
      6) Delay Time: From input to output not greater than one packet time.
      7) Selectable DMX refresh rate: Maximum of 40 Hz.
      8) Supports 255 total RDM devices.
   d. Mechanical:
      1) Intuitive four-button interface.
      2) Onboard display for identification, status, and configuration.
      3) Fabricated from 16-gauge cold-rolled steel.
      4) Finish: Black, Fine-textured, powder-coat.
      5) C-clamp and U-bolt hardware available.
      6) Half 19 inch equipment rack width allows eight DMX ports in 1U height.
      7) Network, power, and data activity LED indicators.
         (a) Blue power indicator, green network activity indicator.
         (b) Bi-color DMX activity indicator.
      8) Repositionable RJ45 connector for connection to lighting network.
      9) Reset button for hard reset or forced reboot.
   e. Environmental:
      1) Ambient operating temperature: 32 to 104 degrees F (0 to 40 degrees C).
      2) Operating Humidity: 5 to 95 percent non-condensing.
      3) Storage temperature: -40 to 158 degrees F (-40 to 70 degrees C).
   f. Electrical:
      1) Compliant with IEEE 802.3i for 10BASE-T, 802.3u for 100BASE-TX and 802.3af for Power over Ethernet.
      2) Power Input: 12-24 VDC for use with non-PoE systems.
      3) Maximum seven watt current draw.
      4) Pluggable clamp style terminals for solid and stranded cable provided for terminal version.
   g. Configuration:
      1) Local configuration options.
      2) Remote configuration by Concert.
         (a) Supports 512 DMX addresses per port.
         (b) Supports 63,999 Streaming ACN universes.
      3) DMX data input or output configurable by user.

4) Multiple sources may be combined to the network with each source or address allowed an independent priority
5) Individual port start address and offset
6) User-configurable labeling

2.8 GENERAL NETWORK

A. General

1. The Electronic Theatre Controls Net3 network shall provide data distribution over TCP/IP Ethernet networks. Data shall be layer 3 routable. Systems using proprietary formats or formats other than 10/100/100Mbit wired Ethernet or non-layer 3 routable networks shall not be accepted.

2. Connections shall be made between consoles, face panels, architectural processors, dimmers, Net3 Gateways, and computers over standard Ethernet distribution systems using 100BaseT, 100BaseFL, or greater wiring. All installations shall conform to established Ethernet wiring practice, and installation shall be performed by contractors qualified to do this type of work. All wiring shall be tested at Category 5e or higher for full bandwidth operation to the appropriate IEEE standard.

3. The Lighting Control system must be supplied by a single manufacturer and must have seamless integration over Ethernet between the Entertainment and Architectural lighting control.

B. Capacities

1. The network shall support DMX routing, patching, and prioritization for up to 63,399 universes (32,767,488 DMX addresses). Each address may be input or output from any port on any DMX gateway in the system. DMX input, routing and output shall be specifically supported on the system from multiple sources and locations up to the maximum number of gateways supported by the Ethernet topology.

2. The network shall support multiple network hosts including consoles, gateways, dimming racks, computers, file servers, printers, and architectural control processors with discrete command lines and control. The lighting network shall support multiple venues within a system and discrete systems on the same network.

C. System Configuration and Monitoring

1. Network device configuration shall be via Net3 Gateway Configuration Editor (GCE) software and/or ANSI E1.17 Architecture for Control Networks (ACN).

2. Patch addresses shall support viewing and manipulation via ANSI E1.17 ACN.

   a. The system shall permit complete user flexibility allowing the system operator to patch each DMX input address to any ANSI E1.31 streaming ACN address, and DMX output to span streaming ACN universes.
   b. The lighting system shall support assignment of DMX offsets, truncation of DMX universes, and provide choice of DMX port prioritization.
   c. The lighting system shall support the DD start code extension to ANSI E1.31 which provides priority per address such that multiple control sources can share universes with discrete control per address.
   d. Lighting systems that do not support the above mentioned address patching capabilities shall not be suitable.

3. The system shall allow assignable labels for all network devices to allow easy identification by system users.

4. Each network device shall have a discrete and unique IP address provided automatically by the software. The user may edit this IP address. Systems that do not support automated IP allocation with IP collision avoidance, and systems that do not allow complete reconfiguration of the above mentioned features over ANSI E1.17 ACN shall not be acceptable.
5. All configuration data for each network device shall be held at the device and system operation shall not require continuous on-line operation of the network configuration software.
6. Lighting console operators shall be able to backup the network configurations in the lighting control console. In the event of a network device failure, the operator shall be able to apply the configuration of the failed device to a replacement device of the same type without manually reentering settings. Systems that do not support configuration backup as described above shall not be accepted.
7. Architectural and Entertainment systems connected to the same network shall be capable of arbitrating control over E1.31 Streaming ACN (sACN) level data. The system shall be capable of alternating control of individual address data between architectural and entertainment systems without intervention by the user. The user shall dictate the conditions under which system shall automatically take control. The network shall allow user override of the selected defaults. Systems which require direct user intervention to allocate control of dimmers between architectural and entertainment lighting systems shall not be accepted.
8. The Net3 network shall allow multiple DMX input sources to be prioritized on the same universe as network native sources using E1.31 Streaming ACN prioritization. Multiple DMX inputs may be assigned to the same streaming ACN address (this provides multi-source control for a particular address). Likewise, the system shall support E1.31 prioritization of multiple simultaneous network sources. Systems that cannot prioritize multiple DMX inputs and multiple native network sources on a network shall not be deemed suitable.
9. The lighting network shall allow each DMX input address to be assigned a priority on the network allowing each DMX control level coming into the system to participate in full arbitration. Addresses with the highest priority shall have control, with lower priority addresses being ignored. Addresses assigned the same numeric priority, between 1 and 200, shall respond in highest level takes precedence (HTP) manor. The network shall require a valid DMX signal present at the input to initiate prioritization. Systems that do not allow for prioritized HTP for DMX inputs to the network shall not be allowed.

D. Operational Features

1. Each DMX gateway shall control up to 512 DMX addresses per port, within the confines of up to 63,999 DMX universes (32,747,488 address). The specific DMX data input or output by the gateway shall be configurable by the user.
2. Duplicate outputs of DMX data (DMX splitter) and discrete outputs shall be fully supported.
3. Merging of multiple DMX input sources on a single gateway without gateway with DMX output on the same gateway shall be supported without connection to the network. The gateway shall support assignment of priority to each input source independently
4. File transmission, synchronization and access to software shall be supported.

2.9 ENTERTAINMENT CONTROLS (EOS)

A. Product: Ion XE 20 as manufactured by ETC Inc.
1. Model Ion Xe 20 12K: Ion Xe 20 console, 12,288 outputs, maximum.

2. Power consumption: Approximately 2 A at 120 V or 230/240 V.
3. Ambient Room Temperature: 32 to 95 degrees F (0 to 35 degrees C).
4. Ambient Humidity: Up to 90 percent non-condensing.
5. Regulatory Compliance: CE compliant, cETLus listed, UKCA marked, FCC compliant, RoHS compliant, and WEEE.
6. Hardware and Interfaces:
    a. Supports two external display port monitors (1920 x 1080 min, 3840 x 2160 max). Optional single-touch or multi-touch screen control and DDC/CI support.
    b. Twenty 45 mm standard faders, 100 10-fader pages configurable as channels, submasters, palettes/presets, timing, and effect rate/speed playback control.
    c. Two internal monochromatic LCD displays for fader content.
    d. Main Playback with two 100 mm standard faders.
    e. Four encoders for non-intensity parameter control.
    f. Dedicated high-resolution intensity level wheel.
    g. Backlit Eos keypad.
    h. Included USB keyboard.
    i. Solid-state hard drive.
    j. IEC Power Input: 100 to 240 VAC at 50/60 Hz, fused mains power switch, locking regionalized power cable included.
    k. Two individually configurable Gigabit Ethernet ports, RJ45 connectors.
    l. One 802.11ac Wi-Fi Ethernet adapter. To be enabled with future software.
    m. Bluetooth 5.1 for connecting input accessories. To be enabled with future software.
    n. sACN and Art-Net network output protocols.
    o. Four DMX-512 / RDM 5-pin XLR ports.
    p. Contact closure triggers via D-Sub connector.
    q. USB 3.1 ports, for flash drives, pointing devices, keyboards.
        1) USB-A Ports: 5. USB-C Ports: 2.
    r. One Littlite XLR port.
    s. One Kensington lock port.
    t. Multiple MIDI and/or SMPTE timecode inputs, MIDI In and Out, Analog/Serial Inputs, OSC transmit/receive, UDP transmit/receive through network interface or Response Gateways.

2.10 SOFTWARE FOR ENTERTAINMENT CONTROLS (EOS)

A. Lighting Control Desk: A microprocessor-based system providing control of stage, studio, and entertainment lighting systems.
    1. Console Model: Ion Xe 20 12k as manufactured by ETC Inc.
    2. Output: Ion Xe 20 12k: 12,288.
    3. The following items may be contained in non-volatile electronic memory and stored to an onboard solid-state hard drive or to any USB storage device.
        a. Cues: 100,000. Cue Lists: 999. Groups: 10,000. Presets: 10,000 presets. Palettes: 4 x 10,000 (Intensity, Focus, Color and Beam). Macros: 99,999. Effects: 10,000. Curves: 10,000. Color Paths: 10,000. Snapshots: 10,000.
    4. Recorded cue lists: May be played back simultaneously on up to 200 faders.
        a. HTP/LTP intensity flags, assert, proportional, intensity master or manual master fade control and priority status may be placed on each cue list.
        b. A cue list may contribute to playback background states or to withhold such contributions.
    5. Channels: Are to, by default, respond to cue information by last instruction, with discrete rate control provided for all cues.
    6. The desk may be placed in Tracking or Cue Only mode by the user as a system default and overridden on individual record actions as required.

7. Control and programming features for automated fixtures: Include the following.
    a. Standard library of fixture profiles. The ability to copy and edit existing profiles and create new profiles. Patch displays including channel and output addressing. 24-bit fade resolution. Color characterization allowing color mixing and matching to color media data.
8. Displays: Three user definable work spaces, providing individually configured frames, with size/scaling controls.
9. Help Feature: Context sensitive. Explain and provide operation examples of system features. To be integrated into the on-board user manual via hyperlinks.
10. A fully integrated Virtual Media Server feature shall allow the user to map images and animations to a rig array. Forty such maps may be created, each with twelve layers. Systems that rely on external hardware or software for this functionality shall not be acceptable.
11. Fully integrated 3D visualization and programming environment included. Includes tools for programming fixed-focus and moving fixtures, including ability for straight-line focus moves, click-to-focus, and integration with personal device apps that allow finding the devices' location in real space and automatically adjusting moving fixtures to point at the location. The 3D environment receives its data from the internal programming of the lighting controller, not by monitoring the output levels being sent to the lighting system. The 3D environment displays a replica of live output to the lighting system, and displays recorded states in Blind, for the user to preview and modify the lighting states without changing live output to the lighting system.
12. Software Upgrades: By user via USB flash drive. Install software updates in all desks, processor units and video remotes from one device over the network.
13. The device operating software shall be loaded into program execution memory from the internal hard drive when the desk is powered. In the event of an uncontrolled shutdown, the device shall return to its last output state when power is restored. Devices requiring a UPS to provide such protections shall not be acceptable.
14. Output shall be distributed over a 100/1000/10000 Mbps Ethernet network using Streaming ACN (sACN), and/or Art-Net protocols. The user shall be able to control the application of protocols at an individual address level.
15. Output shall additionally be allowed via local ports utilizing the USITT DMX512-A output protocol, where the lighting console has these ports installed.
16. The system shall support full bi-directional RDM communication with compatible devices via ETC Net3 and Response DMX/RDM Gateways. RDM communication shall adhere to ANSII standard E1.20-2006 Entertainment Technology RDM Remote Device Management Over DMX512 Networks. Supported RDM features shall include:
    a. Discovery and Identification of RDM-capable devices.
    b. Setting of start addresses, operating modes and additional settings as exposed by connected devices and controllable via RDM.
    c. Viewing of sensor data as provided by connected devices.
    d. Error reporting as provided by connected devices.
17. Integrated power control monitoring features shall be provided to allow indication of power control system status, error states and circuit load monitoring. Adjustment of circuit configuration from the console shall also be supported. Communications with the power control system shall utilize ANSI E1.17 2006 Entertainment Technology Architecture for Control Networks.

18. Show data may be created and modified on a personal computer, using Windows 7 64-bit or higher operating systems, with a free offline editing application. The offline editor may also run natively on Macintosh platforms using OS 10.14 (Mojave) or later. The program shall also allow output to visualization software supporting the same protocols as the lighting system, without the need for additional keys or hardware. Systems that do not offer visualization output from a personal computer without additional keys or hardware shall not be acceptable.
19. PC: Windows 7, 64-bit or higher. Macintosh computer: OS 10.14 running a client software application. Connect to a control system via the network and view or modify current show data in an independent display environment, using an ETCnomad license key. When connected without the key, the computer shall operate in Mirror Mode, with the device to be mirrored selectable by the user.
20. Synchronized backup shall be provided via another full desk on the network, a processor unit or a PC/Mac using ETCnomad. The backup unit shall maintain synchronized playback with the host controller and shall take over control of the lighting system upon loss of communication with the host controller, either automatically or upon user confirmation. Use of two processor units to service and backup system output is also supported.
21. A maximum of 99 users may access and interact with show data simultaneously. Each user shall have an individual workspace. User identification may be assigned to more than one control device, allowing users to work in tandem, or allowing a designer/ALD to mirror the current display format, mode, and command line of the associated programmer. Partitioned control allows discrete control of channel/parameter groupings by user. Partitioned control may be easily enabled and disabled with no need to merge show data from multiple users.
22. Show files are saved across the system to all available integral hard drives simultaneously.
23. Support 32 individual simultaneous Time Code inputs or Event lists.
24. Controls and Playback:
    a. Manual Control and Programming Section:
        1) The programming keyboard shall be grouped by function. Major groupings shall be recording target functions, numeric keys, level assignment functions, display navigation functions and controls, as well as non-intensity parameter controls.
        2) The command keypad shall be fully interactive with the virtual controls, such as color pickers and direct selects. The command keypad shall allow navigation of virtual fields on displays and in dialogues, reducing the need for a pointing device.
        3) Provide direct select virtual controls, which provide "one touch" selection of channels, groups, palettes, presets, effects, snapshots, magic sheets, and macros. Labels and icons may be applied to the targets for quick reference, with a stock library of common images included, and custom images easily importable. The user shall be able to create custom direct selects, with any arrangement and combination of controls.
        4) Non-intensity parameters may be set numerically via an extensible keypad on the main display. This control shall be fully interactive with the page-able encoders. The display associated with the encoders shall display the current encoder function. The touch screen shall also access available modes for each parameter type, min, and max values for each parameter as applicable, as well as home position on a parameter basis.
        5) Only those parameters available for control in the active lighting system shall be displayed for control. Displays shall lowlight parameters not available to selected channels. Alternatively, the encoders may be placed in a state allowing parameters not applicable to the current selection to be suppressed.

6) Lamp controls provide direct access to luminaire functions such as striking and dousing arc lamps and calibrating entire fixtures or individual mechanisms of fixtures, as provided by the luminaire manufacturer. User access to these features is normalized across all manufacturers for ease of use. Use of a "control channel" for accessing these functions shall not be required and systems requiring use of control channels for these functions shall not be acceptable.
7) Fan functions shall be provided both via command line operation and through encoder controls.
8) Highlight shall be supported, with user definable highlight values. Lowlight conditions may be defined for selected, but not specified channels. Rem Dim commands, at specific levels by channel, may be optionally and automatically called with the highlight command.
9) Fixtures with color mixing may be set with direct additive or subtractive encoder controls or the command line, as well as via the color pickers. Six optional color spaces are supported, as well as tinting tools, and spectrum tools for systems with more than two color mixing elements. Color may also be set directly to a gel match via a graphic selection tool or from the command line. The gel picker shall support tools for identifying similar colors, show favorites, and graphic indications of gel locations. Color Path tools, with intensity dampening, shall be provided.
10) The Virtual Media Server function shall allow the user to create two-dimensional layouts of devices, identified as pixel maps. Media content (images, movies, text, and procedurally generated effects) may then be applied, manipulated and stored. Stock content is provided and the user may import custom imagery and animations.
11) Macros shall allow the user to create strings of commands, and replay them manually or triggered by a cue, a submaster, or an outside source via OSC or sACN input. By default, macros triggered manually shall post to the command line, but those executed via cue lists shall run in the background. The user may override this behavior by defining the macro to always execute in the foreground or background, regardless of the recall method. Startup, Shutdown and Disconnect macros may also be defined.
12) Playback Section
13) Up to 1,000 playback faders may be defined on the fader array, on pages of ten faders each.
14) Faders may be grouped for playback, with sliders and button action defined by the user.
15) Instantaneously halt an active cue, back to the previous cue, manually override the intensity fade or manually override the entire fade or go to a cue at a specified percentage of completion.
16) Cue list to contribute to background state or for the contents of each cue list to be withheld from such.
    (a) Priority and background priority states may be established.
17) Playback Faders: To have the following associated controls:
    (a) Freeze: Halts fader output
    (b) Stop Effect: Stops action of an effect.
    (c) Filter: Assigns fader filter states.
    (d) Go To Cue 0: Reset a cue list.
    (e) Off: Turns off contents of a playback, releasing control to the background state or to set to null.
    (f) Assert: Replays an active cue.
    (g) Release: Releases control to background and resets the cue list.

(h) Timing Disable, channel filters and independent status may also be defined.
(i) The potentiometer shall be configurable as a proportional master, an intensity master, or manual master. Support for rate, effect rate, effect size and Master Only controls is also provided. Filtered manual timing masters and effects masters may be configured.
(j) Rate Override / Fader Paging: Supported with associated controls.

b. Submasters:
1) Up to 999 proportional, fully overlapping additive, effect or inhibitive submasters may be defined. Submasters shall use system-defined colored graphics and LEDs, where available, to indicate submaster status. Each submaster may have fade up, dwell and down fade times. Submasters may be set to priority and background priority status.
2) Submasters may be set to HTP or LTP intensity. Non-intensity parameters on submasters shall be LTP only.
3) Exclusive mode for a submaster shall prohibit the live contribution of that submaster from storing to cues or other submasters. Shield mode prohibits access of associated channels from any other playback or manual control operations.
4) A submaster potentiometer may be defined as proportional, master only or intensity master. When set as an Intensity Master, a mark and unmark feature is supplied.
5) Motorized faders shall set submasters to required positions as fader pages are changed. Upon a page change, non-motorized faders shall blink the associated indicator LED, and display an arrow graphic to indicate the direction the user must move the fader to match the newly mapped content. The user shall not gain control of the content until the non-motorized fader has matched the content's value.
6) The submaster blind buffer shall be linked directly to live playback.
7) Set submaster values directly from the command line.
8) LTP submasters may be set to fade to background or to minimum value when the fader is returned toward zero.
9) Submaster values may contribute to the background state or be withheld.

c. Grand Master Fader
1) The location of the Grand Master shall be user definable. The grand master shall have associated blackout and blackout enable buttons.
2) Blackout shall send all associated intensity outputs to zero. Non-intensity outputs shall not be affected.
3) Lighting control devices with motorized faders shall set the grand master to required positions as fader pages are changed.
4) If the Grand Master Fader is set below 100 percent, the system shall display a virtual fader on all monitors, for access when the Grand Master is located on a fader page that is not visible.

25. Display Controls:
a. Format shall change the view of selected displays.
b. It shall be possible for the user to choose which parameter categories or parameters they wish to display. Parameters and categories shall have adjustable column widths.
c. Flexichannel modes shall change which channels are viewed in selected displays, as follows:
1) No modes
2) Parent channels only / cell channels only
3) Use Partitions

4) Flexichannel states shall change which channels are viewed in selected displays, modified by the flexi modes, as follows:
   (a) All channels
   (b) Patched channels.
   (c) Show channels.
   (d) Active/Moved channels.
   (e) Selected channels.
   (f) Manual Channels.
   (g) View channels; user identified list.
   (h) Channels with discrete timing.

d. Expand shall extend the selected view sequentially across connected displays.

e. "Time" depressed shall display discrete timing data. "Data" suppressed shall display absolute values of referenced data. These controls may be latched.

f. Displays may be toggled to show stored data currently manually overridden, the source of the current parameter data, output level, patch assignment, part structure and referenced marking data. These controls may be latched.

g. User definable magic sheets shall provide alternative display of and access to channels and record targets. Multiple magic sheets may be created, each with a variety of zoom and placement factors for rapid recall of the required view. User-definable, interactive displays may be created. These displays, which can be used in live and blind operating modes, allow graphical layout of channels, desk buttons and programming tools. Standard symbols are provided, and the user may import their own symbols or graphics. Each symbol may be individually defined with data feedback characteristics. Non-interactive status information, such as a mirror of other user's command lines, may also be included in the display. A graphical browser is provided for fast selection of these views. Multiple zoom factors and placements may be stored and recalled for each display.

h. Playback status displays are provided with a variety of different formats. Indications are provided per cue for live moves, lights fading from zero and moving non-intensity parameters, and dark moves, inactive lights which have stored non-intensity parameter moves. The user may select a static or dynamic time display in the cue list itself.

i. Display content including which of the workspaces is in focus on any of the monitors and what views are docked in those workspaces may be instantly recalled using snapshots.

26. Operating Modes:

a. Live Mode:

1) Channel lists may be constructed using the +, -, and Thru keys as well as the direct selects. Channel selection is fully interactive, regardless of the method used.

2) Levels may also be set with the keypad, level wheel and non-intensity encoders. "Selected" channels shall be those last addressed and under keypad control. Controls are provided for single button access to the last selected channel list, all channels with manual levels and all active channels.

3) Channels may be set at a user defined default level using the Level key. + percent and percent keys adjust channels quickly by user definable values.

4) Channels and/or channel parameters may be captured. Capture mode shall allow the user to selectively capture channel data at specific levels. Captured data shall be indicated on the Live display.

5) Sneak is used to restore specified channels to background states, default values, or send them to specified values, in user specified times.

6) Selected channels may be set at a level or held to current values while other channels are set to zero using Rem Dim. Toggling Rem Dim restores unselected channels to original levels. The Rem Dim level shall be user definable via the command line or with a default setup value.
7) Channels may be recorded into groups for fast recall of commonly used channels. 10,000 groups shall be available. Groups shall store selection order and subgrouping functions. The Offset function supports rapid creation of ordered groups, including reverse and random order.
8) Parameter Settings: Stored to Intensity, Focus, Color, Beam Palettes, and to Presets. Referenced data may be stored to whole numbers or up to thousandths decimal places between each whole number.
9) The following conditions may be placed on a channel or channel parameter to be included with a cue record action.
   (a) Discrete fade time and/or delay.
   (b) Block flag.
   (c) Assert flag.
   (d) IFCB Filters, which may be set at a parameter level.
   (e) Release and restore.
10) 999 cue lists may be stored. Cues may be recorded in any order. Up to thousandth decimal cues may be inserted between any two whole number cues. Each cue may contain a maximum of twenty parts.
11) It shall be possible to record cues and cue parts with the following information:
   (a) Any collection of channel data, as determined using "Record", "Record Only" or selective store commands, combined with parameter filters - including Effects.
   (b) Cue Level timing and delays for Intensity Up, Intensity Down, Focus, Color and Beam.
   (c) Follow or hang time.
   (d) Link instruction.
   (e) Loop value.
   (f) Block, Assert, Preheat, Release, and/or Mark Flag.
   (g) Curve.
   (h) Rate.
   (i) Allfade.
   (j) Label and note.
   (k) Alert countdown time.
   (l) Timecode playback stamp.
   (m) Scene label; cues only, not cue parts.
   (n) Execute commands to trigger other activity; execute cue lists, cues, macros, snapshots, OSC and UDP strings, and MIDI raw commands.
   (o) Cue list partitions shall be available to filter list content.
12) Channel parameters may be stored with an effect instruction. Effects may contain relative offsets from current value, or absolute instructions. Effects may be progressive actions or on/off states. Entry and exit behaviors modify the channel parameters activity when beginning and ending the effect. Channel and cue level overrides are provided.

13) Non-intensity channel parameters may be marked (pre-set), in two ways. Automark pre-sets any parameter transitions in the cue just prior to intensity becoming active. Automark may be disabled on a cue or cue part basis, enabling a "live" move. Alternatively, non-intensity parameters may be marked to a specific cue with a single command instruction. It shall not be necessary to store or update these parameters directly into the cue in which the movement is to occur.
14) Update may be used to selectively add modified parameter data quickly to that parameter's current source. Trace may be used to modify the data to the original source of its move instruction. It shall be possible to update inactive record targets. A context sensitive display provides detailed information regarding the results of the update command.
15) Recall From quickly pulls specified data from record targets or other channels into the current view. Recall on an HTP basis shall be provided.
16) Copy To quickly copies selected data to specified channels or other record targets.
17) Address and channel check functions shall be provided.
18) Channel parameters may be "parked" at levels. Those levels are not added to any live record operations, nor may they be changed until the parked element is "unparked". Scaled park provides real time proportional adjustment of stored intensity values. Address Park shall also be provided.
19) About shall provide detailed status of selected channels or specified record targets. This shall include current source, current value, discrete timing, parked value, marked to and for indications. Background levels and current DMX output are also displayed. Channel usage indicates submaster and cue information and provides a "dark moves" report on a per channel basis.
20) 10,000 snapshots may be stored which instantly recall specified front panel and display configurations.
21) Query shall allow selection of channels by their current or possible state. Keywords and fixture types shall allow quick access to fixtures.
22) User definable home positions, on a per channel basis, may be defined.
23) Undo shall be used to sequentially step back through manual operations or to undo record and delete actions. It shall be possible to undo multiple commands in one action.

b. Blind Mode:
1) The Blind display allows viewing and modification of all record targets without affecting stage levels.
2) Record target data may be displayed in a summary view, a detailed table orientation or a spreadsheet view, which allows quick data comparisons, move, and replace functions.
3) Changes to blind data shall be automatically stored. Range selection of both record targets and channels shall be supported.

c. Staging Mode:
1) Staging mode shall allow temporary changes to be made to the lighting system, which are only displayed on Live and Blind displays and represented in the 3D environment, without changing the live output to the lighting system, so that the user may preview changes before committing them to output.
2) Staging mode shall be accessible in Live or Blind mode, and the user shall be able to abandon or commit changes to the live output or to the stored database separately. The user may leave Staging mode, and the buffer shall remain until the user clears the changes.

d. Patch Display:
   1) Patch shall be used to display and modify the system control channels with their associated library data.
   2) Each channel may be provided with a proportional patch level, curve, label, swap and invert functions, Live/Dark flag enable/disable, as well as keywords to service Query.
   3) A full library of profiles is provided, with the ability for the user to define "favorites" for fast selection. The user may also modify library profiles or create new profiles, to function with any controlled device.
   4) Offset functions in patch shall allow selection of channel ranges and shall allow the user to establish a "custom" footprint for any device output.
   5) Custom color wheels, color scrolls and gobo wheels shall be defined in patch. These devices shall be created with a simple table and graphical user interface supported by images of major manufacturers.
   6) The user may define or modify color configuration for parameters of color-changing fixtures, allowing the color picking tools to accurately control a fixture's color system.
   7) RDM discovery, patching and device monitoring shall be supported.
   8) Copy to, Swap and Move functions shall be supported in patch.

e. Setup/Browser:
   1) Access system, user, and device configurations.
   2) Possible to partially merge show files. Users may select as much or as little of the show file as required, with renumber tools.
   3) Import ASCII and Lightwright data files. Export as ASCII or .csv.
   4) Access for show data storage, import, export, print to .pdf and clear functions, as well as show data utilities.
   5) Support programming and playback of real time clock events, including cue, submaster and macro execution at specific times of specified days or at a time based on astronomical events.
   6) Control screen: For network configuration, selecting date/time, software update controls, selecting functional language and/or keyboard for labeling option, and other system level tools.
   7) Languages for prompts, advisories, and help: English, Bulgarian, German, Spanish, French, Italian, Polish, Slovenian, Russian, Japanese, Chinese simplified, Chinese traditional, and Korean.
   8) Supported keyboards: Latin American, American International, United Kingdom, French, German, Italian, Korean, Norwegian, Russian, Slovakian, Turkish, Swiss, Swedish, Finnish, and Bulgarian.

27. Output and Integration of Power Control Monitoring and Configuration:
   a. Lighting Control System: Provides communication with an ETC Sensor+ and Sensor3 dimming systems for remote monitoring and configuration of show specific functions from within the software application.
   b. Circuit Level Configuration and Monitoring Functions Not Limited To:
      1) Control mode; dimmable, switched, latch-lock, always on, off or fluorescent.
      2) Curves.
      3) Control threshold.
      4) Min and Max Scale Voltage.
      5) Preheat.
      6) Scale load.
   c. Rack status messages Not Limited To:
      1) State of UL924 panic closure.
      2) DMX port error/failure.

3) Network error/failure.
4) A, B, C Phase below 90 or above 139 volts and headroom warning.
5) Ambient temperatures out of range.

d. Circuit status N limited to:
1) Module type and location.
2) Output level.
3) Control Source.
4) Overtemp.

e. Advanced circuit feedback Not limited to:
1) Load higher or lower than recorded value.
2) DC detected on output.
3) SCR failed on/off.
4) Breaker trip.
5) Module has been removed.
6) Load failure.

f. Shutdown due to Overtemp.

2.11 ARCHITECTURAL LED RUNNING LIGHTS

A. General
1. The instrument shall be a BluesSystem luminaire as manufactured by ETC, Inc., or approved equal.
2. The product shall be controlled via an external, proprietary power supply from the BluesSystem range of products (see section E below).
3. The product shall be provided with a minimum warranty of 5 years full fixture coverage and 10 years LED array coverage

B. Physical
1. The product shall be constructed of an injection molded poly-carbonate material with enclosed LED emitter and electronics sealed in place using an epoxy resin to form one complete fixture.
2. The luminaire:
a. Shall have pre-installed factory fitted reflectors or lenses for different beam angles as specified below.
b. Shall have 3 factory installed screw terminals accepting allowing low voltage connection to the separate power supply.
3. The luminaire shall be offered in multiple variants as follows:
a. Beam:
1) Round form factor with shallow profile no greater than 1” in height housing a 49mm optical lens providing fixed beam angle options of the following values:
(a) VNSP (approx. 10 degrees)
(b) NSP (approx. 15 degrees)
(c) MFL (approx. 20 degrees)
(d) WFL (approx. 65 degrees)
2) Testing to UL1598 and CSA22.2 (No. 250) standard, CE compliant, and listed with a 3rd-party laboratory
3) 2 x holes at 2” (51mm) spacing for mechanical securement.
b. Dome:
1) Round form factor with shallow profile no greater than 1.5” in height housing integrated dome optical lens providing 2 options of diffusion as follows:
(a) Frosted Lens
(b) Opaque Lens
2) Testing to UL1598 and CSA22.2 (No. 250) standard, CE compliant, and listed with a 3rd-party laboratory.

3) 2 x holes at 2” (51mm) spacing for mechanical securement.

C. Optical
1. The luminaire shall contain integral optics to provide various beam options as detailed in section 3.
2. The luminaire shall contain a single color Blue LED.

D. LED
1. The luminaire shall utilize a single Blue LED emitter.
2. The LED shall be rated for an average of 70% output after 50,000 hours of use
3. The Luminaire shall have an expected average power consumption of less than 4W
4. The Luminaire shall have a minimum output of
   a. BlueBeam VNSP: 9 field lumens
   b. BlueBeam NSP: 8.5 field lumens
   c. BlueBeam MFL: 9 field lumens
   d. BlueBeam WFL: 11 field lumens
   e. BlueDome Opaque Lens: 2 field lumens
   f. BlueDome Frosted Lens: 3 field lumens

E. Power Supply
1. The BluesSystem luminaire shall require the use of a separate BluesSystem power supply.
2. The BluesSystem power supply shall be manufactured from a cold rolled steel enclosure finished in a fine texture, high temperature black powder coat paint and be available in 2 physical variants:
   a. 1-Zone power supply capable of providing power and control for up to 10 BluesSystem luminaires on a single circuit. The 1-Zone power supply shall be a wall mount only product listed to UL1598/CSA22.2 No.250 and CE Compliant.
   b. 6-Zone power supply capable of providing power and control for up to 60 BluesSystem luminaires across 6 circuits. The 6-Zone power supply shall be available as a wall mount product (listed to UL1598/CSA22.2 No.250) or 19” rack mount product (listed to UL2108/CS22.2 No.9 and CE Compliant)
3. The power supply shall have the following electrical properties:
   a. 1-Zone power supply
      1) 100-240V AC 50/60Hz Input
      2) 24V DC Output
   b. 6-Zone power supply
      1) 100-240V AC 50/60Hz Input
      2) 36V DC Output
4. The BluesSystem power supply shall have the following control options:
   a. 1-Zone power supply
      1) Switched (Dry Contact Input) via internal terminal blocks
      2) DMX512-A (ANSI E1.11-2008) in and through via internal terminal blocks
   b. 6-Zone power supply
      1) Switched (Dry Contact Input) via internal terminal blocks
      2) 0-10V Analog control via internal terminal blocks
      3) DMX512-A (ANSI E1.11-2008) in and through via internal terminal blocks

2.12 ENTERTAINMENT LUMINAIRES (SOURCE FOUR LED SERIES)

A. Basis of Design: Source Four LED Series 3 as manufactured by ETC Inc. A color-mixing high-intensity LED illuminator. DMX control of intensity and color. Eight-color Lustr X8 array and tunable white light Daylight HDR array. Deep red LEDs in both arrays. Wireless DMX/RDM. Contactless programming and control using NFC and ETC's Set Light app, and intuitive user interface featuring a color picker and action-responsive backlit encoders.

1. Standards Compliance:
   a. Listed: cETLus, UL1573, and C22.2 C22. No.166.
   b. Compliance: CE and USITT DMX-512A
2. Light Engine With XDLT Shutter Barrel: For use with XDLT fixed-field lens tubes only.
   a. Model: Lustr X8.
3. Source:
   a. LED Details: 90 Lumileds LUXEON C and CZ.
   b. Lustr: Max Lumens: 10,889. Lumens per Watt: 0.35.
   c. L70 Rating: Greater than 54,000 hours.
4. Colors: Utilize 60 LED emitters. Available in LED arrays as outlined below:
   a. Lustr X8: Colors Used: Deep Red, Red, Amber, Lime, Green, Cyan, Blue, Indigo.
   b. Color Temperature Range: 1,900 - 10,450 K.
   c. Calibrated Array: Yes.
   d. Red Shift: Yes. Selectable.
5. Optical: Can be used with LED CYC and Fresnel adapter.
   a. Beam Angle Range: Swappable lens tubes between 5 to 90 degrees.
   b. Gate Size: 3.15 inches.
   c. Aperture Size: 6.25 to 17.5 inches, depending on lens tube.
   d. Pattern Projection: Yes. Pattern Size: A or B.
   e. Camera Flicker Control/Hz Range: Yes. 5,000 to 25,000 Hz.
   f. Light Beam: 2-to-1 center-to-edge drop-off ratio.
      1) Low gate and beam temperature.
      2) Sharp imaging through a three-plane shutter design.
   g. The Unit Provides, but is not Limited to:
      1) Degree Field Angles: 5, 10, 14, 19, 26, 36, 50, 70 and 90.
      2) Accept standard (5 to 90), EDLT (19 to 50) or XDLT (5 to 70) lenses.
      3) High-quality pattern imaging.
      4) Sharp shutter cuts without halation.
      5) Shutter warping and burnout in normal use shall be unacceptable.
      6) Adjustable hard and soft beam edges.
   h. Lens Tubes: XDLT for precision, high-contrast imaging, and color-correction for 14, 19, 26, and 36 degree units.
6. Control and User Interface:
   a. Input Method: 5-Pin XLR, Multiverse wireless and NFC.
   b. Protocols: USITT DMX-512A, RDM, City Theatrical Multiverse, NFC.
   c. RDM Configuration: Yes. Compatible with the ANSI RDM E1.20.
   d. Integrated radios for City Theatrical Multiverse technologies.
   e. Integrated Near Field Communication (NFC) hardware. Configuration from mobile devices.
   f. Color LCD display for easy-to-read status reports, control and configuration changes.
   g. USB port for software updates, diagnostics, configuration saving and loading.
   h. A two-button, 4 encoder user-interface. Encoders to be RGB backlit.
   i. Hard lockout switch to prevent nuisance bumping of the User Interface.
   j. Multiple DMX input profile options to include:
      1) RGB Control: LED colors via a 3-channel profile: Red, Green, Blue.

2) Single Channel: Control intensity of prerecorded preset.
3) Expanded: Full control of attributes. Intensity, CCT, Tint, Tuning, Mix, RGB Color Control, Strobe, Curve, Fan
4) Direct: Control of individual color channels via an independent channel.
   (a) Intensity, Direct Color Control, Strobe, Curve, Fan
5) Studio: Control in a white-light profile.
   (a) Intensity, CCT, Tint, Tuning, Strobe, Curve, Fan

k. Droop Compensation: Yes.
   1) User-Definable Options: Including but not limited to the following.
l. Display time out.
   1) Loss of data behavior.
   2) Red-shift for tungsten dimming emulation.
m. Local Control Modes:
   1) Studio: For white light operations.
   2) HSI Color Picker: Access to selecting and storing user defined colors.
   3) Presets: Quick access to default or user defined colors.
   4) Effects: Playback of built-in sequences.
   5) DMX: For setup of DMX parameters.
n. Stand-Alone Functionality. No console.
   1) 24 preset colors accessible as a stand-alone feature.
   2) Fixtures, up to 32, can be linked with DMX cables and controlled from a primary fixture.
   3) Restores to settings prior to power cycling. No need for reprogramming.
o. Capable of copying performance settings to other fixtures of same type via a 5 pin XLR DMX cable.

7. Electrical: Internal Power Supply: 100V to 240 V 50/60Hz. Power factor correction.
   a. Input Method: AC via Neutrik powerCON TRUE1 TOP. Requires power from a non-dimmable source.
   b. Inrush First half-cycle: 40 A at 120 V. 80 A at 230 V.
   c. Power supply outputs: Self-resetting current-limiting protection.
   d. Support Power In and Thru Operation.
      1) Power In: Via Neutrik TRUE1 TOP input connector.
      2) Power Thru: Via Neutrik TRUE1 TOP output connector.
      3) Fixture Power Wiring and Accessory Power Cables: Rated to support linking of multiple fixtures up to capacity of a 15A breaker.
   e. Fixtures per Circuit: 5. Link up to 4 via Power Thru connector.
      1) TRUE1 Connector: Rated 20 A, 120 V/60 Hz, and 16 A 240 V/50 Hz.
   f. Wattage: Lustr X8: 307 at 120 V. 305 at 230 V.
   g. Current Draw Lustr X8: 2.6 A at 120 V. 1.35 A at 230 V
8. LED Emitters
   a. Eight different LED colors provide color characteristics as specified,
   b. LEDs Used: High brightness. Proven quality from reputable manufacturers.
      1) Utilize Luxeon C LED emitters
   c. Manufacturer to use an LED binning process to maintain color consistency.
   d. Each LED fixture must undergo a burn-in test during manufacturing.
   e. PWM Frequency: Up to 25,000 Hz to avoid camera flicker.
9. Calibration: At factory for consistent color and intensity output between fixtures built at different times and/or from different LED lots or bins.
   a. Calibration Data: Stored on LED array as part of on-board operating system.
   b. Arrays, Including Replacement Arrays: Calibrated to same standards.

10. Color: Utilize 90 LED emitters. minimum
    a. Color Temperature Range: 1900 to 10,450 K
    b. Lustr X8: Deep Red, Red, Amber, Lime, Green, Cyan, Blue and Indigo LEDs in array for broad spectrum color, light tints, and variable whites.
11. Dimming: 15-bit nonlinear scaling techniques for high-resolution dimming.
    a. Optimized dimming curves for smooth dimming over longer timed fades.
    b. Digitally Driven: High-speed pulse width modulation (PWM). Allow settings to eliminate or reduce flicker when lighting for camera.
12. Thermal: Operating Temperature: 32 to 104 degrees F.
    a. Cooling Fan. Speed control via a DMX channel.
    b. Fan speed software: Honor DMX fan settings but may power budget output to prevent damage if necessary
    c. Advanced Thermal Management Systems: Maintains LED life to 70 percent intensity after 54,000 hrs of use.
        1) Multiple temperature sensors within the housing.
            (a) LED array circuit board temperatures.
            (b) Temperature sensors placed on each individual LED color circuit.
            (c) Control temperature.
        2) Temperature Sensors Monitor: Legible LCD multi-line backlit display.
    d. Droop Compensation: Yes.
    e. dB Range: 34 dBA at 39 inches average.
    f. BTUs/Hour: Lustr: 1,047. Daylight HDR: 1,159.
13. Physical: IP Rating: IP-20.
    a. Housing: Die-cast aluminum. Positive locking double-clutch fixture body.
        1) Slot for glass or stainless steel patterns and soft focus diffuser.
        2) Accessory slot with sliding cover for motorized pattern device or iris.
    b. Color Options: Black, white, silver, or custom color,
    c. Shutter Assembly: Plus or minus 25 degree rotation.
    d. Shutters: 25 gauge stainless steel
    e. Interchangeable Lens Tubes: For field angles. Ryton BR42B guides (in XDLT barrel) for smooth tube movement.
    f. Integral die cast gel frame holders with two accessory slots, and top-mounted, quick release gel frame retainer.
    g. Mounting Options: Yoke, cyc floor stand.
    h. Yoke: Steel with two mounting positions allowing 300 degree rotation of fixture
        1) Positive locking, hand operated yoke clutch.
    i. Included Accessories: Hanging yoke, 5 ft power cable, an A-size gobo holder, and c-clamp

2.13 ENTERTAINMENT LUMINAIRES (COLORSOURCE)

A. Basis of Design: ColorSource CYC as manufactured by ETC Inc. A dedicated cyclorama fixture for creating beautiful, smooth washes of light on a cyclorama or wall. Five-color mix of red, green, blue, lime, and indigo for expanded range and color control.
    1. Standards Compliance:
        a. Listed: cETLus, UL 1573, and CSA C22.2 No. 166.
        b. Compliance: CE and EAC.
    2. Source:
        a. LED Details: 42 Lumileds LUXEON C LEDs.
        b. Max Lumens: 4117.
        c. Lumens per Watt: 31.
        d. L70 rating: greater than 50,000 hours.

3. Color:
    a. Colors Used: Red, Green, Blue, Indigo, and Lime.
    b. Color Temperature Range: Range.
    c. Calibrated Array: Yes.
    d. Red Shift: No.
4. Optical:
    a. Beam Angle Range: DMX-512 via 5-pin XLR connector
    b. Gate Size: N/A.
    c. Aperture Size: N/A.
    d. Pattern Projection: No.
    e. Pattern Size: N/A.
    f. Camera Flicker Control/Hz Range: Default: 1,200 Hz. RDM: 25,000 Hz.
    g. The ColorSource CYC has a built in accessory for spill control.
5. Control:
    a. Input Method: DMX-512 via 5-pin XLR connector. Protocols: DMX.
    b. Modes (Footprint): 5 channel: IRGBS (5). Direct: IRGBILS (7). 1 channel: (1). RGB: RGB (3).
    c. RDM Configuration: Yes.
    d. User Interface Type: 7-segment address display, local level control via UI.
    e. Local Control: Yes.
    f. Onboard Presets: Yes, 12. Onboard Sequences: Yes, 5. Onboard Effects: No.
    g. FixtureLink support: Yes.
6. Electrical:
    a. Voltage: 100 to 230 VAC, 50 to 60 Hz.
    b. Input Method: PowerCON in and thru.
    c. Inrush First Half-Cycle: 39 A at 120 V. 74 A at 240 V.
    d. Wattage (Typical/Standby): 133 / 1.4 W at 120 V. 116 / 1.2 W at 230 V.
    e. Current Draw: 1.11 A at 120 V. 1.11 A at 230 V.
7. Thermal: Operating Temperature: 32 to 104 degrees F.
    a. Fan: No. db Range: 18.5 dBa average at 39 inches.
    b. Droop Compensation: Yes.
    c. BTUs/hour: 453.
8. Physical: IP Rating: IP-20.
    a. Materials: Die-cast aluminum. Colors: Black, white, silver, or custom.
    b. Mounting Options: Yoke and floor.
    c. Included Accessories: Hanging yoke, power cable.

B. Basis of Design: ColorSource Spot V and ColorSource Spot VXT as manufactured by ETC Inc. Brings together a five-color light engine with the build-quality and support of an ETC product. Uses a mix of red, green, blue, indigo and lime LED emitters. ETC optics, adapters, and accessories.
1. Standards Compliance:
    a. Listed: cETLus, UL 1598, UL 924, CSA C22.2 No. 250.0.
    b. Compliance: CE.
2. Model ColorSource Spot V with shutter barrel, black.
3. Source:
    a. LED Details: 60 Lumileds LUXEON Rebel and LUXEON C LEDs.
    b. Max Lumens: 9300.
    c. Lumens per Watt: 47.2.
    d. L70 Rating: Greater than 54000 hours.
4. Colors:
    a. Colors Used Spot: Red, green, blue, indigo, lime.

b. Color temperature Range: Color mixing.
c. Calibrated Array: Yes.
d. Red Shift: No.

5. Optical:
   a. Beam Angle Range: 5 to 90 degrees. Swappable lens tubes.
   b. Gate Size: 80 mm.
   c. Aperture Size: 6.25 to 14 inches depending on lend tube.
   d. Pattern Projection: Yes.
   e. Pattern Size: A or B.
   f. Camera Flicker Control/Hz Range: 5 kHz and 25 kHz.
6. Control:
   a. Input Method:
      1) DMX-512 via 5-pin XLR connector. Protocols: DMX512, RDM.
      2) City Theatrical Multiverse. Protocols: DMX512, RDM.
   b. NFC Configuration: Yes, via Set Light app.
   c. RDM Configuration: Yes.
   d. User Interface Type:
      1) ColorSource Spot V: 7-segment 3 button interface.
   e. Local Control: Yes. (ColorSource Spot V only)
   f. Onboard Presets: Yes, 12. Onboard Sequences: Yes, 5. Onboard Effects: No.
   g. Fixture-to-Fixture Control: Yes.
   h. 15-bit virtual dimming engine.
7. Electrical:
   a. Voltage: 100 to 240 VAC, 50 to 60 Hz.
   b. Input Method: powerCON True1 TOP in and thru.
   c. Inrush First Half Cycle: 55 A at 120 V. 59 A at 240 V.
   d. Fixtures per Circuit:
      1) Eight. (R20 module or similar).
8. Thermal: Operating Temperature: 32 to 104 degrees F.
   a. Fan: Yes. Controllable.
   b. Droop Compensation: Yes.
   c. BTUs/hour: 671.77.
9. Physical: IP Rating: ColorSource Spot V: IP-20. ColorSource Spot VXT: IP-65.
   a. Materials: Die-cast aluminum. Colors: Black, white, silver, or custom.
   b. Mounting Options: Yoke.
   c. Included Accessories: Hanging yoke, 39 inch power cable, soft-focus diffuser in an A-size gobo holder.

C. Basis of Design: ColorSource Fresnel V as manufactured by ETC Inc. An affordable high quality Fresnel wash fixture with motorized zoom. Uses RGBIL color system.
1. Standards Compliance:
   a. Listed: cETLus, UL 1573, CSA C22.2 No. 166.
   b. Compliance: CE and EAC.
2. Model ColorSource Fresnel V: Black.
3. Arrays:
   a. RGBIL (Red/Green/Blue/Indigo/Lime).
4. Source:
   a. LED Details: 44 Lumileds LUXEON C LEDs.
   b. Max. Lumens: 5,300.
   c. Lumens per Watt: 36.
   d. L70 rating: Greater than 54,000 hours.

5. Color:
    a. Color temperature Range: Color mixing.
    b. Calibrated Array: Yes.
    c. Red Shift: No.
6. Optical:
    a. Beam Angle Range: 13 to 44 degrees.
        1) Motorized zoom.
    b. Gate Size: N/A.
    c. Aperture Size: 7".
    d. Pattern Projection: No.
    e. Pattern Size: N/A.
    f. Camera Flicker Control/Hz Range: Default: 5kHz. RDM: 25,000 Hz.
7. Control:
    a. Input Method: DMX-512 via 5-pin XLR connector. Protocols: DMX512, RDM, City Theatrical Multiverse, NFC.
    b. RDM Configuration: Yes.
    c. NFC Configuration: Yes.
    d. User Interface Type: 7-segment 3 button, single encoder interface.
        1) Encoder controls local motorized zoom.
    e. Local Control: Yes.
    f. Onboard Presets: Yes, 12. Onboard Sequences: Yes, 5. Onboard Effects: No.
    g. Fixture-to-Fixture Control: Yes.
    h. 15-bit virtual dimming engine.
8. Electrical:
    a. Voltage: 100 to 240 VAC, 50 to 60 Hz. Input Method: PowerCON True1 in and thru.
    b. Inrush First Half-Cycle:
    c. Fixtures per Circuit:
        1) 20 Amp Power-Thru Connector: Quantity of 8.
        2) R20 Module or Similar: Quantity of 9.
        3) Wattage at 120 Volts: 148.4 W.
        4) Wattage at 240 Vol: 147 W.
        5) Current Draw at 120 Volts: 1.28 Amps.
        6) Current Draw at 240 Volts: 10.70 Amps.
9. Thermal: Operating Temperature: 32 to 104 degrees F.
    a. Fan: Yes. Not controllable. dB Range: 22.9 dBA average at 39 inches.
    b. Droop Compensation: Yes.
10. Physical: IP Rating: IP-20.
    a. Materials: Die-cast aluminum. Colors: Black, white, silver, or custom.
    b. Mounting Options: Yoke or floor stand.
    c. Included Accessories: Power cable and hanging yoke.
    d. Seven-segment, three-button Interface.

2.14 ENTERTAINMENT LUMINAIRES (HIGH END SYSTEMS)

A. Basis of Design: Lonestar as manufactured by ETC Inc.
1. The fixture shall be a high-intensity white-light fixture with Cyan, Magenta, and Yellow subtractive color mixing and framing shutters.
2. All LED moving light fixtures shall be provided by a single manufacturer to ensure compatibility.
3. The fixture shall be UL 1573 listed for stage and studio use and comply with EN60598-2-17 standard per CE certification
4. The fixture shall comply with the USITT DMX-512A standard.

B. Physical or Mechanical
   1. The fixtures structural framing shall be constructed of rugged, 1/8” aluminum, free of burrs and pits and finished with a matte black powder coating.
   2. Outer covers of head and yoke shall be constructed of ABS plastic with fine textured black surface and fastened to the head frame with quarter turn fasteners.
   3. The fixture dimensions shall be
      a. 23.6” from base of the enclosure, to the tip of the lens baffling. Fixtures that are longer than this dimension shall not be deemed acceptable.
      b. 14.5” across the exterior dimensions of the yoke
      c. The Electronics enclosure shall be 220 mm (8.7”) Wide
      d. Head length 16.1 ”
      e. Fixtures shall weigh 50 lbs
   4. The fixture shall be able to be either truss mounted or set upright on a stable surface. Fixture shall be suitably designed for operation over or under mounted on a truss perpendicular to the ground as well as outrigged parallel to the ground.
   5. The following shall be provided:
      a. Shutter assembly shall be a four plane system capable of rotating +/- 30° on and fully crossing the beam on each individual shutter blade. Additionally the entire Shutter assembly must rotate +/- 60° .
      b. The fixture must include nine (9) interchangeable rotating gobos with 17.5 mm outside diameter and 13 mm image area. Fixtures that have less than nine rotating gobo patterns shall not be deemed acceptable.
         1) Rotating gobo systems must be able to index to any point on the 360° positioning of the gobo.
         2) Rotating gobos must be interchangeable with glass and metal gobo patterns without permanent or semi-permanent modification to the wheels or cartridges.
      c. CMY (Cyan Magenta Yellow) subtractive color mixing system
      d. Ten (10) interchangeable colors including red, blue, green, yellow, orange, purple, TM-30 filter, lavender, half CTO, full CTO, and dark blue. Capable of split colors and linear indexed positioning. Fixtures without color wheels shall not be deemed acceptable.
      e. Electronic Linear CTO from Native Color temperature minus 4800 K
      f. Fixture shall have 540 degrees of pan and 251 degrees of tilt. Pan and tilt must be controlled with 16bit control and utilize encoder sensors to guarantee correct step position.
         1) Fixture shall have a pan speed of 2.30s for 360 degree movement
         2) Fixture shall have a tilt speed of 1.26s for 180 degree of movement.
         3) Pan and tilt locks that stop at 0, 45, and 90 degrees for service and handling. Pan and tilt locks are not intended to be engaged during transport in pre-rigged truss.
      g. A 15 leaf iris which reduces the projection area by 96%.
      h. Frost system with two different diffusion media that softens the edges of the projection on a surface and allows for variation in insertion speed. Fixtures that do not have two or more diffusion media shall not be deemed acceptable.
      i. Automated 3.8-55° zooming lens system. Fixtures that cannot achieve a hard focus on the gate at less than 4° degrees shall not be deemed acceptable.
      j. Animation wheel that allows for continuous and uninterrupted motion in two directions and can be moved in/out of the beam.
      k. Two prisms including five facet prism and four facet linear.
         1) Prism are index able, and continuously rotatable in both clockwise and counterclockwise directions.

2) Both prisms must be able to be inserted in the beam simultaneously. Fixtures that cannot insert two prisms into the beam simultaneously shall not be deemed acceptable.

6. The yoke arms must have collapsible, spring loaded, handles for fixture handling and manipulation.
7. Power supply, cooling and electronics shall be integral to each unit.
8. The unit shall ship with:
   a. 5' Neutrik True1 PowerCon™ to wire ferrule as standard
   b. Two (2) brackets that facilitate attaching standard brackets to the fixture base via ¼ turn thumb screws.

C. Optical
1. The light emitting diode engine shall produce 7000K white light within +/-400K out of the front lens of the luminaire
2. The light engine shall create color rendering at greater than 70 CRI
3. The fixture shall produce a maximum of 12,000 or greater field lumens while thermally stable and at full intensity. Luminaires that reach 12,000 lumens only by integrating sphere or total lumen testing shall not be deemed acceptable.
4. The unit shall provide, but not be limited to:
   a. Low gate and beam temperature
   b. Sharp imaging through a four-plane shutter design
   c. Sharp Imaging on all gobo Planes and Iris planes
5. The unit shall provide, but not be limited to:
   a. 3.8 through 55 degree field angles
   b. High-quality pattern imaging throughout zoom range
   c. Sharp shutter cuts without halation. Shutter systems that suffer from warping and burnout in normal use shall be deemed unacceptable.
      1) No more than 5% distortion curvature on framing blades when measured in the widest possible zoom with sharp edge framing shutters. Systems that have more than 5% curvature shall be deemed unacceptable.
6. Fixture shall have two diffusions, one light and one medium, and have an option for a third diffusion, heavy, to be added without removing either of the other two diffusion options.

D. Environmental and Agency Compliance
1. The fixture shall be ETL and cETL LISTED and/or CE rated, and shall be so labeled when delivered to the job site.
2. The fixture shall be ETL LISTED to the UL1573 standard for stage and studio use
3. The fixture shall be rated for IP-20 dry location use.
4. When the fixture is stationary, and at full intensity, the fixture may not produce noise in excess of 35 dBA. A fixture that produces noise in excess of 35 dBA when stationary and at full intensity shall be deemed unacceptable.
   a. At no time may the fixture produce noise in excess of 43.5 dBA.
      1) All dBA numbers above are tested in a test chamber with background noise level of 16.3 dBA.
5. Fixture shall have linear fan control that allows a user to select fan speed level. When this feature is active the luminaire may budget output as is necessary to maintain safe operating temperatures but may not change fan speed. Fixtures that do not have linear fan control in this manner shall be deemed unacceptable.

E. Thermal
1. Fixture shall be equipped with a heat pipe radiant cooling system.

2. The fixture shall utilize advanced thermal management systems to maintain LED life to an average of 70% intensity after 20,000 hours of use
    a. Fan speed will adjust automatically based on thermal management needs.
        1) Fixture will provide three fan speed modes that are selectable via DMX.
        2) Fixture will also provide a linear fan speed control channel.
    b. Thermal management shall include temperature sensors within the housing to include:
        1) LED array circuit board temperatures
    c. Fixture shall permit monitoring of temperature sensors via a legible LCD multi-line backlit display
    d. Fixtures that do not provide active thermal monitoring, fan speed controls, and current management of LED circuits shall not be acceptable.
3. The fixture shall operate in an ambient temperature range of 0°C (32°F) minimum, to 45° C (113°F) maximum ambient temperature. During times of storage, the fixture shall be stored in temperatures range of -20C (0°F) to 60C (140°F)
4. The fixture shall maintain .5 m (1.64 feet) distance from any flammable object
5. The fixture shall maintain a minimum of 2.0 m (6.56 feet) to any lighted object.

F. Electrical
1. The fixture shall be equipped with a 100V to 240V 50/60Hz auto-sensing internal power supply
    a. Fixture shall draw a maximum of 6.2 amps at 100V and 2.5 amps at 240 V.
2. The fixture shall support power in and thru operation
    a. Power in shall be via Neutrik® PowerCon™ True1 input connector
    b. Power thru shall be via Neutrik ® PowerCon ™ True1 output connector
3. The fixture requires power from a non-dimmer source
4. Power supply outputs shall have self-resetting current-limiting protection
5. Power supply shall have power factor correction greater than 0.95 from 100 VAC to 240 VAC.

G. LED Emitters
1. All LEDs used in the fixture shall be high brightness and proven quality from established and reputable LED manufacturers.
    a. YLX is the sole manufacturer of approved emitter engines.
2. Manufacturer of LED emitters shall utilize an advanced production LED binning process to maintain color consistency.
3. All LED fixtures (100% of each lot) shall undergo a minimum 12-hour burn-in and stress test during manufacturing.
4. LED system shall comply with all relevant patents
5. Fixtures shall have PWM frequency up to 16,000hz to avoid flicker on camera

H. Calibration
1. Fixture shall be calibrated at factory to achieve consistent color and intensity output between fixtures built at different times and/or from different LED lots or bins
    a. All arrays, including replacement arrays shall be calibrated to the same standard to ensure consistency.

I. Color
1. The fixture shall be available in specialized LED arrays as outlined below:
    a. Ultra-Bright 8000k white light engine
        1) White LED Engine calibrated and binned to achieve 8000k (+/- 400k).
            (a) Measured brightness of Ultra-Bright 8000k engine installed in luminaire shall be greater than 15,400 Lumens when tested in an integrating sphere.

2. Fixture must have a subtractive color mixing system utilizing six (6) dichroic color flags, controlled in pairs, to linearly subtract the following colors out of fixtures light output.
    a. Cyan, Magenta, Yellow
3. Fixture must have semi trapezoidal dichroic glass color segments on a single wheel that transmit the following colors. Dichroics are permanent and mounted in place via adhesive.
    a. Red, Green, Blue, Yellow, Purple
    b. TM-30
    c. Lavender
    d. Half CTO, Full CTO
    e. Dark Blue
4. Fixture shall have an electronic CTO that utilizes the CMY mixing system of the fixture to reduce CCT color temperature from fixtures native color temperature down to 2200 K

J. Dimming
1. The LED system shall use 16-bit DMX control techniques for high-resolution dimming.
2. Dimming curves shall be optimized for smooth dimming over longer timed fades.
3. The LED system shall be digitally driven using high-speed pulse width modulation (PWM)
4. LED control shall be compatible with broadcast equipment in the following ways:
    a. PWM control of LED levels shall be imperceptible to video cameras and related equipment

K. Control and User interface
1. Ethernet compatible with support for ANSI1.31 Streaming ACN and ArtNet protocols
2. Fixture must provide an internal ethernet switch that supports both active and passive data pass-through.
3. Fixtures shall be support protocol conversion from Ethernet to DMX output and also conversion from DMX input to Ethernet output.
4. The fixture shall be USITT DMX 512A-compatible via In and Thru 5-pin XLR connectors
5. The fixture shall be compatible with the ANSI RDM E1.20 standard
    a. All fixture functions shall be accessible via RDM protocol for modification from suitably equipped control console
    b. Temperature sensors within the luminaire shall be viewable in real time via RDM.
    c. Fixtures not offering RDM compatibility, feature set access or temperature monitoring via RDM shall not be compatible
6. The fixture shall be equipped with multi-line color LCD display for easy-to-read status reports and configuration changes.
    a. Display must have a feature to battery power the menu structure when the fixture is unplugged to allow fixture settings to be adjusted, including DMX.
7. The fixture shall be equipped with a six-button user-interface
8. The fixture may offer two DMX control profiles.
    a. Standard DMX Control Profile will have 48 channel control.
    b. Trifusion DMX Control Profile will have 48 channel control.

PART 3 CANTO USA PRODUCTS

3.1 CANTO ASTRO 600 FOLLOWSPOT

A. The basis of this design shall be the Canto Astro 600 LED follow spotlight, as marketed by CantoUSA.

B. Physical
1. The unit frame and enclosure shall be constructed of formed cold rolled steel and sturdy aluminum extrusions, free of burrs and protected by a black powder coat finish.
2. Handles shall be provided to facilitate smooth operation and to lift the unit.
3. The unit shall be mounted on a stable, folding three-point floor stand, with:
    a. Easy height adjustments,

b. Horizontal Swing Control Lever and
c. Vertical Tilt Control Lever

4. The Power Supply shall be integral to the followspot.
5. Weight of Head, including power supply, shall not exceed 54 pounds.
6. Length of head unit with color changing boomerang shall not exceed 41”.
7. A sliding panel shall provide access to lenses without the use of tools.
8. LED lamp house head must be of a modular design for servicing and be fully upgradeable to a higher output LED engine by the removal of 8 screws. **Any alternate fixture that does not comply with this requirement must be rejected.**

C. Controls
1. The Lamphouse shall as a minimum incorporate the following:
   a. Silent and adjustable fan cooling system;
2. The body of the unit shall, as minimum incorporate the following:
   a. Optical dimmer iris mechanism for smooth manual dimming;
   b. Optional Four shutters mounted on two planes, for both vertical and horizontal masking
   c. Drop-in Nichrome steel iris
   d. Drop-in Gobo Holder
   e. Zoom focus controls with calibrations silk screened on followspot body.
      1) With the iris fully open this followspot shall be capable of producing a continuous range of field angles from 10.6 degrees in spot to 19.2 degrees in flood.
      2) At any field angle the beam shall be adjustable between soft and sharp edges.
3. The front of the unit shall house a five color or six color, self-canceling boomerang with color filters

D. Optical
1. The unit’s optical train shall consist of
   a. Modular mounted LED 600 watt or higher LED engine, with the following features:
      1) 3,200K or 5600K color temperature;
      2) CRI greater than 82 in 3000K or 80 in 6000K;
      3) 25000 hour average life on LED engine.
      4) Upgradeable LED light engine.
   b. Fixed Optical Quality glass reflector and double condenser lens;
   c. Variable focus lens system utilizing Optical-quality glass;
   d. Iris/Gobo Holder, Shutters for beam shaping control;
   e. Optical slide dimmer Iris;
   f. Five or six color boomerang.
2. The zoom focus shall increase light intensity as it decreases the spot diameter.

E. Electrical
1. Lamp system input shall be 90-265 V.AC, 50/60 Hertz, single phase.
2. 0-100% dimming either by DMX input or handle mount potentiometer control.
3. Unit to have rear information panel.

F. Performance

The Field diameter at a 60 foot throw shall be continuously adjustable from 20.3 feet in Flood focus to 11.2 feet in Spot focus. With full iris the Field diameter in spot focus shall be less than 15”.

G. Furnish: (2) #K01607170 / 3000 or #K01607170 / 6000 Canto Astro LED followspots, complete with Iris, Gobo Holder, Color Changer, Stand and all necessary accessories

PART 4 EXECUTION

4.1 GENERAL

A. Install devices complete as indicated, and with accessories, equipment, materials, parts, attachments, devices, hardware, hangers, cables, supports, channels, frames, and brackets necessary to make a safe, complete, and fully operative installation.

B. Verify and provide devices that are appropriate for the mounting conditions of the project.

C. Reject and do not install blemished damaged or unsatisfactory devices. Replace imperfect or unsatisfactory devices, if installed, as directed by Architect.

D. Set devices, when installed, to be true, and free of light leaks, warps, dents, or other irregularities.

E. Provide finish for exposed parts as specified so indicated, provide a finish as directed by Lighting Designer and/ or Architect.

F. Mount devices at heights and locations indicated on the Contract Drawings, or as required by Lighting Designer and/ or Architect.

G. Upon completion of the installation, the lighting devices and lighting equipment shall be in first class operating order and free from defects in condition and finish. At time of final inspection, all devices and equipment shall be clean and complete as necessary for the function of the devices.

4.2 STANDARDS

A. All applicable requirements of The State of Tennessee shall govern work in this Specification.

B. All Equipment and work shall comply with NEC, NEMA, and ANSI codes and standards.

C. All Equipment shall be UL and/ or ETL listed. Proof of listing shall be provided upon request.

D. All Equipment shall be new, in the box or original factory packaging, with full factory warranty. Used or refurbished equipment is not allowed.

E. Catalog designations are referenced herein to ensure compatibility with other systems already specified for installation on this project. No alternate manufacturers will be accepted.

F. The Lighting Systems Integrator’s service representative shall be capable of responding to a service request within eight hours of notification.

G. Conduit and wiring which may be shown on drawings are for estimating purposes only. Actual work will depend on furnished product’s Manufacturer’s standards. It is the Electrical Contractor’s responsibility to ascertain Manufacturer's requirements prior to bidding. LSI shall assist as requested in providing this information. No claim or extra charge will be accepted for any variation from data shown on drawings or descriptions in specifications following award of Contract.

H. System rough-in wiring and installation shall be made according to Manufacturer's instructions and wiring diagrams. Any discrepancies between these requirements and Contract Drawings shall be brought to the attention of the Architect/Engineer.

4.3 WORKMANSHIP

A. The fabrication of all equipment shall incorporate only new and unused materials. This includes all metal components in various shapes required such as plate, bar, rod, castings, structural, stampings, forging, clamps, bolts, and all other accessories not mentioned.

B. The mechanical fabrication and workmanship shall incorporate neat and mechanically acceptable practices such as clean drilled and punched holes without flash; hand smooth finish for all sheared, machined, and cut edges; and proper fit of component and contiguous parts without irregularity where matching is intended. Welding shall meet qualifications of AWS D1, 1-81 and shall be without spatter and other evidence of poor practice. All bolts and rivets shall be sized and located in conformity with minimum acceptable standards as set forth in the Machinery's Handbook and all revisions to date.

C. All moving parts shall have acceptable tolerances, mountings, connections, and accessories coordinated into the system in a manner approved by the Architect.

D. No wood construction or equipment shall be incorporated into the system excepting as may be set forth in the specifications.

E. All electrical and electronic parts and components selected and installed shall be consistent with good practice and conservatively rated in their use in the circuit design.

F. Each piece of equipment shall meet accepted basic engineering standards.

G. All low voltage control wire runs shall be one continuous run. Splices are NOT permitted.

4.4 LIGHTING SYSTEMS INTEGRATOR SERVICES

A. The LSI shall examine the plans and specifications in detail to familiarize him or herself with the scope of work.

B. The LSI shall furnish all devices, accessories, and equipment specified herein and shown on the LX drawings and shall advise the installing Electrical Contractor on any required low-voltage (control) cabling or related conduit required for a complete and working system.

C. Provide a project manager to coordinate the construction schedule and other services listed in this Section.

D. The LSI shall coordinate with the installing Electrical Contractor the control wire conduit and device locations with the Electrical Contractor to ensure wiring paths meet the requirements of the lighting equipment manufacturers.

E. Upon completion of the installation, including testing of load circuits, the installing Electrical Contractor shall notify the LSI's Project Manager that the system is available for formal checkout by the dimming system manufacturer.

F. Notification shall be provided in writing, 21 days prior to the time factory- trained personnel are needed on the job site.

G. LSI shall provide the services of a qualified, factory authorized Field Service Technician employed by the Lighting Systems Integrator to check the installation prior to initial energization of the system. The Field Service Technician shall supervise initial turn-on and shall make or coordinate with the Contractor in making any required adjustments or trimming of components to enable the system to function as specified.

H. The LSI shall provide all low voltage system control devices. All such devices shall be terminated by LSI's Field Service Technician.

I. No power is to be applied to the dimming system prior to arrival of LSI / factory technicians onsite unless specifically authorized by written instructions from the LSI's Project Manager.

J. The installing Electrical Contractor shall be liable for any return visits by the factory engineer as a result of incomplete or incorrect wiring.

K. Installing Electrical Contractor shall provide time and manpower to verify that all lighting circuits are properly wired. For outlet boxes or other devices without a hard-wired fixture, testing shall be accomplished by successively moving a test fixture or other test unit provided by the Field Service Technician from receptacle to receptacle during the system startup and testing.

L. Upon completion of the formal check-out, the LSI/ factory engineer shall demonstrate operation and maintenance of the system to the Lighting Designer and Owner's representatives. Training session shall not exceed eight working hours in up to two sessions of not more than four hours each, or as specified herein.

M. Additional training shall be provided six months after the first training sessions upon request by Owner. This training session shall not exceed four working hours. Additional training shall be available upon request. Scheduling for training sessions shall be made in writing, 21 days prior to the time factory-trained personnel are needed on the job site.

N. Owner shall be permitted to video record training sessions at Owner's expense.

O. The Lighting Systems Integrator shall provide documentation of the power and lighting control system startup and three (3) copies of all system manuals, and system warranties. One (1) hard-copy and complete PDF on CD/ DVD shall be delivered to the Owner at the first training.

4.5 SCOPE MATRIX

A. The following matrix of responsibilities is intended to provide a guide for delineating the work between the Lighting Control Systems Integrator and the installing Electrical Contractor.

SCOPE OF CONTRACTORS WORK			
Scope of Work Item	**Integration Contractor**	**Electrical Contractor**	**Notes**
Mounting of dimming and equipment enclosures		X	
Provide power feeds to dimming and equipment racks		X	
Provision and pulling of low voltage wire		X	
Provision, pulling and termination of line voltage wire		X	
Termination of low voltage wire	X		
As submittal and as-builts of Theatrical System	X		
Two site visits for Theatrical / Architectural programming not to exceed one day each. Warranty visits are not considered site visits.	X		
Network and Low Voltage terminations to all Theatre devices. Equipment rack Cat5 terminations.	X		
Create DMX schedule and program for a base of operation.	X		

SCOPE OF CONTRACTORS WORK			
Scope of Work Item	**Integration Contractor**	**Electrical Contractor**	**Notes**
Installation of motorized rigging system	X		Coordinate with Electrical Contractor
Installation of plug boxes and FOH connector strips		X	Coordinate with Theatrical Contractor
System commissioning	X		
Fixture hang and focus	X		
Ladders, Lifts, access to all devices required for a complete and working installation		X	
Training for the rigging, theatrical LED fixtures, architectural system and theatre console.	X		Provide One Day of onsite training.

*Flush mount LCD control station backboxes furnished by LSI, installed by EC.

4.6 WORK NOT INCLUDED

A. The following work, although in other Sections, has significant impact on the scope of this work. The Lighting Systems Integrator shall assist with the coordination of the following.
   1. Lighting system low-voltage (data) cable conduit.
   2. Installation of low-voltage (control) cable.
   3. Structure and support infrastructure for staging lighting circuit strips and stage curtains.

4.7 ACCESSIBILITY

A. Install equipment such as junction and pull boxes, device housings, transformers, ballasts, power supplies, drivers, switches and controls, and other apparatus that shall be reached from time to time for operation and maintenance, to be easily accessible and appropriate for mounting and ceiling conditions.

4.8 SUPPORTS

A. Provide necessary hardware supports for devices that are adequate and safe to support the weight of the devices.

B. Provide visible hanging devices that are finished to match the device finish, unless indicated otherwise.

C. Provide attachment devices including brackets, cast metal shapes with the requisite rigidity and strength to maintain continuous alignment of installed devices.

D. Provide supporting members that are surface passivated, and which are primed or paint-dipped to resist corrosion.

E. Provide fastening devices of a positive locking type, which do not require special tools to apply or remove them. Do not use tie wires in place of fastening devices.

F. Contractor is responsible for the necessary suspension system; Contractor shall ascertain the structural reliability of supports provided under other Sections of the specification.

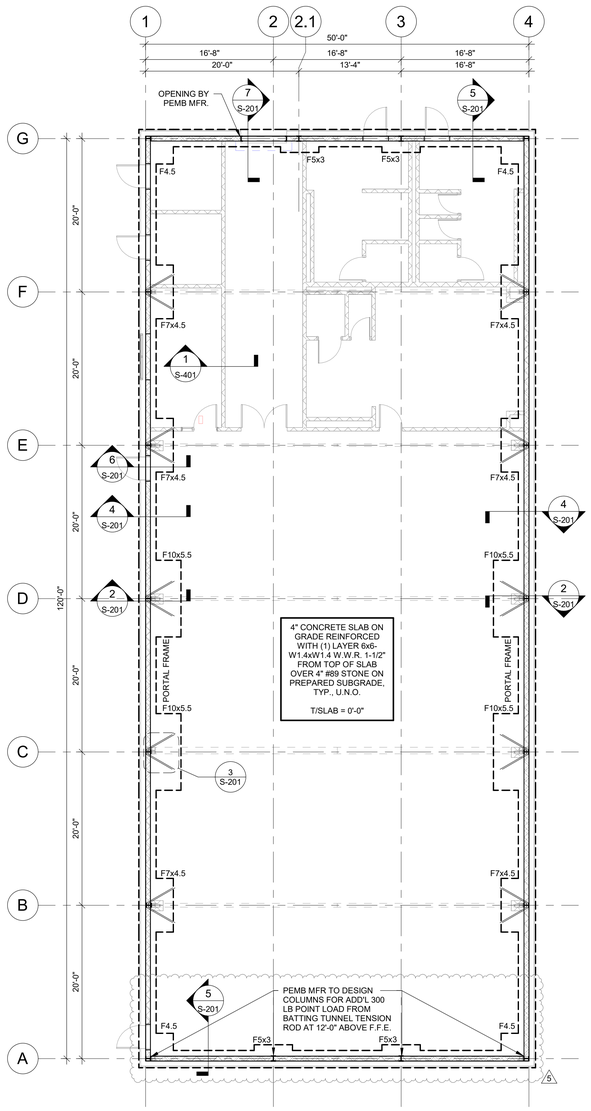
G. Provide surface mounted devices with required mounting devices and accessories. Uniformly maintain the device heights shown on the Contract Drawings or established in the field. The allowable tolerances in individual device mounting shall not exceed 1/4 inch and may not vary more than 1/2 inch from mounting height shown on the drawings. Install devices in continuous runs absolutely level, and in line with each other. Hanging devices shall comply with code requirements.

END OF SECTION 265560

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BATTING FACILITY FOUNDATION PLAN AND DETAILS
S-201
FOR BLUEBEAM LABELING/DOCR:

0"
1"



1 S-201 BATTING FACILITY FOUNDATION PLAN

SCALE: 1/8" = 1'-0"

FOUNDATION PLAN NOTES:

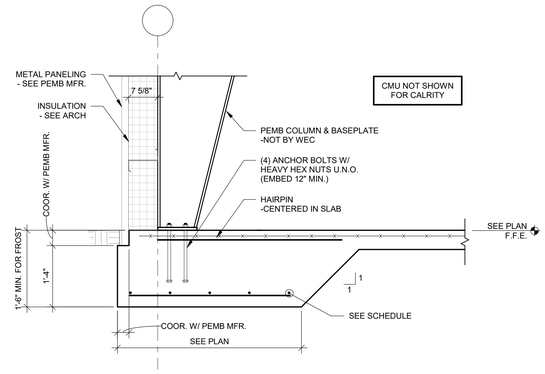
1. TOP OF ALL FOOTINGS SHALL BE AT FINISHED FLOOR, U.N.O.
2. REFER TO ARCH'L AND CIVIL DRAWINGS FOR LOCATION OF MOISTURE BARRIER, CURBS, EXTERIOR SLABS, DRAINAGE, RAMPS, STEPS, WALKS, ETC.
3. BUILDING SLAB IS NOT DESIGNED TO SUPPORT CRANE LOADS, CONCRETE MIXING TRUCKS, OR OTHER SPECIFIC CONSTRUCTION LOADINGS.
4. FOOTINGS SHALL BE CENTERED ON THE CENTERLINE OF THE WALL AND/OR COLUMNS, U.N.O.
5. COORDINATE LOCATION OF LOWERED FOOTINGS WITH PLUMBING DRAWINGS.
6. REFER TO ARCHITECTURAL PLANS FOR DIMENSIONS NOT SHOWN. COORDINATE SLAB ELEVATIONS AND SLOPES WITH ARCHITECTURAL PLANS.
7. REFER TO ARCHITECTURAL AND MEP DRAWINGS FOR SIZE AND LOCATION OF SLAB AND FOUNDATION PENETRATIONS.
8. THICKEN SLAB TO MAINTAIN THE SLAB THICKNESS AROUND FLOOR BOXES AND CONDUIT.

FOOTING SCHEDULE

MARK	LENGTH	WIDTH	THICKNESS	REINFORCEMENT
F4.5	4' - 6"	4' - 6"	1' - 6"	(6) #5 E.W.
F5x3	3' - 0"	5' - 0"	1' - 6"	(4) #5 LONG & (7) #5 SHORT
F7x4.5	4' - 6"	7' - 0"	1' - 6"	(6) #5 LONG & (9) #5 SHORT
F10x5.5	5' - 6"	10' - 0"	1' - 6"	(7) #5 LONG & (13) #5 SHORT

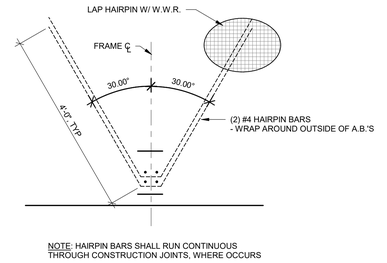
FOUNDATION SIZES ARE PRELIMINARY AND ARE SUBJECT TO CHANGE UPON RECEIPT OF REACTIONS FROM THE MBM.

TO ACCOUNT FOR ANY POTENTIAL UNREALIZED CONDITIONS, THE GENERAL CONTRACTOR SHALL PROVIDE AN ALLOWANCE FOR AN ADDITIONAL 30 CUBIC YARDS OF CONCRETE. ALLOWANCE SHALL INCLUDE/ACCOUNT FOR ALL COSTS FOR MATERIAL, FABRICATION, DELIVERY, LABOR FOR INSTALLATION/PLACEMENT, FORMWORK, ETC. REINFORCEMENT FOR CONCRETE SHALL ALSO BE INCLUDED AS PART OF ALLOWANCE AND SHALL BE ASSUMED TO BE 2% MINIMUM BY VOLUME. ANY UNUSED PORTION OF THE 30 CUBIC YARDS OF CONCRETE SHALL BE CREDITED BACK TO THE OWNER.



2 S-201 TYP. EXT. COLUMN FOOTING

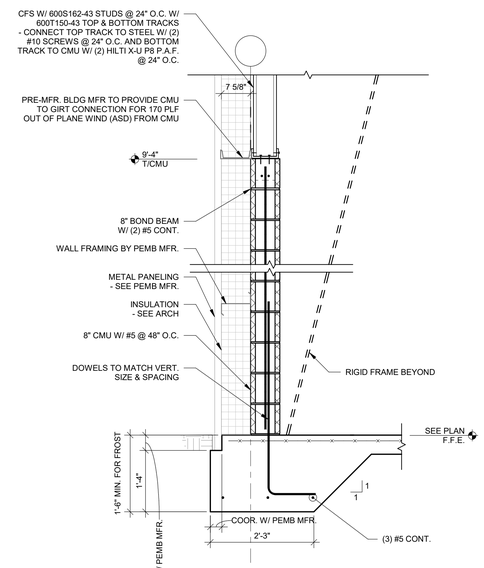
SCALE: 3/4" = 1'-0"



NOTE: HAIRPIN BARS SHALL RUN CONTINUOUS THROUGH CONSTRUCTION JOINTS, WHERE OCCURS

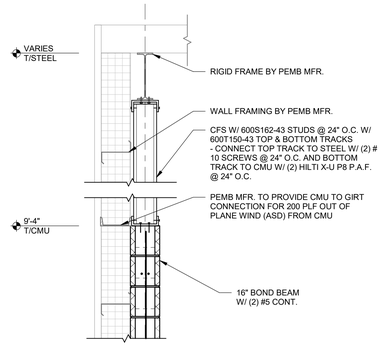
3 S-201 TYPICAL HAIRPIN DETAIL

SCALE: 3/4" = 1'-0"



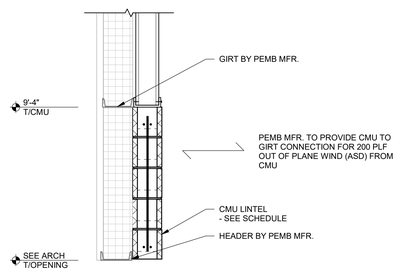
4 S-201 TYP. EXT. WALL @ CMU

SCALE: 3/4" = 1'-0"



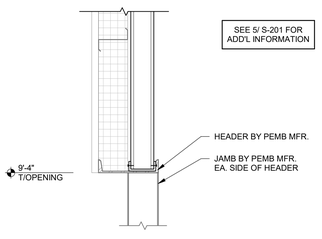
5 S-201 CMU WALL TO PEMB

SCALE: 3/4" = 1'-0"



6 S-201 SECTION AT CMU OPENINGS

SCALE: 3/4" = 1'-0"



7 S-201 SECTION AT OVERHEAD DOOR

SCALE: 3/4" = 1'-0"

Willett Engineering Company
Consulting Structural Engineers
3528 Habersham at Northlake
Tucker, Georgia 30084
Phone: (770) 270-9484
www.WillettEngineering.com

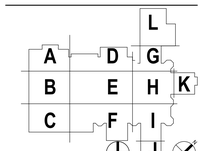
PBK
www.pbk.com
770.227.5473
GRIFFIN, GA

Whitewater High School Renovations

100 Wildcat Way
Fayetteville, GA 30215

CLIENT PROJECT NUMBER: 240477
Bid Set
AGENCY NAME: AGENCY NO

Fayette County Public Schools — Where Excellence and Creativity Merge



GEORGIA REGISTERED No. SE000538 STRUCTURAL ENGINEER BRANDON JOSEPH HOFFMAN

CLIENT	
Fayette County Schools	
DATE	PROJECT NUMBER
09/11/26	240477

DRAWING HISTORY

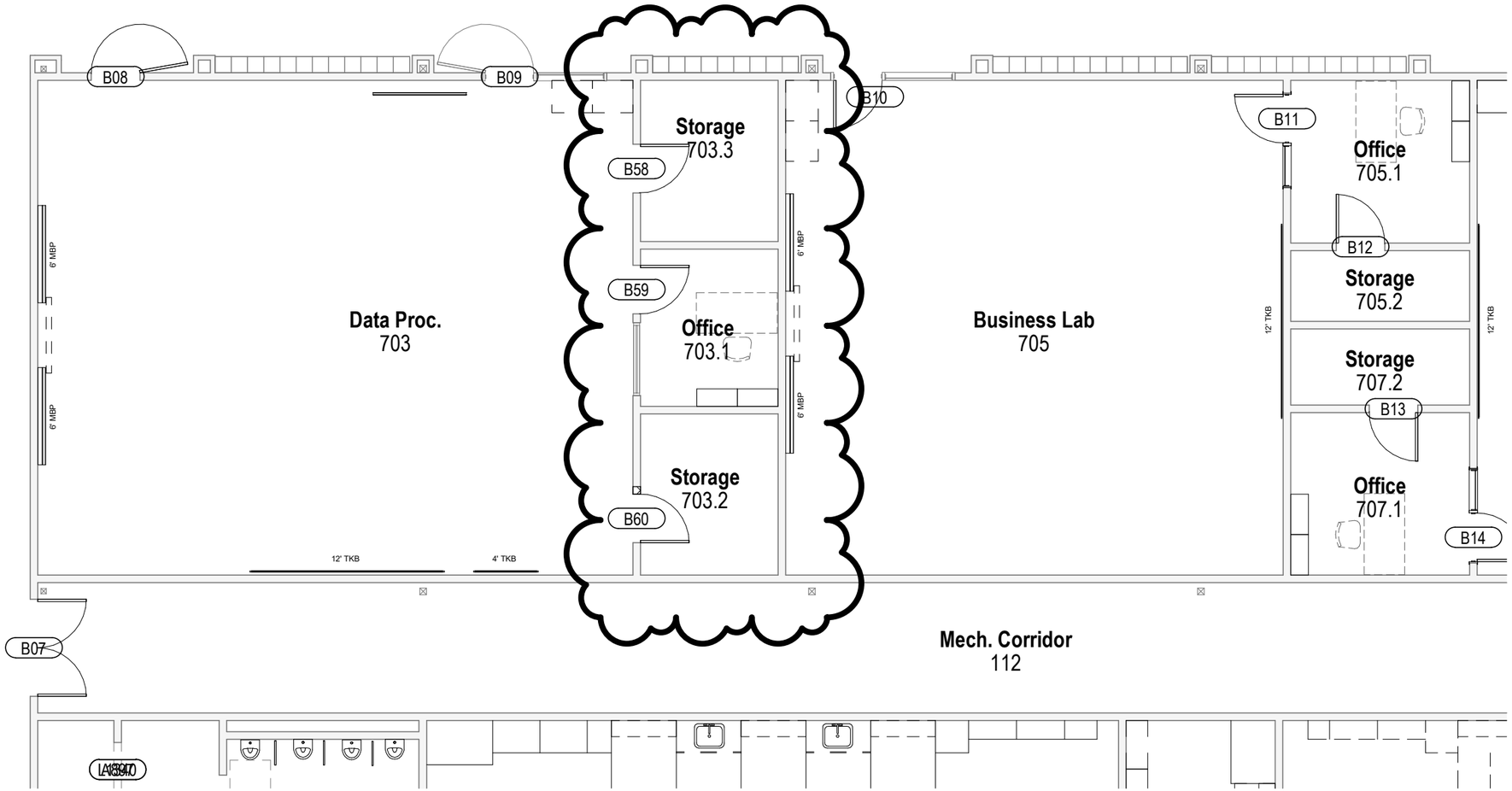
No.	Description	Date
5	ADDENDUM NO. 5	11-02-26

CHECKED BY: KAG
DRAWN BY: JEM

BATTING FACILITY FOUNDATION PLAN AND DETAILS

S-201

Plot Stamp:
10/30/2026 8:36:05 AM



1 LEVEL 1 - AREA B FLOOR PLAN

1/8" = 1'-0"

PBK

GRIFFIN
525 East Taylor Street
Griffin, GA, 30223
770-227-5473 P

SUGAR HILL
E Center at Sugar Hill
5019 West Broad St, Suite M207
Sugar Hill, GA 30518
770-227-5473 P

PROJECT:
Whitewater High School Renovations

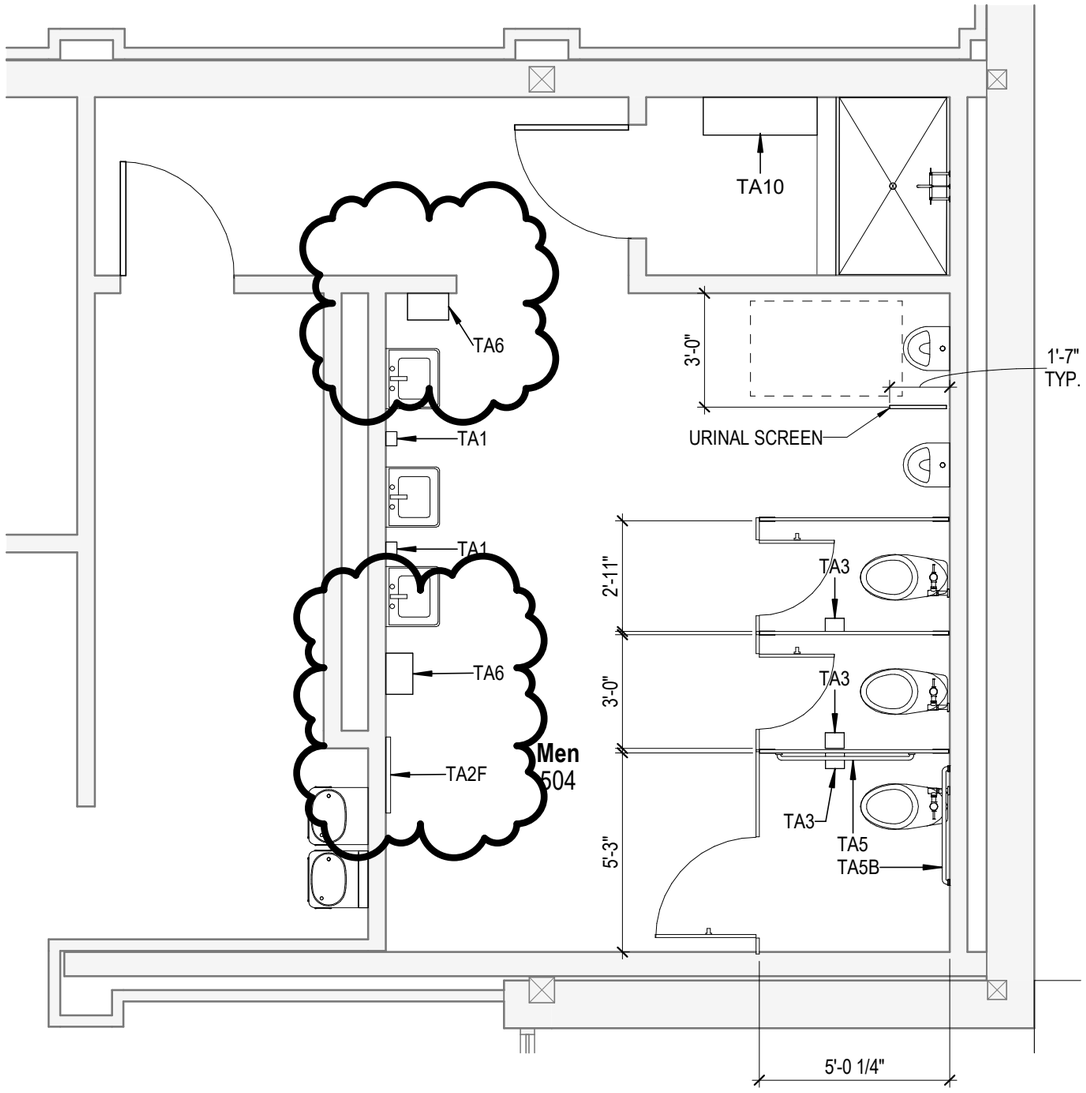
PROJECT No: 240477

Addendum No.5 -
11/02/2026

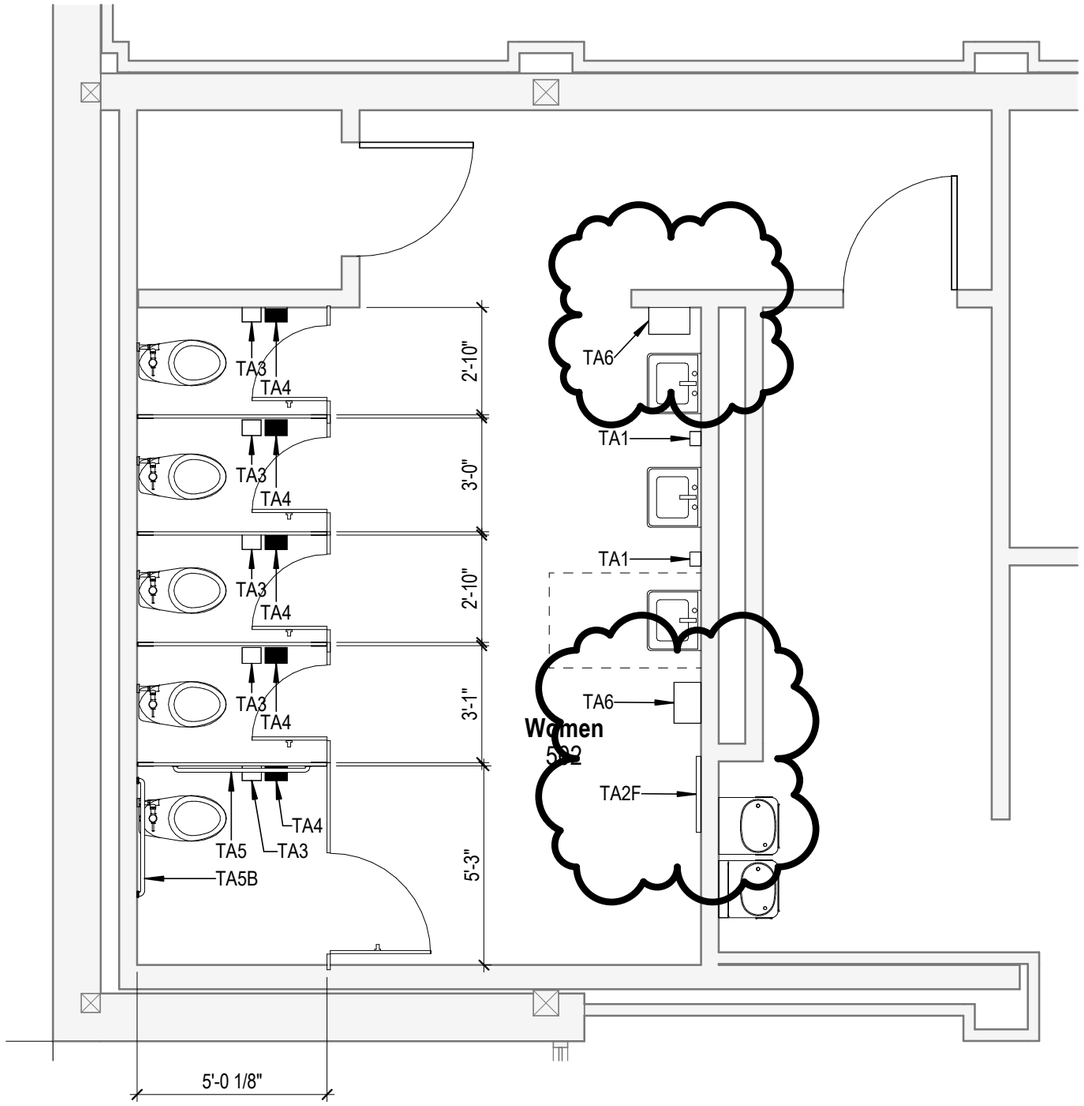
SCALE:
1/8" = 1'-0"

SKETCH NUMBER:
SDA-101B

STATE OF GEORGIA
BRETT R. McIVER
CERTIFICATE NO. RA 902
REGISTERED ARCHITECT



13 ENLARGED TOILET PLAN - SECTOR J
1/4" = 1'-0"



12 ENLARGED TOILET PLAN - SECTOR J
1/4" = 1'-0"

PBK
GRIFFIN
525 East Taylor Street
Griffin, GA, 30223
770-227-5473 P
SUGAR HILL
E Center at Sugar Hill
5019 West Broad St, Suite M207
Sugar Hill, GA 30518
770-227-5473 P

PROJECT:
Whitewater High School Renovations

PROJECT No: 240477

Addendum No.5 -
11/02/2026

SCALE:
1/4" = 1'-0"

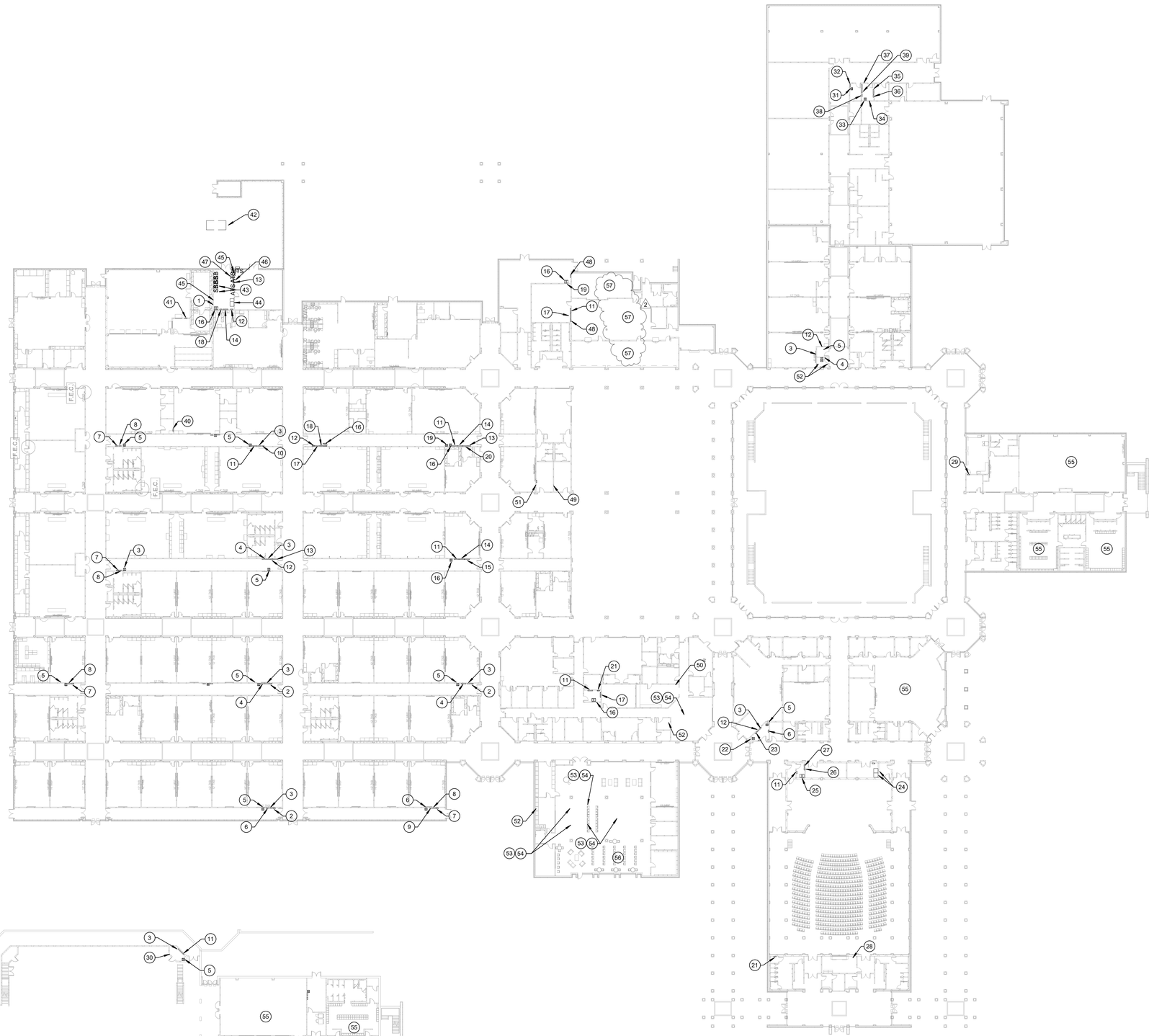
SKETCH NUMBER:
SDA-405

STATE OF GEORGIA
BRETT R. McIVER
CERTIFICATE NO. RA 9020
REGISTERED ARCHITECT

0"

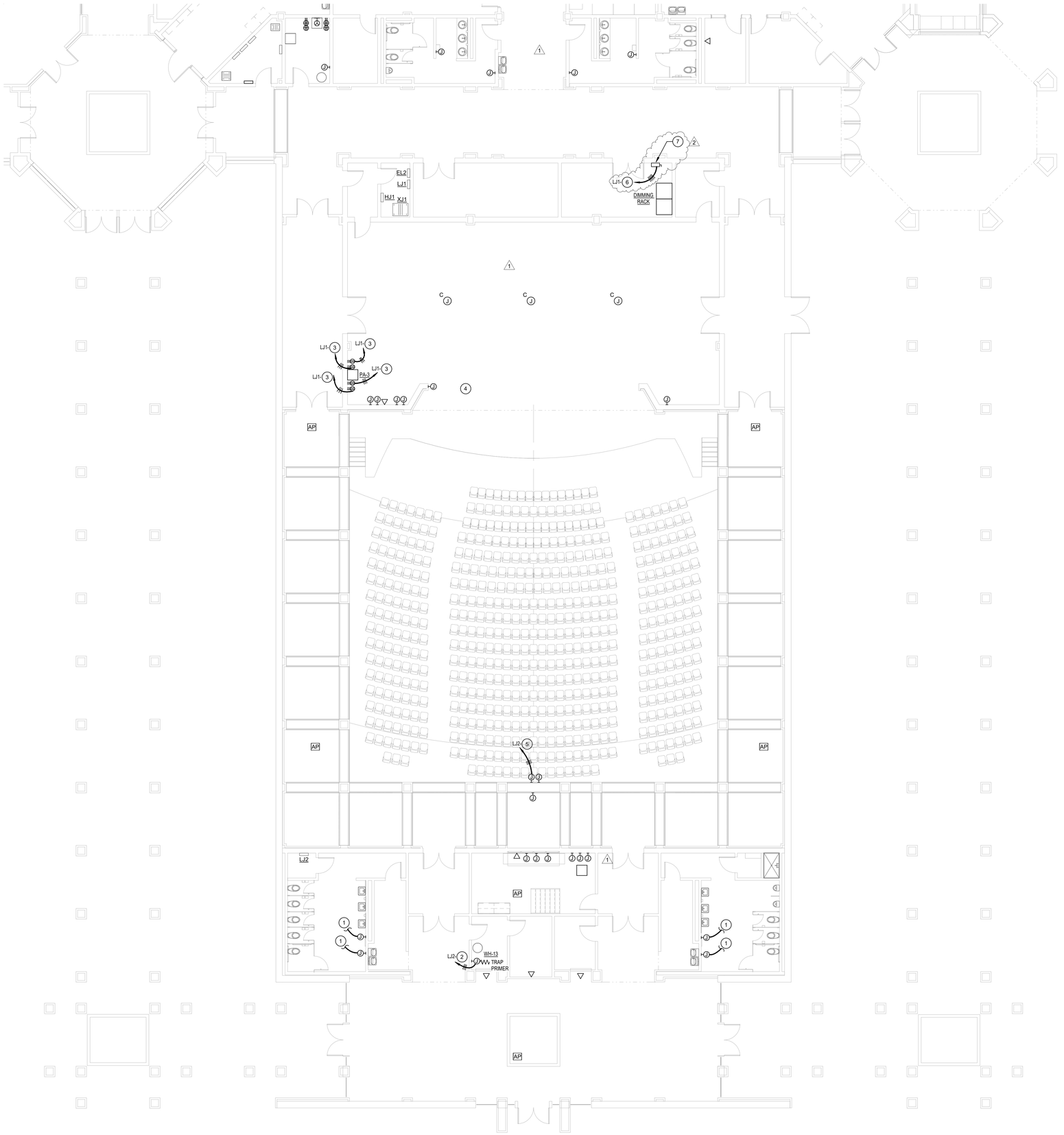
1"

OVERALL ELECTRICAL DEMOLITION PLAN
ED101
FOR BLUEBEAM LABELING/OCR:


SPARE
SPARE
SPARE

0"
1"

ELECTRICAL POWER LEVEL 1 - AREA J FLOOR PLAN
E-201J
FOR BLUEBEAM LABELING/DOOR:



ELECTRICAL NEW WORK POWER FLOOR PLAN - AREA J
SCALE: 1/8" = 1'-0"

GENERAL NOTES: (THIS SHEET ONLY)

A. ENSURE CONVENIENCE RECEPTACLES ARE NOT CASCADED ON THE "LOAD" SIDE OF GFCI DEVICES, UNLESS SPECIFICALLY NOTED OTHERWISE.

B. COORDINATE ALL MOUNTING HEIGHTS WITH FURNITURE AND ARCHITECTURAL PLANS PRIOR TO ROUGH-INS.

C. SEE MECHANICAL EQUIPMENT SCHEDULE FOR ELECTRICAL CONNECTIONS INFORMATION.

D. CONTRACTOR SHALL COORDINATE EXISTING PANELBOARD CIRCUITS, SPARES, AND SPACES DISCREPANCY WITH ENGINEER AND ARCHITECT PRIOR TO COMMENCEMENT OF WORK. CIRCUIT DESIGNATIONS AS SHOWN ON THIS DRAWINGS ARE BASED ON EXISTING DRAWINGS.

NOTES: (THIS SHEET ONLY)

1. RECONNECT NEW HAND DRY TO EXISTING CIRCUIT. MATCH EXISTING CONDUCTORS AND CONDUIT TO EXTEND AS REQUIRED.
2. CONNECT TO EXISTING PANEL INDICATED. PROVIDE A 20A/1P, 10kAIC, CIRCUIT BREAKER. UTILIZE 2 #12, #12G CONDUCTORS IN 1/2" CONDUIT FOR THIS CIRCUIT. MAKE ALL CONNECTIONS.
3. CONNECT TO EXISTING PANEL INDICATED. PROVIDE A 20A/1P, 10kAIC, CIRCUIT BREAKER. UTILIZE 2 #12, #12G CONDUCTORS IN 1/2" CONDUIT FOR THIS CIRCUIT. MAKE ALL CONNECTIONS. REARRANGE EXISTING BREAKERS IN PANELBOARD TO ALLOW FOR ALL FOUR AUDITORIUM RACK CIRCUITS TO BE ON THE SAME PHASE LEG. UPDATE PANELBOARD SCHEDULE ACCORDINGLY.
4. APPROXIMATE LOCATION OF EXISTING TO BE REPLACED PROJECTION SCREEN. COORDINATE DISCONNECT RECONNECT WITH MANUFACTURER INSTALLATION INSTRUCTIONS.
5. CONNECT TO EXISTING PANEL INDICATED. PROVIDE A 20A/1P, 10kAIC, CIRCUIT BREAKER. UTILIZE 2 #10, #10G CONDUCTORS IN 1/2" CONDUIT FOR THIS CIRCUIT. MAKE ALL CONNECTIONS.
6. CONNECT TO EXISTING PANEL INDICATED. PROVIDE A 200A/3P, 10kAIC, CIRCUIT BREAKER. UTILIZE 4#3/0, #6G CONDUCTORS IN 2-1/2" CONDUIT FOR THIS CIRCUIT. MAKE ALL CONNECTIONS. UPDATE PANELBOARD SCHEDULE ACCORDINGLY.
7. PROVIDE 200A/3P/NEMA 1 DISCONNECT FOR AUDITORIUM LIGHTING RELAY PANEL.

PBK
www.pbk.com
770.227.5473
GRIFFIN, GA

AH&P CONSULTING ENGINEERS
ANDREWS, HAMMOCK & POWELL, INC.
250 Charter Lane
Suite 100
MACON, GEORGIA 31210
MACON (478) 405-8301
FAX (478) 405-8210
WWW.AHPENGR.COM

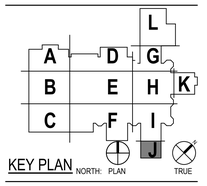
Whitewater High School Renovations

100 Wildcat Way
Fayetteville, GA 30215

CLIENT PROJECT NUMBER: 240477

Bid Set

When Excellence and Creativity Merge



GEORGIA REGISTERED No. 17029 PROFESSIONAL ENGINEER JAMES A. ANDREWS, JR.

CLIENT	
FAYETTE COUNTY SCHOOLS	
DATE: 09/11/2026	PROJECT NUMBER: 20170081

DRAWING HISTORY

No.	Description	Date
1	ADDENDUM #4	10/21/2026
2	ADDENDUM #5	10/30/2023

CHECKED BY: NHO

DRAWN BY: CTS

ELECTRICAL POWER LEVEL 1 - AREA J FLOOR PLAN

E-201J

Plot Stamp:
10/28/2026 11:43:01 AM

ELECTRICAL STAGE LIGHTING RISE DIAGRAM
E-502
FOR BLUEBEAM LABELING/OCR:

CONTROL WIRING LEGEND	
UV	(1) TMB PCLP2PT (UNISON LON OR ECHO BUS WITH OPTIONAL AUX POWER)
DMX	(1) TMB PC244T (DMX)
NET	(1) BELDEN #1583A (ETCNet - Cat5e)
NG	(1) BELDEN #1583A + (1) #14 AWG GND WIRE (ETCNet with GROUND- Cat5e)
BS	(1) BELDEN 8489 (BLUESSYSTEM CTRL+PWR+GND)
P	(2) #16 AWG. STRANDED WIRES (PANIC)

NOTES

1.) ALL CONTROL WIRING IS PROVIDED BY EC UNLESS NOTED OTHERWISE.

2.) ALL ETCNet RUNS SHALL BE CONTINUOUS, UNSPLICED RUNS LESS THAN 300' (90M). ALL NETWORK CONNECTIONS TO BE TIA/EIA 568B.

3.) TOTAL COMBINED LENGTH OF UNISON/ECHO WIRING RUNS CANNOT EXCEED 1640' (500M). UNISON MAY BE HOMERUN, STAR, "T", OR DAISY CHAINED.

4.) DMX IN/OUT PLUG LOCATIONS SHALL BE CONTINUOUS, UNSPLICED RUNS LESS THAN 1640' (500M).

SESCO LIGHTING

ELECTRICAL SYSTEMS ASSOCIATED WITH THE LIGHTING CONTROL SYSTEM HEREIN ARE FOR *REPRESENTATION ONLY.*
ELECTRICAL POWER DISTRIBUTION MUST BE SPECIFIED AND DIRECTED BY THE ELECTRICAL ENGINEER OF RECORD FOR THIS PROJECT. IF THERE IS NO ENGINEER, RESPONSIBILITY FALLS TO THE ELECTRICAL CONTRACTOR.

PLATES TO BE MOUNTED IN FLOOR POCKETS - FLOOR POCKETS TO BE PROVIDED BY AV CONTRACTOR

DMX OUT PLUG-IN → OUTLET PLATE 9801AD FLOOR POCKET → CIRCUIT 42
DMX OUT PLUG-IN → OUTLET PLATE 9801AD FLOOR POCKET → CIRCUIT 43
DMX OUT PLUG-IN → OUTLET PLATE 9801AD FLOOR POCKET → CIRCUIT 44
DMX OUT PLUG-IN → OUTLET PLATE 9801AD FLOOR POCKET → CIRCUIT 45

DMX OUT PLUG-IN → OUTLET PLATE 9801AD FLOOR POCKET → CIRCUIT 38
DMX OUT PLUG-IN → OUTLET PLATE 9801AD FLOOR POCKET → CIRCUIT 39
DMX OUT PLUG-IN → OUTLET PLATE 9801AD FLOOR POCKET → CIRCUIT 40
DMX OUT PLUG-IN → OUTLET PLATE 9801AD FLOOR POCKET → CIRCUIT 41

DMX OUT PLUG-IN → PIGTAIL BOX 9302A/1 CATWALK → CIRCUIT 7
DMX OUT PLUG-IN → PIGTAIL BOX 9302A/1 CATWALK → CIRCUIT 8
DMX OUT PLUG-IN → PIGTAIL BOX 9302A/1 CATWALK → CIRCUIT 9
DMX OUT PLUG-IN → PIGTAIL BOX 9302A/1 CATWALK → CIRCUIT 10
DMX OUT PLUG-IN → PIGTAIL BOX 9302A/1 CATWALK → CIRCUIT 11
DMX OUT PLUG-IN → OUTLET BOX 9102AD/1 REAR WALL → CIRCUIT 36
DMX OUT PLUG-IN → OUTLET BOX 9102AD/1 REAR WALL → CIRCUIT 37

DMX → FOH HOIST - CONNECTOR STRIP CM56-(18AP/6)(2X/2) → CIRCUITS 1-6
DMX → ELECTRIC 1 - CONNECTOR STRIP 9948-(18AP/6)(2X/2) → CIRCUITS 12-17
DMX → ELECTRIC 2 - CONNECTOR STRIP 9948-(18AP/6)(2X/2) → CIRCUITS 18-23
DMX → ELECTRIC 3 - CONNECTOR STRIP 9948-(18AP/6)(2X/2) → CIRCUITS 24-29
DMX → ELECTRIC 4 - CONNECTOR STRIP 9948-(18AP/6)(2X/2) → CIRCUITS 30-35

TO NORMAL DMX CONTROLLED HOUSE LIGHTS. MAX 10 HOME RUNS. MAX 32 FIXTURES PER RUN.

EQUIPMENT RACK - 16U
- UNISON ERo2-RM ARCHITECTURAL CONTROL UNIT — 1 - P-ACP3, 1 - P-SPM-E
- CISCO 28-PORT SWITCH WITH PoE
- BRUSH PANEL 1U
- 24-PORT PATCH PANEL
- RESPONSE 8-PORT GATEWAY (DUAL)
- RESPONSE 8-PORT GATEWAY (DUAL)
- BLUESSYSTEM 6-ZONE POWER SUPPLY
- RESPONSE 8-PORT GATEWAY (SINGLE)
- UNINTERRUPTIBLE POWER SUPPLY

1Ø, 2 WIRE + GND 120V / 60 Hz 20A MAX. (BY EC)

SENSOR IG48 — 40 - 1 POLE BREAKERS; 1 - DOOR - SURFACE; 1 - IG-UC; 1 - IG-NP

3Ø, 4 WIRE + GND 120 / 208 VAC 400A MAX. 60Hz (BY EC)

ECHO RELAY PANEL — 24 20A 1P RELAYS; 1 - DOOR - SURFACE; 1 - ERP-UID

3Ø, 4 WIRE + GND 120 / 208 VAC 200A MAX. 60Hz (BY EC)

EMERGENCY - ONE SC1008 PER EMERGENCY CIRCUIT. QTY TBD

SC1008 BCELTS

** 2 OR 3 WIRE 20A MAX. NORMAL/SENSE FEED TO ENGINEER SPECIFIED POWER SOURCE (BY EC)
1Ø, 2 WIRE + GND 120-277V / 60Hz 20A MAX. EMERGENCY POWER FEED (BY EC)
1Ø, 2 WIRE + GND 120-277V / 60Hz 20A MAX. NORMAL EMERGENCY TO LOAD (BY EC)

** If the normal power source is dimmed or switched 3 wires minimum need to be pulled to accommodate the normal source and constant feed (Normal [Hot], Neutral, Sense [Hot])

24 CIRCUITS TO DMX HOUSE LIGHTS.
0-10V CONTROL OPTIONAL FOR WORK LIGHTS.

TO NORMAL / EMERGENCY DMX CONTROLLED HOUSE LIGHTS. MAX 6 HOME RUNS. MAX 32 FIXTURES PER RUN.

DEBC-6 — 1Ø, 2 WIRE + GND NORMAL/EMERGENCY FEED 100-277VAC 50/60Hz 20A MAX. (BY OTHERS)

EBDK — PANIC DEVICE

OPTIONAL 2-WIRE PANIC INPUT FROM FIRE ALARM (BY OTHERS)

4-WIRE 20A MAX. SENSE FEED TO ENGINEER SPECIFIED NORMAL POWER SOURCE (BY EC)

ETCPAD

WAP-POE WIRELESS ACCESS POINT — 25' NET CABLE — NET PLUG-IN — NET

NETNET PLUG-IN — NET — NET

25' NET CABLE

24" WIDESCREEN LCD MONITOR

24" WIDESCREEN LCD MONITOR

ION Xe 20 12K CONTROL CONSOLE

DMXNET PLUG-IN — DMX — NET

DMXNET PLUG-IN — DMX — NET

P-TS7-WM PARADIGM 7" TOUCHSCREEN — NG

P-TS7-WM PARADIGM 7" TOUCHSCREEN — NG

PARADIGM P1004 — UV — LOBBY
PARADIGM P1004 — UV — LOBBY
PARADIGM P1004 — UV — TICKET BOOTH
PARADIGM P1004 — UV — BACK STAGE
PARADIGM P1004 — UV — BACK STAGE
PARADIGM P1004 — UV — VESTIBULE
PARADIGM P1004 — UV — VESTIBULE

BLUEDOME LED — BS — P — STAGE RIGHT
BLUEDOME LED — BS — P — STAGE LEFT
BLUEDOME LED — BS — P — SPIRAL STAIR
REQUIRES CUSTOM MOUNTING PLATE
BLUEDOME LED — BS — P — APRON STAIR
BLUEDOME LED — BS — P — FOH CATWALK
BLUEDOME LED — BS — P — OVERSTAGE CATWALK

NOTE: BLUES SYSTEM MAX 10 FIXTURES PER HOME RUN

PROJECT:	WHITE WATER HIGH SCHOOL FAYETTE COUNTY, GA
ARCHITECT:	
ENGINEER:	
DESIGNER:	
INTEGRATOR:	

REV:	DESCRIPTION:	DATE:	BY:
OG	PRELIMINARY DESIGN	7/6/2026	ARP

DRAWN BY: A. PITTMAN CHECKED BY:

SESCO LIGHTING
5100 Peachtree Industrial Blvd.
Peachtree Corners, GA 30071
Tel: (770) 449-7045
www.sescolighting.com

DESCRIPTION:
LIGHTING CONTROLS RISER

PAGE:

PBK
AH&P CONSULTING ENGINEERS
ANDREWS, HAMMOCK & POWELL, INC.
250 Charter Lane
Suite 100
MACON, GEORGIA 31210
MACON (478) 405-8301
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Whitewater High School Renovations
100 Wildcat Way
Fayetteville, GA 30215

CLIENT PROJECT NUMBER: 240477

Bid Set

FAYETTE COUNTY PUBLIC SCHOOLS — Where Excellence and Creativity Merge

KEY PLAN — NORTH: PLAN / TRUE

GEORGIA REGISTERED PROFESSIONAL ENGINEER — JAMES A. ANDREWS, II

CLIENT	
FAYETTE COUNTY SCHOOLS	
DATE: 09/11/2026	PROJECT NUMBER: 20170081

DRAWING HISTORY

No.	Description	Date
1	ADDENDUM #4	10/21/2026
2	ADDENDUM #5	10/30/2023

CHECKED BY: NHO
DRAWN BY: CTS

ELECTRICAL STAGE LIGHTING RISE DIAGRAM

E-502

Plot Stamp:
10/28/2026 11:43:02 AM